

**EXPERIMENTAL STUDY OF THE BEHAVIOUR OF A 10Ah
SODIUM SULPHUR BATTERY (NaS) CELL**

By

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The candidate confirms that the work submitted is his/her own, except where work which has formed part of jointly authored publications has been included. The contribution of the candidate and the other authors to this work has been explicitly indicated below. The candidate confirms that appropriate credit has been given within the thesis where reference has been made to the work of others.

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Abstract

Sodium sulphur batteries (NaS) are ideally suited to constant temperature energy storage because they have a good high energy density, it is one of the main batteries used for energy storage in medium to large scale storage. There has been a surge in the popularity of NaS batteries also known as molten metal battery in recent years owing to their high specific energy density capacity and long-life cycle in energy storage.

This research is centred on a feasibility study of an electrical energy storage receiver / solar parabolic trough collector developed at the University of Leeds. The receiver is a heat collecting device with integrated thermal storage of NaS batteries. This research is looking at the battery cell at how the cope with hybridization in a renewable system with solar thermal. The work is on the heat treatment to the battery cell from room temperature to 360°C and was undertaken in collaboration with and at the request of the company Ionotec Ltd who provided the batteries for the research, presently the current literature only refers to experimentation when the cell is at operational temperature, this work is looking at taking the battery cell up from room temperature to operating temperature, charge, and discharge.

This thesis presents a background into energy storage and the reason for incorporating renewable energy into the energy generation mix. Also presented is a brief overview of two types of energy storage technologies and battery charging methods. In addition, presented is a summary of work done in preparation for experimental work and recommissioning of the rig.

The stand-alone system consisting of the sodium sulphur cell and a furnace was constructed. The system was designed to fit the test parameters developed for the experiments. An automated monitoring system was developed based on the initial system with LabView. Heating trials and charging and discharging of the sodium sulphur cell were conducted using the stand-alone system and results were obtained. The system was tested and validated to the results. Three Heating rates of 1°C/min, 2°C/min and 3°C/min of the NaS cell was developed and experimented at successfully. At all three rates at operating temperature, they showed an open circuit voltage indicating a fully functioning cell.

Findings were subsequently analysed, and conclusions drawn. Recommendations based in the findings were made regarding prospective improvements to the system.

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OVERVIEW OF THIS THESIS

1.1 Introduction

Energy is a vital part of modern living but the cost of producing it and all its environmental implications to the world has proved problematic. Globally there is a move towards the reduction of greenhouse gas emissions in the bid to mitigating climate change. According to the International Energy Agency (IEA), the demand for energy globally by 2035 will have increased significantly from what it was in 2011 and with it an increase of 20% in the Energy-related CO₂ emissions(IEA, 2013; Xu et al., 2016).

Also, in Figure 1-1, the IEA in 2016 further illustrated the rise in energy demand and CO₂ emissions and also the rise in Purchasing power parity (PPP), which is an economic theory that measures and compares prices in different countries currency. Bearing this in mind, having a greater mix of renewable energy is more prevalent today than as ever, which is why of recent both nationally and internationally there has been a shift to incorporate a greater mix of clean and efficient fuels from renewable sources (Kousksou et al., 2014). Currently, Solar Photo-Voltaic (PV) and wind are said to be the fastest-growing electricity-generating source globally (IEA, 2017)

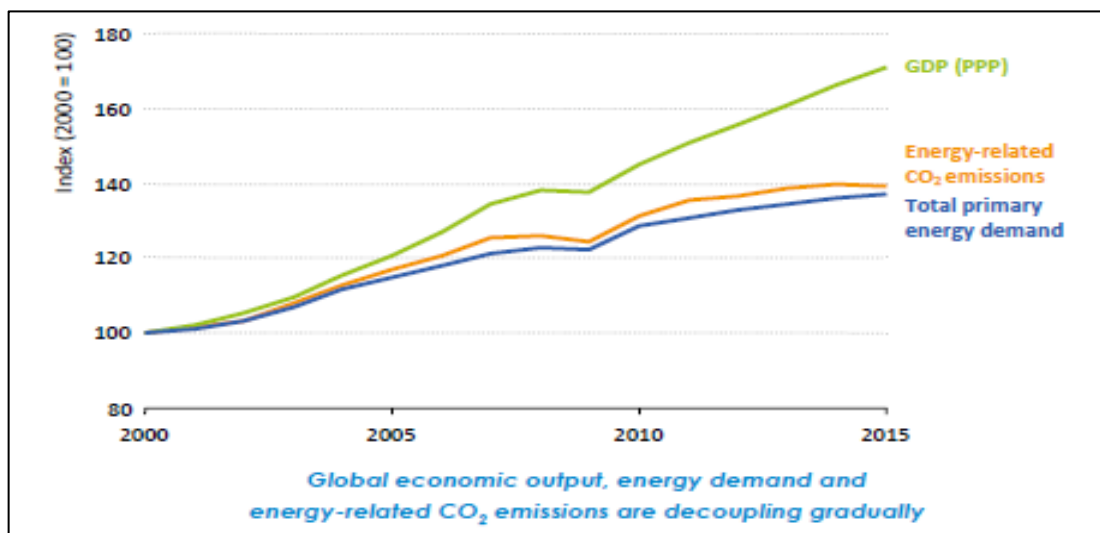


Figure 1-1: Rise in energy demand and CO₂ emissions. Source (IEA, 2016)

Electricity once generated if not used or stored goes to the ground. Globally electricity is one of the largest forms of energy use and the storage of it has also been a vital part, but with all the development strides in the generation of electricity, especially with respect to renewable energy, the method of its storage has lagged behind.

Energy storage is the focal point of this research because the option of incorporating it into renewable energy poses the possibility of mitigating various environmental concerns and stabilizing the intermittences of power generation from a renewable energy source.

This research is going to be centred on experimentation with Sodium Sulphur battery (NaS), and its feasibility in hybridisation with concentrated solar power

There have been a number of studies done on each field respectively, with concentrated solar power being a tried and tested form of electricity generation and sodium sulphur battery a major contributor to electrical storage in wind energy. Their application together in terms of exploring the possibility of incorporating an electrical energy storage system NaS to complement the operations of a Solar Parabolic Trough Collector (PTC), requires further research.

1.2 Research background

Energy generation from concentrated solar power has naturally lent towards energy storage, especially in the form of thermal storage. Sodium Sulphur batteries because of their high energy density are being installed for electrical energy storage applications in wind and Photovoltaic plants around the world (NGK, 2017; Aneke and Wang, 2016). The awareness of their application for grid support, delivering power outputs in the megawatt for the time duration of 6-8 hours attracted the interest in these battery systems, as this was roughly the same as the average power supply of a PTC plant thermal energy storage system (Chung et al., 2004; Fernández-García et al., 2010). Also, a bonus was the fact that the NaS batteries were thermal batteries and had a similar operating temperature range of 300 – 400°C of a PTC power plant (Nation, 2013). The NaS batteries must be in a molten state for it to be operational, hence the need for high temperatures.

The similarities in their operating temperature suggested a possibility of using the Heat Transfer Fluid (HTF) from the solar field to heat the NaS batteries, which was a totally different process to the typical method of heating batteries in a module, sand-filled and fitted out with an electrical heater and a temperature control system. Also, it became clear that the cylindrical shape of the NaS cells enables them to be readily fitted into a standard PTC receiver tube for heating (Nation et al., 2017).

To this end, a research was started at the University of Leeds in collaboration with Ionotec Ltd, the aim of the research was the design and modelling of an Electrical Energy Storage receiver and to aid the implementation of this concept, a heating rig was designed for experimentation. The objective was to test and to discover how

various key aspects of a conceptual NaS battery-based electrical energy storage approach by simulation and experimentation would complement the operation of existing thermal storage of current PTC power plants. Owing to various constraints which will be detailed below, work was limited to the design and construction of the concept.

The pivotal point of the original work outlined the conceptualisation, mathematical models to simulate solar energy conversion and heat transfer and design of a novel Electrical Energy Storage (EES) receiver, which could be used in solar parabolic trough collector power plants. Modelling of the EES receiver operation was accomplished using “a system of ten steady-state algebraic equations and two transient partial differential temperature-dependent equations” (Nation, 2013; Nation et al., 2017).

Nation in 2013 deployed extensive mathematical modelling and simulation in the research conducted to investigate the integration of sodium sulphur batteries within a parabolic trough collector (PTC). The result of the integration of sodium sulphur cells was the alteration of the interior of the thermal receiver tube to incorporate the NaS cells within it (tube), even as it was surrounded by the heat transfer fluid (HTF) that would, in turn, heat the cell to its operating temperature of 350°C.

Nation in 2013 utilized the Forristall model (Forristall, 2003) of the heat transfer that occurred within the conceptual integrated PTC as well as conducted extensive mathematical modelling. The efficiency of heat gain and loss of the heat transfer fluid at various points within the tube, as well as the heat transfer efficiency, was what the modelling program calculated. Finally, an experimental model was built to test the concept with 10 HP4 sodium sulphur batteries cells by Ionotec Ltd connected together and integrated into (a) collector tube that operated with Therminol 66 synthetic oil as the heat transfer fluid. By utilizing a heat pump that would heat the HTF to the operating 350°C temperature of the battery cells, the integrated receiver was built to be tested as indoor heating which would simulate the solar heating of a solar thermal system. Although the medium of a suitable high-temperature heat pump could not be obtained as time constraints did not permit, a simple central heating pump was deployed to heat the experimental prototype to 120°C. Although the aim was to heat the NaS batteries to the point of its operating temperature. Since the heating pump could not reach the operational temperature of the battery, when the experimentation began, the heating of the HTF was far too rapid and could not be controlled. The resultant effect was damage to the sodium sulphur battery. Time constraints also did not allow for Nation to investigate the cause of the failure. The

upshot of this was that the research was then focused on the mathematical modelling and simulation of the charging and discharging of the EES integrated with parabolic trough.

A crucial factor to successfully incorporate a sodium sulphur battery with a parabolic trough collector is the analysis of the heat transfer that occurs between the heat transfer fluid, and the sodium sulphur battery cell, which was the focus of this thesis. The sodium sulphur cross-sectional diagram in Figure 1-2 shows the various components within the battery module, of which the main components are the sodium and sulphur electrodes.

In keeping with the discharge process of NaS batteries being exothermic, Nation's analysis found that the NaS battery powering 50 MWe plant was supported fully for 4 hours only relying upon the heat released upon the discharge of the cells. However, 4 hours is not sufficient to sustain the battery over the period in which there is no available solar thermal heating. Therefore, this points to the need for a temperature control system. The critical cycles times of charge times, discharge, and maintenance of the batteries operating temperatures should therefore be strategized efficiently.

The EES receiver is basically a heat gathering component with electrochemical storage built in. The idea of the EES receiver concept was the hybridisation of sodium sulphur battery and PTC Technologies. This, if implemented, could in the future enable PTC power plants to operate for the entire day with solar power only, thereby at the same time providing substantial auxiliary power benefits. Below in *Figure 1-2* is a schematic of (a) the cross-section of a standard receiver tube and (b) a conceptual EES receiver tube (Nation, 2013; Nation et al., 2017).

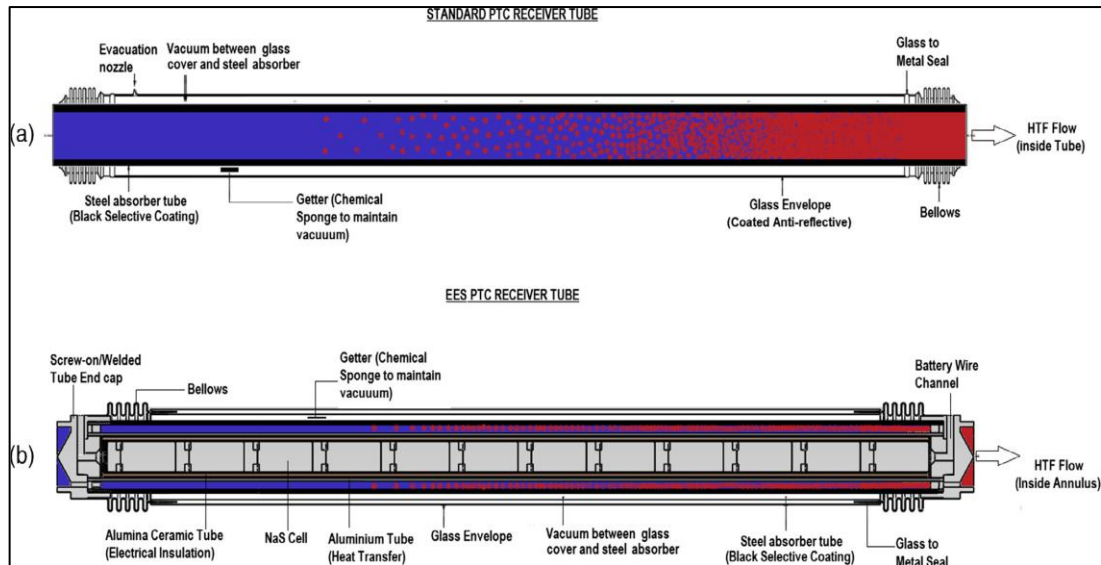
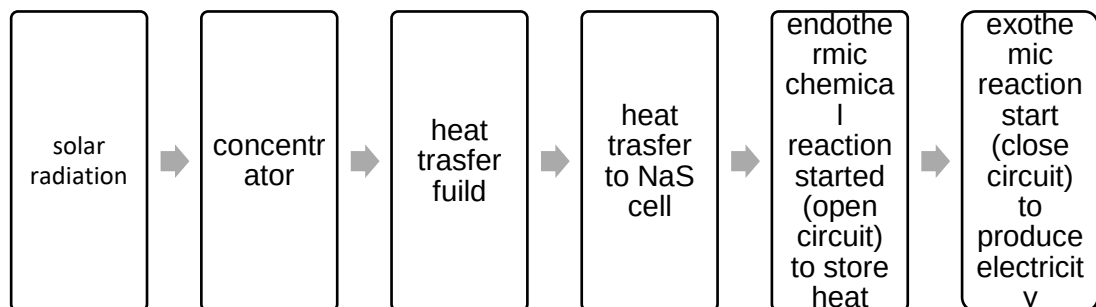


Figure 1-2: Schematic of (a) the cross-section of a standard receiver tube and (b) a conceptual EES receiver tube. (Nation et al., 2017)

From figure 1-2, the process of the conceptual receiver tube is better explained as follows,



Owing to cost and time constraints a high-temperature pump could not be obtained to circulate the Therminol 66 synthetic oil, so a simple central heating pump was used, which limited the experiment to a maximum temperature of 120°C. The operation of the heating rig was restricted consequently to only the only first phase change (The melting of sodium and sulphur) of the NaS cells could be observed and this resulted in the fracturing of the NaS cells from repeated experiments.

Other research investigations conducted at Leeds University was focused on a sodium sulphur electrical model. The model developed is based on the numerical analysis of heat transfer to the NaS cell, to find suitable numerical methods to predict an appropriate heating rate and holding times, the research conducted by Ben Turner in 2018, a previous student at the University of Leeds, under the supervision of Prof. Peter Heggs was based on experimental data conducted by from this present study.

This utilizes two methods, namely the forwards difference and trapezoidal rule, to predict and correct a solution for the equation to a certain degree of error. The equation allows us to calculate the change in temperature of the battery and after setting an appropriate time interval based on the experimental procedure of this current research. Furthermore, Mohammed Mustafa Akbari in 2019 supervised by Dr Darron Dixon-Hardy successfully developed a MATLAB model based on previous work done by B. Turner, and experimental data of the current study. His model predicted the heating rates and times of the furnace. Even though the model was moderately accurate, additional development is needed in phase change states, where there were certain errors. Presently a model is in development to investigate the discharge/charge cycles of the NaS battery at the University of Leeds.

1.3 Research Aim and Objectives

This research is aimed at furthering the previous research by Nation in 2013 by studying experimentally the process of the sodium sulphur (NaS) battery cell. This research would continue the work by Nation in 2013 by focusing on the heat treatment of the NaS cell and the cooling cycles and its effect on the cell characteristics,

To analyse these, this study will use a rig that has been designed for this specific purpose in a controlled laboratory-based experiment. The aim will be to test and to discover how various fundamental aspects of a the NaS battery-based electrical energy storage through simulation and experimentation would complement the operation of existing thermal storage of current PTC power plants. This will be achieved by the following objectives:

- To imitate the working conditions of a receiver in a typical parabolic trough collector using a heating rig.
- To develop a heating procedure to safely heat the NaS cell to mitigate cell fracturing
- To observe the charge/discharge operations on the NaS cells at their full operating temperature. Which include Thermal measurement and Electrical (NaS cell Voltage and Current) measurement.

- To develop charging and discharge control system suitable to the hybrid system to work with a thermal storage PTC plant.
- To analyse the prospects of incorporating the Hybrid NaS receiver with thermal storage in a PTC plant.
- To develop a suitable temperature control strategy for the NaS batteries in the EES receiver.

1.4 Thesis development

A brief description of the chapters and sections of the thesis is as follows

Chapter 2 provides a brief literature review of energy storage options and a brief overview of thermal energy storage and electrochemical energy storage as applied to this thesis. For a more intensive review, the thesis by Nation from the previous research should be seen (Nation, 2013).

The experimental apparatus section in chapter 3 covers the equipment and the various components used for the experimental work.

The experimental procedure section in chapter 4 covers the methodology developed with the research partner Ionotec and experimental procedure tables and results.

The analysis of results is covered in chapter 5, results from the experiments are shown, analysed, and validated. On the results, conclusions are drawn.

It is hoped that at the end of this research significant strides would have been made in reaching the aim and objectives stated above and this, in turn, contributes to a better understanding of the concept and its incorporation into PTC plants.

LITERATURE REVIEW

There is extensive interest in the research community concerning energy storage technologies and development for domestic, utilities and commercial purposes. In this chapter, the area of battery modelling and electrochemical energy storage technologies and battery charging methods are described. Consequently, the following section reviews several articles on this subject and an overview of the two types of ES technologies: thermal energy storage and electrochemical energy storage also referred to as battery energy storage, furthermore an overview of various battery charging methods is presented.

2.1 Review of Energy Storage (ES)

Energy Storage can be said to be the storage of energy in any form, which could at a later date and time be drawn upon and reintroduced back into a system for a given function. Also, the application could potentially increase the energy efficiency of any area it is applied. Especially in the difference between demand and supply of energy in power generation (Fernandes et al., 2012). Both Could and Elkind defined energy storage technology as comprising of a physical system that has the capability to capture and store energy for the transmission of electricity at a later time (Elkind et al., 2010; Ould Amrouche et al., 2016). Furthermore, Energy storage could be used for heat or in the production of hydrogen.

Increasingly in recent times, more emphasis on the decarbonisation of energy systems has revealed more light on the ability of energy storage technologies to efficiently improve resources, for example by making use of thermal storage for waste heat and providing support for renewable energy from variable supply resources. Intending to reach a low carbon future energy storage technology has emerged as a valuable part of energy systems. In energy generation, owing to the variableness of renewable energy, energy storage is particularly important for these resources to be totally dependable as primary sources of energy. Traditionally, energy storage technologies were installed mostly as an investment that possibly may benefit variable demand and has proved themselves vital in allowing the demand and energy supply to decouple (IEA, 2014; Landry and Gagnon, 2015; IEA, 2015).

Energy from the sun is easily observed as the most abundant source of renewable energy in the world. Solar energy or power is clean, climate and environmentally friendly, and a vast energy resource. Admitting to the challenges facing the production of energy from fossil fuel-based sources and the environmental impacts. Solar energy is positioned as a significant contributor to renewable energy. The

promise of solar power technology is such that it offers much in terms of its prospects in meeting energy demands and needs globally. Although solar energy is relatively easy to collect and the cost of production overall is relatively lower when compared to other forms of renewable energy, it does have the unique challenge of its dependency on the sun (IEA, 2011; SBC, 2012; SBC, 2013; IEA, 2017).

There are three main technologies of solar power presently, Photovoltaic (PV), Concentrated Solar Power (CSP) and Flat-plate solar collectors. Although PV is the more popular of them, nonetheless CSP is still viewed as one of the most relevant technologies for large scale renewable energy generation (IEA, 2015), while the flat-plate collectors finds its use in hot water domestic systems. A major advantage CSP has over PV is in the electricity generation process. Sunlight is concentrated using mirrors to generate heat and drive a turbine. This process of generating electricity directly produces alternating current, akin to the production process of a conventional fossil fuel electricity generation plant, this inherently offers technical benefits to the grid that PV cannot deliver directly (IEA, 2016).

In the generation of solar energy, energy storage has always been important, especially in CSP. Energy storage in terms of CSP is of immense importance because of the added benefit of power delivery during the downtime of the sun. It could be said the ability to reliable use solar energy is strongly dependent on the efficiency of the implemented storage process (Lefebvre and Tezel, 2017). In concentrating solar power energy storage can be grouped into three main classifications; chemical, thermal and electrical energy storage and into further sub-classifications; electro-chemical, electro-thermal and thermo-chemical energy storage, which are a hybrid of the main three classes, this is illustrated in Figure 2-1. However, of the energy storage options available, CSP has predominantly leant more towards thermal energy storage, owing to the low cost of its implementation (Nation, 2013).

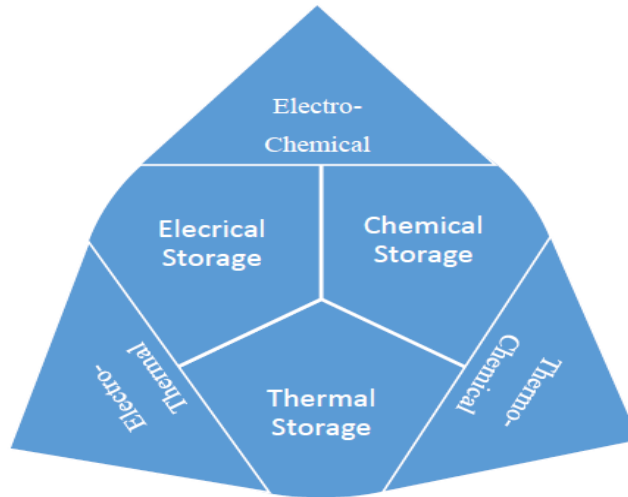


Figure 2-1: Energy storage options for concentrating solar power

Kyriakopoulos and Landry 2015 and 2016 presented energy storage technology applications and policy options connected to energy systems or grids. They concluded that although some storage technologies are still in their development stages, they are still promising tools in achieving a low carbon future (Landry and Gagnon, 2015; Kyriakopoulos and Arabatzis, 2016). This conclusion was a running theme among several articles reviewed by Luo, Mahlia, Palizban and Lombardi (Mahlia et al., 2014; Luo et al., 2015; Palizban and Kauhaniemi, 2016; Lombardi and Schwabe, 2017). Furthermore, Kyriakopoulos and Landry explained electrical and thermal are types of energy storage and the latest technologies that drive them in real life. The advantages and limitations of each one of the research projects are highlighted. Also, the study compared the different energy storage technologies in terms of capital and operating cost, energy/ power density, lifetime, storage capacity duration, round trip efficiencies, response time and technological maturity.

The study by Aneke and Wang in 2016 focused on energy storage technologies and real-life applications. The study highlighted various ES projects across the world and how they contribute to reducing energy wastage and greenhouse emissions (Aneke and Wang, 2016). Furthermore, the study stated the following as the overarching challenges militating against the application of energy storage: improvement of round-trip efficiency; system economics (difficulty in the economic evaluation of energy storages); the physical connections lack a typical standard for diverse energy storage solutions to the grid; and policy support by the government. These conclusions support the studies done by both Gallo and Zhang (Zhang et al., 2016; Gallo et al., 2016).

Lefebvre review on ES focuses on the adsorption processes for thermal energy. The author noted that although this process for thermo-chemical storage had many advantages and benefits, at its current state it was still in the material characterisation, development and pilot operation stage (Lefebvre and Tezel, 2017).

2.1.1 Thermal Energy Storage (TES)

Thermal energy storage mitigates the intermittency of solar energy and is one of the most important and practise a form of energy storage in the world. Solar TES technology has been extensively researched and is considered to be environmentally friendly, widely accepted and implemented (Aydin et al., 2015). This storage uses heat and consists of a wide range of technologies to store various temperatures ranges, available energy by either cooling or heating, basically undergoing a thermal-chemical process in a system. The captured energy in the TES system is used to power a steam turbine that produces electrical power for usage (Ould Amrouche et al., 2016; Lefebvre and Tezel, 2017).

A TES system is required for the constant and maintainable operation of any solar thermal power plant after the sunsets. A TES system consists of two basic operation modes: charging and discharging. There are essentially three approaches to storing thermal energy: sensible, latent and chemical. For parabolic trough plants, sensible and latent heat storage approaches are the most considered and in use. Thermo-chemical storage currently is still at the developmental stage and is very expensive (Nation, 2013).

2.1.1.1 *Sensible Heat Energy Storage*

Sensible heat is a source of energy that increases the temperature of any medium that is added to. This form of energy storage is simple and is based on the principle of heating or cooling a liquid or solid. Water is by far the most utilized medium, mainly because it is very cost-effective (Ould Amrouche et al., 2016). The core applications of sensible heat storage are grouped into two: liquid media and solid media (Lefebvre and Tezel, 2017).

In sensible heat storage, the amount of heat stored in solid or liquid form is wholly dependent on the material selected. The material selection is on its thermal properties (specific heat capacity), which is the amount of energy required to change the temperature of a kilogram of a particular substance by a degree Celsius, storage capacity and the requirement to meet the operational temperature. Sensible heat energy storage has low specific energy (energy per unit mass), and its efficiency

varies mainly because of the issues of both thermal isolation and leakage. The development and research in this area have focused on improving the specific energy of new materials and developing their thermal insulation (Mahlia et al., 2014; Gallo et al., 2016).

2.1.1.2 Latent Energy Storage

In Latent heat energy storage, the materials are identified as phase change materials. The material absorbs heat energy during the melting process as their latent heat of fusion which is changing phase at a specific temperature and pressure (Alva et al., 2017). The energy density (energy per unit volume) in latent heat energy storage is increased by the use of phase change materials like fatty acids and paraffin. This form of storage is based on either solid-solid or solid-liquid change of phase. The application of this form can have an efficiency of 75 to 90% for the short-to-long term. Currently, there are several materials and methods under research and development. In general, they are more at the development and project demonstration stages (Ould Amrouche et al., 2016; Alva et al., 2017).

Latent energy systems usually consist of three parts: a heat exchanging surface, a heat storage material that goes through a phase change, and a container that enfolds the material (Lefebvre and Tezel, 2017). The advantage that latent heat energy storage has over sensible heat is the higher energy density from the materials used. While the discharging process is going on the temperature of the storage medium remains the same. Therefore, the HTF temperature also remains the same, which means there is no difference in temperature between storing and releasing heat energy (Mahlia et al., 2014; Alva et al., 2017).

2.1.1.3 Thermo-Chemical Energy Storage

Thermo-chemical energy storage is an emerging technology with much research and development still ongoing. This form of storage poses the possibility to overcome the inherent drawback facing both sensible and latent energy storage. This form of storage system has a higher energy density than other forms of thermal energy storage, and in volume, comparison requires less material (Lefebvre and Tezel, 2017).

In thermochemical storage systems, the processes for storage include both sorption processes and thermochemical reactions. In the thermochemical reaction chain, energy is stored from a reversible chemical reaction (Nation, 2013). Sorption processes in thermal energy storage systems combined with a chemical system are progressively attaining and are viable alternatives for solar heat storage. This is partly

because of their unique ability to preserve energy for periods with minimal heat loss and their higher storage capacity. Ergo, this process has been shown to have high efficiency in the development phase (Aydin et al., 2015; Ould Amrouche et al., 2016).

2.1.2 Electro-Chemical Energy Storage (EES)

Electrochemical energy storage is known as Battery Energy Storage (BES). A battery is an electrical cell device that comprised an individual or series of electrochemical cells allowing the conversion of chemical energy for the production of electricity (Menictas et al., 2015). Electricity in general in its basic form must be used once it has been generated or stored or else it all goes to waste, owing to that fact alone has made batteries so popular. In the storage of electrical energy, batteries have a great contributing role and are primarily the oldest. Also, recognised types of energy storage. Additionally, batteries provide flexibility in the generation of power from fossil fuel, but it also has added benefits for the environment. An example is in the emissions reduction of greenhouse gas and they have proved vital in the emerging renewable energy industry because of the improvement to system stability they offer (Crompton, 2000; Leadbetter and Swan, 2012; Cho et al., 2015; Koskinen and Breyer, 2016). The BES system consists of large batteries, power conditioning and control systems. The advantage includes rapid response time that is in milliseconds while the disadvantage is the expensive cost of the batteries owing to the cost of the composite material and lifespan (Alamri and Alamri, 2009; Divya and Østergaard, 2009). Batteries generally have a very low standby loss and they have the capacity of having very high levels of energy efficiency in the range of 60–95% (Chen et al., 2009). With variable renewable electricity generating sources like wind and solar contributing more to the electricity generation mix, the importance of BES has grown, owing primarily to the variability in power output of these sources. Furthermore, with new advances emerging for renewable electricity sources, interest in the development of a better battery energy storage system has been on the increase. Consequently, energy storage is now more than ever, been seen as the likely answer to the issue of power from variable renewable electricity sources (Dti Report, 2004; Alamri and Alamri, 2009; Beaudin et al., 2015; Ould Amrouche et al., 2016). BES systems presently are a collection of the old and reliable like the lead-acid battery, which is the oldest type of battery and has been developed, tried, and tested over a long period to the new and upcoming designs like the sodium nickel chloride. Also, the not so old and new such as the sodium sulphur and that are in various phases of development and advancement (Dti Report, 2004; Menictas et al., 2015). Batteries are in general categorised as either a Primary cell or as a Secondary cell. The primary

cell battery is the most generic form of a battery. The main difference in them majorly is the fact that in most cases it's not possible to recharge a primary cell battery, while a secondary cell battery can be recharged (Linden and Reddy, 2001; Chen et al., 2009).

2.1.2.1 *Lead-Acid (PbO_2)*

The Lead Acid battery is over 130 years old and is still one of the common batteries in use. It is the first secondary cell battery that has different applications in the industry ranging from small to large scale storage (Dti Report, 2004). The French Scientist, Gaston Planté, started the PbO_2 batteries development in the 1850s, and by 1859 he had produced a practical version. Thereafter, by the 1870's it was incorporated into the early systems for power delivery on load levelling duties (Baxter, 2007). Since its development, the PbO_2 battery has consistently been upgraded and improved upon particularly in its cell proficiencies. Consequently low cost is a benefits of models used and their dependability (Dti Report 2004). In Figure 2-2 and equ. 2-1 is the reaction in a PbO_2 battery.

Sequeira and Pedro noted that energy density has increased to above 50% (Sequeira and Pedro, 2007). However, this figure is still low because of the high innate density of lead, which leads to a high mass total and as a result, it requires a lot of space for storage of large-scale energy uses unlike the sodium sulphur battery (Dti Report 2004). The PbO_2 battery as a low-cost battery is reliable and has high efficiency of about (65 to 80)% makes it suitable to be used more for power supply (Chen et al., 2009). Due to its low cost, PbO_2 batteries will be readily available for the current practical applications. It is suitable for less demanding applications such as Uninterruptible Power Supplies (UPS), telecommunications, and remote off-grid renewable markets (Sequeira and Pedro, 2007). Also, PbO_2 battery has a 75% application rate in up-and-coming solar photovoltaic systems due to its dependability and low cost (Chang et al., 2009). However, the PbO_2 battery has a short life cycle. Hence, it has poor durability and requires frequent maintenance (Chen et al., 2009; Beaudin et al., 2010). Also, it is short life cycle makes it difficult to apply to comprehensive and multi-MW systems because of the intense monitoring and environmental controls required. Furthermore, other energy storage technologies still present effective competition for the market share than PbO_2 , despite its continuous growth (Baxter, 2007).

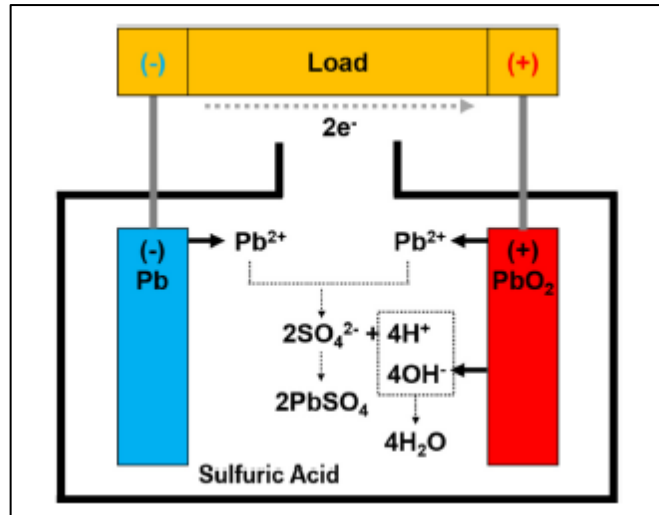
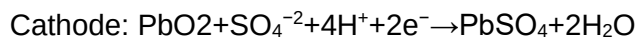
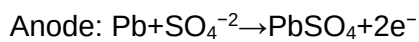


Figure 2-2: Lead-Acid Reaction (Cho et al., 2015)

Reactions:

equ. 2-1



Overall reaction:



Recently a hybrid of the PbO_2 battery called the Ultra-battery has been introduced into the market, this hybrid is reported to have a longer life cycle than a conventional PbO_2 battery (Mahlia et al., 2014).

2.1.2.2 Sodium Sulphur (NaS)

The sodium sulphur battery is a molten salt battery and one of the principal batteries used for energy storage in medium to large scale storage (Menictas et al., 2015). There has been a surge in the popularity of sodium sulphur batteries, also known as the molten metal battery in recent years owing to their capabilities of the high specific energy density of 760 Wh/kg at 350°C and a long-life cycle in energy storage. It is renowned for high efficiency and economical in its use of space. Because its high energy density enables it to occupy about a third of the space other kinds of batteries require necessary-like the lead-acid battery (Sarasua et al., 2010). The benefits of sodium sulphur batteries are immense. The sodium sulphur are relatively inexpensive, non-hazardous and easily obtainable (Lu et al., 2013). According to (Wen et al., 2008), sodium sulphur batteries principally consist of sodium and sulphur,

which are anode and cathode respectively. These batteries contain beta alumina ceramics which act as both separator and electrolyte shown in Figure 2-3.

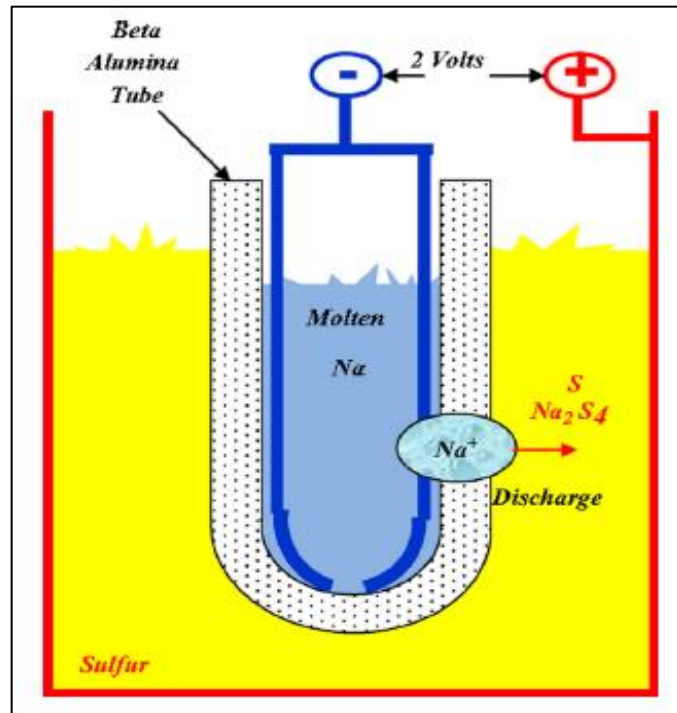
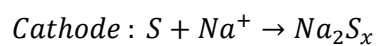
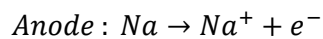


Figure 2-3: Sodium Sulphur Battery (Aneke and Wang, 2016)

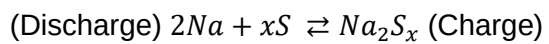
equ. 2-2 and Figure 2-4 shows the simple operating principle of the battery.

Reactions:

equ. 2-2



Overall reaction:



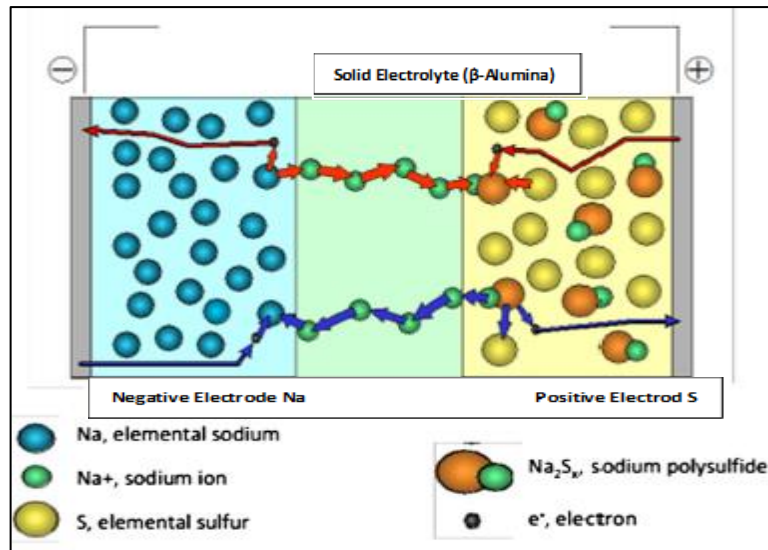


Figure 2-4: Sodium sulphur battery operating principle (Aneke and Wang, 2016)

During the discharge the oxidation occurs at the sodium/beta alumina interface creating Na^+ , and at that stage negative sodium electrode releases electrons and positive sodium ions go through the beta-alumina (which has a conductivity for sodium ions at approximately 300°C) to react with the positive sulphur electrode and create sodium polysulphides ($\text{Na}_2\text{S}_{5-x}$) (Baxter, 2007; Aneke and Wang, 2016). In the case of a charged cell the reverse reaction occurs (Baxter, 2007). Note, sodium polysulfide can be generated by melting sulphur into a solution of sodium sulphide. Alternatively, they are created by the redox reaction of liquid sodium hydroxide along with sulphur at high temperatures (Wang et al., 2017). As a result of discharging the sodium levels fall; this decreases area of the electrolyte wetted with sodium proportionally and its surface area effectively. Subsequently the cell internal resistance rises and causes a corresponding reduction in existing power (Lomax, 1979).

The Na-S cells are arranged in series or parallel and operate at about 2V then sealed in a thermally insulated case which allows it to be used outdoors. From this the modules can then be adjusted for power quality, peak shaving or Load levelling (Baxter, 2007).

The Ford Motor Company has the credit of introducing this specification of battery in the 1960s. They are formulated it for electric vehicles. It is discovered by the scientists at Ford that they performed well at temperatures exceeding 300°C . The ceramic material of sodium β -alumina proved to be a good conductor of sodium ions. According to Sequeira and Pedro, this capability signalled the possibility of battery performance at high temperatures that had liquid sodium and sulphur as anodes and

cathodes respectively (Sequeira and Pedro, 2008). However, subsequent research into this technology was not encouraging as New Energy and Industrial Technology Development Organization in Japan and General Electric in the United States would come to find out as they researched the immobile applications of this battery. In Europe, ABB had to discontinue after some years of research because overcoming the technical and safety issues associated with the battery proved daunting (Baxter, 2007). The lead manufacturers of this battery presently are Tokyo Electric Power Company (TEPCO) and NGK Insulators Ltd went into a joint venture in 1983 (Fukushima, 2013). According to Wen, this joint venture conducted research and development into the applications of the battery on load-levelling and not on electric vehicles as was previously done (Wen et al., 2008).

The major concern of the Na-S battery has been fire owing to the dangers of using elemental sodium and sulphur, especially in the case of sodium which is a very well-known reactive material when it encounters moisture or air and this is heightened by the requirement of high temperature to keep them in a molten state of about 350°C, with a thin electrolyte separating them. Safety standards for the NaS battery is fundamentally dependent on the accountability of the materials used in the cell design; usually a small Na-S battery comprises about 40kg of molten sodium and 60 kg of molten sulphur kept at about 350°C for operations (Ohi, 1992).

Basically, the safety of the Na/S battery has become reliant on to a great degree, on each cell safety. Therefore, several protection systems have been put in place. For the safeguards see Figure 2-5.

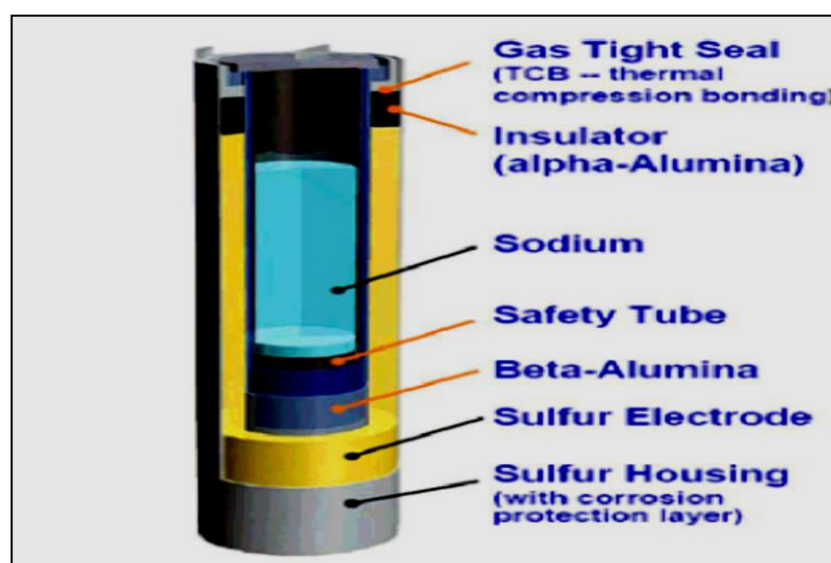


Figure 2-5: Na-S battery cell (NGK, 2013)

Kamibayashi and Tanaka suggest that the primary aim for the mass production of a viable bulk energy storage device was its utility in large energy storage capabilities for industries (Kamibayashi and Tanaka, 2001). However, Sequeira and Pedro assert that it was still not clear how the technical challenges of durability and reliability are overcome seeing that the safety issues associated with its use for electric vehicles were found to be so overwhelming (Sequeira and Pedro, 2008). The application of sodium sulphur batteries according to Hatta can be seen in the following areas (Hatta, 2012):

- Peak shaving: They are used as a backup in emergencies as the NaS battery can be discharged for the supply of power to consumers when the power grid loses power.
- Load levelling: This battery system is suitable for load levelling as it can be charged and stored when power demand is low and later used to help supply demand.
- Power quality: The NaS battery is noted for its precision as it discharges energy quickly and consistently and can therefore compensate for the inconsistencies associated with variable renewable energy sources.

Baxter in 2007 and later in 2010 Sarasua, asserts that the NaS battery is one of the most technologically advanced in energy storage applications due to its strong operating qualities (Baxter, 2007; Sarasua et al., 2010). These batteries are compact, durable and with minimal cell degradation as a drawback. Again, the life cycle of the NaS battery is notably higher than other batteries and is well noted for its efficiency when applied to meet industrial power requirements. Although deficiency of this battery is its dependence on a high operating temperature and the constant need to keep it at a molten state whether in use or not. For the NaS battery, letting the temperature drop would result in freezing of the active materials and this could potentially decrease the lifespan of the battery system (Menictas et al., 2015).

Presently research and literature on a low temperature operating sodium sulphur battery is limited, the problem of its high temperature dependency and safety issue is still prevalent (Abraham et al., 1978). However The Berkeley Lab researcher Gao Liu is designing a Na-S battery which will operate at temperatures as low as 60°C, and is corrosion resistant (LBL 2013). A few case studies that have been done on it however are all facing similar challenges of high self-discharging, formation of pin-like metallic sodium dendrite while charge is on-going, this is critical for ambient temperature batteries because when the dendrites get too long the current part way

of the cathode and anode gets shorted. Furthermore the utilization of sulphur cathode is unfavourable.(Lu et al., 2013).

Energy industry today hybridization of the Na-S battery with renewable energy systems is increasing, because usually their output power is influenced by the climatic conditions, therefor it appears that hybrid energy system will have a better reliability and better quality of power (Yang et al., 2007; Yang et al., 2018).

2.1.2.3 Sodium Nickel Chloride (Na-NiCl₂)

The sodium nickel chloride battery known as the Zero Emission Battery Research Activities (ZEBRA) battery was developed in South Africa in the '70s (Sequeira and Pedro, 2008). The development was brought about by the search for a safer alternative to the sodium sulphur battery (Mahlia et al., 2014). They are regarded as one of the more attractive molten salt battery technologies for stationary electrochemical energy storage. Nevertheless, their application use is relatively low despite its rather well-known redox system (Li et al., 2016). The Na-NiCl₂ battery in terms of characteristics is similar to the NaS battery and like the NaS battery it has high operating efficiency and operating temperature of about 270 - 350°C, on the other hand, it has a lower energy density of approximately 120 Wh/kg and uses nickel chloride for the positive anode with the capability to function on a wide temperature range of about -40 to +70 short of cooling (Chen et al., 2009). Nonetheless, the Na-NiCl₂ in comparison to the NaS batteries can hold up under to some degree overcharge and discharge. They have possible better safety features because of the nickel substitute and a higher cell voltage (Dti Report, 2004). In general, the redox reaction in Na-NiCl₂ battery in the course of charging and discharging is described in equ. 2-3 and shown in Figure 2-6, although despite the relatively straightforward redox reaction, the mechanisms of cell degradation in Na-NiCl₂ have not been understood clearly (Li et al., 2016).

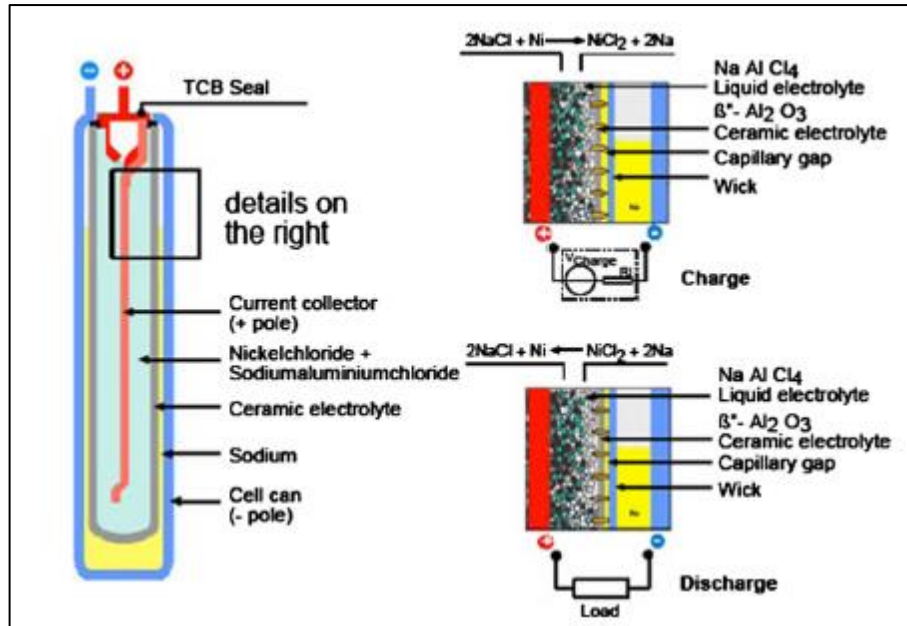
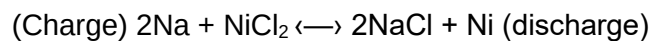


Figure 2-6: Sodium Nickel Chloride Battery (Aneke and Wang, 2016)



equ. 2-3

The foremost disadvantage of the Na-NiCl₂ is its cost and high-temperature dependency like the NaS battery. Presently more research and development is been done and pilot programs are in place to see how well it would do in energy storage for VRES for load levelling (Chen et al., 2009). One obstacle hindering penetration into the energy market is its high operating temperature (Li et al., 2016).

2.1.2.4 Lithium-ion (Li-ion)

Lithium-ion batteries are secondary cell rechargeable batteries that are usually a li-ion battery system that uses lithium metal oxide as the cathodes, graphitic carbon as the anodes, and non-aqueous carbonated liquids as the electrolytes, as shown in Figure 2-7 (Cho et al., 2015). According to Sequeira and Pedro, since the early development in the 1970s of the li-ion battery considerable progress has been made (Sequeira and Pedro, 2008). The first marketable li-ion battery was introduced in 1991 by Sony Corporation Japan. Hence, the battery has seen tremendous demand and growth. Li-ion batteries are considered to be more powerful than their counterparts. They are also smaller and lighter with specific energy ranging from 90 -190 Wh/kg and power density which is the amount of power per unit volume and could also be referred to as volume power density or volume-specific power ranging from and 500 – 2000 W/kg (Aneke and Wang, 2016). The Li-ion battery operates at

the high efficiency of approximately 95%, with a life cycle of over 1,000 cycles (Chen et al., 2009; Menictas et al., 2015).

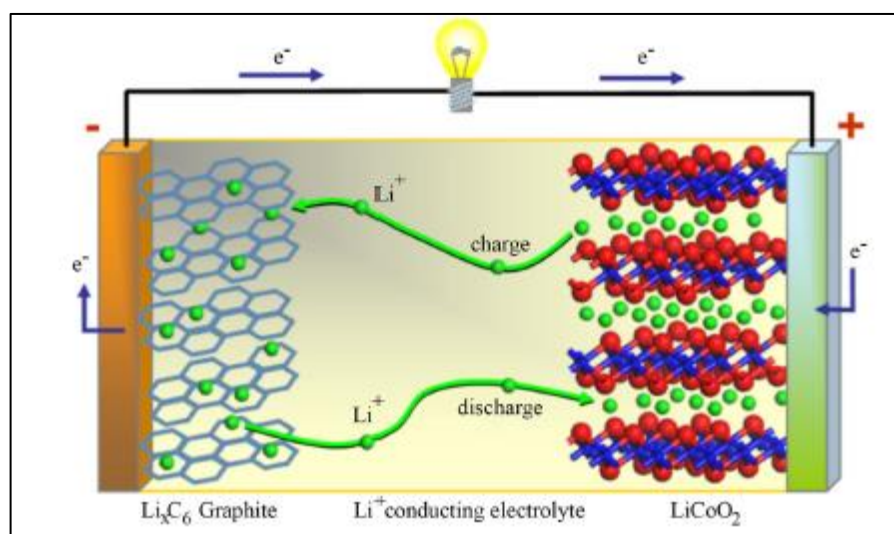


Figure 2-7: *Lithium-ion battery (Gallo et al., 2016)*

Presently the li-ion battery is predominantly used for vehicle batteries and portable electronics. Also, it has been noted that reserves of lithium-ion are limited (Armand and Tarascon, 2008; Bruce et al., 2012). Li-ion batteries have exhibited good potential and promise under research conditions. The current focus is on getting them to a stage they can deploy in medium to large-scale storage applications (Kim et al., 2015). The cost of developing li-ion batteries for large scale energy storage in grid stabilisation and frequency regulation application is very high, that notwithstanding, both A123 Systems and Eagle Picher Technologies are examples of companies that are currently developing the li-ion battery for large scale industrial application (Beaudin et al., 2015). Although Li-ion batteries have seen a considerable amount in reduction of cost, for it to reach widespread competitiveness, further substantial reduction of cost is needed (IEA, 2014). Li-ion batteries are sensitive to heat from exposure to elevated temperatures and tend to degrade faster under that condition. Furthermore, if the manufacturing process is not correct, there is a risk of fire from the battery exploding (Oswal et al., 2010).

2.1.2.5 *Nickel-cadmium (Ni-Cd)*

The nickel-cadmium battery was first introduced in 1899 by the Swedish scientist Waldmar Jungner. Initially, it was sparingly used because of difficulties in manufacturing and cost, but the battery became widely applicable in the 1970's owing to research and development. The Ni-Cd battery is the most common and developed

of all other nickel electrode batteries and is best applied in energy storage in the utility industry (Aneke and Wang, 2016). In terms of advanced battery technology, the Ni-Cd battery is near the lead-acid battery. Ni-Cd battery has specific energy ranging from 55–75 Wh/kg, a longer life cycle of 1000-1500 than the lead-acid battery and does not need as much maintenance as the lead-acid battery, but the Ni-Cd battery cost more to produce than the lead-acid battery (EPRI, 2003; Beaudin et al., 2010; Gallo et al., 2016). However, with the varied application of the Ni-Cd battery, its DC-DC cycle efficiency is about 60 to 70% for normal conditions. This is a little bit less than the Lead-acid battery (Baxter, 2007).

The operation of the Ni-Cd battery is based on the redox reaction between nickel oxide hydroxide and metallic cadmium as the electrode. The chemical reactions are given in equ. 2-4 to equ. 2-6.

At the nickel oxide, negative electrode.



During discharge, the reaction occurs at the cadmium electrode which is positive.



The net reaction is given below



The application of the Ni-Cd battery has proven to be better for a steady power supply (32). Also, Ni-Cd is dependable with a quick response time of milliseconds and has a favourable and diverse application in renewable energy. An example is the second largest Ni-Cd battery that is installed at Golden Valley, Fairbanks, Alaska, with a storage capability of 40 MW. The essence of its installation was to provide spinning reserves and grid stabilization (32,39). That notwithstanding, there have been very few commercial successes in the use of Ni-Cd batteries for utility-scale electrochemical energy applications (10). The sale of Ni-Cd has been on the decline due to environmental policies and controls, as one of its main parts (cadmium) is very toxic (33). Also, because of the inconsistent nature of Variable Renewable Energy Sources (VRES), incorporation would not be too practical because of the memory effect of the battery (reversible loss of capacity) that occurs before recharge when the battery is not 100% discharged (32,33,53).

2.1.2.6 Comparison of battery systems for Variable Renewable Energy Sources (VRES)

A properly positioned BES system can minimise some of the challenges produced by VRES (Nourai, 2007; Ngamroo et al., 2009). However, for BES to be a viable choice in applications for VRES, a BES system is required to be scalable and flexible to fit different size requirements. To reduce related costs from replacements, upkeep and operations, a BES system ought to have minimal maintenance cost and a long-life cycle (Beaudin et al., 2015). Table 2-1 shows a comparison between selected battery systems for VRES.

Table 2-1: Comparison of battery systems for VRES (Beaudin et al., 2015; Chamberlain et al., 2015; Ould Amrouche et al., 2016)

Battery	Energy Density (Wh/L)	Specific Energy (Wh/kg)	Specific Power (W/kg)	Charge /Discharge eff. (%)	Self-Discharge (%) per month	Maintenance	Life Cycle (cycles)	Toxic Level
NaS	170	150-240	90-230	86+	Nil	Maintenance Free	2500+	low
PbO ₂	60-75	35-50	75-300	84+	2-5	Regular Maintenance	1200	Very high
Na-NiCl ₂	160	125	130-160	90	Nil	Regular Maintenance	2500+	Low
Li-ion	250-730	150-200	200-315	~95	~1	Maintenance Free	1000 – 10000 +	Low
Ni-Cd	50-150	35-50	150-300	~70	5-20	Regular Maintenance	2500	Very high

The symbol (~) stands for approximately and (+) stands for over.

Figure 2-8 shows the technical maturity of the selected BES system, and from the figure, it can be observed that the batteries discussed above fall into two groups of mature and developed technologies. It has to be noted that the technological maturity of any given energy storage system has an important role in the decision of its use or selection in any storage application (Aneke and Wang, 2016). For the mature technology it means that it is fully developed and widespread and has been in use for years, while for the developed technology, it means they are technically developed and available but its application is not limited (Chen et al., 2009). Also, Figure 2-9,

Figure 2-10 shows the number of BES systems in operation and the percentage share of BES in energy storage.

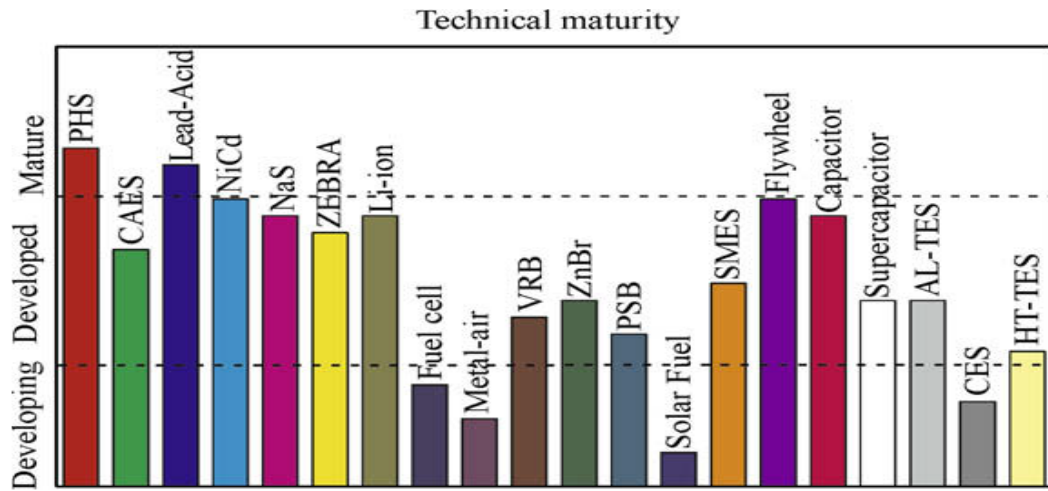


Figure 2-8: Technical maturity of Energy Storage Systems, (Chen et al., 2009)

The break-in Figure 2-8 indicates the levels of maturity and development of difference EES.

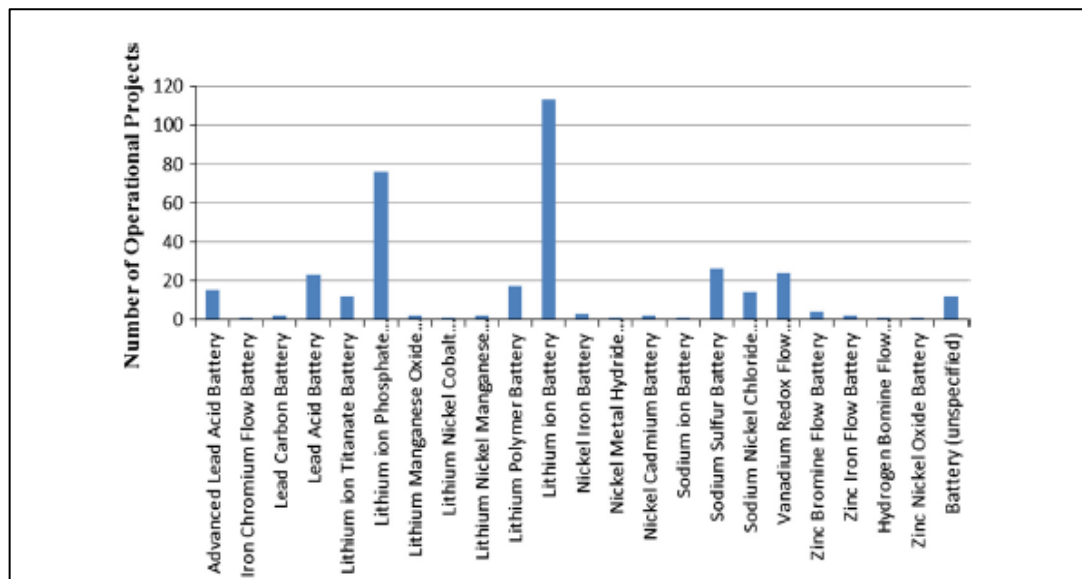


Figure 2-9: Operational Battery Energy Storage (Aneke and Wang, 2016)

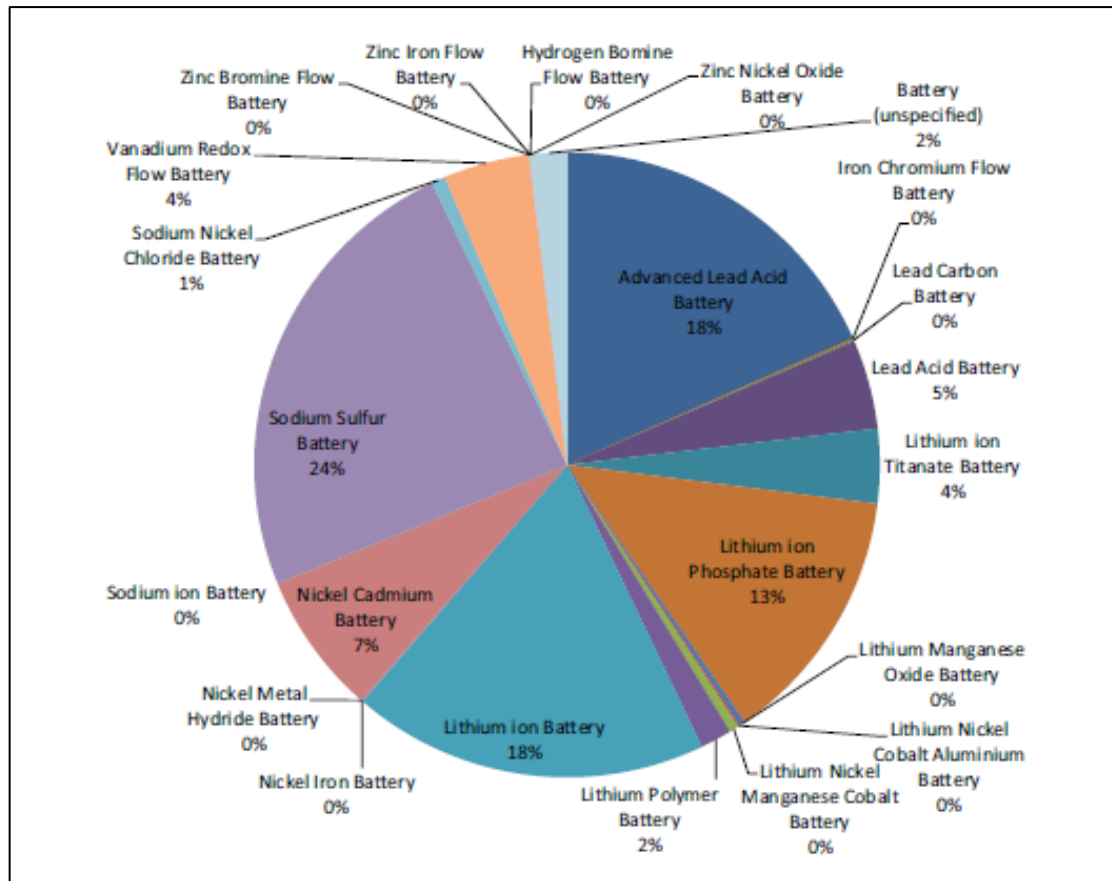


Figure 2-10: Battery energy storage systems in the application (Aneke and Wang, 2016)

Of all the above-mentioned BES systems, for the application into VRES, the Lead-acid battery is the least suitable. For many reasons, the other BES systems are also objectionable, for example, some have a low energy density, a low life cycle and require consistent upkeep and also the toxicity of some of their components (Beaudin et al., 2010). That notwithstanding according to (Nourai, 2007) the Sodium-sulphur battery is possible the most suitable BES System for managing the erratic nature of VRES.

2.2 Battery Charging Methods

In charging, a battery involves direct current passing through the battery to reverse the discharge process. The process by which a battery charge is electrolytic. This process involves an electrochemical reduction reaction at the negative electrode and an electrochemical oxidation reaction at the positive electrode. Although, the charging conditions of a battery is as important as the discharge conditions in determining its longevity. However, in the electrochemical cycle, charging is still a highly neglected half (R M Dell and Rand, 2001). Ergo, the Charge-acceptance (C) of batteries can be said to be the batteries' cell's ability to accept an electrical charge

from the current flowing through and use it for the charging process. The C is measured and expressed as the ratio and a percentage of the amount of accepted useably ampere-hours from a small-time increment to the total amount of ampere-hours supplied in the same time frame (Ronald M Dell and Rand, 2001).

Presently, there is an array of regulated charging systems available. These charging methods include constant voltage and taper charging same as combinations of constant current and constant voltage charging. According to Vincent and Scrosati (Vincent and Scrosati, 1997), these techniques have been developed for systems to minimize charging time for an individual cell, while minimising excessive side reactions near the end of charge. Generally, modes of charging utilise forms of constant or taper current charging to a fixed maximum voltage (58). In charging a battery, the maximum charge current is considered for any specific method of charge. The ability of the battery to accept current on overcharge determines the maximum charge current to be considered for a particular mode of charge. These maximum currents may differ for diverse sizes of the same type of cell and battery and different types of cells and battery. The battery supplier usually provides such (Crompton, 2000). For instance, when a nickel-cadmium battery is charged at a constant current, it leads to a rise in cell voltage, electrolyte temperature, and the internal pressure of the cell. The cell voltage, the electrolyte temperature and the internal pressure of the cells provide a means to monitor and control battery charging operation (Crompton, 2000).

2.2.1 Constant Current Charging

Constant current charging, as implied by the name involves using a constant current all through and it is a direct way to determine the charge delivered. This method of charging can be accomplished using chargers that are equally dependable and low-cost, however, a problem lies in choosing the level of current to use. When the current is low, the total charging process is very slow and long, that notwithstanding if very high currents are used, the batteries with porous electrode structures run into problems because of uneven current distribution (Vincent and Scrosati, 1997; R M Dell and Rand, 2001).

The current during charging is controlled by a resistor connected in series with the battery and a direct current supply of power. It is recommended to charge with the constant current when the time to recharge is critical and it is necessary to know the extent of capacity returned to the battery (Crompton, 2000).

2.2.2 Constant Voltage Charging

The voltage difference between the charger and the battery determines the level of current supplied when charging at a constant voltage (Ronald M Dell and Rand, 2001). The current is high at constant voltage charging but reduces as the charging continues making the current flow to be very low at the end of the process. As a result, it takes a longer time to achieve a full charge. Joule heating early will be excessive if the voltage is too high, which could lead to rapid deterioration of the cell. Constant voltage charging of sealed secondary battery could result in a 'thermal runaway under certain conditions. Thermal runaway occurs when the overcharge reactions take over and the energy of the charging current is largely converted to heat at the end of the normal charge (Vincent and Scrosati, 1997). Consequently, the use of constant voltage charging is generally limited to batteries that have comparatively low discharges (Ronald M Dell and Rand, 2001).

2.2.3 Taper-current Charging

A simple taper charger uses a basic series resistor to adjust the falloff in the current while the voltage in the battery increase from a steady supply of high voltage (Vincent and Scrosati, 1997). This type of charger is unregulated, owing to the controlled fixed voltage other than a fixed current at the end of a charge. In most cases, the chargers are designed in a way that allows the output current of the charger to reduce progressively due to voltage rise, as the battery charges. Taper-current charging can be defined by referring to the current acquired close to the beginning and close to the end of a usual charge (Crompton, 2000; Ronald M Dell and Rand, 2001).

2.2.4 Constant-current – Constant-voltage Charging

The method of constant current – constant voltage charging is used usually for the charging process of different batteries to safeguard the health of the battery and safe charging. This form of charging comprises two charging phases. The first phase is composed of the battery charging with constant current, while across the battery the voltage slowly rises. The second phase will commence when the voltage of the battery attains a certain pre-defined maximum point. From that point on, the battery is charged with constant voltage, and the charging current is allowed to gradually decline (R M Dell and Rand, 2001; Gücin et al., 2015).

2.3 Conclusion

This chapter reviewed several articles published recently on energy storage. An overview of the two types of ES technologies which are thermal energy storage, electrochemical energy storage and battery charging methods. The conclusion drawn was the importance of the incorporation of energy storage in renewable energy. This is because of the possibility of delivering electrical power without backup systems from fossil fuels. It offers the prospect to meet the peak demands of power independent of weather conditions. Also, the scope of energy storage technologies in the current research and development for domestic, utilities and commercial purposes covers a broad scope of technologies. Based on the overview and comparison of the electrochemical energy storage systems. BES technologies are expensive, however, without the incorporation of them into VRES, energy storage would be challenging. Therefore, most BES technologies are in various positions in terms of maturity to meet market demands. However, the market is inclining towards sodium sulphur batteries. This is primarily because of the abundance of its active materials. Thermal energy storage in mitigating the intermittency of VRES can be concluded to be vital especially to plant operators of concentrated solar energy, especially in the ability to shift electricity to meet different load profiles. The next chapter describes the experimental equipment and apparatus.

EXPERIMENTAL APPARATUS

The key aspects of the experimental procedure of this study are presented in this section. The experiment is to investigate the heating of NaS battery cells within the operating temperature range of ambient temperature to 360°C on cell performance. The main test apparatus and data logging system are enumerated as follows.

- 1 NaS10Ah (HP4) cell was used as the test sample
- 2 Electrically heated reactor furnace – Elite Thermal Systems model TSV 12/55/250
- 3 (3) Type K thermocouple used for temperature sensors
- 4 Pico TC-08 Thermocouple data logger used for temperature data logger
- 5 NI USB-6001 Multifunction I/O Device used for Voltage difference sensor
- 6 TENMA Programmable DC Supply
- 7 TENMA Programmable Electronic Load
- 8 Charge and discharge control box

Next, some details on the main steps taken and used methods of data acquisition are presented.

3.1 Sodium Sulphur (NaS) cell (NaS10Ah (HP4) cell)

The cell being tested was built and supplied by Ionotec Ltd. They provided two HP4 battery cells rated at 10 Ah respectively with characteristics which are described in *Table 3-1*. Having just a small amount of reactive agents, this is considered a safe way to learn about the performance and safety. Note, in testing NaS cells the electro-chemical properties are identical for all NaS cells regardless of their capacity. The cells provided by Ionotec Ltd were equipped with sodium and sulphur termination electrodes and 2 type k thermocouples attached to the sodium seal and sulphur cell case.

The thermocouples are attached to monitor the case and seal temperatures. *Figure 3-1* shows a cross-section of the NaS cell. The detail of the cross-section shows the ceramic and glass seals and also the positions of other components of the cell, while *Figure 3-2* shows the positions of the attached thermocouple and electrodes,

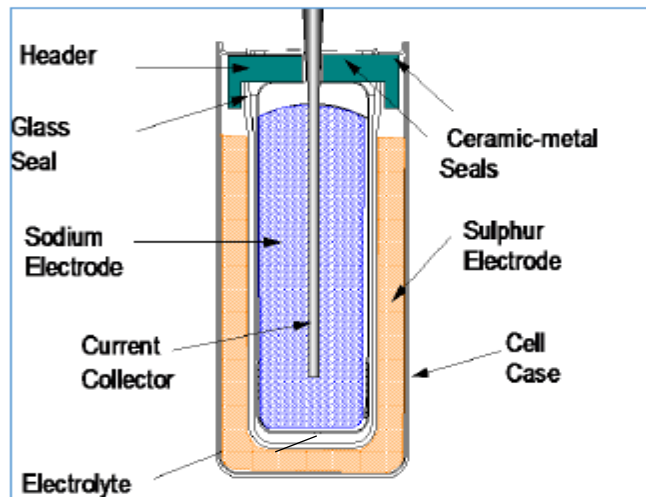


Figure 3-1: Cross-section of the sodium sulphur cell showing the internal structure (Ionotec, 2019)



Figure 3-2: Cell with connections showing the connection points of the electrodes and type k thermocouples

Table 3-1: Characteristics of a NaS 10Ah (HP4) cell

Characteristics	Value
Cell weight	110 g
Cell height	65 mm
Cell diameter	32 mm
Sodium Weight	11.2 g
Sulphur Weight	23 g
Open Circuit Voltage	2.076 V
Capacity (to 1.9Vo/c)	10 Ah
Cell Power	20 Wh
Open circuit voltage (330/350°C)	2.076 Volts
Cell resistance (330/350°C)	25-30 mOhms
Cell containment	Chromised mild steel
Cell seals	Thermo-compression bond
Specific Energy	182Wh/kg
Melting point sodium	97.79°C
Melting point sulphur	112.8°C

Furthermore, the cell is held in place inside the furnace with clamps above the furnace opening. To maximize the heating rate of the battery cell, the cell must be placed in the centre of the tube furnace. This was done by measuring the interior of the tube furnace to ensure correct placement.

The cell undergoing the test was equipped with two thermocouples spots. One thermocouple spot was welded in the middle section of the cell case and the other was welded to the top of the cell case. This was done to observe the various heat transfer changes during the experiment. Furthermore, one electrode was situated in the middle section of the case, and another electrode was on the top of the case. They are to help measure the open-circuit voltage of the cell. A cross-sectional diagram of the furnace and cell is presented in Figure 3-3

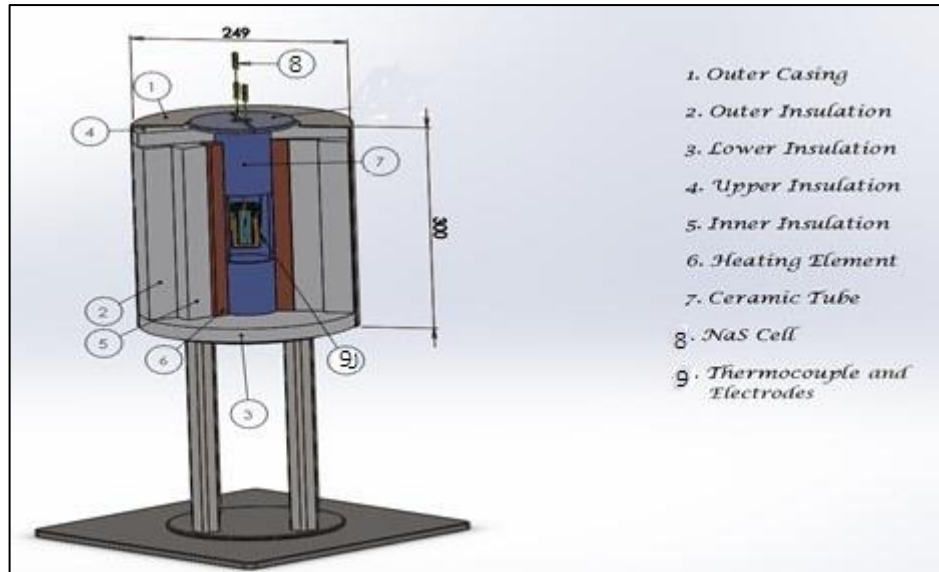


Figure 3-3: Cross-section of NaS and furnace showing the positioning of the cell during an experiment set-up in a furnace

3.2 Tube Furnace

Owing to the design of the battery cells, the furnace used had to be a vertical tube design to attain an accurate imitation of the heat transfer between the heat transfer fluid within the parabolic trough and the NaS cell of D. Nation's EES device (Nation et al., n.d.). An electronic tube furnace was adopted as the most suitable for this application and the 2 different furnaces that were available for use are shown in Figure 3-4, *Table 3-2* describes the characteristics of the furnaces and *Figure 3-5* shows the furnace controller while *Figure 3-6* gives a breakdown of the furnace with *Figure 3-7* showing the wire-wound heating element of the furnace.

Table 3-2: Tube Furnaces Features

<i>Furnace</i>	<i>Brand</i>	<i>Model Number</i>	<i>Controller</i>	<i>Secondary Controller</i>
<i>A</i>	Elite Thermal Systems	TSV 12/55/250	Eurotherm 2461	No
<i>B</i>	Elite Thermal Systems	TSV 11/50/118	Eurotherm 2461	No

The interior dimensioning of the tube furnaces was important to improve the simulation accuracy and to ensure uniform heating of the battery module. Furnace A

was the first component utilized chronologically, and metallic covers were manufactured for the top and bottom of the furnace to increase insulation. Furthermore, fibreglass insulation was utilized to cover all openings that wiring entered the chamber. This furnaces' dimensioning was larger than furnace B comparatively.

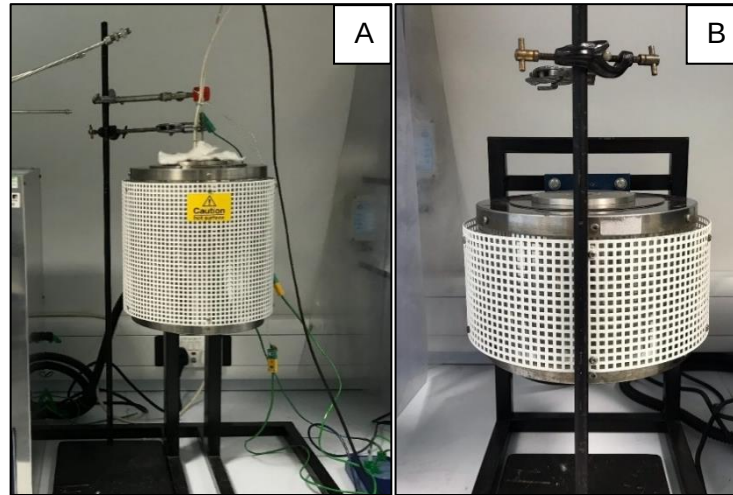


Figure 3-4: Furnace A and B



Figure 3-5: Furnace controller

Measurements are taken of both the outer and inner diameter of the furnace tube and length; this is to ensure the optimal placement of the battery cell to allow maximum absorption of heat. Furthermore, the placement of the cell is important because of the position of the heating element on the tube, so positioning the cell in the middle of the heated section of the tube, will be allowing for an even distribution of heat.

The furnaces different dimensions are shown in Table 3-4. Two varied sizes were chosen for the experiment to investigate if the size of the heating element would have an impact on the experiment

Table 3-3: Furnace dimensions showing the inner and outer diameter of the heating ceramic tube.

Furnace	Dimensions of tube(H/ID/OD/D)
A	303mm/56.91mm/66.01mm/254mm
B	170mm/49.26mm/59.80mm/250mm

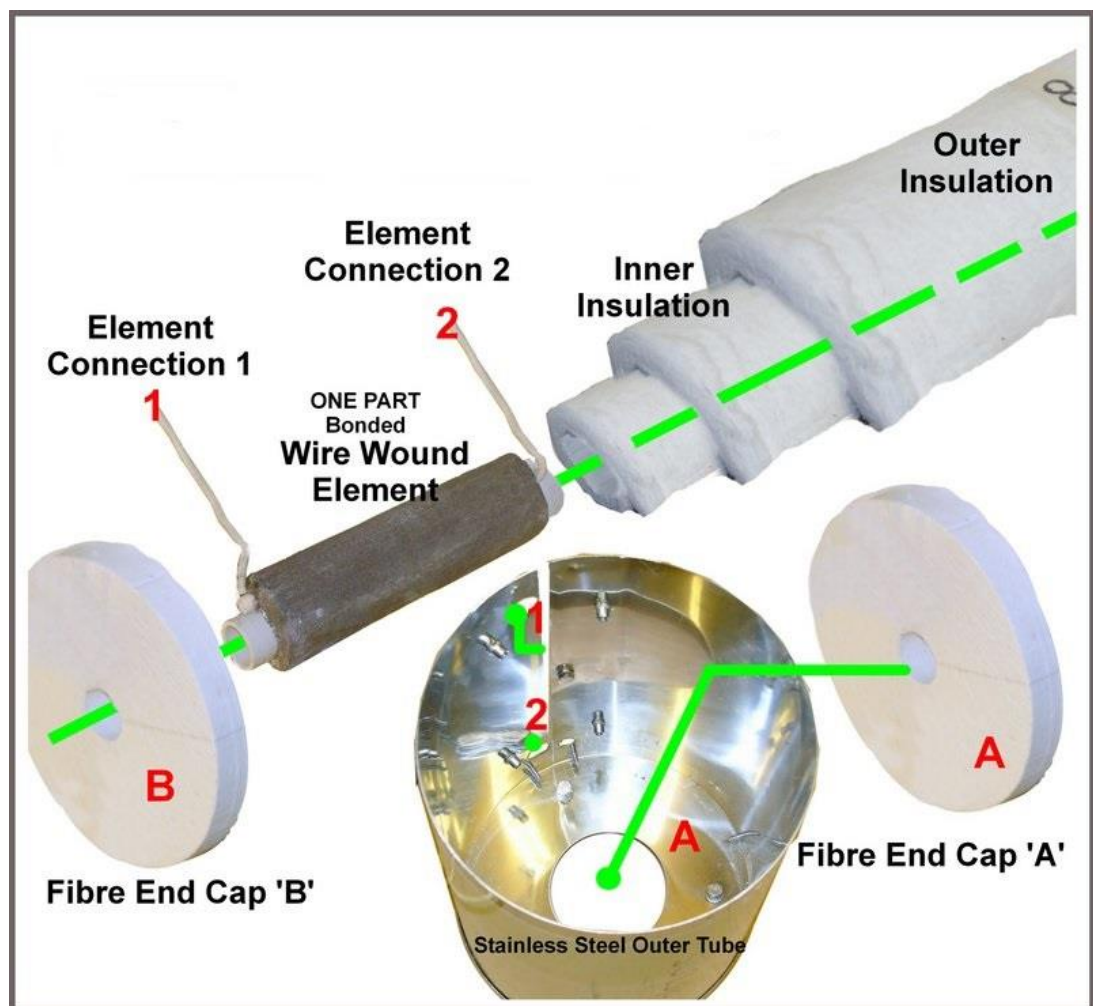


Figure 3-6: General construction of the interior of tube furnaces (Anon, 2019)

The inner and outer insulation is made from Durablanket-S (maximum operating temperature of 1260°C) material sheet, the Endcap disc is known as KVS121 and is made of 60% Alumina (Al_2O_3) which is a hard, chemically resistant material and can withstand very high temperatures in aggressive environments, according to the

manufacturers the wire-wound element was made by Resistalloy trading to order and could only provide the heating specification Fe-Cr-Al alloys i.e. Ferritic stainless steel with aluminium (maximum operating temperature of 1400°C)



Figure 3-7: Heating element of the furnace tube

The heating element of the tube is electronically controlled see Figure 3-5.

3.3 Temperature measurement

Type K thermocouples were used in this experimental setup to monitor the heat transfer that occurs through the cell. The cell is placed as close as possible in the middle of the heated section of the furnace as Figure 3-8 shows a schematic diagram of all locations of the thermocouples when the battery cell is placed in the tube furnace and shows the electrodes and thermocouples. They were two different models used of the standard K type thermocouples, but two had a rod attachment as shown in Figure 3-9 (B), while the other two wire types. The rod thermocouple (noted on the plotted graph in chapter 5 as furnace temperature 1 and 2) was placed inside the furnace tube next to the cell at opposite ends to measure the oven temperature surrounding the cell. One of the wire thermocouples is attached to the centre of the cell box to record the temperature as close to the centre of the cell as possible and the second thermocouple is placed on top of the cell on the cell seal to observe the temperature see Figure 3-9 (A).

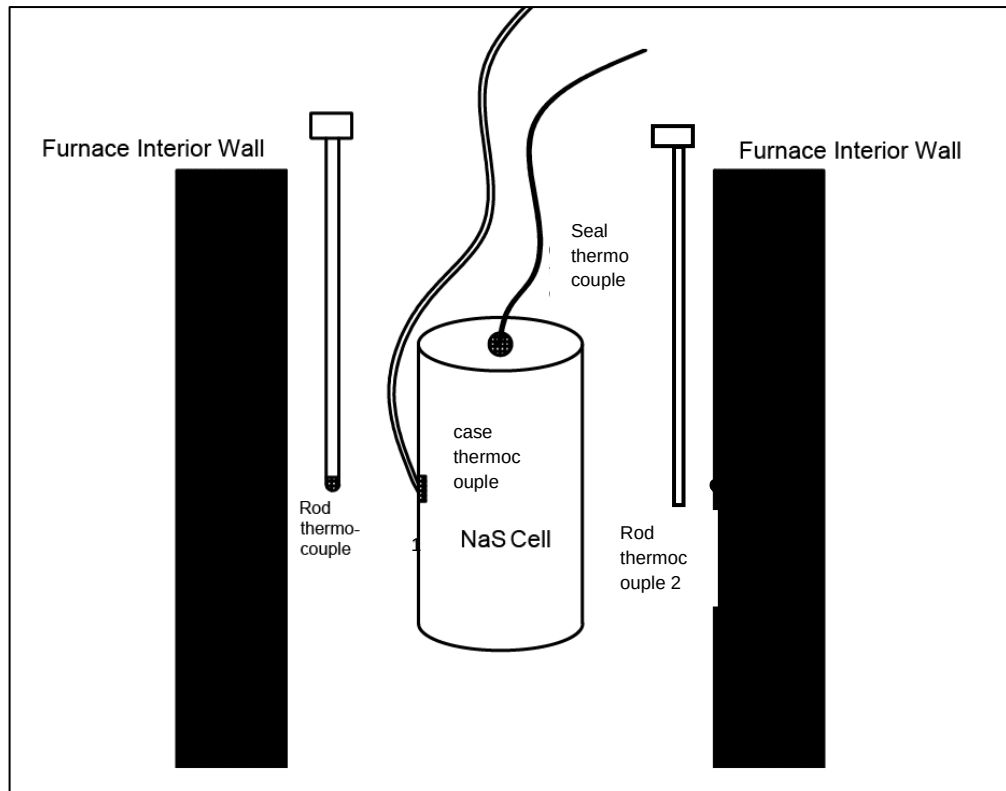


Figure 3-8: Schematic of thermocouple positions in the furnace setup

Moreover, all these temperature variables will provide baseline data to analyse the heat transfer that occurs.

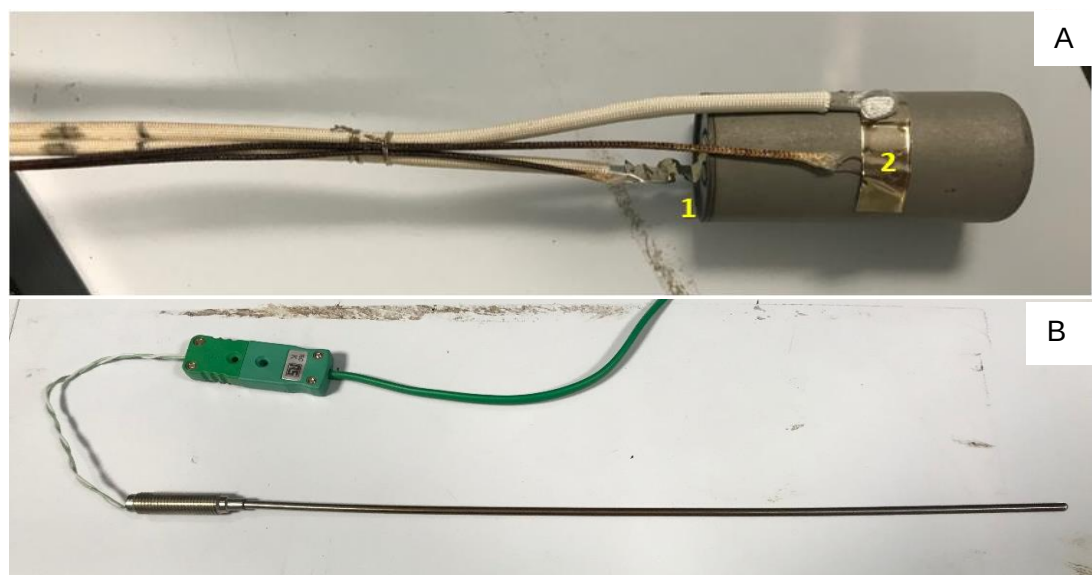


Figure 3-9: Thermocouples connected to seal (1) and case (2) of cell

Data were transferred from thermocouples to a working computer and recorded in Picolog using the Pico TC-08 thermocouple shown in Figure 3-10. The TC-08 is an

8-channel conductivity temperature data logger that also calibrates thermocouples (Pico Technology, 2018). The specific ports of three different thermocouples were used, which correspond to the specific ports programmed during the setup process.



Figure 3-10: Pico TC-08 Datalogger

3.4 Voltage measurement

The USB 6009 which offers a simple way of data sampling and measurements was used (National Instruments, 2017). The active NaS cell was also connected to a voltage measuring device connected to two poles, which was connected to the data logger of the NI USB-6009 multifunction input/output device, shown in *Figure 3-11*, which performed the function of collecting data for connecting to a PC and recording the voltage. The positive electrode was connected to port 5, and the negative to port 6, which corresponds to programming in the PC recording program. The ground wire of the voltage sensor is connected to ports 1 and 6, and this set is important for closing the circuit to obtain the correct voltage readings. Noting the cell being tested is a thermal battery and the open cell voltage can only be noted when the furnace has heated the cell to the appropriate temperature. The open cell voltage of 2.07 V when observed means the cell is fully operational and ready to be discharged.



Figure 3-11: NI USB-6009 Voltage device

3.5 Charge and discharge NaS cell

To be able to charge and discharge the battery cell, also the discharge of the battery will require a more advanced piece of electronics to record and control the voltage and current within the circuit and work out of hours an automated system was proposed, the development of the system was worked on in conjunction with the faculty of engineering electronics services at the University of Leeds. A LabView software was coded based on the manual procedure of the heating and cooling of the NaS battery cell. In the development of the LabVIEW code a control box was also built to interface with the battery cell and the furnace, a power supply to charge the battery and a programmable load to discharge the battery. In the development of the code, several versions were developed with varying successes and complications, for example, version 4 kept freezing and had to be changed from LabView code bit 32 to bit 64 and the charge and discharge software programme (cell voltage) in version 4 had to be upgraded going to version 5.

3.5.1 System purpose

The TENMA 72-13210, 300 W, 120 V 30 A programmable DC electronic load by Farnell-OneCall is used as part of the design because its features and design make it an ideal choice for battery testing. Its software module will form part of a 'state-machine design pattern that would be implemented for the automated battery tests and recording of the results of those tests.

The scope of the system was:

1. Part of LabView- NaS cell charge and discharge program
2. The record discharge capacity of a heated NaS cell. With the feature of the TENMA DC electronic load which can offer up to ten programable battery discharge tests. Five of these tests will be used for the experiments and be carried out by the TENMA load. The system will accept data for Ampere range (A), discharge current (A), cell capacity (AH) and discharge time in seconds(s). Furthermore, the system will record the cell voltage (V), current (A) and cell capacity (AH) directly from the TENMA programmable load.
3. The main benefit of the discharge test being carried out by the TENMA programmable load as opposed to the PC is that these can be run concurrently with the tasks being carried out by the LabView State-Machine code. The PC will therefore be used to log the data generated by the electronic load. A further benefit of this solution is that the final cell voltage cut off, amp-hour capacity or preferably the timer can terminate the test, whichever occurs first.

Finally, in version 6 which was implemented, the compensated voltage measurements from the TENMA Programmable Load were recorded (it removes errors due to cable losses in the system).

With the use of a Tenma 30 V 5 A programmable power supply and a 300 W 120 V 30 A programmable load and discharge control box with schematics shown in *Figure 3-12. (B and A) and Figure 3-13*, with *Figure 3-14* showing the front panel and *Figure 3-15* the internal view. An automated procedure was developed in LabView to heat, charge and discharge the NaS cell and monitored by the charge and discharge circuit in the control box shown in *Figure 3-16*, following the step process in *Figure 3-17*. , The view panel for each process of operation is shown in *Figure 3-18 to Figure 3-24* and the state machine for the LabView code is shown in slides 1-6 of *Figure 3-25*. Furnace B was used with a fourth thermocouple added into the furnace and labelled furnace 2 on the control panel as shown in *Figure 3-25*, with furnace 1 thermocouple used as the control for the LabVIEW code and furnace 2 thermocouples positioned in the furnace to read the programmed temperature.

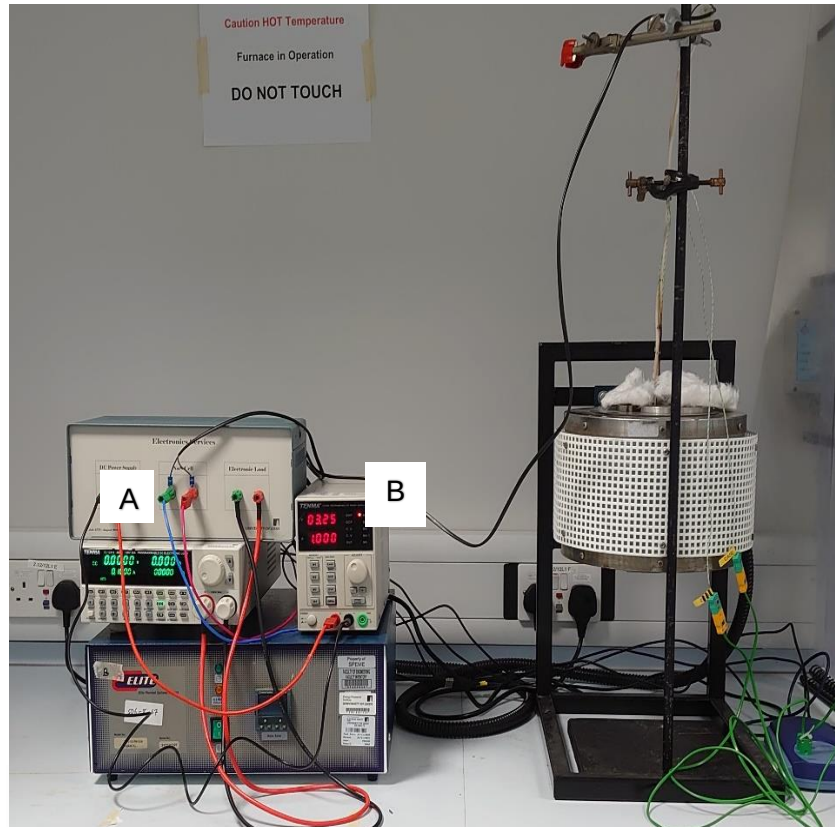


Figure 3-12: Experiment setup with furnace B

The electronics and controls were also custom designed as a part of this study, the entire setup was electrically inspected and certified for operation in the Energy building laboratory of the School of Chemical & Process Engineering at the University of Leeds, UK.

The resistor values in the box schematic were subject to change and may only be used as a guide to the final values selected when the program was run.

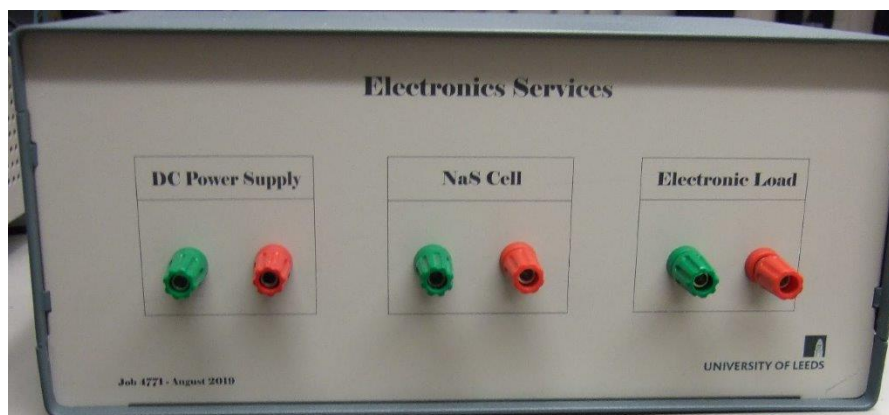


Figure 3-14: Front Panel of the control box, showing the external connection points for the cell, load, and power supply

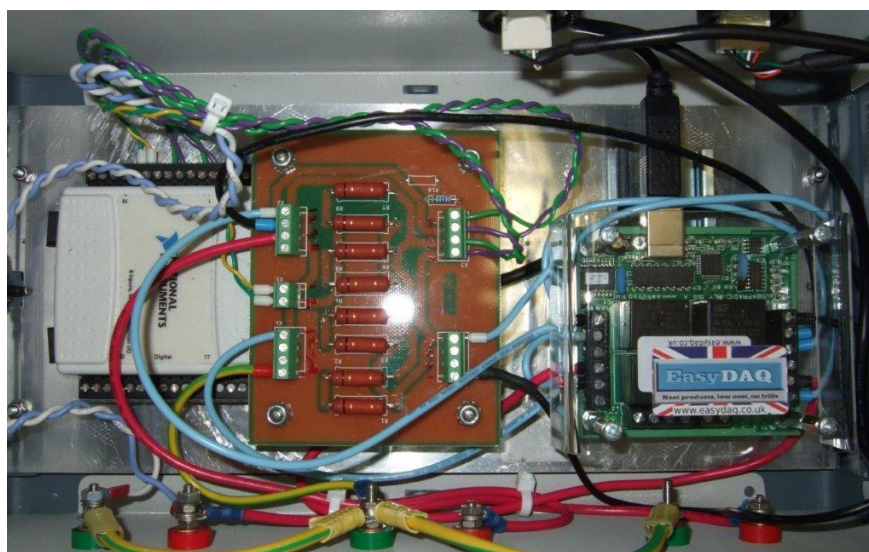


Figure 3-15: NaS Control Box – Internal view

The charge and discharge circuits have a nominal impedance of 1 ohm. The discharge circuit may be bypassed in LabView software via a relay is shown in *Figure 3-15* and *Figure 3-17* to limit the voltage drop on the output to load.

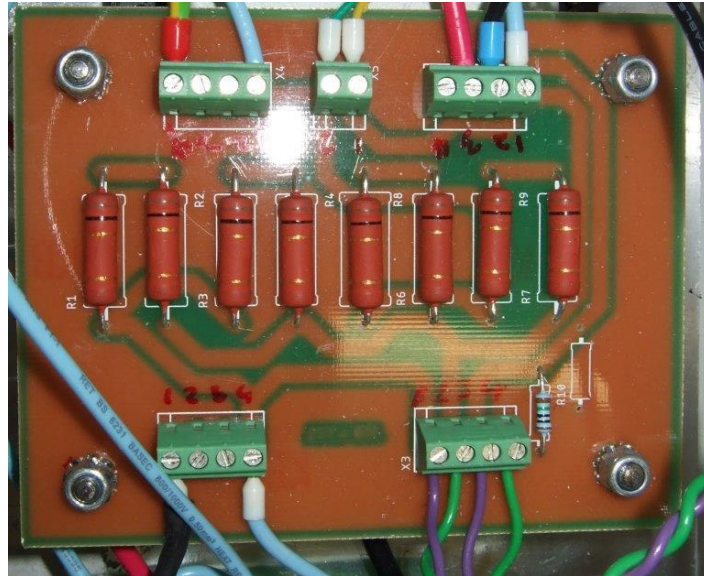


Figure 3-16: Internal view of the Resistor board for charge and load monitoring of the NaS control box.

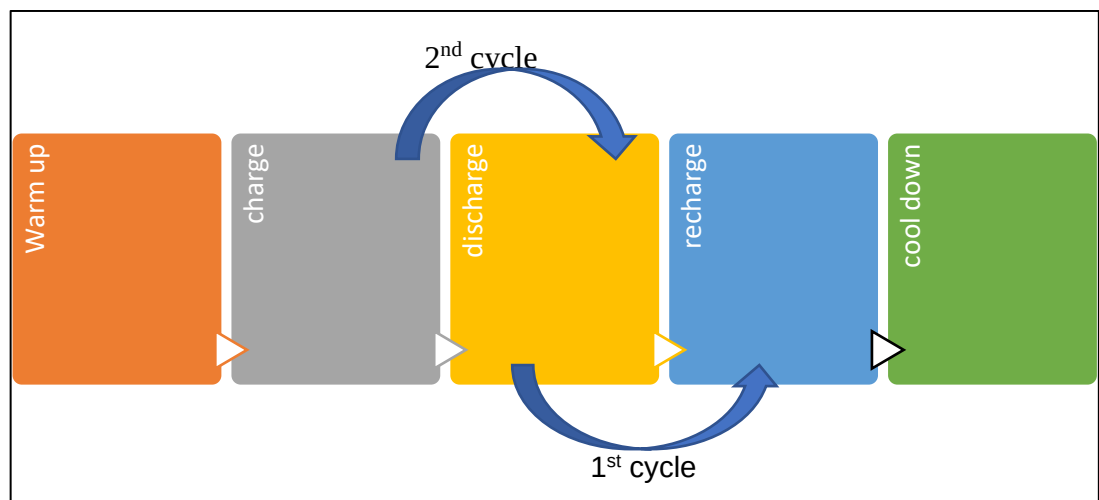


Figure 3-17: Step process of LabView code

Figure 3- 17 shows the flow process of events from start to end of an experiment cycle (warm-up, charge, discharge, charge, discharge, recharge, and cooldown)

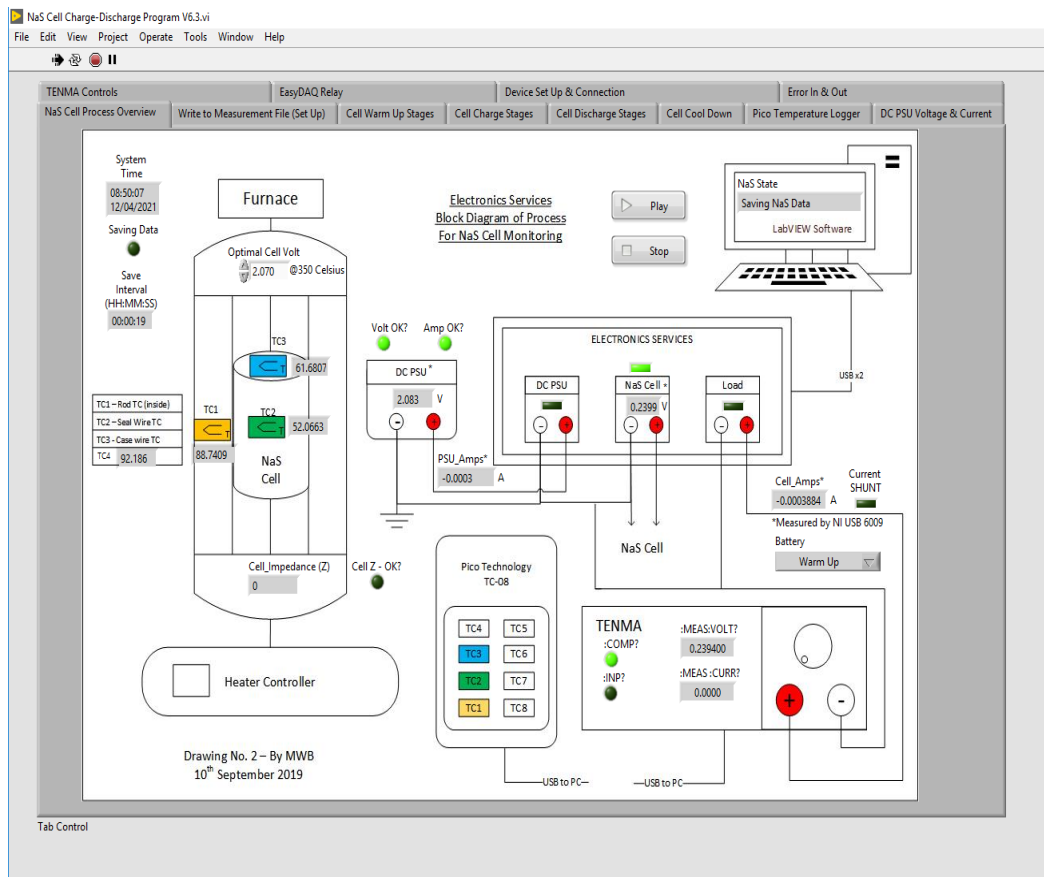


Figure 3-18: NaS cell monitoring control panel of the LabView program

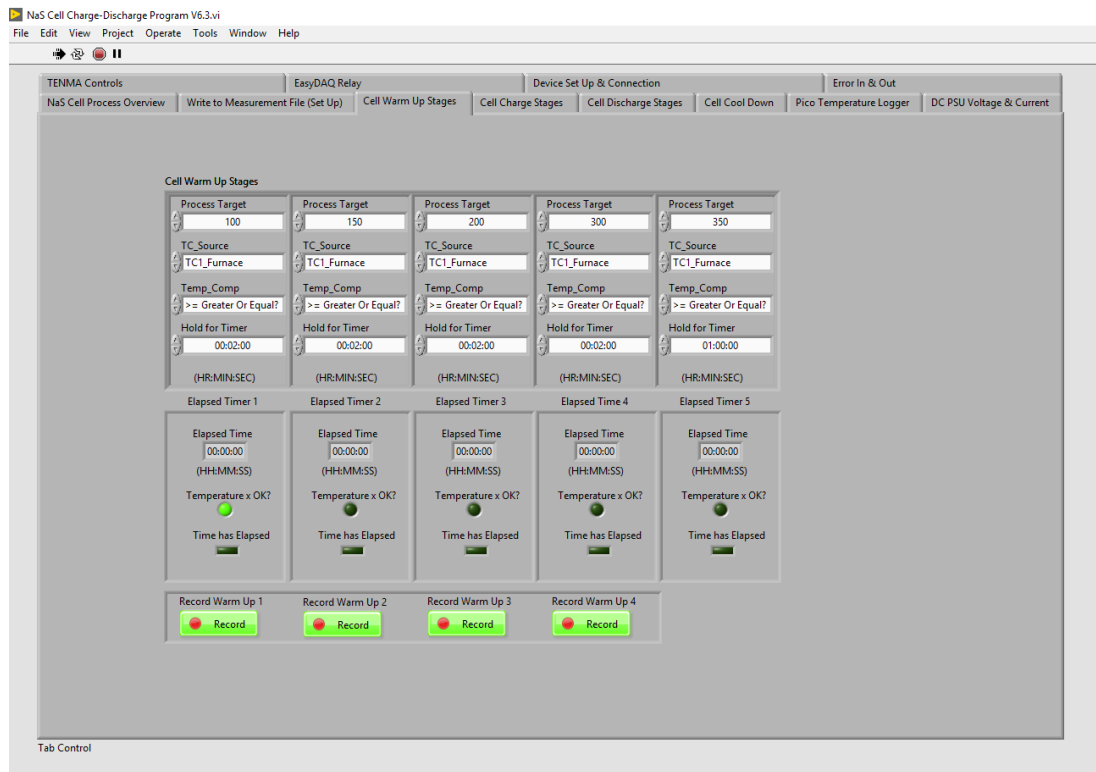


Figure 3-19: Heating Panel

Each stage of the heating panel is set to hit a temperature target within a time limit to move to the next step process, at the end stage if the temperature does not get to the desired temperature of 350°C, the last step process is rerun.

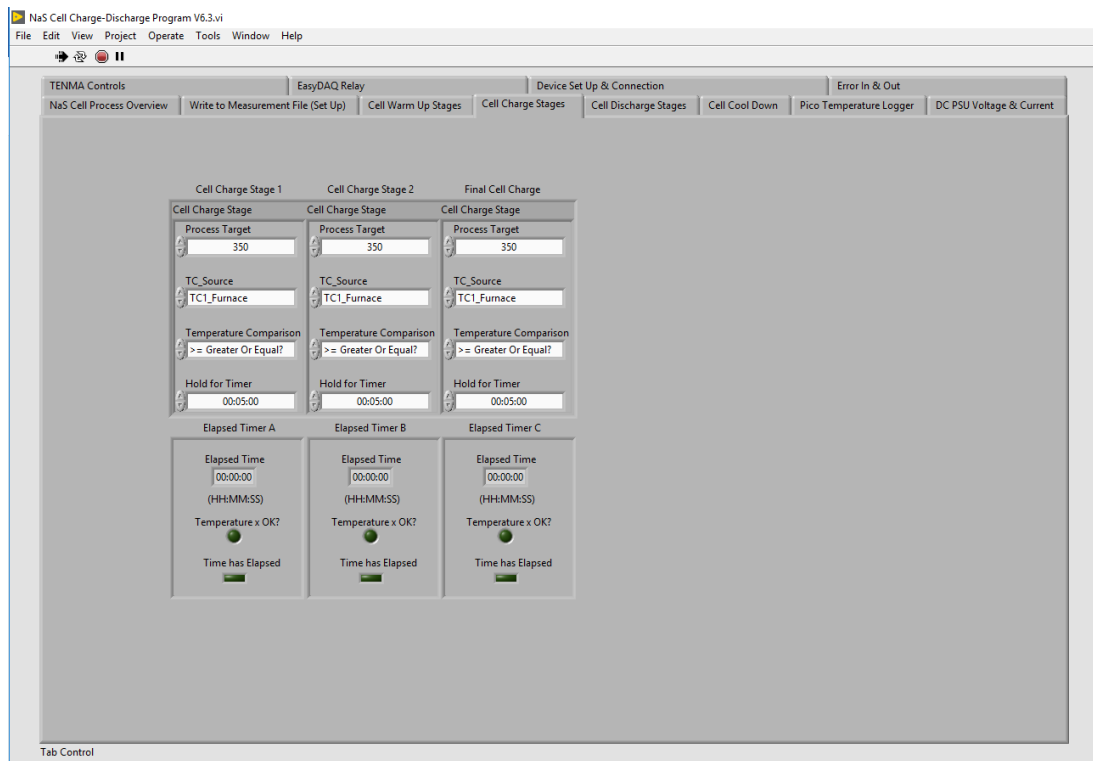


Figure 3-20: Charge Cycle Panel of the LabView program

Figure 3-20 shows the programmable charge panel of the LabView program.

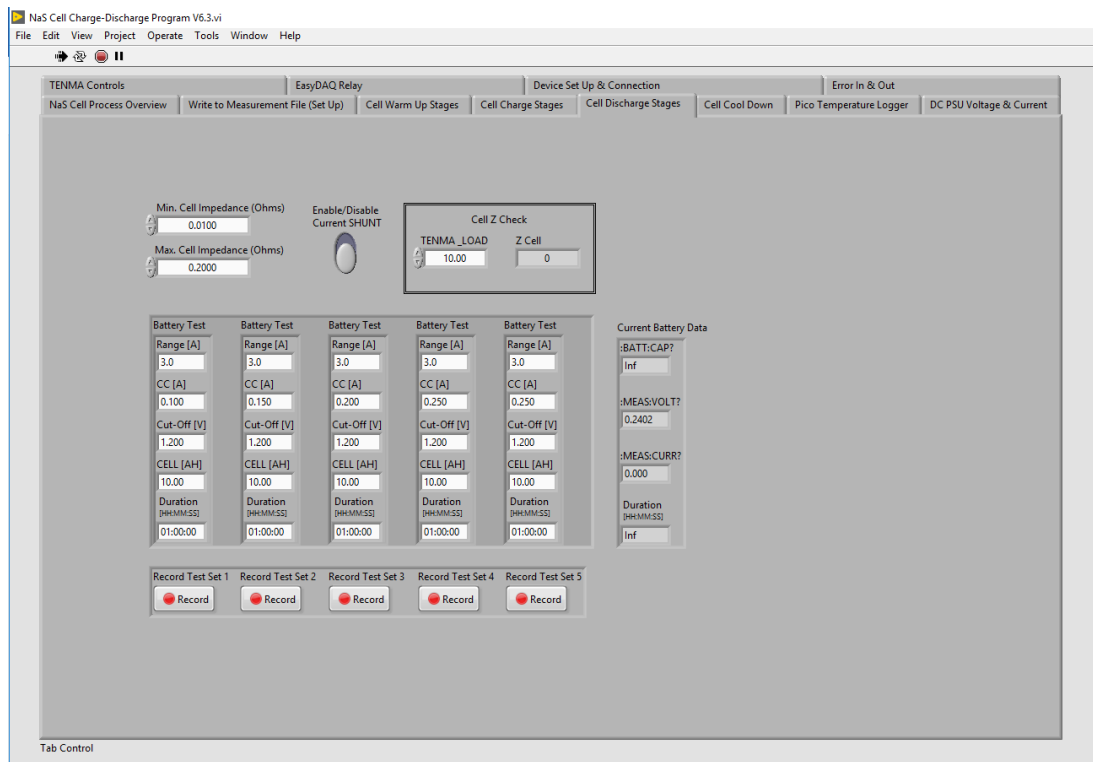


Figure 3-21: Discharge Cycle Panel of the LabView program

The discharge panel in figure 3-21 shows the discharge step process of the battery cell, see Table 3-4, furthermore, the actual discharge of the battery cell is extremely specific as it should not be discharged more than 50 - 60% discharge. The system will be described further in the following chapter.

Table 3-4: Discharge step process of NaS LabView program

Name	Discharge Rate	Time
Initial Discharge	100 mA	60 mins
Pause to calculate the resistance If R> 100 mOhms then continue next steps		
STEP Increase discharge rate	150 mA	60 mins
Pause to calculate the resistance If R> 100 mOhms then continue next steps		
STEP Increase discharge rate	200 mA	60 mins
Pause to calculate the resistance If R> 100 mOhms then continue next steps		
STEP Increase discharge rate	250 mA	60 mins
Pause to calculate the resistance If R> 100 mOhms then continue next steps – HOLD at 250 mA discharge		
HOLD Discharge	250 mA	60 mins

Before each experiment is undertaken a set end temperature has to be logged in for this process to proceed.

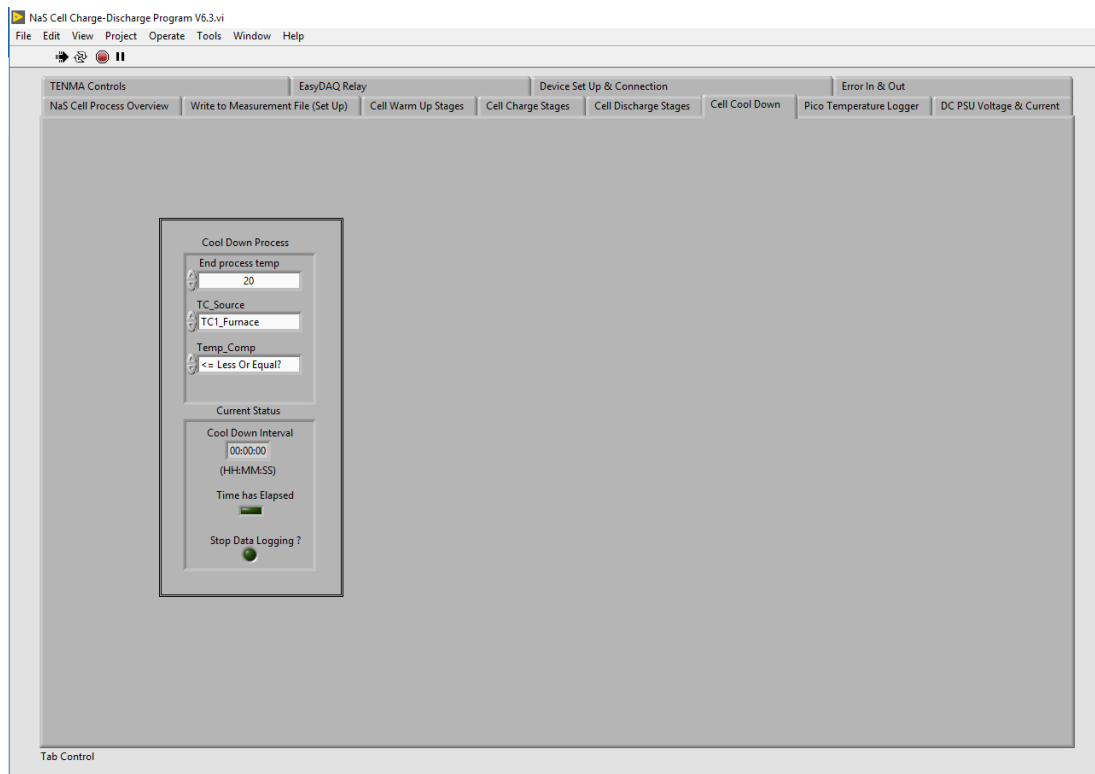


Figure 3-22: Cool-Down Panel shows steps to program for the end process to begin

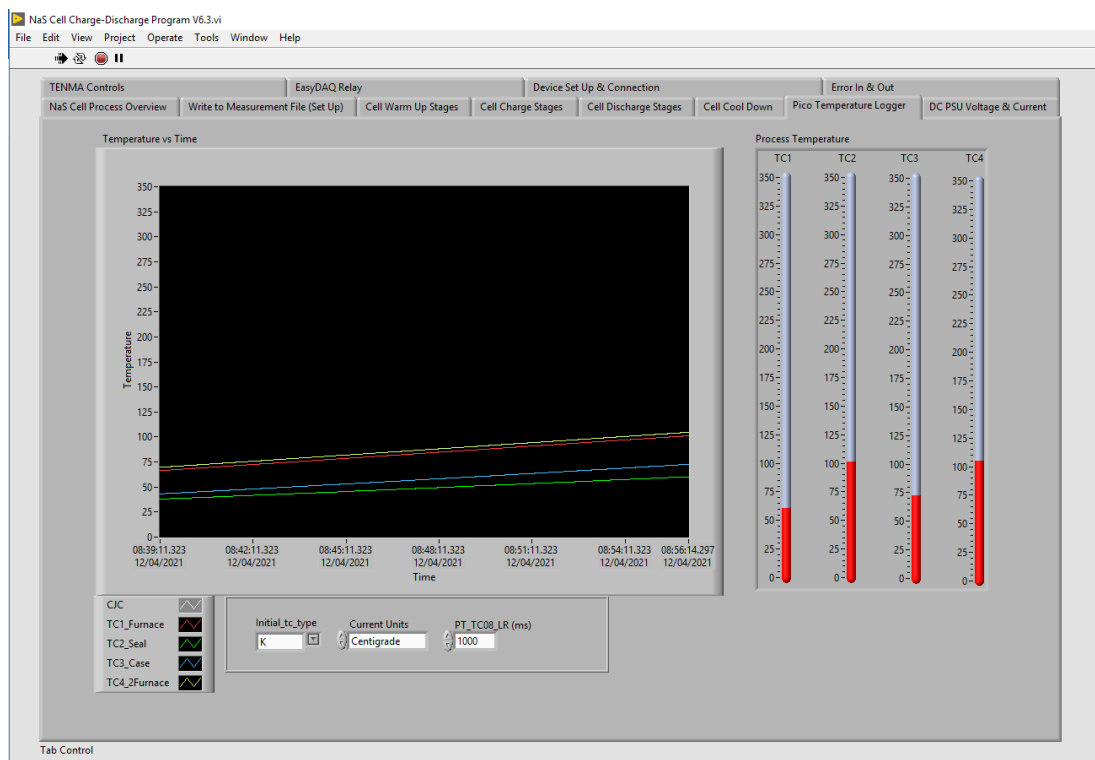


Figure 3-23: Temperature Panel gives a view of each attached thermocouple connected to the system.

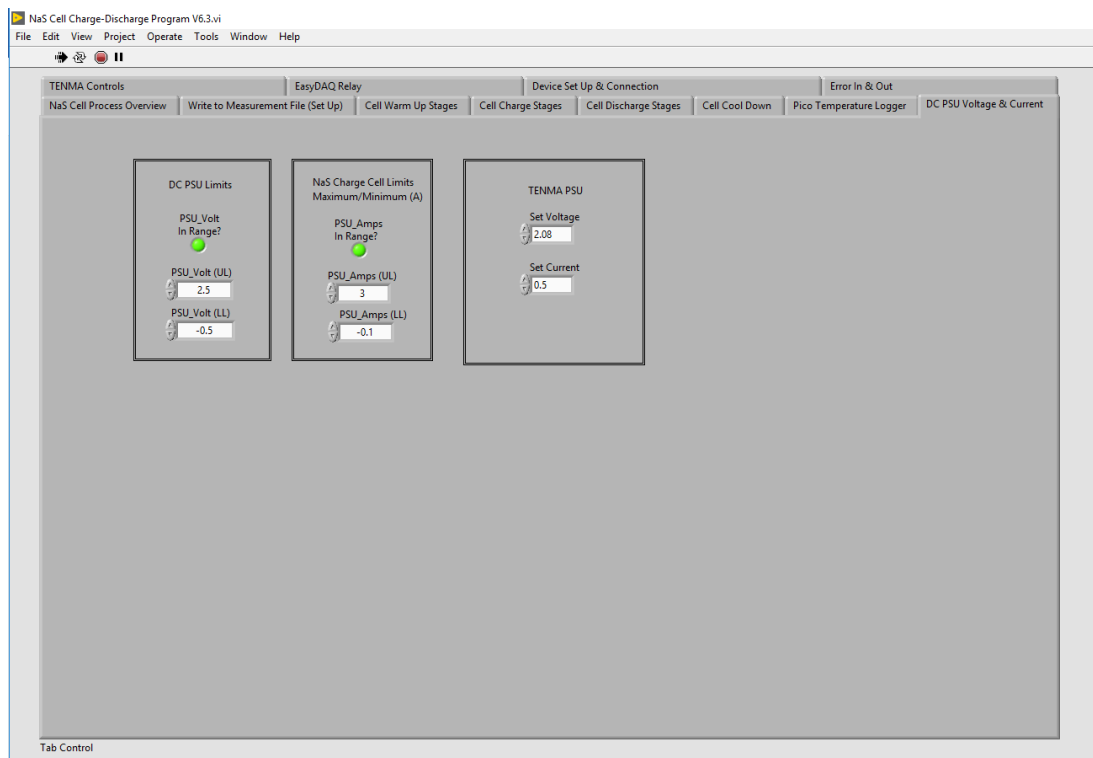
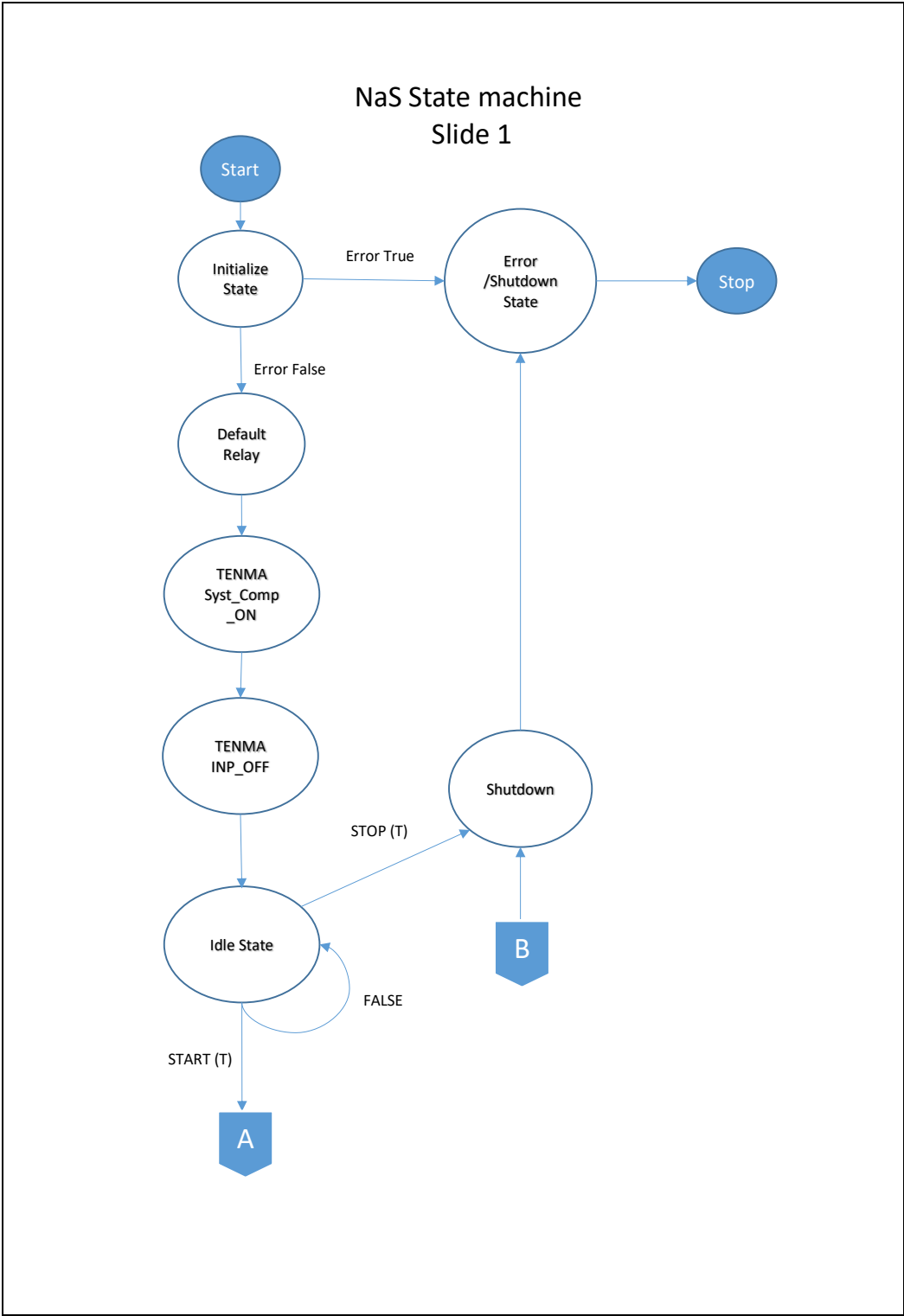


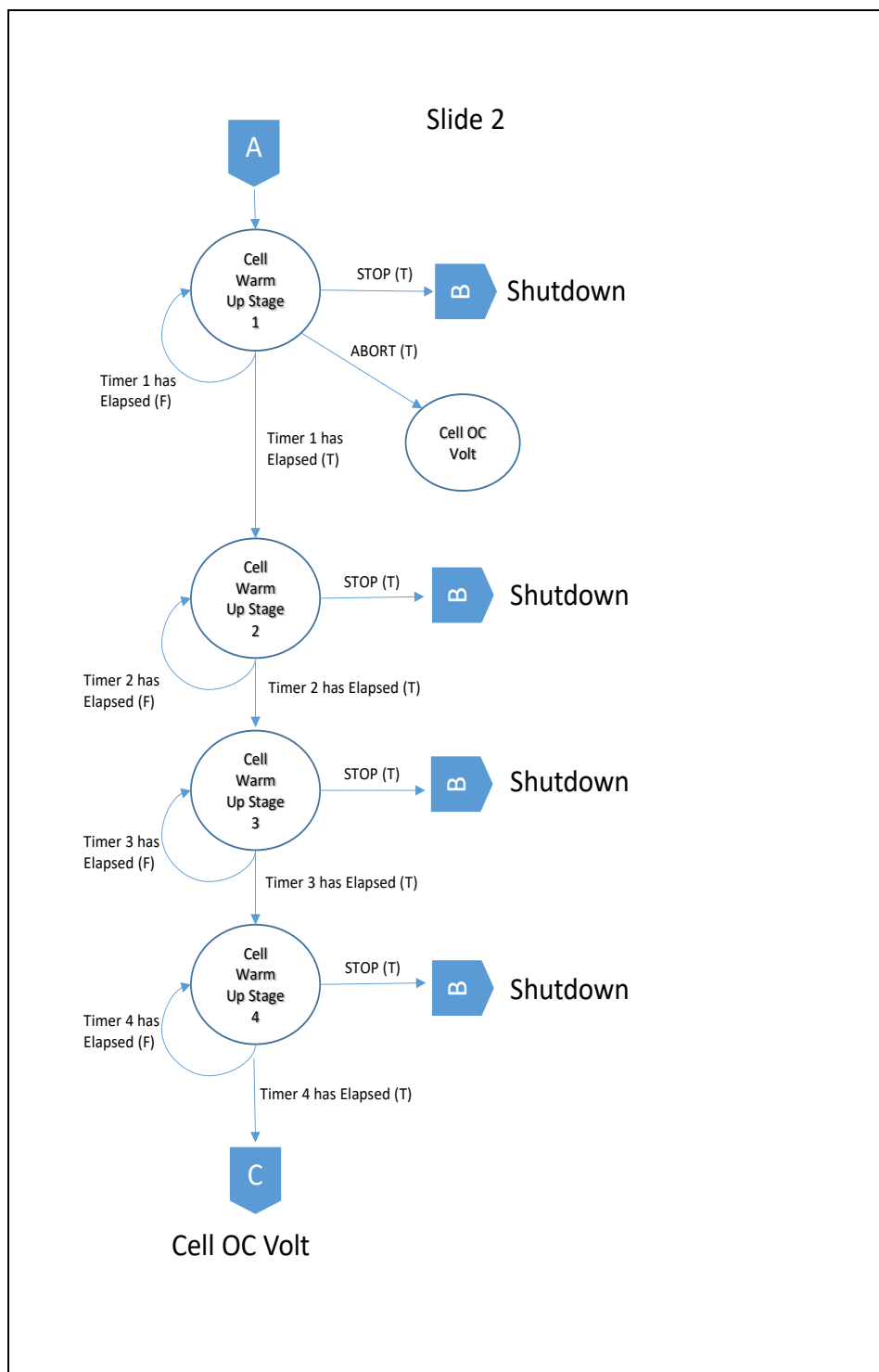
Figure 3-24: Current and Voltage Power Supply Panel of the LabView program

The power supply during the charging process is pre-programmed before the experiment begins.

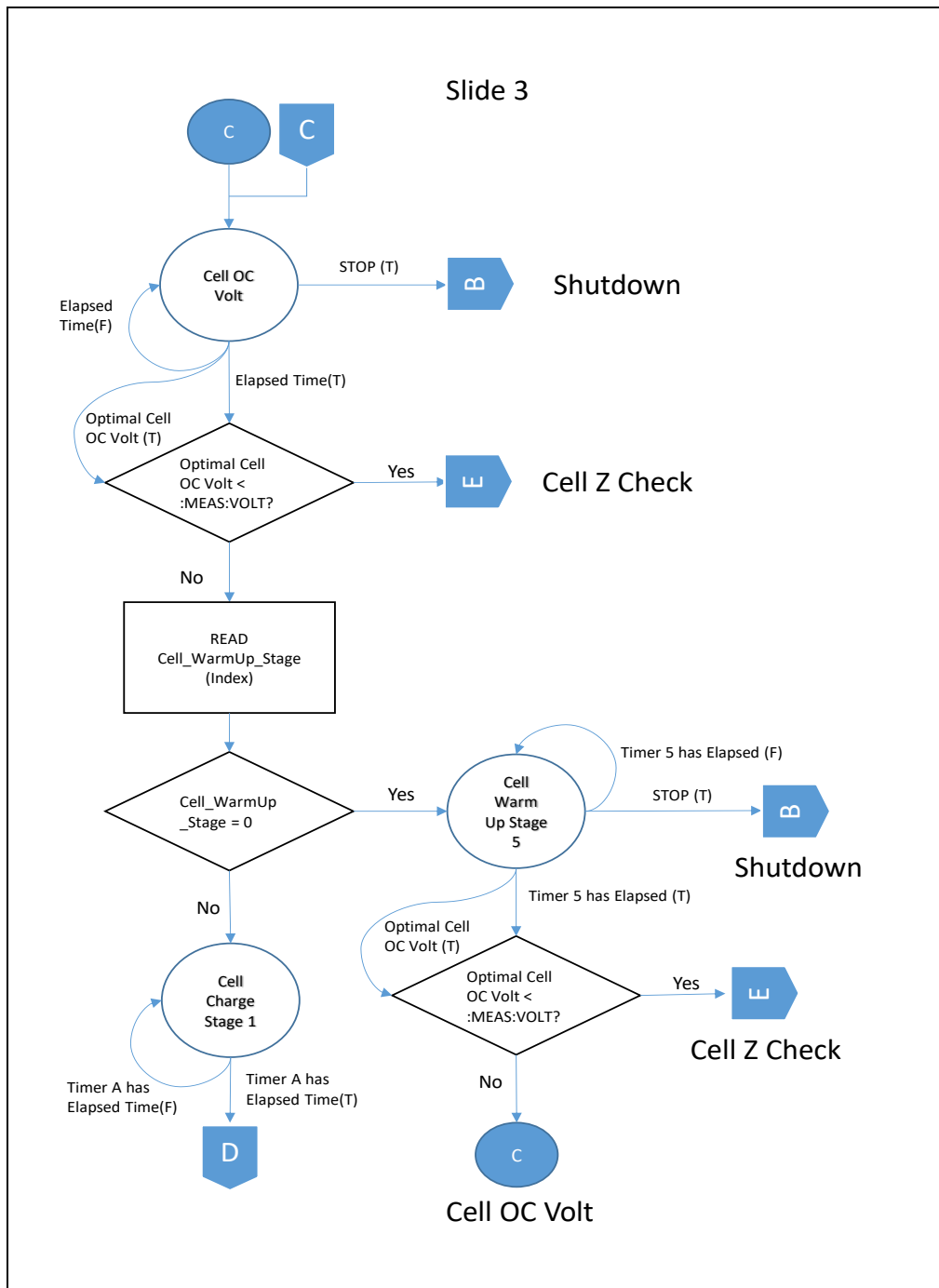
The state machine diagram in slides 1- 6 details the sequence of commands, steps, and flow of events for any given command allowed within the program.



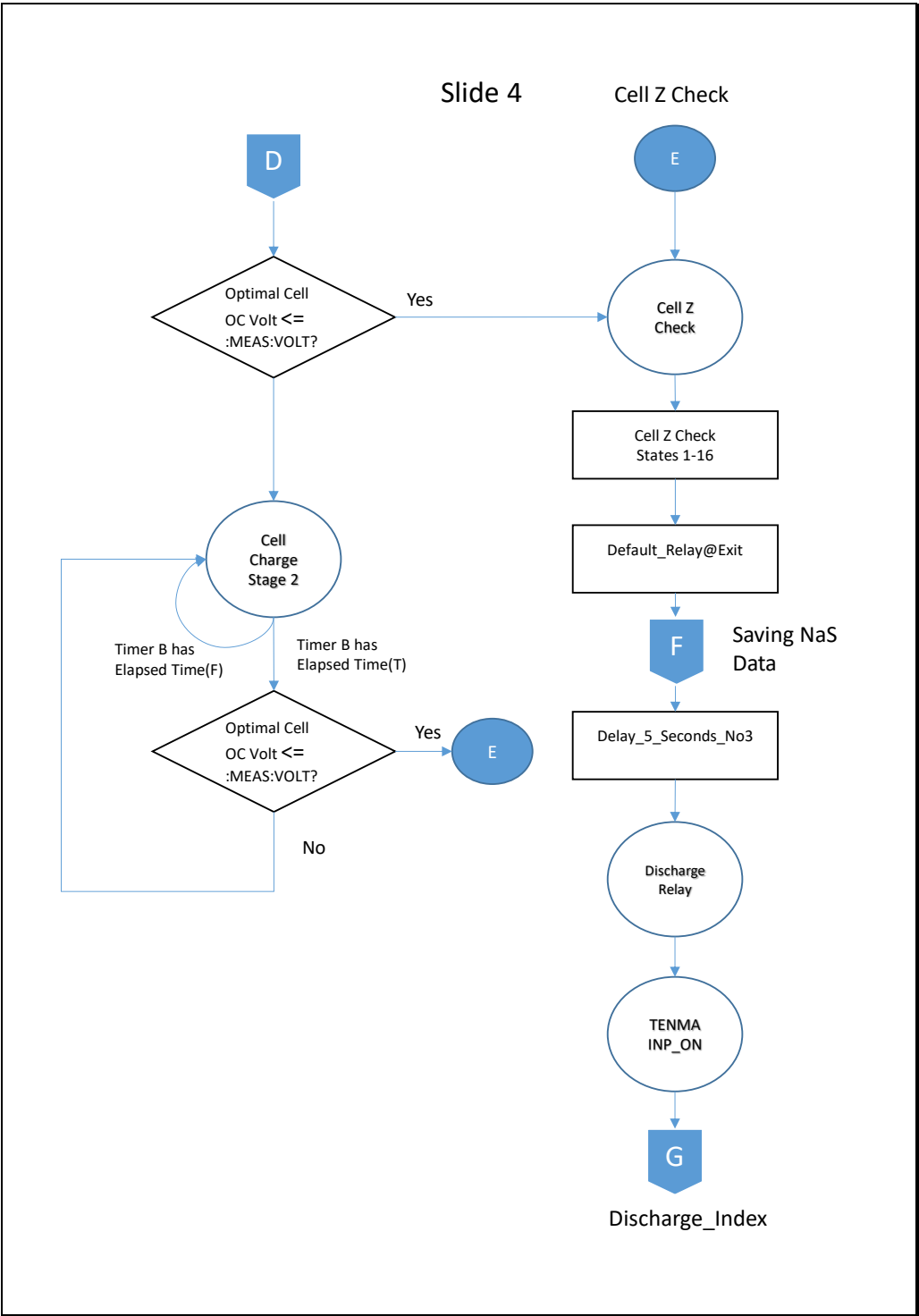
Slide 1 of Figure 3-25 shows the idle/ start state of the LabView programme.



Slide 2 of Figure 3-25 shows the warm-up stages of the LabView program.

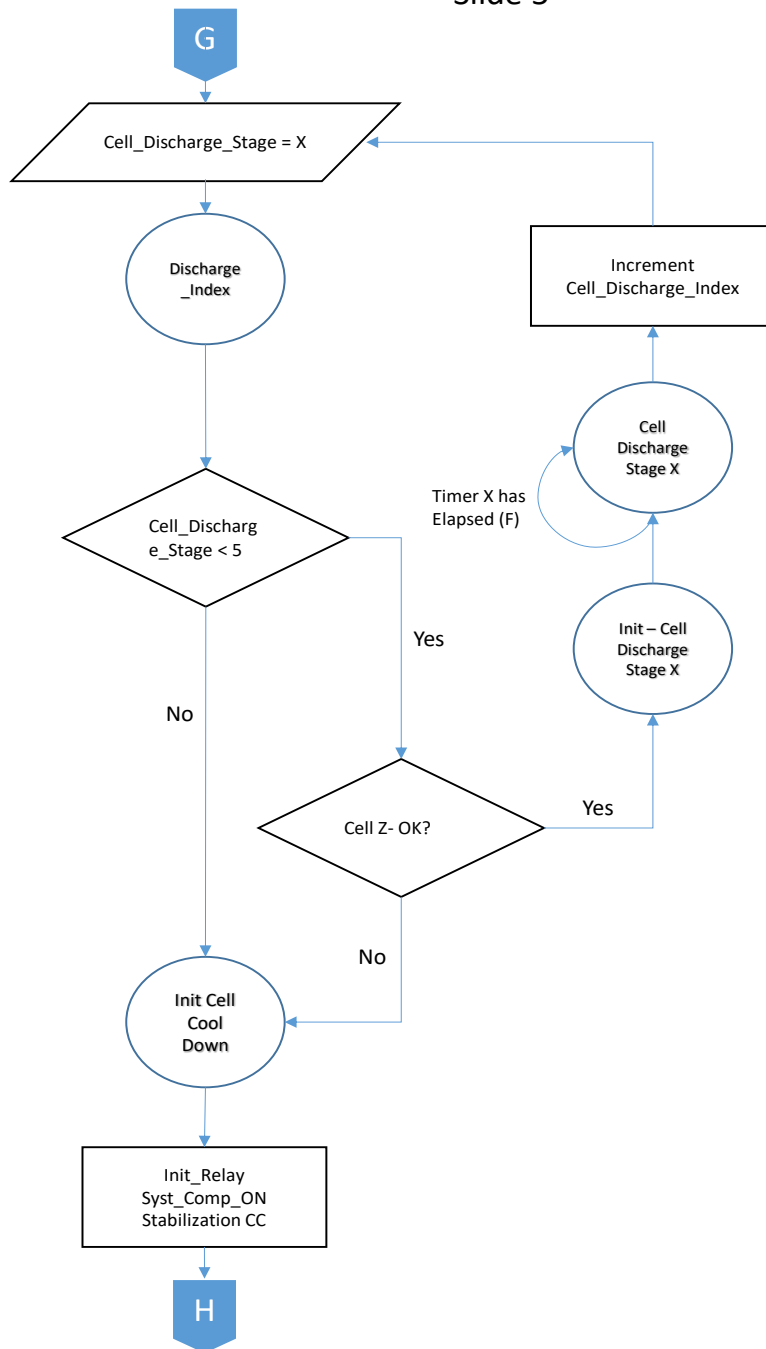


Slide 3 of Figure 3-25 shows the initial cell charge to check the cell voltage level.



Slide 4 of Figure 3-25 shows the checks for charge and the discharge.

Slide 5



Slide 5 of Figure 3-25 shows the cooldown steps.

Slide 6

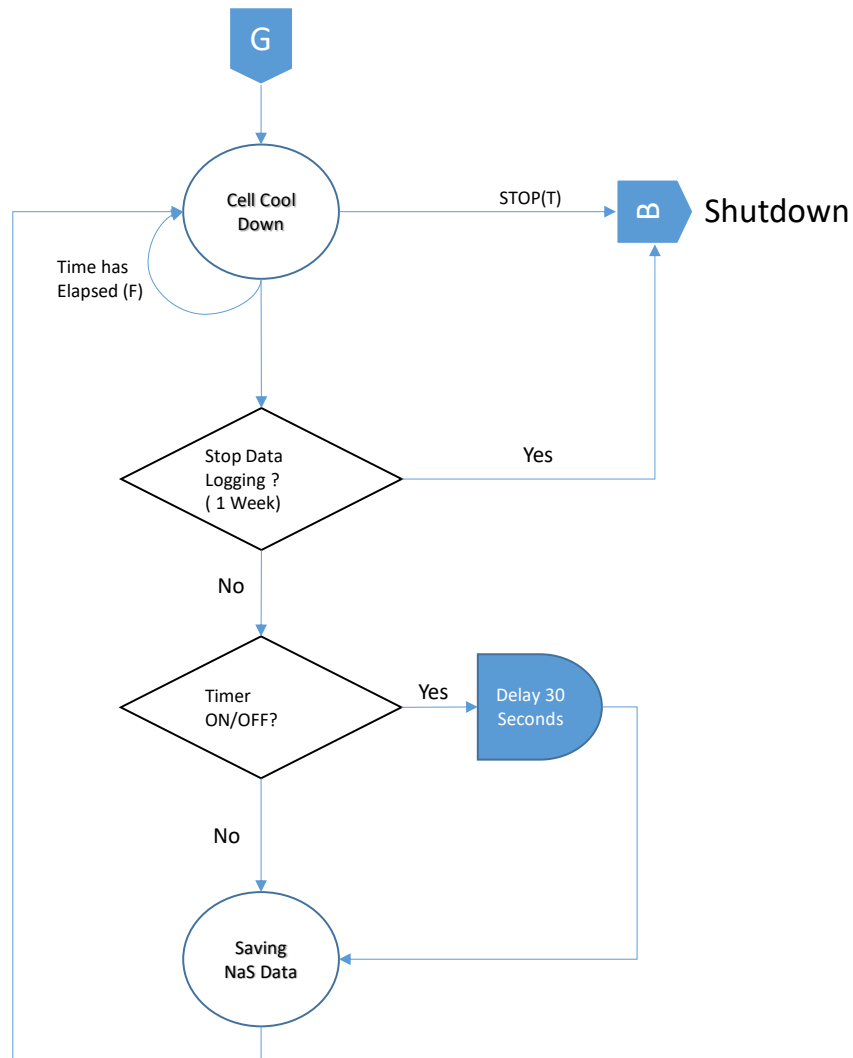


Figure 3-25: Slide 1- 6 of the NaS State machine, shows the breakdown and flow of command in the state machine (Buckley, 2020b)

Slide 6 of Figure 3-25 shows the final shutdown stage of the LabView program. Find more details in the appendix.

3.6 Conclusion

This section covers a description of the equipment and setup, components and its function used for the experiments, an overview of the LabView program and a control box to charge and discharge the battery cell. A recurring issue encountered was the breakdown of the tube furnaces which necessitated the changing of the electrical heating coils of the furnace from the manufacturers and this meant a shutdown of experimentation. Other issues were system bugs with the LabView code, which meant an overhaul and an upgrade, in total six versions were implemented. The LabView code is still in the development stage and the definitive version is yet to be completed. The LabView code was designed to meet the requirements for this experiment owing to the lack of commercially available software that meets the specific requirements.

The following chapter covers the experimental procedure, development, and methodology of the experimental process.

EXPERIMENTAL PROCEDURE

This section covers the experimental procedure. The experimental runs were divided into three sections, the first was on the warm-up and the second was the standby where any charging or discharging could be carried out and finally the third was on the cool-down of the sodium sulphur cell. Also covered in this section is the experimental procedure for each test run and some examples of results from the two furnaces used for the experiments.

The main experimental test conditions, parameters and procedures were designed in collaboration with an industrial partner, Ionotec LTD (a commercial battery component manufacturing company). The method was developed to investigate the failures of the previous cells used in the research used in (Nation, 2013), the failures in cells were fracturing and case bulging which resulted in the mullite tube being cracked see figure 4-1, the mullite tube housed the connected NaS cells in the experimental rig. Shown in Figures 4-2 and 4-3 is the state of the electrical energy storage (EES) receiver and the experimental rig designed and built for the previous experimental work by Nation.



Figure 4-1: Cracked mullite alumina ceramic tube



Figure 4-2: *State of EES receiver*

A controlled laboratory-based procedure was developed to further investigate the thermal properties of the NaS cells to mitigate the cell limitations, which was to be used with the EES solar devices. In mitigating cell fracturing, the experimental rig shown in Figure 4-3 could be commissioned and the original objectives of that research achieved.

In the development of the procedure for NaS heating; assuming that the cells in the “stand-alone” device had to be solar heated this requires that the cells be heated by radiation to simulate the sun during the daylight hours. Owing to the physical attributes of the cell design this informed the type of device (furnace) to be used for the simulation.



Figure 4-3: *State of EES Experimental Rig*

The heating of the cell had to be conducted at a low rate to avoid stressing the electrolyte during the melting phase.

4.1 Procedure Development

The initial heating rig was designed by Nation in 2013 and incorporated sodium sulphur cells in a ceramic mullite tube, on completion of the research work it was established that the first sodium sulphur cell string of cells had failed and had caused bulging of the cell cases and fracturing and entrapment in the mullite holding tube. From the research, the cells were only heated to 120°C before cooling.

Ionotec the manufactures of the cells and partners on that research explained that if cells were cooled down to ambient in the discharged state that they would probably

fail and bulge due to the non-uniform distribution of sodium polysulphides on failure. NaS cells can be cooled down in fully charged conditions.

The heating and cooling rates of NaS cells and batteries are generally at 1°C/min, so with this information, a heating procedure would have to be developed to safely heat the cells.

Discussions took place regarding the next rig, and it was felt that the cells could be connected in a planar 2x2 cell, 4 cell series string rather than a vertical arrangement. Ionotec will connect such an array for the test.

It was thought that developing a cell for the horizontal operation would be too time-consuming and the horizontal arrangement would provide the appropriate electrical information.

Regarding the operation of the cells, since the premise was on the rotation of the sun and the set time for cool down would be when the sunset, i.e., no further solar power would be available. Ionotec stated that this could cause cell failures as the cells would be discharged at this time. On further discussion, it was agreed to use a single cell with a tube furnace as the heating source.

Several cycling suggestions were discussed, and it was felt that the cell discharge would need to be stopped well in advance of the cell cooldown. A proposal was made to limit the discharge capacity and re-heat the cell during the period where solar power was available for cell charging was the best option.

A schematic of the cell cycle is shown in figure 4-4 which included a period for charging and cooling down before the next cycle.

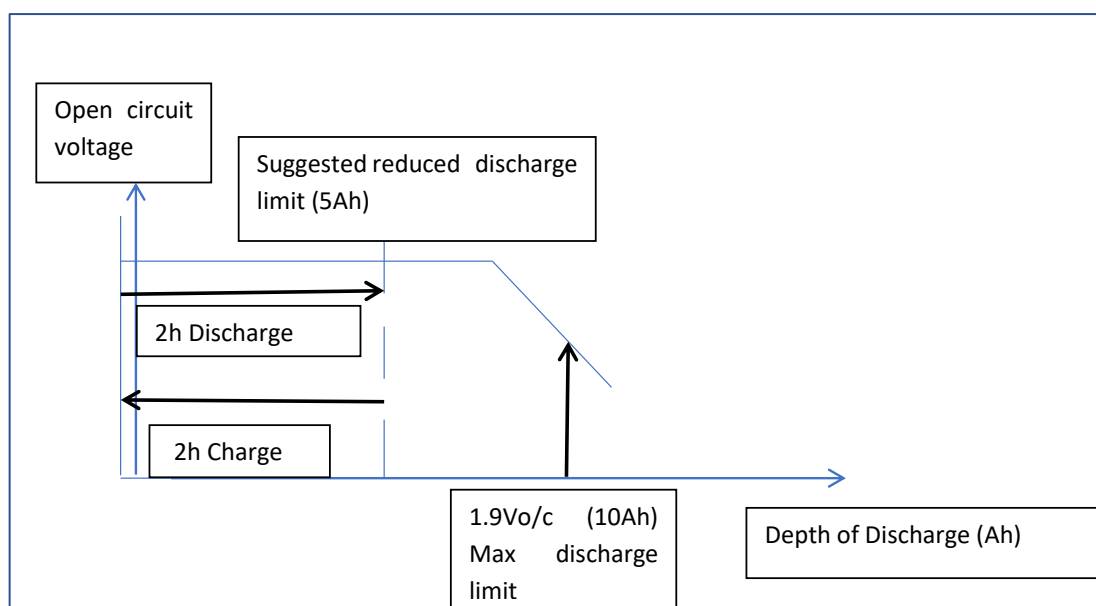


Figure 4-4: Initial suggested, truncated cycle allowing discharge of 2 h at 2.5 A and 2. h at 2.5 A charge. (5 Ah) during a period of sunshine.

Regarding Figure 4-4, the cell would be charged within the period where solar energy was available for a charge after which the cell would be cooled down at $1^{\circ}\text{C}/\text{min}$ before reheating and further discharge the following day during sunshine hours.

This shallow cycle would be repeated with the benefit that the cell would always be cycling in the 2-phase region of operation ($\text{S}+\text{Na}_2\text{S}_5$) which is a much less corrosive environment than cycling into the single-phase region down to 1.9 Vo/c .

It was decided that the research would undertake some cooldown tests on cells with and without thermal insulation to determine the thermal inertia or cooldown time of the cell from 350°C . Unfortunately, owing to time constraints the cells were not fitted with the appropriate insulation material in time for the research.

Cooling would be governed by the thermal inertia of the furnace.

Here, two experiments, denoted as Experiment 1 and Experiment 2, were carried out. In both cases, the thermal properties of NaS battery cells were investigated under different scenarios. The details are presented as follows. Experiment 1 aimed at observing the heat transfer that occurs during the warming and cooling of the NaS cell. The experiment was conducted using a 10 Ah NaS cell and an Elite Thermal tube furnace system. The Elite Thermal tube furnace system was used to simulate the heating of a solar parabolic collector. This arrangement was to heat the cell to the operational 350°C and data loggers. Experiment 2 aimed at observing the NaS cell during discharge and charging.

The experiment runs for over 2 days and involves the holding of the furnace temperature at 350°C which poses apparent safety issues and owing to the out-of-hours running of the furnace, there are some restrictions that are applied in conducting this experiment in the University premises, to mitigate this an automated system in LabView depicted in chapter 4 was developed.

4.2 Experimental procedure cell warm-up and cool-down

The initial testing of the experimental equipment included testing the heating of the furnace. Initial heating was done up to 1000°C to ascertain if the furnace could sustain high temperatures because before that it had only been used for low-temperature experiments, also heating up to 1000°C aided in the further cleaning of the furnace tube of all remaining residue from previous experiments. No thermocouples were utilized in this test, as the furnace has its temperature reading on its control unit. However, the interior of the battery cell is required to reach 350°C therefore, the furnace is further tested to reach 400°C with a thermocouple placed inside, to ensure the full operational purpose of the cell.

The heating rate is set to be 1°C per minute and this is used to avoid any damage to the cell that could be caused by heating it too rapidly. The furnace will be heated from initial room temperature up to 350°C at a rate of 1°C per minute and then it will be allowed to cool overnight. The cycling of temperature was programmed into the temperature controllers that were attached to the various furnaces, and it is particularly important as it is the main variable in the experiment. Also due to the sensitivity of the battery module and the proximity of the melting points of the sodium and sulphur, 97.79°C and 115.2°C, respectively. This step may vary when utilizing different furnaces, but not in this case as they utilize the same Eurotherm controllers, as shown in *Table 4-1* and *Figure 4-5*.

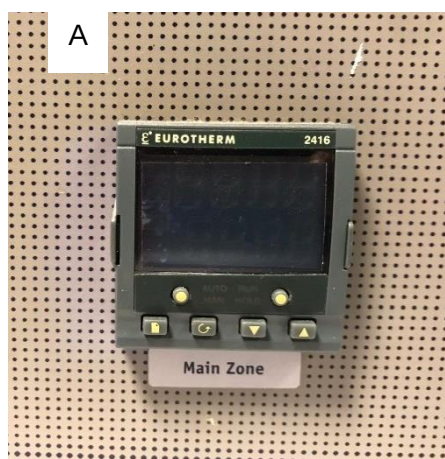


Figure 4-5: Details of Eurotherm 2416

When programming the controller, the first prompt is to set the ramp unit, 'rmp.U' in the display, as per minute. Table 4-1, illustrates all the program instructions for the heating stages of the experiment. The stages of heating and holding are shown in Table 4-2 and the set heating rate of 1°C/min, Using the manual for 2416 found online (Eurotherm, 2014), the heating stages of the furnace was set. For 2416, the stages of heating are separated into segments, defined as 'SEG.n' which can fall under 6 types. For this experiment 3 types were employed, the 'rmP.r', which is a temperature ramp to a set point at a certain rate, 'dwEll', which programs the furnace to dwell for a set time and 'End', which ends the program. Table 4-3 shows the heating procedure for varying heating rates.

Table 4-1: Programming Instructions for heating stages for Eurotherm 2416 for both furnace A and B

<i>Heating Stage</i>	<i>Instructions for 2416</i>
<i>Room temp → 100°C</i>	Set 'tYPE' as 'rmP.r' & set 'tGt' as 100
<i>Hold at 100°C for 60 mins</i>	'dwEll' & set 'dur' as 60
<i>100°C → 160°C</i>	'rmP.r' & set 'tGt' as 160
<i>Hold at 160°C for 60 mins</i>	'dwEll' & set 'dur' as 60
<i>160°C → 350°C</i>	'rmP.r' & set 'tGt' as 350
<i>Hold at 350°C for 120 mins</i>	'End' & set 'End.t' as 'dwell' ¹

¹ This will set the end of the program to indefinitely hold the temperature at 350°C until the furnace is switched off

Table 4-2: Initial Heating Procedure 1°C/min heating rate

<i>Stages</i>	<i>Temperature parameters</i>
<i>Stage 1.</i>	Heat from ambient temperature to 100°C at 1°C/min.
<i>Stage 2.</i>	Hold at 100°C for 1 hour
<i>Stage 3.</i>	Heat from 100 to 160°C for 1hour at 1°C/min.
<i>Stage 4.</i>	Hold at 160°C for 1 hour.
<i>Stage 5.</i>	Heat to 330/350°C at 1°C per min over 3 hours or until the battery temp gets to 350°C.
<i>Stage 6.</i>	Hold at this operating temperature and measure open-circuit cell voltage.
<i>Stage 7.</i>	Heating is stopped at 17.00, and the furnace is left to cool down overnight.

The hold times were assumed owing to the cell design, with a centrally positioned sodium electrode and external sulphur electrode configuration. The 1st hold had to be at a temperature to melt or start the process for sodium without the sulphur changing phase. Noting the melting point for both was close with sodium at 97°C and sulphur at 115°C. The 2nd hold was picked to allow enough time for all 1st phase change to occur. The end of the heating procedure at 5 pm was due to Laboratory regulations. Also at that time, the open-circuit voltage would have been obtained. Table 4-3 lists the experimental trails at increased heating rates to investigate the difference in varying heating conditions.

Table 4-3: Heating procedure for at 2 and 3°C/ min heating rate

<i>Stages</i>	<i>Temperature parameters</i>
<i>Stage 1.</i>	Take room temperature readings for 10 – 30mins
<i>Stage 2.</i>	Heat from room temperature to 350°C at (2 and 3°C/ min)
<i>Stage 3.</i>	Heat to 350°C for 1 hour
<i>Stage 4.</i>	Hold at operating temperature and measure open-circuit cell voltage.
<i>Stage 5.</i>	Heating is stopped, and the furnace is left to cool down.

4.2.1 Procedure for each test setup

To study the thermal properties of the 10 Ah NaS cell, owing to high operating temperature and the safety issues of the NaS battery cell, a heating regime as shown in Table 4-2 was first devised to avoid cell fracture which was a key objective of the study. The heating rate of 1°C/min was devised and adopted, also at that rate, heat transfer by radiation from the furnace to the NaS cell will be absorbed at a slightly lower rate to avoid stress on the electrolyte during melting owing to thermal expansion.

Note: in maximizing the heating rate of the NaS cell, the unit should be centred in the tube furnace. This is done by taking measurements of the interior diameter and length of the tube furnace and ensuring the cell unit when positioning always falls at the midpoint of the furnace.

At the start of each experimental run, Table 4-4 shows the checklist for every experiment.

Table 4-4: Start-up checklist

A. Start-Up, equipment check-up before a test.		
1.	NaS cell	
	a.	<i>Check cell and ensure there is no leakage or damage</i>
	b.	<i>Ensure all connected components are secured (electrodes and thermocouples)</i>
	c.	<i>Insert the cell into the furnace and clamp it in place, ensuring the cell falls mid-way in the furnace.</i>
	d.	<i>Ensure the clamp has insulation before the cell is clamped in place.</i>
2.	Data Logger and computer check	
	a.	<i>Switch on computer and data logger, ensure connection.</i>

	b.	Run LabView program.
	c.	Ensure thermocouples are detecting similar temperatures (ambient).
	d.	Data collection should start at the same time as the start of the test.
3.	Furnace	
	a.	Ensure the surrounding area is clear of debris.
	b.	Turn on the furnace.
	c.	Set temperature controls to the required heating regime.
B. Run Test 1, continuously monitor the open-circuit voltage, which should increase to about 2.076 V o/c at 350 °C. The cell should be held at its operating temperature until this voltage is attained.		
1.		Warm-up/Heating up
2.		Cooldown
	a.	The heating is stopped, and the furnace is left to cool down.
	b.	Leave cell in the furnace with datalogger still on to collect data as cell cools off.
A. Test 2. Cell Discharge repeat section A. 1, 2 and 3, and section B. 1. After soaking the cell at 330/350 °C for a few hours and having attained 2.076V. Ensure cell discharge does not exceed 1.9Vo/c, Owing to the working voltage window of 1.78–2.06 V. Note: cell must not be discharged above 50 – 60 % of capacity.		
1.	a.	Measure cell resistance periodically during discharge.
	b.	Continuously measure discharge capacity.

<i>B. Cell Charge, the cell should be charged at constant current and constant voltage not exceeding 3 A and at 2 V DC</i>		
<i>1.</i>	<i>a.</i>	<i>Using a dc power supply charge cell to 2.076 V</i>

Further clarification is detailed below:

- I. The experiment must begin as soon as possible due to the longevity of the experimental timeline and the access time of the laboratory. Therefore, laboratories open at 8 am at the earliest and initial safety checks are the first step. All safety requirements should be satisfied which means that lab coats, all participating individuals should wear safety goggles and laboratory gloves. All the wiring components must be thoroughly checked and a physical check of the cell as well as the case should be completed as well.
- II. The placement and set-up of the actual battery within the furnace are the next steps. The most important aspect of this step is to make sure that the battery is centred inside of the furnace and the wiring of thermocouples are carefully secured by the clamps. Furthermore, the third thermocouple that reads the furnace temperature should be set up carefully with a clamp to be in the space between the cell and the interior wall of the furnace on the opposite side from the case thermocouple.
- III. the temperature measurements were set to record the temperature at 30-second intervals for 23 hours. These settings were chosen because of the heating rate of 1 degree per minute and the extensive cooling time required. Furthermore, the voltage measurements were not saved, but a live reading was displayed on the PC for tracking and confirmation of the open-circuit voltage (for the first phase of the experiment, when the process was automated with the LabView and the control panel all readings wear logged) This is owing to the unchanging voltage values except for about the 200°C spot where the cell becomes operational.

During the warm-up, it is recommended to continuously monitor the open-circuit voltage (V o/c) which is the electrical potential across the battery, which should increase to about 2.076 V o/c at 350°C if the cell is working properly. At this temperature, the active sodium and sulphur electrodes are in a molten state. Also at

that temperature, the electrolyte beta alumina which has a conductivity for sodium ions at approximately 300°C allows for the flow of ions. The cell must be kept at its operating temperature for the reaction to occur and until this voltage is attained. Holding the temperature at the various stages in the experiment was to give sodium and sulphur enough time to melt and liquefy and reach their operating temperature, owing to their different melting points.

Note, the optimal operating temperature is 350°C owing to the use of beta alumina as the electrolyte. Also at that temperature, a potential of approximately 2V is produced with the free flow of ions.

After of experimental checklist *in* Table 4-3, a final review check of all the wirings should be completed and then the cover and the insulation of the top of the furnace should be done. Fibreglass should be handled with great care as it can irritate exposed skin, therefore gloves are necessary. The insulation is placed at the top of the furnace surrounding the rods holding the battery as well as the wirings to prevent any heat loss. Care must be taken to not move the rods of the battery or the thermocouple as the positioning of these components are important. Figure 4-6. shows the finalized top of the furnace with the fibreglass insulation along with the clamps that have secured the cell as well as the thermocouple.

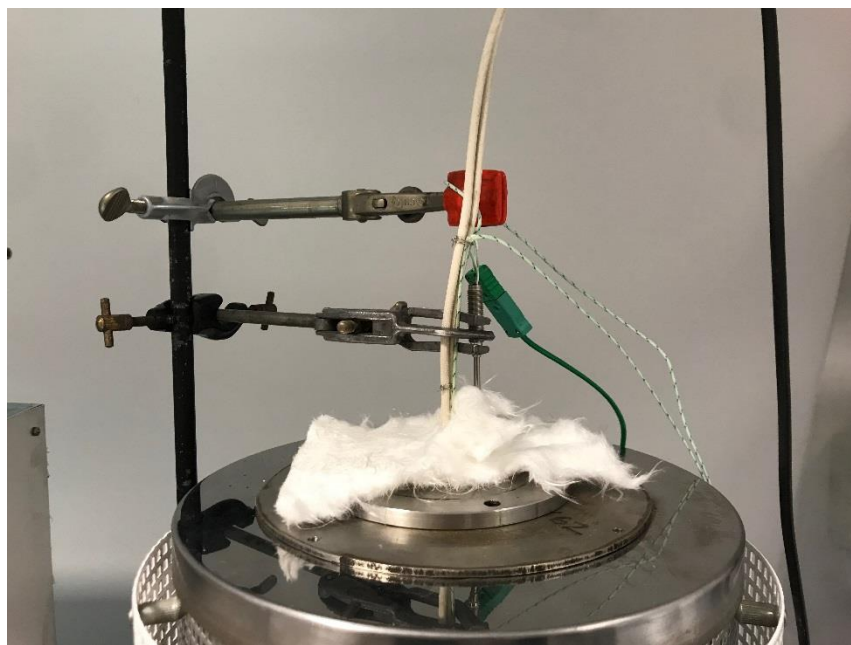


Figure 4-6: *Finalized insulation of the top opening of furnace A*

Finally, if all components are ensured to be ready, then the experiment is ready to begin. Always referring to the checklist and following the procedure, the two programs should be reading live measurements and should be set to start recording the data

before the furnace is turned on. A timer should be ready to start recording the time to keep track of temperature, so the holds are done correctly.

Finally, as the temperature of the furnace reaches 350°C and it is held at that temperature for some time, the battery should become completely operational.



Figure 4-7: *State of the furnace after a malfunction undergoing repairs.*

Limitations of the experimental work were due to the breakdown of the furnace; Figure 4-7 shows the furnace undergoing parts replacement of the heating element. Each breakdown entailed repairs and maintenance which resulted in the shutdown of experimental work.

4.3 Cell charging and discharging

As earlier stated in section 2.3.4, this method of constant current – constant voltage charging is used usually for the charging process of different batteries to safeguard the health of the battery and safe charging. This form of charging comprises two charging phases. The first phase consists of the battery charging with constant current, while across the battery the voltage slowly rises. The second phase will commence when the voltage of the battery attains a certain pre-defined maximum point. From that point on, the battery is charged with constant voltage, and the

charging current is allowed to gradually declines (R M Dell and Rand, 2001; Gücin et al., 2015).

Using a programmable power supply for Cell Charge, the cell should be charged at constant current and constant voltage not exceeding 3 A and at 2.5 V DC.

Note Discharge cell using an electronic programmable load after soaking the cell at 330/350°C for a few hours and having attained 2.076 V. Ensure cell discharge does not exceed 1.9Vo/c which is equivalent to 10 Ah discharge capacity. The cell must not be discharged above 50 – 60% of capacity. Referring to the start-up checklist in Table 4-4 step process C and D.

Also, the cell cannot be cold and reheated in the discharge state without a considerable risk of electrolyte membrane fracture.

Measure cell impedance periodically during discharge, and continuously measure discharge capacity. Cell discharge will be over 3 hours.

Test 1. Discharged initially at a current between 100mA for 1 hour. If the resistance is above 100mOhms continue to Test 2

Test 2. Discharge at 150 mA discharge for 1 hour or until it falls below 100mOhms, if not move to Test 3.

Test 3. Discharge at 200 mA for 1 hour. If below 100mOhms move to Test 5.

Test 4. Discharge at 250 mA for 1 hour

Test 5. Discharge at 250 mA for 1 hour or until it falls below 100mOhms.

Note: The charge and discharge circuits have a nominal impedance of 1 ohm. The discharge circuit may be bypassed in software via a relay to limit the voltage drop on the output to load.

4.4 Experimental test procedure results

The actual result table for the experiments are over 3000 data points for each run because the computer is set to record data at an interval of 30 s for the full run of 23 hours, therefore presented in this section are the records taken of some actual test procedures with both furnaces A and B at different start times and temperatures, showing steps and operational notes recordings taken during the experiment to keep track of proceedings. Tables 4-5 to 4-20, show a testing procedure of the experiment for both furnaces A and B and records of runs that had a difference from the norm.

Table 4-5: Furnace testing before use and test procedure for furnace A

<i>Section</i>	<i>Furnace test</i>
<i>Test 1 Furnace A</i>	Scrub clean furnace tube to remove any residual dirt.
<i>Test 2 Furnace A</i>	The initial temp at 19°C, the furnace is heated to 1000°C and held for 30min to ensure proper function and sterilisation.
<i>Test 3 Furnace A</i>	A Dummy cell test with thermocouples attached was used to check the setup to ensure all the connections were working properly with their interface and software in the computer.
<i>Test 4 Furnace A</i>	Test the temperature ramp rate program on the furnace to make sure the heating is according to the rating rate set.

Table 4-6: sodium sulphur cell 1°C/min heating rate test 1 using furnace A

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	7.59 am	19°C	-
<i>1st Hold</i>	9.18 am	100°C	-
<i>Run</i>	10.22 am	100°C	-
<i>2nd Hold</i>	11.23 am	160°C	-
<i>Run</i>	12.21 pm	160°C	-
<i>3rd Hold</i>	15.40 pm	350°C	2.07 V
<i>Stop</i>	16.44 pm		

The voltage reading was only noted at the end of the experimental run.

The objective of the records was to note anything (error) during the experimental run.

Table 4-7: sodium sulphur cell 1°C/min heating rate test 2 using furnace A

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	8.15am	20°C	-
<i>1st Hold</i>	9.40am	106°C	-
<i>Run</i>	10.40am	106°C	-
<i>2nd Hold</i>	11.37 am	164°C	-
<i>Run</i>	12.37pm	164°C	-
<i>3rd Hold</i>	15.44pm	350°C	2.07V
<i>Stop</i>	17.00pm		

The voltage reading was only noted at the end of the experimental run.

Table 4-8: sodium sulphur cell 1°C/min heating rate test 3 using furnace A

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	7.54am	28°C	-
<i>1st Hold</i>	9.05am	100°C	1.3
<i>Run</i>	10.05am	100°C	1.5
<i>2nd Hold</i>	11.05 am	160°C	1.8
<i>Run</i>	12.05pm	160°C	2.01
<i>3rd Hold</i>	15.15pm	350°C	2.07V
<i>Stop</i>	17.00pm		

This test run had an error signal from one of the thermocouples, on the further investigation after the experiment the fault was found to be from the thermocouple attached to the seal which had disconnected. Open circuit voltage is noted at end of the run.

Table 4-9: sodium sulphur cell 1°C/min heating rate test 4 using furnace A

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	8.11am	20°C	-
<i>1st Hold</i>	9.28 am	100°C	-
<i>Run</i>	10.28am	100°C	1.2V
<i>2nd Hold</i>	11.28 am	160°C	1.3V
<i>Run</i>	12.28pm	160°C	1.5V
<i>3rd Hold</i>	15.38pm	350°C	2.07V
<i>Stop</i>	17.00pm		

On this test run the rod thermocouple inside of the furnace indicated a rapid increase in temperature 28°C at 14:12. On investigation, some particulate matter that was attached to the insulation on top of the furnace covering was smouldering, which had accounted for the increase in temperature. Upon changing the insulation, the temperature returned to normal. Open circuit voltage noted at end of the run.

Table 4-10: sodium sulphur cell 1°C/min heating rate test 5 using furnace A

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	7.57am	32°C	1.09
<i>1st Hold</i>	9.05am	100°C	1.29
<i>Run</i>	10.05am	100°C	1.31V
<i>2nd Hold</i>	11.05 am	160°C	1.70V
<i>Run</i>	12.05pm	160°C	1.97V
<i>3rd Hold</i>	15.15pm	350°C	2.07V
<i>Stop</i>	17.00pm		

The initial start was at 7.50 am with a start temperature of 28°C, but the data recording was turned on late at 7.57 am at the new start time and temperature. Open

circuit voltage is notated at end of the run to ensure the battery cell was in working condition.

Table 4-11: sodium sulphur cell 1°C/min heating rate test 6 using furnace A

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	8.03am	21°C	1.00V
<i>1st Hold</i>	9.22am	100°C	1.12V
<i>Run</i>	10.22am	100°C	1.27V
<i>2nd Hold</i>	11.22 am	160°C	1.64V
<i>Run</i>	12.22pm	160°C	1.92V
<i>3rd Hold</i>	15.32pm	350°C	2.07V
<i>Stop</i>	17.00pm		

Open circuit voltage recorded at 310°C.

Test procedures with both furnaces B at different start times and temperatures, showing steps and operational notes recordings taken during the experiment to keep track of proceedings. Tables 4-12 to 4-20, show a testing procedure of experiment B and records of runs that had a difference from the norm.

Table 4-12: Furnace testing before use and test procedure for furnace B

<i>Section</i>	<i>Furnace test</i>
<i>Test 1 Furnace B</i>	Scrub clean furnace tube to remove any residual dirt.
<i>Test 2 Furnace B</i>	The initial temp at 21°C, the furnace is heated to 600°C and held for 30min to ensure proper function and sterilisation.
<i>Test 3 Furnace B</i>	A Dummy cell test with thermocouples attached was used to check the setup to ensure all the connections were working properly with their interface and software in the computer.
<i>Test 4 Furnace B</i>	Test the temperature ramp rate program on the furnace to make sure the heating is according to the rating rate set.

Table 4-13: sodium sulphur cell 1°C/min heating rate test 7 using furnace B.

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	8.41am	21°C	-
-	13.59 pm	330°C	-
<i>Stop</i>	14.00pm		

A dummy cell was used to test the rate of heating at 1°C/min without hold.

Table 4-14: sodium sulphur cell 1°C/min heating rate test 8 using furnace B.

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	8.26am	21°C	-
<i>1st Hold</i>	9.48am	100°C	-
<i>Run</i>	10.48am	100°C	1.6
<i>2nd Hold</i>	11.48am	160°C	1.7V
<i>Run</i>	12.45pm	160°C	1.89V
<i>3rd Hold</i>	15.58pm	350°C	2.07V
<i>Stop</i>	17.00pm		

The open circuit voltage recorded.

Table 4-15: sodium sulphur cell 1°C/min heating rate test 9 using furnace B.

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	8.22am	20°C	-
<i>1st Hold</i>	9.42 am	100°C	-
<i>Run</i>	10.42 am	100°C	-
<i>2nd Hold</i>	11.42 am	160°C	-
<i>Run</i>	12.42pm	160°C	-
<i>3rd Hold</i>	15.52pm	350°C	2.07V
<i>Stop</i>	17.00pm		

Open circuit voltage notated at end of the run.

Table 4-16: sodium sulphur cell 1°C/min heating rate test 10 using furnace B.

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Initial</i>	7.50am	20°C	-
<i>Start</i>	8.27am	20°C	-
<i>1st Hold</i>	9.47 am	100°C	-
<i>Run</i>	10.47 am	100°C	-
<i>2nd Hold</i>	11.47am	160°C	0.9V
<i>Run</i>	12.47pm	160°C	1.4V
<i>3rd Hold</i>	15.57pm	350°C	2.07V
<i>Stop</i>	17.00pm		

The initial start for 20min to take room temperature before the main start. Open circuit voltage recorded at 274°C.

Table 4-17: sodium sulphur cell 1°C/min heating rate test 11 using furnace B.

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Initial</i>	8.20am	20°C	-
<i>Start</i>	8.30am	20°C	-
<i>1st Hold</i>	9.50am	100°C	1.9
<i>Run</i>	10.50am	100°C	-
<i>2nd Hold</i>	11.50 am	160°C	-
<i>Run</i>	12.50pm	160°C	1.5V
<i>3rd Hold</i>	16.00pm	350°C	2.07V
<i>Stop</i>	17.00pm		

Initial start for 10min to take room temperature before the main start. Open circuit voltage recorded at 280°C.

Table 4-18: sodium sulphur cell 1°C/min heating rate test 12 using furnace B.

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	8.40am	21°C	1.05V
<i>1st Hold</i>	9.58am	100°C	1.09V
<i>Run</i>	10.58 am	100°C	-
<i>2nd Hold</i>	11.58 am	160°C	1.14V
<i>Run</i>	12.25pm	160°C	1.24V
<i>3rd Hold</i>	15.58pm	350°C	2.07V
<i>Stop</i>	17.00pm		

Open circuit voltage recorded at 305°C.

Table 4-19: sodium sulphur cell 3°C/min heating rate test 13 using furnace B.

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	8.02am	19°C	-
<i>Hold</i>	8.22 am		-
-	9.39pm	259°C	2.07V
<i>Stop</i>	17.00pm@ 350°C		

Open circuit notated at end of the run, test at 3°C/min without hold.

Table 4-20: sodium sulphur cell 2°C/min heating rate test 14 using furnace B.

<i>Section</i>	<i>Time</i>	<i>Prog Temp</i>	<i>Voltage</i>
<i>Start</i>	8.03am	21°C	-
<i>Hold</i>	8.22	22°C	-
-	10.31	260°C	2.07V
<i>Stop</i>	17.00pm @ 350°C		

Open circuit notated at end of the run, test at 2°C/min without hold.

Different data sets from furnace A indicates consistency in the results with no significant variables, the experiments were also replicated using a different tube furnace (B) with different dimensions to investigate if the results will remain consistent which resulted in consistent result data sets. This indicates the repeatability of the experiment with a separate set of equipment as long as the set procedure is followed.

4.5 Conclusion

The above section presented the experimental procedure. The experimental runs were divided into three sections, the first was on the warm-up and the second was the standby where any charging or discharging could be carried out and finally the third was on the cool-down of the sodium sulphur cell. Also covered in this section is the experimental procedure for each test run and some examples of results from the two furnaces used for the experiments. Furthermore, presented is the methodology development process in conjunction with the research partner Ionotec.

The next following section will cover the Experimental Analysis and Results obtained from the experimental investigations carried out.

EXPERIMENT DATA RESULT AND ANALYSIS

This section covers the results data from the heat treatment of the sodium sulphur battery cell from ambient temperature to 350°C and, also the cool-down stage which completes a thermal cycle. The thermal cycling trials investigated the 10 Ah NaS cell specifically how it retains heat and loses heat over a complete cycle which consists of the warmup stage (heating) and the cool-down stage. The cell underwent heating rate trials at 1°C/min, 2°C/min and 3°C/min. Experimental results on Discharge and Charge data, this section covers the standby stage, at this stage, the furnace is held at 360°C for this phase of experiments to be carried out. All electrical performance testing of discharge and charge is carried out during this stage.

5.1 Temperature measurement at 1°C/min heating rate

The object of this first experiment procedure was to apply the final heating procedure as shown in Table 5-1. Using a vertical tube furnace because of the configuration of the cell and heating at a rate of 1°C/min, the 10 Ah NaS battery cell was gradually heated from room temperature and left to cool naturally after attaining its operating temperature of 350°C. The heating procedure is shown in Table 5-1, and data were collected and logged for 23 hours for a complete cycle.

Twenty experiments were conducted for the 1st procedure, the first five where results were not applicable, because these were for the calibration of the experimental apparatus and the next five were accepted, because the results were consistent with no variations. Owing to this result the experiment was repeated with a second furnace for a set of ten runs and the results were consistent with the previous data from the first five.

Table 5-1: Heating procedure at 1°C/min heating rate

<i>Stages</i>	<i>Temperature parameters</i>
<i>Stage 1.</i>	Heat from ambient temperature to 100°C at 1°C/min.
<i>Stage 2.</i>	Hold at 100°C for 1 hour
<i>Stage 3.</i>	Heat from 100 to 160°C for 1hour at 1°C/min.
<i>Stage 4.</i>	Hold at 160°C for 1 hour.
<i>Stage 5.</i>	Heat to 350°C at 1°C/min
<i>Stage 6.</i>	Hold at this operating temperature and measure open-circuit cell voltage
<i>Stage 7.</i>	Heating is stopped at 17.00, and the furnace is left to cool down overnight.

The experimental results plotted in Figure 5-1 are the temperature recordings of all three thermocouples, (the furnace temperature 1 indicated in red, the case

temperature in blue and the seal temperature in green and the furnace control temperature in black) throughout the experiment following the procedure that is listed in Table 5-1. In addition, the voltage from the cell was measured and values are shown at certain temperatures on the graph plotted against time which shows the phase changes of both sodium and sulphur with temperature in the cell. The open cell voltage of 2.07 V is attained at 330°C in approximately 7 h. These results are only preliminary but provide a better understanding of the conduct of a NaS battery cell with increasing temperature. It is important to note that the furnace temperature used for the parameters is the set temperature on the controller of the furnace itself and not any of the thermocouples and the temperature plotted is that of the thermocouples with the control temperature for reference only in the warm-up plots as applicable. The result table had over 3000 data points and can be found in the appendix which is included as a separate file.

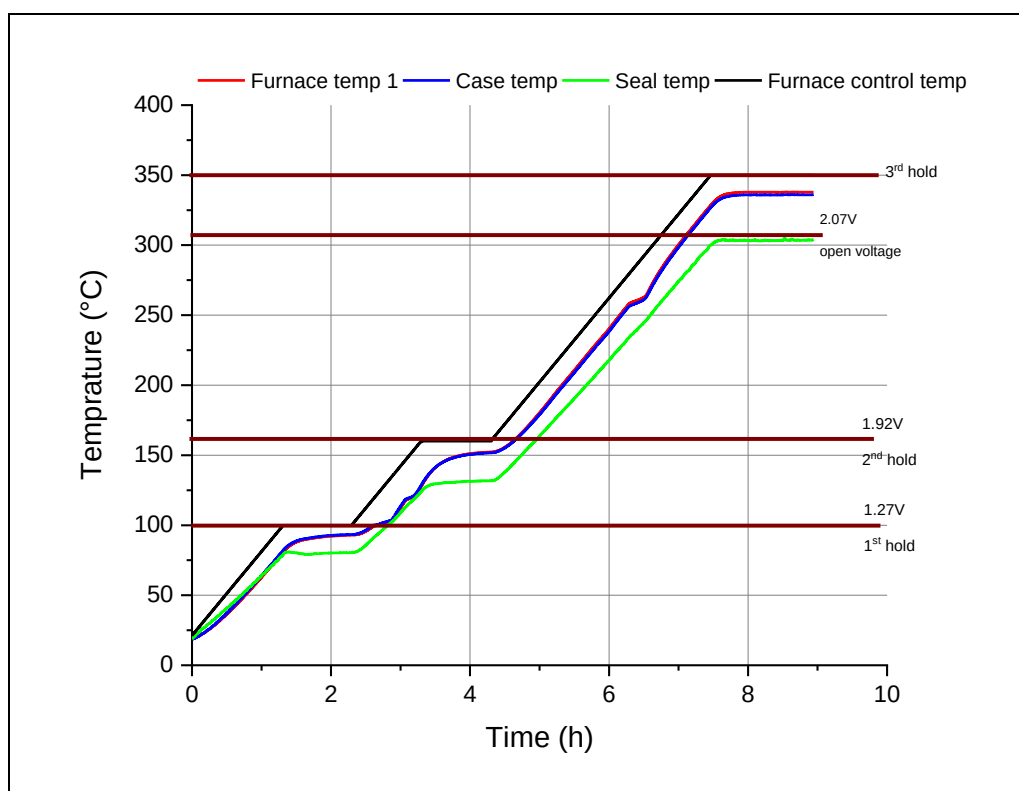


Figure 5-1: Experimental Warmup of the NaS cell at 1°C/min heating rate showing open voltage; this shows the temperature profile of the NaS cell, and the voltage readings are taken at different intervals.

These results indicate that the NaS cell was successfully heated, the elements were melted thoroughly, and the battery recorded an open circuit voltage as shown in

Figure 5-1. The same full run of the live NaS cell was repeated several times to emulate the results and to confirm the successful operation of the cell. Confirming one of the objectives which were the safe usage and heating of the NaS battery cell.

At the 1st Temperature hold at 100°C as recorded by the furnace temperature with a voltage of 1.27V the results indicate the first phase change of the cell, which is the melting of the sodium element, a clearer view of this is shown in Figure 5-2. At this stage, the furnace temperature is held 100°C to allow the sodium element which has the lower melting point of 97°C to start melting. This is done owing to the design of the battery cell which has the sodium element in the middle of the cell, and holding it at that point of 100°C allows the battery cell adequate time to absorb as much heat to melt just the sodium and not the sulphur with a melting point of 112°C.

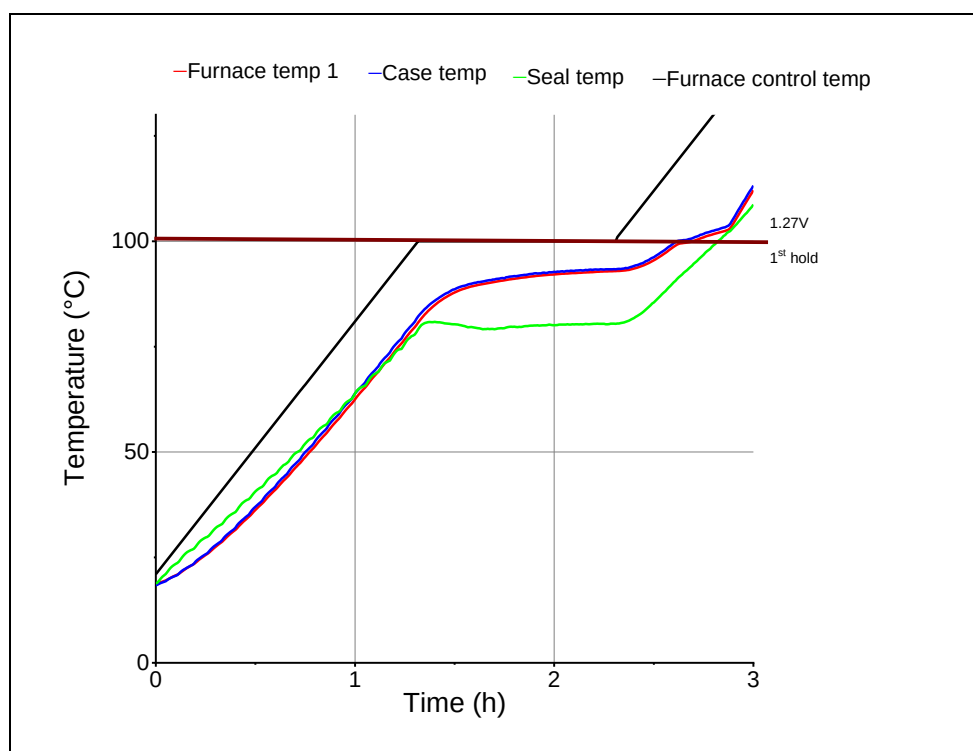


Figure 5-2: 1st Temperature of furnace hold at 100°C for 1 hour; the results indicate the first phase change of the cell, which is the melting of the sodium element.

The 1st hold is better illustrated in Figure 5-2, which is a more close up view of the first 3 hours in Figure 5-1, the 1st hold starts approximately 2 hours into the experiment when the furnace temperature has recorded 100°C on the furnace controls and held at that point for an hour. in reference to the 1st hold time of 100°C and the melting point of sodium 97°C, (not much driving force in the temperature difference).

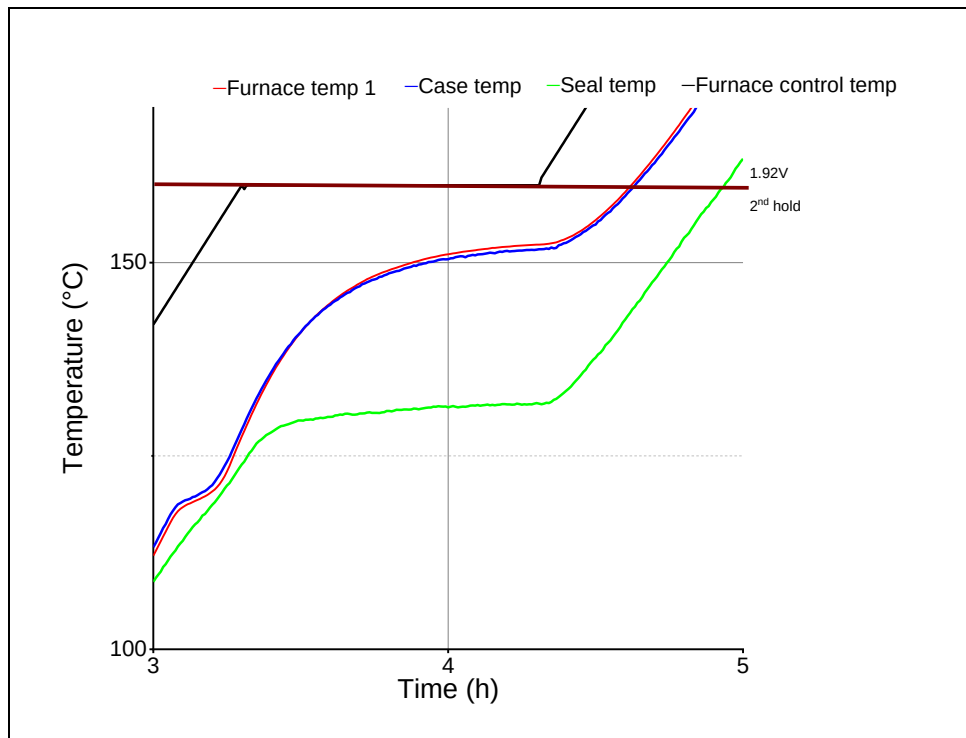


Figure 5-3: 2nd Temperature hold at 160°C

Furthermore, the 2nd temperature held at 160°C is better illustrated in Figure 5-3, which is the next 3 hours view of Figure 5-1, at this stage temperature is held to allow both sodium and sulphur to melt thoroughly. Note only the seal temperature holds around 115°C and the two others continue to rise until they level out above 155°C. Also, the 2nd hold of 160°C had a very large margin for both sodium and sulphur with a melting point of 112°C.

If cell failure had occurred during the heating cycle the cell voltage would have dropped below 2.0 Volts. The trends in the temperature profiles indicate the heat transfer to the battery cell is lagging from the heating parameters set for the experiment.

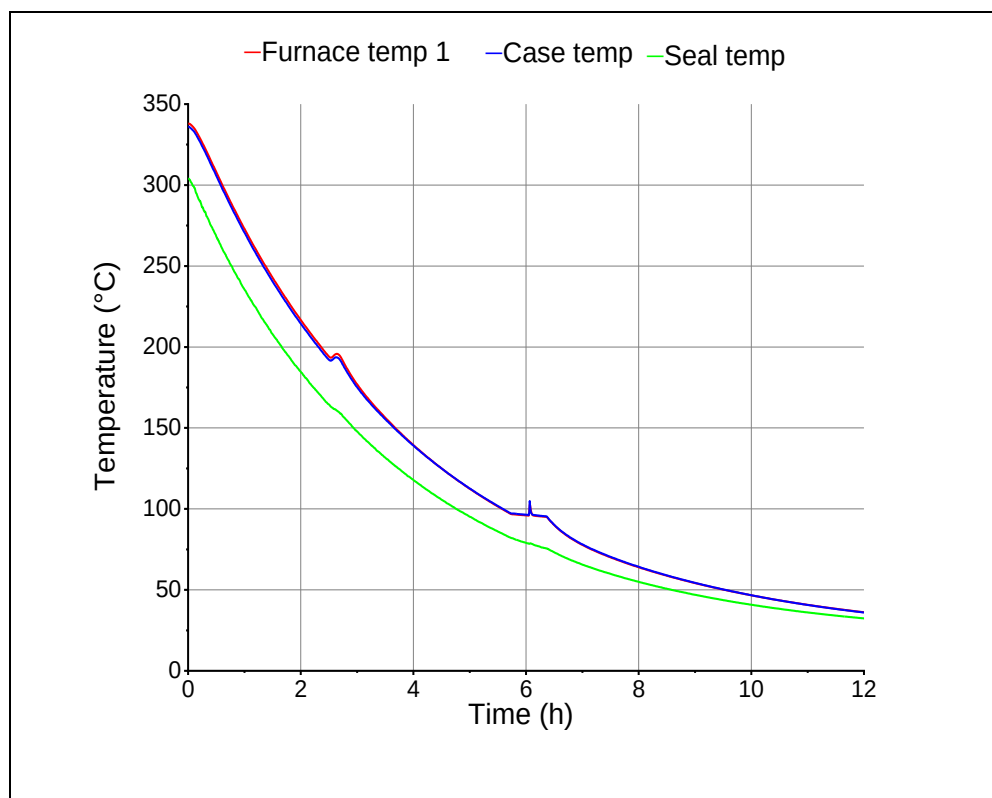


Figure 5-4: *Experimental Cool-down of NaS cell*

The spikes on the graph in Figure 5-4 indicate solid sodium polysulphides forming as the battery cools. Cooling was governed by the thermal inertia of the furnace, and it took about 7 hours for the sodium to freeze at 98°C, as indicated by the temperature spikes and about 5 hours for sulphur, at which point the cell will be in a benign/safe state.

Additionally, the voltage reading after the battery cell had cooled down to room temperature was 0.003 V indicating that the sodium and sulphur liquids had completely changed phase to solids.

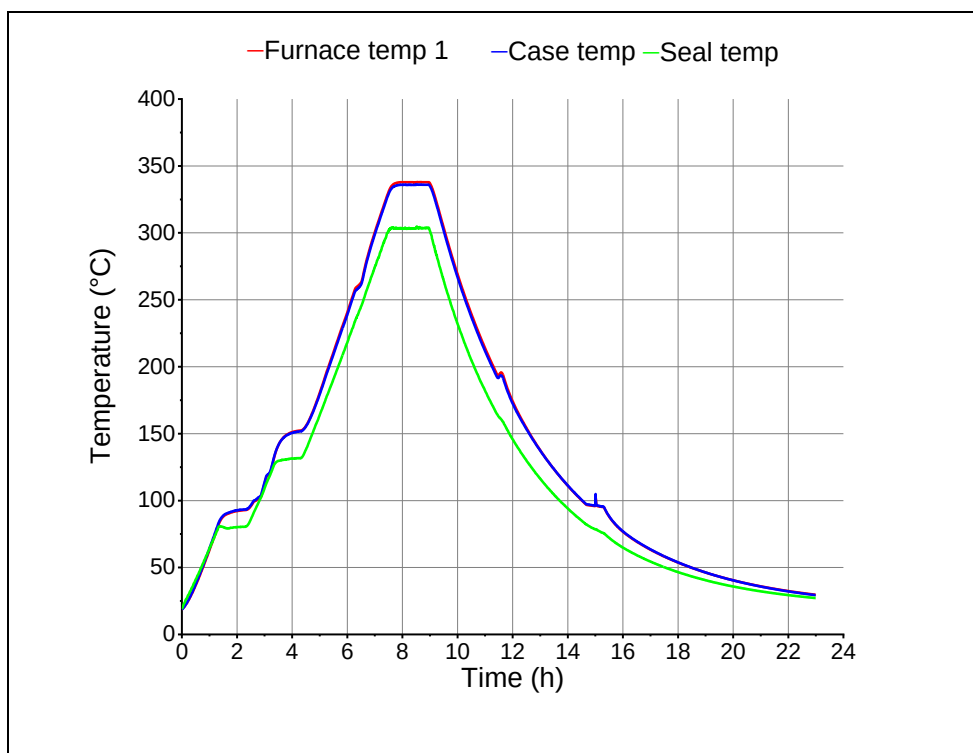


Figure 5-5: Experimental Full Run of temperature vs. time

From the graph in Figure 5-5, it can be observed the three readings from the thermocouples have recorded different results. The graph shows a major difference in temperature of the seal thermocouple as opposed to that of the furnace temp1 and case thermocouple. An assumption could be made here that it is owing to their different positioning on the battery cell and in the furnace, with the case and furnace rod thermocouples positioned closer to the heating elements in the furnace wall of the furnace than the seal thermocouple and the cell design. Note, that the readings for the furnace temperature and case are remarkably close. Table 5-2, shows the three recorded readings at specific times of the furnace rod, case and seal thermocouple and the furnace which was used for the holding times.

Table 5-2: Difference in thermocouple temperatures

Section	Prog Temp	Furnace Temp 1	Case Temp	Seal Temp	voltage
1 st Hold	100°C	90.07°C	90.71°C	79.22°C	1.27V
2 nd Hold	160°C	146.57°C	146.45°C	120.34°C	1.92V
3 rd Hold	350°C	336.13°C	334.33°C	303.45°C	2.07V

An assumption can be made by looking at which thermocouple gives a more accurate reading of the inside temperature of the cell, that it would be the seal thermocouple, as it is the lowest reading and nearest to the core of the cell. But that alone would not

be enough, considering the design which has an electrical insulator just underneath the seal which could count for the lower temperature reading and lag in the temperature response from the temperature measurements of the case of the cell. Furthermore, without a thermal camera, an accurate reading of the internal workings of the cell will not be possible. Therefore, these thermocouples nevertheless are not precision sensors having errors of 0.5 to 2 °C at the operational temperature range of the battery cell. Furthermore, the calibration of the thermocouples would have proved difficult owing to the high-temperature range of the battery cell from ambient to 350 °C.

5.2 Temperature measurement at 2°C/min heating rate

After completing the first experimental procedure and repeating it and the resulting results were consistent. With the use of the same test apparatus and added thermocouples for more temperature readings, see Figure 3-8 in chapter 3, the experiment was modified see Table 5-3 and the heating rate was increased to 2°C/min, the next step was to see if the time to heat the battery cell could be reduced safely, the aim was to investigate the effects of the increase in temperature would have on battery cell concerning the open cell voltage, and what role the hold time played in the change phase of the cell, in reference to the 1st hold time of 100°C and the melting point of sodium 97°C, (not much driving force in the temperature difference). Also, the 2nd hold of 160°C had a very large margin for both sodium and sulphur with a melting point of 112°C.

Ten experiments were conducted, the first five was with furnace A and the second five with furnace B, the results were consistent with no variation.

Table 5-3: Heating procedure at 2°C/min heating rate

Stages	Temperature parameters
Stage 1.	Take room temperature for 20 mins
Stage 2.	Heat from room temperature to 350°C at 2°C/min
Stage 3.	Hold at 350°C for 1 hour
Stage 4.	Hold at operating temperature and measure open-circuit cell voltage.
Stage 5.	Heating is stopped, and the furnace is left to cool down naturally.

The following result was collected with a modified methodology with heating iteration at 2°C/min without holding the temperature for the two separate temperature points. The temperature used for the graph plots are from the recorded data and not the programmed 2°C/min heating rate of the controls.

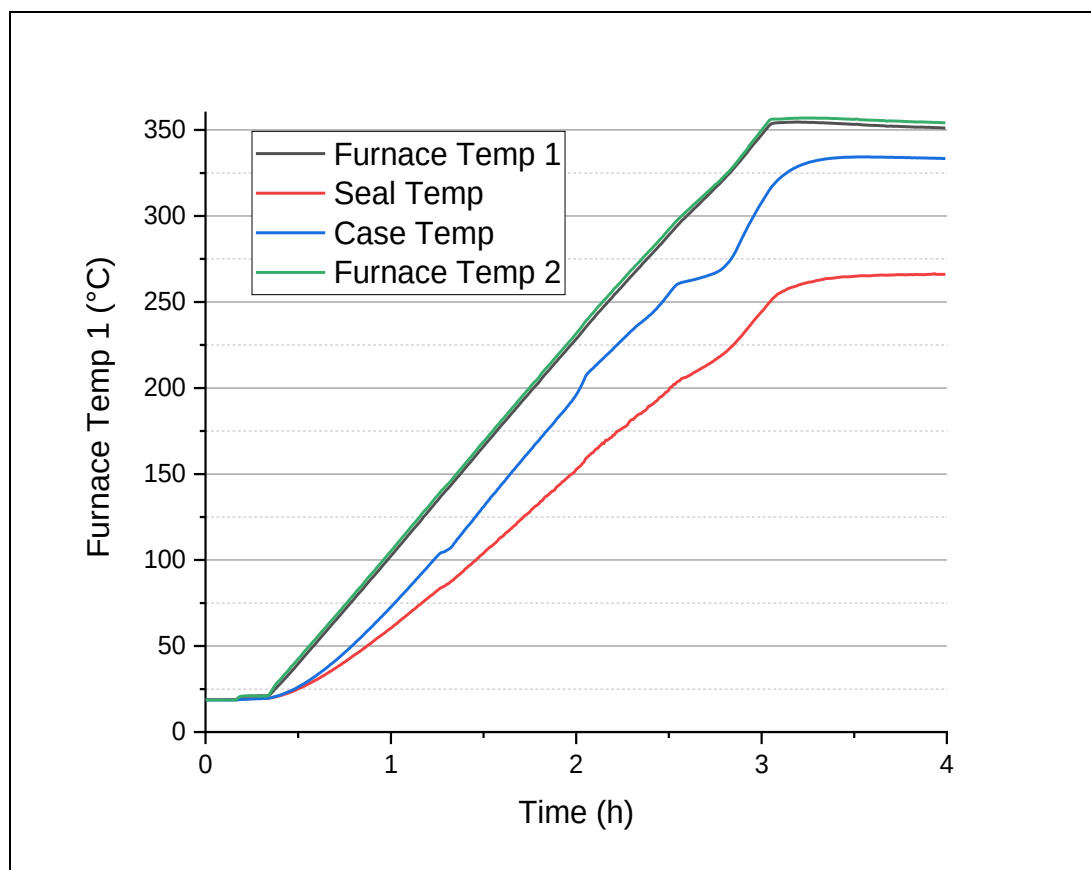


Figure 5-6: Experimental Warm-up of a NaS cell at 2°C/min showing temperature profile of cell and furnace

The experimental results are plotted in Figure 5-6, for the temperature recordings of the four thermocouples, (the furnace temperature 1 indicated in black, furnace temperature 2 indicated in green, the case temperature in blue and the seal temperature in red) throughout the experiment following the procedure that is listed in Table 5-3. Note the positions of furnace temperatures 1 and 2 were read from opposite sides of the NaS cell as illustrated in Figure 3-8 in chapter 3. The first 20 minutes show the recording of room temperature before heating began in the furnace and attaining open cell voltage at 2.07 V at 330°C as seen in Figure 5-7 in approximately 3 hours the open-circuit voltage after heating the cells is at the expected level for a fully charged cell.

If cell failure had occurred during the heating cycle the cell voltage would have dropped below 2.0V.

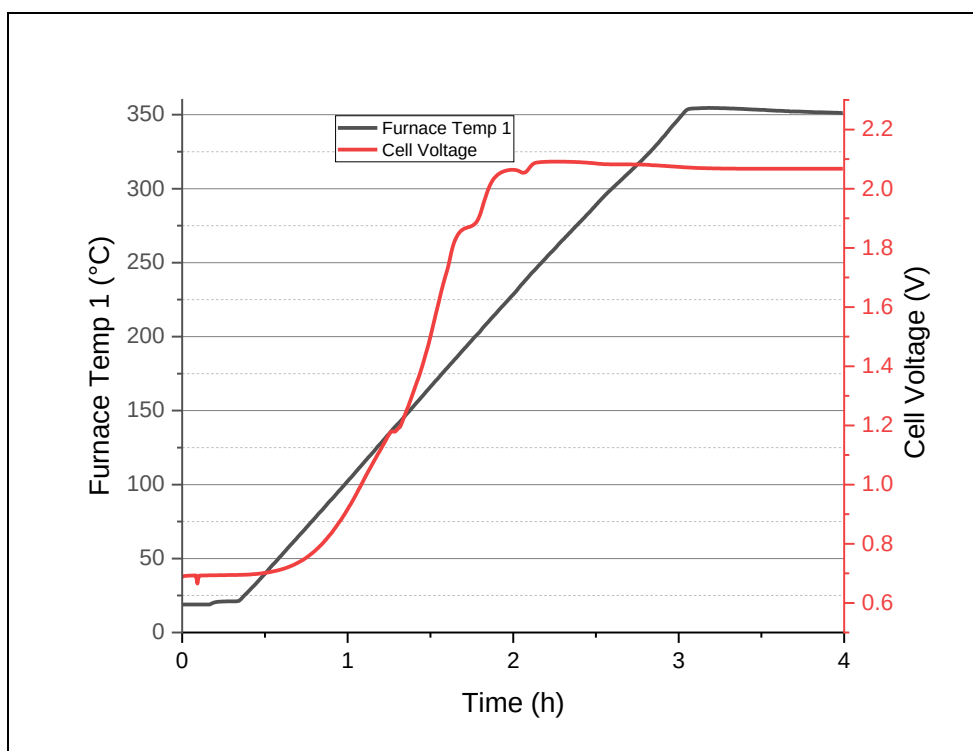


Figure 5-7: Warm-up Furnace temperature at 2°C/min heating rate and Voltage Profile

Figure 5-7 shows the voltage profile of the NaS cell at a 2°C/min heating rate with the furnace temperature during the warm-up stage of the experiment. From the figure, we can see the gradual rise in both temperature and voltage until it attains 2.07V (open cell voltage and operational temperature), this shows the correlation between them. The cell voltage remains constant at the temperature range of 250°C - 350°C owing to the reactance of the cell components which has a working voltage window 1.78–2.06 V. Note an open-cell voltage would only reach if the cell were fully operational.

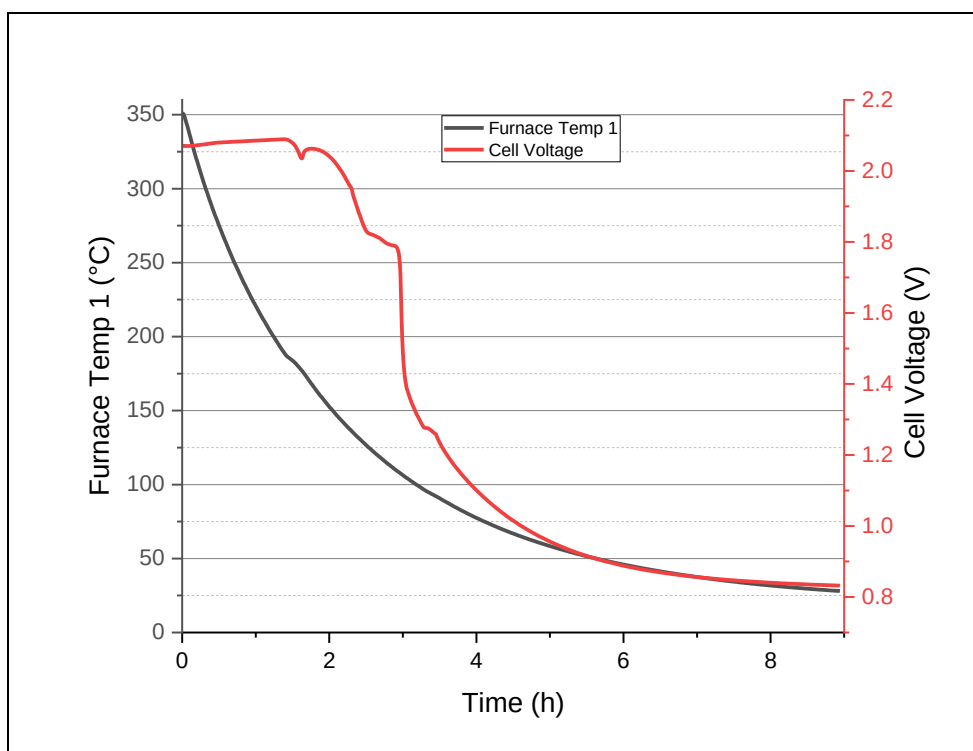


Figure 5-8: Cool-Down Furnace temperature at 2°C/min and Voltage Profile

Cooling was governed by the thermal inertia of the furnace as shown in figure 5-8 and it took about 7 h for the electrical output to fall below 1V. The cooling responses for all the experiments were consistent with no differences in the measurements.

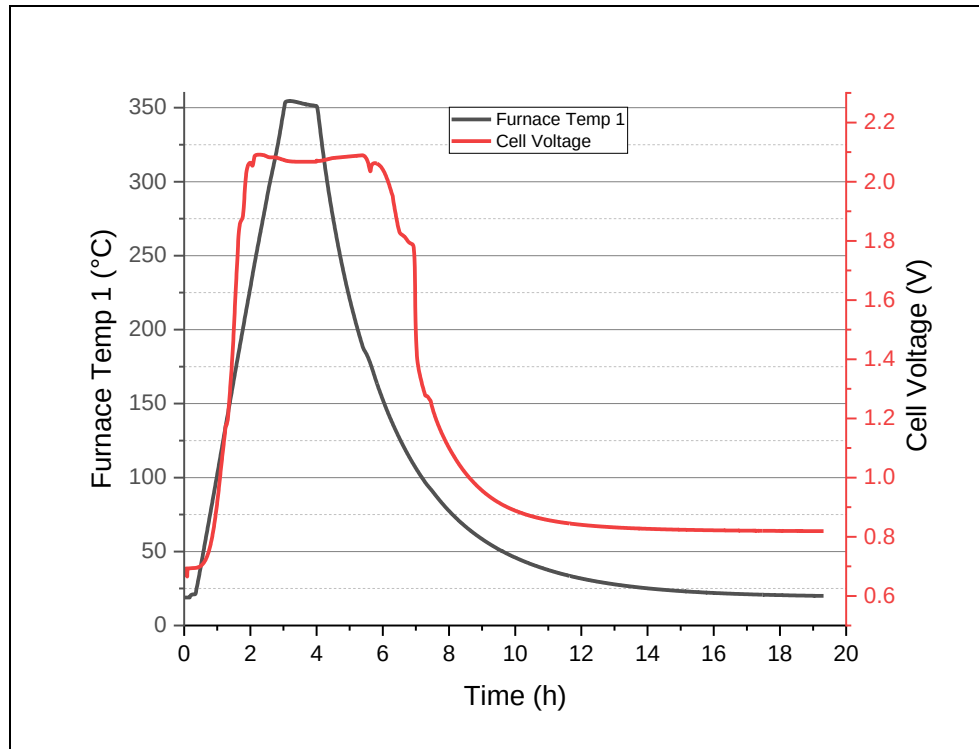


Figure 5-9: Full Cycle run Furnace temperature at 2°C/min and Voltage Profile

The same full run of the live NaS cell at 2°C/min heating rate was repeated several times to emulate the results and to confirm the successful operation of the cell. Confirming one of the objectives which were the safe usage and heating of the NaS battery cell. Furthermore, the cell having attained open cell voltage without faults proved the 1st heating rate procedure of 1°C/min (which had a longer time to get the cell to operating temperature, approximately 7h) was negligible and the hold times had no effects on the phase change of the battery.

5.3 Temperature measurement at 3°C/min heating rate

Following the successful conclusion of procedure 2, the following result was collected with a modified methodology of procedure 2, this heating iteration at 3°C/min heating rate without holding the temperature for the two separate melting points from the 1st procedure and to increase the heating rate to further reduce time to heat the cell and obtain an open circuit voltage, the aim was to investigate the effects of the increase in temperature would have on battery cell concerning the open cell voltage (which only happens when the cell is at its operating temperature).

Ten experiments were conducted, the first five was with furnace A and the second five with furnace B, the results were consistent with no variation.

Table 5-4: Heating procedure at 3°C/min

Stages	Temperature parameters
Stage 1.	Take room temperature for 20 mins
Stage 2.	Heat from room temperature to 350°C at 3°C/min
Stage 3.	Hold at 350°C for 1 hour
Stage 4.	Hold at operating temperature and measure open-circuit cell voltage.
Stage 5.	Heating is stopped, and the furnace is left to cool down naturally.

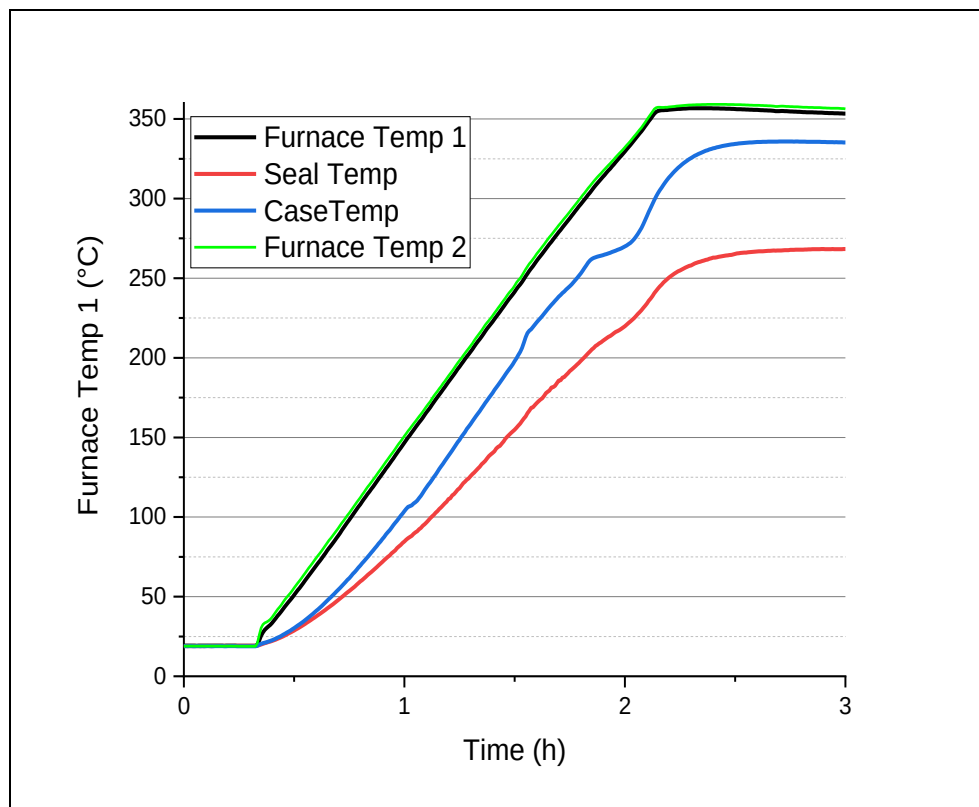


Figure 5-10: Experimental Warm-up of the NaS cell at 3°C/min heating rate with time

The experimental results plotted in figure 5-10, for the temperature recordings of the four thermocouples, (the furnace temperature 1 indicated in black, furnace temperature 2 indicated in green, the case temperature in blue and the seal

temperature in red) throughout the experiment following the procedure that is listed in Table 5-4. The first 20 minutes show the recording of room temperature before heating began in the furnace and attaining open cell voltage at 2.07 V at 330°C as seen in Figure 5-10 in approximately 2 hours the open-circuit voltage after heating the cells is at the expected level for a fully charged cell. The results were consistent in all conducted experiments, and this proves the safe application of the 3°C/min heating rate procedure to heating the NaS cell for further experiments.

If cell failure had occurred during the heating cycle the cell voltage would have dropped below 2.0 V.

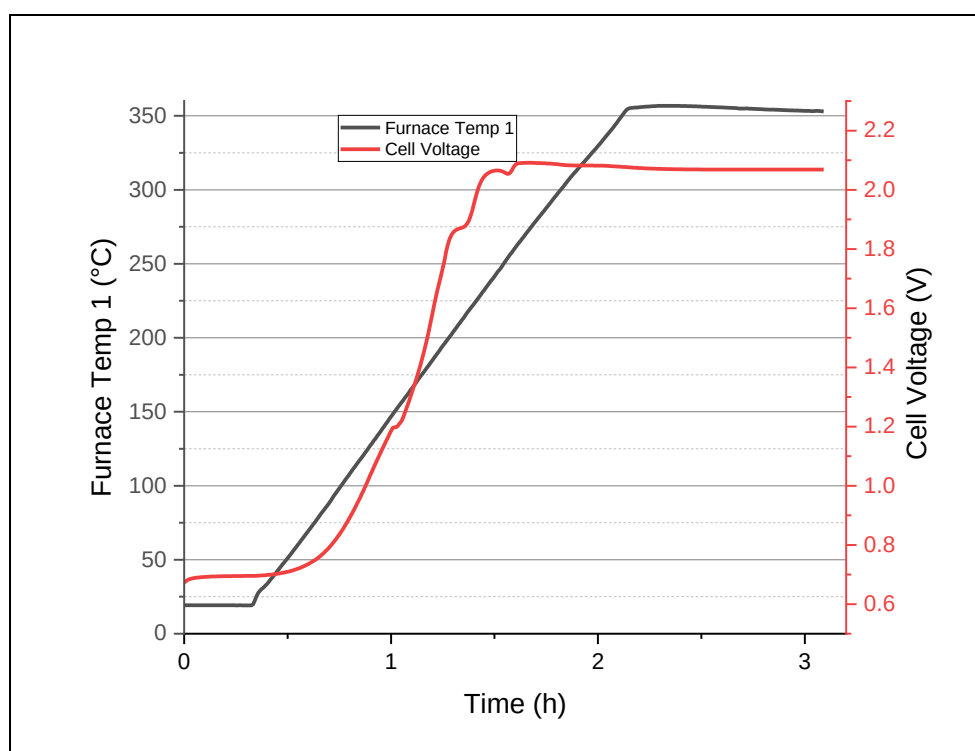


Figure 5-11: Warm-up Furnace temperature at 3°C/min and Voltage Profile

Figure 5-11 shows the voltage profile of the NaS cell at 3°C/min with the furnace temperature during the warm-up stage of the experiment. From the figure, we can see the gradual rise in both temperature and voltage until it attains (open voltage and operational temperature), this shows the correlation between them. The influence of the cell's temperature on the I-V characteristic curve of the cell is illustrated in Figure 5-11. The open-circuit voltage of the NaS cell increases slightly with increasing cell temperature linearly. The cell voltage remains constant at the temperature range of 250°C - 350°C owing to the reactance of the cell components which has a working

voltage window 1.78–2.06 V. Note an open-cell voltage would only reach if the cell were fully operational.

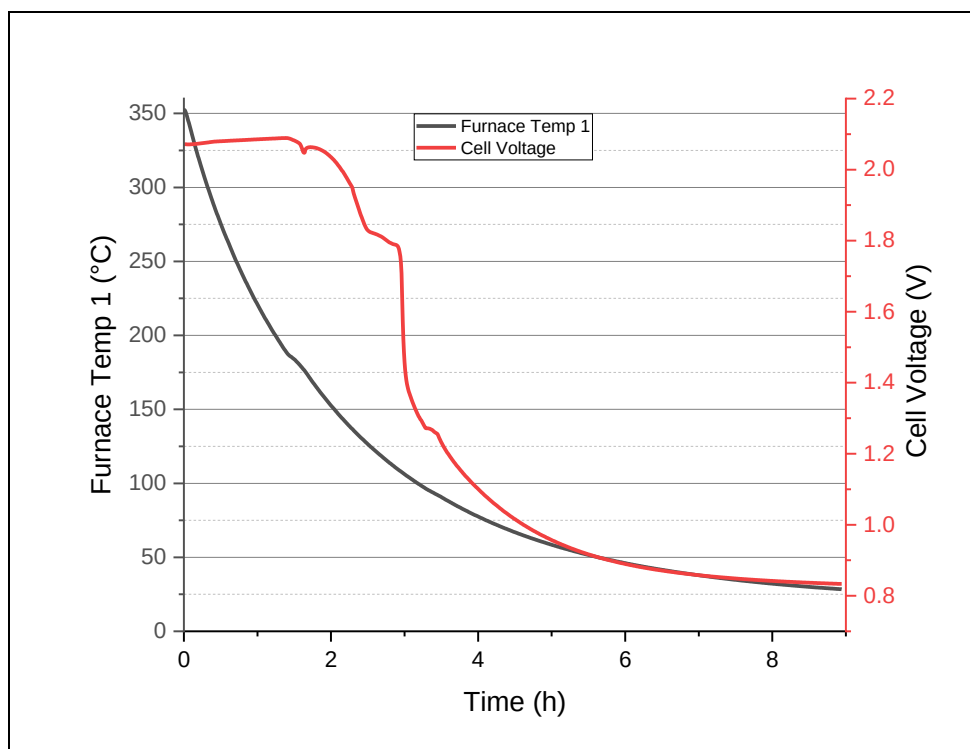


Figure 5-12: *Cooldown Furnace temperature at 3°C/min and Voltage Profile*

Cooling was governed by the thermal inertia of the furnace figure 5-12 and it took about 7 h for the electrical output to fall below 1 V which. Cooling for all experiments was consistent showing no variation in the measurements of the experiments.

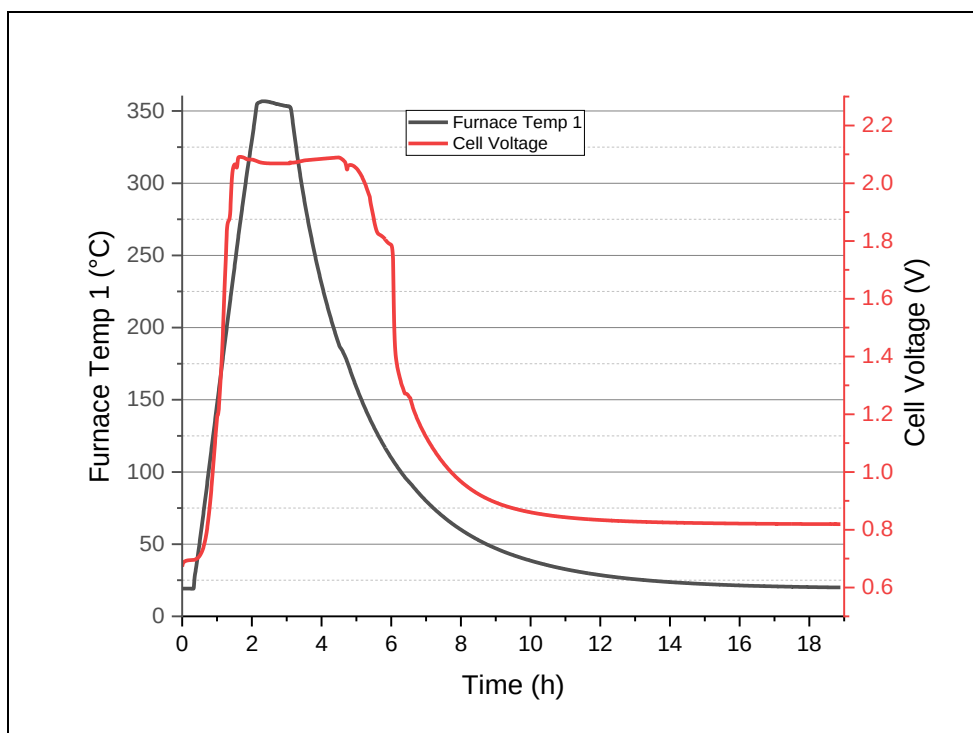


Figure 5-13: Full cycle run Furnace temperature at 3°C/min and Voltage Profile

The same full run of the live NaS cell at 3°C/min heating rate was repeated several times to emulate the results and to confirm the successful operation of the cell. Confirming one of the objectives which were the safe usage and heating of the NaS battery cell. Furthermore, the cell having attained open cell voltage without faults proved the 1st procedure 1°C/min and 2nd procedure 2°C/min heating rate which are now obsolete, and the hold times had no detrimental effects on the phase changes occurring in the battery.

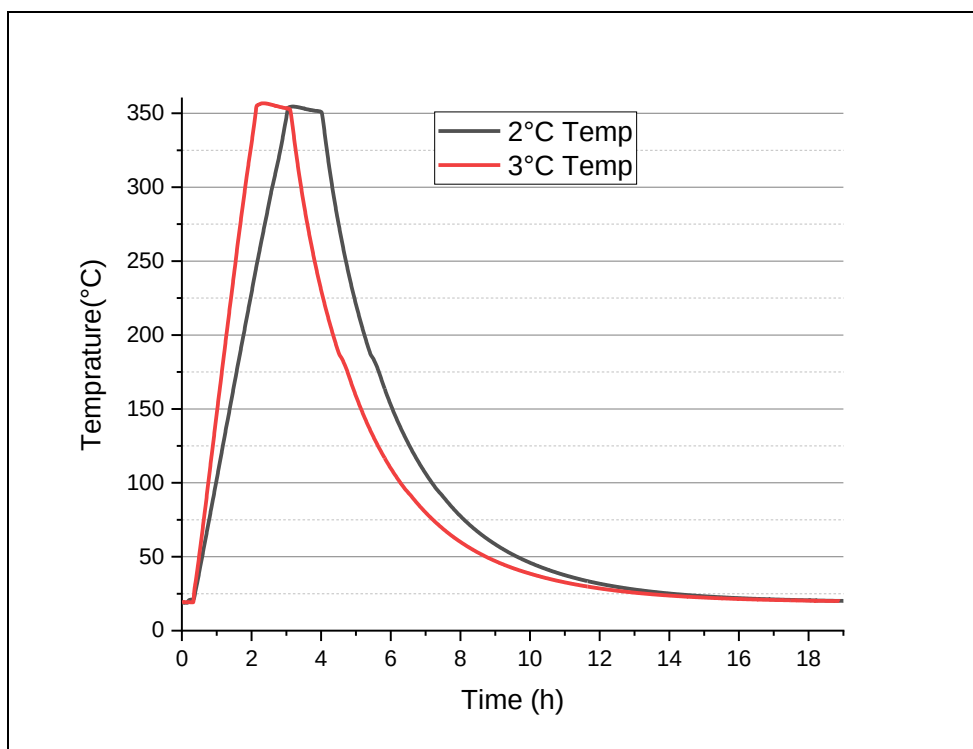


Figure 5-14: Temperature profile of the NaS cell at 2°C/min and 3°C/min heating rate showing the difference in time

From Figure 5-14, the graph is plotted in linear, the time difference can be seen, with 3 hours at 2°C/min and 2 hours at 3°C/min for the cell to get to the operational temperature of 350°C. In Figure 5-15, there is no significant difference in the voltage profile as expected for a fully functioning cell. At both heating rates, the cell had an open circuit which means it was in the molten phase to allow full electrical output.

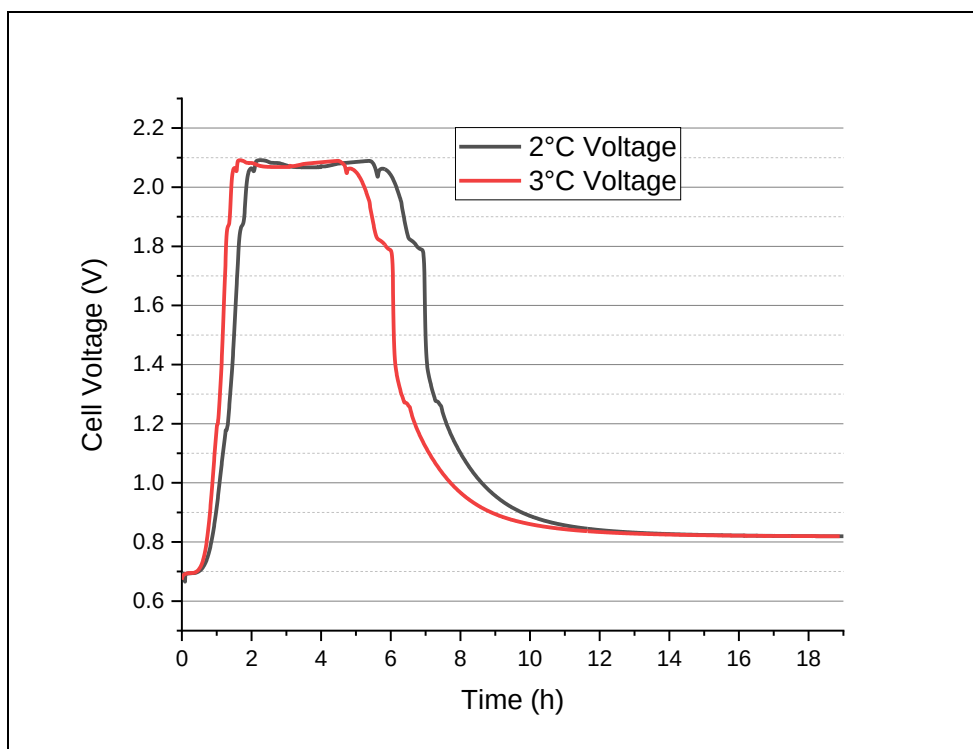


Figure 5-15: Difference in voltage profiles at 2°C and 3°C heating rates

With a side-by-side comparison of the temperature profile and voltage of the NaS cell heated at 2°C/min and 3°C/min as shown in figure 5-14 and figure 5-15, these results have shown the promising indication that the NaS cell was successfully heated, the elements were melted thoroughly, and the battery recorded an open circuit voltage. Having conducted repeated heating trials with a NaS cell at both 2°C/min and 3°C/min a conclusion can be drawn to say there is no problem regarding cell failure at these heating rates.

5.4 Experimental result data of NaS discharge

After soaking the cell at 360°C for a few hours and having attained 2.07V o/c, the cell can be discharged initially at a current between 100 mA for 1 hour, see Table 5-5, and cell resistance is periodically measured during this time. If step criteria are not met the next step is set in motion. Note, the maximum discharge limit is set at 1.9 Vo/c.

Table 5-5: cell discharge load procedure for each cycle

Name	Discharge Rate	Time
Initial Discharge	100 mA	60 mins
Pause to calculate the resistance If $R > 100$ ohms, then continue next steps		
STEP Increase discharge rate	150 mA	60 mins
Pause to calculate the resistance If $R > 100$ mOhms, then continue next steps		
STEP Increase discharge rate	200 mA	60 mins
Pause to calculate the resistance If $R > 100$ mOhms, then continue next steps		
STEP Increase discharge rate	250 mA	60 mins
Pause to calculate the resistance If $R > 100$ mOhms, then continue next steps – HOLD at 250 mA discharge		
HOLD Discharge	250 mA	60 mins

Previous tests indicate that the cell resistance should decrease below 100 mOhms after 1 hour. If the resistance is above 100 mOhms continue with a low rate (100-200 mA) discharge and continue to at this level until it falls below 100 mOhms. When below 100 mOhms gradually increase the discharge to a level of 250 mA. We would expect the discharge resistance on the 1st cycle to drop to a level below 50 mOhms.

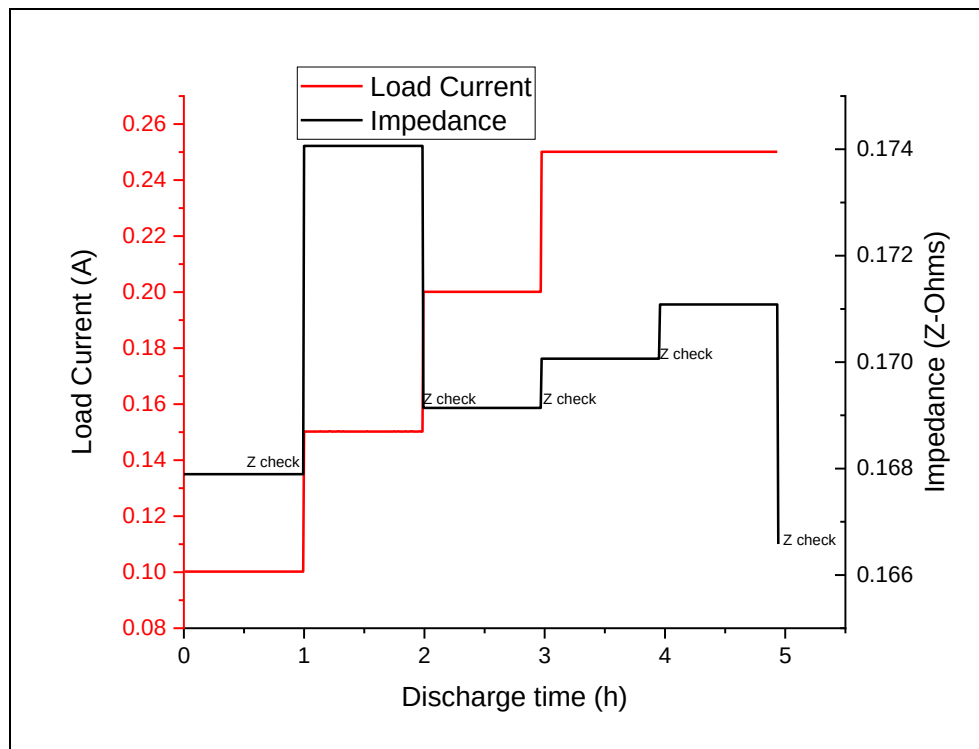


Figure 5-16: 1st Cycle, showing the cell discharge current and impedance; the impedance 'Z' is determined by passing AC current 'I' through the cell, measuring the voltage 'E' drop across the cell by use of the Ohm's Law $Z=E/I$.

As shown in Figure 5-16, the NaS cell was designed and set to discharge at a set procedure described in Table 5-5.

The battery cell is held at 350°C for the discharge and at every hour all electrical testing is paused to do a z-check (impedance check) as indicated in the graph. At the end of every step process a Z- check is done to check the battery function.

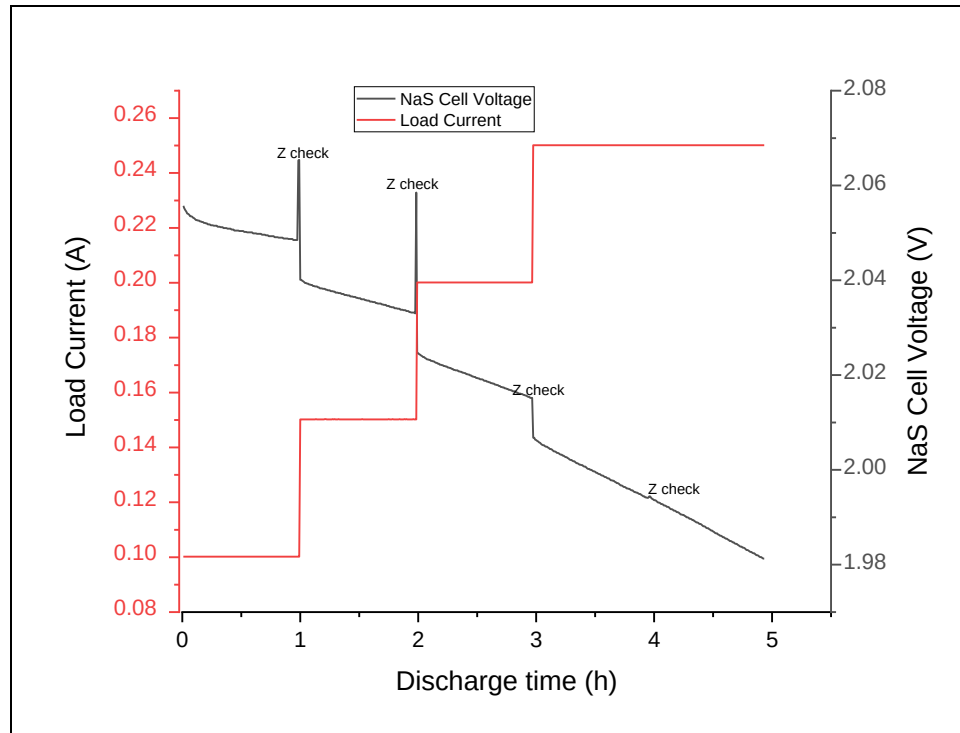


Figure 5-17: 1st cycle discharge load current and voltage over a 5hrs discharge time

Figure 5-17 shows the results obtained for the voltage profile of the discharge and the load current applied to the cell. Also, seen from the plotted graph is the voltage drop as the cell full discharges over 5 hours for the 1st cycle. At every hour, all electrical testing is paused to do a z-check (impedance check) as indicated in the graph. At the end of every step process a z- check is done to check the battery function.

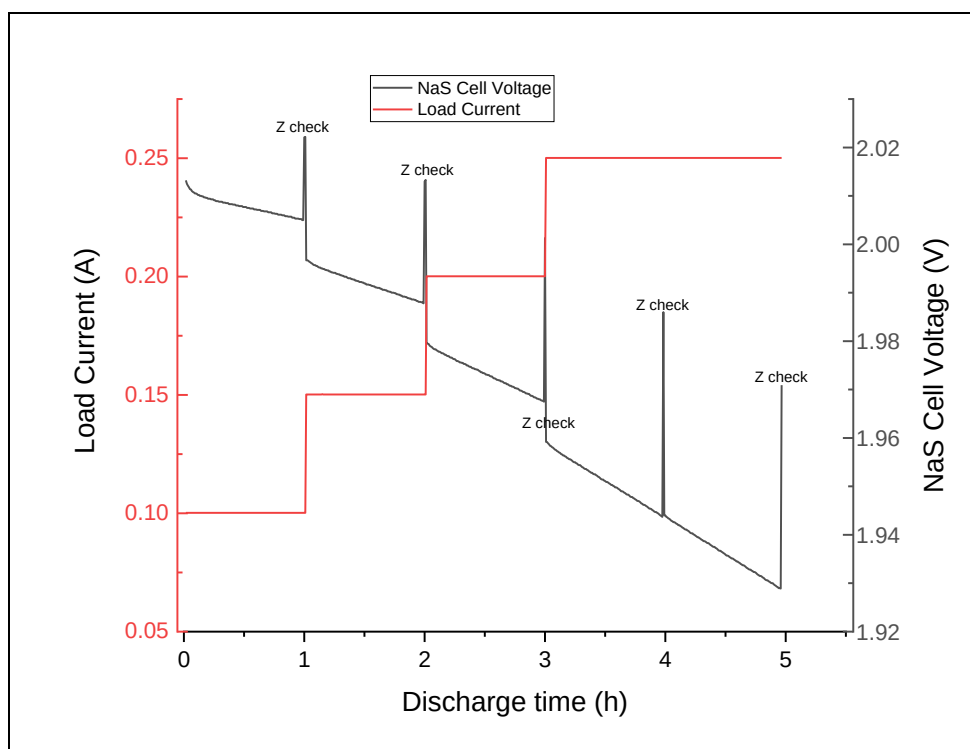


Figure 5-18: 2nd cycle discharge load current and voltage over a 5hrs discharge time

5.4.1 Discharge Voltage Limit

For single-cell tests, the discharge limit can be set at a suitable level, normally for the HP4 cell, this was set at 1.9 Vo/c which is equivalent to approximately 10 Ah discharge capacity and represents 80% of theoretical cell capacity concerning Na_2S_3 i.e., 100% discharged state.

The relationship between the open-circuit voltage and state of discharge (and sodium polysulphide species) at 350C is shown in Table 5-6 below.

Table 5-6: Open Circuit Voltage and Equivalent Depth of Discharge at 350°C
(Stackpool, 2017)

Open circuit voltage	Depth of Discharge (wrt 1.76 Vo/c)	Equivalent Species
2.076	0-60%	S + Na ₂ S ₅
2.061	60 %	Na ₂ S ₅
1.90	80%	Na ₂ S ₄
1.76	100%	Na ₂ S ₃

5.5 Experimental result data of NaS charge

When the cell needs to be removed from the test it is recommended that this be done with the cell in the fully charged condition to avoid stressing the electrolyte when sodium polysulphide “freezes” in the discharged state.

The charging characteristics of NaS were examined with the charging procedure of constant voltage (CV) charging. the effect from charging on the current of the cell is determined. The charging procedure charges the cell by utilizing a set charge at an initial current of 0.5A with a 2.5 V limit and the expected characteristics are shown in Figure 5-19.

The results obtained for the CV charging protocol for a 2.07 Ah sodium sulphur battery cell is displayed below. The battery cell is held at 350°C for the charge process.

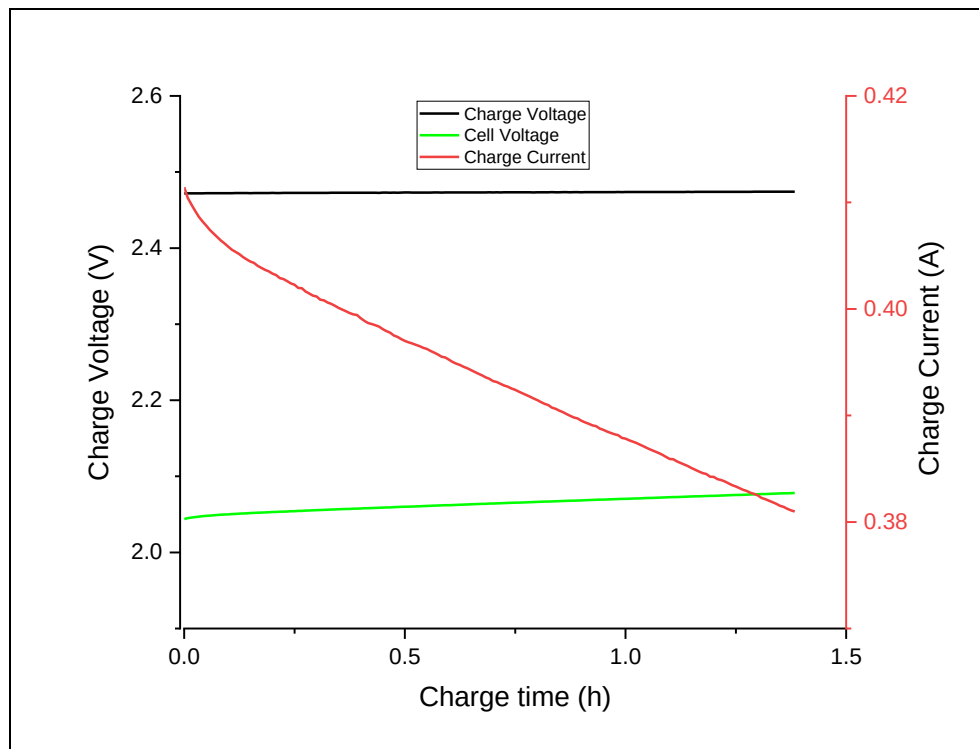


Figure 5-19: 1st charge in the cycle of the NaS cell, showing charge time

The battery cell is held at 350°C for the routine electrical performance testing of the cell was normally conducted on a 5 h discharge/ approximately 2-hour charge regime allowing 2 cycles per day to be performed. The current falls exponentially until the battery cell voltage limit of 2.07 V is reached as indicated in this figure 5-19. The result obtained from the 1st cycle shows the charge time at 1.38 hours with an initial cell voltage of 2.04 V.

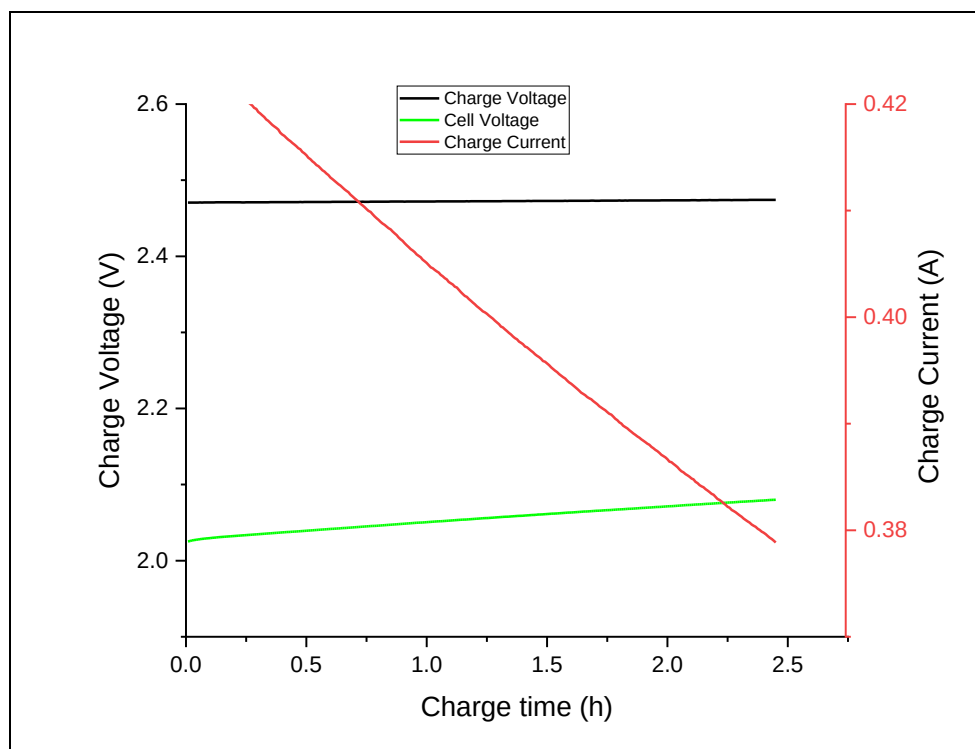


Figure 5-20: 2nd charge cycle of NaS cell against time

The second charge cycle is shown in Figure 5-20 showing how the current decreases when the voltage limit is reached. The time of full charge was 2.45 hours, with an initial cell voltage of 2.02 V. The charge time was dependent on the initial cell voltage.

5.6 Conclusion

In this chapter, the heating trials at three different heating rates were presented also the basic charge/discharge operation of the sodium sulphur battery cell. These results have shown the promising indication that the NaS cell was successfully heated, the elements were melted thoroughly, and the battery recorded an open circuit voltage. The cells were heated at rates of 1°C, 2°C and 3°/min. Based on the successful heating trials, charge and discharge operations of the cell, the safely heating of the cell was achieved and the aim of the experiment was realized. The same full run of the live NaS cell was repeated several times to emulate the results and to confirm the successful operation of the cell.

Compared to the experimental work conducted by Nation 2013 in the previous research investigations, these latest test results are highly successful and the safe usage of the NaS batteries have been confirmed. The utilization of the cell in further experiments with the conceptual receiver will now be possible owing to the completion of this experimental study.

However, in the framework of this current work, time constraints and equipment breakdown meant further investigations into increased heating rate to determine the stage the cells break was limited.

SUMMARY OF CONCLUSION AND RECOMMENDATION FOR FUTURE WORK

6.1 Summary of thesis

This research was aimed at furthering the previous research by studying experimentally the process of the NaS battery storage, the feasibility of incorporating an electrical energy storage method into a conventional parabolic trough collector with thermal storage. With the use of a rig designed for the specific purpose of a controlled laboratory-based experiment. The aim was to test and to discover how various key aspects of a conceptual NaS battery-based electrical energy storage approach by simulation and experimentation would complement the operation of existing thermal storage of current PTC power plants. This was achieved by the following objectives:

- This research aimed to find a safe functional way to simulate the heating of sodium-sulphur battery cells to imitate the working conditions of a receiver in a typical parabolic trough collector that would occur in a solar parabolic trough. This was conducted by the utilization of tube furnaces. From the temperature readings and analysing the various temperature readings across the NaS cell, the experimental cell was successfully and safely heated and made operational, shown by the open-circuit voltage of 2.07V. The experiment was also repeated using different furnaces and consistent results were obtained that confirmed the results.
- A heating regime of 1°C/min, 2°C/min and 3°C/min heating rates was developed and adopted for the safe heating of the cell to mitigate fracturing. Furthermore, a clear temperature profile of the 10 Ah NaS cell was obtained, the results indicating the phase changes of sodium and sulphur, leading to a better understating of the changes in the battery cell with temperature. The test was repeated several times and obtained remarkably comparable results it can be inferred that the experiment was successful owing to the fact the cell recorded an open circuit at each run without fracturing the cell membrane.
- To observe the charge/discharge operations on the NaS cells at their full operating temperature. Thermal measurement and Electrical (NaS cell Voltage and Current) measurement were observed and measured, conclusion drawn is that the cell when heated at an appropriate rate would mitigate any cell fracturing and allow electrical activities.

- To develop charging and discharge control system suitable to the hybrid system to work with a thermal storage PTC plant. The initial phase of software in LabView has been developed to monitor and charge/ discharge the NaS cell.

A brief literature review of energy storage options and a brief overview of thermal energy storage and electrochemical energy storage as applied to this thesis was presented. This chapter reviewed several articles published recently on energy storage. An overview of the two types of ES technologies which are thermal energy storage, electrochemical energy storage and battery charging methods. The conclusion drawn was the importance of the incorporation of energy storage in renewable energy. This is because of the possibility of delivering electrical power without backup systems from fossil fuel. It offers the prospect to meet the peak demands of power independent of weather conditions. Also, the scope of energy storage technologies on the current research and development for domestic, utilities and commercial purposes covers a broad scope of technologies. Based on the overview and comparison of the electrochemical energy storage systems. BES technologies are expensive, however, without the incorporation of them into VRES, energy storage would be challenging. Ergo, most BES technologies are in various positions in terms of maturity to meet market demands. However, the market is inclining towards sodium sulphur batteries. This is primarily because of the abundance of its active materials. Thermal energy storage in mitigating the intermittency of VRES can be concluded to be vital especially to plant operators of concentrated solar energy, especially in the ability to shift electricity to meet different load profiles.

The experimental apparatus section in chapter 3 presented a description of the equipment and setup, components and its function used for the experiments, an overview of the LabView program and a control box to charge and discharge the battery cell.

The experimental procedure in chapter 4, presented the methodology developed in conjunction with research partner Ionotec and experimental procedure tables and results. the experimental procedure. The experimental runs were divided into three sections, the first was on the warm-up and the second was the standby where any charging or discharging could be carried out and finally the third was on the cool-down of the sodium sulphur cell. Also covered in this section is the experimental procedure for each test run and some examples of results from the two furnaces used for the experiments.

The analysis of results is covered in chapter 5, which presented results from the experiments which were displayed and analysed and validated. On the results, conclusions are drawn. In this chapter, the heating trials at three different heating rates were presented also the basic charge/discharge operation of the sodium sulphur battery cell. These results have shown the promising indication that the NaS cell was successfully heated, the elements were melted thoroughly, and the battery recorded an open circuit voltage. The cells were heated at a rate of 1°C, 2°C and 3°/min. Based on the successful heating trials, charge and discharge operations of the cell, the safely heating of the cell was achieved and the aim of the experiment was realized. The same full run of the live NaS cell was repeated several times to emulate the results and to confirm the successful operation of the cell.

Compared to the experimental work conducted by Deju Nation in the previous research, the results of these tests are highly successful and the safe usage of the NaS batteries have been confirmed. The utilization of the cell in further experiments with the conceptual receiver will now be possible owing to the completion of this phase.

From this study, a detailed understanding of the thermal behaviour of Sodium-Sulphur (NaS) cells when subjected to different heating processes has been gained. The experimental basis and model used were guided by previous works in the area. The results obtained were compared to the outcomes from related previous works. The results obtained from this study present some basis for defining the guidelines of the operating condition for NaS-based battery energy storage systems.

6.2 Recommendation for future work

In recommissioning of the EES experimental rig and the successful operational implementation of the concept of integrating NaS battery cells further heating trials with increased heating rates would still have to be investigated to explore at what rate the cells would possibly fail.

Further areas in need of investigation are in the development of charging and discharge control systems suitable to the hybrid system to work with a thermal storage PTC plant. Also, analyse the prospects of incorporating the Hybrid NaS receiver with thermal storage in a PTC plant.

This preliminary work is generally hoped would garner and produce some interest in this focus and encourage investigation by future researchers in this area of solar thermal technology.

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Appendix

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1	02/08/2018	08:03:54	18.79	18.53	19.04	21
2	02/08/2018	08:04:24	18.94	18.76	19.51	21.5
3	02/08/2018	08:04:54	19.11	18.93	20	22
4	02/08/2018	08:05:24	19.27	19.07	20.42	22.5
5	02/08/2018	08:05:54	19.41	19.22	20.76	23
6	02/08/2018	08:06:24	19.55	19.35	21.08	23.5
7	02/08/2018	08:06:54	19.75	19.69	21.59	24
8	02/08/2018	08:07:24	19.98	19.95	22.13	24.5
9	02/08/2018	08:07:54	20.2	20.16	22.58	25
10	02/08/2018	08:08:24	20.4	20.34	22.94	25.5
11	02/08/2018	08:08:54	20.59	20.5	23.23	26
12	02/08/2018	08:09:24	20.77	20.66	23.47	26.5
13	02/08/2018	08:09:54	20.94	20.82	23.69	27
14	02/08/2018	08:10:24	21.15	21.17	24.03	27.5
15	02/08/2018	08:10:54	21.44	21.58	24.58	28
16	02/08/2018	08:11:24	21.73	21.89	25.13	28.5
17	02/08/2018	08:11:54	22.01	22.14	25.58	29
18	02/08/2018	08:12:24	22.28	22.38	25.97	29.5
19	02/08/2018	08:12:54	22.53	22.6	26.28	30
20	02/08/2018	08:13:24	22.76	22.82	26.52	30.5
21	02/08/2018	08:13:54	22.99	23.03	26.72	31
22	02/08/2018	08:14:24	23.21	23.21	26.87	31.5
23	02/08/2018	08:14:54	23.44	23.54	27.08	32
24	02/08/2018	08:15:24	23.75	24.03	27.55	32.5
25	02/08/2018	08:15:54	24.09	24.4	28.08	33
26	02/08/2018	08:16:24	24.42	24.7	28.57	33.5
27	02/08/2018	08:16:54	24.73	24.98	28.96	34
28	02/08/2018	08:17:24	25.02	25.24	29.27	34.5
29	02/08/2018	08:17:54	25.3	25.5	29.52	35
30	02/08/2018	08:18:24	25.57	25.75	29.73	35.5
31	02/08/2018	08:18:54	25.83	25.98	29.87	36
32	02/08/2018	08:19:24	26.11	26.4	30.14	36.5
33	02/08/2018	08:19:54	26.46	26.88	30.63	37
34	02/08/2018	08:20:24	26.83	27.27	31.13	37.5
35	02/08/2018	08:20:54	27.19	27.6	31.57	38
36	02/08/2018	08:21:24	27.51	27.89	31.98	38.5
37	02/08/2018	08:21:54	27.83	28.17	32.28	39
38	02/08/2018	08:22:24	28.14	28.46	32.51	39.5
39	02/08/2018	08:22:54	28.44	28.73	32.71	40
40	02/08/2018	08:23:24	28.73	29.11	32.92	40.5
41	02/08/2018	08:23:54	29.1	29.66	33.43	41
42	02/08/2018	08:24:24	29.51	30.07	34	41.5
43	02/08/2018	08:24:54	29.89	30.44	34.43	42
44	02/08/2018	08:25:24	30.25	30.75	34.79	42.5
45	02/08/2018	08:25:54	30.6	31.08	35.08	43
46	02/08/2018	08:26:24	30.93	31.37	35.32	43.5
47	02/08/2018	08:26:54	31.25	31.65	35.56	44
48	02/08/2018	08:27:24	31.55	32.04	35.76	44.5
49	02/08/2018	08:27:54	31.95	32.64	36.27	45
50	02/08/2018	08:28:24	32.39	33.11	36.86	45.5
51	02/08/2018	08:28:54	32.81	33.47	37.38	46
52	02/08/2018	08:29:24	33.2	33.84	37.82	46.5
53	02/08/2018	08:29:54	33.57	34.17	38.17	47
54	02/08/2018	08:30:24	33.92	34.5	38.44	47.5
55	02/08/2018	08:30:54	34.27	34.82	38.65	48
56	02/08/2018	08:31:24	34.6	35.12	38.8	48.5
57	02/08/2018	08:31:54	34.98	35.7	39.18	49
58	02/08/2018	08:32:24	35.42	36.22	39.73	49.5
59	02/08/2018	08:32:54	35.85	36.65	40.23	50
60	02/08/2018	08:33:24	36.27	37.02	40.66	50.5
61	02/08/2018	08:33:54	36.67	37.38	41	51
62	02/08/2018	08:34:24	37.04	37.71	41.3	51.5
63	02/08/2018	08:34:54	37.4	38.04	41.53	52
64	02/08/2018	08:35:24	37.75	38.41	41.71	52.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
65	02/08/2018	08:35:54	38.15	39.01	42.11	53
66	02/08/2018	08:36:24	38.6	39.53	42.69	53.5
67	02/08/2018	08:36:54	39.07	39.96	43.27	54
68	02/08/2018	08:37:24	39.51	40.36	43.71	54.5
69	02/08/2018	08:37:54	39.91	40.73	44.05	55
70	02/08/2018	08:38:24	40.31	41.08	44.34	55.5
71	02/08/2018	08:38:54	40.68	41.42	44.53	56
72	02/08/2018	08:39:24	41.04	41.8	44.73	56.5
73	02/08/2018	08:39:54	41.44	42.39	45.05	57
74	02/08/2018	08:40:24	41.9	42.89	45.61	57.5
75	02/08/2018	08:40:54	42.36	43.31	46.1	58
76	02/08/2018	08:41:24	42.79	43.72	46.53	58.5
77	02/08/2018	08:41:54	43.21	44.06	46.89	59
78	02/08/2018	08:42:24	43.59	44.43	47.09	59.5
79	02/08/2018	08:42:54	43.97	44.78	47.36	60
80	02/08/2018	08:43:24	44.38	45.35	47.73	60.5
81	02/08/2018	08:43:54	44.85	45.92	48.33	61
82	02/08/2018	08:44:24	45.35	46.41	48.85	61.5
83	02/08/2018	08:44:54	45.81	46.8	49.34	62
84	02/08/2018	08:45:24	46.23	47.15	49.68	62.5
85	02/08/2018	08:45:54	46.63	47.54	49.96	63
86	02/08/2018	08:46:24	47.04	47.92	50.17	63.5
87	02/08/2018	08:46:54	47.42	48.32	50.37	64
88	02/08/2018	08:47:24	47.86	48.99	50.9	64.5
89	02/08/2018	08:47:54	48.37	49.53	51.51	65
90	02/08/2018	08:48:24	48.85	50	52	65.5
91	02/08/2018	08:48:54	49.31	50.36	52.44	66
92	02/08/2018	08:49:24	49.76	50.78	52.85	66.5
93	02/08/2018	08:49:54	50.18	51.14	53.12	67
94	02/08/2018	08:50:24	50.57	51.52	53.26	67.5
95	02/08/2018	08:50:54	50.97	51.98	53.55	68
96	02/08/2018	08:51:24	51.44	52.62	54.13	68.5
97	02/08/2018	08:51:54	51.95	53.16	54.75	69
98	02/08/2018	08:52:24	52.44	53.63	55.22	69.5
99	02/08/2018	08:52:54	52.91	54.03	55.62	70
100	02/08/2018	08:53:24	53.35	54.44	55.92	70.5
101	02/08/2018	08:53:54	53.77	54.82	56.2	71
102	02/08/2018	08:54:24	54.17	55.19	56.38	71.5
103	02/08/2018	08:54:54	54.57	55.66	56.63	72
104	02/08/2018	08:55:24	55.07	56.34	57.21	72.5
105	02/08/2018	08:55:54	55.58	56.85	57.86	73
106	02/08/2018	08:56:24	56.08	57.31	58.34	73.5
107	02/08/2018	08:56:54	56.54	57.72	58.76	74
108	02/08/2018	08:57:24	56.99	58.1	59.08	74.5
109	02/08/2018	08:57:54	57.41	58.48	59.32	75
110	02/08/2018	08:58:24	57.81	58.87	59.48	75.5
111	02/08/2018	08:58:54	58.24	59.47	59.82	76
112	02/08/2018	08:59:24	58.75	60.09	60.41	76.5
113	02/08/2018	08:59:54	59.26	60.55	61.01	77
114	02/08/2018	09:00:24	59.76	61.01	61.5	77.5
115	02/08/2018	09:00:54	60.22	61.4	61.86	78
116	02/08/2018	09:01:24	60.65	61.78	62.14	78.5
117	02/08/2018	09:01:54	61.08	62.18	62.36	79
118	02/08/2018	09:02:24	61.48	62.63	62.62	79.5
119	02/08/2018	09:02:54	61.98	63.34	63.21	80
120	02/08/2018	09:03:24	62.52	63.91	63.9	80.5
121	02/08/2018	09:03:54	63.05	64.37	64.5	81
122	02/08/2018	09:04:24	63.55	64.81	64.9	81.5
123	02/08/2018	09:04:54	64.01	65.24	65.21	82
124	02/08/2018	09:05:24	64.46	65.64	65.42	82.5
125	02/08/2018	09:05:54	64.88	66.03	65.59	83
126	02/08/2018	09:06:24	65.28	66.43	65.71	83.5
127	02/08/2018	09:06:54	65.74	67.12	66.18	84
128	02/08/2018	09:07:24	66.28	67.71	66.86	84.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
129	02/08/2018	09:07:54	66.8	68.17	67.48	85
130	02/08/2018	09:08:24	67.29	68.62	67.96	85.5
131	02/08/2018	09:08:54	67.76	69.03	68.33	86
132	02/08/2018	09:09:24	68.2	69.41	68.53	86.5
133	02/08/2018	09:09:54	68.62	69.86	68.79	87
134	02/08/2018	09:10:24	69.06	70.31	69.02	87.5
135	02/08/2018	09:10:54	69.56	70.99	69.57	88
136	02/08/2018	09:11:24	70.09	71.5	70.2	88.5
137	02/08/2018	09:11:54	70.6	71.95	70.73	89
138	02/08/2018	09:12:24	71.08	72.38	71.13	89.5
139	02/08/2018	09:12:54	71.53	72.74	71.31	90
140	02/08/2018	09:13:24	71.96	73.16	71.51	90.5
141	02/08/2018	09:13:54	72.36	73.61	71.71	91
142	02/08/2018	09:14:24	72.87	74.29	72.33	91.5
143	02/08/2018	09:14:54	73.42	74.86	72.98	92
144	02/08/2018	09:15:24	73.94	75.35	73.51	92.5
145	02/08/2018	09:15:54	74.44	75.77	73.99	93
146	02/08/2018	09:16:24	74.9	76.21	74.26	93.5
147	02/08/2018	09:16:54	75.34	76.55	74.36	94
148	02/08/2018	09:17:24	75.76	76.93	74.46	94.5
149	02/08/2018	09:17:54	76.22	77.62	75.07	95
150	02/08/2018	09:18:24	76.76	78.25	75.7	95.5
151	02/08/2018	09:18:54	77.3	78.75	76.34	96
152	02/08/2018	09:19:24	77.81	79.18	76.8	96.5
153	02/08/2018	09:19:54	78.3	79.63	77.11	97
154	02/08/2018	09:20:24	78.76	80.03	77.47	97.5
155	02/08/2018	09:20:54	79.19	80.44	77.64	98
156	02/08/2018	09:21:24	79.62	80.93	77.89	98.5
157	02/08/2018	09:21:54	80.13	81.59	78.43	99
158	02/08/2018	09:22:24	80.69	82.17	79.11	99.5
159	02/08/2018	09:22:54	81.2	82.63	79.67	100
160	02/08/2018	09:23:24	81.7	83.06	80.12	100
161	02/08/2018	09:23:54	82.18	83.48	80.39	100
162	02/08/2018	09:24:24	82.63	83.91	80.58	100
163	02/08/2018	09:24:54	83.04	84.23	80.71	100
164	02/08/2018	09:25:24	83.44	84.64	80.8	100
165	02/08/2018	09:25:54	83.82	84.99	80.83	100
166	02/08/2018	09:26:24	84.18	85.3	80.82	100
167	02/08/2018	09:26:54	84.52	85.58	80.82	100
168	02/08/2018	09:27:24	84.85	85.89	80.89	100
169	02/08/2018	09:27:54	85.17	86.17	80.81	100
170	02/08/2018	09:28:24	85.48	86.43	80.79	100
171	02/08/2018	09:28:54	85.77	86.71	80.77	100
172	02/08/2018	09:29:24	86.04	86.95	80.7	100
173	02/08/2018	09:29:54	86.3	87.21	80.62	100
174	02/08/2018	09:30:24	86.55	87.45	80.53	100
175	02/08/2018	09:30:54	86.79	87.66	80.47	100
176	02/08/2018	09:31:24	87.01	87.82	80.44	100
177	02/08/2018	09:31:54	87.23	88.06	80.4	100
178	02/08/2018	09:32:24	87.44	88.3	80.34	100
179	02/08/2018	09:32:54	87.65	88.51	80.32	100
180	02/08/2018	09:33:24	87.85	88.61	80.29	100
181	02/08/2018	09:33:54	88.04	88.82	80.26	100
182	02/08/2018	09:34:24	88.21	88.98	80.23	100
183	02/08/2018	09:34:54	88.37	89.12	80.14	100
184	02/08/2018	09:35:24	88.51	89.28	80.04	100
185	02/08/2018	09:35:54	88.66	89.39	79.94	100
186	02/08/2018	09:36:24	88.79	89.47	79.87	100
187	02/08/2018	09:36:54	88.91	89.56	79.73	100
188	02/08/2018	09:37:24	89.04	89.74	79.61	100
189	02/08/2018	09:37:54	89.15	89.85	79.62	100
190	02/08/2018	09:38:24	89.26	89.93	79.67	100
191	02/08/2018	09:38:54	89.36	90.03	79.59	100
192	02/08/2018	09:39:24	89.46	90.14	79.53	100

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
193	02/08/2018	09:39:54	89.54	90.16	79.45	100
194	02/08/2018	09:40:24	89.63	90.32	79.37	100
195	02/08/2018	09:40:54	89.71	90.32	79.33	100
196	02/08/2018	09:41:24	89.78	90.38	79.24	100
197	02/08/2018	09:41:54	89.86	90.45	79.13	100
198	02/08/2018	09:42:24	89.93	90.51	79.15	100
199	02/08/2018	09:42:54	90	90.62	79.18	100
200	02/08/2018	09:43:24	90.07	90.71	79.22	100
201	02/08/2018	09:43:54	90.13	90.76	79.18	100
202	02/08/2018	09:44:24	90.2	90.76	79.2	100
203	02/08/2018	09:44:54	90.27	90.92	79.19	100
204	02/08/2018	09:45:24	90.34	90.91	79.14	100
205	02/08/2018	09:45:54	90.41	91.07	79.2	100
206	02/08/2018	09:46:24	90.49	91.11	79.3	100
207	02/08/2018	09:46:54	90.55	91.14	79.33	100
208	02/08/2018	09:47:24	90.62	91.25	79.37	100
209	02/08/2018	09:47:54	90.68	91.28	79.36	100
210	02/08/2018	09:48:24	90.73	91.22	79.37	100
211	02/08/2018	09:48:54	90.8	91.45	79.52	100
212	02/08/2018	09:49:24	90.87	91.49	79.64	100
213	02/08/2018	09:49:54	90.94	91.58	79.69	100
214	02/08/2018	09:50:24	91	91.64	79.75	100
215	02/08/2018	09:50:54	91.06	91.66	79.69	100
216	02/08/2018	09:51:24	91.11	91.73	79.72	100
217	02/08/2018	09:51:54	91.16	91.7	79.66	100
218	02/08/2018	09:52:24	91.21	91.77	79.64	100
219	02/08/2018	09:52:54	91.27	91.83	79.7	100
220	02/08/2018	09:53:24	91.33	91.93	79.66	100
221	02/08/2018	09:53:54	91.38	91.95	79.72	100
222	02/08/2018	09:54:24	91.42	92.04	79.83	100
223	02/08/2018	09:54:54	91.47	92.02	79.88	100
224	02/08/2018	09:55:24	91.52	92.1	79.89	100
225	02/08/2018	09:55:54	91.58	92.19	79.95	100
226	02/08/2018	09:56:24	91.64	92.25	79.99	100
227	02/08/2018	09:56:54	91.67	92.26	79.99	100
228	02/08/2018	09:57:24	91.72	92.38	80.03	100
229	02/08/2018	09:57:54	91.77	92.41	80.03	100
230	02/08/2018	09:58:24	91.82	92.35	80.04	100
231	02/08/2018	09:58:54	91.85	92.37	79.98	100
232	02/08/2018	09:59:24	91.88	92.38	80.01	100
233	02/08/2018	09:59:54	91.93	92.53	80.07	100
234	02/08/2018	10:00:24	91.97	92.56	80.07	100
235	02/08/2018	10:00:54	91.99	92.47	80.07	100
236	02/08/2018	10:01:24	92.02	92.54	80.12	100
237	02/08/2018	10:01:54	92.06	92.66	80.22	100
238	02/08/2018	10:02:24	92.09	92.65	80.17	100
239	02/08/2018	10:02:54	92.11	92.67	80.11	100
240	02/08/2018	10:03:24	92.15	92.73	80.1	100
241	02/08/2018	10:03:54	92.18	92.71	80.08	100
242	02/08/2018	10:04:24	92.2	92.82	80.12	100
243	02/08/2018	10:04:54	92.24	92.79	80.23	100
244	02/08/2018	10:05:24	92.27	92.84	80.24	100
245	02/08/2018	10:05:54	92.3	92.87	80.25	100
246	02/08/2018	10:06:24	92.31	92.77	80.24	100
247	02/08/2018	10:06:54	92.33	92.91	80.25	100
248	02/08/2018	10:07:24	92.36	92.94	80.29	100
249	02/08/2018	10:07:54	92.39	92.93	80.23	100
250	02/08/2018	10:08:24	92.41	93.01	80.23	100
251	02/08/2018	10:08:54	92.44	92.99	80.29	100
252	02/08/2018	10:09:24	92.46	92.95	80.26	100
253	02/08/2018	10:09:54	92.47	93.05	80.3	100
254	02/08/2018	10:10:24	92.49	93.07	80.3	100
255	02/08/2018	10:10:54	92.52	93.09	80.26	100
256	02/08/2018	10:11:24	92.54	93.12	80.32	100

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
257	02/08/2018	10:11:54	92.56	93.07	80.26	100
258	02/08/2018	10:12:24	92.58	93.11	80.32	100
259	02/08/2018	10:12:54	92.6	93.2	80.37	100
260	02/08/2018	10:13:24	92.62	93.12	80.35	100
261	02/08/2018	10:13:54	92.64	93.23	80.31	100
262	02/08/2018	10:14:24	92.67	93.26	80.33	100
263	02/08/2018	10:14:54	92.68	93.22	80.37	100
264	02/08/2018	10:15:24	92.7	93.27	80.42	100
265	02/08/2018	10:15:54	92.75	93.32	80.43	100
266	02/08/2018	10:16:24	92.78	93.29	80.45	100
267	02/08/2018	10:16:54	92.79	93.28	80.41	100
268	02/08/2018	10:17:24	92.8	93.33	80.4	100
269	02/08/2018	10:17:54	92.82	93.32	80.41	100
270	02/08/2018	10:18:24	92.83	93.28	80.4	100
271	02/08/2018	10:18:54	92.84	93.36	80.32	100
272	02/08/2018	10:19:24	92.85	93.33	80.32	100
273	02/08/2018	10:19:54	92.87	93.35	80.33	100
274	02/08/2018	10:20:24	92.88	93.33	80.45	100
275	02/08/2018	10:20:54	92.89	93.35	80.45	100
276	02/08/2018	10:21:24	92.91	93.39	80.45	100
277	02/08/2018	10:21:54	92.92	93.33	80.4	100
278	02/08/2018	10:22:24	92.94	93.42	80.49	100
279	02/08/2018	10:22:54	92.96	93.46	80.5	101
280	02/08/2018	10:23:24	92.98	93.42	80.61	101.5
281	02/08/2018	10:23:54	93.01	93.48	80.65	102
282	02/08/2018	10:24:24	93.05	93.53	80.72	102.5
283	02/08/2018	10:24:54	93.11	93.67	80.89	103
284	02/08/2018	10:25:24	93.17	93.61	81.04	103.5
285	02/08/2018	10:25:54	93.21	93.73	81.16	104
286	02/08/2018	10:26:24	93.3	93.9	81.39	104.5
287	02/08/2018	10:26:54	93.41	93.99	81.6	105
288	02/08/2018	10:27:24	93.51	94.13	81.76	105.5
289	02/08/2018	10:27:54	93.62	94.26	82.07	106
290	02/08/2018	10:28:24	93.75	94.36	82.29	106.5
291	02/08/2018	10:28:54	93.87	94.49	82.53	107
292	02/08/2018	10:29:24	94.02	94.67	82.79	107.5
293	02/08/2018	10:29:54	94.17	94.79	83.05	108
294	02/08/2018	10:30:24	94.32	94.97	83.39	108.5
295	02/08/2018	10:30:54	94.49	95.23	83.73	109
296	02/08/2018	10:31:24	94.68	95.4	84.11	109.5
297	02/08/2018	10:31:54	94.86	95.57	84.44	110
298	02/08/2018	10:32:24	95.06	95.85	84.82	110.5
299	02/08/2018	10:32:54	95.28	96.06	85.23	111
300	02/08/2018	10:33:24	95.49	96.22	85.5	111.5
301	02/08/2018	10:33:54	95.71	96.5	85.89	112
302	02/08/2018	10:34:24	95.96	96.73	86.26	112.5
303	02/08/2018	10:34:54	96.21	96.98	86.67	113
304	02/08/2018	10:35:24	96.45	97.27	87.05	113.5
305	02/08/2018	10:35:54	96.71	97.54	87.48	114
306	02/08/2018	10:36:24	96.99	97.78	87.86	114.5
307	02/08/2018	10:36:54	97.24	98.05	88.16	115
308	02/08/2018	10:37:24	97.53	98.37	88.63	115.5
309	02/08/2018	10:37:54	97.84	98.69	89.06	116
310	02/08/2018	10:38:24	98.12	98.92	89.41	116.5
311	02/08/2018	10:38:54	98.41	99.25	89.85	117
312	02/08/2018	10:39:24	98.7	99.52	90.26	117.5
313	02/08/2018	10:39:54	98.97	99.76	90.61	118
314	02/08/2018	10:40:24	99.21	100.01	91.07	118.5
315	02/08/2018	10:40:54	99.38	100.15	91.45	119
316	02/08/2018	10:41:24	99.48	100.16	91.76	119.5
317	02/08/2018	10:41:54	99.54	100.22	92.08	120
318	02/08/2018	10:42:24	99.59	100.27	92.52	120.5
319	02/08/2018	10:42:54	99.64	100.28	92.84	121
320	02/08/2018	10:43:24	99.69	100.35	93.14	121.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
321	02/08/2018	10:43:54	99.76	100.5	93.53	122
322	02/08/2018	10:44:24	99.85	100.55	93.89	122.5
323	02/08/2018	10:44:54	99.95	100.66	94.22	123
324	02/08/2018	10:45:24	100.08	100.86	94.66	123.5
325	02/08/2018	10:45:54	100.22	101.04	95	124
326	02/08/2018	10:46:24	100.34	101.15	95.3	124.5
327	02/08/2018	10:46:54	100.49	101.29	95.73	125
328	02/08/2018	10:47:24	100.66	101.52	96.08	125.5
329	02/08/2018	10:47:54	100.81	101.61	96.47	126
330	02/08/2018	10:48:24	100.93	101.73	96.83	126.5
331	02/08/2018	10:48:54	101.09	101.94	97.28	127
332	02/08/2018	10:49:24	101.24	102.08	97.65	127.5
333	02/08/2018	10:49:54	101.35	102.14	97.92	128
334	02/08/2018	10:50:24	101.46	102.27	98.22	128.5
335	02/08/2018	10:50:54	101.58	102.41	98.69	129
336	02/08/2018	10:51:24	101.69	102.48	99.06	129.5
337	02/08/2018	10:51:54	101.8	102.63	99.34	130
338	02/08/2018	10:52:24	101.92	102.75	99.77	130.5
339	02/08/2018	10:52:54	102.03	102.83	100.13	131
340	02/08/2018	10:53:24	102.12	103	100.43	131.5
341	02/08/2018	10:53:54	102.25	103.12	100.78	132
342	02/08/2018	10:54:24	102.36	103.23	101.25	132.5
343	02/08/2018	10:54:54	102.47	103.33	101.51	133
344	02/08/2018	10:55:24	102.6	103.53	101.94	133.5
345	02/08/2018	10:55:54	102.76	103.7	102.19	134
346	02/08/2018	10:56:24	103.09	104.11	102.41	134.5
347	02/08/2018	10:56:54	103.63	104.79	102.86	135
348	02/08/2018	10:57:24	104.27	105.42	103.27	135.5
349	02/08/2018	10:57:54	104.92	106.07	103.69	136
350	02/08/2018	10:58:24	105.59	106.79	104.11	136.5
351	02/08/2018	10:58:54	106.26	107.45	104.61	137
352	02/08/2018	10:59:24	106.91	108.08	105.02	137.5
353	02/08/2018	10:59:54	107.58	108.75	105.51	138
354	02/08/2018	11:00:24	108.24	109.44	105.94	138.5
355	02/08/2018	11:00:54	108.88	109.96	106.37	139
356	02/08/2018	11:01:24	109.52	110.66	106.76	139.5
357	02/08/2018	11:01:54	110.18	111.35	107.24	140
358	02/08/2018	11:02:24	110.82	111.95	107.71	140.5
359	02/08/2018	11:02:54	111.44	112.51	108.14	141
360	02/08/2018	11:03:24	112.09	113.2	108.71	141.5
361	02/08/2018	11:03:54	112.72	113.77	109.23	142
362	02/08/2018	11:04:24	113.34	114.39	109.64	142.5
363	02/08/2018	11:04:54	113.96	115.03	110.05	143
364	02/08/2018	11:05:24	114.59	115.67	110.63	143.5
365	02/08/2018	11:05:54	115.2	116.18	111.01	144
366	02/08/2018	11:06:24	115.81	116.84	111.48	144.5
367	02/08/2018	11:06:54	116.42	117.44	112	145
368	02/08/2018	11:07:24	116.98	117.9	112.38	145.5
369	02/08/2018	11:07:54	117.46	118.38	112.78	146
370	02/08/2018	11:08:24	117.86	118.73	113.29	146.5
371	02/08/2018	11:08:54	118.16	118.9	113.69	147
372	02/08/2018	11:09:24	118.38	119.1	114.03	147.5
373	02/08/2018	11:09:54	118.58	119.27	114.55	148
374	02/08/2018	11:10:24	118.75	119.36	114.97	148.5
375	02/08/2018	11:10:54	118.88	119.46	115.36	149
376	02/08/2018	11:11:24	119.03	119.68	115.8	149.5
377	02/08/2018	11:11:54	119.18	119.76	116.16	150
378	02/08/2018	11:12:24	119.31	119.92	116.41	150.5
379	02/08/2018	11:12:54	119.45	120.14	116.8	151
380	02/08/2018	11:13:24	119.63	120.32	117.29	151.5
381	02/08/2018	11:13:54	119.78	120.44	117.48	152
382	02/08/2018	11:14:24	119.95	120.67	117.87	152.5
383	02/08/2018	11:14:54	120.17	120.98	118.32	153
384	02/08/2018	11:15:24	120.4	121.22	118.68	153.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
385	02/08/2018	11:15:54	120.65	121.66	119.01	154
386	02/08/2018	11:16:24	120.98	122.13	119.4	154.5
387	02/08/2018	11:16:54	121.38	122.59	119.85	155
388	02/08/2018	11:17:24	121.84	123.13	120.27	155.5
389	02/08/2018	11:17:54	122.37	123.72	120.78	156
390	02/08/2018	11:18:24	122.99	124.26	121.17	156.5
391	02/08/2018	11:18:54	123.69	124.87	121.49	157
392	02/08/2018	11:19:24	124.47	125.59	121.97	157.5
393	02/08/2018	11:19:54	125.27	126.32	122.46	158
394	02/08/2018	11:20:24	126.03	126.99	122.94	158.5
395	02/08/2018	11:20:54	126.77	127.72	123.44	159
396	02/08/2018	11:21:24	127.51	128.4	123.89	159.5
397	02/08/2018	11:21:54	128.22	129.08	124.26	160
398	02/08/2018	11:22:24	128.94	129.82	124.78	159.5
399	02/08/2018	11:22:54	129.65	130.5	125.34	160
400	02/08/2018	11:23:24	130.35	131.14	125.66	160
401	02/08/2018	11:23:54	131.02	131.8	126.14	160
402	02/08/2018	11:24:24	131.7	132.44	126.6	160
403	02/08/2018	11:24:54	132.36	133.02	126.92	160
404	02/08/2018	11:25:24	132.99	133.62	127.12	160
405	02/08/2018	11:25:54	133.61	134.21	127.42	160
406	02/08/2018	11:26:24	134.21	134.76	127.7	160
407	02/08/2018	11:26:54	134.8	135.3	127.87	160
408	02/08/2018	11:27:24	135.37	135.81	128.04	160
409	02/08/2018	11:27:54	135.93	136.36	128.25	160
410	02/08/2018	11:28:24	136.47	136.89	128.46	160
411	02/08/2018	11:28:54	136.98	137.32	128.68	160
412	02/08/2018	11:29:24	137.47	137.76	128.85	160
413	02/08/2018	11:29:54	137.95	138.23	128.92	160
414	02/08/2018	11:30:24	138.44	138.7	129.01	160
415	02/08/2018	11:30:54	138.9	139.15	129.11	160
416	02/08/2018	11:31:24	139.34	139.44	129.21	160
417	02/08/2018	11:31:54	139.76	139.96	129.33	160
418	02/08/2018	11:32:24	140.19	140.34	129.45	160
419	02/08/2018	11:32:54	140.59	140.67	129.58	160
420	02/08/2018	11:33:24	140.97	141.01	129.58	160
421	02/08/2018	11:33:54	141.35	141.41	129.56	160
422	02/08/2018	11:34:24	141.73	141.8	129.69	160
423	02/08/2018	11:34:54	142.08	142.05	129.68	160
424	02/08/2018	11:35:24	142.41	142.43	129.72	160
425	02/08/2018	11:35:54	142.75	142.7	129.68	160
426	02/08/2018	11:36:24	143.06	143.05	129.83	160
427	02/08/2018	11:36:54	143.37	143.25	129.85	160
428	02/08/2018	11:37:24	143.67	143.59	129.94	160
429	02/08/2018	11:37:54	143.96	143.87	129.89	160
430	02/08/2018	11:38:24	144.23	144.08	129.95	160
431	02/08/2018	11:38:54	144.5	144.36	130.05	160
432	02/08/2018	11:39:24	144.75	144.56	130.04	160
433	02/08/2018	11:39:54	145.01	144.83	130.07	160
434	02/08/2018	11:40:24	145.26	145.05	130.23	160
435	02/08/2018	11:40:54	145.49	145.2	130.25	160
436	02/08/2018	11:41:24	145.72	145.5	130.35	160
437	02/08/2018	11:41:54	145.95	145.67	130.31	160
438	02/08/2018	11:42:24	146.16	145.89	130.46	160
439	02/08/2018	11:42:54	146.37	146.09	130.47	160
440	02/08/2018	11:43:24	146.57	146.18	130.42	160
441	02/08/2018	11:43:54	146.75	146.45	130.34	160
442	02/08/2018	11:44:24	146.94	146.67	130.34	160
443	02/08/2018	11:44:54	147.15	146.83	130.37	160
444	02/08/2018	11:45:24	147.33	146.93	130.48	160
445	02/08/2018	11:45:54	147.5	147.21	130.49	160
446	02/08/2018	11:46:24	147.67	147.3	130.5	160
447	02/08/2018	11:46:54	147.85	147.46	130.6	160
448	02/08/2018	11:47:24	147.99	147.59	130.64	160

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
449	02/08/2018	11:47:54	148.14	147.74	130.57	160
450	02/08/2018	11:48:24	148.29	147.82	130.57	160
451	02/08/2018	11:48:54	148.42	147.92	130.56	160
452	02/08/2018	11:49:24	148.56	148.15	130.55	160
453	02/08/2018	11:49:54	148.69	148.19	130.62	160
454	02/08/2018	11:50:24	148.8	148.35	130.66	160
455	02/08/2018	11:50:54	148.9	148.45	130.81	160
456	02/08/2018	11:51:24	149.03	148.62	130.81	160
457	02/08/2018	11:51:54	149.14	148.7	130.76	160
458	02/08/2018	11:52:24	149.24	148.8	130.85	160
459	02/08/2018	11:52:54	149.35	148.9	130.97	160
460	02/08/2018	11:53:24	149.45	148.94	130.96	160
461	02/08/2018	11:53:54	149.56	149.08	130.95	160
462	02/08/2018	11:54:24	149.66	149.23	131.01	160
463	02/08/2018	11:54:54	149.77	149.31	131	160
464	02/08/2018	11:55:24	149.86	149.37	130.98	160
465	02/08/2018	11:55:54	149.96	149.45	131	160
466	02/08/2018	11:56:24	150.07	149.62	131.13	160
467	02/08/2018	11:56:54	150.15	149.58	131.1	160
468	02/08/2018	11:57:24	150.23	149.74	131.02	160
469	02/08/2018	11:57:54	150.33	149.79	131.1	160
470	02/08/2018	11:58:24	150.41	149.88	131.16	160
471	02/08/2018	11:58:54	150.49	149.92	131.22	160
472	02/08/2018	11:59:24	150.57	150.07	131.25	160
473	02/08/2018	11:59:54	150.64	150.09	131.26	160
474	02/08/2018	12:00:24	150.7	150.13	131.37	160
475	02/08/2018	12:00:54	150.77	150.22	131.36	160
476	02/08/2018	12:01:24	150.85	150.34	131.43	160
477	02/08/2018	12:01:54	150.91	150.39	131.39	160
478	02/08/2018	12:02:24	150.98	150.43	131.38	160
479	02/08/2018	12:02:54	151.04	150.41	131.39	160
480	02/08/2018	12:03:24	151.08	150.44	131.28	160
481	02/08/2018	12:03:54	151.12	150.55	131.38	160
482	02/08/2018	12:04:24	151.18	150.58	131.46	160
483	02/08/2018	12:04:54	151.22	150.7	131.36	160
484	02/08/2018	12:05:24	151.28	150.76	131.27	160
485	02/08/2018	12:05:54	151.34	150.82	131.33	160
486	02/08/2018	12:06:24	151.39	150.8	131.38	160
487	02/08/2018	12:06:54	151.43	150.68	131.36	160
488	02/08/2018	12:07:24	151.47	150.86	131.41	160
489	02/08/2018	12:07:54	151.51	150.92	131.5	160
490	02/08/2018	12:08:24	151.56	151	131.52	160
491	02/08/2018	12:08:54	151.6	150.94	131.5	160
492	02/08/2018	12:09:24	151.64	151.06	131.59	160
493	02/08/2018	12:09:54	151.68	151.08	131.48	160
494	02/08/2018	12:10:24	151.72	151.09	131.54	160
495	02/08/2018	12:10:54	151.76	151.14	131.59	160
496	02/08/2018	12:11:24	151.79	151.2	131.64	160
497	02/08/2018	12:11:54	151.84	151.29	131.55	160
498	02/08/2018	12:12:24	151.89	151.24	131.61	160
499	02/08/2018	12:12:54	151.9	151.2	131.54	160
500	02/08/2018	12:13:24	151.93	151.32	131.6	160
501	02/08/2018	12:13:54	151.97	151.41	131.63	160
502	02/08/2018	12:14:24	152.01	151.38	131.7	160
503	02/08/2018	12:14:54	152.03	151.47	131.71	160
504	02/08/2018	12:15:24	152.06	151.51	131.66	160
505	02/08/2018	12:15:54	152.08	151.43	131.66	160
506	02/08/2018	12:16:24	152.11	151.47	131.62	160
507	02/08/2018	12:16:54	152.14	151.49	131.64	160
508	02/08/2018	12:17:24	152.16	151.54	131.76	160
509	02/08/2018	12:17:54	152.18	151.56	131.7	160
510	02/08/2018	12:18:24	152.2	151.56	131.62	160
511	02/08/2018	12:18:54	152.22	151.6	131.68	160
512	02/08/2018	12:19:24	152.24	151.63	131.64	160

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
513	02/08/2018	12:19:54	152.27	151.63	131.68	160
514	02/08/2018	12:20:24	152.29	151.65	131.67	160
515	02/08/2018	12:20:54	152.3	151.63	131.76	160
516	02/08/2018	12:21:24	152.32	151.66	131.84	160
517	02/08/2018	12:21:54	152.33	151.72	131.76	160
518	02/08/2018	12:22:24	152.34	151.73	131.68	160
519	02/08/2018	12:22:54	152.36	151.75	131.76	161
520	02/08/2018	12:23:24	152.4	151.83	131.87	161.5
521	02/08/2018	12:23:54	152.44	151.77	131.83	162
522	02/08/2018	12:24:24	152.5	151.96	131.98	162.5
523	02/08/2018	12:24:54	152.56	151.84	132.25	163
524	02/08/2018	12:25:24	152.62	151.89	132.37	163.5
525	02/08/2018	12:25:54	152.73	152.24	132.63	164
526	02/08/2018	12:26:24	152.86	152.32	132.88	164.5
527	02/08/2018	12:26:54	152.95	152.49	133.14	165
528	02/08/2018	12:27:24	153.09	152.56	133.41	165.5
529	02/08/2018	12:27:54	153.24	152.72	133.68	166
530	02/08/2018	12:28:24	153.38	152.89	133.97	166.5
531	02/08/2018	12:28:54	153.54	153.12	134.37	167
532	02/08/2018	12:29:24	153.73	153.32	134.73	167.5
533	02/08/2018	12:29:54	153.91	153.48	135.07	168
534	02/08/2018	12:30:24	154.1	153.66	135.44	168.5
535	02/08/2018	12:30:54	154.31	153.96	135.86	169
536	02/08/2018	12:31:24	154.54	154.1	136.14	169.5
537	02/08/2018	12:31:54	154.74	154.34	136.66	170
538	02/08/2018	12:32:24	154.99	154.58	137.04	170.5
539	02/08/2018	12:32:54	155.25	154.8	137.43	171
540	02/08/2018	12:33:24	155.49	154.92	137.72	171.5
541	02/08/2018	12:33:54	155.76	155.32	138.13	172
542	02/08/2018	12:34:24	156.04	155.5	138.37	172.5
543	02/08/2018	12:34:54	156.3	155.84	138.75	173
544	02/08/2018	12:35:24	156.59	156.17	139.32	173.5
545	02/08/2018	12:35:54	156.89	156.41	139.6	174
546	02/08/2018	12:36:24	157.18	156.61	139.93	174.5
547	02/08/2018	12:36:54	157.48	157.02	140.37	175
548	02/08/2018	12:37:24	157.81	157.32	140.81	175.5
549	02/08/2018	12:37:54	158.1	157.55	141.21	176
550	02/08/2018	12:38:24	158.44	157.91	141.66	176.5
551	02/08/2018	12:38:54	158.78	158.29	142.23	177
552	02/08/2018	12:39:24	159.11	158.59	142.62	177.5
553	02/08/2018	12:39:54	159.47	158.97	143.06	178
554	02/08/2018	12:40:24	159.83	159.3	143.49	178.5
555	02/08/2018	12:40:54	160.17	159.62	143.97	179
556	02/08/2018	12:41:24	160.53	160	144.3	179.5
557	02/08/2018	12:41:54	160.9	160.38	144.8	180
558	02/08/2018	12:42:24	161.27	160.7	145.08	180.5
559	02/08/2018	12:42:54	161.65	161.1	145.53	181
560	02/08/2018	12:43:24	162.06	161.51	146.12	181.5
561	02/08/2018	12:43:54	162.43	161.79	146.53	182
562	02/08/2018	12:44:24	162.8	162.17	146.97	182.5
563	02/08/2018	12:44:54	163.21	162.59	147.44	183
564	02/08/2018	12:45:24	163.61	162.89	147.81	183.5
565	02/08/2018	12:45:54	164	163.33	148.19	184
566	02/08/2018	12:46:24	164.43	163.73	148.68	184.5
567	02/08/2018	12:46:54	164.83	164.06	149.12	185
568	02/08/2018	12:47:24	165.23	164.55	149.5	185.5
569	02/08/2018	12:47:54	165.65	164.96	149.95	186
570	02/08/2018	12:48:24	166.07	165.36	150.34	186.5
571	02/08/2018	12:48:54	166.49	165.73	150.77	187
572	02/08/2018	12:49:24	166.93	166.21	151.36	187.5
573	02/08/2018	12:49:54	167.37	166.56	151.78	188
574	02/08/2018	12:50:24	167.79	166.97	152.07	188.5
575	02/08/2018	12:50:54	168.25	167.44	152.71	189
576	02/08/2018	12:51:24	168.71	167.89	153.2	189.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
577	02/08/2018	12:51:54	169.14	168.3	153.5	190
578	02/08/2018	12:52:24	169.58	168.74	153.83	190.5
579	02/08/2018	12:52:54	170.04	169.08	154.34	191
580	02/08/2018	12:53:24	170.46	169.5	154.82	191.5
581	02/08/2018	12:53:54	170.93	170.07	155.32	192
582	02/08/2018	12:54:24	171.4	170.52	155.81	192.5
583	02/08/2018	12:54:54	171.85	170.9	156.26	193
584	02/08/2018	12:55:24	172.32	171.43	156.6	193.5
585	02/08/2018	12:55:54	172.79	171.78	157.05	194
586	02/08/2018	12:56:24	173.23	172.26	157.3	194.5
587	02/08/2018	12:56:54	173.71	172.71	157.8	195
588	02/08/2018	12:57:24	174.19	173.17	158.17	195.5
589	02/08/2018	12:57:54	174.65	173.62	158.52	196
590	02/08/2018	12:58:24	175.14	174.16	159.07	196.5
591	02/08/2018	12:58:54	175.61	174.53	159.47	197
592	02/08/2018	12:59:24	176.08	174.94	159.74	197.5
593	02/08/2018	12:59:54	176.55	175.43	160.28	198
594	02/08/2018	13:00:24	177.04	175.94	160.64	198.5
595	02/08/2018	13:00:54	177.52	176.39	161.01	199
596	02/08/2018	13:01:24	178.02	176.92	161.59	199.5
597	02/08/2018	13:01:54	178.52	177.39	162.15	200
598	02/08/2018	13:02:24	179	177.84	162.56	200.5
599	02/08/2018	13:02:54	179.51	178.38	163.02	201
600	02/08/2018	13:03:24	180.01	178.79	163.42	201.5
601	02/08/2018	13:03:54	180.48	179.27	163.95	202
602	02/08/2018	13:04:24	180.98	179.73	164.29	202.5
603	02/08/2018	13:04:54	181.48	180.18	164.9	203
604	02/08/2018	13:05:24	181.96	180.68	165.27	203.5
605	02/08/2018	13:05:54	182.47	181.18	165.79	204
606	02/08/2018	13:06:24	182.97	181.67	166.15	204.5
607	02/08/2018	13:06:54	183.45	182.21	166.57	205
608	02/08/2018	13:07:24	183.97	182.74	166.95	205.5
609	02/08/2018	13:07:54	184.5	183.26	167.51	206
610	02/08/2018	13:08:24	185	183.69	167.84	206.5
611	02/08/2018	13:08:54	185.51	184.24	168.17	207
612	02/08/2018	13:09:24	186.03	184.69	168.8	207.5
613	02/08/2018	13:09:54	186.53	185.2	169.33	208
614	02/08/2018	13:10:24	187.05	185.7	169.6	208.5
615	02/08/2018	13:10:54	187.58	186.19	170.09	209
616	02/08/2018	13:11:24	188.07	186.73	170.53	209.5
617	02/08/2018	13:11:54	188.6	187.31	171.02	210
618	02/08/2018	13:12:24	189.13	187.81	171.47	210.5
619	02/08/2018	13:12:54	189.64	188.28	171.89	211
620	02/08/2018	13:13:24	190.17	188.81	172.47	211.5
621	02/08/2018	13:13:54	190.72	189.34	172.92	212
622	02/08/2018	13:14:24	191.24	189.8	173.15	212.5
623	02/08/2018	13:14:54	191.78	190.37	173.62	213
624	02/08/2018	13:15:24	192.32	190.95	174.21	213.5
625	02/08/2018	13:15:54	192.84	191.4	174.57	214
626	02/08/2018	13:16:24	193.36	191.96	175.15	214.5
627	02/08/2018	13:16:54	193.91	192.45	175.76	215
628	02/08/2018	13:17:24	194.43	192.97	176.21	215.5
629	02/08/2018	13:17:54	194.94	193.47	176.48	216
630	02/08/2018	13:18:24	195.48	194.04	177.04	216.5
631	02/08/2018	13:18:54	195.99	194.47	177.57	217
632	02/08/2018	13:19:24	196.5	194.99	178.02	217.5
633	02/08/2018	13:19:54	197.02	195.5	178.45	218
634	02/08/2018	13:20:24	197.51	195.98	178.87	218.5
635	02/08/2018	13:20:54	197.99	196.45	179.15	219
636	02/08/2018	13:21:24	198.51	196.99	179.65	219.5
637	02/08/2018	13:21:54	199.01	197.46	180.01	220
638	02/08/2018	13:22:24	199.49	197.93	180.46	220.5
639	02/08/2018	13:22:54	200	198.46	180.99	221
640	02/08/2018	13:23:24	200.48	198.79	181.3	221.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
641	02/08/2018	13:23:54	200.95	199.38	181.75	222
642	02/08/2018	13:24:24	201.45	199.94	182.31	222.5
643	02/08/2018	13:24:54	201.93	200.3	182.68	223
644	02/08/2018	13:25:24	202.43	200.93	183.28	223.5
645	02/08/2018	13:25:54	202.95	201.36	183.72	224
646	02/08/2018	13:26:24	203.42	201.77	184.15	224.5
647	02/08/2018	13:26:54	203.92	202.35	184.53	225
648	02/08/2018	13:27:24	204.43	202.78	185	225.5
649	02/08/2018	13:27:54	204.9	203.21	185.32	226
650	02/08/2018	13:28:24	205.4	203.83	185.93	226.5
651	02/08/2018	13:28:54	205.9	204.29	186.21	227
652	02/08/2018	13:29:24	206.37	204.69	186.55	227.5
653	02/08/2018	13:29:54	206.87	205.28	187.01	228
654	02/08/2018	13:30:24	207.38	205.7	187.41	228.5
655	02/08/2018	13:30:54	207.86	206.17	187.88	229
656	02/08/2018	13:31:24	208.36	206.8	188.4	229.5
657	02/08/2018	13:31:54	208.87	207.22	189	230
658	02/08/2018	13:32:24	209.36	207.73	189.25	230.5
659	02/08/2018	13:32:54	209.87	208.27	189.86	231
660	02/08/2018	13:33:24	210.38	208.7	190.45	231.5
661	02/08/2018	13:33:54	210.87	209.18	190.73	232
662	02/08/2018	13:34:24	211.37	209.71	191.24	232.5
663	02/08/2018	13:34:54	211.88	210.23	191.63	233
664	02/08/2018	13:35:24	212.37	210.71	191.98	233.5
665	02/08/2018	13:35:54	212.9	211.27	192.62	234
666	02/08/2018	13:36:24	213.4	211.65	193.06	234.5
667	02/08/2018	13:36:54	213.87	212.17	193.46	235
668	02/08/2018	13:37:24	214.38	212.73	193.85	235.5
669	02/08/2018	13:37:54	214.89	213.17	194.37	236
670	02/08/2018	13:38:24	215.38	213.67	194.72	236.5
671	02/08/2018	13:38:54	215.91	214.17	195.21	237
672	02/08/2018	13:39:24	216.4	214.69	195.58	237.5
673	02/08/2018	13:39:54	216.9	215.24	196.17	238
674	02/08/2018	13:40:24	217.42	215.74	196.73	238.5
675	02/08/2018	13:40:54	217.91	216.18	197.06	239
676	02/08/2018	13:41:24	218.41	216.73	197.46	239.5
677	02/08/2018	13:41:54	218.92	217.14	197.95	240
678	02/08/2018	13:42:24	219.41	217.67	198.4	240.5
679	02/08/2018	13:42:54	219.89	218.23	198.74	241
680	02/08/2018	13:43:24	220.42	218.73	199.35	241.5
681	02/08/2018	13:43:54	220.91	219.21	199.72	242
682	02/08/2018	13:44:24	221.42	219.79	200.27	242.5
683	02/08/2018	13:44:54	221.95	220.24	200.95	243
684	02/08/2018	13:45:24	222.43	220.66	201.19	243.5
685	02/08/2018	13:45:54	222.93	221.23	201.6	244
686	02/08/2018	13:46:24	223.45	221.73	202.12	244.5
687	02/08/2018	13:46:54	223.93	222.15	202.49	245
688	02/08/2018	13:47:24	224.43	222.75	202.97	245.5
689	02/08/2018	13:47:54	224.95	223.17	203.37	246
690	02/08/2018	13:48:24	225.43	223.65	203.82	246.5
691	02/08/2018	13:48:54	225.92	224.13	204.23	247
692	02/08/2018	13:49:24	226.43	224.63	204.63	247.5
693	02/08/2018	13:49:54	226.92	225.17	205.12	248
694	02/08/2018	13:50:24	227.43	225.72	205.75	248.5
695	02/08/2018	13:50:54	227.92	226.14	206.21	249
696	02/08/2018	13:51:24	228.39	226.63	206.48	249.5
697	02/08/2018	13:51:54	228.91	227.2	207.06	250
698	02/08/2018	13:52:24	229.38	227.56	207.6	250.5
699	02/08/2018	13:52:54	229.84	228.14	208	251
700	02/08/2018	13:53:24	230.35	228.64	208.39	251.5
701	02/08/2018	13:53:54	230.82	229.07	208.89	252
702	02/08/2018	13:54:24	231.28	229.55	209.44	252.5
703	02/08/2018	13:54:54	231.78	229.92	210.09	253
704	02/08/2018	13:55:24	232.24	230.43	210.26	253.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
705	02/08/2018	13:55:54	232.72	230.99	210.83	254
706	02/08/2018	13:56:24	233.21	231.48	211.33	254.5
707	02/08/2018	13:56:54	233.67	231.84	211.68	255
708	02/08/2018	13:57:24	234.12	232.3	212.09	255.5
709	02/08/2018	13:57:54	234.61	232.79	212.37	256
710	02/08/2018	13:58:24	235.05	233.2	212.87	256.5
711	02/08/2018	13:58:54	235.51	233.79	213.47	257
712	02/08/2018	13:59:24	236	234.26	213.95	257.5
713	02/08/2018	13:59:54	236.45	234.66	214.51	258
714	02/08/2018	14:00:24	236.93	235.2	214.97	258.5
715	02/08/2018	14:00:54	237.44	235.68	215.53	259
716	02/08/2018	14:01:24	237.92	236.12	215.77	259.5
717	02/08/2018	14:01:54	238.42	236.65	216.2	260
718	02/08/2018	14:02:24	238.94	237.15	216.83	260.5
719	02/08/2018	14:02:54	239.42	237.62	217.16	261
720	02/08/2018	14:03:24	239.94	238.2	217.57	261.5
721	02/08/2018	14:03:54	240.45	238.67	217.95	262
722	02/08/2018	14:04:24	240.96	239.16	218.41	262.5
723	02/08/2018	14:04:54	241.49	239.8	219.07	263
724	02/08/2018	14:05:24	242.02	240.27	219.43	263.5
725	02/08/2018	14:05:54	242.54	240.75	219.86	264
726	02/08/2018	14:06:24	243.09	241.3	220.54	264.5
727	02/08/2018	14:06:54	243.61	241.8	220.98	265
728	02/08/2018	14:07:24	244.12	242.4	221.57	265.5
729	02/08/2018	14:07:54	244.67	243.01	222.07	266
730	02/08/2018	14:08:24	245.21	243.44	222.48	266.5
731	02/08/2018	14:08:54	245.73	244.05	223.04	267
732	02/08/2018	14:09:24	246.29	244.61	223.5	267.5
733	02/08/2018	14:09:54	246.81	245.01	223.77	268
734	02/08/2018	14:10:24	247.33	245.66	224.32	268.5
735	02/08/2018	14:10:54	247.88	246.18	224.61	269
736	02/08/2018	14:11:24	248.39	246.65	225.15	269.5
737	02/08/2018	14:11:54	248.91	247.21	225.6	270
738	02/08/2018	14:12:24	249.45	247.73	225.93	270.5
739	02/08/2018	14:12:54	249.95	248.21	226.32	271
740	02/08/2018	14:13:24	250.5	248.81	226.94	271.5
741	02/08/2018	14:13:54	251.04	249.3	227.6	272
742	02/08/2018	14:14:24	251.53	249.81	228.01	272.5
743	02/08/2018	14:14:54	252.07	250.38	228.51	273
744	02/08/2018	14:15:24	252.59	250.81	228.85	273.5
745	02/08/2018	14:15:54	253.08	251.33	229	274
746	02/08/2018	14:16:24	253.61	251.87	229.42	274.5
747	02/08/2018	14:16:54	254.13	252.29	230.11	275
748	02/08/2018	14:17:24	254.63	252.87	230.63	275.5
749	02/08/2018	14:17:54	255.14	253.32	231.11	276
750	02/08/2018	14:18:24	255.64	253.9	231.54	276.5
751	02/08/2018	14:18:54	256.15	254.47	232.24	277
752	02/08/2018	14:19:24	256.67	254.95	232.92	277.5
753	02/08/2018	14:19:54	257.15	255.38	233.34	278
754	02/08/2018	14:20:24	257.62	255.83	233.52	278.5
755	02/08/2018	14:20:54	258.05	256.25	234.14	279
756	02/08/2018	14:21:24	258.4	256.43	234.57	279.5
757	02/08/2018	14:21:54	258.7	256.81	234.98	280
758	02/08/2018	14:22:24	258.94	257.02	235.6	280.5
759	02/08/2018	14:22:54	259.1	257.08	235.86	281
760	02/08/2018	14:23:24	259.27	257.31	236.27	281.5
761	02/08/2018	14:23:54	259.44	257.52	236.69	282
762	02/08/2018	14:24:24	259.57	257.54	236.55	282.5
763	02/08/2018	14:24:54	259.71	257.82	237.39	283
764	02/08/2018	14:25:24	259.88	257.95	237.89	283.5
765	02/08/2018	14:25:54	260.01	258.07	238.36	284
766	02/08/2018	14:26:24	260.19	258.33	238.7	284.5
767	02/08/2018	14:26:54	260.35	258.34	238.74	285
768	02/08/2018	14:27:24	260.48	258.53	239.07	285.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
769	02/08/2018	14:27:54	260.65	258.75	239.82	286
770	02/08/2018	14:28:24	260.79	258.86	240.11	286.5
771	02/08/2018	14:28:54	260.94	259.06	240.66	287
772	02/08/2018	14:29:24	261.13	259.27	241.28	287.5
773	02/08/2018	14:29:54	261.28	259.33	241.6	288
774	02/08/2018	14:30:24	261.46	259.61	241.99	288.5
775	02/08/2018	14:30:54	261.65	259.74	242.45	289
776	02/08/2018	14:31:24	261.8	259.92	242.63	289.5
777	02/08/2018	14:31:54	262.01	260.26	243.2	290
778	02/08/2018	14:32:24	262.23	260.46	243.4	290.5
779	02/08/2018	14:32:54	262.44	260.68	243.83	291
780	02/08/2018	14:33:24	262.7	260.97	244.56	291.5
781	02/08/2018	14:33:54	262.96	261.25	244.96	292
782	02/08/2018	14:34:24	263.21	261.56	245.26	292.5
783	02/08/2018	14:34:54	263.55	262.02	245.59	293
784	02/08/2018	14:35:24	263.96	262.44	246.02	293.5
785	02/08/2018	14:35:54	264.47	263.02	246.48	294
786	02/08/2018	14:36:24	265.14	263.69	246.94	294.5
787	02/08/2018	14:36:54	265.89	264.36	247.55	295
788	02/08/2018	14:37:24	266.71	265.21	248.01	295.5
789	02/08/2018	14:37:54	267.58	266	248.66	296
790	02/08/2018	14:38:24	268.4	266.72	249.05	296.5
791	02/08/2018	14:38:54	269.21	267.61	249.61	297
792	02/08/2018	14:39:24	270.03	268.35	250.22	297.5
793	02/08/2018	14:39:54	270.78	269.1	250.62	298
794	02/08/2018	14:40:24	271.57	269.92	251.36	298.5
795	02/08/2018	14:40:54	272.33	270.63	251.56	299
796	02/08/2018	14:41:24	273.05	271.33	252.12	299.5
797	02/08/2018	14:41:54	273.81	272.16	252.66	300
798	02/08/2018	14:42:24	274.55	272.8	253.32	300.5
799	02/08/2018	14:42:54	275.25	273.51	253.87	301
800	02/08/2018	14:43:24	275.99	274.29	254.34	301.5
801	02/08/2018	14:43:54	276.69	274.94	255.01	302
802	02/08/2018	14:44:24	277.38	275.69	255.32	302.5
803	02/08/2018	14:44:54	278.1	276.42	256.1	303
804	02/08/2018	14:45:24	278.76	277.03	256.53	303.5
805	02/08/2018	14:45:54	279.43	277.74	256.89	304
806	02/08/2018	14:46:24	280.13	278.4	257.3	304.5
807	02/08/2018	14:46:54	280.77	278.95	257.7	305
808	02/08/2018	14:47:24	281.43	279.73	258.25	305.5
809	02/08/2018	14:47:54	282.09	280.35	258.95	306
810	02/08/2018	14:48:24	282.7	280.95	259.52	306.5
811	02/08/2018	14:48:54	283.34	281.62	259.67	307
812	02/08/2018	14:49:24	283.98	282.21	260.45	307.5
813	02/08/2018	14:49:54	284.59	282.79	260.75	308
814	02/08/2018	14:50:24	285.23	283.46	261.25	308.5
815	02/08/2018	14:50:54	285.83	284.05	261.87	309
816	02/08/2018	14:51:24	286.44	284.7	262.18	309.5
817	02/08/2018	14:51:54	287.07	285.33	262.89	310
818	02/08/2018	14:52:24	287.64	285.83	263.03	310.5
819	02/08/2018	14:52:54	288.21	286.5	263.43	311
820	02/08/2018	14:53:24	288.81	287.01	264	311.5
821	02/08/2018	14:53:54	289.38	287.62	264.73	312
822	02/08/2018	14:54:24	289.98	288.28	265.23	312.5
823	02/08/2018	14:54:54	290.56	288.81	265.65	313
824	02/08/2018	14:55:24	291.12	289.41	266.28	313.5
825	02/08/2018	14:55:54	291.71	290.02	266.97	314
826	02/08/2018	14:56:24	292.25	290.5	267.16	314.5
827	02/08/2018	14:56:54	292.78	291.11	267.41	315
828	02/08/2018	14:57:24	293.38	291.71	268.19	315.5
829	02/08/2018	14:57:54	293.94	292.16	268.52	316
830	02/08/2018	14:58:24	294.48	292.73	268.91	316.5
831	02/08/2018	14:58:54	295.05	293.39	269.38	317
832	02/08/2018	14:59:24	295.6	293.88	269.89	317.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
833	02/08/2018	14:59:54	296.17	294.52	270.57	318
834	02/08/2018	15:00:24	296.76	295.08	271.26	318.5
835	02/08/2018	15:00:54	297.29	295.55	271.3	319
836	02/08/2018	15:01:24	297.84	296.15	271.87	319.5
837	02/08/2018	15:01:54	298.39	296.66	272.46	320
838	02/08/2018	15:02:24	298.9	297.18	273.14	320.5
839	02/08/2018	15:02:54	299.46	297.82	273.63	321
840	02/08/2018	15:03:24	300.01	298.27	273.82	321.5
841	02/08/2018	15:03:54	300.51	298.84	274.43	322
842	02/08/2018	15:04:24	301.09	299.43	275.04	322.5
843	02/08/2018	15:04:54	301.61	299.88	275.36	323
844	02/08/2018	15:05:24	302.13	300.43	275.93	323.5
845	02/08/2018	15:05:54	302.65	300.84	275.85	324
846	02/08/2018	15:06:24	303.13	301.41	276.43	324.5
847	02/08/2018	15:06:54	303.66	302.01	276.86	325
848	02/08/2018	15:07:24	304.22	302.54	277.8	325.5
849	02/08/2018	15:07:54	304.73	303.02	277.99	326
850	02/08/2018	15:08:24	305.28	303.65	278.89	326.5
851	02/08/2018	15:08:54	305.82	304.14	279.44	327
852	02/08/2018	15:09:24	306.31	304.61	279.55	327.5
853	02/08/2018	15:09:54	306.85	305.18	280.18	328
854	02/08/2018	15:10:24	307.39	305.67	280.53	328.5
855	02/08/2018	15:10:54	307.89	306.17	281.07	329
856	02/08/2018	15:11:24	308.43	306.76	281.5	329.5
857	02/08/2018	15:11:54	308.89	307.01	281.44	330
858	02/08/2018	15:12:24	309.33	307.61	281.49	330.5
859	02/08/2018	15:12:54	309.85	308.17	282.36	331
860	02/08/2018	15:13:24	310.34	308.58	282.79	331.5
861	02/08/2018	15:13:54	310.84	309.27	283.28	332
862	02/08/2018	15:14:24	311.39	309.77	284.17	332.5
863	02/08/2018	15:14:54	311.9	310.24	284.77	333
864	02/08/2018	15:15:24	312.45	310.86	285.5	333.5
865	02/08/2018	15:15:54	312.96	311.26	285.66	334
866	02/08/2018	15:16:24	313.46	311.82	286.01	334.5
867	02/08/2018	15:16:54	313.99	312.35	286.59	335
868	02/08/2018	15:17:24	314.48	312.69	286.6	335.5
869	02/08/2018	15:17:54	314.94	313.31	287.12	336
870	02/08/2018	15:18:24	315.45	313.81	287.44	336.5
871	02/08/2018	15:18:54	315.96	314.26	288.48	337
872	02/08/2018	15:19:24	316.49	314.87	289.24	337.5
873	02/08/2018	15:19:54	317.04	315.38	289.73	338
874	02/08/2018	15:20:24	317.51	315.69	290	338.5
875	02/08/2018	15:20:54	318.01	316.39	290.55	339
876	02/08/2018	15:21:24	318.51	316.87	291.15	339.5
877	02/08/2018	15:21:54	319	317.34	291.63	340
878	02/08/2018	15:22:24	319.52	317.89	292.22	340.5
879	02/08/2018	15:22:54	320.03	318.35	292.73	341
880	02/08/2018	15:23:24	320.54	318.9	292.71	341.5
881	02/08/2018	15:23:54	321.07	319.36	293.51	342
882	02/08/2018	15:24:24	321.52	319.77	293.46	342.5
883	02/08/2018	15:24:54	322.03	320.43	294.24	343
884	02/08/2018	15:25:24	322.53	320.86	294.68	343.5
885	02/08/2018	15:25:54	323.01	321.35	295.15	344
886	02/08/2018	15:26:24	323.54	321.94	295.43	344.5
887	02/08/2018	15:26:54	324.01	322.26	295.67	345
888	02/08/2018	15:27:24	324.47	322.88	296.07	345.5
889	02/08/2018	15:27:54	324.99	323.28	296.56	346
890	02/08/2018	15:28:24	325.44	323.77	296.71	346.5
891	02/08/2018	15:28:54	325.94	324.4	297.41	347
892	02/08/2018	15:29:24	326.46	324.89	298.3	347.5
893	02/08/2018	15:29:54	326.95	325.36	299.19	348
894	02/08/2018	15:30:24	327.48	325.94	299.66	348.5
895	02/08/2018	15:30:54	327.99	326.36	299.74	349
896	02/08/2018	15:31:24	328.47	326.87	300.33	349.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
961	02/08/2018	16:03:54	337.88	335.94	303.3	350
962	02/08/2018	16:04:24	337.87	335.92	303.26	350
963	02/08/2018	16:04:54	337.88	335.86	303.06	350
964	02/08/2018	16:05:24	337.85	335.83	302.99	350
965	02/08/2018	16:05:54	337.85	335.91	303.1	350
966	02/08/2018	16:06:24	337.86	335.86	303.09	350
967	02/08/2018	16:06:54	337.83	335.92	303.13	350
968	02/08/2018	16:07:24	337.86	335.97	303.4	350
969	02/08/2018	16:07:54	337.86	335.9	303.25	350
970	02/08/2018	16:08:24	337.85	335.89	303.29	350
971	02/08/2018	16:08:54	337.85	336	303.33	350
972	02/08/2018	16:09:24	337.86	336.07	303.96	350
973	02/08/2018	16:09:54	337.89	336	303.97	350
974	02/08/2018	16:10:24	337.9	335.93	303.56	350
975	02/08/2018	16:10:54	337.86	335.88	303.14	350
976	02/08/2018	16:11:24	337.87	335.97	303.22	350
977	02/08/2018	16:11:54	337.86	335.86	303.19	350
978	02/08/2018	16:12:24	337.84	335.87	303.04	350
979	02/08/2018	16:12:54	337.86	335.87	302.99	350
980	02/08/2018	16:13:24	337.84	335.87	303.06	350
981	02/08/2018	16:13:54	337.83	335.89	303.14	350
982	02/08/2018	16:14:24	337.85	335.87	303.1	350
983	02/08/2018	16:14:54	337.82	335.86	303.01	350
984	02/08/2018	16:15:24	337.84	335.92	303.26	350
985	02/08/2018	16:15:54	337.83	335.82	303.1	350
986	02/08/2018	16:16:24	337.81	335.83	303.07	350
987	02/08/2018	16:16:54	337.82	335.84	303.08	350
988	02/08/2018	16:17:24	337.8	335.82	303.25	350
989	02/08/2018	16:17:54	337.81	336.03	303.6	350
990	02/08/2018	16:18:24	337.87	335.99	303.83	350
991	02/08/2018	16:18:54	337.86	335.88	303.39	350
992	02/08/2018	16:19:24	337.87	335.91	303.27	350
993	02/08/2018	16:19:54	337.86	335.94	303.43	350
994	02/08/2018	16:20:24	337.84	335.9	303.49	350
995	02/08/2018	16:20:54	337.84	335.88	303.27	350
996	02/08/2018	16:21:24	337.84	335.83	303.06	350
997	02/08/2018	16:21:54	337.82	335.86	303.04	350
998	02/08/2018	16:22:24	337.84	335.89	303.29	350
999	02/08/2018	16:22:54	337.84	335.84	303.19	350
1000	02/08/2018	16:23:24	337.83	335.9	303.2	350
1001	02/08/2018	16:23:54	337.83	335.83	303.25	350
1002	02/08/2018	16:24:24	337.81	335.84	303.12	350
1003	02/08/2018	16:24:54	337.83	335.88	303.3	350
1004	02/08/2018	16:25:24	337.83	335.84	303.28	350
1005	02/08/2018	16:25:54	337.81	335.83	303.21	350
1006	02/08/2018	16:26:24	337.82	335.86	303.28	350
1007	02/08/2018	16:26:54	337.81	335.84	303.22	350
1008	02/08/2018	16:27:24	337.8	335.84	303.15	350
1009	02/08/2018	16:27:54	337.82	335.88	303.33	350
1010	02/08/2018	16:28:24	337.8	335.84	303.35	350
1011	02/08/2018	16:28:54	337.8	335.89	303.42	350
1012	02/08/2018	16:29:24	337.81	335.86	303.48	350
1013	02/08/2018	16:29:54	337.79	335.84	303.33	350
1014	02/08/2018	16:30:24	337.8	335.87	303.45	350
1015	02/08/2018	16:30:54	337.8	335.85	303.38	350
1016	02/08/2018	16:31:24	337.79	335.86	303.35	350
1017	02/08/2018	16:31:54	337.8	335.91	303.4	350
1018	02/08/2018	16:32:24	337.81	335.85	303.7	350
1019	02/08/2018	16:32:54	337.8	335.92	303.6	350
1020	02/08/2018	16:33:24	337.84	335.91	303.48	350
1021	02/08/2018	16:33:54	337.81	335.84	303.24	350
1022	02/08/2018	16:34:24	337.83	336.04	303.78	350
1023	02/08/2018	16:34:54	337.88	336.08	304.69	350
1024	02/08/2018	16:35:24	337.91	336.07	304.8	350

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1025	02/08/2018	16:35:54	337.95	336.08	304.38	350
1026	02/08/2018	16:36:24	337.95	336	303.81	350
1027	02/08/2018	16:36:54	337.92	336.01	303.61	350
1028	02/08/2018	16:37:24	337.92	336.01	303.54	350
1029	02/08/2018	16:37:54	337.9	335.91	303.41	350
1030	02/08/2018	16:38:24	337.88	336.01	303.63	350
1031	02/08/2018	16:38:54	337.89	335.97	303.57	350
1032	02/08/2018	16:39:24	337.86	335.93	303.34	350
1033	02/08/2018	16:39:54	337.88	335.99	303.9	350
1034	02/08/2018	16:40:24	337.89	335.95	303.68	350
1035	02/08/2018	16:40:54	337.86	336.03	303.62	350
1036	02/08/2018	16:41:24	337.9	336.13	304.39	350
1037	02/08/2018	16:41:54	337.94	336.05	304.08	350
1038	02/08/2018	16:42:24	337.92	336.01	304.04	350
1039	02/08/2018	16:42:54	337.93	336.02	303.66	350
1040	02/08/2018	16:43:24	337.93	335.96	303.43	350
1041	02/08/2018	16:43:54	337.9	335.98	303.46	350
1042	02/08/2018	16:44:24	337.91	336.01	303.53	350
1043	02/08/2018	16:44:54	337.89	336.03	303.58	350
1044	02/08/2018	16:45:24	337.91	336.04	303.7	350
1045	02/08/2018	16:45:54	337.93	335.97	303.56	350
1046	02/08/2018	16:46:24	337.91	335.96	303.5	350
1047	02/08/2018	16:46:54	337.9	336.05	303.76	350
1048	02/08/2018	16:47:24	337.9	335.97	303.63	350
1049	02/08/2018	16:47:54	337.88	335.96	303.5	350
1050	02/08/2018	16:48:24	337.89	335.96	303.45	350
1051	02/08/2018	16:48:54	337.87	335.91	303.34	350
1052	02/08/2018	16:49:24	337.85	335.98	303.53	350
1053	02/08/2018	16:49:54	337.86	335.96	303.62	350
1054	02/08/2018	16:50:24	337.84	335.91	303.53	350
1055	02/08/2018	16:50:54	337.84	336	303.65	350
1056	02/08/2018	16:51:24	337.85	335.93	303.64	350
1057	02/08/2018	16:51:54	337.82	335.91	303.63	350
1058	02/08/2018	16:52:24	337.83	335.99	303.54	350
1059	02/08/2018	16:52:54	337.84	335.94	303.65	350
1060	02/08/2018	16:53:24	337.83	335.92	303.6	350
1061	02/08/2018	16:53:54	337.85	335.94	303.49	350
1062	02/08/2018	16:54:24	337.85	335.94	303.63	350
1063	02/08/2018	16:54:54	337.84	335.97	303.65	350
1064	02/08/2018	16:55:24	337.85	335.93	303.95	350
1065	02/08/2018	16:55:54	337.83	335.91	303.59	350
1066	02/08/2018	16:56:24	337.84	335.99	303.73	350
1067	02/08/2018	16:56:54	337.86	335.96	303.83	350
1068	02/08/2018	16:57:24	337.84	335.95	303.7	350
1069	02/08/2018	16:57:54	337.86	335.99	303.67	350
1070	02/08/2018	16:58:24	337.86	335.93	303.7	350
1071	02/08/2018	16:58:54	337.84	335.92	303.49	350
1072	02/08/2018	16:59:24	337.86	336.01	303.77	350
1073	02/08/2018	16:59:54	337.86	336.04	303.92	350
1074	02/08/2018	17:00:24	337.88	336.05	304.03	350
1075	02/08/2018	17:00:54	337.9	336.03	303.92	303.92
1076	02/08/2018	17:01:24	337.89	335.94	303.78	303.78
1077	02/08/2018	17:01:54	337.81	335.8	303.49	303.49
1078	02/08/2018	17:02:24	337.68	335.58	303.13	303.13
1079	02/08/2018	17:02:54	337.49	335.35	302.47	302.47
1080	02/08/2018	17:03:24	337.27	335.09	301.87	301.87
1081	02/08/2018	17:03:54	337.02	334.86	301.44	301.44
1082	02/08/2018	17:04:24	336.73	334.59	301.03	301.03
1083	02/08/2018	17:04:54	336.42	334.25	300.4	300.4
1084	02/08/2018	17:05:24	336.09	333.89	299.61	299.61
1085	02/08/2018	17:05:54	335.73	333.62	299.42	299.42
1086	02/08/2018	17:06:24	335.38	333.27	299.08	299.08
1087	02/08/2018	17:06:54	335	332.91	298.35	298.35
1088	02/08/2018	17:07:24	334.63	332.5	298.24	298.24

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1089	02/08/2018	17:07:54	334.22	332	297.12	297.12
1090	02/08/2018	17:08:24	333.75	331.5	295.85	295.85
1091	02/08/2018	17:08:54	333.26	331.05	295.07	295.07
1092	02/08/2018	17:09:24	332.79	330.59	294.74	294.74
1093	02/08/2018	17:09:54	332.3	330.02	293.87	293.87
1094	02/08/2018	17:10:24	331.78	329.51	293.09	293.09
1095	02/08/2018	17:10:54	331.27	328.98	292.38	292.38
1096	02/08/2018	17:11:24	330.73	328.43	291.58	291.58
1097	02/08/2018	17:11:54	330.19	327.94	290.96	290.96
1098	02/08/2018	17:12:24	329.66	327.43	290.7	290.7
1099	02/08/2018	17:12:54	329.11	326.96	289.98	289.98
1100	02/08/2018	17:13:24	328.59	326.44	290.04	290.04
1101	02/08/2018	17:13:54	328.06	325.82	289.07	289.07
1102	02/08/2018	17:14:24	327.48	325.26	288.21	288.21
1103	02/08/2018	17:14:54	326.93	324.56	287.12	287.12
1104	02/08/2018	17:15:24	326.33	323.96	286.18	286.18
1105	02/08/2018	17:15:54	325.73	323.54	286.4	286.4
1106	02/08/2018	17:16:24	325.17	322.9	285.86	285.86
1107	02/08/2018	17:16:54	324.59	322.27	284.58	284.58
1108	02/08/2018	17:17:24	323.98	321.64	283.9	283.9
1109	02/08/2018	17:17:54	323.36	321.1	283.42	283.42
1110	02/08/2018	17:18:24	322.76	320.56	283.67	283.67
1111	02/08/2018	17:18:54	322.19	320	283.02	283.02
1112	02/08/2018	17:19:24	321.6	319.27	281.82	281.82
1113	02/08/2018	17:19:54	320.97	318.69	280.77	280.77
1114	02/08/2018	17:20:24	320.35	318.13	280.57	280.57
1115	02/08/2018	17:20:54	319.75	317.58	280.07	280.07
1116	02/08/2018	17:21:24	319.17	316.96	279.34	279.34
1117	02/08/2018	17:21:54	318.57	316.34	278.96	278.96
1118	02/08/2018	17:22:24	317.98	315.76	278.25	278.25
1119	02/08/2018	17:22:54	317.38	315.09	277.38	277.38
1120	02/08/2018	17:23:24	316.75	314.43	276.82	276.82
1121	02/08/2018	17:23:54	316.1	313.78	275.87	275.87
1122	02/08/2018	17:24:24	315.46	313.16	275.29	275.29
1123	02/08/2018	17:24:54	314.82	312.57	274.83	274.83
1124	02/08/2018	17:25:24	314.21	311.97	274.38	274.38
1125	02/08/2018	17:25:54	313.61	311.36	273.93	273.93
1126	02/08/2018	17:26:24	313	310.73	273.3	273.3
1127	02/08/2018	17:26:54	312.37	310.08	272.5	272.5
1128	02/08/2018	17:27:24	311.75	309.51	272.29	272.29
1129	02/08/2018	17:27:54	311.14	308.88	271.34	271.34
1130	02/08/2018	17:28:24	310.53	308.26	270.71	270.71
1131	02/08/2018	17:28:54	309.92	307.69	270.18	270.18
1132	02/08/2018	17:29:24	309.3	307.04	269.68	269.68
1133	02/08/2018	17:29:54	308.7	306.37	269.19	269.19
1134	02/08/2018	17:30:24	308.06	305.74	268.15	268.15
1135	02/08/2018	17:30:54	307.43	305.14	267.72	267.72
1136	02/08/2018	17:31:24	306.82	304.51	266.83	266.83
1137	02/08/2018	17:31:54	306.21	303.91	266.81	266.81
1138	02/08/2018	17:32:24	305.6	303.29	265.8	265.8
1139	02/08/2018	17:32:54	304.98	302.68	265.71	265.71
1140	02/08/2018	17:33:24	304.36	302.07	264.82	264.82
1141	02/08/2018	17:33:54	303.75	301.47	264.16	264.16
1142	02/08/2018	17:34:24	303.14	300.86	263.6	263.6
1143	02/08/2018	17:34:54	302.54	300.2	263.29	263.29
1144	02/08/2018	17:35:24	301.94	299.59	262.36	262.36
1145	02/08/2018	17:35:54	301.3	299.01	261.71	261.71
1146	02/08/2018	17:36:24	300.69	298.4	261.19	261.19
1147	02/08/2018	17:36:54	300.09	297.65	260.65	260.65
1148	02/08/2018	17:37:24	299.44	297.16	259.94	259.94
1149	02/08/2018	17:37:54	298.85	296.53	259.38	259.38
1150	02/08/2018	17:38:24	298.23	295.96	258.76	258.76
1151	02/08/2018	17:38:54	297.64	295.34	258.41	258.41
1152	02/08/2018	17:39:24	297.04	294.76	257.79	257.79

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1153	02/08/2018	17:39:54	296.44	294.15	257.32	257.32
1154	02/08/2018	17:40:24	295.85	293.59	256.96	256.96
1155	02/08/2018	17:40:54	295.26	292.91	256.04	256.04
1156	02/08/2018	17:41:24	294.65	292.36	255.59	255.59
1157	02/08/2018	17:41:54	294.05	291.74	254.96	254.96
1158	02/08/2018	17:42:24	293.45	291.13	254.46	254.46
1159	02/08/2018	17:42:54	292.84	290.56	253.95	253.95
1160	02/08/2018	17:43:24	292.25	289.93	253.56	253.56
1161	02/08/2018	17:43:54	291.66	289.39	253.11	253.11
1162	02/08/2018	17:44:24	291.07	288.8	252.37	252.37
1163	02/08/2018	17:44:54	290.47	288.17	251.51	251.51
1164	02/08/2018	17:45:24	289.9	287.63	251.24	251.24
1165	02/08/2018	17:45:54	289.33	287.04	250.58	250.58
1166	02/08/2018	17:46:24	288.75	286.48	250.4	250.4
1167	02/08/2018	17:46:54	288.18	285.9	249.91	249.91
1168	02/08/2018	17:47:24	287.62	285.3	249.47	249.47
1169	02/08/2018	17:47:54	287.03	284.75	248.61	248.61
1170	02/08/2018	17:48:24	286.46	284.16	247.86	247.86
1171	02/08/2018	17:48:54	285.88	283.58	247.63	247.63
1172	02/08/2018	17:49:24	285.31	282.96	246.78	246.78
1173	02/08/2018	17:49:54	284.73	282.4	246.2	246.2
1174	02/08/2018	17:50:24	284.17	281.87	245.83	245.83
1175	02/08/2018	17:50:54	283.6	281.3	245.31	245.31
1176	02/08/2018	17:51:24	283.03	280.75	244.78	244.78
1177	02/08/2018	17:51:54	282.47	280.14	244.31	244.31
1178	02/08/2018	17:52:24	281.91	279.62	243.75	243.75
1179	02/08/2018	17:52:54	281.34	278.99	243.06	243.06
1180	02/08/2018	17:53:24	280.76	278.43	242.57	242.57
1181	02/08/2018	17:53:54	280.2	277.87	242.18	242.18
1182	02/08/2018	17:54:24	279.63	277.32	242.03	242.03
1183	02/08/2018	17:54:54	279.07	276.79	241.56	241.56
1184	02/08/2018	17:55:24	278.52	276.2	241.02	241.02
1185	02/08/2018	17:55:54	277.97	275.69	240.45	240.45
1186	02/08/2018	17:56:24	277.4	275.11	239.62	239.62
1187	02/08/2018	17:56:54	276.86	274.55	238.96	238.96
1188	02/08/2018	17:57:24	276.32	273.97	238.53	238.53
1189	02/08/2018	17:57:54	275.78	273.4	237.98	237.98
1190	02/08/2018	17:58:24	275.21	272.82	237.35	237.35
1191	02/08/2018	17:58:54	274.66	272.34	236.96	236.96
1192	02/08/2018	17:59:24	274.11	271.75	236.46	236.46
1193	02/08/2018	17:59:54	273.55	271.25	236.19	236.19
1194	02/08/2018	18:00:24	273.03	270.69	235.57	235.57
1195	02/08/2018	18:00:54	272.49	270.16	235.03	235.03
1196	02/08/2018	18:01:24	271.95	269.64	234.79	234.79
1197	02/08/2018	18:01:54	271.41	269.08	234.25	234.25
1198	02/08/2018	18:02:24	270.87	268.56	233.73	233.73
1199	02/08/2018	18:02:54	270.34	268.05	232.99	232.99
1200	02/08/2018	18:03:24	269.82	267.5	232.71	232.71
1201	02/08/2018	18:03:54	269.28	266.82	232.06	232.06
1202	02/08/2018	18:04:24	268.73	266.37	231.6	231.6
1203	02/08/2018	18:04:54	268.19	265.81	231.09	231.09
1204	02/08/2018	18:05:24	267.64	265.31	230.62	230.62
1205	02/08/2018	18:05:54	267.12	264.79	230.36	230.36
1206	02/08/2018	18:06:24	266.59	264.25	229.76	229.76
1207	02/08/2018	18:06:54	266.07	263.73	229.23	229.23
1208	02/08/2018	18:07:24	265.54	263.2	228.7	228.7
1209	02/08/2018	18:07:54	265	262.69	228.64	228.64
1210	02/08/2018	18:08:24	264.49	262.17	227.96	227.96
1211	02/08/2018	18:08:54	263.98	261.55	227.43	227.43
1212	02/08/2018	18:09:24	263.47	261.09	226.86	226.86
1213	02/08/2018	18:09:54	262.93	260.59	226.3	226.3
1214	02/08/2018	18:10:24	262.42	260.03	226	226
1215	02/08/2018	18:10:54	261.89	259.59	225.48	225.48
1216	02/08/2018	18:11:24	261.39	259.08	225.13	225.13

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1217	02/08/2018	18:11:54	260.89	258.48	224.77	224.77
1218	02/08/2018	18:12:24	260.37	258.02	224.42	224.42
1219	02/08/2018	18:12:54	259.86	257.52	223.99	223.99
1220	02/08/2018	18:13:24	259.34	256.82	223.41	223.41
1221	02/08/2018	18:13:54	258.83	256.51	222.82	222.82
1222	02/08/2018	18:14:24	258.34	255.96	222.42	222.42
1223	02/08/2018	18:14:54	257.83	255.47	221.91	221.91
1224	02/08/2018	18:15:24	257.33	254.96	221.31	221.31
1225	02/08/2018	18:15:54	256.82	254.49	220.92	220.92
1226	02/08/2018	18:16:24	256.33	253.87	220.38	220.38
1227	02/08/2018	18:16:54	255.81	253.44	219.94	219.94
1228	02/08/2018	18:17:24	255.33	252.99	219.52	219.52
1229	02/08/2018	18:17:54	254.83	252.5	218.78	218.78
1230	02/08/2018	18:18:24	254.33	252.01	218.4	218.4
1231	02/08/2018	18:18:54	253.84	251.52	217.93	217.93
1232	02/08/2018	18:19:24	253.34	251.03	217.5	217.5
1233	02/08/2018	18:19:54	252.85	250.47	217.31	217.31
1234	02/08/2018	18:20:24	252.35	249.98	216.88	216.88
1235	02/08/2018	18:20:54	251.85	249.5	216.3	216.3
1236	02/08/2018	18:21:24	251.38	249.05	215.87	215.87
1237	02/08/2018	18:21:54	250.88	248.59	215.34	215.34
1238	02/08/2018	18:22:24	250.4	248.08	215	215
1239	02/08/2018	18:22:54	249.93	247.59	214.49	214.49
1240	02/08/2018	18:23:24	249.45	247.09	214.14	214.14
1241	02/08/2018	18:23:54	248.96	246.67	213.77	213.77
1242	02/08/2018	18:24:24	248.5	246.15	213.47	213.47
1243	02/08/2018	18:24:54	248.02	245.7	212.73	212.73
1244	02/08/2018	18:25:24	247.54	245.2	212.5	212.5
1245	02/08/2018	18:25:54	247.08	244.68	211.96	211.96
1246	02/08/2018	18:26:24	246.61	244.21	211.32	211.32
1247	02/08/2018	18:26:54	246.13	243.8	210.89	210.89
1248	02/08/2018	18:27:24	245.64	243.33	210.76	210.76
1249	02/08/2018	18:27:54	245.19	242.88	210.42	210.42
1250	02/08/2018	18:28:24	244.71	242.38	209.74	209.74
1251	02/08/2018	18:28:54	244.23	241.94	209.1	209.1
1252	02/08/2018	18:29:24	243.77	241.47	208.57	208.57
1253	02/08/2018	18:29:54	243.32	240.92	208.32	208.32
1254	02/08/2018	18:30:24	242.85	240.49	207.97	207.97
1255	02/08/2018	18:30:54	242.38	240.07	207.45	207.45
1256	02/08/2018	18:31:24	241.93	239.53	207.17	207.17
1257	02/08/2018	18:31:54	241.45	239.06	206.67	206.67
1258	02/08/2018	18:32:24	240.98	238.7	206.25	206.25
1259	02/08/2018	18:32:54	240.51	238.2	205.8	205.8
1260	02/08/2018	18:33:24	240.07	237.72	205.46	205.46
1261	02/08/2018	18:33:54	239.6	237.24	204.97	204.97
1262	02/08/2018	18:34:24	239.13	236.82	204.67	204.67
1263	02/08/2018	18:34:54	238.69	236.36	204.49	204.49
1264	02/08/2018	18:35:24	238.24	235.92	203.95	203.95
1265	02/08/2018	18:35:54	237.76	235.44	203.37	203.37
1266	02/08/2018	18:36:24	237.31	235.01	203	203
1267	02/08/2018	18:36:54	236.86	234.53	202.74	202.74
1268	02/08/2018	18:37:24	236.42	234.14	202.27	202.27
1269	02/08/2018	18:37:54	235.97	233.69	201.92	201.92
1270	02/08/2018	18:38:24	235.51	233.22	201.39	201.39
1271	02/08/2018	18:38:54	235.07	232.73	201.14	201.14
1272	02/08/2018	18:39:24	234.63	232.33	200.71	200.71
1273	02/08/2018	18:39:54	234.17	231.88	200.31	200.31
1274	02/08/2018	18:40:24	233.73	231.35	199.66	199.66
1275	02/08/2018	18:40:54	233.27	230.97	199.24	199.24
1276	02/08/2018	18:41:24	232.84	230.52	198.9	198.9
1277	02/08/2018	18:41:54	232.41	230.07	198.52	198.52
1278	02/08/2018	18:42:24	231.97	229.65	198.22	198.22
1279	02/08/2018	18:42:54	231.53	229.26	197.76	197.76
1280	02/08/2018	18:43:24	231.1	228.8	197.43	197.43

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1281	02/08/2018	18:43:54	230.66	228.31	196.9	196.9
1282	02/08/2018	18:44:24	230.23	227.92	196.66	196.66
1283	02/08/2018	18:44:54	229.79	227.45	196.18	196.18
1284	02/08/2018	18:45:24	229.34	227.07	195.8	195.8
1285	02/08/2018	18:45:54	228.92	226.63	195.42	195.42
1286	02/08/2018	18:46:24	228.48	226.12	194.87	194.87
1287	02/08/2018	18:46:54	228.04	225.68	194.73	194.73
1288	02/08/2018	18:47:24	227.6	225.26	194.46	194.46
1289	02/08/2018	18:47:54	227.16	224.79	194.06	194.06
1290	02/08/2018	18:48:24	226.73	224.41	193.57	193.57
1291	02/08/2018	18:48:54	226.3	223.94	193.09	193.09
1292	02/08/2018	18:49:24	225.85	223.58	192.96	192.96
1293	02/08/2018	18:49:54	225.43	223.04	192.34	192.34
1294	02/08/2018	18:50:24	224.99	222.74	191.8	191.8
1295	02/08/2018	18:50:54	224.58	222.26	191.42	191.42
1296	02/08/2018	18:51:24	224.16	221.89	191.11	191.11
1297	02/08/2018	18:51:54	223.74	221.44	190.73	190.73
1298	02/08/2018	18:52:24	223.32	220.99	190.3	190.3
1299	02/08/2018	18:52:54	222.9	220.64	189.98	189.98
1300	02/08/2018	18:53:24	222.48	220.18	189.52	189.52
1301	02/08/2018	18:53:54	222.08	219.76	189.09	189.09
1302	02/08/2018	18:54:24	221.67	219.38	188.72	188.72
1303	02/08/2018	18:54:54	221.23	218.88	188.52	188.52
1304	02/08/2018	18:55:24	220.8	218.51	188.27	188.27
1305	02/08/2018	18:55:54	220.38	218.07	187.88	187.88
1306	02/08/2018	18:56:24	219.98	217.76	187.51	187.51
1307	02/08/2018	18:56:54	219.55	217.29	187.07	187.07
1308	02/08/2018	18:57:24	219.16	216.87	186.79	186.79
1309	02/08/2018	18:57:54	218.75	216.54	186.51	186.51
1310	02/08/2018	18:58:24	218.34	216.07	186.04	186.04
1311	02/08/2018	18:58:54	217.94	215.62	185.57	185.57
1312	02/08/2018	18:59:24	217.53	215.23	185.29	185.29
1313	02/08/2018	18:59:54	217.11	214.85	184.97	184.97
1314	02/08/2018	19:00:24	216.71	214.48	184.69	184.69
1315	02/08/2018	19:00:54	216.32	214.03	184.19	184.19
1316	02/08/2018	19:01:24	215.9	213.67	184	184
1317	02/08/2018	19:01:54	215.49	213.29	183.86	183.86
1318	02/08/2018	19:02:24	215.08	212.81	183.33	183.33
1319	02/08/2018	19:02:54	214.67	212.41	182.85	182.85
1320	02/08/2018	19:03:24	214.27	212.02	182.47	182.47
1321	02/08/2018	19:03:54	213.87	211.7	182.28	182.28
1322	02/08/2018	19:04:24	213.49	211.25	181.72	181.72
1323	02/08/2018	19:04:54	213.1	210.91	181.3	181.3
1324	02/08/2018	19:05:24	212.71	210.47	180.97	180.97
1325	02/08/2018	19:05:54	212.32	210.14	180.8	180.8
1326	02/08/2018	19:06:24	211.92	209.63	180.45	180.45
1327	02/08/2018	19:06:54	211.52	209.36	180.22	180.22
1328	02/08/2018	19:07:24	211.14	208.96	179.69	179.69
1329	02/08/2018	19:07:54	210.75	208.55	179.41	179.41
1330	02/08/2018	19:08:24	210.36	208.14	178.95	178.95
1331	02/08/2018	19:08:54	209.96	207.79	178.6	178.6
1332	02/08/2018	19:09:24	209.58	207.33	178.01	178.01
1333	02/08/2018	19:09:54	209.19	206.98	177.72	177.72
1334	02/08/2018	19:10:24	208.81	206.52	177.32	177.32
1335	02/08/2018	19:10:54	208.41	206.26	177.15	177.15
1336	02/08/2018	19:11:24	208.05	205.81	176.76	176.76
1337	02/08/2018	19:11:54	207.65	205.39	176.26	176.26
1338	02/08/2018	19:12:24	207.27	205.06	175.97	175.97
1339	02/08/2018	19:12:54	206.88	204.71	175.76	175.76
1340	02/08/2018	19:13:24	206.5	204.31	175.3	175.3
1341	02/08/2018	19:13:54	206.12	203.91	175.08	175.08
1342	02/08/2018	19:14:24	205.74	203.59	174.75	174.75
1343	02/08/2018	19:14:54	205.37	203.11	174.49	174.49
1344	02/08/2018	19:15:24	204.98	202.72	174.27	174.27

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1345	02/08/2018	19:15:54	204.61	202.42	173.69	173.69
1346	02/08/2018	19:16:24	204.24	202.06	173.4	173.4
1347	02/08/2018	19:16:54	203.87	201.71	173.22	173.22
1348	02/08/2018	19:17:24	203.49	201.35	172.74	172.74
1349	02/08/2018	19:17:54	203.12	200.82	172.33	172.33
1350	02/08/2018	19:18:24	202.73	200.6	172.15	172.15
1351	02/08/2018	19:18:54	202.37	200.18	171.74	171.74
1352	02/08/2018	19:19:24	202	199.84	171.44	171.44
1353	02/08/2018	19:19:54	201.63	199.53	171.04	171.04
1354	02/08/2018	19:20:24	201.26	199.13	170.8	170.8
1355	02/08/2018	19:20:54	200.9	198.76	170.48	170.48
1356	02/08/2018	19:21:24	200.53	198.26	170.23	170.23
1357	02/08/2018	19:21:54	200.15	198.02	169.81	169.81
1358	02/08/2018	19:22:24	199.77	197.57	169.44	169.44
1359	02/08/2018	19:22:54	199.4	197.31	169.09	169.09
1360	02/08/2018	19:23:24	199.04	196.9	168.79	168.79
1361	02/08/2018	19:23:54	198.65	196.58	168.46	168.46
1362	02/08/2018	19:24:24	198.29	196.11	168.18	168.18
1363	02/08/2018	19:24:54	197.92	195.72	167.74	167.74
1364	02/08/2018	19:25:24	197.56	195.45	167.41	167.41
1365	02/08/2018	19:25:54	197.19	195.07	167.09	167.09
1366	02/08/2018	19:26:24	196.84	194.77	166.78	166.78
1367	02/08/2018	19:26:54	196.48	194.39	166.29	166.29
1368	02/08/2018	19:27:24	196.12	193.99	166	166
1369	02/08/2018	19:27:54	195.76	193.69	165.79	165.79
1370	02/08/2018	19:28:24	195.41	193.23	165.48	165.48
1371	02/08/2018	19:28:54	195.06	192.9	165.1	165.1
1372	02/08/2018	19:29:24	194.71	192.68	164.82	164.82
1373	02/08/2018	19:29:54	194.38	192.37	164.71	164.71
1374	02/08/2018	19:30:24	194.09	192.12	164.52	164.52
1375	02/08/2018	19:30:54	193.82	191.79	164.19	164.19
1376	02/08/2018	19:31:24	193.61	191.74	163.86	163.86
1377	02/08/2018	19:31:54	193.47	191.57	163.4	163.4
1378	02/08/2018	19:32:24	193.4	191.61	163.22	163.22
1379	02/08/2018	19:32:54	193.42	191.56	162.91	162.91
1380	02/08/2018	19:33:24	193.53	191.8	162.72	162.72
1381	02/08/2018	19:33:54	193.72	191.98	162.55	162.55
1382	02/08/2018	19:34:24	193.97	192.23	162.38	162.38
1383	02/08/2018	19:34:54	194.25	192.42	162.14	162.14
1384	02/08/2018	19:35:24	194.54	192.74	161.76	161.76
1385	02/08/2018	19:35:54	194.83	193.06	161.7	161.7
1386	02/08/2018	19:36:24	195.09	193.24	161.74	161.74
1387	02/08/2018	19:36:54	195.3	193.43	161.48	161.48
1388	02/08/2018	19:37:24	195.48	193.62	161.42	161.42
1389	02/08/2018	19:37:54	195.62	193.59	161.21	161.21
1390	02/08/2018	19:38:24	195.72	193.6	160.91	160.91
1391	02/08/2018	19:38:54	195.76	193.58	160.68	160.68
1392	02/08/2018	19:39:24	195.74	193.44	160.5	160.5
1393	02/08/2018	19:39:54	195.62	193.34	160.27	160.27
1394	02/08/2018	19:40:24	195.46	193.14	160.09	160.09
1395	02/08/2018	19:40:54	195.22	192.97	159.89	159.89
1396	02/08/2018	19:41:24	194.96	192.6	159.6	159.6
1397	02/08/2018	19:41:54	194.64	192.27	159.23	159.23
1398	02/08/2018	19:42:24	194.27	191.87	158.84	158.84
1399	02/08/2018	19:42:54	193.85	191.46	158.83	158.83
1400	02/08/2018	19:43:24	193.38	190.99	158.81	158.81
1401	02/08/2018	19:43:54	192.86	190.58	158.39	158.39
1402	02/08/2018	19:44:24	192.33	189.92	158.04	158.04
1403	02/08/2018	19:44:54	191.79	189.3	157.45	157.45
1404	02/08/2018	19:45:24	191.24	188.94	157.04	157.04
1405	02/08/2018	19:45:54	190.71	188.46	156.88	156.88
1406	02/08/2018	19:46:24	190.17	187.78	156.62	156.62
1407	02/08/2018	19:46:54	189.62	187.3	156.31	156.31
1408	02/08/2018	19:47:24	189.08	186.87	156.13	156.13

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1409	02/08/2018	19:47:54	188.56	186.37	155.71	155.71
1410	02/08/2018	19:48:24	188.04	185.87	155.31	155.31
1411	02/08/2018	19:48:54	187.5	185.38	155.06	155.06
1412	02/08/2018	19:49:24	187	184.91	154.76	154.76
1413	02/08/2018	19:49:54	186.48	184.32	154.31	154.31
1414	02/08/2018	19:50:24	185.96	183.75	154.12	154.12
1415	02/08/2018	19:50:54	185.46	183.4	153.72	153.72
1416	02/08/2018	19:51:24	184.97	182.97	153.4	153.4
1417	02/08/2018	19:51:54	184.48	182.39	152.97	152.97
1418	02/08/2018	19:52:24	183.98	182	152.75	152.75
1419	02/08/2018	19:52:54	183.51	181.55	152.51	152.51
1420	02/08/2018	19:53:24	183.05	181.04	152.2	152.2
1421	02/08/2018	19:53:54	182.59	180.58	152	152
1422	02/08/2018	19:54:24	182.14	180.24	151.49	151.49
1423	02/08/2018	19:54:54	181.7	179.78	150.95	150.95
1424	02/08/2018	19:55:24	181.24	179.38	150.82	150.82
1425	02/08/2018	19:55:54	180.8	178.93	150.51	150.51
1426	02/08/2018	19:56:24	180.37	178.55	150.15	150.15
1427	02/08/2018	19:56:54	179.93	178	149.88	149.88
1428	02/08/2018	19:57:24	179.48	177.53	149.61	149.61
1429	02/08/2018	19:57:54	179.05	177.25	149.27	149.27
1430	02/08/2018	19:58:24	178.65	176.66	148.86	148.86
1431	02/08/2018	19:58:54	178.2	176.38	148.49	148.49
1432	02/08/2018	19:59:24	177.78	175.85	148.42	148.42
1433	02/08/2018	19:59:54	177.37	175.6	148.3	148.3
1434	02/08/2018	20:00:24	176.98	175.17	147.87	147.87
1435	02/08/2018	20:00:54	176.57	174.66	147.52	147.52
1436	02/08/2018	20:01:24	176.15	174.37	147.24	147.24
1437	02/08/2018	20:01:54	175.75	173.89	146.96	146.96
1438	02/08/2018	20:02:24	175.34	173.62	146.61	146.61
1439	02/08/2018	20:02:54	174.95	173.31	146.31	146.31
1440	02/08/2018	20:03:24	174.57	172.78	146.03	146.03
1441	02/08/2018	20:03:54	174.19	172.49	145.81	145.81
1442	02/08/2018	20:04:24	173.81	172.06	145.57	145.57
1443	02/08/2018	20:04:54	173.41	171.68	145.25	145.25
1444	02/08/2018	20:05:24	173.02	171.43	145.02	145.02
1445	02/08/2018	20:05:54	172.66	171.11	144.71	144.71
1446	02/08/2018	20:06:24	172.28	170.75	144.33	144.33
1447	02/08/2018	20:06:54	171.93	170.36	144.05	144.05
1448	02/08/2018	20:07:24	171.57	170.01	143.71	143.71
1449	02/08/2018	20:07:54	171.19	169.53	143.51	143.51
1450	02/08/2018	20:08:24	170.82	169.28	143.23	143.23
1451	02/08/2018	20:08:54	170.45	168.91	142.98	142.98
1452	02/08/2018	20:09:24	170.09	168.56	142.78	142.78
1453	02/08/2018	20:09:54	169.73	168.24	142.37	142.37
1454	02/08/2018	20:10:24	169.36	167.81	142.02	142.02
1455	02/08/2018	20:10:54	169.01	167.49	141.83	141.83
1456	02/08/2018	20:11:24	168.66	167.21	141.6	141.6
1457	02/08/2018	20:11:54	168.32	166.77	141.34	141.34
1458	02/08/2018	20:12:24	167.95	166.56	141.13	141.13
1459	02/08/2018	20:12:54	167.6	166.19	140.8	140.8
1460	02/08/2018	20:13:24	167.24	165.89	140.55	140.55
1461	02/08/2018	20:13:54	166.92	165.61	140.19	140.19
1462	02/08/2018	20:14:24	166.58	165.28	139.92	139.92
1463	02/08/2018	20:14:54	166.25	164.85	139.68	139.68
1464	02/08/2018	20:15:24	165.91	164.48	139.3	139.3
1465	02/08/2018	20:15:54	165.57	164.24	139.05	139.05
1466	02/08/2018	20:16:24	165.24	163.86	139	139
1467	02/08/2018	20:16:54	164.9	163.55	138.67	138.67
1468	02/08/2018	20:17:24	164.56	163.31	138.43	138.43
1469	02/08/2018	20:17:54	164.24	162.91	138.17	138.17
1470	02/08/2018	20:18:24	163.9	162.69	137.88	137.88
1471	02/08/2018	20:18:54	163.58	162.33	137.61	137.61
1472	02/08/2018	20:19:24	163.25	162.09	137.52	137.52

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1473	02/08/2018	20:19:54	162.95	161.68	137.16	137.16
1474	02/08/2018	20:20:24	162.63	161.37	136.81	136.81
1475	02/08/2018	20:20:54	162.3	161.14	136.41	136.41
1476	02/08/2018	20:21:24	161.99	160.79	136.06	136.06
1477	02/08/2018	20:21:54	161.66	160.47	135.81	135.81
1478	02/08/2018	20:22:24	161.34	160.2	135.66	135.66
1479	02/08/2018	20:22:54	161.03	159.89	135.37	135.37
1480	02/08/2018	20:23:24	160.71	159.59	135.23	135.23
1481	02/08/2018	20:23:54	160.41	159.33	135.08	135.08
1482	02/08/2018	20:24:24	160.09	159	134.79	134.79
1483	02/08/2018	20:24:54	159.78	158.7	134.43	134.43
1484	02/08/2018	20:25:24	159.46	158.24	134.21	134.21
1485	02/08/2018	20:25:54	159.15	158.09	133.98	133.98
1486	02/08/2018	20:26:24	158.85	157.77	133.63	133.63
1487	02/08/2018	20:26:54	158.55	157.54	133.33	133.33
1488	02/08/2018	20:27:24	158.25	157.25	133.23	133.23
1489	02/08/2018	20:27:54	157.93	157	133.01	133.01
1490	02/08/2018	20:28:24	157.63	156.59	132.73	132.73
1491	02/08/2018	20:28:54	157.31	156.26	132.3	132.3
1492	02/08/2018	20:29:24	156.99	155.98	132.11	132.11
1493	02/08/2018	20:29:54	156.7	155.79	131.94	131.94
1494	02/08/2018	20:30:24	156.4	155.44	131.76	131.76
1495	02/08/2018	20:30:54	156.09	155.19	131.46	131.46
1496	02/08/2018	20:31:24	155.79	154.93	131.14	131.14
1497	02/08/2018	20:31:54	155.5	154.54	130.91	130.91
1498	02/08/2018	20:32:24	155.2	154.34	130.65	130.65
1499	02/08/2018	20:32:54	154.9	154.03	130.59	130.59
1500	02/08/2018	20:33:24	154.58	153.76	130.36	130.36
1501	02/08/2018	20:33:54	154.28	153.41	130.03	130.03
1502	02/08/2018	20:34:24	153.99	153.08	129.63	129.63
1503	02/08/2018	20:34:54	153.68	152.85	129.4	129.4
1504	02/08/2018	20:35:24	153.38	152.57	129.15	129.15
1505	02/08/2018	20:35:54	153.08	152.3	129.01	129.01
1506	02/08/2018	20:36:24	152.78	152.04	128.71	128.71
1507	02/08/2018	20:36:54	152.49	151.75	128.42	128.42
1508	02/08/2018	20:37:24	152.2	151.47	128.25	128.25
1509	02/08/2018	20:37:54	151.91	151.15	128.01	128.01
1510	02/08/2018	20:38:24	151.61	150.86	127.69	127.69
1511	02/08/2018	20:38:54	151.32	150.55	127.61	127.61
1512	02/08/2018	20:39:24	151.01	150.31	127.35	127.35
1513	02/08/2018	20:39:54	150.73	149.97	127.06	127.06
1514	02/08/2018	20:40:24	150.43	149.68	126.75	126.75
1515	02/08/2018	20:40:54	150.13	149.4	126.64	126.64
1516	02/08/2018	20:41:24	149.84	149.15	126.29	126.29
1517	02/08/2018	20:41:54	149.56	148.91	126.22	126.22
1518	02/08/2018	20:42:24	149.28	148.63	126.06	126.06
1519	02/08/2018	20:42:54	148.99	148.3	125.76	125.76
1520	02/08/2018	20:43:24	148.69	148.03	125.46	125.46
1521	02/08/2018	20:43:54	148.42	147.74	125.23	125.23
1522	02/08/2018	20:44:24	148.13	147.5	124.98	124.98
1523	02/08/2018	20:44:54	147.84	147.29	124.83	124.83
1524	02/08/2018	20:45:24	147.57	146.9	124.6	124.6
1525	02/08/2018	20:45:54	147.29	146.72	124.37	124.37
1526	02/08/2018	20:46:24	147	146.46	124.17	124.17
1527	02/08/2018	20:46:54	146.73	146.16	123.91	123.91
1528	02/08/2018	20:47:24	146.45	145.84	123.63	123.63
1529	02/08/2018	20:47:54	146.17	145.49	123.37	123.37
1530	02/08/2018	20:48:24	145.88	145.36	123.12	123.12
1531	02/08/2018	20:48:54	145.61	145	122.86	122.86
1532	02/08/2018	20:49:24	145.33	144.78	122.67	122.67
1533	02/08/2018	20:49:54	145.06	144.55	122.48	122.48
1534	02/08/2018	20:50:24	144.79	144.28	122.24	122.24
1535	02/08/2018	20:50:54	144.5	143.96	122.02	122.02
1536	02/08/2018	20:51:24	144.23	143.73	121.76	121.76

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1537	02/08/2018	20:51:54	143.95	143.54	121.57	121.57
1538	02/08/2018	20:52:24	143.7	143.26	121.38	121.38
1539	02/08/2018	20:52:54	143.43	142.99	121.16	121.16
1540	02/08/2018	20:53:24	143.16	142.71	120.97	120.97
1541	02/08/2018	20:53:54	142.89	142.38	120.54	120.54
1542	02/08/2018	20:54:24	142.61	142.21	120.26	120.26
1543	02/08/2018	20:54:54	142.35	141.92	120.13	120.13
1544	02/08/2018	20:55:24	142.08	141.53	119.99	119.99
1545	02/08/2018	20:55:54	141.81	141.37	119.83	119.83
1546	02/08/2018	20:56:24	141.54	141.06	119.6	119.6
1547	02/08/2018	20:56:54	141.27	140.82	119.41	119.41
1548	02/08/2018	20:57:24	141.01	140.65	119.15	119.15
1549	02/08/2018	20:57:54	140.75	140.33	118.92	118.92
1550	02/08/2018	20:58:24	140.48	140.08	118.76	118.76
1551	02/08/2018	20:58:54	140.21	139.73	118.43	118.43
1552	02/08/2018	20:59:24	139.95	139.61	118.32	118.32
1553	02/08/2018	20:59:54	139.7	139.4	118.15	118.15
1554	02/08/2018	21:00:24	139.45	139.11	117.91	117.91
1555	02/08/2018	21:00:54	139.19	138.84	117.53	117.53
1556	02/08/2018	21:01:24	138.93	138.62	117.4	117.4
1557	02/08/2018	21:01:54	138.68	138.4	117.22	117.22
1558	02/08/2018	21:02:24	138.42	138.04	116.96	116.96
1559	02/08/2018	21:02:54	138.17	137.85	116.79	116.79
1560	02/08/2018	21:03:24	137.91	137.61	116.63	116.63
1561	02/08/2018	21:03:54	137.65	137.37	116.45	116.45
1562	02/08/2018	21:04:24	137.4	137.1	116.18	116.18
1563	02/08/2018	21:04:54	137.13	136.9	116	116
1564	02/08/2018	21:05:24	136.9	136.62	115.76	115.76
1565	02/08/2018	21:05:54	136.65	136.4	115.48	115.48
1566	02/08/2018	21:06:24	136.39	136.12	115.27	115.27
1567	02/08/2018	21:06:54	136.14	135.87	115.06	115.06
1568	02/08/2018	21:07:24	135.89	135.61	114.88	114.88
1569	02/08/2018	21:07:54	135.63	135.37	114.74	114.74
1570	02/08/2018	21:08:24	135.39	135.13	114.55	114.55
1571	02/08/2018	21:08:54	135.13	134.76	114.24	114.24
1572	02/08/2018	21:09:24	134.87	134.65	113.97	113.97
1573	02/08/2018	21:09:54	134.63	134.37	113.8	113.8
1574	02/08/2018	21:10:24	134.38	134.16	113.55	113.55
1575	02/08/2018	21:10:54	134.13	133.91	113.36	113.36
1576	02/08/2018	21:11:24	133.89	133.7	113.18	113.18
1577	02/08/2018	21:11:54	133.64	133.47	112.99	112.99
1578	02/08/2018	21:12:24	133.4	133.27	112.78	112.78
1579	02/08/2018	21:12:54	133.15	132.96	112.6	112.6
1580	02/08/2018	21:13:24	132.9	132.65	112.34	112.34
1581	02/08/2018	21:13:54	132.65	132.48	112.09	112.09
1582	02/08/2018	21:14:24	132.41	132.21	111.97	111.97
1583	02/08/2018	21:14:54	132.17	132.01	111.84	111.84
1584	02/08/2018	21:15:24	131.94	131.83	111.62	111.62
1585	02/08/2018	21:15:54	131.69	131.49	111.4	111.4
1586	02/08/2018	21:16:24	131.46	131.3	111.18	111.18
1587	02/08/2018	21:16:54	131.22	131.12	111.01	111.01
1588	02/08/2018	21:17:24	130.98	130.89	110.85	110.85
1589	02/08/2018	21:17:54	130.75	130.66	110.56	110.56
1590	02/08/2018	21:18:24	130.52	130.34	110.32	110.32
1591	02/08/2018	21:18:54	130.29	130.19	110.09	110.09
1592	02/08/2018	21:19:24	130.06	129.95	109.81	109.81
1593	02/08/2018	21:19:54	129.82	129.67	109.64	109.64
1594	02/08/2018	21:20:24	129.59	129.5	109.49	109.49
1595	02/08/2018	21:20:54	129.35	129.32	109.43	109.43
1596	02/08/2018	21:21:24	129.12	129.09	109.24	109.24
1597	02/08/2018	21:21:54	128.89	128.69	108.98	108.98
1598	02/08/2018	21:22:24	128.65	128.59	108.83	108.83
1599	02/08/2018	21:22:54	128.41	128.35	108.71	108.71
1600	02/08/2018	21:23:24	128.17	128.05	108.46	108.46

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1601	02/08/2018	21:23:54	127.94	127.87	108.28	108.28
1602	02/08/2018	21:24:24	127.71	127.67	108.07	108.07
1603	02/08/2018	21:24:54	127.48	127.47	107.82	107.82
1604	02/08/2018	21:25:24	127.25	127.21	107.58	107.58
1605	02/08/2018	21:25:54	127.02	127	107.41	107.41
1606	02/08/2018	21:26:24	126.8	126.75	107.23	107.23
1607	02/08/2018	21:26:54	126.58	126.56	107.09	107.09
1608	02/08/2018	21:27:24	126.35	126.32	106.91	106.91
1609	02/08/2018	21:27:54	126.13	126.08	106.77	106.77
1610	02/08/2018	21:28:24	125.9	125.94	106.59	106.59
1611	02/08/2018	21:28:54	125.68	125.69	106.37	106.37
1612	02/08/2018	21:29:24	125.46	125.34	106.11	106.11
1613	02/08/2018	21:29:54	125.22	125.22	105.91	105.91
1614	02/08/2018	21:30:24	125	124.98	105.64	105.64
1615	02/08/2018	21:30:54	124.78	124.74	105.49	105.49
1616	02/08/2018	21:31:24	124.56	124.6	105.4	105.4
1617	02/08/2018	21:31:54	124.34	124.31	105.19	105.19
1618	02/08/2018	21:32:24	124.12	124.15	105	105
1619	02/08/2018	21:32:54	123.89	123.91	104.83	104.83
1620	02/08/2018	21:33:24	123.66	123.7	104.66	104.66
1621	02/08/2018	21:33:54	123.45	123.45	104.47	104.47
1622	02/08/2018	21:34:24	123.23	123.24	104.34	104.34
1623	02/08/2018	21:34:54	123	123.06	104.07	104.07
1624	02/08/2018	21:35:24	122.78	122.82	103.81	103.81
1625	02/08/2018	21:35:54	122.57	122.56	103.59	103.59
1626	02/08/2018	21:36:24	122.35	122.38	103.42	103.42
1627	02/08/2018	21:36:54	122.13	122.24	103.27	103.27
1628	02/08/2018	21:37:24	121.91	121.96	103.17	103.17
1629	02/08/2018	21:37:54	121.69	121.64	103	103
1630	02/08/2018	21:38:24	121.46	121.52	102.84	102.84
1631	02/08/2018	21:38:54	121.25	121.33	102.67	102.67
1632	02/08/2018	21:39:24	121.04	121.14	102.43	102.43
1633	02/08/2018	21:39:54	120.83	120.92	102.25	102.25
1634	02/08/2018	21:40:24	120.61	120.67	102.06	102.06
1635	02/08/2018	21:40:54	120.39	120.45	101.88	101.88
1636	02/08/2018	21:41:24	120.17	120.29	101.66	101.66
1637	02/08/2018	21:41:54	119.96	120.07	101.5	101.5
1638	02/08/2018	21:42:24	119.74	119.86	101.35	101.35
1639	02/08/2018	21:42:54	119.54	119.68	101.23	101.23
1640	02/08/2018	21:43:24	119.33	119.43	101.05	101.05
1641	02/08/2018	21:43:54	119.12	119.2	100.88	100.88
1642	02/08/2018	21:44:24	118.91	119	100.64	100.64
1643	02/08/2018	21:44:54	118.7	118.87	100.43	100.43
1644	02/08/2018	21:45:24	118.5	118.63	100.27	100.27
1645	02/08/2018	21:45:54	118.3	118.47	100.06	100.06
1646	02/08/2018	21:46:24	118.1	118.18	99.88	99.88
1647	02/08/2018	21:46:54	117.9	118.01	99.71	99.71
1648	02/08/2018	21:47:24	117.69	117.78	99.57	99.57
1649	02/08/2018	21:47:54	117.47	117.62	99.33	99.33
1650	02/08/2018	21:48:24	117.27	117.4	99.23	99.23
1651	02/08/2018	21:48:54	117.07	117.11	99.09	99.09
1652	02/08/2018	21:49:24	116.85	116.96	98.86	98.86
1653	02/08/2018	21:49:54	116.65	116.73	98.68	98.68
1654	02/08/2018	21:50:24	116.44	116.55	98.46	98.46
1655	02/08/2018	21:50:54	116.24	116.41	98.33	98.33
1656	02/08/2018	21:51:24	116.05	116.12	98.21	98.21
1657	02/08/2018	21:51:54	115.85	116.03	98.05	98.05
1658	02/08/2018	21:52:24	115.64	115.78	97.97	97.97
1659	02/08/2018	21:52:54	115.44	115.6	97.8	97.8
1660	02/08/2018	21:53:24	115.23	115.39	97.61	97.61
1661	02/08/2018	21:53:54	115.04	115.21	97.39	97.39
1662	02/08/2018	21:54:24	114.84	114.94	97.27	97.27
1663	02/08/2018	21:54:54	114.63	114.73	97.06	97.06
1664	02/08/2018	21:55:24	114.44	114.66	96.9	96.9

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1665	02/08/2018	21:55:54	114.24	114.32	96.77	96.77
1666	02/08/2018	21:56:24	114.03	114.15	96.6	96.6
1667	02/08/2018	21:56:54	113.83	114.01	96.47	96.47
1668	02/08/2018	21:57:24	113.65	113.88	96.39	96.39
1669	02/08/2018	21:57:54	113.45	113.58	96.16	96.16
1670	02/08/2018	21:58:24	113.24	113.39	95.97	95.97
1671	02/08/2018	21:58:54	113.04	113.27	95.75	95.75
1672	02/08/2018	21:59:24	112.84	113.03	95.58	95.58
1673	02/08/2018	21:59:54	112.64	112.81	95.39	95.39
1674	02/08/2018	22:00:24	112.45	112.57	95.18	95.18
1675	02/08/2018	22:00:54	112.26	112.45	95.07	95.07
1676	02/08/2018	22:01:24	112.06	112.28	94.96	94.96
1677	02/08/2018	22:01:54	111.86	112.09	94.84	94.84
1678	02/08/2018	22:02:24	111.69	111.82	94.64	94.64
1679	02/08/2018	22:02:54	111.5	111.64	94.44	94.44
1680	02/08/2018	22:03:24	111.31	111.51	94.33	94.33
1681	02/08/2018	22:03:54	111.11	111.36	94.16	94.16
1682	02/08/2018	22:04:24	110.92	111.12	93.98	93.98
1683	02/08/2018	22:04:54	110.74	110.84	93.74	93.74
1684	02/08/2018	22:05:24	110.54	110.69	93.6	93.6
1685	02/08/2018	22:05:54	110.34	110.58	93.44	93.44
1686	02/08/2018	22:06:24	110.15	110.4	93.33	93.33
1687	02/08/2018	22:06:54	109.96	110.11	93.15	93.15
1688	02/08/2018	22:07:24	109.77	109.95	92.96	92.96
1689	02/08/2018	22:07:54	109.58	109.77	92.77	92.77
1690	02/08/2018	22:08:24	109.39	109.58	92.64	92.64
1691	02/08/2018	22:08:54	109.2	109.41	92.42	92.42
1692	02/08/2018	22:09:24	109.02	109.2	92.29	92.29
1693	02/08/2018	22:09:54	108.82	109.05	92.15	92.15
1694	02/08/2018	22:10:24	108.63	108.85	91.96	91.96
1695	02/08/2018	22:10:54	108.45	108.62	91.85	91.85
1696	02/08/2018	22:11:24	108.26	108.49	91.72	91.72
1697	02/08/2018	22:11:54	108.09	108.29	91.62	91.62
1698	02/08/2018	22:12:24	107.9	108.11	91.44	91.44
1699	02/08/2018	22:12:54	107.7	107.87	91.27	91.27
1700	02/08/2018	22:13:24	107.52	107.79	91.17	91.17
1701	02/08/2018	22:13:54	107.34	107.57	91	91
1702	02/08/2018	22:14:24	107.16	107.4	90.86	90.86
1703	02/08/2018	22:14:54	106.98	107.19	90.69	90.69
1704	02/08/2018	22:15:24	106.79	107	90.47	90.47
1705	02/08/2018	22:15:54	106.61	106.86	90.32	90.32
1706	02/08/2018	22:16:24	106.42	106.72	90.16	90.16
1707	02/08/2018	22:16:54	106.25	106.46	90.06	90.06
1708	02/08/2018	22:17:24	106.06	106.31	89.86	89.86
1709	02/08/2018	22:17:54	105.88	106.15	89.7	89.7
1710	02/08/2018	22:18:24	105.7	106.02	89.54	89.54
1711	02/08/2018	22:18:54	105.53	105.77	89.37	89.37
1712	02/08/2018	22:19:24	105.34	105.67	89.26	89.26
1713	02/08/2018	22:19:54	105.17	105.45	89.08	89.08
1714	02/08/2018	22:20:24	104.99	105.25	88.93	88.93
1715	02/08/2018	22:20:54	104.81	105.11	88.76	88.76
1716	02/08/2018	22:21:24	104.63	104.94	88.59	88.59
1717	02/08/2018	22:21:54	104.45	104.68	88.43	88.43
1718	02/08/2018	22:22:24	104.27	104.53	88.35	88.35
1719	02/08/2018	22:22:54	104.09	104.37	88.19	88.19
1720	02/08/2018	22:23:24	103.91	104.19	88.05	88.05
1721	02/08/2018	22:23:54	103.73	104.05	87.96	87.96
1722	02/08/2018	22:24:24	103.55	103.87	87.82	87.82
1723	02/08/2018	22:24:54	103.36	103.64	87.66	87.66
1724	02/08/2018	22:25:24	103.18	103.48	87.53	87.53
1725	02/08/2018	22:25:54	103.02	103.37	87.38	87.38
1726	02/08/2018	22:26:24	102.85	103.18	87.24	87.24
1727	02/08/2018	22:26:54	102.68	103	87.06	87.06
1728	02/08/2018	22:27:24	102.51	102.84	86.85	86.85

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1729	02/08/2018	22:27:54	102.35	102.73	86.71	86.71
1730	02/08/2018	22:28:24	102.18	102.5	86.65	86.65
1731	02/08/2018	22:28:54	102.01	102.34	86.58	86.58
1732	02/08/2018	22:29:24	101.84	102.11	86.4	86.4
1733	02/08/2018	22:29:54	101.67	101.99	86.24	86.24
1734	02/08/2018	22:30:24	101.5	101.83	86.07	86.07
1735	02/08/2018	22:30:54	101.32	101.66	85.87	85.87
1736	02/08/2018	22:31:24	101.15	101.51	85.77	85.77
1737	02/08/2018	22:31:54	100.97	101.32	85.64	85.64
1738	02/08/2018	22:32:24	100.79	101.17	85.5	85.5
1739	02/08/2018	22:32:54	100.63	100.91	85.37	85.37
1740	02/08/2018	22:33:24	100.46	100.78	85.22	85.22
1741	02/08/2018	22:33:54	100.29	100.55	85.06	85.06
1742	02/08/2018	22:34:24	100.11	100.39	85.01	85.01
1743	02/08/2018	22:34:54	99.94	100.24	84.82	84.82
1744	02/08/2018	22:35:24	99.78	100.09	84.63	84.63
1745	02/08/2018	22:35:54	99.61	99.94	84.47	84.47
1746	02/08/2018	22:36:24	99.44	99.8	84.33	84.33
1747	02/08/2018	22:36:54	99.28	99.59	84.22	84.22
1748	02/08/2018	22:37:24	99.11	99.45	84.09	84.09
1749	02/08/2018	22:37:54	98.95	99.22	83.92	83.92
1750	02/08/2018	22:38:24	98.78	99.11	83.78	83.78
1751	02/08/2018	22:38:54	98.61	98.98	83.64	83.64
1752	02/08/2018	22:39:24	98.45	98.84	83.46	83.46
1753	02/08/2018	22:39:54	98.29	98.67	83.32	83.32
1754	02/08/2018	22:40:24	98.12	98.48	83.14	83.14
1755	02/08/2018	22:40:54	97.96	98.33	83.08	83.08
1756	02/08/2018	22:41:24	97.8	98.12	82.91	82.91
1757	02/08/2018	22:41:54	97.63	97.97	82.68	82.68
1758	02/08/2018	22:42:24	97.47	97.73	82.6	82.6
1759	02/08/2018	22:42:54	97.29	97.61	82.45	82.45
1760	02/08/2018	22:43:24	97.14	97.52	82.36	82.36
1761	02/08/2018	22:43:54	96.98	97.39	82.24	82.24
1762	02/08/2018	22:44:24	96.85	97.2	82.12	82.12
1763	02/08/2018	22:44:54	96.78	97.2	81.98	81.98
1764	02/08/2018	22:45:24	96.73	97.18	81.94	81.94
1765	02/08/2018	22:45:54	96.71	97.19	81.87	81.87
1766	02/08/2018	22:46:24	96.68	97.16	81.8	81.8
1767	02/08/2018	22:46:54	96.66	97.15	81.68	81.68
1768	02/08/2018	22:47:24	96.64	97.13	81.53	81.53
1769	02/08/2018	22:47:54	96.62	97.15	81.39	81.39
1770	02/08/2018	22:48:24	96.59	97.1	81.28	81.28
1771	02/08/2018	22:48:54	96.56	97.01	81.15	81.15
1772	02/08/2018	22:49:24	96.53	97.03	81.05	81.05
1773	02/08/2018	22:49:54	96.52	96.91	80.98	80.98
1774	02/08/2018	22:50:24	96.49	96.93	80.94	80.94
1775	02/08/2018	22:50:54	96.45	96.83	80.8	80.8
1776	02/08/2018	22:51:24	96.42	96.84	80.68	80.68
1777	02/08/2018	22:51:54	96.39	96.85	80.6	80.6
1778	02/08/2018	22:52:24	96.37	96.78	80.5	80.5
1779	02/08/2018	22:52:54	96.34	96.76	80.41	80.41
1780	02/08/2018	22:53:24	96.32	96.8	80.21	80.21
1781	02/08/2018	22:53:54	96.3	96.75	80.19	80.19
1782	02/08/2018	22:54:24	96.28	96.63	80.08	80.08
1783	02/08/2018	22:54:54	96.25	96.68	79.93	79.93
1784	02/08/2018	22:55:24	96.23	96.64	79.84	79.84
1785	02/08/2018	22:55:54	96.21	96.61	79.79	79.79
1786	02/08/2018	22:56:24	96.18	96.62	79.72	79.72
1787	02/08/2018	22:56:54	96.16	96.55	79.62	79.62
1788	02/08/2018	22:57:24	96.14	96.56	79.55	79.55
1789	02/08/2018	22:57:54	96.12	96.48	79.47	79.47
1790	02/08/2018	22:58:24	96.09	96.53	79.4	79.4
1791	02/08/2018	22:58:54	96.08	96.47	79.37	79.37
1792	02/08/2018	22:59:24	96.05	96.39	79.22	79.22

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1793	02/08/2018	22:59:54	96.02	96.46	79.16	79.16
1794	02/08/2018	23:00:24	96.01	96.42	79.07	79.07
1795	02/08/2018	23:00:54	95.98	96.41	78.91	78.91
1796	02/08/2018	23:01:24	95.95	96.33	78.8	78.8
1797	02/08/2018	23:01:54	95.93	96.35	78.76	78.76
1798	02/08/2018	23:02:24	95.91	96.32	78.77	78.77
1799	02/08/2018	23:02:54	95.89	96.24	78.71	78.71
1800	02/08/2018	23:03:24	95.86	96.21	78.57	78.57
1801	02/08/2018	23:03:54	98.23	97.93	78.47	78.47
1802	02/08/2018	23:04:24	102.71	104.93	78.56	78.56
1803	02/08/2018	23:04:54	102.01	101.37	78.71	78.71
1804	02/08/2018	23:05:24	99.82	98.58	78.7	78.7
1805	02/08/2018	23:05:54	98.13	97.39	78.58	78.58
1806	02/08/2018	23:06:24	97.1	96.92	78.41	78.41
1807	02/08/2018	23:06:54	96.5	96.55	78.31	78.31
1808	02/08/2018	23:07:24	96.18	96.36	78.24	78.24
1809	02/08/2018	23:07:54	96	96.38	78.04	78.04
1810	02/08/2018	23:08:24	95.91	96.31	77.94	77.94
1811	02/08/2018	23:08:54	95.85	96.29	77.79	77.79
1812	02/08/2018	23:09:24	95.81	96.18	77.65	77.65
1813	02/08/2018	23:09:54	95.77	96.12	77.58	77.58
1814	02/08/2018	23:10:24	95.72	96.17	77.48	77.48
1815	02/08/2018	23:10:54	95.69	96.09	77.39	77.39
1816	02/08/2018	23:11:24	95.65	96.02	77.32	77.32
1817	02/08/2018	23:11:54	95.62	96.03	77.21	77.21
1818	02/08/2018	23:12:24	95.59	95.99	77.17	77.17
1819	02/08/2018	23:12:54	95.56	95.94	77.08	77.08
1820	02/08/2018	23:13:24	95.53	95.79	76.93	76.93
1821	02/08/2018	23:13:54	95.5	95.85	76.91	76.91
1822	02/08/2018	23:14:24	95.47	95.88	76.81	76.81
1823	02/08/2018	23:14:54	95.45	95.86	76.77	76.77
1824	02/08/2018	23:15:24	95.42	95.69	76.62	76.62
1825	02/08/2018	23:15:54	95.39	95.7	76.49	76.49
1826	02/08/2018	23:16:24	95.38	95.73	76.32	76.32
1827	02/08/2018	23:16:54	95.35	95.69	76.18	76.18
1828	02/08/2018	23:17:24	95.32	95.72	76.18	76.18
1829	02/08/2018	23:17:54	95.29	95.6	76.19	76.19
1830	02/08/2018	23:18:24	95.26	95.56	76.1	76.1
1831	02/08/2018	23:18:54	95.24	95.62	76.02	76.02
1832	02/08/2018	23:19:24	95.21	95.56	75.91	75.91
1833	02/08/2018	23:19:54	95.2	95.47	75.91	75.91
1834	02/08/2018	23:20:24	95.17	95.49	75.9	75.9
1835	02/08/2018	23:20:54	95.14	95.45	75.79	75.79
1836	02/08/2018	23:21:24	95.11	95.49	75.7	75.7
1837	02/08/2018	23:21:54	95.08	95.39	75.68	75.68
1838	02/08/2018	23:22:24	95.01	95.33	75.55	75.55
1839	02/08/2018	23:22:54	94.82	95.03	75.41	75.41
1840	02/08/2018	23:23:24	94.52	94.65	75.43	75.43
1841	02/08/2018	23:23:54	94.16	94.39	75.19	75.19
1842	02/08/2018	23:24:24	93.81	93.94	75.13	75.13
1843	02/08/2018	23:24:54	93.45	93.5	74.89	74.89
1844	02/08/2018	23:25:24	93.09	93.25	74.73	74.73
1845	02/08/2018	23:25:54	92.76	92.93	74.58	74.58
1846	02/08/2018	23:26:24	92.43	92.61	74.42	74.42
1847	02/08/2018	23:26:54	92.11	92.38	74.24	74.24
1848	02/08/2018	23:27:24	91.8	91.97	74.1	74.1
1849	02/08/2018	23:27:54	91.49	91.73	74	74
1850	02/08/2018	23:28:24	91.2	91.39	73.88	73.88
1851	02/08/2018	23:28:54	90.88	90.93	73.67	73.67
1852	02/08/2018	23:29:24	90.57	90.81	73.45	73.45
1853	02/08/2018	23:29:54	90.29	90.44	73.38	73.38
1854	02/08/2018	23:30:24	89.98	90.1	73.23	73.23
1855	02/08/2018	23:30:54	89.7	89.95	73.03	73.03
1856	02/08/2018	23:31:24	89.41	89.65	72.93	72.93

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1857	02/08/2018	23:31:54	89.13	89.34	72.76	72.76
1858	02/08/2018	23:32:24	88.87	89.03	72.6	72.6
1859	02/08/2018	23:32:54	88.6	88.88	72.47	72.47
1860	02/08/2018	23:33:24	88.34	88.53	72.35	72.35
1861	02/08/2018	23:33:54	88.08	88.37	72.26	72.26
1862	02/08/2018	23:34:24	87.82	88.05	72.11	72.11
1863	02/08/2018	23:34:54	87.57	87.82	71.95	71.95
1864	02/08/2018	23:35:24	87.31	87.54	71.75	71.75
1865	02/08/2018	23:35:54	87.06	87.25	71.64	71.64
1866	02/08/2018	23:36:24	86.81	87.11	71.46	71.46
1867	02/08/2018	23:36:54	86.57	86.78	71.31	71.31
1868	02/08/2018	23:37:24	86.33	86.59	71.17	71.17
1869	02/08/2018	23:37:54	86.1	86.42	71.06	71.06
1870	02/08/2018	23:38:24	85.88	86.14	70.87	70.87
1871	02/08/2018	23:38:54	85.65	85.88	70.71	70.71
1872	02/08/2018	23:39:24	85.42	85.69	70.61	70.61
1873	02/08/2018	23:39:54	85.2	85.48	70.48	70.48
1874	02/08/2018	23:40:24	84.98	85.26	70.39	70.39
1875	02/08/2018	23:40:54	84.76	85	70.24	70.24
1876	02/08/2018	23:41:24	84.54	84.86	70.08	70.08
1877	02/08/2018	23:41:54	84.33	84.61	69.96	69.96
1878	02/08/2018	23:42:24	84.12	84.41	69.81	69.81
1879	02/08/2018	23:42:54	83.92	84.2	69.7	69.7
1880	02/08/2018	23:43:24	83.71	83.97	69.59	69.59
1881	02/08/2018	23:43:54	83.5	83.82	69.47	69.47
1882	02/08/2018	23:44:24	83.3	83.59	69.38	69.38
1883	02/08/2018	23:44:54	83.1	83.46	69.26	69.26
1884	02/08/2018	23:45:24	82.91	83.25	69.08	69.08
1885	02/08/2018	23:45:54	82.71	82.99	68.92	68.92
1886	02/08/2018	23:46:24	82.52	82.85	68.82	68.82
1887	02/08/2018	23:46:54	82.32	82.59	68.73	68.73
1888	02/08/2018	23:47:24	82.14	82.43	68.67	68.67
1889	02/08/2018	23:47:54	81.95	82.26	68.47	68.47
1890	02/08/2018	23:48:24	81.77	82.11	68.32	68.32
1891	02/08/2018	23:48:54	81.59	81.86	68.19	68.19
1892	02/08/2018	23:49:24	81.39	81.68	68.06	68.06
1893	02/08/2018	23:49:54	81.22	81.58	68.01	68.01
1894	02/08/2018	23:50:24	81.04	81.34	67.91	67.91
1895	02/08/2018	23:50:54	80.86	81.21	67.74	67.74
1896	02/08/2018	23:51:24	80.69	81.03	67.67	67.67
1897	02/08/2018	23:51:54	80.53	80.87	67.53	67.53
1898	02/08/2018	23:52:24	80.35	80.65	67.41	67.41
1899	02/08/2018	23:52:54	80.18	80.5	67.3	67.3
1900	02/08/2018	23:53:24	80.01	80.33	67.23	67.23
1901	02/08/2018	23:53:54	79.83	80.13	67.07	67.07
1902	02/08/2018	23:54:24	79.67	80.02	66.94	66.94
1903	02/08/2018	23:54:54	79.51	79.8	66.8	66.8
1904	02/08/2018	23:55:24	79.34	79.66	66.71	66.71
1905	02/08/2018	23:55:54	79.17	79.46	66.61	66.61
1906	02/08/2018	23:56:24	79.02	79.34	66.52	66.52
1907	02/08/2018	23:56:54	78.87	79.2	66.48	66.48
1908	02/08/2018	23:57:24	78.7	79.03	66.41	66.41
1909	02/08/2018	23:57:54	78.53	78.88	66.24	66.24
1910	02/08/2018	23:58:24	78.38	78.62	66.09	66.09
1911	02/08/2018	23:58:54	78.21	78.52	65.92	65.92
1912	02/08/2018	23:59:24	78.06	78.36	65.86	65.86
1913	02/08/2018	23:59:54	77.91	78.22	65.77	65.77
1914	03/08/2018	00:00:24	77.76	78.12	65.54	65.54
1915	03/08/2018	00:00:54	77.61	77.93	65.47	65.47
1916	03/08/2018	00:01:24	77.46	77.81	65.35	65.35
1917	03/08/2018	00:01:54	77.32	77.68	65.33	65.33
1918	03/08/2018	00:02:24	77.17	77.5	65.19	65.19
1919	03/08/2018	00:02:54	77.02	77.32	65.1	65.1
1920	03/08/2018	00:03:24	76.88	77.14	64.99	64.99

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1921	03/08/2018	00:03:54	76.72	77.02	64.87	64.87
1922	03/08/2018	00:04:24	76.58	76.92	64.79	64.79
1923	03/08/2018	00:04:54	76.43	76.76	64.71	64.71
1924	03/08/2018	00:05:24	76.29	76.65	64.62	64.62
1925	03/08/2018	00:05:54	76.15	76.46	64.54	64.54
1926	03/08/2018	00:06:24	76.01	76.33	64.4	64.4
1927	03/08/2018	00:06:54	75.88	76.25	64.27	64.27
1928	03/08/2018	00:07:24	75.74	76.09	64.15	64.15
1929	03/08/2018	00:07:54	75.6	75.94	64.08	64.08
1930	03/08/2018	00:08:24	75.47	75.77	64	64
1931	03/08/2018	00:08:54	75.33	75.59	63.96	63.96
1932	03/08/2018	00:09:24	75.19	75.51	63.86	63.86
1933	03/08/2018	00:09:54	75.05	75.36	63.73	63.73
1934	03/08/2018	00:10:24	74.92	75.23	63.6	63.6
1935	03/08/2018	00:10:54	74.78	75.14	63.54	63.54
1936	03/08/2018	00:11:24	74.65	74.93	63.4	63.4
1937	03/08/2018	00:11:54	74.53	74.85	63.28	63.28
1938	03/08/2018	00:12:24	74.39	74.73	63.2	63.2
1939	03/08/2018	00:12:54	74.28	74.63	63.05	63.05
1940	03/08/2018	00:13:24	74.15	74.52	62.98	62.98
1941	03/08/2018	00:13:54	74.02	74.34	62.9	62.9
1942	03/08/2018	00:14:24	73.89	74.25	62.81	62.81
1943	03/08/2018	00:14:54	73.77	74.06	62.73	62.73
1944	03/08/2018	00:15:24	73.64	73.98	62.63	62.63
1945	03/08/2018	00:15:54	73.52	73.84	62.54	62.54
1946	03/08/2018	00:16:24	73.39	73.67	62.43	62.43
1947	03/08/2018	00:16:54	73.26	73.55	62.3	62.3
1948	03/08/2018	00:17:24	73.13	73.49	62.2	62.2
1949	03/08/2018	00:17:54	73	73.34	62.06	62.06
1950	03/08/2018	00:18:24	72.88	73.21	62.01	62.01
1951	03/08/2018	00:18:54	72.76	73.07	61.9	61.9
1952	03/08/2018	00:19:24	72.64	72.98	61.84	61.84
1953	03/08/2018	00:19:54	72.52	72.85	61.79	61.79
1954	03/08/2018	00:20:24	72.4	72.77	61.72	61.72
1955	03/08/2018	00:20:54	72.28	72.64	61.63	61.63
1956	03/08/2018	00:21:24	72.17	72.49	61.54	61.54
1957	03/08/2018	00:21:54	72.05	72.38	61.43	61.43
1958	03/08/2018	00:22:24	71.93	72.28	61.29	61.29
1959	03/08/2018	00:22:54	71.82	72.1	61.17	61.17
1960	03/08/2018	00:23:24	71.69	71.96	61.05	61.05
1961	03/08/2018	00:23:54	71.57	71.9	60.99	60.99
1962	03/08/2018	00:24:24	71.46	71.77	60.93	60.93
1963	03/08/2018	00:24:54	71.34	71.68	60.85	60.85
1964	03/08/2018	00:25:24	71.22	71.56	60.77	60.77
1965	03/08/2018	00:25:54	71.1	71.43	60.72	60.72
1966	03/08/2018	00:26:24	70.98	71.27	60.61	60.61
1967	03/08/2018	00:26:54	70.87	71.22	60.52	60.52
1968	03/08/2018	00:27:24	70.75	71.09	60.39	60.39
1969	03/08/2018	00:27:54	70.65	70.94	60.32	60.32
1970	03/08/2018	00:28:24	70.54	70.86	60.27	60.27
1971	03/08/2018	00:28:54	70.43	70.73	60.17	60.17
1972	03/08/2018	00:29:24	70.32	70.63	60.09	60.09
1973	03/08/2018	00:29:54	70.21	70.51	60.01	60.01
1974	03/08/2018	00:30:24	70.09	70.39	59.9	59.9
1975	03/08/2018	00:30:54	69.97	70.3	59.8	59.8
1976	03/08/2018	00:31:24	69.85	70.2	59.68	59.68
1977	03/08/2018	00:31:54	69.75	70.07	59.6	59.6
1978	03/08/2018	00:32:24	69.63	69.95	59.51	59.51
1979	03/08/2018	00:32:54	69.53	69.83	59.42	59.42
1980	03/08/2018	00:33:24	69.42	69.72	59.31	59.31
1981	03/08/2018	00:33:54	69.31	69.65	59.22	59.22
1982	03/08/2018	00:34:24	69.21	69.5	59.14	59.14
1983	03/08/2018	00:34:54	69.1	69.4	59.07	59.07
1984	03/08/2018	00:35:24	68.99	69.33	58.96	58.96

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
1985	03/08/2018	00:35:54	68.87	69.2	58.88	58.88
1986	03/08/2018	00:36:24	68.77	69.09	58.78	58.78
1987	03/08/2018	00:36:54	68.67	68.95	58.71	58.71
1988	03/08/2018	00:37:24	68.56	68.88	58.64	58.64
1989	03/08/2018	00:37:54	68.46	68.74	58.54	58.54
1990	03/08/2018	00:38:24	68.35	68.64	58.49	58.49
1991	03/08/2018	00:38:54	68.24	68.58	58.4	58.4
1992	03/08/2018	00:39:24	68.14	68.46	58.34	58.34
1993	03/08/2018	00:39:54	68.04	68.32	58.26	58.26
1994	03/08/2018	00:40:24	67.93	68.23	58.16	58.16
1995	03/08/2018	00:40:54	67.83	68.14	58.11	58.11
1996	03/08/2018	00:41:24	67.73	68.05	58.03	58.03
1997	03/08/2018	00:41:54	67.62	67.89	57.89	57.89
1998	03/08/2018	00:42:24	67.52	67.8	57.82	57.82
1999	03/08/2018	00:42:54	67.41	67.68	57.75	57.75
2000	03/08/2018	00:43:24	67.31	67.6	57.71	57.71
2001	03/08/2018	00:43:54	67.21	67.46	57.59	57.59
2002	03/08/2018	00:44:24	67.09	67.34	57.48	57.48
2003	03/08/2018	00:44:54	66.99	67.3	57.32	57.32
2004	03/08/2018	00:45:24	66.89	67.21	57.25	57.25
2005	03/08/2018	00:45:54	66.8	67.07	57.19	57.19
2006	03/08/2018	00:46:24	66.69	66.99	57.13	57.13
2007	03/08/2018	00:46:54	66.6	66.86	57.06	57.06
2008	03/08/2018	00:47:24	66.5	66.78	56.98	56.98
2009	03/08/2018	00:47:54	66.39	66.67	56.91	56.91
2010	03/08/2018	00:48:24	66.29	66.59	56.81	56.81
2011	03/08/2018	00:48:54	66.19	66.49	56.74	56.74
2012	03/08/2018	00:49:24	66.09	66.32	56.66	56.66
2013	03/08/2018	00:49:54	65.99	66.27	56.6	56.6
2014	03/08/2018	00:50:24	65.9	66.18	56.56	56.56
2015	03/08/2018	00:50:54	65.8	66.1	56.41	56.41
2016	03/08/2018	00:51:24	65.71	66	56.31	56.31
2017	03/08/2018	00:51:54	65.61	65.87	56.23	56.23
2018	03/08/2018	00:52:24	65.5	65.73	56.19	56.19
2019	03/08/2018	00:52:54	65.4	65.65	56.15	56.15
2020	03/08/2018	00:53:24	65.29	65.56	56.06	56.06
2021	03/08/2018	00:53:54	65.19	65.48	55.97	55.97
2022	03/08/2018	00:54:24	65.1	65.4	55.87	55.87
2023	03/08/2018	00:54:54	65	65.27	55.85	55.85
2024	03/08/2018	00:55:24	64.91	65.14	55.74	55.74
2025	03/08/2018	00:55:54	64.81	65.09	55.66	55.66
2026	03/08/2018	00:56:24	64.72	65.03	55.58	55.58
2027	03/08/2018	00:56:54	64.63	64.93	55.47	55.47
2028	03/08/2018	00:57:24	64.54	64.84	55.39	55.39
2029	03/08/2018	00:57:54	64.44	64.74	55.32	55.32
2030	03/08/2018	00:58:24	64.34	64.62	55.25	55.25
2031	03/08/2018	00:58:54	64.25	64.53	55.17	55.17
2032	03/08/2018	00:59:24	64.15	64.44	55.12	55.12
2033	03/08/2018	00:59:54	64.06	64.35	55.03	55.03
2034	03/08/2018	01:00:24	63.97	64.26	54.94	54.94
2035	03/08/2018	01:00:54	63.87	64.13	54.87	54.87
2036	03/08/2018	01:01:24	63.78	64.06	54.79	54.79
2037	03/08/2018	01:01:54	63.68	63.97	54.68	54.68
2038	03/08/2018	01:02:24	63.59	63.86	54.62	54.62
2039	03/08/2018	01:02:54	63.51	63.75	54.59	54.59
2040	03/08/2018	01:03:24	63.41	63.69	54.52	54.52
2041	03/08/2018	01:03:54	63.31	63.52	54.45	54.45
2042	03/08/2018	01:04:24	63.22	63.5	54.37	54.37
2043	03/08/2018	01:04:54	63.14	63.41	54.32	54.32
2044	03/08/2018	01:05:24	63.05	63.31	54.21	54.21
2045	03/08/2018	01:05:54	62.95	63.2	54.12	54.12
2046	03/08/2018	01:06:24	62.86	63.12	54.08	54.08
2047	03/08/2018	01:06:54	62.78	63.03	53.99	53.99
2048	03/08/2018	01:07:24	62.68	62.92	53.91	53.91

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2049	03/08/2018	01:07:54	62.6	62.81	53.84	53.84
2050	03/08/2018	01:08:24	62.5	62.75	53.75	53.75
2051	03/08/2018	01:08:54	62.41	62.66	53.7	53.7
2052	03/08/2018	01:09:24	62.32	62.55	53.6	53.6
2053	03/08/2018	01:09:54	62.22	62.44	53.53	53.53
2054	03/08/2018	01:10:24	62.13	62.4	53.44	53.44
2055	03/08/2018	01:10:54	62.05	62.29	53.37	53.37
2056	03/08/2018	01:11:24	61.96	62.21	53.3	53.3
2057	03/08/2018	01:11:54	61.88	62.11	53.24	53.24
2058	03/08/2018	01:12:24	61.8	62.06	53.17	53.17
2059	03/08/2018	01:12:54	61.7	61.95	53.1	53.1
2060	03/08/2018	01:13:24	61.61	61.87	53.03	53.03
2061	03/08/2018	01:13:54	61.53	61.75	52.99	52.99
2062	03/08/2018	01:14:24	61.44	61.71	52.93	52.93
2063	03/08/2018	01:14:54	61.35	61.61	52.86	52.86
2064	03/08/2018	01:15:24	61.27	61.51	52.76	52.76
2065	03/08/2018	01:15:54	61.18	61.45	52.72	52.72
2066	03/08/2018	01:16:24	61.09	61.35	52.63	52.63
2067	03/08/2018	01:16:54	61.01	61.22	52.56	52.56
2068	03/08/2018	01:17:24	60.92	61.15	52.46	52.46
2069	03/08/2018	01:17:54	60.83	61.09	52.42	52.42
2070	03/08/2018	01:18:24	60.75	60.97	52.32	52.32
2071	03/08/2018	01:18:54	60.66	60.88	52.23	52.23
2072	03/08/2018	01:19:24	60.58	60.81	52.16	52.16
2073	03/08/2018	01:19:54	60.5	60.75	52.11	52.11
2074	03/08/2018	01:20:24	60.41	60.63	52.06	52.06
2075	03/08/2018	01:20:54	60.33	60.57	51.98	51.98
2076	03/08/2018	01:21:24	60.25	60.49	51.88	51.88
2077	03/08/2018	01:21:54	60.16	60.37	51.82	51.82
2078	03/08/2018	01:22:24	60.08	60.32	51.78	51.78
2079	03/08/2018	01:22:54	59.99	60.24	51.71	51.71
2080	03/08/2018	01:23:24	59.91	60.15	51.64	51.64
2081	03/08/2018	01:23:54	59.82	60.03	51.58	51.58
2082	03/08/2018	01:24:24	59.74	59.98	51.57	51.57
2083	03/08/2018	01:24:54	59.67	59.91	51.45	51.45
2084	03/08/2018	01:25:24	59.58	59.77	51.39	51.39
2085	03/08/2018	01:25:54	59.49	59.73	51.32	51.32
2086	03/08/2018	01:26:24	59.41	59.6	51.22	51.22
2087	03/08/2018	01:26:54	59.32	59.53	51.13	51.13
2088	03/08/2018	01:27:24	59.23	59.43	51.06	51.06
2089	03/08/2018	01:27:54	59.15	59.39	51.01	51.01
2090	03/08/2018	01:28:24	59.08	59.27	50.95	50.95
2091	03/08/2018	01:28:54	58.99	59.18	50.85	50.85
2092	03/08/2018	01:29:24	58.9	59.13	50.79	50.79
2093	03/08/2018	01:29:54	58.83	59.02	50.78	50.78
2094	03/08/2018	01:30:24	58.75	58.95	50.67	50.67
2095	03/08/2018	01:30:54	58.66	58.9	50.6	50.6
2096	03/08/2018	01:31:24	58.58	58.78	50.54	50.54
2097	03/08/2018	01:31:54	58.49	58.69	50.48	50.48
2098	03/08/2018	01:32:24	58.41	58.65	50.44	50.44
2099	03/08/2018	01:32:54	58.34	58.56	50.38	50.38
2100	03/08/2018	01:33:24	58.25	58.48	50.32	50.32
2101	03/08/2018	01:33:54	58.18	58.4	50.25	50.25
2102	03/08/2018	01:34:24	58.1	58.29	50.18	50.18
2103	03/08/2018	01:34:54	58.02	58.23	50.1	50.1
2104	03/08/2018	01:35:24	57.94	58.14	50.02	50.02
2105	03/08/2018	01:35:54	57.86	58.08	49.96	49.96
2106	03/08/2018	01:36:24	57.78	57.97	49.89	49.89
2107	03/08/2018	01:36:54	57.71	57.89	49.82	49.82
2108	03/08/2018	01:37:24	57.63	57.84	49.77	49.77
2109	03/08/2018	01:37:54	57.55	57.74	49.72	49.72
2110	03/08/2018	01:38:24	57.47	57.68	49.64	49.64
2111	03/08/2018	01:38:54	57.4	57.59	49.58	49.58
2112	03/08/2018	01:39:24	57.31	57.5	49.5	49.5

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2113	03/08/2018	01:39:54	57.24	57.42	49.43	49.43
2114	03/08/2018	01:40:24	57.16	57.33	49.37	49.37
2115	03/08/2018	01:40:54	57.08	57.28	49.3	49.3
2116	03/08/2018	01:41:24	57	57.22	49.26	49.26
2117	03/08/2018	01:41:54	56.92	57.11	49.2	49.2
2118	03/08/2018	01:42:24	56.85	57.04	49.12	49.12
2119	03/08/2018	01:42:54	56.78	56.98	49.1	49.1
2120	03/08/2018	01:43:24	56.71	56.86	49.02	49.02
2121	03/08/2018	01:43:54	56.62	56.8	48.96	48.96
2122	03/08/2018	01:44:24	56.54	56.73	48.87	48.87
2123	03/08/2018	01:44:54	56.46	56.66	48.83	48.83
2124	03/08/2018	01:45:24	56.38	56.6	48.79	48.79
2125	03/08/2018	01:45:54	56.31	56.5	48.72	48.72
2126	03/08/2018	01:46:24	56.23	56.41	48.67	48.67
2127	03/08/2018	01:46:54	56.16	56.37	48.59	48.59
2128	03/08/2018	01:47:24	56.08	56.23	48.54	48.54
2129	03/08/2018	01:47:54	56.01	56.22	48.48	48.48
2130	03/08/2018	01:48:24	55.94	56.11	48.39	48.39
2131	03/08/2018	01:48:54	55.87	56.06	48.38	48.38
2132	03/08/2018	01:49:24	55.8	55.99	48.33	48.33
2133	03/08/2018	01:49:54	55.72	55.91	48.25	48.25
2134	03/08/2018	01:50:24	55.65	55.84	48.2	48.2
2135	03/08/2018	01:50:54	55.58	55.77	48.11	48.11
2136	03/08/2018	01:51:24	55.5	55.65	48.03	48.03
2137	03/08/2018	01:51:54	55.43	55.58	47.98	47.98
2138	03/08/2018	01:52:24	55.36	55.54	47.9	47.9
2139	03/08/2018	01:52:54	55.29	55.46	47.84	47.84
2140	03/08/2018	01:53:24	55.22	55.41	47.77	47.77
2141	03/08/2018	01:53:54	55.14	55.32	47.7	47.7
2142	03/08/2018	01:54:24	55.06	55.22	47.69	47.69
2143	03/08/2018	01:54:54	54.99	55.15	47.63	47.63
2144	03/08/2018	01:55:24	54.91	55.08	47.58	47.58
2145	03/08/2018	01:55:54	54.84	55.01	47.51	47.51
2146	03/08/2018	01:56:24	54.76	54.94	47.44	47.44
2147	03/08/2018	01:56:54	54.68	54.84	47.36	47.36
2148	03/08/2018	01:57:24	54.61	54.77	47.27	47.27
2149	03/08/2018	01:57:54	54.54	54.72	47.25	47.25
2150	03/08/2018	01:58:24	54.47	54.66	47.18	47.18
2151	03/08/2018	01:58:54	54.4	54.57	47.13	47.13
2152	03/08/2018	01:59:24	54.33	54.51	47.04	47.04
2153	03/08/2018	01:59:54	54.26	54.42	47.01	47.01
2154	03/08/2018	02:00:24	54.19	54.34	46.94	46.94
2155	03/08/2018	02:00:54	54.12	54.29	46.91	46.91
2156	03/08/2018	02:01:24	54.04	54.2	46.85	46.85
2157	03/08/2018	02:01:54	53.97	54.12	46.81	46.81
2158	03/08/2018	02:02:24	53.89	54.07	46.75	46.75
2159	03/08/2018	02:02:54	53.83	53.97	46.68	46.68
2160	03/08/2018	02:03:24	53.76	53.91	46.65	46.65
2161	03/08/2018	02:03:54	53.69	53.86	46.59	46.59
2162	03/08/2018	02:04:24	53.62	53.79	46.52	46.52
2163	03/08/2018	02:04:54	53.56	53.7	46.46	46.46
2164	03/08/2018	02:05:24	53.49	53.66	46.4	46.4
2165	03/08/2018	02:05:54	53.42	53.55	46.34	46.34
2166	03/08/2018	02:06:24	53.35	53.5	46.29	46.29
2167	03/08/2018	02:06:54	53.28	53.44	46.24	46.24
2168	03/08/2018	02:07:24	53.21	53.37	46.19	46.19
2169	03/08/2018	02:07:54	53.15	53.28	46.12	46.12
2170	03/08/2018	02:08:24	53.07	53.22	46.05	46.05
2171	03/08/2018	02:08:54	53.01	53.13	46.02	46.02
2172	03/08/2018	02:09:24	52.94	53.04	45.95	45.95
2173	03/08/2018	02:09:54	52.86	53	45.86	45.86
2174	03/08/2018	02:10:24	52.79	52.95	45.82	45.82
2175	03/08/2018	02:10:54	52.73	52.87	45.75	45.75
2176	03/08/2018	02:11:24	52.66	52.8	45.71	45.71

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2177	03/08/2018	02:11:54	52.59	52.71	45.65	45.65
2178	03/08/2018	02:12:24	52.52	52.67	45.59	45.59
2179	03/08/2018	02:12:54	52.46	52.58	45.53	45.53
2180	03/08/2018	02:13:24	52.39	52.51	45.46	45.46
2181	03/08/2018	02:13:54	52.32	52.48	45.43	45.43
2182	03/08/2018	02:14:24	52.25	52.38	45.39	45.39
2183	03/08/2018	02:14:54	52.19	52.34	45.35	45.35
2184	03/08/2018	02:15:24	52.13	52.26	45.29	45.29
2185	03/08/2018	02:15:54	52.05	52.19	45.25	45.25
2186	03/08/2018	02:16:24	51.99	52.12	45.17	45.17
2187	03/08/2018	02:16:54	51.93	52.05	45.11	45.11
2188	03/08/2018	02:17:24	51.86	51.99	45.04	45.04
2189	03/08/2018	02:17:54	51.8	51.93	45	45
2190	03/08/2018	02:18:24	51.72	51.84	44.94	44.94
2191	03/08/2018	02:18:54	51.66	51.8	44.9	44.9
2192	03/08/2018	02:19:24	51.6	51.74	44.83	44.83
2193	03/08/2018	02:19:54	51.53	51.64	44.8	44.8
2194	03/08/2018	02:20:24	51.47	51.59	44.74	44.74
2195	03/08/2018	02:20:54	51.41	51.52	44.68	44.68
2196	03/08/2018	02:21:24	51.34	51.45	44.63	44.63
2197	03/08/2018	02:21:54	51.28	51.41	44.61	44.61
2198	03/08/2018	02:22:24	51.21	51.35	44.54	44.54
2199	03/08/2018	02:22:54	51.15	51.28	44.48	44.48
2200	03/08/2018	02:23:24	51.08	51.18	44.44	44.44
2201	03/08/2018	02:23:54	51.01	51.12	44.37	44.37
2202	03/08/2018	02:24:24	50.95	51.06	44.32	44.32
2203	03/08/2018	02:24:54	50.89	50.99	44.28	44.28
2204	03/08/2018	02:25:24	50.82	50.93	44.23	44.23
2205	03/08/2018	02:25:54	50.76	50.86	44.19	44.19
2206	03/08/2018	02:26:24	50.69	50.81	44.1	44.1
2207	03/08/2018	02:26:54	50.63	50.71	44.04	44.04
2208	03/08/2018	02:27:24	50.55	50.65	43.98	43.98
2209	03/08/2018	02:27:54	50.49	50.59	43.93	43.93
2210	03/08/2018	02:28:24	50.43	50.55	43.88	43.88
2211	03/08/2018	02:28:54	50.37	50.48	43.84	43.84
2212	03/08/2018	02:29:24	50.31	50.42	43.78	43.78
2213	03/08/2018	02:29:54	50.24	50.34	43.75	43.75
2214	03/08/2018	02:30:24	50.19	50.29	43.67	43.67
2215	03/08/2018	02:30:54	50.13	50.23	43.61	43.61
2216	03/08/2018	02:31:24	50.06	50.15	43.57	43.57
2217	03/08/2018	02:31:54	50	50.12	43.53	43.53
2218	03/08/2018	02:32:24	49.94	50.05	43.47	43.47
2219	03/08/2018	02:32:54	49.87	49.97	43.43	43.43
2220	03/08/2018	02:33:24	49.81	49.91	43.37	43.37
2221	03/08/2018	02:33:54	49.75	49.84	43.33	43.33
2222	03/08/2018	02:34:24	49.69	49.77	43.27	43.27
2223	03/08/2018	02:34:54	49.63	49.73	43.21	43.21
2224	03/08/2018	02:35:24	49.56	49.67	43.17	43.17
2225	03/08/2018	02:35:54	49.51	49.59	43.13	43.13
2226	03/08/2018	02:36:24	49.44	49.52	43.07	43.07
2227	03/08/2018	02:36:54	49.38	49.48	43.03	43.03
2228	03/08/2018	02:37:24	49.32	49.4	42.97	42.97
2229	03/08/2018	02:37:54	49.26	49.36	42.94	42.94
2230	03/08/2018	02:38:24	49.2	49.28	42.87	42.87
2231	03/08/2018	02:38:54	49.14	49.22	42.83	42.83
2232	03/08/2018	02:39:24	49.07	49.13	42.77	42.77
2233	03/08/2018	02:39:54	49.01	49.11	42.74	42.74
2234	03/08/2018	02:40:24	48.96	49.01	42.68	42.68
2235	03/08/2018	02:40:54	48.9	48.98	42.62	42.62
2236	03/08/2018	02:41:24	48.84	48.92	42.55	42.55
2237	03/08/2018	02:41:54	48.78	48.85	42.52	42.52
2238	03/08/2018	02:42:24	48.72	48.78	42.48	42.48
2239	03/08/2018	02:42:54	48.66	48.74	42.44	42.44
2240	03/08/2018	02:43:24	48.6	48.69	42.39	42.39

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2241	03/08/2018	02:43:54	48.55	48.61	42.33	42.33
2242	03/08/2018	02:44:24	48.48	48.54	42.3	42.3
2243	03/08/2018	02:44:54	48.42	48.49	42.22	42.22
2244	03/08/2018	02:45:24	48.36	48.44	42.19	42.19
2245	03/08/2018	02:45:54	48.31	48.39	42.15	42.15
2246	03/08/2018	02:46:24	48.25	48.3	42.1	42.1
2247	03/08/2018	02:46:54	48.19	48.25	42.05	42.05
2248	03/08/2018	02:47:24	48.13	48.17	42.01	42.01
2249	03/08/2018	02:47:54	48.07	48.13	41.94	41.94
2250	03/08/2018	02:48:24	48.01	48.07	41.88	41.88
2251	03/08/2018	02:48:54	47.95	48.03	41.87	41.87
2252	03/08/2018	02:49:24	47.9	47.96	41.83	41.83
2253	03/08/2018	02:49:54	47.84	47.9	41.77	41.77
2254	03/08/2018	02:50:24	47.78	47.85	41.74	41.74
2255	03/08/2018	02:50:54	47.72	47.79	41.69	41.69
2256	03/08/2018	02:51:24	47.66	47.72	41.64	41.64
2257	03/08/2018	02:51:54	47.61	47.68	41.6	41.6
2258	03/08/2018	02:52:24	47.55	47.62	41.56	41.56
2259	03/08/2018	02:52:54	47.49	47.53	41.51	41.51
2260	03/08/2018	02:53:24	47.43	47.49	41.47	41.47
2261	03/08/2018	02:53:54	47.37	47.41	41.44	41.44
2262	03/08/2018	02:54:24	47.31	47.37	41.37	41.37
2263	03/08/2018	02:54:54	47.26	47.32	41.32	41.32
2264	03/08/2018	02:55:24	47.2	47.26	41.25	41.25
2265	03/08/2018	02:55:54	47.15	47.22	41.24	41.24
2266	03/08/2018	02:56:24	47.1	47.14	41.21	41.21
2267	03/08/2018	02:56:54	47.04	47.1	41.16	41.16
2268	03/08/2018	02:57:24	46.97	47.01	41.08	41.08
2269	03/08/2018	02:57:54	46.92	46.96	41.05	41.05
2270	03/08/2018	02:58:24	46.86	46.89	41.01	41.01
2271	03/08/2018	02:58:54	46.8	46.86	40.95	40.95
2272	03/08/2018	02:59:24	46.75	46.8	40.92	40.92
2273	03/08/2018	02:59:54	46.7	46.74	40.86	40.86
2274	03/08/2018	03:00:24	46.64	46.69	40.83	40.83
2275	03/08/2018	03:00:54	46.59	46.65	40.78	40.78
2276	03/08/2018	03:01:24	46.54	46.58	40.75	40.75
2277	03/08/2018	03:01:54	46.47	46.52	40.71	40.71
2278	03/08/2018	03:02:24	46.42	46.47	40.67	40.67
2279	03/08/2018	03:02:54	46.37	46.4	40.58	40.58
2280	03/08/2018	03:03:24	46.31	46.34	40.51	40.51
2281	03/08/2018	03:03:54	46.25	46.29	40.49	40.49
2282	03/08/2018	03:04:24	46.19	46.24	40.42	40.42
2283	03/08/2018	03:04:54	46.14	46.19	40.41	40.41
2284	03/08/2018	03:05:24	46.09	46.14	40.37	40.37
2285	03/08/2018	03:05:54	46.03	46.07	40.31	40.31
2286	03/08/2018	03:06:24	45.98	46.03	40.27	40.27
2287	03/08/2018	03:06:54	45.93	45.98	40.25	40.25
2288	03/08/2018	03:07:24	45.87	45.92	40.21	40.21
2289	03/08/2018	03:07:54	45.83	45.86	40.16	40.16
2290	03/08/2018	03:08:24	45.77	45.81	40.12	40.12
2291	03/08/2018	03:08:54	45.71	45.76	40.08	40.08
2292	03/08/2018	03:09:24	45.66	45.7	40.01	40.01
2293	03/08/2018	03:09:54	45.61	45.64	39.96	39.96
2294	03/08/2018	03:10:24	45.55	45.58	39.91	39.91
2295	03/08/2018	03:10:54	45.5	45.51	39.88	39.88
2296	03/08/2018	03:11:24	45.44	45.46	39.85	39.85
2297	03/08/2018	03:11:54	45.38	45.42	39.8	39.8
2298	03/08/2018	03:12:24	45.33	45.35	39.75	39.75
2299	03/08/2018	03:12:54	45.28	45.29	39.69	39.69
2300	03/08/2018	03:13:24	45.23	45.26	39.66	39.66
2301	03/08/2018	03:13:54	45.18	45.2	39.64	39.64
2302	03/08/2018	03:14:24	45.13	45.14	39.62	39.62
2303	03/08/2018	03:14:54	45.07	45.1	39.57	39.57
2304	03/08/2018	03:15:24	45.02	45.04	39.51	39.51

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2305	03/08/2018	03:15:54	44.97	44.98	39.45	39.45
2306	03/08/2018	03:16:24	44.92	44.95	39.4	39.4
2307	03/08/2018	03:16:54	44.87	44.9	39.37	39.37
2308	03/08/2018	03:17:24	44.82	44.83	39.33	39.33
2309	03/08/2018	03:17:54	44.77	44.79	39.28	39.28
2310	03/08/2018	03:18:24	44.72	44.73	39.26	39.26
2311	03/08/2018	03:18:54	44.67	44.66	39.22	39.22
2312	03/08/2018	03:19:24	44.61	44.63	39.18	39.18
2313	03/08/2018	03:19:54	44.56	44.58	39.1	39.1
2314	03/08/2018	03:20:24	44.51	44.51	39.05	39.05
2315	03/08/2018	03:20:54	44.46	44.46	39.01	39.01
2316	03/08/2018	03:21:24	44.41	44.41	38.99	38.99
2317	03/08/2018	03:21:54	44.36	44.35	38.93	38.93
2318	03/08/2018	03:22:24	44.31	44.31	38.91	38.91
2319	03/08/2018	03:22:54	44.27	44.26	38.87	38.87
2320	03/08/2018	03:23:24	44.21	44.21	38.84	38.84
2321	03/08/2018	03:23:54	44.16	44.16	38.8	38.8
2322	03/08/2018	03:24:24	44.11	44.11	38.76	38.76
2323	03/08/2018	03:24:54	44.05	44.05	38.7	38.7
2324	03/08/2018	03:25:24	44.01	44.01	38.67	38.67
2325	03/08/2018	03:25:54	43.96	43.97	38.63	38.63
2326	03/08/2018	03:26:24	43.9	43.91	38.6	38.6
2327	03/08/2018	03:26:54	43.86	43.86	38.56	38.56
2328	03/08/2018	03:27:24	43.81	43.8	38.51	38.51
2329	03/08/2018	03:27:54	43.76	43.74	38.48	38.48
2330	03/08/2018	03:28:24	43.71	43.7	38.44	38.44
2331	03/08/2018	03:28:54	43.67	43.67	38.43	38.43
2332	03/08/2018	03:29:24	43.62	43.61	38.38	38.38
2333	03/08/2018	03:29:54	43.57	43.56	38.34	38.34
2334	03/08/2018	03:30:24	43.52	43.52	38.31	38.31
2335	03/08/2018	03:30:54	43.47	43.45	38.25	38.25
2336	03/08/2018	03:31:24	43.42	43.41	38.21	38.21
2337	03/08/2018	03:31:54	43.38	43.38	38.18	38.18
2338	03/08/2018	03:32:24	43.33	43.3	38.14	38.14
2339	03/08/2018	03:32:54	43.27	43.26	38.08	38.08
2340	03/08/2018	03:33:24	43.23	43.22	38.04	38.04
2341	03/08/2018	03:33:54	43.18	43.17	38	38
2342	03/08/2018	03:34:24	43.13	43.12	37.96	37.96
2343	03/08/2018	03:34:54	43.09	43.08	37.92	37.92
2344	03/08/2018	03:35:24	43.04	43.03	37.88	37.88
2345	03/08/2018	03:35:54	42.98	42.97	37.82	37.82
2346	03/08/2018	03:36:24	42.94	42.93	37.8	37.8
2347	03/08/2018	03:36:54	42.89	42.86	37.77	37.77
2348	03/08/2018	03:37:24	42.85	42.84	37.74	37.74
2349	03/08/2018	03:37:54	42.8	42.79	37.69	37.69
2350	03/08/2018	03:38:24	42.75	42.72	37.66	37.66
2351	03/08/2018	03:38:54	42.7	42.68	37.63	37.63
2352	03/08/2018	03:39:24	42.65	42.62	37.59	37.59
2353	03/08/2018	03:39:54	42.61	42.58	37.54	37.54
2354	03/08/2018	03:40:24	42.55	42.53	37.5	37.5
2355	03/08/2018	03:40:54	42.51	42.49	37.47	37.47
2356	03/08/2018	03:41:24	42.46	42.44	37.44	37.44
2357	03/08/2018	03:41:54	42.42	42.39	37.4	37.4
2358	03/08/2018	03:42:24	42.37	42.34	37.37	37.37
2359	03/08/2018	03:42:54	42.33	42.3	37.32	37.32
2360	03/08/2018	03:43:24	42.28	42.24	37.28	37.28
2361	03/08/2018	03:43:54	42.23	42.2	37.25	37.25
2362	03/08/2018	03:44:24	42.19	42.16	37.22	37.22
2363	03/08/2018	03:44:54	42.15	42.1	37.18	37.18
2364	03/08/2018	03:45:24	42.1	42.07	37.13	37.13
2365	03/08/2018	03:45:54	42.05	42.02	37.1	37.1
2366	03/08/2018	03:46:24	42.01	41.97	37.06	37.06
2367	03/08/2018	03:46:54	41.96	41.92	37.02	37.02
2368	03/08/2018	03:47:24	41.91	41.88	36.99	36.99

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2369	03/08/2018	03:47:54	41.86	41.82	36.94	36.94
2370	03/08/2018	03:48:24	41.81	41.77	36.89	36.89
2371	03/08/2018	03:48:54	41.77	41.73	36.86	36.86
2372	03/08/2018	03:49:24	41.72	41.69	36.83	36.83
2373	03/08/2018	03:49:54	41.68	41.65	36.8	36.8
2374	03/08/2018	03:50:24	41.63	41.59	36.75	36.75
2375	03/08/2018	03:50:54	41.59	41.55	36.72	36.72
2376	03/08/2018	03:51:24	41.54	41.5	36.67	36.67
2377	03/08/2018	03:51:54	41.5	41.47	36.64	36.64
2378	03/08/2018	03:52:24	41.45	41.41	36.61	36.61
2379	03/08/2018	03:52:54	41.4	41.36	36.57	36.57
2380	03/08/2018	03:53:24	41.36	41.33	36.54	36.54
2381	03/08/2018	03:53:54	41.32	41.28	36.49	36.49
2382	03/08/2018	03:54:24	41.27	41.24	36.47	36.47
2383	03/08/2018	03:54:54	41.23	41.19	36.44	36.44
2384	03/08/2018	03:55:24	41.19	41.15	36.41	36.41
2385	03/08/2018	03:55:54	41.15	41.11	36.37	36.37
2386	03/08/2018	03:56:24	41.1	41.04	36.32	36.32
2387	03/08/2018	03:56:54	41.06	41.02	36.28	36.28
2388	03/08/2018	03:57:24	41.01	40.97	36.25	36.25
2389	03/08/2018	03:57:54	40.97	40.93	36.21	36.21
2390	03/08/2018	03:58:24	40.92	40.88	36.17	36.17
2391	03/08/2018	03:58:54	40.87	40.83	36.14	36.14
2392	03/08/2018	03:59:24	40.83	40.79	36.12	36.12
2393	03/08/2018	03:59:54	40.8	40.75	36.12	36.12
2394	03/08/2018	04:00:24	40.75	40.7	36.07	36.07
2395	03/08/2018	04:00:54	40.71	40.65	36.03	36.03
2396	03/08/2018	04:01:24	40.67	40.61	36	36
2397	03/08/2018	04:01:54	40.63	40.58	35.95	35.95
2398	03/08/2018	04:02:24	40.58	40.53	35.91	35.91
2399	03/08/2018	04:02:54	40.54	40.49	35.86	35.86
2400	03/08/2018	04:03:24	40.5	40.44	35.84	35.84
2401	03/08/2018	04:03:54	40.46	40.41	35.81	35.81
2402	03/08/2018	04:04:24	40.42	40.36	35.77	35.77
2403	03/08/2018	04:04:54	40.37	40.32	35.73	35.73
2404	03/08/2018	04:05:24	40.33	40.26	35.71	35.71
2405	03/08/2018	04:05:54	40.29	40.23	35.68	35.68
2406	03/08/2018	04:06:24	40.25	40.19	35.66	35.66
2407	03/08/2018	04:06:54	40.2	40.14	35.62	35.62
2408	03/08/2018	04:07:24	40.16	40.11	35.61	35.61
2409	03/08/2018	04:07:54	40.12	40.06	35.57	35.57
2410	03/08/2018	04:08:24	40.07	40.01	35.52	35.52
2411	03/08/2018	04:08:54	40.03	39.96	35.48	35.48
2412	03/08/2018	04:09:24	39.99	39.92	35.44	35.44
2413	03/08/2018	04:09:54	39.96	39.89	35.42	35.42
2414	03/08/2018	04:10:24	39.91	39.84	35.39	35.39
2415	03/08/2018	04:10:54	39.87	39.8	35.37	35.37
2416	03/08/2018	04:11:24	39.82	39.75	35.33	35.33
2417	03/08/2018	04:11:54	39.79	39.71	35.29	35.29
2418	03/08/2018	04:12:24	39.74	39.66	35.25	35.25
2419	03/08/2018	04:12:54	39.71	39.63	35.22	35.22
2420	03/08/2018	04:13:24	39.67	39.6	35.2	35.2
2421	03/08/2018	04:13:54	39.63	39.55	35.18	35.18
2422	03/08/2018	04:14:24	39.59	39.51	35.13	35.13
2423	03/08/2018	04:14:54	39.54	39.46	35.09	35.09
2424	03/08/2018	04:15:24	39.51	39.42	35.08	35.08
2425	03/08/2018	04:15:54	39.46	39.36	35.02	35.02
2426	03/08/2018	04:16:24	39.41	39.33	34.99	34.99
2427	03/08/2018	04:16:54	39.38	39.3	34.97	34.97
2428	03/08/2018	04:17:24	39.34	39.25	34.93	34.93
2429	03/08/2018	04:17:54	39.3	39.21	34.9	34.9
2430	03/08/2018	04:18:24	39.26	39.17	34.86	34.86
2431	03/08/2018	04:18:54	39.22	39.13	34.84	34.84
2432	03/08/2018	04:19:24	39.18	39.09	34.79	34.79

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2433	03/08/2018	04:19:54	39.13	39.04	34.74	34.74
2434	03/08/2018	04:20:24	39.09	39	34.72	34.72
2435	03/08/2018	04:20:54	39.06	38.96	34.7	34.7
2436	03/08/2018	04:21:24	39.02	38.92	34.68	34.68
2437	03/08/2018	04:21:54	38.98	38.89	34.63	34.63
2438	03/08/2018	04:22:24	38.95	38.85	34.61	34.61
2439	03/08/2018	04:22:54	38.91	38.81	34.59	34.59
2440	03/08/2018	04:23:24	38.86	38.77	34.54	34.54
2441	03/08/2018	04:23:54	38.83	38.74	34.51	34.51
2442	03/08/2018	04:24:24	38.79	38.69	34.48	34.48
2443	03/08/2018	04:24:54	38.75	38.65	34.46	34.46
2444	03/08/2018	04:25:24	38.71	38.61	34.44	34.44
2445	03/08/2018	04:25:54	38.67	38.56	34.39	34.39
2446	03/08/2018	04:26:24	38.63	38.53	34.36	34.36
2447	03/08/2018	04:26:54	38.6	38.49	34.34	34.34
2448	03/08/2018	04:27:24	38.56	38.46	34.31	34.31
2449	03/08/2018	04:27:54	38.51	38.42	34.27	34.27
2450	03/08/2018	04:28:24	38.47	38.37	34.24	34.24
2451	03/08/2018	04:28:54	38.43	38.33	34.2	34.2
2452	03/08/2018	04:29:24	38.39	38.29	34.18	34.18
2453	03/08/2018	04:29:54	38.35	38.25	34.14	34.14
2454	03/08/2018	04:30:24	38.31	38.21	34.1	34.1
2455	03/08/2018	04:30:54	38.28	38.18	34.08	34.08
2456	03/08/2018	04:31:24	38.25	38.14	34.06	34.06
2457	03/08/2018	04:31:54	38.21	38.1	34.02	34.02
2458	03/08/2018	04:32:24	38.16	38.05	33.98	33.98
2459	03/08/2018	04:32:54	38.12	38.01	33.95	33.95
2460	03/08/2018	04:33:24	38.09	37.98	33.92	33.92
2461	03/08/2018	04:33:54	38.05	37.94	33.89	33.89
2462	03/08/2018	04:34:24	38.02	37.91	33.85	33.85
2463	03/08/2018	04:34:54	37.98	37.87	33.83	33.83
2464	03/08/2018	04:35:24	37.94	37.82	33.79	33.79
2465	03/08/2018	04:35:54	37.9	37.78	33.77	33.77
2466	03/08/2018	04:36:24	37.87	37.76	33.75	33.75
2467	03/08/2018	04:36:54	37.84	37.72	33.72	33.72
2468	03/08/2018	04:37:24	37.79	37.67	33.68	33.68
2469	03/08/2018	04:37:54	37.76	37.63	33.65	33.65
2470	03/08/2018	04:38:24	37.72	37.61	33.62	33.62
2471	03/08/2018	04:38:54	37.69	37.57	33.6	33.6
2472	03/08/2018	04:39:24	37.65	37.54	33.57	33.57
2473	03/08/2018	04:39:54	37.62	37.49	33.55	33.55
2474	03/08/2018	04:40:24	37.57	37.45	33.52	33.52
2475	03/08/2018	04:40:54	37.54	37.42	33.48	33.48
2476	03/08/2018	04:41:24	37.51	37.39	33.47	33.47
2477	03/08/2018	04:41:54	37.47	37.34	33.43	33.43
2478	03/08/2018	04:42:24	37.43	37.31	33.39	33.39
2479	03/08/2018	04:42:54	37.39	37.26	33.36	33.36
2480	03/08/2018	04:43:24	37.36	37.23	33.33	33.33
2481	03/08/2018	04:43:54	37.32	37.19	33.3	33.3
2482	03/08/2018	04:44:24	37.28	37.15	33.27	33.27
2483	03/08/2018	04:44:54	37.25	37.12	33.24	33.24
2484	03/08/2018	04:45:24	37.22	37.09	33.22	33.22
2485	03/08/2018	04:45:54	37.18	37.05	33.19	33.19
2486	03/08/2018	04:46:24	37.15	37.02	33.18	33.18
2487	03/08/2018	04:46:54	37.11	36.98	33.14	33.14
2488	03/08/2018	04:47:24	37.07	36.94	33.1	33.1
2489	03/08/2018	04:47:54	37.04	36.91	33.08	33.08
2490	03/08/2018	04:48:24	37	36.87	33.04	33.04
2491	03/08/2018	04:48:54	36.96	36.83	33.01	33.01
2492	03/08/2018	04:49:24	36.92	36.8	32.99	32.99
2493	03/08/2018	04:49:54	36.88	36.76	32.96	32.96
2494	03/08/2018	04:50:24	36.85	36.72	32.94	32.94
2495	03/08/2018	04:50:54	36.82	36.68	32.91	32.91
2496	03/08/2018	04:51:24	36.78	36.65	32.89	32.89

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2497	03/08/2018	04:51:54	36.75	36.62	32.87	32.87
2498	03/08/2018	04:52:24	36.72	36.59	32.84	32.84
2499	03/08/2018	04:52:54	36.69	36.55	32.82	32.82
2500	03/08/2018	04:53:24	36.65	36.51	32.78	32.78
2501	03/08/2018	04:53:54	36.62	36.48	32.75	32.75
2502	03/08/2018	04:54:24	36.58	36.44	32.71	32.71
2503	03/08/2018	04:54:54	36.55	36.4	32.67	32.67
2504	03/08/2018	04:55:24	36.52	36.37	32.65	32.65
2505	03/08/2018	04:55:54	36.47	36.33	32.62	32.62
2506	03/08/2018	04:56:24	36.44	36.3	32.59	32.59
2507	03/08/2018	04:56:54	36.41	36.27	32.57	32.57
2508	03/08/2018	04:57:24	36.37	36.23	32.54	32.54
2509	03/08/2018	04:57:54	36.34	36.19	32.51	32.51
2510	03/08/2018	04:58:24	36.31	36.16	32.49	32.49
2511	03/08/2018	04:58:54	36.27	36.12	32.47	32.47
2512	03/08/2018	04:59:24	36.24	36.09	32.44	32.44
2513	03/08/2018	04:59:54	36.2	36.05	32.4	32.4
2514	03/08/2018	05:00:24	36.17	36.01	32.38	32.38
2515	03/08/2018	05:00:54	36.14	35.98	32.36	32.36
2516	03/08/2018	05:01:24	36.1	35.95	32.33	32.33
2517	03/08/2018	05:01:54	36.07	35.91	32.3	32.3
2518	03/08/2018	05:02:24	36.03	35.88	32.27	32.27
2519	03/08/2018	05:02:54	36	35.84	32.25	32.25
2520	03/08/2018	05:03:24	35.96	35.81	32.22	32.22
2521	03/08/2018	05:03:54	35.93	35.77	32.19	32.19
2522	03/08/2018	05:04:24	35.9	35.74	32.18	32.18
2523	03/08/2018	05:04:54	35.86	35.7	32.15	32.15
2524	03/08/2018	05:05:24	35.83	35.67	32.14	32.14
2525	03/08/2018	05:05:54	35.8	35.64	32.11	32.11
2526	03/08/2018	05:06:24	35.77	35.6	32.08	32.08
2527	03/08/2018	05:06:54	35.73	35.57	32.04	32.04
2528	03/08/2018	05:07:24	35.7	35.53	32	32
2529	03/08/2018	05:07:54	35.67	35.5	31.98	31.98
2530	03/08/2018	05:08:24	35.63	35.47	31.95	31.95
2531	03/08/2018	05:08:54	35.59	35.43	31.93	31.93
2532	03/08/2018	05:09:24	35.57	35.4	31.91	31.91
2533	03/08/2018	05:09:54	35.54	35.37	31.88	31.88
2534	03/08/2018	05:10:24	35.5	35.33	31.86	31.86
2535	03/08/2018	05:10:54	35.48	35.31	31.84	31.84
2536	03/08/2018	05:11:24	35.44	35.28	31.82	31.82
2537	03/08/2018	05:11:54	35.41	35.24	31.79	31.79
2538	03/08/2018	05:12:24	35.38	35.2	31.76	31.76
2539	03/08/2018	05:12:54	35.35	35.17	31.73	31.73
2540	03/08/2018	05:13:24	35.31	35.14	31.7	31.7
2541	03/08/2018	05:13:54	35.28	35.11	31.67	31.67
2542	03/08/2018	05:14:24	35.26	35.09	31.65	31.65
2543	03/08/2018	05:14:54	35.22	35.04	31.63	31.63
2544	03/08/2018	05:15:24	35.18	35.01	31.59	31.59
2545	03/08/2018	05:15:54	35.15	34.97	31.57	31.57
2546	03/08/2018	05:16:24	35.12	34.94	31.54	31.54
2547	03/08/2018	05:16:54	35.1	34.92	31.53	31.53
2548	03/08/2018	05:17:24	35.06	34.88	31.5	31.5
2549	03/08/2018	05:17:54	35.03	34.85	31.47	31.47
2550	03/08/2018	05:18:24	35	34.82	31.45	31.45
2551	03/08/2018	05:18:54	34.97	34.79	31.43	31.43
2552	03/08/2018	05:19:24	34.93	34.75	31.4	31.4
2553	03/08/2018	05:19:54	34.9	34.72	31.37	31.37
2554	03/08/2018	05:20:24	34.87	34.69	31.36	31.36
2555	03/08/2018	05:20:54	34.84	34.66	31.34	31.34
2556	03/08/2018	05:21:24	34.81	34.63	31.31	31.31
2557	03/08/2018	05:21:54	34.78	34.6	31.28	31.28
2558	03/08/2018	05:22:24	34.75	34.57	31.26	31.26
2559	03/08/2018	05:22:54	34.71	34.53	31.24	31.24
2560	03/08/2018	05:23:24	34.69	34.51	31.21	31.21

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2561	03/08/2018	05:23:54	34.65	34.47	31.17	31.17
2562	03/08/2018	05:24:24	34.62	34.44	31.16	31.16
2563	03/08/2018	05:24:54	34.59	34.41	31.12	31.12
2564	03/08/2018	05:25:24	34.56	34.37	31.1	31.1
2565	03/08/2018	05:25:54	34.53	34.34	31.08	31.08
2566	03/08/2018	05:26:24	34.5	34.31	31.05	31.05
2567	03/08/2018	05:26:54	34.47	34.28	31.03	31.03
2568	03/08/2018	05:27:24	34.44	34.26	31.01	31.01
2569	03/08/2018	05:27:54	34.41	34.23	30.99	30.99
2570	03/08/2018	05:28:24	34.38	34.19	30.96	30.96
2571	03/08/2018	05:28:54	34.35	34.16	30.93	30.93
2572	03/08/2018	05:29:24	34.33	34.14	30.92	30.92
2573	03/08/2018	05:29:54	34.29	34.1	30.89	30.89
2574	03/08/2018	05:30:24	34.26	34.07	30.86	30.86
2575	03/08/2018	05:30:54	34.23	34.04	30.84	30.84
2576	03/08/2018	05:31:24	34.2	34.02	30.82	30.82
2577	03/08/2018	05:31:54	34.17	33.98	30.8	30.8
2578	03/08/2018	05:32:24	34.14	33.95	30.78	30.78
2579	03/08/2018	05:32:54	34.11	33.92	30.75	30.75
2580	03/08/2018	05:33:24	34.08	33.89	30.73	30.73
2581	03/08/2018	05:33:54	34.05	33.86	30.71	30.71
2582	03/08/2018	05:34:24	34.02	33.83	30.69	30.69
2583	03/08/2018	05:34:54	33.99	33.8	30.67	30.67
2584	03/08/2018	05:35:24	33.97	33.78	30.65	30.65
2585	03/08/2018	05:35:54	33.94	33.75	30.63	30.63
2586	03/08/2018	05:36:24	33.91	33.71	30.6	30.6
2587	03/08/2018	05:36:54	33.89	33.69	30.58	30.58
2588	03/08/2018	05:37:24	33.86	33.66	30.56	30.56
2589	03/08/2018	05:37:54	33.82	33.62	30.53	30.53
2590	03/08/2018	05:38:24	33.79	33.59	30.49	30.49
2591	03/08/2018	05:38:54	33.76	33.56	30.47	30.47
2592	03/08/2018	05:39:24	33.74	33.53	30.45	30.45
2593	03/08/2018	05:39:54	33.71	33.5	30.43	30.43
2594	03/08/2018	05:40:24	33.68	33.48	30.41	30.41
2595	03/08/2018	05:40:54	33.66	33.45	30.39	30.39
2596	03/08/2018	05:41:24	33.62	33.42	30.36	30.36
2597	03/08/2018	05:41:54	33.59	33.38	30.33	30.33
2598	03/08/2018	05:42:24	33.56	33.35	30.3	30.3
2599	03/08/2018	05:42:54	33.54	33.33	30.29	30.29
2600	03/08/2018	05:43:24	33.51	33.3	30.27	30.27
2601	03/08/2018	05:43:54	33.49	33.27	30.25	30.25
2602	03/08/2018	05:44:24	33.46	33.24	30.22	30.22
2603	03/08/2018	05:44:54	33.43	33.22	30.2	30.2
2604	03/08/2018	05:45:24	33.4	33.19	30.17	30.17
2605	03/08/2018	05:45:54	33.37	33.16	30.15	30.15
2606	03/08/2018	05:46:24	33.34	33.13	30.13	30.13
2607	03/08/2018	05:46:54	33.32	33.1	30.11	30.11
2608	03/08/2018	05:47:24	33.29	33.07	30.08	30.08
2609	03/08/2018	05:47:54	33.26	33.04	30.06	30.06
2610	03/08/2018	05:48:24	33.23	33.02	30.04	30.04
2611	03/08/2018	05:48:54	33.2	32.98	30.02	30.02
2612	03/08/2018	05:49:24	33.18	32.96	30.01	30.01
2613	03/08/2018	05:49:54	33.15	32.93	29.99	29.99
2614	03/08/2018	05:50:24	33.12	32.9	29.96	29.96
2615	03/08/2018	05:50:54	33.08	32.87	29.93	29.93
2616	03/08/2018	05:51:24	33.06	32.84	29.92	29.92
2617	03/08/2018	05:51:54	33.03	32.8	29.89	29.89
2618	03/08/2018	05:52:24	33	32.78	29.86	29.86
2619	03/08/2018	05:52:54	32.98	32.76	29.85	29.85
2620	03/08/2018	05:53:24	32.95	32.73	29.83	29.83
2621	03/08/2018	05:53:54	32.92	32.7	29.81	29.81
2622	03/08/2018	05:54:24	32.9	32.68	29.79	29.79
2623	03/08/2018	05:54:54	32.86	32.64	29.76	29.76
2624	03/08/2018	05:55:24	32.83	32.61	29.74	29.74

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2625	03/08/2018	05:55:54	32.81	32.58	29.72	29.72
2626	03/08/2018	05:56:24	32.78	32.56	29.7	29.7
2627	03/08/2018	05:56:54	32.75	32.53	29.67	29.67
2628	03/08/2018	05:57:24	32.73	32.51	29.66	29.66
2629	03/08/2018	05:57:54	32.71	32.48	29.63	29.63
2630	03/08/2018	05:58:24	32.68	32.45	29.62	29.62
2631	03/08/2018	05:58:54	32.65	32.43	29.59	29.59
2632	03/08/2018	05:59:24	32.63	32.4	29.58	29.58
2633	03/08/2018	05:59:54	32.61	32.38	29.55	29.55
2634	03/08/2018	06:00:24	32.59	32.35	29.53	29.53
2635	03/08/2018	06:00:54	32.56	32.32	29.5	29.5
2636	03/08/2018	06:01:24	32.53	32.29	29.49	29.49
2637	03/08/2018	06:01:54	32.5	32.26	29.46	29.46
2638	03/08/2018	06:02:24	32.47	32.23	29.44	29.44
2639	03/08/2018	06:02:54	32.45	32.21	29.42	29.42
2640	03/08/2018	06:03:24	32.42	32.19	29.41	29.41
2641	03/08/2018	06:03:54	32.39	32.16	29.38	29.38
2642	03/08/2018	06:04:24	32.36	32.13	29.36	29.36
2643	03/08/2018	06:04:54	32.34	32.11	29.34	29.34
2644	03/08/2018	06:05:24	32.32	32.08	29.32	29.32
2645	03/08/2018	06:05:54	32.3	32.06	29.31	29.31
2646	03/08/2018	06:06:24	32.26	32.03	29.27	29.27
2647	03/08/2018	06:06:54	32.24	32	29.25	29.25
2648	03/08/2018	06:07:24	32.22	31.98	29.23	29.23
2649	03/08/2018	06:07:54	32.19	31.95	29.21	29.21
2650	03/08/2018	06:08:24	32.16	31.93	29.2	29.2
2651	03/08/2018	06:08:54	32.14	31.9	29.18	29.18
2652	03/08/2018	06:09:24	32.11	31.88	29.16	29.16
2653	03/08/2018	06:09:54	32.08	31.85	29.13	29.13
2654	03/08/2018	06:10:24	32.06	31.83	29.11	29.11
2655	03/08/2018	06:10:54	32.02	31.79	29.08	29.08
2656	03/08/2018	06:11:24	32	31.76	29.06	29.06
2657	03/08/2018	06:11:54	31.97	31.74	29.04	29.04
2658	03/08/2018	06:12:24	31.95	31.72	29.02	29.02
2659	03/08/2018	06:12:54	31.93	31.7	29.01	29.01
2660	03/08/2018	06:13:24	31.9	31.66	28.98	28.98
2661	03/08/2018	06:13:54	31.88	31.64	28.96	28.96
2662	03/08/2018	06:14:24	31.86	31.61	28.95	28.95
2663	03/08/2018	06:14:54	31.84	31.59	28.93	28.93
2664	03/08/2018	06:15:24	31.82	31.57	28.92	28.92
2665	03/08/2018	06:15:54	31.79	31.55	28.89	28.89
2666	03/08/2018	06:16:24	31.77	31.52	28.87	28.87
2667	03/08/2018	06:16:54	31.74	31.49	28.84	28.84
2668	03/08/2018	06:17:24	31.72	31.47	28.83	28.83
2669	03/08/2018	06:17:54	31.69	31.44	28.81	28.81
2670	03/08/2018	06:18:24	31.67	31.42	28.79	28.79
2671	03/08/2018	06:18:54	31.65	31.4	28.77	28.77
2672	03/08/2018	06:19:24	31.63	31.37	28.76	28.76
2673	03/08/2018	06:19:54	31.6	31.34	28.73	28.73
2674	03/08/2018	06:20:24	31.58	31.33	28.72	28.72
2675	03/08/2018	06:20:54	31.55	31.3	28.69	28.69
2676	03/08/2018	06:21:24	31.53	31.27	28.68	28.68
2677	03/08/2018	06:21:54	31.51	31.25	28.66	28.66
2678	03/08/2018	06:22:24	31.47	31.22	28.63	28.63
2679	03/08/2018	06:22:54	31.45	31.19	28.61	28.61
2680	03/08/2018	06:23:24	31.43	31.17	28.6	28.6
2681	03/08/2018	06:23:54	31.41	31.15	28.58	28.58
2682	03/08/2018	06:24:24	31.39	31.13	28.56	28.56
2683	03/08/2018	06:24:54	31.36	31.1	28.54	28.54
2684	03/08/2018	06:25:24	31.34	31.08	28.52	28.52
2685	03/08/2018	06:25:54	31.32	31.06	28.51	28.51
2686	03/08/2018	06:26:24	31.29	31.02	28.48	28.48
2687	03/08/2018	06:26:54	31.27	31.01	28.47	28.47
2688	03/08/2018	06:27:24	31.24	30.98	28.45	28.45

Comments	Appendix 1 - 1°C /min heating rate						
UserDefined							
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp	
Units	--	h:m:s	°C	°C	°C	°C	
2689	03/08/2018	06:27:54	31.22	30.96	28.43		28.43
2690	03/08/2018	06:28:24	31.2	30.93	28.41		28.41
2691	03/08/2018	06:28:54	31.17	30.91	28.39		28.39
2692	03/08/2018	06:29:24	31.15	30.88	28.37		28.37
2693	03/08/2018	06:29:54	31.12	30.86	28.34		28.34
2694	03/08/2018	06:30:24	31.09	30.82	28.32		28.32
2695	03/08/2018	06:30:54	31.06	30.8	28.3		28.3
2696	03/08/2018	06:31:24	31.04	30.78	28.28		28.28
2697	03/08/2018	06:31:54	31.02	30.76	28.27		28.27
2698	03/08/2018	06:32:24	30.99	30.73	28.24		28.24
2699	03/08/2018	06:32:54	30.98	30.71	28.23		28.23
2700	03/08/2018	06:33:24	30.94	30.67	28.2		28.2
2701	03/08/2018	06:33:54	30.93	30.66	28.2		28.2
2702	03/08/2018	06:34:24	30.9	30.63	28.17		28.17
2703	03/08/2018	06:34:54	30.89	30.62	28.16		28.16
2704	03/08/2018	06:35:24	30.87	30.6	28.15		28.15
2705	03/08/2018	06:35:54	30.85	30.58	28.13		28.13
2706	03/08/2018	06:36:24	30.82	30.55	28.11		28.11
2707	03/08/2018	06:36:54	30.8	30.53	28.09		28.09
2708	03/08/2018	06:37:24	30.78	30.5	28.07		28.07
2709	03/08/2018	06:37:54	30.76	30.48	28.05		28.05
2710	03/08/2018	06:38:24	30.73	30.46	28.04		28.04
2711	03/08/2018	06:38:54	30.71	30.43	28.02		28.02
2712	03/08/2018	06:39:24	30.68	30.41	27.99		27.99
2713	03/08/2018	06:39:54	30.66	30.39	27.98		27.98
2714	03/08/2018	06:40:24	30.64	30.36	27.96		27.96
2715	03/08/2018	06:40:54	30.62	30.34	27.95		27.95
2716	03/08/2018	06:41:24	30.59	30.32	27.92		27.92
2717	03/08/2018	06:41:54	30.58	30.3	27.91		27.91
2718	03/08/2018	06:42:24	30.55	30.27	27.89		27.89
2719	03/08/2018	06:42:54	30.53	30.25	27.87		27.87
2720	03/08/2018	06:43:24	30.51	30.23	27.85		27.85
2721	03/08/2018	06:43:54	30.49	30.21	27.84		27.84
2722	03/08/2018	06:44:24	30.46	30.18	27.82		27.82
2723	03/08/2018	06:44:54	30.45	30.16	27.8		27.8
2724	03/08/2018	06:45:24	30.42	30.14	27.78		27.78
2725	03/08/2018	06:45:54	30.41	30.12	27.77		27.77
2726	03/08/2018	06:46:24	30.38	30.1	27.75		27.75
2727	03/08/2018	06:46:54	30.36	30.08	27.73		27.73
2728	03/08/2018	06:47:24	30.33	30.05	27.71		27.71
2729	03/08/2018	06:47:54	30.31	30.02	27.69		27.69
2730	03/08/2018	06:48:24	30.28	30	27.67		27.67
2731	03/08/2018	06:48:54	30.27	29.98	27.66		27.66
2732	03/08/2018	06:49:24	30.24	29.96	27.64		27.64
2733	03/08/2018	06:49:54	30.22	29.93	27.62		27.62
2734	03/08/2018	06:50:24	30.2	29.92	27.61		27.61
2735	03/08/2018	06:50:54	30.18	29.89	27.59		27.59
2736	03/08/2018	06:51:24	30.16	29.88	27.58		27.58
2737	03/08/2018	06:51:54	30.14	29.85	27.56		27.56
2738	03/08/2018	06:52:24	30.12	29.83	27.54		27.54
2739	03/08/2018	06:52:54	30.09	29.8	27.52		27.52
2740	03/08/2018	06:53:24	30.07	29.78	27.5		27.5
2741	03/08/2018	06:53:54	30.06	29.77	27.5		27.5
2742	03/08/2018	06:54:24	30.04	29.75	27.48		27.48
2743	03/08/2018	06:54:54	30.01	29.72	27.46		27.46
2744	03/08/2018	06:55:24	29.99	29.7	27.45		27.45
2745	03/08/2018	06:55:54	29.97	29.68	27.43		27.43
2746	03/08/2018	06:56:24	29.95	29.65	27.41		27.41
2747	03/08/2018	06:56:54	29.93	29.63	27.39		27.39
2748	03/08/2018	06:57:24	29.91	29.61	27.38		27.38
2749	03/08/2018	06:57:54	29.88	29.58	27.36		27.36
2750	03/08/2018	06:58:24	29.87	29.57	27.34		27.34
2751	03/08/2018	06:58:54	29.85	29.55	27.33		27.33
2752	03/08/2018	06:59:24	29.83	29.53	27.32		27.32

Comments	Appendix 1 - 1°C /min heating rate					
UserDefined						
Long Name	Date	Time	Furnace temp 1	Case temp	Seal temp	Furnace control temp
Units	--	h:m:s	°C	°C	°C	°C
2753	03/08/2018	06:59:54	29.79	29.49	27.29	27.29
2754	03/08/2018	07:00:24	29.77	29.47	27.26	27.26
2755	03/08/2018	07:00:54	29.75	29.45	27.25	27.25
2756	03/08/2018	07:01:24	29.73	29.43	27.23	27.23
2757	03/08/2018	07:01:54	29.72	29.42	27.23	27.23
2758	03/08/2018	07:02:24	29.7	29.39	27.21	27.21
2759	03/08/2018	07:02:54	29.68	29.37	27.19	27.19
2760	03/08/2018	07:03:24	29.66	29.35	27.18	27.18

Comments	Appendix 2 - 2°C /min heating rate							
F(x)=	Warm-up							
Long Name	Time	Furnace Te	Seal Temp	Case Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	°C	V	V	
65	13/04/2021 08:45:34	42.94724	26.27159	27.72124	45.76795	0.70377	0.7035	
66	13/04/2021 08:46:04	44.03139	26.70585	28.25851	46.84122	0.70465	0.7044	
67	13/04/2021 08:46:35	45.06044	27.1541	28.8245	47.7905	0.70548	0.7053	
68	13/04/2021 08:47:06	46.06829	27.61762	29.39105	48.77297	0.70649	0.7063	
69	13/04/2021 08:47:36	47.06099	28.06946	29.95326	49.78381	0.70745	0.7072	
70	13/04/2021 08:48:06	48.04653	28.54346	30.54696	50.78366	0.7085	0.7083	
71	13/04/2021 08:48:37	49.06863	29.00306	31.13686	51.84051	0.70965	0.7094	
72	13/04/2021 08:49:07	50.13303	29.49887	31.77356	52.8607	0.71087	0.7106	
73	13/04/2021 08:49:38	51.1574	30.02445	32.38532	53.90311	0.71214	0.7119	
74	13/04/2021 08:50:08	52.14153	30.48629	32.98196	54.90168	0.71341	0.7131	
75	13/04/2021 08:50:39	53.23792	31.00317	33.67008	55.95116	0.71483	0.7146	
76	13/04/2021 08:51:09	54.31984	31.52004	34.29989	57.03669	0.71634	0.7161	
77	13/04/2021 08:51:40	55.39407	32.05463	35.00571	58.04236	0.71786	0.7177	
78	13/04/2021 08:52:11	56.44341	32.62238	35.67913	59.09531	0.71952	0.7192	
79	13/04/2021 08:52:42	57.46011	33.12439	36.39245	60.12943	0.72125	0.7211	
80	13/04/2021 08:53:13	58.49477	33.68824	37.04374	61.16269	0.72313	0.7228	
81	13/04/2021 08:53:43	59.52539	34.24804	37.79663	62.19912	0.725	0.7249	
82	13/04/2021 08:54:13	60.58568	34.80421	38.54225	63.27507	0.72693	0.7268	
83	13/04/2021 08:54:44	61.64033	35.32055	39.27718	64.27586	0.72911	0.7289	
84	13/04/2021 08:55:14	62.61557	35.87654	39.93884	65.18648	0.73136	0.7311	
85	13/04/2021 08:55:44	63.66267	36.45079	40.69187	66.2623	0.73357	0.7335	
86	13/04/2021 08:56:14	64.72794	37.06171	41.46296	67.32038	0.73602	0.7358	
87	13/04/2021 08:56:45	65.7532	37.6903	42.17189	68.33486	0.73848	0.7383	
88	13/04/2021 08:57:16	66.7753	38.27199	43.00454	69.40725	0.74119	0.7411	
89	13/04/2021 08:57:46	67.77168	38.83486	43.71695	70.42415	0.74389	0.7438	
90	13/04/2021 08:58:16	68.80055	39.44526	44.48753	71.45053	0.74674	0.7466	
91	13/04/2021 08:58:47	69.86889	40.06988	45.34873	72.50556	0.74982	0.7497	
92	13/04/2021 08:59:18	70.93869	40.68467	46.10855	73.54281	0.75305	0.7529	
93	13/04/2021 08:59:49	71.97235	41.26321	46.98801	74.59797	0.75632	0.7563	
94	13/04/2021 09:00:20	72.99887	41.93604	47.76235	75.66389	0.75978	0.7598	
95	13/04/2021 09:00:51	74.08975	42.55436	48.59459	76.74045	0.76345	0.7634	
96	13/04/2021 09:01:22	75.14134	43.19816	49.43055	77.79919	0.76721	0.7671	
97	13/04/2021 09:01:52	76.12429	43.8559	50.18528	78.76782	0.77101	0.771	
98	13/04/2021 09:02:23	77.14682	44.52469	51.06009	79.83333	0.77503	0.7751	
99	13/04/2021 09:02:53	78.20493	45.13884	51.94548	80.83254	0.77915	0.7791	
100	13/04/2021 09:03:23	79.24139	45.66221	52.82351	81.96845	0.78336	0.7834	
101	13/04/2021 09:03:53	80.35751	46.32333	53.66543	83.07562	0.78769	0.7878	
102	13/04/2021 09:04:24	81.35378	47.00299	54.47891	84.00008	0.79238	0.7924	
103	13/04/2021 09:04:55	82.29231	47.5736	55.35344	84.9458	0.79722	0.7973	
104	13/04/2021 09:05:26	83.35679	48.26412	56.27152	86.02823	0.80222	0.8023	
105	13/04/2021 09:05:56	84.47118	48.90715	57.15679	87.21802	0.80736	0.8073	
106	13/04/2021 09:06:27	85.53513	49.56089	58.03827	88.29992	0.81252	0.8126	
107	13/04/2021 09:06:58	86.635	50.3038	58.84401	89.42133	0.81795	0.8181	
108	13/04/2021 09:07:29	87.73486	51.059	59.77961	90.55125	0.82365	0.8237	
109	13/04/2021 09:07:59	88.78763	51.57928	60.75804	91.52377	0.82929	0.8294	
110	13/04/2021 09:08:29	89.75411	52.27984	61.56294	92.4566	0.83499	0.8351	
111	13/04/2021 09:09:00	90.70084	53.03102	62.51877	93.45792	0.84112	0.8412	
112	13/04/2021 09:09:31	91.70219	53.70285	63.38484	94.50246	0.84734	0.8475	
113	13/04/2021 09:10:02	92.7935	54.46486	64.34066	95.61896	0.85366	0.8539	
114	13/04/2021 09:10:32	93.85923	54.98836	65.12017	96.68469	0.86006	0.8603	
115	13/04/2021 09:11:02	94.9468	55.72138	66.26617	97.79386	0.8667	0.8669	
116	13/04/2021 09:11:33	96.03026	56.35284	67.0454	98.81612	0.87329	0.8735	
117	13/04/2021 09:12:03	97.04834	57.01981	67.96767	99.8486	0.88009	0.8803	
118	13/04/2021 09:12:34	98.11326	57.69042	68.9223	100.93739	0.88723	0.8874	
119	13/04/2021 09:13:04	99.13874	58.36478	69.78732	101.99782	0.89423	0.8944	
120	13/04/2021 09:13:35	100.18275	59.06451	70.71535	103.08721	0.90163	0.9019	
121	13/04/2021 09:14:06	101.28299	59.80394	71.70734	104.14054	0.90924	0.9094	
122	13/04/2021 09:14:37	102.33659	60.44409	72.65664	105.17249	0.9169	0.9173	
123	13/04/2021 09:15:08	103.39739	61.16944	73.60591	106.24051	0.92477	0.9251	
124	13/04/2021 09:15:38	104.42896	61.98418	74.54765	107.25044	0.93256	0.9329	
125	13/04/2021 09:16:08	105.48573	62.58704	75.57173	108.33968	0.94071	0.9409	
126	13/04/2021 09:16:39	106.50978	63.28299	76.41288	109.40703	0.94876	0.949	
127	13/04/2021 09:17:10	107.6314	63.97192	77.46193	110.50584	0.95721	0.9574	
128	13/04/2021 09:17:41	108.68823	64.76153	78.41084	111.57506	0.96581	0.9661	

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Warm-up						
Long Name	Time	Furnace Te	Seal Temp	Case Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	°C	V	V
129	13/04/2021 09:18:12	109.74823	65.53278	79.45245	112.67648	0.97448	0.975
130	13/04/2021 09:18:43	110.83083	66.283	80.39885	113.76756	0.98335	0.9837
131	13/04/2021 09:19:14	111.92165	66.89652	81.34988	114.81487	0.99223	0.9926
132	13/04/2021 09:19:45	112.99085	67.71483	82.30824	115.89857	1.00113	1.0016
133	13/04/2021 09:20:16	114.06702	68.37847	83.27349	116.99285	1.01001	1.0105
134	13/04/2021 09:20:47	115.13596	69.20373	84.3465	118.05817	1.01888	1.0194
135	13/04/2021 09:21:17	116.20122	69.75604	85.30096	119.13433	1.02772	1.028
136	13/04/2021 09:21:48	117.25874	70.66173	86.27288	120.17498	1.03624	1.0366
137	13/04/2021 09:22:19	118.35638	71.345	87.16605	121.28436	1.04493	1.0453
138	13/04/2021 09:22:49	119.36692	72.00309	88.27097	122.31693	1.05347	1.0538
139	13/04/2021 09:23:20	120.39875	72.81547	89.33665	123.35708	1.06199	1.0622
140	13/04/2021 09:23:51	121.38758	73.60261	90.19438	124.28747	1.07047	1.0708
141	13/04/2021 09:24:21	122.41998	74.17456	91.2442	125.3929	1.07858	1.079
142	13/04/2021 09:24:51	123.61296	74.97923	92.17874	126.6918	1.08665	1.087
143	13/04/2021 09:25:22	124.78783	75.67302	93.21781	127.79728	1.09508	1.0954
144	13/04/2021 09:25:53	125.88219	76.59229	94.24231	128.8259	1.10343	1.1038
145	13/04/2021 09:26:23	126.91798	77.17474	95.19109	129.68637	1.11179	1.112
146	13/04/2021 09:26:54	127.90601	77.97544	96.25482	130.70171	1.11978	1.1201
147	13/04/2021 09:27:24	128.9303	78.60033	97.14907	131.83836	1.12778	1.1281
148	13/04/2021 09:27:55	130.08658	79.39027	98.25597	132.99358	1.13607	1.1364
149	13/04/2021 09:28:26	131.14294	79.87933	99.17572	134.10854	1.14449	1.1448
150	13/04/2021 09:28:56	132.17693	80.71716	100.28649	135.1718	1.15267	1.1531
151	13/04/2021 09:29:26	133.29837	81.50459	101.22566	136.27129	1.16111	1.1616
152	13/04/2021 09:29:57	134.3869	82.19872	102.29118	137.3232	1.16982	1.1703
153	13/04/2021 09:30:27	135.43454	82.99277	103.16124	138.39648	1.17694	1.1772
154	13/04/2021 09:30:58	136.6142	83.58953	104.00984	139.5029	1.1792	1.1794
155	13/04/2021 09:31:29	137.67651	84.13946	104.44336	140.53755	1.17918	1.1794
156	13/04/2021 09:32:00	138.68407	84.42024	104.61005	141.43309	1.1786	1.1788
157	13/04/2021 09:32:30	139.62585	84.97762	104.91036	142.27701	1.18073	1.1809
158	13/04/2021 09:33:01	140.6431	85.76798	105.54578	143.25357	1.18663	1.1869
159	13/04/2021 09:33:32	141.57166	86.20289	106.03333	144.19692	1.19101	1.1913
160	13/04/2021 09:34:02	142.58098	86.77728	106.6646	145.12489	1.19516	1.1955
161	13/04/2021 09:34:33	143.65271	87.55951	107.34599	146.18922	1.20552	1.206
162	13/04/2021 09:35:04	144.70969	88.15865	108.43511	147.28319	1.21772	1.2182
163	13/04/2021 09:35:34	145.75188	88.92654	109.72269	148.35127	1.22932	1.2299
164	13/04/2021 09:36:04	146.81993	89.79137	110.70695	149.4563	1.24157	1.2419
165	13/04/2021 09:36:35	147.9032	90.67619	112.03381	150.56316	1.25339	1.254
166	13/04/2021 09:37:06	148.9717	91.31315	113.11775	151.64542	1.26608	1.2667
167	13/04/2021 09:37:37	150.02162	92.06879	114.29946	152.72385	1.27881	1.2795
168	13/04/2021 09:38:07	151.0925	92.82067	115.28888	153.75766	1.29151	1.2922
169	13/04/2021 09:38:38	152.16649	93.66198	116.53152	154.84277	1.30446	1.3051
170	13/04/2021 09:39:08	153.2106	94.68301	117.67966	155.89058	1.31741	1.3181
171	13/04/2021 09:39:38	154.28815	95.3622	118.82787	156.93478	1.33041	1.3311
172	13/04/2021 09:40:09	155.30974	96.15981	119.80534	158.00456	1.34386	1.3445
173	13/04/2021 09:40:40	156.41711	96.94715	120.92786	159.07858	1.35707	1.3578
174	13/04/2021 09:41:10	157.47615	97.52198	121.94942	160.15282	1.36991	1.3707
175	13/04/2021 09:41:41	158.53508	98.45663	123.09139	161.24782	1.38441	1.3852
176	13/04/2021 09:42:12	159.59827	99.24425	124.25215	162.35454	1.39946	1.4004
177	13/04/2021 09:42:42	160.64421	99.80841	125.29576	163.39778	1.41459	1.4156
178	13/04/2021 09:43:13	161.77281	100.91819	126.55838	164.47435	1.43062	1.4315
179	13/04/2021 09:43:44	162.85667	101.46543	127.60174	165.61395	1.44731	1.4482
180	13/04/2021 09:44:14	163.95123	102.53178	128.69942	166.74567	1.46392	1.465
181	13/04/2021 09:44:45	165.00879	103.23029	130.03476	167.74376	1.48185	1.483
182	13/04/2021 09:45:15	166.06624	103.99361	130.90454	168.76035	1.49988	1.5009
183	13/04/2021 09:45:46	167.10507	104.90847	132.10014	169.76202	1.51901	1.5202
184	13/04/2021 09:46:16	168.17064	105.83122	133.30008	170.86534	1.53856	1.5394
185	13/04/2021 09:46:47	169.22157	106.56659	134.34653	171.89914	1.55775	1.559
186	13/04/2021 09:47:17	170.24348	107.47826	135.50961	172.95482	1.57768	1.5785
187	13/04/2021 09:47:48	171.25449	107.90656	136.70212	173.92848	1.59761	1.5985
188	13/04/2021 09:48:18	172.2767	108.71372	137.67857	175.08514	1.61676	1.6176
189	13/04/2021 09:48:48	173.43041	109.54329	138.72542	176.25005	1.63572	1.6367
190	13/04/2021 09:49:19	174.54573	110.196	139.69434	177.30936	1.65462	1.6556
191	13/04/2021 09:49:50	175.61633	111.11933	140.93617	178.32022	1.67272	1.6736
192	13/04/2021 09:50:20	176.61224	112.22031	141.9185	179.32733	1.68939	1.6902

Comments	Appendix 2 - 2°C /min heating rate							
F(x)=	Warm-up							
Long Name	Time	Furnace Te	Seal Temp	Case Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	°C	V	V	
257	13/04/2021 10:23:31	244.47803	166.18306	215.14235	247.90234	2.0854	2.0862	
258	13/04/2021 10:24:02	245.44063	166.85297	215.94605	248.85764	2.08728	2.0881	
259	13/04/2021 10:24:33	246.45094	168.08025	216.77571	249.92297	2.08833	2.0892	
260	13/04/2021 10:25:04	247.54977	167.62834	217.62067	251.00949	2.08895	2.0898	
261	13/04/2021 10:25:35	248.48358	169.60312	218.56241	251.88759	2.08946	2.0903	
262	13/04/2021 10:26:06	249.43164	169.55969	219.41083	252.84563	2.08985	2.0906	
263	13/04/2021 10:26:37	250.49106	170.257	220.23573	253.94606	2.09023	2.0909	
264	13/04/2021 10:27:08	251.45975	170.96747	221.09813	254.90747	2.09049	2.0912	
265	13/04/2021 10:27:39	252.3703	171.29729	221.898	255.76323	2.09071	2.0914	
266	13/04/2021 10:28:09	253.41174	172.70955	222.91165	256.96173	2.09092	2.0917	
267	13/04/2021 10:28:40	254.51921	172.82617	223.77036	258.03998	2.09109	2.0918	
268	13/04/2021 10:29:11	255.48428	174.62341	224.70671	258.91739	2.09122	2.0918	
269	13/04/2021 10:29:42	256.44931	174.90437	225.50624	259.86417	2.09133	2.092	
270	13/04/2021 10:30:13	257.37051	175.45052	226.44258	260.78882	2.09145	2.0922	
271	13/04/2021 10:30:44	258.29923	176.06776	227.29036	261.69116	2.09148	2.0922	
272	13/04/2021 10:31:14	259.35919	176.66615	228.22669	262.82233	2.09149	2.0922	
273	13/04/2021 10:31:45	260.30072	177.1561	228.978	263.72073	2.09153	2.0922	
274	13/04/2021 10:32:15	261.37363	177.68343	229.88095	264.78272	2.09151	2.0922	
275	13/04/2021 10:32:46	262.44632	178.33011	230.77074	265.86997	2.09146	2.0922	
276	13/04/2021 10:33:17	263.45013	179.88445	231.72675	266.90653	2.09139	2.0922	
277	13/04/2021 10:33:48	264.47934	180.96819	232.61635	267.96478	2.09138	2.092	
278	13/04/2021 10:34:19	265.39597	181.60007	233.32892	268.7796	2.09129	2.092	
279	13/04/2021 10:34:50	266.27985	181.7614	234.2296	269.61258	2.09122	2.0918	
280	13/04/2021 10:35:21	267.34137	182.7887	235.03029	270.74866	2.09112	2.0918	
281	13/04/2021 10:35:51	268.24289	183.68146	235.88619	271.60806	2.09101	2.0917	
282	13/04/2021 10:36:21	269.21744	184.358	236.63918	272.50778	2.09092	2.0915	
283	13/04/2021 10:36:52	270.18033	185.00053	237.38811	273.49048	2.09078	2.0915	
284	13/04/2021 10:37:22	271.18823	185.14246	238.05202	274.48026	2.09068	2.0914	
285	13/04/2021 10:37:53	272.24329	186.03874	238.73436	275.53894	2.0905	2.0912	
286	13/04/2021 10:38:24	273.22571	186.498	239.49405	276.4996	2.09033	2.0911	
287	13/04/2021 10:38:54	274.14966	187.16217	240.17131	277.37643	2.09016	2.0909	
288	13/04/2021 10:39:25	275.10642	188.12531	240.90862	278.32233	2.08999	2.0907	
289	13/04/2021 10:39:56	276.07388	189.47665	241.7852	279.28616	2.08976	2.0906	
290	13/04/2021 10:40:27	277.05603	189.64056	242.52254	280.2309	2.08957	2.0903	
291	13/04/2021 10:40:57	277.98709	190.4129	243.34396	281.18274	2.08933	2.0901	
292	13/04/2021 10:41:27	278.98343	190.93129	244.2645	282.17062	2.08904	2.0898	
293	13/04/2021 10:41:58	279.89972	191.93864	245.18471	283.09329	2.08877	2.0896	
294	13/04/2021 10:42:28	280.85178	192.27753	246.04627	284.05209	2.08846	2.0893	
295	13/04/2021 10:42:59	281.90436	193.33714	247.09129	285.07221	2.08813	2.0889	
296	13/04/2021 10:43:29	282.83777	194.50124	248.13622	286.05252	2.08777	2.0886	
297	13/04/2021 10:43:59	283.80707	194.95931	249.06722	287.01462	2.0874	2.0882	
298	13/04/2021 10:44:30	284.81952	195.62634	250.23906	288.01624	2.08697	2.0878	
299	13/04/2021 10:45:01	285.87543	196.49152	251.32619	289.07217	2.0866	2.0873	
300	13/04/2021 10:45:32	286.89871	197.50584	252.48616	290.10599	2.08608	2.0868	
301	13/04/2021 10:46:02	287.88193	197.97832	253.51428	291.10123	2.08562	2.0864	
302	13/04/2021 10:46:32	288.90857	198.84305	254.72881	292.13977	2.08515	2.0859	
303	13/04/2021 10:47:03	289.8812	200.39682	255.896	293.15326	2.08471	2.0854	
304	13/04/2021 10:47:34	290.95255	200.83002	257.07047	294.22794	2.08431	2.0851	
305	13/04/2021 10:48:05	291.98749	202.12146	258.28131	295.26285	2.08384	2.0846	
306	13/04/2021 10:48:35	292.98657	202.13104	259.15634	296.21515	2.08346	2.0842	
307	13/04/2021 10:49:05	293.96063	203.33734	260.05676	297.13519	2.0831	2.0839	
308	13/04/2021 10:49:36	294.94562	203.84142	260.52799	298.05182	2.08287	2.0837	
309	13/04/2021 10:50:06	295.87213	204.28148	260.93295	298.92438	2.08266	2.0835	
310	13/04/2021 10:50:36	296.80634	205.25713	261.2475	299.82254	2.08257	2.0834	
311	13/04/2021 10:51:07	297.7088	205.71689	261.48276	300.65506	2.08249	2.0832	
312	13/04/2021 10:51:37	298.61789	206.03859	261.71744	301.50449	2.08242	2.0832	
313	13/04/2021 10:52:08	299.50223	206.20841	261.88715	302.31851	2.08238	2.0832	
314	13/04/2021 10:52:38	300.35675	206.68279	262.09671	303.11435	2.08236	2.0832	
315	13/04/2021 10:53:09	301.24252	207.19072	262.31	303.97861	2.08233	2.0831	
316	13/04/2021 10:53:39	302.08496	207.60922	262.51941	304.77795	2.08229	2.0831	
317	13/04/2021 10:54:10	302.95639	208.23607	262.70367	305.59552	2.08226	2.0831	
318	13/04/2021 10:54:41	303.85599	208.86237	262.94913	306.46997	2.08222	2.0831	
319	13/04/2021 10:55:12	304.75571	209.36246	263.16928	307.31943	2.08223	2.0829	
320	13/04/2021 10:55:42	305.63751	209.76967	263.40762	308.14737	2.08219	2.0829	

Comments	Appendix 2 - 2°C /min heating rate							
F(x)=	Warm-up							
Long Name	Time	Furnace Te	Seal Temp	Case Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	°C	V	V	
321	13/04/2021 10:56:12	306.49442	210.34062	263.66077	308.95761	2.08215	2.0829	
322	13/04/2021 10:56:43	307.37219	210.87372	263.89505	309.77435	2.08215	2.0829	
323	13/04/2021 10:57:14	308.26074	211.36597	264.14752	310.59683	2.08212	2.0829	
324	13/04/2021 10:57:45	309.16022	211.91036	264.40378	311.44397	2.08209	2.0829	
325	13/04/2021 10:58:15	310.02814	212.25496	264.66812	312.24182	2.0821	2.0829	
326	13/04/2021 10:58:46	310.9082	212.87811	264.965	313.0932	2.08203	2.0828	
327	13/04/2021 10:59:17	311.79916	213.47913	265.2403	313.92688	2.08204	2.0828	
328	13/04/2021 10:59:48	312.70117	214.04324	265.53397	314.73575	2.08196	2.0828	
329	13/04/2021 11:00:19	313.59268	214.48872	265.83521	315.56278	2.08191	2.0828	
330	13/04/2021 11:00:49	314.44412	215.16765	266.16486	316.3605	2.08181	2.0826	
331	13/04/2021 11:01:19	315.35294	215.66455	266.53455	317.21918	2.08179	2.0826	
332	13/04/2021 11:01:50	316.30801	216.4212	266.94025	318.19211	2.0817	2.0825	
333	13/04/2021 11:02:21	317.17731	216.92917	267.32797	318.88236	2.08162	2.0825	
334	13/04/2021 11:02:52	317.99951	217.75983	267.80969	319.66516	2.08158	2.0823	
335	13/04/2021 11:03:23	318.87936	218.21922	268.33533	320.52225	2.08146	2.0821	
336	13/04/2021 11:03:54	319.81702	219.00244	268.97052	321.45407	2.08134	2.0821	
337	13/04/2021 11:04:25	320.76398	219.54825	269.66061	322.37558	2.08114	2.082	
338	13/04/2021 11:04:56	321.7178	220.3378	270.45517	323.28656	2.08102	2.0818	
339	13/04/2021 11:05:27	322.68472	220.98332	271.35278	324.18558	2.08087	2.0817	
340	13/04/2021 11:05:57	323.62235	221.7612	272.3476	325.08743	2.08057	2.0814	
341	13/04/2021 11:06:27	324.59638	222.7617	273.44464	326.03647	2.08025	2.081	
342	13/04/2021 11:06:58	325.55997	223.58868	274.62897	326.96433	2.07982	2.0806	
343	13/04/2021 11:07:29	326.58484	224.41992	275.95523	328.07495	2.07937	2.0801	
344	13/04/2021 11:08:00	327.56659	225.21393	277.35013	329.06741	2.07908	2.0798	
345	13/04/2021 11:08:31	328.60205	226.28909	278.95544	330.12436	2.07889	2.0796	
346	13/04/2021 11:09:01	329.63397	227.15346	280.69873	331.22769	2.07869	2.0795	
347	13/04/2021 11:09:32	330.72345	228.31776	282.625	332.38507	2.07841	2.0792	
348	13/04/2021 11:10:03	331.81665	229.31213	284.55502	333.58908	2.07815	2.079	
349	13/04/2021 11:10:34	332.94885	230.26486	286.43063	334.81061	2.07783	2.0787	
350	13/04/2021 11:11:04	334.02396	231.38191	288.20886	335.94647	2.07757	2.0784	
351	13/04/2021 11:11:34	335.08829	232.42149	289.99429	337.02506	2.07725	2.0781	
352	13/04/2021 11:12:05	336.01654	233.56032	291.65994	337.95691	2.07693	2.0778	
353	13/04/2021 11:12:36	337.20526	234.61765	293.44397	339.36359	2.07655	2.0773	
354	13/04/2021 11:13:07	338.4436	235.68558	295.17719	340.72711	2.07623	2.077	
355	13/04/2021 11:13:38	339.67453	236.88974	296.88135	341.99124	2.0759	2.0767	
356	13/04/2021 11:14:09	340.79041	238.07126	298.52744	343.1127	2.07557	2.0764	
357	13/04/2021 11:14:40	341.84052	239.18617	300.15137	344.1984	2.07523	2.076	
358	13/04/2021 11:15:11	342.90509	240.22281	301.73966	345.31632	2.07489	2.0757	
359	13/04/2021 11:15:42	343.93497	241.25259	303.30008	346.38528	2.0746	2.0754	
360	13/04/2021 11:16:13	344.91922	242.20963	304.80731	347.42645	2.07432	2.0751	
361	13/04/2021 11:16:43	346.08917	243.22252	306.35117	348.76355	2.07398	2.0748	
362	13/04/2021 11:17:14	347.20477	244.36652	307.82581	349.9325	2.07374	2.0745	
363	13/04/2021 11:17:44	348.2821	245.23242	309.25104	351.04291	2.07339	2.0742	
364	13/04/2021 11:18:15	349.38797	246.32236	310.71777	352.20648	2.07312	2.0739	
365	13/04/2021 11:18:45	350.4317	247.50697	312.10678	353.30194	2.07274	2.0735	
366	13/04/2021 11:19:16	351.51325	248.55614	313.57123	354.43674	2.07246	2.0732	
367	13/04/2021 11:19:47	352.56006	249.6133	314.95407	355.51898	2.07217	2.0729	
368	13/04/2021 11:20:18	353.36801	250.64049	316.23901	356.17438	2.0719	2.0726	
369	13/04/2021 11:20:49	353.78912	251.75697	317.44507	356.3649	2.07165	2.0724	
370	13/04/2021 11:21:19	353.98032	252.65503	318.46198	356.32193	2.07134	2.0721	
371	13/04/2021 11:21:50	354.09332	253.38855	319.4393	356.32846	2.07109	2.0718	
372	13/04/2021 11:22:21	354.17709	254.21988	320.34689	356.31293	2.07082	2.0717	
373	13/04/2021 11:22:52	354.23959	254.83202	321.26392	356.32575	2.07058	2.0714	
374	13/04/2021 11:23:22	354.25937	255.29065	322.04141	356.30295	2.0704	2.0712	
375	13/04/2021 11:23:53	354.30045	255.83698	322.81174	356.3476	2.0702	2.071	
376	13/04/2021 11:24:24	354.31986	256.29886	323.54599	356.39536	2.07007	2.0709	
377	13/04/2021 11:24:55	354.3858	256.63699	324.25201	356.48969	2.0699	2.0707	
378	13/04/2021 11:25:25	354.42642	257.16821	324.89688	356.55872	2.06967	2.0706	
379	13/04/2021 11:25:56	354.48511	257.68515	325.55631	356.63867	2.0696	2.0704	
380	13/04/2021 11:26:26	354.5191	258.03424	326.14795	356.70459	2.06943	2.0703	
381	13/04/2021 11:26:57	354.52512	258.36551	326.67935	356.74255	2.0693	2.0701	
382	13/04/2021 11:27:28	354.54202	258.64584	327.2074	356.78073	2.06917	2.0699	
383	13/04/2021 11:27:59	354.5614	258.8667	327.69147	356.81433	2.06908	2.0698	
384	13/04/2021 11:28:29	354.55609	259.18262	328.13278	356.83029	2.06897	2.0698	

Comments	Appendix 2 - 2°C /min heating rate							
F(x)=	Warm-up							
Long Name	Time	Furnace Te	Seal Temp	Case Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	°C	V	V	
385	13/04/2021 11:29:00	354.55475	259.45148	328.58524	356.86087	2.06883	2.0696	
386	13/04/2021 11:29:31	354.55283	259.86224	328.98712	356.86957	2.06873	2.0695	
387	13/04/2021 11:30:02	354.55765	260.13675	329.36002	356.92053	2.06864	2.0695	
388	13/04/2021 11:30:33	354.54849	260.41815	329.7403	356.93976	2.06854	2.0693	
389	13/04/2021 11:31:04	354.53937	260.68863	330.0849	356.9484	2.06846	2.0693	
390	13/04/2021 11:31:34	354.50562	260.90122	330.40466	356.94656	2.06838	2.0692	
391	13/04/2021 11:32:05	354.47888	261.13187	330.70288	356.94467	2.06831	2.0692	
392	13/04/2021 11:32:36	354.44614	261.40366	330.98798	356.94742	2.06822	2.069	
393	13/04/2021 11:33:07	354.42322	261.56549	331.23648	356.94577	2.06815	2.069	
394	13/04/2021 11:33:38	354.40414	261.62955	331.48526	356.95865	2.06816	2.0688	
395	13/04/2021 11:34:08	354.36713	261.7843	331.67313	356.95001	2.06807	2.0688	
396	13/04/2021 11:34:39	354.35147	261.99716	331.90033	356.94141	2.06796	2.0688	
397	13/04/2021 11:35:10	354.32474	262.29691	332.11636	356.94309	2.06793	2.0687	
398	13/04/2021 11:35:41	354.25909	262.47318	332.28256	356.87744	2.0679	2.0687	
399	13/04/2021 11:36:11	354.2319	262.66339	332.45529	356.88217	2.06785	2.0687	
400	13/04/2021 11:36:41	354.21207	262.84656	332.63535	356.8765	2.06784	2.0687	
401	13/04/2021 11:37:12	354.19254	262.97922	332.79794	356.89246	2.06777	2.0685	
402	13/04/2021 11:37:43	354.17288	263.2644	332.94614	356.87994	2.06776	2.0685	
403	13/04/2021 11:38:14	354.11758	263.43308	333.09058	356.84946	2.06771	2.0685	
404	13/04/2021 11:38:45	354.06943	263.60184	333.24213	356.81906	2.06768	2.0685	
405	13/04/2021 11:39:16	354.03519	263.61398	333.35062	356.80963	2.06768	2.0685	
406	13/04/2021 11:39:47	353.99783	263.69928	333.42731	356.7652	2.06763	2.0684	
407	13/04/2021 11:40:18	353.94611	263.69351	333.49316	356.69574	2.06758	2.0684	
408	13/04/2021 11:40:49	353.90131	263.86572	333.61243	356.67221	2.06757	2.0684	
409	13/04/2021 11:41:20	353.86002	263.94699	333.67444	356.63803	2.06756	2.0684	
410	13/04/2021 11:41:51	353.81879	264.06467	333.74371	356.61099	2.06754	2.0684	
411	13/04/2021 11:42:22	353.78833	264.24429	333.81311	356.58765	2.06752	2.0684	
412	13/04/2021 11:42:53	353.73373	264.30466	333.88678	356.52954	2.06747	2.0684	
413	13/04/2021 11:43:24	353.67209	264.47412	333.95688	356.49976	2.06749	2.0682	
414	13/04/2021 11:43:55	353.6174	264.51257	334.009	356.4628	2.06746	2.0682	
415	13/04/2021 11:44:26	353.57712	264.65305	334.08279	356.43671	2.06748	2.0682	
416	13/04/2021 11:44:57	353.53592	264.64356	334.1199	356.41684	2.06745	2.0682	
417	13/04/2021 11:45:27	353.49118	264.60858	334.12488	356.36142	2.06741	2.0682	
418	13/04/2021 11:45:58	353.44681	264.61038	334.17661	356.3277	2.06741	2.0682	
419	13/04/2021 11:46:29	353.3913	264.68073	334.17075	356.28281	2.06741	2.0682	
420	13/04/2021 11:47:00	353.36456	264.72238	334.21173	356.25253	2.0674	2.0682	
421	13/04/2021 11:47:31	353.29868	264.88025	334.22757	356.1973	2.06741	2.0682	
422	13/04/2021 11:48:02	353.23654	264.90744	334.23642	356.16711	2.06738	2.0682	
423	13/04/2021 11:48:32	353.28775	264.98172	334.29517	356.28217	2.06738	2.0682	
424	13/04/2021 11:49:03	353.32813	265.03037	334.33585	356.30835	2.06738	2.0682	
425	13/04/2021 11:49:34	353.20599	265.18875	334.31647	356.08334	2.06738	2.0682	
426	13/04/2021 11:50:05	353.0694	265.21964	334.3075	355.96094	2.06737	2.0682	
427	13/04/2021 11:50:35	353.01444	265.27234	334.32364	355.94498	2.06735	2.0682	
428	13/04/2021 11:51:06	352.93774	265.2374	334.32501	355.88959	2.06735	2.0682	
429	13/04/2021 11:51:36	352.8934	265.28287	334.32681	355.85236	2.06738	2.0682	
430	13/04/2021 11:52:07	352.83817	265.24442	334.30689	355.79712	2.06741	2.0682	
431	13/04/2021 11:52:37	352.78641	265.18778	334.2905	355.75244	2.06737	2.0682	
432	13/04/2021 11:53:08	352.73785	265.29071	334.28091	355.70392	2.06738	2.0682	
433	13/04/2021 11:53:39	352.71436	265.28845	334.27515	355.69107	2.06737	2.0682	
434	13/04/2021 11:54:09	352.6875	265.35904	334.26593	355.67838	2.06737	2.0682	
435	13/04/2021 11:54:40	352.64603	265.4256	334.26703	355.62982	2.06739	2.0682	
436	13/04/2021 11:55:10	352.62543	265.49896	334.25699	355.61984	2.06739	2.0682	
437	13/04/2021 11:55:41	352.59049	265.60858	334.26114	355.58847	2.06736	2.0682	
438	13/04/2021 11:56:11	352.54163	265.61301	334.25476	355.55023	2.06732	2.0682	
439	13/04/2021 11:56:41	352.48227	265.67581	334.23074	355.49091	2.06736	2.0682	
440	13/04/2021 11:57:12	352.41596	265.66965	334.2283	355.4317	2.06737	2.0682	
441	13/04/2021 11:57:43	352.43845	265.63092	334.22595	355.50031	2.0674	2.0682	
442	13/04/2021 11:58:14	352.33655	265.5556	334.16614	355.32388	2.0674	2.0682	
443	13/04/2021 11:58:45	352.20621	265.56744	334.10992	355.15454	2.0674	2.0682	
444	13/04/2021 11:59:15	352.16092	265.5683	334.10364	355.16245	2.06738	2.0682	
445	13/04/2021 11:59:46	352.2323	265.64871	334.11478	355.2977	2.06742	2.0682	
446	13/04/2021 12:00:17	352.21127	265.66348	334.0936	355.24829	2.06736	2.0682	
447	13/04/2021 12:00:48	352.20132	265.70056	334.09427	355.23123	2.06742	2.0682	
448	13/04/2021 12:01:19	352.17377	265.77045	334.05939	355.2001	2.0674	2.0682	

Comments	Appendix 2 - 2°C /min heating rate							
F(x)=	Warm-up							
Long Name	Time	Furnace Te	Seal Temp	Case Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	°C	V	V	
449	13/04/2021 12:01:49	352.1532	265.77481	334.06366	355.19019	2.06741	2.0682	
450	13/04/2021 12:02:20	352.11523	265.8486	334.04334	355.15576	2.06741	2.0682	
451	13/04/2021 12:02:51	352.08057	265.83127	334.02628	355.10693	2.0674	2.0682	
452	13/04/2021 12:03:21	352.03485	265.84622	334.0195	355.0683	2.06743	2.0682	
453	13/04/2021 12:03:52	351.9751	265.85403	333.99863	355.0192	2.06741	2.0682	
454	13/04/2021 12:04:23	351.94766	265.87683	333.97458	354.9953	2.06741	2.0682	
455	13/04/2021 12:04:54	351.92722	265.78684	333.9397	354.95712	2.06742	2.0682	
456	13/04/2021 12:05:25	351.86768	265.77673	333.90833	354.87985	2.06742	2.0682	
457	13/04/2021 12:05:56	351.82977	265.85059	333.88446	354.8526	2.06743	2.0682	
458	13/04/2021 12:06:26	351.8093	265.90228	333.87451	354.84274	2.06742	2.0682	
459	13/04/2021 12:06:57	351.78473	265.96799	333.84979	354.82172	2.06743	2.0682	
460	13/04/2021 12:07:28	351.70737	265.90689	333.82547	354.72662	2.06744	2.0682	
461	13/04/2021 12:07:59	351.68323	265.8967	333.80472	354.68118	2.06744	2.0682	
462	13/04/2021 12:08:30	351.65878	265.96982	333.79083	354.70642	2.06747	2.0682	
463	13/04/2021 12:09:01	351.61688	265.92691	333.76651	354.65033	2.06746	2.0682	
464	13/04/2021 12:09:32	351.61374	265.90186	333.77048	354.70395	2.06748	2.0684	
465	13/04/2021 12:10:03	351.64368	265.93616	333.75058	354.7197	2.06746	2.0682	
466	13/04/2021 12:10:34	351.63025	265.87878	333.71924	354.68146	2.06748	2.0682	
467	13/04/2021 12:11:05	351.60303	265.87634	333.72394	354.63648	2.06745	2.0684	
468	13/04/2021 12:11:35	351.57513	265.95316	333.67798	354.6228	2.06752	2.0684	
469	13/04/2021 12:12:06	351.57227	266.01199	333.67868	354.62347	2.06751	2.0682	
470	13/04/2021 12:12:37	351.50913	266.08905	333.63654	354.54257	2.06748	2.0684	
471	13/04/2021 12:13:07	351.49545	266.11505	333.63345	354.50406	2.0675	2.0682	
472	13/04/2021 12:13:38	351.44992	266.21011	333.62692	354.46918	2.06748	2.0684	
473	13/04/2021 12:14:08	351.41821	266.18494	333.60931	354.44812	2.06751	2.0684	
474	13/04/2021 12:14:39	351.38724	266.50211	333.58167	354.41364	2.0675	2.0684	
475	13/04/2021 12:15:10	351.38306	266.11258	333.54169	354.42004	2.06751	2.0684	
476	13/04/2021 12:15:40	351.3638	266.05289	333.53302	354.3866	2.06752	2.0684	
477	13/04/2021 12:16:11	351.3125	266.04758	333.49564	354.32114	2.06752	2.0684	
478	13/04/2021 12:16:42	351.26898	266.0575	333.48758	354.27759	2.06752	2.0684	
479	13/04/2021 12:17:13	351.211	266.04898	333.45773	354.23026	2.06749	2.0684	
480	13/04/2021 12:17:44	351.18424	266.07245	333.42365	354.17514	2.06752	2.0684	
481	13/04/2021 12:18:15	351.11832	266.07034	333.37869	354.09854	2.06754	2.0684	
482								

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Cool-down						
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt	
Units	Time	°C	°C	°C	V	V	
1							
2	13/04/2021 12:25:36	350.88522	266.28586	353.8548	2.07169		0.0761
3	13/04/2021 12:26:06	350.87732	266.32504	353.83624	2.07117		0.0018
4	13/04/2021 12:26:36	350.51477	266.34976	353.14731	2.0708		0.0018
5	13/04/2021 12:27:07	349.68338	266.13129	351.9122	2.07055		0.0017
6	13/04/2021 12:27:38	348.52731	265.80389	350.41119	2.07041		0.0017
7	13/04/2021 12:28:09	347.20407	265.37842	348.81509	2.07034		0.0017
8	13/04/2021 12:28:39	345.81656	264.89447	347.2142	2.07025		0.0015
9	13/04/2021 12:29:10	344.32288	264.37842	345.56406	2.07016		0.0015
10	13/04/2021 12:29:40	342.86762	263.77799	343.98074	2.0702		0.0015
11	13/04/2021 12:30:11	341.32996	263.09699	342.33997	2.07016		0.0015
12	13/04/2021 12:30:41	339.83725	262.37921	340.76627	2.0702		0.0015
13	13/04/2021 12:31:12	338.27737	261.64676	339.15997	2.0703		0.0015
14	13/04/2021 12:31:42	336.72403	260.89188	337.55304	2.07035		0.0015
15	13/04/2021 12:32:13	335.22827	260.15564	336.03583	2.07046		0.0015
16	13/04/2021 12:32:44	333.69708	259.40591	334.46176	2.07054		0.0015
17	13/04/2021 12:33:15	332.15472	258.60379	332.90869	2.07066		0.0015
18	13/04/2021 12:33:46	330.6301	257.99149	331.38409	2.07079		0.0015
19	13/04/2021 12:34:17	329.17279	257.18866	329.8732	2.07098		0.0015
20	13/04/2021 12:34:48	327.68329	256.11548	328.37293	2.07114		0.0015
21	13/04/2021 12:35:19	326.23697	254.76515	326.89447	2.0713		0.0015
22	13/04/2021 12:35:50	324.74838	253.90111	325.42017	2.07147		0.0015
23	13/04/2021 12:36:21	323.28153	253.08485	323.97476	2.07165		0.0015
24	13/04/2021 12:36:51	321.85034	252.03845	322.54358	2.07191		0.0015
25	13/04/2021 12:37:22	320.43652	251.70374	321.1691	2.07205		0
26	13/04/2021 12:37:53	319.03876	250.23003	319.74085	2.07224		0
27	13/04/2021 12:38:23	317.67145	249.58989	318.38068	2.0724		0.0015
28	13/04/2021 12:38:53	316.31455	248.58124	317.03091	2.07262		0.0015
29	13/04/2021 12:39:24	314.92529	247.93222	315.65601	2.07287		0.0015
30	13/04/2021 12:39:55	313.56125	247.19519	314.29553	2.07306		0.0015
31	13/04/2021 12:40:26	312.20007	246.54556	312.9487	2.07331		0.0015
32	13/04/2021 12:40:56	310.92157	245.08145	311.64514	2.07351		0
33	13/04/2021 12:41:27	309.58115	244.14945	310.3093	2.07373		0
34	13/04/2021 12:41:57	308.22418	243.38268	308.97461	2.07395		0
35	13/04/2021 12:42:28	306.95322	242.55335	307.70371	2.07415	0.0015	
36	13/04/2021 12:42:58	305.67465	241.49599	306.42871	2.07435		0
37	13/04/2021 12:43:29	304.36023	240.55246	305.14658	2.07457		0
38	13/04/2021 12:44:00	303.07809	239.80621	303.86087	2.07482		0
39	13/04/2021 12:44:30	301.84195	238.86467	302.61035	2.07506		0
40	13/04/2021 12:45:01	300.56946	238.203	301.35584	2.07526		0
41	13/04/2021 12:45:32	299.33377	237.1308	300.09659	2.0755		0
42	13/04/2021 12:46:03	298.10086	236.09975	298.84232	2.07572		0
43	13/04/2021 12:46:34	296.8172	235.33017	297.55866	2.07594		0
44	13/04/2021 12:47:05	295.62329	234.54565	296.38995	2.07621		0
45	13/04/2021 12:47:36	294.40424	233.68739	295.13849	2.07643		0
46	13/04/2021 12:48:07	293.17908	232.95198	293.95651	2.07667		0
47	13/04/2021 12:48:37	292.02557	231.80681	292.77423	2.07693		0
48	13/04/2021 12:49:07	290.85709	230.93027	291.62732	2.07715		0
49	13/04/2021 12:49:38	289.67337	230.01683	290.448	2.07743		0
50	13/04/2021 12:50:08	288.53836	229.07556	289.27802	2.07765		0
51	13/04/2021 12:50:39	287.36035	228.52647	288.12524	2.07785		0
52	13/04/2021 12:51:10	286.2077	227.57076	286.95456	2.0781		0
53	13/04/2021 12:51:40	285.06494	226.481	285.81177	2.07829		0
54	13/04/2021 12:52:11	283.94464	225.70267	284.6951	2.07853		0
55	13/04/2021 12:52:41	282.84638	224.85075	283.586	2.07875		0
56	13/04/2021 12:53:12	281.71832	223.8981	282.45795	2.07902		0
57	13/04/2021 12:53:43	280.5936	223.11891	281.34045	2.07925		0
58	13/04/2021 12:54:14	279.48105	222.15511	280.20517	2.07945		0
59	13/04/2021 12:54:44	278.46378	221.90151	279.13089	2.07963		0
60	13/04/2021 12:55:15	277.3298	221.39212	278.03317	2.07975		0
61	13/04/2021 12:55:45	276.27252	219.95126	276.95413	2.07985		0
62	13/04/2021 12:56:16	275.17902	219.3656	275.86426	2.07994		0
63	13/04/2021 12:56:46	274.08881	218.71266	274.78128	2.08003		0
64	13/04/2021 12:57:17	273.10278	217.54598	273.72272	2.08012		0

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Cool-down						
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt	
Units	Time	°C	°C	°C	V	V	
65	13/04/2021 12:57:47	272.11676	216.78436	272.68234	2.08019		0
66	13/04/2021 12:58:18	271.0882	215.94563	271.62476	2.08034		0
67	13/04/2021 12:58:49	270.08081	215.65266	270.57752	2.0804		0
68	13/04/2021 12:59:20	269.03009	214.68219	269.51709	2.08055		0
69	13/04/2021 12:59:51	267.9686	213.70088	268.46286	2.08064		0
70	13/04/2021 13:00:21	266.98639	212.88994	267.46979	2.08074		0
71	13/04/2021 13:00:52	265.95087	211.95006	266.4306	2.08078		0
72	13/04/2021 13:01:23	264.92233	211.11023	265.41296	2.08093		0
73	13/04/2021 13:01:53	263.89667	210.35887	264.38007	2.08101		0
74	13/04/2021 13:02:24	262.91708	209.78459	263.40772	2.08109		0
75	13/04/2021 13:02:55	261.89789	209.03238	262.39941	2.08118		0
76	13/04/2021 13:03:26	260.88934	208.21672	261.40176	2.08127		0
77	13/04/2021 13:03:57	259.87766	207.2944	260.42703	2.0814		0
78	13/04/2021 13:04:28	258.8696	206.36168	259.42477	2.08146		0
79	13/04/2021 13:04:58	257.89783	205.64421	258.47488	2.08157		0
80	13/04/2021 13:05:29	256.91156	205.03461	257.49957	2.08163		0
81	13/04/2021 13:05:59	255.95944	204.32602	256.55844	2.08176		0
82	13/04/2021 13:06:29	255.02252	203.61798	255.62517	2.08185		0
83	13/04/2021 13:07:00	254.05914	202.79759	254.66179	2.08192		0
84	13/04/2021 13:07:31	253.10252	202.15872	253.71611	2.08203		0
85	13/04/2021 13:08:02	252.15012	201.30486	252.74907	2.0821		0
86	13/04/2021 13:08:33	251.1987	200.69357	251.79767	2.08217		0
87	13/04/2021 13:09:03	250.30278	200.02728	250.89444	2.08228		0
88	13/04/2021 13:09:34	249.36343	199.21944	249.9727	2.08236		0
89	13/04/2021 13:10:04	248.46692	198.61716	249.05782	2.08242		0
90	13/04/2021 13:10:34	247.56699	197.96663	248.1579	2.08253		0
91	13/04/2021 13:11:05	246.63796	197.17442	247.2289	2.08264		0
92	13/04/2021 13:11:36	245.731	196.47937	246.32558	2.08271		0
93	13/04/2021 13:12:06	244.85678	195.62715	245.45139	2.08278		0
94	13/04/2021 13:12:37	243.94251	194.97316	244.54808	2.08286		0
95	13/04/2021 13:13:08	243.05798	194.29346	243.66356	2.08299		0
96	13/04/2021 13:13:39	242.15932	193.42012	242.76489	2.08304		0
97	13/04/2021 13:14:10	241.27518	192.88277	241.86612	2.08314		0
98	13/04/2021 13:14:41	240.40611	192.08431	240.98602	2.08326		0
99	13/04/2021 13:15:12	239.52045	191.49924	240.10638	2.08334		0
100	13/04/2021 13:15:43	238.65099	190.91019	239.23744	2.08339		0
101	13/04/2021 13:16:14	237.75949	190.07475	238.33489	2.0835		0
102	13/04/2021 13:16:44	236.92354	189.41504	237.49892	2.08357		0
103	13/04/2021 13:17:15	236.07253	188.87456	236.66267	2.0837		0
104	13/04/2021 13:17:46	235.22163	188.14745	235.79334	2.08383		0
105	13/04/2021 13:18:17	234.3855	187.52863	234.95352	2.08389		0
106	13/04/2021 13:18:48	233.53479	186.7569	234.10648	2.08396		0
107	13/04/2021 13:19:19	232.69565	186.14626	233.26001	2.08404		0
108	13/04/2021 13:19:50	231.87143	185.36401	232.43945	2.08415		0
109	13/04/2021 13:20:21	231.0397	184.66003	231.59299	2.08423		0
110	13/04/2021 13:20:52	230.21509	184.07904	230.76097	2.08431		0
111	13/04/2021 13:21:23	229.3885	183.4677	229.92464	2.0844		0
112	13/04/2021 13:21:53	228.56944	182.81972	229.1019	2.08448		0
113	13/04/2021 13:22:24	227.78732	182.20523	228.32715	2.08461		0
114	13/04/2021 13:22:54	227.00101	181.52683	227.52608	2.08469		0
115	13/04/2021 13:23:25	226.20673	180.88145	226.73918	2.08477		0
116	13/04/2021 13:23:56	225.39758	180.23224	225.91892	2.08488		0
117	13/04/2021 13:24:26	224.63612	179.69844	225.15378	2.08497		0
118	13/04/2021 13:24:57	223.85667	179.04935	224.36322	2.08503		0
119	13/04/2021 13:25:28	223.05504	178.39279	223.56531	2.08515		0
120	13/04/2021 13:25:59	222.27226	177.71797	222.78626	2.08526		0
121	13/04/2021 13:26:30	221.50786	177.03554	222.01814	2.08532		0
122	13/04/2021 13:27:01	220.7135	176.35269	221.21637	2.08541		0
123	13/04/2021 13:27:31	219.98557	175.83038	220.47366	2.08549		0
124	13/04/2021 13:28:01	219.23531	175.21086	219.72211	2.08559		0
125	13/04/2021 13:28:32	218.47786	174.6214	218.9572	2.08568		0
126	13/04/2021 13:29:03	217.71594	173.96394	218.19159	2.08573		0
127	13/04/2021 13:29:33	217.00305	173.46783	217.45268	2.08583		0
128	13/04/2021 13:30:04	216.24558	172.81111	216.68774	2.08593		0

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Cool-down						
Long Name	Date		Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time		°C	°C	°C	V	V
129	13/04/2021	13:30:34	215.52121	172.24747	215.95229	2.08597	0
130	13/04/2021	13:31:04	214.79688	171.69876	215.22052	2.08606	0
131	13/04/2021	13:31:35	214.05753	171.02666	214.47372	2.08616	0
132	13/04/2021	13:32:05	213.32921	170.4478	213.74538	2.08628	0
133	13/04/2021	13:32:35	212.6337	169.90244	213.03131	2.08631	0
134	13/04/2021	13:33:06	211.90181	169.27832	212.29202	2.08642	0
135	13/04/2021	13:33:37	211.18475	168.81766	211.56752	2.0865	0
136	13/04/2021	13:34:08	210.4527	168.17108	210.83176	2.08656	0
137	13/04/2021	13:34:39	209.7354	167.56897	210.09955	2.08665	0
138	13/04/2021	13:35:10	209.03279	167.07443	209.39323	2.08672	0
139	13/04/2021	13:35:41	208.31189	166.36839	208.65749	2.08684	0
140	13/04/2021	13:36:12	207.6127	165.84389	207.93602	2.08691	0
141	13/04/2021	13:36:43	206.87238	165.20386	207.20308	2.08701	0
142	13/04/2021	13:37:14	206.19905	164.64203	206.52237	2.08706	0
143	13/04/2021	13:37:45	205.51132	164.21071	205.81975	2.08718	0
144	13/04/2021	13:38:16	204.82311	163.60425	205.12413	2.08724	0
145	13/04/2021	13:38:46	204.13821	163.09773	204.42809	2.08734	0
146	13/04/2021	13:39:17	203.47165	162.49803	203.75037	2.08744	0
147	13/04/2021	13:39:48	202.77519	162.05425	203.05759	2.08754	0
148	13/04/2021	13:40:18	202.1303	161.53198	202.40157	2.08753	0
149	13/04/2021	13:40:49	201.44426	160.9463	201.71184	2.08766	0
150	13/04/2021	13:41:20	200.76982	160.35733	201.02622	2.08778	0
151	13/04/2021	13:41:50	200.10591	159.89807	200.35118	2.08787	0
152	13/04/2021	13:42:21	199.45705	159.38693	199.69606	2.08792	0
153	13/04/2021	13:42:52	198.78137	158.75336	199.00545	2.08804	0
154	13/04/2021	13:43:22	198.15822	158.27205	198.35991	2.08808	0
155	13/04/2021	13:43:53	197.50494	157.77931	197.7066	2.08825	0
156	13/04/2021	13:44:24	196.85559	157.33496	197.03857	2.08825	0
157	13/04/2021	13:44:55	196.19466	156.71974	196.37018	2.08835	0
158	13/04/2021	13:45:26	195.54843	156.32671	195.72022	2.08843	0
159	13/04/2021	13:45:56	194.91307	155.79248	195.06621	2.08851	0
160	13/04/2021	13:46:27	194.25938	155.25485	194.40505	2.08858	0
161	13/04/2021	13:46:57	193.61702	154.71736	193.76268	2.08866	0
162	13/04/2021	13:47:28	193.00153	154.2325	193.14345	2.08876	0
163	13/04/2021	13:47:59	192.36734	153.77725	192.49805	2.0888	0
164	13/04/2021	13:48:29	191.74463	153.3223	191.86041	2.08893	0
165	13/04/2021	13:49:00	191.10373	152.74548	191.22697	2.08901	0
166	13/04/2021	13:49:30	190.48895	152.27245	190.6122	2.08909	0
167	13/04/2021	13:50:00	189.88551	151.81809	190.00504	2.08912	0
168	13/04/2021	13:50:31	189.29312	151.36353	189.40889	2.08913	0
169	13/04/2021	13:51:01	188.71143	150.98636	188.86081	2.08908	0
170	13/04/2021	13:51:32	188.1331	150.73482	188.3273	2.08892	0
171	13/04/2021	13:52:02	187.60724	150.51685	187.89481	2.08868	0
172	13/04/2021	13:52:33	187.13336	150.40605	187.52922	2.08835	0
173	13/04/2021	13:53:04	186.69711	150.32521	187.25357	2.088	0
174	13/04/2021	13:53:35	186.31331	150.40018	187.05649	2.0875	0
175	13/04/2021	13:54:05	186.01195	150.47919	186.9008	2.08695	0
176	13/04/2021	13:54:35	185.70253	150.5242	186.74075	2.08633	0
177	13/04/2021	13:55:06	185.41194	150.79179	186.56593	2.08532	0
178	13/04/2021	13:55:36	185.13629	150.87035	186.37991	2.08412	0
179	13/04/2021	13:56:07	184.82332	150.93779	186.13791	2.08287	0
180	13/04/2021	13:56:38	184.49608	150.89471	185.85548	2.08166	0
181	13/04/2021	13:57:08	184.16783	150.9433	185.57578	2.08034	0
182	13/04/2021	13:57:39	183.83589	150.91782	185.25505	2.07889	0
183	13/04/2021	13:58:10	183.46945	150.87657	184.92969	2.07731	0
184	13/04/2021	13:58:40	183.10677	150.64635	184.58196	2.07548	0
185	13/04/2021	13:59:10	182.70314	150.5015	184.19699	2.07362	0
186	13/04/2021	13:59:41	182.27019	150.27193	183.79765	2.07131	0
187	13/04/2021	14:00:11	181.87892	150.06892	183.43253	2.06878	0
188	13/04/2021	14:00:42	181.43924	149.71848	183.00406	2.06605	0
189	13/04/2021	14:01:12	180.99623	149.32423	182.57594	2.06311	0
190	13/04/2021	14:01:43	180.5383	149.18514	182.12177	2.05965	0
191	13/04/2021	14:02:13	180.09203	148.82463	181.69045	2.05582	0
192	13/04/2021	14:02:44	179.63152	148.26146	181.2262	2.05185	0

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Cool-down						
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt	
Units	Time	°C	°C	°C	V	V	
321	13/04/2021 15:08:40	119.7488	96.78755	119.34636	1.81376		0
322	13/04/2021 15:09:11	119.38773	96.52988	118.98528	1.8128		0
323	13/04/2021 15:09:42	119.04122	96.29388	118.63879	1.81176		0
324	13/04/2021 15:10:13	118.69497	96.02572	118.28529	1.81065		0
325	13/04/2021 15:10:44	118.32278	95.73901	117.92033	1.80946		0
326	13/04/2021 15:11:15	117.99046	95.48829	117.56265	1.80826		0
327	13/04/2021 15:11:45	117.64745	95.26652	117.23051	1.80699		0
328	13/04/2021 15:12:16	117.30788	95.0374	116.88368	1.80566		0
329	13/04/2021 15:12:46	116.96221	94.83101	116.53438	1.80437		0
330	13/04/2021 15:13:16	116.63143	94.60341	116.20723	1.803		0
331	13/04/2021 15:13:47	116.28211	94.33221	115.85793	1.8016		0
332	13/04/2021 15:14:18	115.93993	94.07168	115.50122	1.80029		0
333	13/04/2021 15:14:49	115.60131	93.79311	115.16262	1.79903		0
334	13/04/2021 15:15:20	115.26958	93.56096	114.83089	1.79787		0
335	13/04/2021 15:15:51	114.91288	93.29324	114.48144	1.79685		0
336	13/04/2021 15:16:22	114.58855	93.06484	114.13898	1.79587		0
337	13/04/2021 15:16:52	114.26082	92.82227	113.81124	1.79507		0
338	13/04/2021 15:17:22	113.91806	92.55398	113.46848	1.7943		0
339	13/04/2021 15:17:53	113.59358	92.31103	113.14763	1.79355		0
340	13/04/2021 15:18:24	113.27258	92.06793	112.82663	1.79292		0
341	13/04/2021 15:18:54	112.95561	91.82885	112.50604	1.79235		0
342	13/04/2021 15:19:25	112.61687	91.53216	112.16367	1.79179		0
343	13/04/2021 15:19:56	112.28989	91.29393	111.83669	1.79135		0
344	13/04/2021 15:20:27	111.96988	91.06622	111.49855	1.7909		0
345	13/04/2021 15:20:58	111.6349	90.80565	111.17808	1.79054		0
346	13/04/2021 15:21:29	111.30705	90.53057	110.85385	1.79017		0
347	13/04/2021 15:22:00	110.99136	90.29636	110.53455	1.78977		0
348	13/04/2021 15:22:30	110.66477	90.04413	110.20433	1.78938		0
349	13/04/2021 15:23:01	110.34503	89.81712	109.90679	1.78882		0
350	13/04/2021 15:23:32	110.02888	89.57225	109.57053	1.78807		0
351	13/04/2021 15:24:02	109.72502	89.33821	109.27401	1.78691		0
352	13/04/2021 15:24:32	109.41095	89.07951	108.96357	1.78516		0
353	13/04/2021 15:25:03	109.11134	88.82084	108.64591	1.78222		0
354	13/04/2021 15:25:34	108.7865	88.54784	108.3355	1.77755		0
355	13/04/2021 15:26:05	108.48026	88.28256	108.02564	1.76988		0
356	13/04/2021 15:26:35	108.18079	88.04558	107.72257	1.75808		0
357	13/04/2021 15:27:05	107.86328	87.80859	107.40867	1.74073		0
358	13/04/2021 15:27:36	107.55324	87.56828	107.09503	1.71079		0
359	13/04/2021 15:28:07	107.26085	87.34193	106.80985	1.64352		0
360	13/04/2021 15:28:38	106.94684	87.09764	106.49945	1.57857		0
361	13/04/2021 15:29:09	106.65151	86.85042	106.18607	1.52808		0
362	13/04/2021 15:29:39	106.35217	86.62792	105.89756	1.4914		0
363	13/04/2021 15:30:09	106.06036	86.39858	105.59854	1.46351		0
364	13/04/2021 15:30:40	105.76142	86.18006	105.29598	1.44187		0
365	13/04/2021 15:31:11	105.4485	85.94764	104.99027	1.42491		0
366	13/04/2021 15:31:42	105.15333	85.7257	104.68428	1.41153		0
367	13/04/2021 15:32:13	104.83305	85.50034	104.37123	1.4004		0
368	13/04/2021 15:32:44	104.55568	85.28892	104.09023	1.3918		0
369	13/04/2021 15:33:14	104.27827	85.07748	103.81643	1.38467		0
370	13/04/2021 15:33:45	103.9831	84.83041	103.51405	1.37883		0
371	13/04/2021 15:34:15	103.69833	84.61523	103.2329	1.37322		0
372	13/04/2021 15:34:46	103.39164	84.36029	102.9262	1.36807		0
373	13/04/2021 15:35:17	103.10719	84.12748	102.6237	1.36278		0
374	13/04/2021 15:35:48	102.812	83.88399	102.34657	1.35776		0
375	13/04/2021 15:36:19	102.51685	83.63694	102.05142	1.35306		0
376	13/04/2021 15:36:49	102.23225	83.41834	101.76681	1.34891		0
377	13/04/2021 15:37:20	101.95525	83.20372	101.48982	1.34438		0
378	13/04/2021 15:37:51	101.67495	82.993	101.21313	1.34062		0
379	13/04/2021 15:38:22	101.39114	82.75365	100.93653	1.33675		0
380	13/04/2021 15:38:53	101.10322	82.5425	100.65221	1.33322		0
381	13/04/2021 15:39:24	100.82584	82.35981	100.37843	1.32906		0
382	13/04/2021 15:39:54	100.54176	82.14533	100.08714	1.32493		0
383	13/04/2021 15:40:25	100.27586	81.94535	99.81449	1.32105		0
384	13/04/2021 15:40:57	99.98474	81.70228	99.53484	1.31721		0

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Cool-down						
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt	
Units	Time	°C	°C	°C	V	V	
385	13/04/2021 15:41:27	99.71564	81.4805	99.26213	1.3134		0
386	13/04/2021 15:41:58	99.45013	81.26949	98.99662	1.30981		0
387	13/04/2021 15:42:29	99.16303	81.04052	98.70952	1.30641		0
388	13/04/2021 15:42:59	98.89777	80.81901	98.43346	1.30298		0
389	13/04/2021 15:43:29	98.6255	80.61919	98.16838	1.29975		0
390	13/04/2021 15:44:00	98.33865	80.41921	97.88155	1.29652		0
391	13/04/2021 15:44:31	98.08433	80.21218	97.62723	1.29325		0
392	13/04/2021 15:45:02	97.80486	80.01955	97.34055	1.29009		0
393	13/04/2021 15:45:33	97.5359	79.82349	97.08238	1.28684		0
394	13/04/2021 15:46:04	97.26775	79.61393	96.80343	1.2838		0
395	13/04/2021 15:46:35	97.00995	79.42902	96.55284	1.28081		0
396	13/04/2021 15:47:06	96.72315	79.20448	96.26243	1.27797		0
397	13/04/2021 15:47:37	96.46481	79.04769	96.00771	1.27658		0
398	13/04/2021 15:48:08	96.20638	78.90871	95.75646	1.27648		0
399	13/04/2021 15:48:39	95.95165	78.77698	95.51972	1.27629		0
400	13/04/2021 15:49:10	95.69693	78.6238	95.27941	1.27612		0
401	13/04/2021 15:49:41	95.46738	78.49921	95.05706	1.27579		0
402	13/04/2021 15:50:11	95.2448	78.37443	94.86327	1.27537		0
403	13/04/2021 15:50:42	95.01168	78.24273	94.63736	1.27491		0
404	13/04/2021 15:51:13	94.78587	78.12905	94.41515	1.27418		0
405	13/04/2021 15:51:44	94.56011	77.9975	94.19298	1.27325		0
406	13/04/2021 15:52:15	94.32337	77.85862	93.97064	1.27221		0
407	13/04/2021 15:52:45	94.12638	77.74854	93.77365	1.27098		0
408	13/04/2021 15:53:16	93.88992	77.59561	93.548	1.26969		0
409	13/04/2021 15:53:47	93.66331	77.45604	93.33577	1.2681		0
410	13/04/2021 15:54:18	93.45094	77.3056	93.11981	1.26644		0
411	13/04/2021 15:54:49	93.22808	77.18411	92.90414	1.26493		0
412	13/04/2021 15:55:20	93.00133	77.0265	92.68098	1.26362		0
413	13/04/2021 15:55:51	92.7891	76.91558	92.48315	1.26246		0
414	13/04/2021 15:56:22	92.56594	76.7723	92.2708	1.26123		0
415	13/04/2021 15:56:53	92.35384	76.64362	92.0623	1.26008		0
416	13/04/2021 15:57:24	92.12723	76.48973	91.85008	1.25793		0
417	13/04/2021 15:57:54	91.92124	76.36353	91.64409	1.25331		0
418	13/04/2021 15:58:25	91.68644	76.18001	91.3985	1.24925		0
419	13/04/2021 15:58:56	91.44434	75.97847	91.14558	1.24539		0
420	13/04/2021 15:59:27	91.20251	75.77363	90.88937	1.24168		0
421	13/04/2021 15:59:57	90.97808	75.58252	90.66135	1.23822		0
422	13/04/2021 16:00:28	90.73982	75.36689	90.41228	1.23474		0
423	13/04/2021 16:00:59	90.48747	75.14441	90.17073	1.2314		0
424	13/04/2021 16:01:30	90.24921	74.93595	89.91827	1.22827		0
425	13/04/2021 16:02:00	90.02522	74.74169	89.68764	1.22511		0
426	13/04/2021 16:02:31	89.77587	74.50734	89.44553	1.22218		0
427	13/04/2021 16:03:01	89.54803	74.29079	89.2141	1.21916		0
428	13/04/2021 16:03:32	89.29088	74.07724	88.95335	1.21631		0
429	13/04/2021 16:04:02	89.06299	73.8499	88.72188	1.21351		0
430	13/04/2021 16:04:32	88.83875	73.64053	88.50842	1.21075		0
431	13/04/2021 16:05:03	88.58586	73.40974	88.25552	1.20794		0
432	13/04/2021 16:05:33	88.34735	73.20404	88.02419	1.20535		0
433	13/04/2021 16:06:04	88.11946	72.99818	87.79273	1.20264		0
434	13/04/2021 16:06:35	87.88416	72.79927	87.561	1.2		0
435	13/04/2021 16:07:06	87.64881	72.56807	87.31847	1.19739		0
436	13/04/2021 16:07:37	87.39927	72.35136	87.06534	1.19489		0
437	13/04/2021 16:08:07	87.19294	72.14554	86.85183	1.19238		0
438	13/04/2021 16:08:37	86.9652	71.95417	86.62051	1.18999		0
439	13/04/2021 16:09:08	86.73029	71.75564	86.38918	1.1875		0
440	13/04/2021 16:09:39	86.48419	71.54595	86.14308	1.18512		0
441	13/04/2021 16:10:10	86.26032	71.36561	85.91203	1.18269		0
442	13/04/2021 16:10:41	86.02859	71.14517	85.68388	1.18033		0
443	13/04/2021 16:11:12	85.79657	70.94237	85.45187	1.17794		0
444	13/04/2021 16:11:43	85.57228	70.73653	85.2204	1.17566		0
445	13/04/2021 16:12:14	85.33312	70.54092	84.992	1.17337		0
446	13/04/2021 16:12:45	85.11557	70.34181	84.76728	1.17106		0
447	13/04/2021 16:13:16	84.88395	70.14657	84.53925	1.16884		0
448	13/04/2021 16:13:47	84.65223	69.96547	84.30393	1.16656		0

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Cool-down						
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt	
Units	Time	°C	°C	°C	V	V	
449	13/04/2021 16:14:18	84.43114	69.78746	84.08284	1.16439		0
450	13/04/2021 16:14:49	84.21378	69.60243	83.86908	1.16218		0
451	13/04/2021 16:15:19	83.98547	69.41361	83.64435	1.16011		0
452	13/04/2021 16:15:50	83.75315	69.22438	83.40485	1.15796		0
453	13/04/2021 16:16:21	83.53924	69.04278	83.18736	1.15582		0
454	13/04/2021 16:16:52	83.32618	68.88358	82.9743	1.15367		0
455	13/04/2021 16:17:23	83.09444	68.70211	82.74974	1.15165		0
456	13/04/2021 16:17:53	82.88065	68.50986	82.53235	1.14956		0
457	13/04/2021 16:18:24	82.68134	68.34645	82.31868	1.14748		0
458	13/04/2021 16:18:55	82.4568	68.15782	82.10132	1.14548		0
459	13/04/2021 16:19:26	82.22532	67.96943	81.88062	1.14345		0
460	13/04/2021 16:19:56	82.03047	67.78536	81.67141	1.14148		0
461	13/04/2021 16:20:27	81.78892	67.59766	81.43703	1.13949		0
462	13/04/2021 16:20:58	81.60125	67.44591	81.24937	1.1375		0
463	13/04/2021 16:21:29	81.37751	67.25449	81.01845	1.1355		0
464	13/04/2021 16:22:00	81.16151	67.08875	80.8204	1.13352		0
465	13/04/2021 16:22:31	80.94511	66.91544	80.58964	1.13169		0
466	13/04/2021 16:23:01	80.7602	66.76643	80.40832	1.12975		0
467	13/04/2021 16:23:32	80.55001	66.57061	80.18736	1.12786		0
468	13/04/2021 16:24:03	80.32187	66.37478	79.96289	1.12594		0
469	13/04/2021 16:24:34	80.1086	66.20461	79.75014	1.12408		0
470	13/04/2021 16:25:05	79.91065	66.03515	79.55244	1.12218		0
471	13/04/2021 16:25:36	79.70524	65.86875	79.35062	1.12038		0
472	13/04/2021 16:26:07	79.50038	65.72085	79.1386	1.1185		0
473	13/04/2021 16:26:38	79.29536	65.53689	78.94434	1.1167		0
474	13/04/2021 16:27:09	79.08362	65.36413	78.72542	1.11487		0
475	13/04/2021 16:27:40	78.89019	65.20973	78.52841	1.1131		0
476	13/04/2021 16:28:10	78.68905	65.06913	78.33085	1.11131		0
477	13/04/2021 16:28:41	78.49148	64.89263	78.12611	1.10957		0
478	13/04/2021 16:29:12	78.27589	64.73039	77.91411	1.10777		0
479	13/04/2021 16:29:43	78.08862	64.5714	77.73042	1.10604		0
480	13/04/2021 16:30:14	77.89394	64.42652	77.52859	1.10429		0
481	13/04/2021 16:30:45	77.68909	64.2463	77.32731	1.10257		0
482	13/04/2021 16:31:15	77.49513	64.09138	77.12261	1.1009		0
483	13/04/2021 16:31:46	77.29455	63.94416	76.93276	1.09924		0
484	13/04/2021 16:32:17	77.1047	63.78259	76.73575	1.09757		0
485	13/04/2021 16:32:47	76.90737	63.62428	76.55634	1.09589		0
486	13/04/2021 16:33:18	76.71355	63.46949	76.35535	1.09414		0
487	13/04/2021 16:33:48	76.52342	63.31841	76.16881	1.0926		0
488	13/04/2021 16:34:19	76.32188	63.15229	75.95652	1.09094		0
489	13/04/2021 16:34:50	76.13492	63.00436	75.77313	1.08927		0
490	13/04/2021 16:35:21	75.94054	62.86338	75.57876	1.08762		0
491	13/04/2021 16:35:52	75.77093	62.74363	75.40556	1.08597		0
492	13/04/2021 16:36:23	75.5695	62.56685	75.21488	1.08439		0
493	13/04/2021 16:36:54	75.36766	62.38966	75.00945	1.08279		0
494	13/04/2021 16:37:25	75.19479	62.25585	74.82942	1.08117		0
495	13/04/2021 16:37:56	74.99361	62.10088	74.63541	1.07958		0
496	13/04/2021 16:38:27	74.80335	61.94967	74.44874	1.078		0
497	13/04/2021 16:38:58	74.60992	61.79526	74.24815	1.07642		0
498	13/04/2021 16:39:29	74.43813	61.66256	74.07993	1.07485		0
499	13/04/2021 16:40:00	74.25228	61.51216	73.8905	1.07331		0
500	13/04/2021 16:40:31	74.0696	61.37213	73.70424	1.07177		0
501	13/04/2021 16:41:02	73.87244	61.21758	73.52499	1.07021		0
502	13/04/2021 16:41:32	73.71085	61.07714	73.34547	1.06873		0
503	13/04/2021 16:42:03	73.50281	60.91887	73.15535	1.06723		0
504	13/04/2021 16:42:34	73.33488	60.78285	72.98384	1.06575		0
505	13/04/2021 16:43:04	73.15619	60.63964	72.7944	1.06428		0
506	13/04/2021 16:43:35	72.97434	60.49685	72.62331	1.06278		0
507	13/04/2021 16:44:06	72.78202	60.36152	72.44531	1.06127		0
508	13/04/2021 16:44:37	72.60059	60.22273	72.24239	1.05987		0
509	13/04/2021 16:45:08	72.4296	60.1016	72.08572	1.05838		0
510	13/04/2021 16:45:39	72.23756	59.95557	71.89011	1.05692		0
511	13/04/2021 16:46:09	72.0593	59.79404	71.71542	1.05556		0
512	13/04/2021 16:46:40	71.88458	59.65414	71.54428	1.05414		0

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Cool-down						
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt	
Units	Time	°C	°C	°C	V	V	
577	13/04/2021 17:19:57	61.73212	51.83286	61.42692	0.97807		0
578	13/04/2021 17:20:28	61.59209	51.7138	61.29048	0.9771		0
579	13/04/2021 17:20:58	61.45494	51.60484	61.14974	0.97622		0
580	13/04/2021 17:21:29	61.32056	51.50229	61.01895	0.97526		0
581	13/04/2021 17:22:00	61.17902	51.37449	60.8774	0.9743		0
582	13/04/2021 17:22:31	61.04131	51.28663	60.73969	0.97338		0
583	13/04/2021 17:23:01	60.90392	51.17382	60.60589	0.97246		0
584	13/04/2021 17:23:31	60.78834	51.08295	60.48673	0.97155		0
585	13/04/2021 17:24:02	60.64715	50.96272	60.34554	0.97063		0
586	13/04/2021 17:24:33	60.5095	50.8641	60.21507	0.96974		0
587	13/04/2021 17:25:04	60.37207	50.75126	60.07045	0.96885		0
588	13/04/2021 17:25:34	60.24185	50.63845	59.93995	0.96796		0
589	13/04/2021 17:26:05	60.11521	50.54728	59.8163	0.96712		0
590	13/04/2021 17:26:35	59.97783	50.43459	59.67114	0.9662		0
591	13/04/2021 17:27:05	59.85738	50.34661	59.5543	0.96543		0
592	13/04/2021 17:27:36	59.71526	50.24779	59.40859	0.96455		0
593	13/04/2021 17:28:06	59.58732	50.15593	59.29145	0.96366		0
594	13/04/2021 17:28:37	59.47004	50.0603	59.16697	0.96281		0
595	13/04/2021 17:29:07	59.32419	49.94666	59.02472	0.96196		0
596	13/04/2021 17:29:38	59.19609	49.84695	58.89663	0.96113		0
597	13/04/2021 17:30:09	59.06415	49.73611	58.75746	0.96021		0
598	13/04/2021 17:30:40	58.93686	49.63721	58.63739	0.95942		0
599	13/04/2021 17:31:11	58.80226	49.54184	58.5064	0.95857		0
600	13/04/2021 17:31:41	58.67487	49.45371	58.3754	0.95778		0
601	13/04/2021 17:32:12	58.55109	49.35109	58.25163	0.95692		0
602	13/04/2021 17:32:43	58.42328	49.2444	58.12021	0.95616		0
603	13/04/2021 17:33:13	58.2992	49.15236	58.00334	0.95533		0
604	13/04/2021 17:33:44	58.17516	49.05309	57.88292	0.95455		0
605	13/04/2021 17:34:15	58.03692	48.93955	57.73745	0.95373		0
606	13/04/2021 17:34:46	57.92034	48.85503	57.62088	0.95293		0
607	13/04/2021 17:35:16	57.78589	48.75256	57.48282	0.95214		0
608	13/04/2021 17:35:47	57.65793	48.66748	57.36206	0.95137		0
609	13/04/2021 17:36:18	57.53387	48.57182	57.23801	0.95053		0
610	13/04/2021 17:36:48	57.40998	48.47634	57.11412	0.94983		0
611	13/04/2021 17:37:19	57.29672	48.38789	57.00085	0.94901		0
612	13/04/2021 17:37:50	57.17585	48.28095	56.86916	0.94827		0
613	13/04/2021 17:38:20	57.03637	48.17342	56.74773	0.94751		0
614	13/04/2021 17:38:51	56.92992	48.08458	56.63767	0.94676		0
615	13/04/2021 17:39:21	56.80571	47.99965	56.51347	0.94601		0
616	13/04/2021 17:39:52	56.6879	47.89939	56.39204	0.94528		0
617	13/04/2021 17:40:23	56.57703	47.8061	56.28838	0.94452		0
618	13/04/2021 17:40:53	56.4481	47.69106	56.15225	0.94378		0
619	13/04/2021 17:41:24	56.32595	47.60819	56.0337	0.94306		0
620	13/04/2021 17:41:55	56.21508	47.52578	55.912	0.94235		0
621	13/04/2021 17:42:26	56.07562	47.41102	55.77614	0.94161		0
622	13/04/2021 17:42:56	55.96486	47.32149	55.67261	0.94089		0
623	13/04/2021 17:43:27	55.82888	47.23923	55.54384	0.94019		0
624	13/04/2021 17:43:58	55.736	47.1459	55.44014	0.93947		0
625	13/04/2021 17:44:29	55.6218	47.05289	55.31512	0.93871		0
626	13/04/2021 17:45:00	55.48609	46.94916	55.18302	0.93806		0
627	13/04/2021 17:45:31	55.37215	46.87454	55.06908	0.93738		0
628	13/04/2021 17:46:01	55.26545	46.78182	54.96597	0.93666		0
629	13/04/2021 17:46:32	55.15137	46.70344	54.85551	0.93598		0
630	13/04/2021 17:47:03	55.0259	46.59912	54.73005	0.93529		0
631	13/04/2021 17:47:33	54.91559	46.49915	54.61251	0.93463		0
632	13/04/2021 17:48:04	54.8015	46.41713	54.50925	0.93393		0
633	13/04/2021 17:48:35	54.68755	46.3135	54.38448	0.93327		0
634	13/04/2021 17:49:06	54.56963	46.22764	54.27738	0.93257		0
635	13/04/2021 17:49:37	54.46608	46.13083	54.14857	0.93193		0
636	13/04/2021 17:50:08	54.35174	46.0522	54.05227	0.93127		0
637	13/04/2021 17:50:39	54.23737	45.98077	53.9379	0.93062		0
638	13/04/2021 17:51:10	54.11888	45.87621	53.82303	0.92992		0
639	13/04/2021 17:51:41	53.99965	45.80353	53.69657	0.92932		0
640	13/04/2021 17:52:12	53.89944	45.71372	53.58555	0.9287		0

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Cool-down						
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt	
Units	Time	°C	°C	°C	V	V	
769	13/04/2021 18:58:15	42.26392	36.5477	41.93762	0.87287		0
770	13/04/2021 18:58:46	42.19611	36.49049	41.86618	0.8725		0
771	13/04/2021 18:59:17	42.12127	36.45171	41.79134	0.87231		0
772	13/04/2021 18:59:48	42.04631	36.3946	41.71638	0.87199		0
773	13/04/2021 19:00:19	41.97054	36.33669	41.64062	0.8717		0
774	13/04/2021 19:00:50	41.89117	36.26786	41.55762	0.87143		0
775	13/04/2021 19:01:21	41.81904	36.21722	41.49274	0.87117		0
776	13/04/2021 19:01:52	41.75377	36.16621	41.4166	0.87088		0
777	13/04/2021 19:02:23	41.68861	36.10802	41.34418	0.8707		0
778	13/04/2021 19:02:53	41.62011	36.04648	41.28656	0.87036		0
779	13/04/2021 19:03:24	41.54031	35.98086	41.20313	0.8701		0
780	13/04/2021 19:03:54	41.46859	35.91972	41.14229	0.86984		0
781	13/04/2021 19:04:25	41.40022	35.86559	41.0703	0.86958		0
782	13/04/2021 19:04:56	41.33545	35.81143	41.0019	0.86933		0
783	13/04/2021 19:05:27	41.26388	35.76137	40.93033	0.86908		0
784	13/04/2021 19:05:57	41.19954	35.71492	40.86598	0.86882		0
785	13/04/2021 19:06:28	41.11331	35.64285	40.78701	0.86858		0
786	13/04/2021 19:06:58	41.06641	35.59936	40.71472	0.86828		0
787	13/04/2021 19:07:28	40.99415	35.55225	40.66785	0.86806		0
788	13/04/2021 19:07:58	40.92164	35.48303	40.59171	0.8678		0
789	13/04/2021 19:08:29	40.84516	35.42075	40.50798	0.86756		0
790	13/04/2021 19:09:00	40.76849	35.351	40.42406	0.8673		0
791	13/04/2021 19:09:31	40.70226	35.30994	40.37958	0.86706		0
792	13/04/2021 19:10:01	40.66221	35.25512	40.31777	0.86678		0
793	13/04/2021 19:10:32	40.58883	35.21417	40.2589	0.86654		0
794	13/04/2021 19:11:03	40.51913	35.15506	40.18557	0.86633		0
795	13/04/2021 19:11:34	40.45706	35.11091	40.12351	0.86609		0
796	13/04/2021 19:12:05	40.38115	35.04919	40.04396	0.86587		0
797	13/04/2021 19:12:36	40.31603	34.99469	39.98968	0.86562		0
798	13/04/2021 19:13:06	40.24305	34.94321	39.90541	0.86532		0
799	13/04/2021 19:13:37	40.19563	34.91014	39.85776	0.8651		0
800	13/04/2021 19:14:08	40.13037	34.8482	39.78854	0.8649		0
801	13/04/2021 19:14:38	40.06159	34.80095	39.73035	0.86467		0
802	13/04/2021 19:15:09	39.98884	34.73518	39.65001	0.86443		0
803	13/04/2021 19:15:39	39.93821	34.70276	39.61031	0.86423		0
804	13/04/2021 19:16:09	39.86519	34.64796	39.54093	0.864		0
805	13/04/2021 19:16:40	39.80227	34.58504	39.46708	0.86376		0
806	13/04/2021 19:17:11	39.73248	34.52618	39.40093	0.86352		0
807	13/04/2021 19:17:42	39.67767	34.48595	39.33521	0.86332		0
808	13/04/2021 19:18:12	39.60707	34.42263	39.2646	0.86309		0
809	13/04/2021 19:18:43	39.54092	34.37106	39.19845	0.86287		0
810	13/04/2021 19:19:14	39.47583	34.32419	39.14065	0.86263		0
811	13/04/2021 19:19:45	39.4147	34.28492	39.07952	0.8624		0
812	13/04/2021 19:20:15	39.34907	34.2375	39.02482	0.86223		0
813	13/04/2021 19:20:46	39.28698	34.17905	38.93722	0.86201		0
814	13/04/2021 19:21:16	39.21396	34.15339	38.87877	0.86178		0
815	13/04/2021 19:21:47	39.16322	34.15366	38.8171	0.8616		0
816	13/04/2021 19:22:17	39.10192	34.11058	38.76309	0.86136		0
817	13/04/2021 19:22:48	39.03689	34.05647	38.70535	0.86115		0
818	13/04/2021 19:23:19	38.96761	33.99084	38.63242	0.86092		0
819	13/04/2021 19:23:49	38.89795	33.91753	38.56276	0.86075		0
820	13/04/2021 19:24:20	38.83557	33.86609	38.50403	0.86048		0
821	13/04/2021 19:24:51	38.77645	33.80697	38.45219	0.86033		0
822	13/04/2021 19:25:21	38.71827	33.75607	38.37943	0.86013		0
823	13/04/2021 19:25:52	38.65656	33.71986	38.32866	0.85989		0
824	13/04/2021 19:26:22	38.59853	33.67641	38.26698	0.85972		0
825	13/04/2021 19:26:53	38.54078	33.64051	38.21288	0.85948		0
826	13/04/2021 19:27:23	38.47933	33.60093	38.14779	0.85931		0
827	13/04/2021 19:27:53	38.40657	33.54639	38.07139	0.8591		0
828	13/04/2021 19:28:24	38.35219	33.51022	38.02794	0.85891		0
829	13/04/2021 19:28:54	38.29708	33.46969	37.95825	0.85874		0
830	13/04/2021 19:29:25	38.25295	33.43284	37.91776	0.85852		0
831	13/04/2021 19:29:55	38.16545	33.36356	37.8339	0.85832		0
832	13/04/2021 19:30:26	38.11146	33.30957	37.77992	0.85812		0

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Cool-down						
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt	
Units	Time	°C	°C	°C	V	V	
833	13/04/2021 19:30:57	38.04573	33.25477	37.71783	0.85794		0
834	13/04/2021 19:31:28	38.00589	33.23315	37.66707	0.85772		0
835	13/04/2021 19:31:59	37.92976	33.16066	37.59093	0.85755		0
836	13/04/2021 19:32:29	37.88711	33.12166	37.55193	0.85739		0
837	13/04/2021 19:32:59	37.82623	33.08263	37.49105	0.85718		0
838	13/04/2021 19:33:30	37.76928	33.03661	37.41952	0.85698		0
839	13/04/2021 19:34:01	37.70517	32.99436	37.36634	0.8568		0
840	13/04/2021 19:34:32	37.64065	32.94806	37.29818	0.85662		0
841	13/04/2021 19:35:03	37.5865	32.9012	37.24768	0.85643		0
842	13/04/2021 19:35:34	37.52103	32.85395	37.17857	0.85626		0
843	13/04/2021 19:36:05	37.4704	32.81789	37.13158	0.85602		0
844	13/04/2021 19:36:36	37.42668	32.77781	37.07692	0.85591		0
845	13/04/2021 19:37:07	37.36459	32.72665	37.01848	0.85572		0
846	13/04/2021 19:37:38	37.3022	32.68977	36.96338	0.85548		0
847	13/04/2021 19:38:08	37.24751	32.63872	36.90504	0.85532		0
848	13/04/2021 19:38:39	37.19324	32.59538	36.83984	0.85517		0
849	13/04/2021 19:39:10	37.12886	32.54557	36.79368	0.85496		0
850	13/04/2021 19:39:41	37.07148	32.49912	36.72901	0.85479		0
851	13/04/2021 19:40:11	37.01873	32.46095	36.67262	0.85466		0
852	13/04/2021 19:40:42	36.97622	32.4403	36.62647	0.85447		0
853	13/04/2021 19:41:12	36.91883	32.40476	36.56543	0.85431		0
854	13/04/2021 19:41:43	36.84338	32.3366	36.49726	0.85415		0
855	13/04/2021 19:42:14	36.80085	32.31228	36.45473	0.85395		0
856	13/04/2021 19:42:44	36.74716	32.26588	36.3974	0.85377		0
857	13/04/2021 19:43:14	36.70083	32.23048	36.34743	0.8536		0
858	13/04/2021 19:43:45	36.64335	32.18393	36.28631	0.85345		0
859	13/04/2021 19:44:16	36.58126	32.13277	36.2315	0.85331		0
860	13/04/2021 19:44:46	36.52763	32.08278	36.18516	0.85312		0
861	13/04/2021 19:45:17	36.46257	32.02866	36.11282	0.85296		0
862	13/04/2021 19:45:47	36.41951	32.00017	36.07704	0.85283		0
863	13/04/2021 19:46:18	36.362	31.95723	36.01952	0.85264		0
864	13/04/2021 19:46:48	36.29817	31.9189	35.96299	0.85248		0
865	13/04/2021 19:47:19	36.24931	31.87734	35.9032	0.85235		0
866	13/04/2021 19:47:50	36.20735	31.84995	35.85759	0.85215		0
867	13/04/2021 19:48:20	36.15402	31.81483	35.80426	0.852		0
868	13/04/2021 19:48:51	36.10043	31.77946	35.75431	0.85186		0
869	13/04/2021 19:49:22	36.03915	31.73275	35.69668	0.85165		0
870	13/04/2021 19:49:53	35.97153	31.67971	35.62906	0.85152		0
871	13/04/2021 19:50:24	35.92983	31.65622	35.59464	0.85136		0
872	13/04/2021 19:50:55	35.87231	31.60963	35.53348	0.85126		0
873	13/04/2021 19:51:26	35.82911	31.55915	35.483	0.85106		0
874	13/04/2021 19:51:57	35.78198	31.53023	35.43586	0.85091		0
875	13/04/2021 19:52:27	35.72125	31.47679	35.37878	0.85078		0
876	13/04/2021 19:52:57	35.67158	31.44533	35.32546	0.85065		0
877	13/04/2021 19:53:28	35.61814	31.41375	35.27567	0.85045		0
878	13/04/2021 19:53:59	35.56898	31.36824	35.22286	0.85031		0
879	13/04/2021 19:54:29	35.51942	31.34419	35.16967	0.85019		0
880	13/04/2021 19:55:00	35.46627	31.30924	35.1238	0.85004		0
881	13/04/2021 19:55:31	35.42347	31.26645	35.07372	0.8499		0
882	13/04/2021 19:56:01	35.36585	31.2234	35.02702	0.84972		0
883	13/04/2021 19:56:32	35.30807	31.17291	34.9656	0.84957		0
884	13/04/2021 19:57:03	35.25744	31.13321	34.91132	0.8494		0
885	13/04/2021 19:57:33	35.22098	31.11497	34.8858	0.84932		0
886	13/04/2021 19:58:03	35.15999	31.06855	34.81752	0.84914		0
887	13/04/2021 19:58:34	35.11364	31.02949	34.77482	0.849		0
888	13/04/2021 19:59:05	35.05994	30.994	34.72839	0.84884		0
889	13/04/2021 19:59:36	35.00905	30.95039	34.67022	0.84871		0
890	13/04/2021 20:00:07	34.94035	30.9072	34.61245	0.84857		0
891	13/04/2021 20:00:38	34.89808	30.87222	34.57018	0.84846		0
892	13/04/2021 20:01:09	34.85621	30.84128	34.52103	0.84829		0
893	13/04/2021 20:01:40	34.79239	30.79931	34.45356	0.84819		0
894	13/04/2021 20:02:11	34.75769	30.78283	34.41886	0.84802		0
895	13/04/2021 20:02:41	34.70102	30.74073	34.36583	0.8479		0
896	13/04/2021 20:03:11	34.65067	30.69767	34.31184	0.84779		0

Comments	Appendix 2 - 2°C /min heating rate					
F(x)=	Cool-down					
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time	°C	°C	°C	V	V
961	13/04/2021 20:36:26	31.78621	28.49616	31.45467	0.84038	0
962	13/04/2021 20:36:57	31.75169	28.46866	31.4165	0.84037	0
963	13/04/2021 20:37:27	31.71374	28.44137	31.37856	0.84021	0
964	13/04/2021 20:37:58	31.68633	28.41737	31.35479	0.84006	0
965	13/04/2021 20:38:28	31.64799	28.38601	31.30916	0.84004	0
966	13/04/2021 20:38:59	31.61318	28.3619	31.27435	0.83992	0
967	13/04/2021 20:39:30	31.56079	28.31635	31.22925	0.83983	0
968	13/04/2021 20:40:00	31.53433	28.29698	31.19186	0.83973	0
969	13/04/2021 20:40:31	31.48587	28.26276	31.14704	0.83964	0
970	13/04/2021 20:41:02	31.45191	28.23582	31.11672	0.83958	0
971	13/04/2021 20:41:33	31.40356	28.2054	31.07202	0.83947	0
972	13/04/2021 20:42:04	31.37646	28.17802	31.04127	0.83937	0
973	13/04/2021 20:42:34	31.32018	28.14327	30.98864	0.83926	0
974	13/04/2021 20:43:05	31.29305	28.12323	30.95422	0.8392	0
975	13/04/2021 20:43:36	31.25456	28.08068	30.91573	0.83907	0
976	13/04/2021 20:44:06	31.22785	28.05002	30.89266	0.83905	0
977	13/04/2021 20:44:37	31.17505	28.0151	30.84715	0.83895	0
978	13/04/2021 20:45:08	31.14416	27.98759	30.80898	0.83883	0
979	13/04/2021 20:45:38	31.09907	27.94572	30.76753	0.83875	0
980	13/04/2021 20:46:09	31.08017	27.93768	30.74863	0.83869	0
981	13/04/2021 20:46:40	31.03171	27.90714	30.70381	0.83856	0
982	13/04/2021 20:47:11	30.99771	27.87648	30.65888	0.83845	0
983	13/04/2021 20:47:41	30.95599	27.84539	30.61716	0.83842	0
984	13/04/2021 20:48:11	30.91847	27.82221	30.57964	0.83834	0
985	13/04/2021 20:48:42	30.88445	27.80993	30.54562	0.8382	0
986	13/04/2021 20:49:12	30.85299	27.78185	30.52145	0.83815	0
987	13/04/2021 20:49:42	30.80695	27.73535	30.47905	0.83808	0
988	13/04/2021 20:50:13	30.77537	27.71817	30.44383	0.83802	0
989	13/04/2021 20:50:43	30.74094	27.67972	30.40575	0.83791	0
990	13/04/2021 20:51:14	30.70707	27.65656	30.36824	0.83786	0
991	13/04/2021 20:51:44	30.66618	27.61526	30.32735	0.83774	0
992	13/04/2021 20:52:14	30.63229	27.59576	30.29347	0.83774	0
993	13/04/2021 20:52:45	30.599	27.57317	30.26381	0.8376	0
994	13/04/2021 20:53:15	30.5767	27.55066	30.2233	0.83753	0
995	13/04/2021 20:53:46	30.54338	27.53908	30.20456	0.83742	0
996	13/04/2021 20:54:17	30.49845	27.50107	30.16327	0.83734	0
997	13/04/2021 20:54:47	30.46426	27.4739	30.12908	0.8373	0
998	13/04/2021 20:55:18	30.42608	27.43534	30.09089	0.83719	0
999	13/04/2021 20:55:49	30.38007	27.4036	30.04125	0.83719	0
1000	13/04/2021 20:56:19	30.35198	27.37523	30.0168	0.83703	0
1001	13/04/2021 20:56:50	30.30998	27.33649	29.96719	0.83694	0
1002	13/04/2021 20:57:20	30.28283	27.31643	29.94713	0.83687	0
1003	13/04/2021 20:57:51	30.24925	27.28988	29.90954	0.83684	0
1004	13/04/2021 20:58:22	30.21225	27.25619	29.87217	0.83676	0
1005	13/04/2021 20:58:52	30.19028	27.2524	29.85366	0.83671	0
1006	13/04/2021 20:59:23	30.13954	27.21587	29.8061	0.83658	0
1007	13/04/2021 20:59:53	30.12496	27.20115	29.76931	0.83655	0
1008	13/04/2021 21:00:24	30.07425	27.16466	29.72913	0.83637	0
1009	13/04/2021 21:00:54	30.04466	27.15685	29.69924	0.83635	0
1010	13/04/2021 21:01:25	30.00743	27.12294	29.66533	0.83622	0
1011	13/04/2021 21:01:55	29.97685	27.08492	29.62732	0.83617	0
1012	13/04/2021 21:02:26	29.95258	27.06801	29.59568	0.83611	0
1013	13/04/2021 21:02:56	29.89953	27.02967	29.55367	0.83602	0
1014	13/04/2021 21:03:27	29.8768	27.01063	29.53095	0.83593	0
1015	13/04/2021 21:03:57	29.82786	26.97641	29.48201	0.83595	0
1016	13/04/2021 21:04:28	29.80495	26.95717	29.46277	0.83575	0
1017	13/04/2021 21:04:59	29.76394	26.91985	29.41809	0.8358	0
1018	13/04/2021 21:05:30	29.74116	26.90442	29.39531	0.83575	0
1019	13/04/2021 21:06:00	29.70721	26.87415	29.36135	0.83561	0
1020	13/04/2021 21:06:31	29.6692	26.85821	29.32334	0.83555	0
1021	13/04/2021 21:07:01	29.66033	26.86038	29.31447	0.8355	0
1022	13/04/2021 21:07:32	29.60689	26.81062	29.26839	0.83541	0
1023	13/04/2021 21:08:02	29.57568	26.77573	29.22983	0.83532	0
1024	13/04/2021 21:08:33	29.54106	26.74111	29.19153	0.83526	0

Comments	Appendix 2 - 2°C /min heating rate					
F(x)=	Cool-down					
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time	°C	°C	°C	V	V
1025	13/04/2021 21:09:03	29.51338	26.72815	29.16753	0.83521	0
1026	13/04/2021 21:09:34	29.47138	26.70087	29.12185	0.83515	0
1027	13/04/2021 21:10:05	29.45163	26.68848	29.10946	0.83506	0
1028	13/04/2021 21:10:36	29.41715	26.65767	29.06762	0.83499	0
1029	13/04/2021 21:11:07	29.39043	26.63464	29.03354	0.83492	0
1030	13/04/2021 21:11:38	29.35296	26.61188	29.00342	0.83489	0
1031	13/04/2021 21:12:08	29.32949	26.59577	28.98363	0.83481	0
1032	13/04/2021 21:12:39	29.30619	26.57983	28.95298	0.83473	0
1033	13/04/2021 21:13:10	29.27171	26.56006	28.92217	0.83465	0
1034	13/04/2021 21:13:40	29.24008	26.53211	28.88686	0.83459	0
1035	13/04/2021 21:14:11	29.20165	26.50104	28.85579	0.83454	0
1036	13/04/2021 21:14:42	29.17381	26.47689	28.83164	0.83444	0
1037	13/04/2021 21:15:13	29.1426	26.46039	28.80411	0.83438	0
1038	13/04/2021 21:15:44	29.12624	26.42932	28.76935	0.83434	0
1039	13/04/2021 21:16:14	29.08396	26.40543	28.74179	0.83427	0
1040	13/04/2021 21:16:45	29.05262	26.38145	28.70308	0.83424	0
1041	13/04/2021 21:17:16	29.01487	26.35106	28.65798	0.8341	0
1042	13/04/2021 21:17:47	28.98473	26.3246	28.6352	0.83404	0
1043	13/04/2021 21:18:18	28.93965	26.29423	28.59011	0.83398	0
1044	13/04/2021 21:18:48	28.92722	26.28548	28.58136	0.83397	0
1045	13/04/2021 21:19:19	28.90022	26.26584	28.54333	0.83391	0
1046	13/04/2021 21:19:50	28.86194	26.23492	28.51241	0.83381	0
1047	13/04/2021 21:20:21	28.82362	26.20764	28.47409	0.83375	0
1048	13/04/2021 21:20:52	28.80021	26.18423	28.45436	0.8337	0
1049	13/04/2021 21:21:23	28.77317	26.16456	28.431	0.83366	0
1050	13/04/2021 21:21:53	28.75341	26.14846	28.40019	0.83359	0
1051	13/04/2021 21:22:24	28.7259	26.12464	28.36901	0.83353	0
1052	13/04/2021 21:22:54	28.6767	26.09015	28.32716	0.83343	0
1053	13/04/2021 21:23:24	28.6569	26.07036	28.30737	0.83338	0
1054	13/04/2021 21:23:55	28.62282	26.04731	28.27696	0.83329	0
1055	13/04/2021 21:24:26	28.58917	26.02102	28.23228	0.83324	0
1056	13/04/2021 21:24:57	28.55468	25.99389	28.20147	0.8332	0
1057	13/04/2021 21:25:28	28.52403	25.98163	28.17817	0.83316	0
1058	13/04/2021 21:25:59	28.51133	25.96526	28.15444	0.83308	0
1059	13/04/2021 21:26:30	28.48026	25.94522	28.12705	0.83301	0
1060	13/04/2021 21:27:00	28.44209	25.91441	28.09256	0.833	0
1061	13/04/2021 21:27:31	28.4219	25.89422	28.06133	0.83291	0
1062	13/04/2021 21:28:02	28.39052	25.87756	28.04467	0.83286	0
1063	13/04/2021 21:28:33	28.35209	25.84648	28.00255	0.83285	0
1064	13/04/2021 21:29:04	28.32892	25.827	27.98675	0.83273	0
1065	13/04/2021 21:29:35	28.31299	25.81107	27.95977	0.83262	0
1066	13/04/2021 21:30:05	28.27522	25.77698	27.92937	0.83259	0
1067	13/04/2021 21:30:36	28.25248	25.76527	27.90662	0.83256	0
1068	13/04/2021 21:31:07	28.21839	25.7459	27.86518	0.83252	0
1069	13/04/2021 21:31:37	28.19509	25.73732	27.84556	0.83246	0
1070	13/04/2021 21:32:08	28.16385	25.70608	27.81064	0.83237	0
1071	13/04/2021 21:32:38	28.14324	25.69283	27.79371	0.83233	0
1072	13/04/2021 21:33:09	28.11247	25.67309	27.76661	0.83226	0
1073	13/04/2021 21:33:39	28.08153	25.64951	27.732	0.83225	0
1074	13/04/2021 21:34:10	28.05455	25.6115	27.7087	0.83217	0
1075	13/04/2021 21:34:41	28.02769	25.592	27.6708	0.8321	0
1076	13/04/2021 21:35:12	27.97889	25.55423	27.63303	0.83204	0
1077	13/04/2021 21:35:43	27.96333	25.54235	27.6138	0.83198	0
1078	13/04/2021 21:36:14	27.92911	25.51181	27.58326	0.83195	0
1079	13/04/2021 21:36:44	27.90227	25.49969	27.55642	0.83188	0
1080	13/04/2021 21:37:15	27.88633	25.48375	27.52208	0.83187	0
1081	13/04/2021 21:37:46	27.85564	25.47145	27.5061	0.83176	0
1082	13/04/2021 21:38:17	27.83531	25.45113	27.47842	0.8317	0
1083	13/04/2021 21:38:48	27.7958	25.41161	27.44258	0.83169	0
1084	13/04/2021 21:39:19	27.75925	25.38242	27.40603	0.83162	0
1085	13/04/2021 21:39:50	27.74136	25.37557	27.38815	0.8316	0
1086	13/04/2021 21:40:21	27.7134	25.34761	27.35651	0.83149	0
1087	13/04/2021 21:40:52	27.67458	25.31983	27.32505	0.83147	0
1088	13/04/2021 21:41:23	27.66625	25.31518	27.31304	0.83142	0

Comments	Appendix 2 - 2°C /min heating rate					
F(x)=	Cool-down					
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time	°C	°C	°C	V	V
1089	13/04/2021 21:41:54	27.64728	25.30725	27.29407	0.83135	0
1090	13/04/2021 21:42:25	27.60984	25.27349	27.26031	0.83133	0
1091	13/04/2021 21:42:55	27.5797	25.25438	27.23017	0.83125	0
1092	13/04/2021 21:43:25	27.57143	25.25715	27.21086	0.8312	0
1093	13/04/2021 21:43:56	27.53318	25.21522	27.17997	0.83116	0
1094	13/04/2021 21:44:27	27.50965	25.19905	27.15276	0.83127	0
1095	13/04/2021 21:44:57	27.4781	25.17486	27.12857	0.83101	0
1096	13/04/2021 21:45:28	27.46142	25.16186	27.11189	0.83099	0
1097	13/04/2021 21:45:59	27.43091	25.13135	27.08506	0.83094	0
1098	13/04/2021 21:46:30	27.41188	25.11599	27.06602	0.83087	0
1099	13/04/2021 21:47:01	27.38151	25.09299	27.02094	0.83085	0
1100	13/04/2021 21:47:31	27.35523	25.06303	26.99834	0.8308	0
1101	13/04/2021 21:48:02	27.33632	25.05884	26.97943	0.83078	0
1102	13/04/2021 21:48:32	27.31778	25.04029	26.94984	0.83074	0
1103	13/04/2021 21:49:03	27.29927	25.04386	26.94237	0.83064	0
1104	13/04/2021 21:49:34	27.27272	25.02834	26.9195	0.83061	0
1105	13/04/2021 21:50:04	27.25338	25.01268	26.89649	0.83041	0
1106	13/04/2021 21:50:35	27.22934	24.99968	26.87244	0.83044	0
1107	13/04/2021 21:51:05	27.18637	24.96408	26.83316	0.83042	0
1108	13/04/2021 21:51:35	27.15932	24.93334	26.8061	0.83039	0
1109	13/04/2021 21:52:06	27.13249	24.91387	26.77192	0.83035	0
1110	13/04/2021 21:52:37	27.11644	24.89415	26.75587	0.83039	0
1111	13/04/2021 21:53:08	27.09765	24.87535	26.7334	0.83031	0
1112	13/04/2021 21:53:38	27.07903	24.87145	26.72214	0.83027	0
1113	13/04/2021 21:54:09	27.05669	24.84911	26.70347	0.83006	0
1114	13/04/2021 21:54:39	27.02344	24.83058	26.67391	0.83019	0
1115	13/04/2021 21:55:10	27.00873	24.82322	26.65183	0.83009	0
1116	13/04/2021 21:55:41	26.97823	24.79273	26.61398	0.83006	0
1117	13/04/2021 21:56:12	26.92906	24.76195	26.57585	0.83	0
1118	13/04/2021 21:56:43	26.92025	24.75682	26.56335	0.82994	0
1119	13/04/2021 21:57:14	26.88493	24.72886	26.52435	0.82993	0
1120	13/04/2021 21:57:44	26.87898	24.72659	26.52209	0.82986	0
1121	13/04/2021 21:58:15	26.85194	24.71059	26.49873	0.82979	0
1122	13/04/2021 21:58:46	26.83275	24.68404	26.47218	0.82976	0
1123	13/04/2021 21:59:16	26.80647	24.66143	26.44589	0.82973	0
1124	13/04/2021 21:59:47	26.78003	24.64603	26.42314	0.8297	0
1125	13/04/2021 22:00:18	26.74654	24.6199	26.39701	0.82962	0
1126	13/04/2021 22:00:48	26.73131	24.60836	26.36338	0.82961	0
1127	13/04/2021 22:01:19	26.70069	24.58509	26.35116	0.82956	0
1128	13/04/2021 22:01:50	26.68833	24.58745	26.33512	0.82951	0
1129	13/04/2021 22:02:21	26.65376	24.56392	26.30423	0.82948	0
1130	13/04/2021 22:02:52	26.63366	24.54014	26.28045	0.82944	0
1131	13/04/2021 22:03:23	26.6234	24.52988	26.26651	0.82943	0
1132	13/04/2021 22:03:54	26.60608	24.51623	26.24918	0.82934	0
1133	13/04/2021 22:04:25	26.57094	24.48478	26.21405	0.8293	0
1134	13/04/2021 22:04:56	26.54361	24.45377	26.18672	0.82927	0
1135	13/04/2021 22:05:26	26.52813	24.44196	26.17124	0.82921	0
1136	13/04/2021 22:05:57	26.4979	24.42277	26.14469	0.82918	0
1137	13/04/2021 22:06:27	26.46439	24.4003	26.10382	0.82912	0
1138	13/04/2021 22:06:58	26.46058	24.39281	26.08897	0.82907	0
1139	13/04/2021 22:07:29	26.42011	24.37442	26.06689	0.82908	0
1140	13/04/2021 22:08:00	26.40474	24.36273	26.0405	0.82899	0
1141	13/04/2021 22:08:30	26.38475	24.35009	26.02417	0.82895	0
1142	13/04/2021 22:09:01	26.37553	24.3372	26.00761	0.82894	0
1143	13/04/2021 22:09:31	26.3377	24.31409	25.98081	0.8289	0
1144	13/04/2021 22:10:01	26.3218	24.29082	25.96858	0.82885	0
1145	13/04/2021 22:10:32	26.29514	24.2752	25.94193	0.82883	0
1146	13/04/2021 22:11:02	26.28355	24.26729	25.92666	0.82877	0
1147	13/04/2021 22:11:32	26.25663	24.2514	25.90341	0.82874	0
1148	13/04/2021 22:12:03	26.23783	24.23261	25.88462	0.82867	0
1149	13/04/2021 22:12:34	26.21917	24.22131	25.8586	0.82864	0
1150	13/04/2021 22:13:05	26.21157	24.22106	25.84732	0.82863	0
1151	13/04/2021 22:13:36	26.16673	24.18727	25.81352	0.82856	0
1152	13/04/2021 22:14:07	26.14401	24.17191	25.77976	0.82857	0

Comments	Appendix 2 - 2°C /min heating rate					
F(x)=	Cool-down					
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time	°C	°C	°C	V	V
1153	13/04/2021 22:14:38	26.13179	24.15233	25.76754	0.82852	0
1154	13/04/2021 22:15:09	26.10169	24.13695	25.74112	0.82847	0
1155	13/04/2021 22:15:40	26.09695	24.13221	25.74374	0.82839	0
1156	13/04/2021 22:16:10	26.06265	24.0979	25.70576	0.82835	0
1157	13/04/2021 22:16:41	26.0469	24.08951	25.69368	0.82836	0
1158	13/04/2021 22:17:11	26.02825	24.06719	25.664	0.8283	0
1159	13/04/2021 22:17:42	25.99393	24.04022	25.64072	0.82828	0
1160	13/04/2021 22:18:13	25.97121	24.02486	25.618	0.82824	0
1161	13/04/2021 22:18:44	25.95595	24.01696	25.59906	0.8282	0
1162	13/04/2021 22:19:15	25.92982	23.99819	25.57292	0.82818	0
1163	13/04/2021 22:19:46	25.90365	23.97937	25.55043	0.8281	0
1164	13/04/2021 22:20:17	25.88513	23.96454	25.53192	0.82809	0
1165	13/04/2021 22:20:48	25.86557	23.95969	25.50868	0.82804	0
1166	13/04/2021 22:21:19	25.84534	23.93947	25.48477	0.82802	0
1167	13/04/2021 22:21:50	25.82875	23.92288	25.46818	0.82799	0
1168	13/04/2021 22:22:21	25.80496	23.90276	25.44439	0.82798	0
1169	13/04/2021 22:22:51	25.77462	23.88714	25.42141	0.82791	0
1170	13/04/2021 22:23:22	25.7666	23.86808	25.40603	0.82787	0
1171	13/04/2021 22:23:53	25.73624	23.85244	25.38671	0.82799	0
1172	13/04/2021 22:24:23	25.73177	23.84061	25.37487	0.82784	0
1173	13/04/2021 22:24:54	25.6946	23.82183	25.33402	0.82776	0
1174	13/04/2021 22:25:25	25.67569	23.8066	25.31144	0.82772	0
1175	13/04/2021 22:25:56	25.66476	23.80672	25.30787	0.82772	0
1176	13/04/2021 22:26:27	25.65293	23.80592	25.29604	0.82759	0
1177	13/04/2021 22:26:58	25.62599	23.77898	25.26174	0.82761	0
1178	13/04/2021 22:27:29	25.59904	23.75204	25.22743	0.82756	0
1179	13/04/2021 22:28:00	25.57225	23.72892	25.21168	0.82752	0
1180	13/04/2021 22:28:31	25.55659	23.72798	25.20338	0.82745	0
1181	13/04/2021 22:29:02	25.54083	23.71222	25.18762	0.82742	0
1182	13/04/2021 22:29:33	25.50719	23.68594	25.15766	0.82736	0
1183	13/04/2021 22:30:04	25.50666	23.68173	25.14241	0.82742	0
1184	13/04/2021 22:30:35	25.48066	23.66677	25.11273	0.82743	0
1185	13/04/2021 22:31:06	25.47262	23.66241	25.11941	0.8273	0
1186	13/04/2021 22:31:37	25.44308	23.6439	25.0825	0.82725	0
1187	13/04/2021 22:32:07	25.43583	23.63665	25.07894	0.82734	0
1188	13/04/2021 22:32:38	25.39851	23.61405	25.04529	0.82726	0
1189	13/04/2021 22:33:09	25.38645	23.60935	25.03324	0.82722	0
1190	13/04/2021 22:33:40	25.37379	23.58565	25.02425	0.82715	0
1191	13/04/2021 22:34:11	25.3429	23.55844	24.98233	0.82709	0
1192	13/04/2021 22:34:41	25.32348	23.53534	24.96291	0.82711	0
1193	13/04/2021 22:35:12	25.30811	23.531	24.95121	0.82708	0
1194	13/04/2021 22:35:43	25.27839	23.50865	24.92518	0.82706	0
1195	13/04/2021 22:36:14	25.26724	23.50485	24.91402	0.827	0
1196	13/04/2021 22:36:45	25.25225	23.50091	24.89168	0.827	0
1197	13/04/2021 22:37:16	25.22584	23.47449	24.87263	0.82696	0
1198	13/04/2021 22:37:47	25.21416	23.47385	24.85359	0.82692	0
1199	13/04/2021 22:38:17	25.19561	23.44794	24.83504	0.82684	0
1200	13/04/2021 22:38:48	25.17602	23.43204	24.80809	0.82684	0
1201	13/04/2021 22:39:19	25.15212	23.42285	24.79155	0.82679	0
1202	13/04/2021 22:39:50	25.14357	23.41798	24.77932	0.82677	0
1203	13/04/2021 22:40:21	25.11272	23.39081	24.7595	0.82677	0
1204	13/04/2021 22:40:52	25.07802	23.35611	24.71745	0.82674	0
1205	13/04/2021 22:41:22	25.08405	23.36214	24.71198	0.82668	0
1206	13/04/2021 22:41:53	25.04986	23.34267	24.69665	0.82666	0
1207	13/04/2021 22:42:23	25.04184	23.33097	24.68863	0.82663	0
1208	13/04/2021 22:42:54	25.01952	23.30865	24.66263	0.8266	0
1209	13/04/2021 22:43:25	25.00834	23.29746	24.64408	0.82658	0
1210	13/04/2021 22:43:56	24.98601	23.29722	24.62544	0.82657	0
1211	13/04/2021 22:44:27	24.96709	23.27461	24.60284	0.82652	0
1212	13/04/2021 22:44:58	24.9291	23.25502	24.58325	0.82647	0
1213	13/04/2021 22:45:29	24.9354	23.25765	24.57851	0.82648	0
1214	13/04/2021 22:45:59	24.92659	23.24515	24.57706	0.82643	0
1215	13/04/2021 22:46:30	24.88914	23.21138	24.52121	0.82636	0
1216	13/04/2021 22:47:01	24.87325	23.19917	24.51268	0.82636	0

Comments	Appendix 2 - 2°C /min heating rate						
F(x)=	Cool-down						
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt	
Units	Time	°C	°C	°C	V	V	
1281	13/04/2021 23:20:19	23.83786	22.42501	23.46993	0.82464		0
1282	13/04/2021 23:20:49	23.83023	22.42842	23.46598	0.82459		0
1283	13/04/2021 23:21:20	23.8071	22.40529	23.44285	0.8246		0
1284	13/04/2021 23:21:51	23.79857	22.40044	23.43432	0.82457		0
1285	13/04/2021 23:22:22	23.79029	22.38479	23.41868	0.82455		0
1286	13/04/2021 23:22:53	23.77821	22.38007	23.41028	0.82454		0
1287	13/04/2021 23:23:24	23.75891	22.36077	23.39466	0.82452		0
1288	13/04/2021 23:23:54	23.75127	22.34577	23.37598	0.82449		0
1289	13/04/2021 23:24:25	23.73274	22.34196	23.36481	0.82449		0
1290	13/04/2021 23:24:55	23.71721	22.33379	23.35296	0.82446		0
1291	13/04/2021 23:25:26	23.71672	22.32962	23.3451	0.8245		0
1292	13/04/2021 23:25:57	23.69775	22.31801	23.32614	0.82441		0
1293	13/04/2021 23:26:28	23.67873	22.299	23.31448	0.8244		0
1294	13/04/2021 23:26:59	23.65626	22.2986	23.29201	0.82437		0
1295	13/04/2021 23:27:30	23.64128	22.28362	23.28071	0.8243		0
1296	13/04/2021 23:28:01	23.63337	22.27203	23.26176	0.82431		0
1297	13/04/2021 23:28:32	23.61788	22.26758	23.25363	0.8243		0
1298	13/04/2021 23:29:02	23.59897	22.23763	23.23104	0.82423		0
1299	13/04/2021 23:29:33	23.57622	22.2296	23.21565	0.82423		0
1300	13/04/2021 23:30:04	23.5761	22.2258	23.21921	0.8242		0
1301	13/04/2021 23:30:35	23.56478	22.21816	23.19685	0.82421		0
1302	13/04/2021 23:31:06	23.55663	22.21369	23.19238	0.82419		0
1303	13/04/2021 23:31:36	23.53061	22.18767	23.17004	0.82418		0
1304	13/04/2021 23:32:06	23.52325	22.18399	23.159	0.82416		0
1305	13/04/2021 23:32:37	23.51984	22.18425	23.14823	0.8241		0
1306	13/04/2021 23:33:08	23.50092	22.17637	23.13666	0.82414		0
1307	13/04/2021 23:33:39	23.47372	22.16021	23.10579	0.82408		0
1308	13/04/2021 23:34:10	23.45795	22.14812	23.09738	0.82408		0
1309	13/04/2021 23:34:41	23.4535	22.13999	23.09292	0.82401		0
1310	13/04/2021 23:35:12	23.43127	22.12512	23.0707	0.824		0
1311	13/04/2021 23:35:43	23.42012	22.10661	23.05587	0.824		0
1312	13/04/2021 23:36:13	23.41276	22.10661	23.04851	0.824		0
1313	13/04/2021 23:36:44	23.39463	22.09216	23.0267	0.82397		0
1314	13/04/2021 23:37:15	23.37608	22.08464	23.02287	0.82391		0
1315	13/04/2021 23:37:46	23.37634	22.07755	22.99738	0.82395		0
1316	13/04/2021 23:38:17	23.35783	22.06272	22.9899	0.82391		0
1317	13/04/2021 23:38:47	23.34323	22.05915	22.9753	0.82387		0
1318	13/04/2021 23:39:18	23.33142	22.0547	22.96349	0.82385		0
1319	13/04/2021 23:39:49	23.31576	22.03168	22.94415	0.82385		0
1320	13/04/2021 23:40:19	23.30381	22.0271	22.9322	0.82384		0
1321	13/04/2021 23:40:50	23.29174	22.02606	22.93116	0.8238		0
1322	13/04/2021 23:41:21	23.27253	22.01421	22.91196	0.82381		0
1323	13/04/2021 23:41:52	23.27226	21.99922	22.91169	0.82376		0
1324	13/04/2021 23:42:23	23.26138	21.99202	22.88609	0.82374		0
1325	13/04/2021 23:42:54	23.26098	21.99162	22.88201	0.8237		0
1326	13/04/2021 23:43:25	23.23904	21.97704	22.86743	0.82374		0
1327	13/04/2021 23:43:56	23.20947	21.95851	22.84154	0.82368		0
1328	13/04/2021 23:44:27	23.20498	21.95402	22.82969	0.82367		0
1329	13/04/2021 23:44:57	23.19277	21.94181	22.82116	0.82368		0
1330	13/04/2021 23:45:28	23.17675	21.93314	22.80882	0.82361		0
1331	13/04/2021 23:45:59	23.15677	21.91684	22.78884	0.82361		0
1332	13/04/2021 23:46:30	23.15569	21.92312	22.79144	0.82355		0
1333	13/04/2021 23:47:00	23.14018	21.90026	22.77225	0.82362		0
1334	13/04/2021 23:47:30	23.12863	21.89607	22.76438	0.82358		0
1335	13/04/2021 23:48:01	23.10814	21.87925	22.74021	0.82358		0
1336	13/04/2021 23:48:32	23.10682	21.87793	22.74624	0.82355		0
1337	13/04/2021 23:49:02	23.07712	21.85191	22.7239	0.82351		0
1338	13/04/2021 23:49:33	23.08436	21.85548	22.72011	0.82345		0
1339	13/04/2021 23:50:04	23.08012	21.85859	22.71955	0.82346		0
1340	13/04/2021 23:50:35	23.05019	21.84706	22.70066	0.82347		0
1341	13/04/2021 23:51:05	23.06793	21.85744	22.7	0.82342		0
1342	13/04/2021 23:51:36	23.04479	21.83062	22.68422	0.82338		0
1343	13/04/2021 23:52:07	23.03285	21.82972	22.6686	0.82341		0
1344	13/04/2021 23:52:38	23.01036	21.81826	22.64611	0.82339		0

Comments	Appendix 2 - 2°C /min heating rate					
F(x)=	Cool-down					
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time	°C	°C	°C	V	V
1345	13/04/2021 23:53:09	23.01351	21.81406	22.64926	0.82335	0
1346	13/04/2021 23:53:39	22.98656	21.78711	22.62599	0.82333	0
1347	13/04/2021 23:54:10	22.98524	21.78579	22.60627	0.8233	0
1348	13/04/2021 23:54:41	22.97343	21.78134	22.61286	0.82327	0
1349	13/04/2021 23:55:12	22.9553	21.75953	22.58737	0.82326	0
1350	13/04/2021 23:55:43	22.95581	21.76371	22.58052	0.82327	0
1351	13/04/2021 23:56:14	22.94532	21.76426	22.57371	0.82326	0
1352	13/04/2021 23:56:45	22.9306	21.74587	22.55531	0.82321	0
1353	13/04/2021 23:57:16	22.91588	21.74587	22.55163	0.82324	0
1354	13/04/2021 23:57:47	22.89709	21.72339	22.52916	0.82319	0
1355	13/04/2021 23:58:18	22.89616	21.73351	22.52823	0.82325	0
1356	13/04/2021 23:58:48	22.88382	21.72484	22.51221	0.82315	0
1357	13/04/2021 23:59:19	22.85412	21.69515	22.47884	0.82315	0
1358	13/04/2021 23:59:50	22.85005	21.69107	22.48948	0.82308	0
1359	14/04/2021 00:00:21	22.84625	21.69095	22.49304	0.82307	0
1360	14/04/2021 00:00:52	22.8389	21.6836	22.47097	0.82307	0
1361	14/04/2021 00:01:23	22.83154	21.66888	22.46729	0.82309	0
1362	14/04/2021 00:01:54	22.80971	21.66177	22.44546	0.82304	0
1363	14/04/2021 00:02:25	22.79512	21.6435	22.42719	0.82304	0
1364	14/04/2021 00:02:55	22.77278	21.63588	22.40853	0.82303	0
1365	14/04/2021 00:03:26	22.76474	21.62784	22.40049	0.82298	0
1366	14/04/2021 00:03:57	22.74897	21.60471	22.38104	0.82294	0
1367	14/04/2021 00:04:27	22.74452	21.60761	22.37659	0.82295	0
1368	14/04/2021 00:04:58	22.73597	21.59906	22.37172	0.82295	0
1369	14/04/2021 00:05:29	22.72755	21.58329	22.3633	0.82294	0
1370	14/04/2021 00:06:00	22.72348	21.59761	22.36658	0.82293	0
1371	14/04/2021 00:06:31	22.71612	21.58289	22.35555	0.82291	0
1372	14/04/2021 00:07:01	22.69721	21.56767	22.33296	0.82288	0
1373	14/04/2021 00:07:32	22.68932	21.56346	22.31772	0.82286	0
1374	14/04/2021 00:08:02	22.68185	21.56334	22.32128	0.82286	0
1375	14/04/2021 00:08:33	22.67028	21.5481	22.30236	0.82285	0
1376	14/04/2021 00:09:04	22.65189	21.53706	22.28396	0.82282	0
1377	14/04/2021 00:09:35	22.65134	21.54019	22.28709	0.82279	0
1378	14/04/2021 00:10:05	22.6466	21.54281	22.27499	0.82279	0
1379	14/04/2021 00:10:36	22.62691	21.51576	22.25897	0.82276	0
1380	14/04/2021 00:11:06	22.6039	21.51115	22.23597	0.82272	0
1381	14/04/2021 00:11:37	22.60717	21.4997	22.24292	0.8227	0
1382	14/04/2021 00:12:07	22.59234	21.49223	22.22441	0.82271	0
1383	14/04/2021 00:12:37	22.59207	21.503	22.2315	0.82268	0
1384	14/04/2021 00:13:08	22.58471	21.49932	22.22046	0.82263	0
1385	14/04/2021 00:13:39	22.57051	21.47776	22.20258	0.82268	0
1386	14/04/2021 00:14:10	22.54136	21.45596	22.16975	0.82264	0
1387	14/04/2021 00:14:41	22.55622	21.46347	22.17726	0.82264	0
1388	14/04/2021 00:15:11	22.54188	21.46017	22.17395	0.82264	0
1389	14/04/2021 00:15:42	22.52964	21.4516	22.16539	0.82262	0
1390	14/04/2021 00:16:13	22.51745	21.45045	22.14952	0.82257	0
1391	14/04/2021 00:16:43	22.50573	21.43137	22.14148	0.82261	0
1392	14/04/2021 00:17:13	22.50143	21.43443	22.12614	0.82256	0
1393	14/04/2021 00:17:44	22.4892	21.4222	22.12495	0.82256	0
1394	14/04/2021 00:18:48	22.46199	21.39499	22.09774	0.82253	0
1395	14/04/2021 00:19:18	22.45042	21.39079	22.07881	0.82248	0
1396	14/04/2021 00:19:48	22.44293	21.38697	22.07868	0.82249	0
1397	14/04/2021 00:20:19	22.42453	21.36858	22.06396	0.82248	0
1398	14/04/2021 00:20:50	22.40953	21.37197	22.04528	0.82244	0
1399	14/04/2021 00:21:21	22.42031	21.37539	22.0487	0.82243	0
1400	14/04/2021 00:21:51	22.39365	21.35609	22.02572	0.82245	0
1401	14/04/2021 00:22:22	22.38537	21.3478	22.01743	0.82242	0
1402	14/04/2021 00:22:53	22.3704	21.33284	21.99879	0.82243	0
1403	14/04/2021 00:23:24	22.37274	21.33518	22.00849	0.82237	0
1404	14/04/2021 00:23:54	22.36064	21.32308	21.98904	0.82235	0
1405	14/04/2021 00:24:25	22.35947	21.31455	21.98786	0.82234	0
1406	14/04/2021 00:24:56	22.34002	21.30614	21.97577	0.82237	0
1407	14/04/2021 00:25:27	22.33609	21.30589	21.96816	0.82235	0
1408	14/04/2021 00:25:58	22.32832	21.29812	21.96039	0.82232	0

Comments	Appendix 2 - 2°C /min heating rate					
F(x)=	Cool-down					
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time	°C	°C	°C	V	V
1409	14/04/2021 00:26:29	22.30203	21.28655	21.93411	0.8223	0
1410	14/04/2021 00:26:59	22.31256	21.2934	21.9336	0.82228	0
1411	14/04/2021 00:27:30	22.2972	21.2854	21.93295	0.82228	0
1412	14/04/2021 00:28:01	22.28928	21.28115	21.92135	0.82235	0
1413	14/04/2021 00:28:31	22.28441	21.27628	21.91648	0.82231	0
1414	14/04/2021 00:29:02	22.25777	21.257	21.89352	0.82228	0
1415	14/04/2021 00:29:33	22.23186	21.23477	21.86761	0.82221	0
1416	14/04/2021 00:30:03	22.25026	21.24949	21.88233	0.82223	0
1417	14/04/2021 00:30:34	22.23554	21.23109	21.87129	0.82215	0
1418	14/04/2021 00:31:05	22.22388	21.22311	21.85227	0.82215	0
1419	14/04/2021 00:31:35	22.22333	21.22256	21.84804	0.82212	0
1420	14/04/2021 00:32:05	22.20048	21.19972	21.82888	0.82213	0
1421	14/04/2021 00:32:36	22.19205	21.19864	21.8278	0.82213	0
1422	14/04/2021 00:33:06	22.19482	21.20509	21.83057	0.82214	0
1423	14/04/2021 00:33:37	22.16789	21.18552	21.80364	0.8221	0
1424	14/04/2021 00:34:07	22.1781	21.19941	21.81017	0.82209	0
1425	14/04/2021 00:34:37	22.14461	21.16224	21.78404	0.82209	0
1426	14/04/2021 00:35:08	22.14014	21.16144	21.77589	0.82206	0
1427	14/04/2021 00:35:38	22.13923	21.15318	21.7713	0.82204	0
1428	14/04/2021 00:36:09	22.12806	21.14201	21.76381	0.82205	0
1429	14/04/2021 00:36:39	22.12004	21.13767	21.75211	0.82204	0
1430	14/04/2021 00:37:10	22.12346	21.14108	21.75553	0.822	0
1431	14/04/2021 00:37:41	22.10544	21.12674	21.72647	0.82201	0
1432	14/04/2021 00:38:11	22.09863	21.13097	21.72334	0.822	0
1433	14/04/2021 00:38:41	22.09127	21.13097	21.71966	0.82199	0
1434	14/04/2021 00:39:12	22.08759	21.13097	21.71966	0.82197	0
1435	14/04/2021 00:39:43	22.08734	21.12705	21.71573	0.82195	0
1436	14/04/2021 00:40:14	22.07142	21.11112	21.69981	0.82194	0
1437	14/04/2021 00:40:44	22.05604	21.1031	21.68443	0.82191	0
1438	14/04/2021 00:41:14	22.05159	21.10601	21.68733	0.82195	0
1439	14/04/2021 00:41:45	22.0396	21.09402	21.66799	0.82192	0
1440	14/04/2021 00:42:16	22.02779	21.08221	21.66354	0.82186	0
1441	14/04/2021 00:42:47	22.03803	21.07774	21.65907	0.82186	0
1442	14/04/2021 00:43:18	22.02647	21.07353	21.6475	0.82187	0
1443	14/04/2021 00:43:49	22.00047	21.05489	21.6399	0.82187	0
1444	14/04/2021 00:44:20	22.0002	21.0583	21.62859	0.82187	0
1445	14/04/2021 00:44:51	21.9856	21.04738	21.61767	0.82183	0
1446	14/04/2021 00:45:22	21.96736	21.02914	21.59943	0.82183	0
1447	14/04/2021 00:45:52	21.96641	21.03555	21.5948	0.82178	0
1448	14/04/2021 00:46:22	21.96154	21.027	21.58625	0.8218	0
1449	14/04/2021 00:46:52	21.94905	21.01819	21.58112	0.82177	0
1450	14/04/2021 00:47:23	21.92609	20.9989	21.55448	0.82176	0
1451	14/04/2021 00:47:53	21.92175	21.00192	21.55382	0.82179	0
1452	14/04/2021 00:48:23	21.91661	20.98943	21.545	0.82176	0
1453	14/04/2021 00:48:54	21.91238	20.9852	21.54078	0.8217	0
1454	14/04/2021 00:49:25	21.90463	20.97745	21.54038	0.82169	0
1455	14/04/2021 00:49:55	21.89716	20.97733	21.52555	0.82172	0
1456	14/04/2021 00:50:25	21.88612	20.9663	21.51083	0.82166	0
1457	14/04/2021 00:50:56	21.87152	20.95905	21.49991	0.82163	0
1458	14/04/2021 00:51:26	21.87914	20.97035	21.49649	0.82164	0
1459	14/04/2021 00:51:57	21.85338	20.94828	21.48913	0.82166	0
1460	14/04/2021 00:52:28	21.86048	20.94066	21.47783	0.8216	0
1461	14/04/2021 00:52:58	21.85301	20.94422	21.47772	0.82165	0
1462	14/04/2021 00:53:29	21.84129	20.93986	21.48072	0.82164	0
1463	14/04/2021 00:53:59	21.8371	20.93199	21.46181	0.82163	0
1464	14/04/2021 00:54:30	21.82963	20.92084	21.45066	0.82156	0
1465	14/04/2021 00:55:01	21.82606	20.92463	21.45445	0.82161	0
1466	14/04/2021 00:55:32	21.8191	20.91767	21.44381	0.82157	0
1467	14/04/2021 00:56:03	21.80506	20.91099	21.42977	0.82156	0
1468	14/04/2021 00:56:33	21.79072	20.89665	21.42279	0.82157	0
1469	14/04/2021 00:57:04	21.78322	20.89282	21.40793	0.82153	0
1470	14/04/2021 00:57:35	21.77931	20.88524	21.40034	0.82158	0
1471	14/04/2021 00:58:06	21.78559	20.89888	21.4103	0.8215	0
1472	14/04/2021 00:58:37	21.76666	20.88731	21.39873	0.8215	0

Comments	Appendix 2 - 2°C /min heating rate					
F(x)=	Cool-down					
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time	°C	°C	°C	V	V
1473	14/04/2021 00:59:07	21.74393	20.86825	21.376	0.82146	0
1474	14/04/2021 00:59:37	21.7358	20.8638	21.36419	0.82144	0
1475	14/04/2021 01:00:08	21.73866	20.86299	21.36705	0.82149	0
1476	14/04/2021 01:00:39	21.73815	20.86248	21.37758	0.82144	0
1477	14/04/2021 01:01:10	21.71568	20.84736	21.34775	0.8215	0
1478	14/04/2021 01:01:41	21.7191	20.85078	21.35484	0.8214	0
1479	14/04/2021 01:02:12	21.70477	20.8475	21.3442	0.8214	0
1480	14/04/2021 01:02:43	21.70794	20.84699	21.33633	0.8214	0
1481	14/04/2021 01:03:14	21.71134	20.85038	21.34341	0.82136	0
1482	14/04/2021 01:03:45	21.69902	20.84174	21.33476	0.82138	0
1483	14/04/2021 01:04:15	21.67954	20.82595	21.30426	0.82145	0
1484	14/04/2021 01:04:45	21.6602	20.81397	21.28859	0.82138	0
1485	14/04/2021 01:05:15	21.66243	20.80147	21.29082	0.82137	0
1486	14/04/2021 01:05:46	21.64299	20.78572	21.27139	0.82131	0
1487	14/04/2021 01:06:17	21.63896	20.778	21.26735	0.82134	0
1488	14/04/2021 01:06:48	21.63173	20.77813	21.26012	0.82133	0
1489	14/04/2021 01:07:19	21.62107	20.77115	21.25314	0.82129	0
1490	14/04/2021 01:07:50	21.62828	20.771	21.25667	0.82133	0
1491	14/04/2021 01:08:20	21.60241	20.75985	21.23448	0.82123	0
1492	14/04/2021 01:08:51	21.60279	20.76391	21.23485	0.82122	0
1493	14/04/2021 01:09:22	21.60318	20.7643	21.23525	0.82126	0
1494	14/04/2021 01:09:53	21.58873	20.74985	21.21344	0.82124	0
1495	14/04/2021 01:10:24	21.58807	20.74551	21.22382	0.82123	0
1496	14/04/2021 01:10:55	21.58728	20.73736	21.20095	0.82123	0
1497	14/04/2021 01:11:26	21.57586	20.74434	21.20793	0.82125	0
1498	14/04/2021 01:11:57	21.56837	20.73317	21.20044	0.82121	0
1499	14/04/2021 01:12:28	21.55327	20.72543	21.1927	0.82122	0
1500	14/04/2021 01:12:58	21.54933	20.71781	21.17772	0.8212	0
1501	14/04/2021 01:13:29	21.54156	20.70268	21.16995	0.82116	0
1502	14/04/2021 01:14:00	21.53772	20.70252	21.16979	0.82111	0
1503	14/04/2021 01:14:31	21.53393	20.69505	21.166	0.82118	0
1504	14/04/2021 01:15:01	21.53354	20.70937	21.15825	0.82113	0
1505	14/04/2021 01:15:31	21.51463	20.69415	21.14302	0.82115	0
1506	14/04/2021 01:16:02	21.49606	20.67926	21.13181	0.82114	0
1507	14/04/2021 01:16:33	21.49595	20.67915	21.12434	0.82115	0
1508	14/04/2021 01:17:04	21.47061	20.66852	21.10636	0.82104	0
1509	14/04/2021 01:17:34	21.48097	20.66784	21.11304	0.82112	0
1510	14/04/2021 01:18:05	21.48361	20.67049	21.10832	0.82105	0
1511	14/04/2021 01:18:35	21.47204	20.66628	21.10043	0.82106	0
1512	14/04/2021 01:19:06	21.4497	20.63658	21.07809	0.82108	0
1513	14/04/2021 01:19:37	21.43842	20.62529	21.07049	0.8211	0
1514	14/04/2021 01:20:08	21.44983	20.64039	21.07822	0.82103	0
1515	14/04/2021 01:20:38	21.44289	20.63713	21.07128	0.82105	0
1516	14/04/2021 01:21:09	21.43185	20.62977	21.06024	0.82101	0
1517	14/04/2021 01:21:40	21.42053	20.62212	21.04892	0.82099	0
1518	14/04/2021 01:22:10	21.41291	20.62554	21.0413	0.82099	0
1519	14/04/2021 01:22:41	21.41976	20.62871	21.04815	0.82102	0
1520	14/04/2021 01:23:11	21.40815	20.61342	21.03286	0.82101	0
1521	14/04/2021 01:23:41	21.40778	20.62408	21.04353	0.82095	0
1522	14/04/2021 01:24:11	21.39964	20.61963	21.02803	0.82091	0
1523	14/04/2021 01:24:42	21.39174	20.59333	21.01645	0.82097	0
1524	14/04/2021 01:25:12	21.384	20.60031	21.02343	0.82097	0
1525	14/04/2021 01:25:43	21.37966	20.58861	21.01173	0.82096	0
1526	14/04/2021 01:26:13	21.3757	20.58833	21.00041	0.82091	0
1527	14/04/2021 01:26:44	21.35758	20.58125	20.98966	0.82094	0
1528	14/04/2021 01:27:15	21.35417	20.57784	20.97888	0.82094	0
1529	14/04/2021 01:27:45	21.35417	20.57784	20.98256	0.82094	0
1530	14/04/2021 01:28:16	21.34313	20.57784	20.97888	0.82092	0
1531	14/04/2021 01:28:47	21.34615	20.5735	20.97822	0.82088	0
1532	14/04/2021 01:29:18	21.33762	20.56497	20.95865	0.82089	0
1533	14/04/2021 01:29:48	21.33603	20.56338	20.95706	0.82085	0
1534	14/04/2021 01:30:19	21.31986	20.55089	20.94457	0.82087	0
1535	14/04/2021 01:30:50	21.30043	20.52409	20.92882	0.82085	0
1536	14/04/2021 01:31:20	21.31092	20.53827	20.94299	0.82084	0

Comments	Appendix 2 - 2°C /min heating rate					
F(x)=	Cool-down					
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time	°C	°C	°C	V	V
1601	14/04/2021 02:04:31	20.92129	20.24797	20.53864	0.8203	0
1602	14/04/2021 02:05:02	20.92428	20.24729	20.54532	0.82032	0
1603	14/04/2021 02:05:33	20.91629	20.23929	20.541	0.8203	0
1604	14/04/2021 02:06:04	20.90432	20.24205	20.54007	0.82025	0
1605	14/04/2021 02:06:35	20.88883	20.22288	20.51722	0.82037	0
1606	14/04/2021 02:07:06	20.88421	20.21825	20.5126	0.82028	0
1607	14/04/2021 02:07:36	20.88315	20.2172	20.51154	0.82023	0
1608	14/04/2021 02:08:07	20.87133	20.20538	20.50341	0.82024	0
1609	14/04/2021 02:08:38	20.87107	20.20512	20.49946	0.82022	0
1610	14/04/2021 02:09:08	20.87843	20.21615	20.49946	0.82023	0
1611	14/04/2021 02:09:39	20.86371	20.20512	20.48842	0.82022	0
1612	14/04/2021 02:10:10	20.86739	20.21248	20.49578	0.82022	0
1613	14/04/2021 02:10:40	20.85896	20.20404	20.49103	0.82021	0
1614	14/04/2021 02:11:11	20.85796	20.20304	20.48635	0.82019	0
1615	14/04/2021 02:11:42	20.85333	20.2021	20.47069	0.82023	0
1616	14/04/2021 02:12:13	20.8378	20.19025	20.46987	0.82017	0
1617	14/04/2021 02:12:44	20.84045	20.18921	20.46884	0.82018	0
1618	14/04/2021 02:13:14	20.83218	20.18462	20.45689	0.82016	0
1619	14/04/2021 02:13:45	20.82427	20.16936	20.44898	0.82016	0
1620	14/04/2021 02:14:15	20.81669	20.16913	20.44876	0.82016	0
1621	14/04/2021 02:14:46	20.80603	20.15479	20.4381	0.82016	0
1622	14/04/2021 02:15:17	20.81746	20.16991	20.43849	0.82015	0
1623	14/04/2021 02:15:48	20.80297	20.15542	20.424	0.82013	0
1624	14/04/2021 02:16:18	20.80642	20.16991	20.44217	0.82012	0
1625	14/04/2021 02:16:48	20.79867	20.16215	20.42338	0.82009	0
1626	14/04/2021 02:17:19	20.78369	20.14349	20.41208	0.82015	0
1627	14/04/2021 02:17:50	20.78341	20.14689	20.40444	0.82009	0
1628	14/04/2021 02:18:20	20.78986	20.15334	20.41457	0.82009	0
1629	14/04/2021 02:18:51	20.77737	20.14085	20.40208	0.82009	0
1630	14/04/2021 02:19:21	20.76527	20.13243	20.3863	0.82007	0
1631	14/04/2021 02:19:52	20.77159	20.13139	20.3963	0.82006	0
1632	14/04/2021 02:20:23	20.7633	20.13047	20.38434	0.82013	0
1633	14/04/2021 02:20:53	20.76304	20.1302	20.38775	0.82007	0
1634	14/04/2021 02:21:24	20.75174	20.1189	20.38013	0.82009	0
1635	14/04/2021 02:21:54	20.75174	20.1189	20.38381	0.8201	0
1636	14/04/2021 02:22:24	20.74821	20.11537	20.37292	0.82007	0
1637	14/04/2021 02:22:54	20.74085	20.10433	20.36189	0.82006	0
1638	14/04/2021 02:23:25	20.74042	20.11494	20.36145	0.82002	0
1639	14/04/2021 02:23:56	20.73572	20.11024	20.36411	0.82	0
1640	14/04/2021 02:24:26	20.71655	20.09474	20.34862	0.81997	0
1641	14/04/2021 02:24:57	20.71955	20.09775	20.34794	0.81998	0
1642	14/04/2021 02:25:28	20.71468	20.10391	20.35043	0.81997	0
1643	14/04/2021 02:25:59	20.71415	20.10338	20.34622	0.82	0
1644	14/04/2021 02:26:29	20.70996	20.09552	20.33835	0.81999	0
1645	14/04/2021 02:27:00	20.70586	20.08774	20.33426	0.82	0
1646	14/04/2021 02:27:31	20.6976	20.08684	20.32599	0.81993	0
1647	14/04/2021 02:28:02	20.70468	20.08655	20.32571	0.82001	0
1648	14/04/2021 02:28:32	20.69709	20.08265	20.31812	0.82	0
1649	14/04/2021 02:29:03	20.69324	20.08983	20.32531	0.81994	0
1650	14/04/2021 02:29:33	20.67801	20.07093	20.31008	0.81992	0
1651	14/04/2021 02:30:04	20.67724	20.07015	20.30931	0.81995	0
1652	14/04/2021 02:30:34	20.66526	20.06185	20.28997	0.81987	0
1653	14/04/2021 02:31:05	20.65291	20.05319	20.28499	0.81994	0
1654	14/04/2021 02:31:36	20.65933	20.05224	20.2914	0.81985	0
1655	14/04/2021 02:32:07	20.65829	20.05857	20.28301	0.81989	0
1656	14/04/2021 02:32:37	20.67576	20.065	20.30415	0.81988	0
1657	14/04/2021 02:33:07	20.65276	20.04936	20.28115	0.81992	0
1658	14/04/2021 02:33:38	20.63763	20.0379	20.27338	0.81988	0
1659	14/04/2021 02:34:09	20.64148	20.03807	20.26987	0.82007	0
1660	14/04/2021 02:34:39	20.63463	20.03858	20.27038	0.81993	0
1661	14/04/2021 02:35:10	20.63452	20.05319	20.26291	0.81988	0
1662	14/04/2021 02:35:41	20.6378	20.03807	20.25883	0.81985	0
1663	14/04/2021 02:36:11	20.61136	20.02636	20.24711	0.81989	0
1664	14/04/2021 02:36:41	20.60312	20.01811	20.23519	0.81988	0

Comments	Appendix 2 - 2°C /min heating rate					
F(x)=	Cool-down					
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time	°C	°C	°C	V	V
1665	14/04/2021 02:37:12	20.61321	20.02453	20.24528	0.81988	0
1666	14/04/2021 02:37:43	20.60885	20.01648	20.23724	0.81978	0
1667	14/04/2021 02:38:14	20.59008	20.00507	20.22583	0.81982	0
1668	14/04/2021 02:38:44	20.58942	20.00073	20.21413	0.81981	0
1669	14/04/2021 02:39:15	20.58168	19.99664	20.21375	0.81983	0
1670	14/04/2021 02:39:45	20.60402	20.01165	20.23241	0.81981	0
1671	14/04/2021 02:40:16	20.57853	19.99346	20.21796	0.81977	0
1672	14/04/2021 02:40:47	20.57853	19.99346	20.21796	0.8198	0
1673	14/04/2021 02:41:18	20.56749	19.97488	20.19221	0.81977	0
1674	14/04/2021 02:41:49	20.57144	19.99373	20.19983	0.81979	0
1675	14/04/2021 02:42:20	20.57195	19.99796	20.20034	0.81978	0
1676	14/04/2021 02:42:50	20.55734	19.9832	20.18941	0.81979	0
1677	14/04/2021 02:43:21	20.568	19.98654	20.19272	0.8198	0
1678	14/04/2021 02:43:51	20.5604	19.99001	20.18511	0.81979	0
1679	14/04/2021 02:44:22	20.55974	19.97819	20.18077	0.81975	0
1680	14/04/2021 02:44:53	20.55538	19.97751	20.17641	0.81988	0
1681	14/04/2021 02:45:23	20.55132	19.97341	20.17971	0.81988	0
1682	14/04/2021 02:45:54	20.53634	19.96199	20.16105	0.81975	0
1683	14/04/2021 02:46:25	20.52568	19.95494	20.14671	0.81975	0
1684	14/04/2021 02:46:55	20.5333	19.95149	20.15434	0.81972	0
1685	14/04/2021 02:47:25	20.52636	19.95191	20.15475	0.81968	0
1686	14/04/2021 02:47:56	20.53017	19.9632	20.14752	0.81979	0
1687	14/04/2021 02:48:26	20.51872	19.95534	20.15079	0.81975	0
1688	14/04/2021 02:48:57	20.53241	19.96174	20.14977	0.81976	0
1689	14/04/2021 02:49:28	20.50939	19.94221	20.13779	0.81971	0
1690	14/04/2021 02:49:59	20.50889	19.9417	20.12624	0.81968	0
1691	14/04/2021 02:50:30	20.52975	19.95534	20.14343	0.81985	0
1692	14/04/2021 02:51:01	20.48441	19.92441	20.1128	0.81965	0
1693	14/04/2021 02:51:32	20.47984	19.91608	20.11191	0.81961	0
1694	14/04/2021 02:52:03	20.48694	19.92325	20.11533	0.81962	0
1695	14/04/2021 02:52:34	20.48364	19.9162	20.10835	0.81966	0
1696	14/04/2021 02:53:04	20.47694	19.91315	20.10165	0.81967	0
1697	14/04/2021 02:53:35	20.47762	19.91755	20.10601	0.81965	0
1698	14/04/2021 02:54:06	20.48192	19.90703	20.09559	0.81964	0
1699	14/04/2021 02:54:36	20.46773	19.91128	20.0998	0.81965	0
1700	14/04/2021 02:55:07	20.47103	19.91833	20.09942	0.81963	0
1701	14/04/2021 02:55:37	20.45632	19.90347	20.08103	0.81963	0
1702	14/04/2021 02:56:08	20.44843	19.89922	20.07314	0.81964	0
1703	14/04/2021 02:56:39	20.44801	19.90252	20.07641	0.81965	0
1704	14/04/2021 02:57:10	20.4513	19.89468	20.07969	0.81961	0
1705	14/04/2021 02:57:41	20.44367	19.89441	20.06838	0.8196	0
1706	14/04/2021 02:58:12	20.44356	19.89059	20.07195	0.81959	0
1707	14/04/2021 02:58:43	20.42122	19.87174	20.05329	0.81962	0
1708	14/04/2021 02:59:13	20.42858	19.87917	20.04593	0.81958	0
1709	14/04/2021 02:59:44	20.42858	19.88289	20.05697	0.81958	0
1710	14/04/2021 03:00:14	20.42135	19.87187	20.04606	0.81959	0
1711	14/04/2021 03:00:45	20.43554	19.8862	20.05657	0.8196	0
1712	14/04/2021 03:01:16	20.42082	19.87877	20.04186	0.81958	0
1713	14/04/2021 03:01:47	20.42371	19.87797	20.04474	0.81957	0
1714	14/04/2021 03:02:18	20.40465	19.86244	20.02201	0.81957	0
1715	14/04/2021 03:02:49	20.39584	19.85725	20.03159	0.81957	0
1716	14/04/2021 03:03:20	20.40584	19.85992	20.03423	0.81959	0
1717	14/04/2021 03:03:50	20.40189	19.85593	20.03764	0.81954	0
1718	14/04/2021 03:04:20	20.3868	19.83697	20.01887	0.81951	0
1719	14/04/2021 03:04:51	20.38244	19.83629	20.00715	0.8195	0
1720	14/04/2021 03:05:21	20.3785	19.8323	20.00321	0.81957	0
1721	14/04/2021 03:05:52	20.38204	19.83589	19.99568	0.81953	0
1722	14/04/2021 03:06:23	20.37495	19.83615	19.99966	0.81952	0
1723	14/04/2021 03:06:54	20.36721	19.83577	19.98813	0.81952	0
1724	14/04/2021 03:07:25	20.35997	19.83217	19.98824	0.81951	0
1725	14/04/2021 03:07:55	20.36365	19.83589	19.98824	0.81951	0
1726	14/04/2021 03:08:26	20.35959	19.82436	19.98043	0.81947	0
1727	14/04/2021 03:08:56	20.3558	19.82424	19.9766	0.81949	0
1728	14/04/2021 03:09:27	20.36706	19.83562	19.98798	0.81946	0

Comments	Appendix 2 - 2°C /min heating rate					
F(x)=	Cool-down					
Long Name	Date	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Volt
Units	Time	°C	°C	°C	V	V
1793	14/04/2021 03:42:32	20.14324	19.65416	19.76564	0.81922	0
1794	14/04/2021 03:43:02	20.15404	19.67249	19.76911	0.81924	0
1795	14/04/2021 03:43:33	20.14562	19.67143	19.76804	0.81916	0
1796	14/04/2021 03:44:03	20.13749	19.65206	19.75611	0.81913	0
1797	14/04/2021 03:44:34	20.13339	19.65164	19.74826	0.81918	0
1798	14/04/2021 03:45:05	20.12183	19.65111	19.7403	0.8192	0
1799	14/04/2021 03:45:35	20.12115	19.65414	19.73961	0.81915	0
1800	14/04/2021 03:46:06	20.12103	19.65031	19.74321	0.81916	0
1801	14/04/2021 03:46:36	20.12432	19.65362	19.74652	0.81916	0
1802	14/04/2021 03:47:07	20.11316	19.63121	19.72783	0.81915	0
1803	14/04/2021 03:47:38	20.09856	19.62761	19.72794	0.81915	0
1804	14/04/2021 03:48:09	20.09883	19.62788	19.7245	0.81915	0
1805	14/04/2021 03:48:40	20.09539	19.63184	19.72846	0.81914	0
1806	14/04/2021 03:49:11	20.10318	19.62857	19.71775	0.81915	0
1807	14/04/2021 03:49:41	20.0916	19.63173	19.72091	0.81904	0
1808	14/04/2021 03:50:12	20.11343	19.6352	19.72438	0.81915	0
1809	14/04/2021 03:50:42	20.09819	19.62352	19.72385	0.81905	0
1810	14/04/2021 03:51:13	20.08622	19.61886	19.70433	0.81914	0
1811	14/04/2021 03:51:44	20.09633	19.62908	19.71083	0.81912	0
1812	14/04/2021 03:52:14	20.09963	19.63613	19.71788	0.81904	0
1813	14/04/2021 03:52:45	20.09565	19.62839	19.72129	0.8191	0
1814	14/04/2021 03:53:16	20.08847	19.62485	19.71031	0.81908	0
1815	14/04/2021 03:53:46	20.08094	19.61353	19.69899	0.81925	0
1816	14/04/2021 03:54:17	20.07714	19.6097	19.69145	0.81911	0
1817	14/04/2021 03:54:47	20.08439	19.6133	19.69505	0.81907	0
1818	14/04/2021 03:55:18	20.0728	19.61275	19.70193	0.81916	0
1819	14/04/2021 03:55:48	20.06478	19.60465	19.69383	0.81909	0
1820	14/04/2021 03:56:19	20.06438	19.59681	19.68971	0.81905	0
1821	14/04/2021 03:56:50	20.06782	19.60771	19.69318	0.81913	0
1822	14/04/2021 03:57:20	20.0564	19.59618	19.68537	0.81899	0
1823	14/04/2021 03:57:51	20.06661	19.60649	19.68453	0.81908	0
1824	14/04/2021 03:58:22	20.05127	19.591	19.66903	0.81909	0
1825	14/04/2021 03:58:52	20.06242	19.60226	19.68773	0.81902	0
1826	14/04/2021 03:59:23	20.05178	19.59523	19.6807	0.8191	0
1827	14/04/2021 03:59:54	20.04861	19.59575	19.68121	0.81915	0
1828	14/04/2021 04:00:25	20.04821	19.59534	19.66595	0.81897	0
1829	14/04/2021 04:00:56	20.03008	19.57703	19.65878	0.81896	0
1830	14/04/2021 04:01:26	20.03008	19.57332	19.65878	0.81903	0
1831	14/04/2021 04:01:57	20.04101	19.58063	19.65867	0.81912	0
1832	14/04/2021 04:02:28	20.03733	19.58806	19.66238	0.81897	0
1833	14/04/2021 04:02:58	20.02944	19.57267	19.6507	0.81906	0
1834	14/04/2021 04:03:28	20.02893	19.57587	19.64647	0.81901	0
1835	14/04/2021 04:03:59	20.03231	19.58671	19.66103	0.81914	0
1836	14/04/2021 04:04:29	20.02076	19.58619	19.65308	0.81896	0
1837	14/04/2021 04:05:00	20.02406	19.57467	19.64899	0.81884	0
1838	14/04/2021 04:05:30	20.01604	19.56285	19.64088	0.81886	0
1839	14/04/2021 04:06:00	20.01525	19.56577	19.63637	0.81903	0
1840	14/04/2021 04:06:31	20.01142	19.56561	19.63622	0.81898	0

Comments	Appendix 3 - 3°C /min heating rate						
F(x)=	Warm-up						
Long Name	Time	Furnace Temp 1	Seal Temp	CaseTemp	Furnace Temp 2	Cell Voltag	Measured Voltag
Units	h	°C	°C	°C	°C	V	
1							
2	14/04/2021 08:02:05	19.20147	18.97108	18.88933	18.91906	0.67201	0.6719
3	14/04/2021 08:02:36	19.20655	18.97244	18.89812	18.9167	0.67784	0.6776
4	14/04/2021 08:03:07	19.20787	18.97376	18.89572	18.93288	0.68146	0.6812
5	14/04/2021 08:03:38	19.21254	18.99329	18.90783	18.92641	0.68402	0.6837
6	14/04/2021 08:04:08	19.21399	18.9836	18.90185	18.92414	0.68576	0.6855
7	14/04/2021 08:04:39	19.20473	18.98177	18.89259	18.9186	0.68718	0.6869
8	14/04/2021 08:05:09	19.21069	18.99516	18.89111	18.91341	0.68829	0.688
9	14/04/2021 08:05:40	19.20143	18.9859	18.90043	18.91901	0.68919	0.6889
10	14/04/2021 08:06:11	19.21773	18.99105	18.90187	18.92045	0.68993	0.6895
11	14/04/2021 08:06:41	19.21802	18.99134	18.89473	18.91702	0.69055	0.6902
12	14/04/2021 08:07:12	19.21482	18.99186	18.90639	18.91382	0.69112	0.6908
13	14/04/2021 08:07:43	19.20846	18.98178	18.89631	18.90746	0.69152	0.6913
14	14/04/2021 08:08:14	19.20675	18.9875	18.90204	18.90204	0.69193	0.6916
15	14/04/2021 08:08:45	19.2203	19.00106	18.90816	18.91559	0.69227	0.6919
16	14/04/2021 08:09:15	19.20383	18.99202	18.90283	18.90654	0.69258	0.6922
17	14/04/2021 08:09:46	19.20598	18.99417	18.89012	18.90127	0.69283	0.6925
18	14/04/2021 08:10:16	19.21197	19.00016	18.8924	18.90355	0.6932	0.6928
19	14/04/2021 08:10:47	19.21834	19.01025	18.9062	18.91735	0.69334	0.693
20	14/04/2021 08:11:18	19.21359	19.01664	18.90516	18.90887	0.69342	0.6931
21	14/04/2021 08:11:48	19.20869	19.01546	18.90027	18.90398	0.69367	0.6933
22	14/04/2021 08:12:19	19.20432	19.02595	18.89961	18.90332	0.69383	0.6934
23	14/04/2021 08:12:49	19.20421	19.03327	18.8995	18.88835	0.69404	0.6936
24	14/04/2021 08:13:20	19.2009	19.04483	18.89619	18.90734	0.69421	0.6938
25	14/04/2021 08:13:51	19.20567	19.05331	18.89353	18.90096	0.69439	0.6939
26	14/04/2021 08:14:22	19.20715	19.05851	18.89872	18.90244	0.69423	0.6941
27	14/04/2021 08:14:53	19.21259	19.0751	18.89673	18.90788	0.69449	0.6941
28	14/04/2021 08:15:24	19.20716	19.08825	18.90245	18.90245	0.69458	0.6942
29	14/04/2021 08:15:55	19.20572	19.08681	18.8973	18.89358	0.69464	0.6944
30	14/04/2021 08:16:26	19.21597	19.1082	18.90754	18.90754	0.69478	0.6944
31	14/04/2021 08:16:57	19.20062	19.11143	18.88847	18.89962	0.69485	0.6945
32	14/04/2021 08:17:28	19.18547	19.11116	18.87333	18.8882	0.69481	0.6945
33	14/04/2021 08:17:59	19.18562	19.12616	18.87719	18.88462	0.69506	0.6947
34	14/04/2021 08:18:30	19.19348	19.13403	18.87762	18.88505	0.69506	0.6947
35	14/04/2021 08:19:01	19.19069	19.16096	18.88226	18.88598	0.69509	0.6947
36	14/04/2021 08:19:32	19.17321	19.15091	18.8685	18.8685	0.69509	0.6948
37	14/04/2021 08:20:03	19.17814	19.17442	18.88829	18.88829	0.69523	0.6948
38	14/04/2021 08:20:34	19.16477	19.16848	18.8712	18.8712	0.69521	0.6948
39	14/04/2021 08:21:05	19.16305	19.17048	18.86205	18.86948	0.69525	0.695
40	14/04/2021 08:21:36	19.15788	19.18389	18.85316	18.87546	0.69528	0.695
41	14/04/2021 08:22:06	19.15949	19.20036	18.86593	18.88079	0.69536	0.695
42	14/04/2021 08:22:36	19.8978	19.25865	19.15089	20.74873	0.6954	0.695
43	14/04/2021 08:23:07	22.55437	19.53645	19.82258	26.04971	0.69555	0.6952
44	14/04/2021 08:23:38	25.41975	19.94812	20.36439	30.35387	0.69578	0.6955
45	14/04/2021 08:24:08	27.55234	20.36299	20.73828	32.53847	0.69603	0.6958
46	14/04/2021 08:24:39	29.10001	20.75536	21.0865	33.52816	0.6964	0.6961
47	14/04/2021 08:25:10	30.20808	21.10019	21.40558	34.05542	0.69685	0.6966
48	14/04/2021 08:25:41	31.23424	21.44845	21.76119	34.75004	0.69729	0.697
49	14/04/2021 08:26:12	32.33698	21.80047	22.17208	35.75077	0.69767	0.6975
50	14/04/2021 08:26:43	33.53761	22.18879	22.64135	37.04247	0.69829	0.698
51	14/04/2021 08:27:13	34.91636	22.59879	23.13965	38.68354	0.69888	0.6986
52	14/04/2021 08:27:44	36.39727	23.05309	23.67857	40.33769	0.69956	0.6992
53	14/04/2021 08:28:15	37.88572	23.53339	24.22878	41.92403	0.70009	0.6999
54	14/04/2021 08:28:45	39.31574	24.03564	24.79725	43.37973	0.70083	0.7006
55	14/04/2021 08:29:16	40.73511	24.53443	25.38435	44.8429	0.70159	0.7014
56	14/04/2021 08:29:47	42.27772	25.09177	26.02999	46.52329	0.7025	0.7022
57	14/04/2021 08:30:18	43.81654	25.67102	26.69386	48.13461	0.7034	0.7031
58	14/04/2021 08:30:49	45.27198	26.26498	27.35405	49.56467	0.70443	0.7042
59	14/04/2021 08:31:20	46.66927	26.84778	28.03619	50.93205	0.70552	0.7053
60	14/04/2021 08:31:51	48.09619	27.46431	28.76311	52.38093	0.70671	0.7064
61	14/04/2021 08:32:22	49.55595	28.08843	29.50864	53.89857	0.70791	0.7077
62	14/04/2021 08:32:53	51.06847	28.74928	30.28806	55.50635	0.70926	0.7091
63	14/04/2021 08:33:23	52.54239	29.39871	31.05866	57.05243	0.71067	0.7105
64	14/04/2021 08:33:54	54.06358	30.08448	31.85149	58.6097	0.71221	0.7121

Comments	Apendix 3 - 3°C /min heating rate							
F(x)=	Warm-up							
Long Name	Time	Furnace Temp 1	Seal Temp	CaseTemp	Furnace Temp 2	Cell Voltag	Measured Voltag	
Units	h	°C	°C	°C	°C	V		
129	14/04/2021 09:07:09	157.7701	91.07308	110.28725	161.58086	1.23067	1.2312	
130	14/04/2021 09:07:40	159.34921	92.29688	111.87169	163.08217	1.24662	1.2473	
131	14/04/2021 09:08:10	160.82947	93.18153	113.39727	164.62723	1.26254	1.2632	
132	14/04/2021 09:08:40	162.37109	94.50198	115.13342	166.19486	1.27886	1.2795	
133	14/04/2021 09:09:11	164.0835	95.49474	116.96368	167.81436	1.29606	1.2968	
134	14/04/2021 09:09:42	165.71788	96.60629	118.59094	169.44502	1.3137	1.3147	
135	14/04/2021 09:10:12	167.19615	97.82939	120.16132	170.90179	1.33123	1.3322	
136	14/04/2021 09:10:43	168.81154	99.21768	121.72707	172.46553	1.34932	1.3503	
137	14/04/2021 09:11:14	170.54471	100.31146	123.40591	174.28307	1.367	1.368	
138	14/04/2021 09:11:45	172.19804	101.38921	125.08122	175.98123	1.38636	1.3874	
139	14/04/2021 09:12:16	173.79941	102.66928	126.66552	177.5527	1.40709	1.4082	
140	14/04/2021 09:12:46	175.30418	103.71893	128.35257	178.99025	1.42802	1.4292	
141	14/04/2021 09:13:17	176.87231	105.06436	130.23001	180.59201	1.45097	1.4523	
142	14/04/2021 09:13:47	178.46635	106.18581	131.90254	182.18977	1.47422	1.4755	
143	14/04/2021 09:14:18	180.13478	107.38277	133.47228	183.8246	1.49952	1.5009	
144	14/04/2021 09:14:48	181.62395	108.64107	135.14818	185.34737	1.52525	1.5268	
145	14/04/2021 09:15:19	183.23598	109.62835	136.79442	186.9594	1.55295	1.5546	
146	14/04/2021 09:15:50	184.84364	111.28518	138.42542	188.59694	1.58206	1.5832	
147	14/04/2021 09:16:21	186.48053	111.87722	140.2153	190.15541	1.61044	1.6117	
148	14/04/2021 09:16:51	188.0614	113.54247	141.82484	191.76241	1.63786	1.6387	
149	14/04/2021 09:17:22	189.5789	114.3957	143.50108	193.35835	1.6633	1.6645	
150	14/04/2021 09:17:53	191.24167	115.69449	145.27676	195.05098	1.68798	1.6891	
151	14/04/2021 09:18:24	192.93776	117.16702	146.95599	196.73959	1.71079	1.7119	
152	14/04/2021 09:18:55	194.49509	118.20756	148.53854	198.29695	1.73443	1.7357	
153	14/04/2021 09:19:25	196.04897	119.68345	150.35892	199.80225	1.76096	1.7625	
154	14/04/2021 09:19:56	197.5799	121.20018	151.88953	201.34142	1.79193	1.7934	
155	14/04/2021 09:20:27	199.21147	122.24794	153.43109	202.92769	1.8167	1.8178	
156	14/04/2021 09:20:58	200.75261	123.48119	155.32402	204.43518	1.83463	1.8358	
157	14/04/2021 09:21:28	202.22731	124.24397	156.76914	205.84299	1.84712	1.848	
158	14/04/2021 09:21:58	203.86563	125.75192	158.38113	207.45526	1.85572	1.8565	
159	14/04/2021 09:22:29	205.41109	126.9239	160.09348	209.07877	1.86136	1.8621	
160	14/04/2021 09:23:00	207.04956	127.93165	161.7394	210.85104	1.86524	1.8658	
161	14/04/2021 09:23:31	208.68074	129.17688	163.41884	212.45989	1.86788	1.8685	
162	14/04/2021 09:24:01	210.21132	130.37537	164.9346	214.0165	1.86982	1.8704	
163	14/04/2021 09:24:32	211.80521	131.61992	166.52478	215.61038	1.87163	1.8722	
164	14/04/2021 09:25:03	213.35489	133.11015	168.32715	217.21582	1.8741	1.8748	
165	14/04/2021 09:25:33	214.96446	134.14681	169.91812	218.8923	1.8778	1.8785	
166	14/04/2021 09:26:04	216.72287	135.28615	171.65506	220.62897	1.88398	1.8849	
167	14/04/2021 09:26:35	218.25456	136.8575	173.21309	222.03104	1.89386	1.8949	
168	14/04/2021 09:27:05	219.76392	138.22382	174.82713	223.43306	1.90876	1.9098	
169	14/04/2021 09:27:36	221.25221	139.30821	176.39638	224.91647	1.92819	1.9296	
170	14/04/2021 09:28:06	222.73235	140.23424	177.99591	226.46317	1.95056	1.952	
171	14/04/2021 09:28:37	224.31233	141.31874	179.75604	228.08012	1.9736	1.975	
172	14/04/2021 09:29:07	225.80763	143.05811	181.33733	229.63092	1.99375	1.995	
173	14/04/2021 09:29:38	227.355	144.08412	182.85913	231.24544	2.01134	2.0125	
174	14/04/2021 09:30:09	229.01372	144.79257	184.59798	232.85211	2.0254	2.0266	
175	14/04/2021 09:30:40	230.60422	146.18858	186.21338	234.46596	2.03631	2.0373	
176	14/04/2021 09:31:10	232.19243	147.49233	187.83269	236.00992	2.04433	2.0452	
177	14/04/2021 09:31:41	233.79199	149.26595	189.54939	237.59476	2.05043	2.0513	
178	14/04/2021 09:32:11	235.43967	150.49001	191.21025	239.33093	2.05512	2.056	
179	14/04/2021 09:32:42	236.96161	151.6192	192.75501	240.79364	2.05854	2.0593	
180	14/04/2021 09:33:12	238.43961	152.84135	194.36729	242.20194	2.0611	2.062	
181	14/04/2021 09:33:43	239.85513	153.80058	195.9462	243.53342	2.06311	2.0638	
182	14/04/2021 09:34:14	241.45123	154.83357	197.89822	245.3123	2.06442	2.0653	
183	14/04/2021 09:34:44	243.1758	156.08975	199.69788	247.24242	2.0652	2.0659	
184	14/04/2021 09:35:15	244.73584	157.39473	201.69508	248.70338	2.06537	2.066	
185	14/04/2021 09:35:46	246.11995	158.67026	203.76901	250.00307	2.06479	2.0656	
186	14/04/2021 09:36:16	247.6842	160.36218	206.22606	251.74225	2.06358	2.0643	
187	14/04/2021 09:36:47	249.36218	161.83815	209.44482	253.64211	2.06153	2.0621	
188	14/04/2021 09:37:17	251.15593	163.21407	212.95	255.60434	2.05815	2.0588	
189	14/04/2021 09:37:48	252.85884	165.27374	215.59309	257.35477	2.05469	2.0552	
190	14/04/2021 09:38:19	254.55119	166.75781	216.93596	258.99963	2.05384	2.0546	
191	14/04/2021 09:38:50	256.16339	168.60994	218.00401	260.49982	2.05733	2.0582	
192	14/04/2021 09:39:20	257.655	169.03139	219.41391	261.99506	2.06501	2.066	

Comments	Apendix 3 - 3°C /min heating rate							
F(x)=	Warm-up							
Long Name	Time	Furnace Temp 1	Seal Temp	CaseTemp	Furnace Temp 2	Cell Voltag	Measured Voltag	
Units	h	°C	°C	°C	°C	V		
193	14/04/2021 09:39:51	259.24582	170.35071	220.81661	263.56357	2.07589	2.077	
194	14/04/2021 09:40:22	260.85437	171.5741	222.24597	265.23746	2.08401	2.085	
195	14/04/2021 09:40:53	262.36499	172.63712	223.62016	266.66815	2.08818	2.089	
196	14/04/2021 09:41:24	263.89362	173.78215	224.9202	268.2077	2.08969	2.0904	
197	14/04/2021 09:41:54	265.39334	174.59496	226.29067	269.71832	2.09043	2.0911	
198	14/04/2021 09:42:25	266.8819	175.98636	227.62387	271.20755	2.09083	2.0915	
199	14/04/2021 09:42:56	268.42184	177.77048	229.08336	272.79089	2.09109	2.0917	
200	14/04/2021 09:43:27	269.96506	178.68022	230.47839	274.31223	2.09124	2.0918	
201	14/04/2021 09:43:58	271.50461	179.49291	231.85643	275.81903	2.09134	2.0918	
202	14/04/2021 09:44:28	272.90973	181.30258	233.29698	277.24228	2.09129	2.0918	
203	14/04/2021 09:44:59	274.43845	181.58881	234.50179	278.72028	2.09118	2.0918	
204	14/04/2021 09:45:30	275.92026	182.4915	235.86173	280.21912	2.09112	2.0917	
205	14/04/2021 09:46:00	277.43097	184.04393	237.08144	281.69727	2.09095	2.0915	
206	14/04/2021 09:46:31	278.91672	185.74614	238.4048	283.17221	2.09077	2.0914	
207	14/04/2021 09:47:01	280.3859	185.90205	239.49931	284.62531	2.09048	2.0912	
208	14/04/2021 09:47:32	281.82834	187.54451	240.66815	286.03174	2.09036	2.0911	
209	14/04/2021 09:48:02	283.29959	187.97311	241.6546	287.45966	2.09009	2.0907	
210	14/04/2021 09:48:33	284.70618	189.18257	242.81383	288.81934	2.08985	2.0906	
211	14/04/2021 09:49:04	286.14133	190.32448	243.91402	290.26465	2.08963	2.0903	
212	14/04/2021 09:49:35	287.6633	191.7131	244.98142	291.75052	2.08934	2.09	
213	14/04/2021 09:50:06	289.16	192.65733	246.16264	293.23645	2.08898	2.0896	
214	14/04/2021 09:50:36	290.61908	193.69486	247.45018	294.68631	2.08862	2.0893	
215	14/04/2021 09:51:07	292.14423	194.64623	248.79619	296.17188	2.08819	2.089	
216	14/04/2021 09:51:38	293.60861	195.76231	250.07985	297.60025	2.08771	2.0886	
217	14/04/2021 09:52:08	295.06564	196.76622	251.54735	299.06809	2.08721	2.0879	
218	14/04/2021 09:52:39	296.51193	198.1212	253.06966	300.58136	2.08665	2.0875	
219	14/04/2021 09:53:09	297.97604	199.28183	254.6795	302.09576	2.08607	2.0868	
220	14/04/2021 09:53:39	299.39334	200.35848	256.37326	303.5061	2.08531	2.0861	
221	14/04/2021 09:54:10	300.85193	201.58405	258.06723	305.00272	2.08467	2.0854	
222	14/04/2021 09:54:40	302.32312	202.86137	259.72073	306.50623	2.08403	2.0848	
223	14/04/2021 09:55:10	303.79086	204.05707	261.14597	307.9704	2.08344	2.0842	
224	14/04/2021 09:55:41	305.29138	205.2532	262.13776	309.39905	2.08297	2.0837	
225	14/04/2021 09:56:12	306.78757	206.19969	262.69998	310.7785	2.08274	2.0835	
226	14/04/2021 09:56:43	308.22675	207.41411	263.13547	312.13181	2.08257	2.0834	
227	14/04/2021 09:57:13	309.59369	208.13762	263.48325	313.40234	2.0825	2.0832	
228	14/04/2021 09:57:43	310.92609	208.98369	263.81287	314.66211	2.08241	2.0831	
229	14/04/2021 09:58:14	312.28287	209.74463	264.1355	315.91501	2.08235	2.0831	
230	14/04/2021 09:58:44	313.59995	210.64278	264.49057	317.16763	2.0823	2.0831	
231	14/04/2021 09:59:14	314.9165	211.4995	264.82694	318.42331	2.08225	2.0831	
232	14/04/2021 09:59:45	316.25436	212.29285	265.19946	319.6752	2.08227	2.0829	
233	14/04/2021 10:00:16	317.58127	213.08969	265.59717	320.93179	2.08221	2.0829	
234	14/04/2021 10:00:46	318.88675	213.73424	266.01315	322.15195	2.08218	2.0829	
235	14/04/2021 10:01:17	320.22424	214.5575	266.43671	323.39386	2.0821	2.0829	
236	14/04/2021 10:01:48	321.53723	215.42491	266.87439	324.65323	2.08207	2.0828	
237	14/04/2021 10:02:18	322.88596	216.24403	267.33029	325.94836	2.08205	2.0828	
238	14/04/2021 10:02:49	324.21225	216.76115	267.77789	327.21036	2.08201	2.0828	
239	14/04/2021 10:03:20	325.54907	217.37843	268.2435	328.45786	2.08196	2.0828	
240	14/04/2021 10:03:50	326.86029	218.19197	268.75205	329.67255	2.08193	2.0826	
241	14/04/2021 10:04:21	328.19016	218.97289	269.30505	330.86664	2.08189	2.0826	
242	14/04/2021 10:04:52	329.55933	219.87276	269.90894	332.18222	2.08175	2.0826	
243	14/04/2021 10:05:23	330.92838	220.82777	270.5622	333.4762	2.08172	2.0825	
244	14/04/2021 10:05:54	332.30017	221.83308	271.32678	334.78009	2.08162	2.0823	
245	14/04/2021 10:06:25	333.69696	222.88277	272.1965	336.15903	2.08144	2.0821	
246	14/04/2021 10:06:56	335.12579	223.88428	273.26187	337.57358	2.08129	2.082	
247	14/04/2021 10:07:27	336.55777	224.90009	274.548	338.97699	2.08107	2.0818	
248	14/04/2021 10:07:58	337.96829	226.1415	276.05524	340.34656	2.08078	2.0815	
249	14/04/2021 10:08:29	339.4006	227.47565	277.72961	341.75421	2.08032	2.081	
250	14/04/2021 10:09:00	340.81818	228.56201	279.57434	343.15118	2.07976	2.0804	
251	14/04/2021 10:09:31	342.28275	229.92937	281.60342	344.64774	2.07944	2.0801	
252	14/04/2021 10:10:02	343.81101	231.38916	283.88992	346.24356	2.07916	2.08	
253	14/04/2021 10:10:33	345.39212	232.64905	286.4357	347.91357	2.07883	2.0795	
254	14/04/2021 10:11:03	346.95841	234.11124	288.9917	349.58301	2.0785	2.0792	
255	14/04/2021 10:11:34	348.56412	235.83926	291.60187	351.25333	2.07815	2.0789	
256	14/04/2021 10:12:04	350.16901	237.24228	294.17316	352.96121	2.07777	2.0784	

Comments	Apendix 3 - 3°C /min heating rate							
F(x)=	Warm-up							
Long Name	Time	Furnace Temp 1	Seal Temp	CaseTemp	Furnace Temp 2	Cell Voltag	Measured Voltag	
Units	h	°C	°C	°C	°C	V		
321	14/04/2021 10:45:21	355.29266	267.22452	335.74274	358.25513	2.06825		2.069
322	14/04/2021 10:45:52	355.20068	267.3302	335.75018	358.17026	2.06831		2.069
323	14/04/2021 10:46:22	355.11621	267.37091	335.7652	358.04678	2.0683		2.069
324	14/04/2021 10:46:53	354.94702	267.35022	335.74481	357.8634	2.06827		2.069
325	14/04/2021 10:47:23	354.92328	267.38406	335.77808	357.9035	2.06828		2.069
326	14/04/2021 10:47:54	354.90326	267.4035	335.81152	357.96509	2.06828		2.069
327	14/04/2021 10:48:24	354.96121	267.43744	335.83774	358.05499	2.06827		2.069
328	14/04/2021 10:48:55	354.99103	267.52609	335.84988	358.08124	2.06826		2.069
329	14/04/2021 10:49:25	354.95648	267.59979	335.8616	358.01123	2.06826		2.069
330	14/04/2021 10:49:56	354.85825	267.60089	335.82694	357.88104	2.06828		2.069
331	14/04/2021 10:50:27	354.78485	267.64929	335.82449	357.81125	2.06821		2.069
332	14/04/2021 10:50:58	354.72934	267.76325	335.83286	357.76633	2.06827		2.069
333	14/04/2021 10:51:29	354.66971	267.77847	335.83002	357.72092	2.06822		2.069
334	14/04/2021 10:52:00	354.61078	267.84164	335.78854	357.65488	2.06825		2.069
335	14/04/2021 10:52:30	354.56931	267.86462	335.82178	357.63113	2.06826		2.069
336	14/04/2021 10:53:01	354.53162	267.89871	335.81955	357.61118	2.06829		2.069
337	14/04/2021 10:53:32	354.47293	267.92947	335.7962	357.53125	2.06823		2.069
338	14/04/2021 10:54:03	354.3783	267.93427	335.7652	357.43304	2.06827		2.069
339	14/04/2021 10:54:34	354.30826	267.93887	335.7197	357.38431	2.06824		2.069
340	14/04/2021 10:55:05	354.28757	267.99759	335.72028	357.35651	2.06826		2.069
341	14/04/2021 10:55:36	354.2424	268.00223	335.70337	357.32199	2.06831		2.069
342	14/04/2021 10:56:07	354.20761	268.07199	335.70407	357.28012	2.06827		2.069
343	14/04/2021 10:56:38	354.17651	268.10553	335.66559	357.24545	2.06829		2.069
344	14/04/2021 10:57:08	354.1593	268.17877	335.68042	357.24597	2.06824		2.069
345	14/04/2021 10:57:39	354.10312	268.23752	335.64887	357.1969	2.06829		2.069
346	14/04/2021 10:58:09	354.05399	268.23807	335.62796	357.1442	2.06827		2.069
347	14/04/2021 10:58:40	354.01538	268.2276	335.62479	357.11978	2.06827		2.069
348	14/04/2021 10:59:11	353.99893	268.2507	335.61179	357.09976	2.0683		2.0692
349	14/04/2021 10:59:42	353.94312	268.28436	335.57343	357.02976	2.06831		2.069
350	14/04/2021 11:00:13	353.88318	268.31387	335.55954	356.96985	2.0683		2.069
351	14/04/2021 11:00:44	353.81934	268.24121	335.50241	356.90601	2.06827		2.069
352	14/04/2021 11:01:15	353.77719	268.24161	335.48496	356.86029	2.06831		2.0692
353	14/04/2021 11:01:46	353.73474	268.22723	335.47437	356.82498	2.06832		2.0692
354	14/04/2021 11:02:16	353.68988	268.2467	335.43277	356.79077	2.06831		2.0692
355	14/04/2021 11:02:47	353.65167	268.26938	335.42642	356.75253	2.06839		2.0692
356	14/04/2021 11:03:18	353.63068	268.22965	335.39813	356.72086	2.06835		2.0692
357	14/04/2021 11:03:49	353.60242	268.18982	335.40186	356.70328	2.06835		2.0692
358	14/04/2021 11:04:20	353.59918	268.19376	335.35565	356.70004	2.06834		2.0692
359	14/04/2021 11:04:51	353.52741	268.16748	335.33341	356.61404	2.06838		2.0692
360	14/04/2021 11:05:21	353.47717	268.18872	335.29712	356.55673	2.06835		2.0692
361	14/04/2021 11:05:52	353.42328	268.2789	335.24997	356.49576	2.0684		2.0692
362	14/04/2021 11:06:22	353.33334	268.32123	335.19873	356.3739	2.06836		2.0692
363	14/04/2021 11:06:52	353.32599	268.32462	335.22348	356.43042	2.06834		2.0692
364	14/04/2021 11:07:22	353.36081	268.25485	335.20496	356.49005	2.0684		2.0692
365	14/04/2021 11:07:53	353.26041	268.2356	335.14664	356.30093	2.06837		2.0692
366	14/04/2021 11:08:23	353.14493	268.20816	335.10898	356.18549	2.06841		2.0692
367	14/04/2021 11:08:54	353.13974	268.23193	335.10376	356.25833	2.0684		2.0692
368	14/04/2021 11:09:25	353.27579	268.22592	335.14072	356.50082	2.06837		2.0692
369	14/04/2021 11:09:56	353.33789	268.30408	335.14612	356.50971	2.06838		2.0692
370	14/04/2021 11:10:27	353.25836	268.34976	335.0517	356.32373	2.06838		2.0692
371	14/04/2021 11:10:57	353.16803	268.38449	335.0358	356.22632	2.06844		2.0692
372	14/04/2021 11:11:28	353.09897	268.35736	335.00913	356.16083	2.06844		2.0692
373	14/04/2021 11:11:58	352.99445	268.3884	334.97174	356.04565	2.06843		2.0692
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Comments	Appendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
65	14/04/2021 11:51:20	272.36371	218.35664	273.00543	2.08023		0
66	14/04/2021 11:51:51	271.29169	217.26158	271.95154	2.0803		0
67	14/04/2021 11:52:22	270.22351	216.33029	270.88336	2.08044		0
68	14/04/2021 11:52:52	269.19367	215.99025	269.82971	2.08052		0
69	14/04/2021 11:53:23	268.22498	214.99611	268.80649	2.08061		0
70	14/04/2021 11:53:54	267.23102	214.52235	267.73254	2.08072		0
71	14/04/2021 11:54:25	266.24744	213.88091	266.69449	2.08078		0
72	14/04/2021 11:54:56	265.25302	213.06854	265.66736	2.0809		0
73	14/04/2021 11:55:27	264.24072	212.05582	264.6478	2.08096		0
74	14/04/2021 11:55:57	263.25015	211.22881	263.66086	2.08108		0
75	14/04/2021 11:56:28	262.24454	210.39017	262.64798	2.0812		0
76	14/04/2021 11:56:59	261.24997	209.45129	261.65338	2.08123		0
77	14/04/2021 11:57:30	260.24814	208.53099	260.65521	2.08138		0
78	14/04/2021 11:58:00	259.23938	207.95674	259.66306	2.08147		0
79	14/04/2021 11:58:31	258.2619	207.09596	258.69647	2.08156		0
80	14/04/2021 11:59:02	257.26617	206.33185	257.71542	2.08164		0
81	14/04/2021 11:59:33	256.27472	205.56465	256.7276	2.08175		0
82	14/04/2021 12:00:04	255.29793	204.86063	255.76541	2.08187		0
83	14/04/2021 12:00:35	254.30985	204.17491	254.78832	2.08191		0
84	14/04/2021 12:01:05	253.36128	203.34352	253.85797	2.08205		0
85	14/04/2021 12:01:36	252.40505	202.66049	252.91638	2.08211		0
86	14/04/2021 12:02:07	251.43837	201.7029	251.96065	2.0822		0
87	14/04/2021 12:02:37	250.47894	200.98686	251.01949	2.08229		0
88	14/04/2021 12:03:08	249.56485	200.30054	250.1075	2.08238		0
89	14/04/2021 12:03:39	248.64124	199.4668	249.18811	2.08245		0
90	14/04/2021 12:04:09	247.72141	198.97153	248.27194	2.08254		0
91	14/04/2021 12:04:40	246.79411	198.22214	247.34099	2.0826		0
92	14/04/2021 12:05:11	245.88927	197.49936	246.42145	2.08267		0
93	14/04/2021 12:05:41	244.99937	196.73578	245.54625	2.08278		0
94	14/04/2021 12:06:12	244.08678	196.15448	244.6226	2.08288		0
95	14/04/2021 12:06:42	243.22131	195.47548	243.75349	2.08294		0
96	14/04/2021 12:07:13	242.33368	194.63203	242.87686	2.08304		0
97	14/04/2021 12:07:43	241.44267	194.08766	241.97119	2.08315		0
98	14/04/2021 12:08:14	240.58466	193.23702	241.11319	2.08322		0
99	14/04/2021 12:08:45	239.69922	192.51308	240.22923	2.08334		0
100	14/04/2021 12:09:16	238.82962	191.96497	239.36073	2.08341		0
101	14/04/2021 12:09:46	237.99304	191.16647	238.52051	2.0835		0
102	14/04/2021 12:10:17	237.11223	190.41653	237.6286	2.08356		0
103	14/04/2021 12:10:48	236.23485	189.85304	236.76228	2.08367		0
104	14/04/2021 12:11:18	235.41628	189.09145	235.93634	2.08375		0
105	14/04/2021 12:11:49	234.56494	188.32283	235.07764	2.08385		0
106	14/04/2021 12:12:20	233.71735	187.68492	234.22264	2.08395		0
107	14/04/2021 12:12:50	232.88081	187.02466	233.38611	2.08402		0
108	14/04/2021 12:13:21	232.0685	186.38516	232.57013	2.08417		0
109	14/04/2021 12:13:52	231.23021	185.73428	231.72078	2.08423		0
110	14/04/2021 12:14:23	230.40682	185.09106	230.90108	2.08433		0
111	14/04/2021 12:14:54	229.58205	184.42131	230.0773	2.08436		0
112	14/04/2021 12:15:25	228.75618	183.78511	229.24059	2.0845		0
113	14/04/2021 12:15:56	227.94457	183.18944	228.42894	2.08456		0
114	14/04/2021 12:16:26	227.15912	182.45961	227.64348	2.08466		0
115	14/04/2021 12:16:57	226.36644	181.84572	226.82861	2.08478		0
116	14/04/2021 12:17:28	225.54314	181.20462	226.02013	2.08489		0
117	14/04/2021 12:17:59	224.7426	180.55667	225.21962	2.08496		0
118	14/04/2021 12:18:29	223.99388	179.97966	224.44496	2.08505		0
119	14/04/2021 12:19:00	223.18652	179.30612	223.6339	2.08513		0
120	14/04/2021 12:19:31	222.41269	178.60298	222.84901	2.08526		0
121	14/04/2021 12:20:01	221.64478	178.02901	222.08106	2.08535		0
122	14/04/2021 12:20:31	220.90183	177.45416	221.33075	2.08539		0
123	14/04/2021 12:21:02	220.12563	176.75983	220.55454	2.0855		0
124	14/04/2021 12:21:33	219.36147	176.19286	219.78507	2.08561		0
125	14/04/2021 12:22:04	218.60454	175.55913	219.00958	2.0857		0
126	14/04/2021 12:22:35	217.83646	174.9478	218.23406	2.08578		0
127	14/04/2021 12:23:05	217.07121	174.28326	217.45767	2.08585		0
128	14/04/2021 12:23:36	216.34361	173.67154	216.72638	2.08597		0

Comments	Apendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
129	14/04/2021 12:24:07	215.58296	173.11621	215.9583	2.08606		0
130	14/04/2021 12:24:37	214.85608	172.53505	215.22768	2.08609		0
131	14/04/2021 12:25:08	214.11369	171.85246	214.47417	2.08617		0
132	14/04/2021 12:25:38	213.40106	171.3454	213.7578	2.0863		0
133	14/04/2021 12:26:09	212.65859	170.73735	213.01161	2.08634		0
134	14/04/2021 12:26:39	211.95726	170.17816	212.29913	2.08648		0
135	14/04/2021 12:27:10	211.23663	169.7242	211.56735	2.08649		0
136	14/04/2021 12:27:41	210.49814	169.08975	210.8177	2.08659		0
137	14/04/2021 12:28:12	209.79338	168.47791	210.10555	2.08668		0
138	14/04/2021 12:28:42	209.10062	167.91893	209.41275	2.08674		0
139	14/04/2021 12:29:13	208.38544	167.41927	208.67528	2.08683		0
140	14/04/2021 12:29:43	207.69167	166.79982	207.98151	2.08688		0
141	14/04/2021 12:30:13	207.00636	166.24085	207.29619	2.08699		0
142	14/04/2021 12:30:44	206.29491	165.7635	206.57733	2.08711		0
143	14/04/2021 12:31:15	205.58684	165.18549	205.85066	2.08714		0
144	14/04/2021 12:31:46	204.91525	164.57709	205.16051	2.0873		0
145	14/04/2021 12:32:17	204.21745	164.1097	204.459	2.08738		0
146	14/04/2021 12:32:47	203.50827	163.4897	203.74611	2.08743		0
147	14/04/2021 12:33:18	202.85201	163.01549	203.08611	2.08747		0
148	14/04/2021 12:33:48	202.18497	162.51196	202.41907	2.08757		0
149	14/04/2021 12:34:19	201.50652	161.92641	201.72946	2.08767		0
150	14/04/2021 12:34:50	200.83904	161.33325	201.05086	2.08779		0
151	14/04/2021 12:35:21	200.16798	160.90378	200.36496	2.08782		0
152	14/04/2021 12:35:51	199.517	160.32948	199.71121	2.08793		0
153	14/04/2021 12:36:22	198.85352	159.87401	199.04024	2.08802		0
154	14/04/2021 12:36:52	198.20934	159.31616	198.38484	2.08811		0
155	14/04/2021 12:37:23	197.55721	158.88388	197.71404	2.0882		0
156	14/04/2021 12:37:53	196.89296	158.20979	197.04234	2.0883		0
157	14/04/2021 12:38:24	196.25478	157.79507	196.38922	2.08839		0
158	14/04/2021 12:38:55	195.59804	157.15436	195.73248	2.0884		0
159	14/04/2021 12:39:25	194.96506	156.75964	195.10324	2.08858		0
160	14/04/2021 12:39:56	194.32486	156.20575	194.44811	2.08858		0
161	14/04/2021 12:40:27	193.66998	155.71886	193.78949	2.0887		0
162	14/04/2021 12:40:57	193.04428	155.16826	193.14885	2.08876		0
163	14/04/2021 12:41:28	192.39244	154.72516	192.50076	2.08884		0
164	14/04/2021 12:41:59	191.77782	154.22261	191.8712	2.08893		0
165	14/04/2021 12:42:29	191.15602	153.76111	191.24191	2.08903		0
166	14/04/2021 12:42:59	190.53331	153.23573	190.61546	2.08906		0
167	14/04/2021 12:43:30	189.93704	152.82927	190.01173	2.08909		0
168	14/04/2021 12:44:00	189.34052	152.36693	189.42268	2.08912		0
169	14/04/2021 12:44:31	188.7296	152.00151	188.84538	2.08906		0
170	14/04/2021 12:45:02	188.15964	151.66933	188.3165	2.08895		0
171	14/04/2021 12:45:33	187.61957	151.53362	187.86232	2.08872		0
172	14/04/2021 12:46:03	187.16148	151.40884	187.51628	2.08843		0
173	14/04/2021 12:46:33	186.76044	151.35552	187.24593	2.08807		0
174	14/04/2021 12:47:04	186.40334	151.53859	187.03076	2.08759		0
175	14/04/2021 12:47:35	186.08345	151.61768	186.87892	2.08711		0
176	14/04/2021 12:48:05	185.77145	151.78621	186.70139	2.08651		0
177	14/04/2021 12:48:36	185.50096	151.95142	186.52426	2.08587		0
178	14/04/2021 12:49:06	185.20781	152.04593	186.30951	2.08502		0
179	14/04/2021 12:49:37	184.88532	152.13362	186.0356	2.08419		0
180	14/04/2021 12:50:07	184.57652	152.1496	185.76787	2.08349		0
181	14/04/2021 12:50:38	184.21556	151.99149	185.44797	2.08277		0
182	14/04/2021 12:51:09	183.85123	152.00427	185.11728	2.08209		0
183	14/04/2021 12:51:39	183.47548	151.80185	184.78261	2.08133		0
184	14/04/2021 12:52:10	183.08116	151.7552	184.42937	2.08041		0
185	14/04/2021 12:52:41	182.64209	151.40836	184.0351	2.07949		0
186	14/04/2021 12:53:11	182.22266	151.09586	183.65677	2.07851		0
187	14/04/2021 12:53:42	181.81444	150.91678	183.28586	2.0777		0
188	14/04/2021 12:54:13	181.37215	150.61124	182.88094	2.07675		0
189	14/04/2021 12:54:43	180.94428	150.40524	182.46426	2.07582		0
190	14/04/2021 12:55:14	180.48705	150.02188	182.01453	2.07466		0
191	14/04/2021 12:55:45	180.02985	149.62462	181.54984	2.07322		0
192	14/04/2021 12:56:16	179.55768	149.26067	181.07021	2.07063		0

Comments	Appendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
193	14/04/2021 12:56:47	179.08151	148.8521	180.6015	2.0671		0
194	14/04/2021 12:57:18	178.5976	148.47279	180.11011	2.06318		0
195	14/04/2021 12:57:48	178.08766	148.0123	179.59645	2.05858		0
196	14/04/2021 12:58:19	177.59323	147.66332	179.0871	2.05341		0
197	14/04/2021 12:58:49	177.09467	147.23253	178.59224	2.04889		0
198	14/04/2021 12:59:20	176.57787	146.73935	178.06799	2.04719		0
199	14/04/2021 12:59:51	176.05818	146.19525	177.52216	2.0482		0
200	14/04/2021 13:00:22	175.50101	145.72862	176.93135	2.0558		0
201	14/04/2021 13:00:53	174.95099	145.11383	176.33279	2.05868		0
202	14/04/2021 13:01:24	174.37112	144.47687	175.69692	2.06033		0
203	14/04/2021 13:01:55	173.79524	143.78468	175.08743	2.06141		0
204	14/04/2021 13:02:26	173.20447	143.18869	174.47798	2.06209		0
205	14/04/2021 13:02:56	172.61729	142.51488	173.86839	2.06254		0
206	14/04/2021 13:03:27	172.04501	141.99635	173.25879	2.0629		0
207	14/04/2021 13:03:58	171.44316	141.27846	172.62705	2.06308		0
208	14/04/2021 13:04:29	170.86388	140.65315	172.02533	2.06324		0
209	14/04/2021 13:05:00	170.27365	139.98756	171.42018	2.0633		0
210	14/04/2021 13:05:31	169.67804	139.41304	170.80054	2.0632		0
211	14/04/2021 13:06:02	169.09503	138.813	170.18846	2.06304		0
212	14/04/2021 13:06:33	168.52307	138.24216	169.58212	2.06296		0
213	14/04/2021 13:07:04	167.93665	137.63875	168.95854	2.06265		0
214	14/04/2021 13:07:34	167.36083	137.05312	168.36043	2.06238		0
215	14/04/2021 13:08:04	166.7787	136.44296	167.75601	2.0621		0
216	14/04/2021 13:08:35	166.23358	135.8949	167.18117	2.06171		0
217	14/04/2021 13:09:06	165.67	135.30669	166.58415	2.06134		0
218	14/04/2021 13:09:36	165.12451	134.76556	166.0052	2.0608		0
219	14/04/2021 13:10:06	164.57568	134.18457	165.43037	2.06028		0
220	14/04/2021 13:10:37	164.02699	133.60368	164.85565	2.05971		0
221	14/04/2021 13:11:07	163.48521	133.14676	164.28413	2.05914		0
222	14/04/2021 13:11:37	162.94664	132.51363	163.72328	2.05843		0
223	14/04/2021 13:12:08	162.39706	132.05272	163.15886	2.05778		0
224	14/04/2021 13:12:38	161.87357	131.63577	162.6019	2.05701		0
225	14/04/2021 13:13:08	161.33504	131.11252	162.02249	2.05626		0
226	14/04/2021 13:13:39	160.81923	130.59332	161.48068	2.05532		0
227	14/04/2021 13:14:10	160.27727	130.12524	160.91269	2.05442		0
228	14/04/2021 13:14:41	159.75078	129.65436	160.35217	2.05349		0
229	14/04/2021 13:15:12	159.22133	129.17285	159.80698	2.05252		0
230	14/04/2021 13:15:42	158.7105	128.76451	159.26651	2.05151		0
231	14/04/2021 13:16:13	158.17357	128.23547	158.70363	2.05042		0
232	14/04/2021 13:16:43	157.67702	127.80467	158.18857	2.04937		0
233	14/04/2021 13:17:14	157.15465	127.33379	157.63281	2.04814		0
234	14/04/2021 13:17:45	156.63628	126.88878	157.10704	2.04688		0
235	14/04/2021 13:18:15	156.11789	126.44011	156.56639	2.04555		0
236	14/04/2021 13:18:46	155.62575	125.95522	156.0446	2.04429		0
237	14/04/2021 13:19:17	155.09343	125.49645	155.49376	2.04285		0
238	14/04/2021 13:19:47	154.6087	125.12477	154.97197	2.04151		0
239	14/04/2021 13:20:18	154.11612	124.69421	154.45714	2.04003		0
240	14/04/2021 13:20:49	153.60173	124.20932	153.9131	2.03844		0
241	14/04/2021 13:21:20	153.09464	123.77541	153.39117	2.03689		0
242	14/04/2021 13:21:50	152.61388	123.4186	152.89191	2.03533		0
243	14/04/2021 13:22:21	152.13289	122.98485	152.38495	2.03362		0
244	14/04/2021 13:22:51	151.63689	122.55093	151.86671	2.0319		0
245	14/04/2021 13:23:22	151.14815	122.14974	151.37799	2.0301		0
246	14/04/2021 13:23:53	150.66315	121.69741	150.867	2.02832		0
247	14/04/2021 13:24:24	150.18555	121.25607	150.35977	2.02638		0
248	14/04/2021 13:24:55	149.69446	120.80066	149.85715	2.02447		0
249	14/04/2021 13:25:26	149.21066	120.40679	149.35855	2.02248		0
250	14/04/2021 13:25:57	148.72641	120.02709	148.8558	2.02045		0
251	14/04/2021 13:26:28	148.24985	119.60675	148.36078	2.01832		0
252	14/04/2021 13:26:59	147.7811	119.20512	147.86983	2.01624		0
253	14/04/2021 13:27:30	147.29701	118.78847	147.36354	2.01395		0
254	14/04/2021 13:28:01	146.80866	118.38574	146.8678	2.01175		0
255	14/04/2021 13:28:31	146.36522	117.99447	146.40588	2.00952		0
256	14/04/2021 13:29:02	145.89977	117.63233	145.92934	2.0073		0

Comments	Appendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
257	14/04/2021 13:29:33	145.43059	117.28829	145.44167	2.00484		0
258	14/04/2021 13:30:04	144.96838	116.86411	144.96098	2.00242		0
259	14/04/2021 13:30:35	144.48787	116.43644	144.48045	1.99997		0
260	14/04/2021 13:31:06	144.04063	116.0378	144.01476	1.99741		0
261	14/04/2021 13:31:36	143.58225	115.63183	143.54895	1.99499		0
262	14/04/2021 13:32:07	143.14281	115.26621	143.09473	1.99242		0
263	14/04/2021 13:32:38	142.6846	114.94746	142.62175	1.98963		0
264	14/04/2021 13:33:08	142.2372	114.55589	142.15584	1.98692		0
265	14/04/2021 13:33:39	141.78626	114.22249	141.69751	1.98426		0
266	14/04/2021 13:34:10	141.34934	113.84483	141.23473	1.98132		0
267	14/04/2021 13:34:41	140.89429	113.53278	140.77596	1.97843		0
268	14/04/2021 13:35:12	140.44272	113.17342	140.3096	1.97556		0
269	14/04/2021 13:35:43	140.00574	112.81018	139.85556	1.97256		0
270	14/04/2021 13:36:14	139.55463	112.47591	139.4155	1.96951		0
271	14/04/2021 13:36:45	139.1364	112.11977	138.97531	1.9667		0
272	14/04/2021 13:37:16	138.68549	111.78201	138.51706	1.96377		0
273	14/04/2021 13:37:46	138.27881	111.45182	138.09576	1.96094		0
274	14/04/2021 13:38:16	137.85019	111.12885	137.65613	1.95811		0
275	14/04/2021 13:38:47	137.42127	110.79476	137.21623	1.95525		0
276	14/04/2021 13:39:18	136.985	110.40261	136.77997	1.95188		0
277	14/04/2021 13:39:49	136.5744	110.07578	136.34375	1.94719		0
278	14/04/2021 13:40:20	136.13701	109.70572	135.91368	1.93944		0
279	14/04/2021 13:40:51	135.72218	109.40153	135.48785	1.93269		0
280	14/04/2021 13:41:22	135.29224	109.01392	135.04695	1.92719		0
281	14/04/2021 13:41:52	134.8878	108.67672	134.63519	1.92198		0
282	14/04/2021 13:42:23	134.46185	108.3688	134.20557	1.91681		0
283	14/04/2021 13:42:53	134.06163	108.03571	133.7907	1.91181		0
284	14/04/2021 13:43:24	133.63919	107.72044	133.37192	1.90671		0
285	14/04/2021 13:43:55	133.24968	107.37268	132.96411	1.90146		0
286	14/04/2021 13:44:25	132.84203	107.0467	132.56743	1.89631		0
287	14/04/2021 13:44:56	132.43016	106.77431	132.13359	1.89131		0
288	14/04/2021 13:45:27	132.02203	106.41183	131.72548	1.88603		0
289	14/04/2021 13:45:58	131.5993	106.04575	131.30641	1.88085		0
290	14/04/2021 13:46:29	131.2094	105.78056	130.90916	1.87575		0
291	14/04/2021 13:46:59	130.82225	105.464	130.50739	1.87095		0
292	14/04/2021 13:47:30	130.41278	105.19396	130.10158	1.86584		0
293	14/04/2021 13:48:00	130.00822	104.85302	129.67952	1.86103		0
294	14/04/2021 13:48:31	129.61894	104.5803	129.29388	1.85648		0
295	14/04/2021 13:49:01	129.2329	104.25306	128.90054	1.85214		0
296	14/04/2021 13:49:32	128.84619	103.96484	128.50653	1.84777		0
297	14/04/2021 13:50:03	128.44934	103.61248	128.09872	1.84386		0
298	14/04/2021 13:50:34	128.06767	103.31483	127.72072	1.84006		0
299	14/04/2021 13:51:05	127.67493	103.02064	127.31336	1.83667		0
300	14/04/2021 13:51:35	127.28961	102.74822	126.93534	1.83372		0
301	14/04/2021 13:52:06	126.91467	102.44999	126.55311	1.83115		0
302	14/04/2021 13:52:37	126.52515	102.16259	126.15992	1.82916		0
303	14/04/2021 13:53:07	126.12872	101.85756	125.75984	1.82749		0
304	14/04/2021 13:53:38	125.75734	101.60252	125.38847	1.82627		0
305	14/04/2021 13:54:09	125.36809	101.29736	124.99554	1.82524		0
306	14/04/2021 13:54:40	124.99738	101.05022	124.6066	1.8244		0
307	14/04/2021 13:55:10	124.62666	101.04837	124.24318	1.82361		0
308	14/04/2021 13:55:41	124.2411	100.72881	123.84665	1.82289		0
309	14/04/2021 13:56:11	123.87388	100.44183	123.47943	1.82225		0
310	14/04/2021 13:56:42	123.50668	100.15482	123.11223	1.82167		0
311	14/04/2021 13:57:13	123.13936	99.90044	122.73761	1.82103		0
312	14/04/2021 13:57:43	122.78969	99.60622	122.38429	1.82051		0
313	14/04/2021 13:58:13	122.40803	99.32369	121.99534	1.81988		0
314	14/04/2021 13:58:44	122.05226	99.10623	121.64321	1.81928		0
315	14/04/2021 13:59:15	121.68066	98.78681	121.27526	1.8186		0
316	14/04/2021 13:59:45	121.32754	98.5036	120.90753	1.81793		0
317	14/04/2021 14:00:16	120.97059	98.24542	120.54692	1.8173		0
318	14/04/2021 14:00:47	120.60336	97.9411	120.17971	1.8166		0
319	14/04/2021 14:01:17	120.26527	97.6907	119.83189	1.81579		0
320	14/04/2021 14:01:48	119.89462	97.39304	119.46317	1.81501		0

Comments	Appendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
321	14/04/2021 14:02:19	119.55159	97.11728	119.1129	1.81424		0
322	14/04/2021 14:02:49	119.20145	96.86326	118.77002	1.81341		0
323	14/04/2021 14:03:19	118.82996	96.57363	118.38038	1.81247		0
324	14/04/2021 14:03:50	118.48776	96.32391	118.04544	1.81154		0
325	14/04/2021 14:04:21	118.13413	96.04842	117.69904	1.81039		0
326	14/04/2021 14:04:52	117.79913	95.78784	117.35318	1.8093		0
327	14/04/2021 14:05:23	117.4306	95.49397	116.99554	1.80817		0
328	14/04/2021 14:05:54	117.09855	95.22911	116.64898	1.80692		0
329	14/04/2021 14:06:25	116.72988	94.91711	116.29119	1.80566		0
330	14/04/2021 14:06:56	116.40076	94.64796	115.95482	1.80438		0
331	14/04/2021 14:07:27	116.05438	94.37607	115.60844	1.80303		0
332	14/04/2021 14:07:58	115.71538	94.10072	115.2658	1.80169		0
333	14/04/2021 14:08:28	115.3725	93.83591	114.91931	1.80043		0
334	14/04/2021 14:08:59	115.02942	93.5673	114.57985	1.79907		0
335	14/04/2021 14:09:30	114.69786	93.30293	114.2374	1.79788		0
336	14/04/2021 14:10:00	114.37362	93.05303	113.92043	1.79679		0
337	14/04/2021 14:10:31	114.03519	92.81422	113.57473	1.79562		0
338	14/04/2021 14:11:02	113.69635	92.53183	113.22865	1.7945		0
339	14/04/2021 14:11:32	113.39415	92.31101	112.9337	1.79358		0
340	14/04/2021 14:12:03	113.05208	92.03981	112.588	1.79273		0
341	14/04/2021 14:12:34	112.71323	91.779	112.24552	1.79187		0
342	14/04/2021 14:13:04	112.38943	91.51153	111.9181	1.79115		0
343	14/04/2021 14:13:35	112.06496	91.2434	111.59364	1.79051		0
344	14/04/2021 14:14:05	111.73698	90.97178	111.2729	1.78995		0
345	14/04/2021 14:14:36	111.40928	90.69685	110.94159	1.78953		0
346	14/04/2021 14:15:07	111.0845	90.44281	110.61681	1.78915		0
347	14/04/2021 14:15:38	110.77436	90.20691	110.30666	1.78869		0
348	14/04/2021 14:16:08	110.46796	89.96401	110.00028	1.78822		0
349	14/04/2021 14:16:38	110.1474	89.71835	109.66321	1.78743		0
350	14/04/2021 14:17:08	109.86038	89.49805	109.38413	1.78622		0
351	14/04/2021 14:17:38	109.51611	89.21288	109.03985	1.78436		0
352	14/04/2021 14:18:08	109.21582	88.95354	108.73595	1.78115		0
353	14/04/2021 14:18:39	108.91563	88.71944	108.43576	1.7762		0
354	14/04/2021 14:19:10	108.58592	88.46313	108.11687	1.76805		0
355	14/04/2021 14:19:40	108.30311	88.21399	107.82685	1.75588		0
356	14/04/2021 14:20:11	107.98131	87.95837	107.50865	1.73828		0
357	14/04/2021 14:20:41	107.68848	87.74236	107.20499	1.70786		0
358	14/04/2021 14:21:11	107.39209	87.49408	106.9014	1.64079		0
359	14/04/2021 14:21:42	107.07416	87.23154	106.57984	1.57545		0
360	14/04/2021 14:22:13	106.77401	87.00465	106.28332	1.52318		0
361	14/04/2021 14:22:44	106.4633	86.76006	105.98342	1.4858		0
362	14/04/2021 14:23:14	106.16744	86.52308	105.67675	1.45723		0
363	14/04/2021 14:23:45	105.85365	86.28621	105.37017	1.43528		0
364	14/04/2021 14:24:15	105.57572	86.08143	105.09585	1.41955		0
365	14/04/2021 14:24:45	105.27307	85.84129	104.79321	1.40647		0
366	14/04/2021 14:25:16	104.98455	85.61518	104.50107	1.39646		0
367	14/04/2021 14:25:46	104.68507	85.38538	104.21243	1.38857		0
368	14/04/2021 14:26:17	104.397	85.16332	103.9027	1.38155		0
369	14/04/2021 14:26:47	104.10208	84.93806	103.61862	1.37531		0
370	14/04/2021 14:27:18	103.80363	84.70209	103.32017	1.36921		0
371	14/04/2021 14:27:48	103.51595	84.47324	103.03248	1.36394		0
372	14/04/2021 14:28:18	103.22051	84.22948	102.73341	1.35964		0
373	14/04/2021 14:28:49	102.93936	84.0215	102.45588	1.35449		0
374	14/04/2021 14:29:19	102.65849	83.82098	102.17141	1.34972		0
375	14/04/2021 14:29:49	102.38138	83.57034	101.89791	1.34505		0
376	14/04/2021 14:30:20	102.09274	83.34413	101.60927	1.34073		0
377	14/04/2021 14:30:50	101.81503	83.11803	101.33878	1.33662		0
378	14/04/2021 14:31:21	101.52628	82.90608	101.04641	1.33246		0
379	14/04/2021 14:31:52	101.23359	82.66148	100.75733	1.32796		0
380	14/04/2021 14:32:23	100.95164	82.40601	100.46454	1.32429		0
381	14/04/2021 14:32:54	100.65199	82.17963	100.17213	1.32039		0
382	14/04/2021 14:33:24	100.38529	81.97167	99.89486	1.31675		0
383	14/04/2021 14:33:55	100.10818	81.79283	99.622	1.31295		0
384	14/04/2021 14:34:25	99.81677	81.54549	99.33807	1.30926		0

Comments	Appendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
385	14/04/2021 14:34:55	99.56123	81.36955	99.07532	1.30578		0
386	14/04/2021 14:35:25	99.2917	81.14735	98.8058	1.30244		0
387	14/04/2021 14:35:56	99.02216	80.93592	98.53626	1.29926		0
388	14/04/2021 14:36:27	98.74237	80.69988	98.25646	1.29619		0
389	14/04/2021 14:36:58	98.47009	80.53239	98.00578	1.29442		0
390	14/04/2021 14:37:28	98.22241	80.34993	97.7617	1.29151		0
391	14/04/2021 14:37:59	97.94653	80.1573	97.48583	1.28828		0
392	14/04/2021 14:38:29	97.67466	79.97591	97.20316	1.28518		0
393	14/04/2021 14:39:00	97.4317	79.7592	96.9458	1.28184		0
394	14/04/2021 14:39:30	97.17033	79.5743	96.69163	1.27888		0
395	14/04/2021 14:40:01	96.9077	79.31294	96.42539	1.27595		0
396	14/04/2021 14:40:32	96.63806	79.084	96.16296	1.27293		0
397	14/04/2021 14:41:02	96.37616	78.93439	95.90105	1.27158		0
398	14/04/2021 14:41:32	96.11408	78.79177	95.66057	1.27171		0
399	14/04/2021 14:42:03	95.87277	78.70566	95.42287	1.27175		0
400	14/04/2021 14:42:33	95.62431	78.55869	95.19239	1.27149		0
401	14/04/2021 14:43:04	95.3974	78.45107	94.97989	1.27119		0
402	14/04/2021 14:43:35	95.17451	78.31522	94.76059	1.27069		0
403	14/04/2021 14:44:05	94.94113	78.20834	94.55241	1.27031		0
404	14/04/2021 14:44:35	94.71867	78.07649	94.33714	1.26973		0
405	14/04/2021 14:45:06	94.4965	77.97001	94.11498	1.26888		0
406	14/04/2021 14:45:36	94.28509	77.84201	93.91436	1.26797		0
407	14/04/2021 14:46:07	94.05531	77.69572	93.69178	1.26679		0
408	14/04/2021 14:46:38	93.84278	77.53079	93.47925	1.26556		0
409	14/04/2021 14:47:08	93.61631	77.35912	93.25278	1.26409		0
410	14/04/2021 14:47:39	93.3944	77.2135	93.05247	1.26247		0
411	14/04/2021 14:48:09	93.15448	77.05354	92.81615	1.26116		0
412	14/04/2021 14:48:40	92.95763	76.94361	92.61569	1.25999		0
413	14/04/2021 14:49:10	92.74252	76.81908	92.40778	1.25902		0
414	14/04/2021 14:49:41	92.5202	76.67305	92.19986	1.25785		0
415	14/04/2021 14:50:11	92.29427	76.54135	91.98114	1.25689		0
416	14/04/2021 14:50:42	92.07926	76.40974	91.77692	1.25529		0
417	14/04/2021 14:51:13	91.85693	76.28521	91.55459	1.25053		0
418	14/04/2021 14:51:44	91.63461	76.12843	91.32507	1.24639		0
419	14/04/2021 14:52:14	91.40192	75.94344	91.08519	1.24254		0
420	14/04/2021 14:52:45	91.16921	75.74406	90.84527	1.23881		0
421	14/04/2021 14:53:15	90.94372	75.54832	90.59818	1.23533		0
422	14/04/2021 14:53:46	90.69328	75.35998	90.35494	1.23189		0
423	14/04/2021 14:54:16	90.46456	75.15028	90.10823	1.22867		0
424	14/04/2021 14:54:47	90.20625	74.92545	89.85387	1.22546		0
425	14/04/2021 14:55:18	89.97669	74.73631	89.61762	1.22232		0
426	14/04/2021 14:55:49	89.73334	74.51148	89.38504	1.21929		0
427	14/04/2021 14:56:20	89.48988	74.25427	89.13441	1.21634		0
428	14/04/2021 14:56:50	89.25329	74.03974	88.90141	1.2135		0
429	14/04/2021 14:57:21	89.0025	73.79672	88.65421	1.21062		0
430	14/04/2021 14:57:51	88.77324	73.57876	88.42136	1.2079		0
431	14/04/2021 14:58:21	88.54439	73.38269	88.19968	1.20523		0
432	14/04/2021 14:58:51	88.30164	73.18351	87.96053	1.20266		0
433	14/04/2021 14:59:22	88.05473	72.95868	87.71361	1.19999		0
434	14/04/2021 14:59:52	87.82561	72.75877	87.47372	1.19756		0
435	14/04/2021 15:00:22	87.60324	72.56202	87.25137	1.19495		0
436	14/04/2021 15:00:52	87.36227	72.35745	87.01398	1.19255		0
437	14/04/2021 15:01:23	87.13246	72.18192	86.78777	1.19003		0
438	14/04/2021 15:01:54	86.88788	71.95225	86.54677	1.18756		0
439	14/04/2021 15:02:25	86.66885	71.75166	86.31338	1.18514		0
440	14/04/2021 15:02:55	86.44168	71.56086	86.0934	1.18279		0
441	14/04/2021 15:03:25	86.19695	71.38119	85.84866	1.18047		0
442	14/04/2021 15:03:56	85.97349	71.19408	85.61801	1.17815		0
443	14/04/2021 15:04:26	85.75766	71.00385	85.3986	1.17592		0
444	14/04/2021 15:04:56	85.53465	70.79212	85.17558	1.17366		0
445	14/04/2021 15:05:27	85.30786	70.59811	84.94521	1.1714		0
446	14/04/2021 15:05:57	85.08469	70.40772	84.7328	1.16924		0
447	14/04/2021 15:06:28	84.84634	70.20218	84.50523	1.16699		0
448	14/04/2021 15:06:59	84.62897	69.99966	84.26631	1.16483		0

Comments	Apendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
449	14/04/2021 15:07:30	84.41517	69.82176	84.04892	1.16263		0
450	14/04/2021 15:08:00	84.17969	69.6186	83.82781	1.16056		0
451	14/04/2021 15:08:30	83.96535	69.43658	83.60988	1.15847		0
452	14/04/2021 15:09:01	83.74053	69.24048	83.39224	1.15634		0
453	14/04/2021 15:09:31	83.52299	69.04808	83.16393	1.15428		0
454	14/04/2021 15:10:02	83.31928	68.88028	82.96022	1.15222		0
455	14/04/2021 15:10:32	83.08772	68.68462	82.73225	1.15021		0
456	14/04/2021 15:11:03	82.87353	68.50633	82.52165	1.14819		0
457	14/04/2021 15:11:34	82.66592	68.33104	82.31403	1.14611		0
458	14/04/2021 15:12:04	82.44813	68.15635	82.08907	1.14418		0
459	14/04/2021 15:12:34	82.23035	67.9637	81.87128	1.14224		0
460	14/04/2021 15:13:05	82.02306	67.79591	81.67117	1.14025		0
461	14/04/2021 15:13:36	81.79366	67.60242	81.44178	1.13825		0
462	14/04/2021 15:14:06	81.59728	67.42757	81.24539	1.13641		0
463	14/04/2021 15:14:36	81.39703	67.24886	81.02718	1.13448		0
464	14/04/2021 15:15:07	81.17177	67.0667	80.81631	1.13257		0
465	14/04/2021 15:15:38	80.97495	66.91297	80.61589	1.13068		0
466	14/04/2021 15:16:08	80.75633	66.74461	80.40086	1.12885		0
467	14/04/2021 15:16:39	80.54546	66.59119	80.18998	1.12697		0
468	14/04/2021 15:17:09	80.34521	66.43044	79.97902	1.12517		0
469	14/04/2021 15:17:40	80.12672	66.24786	79.76822	1.12329		0
470	14/04/2021 15:18:11	79.93366	66.1049	79.56471	1.12145		0
471	14/04/2021 15:18:42	79.71215	65.90799	79.35037	1.11961		0
472	14/04/2021 15:19:13	79.50452	65.75013	79.14632	1.11778		0
473	14/04/2021 15:19:43	79.3039	65.58494	78.94212	1.11605		0
474	14/04/2021 15:20:14	79.11073	65.42362	78.75612	1.11427		0
475	14/04/2021 15:20:44	78.91057	65.25528	78.55595	1.11258		0
476	14/04/2021 15:21:14	78.71423	65.0872	78.35603	1.11084		0
477	14/04/2021 15:21:45	78.5146	64.92299	78.16356	1.10911		0
478	14/04/2021 15:22:15	78.32597	64.76623	77.96061	1.10738		0
479	14/04/2021 15:22:45	78.12606	64.60175	77.76428	1.10575		0
480	14/04/2021 15:23:15	77.92202	64.45107	77.5674	1.10405		0
481	14/04/2021 15:23:46	77.73275	64.30084	77.37812	1.10235		0
482	14/04/2021 15:24:17	77.53254	64.13606	77.17793	1.10068		0
483	14/04/2021 15:24:48	77.34312	63.98568	76.9885	1.09895		0
484	14/04/2021 15:25:18	77.16082	63.85321	76.79904	1.09737		0
485	14/04/2021 15:25:49	76.96036	63.68816	76.59499	1.09567		0
486	14/04/2021 15:26:20	76.76086	63.49896	76.40266	1.09398		0
487	14/04/2021 15:26:51	76.56493	63.34923	76.20673	1.0923		0
488	14/04/2021 15:27:21	76.38747	63.19649	76.01495	1.09079		0
489	14/04/2021 15:27:52	76.19104	63.04626	75.82925	1.08913		0
490	14/04/2021 15:28:23	76.00216	62.88923	75.63321	1.08752		0
491	14/04/2021 15:28:54	75.80279	62.71811	75.44459	1.08592		0
492	14/04/2021 15:29:25	75.61789	62.57586	75.24537	1.08426		0
493	14/04/2021 15:29:56	75.43341	62.41607	75.06446	1.08272		0
494	14/04/2021 15:30:27	75.24935	62.2567	74.86966	1.08114		0
495	14/04/2021 15:30:58	75.04671	62.10383	74.67059	1.07957		0
496	14/04/2021 15:31:29	74.85475	61.96169	74.48222	1.07796		0
497	14/04/2021 15:32:00	74.67014	61.82331	74.30119	1.07642		0
498	14/04/2021 15:32:31	74.48611	61.66037	74.11358	1.07487		0
499	14/04/2021 15:33:01	74.29871	61.51561	73.93334	1.0734		0
500	14/04/2021 15:33:31	74.11493	61.35652	73.74598	1.0719		0
501	14/04/2021 15:34:02	73.9423	61.2158	73.57336	1.07038		0
502	14/04/2021 15:34:32	73.75179	61.05355	73.38284	1.06896		0
503	14/04/2021 15:35:03	73.58244	60.91969	73.20991	1.06746		0
504	14/04/2021 15:35:34	73.39909	60.78976	73.01939	1.066		0
505	14/04/2021 15:36:05	73.20507	60.60965	72.83614	1.06446		0
506	14/04/2021 15:36:36	73.02586	60.48386	72.65334	1.06304		0
507	14/04/2021 15:37:07	72.84977	60.34325	72.47366	1.06153		0
508	14/04/2021 15:37:37	72.67801	60.23212	72.31622	1.06016		0
509	14/04/2021 15:38:07	72.50263	60.07068	72.12294	1.05878		0
510	14/04/2021 15:38:37	72.3242	59.93459	71.9481	1.05737		0
511	14/04/2021 15:39:08	72.14578	59.8054	71.78042	1.0559		0
512	14/04/2021 15:39:39	71.97495	59.6694	71.60242	1.0545		0

Comments	Appendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
577	14/04/2021 16:12:50	61.77535	51.72837	61.45937	0.97879		0
578	14/04/2021 16:13:21	61.64138	51.64066	61.31463	0.97784		0
579	14/04/2021 16:13:51	61.51461	51.52049	61.18427	0.9769		0
580	14/04/2021 16:14:22	61.37279	51.42128	61.04604	0.97598		0
581	14/04/2021 16:14:53	61.24559	51.28264	60.90089	0.97503		0
582	14/04/2021 16:15:23	61.11149	51.14067	60.75961	0.97414		0
583	14/04/2021 16:15:54	60.96633	51.08862	60.63241	0.97319		0
584	14/04/2021 16:16:25	60.83443	50.96329	60.49332	0.97233		0
585	14/04/2021 16:16:56	60.69884	50.85591	60.35773	0.97145		0
586	14/04/2021 16:17:27	60.58528	50.76706	60.22622	0.97053		0
587	14/04/2021 16:17:57	60.44634	50.64909	60.10164	0.96961		0
588	14/04/2021 16:18:27	60.30785	50.5388	59.96297	0.96876		0
589	14/04/2021 16:18:58	60.18009	50.47176	59.84542	0.96788		0
590	14/04/2021 16:19:28	60.04597	50.37307	59.69982	0.96705		0
591	14/04/2021 16:19:59	59.91133	50.26346	59.57579	0.9662		0
592	14/04/2021 16:20:30	59.7763	50.13204	59.43353	0.96528		0
593	14/04/2021 16:21:01	59.64114	50.051	59.3056	0.96437		0
594	14/04/2021 16:21:32	59.51302	49.96601	59.17026	0.96354		0
595	14/04/2021 16:22:02	59.3779	49.881	59.04235	0.96274		0
596	14/04/2021 16:22:32	59.25354	49.77053	58.918	0.96191		0
597	14/04/2021 16:23:03	59.12182	49.63817	58.77545	0.96105		0
598	14/04/2021 16:23:33	59.00428	49.54544	58.66513	0.96023		0
599	14/04/2021 16:24:04	58.87608	49.43474	58.53332	0.95943		0
600	14/04/2021 16:24:35	58.73689	49.33474	58.39051	0.9586		0
601	14/04/2021 16:25:05	58.61183	49.25984	58.26547	0.95783		0
602	14/04/2021 16:25:36	58.48304	49.15218	58.13307	0.957		0
603	14/04/2021 16:26:07	58.36565	49.08859	58.00485	0.95618		0
604	14/04/2021 16:26:38	58.22659	48.92349	57.87661	0.95538		0
605	14/04/2021 16:27:08	58.10213	48.84917	57.75936	0.95456		0
606	14/04/2021 16:27:39	57.97695	48.73426	57.62697	0.95383		0
607	14/04/2021 16:28:10	57.84761	48.64418	57.50485	0.95304		0
608	14/04/2021 16:28:40	57.72271	48.54768	57.38717	0.95227		0
609	14/04/2021 16:29:11	57.61903	48.49788	57.26906	0.95144		0
610	14/04/2021 16:29:42	57.47569	48.33571	57.13653	0.95066		0
611	14/04/2021 16:30:13	57.35022	48.21689	57.01829	0.94993		0
612	14/04/2021 16:30:43	57.22142	48.14546	56.88948	0.94915		0
613	14/04/2021 16:31:14	57.08556	48.05245	56.76084	0.94844		0
614	14/04/2021 16:31:44	56.97497	47.9812	56.63582	0.94768		0
615	14/04/2021 16:32:14	56.85422	47.86712	56.52589	0.94692		0
616	14/04/2021 16:32:45	56.74072	47.79657	56.39796	0.9462		0
617	14/04/2021 16:33:16	56.62734	47.72614	56.2918	0.94547		0
618	14/04/2021 16:33:46	56.50729	47.65989	56.16452	0.94471		0
619	14/04/2021 16:34:17	56.38673	47.52062	56.05118	0.944		0
620	14/04/2021 16:34:48	56.27015	47.4361	55.92738	0.94322		0
621	14/04/2021 16:35:19	56.14968	47.34405	55.79969	0.94251		0
622	14/04/2021 16:35:49	56.02175	47.23362	55.68259	0.94184		0
623	14/04/2021 16:36:20	55.90781	47.13363	55.56144	0.94112		0
624	14/04/2021 16:36:50	55.78721	47.06683	55.45888	0.94041		0
625	14/04/2021 16:37:21	55.67383	46.95652	55.33106	0.93973		0
626	14/04/2021 16:37:51	55.56017	46.87131	55.2174	0.93904		0
627	14/04/2021 16:38:22	55.44334	46.81918	55.1078	0.93833		0
628	14/04/2021 16:38:52	55.31913	46.70525	54.97998	0.93769		0
629	14/04/2021 16:39:23	55.2203	46.6168	54.88836	0.937		0
630	14/04/2021 16:39:54	55.10071	46.52926	54.74351	0.9363		0
631	14/04/2021 16:40:25	54.98093	46.45603	54.63095	0.93563		0
632	14/04/2021 16:40:56	54.86102	46.32467	54.52909	0.93493		0
633	14/04/2021 16:41:27	54.75196	46.2332	54.40198	0.93427		0
634	14/04/2021 16:41:57	54.63914	46.13434	54.28555	0.93364		0
635	14/04/2021 16:42:28	54.52241	46.06417	54.17603	0.93296		0
636	14/04/2021 16:42:59	54.40239	45.96895	54.06685	0.93232		0
637	14/04/2021 16:43:29	54.29316	45.88818	53.95761	0.9317		0
638	14/04/2021 16:44:00	54.19129	45.82571	53.8341	0.931		0
639	14/04/2021 16:44:30	54.07892	45.70916	53.74337	0.93037		0
640	14/04/2021 16:45:01	53.96288	45.63244	53.62373	0.92974		0

Comments	Apendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
641	14/04/2021 16:45:31	53.85077	45.53066	53.51884	0.92915		0
642	14/04/2021 16:46:02	53.73489	45.43596	53.39934	0.92851		0
643	14/04/2021 16:46:32	53.61567	45.35605	53.28013	0.92789		0
644	14/04/2021 16:47:03	53.51453	45.2943	53.17898	0.92721		0
645	14/04/2021 16:47:34	53.40629	45.24355	53.06353	0.92663		0
646	14/04/2021 16:48:05	53.29445	45.14928	52.95168	0.92598		0
647	14/04/2021 16:48:35	53.19007	45.06978	52.84731	0.92544		0
648	14/04/2021 16:49:06	53.0785	44.94679	52.74296	0.92482		0
649	14/04/2021 16:49:37	52.98498	44.88907	52.6386	0.92419		0
650	14/04/2021 16:50:07	52.86287	44.83524	52.52732	0.92364		0
651	14/04/2021 16:50:38	52.76238	44.73064	52.41962	0.92304		0
652	14/04/2021 16:51:09	52.64705	44.65826	52.3043	0.92242		0
653	14/04/2021 16:51:39	52.55743	44.58271	52.20746	0.92182		0
654	14/04/2021 16:52:10	52.44241	44.51788	52.09603	0.92124		0
655	14/04/2021 16:52:41	52.33443	44.42388	51.99527	0.92067		0
656	14/04/2021 16:53:12	52.21954	44.35556	51.88398	0.92011		0
657	14/04/2021 16:53:42	52.1192	44.25474	51.77644	0.91953		0
658	14/04/2021 16:54:13	52.01541	44.20482	51.67986	0.91896		0
659	14/04/2021 16:54:44	51.90466	44.13342	51.56551	0.91841		0
660	14/04/2021 16:55:15	51.8085	44.0658	51.46935	0.91788		0
661	14/04/2021 16:55:45	51.71262	43.9912	51.36625	0.91731		0
662	14/04/2021 16:56:16	51.60548	43.91255	51.25911	0.91674		0
663	14/04/2021 16:56:47	51.49849	43.84129	51.15212	0.91622		0
664	14/04/2021 16:57:18	51.39152	43.74106	51.05598	0.91568		0
665	14/04/2021 16:57:49	51.30269	43.65542	50.95271	0.91521		0
666	14/04/2021 16:58:20	51.19209	43.58779	50.86016	0.91459		0
667	14/04/2021 16:58:50	51.09606	43.51304	50.74969	0.91404		0
668	14/04/2021 16:59:21	50.99283	43.41656	50.64646	0.91353		0
669	14/04/2021 16:59:51	50.88945	43.34531	50.5503	0.91301		0
670	14/04/2021 17:00:22	50.79356	43.27071	50.44719	0.91251		0
671	14/04/2021 17:00:53	50.69391	43.22858	50.34754	0.91193		0
672	14/04/2021 17:01:23	50.58374	43.13963	50.2518	0.91143		0
673	14/04/2021 17:01:54	50.48052	43.05765	50.15579	0.91091		0
674	14/04/2021 17:02:25	50.38433	42.96825	50.04157	0.91043		0
675	14/04/2021 17:02:55	50.29536	42.94048	49.94512	0.90996		0
676	14/04/2021 17:03:26	50.19215	42.87302	49.8414	0.90942		0
677	14/04/2021 17:03:56	50.09627	42.74767	49.7378	0.90894		0
678	14/04/2021 17:04:27	50.00039	42.70208	49.65596	0.90846		0
679	14/04/2021 17:04:58	49.91464	42.63808	49.55933	0.90798		0
680	14/04/2021 17:05:29	49.79985	42.5378	49.4663	0.90742		0
681	14/04/2021 17:06:00	49.71425	42.44857	49.37707	0.90697		0
682	14/04/2021 17:06:30	49.61065	42.3776	49.27347	0.90649		0
683	14/04/2021 17:07:01	49.51426	42.27759	49.16983	0.90601		0
684	14/04/2021 17:07:31	49.41428	42.20662	49.07711	0.90557		0
685	14/04/2021 17:08:01	49.33941	42.15712	48.99498	0.90509		0
686	14/04/2021 17:08:32	49.24669	42.10791	48.91313	0.9046		0
687	14/04/2021 17:09:02	49.14686	42.04796	48.80968	0.90418		0
688	14/04/2021 17:09:33	49.05384	41.96944	48.71666	0.90371		0
689	14/04/2021 17:10:03	48.96085	41.8982	48.62729	0.90323		0
690	14/04/2021 17:10:34	48.85319	41.83043	48.51963	0.90279		0
691	14/04/2021 17:11:05	48.75977	41.74789	48.42259	0.90231		0
692	14/04/2021 17:11:35	48.66605	41.66142	48.33249	0.90188		0
693	14/04/2021 17:12:06	48.57945	41.60382	48.2604	0.90143		0
694	14/04/2021 17:12:36	48.49649	41.50636	48.15931	0.90101		0
695	14/04/2021 17:13:07	48.39901	41.46327	48.07634	0.90055		0
696	14/04/2021 17:13:37	48.31271	41.3806	47.98279	0.90009		0
697	14/04/2021 17:14:08	48.22279	41.3088	47.89286	0.89968		0
698	14/04/2021 17:14:38	48.12556	41.22606	47.79563	0.89923		0
699	14/04/2021 17:15:09	48.04318	41.17994	47.70963	0.8988		0
700	14/04/2021 17:15:40	47.9606	41.12637	47.63068	0.89835		0
701	14/04/2021 17:16:10	47.87821	41.05123	47.54103	0.89797		0
702	14/04/2021 17:16:40	47.79204	40.99769	47.44761	0.89752		0
703	14/04/2021 17:17:11	47.68731	40.89296	47.35013	0.89712		0
704	14/04/2021 17:17:42	47.59363	40.83191	47.27095	0.89667		0

Comments	Apendix 3 - 3°C /min heating rate					
UserDefined	Cool-down					
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	V	V
769	14/04/2021 17:50:46	42.45585	36.89359	42.11504	0.87449	0
770	14/04/2021 17:51:16	42.36884	36.81344	42.02441	0.87421	0
771	14/04/2021 17:51:47	42.30038	36.77379	41.9632	0.87395	0
772	14/04/2021 17:52:17	42.22798	36.71561	41.89443	0.87365	0
773	14/04/2021 17:52:47	42.15215	36.65398	41.82584	0.87342	0
774	14/04/2021 17:53:18	42.09062	36.61401	41.75707	0.8731	0
775	14/04/2021 17:53:48	42.01518	36.56735	41.67801	0.87285	0
776	14/04/2021 17:54:19	41.96484	36.50947	41.6204	0.87259	0
777	14/04/2021 17:54:49	41.89317	36.4921	41.55962	0.87234	0
778	14/04/2021 17:55:20	41.82135	36.42723	41.4878	0.87208	0
779	14/04/2021 17:55:51	41.75683	36.38059	41.4269	0.87184	0
780	14/04/2021 17:56:21	41.68514	36.32314	41.35159	0.87156	0
781	14/04/2021 17:56:51	41.6206	36.28742	41.29067	0.8713	0
782	14/04/2021 17:57:21	41.5556	36.23304	41.22205	0.87102	0
783	14/04/2021 17:57:52	41.47623	36.16421	41.13905	0.87077	0
784	14/04/2021 17:58:22	41.41489	36.11715	41.07047	0.87052	0
785	14/04/2021 17:58:52	41.3753	36.08829	41.02724	0.8703	0
786	14/04/2021 17:59:23	41.30335	36.02692	40.96617	0.87004	0
787	14/04/2021 17:59:53	41.23138	35.96188	40.89058	0.86978	0
788	14/04/2021 18:00:24	41.16278	35.91845	40.8111	0.86952	0
789	14/04/2021 18:00:55	41.0978	35.87137	40.75337	0.86932	0
790	14/04/2021 18:01:25	41.02919	35.82793	40.68477	0.86903	0
791	14/04/2021 18:01:56	40.96784	35.77356	40.62341	0.86876	0
792	14/04/2021 18:02:26	40.89212	35.72662	40.55856	0.86856	0
793	14/04/2021 18:02:57	40.84152	35.68669	40.49345	0.86829	0
794	14/04/2021 18:03:27	40.76943	35.63976	40.43225	0.86809	0
795	14/04/2021 18:03:57	40.6902	35.57107	40.34214	0.86786	0
796	14/04/2021 18:04:28	40.63639	35.52065	40.29196	0.86761	0
797	14/04/2021 18:04:58	40.57166	35.48474	40.2236	0.86739	0
798	14/04/2021 18:05:28	40.50335	35.44161	40.16255	0.86717	0
799	14/04/2021 18:05:59	40.44589	35.39843	40.09783	0.86692	0
800	14/04/2021 18:06:30	40.38063	35.34743	40.02895	0.86669	0
801	14/04/2021 18:07:00	40.31105	35.29937	39.96646	0.8665	0
802	14/04/2021 18:07:31	40.24483	35.23282	39.89991	0.86623	0
803	14/04/2021 18:08:02	40.19296	35.20256	39.85872	0.86601	0
804	14/04/2021 18:08:32	40.11918	35.12113	39.77364	0.86577	0
805	14/04/2021 18:09:02	40.06716	35.07614	39.72137	0.86557	0
806	14/04/2021 18:09:33	39.99377	35.00971	39.6513	0.86536	0
807	14/04/2021 18:10:03	39.93015	34.95702	39.59132	0.86513	0
808	14/04/2021 18:10:34	39.87633	34.90685	39.5375	0.86492	0
809	14/04/2021 18:11:05	39.81511	34.84927	39.46535	0.86467	0
810	14/04/2021 18:11:35	39.75681	34.79826	39.41798	0.86447	0
811	14/04/2021 18:12:06	39.69008	34.73517	39.34761	0.86424	0
812	14/04/2021 18:12:36	39.63094	34.6906	39.28846	0.86404	0
813	14/04/2021 18:13:07	39.56716	34.63047	39.22105	0.86381	0
814	14/04/2021 18:13:37	39.51096	34.5852	39.16121	0.8636	0
815	14/04/2021 18:14:07	39.44004	34.51428	39.10121	0.86338	0
816	14/04/2021 18:14:38	39.39507	34.46202	39.04531	0.86315	0
817	14/04/2021 18:15:09	39.33102	34.40525	38.97762	0.86293	0
818	14/04/2021 18:15:39	39.27436	34.36317	38.92096	0.86272	0
819	14/04/2021 18:16:10	39.23162	34.32772	38.88186	0.86251	0
820	14/04/2021 18:16:40	39.15358	34.2679	38.79654	0.86232	0
821	14/04/2021 18:17:11	39.10801	34.22597	38.75825	0.86213	0
822	14/04/2021 18:17:41	39.05238	34.18491	38.69898	0.86191	0
823	14/04/2021 18:18:11	38.97766	34.1284	38.63154	0.86173	0
824	14/04/2021 18:18:41	38.92399	34.07838	38.56694	0.86155	0
825	14/04/2021 18:19:11	38.87732	34.04264	38.51663	0.86135	0
826	14/04/2021 18:19:42	38.81395	33.97927	38.44962	0.8611	0
827	14/04/2021 18:20:13	38.75397	33.93386	38.40057	0.86092	0
828	14/04/2021 18:20:43	38.69091	33.87445	38.33387	0.86073	0
829	14/04/2021 18:21:13	38.63372	33.83183	38.27667	0.86055	0
830	14/04/2021 18:21:44	38.56813	33.77717	38.2038	0.86034	0
831	14/04/2021 18:22:15	38.52101	33.73369	38.15668	0.86013	0
832	14/04/2021 18:22:46	38.44801	33.67526	38.09824	0.85993	0

Comments	Apendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
833	14/04/2021 18:23:17	38.37833	33.60923	38.02493	0.85971		0
834	14/04/2021 18:23:47	38.32509	33.57785	37.97169	0.85953		0
835	14/04/2021 18:24:18	38.27546	33.54279	37.91841	0.85935		0
836	14/04/2021 18:24:49	38.19587	33.48142	37.83883	0.85914		0
837	14/04/2021 18:25:19	38.15296	33.43851	37.79227	0.859		0
838	14/04/2021 18:25:49	38.10344	33.4072	37.75003	0.85879		0
839	14/04/2021 18:26:20	38.05292	33.35669	37.69223	0.85857		0
840	14/04/2021 18:26:51	37.9812	33.30683	37.63144	0.85838		0
841	14/04/2021 18:27:21	37.9284	33.26131	37.575	0.85824		0
842	14/04/2021 18:27:52	37.88694	33.23078	37.5299	0.85806		0
843	14/04/2021 18:28:22	37.81634	33.19297	37.47023	0.85787		0
844	14/04/2021 18:28:52	37.76678	33.14341	37.40974	0.85772		0
845	14/04/2021 18:29:23	37.70248	33.10826	37.36001	0.85745		0
846	14/04/2021 18:29:53	37.64296	33.0706	37.29685	0.85733		0
847	14/04/2021 18:30:24	37.59477	33.03333	37.24136	0.85713		0
848	14/04/2021 18:30:55	37.53913	32.99227	37.18209	0.85693		0
849	14/04/2021 18:31:26	37.47944	32.94716	37.12603	0.85677		0
850	14/04/2021 18:31:56	37.42679	32.90179	37.07339	0.8566		0
851	14/04/2021 18:32:26	37.37697	32.85926	37.0345	0.85643		0
852	14/04/2021 18:32:57	37.32024	32.81346	36.97048	0.85626		0
853	14/04/2021 18:33:27	37.26109	32.77617	36.91134	0.85609		0
854	14/04/2021 18:33:57	37.21208	32.7308	36.86233	0.85593		0
855	14/04/2021 18:34:28	37.15968	32.69662	36.80627	0.85572		0
856	14/04/2021 18:34:58	37.10486	32.66002	36.74781	0.85559		0
857	14/04/2021 18:35:29	37.05319	32.63385	36.69614	0.85538		0
858	14/04/2021 18:35:59	37.00077	32.58506	36.64008	0.85526		0
859	14/04/2021 18:36:30	36.94392	32.55373	36.59781	0.8551		0
860	14/04/2021 18:37:01	36.88019	32.50821	36.53043	0.85489		0
861	14/04/2021 18:37:32	36.83184	32.46715	36.4748	0.85476		0
862	14/04/2021 18:38:02	36.77217	32.41476	36.4297	0.85457		0
863	14/04/2021 18:38:32	36.73086	32.3771	36.3811	0.85446		0
864	14/04/2021 18:39:02	36.67089	32.3317	36.33206	0.85427		0
865	14/04/2021 18:39:33	36.62552	32.3009	36.28669	0.85411		0
866	14/04/2021 18:40:03	36.56271	32.24174	36.22025	0.85396		0
867	14/04/2021 18:40:34	36.51061	32.21879	36.16085	0.85383		0
868	14/04/2021 18:41:05	36.47023	32.1784	36.12047	0.85362		0
869	14/04/2021 18:41:35	36.41123	32.14127	36.07241	0.8535		0
870	14/04/2021 18:42:06	36.36348	32.11173	36.02465	0.85331		0
871	14/04/2021 18:42:37	36.30093	32.06376	35.95846	0.85313		0
872	14/04/2021 18:43:07	36.25612	32.03716	35.91	0.85295		0
873	14/04/2021 18:43:38	36.2106	31.98435	35.86449	0.85285		0
874	14/04/2021 18:44:08	36.13958	31.92062	35.78982	0.85269		0
875	14/04/2021 18:44:39	36.08395	31.87956	35.74876	0.85251		0
876	14/04/2021 18:45:10	36.02577	31.8396	35.69058	0.85236		0
877	14/04/2021 18:45:40	35.97204	31.80044	35.63685	0.85219		0
878	14/04/2021 18:46:11	35.9213	31.76427	35.59704	0.85208		0
879	14/04/2021 18:46:41	35.88873	31.73535	35.54262	0.85194		0
880	14/04/2021 18:47:12	35.82758	31.69242	35.48511	0.85179		0
881	14/04/2021 18:47:43	35.77726	31.64938	35.43843	0.85164		0
882	14/04/2021 18:48:13	35.7297	31.61276	35.38359	0.85155		0
883	14/04/2021 18:48:44	35.69338	31.58736	35.34726	0.85136		0
884	14/04/2021 18:49:14	35.6345	31.5467	35.29567	0.8512		0
885	14/04/2021 18:49:45	35.5797	31.50283	35.24451	0.85102		0
886	14/04/2021 18:50:15	35.54311	31.48081	35.21521	0.8509		0
887	14/04/2021 18:50:46	35.49235	31.44827	35.15716	0.85078		0
888	14/04/2021 18:51:17	35.43781	31.39373	35.10263	0.85062		0
889	14/04/2021 18:51:48	35.42024	31.38344	35.08505	0.85047		0
890	14/04/2021 18:52:18	35.35209	31.3408	35.03147	0.85034		0
891	14/04/2021 18:52:49	35.29821	31.29421	34.96666	0.8502		0
892	14/04/2021 18:53:20	35.24815	31.25507	34.90932	0.85004		0
893	14/04/2021 18:53:51	35.2052	31.2267	34.87366	0.84992		0
894	14/04/2021 18:54:21	35.16269	31.19147	34.83114	0.84974		0
895	14/04/2021 18:54:51	35.09478	31.14907	34.77053	0.84961		0
896	14/04/2021 18:55:22	35.04147	31.0994	34.70993	0.84953		0

Comments	Apendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
897	14/04/2021 18:55:53	35.00528	31.07414	34.67738	0.84935		0
898	14/04/2021 18:56:23	34.95843	31.03093	34.6196	0.84921		0
899	14/04/2021 18:56:54	34.89702	30.99139	34.56912	0.84909		0
900	14/04/2021 18:57:25	34.85828	30.96357	34.53038	0.84896		0
901	14/04/2021 18:57:56	34.7977	30.90664	34.4698	0.84885		0
902	14/04/2021 18:58:26	34.76975	30.90419	34.43456	0.84872		0
903	14/04/2021 18:58:56	34.70546	30.85084	34.37392	0.84857		0
904	14/04/2021 18:59:27	34.66688	30.81954	34.33534	0.84842		0
905	14/04/2021 18:59:57	34.62406	30.78765	34.28888	0.84832		0
906	14/04/2021 19:00:28	34.57817	30.75269	34.23934	0.84819		0
907	14/04/2021 19:00:59	34.53526	30.70978	34.20008	0.84805		0
908	14/04/2021 19:01:30	34.48407	30.68045	34.15252	0.84795		0
909	14/04/2021 19:02:00	34.4263	30.62996	34.09476	0.84779		0
910	14/04/2021 19:02:31	34.38322	30.59053	34.04804	0.84769		0
911	14/04/2021 19:03:02	34.33274	30.55826	34.0012	0.84752		0
912	14/04/2021 19:03:33	34.28928	30.52574	33.9541	0.84744		0
913	14/04/2021 19:04:03	34.24203	30.50035	33.91778	0.84729		0
914	14/04/2021 19:04:34	34.19585	30.47603	33.8716	0.84717		0
915	14/04/2021 19:05:05	34.1598	30.43633	33.8319	0.84703		0
916	14/04/2021 19:05:35	34.11283	30.39665	33.78493	0.84694		0
917	14/04/2021 19:06:06	34.05546	30.35385	33.73121	0.84681		0
918	14/04/2021 19:06:37	34.00832	30.31764	33.68407	0.84664		0
919	14/04/2021 19:07:08	33.95703	30.27728	33.64006	0.84653		0
920	14/04/2021 19:07:39	33.92448	30.25931	33.60023	0.84643		0
921	14/04/2021 19:08:10	33.87708	30.20826	33.55283	0.8463		0
922	14/04/2021 19:08:41	33.84508	30.17626	33.51354	0.84619		0
923	14/04/2021 19:09:11	33.78475	30.13779	33.45685	0.84604		0
924	14/04/2021 19:09:42	33.75668	30.10972	33.42149	0.84593		0
925	14/04/2021 19:10:12	33.71792	30.08189	33.39367	0.84581		0
926	14/04/2021 19:10:43	33.67567	30.06151	33.34778	0.84568		0
927	14/04/2021 19:11:13	33.6264	30.01588	33.30215	0.84562		0
928	14/04/2021 19:11:44	33.5797	29.97623	33.25544	0.8455		0
929	14/04/2021 19:12:14	33.54098	29.93712	33.21308	0.84536		0
930	14/04/2021 19:12:45	33.50518	29.92305	33.17	0.84527		0
931	14/04/2021 19:13:16	33.45767	29.87139	33.12613	0.84514		0
932	14/04/2021 19:13:47	33.40632	29.8269	33.07843	0.84505		0
933	14/04/2021 19:14:17	33.36613	29.79734	33.03823	0.84492		0
934	14/04/2021 19:14:48	33.30767	29.75302	32.98705	0.84481		0
935	14/04/2021 19:15:19	33.28928	29.73813	32.96138	0.84474		0
936	14/04/2021 19:15:50	33.24622	29.69832	32.91468	0.84462		0
937	14/04/2021 19:16:20	33.20327	29.66231	32.86809	0.84447		0
938	14/04/2021 19:16:51	33.16019	29.6372	32.82865	0.84438		0
939	14/04/2021 19:17:21	33.10703	29.60559	32.77549	0.84424		0
940	14/04/2021 19:17:52	33.0575	29.56293	32.72595	0.84415		0
941	14/04/2021 19:18:22	33.04088	29.56086	32.70934	0.84406		0
942	14/04/2021 19:18:53	32.99108	29.50321	32.64861	0.8439		0
943	14/04/2021 19:19:23	32.95488	29.48505	32.62334	0.84384		0
944	14/04/2021 19:19:54	32.88956	29.42645	32.55438	0.84371		0
945	14/04/2021 19:20:25	32.86143	29.387	32.52625	0.84361		0
946	14/04/2021 19:20:56	32.82216	29.3731	32.48333	0.84351		0
947	14/04/2021 19:21:27	32.76763	29.32171	32.43609	0.84343		0
948	14/04/2021 19:21:58	32.74186	29.30672	32.40667	0.84329		0
949	14/04/2021 19:22:29	32.7051	29.27327	32.36627	0.84323		0
950	14/04/2021 19:23:00	32.66055	29.243	32.32536	0.84309		0
951	14/04/2021 19:23:31	32.60612	29.19907	32.27822	0.843		0
952	14/04/2021 19:24:01	32.58883	29.18161	32.24636	0.84288		0
953	14/04/2021 19:24:32	32.5459	29.15666	32.21436	0.84278		0
954	14/04/2021 19:25:03	32.50312	29.12449	32.17158	0.8427		0
955	14/04/2021 19:25:33	32.46733	29.10307	32.13215	0.84257		0
956	14/04/2021 19:26:04	32.41644	29.06271	32.07761	0.8425		0
957	14/04/2021 19:26:35	32.37338	29.01554	32.03455	0.84233		0
958	14/04/2021 19:27:06	32.34877	29.00541	32.0063	0.84228		0
959	14/04/2021 19:27:37	32.30532	28.97625	31.97378	0.84217		0
960	14/04/2021 19:28:08	32.26911	28.93968	31.93393	0.84207		0

Comments	Apendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
1025	14/04/2021 20:01:17	29.92838	27.09531	29.57516	0.83659		0
1026	14/04/2021 20:01:47	29.89223	27.07757	29.5427	0.83653		0
1027	14/04/2021 20:02:18	29.87053	27.04851	29.521	0.83645		0
1028	14/04/2021 20:02:49	29.84562	27.03095	29.48504	0.83637		0
1029	14/04/2021 20:03:20	29.81355	26.99888	29.46034	0.83629		0
1030	14/04/2021 20:03:51	29.75958	26.95963	29.4174	0.83622		0
1031	14/04/2021 20:04:21	29.72764	26.93874	29.37811	0.83615		0
1032	14/04/2021 20:04:52	29.71091	26.93304	29.36137	0.83604		0
1033	14/04/2021 20:05:23	29.66851	26.90903	29.32633	0.83604		0
1034	14/04/2021 20:05:53	29.63701	26.88121	29.2838	0.83601		0
1035	14/04/2021 20:06:24	29.61316	26.85737	29.25995	0.8359		0
1036	14/04/2021 20:06:54	29.58222	26.83747	29.23269	0.83584		0
1037	14/04/2021 20:07:25	29.54718	26.80243	29.19397	0.83574		0
1038	14/04/2021 20:07:56	29.51512	26.78508	29.16926	0.83567		0
1039	14/04/2021 20:08:26	29.49754	26.7675	29.14433	0.83563		0
1040	14/04/2021 20:08:57	29.4584	26.73572	29.10886	0.83555		0
1041	14/04/2021 20:09:27	29.43426	26.71526	29.08105	0.83549		0
1042	14/04/2021 20:09:58	29.38834	26.68037	29.0388	0.83544		0
1043	14/04/2021 20:10:29	29.37129	26.66701	29.0144	0.83536		0
1044	14/04/2021 20:11:00	29.33257	26.65036	28.97936	0.83529		0
1045	14/04/2021 20:11:31	29.29344	26.61123	28.93287	0.8352		0
1046	14/04/2021 20:12:01	29.26549	26.60167	28.92331	0.8351		0
1047	14/04/2021 20:12:32	29.22637	26.56255	28.87315	0.83509		0
1048	14/04/2021 20:13:03	29.21639	26.55994	28.86318	0.83499		0
1049	14/04/2021 20:13:33	29.18067	26.52789	28.82745	0.83496		0
1050	14/04/2021 20:14:04	29.15558	26.49912	28.80236	0.83494		0
1051	14/04/2021 20:14:34	29.10897	26.46355	28.75943	0.83484		0
1052	14/04/2021 20:15:05	29.0956	26.44283	28.74239	0.83477		0
1053	14/04/2021 20:15:36	29.06462	26.41921	28.71877	0.83473		0
1054	14/04/2021 20:16:07	29.02608	26.39537	28.67654	0.83463		0
1055	14/04/2021 20:16:38	28.99527	26.37561	28.64205	0.83456		0
1056	14/04/2021 20:17:08	28.96854	26.36728	28.62636	0.83452		0
1057	14/04/2021 20:17:39	28.93761	26.33635	28.59176	0.83442		0
1058	14/04/2021 20:18:10	28.90582	26.32295	28.56364	0.83437		0
1059	14/04/2021 20:18:40	28.89287	26.30264	28.53598	0.83436		0
1060	14/04/2021 20:19:10	28.86138	26.27115	28.50081	0.83424		0
1061	14/04/2021 20:19:41	28.8153	26.23611	28.45841	0.83421		0
1062	14/04/2021 20:20:12	28.79824	26.23377	28.44502	0.83412		0
1063	14/04/2021 20:20:42	28.76335	26.19888	28.41382	0.83407		0
1064	14/04/2021 20:21:13	28.74276	26.17829	28.38219	0.83402		0
1065	14/04/2021 20:21:44	28.71876	26.17268	28.35451	0.83397		0
1066	14/04/2021 20:22:15	28.66917	26.12678	28.31964	0.83391		0
1067	14/04/2021 20:22:46	28.64488	26.09881	28.28799	0.83382		0
1068	14/04/2021 20:23:17	28.60969	26.07097	28.26016	0.83378		0
1069	14/04/2021 20:23:48	28.58925	26.06525	28.23236	0.83374		0
1070	14/04/2021 20:24:18	28.56538	26.05242	28.21585	0.83367		0
1071	14/04/2021 20:24:49	28.54533	26.03236	28.18476	0.8336		0
1072	14/04/2021 20:25:20	28.50337	26.00145	28.14648	0.83354		0
1073	14/04/2021 20:25:51	28.47569	25.9848	28.12615	0.83345		0
1074	14/04/2021 20:26:22	28.44814	25.96093	28.09125	0.83347		0
1075	14/04/2021 20:26:53	28.41748	25.9266	28.06795	0.83338		0
1076	14/04/2021 20:27:24	28.39091	25.91106	28.04137	0.8333		0
1077	14/04/2021 20:27:54	28.35615	25.89838	28.0103	0.83321		0
1078	14/04/2021 20:28:24	28.32517	25.87108	27.97932	0.83324		0
1079	14/04/2021 20:28:55	28.30214	25.85541	27.94157	0.83317		0
1080	14/04/2021 20:29:26	28.28606	25.84668	27.93284	0.83311		0
1081	14/04/2021 20:29:56	28.25811	25.81505	27.89754	0.83302		0
1082	14/04/2021 20:30:26	28.2228	25.79078	27.86959	0.83297		0
1083	14/04/2021 20:30:57	28.20587	25.77753	27.85266	0.83296		0
1084	14/04/2021 20:31:29	28.15274	25.73176	27.79585	0.83289		0
1085	14/04/2021 20:31:59	28.12956	25.71594	27.77634	0.83279		0
1086	14/04/2021 20:32:30	28.12096	25.70366	27.76406	0.83276		0
1087	14/04/2021 20:33:00	28.08689	25.68431	27.73368	0.83273		0
1088	14/04/2021 20:33:31	28.05267	25.65377	27.70314	0.83266		0

Comments	Apendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
1089	14/04/2021 20:34:02	28.03252	25.63361	27.67195	0.83265		0
1090	14/04/2021 20:34:33	28.00918	25.62868	27.65597	0.83253		0
1091	14/04/2021 20:35:03	27.97866	25.60184	27.62177	0.8325		0
1092	14/04/2021 20:35:33	27.96284	25.60073	27.60963	0.83241		0
1093	14/04/2021 20:36:04	27.9319	25.56611	27.56765	0.83235		0
1094	14/04/2021 20:36:35	27.90461	25.55354	27.5514	0.83231		0
1095	14/04/2021 20:37:06	27.86239	25.515	27.50182	0.8323		0
1096	14/04/2021 20:37:37	27.84899	25.50159	27.48106	0.83218		0
1097	14/04/2021 20:38:08	27.81778	25.47406	27.46824	0.83223		0
1098	14/04/2021 20:38:39	27.78261	25.44993	27.43675	0.83217		0
1099	14/04/2021 20:39:09	27.77698	25.43327	27.40905	0.83207		0
1100	14/04/2021 20:39:40	27.74222	25.41691	27.38533	0.83204		0
1101	14/04/2021 20:40:10	27.71906	25.39375	27.35481	0.83189		0
1102	14/04/2021 20:40:41	27.69209	25.37781	27.33887	0.83191		0
1103	14/04/2021 20:41:12	27.67941	25.37617	27.32252	0.83199		0
1104	14/04/2021 20:41:43	27.64778	25.3519	27.29457	0.83181		0
1105	14/04/2021 20:42:13	27.6119	25.32338	27.26237	0.83181		0
1106	14/04/2021 20:42:43	27.57972	25.2912	27.23755	0.83175		0
1107	14/04/2021 20:43:14	27.56638	25.27417	27.20581	0.8317		0
1108	14/04/2021 20:43:44	27.53402	25.2455	27.17713	0.83161		0
1109	14/04/2021 20:44:15	27.53511	25.25762	27.18557	0.83154		0
1110	14/04/2021 20:44:45	27.50022	25.23009	27.15069	0.83155		0
1111	14/04/2021 20:45:16	27.4806	25.21048	27.12371	0.83144		0
1112	14/04/2021 20:45:47	27.46121	25.20581	27.10432	0.83136		0
1113	14/04/2021 20:46:17	27.42701	25.18632	27.08116	0.83136		0
1114	14/04/2021 20:46:48	27.38829	25.1476	27.02772	0.83131		0
1115	14/04/2021 20:47:18	27.36879	25.13546	27.00822	0.83128		0
1116	14/04/2021 20:47:49	27.3425	25.11653	26.98193	0.83125		0
1117	14/04/2021 20:48:19	27.32695	25.10465	26.96638	0.83119		0
1118	14/04/2021 20:48:50	27.28893	25.08135	26.9394	0.83116		0
1119	14/04/2021 20:49:21	27.26615	25.05858	26.91294	0.83111		0
1120	14/04/2021 20:49:51	27.23605	25.03583	26.87916	0.83103		0
1121	14/04/2021 20:50:21	27.22063	25.0204	26.86373	0.83101		0
1122	14/04/2021 20:50:52	27.19024	24.99738	26.84071	0.83094		0
1123	14/04/2021 20:51:22	27.16325	24.9851	26.81371	0.83091		0
1124	14/04/2021 20:51:53	27.13979	24.96165	26.7829	0.83087		0
1125	14/04/2021 20:52:24	27.1087	24.92688	26.74445	0.83081		0
1126	14/04/2021 20:52:55	27.09208	24.92129	26.7315	0.83077		0
1127	14/04/2021 20:53:25	27.07558	24.91584	26.71869	0.83073		0
1128	14/04/2021 20:53:56	27.0483	24.89224	26.69509	0.83065		0
1129	14/04/2021 20:54:27	27.01765	24.86526	26.66076	0.83052		0
1130	14/04/2021 20:54:57	26.99365	24.85597	26.64779	0.83065		0
1131	14/04/2021 20:55:28	26.97689	24.83554	26.61632	0.83057		0
1132	14/04/2021 20:55:58	26.95302	24.80799	26.59245	0.83053		0
1133	14/04/2021 20:56:29	26.9188	24.77745	26.56191	0.83045		0
1134	14/04/2021 20:56:59	26.90244	24.78317	26.54923	0.83044		0
1135	14/04/2021 20:57:30	26.88227	24.76668	26.51802	0.83047		0
1136	14/04/2021 20:58:00	26.86998	24.75806	26.5094	0.83046		0
1137	14/04/2021 20:58:31	26.843	24.73844	26.47507	0.83029		0
1138	14/04/2021 20:59:02	26.82279	24.71823	26.45854	0.83024		0
1139	14/04/2021 20:59:33	26.78832	24.70216	26.44247	0.83019		0
1140	14/04/2021 21:00:03	26.76447	24.67095	26.40022	0.83013		0
1141	14/04/2021 21:00:34	26.74415	24.66535	26.38726	0.8301		0
1142	14/04/2021 21:01:04	26.70572	24.62692	26.34515	0.8301		0
1143	14/04/2021 21:01:35	26.69302	24.62157	26.33613	0.83003		0
1144	14/04/2021 21:02:06	26.67693	24.59812	26.30532	0.83006		0
1145	14/04/2021 21:02:36	26.65035	24.58259	26.29346	0.82996		0
1146	14/04/2021 21:03:07	26.63005	24.56964	26.27316	0.82989		0
1147	14/04/2021 21:03:37	26.62456	24.56783	26.26031	0.82987		0
1148	14/04/2021 21:04:08	26.58243	24.52938	26.22186	0.82984		0
1149	14/04/2021 21:04:39	26.55871	24.51302	26.2055	0.82972		0
1150	14/04/2021 21:05:09	26.54661	24.50092	26.17868	0.82967		0
1151	14/04/2021 21:05:40	26.51888	24.48055	26.15831	0.82971		0
1152	14/04/2021 21:06:10	26.49153	24.46424	26.13096	0.82965		0

Comments	Apendix 3 - 3°C /min heating rate					
UserDefined	Cool-down					
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	V	V
1153	14/04/2021 21:06:41	26.47491	24.46233	26.11801	0.82962	0
1154	14/04/2021 21:07:12	26.45075	24.42345	26.08282	0.82957	0
1155	14/04/2021 21:07:43	26.4236	24.4147	26.05935	0.82951	0
1156	14/04/2021 21:08:14	26.41163	24.39905	26.04738	0.82949	0
1157	14/04/2021 21:08:45	26.38111	24.37957	26.01686	0.8295	0
1158	14/04/2021 21:09:15	26.36134	24.35244	26.00077	0.82942	0
1159	14/04/2021 21:09:46	26.33448	24.34765	25.98126	0.82936	0
1160	14/04/2021 21:10:16	26.33308	24.34258	25.96883	0.82932	0
1161	14/04/2021 21:10:46	26.29452	24.31505	25.93027	0.82915	0
1162	14/04/2021 21:11:17	26.27149	24.29939	25.91828	0.82925	0
1163	14/04/2021 21:11:47	26.24857	24.28751	25.88432	0.82921	0
1164	14/04/2021 21:12:18	26.23603	24.27864	25.87545	0.82918	0
1165	14/04/2021 21:12:48	26.21595	24.26225	25.85906	0.82914	0
1166	14/04/2021 21:13:19	26.19199	24.24196	25.83142	0.8291	0
1167	14/04/2021 21:13:49	26.17521	24.22518	25.8036	0.82908	0
1168	14/04/2021 21:14:20	26.15501	24.21969	25.79443	0.82901	0
1169	14/04/2021 21:14:50	26.12734	24.18467	25.76309	0.82901	0
1170	14/04/2021 21:15:21	26.1069	24.17159	25.74633	0.82897	0
1171	14/04/2021 21:15:52	26.09093	24.1593	25.73035	0.82894	0
1172	14/04/2021 21:16:23	26.06816	24.14389	25.70024	0.82886	0
1173	14/04/2021 21:16:53	26.0521	24.13518	25.6952	0.82883	0
1174	14/04/2021 21:17:24	26.03219	24.11528	25.6569	0.8288	0
1175	14/04/2021 21:17:54	25.99772	24.08817	25.63715	0.82876	0
1176	14/04/2021 21:18:24	25.98158	24.0757	25.62468	0.8287	0
1177	14/04/2021 21:18:55	25.96949	24.06361	25.59788	0.82865	0
1178	14/04/2021 21:19:26	25.94901	24.05049	25.58476	0.82868	0
1179	14/04/2021 21:19:56	25.92884	24.034	25.56827	0.82857	0
1180	14/04/2021 21:20:27	25.89803	24.00687	25.53378	0.8286	0
1181	14/04/2021 21:20:58	25.87826	23.9871	25.51401	0.82855	0
1182	14/04/2021 21:21:28	25.85878	23.97498	25.48717	0.82845	0
1183	14/04/2021 21:21:59	25.8469	23.9631	25.47529	0.82846	0
1184	14/04/2021 21:22:29	25.82035	23.95494	25.46346	0.82842	0
1185	14/04/2021 21:23:00	25.80435	23.94631	25.44378	0.8283	0
1186	14/04/2021 21:23:31	25.77766	23.91962	25.41709	0.82835	0
1187	14/04/2021 21:24:01	25.76168	23.90732	25.39743	0.82828	0
1188	14/04/2021 21:24:31	25.74506	23.89069	25.37713	0.82829	0
1189	14/04/2021 21:25:02	25.72052	23.88088	25.36731	0.82825	0
1190	14/04/2021 21:25:33	25.7006	23.86095	25.34739	0.82822	0
1191	14/04/2021 21:26:03	25.69174	23.85209	25.32381	0.82819	0
1192	14/04/2021 21:26:34	25.67508	23.83175	25.31451	0.82816	0
1193	14/04/2021 21:27:05	25.65477	23.82984	25.29052	0.82809	0
1194	14/04/2021 21:27:36	25.6233	23.79837	25.25905	0.82808	0
1195	14/04/2021 21:28:07	25.61104	23.78978	25.25415	0.82802	0
1196	14/04/2021 21:28:37	25.58431	23.76674	25.22742	0.82798	0
1197	14/04/2021 21:29:08	25.55036	23.75118	25.19715	0.82795	0
1198	14/04/2021 21:29:38	25.5453	23.74981	25.18841	0.82799	0
1199	14/04/2021 21:30:09	25.52596	23.73414	25.16906	0.8279	0
1200	14/04/2021 21:30:40	25.51751	23.72569	25.14958	0.82786	0
1201	14/04/2021 21:31:10	25.49829	23.71015	25.13772	0.82786	0
1202	14/04/2021 21:31:40	25.48985	23.70171	25.12192	0.8278	0
1203	14/04/2021 21:32:11	25.45139	23.67797	25.10186	0.82778	0
1204	14/04/2021 21:32:42	25.44592	23.66514	25.08535	0.82775	0
1205	14/04/2021 21:33:13	25.41526	23.64552	25.05469	0.8277	0
1206	14/04/2021 21:33:44	25.39931	23.63693	25.04978	0.8277	0
1207	14/04/2021 21:34:15	25.39479	23.63241	25.03054	0.82766	0
1208	14/04/2021 21:34:46	25.36865	23.60995	25.00073	0.82758	0
1209	14/04/2021 21:35:16	25.34627	23.59125	24.97466	0.82752	0
1210	14/04/2021 21:35:47	25.32296	23.58633	24.96607	0.82768	0
1211	14/04/2021 21:36:18	25.29939	23.56277	24.93514	0.82761	0
1212	14/04/2021 21:36:49	25.28331	23.55403	24.91905	0.82754	0
1213	14/04/2021 21:37:19	25.25968	23.53409	24.90279	0.82746	0
1214	14/04/2021 21:37:50	25.23146	23.51324	24.87458	0.82741	0
1215	14/04/2021 21:38:20	25.22971	23.50044	24.86546	0.8274	0
1216	14/04/2021 21:38:50	25.21021	23.49198	24.84596	0.82736	0

Comments	Apendix 3 - 3°C /min heating rate					
UserDefined	Cool-down					
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	V	V
1217	14/04/2021 21:39:20	25.18659	23.47203	24.8297	0.82732	0
1218	14/04/2021 21:39:51	25.19286	23.48567	24.83597	0.82727	0
1219	14/04/2021 21:40:22	25.15443	23.44723	24.79018	0.82727	0
1220	14/04/2021 21:40:52	25.1465	23.44666	24.7896	0.82727	0
1221	14/04/2021 21:41:23	25.12388	23.43141	24.76699	0.82723	0
1222	14/04/2021 21:41:53	25.11542	23.43398	24.75485	0.82719	0
1223	14/04/2021 21:42:24	25.08913	23.41137	24.72856	0.82711	0
1224	14/04/2021 21:42:54	25.06231	23.37719	24.70174	0.82711	0
1225	14/04/2021 21:43:25	25.04648	23.3724	24.68591	0.82707	0
1226	14/04/2021 21:43:56	25.0308	23.3604	24.6739	0.82703	0
1227	14/04/2021 21:44:27	25.01497	23.34825	24.6544	0.82701	0
1228	14/04/2021 21:44:58	25.00679	23.34007	24.63886	0.82696	0
1229	14/04/2021 21:45:28	24.98022	23.31718	24.61229	0.82698	0
1230	14/04/2021 21:45:59	24.96521	23.30585	24.60465	0.82694	0
1231	14/04/2021 21:46:29	24.95034	23.29834	24.58609	0.82691	0
1232	14/04/2021 21:47:00	24.93595	23.28762	24.5717	0.82685	0
1233	14/04/2021 21:47:30	24.9208	23.27983	24.55287	0.82686	0
1234	14/04/2021 21:48:01	24.89819	23.26458	24.53762	0.8268	0
1235	14/04/2021 21:48:32	24.8678	23.24155	24.51459	0.82679	0
1236	14/04/2021 21:49:03	24.85918	23.23661	24.50229	0.82677	0
1237	14/04/2021 21:49:34	24.84675	23.22786	24.48986	0.82673	0
1238	14/04/2021 21:50:04	24.83041	23.21152	24.47352	0.82674	0
1239	14/04/2021 21:50:35	24.80697	23.17703	24.44639	0.82664	0
1240	14/04/2021 21:51:06	24.79838	23.17213	24.43413	0.82665	0
1241	14/04/2021 21:51:36	24.77152	23.15263	24.41463	0.82664	0
1242	14/04/2021 21:52:07	24.75599	23.14077	24.39909	0.8266	0
1243	14/04/2021 21:52:37	24.74054	23.13637	24.38365	0.82654	0
1244	14/04/2021 21:53:08	24.72502	23.12453	24.36813	0.82655	0
1245	14/04/2021 21:53:39	24.70949	23.11267	24.34524	0.82649	0
1246	14/04/2021 21:54:10	24.69014	23.10436	24.32957	0.82645	0
1247	14/04/2021 21:54:41	24.67405	23.08827	24.3098	0.82646	0
1248	14/04/2021 21:55:11	24.65796	23.07586	24.29738	0.8264	0
1249	14/04/2021 21:55:42	24.64595	23.06017	24.27802	0.82641	0
1250	14/04/2021 21:56:13	24.63775	23.05565	24.26982	0.82637	0
1251	14/04/2021 21:56:43	24.59987	23.03249	24.24666	0.82632	0
1252	14/04/2021 21:57:14	24.58746	23.02375	24.23056	0.82629	0
1253	14/04/2021 21:57:45	24.57493	23.00755	24.20332	0.82627	0
1254	14/04/2021 21:58:15	24.55937	22.99935	24.1988	0.82627	0
1255	14/04/2021 21:58:46	24.5512	22.99853	24.18695	0.82621	0
1256	14/04/2021 21:59:17	24.53552	22.97918	24.1676	0.82619	0
1257	14/04/2021 21:59:47	24.50855	22.9706	24.14798	0.82621	0
1258	14/04/2021 22:00:18	24.49612	22.96185	24.13555	0.82607	0
1259	14/04/2021 22:00:49	24.48777	22.94614	24.12352	0.82605	0
1260	14/04/2021 22:01:20	24.48329	22.94902	24.11904	0.82606	0
1261	14/04/2021 22:01:51	24.45361	22.91934	24.08936	0.82604	0
1262	14/04/2021 22:02:22	24.44554	22.91127	24.08497	0.82603	0
1263	14/04/2021 22:02:53	24.42972	22.89913	24.05075	0.82598	0
1264	14/04/2021 22:03:24	24.40261	22.88306	24.03468	0.82597	0
1265	14/04/2021 22:03:55	24.39403	22.87816	24.02978	0.82596	0
1266	14/04/2021 22:04:25	24.35981	22.85498	23.9882	0.82594	0
1267	14/04/2021 22:04:56	24.35093	22.85345	23.98668	0.8259	0
1268	14/04/2021 22:05:27	24.33823	22.83707	23.98134	0.82587	0
1269	14/04/2021 22:05:57	24.31808	22.82796	23.96119	0.8259	0
1270	14/04/2021 22:06:27	24.30961	22.81949	23.94536	0.82581	0
1271	14/04/2021 22:06:58	24.29419	22.80775	23.92994	0.82581	0
1272	14/04/2021 22:07:28	24.27825	22.78813	23.90664	0.82582	0
1273	14/04/2021 22:07:58	24.26613	22.78705	23.90555	0.82577	0
1274	14/04/2021 22:08:29	24.25777	22.78606	23.88616	0.82578	0
1275	14/04/2021 22:09:00	24.25274	22.77734	23.88113	0.82574	0
1276	14/04/2021 22:09:31	24.21783	22.73876	23.85358	0.82569	0
1277	14/04/2021 22:10:01	24.20884	22.73344	23.8409	0.82565	0
1278	14/04/2021 22:10:31	24.18579	22.71775	23.83258	0.82566	0
1279	14/04/2021 22:11:02	24.17422	22.71354	23.80997	0.82568	0
1280	14/04/2021 22:11:33	24.15919	22.69851	23.78758	0.8256	0

Comments	Apendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
1281	14/04/2021 22:12:04	24.1411	22.69514	23.77685	0.82556		0
1282	14/04/2021 22:12:34	24.13374	22.6841	23.75846	0.82552		0
1283	14/04/2021 22:13:05	24.11466	22.67238	23.74673	0.82555		0
1284	14/04/2021 22:13:36	24.09897	22.66404	23.73472	0.82544		0
1285	14/04/2021 22:14:07	24.0833	22.64469	23.71905	0.82545		0
1286	14/04/2021 22:14:38	24.07116	22.62887	23.70323	0.8254		0
1287	14/04/2021 22:15:08	24.06299	22.62439	23.69139	0.82539		0
1288	14/04/2021 22:15:39	24.05169	22.61309	23.68008	0.82544		0
1289	14/04/2021 22:16:10	24.02536	22.59412	23.65743	0.82542		0
1290	14/04/2021 22:16:40	24.01027	22.57166	23.63866	0.82535		0
1291	14/04/2021 22:17:11	23.98736	22.56347	23.61943	0.82532		0
1292	14/04/2021 22:17:41	23.97911	22.56258	23.61486	0.8253		0
1293	14/04/2021 22:18:11	23.95938	22.54653	23.60248	0.82528		0
1294	14/04/2021 22:18:42	23.94677	22.54128	23.57516	0.8252		0
1295	14/04/2021 22:19:13	23.92719	22.51801	23.56294	0.82524		0
1296	14/04/2021 22:19:44	23.92967	22.52786	23.56174	0.82523		0
1297	14/04/2021 22:20:14	23.92099	22.52286	23.55306	0.82519		0
1298	14/04/2021 22:20:45	23.90588	22.50407	23.54531	0.82518		0
1299	14/04/2021 22:21:15	23.89065	22.49988	23.52272	0.82518		0
1300	14/04/2021 22:21:45	23.85659	22.48054	23.50338	0.82512		0
1301	14/04/2021 22:22:16	23.85584	22.46874	23.48791	0.82509		0
1302	14/04/2021 22:22:46	23.85165	22.46823	23.4874	0.82511		0
1303	14/04/2021 22:23:17	23.8218	22.44574	23.45755	0.82506		0
1304	14/04/2021 22:23:47	23.8101	22.43772	23.44953	0.82503		0
1305	14/04/2021 22:24:18	23.80523	22.43653	23.44834	0.82505		0
1306	14/04/2021 22:24:48	23.78919	22.42417	23.42862	0.82498		0
1307	14/04/2021 22:25:19	23.76278	22.40879	23.40589	0.82496		0
1308	14/04/2021 22:25:49	23.76897	22.40763	23.39736	0.82497		0
1309	14/04/2021 22:26:19	23.74925	22.38791	23.37396	0.82492		0
1310	14/04/2021 22:26:49	23.72953	22.37554	23.3616	0.8249		0
1311	14/04/2021 22:27:20	23.70311	22.36385	23.34622	0.82487		0
1312	14/04/2021 22:27:51	23.69139	22.34477	23.32714	0.8249		0
1313	14/04/2021 22:28:22	23.67973	22.34415	23.32284	0.82483		0
1314	14/04/2021 22:28:53	23.675	22.32837	23.29971	0.82482		0
1315	14/04/2021 22:29:24	23.65215	22.31656	23.29157	0.82483		0
1316	14/04/2021 22:29:55	23.64071	22.31616	23.27646	0.82475		0
1317	14/04/2021 22:30:25	23.62846	22.30392	23.26421	0.82473		0
1318	14/04/2021 22:30:56	23.63096	22.31009	23.27038	0.82476		0
1319	14/04/2021 22:31:27	23.6148	22.29393	23.25791	0.82473		0
1320	14/04/2021 22:31:58	23.59171	22.27084	23.22746	0.82472		0
1321	14/04/2021 22:32:29	23.58695	22.26608	23.2227	0.82468		0
1322	14/04/2021 22:33:00	23.56723	22.2574	23.20298	0.82464		0
1323	14/04/2021 22:33:30	23.56632	22.24914	23.1984	0.8246		0
1324	14/04/2021 22:34:01	23.54332	22.24453	23.19011	0.82459		0
1325	14/04/2021 22:34:33	23.53545	22.2293	23.17488	0.8246		0
1326	14/04/2021 22:35:03	23.52742	22.22127	23.16317	0.82458		0
1327	14/04/2021 22:35:34	23.50457	22.20945	23.14032	0.82454		0
1328	14/04/2021 22:36:05	23.49296	22.20889	23.13607	0.82452		0
1329	14/04/2021 22:36:36	23.48104	22.19696	23.12046	0.82449		0
1330	14/04/2021 22:37:06	23.45449	22.17777	23.10495	0.82449		0
1331	14/04/2021 22:37:37	23.45683	22.18379	23.09994	0.82445		0
1332	14/04/2021 22:38:07	23.45537	22.16762	23.08377	0.82446		0
1333	14/04/2021 22:38:38	23.42884	22.15213	23.06827	0.82438		0
1334	14/04/2021 22:39:08	23.41362	22.14058	23.04937	0.82445		0
1335	14/04/2021 22:39:39	23.40926	22.13622	23.04501	0.8244		0
1336	14/04/2021 22:40:09	23.40467	22.13163	23.0441	0.82435		0
1337	14/04/2021 22:40:40	23.37458	22.11258	23.00665	0.82438		0
1338	14/04/2021 22:41:11	23.36354	22.09786	22.99929	0.8243		0
1339	14/04/2021 22:41:41	23.35948	22.0938	22.99523	0.82425		0
1340	14/04/2021 22:42:12	23.35157	22.10429	22.991	0.8243		0
1341	14/04/2021 22:42:43	23.32529	22.08537	22.97576	0.82423		0
1342	14/04/2021 22:43:14	23.29901	22.06276	22.95315	0.82426		0
1343	14/04/2021 22:43:45	23.31648	22.06552	22.94855	0.82421		0
1344	14/04/2021 22:44:16	23.29061	22.05069	22.92636	0.82417		0

Comments	Apendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
1345	14/04/2021 22:44:47	23.28627	22.05002	22.9257	0.82421		0
1346	14/04/2021 22:45:17	23.27078	22.04189	22.91021	0.82421		0
1347	14/04/2021 22:45:48	23.26999	22.03742	22.91309	0.82417		0
1348	14/04/2021 22:46:18	23.25095	22.01838	22.89405	0.82412		0
1349	14/04/2021 22:46:48	23.24302	22.01782	22.88613	0.82411		0
1350	14/04/2021 22:47:19	23.23121	22.00232	22.86696	0.82409		0
1351	14/04/2021 22:47:49	23.20834	21.99049	22.85145	0.82407		0
1352	14/04/2021 22:48:20	23.20715	21.98562	22.83554	0.82407		0
1353	14/04/2021 22:48:50	23.19496	21.98447	22.82703	0.82402		0
1354	14/04/2021 22:49:21	23.17941	21.9726	22.81516	0.82404		0
1355	14/04/2021 22:49:52	23.16351	21.96037	22.80293	0.824		0
1356	14/04/2021 22:50:22	23.14118	21.93437	22.78061	0.82396		0
1357	14/04/2021 22:50:52	23.15143	21.94462	22.78718	0.82393		0
1358	14/04/2021 22:51:23	23.13211	21.92898	22.7605	0.82392		0
1359	14/04/2021 22:51:54	23.11294	21.91349	22.74501	0.82392		0
1360	14/04/2021 22:52:25	23.09756	21.91282	22.73698	0.82391		0
1361	14/04/2021 22:52:56	23.08624	21.89414	22.71831	0.82388		0
1362	14/04/2021 22:53:27	23.05931	21.87826	22.7061	0.82389		0
1363	14/04/2021 22:53:58	23.06984	21.88511	22.70559	0.82384		0
1364	14/04/2021 22:54:28	23.05803	21.88065	22.6901	0.82382		0
1365	14/04/2021 22:54:59	23.04237	21.87603	22.6818	0.82384		0
1366	14/04/2021 22:55:30	23.03421	21.86052	22.67732	0.82378		0
1367	14/04/2021 22:56:01	23.02606	21.85605	22.65445	0.82377		0
1368	14/04/2021 22:56:32	22.99887	21.83989	22.64198	0.82376		0
1369	14/04/2021 22:57:03	23.00451	21.83818	22.64394	0.8237		0
1370	14/04/2021 22:57:34	22.98836	21.82938	22.62779	0.8237		0
1371	14/04/2021 22:58:05	22.96534	21.79532	22.60109	0.82369		0
1372	14/04/2021 22:58:35	22.9643	21.79796	22.60005	0.82372		0
1373	14/04/2021 22:59:06	22.97455	21.80453	22.61029	0.82364		0
1374	14/04/2021 22:59:36	22.94485	21.78955	22.5806	0.82363		0
1375	14/04/2021 23:00:07	22.95207	21.79677	22.58046	0.82365		0
1376	14/04/2021 23:00:37	22.92581	21.77787	22.56156	0.82359		0
1377	14/04/2021 23:01:08	22.91054	21.77364	22.54629	0.82362		0
1378	14/04/2021 23:01:39	22.90228	21.76538	22.54539	0.82357		0
1379	14/04/2021 23:02:10	22.89397	21.75339	22.52972	0.82358		0
1380	14/04/2021 23:02:40	22.88137	21.74079	22.52448	0.82353		0
1381	14/04/2021 23:03:10	22.87295	21.73973	22.51606	0.82353		0
1382	14/04/2021 23:03:41	22.86114	21.72056	22.50425	0.8235		0
1383	14/04/2021 23:04:12	22.84642	21.7132	22.48953	0.8235		0
1384	14/04/2021 23:04:43	22.84669	21.69875	22.4714	0.82349		0
1385	14/04/2021 23:05:13	22.81331	21.68376	22.44906	0.82348		0
1386	14/04/2021 23:05:44	22.81659	21.70544	22.45602	0.82343		0
1387	14/04/2021 23:06:15	22.80501	21.69018	22.44812	0.82343		0
1388	14/04/2021 23:06:46	22.80042	21.68192	22.43249	0.82342		0
1389	14/04/2021 23:07:16	22.7702	21.66272	22.40962	0.82339		0
1390	14/04/2021 23:07:47	22.76587	21.66209	22.40162	0.8234		0
1391	14/04/2021 23:08:18	22.74272	21.64997	22.37479	0.82338		0
1392	14/04/2021 23:08:49	22.74551	21.6454	22.37758	0.82336		0
1393	14/04/2021 23:09:19	22.72276	21.63001	22.36219	0.82334		0
1394	14/04/2021 23:09:50	22.72287	21.6338	22.35494	0.82328		0
1395	14/04/2021 23:10:20	22.70778	21.61135	22.33617	0.82334		0
1396	14/04/2021 23:10:50	22.715	21.61489	22.35443	0.82332		0
1397	14/04/2021 23:11:21	22.69319	21.6078	22.32158	0.82327		0
1398	14/04/2021 23:11:52	22.68583	21.59676	22.31054	0.82326		0
1399	14/04/2021 23:12:23	22.67821	21.60017	22.31028	0.82325		0
1400	14/04/2021 23:12:54	22.65627	21.57823	22.29202	0.8232		0
1401	14/04/2021 23:13:25	22.65627	21.57823	22.28466	0.82322		0
1402	14/04/2021 23:13:56	22.64115	21.57415	22.27322	0.82317		0
1403	14/04/2021 23:14:26	22.63341	21.56642	22.26548	0.82317		0
1404	14/04/2021 23:14:57	22.62498	21.55798	22.25337	0.82317		0
1405	14/04/2021 23:15:28	22.62828	21.55761	22.26035	0.82313		0
1406	14/04/2021 23:15:59	22.60989	21.54657	22.23828	0.82316		0
1407	14/04/2021 23:16:30	22.59832	21.53132	22.23039	0.82312		0
1408	14/04/2021 23:17:00	22.59766	21.53066	22.22237	0.82311		0

Comments	Apendix 3 - 3°C /min heating rate						
UserDefined	Cool-down						
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag	
Units		°C	°C	°C	V	V	
1409	14/04/2021 23:17:31	22.57122	21.51526	22.20697	0.82312		0
1410	14/04/2021 23:18:02	22.57439	21.51843	22.20646	0.82306		0
1411	14/04/2021 23:18:33	22.55535	21.50675	22.19478	0.82304		0
1412	14/04/2021 23:19:03	22.54379	21.49519	22.17954	0.82298		0
1413	14/04/2021 23:19:33	22.54313	21.4982	22.17152	0.823		0
1414	14/04/2021 23:20:04	22.53879	21.49754	22.17454	0.82299		0
1415	14/04/2021 23:20:35	22.51618	21.47494	22.15561	0.823		0
1416	14/04/2021 23:21:05	22.51237	21.47113	22.14812	0.82297		0
1417	14/04/2021 23:21:36	22.49384	21.45996	22.12959	0.82297		0
1418	14/04/2021 23:22:07	22.5045	21.47062	22.13289	0.82296		0
1419	14/04/2021 23:22:37	22.48584	21.45564	22.11791	0.8229		0
1420	14/04/2021 23:23:08	22.48174	21.44786	22.11749	0.82293		0
1421	14/04/2021 23:23:39	22.46703	21.4405	22.10278	0.82295		0
1422	14/04/2021 23:24:10	22.44524	21.42239	22.07731	0.82291		0
1423	14/04/2021 23:24:41	22.44455	21.42539	22.06927	0.82288		0
1424	14/04/2021 23:25:12	22.43625	21.41709	22.06096	0.82287		0
1425	14/04/2021 23:25:43	22.4167	21.39754	22.04877	0.82282		0
1426	14/04/2021 23:26:14	22.41552	21.40739	22.05494	0.82283		0
1427	14/04/2021 23:26:45	22.4075	21.39569	22.03956	0.8228		0
1428	14/04/2021 23:27:16	22.39623	21.38074	22.03566	0.82279		0
1429	14/04/2021 23:27:47	22.39172	21.37623	22.02747	0.82277		0
1430	14/04/2021 23:28:17	22.37295	21.35746	22.0087	0.82274		0
1431	14/04/2021 23:28:48	22.36166	21.34986	21.99741	0.82277		0
1432	14/04/2021 23:29:19	22.36545	21.35733	21.99017	0.82278		0
1433	14/04/2021 23:29:50	22.34706	21.34997	21.97545	0.82276		0
1434	14/04/2021 23:30:21	22.33877	21.33801	21.96717	0.82271		0
1435	14/04/2021 23:30:52	22.32679	21.3297	21.9515	0.82272		0
1436	14/04/2021 23:31:23	22.32223	21.33249	21.95062	0.82269		0
1437	14/04/2021 23:31:54	22.30289	21.31683	21.93863	0.82269		0
1438	14/04/2021 23:32:24	22.29449	21.31212	21.92656	0.82262		0
1439	14/04/2021 23:32:55	22.29013	21.30776	21.92588	0.82266		0
1440	14/04/2021 23:33:26	22.28607	21.29634	21.91078	0.82265		0
1441	14/04/2021 23:33:56	22.27054	21.28449	21.89893	0.82263		0
1442	14/04/2021 23:34:27	22.26256	21.28019	21.89095	0.82259		0
1443	14/04/2021 23:34:58	22.25505	21.28004	21.87976	0.82255		0
1444	14/04/2021 23:35:28	22.24401	21.26164	21.86136	0.82259		0
1445	14/04/2021 23:35:59	22.22945	21.25811	21.85784	0.82262		0
1446	14/04/2021 23:36:30	22.22956	21.2619	21.86531	0.82253		0
1447	14/04/2021 23:37:01	22.21814	21.25417	21.85022	0.82251		0
1448	14/04/2021 23:37:32	22.20973	21.24943	21.83812	0.8225		0
1449	14/04/2021 23:38:02	22.20471	21.24441	21.83678	0.82251		0
1450	14/04/2021 23:38:32	22.1962	21.2359	21.83195	0.82252		0
1451	14/04/2021 23:39:03	22.17621	21.2196	21.80828	0.8225		0
1452	14/04/2021 23:39:34	22.18551	21.22522	21.81759	0.8225		0
1453	14/04/2021 23:40:05	22.15874	21.2058	21.79081	0.82246		0
1454	14/04/2021 23:40:36	22.15401	21.19739	21.78975	0.82243		0
1455	14/04/2021 23:41:06	22.15334	21.20041	21.78909	0.82242		0
1456	14/04/2021 23:41:36	22.14929	21.18899	21.78504	0.82246		0
1457	14/04/2021 23:42:07	22.12312	21.18121	21.75518	0.82244		0
1458	14/04/2021 23:42:37	22.11155	21.16597	21.75098	0.82241		0
1459	14/04/2021 23:43:08	22.10774	21.16216	21.74348	0.82237		0
1460	14/04/2021 23:43:39	22.10026	21.16204	21.73233	0.82236		0
1461	14/04/2021 23:44:09	22.0854	21.15453	21.7285	0.82231		0
1462	14/04/2021 23:44:40	22.07698	21.13876	21.70537	0.82235		0
1463	14/04/2021 23:45:11	22.08341	21.15623	21.72652	0.82234		0
1464	14/04/2021 23:45:42	22.06832	21.14482	21.70407	0.82232		0
1465	14/04/2021 23:46:13	22.04873	21.11787	21.6808	0.8223		0
1466	14/04/2021 23:46:44	22.0477	21.11683	21.67976	0.8223		0
1467	14/04/2021 23:47:15	22.04362	21.11643	21.67201	0.82229		0
1468	14/04/2021 23:47:46	22.04007	21.11289	21.67214	0.82227		0
1469	14/04/2021 23:48:17	22.02824	21.10473	21.66031	0.8222		0
1470	14/04/2021 23:48:48	22.0239	21.10407	21.65597	0.82224		0
1471	14/04/2021 23:49:18	22.0193	21.09947	21.64769	0.8222		0
1472	14/04/2021 23:49:48	22.0038	21.10238	21.63955	0.82226		0

Comments	Appendix 3 - 3°C /min heating rate					
UserDefined	Cool-down					
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	V	V
1473	14/04/2021 23:50:19	21.99603	21.0762	21.62074	0.82217	0
1474	14/04/2021 23:50:50	21.98788	21.07541	21.61259	0.82219	0
1475	14/04/2021 23:51:21	21.97591	21.06713	21.61166	0.82221	0
1476	14/04/2021 23:51:52	21.97186	21.05571	21.60393	0.82217	0
1477	14/04/2021 23:52:23	21.9562	21.05109	21.58827	0.82215	0
1478	14/04/2021 23:52:54	21.95557	21.04311	21.58764	0.82212	0
1479	14/04/2021 23:53:25	21.95174	21.04295	21.58381	0.82212	0
1480	14/04/2021 23:53:55	21.9335	21.02839	21.57661	0.82211	0
1481	14/04/2021 23:54:26	21.94044	21.03533	21.57619	0.82211	0
1482	14/04/2021 23:54:56	21.92506	21.02731	21.55345	0.82209	0
1483	14/04/2021 23:55:26	21.90234	21.00459	21.53441	0.82207	0
1484	14/04/2021 23:55:57	21.90902	21.01863	21.54109	0.82204	0
1485	14/04/2021 23:56:28	21.89759	21.01456	21.52966	0.82206	0
1486	14/04/2021 23:56:59	21.89314	21.00275	21.52152	0.82209	0
1487	14/04/2021 23:57:30	21.87802	20.98763	21.51377	0.822	0
1488	14/04/2021 23:58:01	21.87317	20.98278	21.50892	0.82206	0
1489	14/04/2021 23:58:32	21.8579	20.97487	21.49733	0.82202	0
1490	14/04/2021 23:59:03	21.84636	20.96333	21.48211	0.82199	0
1491	14/04/2021 23:59:34	21.85372	20.97068	21.48211	0.82203	0
1492	15/04/2021 00:00:04	21.839	20.95597	21.47475	0.82195	0
1493	15/04/2021 00:00:35	21.82428	20.95965	21.45267	0.82199	0
1494	15/04/2021 00:01:06	21.82413	20.95214	21.45252	0.82195	0
1495	15/04/2021 00:01:37	21.80891	20.94795	21.44833	0.82198	0
1496	15/04/2021 00:02:08	21.82651	20.96923	21.45122	0.82192	0
1497	15/04/2021 00:02:39	21.79613	20.93149	21.42084	0.82195	0
1498	15/04/2021 00:03:10	21.78737	20.92642	21.41945	0.82186	0
1499	15/04/2021 00:03:41	21.78565	20.9247	21.41772	0.82187	0
1500	15/04/2021 00:04:12	21.76986	20.90155	21.40193	0.82193	0
1501	15/04/2021 00:04:43	21.7655	20.88983	21.39021	0.8219	0
1502	15/04/2021 00:05:13	21.75777	20.90417	21.39352	0.82186	0
1503	15/04/2021 00:05:44	21.75408	20.90417	21.40087	0.82186	0
1504	15/04/2021 00:06:15	21.7571	20.89983	21.38917	0.82185	0
1505	15/04/2021 00:06:46	21.74884	20.89156	21.37355	0.82181	0
1506	15/04/2021 00:07:17	21.74071	20.89447	21.3691	0.82178	0
1507	15/04/2021 00:07:48	21.72504	20.88616	21.36815	0.82185	0
1508	15/04/2021 00:08:19	21.72018	20.88129	21.34856	0.82177	0
1509	15/04/2021 00:08:50	21.71191	20.87671	21.34398	0.82179	0
1510	15/04/2021 00:09:21	21.70757	20.86501	21.33964	0.82177	0
1511	15/04/2021 00:09:51	21.71413	20.8679	21.34253	0.82184	0
1512	15/04/2021 00:10:22	21.70991	20.86367	21.3383	0.82178	0
1513	15/04/2021 00:10:53	21.68745	20.84857	21.3232	0.82171	0
1514	15/04/2021 00:11:24	21.67996	20.84477	21.31939	0.82175	0
1515	15/04/2021 00:11:55	21.66855	20.83703	21.3043	0.82171	0
1516	15/04/2021 00:12:25	21.66815	20.83663	21.3039	0.8217	0
1517	15/04/2021 00:12:56	21.65657	20.82872	21.28496	0.82171	0
1518	15/04/2021 00:13:26	21.66368	20.82848	21.29207	0.82169	0
1519	15/04/2021 00:13:57	21.64094	20.81678	21.27301	0.82171	0
1520	15/04/2021 00:14:28	21.63252	20.8194	21.27563	0.8217	0
1521	15/04/2021 00:14:58	21.62071	20.80023	21.25278	0.82162	0
1522	15/04/2021 00:16:23	21.60811	20.78027	21.24018	0.82166	0
1523	15/04/2021 00:17:28	21.59994	20.77946	21.23569	0.82163	0
1524	15/04/2021 00:17:59	21.58509	20.77196	21.21348	0.82162	0
1525	15/04/2021 00:18:30	21.57405	20.76829	21.20244	0.8216	0
1526	15/04/2021 00:19:01	21.5809	20.76778	21.20193	0.82156	0
1527	15/04/2021 00:19:32	21.55433	20.74121	21.18272	0.82161	0
1528	15/04/2021 00:20:03	21.55722	20.75881	21.18929	0.82153	0
1529	15/04/2021 00:20:34	21.54565	20.73989	21.17772	0.82155	0
1530	15/04/2021 00:21:05	21.53779	20.73202	21.1625	0.82152	0
1531	15/04/2021 00:21:36	21.53305	20.73832	21.16512	0.82154	0
1532	15/04/2021 00:22:07	21.52452	20.71139	21.14555	0.82149	0
1533	15/04/2021 00:22:38	21.50123	20.71018	21.14066	0.8215	0
1534	15/04/2021 00:23:09	21.5044	20.70967	21.13279	0.82154	0
1535	15/04/2021 00:23:39	21.49284	20.69443	21.13226	0.82151	0
1536	15/04/2021 00:24:10	21.49246	20.69405	21.12821	0.82147	0

Comments	Apendix 3 - 3°C /min heating rate					
UserDefined	Cool-down					
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	V	V
1537	15/04/2021 00:24:41	21.49625	20.70152	21.12832	0.82146	0
1538	15/04/2021 00:25:11	21.48114	20.70113	21.12057	0.82143	0
1539	15/04/2021 00:25:42	21.46944	20.68575	21.10151	0.82147	0
1540	15/04/2021 00:26:13	21.46483	20.68482	21.10058	0.82143	0
1541	15/04/2021 00:26:44	21.46747	20.6801	21.09587	0.82142	0
1542	15/04/2021 00:27:15	21.46613	20.68244	21.10188	0.82139	0
1543	15/04/2021 00:27:46	21.44685	20.6742	21.08628	0.82149	0
1544	15/04/2021 00:28:17	21.44249	20.66248	21.07456	0.82143	0
1545	15/04/2021 00:28:48	21.43068	20.65067	21.06643	0.82138	0
1546	15/04/2021 00:29:19	21.44485	20.66851	21.07692	0.82137	0
1547	15/04/2021 00:29:50	21.41501	20.635	21.05813	0.82137	0
1548	15/04/2021 00:30:21	21.42988	20.65355	21.06195	0.82135	0
1549	15/04/2021 00:30:52	21.42922	20.66025	21.06129	0.82136	0
1550	15/04/2021 00:31:23	21.41383	20.64485	21.04958	0.82132	0
1551	15/04/2021 00:31:54	21.39516	20.62619	21.03091	0.82137	0
1552	15/04/2021 00:32:24	21.39124	20.62963	21.03067	0.82121	0
1553	15/04/2021 00:32:55	21.39371	20.6321	21.02946	0.82126	0
1554	15/04/2021 00:33:26	21.37822	20.62396	21.01029	0.8213	0
1555	15/04/2021 00:33:57	21.37375	20.61581	21.01318	0.82132	0
1556	15/04/2021 00:34:28	21.35775	20.60349	20.98246	0.82131	0
1557	15/04/2021 00:34:59	21.35286	20.5986	20.97757	0.82132	0
1558	15/04/2021 00:35:29	21.3414	20.59451	20.97348	0.82129	0
1559	15/04/2021 00:36:00	21.3414	20.59083	20.97715	0.82124	0
1560	15/04/2021 00:36:30	21.34157	20.60203	20.97732	0.82124	0
1561	15/04/2021 00:37:01	21.34171	20.59481	20.97378	0.82125	0
1562	15/04/2021 00:37:32	21.33814	20.59124	20.97021	0.82123	0
1563	15/04/2021 00:38:03	21.31974	20.57285	20.95917	0.82125	0
1564	15/04/2021 00:38:34	21.30897	20.56207	20.93	0.82126	0
1565	15/04/2021 00:39:05	21.31595	20.57641	20.94434	0.82121	0
1566	15/04/2021 00:39:36	21.30093	20.55771	20.93668	0.82118	0
1567	15/04/2021 00:40:06	21.28952	20.55734	20.92159	0.82121	0
1568	15/04/2021 00:40:37	21.28191	20.54973	20.9103	0.8212	0
1569	15/04/2021 00:41:08	21.27429	20.53843	20.89164	0.82118	0
1570	15/04/2021 00:41:39	21.27784	20.54933	20.9099	0.82113	0
1571	15/04/2021 00:42:10	21.2484	20.5199	20.88047	0.82119	0
1572	15/04/2021 00:42:41	21.25957	20.52739	20.89532	0.82115	0
1573	15/04/2021 00:43:12	21.25984	20.52398	20.88823	0.82112	0
1574	15/04/2021 00:43:43	21.24497	20.51647	20.87704	0.8211	0
1575	15/04/2021 00:44:14	21.24797	20.51947	20.87636	0.82112	0
1576	15/04/2021 00:44:44	21.2401	20.51896	20.87217	0.82111	0
1577	15/04/2021 00:45:14	21.2321	20.51464	20.86049	0.82114	0
1578	15/04/2021 00:45:45	21.22434	20.50688	20.85641	0.82111	0
1579	15/04/2021 00:46:16	21.22842	20.50728	20.85313	0.82111	0
1580	15/04/2021 00:46:46	21.225	20.4965	20.83868	0.8211	0
1581	15/04/2021 00:47:17	21.21017	20.48535	20.83489	0.82106	0
1582	15/04/2021 00:47:48	21.20623	20.48509	20.83462	0.82106	0
1583	15/04/2021 00:48:19	21.2137	20.49992	20.84209	0.82106	0
1584	15/04/2021 00:48:49	21.1983	20.48452	20.83037	0.82102	0
1585	15/04/2021 00:49:20	21.18676	20.47665	20.81515	0.82105	0
1586	15/04/2021 00:49:51	21.17546	20.48375	20.8112	0.82101	0
1587	15/04/2021 00:50:21	21.18611	20.48337	20.81451	0.82101	0
1588	15/04/2021 00:50:52	21.17085	20.4681	20.79924	0.82101	0
1589	15/04/2021 00:51:23	21.16296	20.45654	20.79503	0.82104	0
1590	15/04/2021 00:51:54	21.15877	20.45971	20.78717	0.82099	0
1591	15/04/2021 00:52:25	21.15047	20.44037	20.77518	0.82102	0
1592	15/04/2021 00:52:55	21.15036	20.45497	20.77875	0.82099	0
1593	15/04/2021 00:53:26	21.14679	20.45141	20.76782	0.82094	0
1594	15/04/2021 00:53:57	21.14694	20.4442	20.76798	0.82096	0
1595	15/04/2021 00:54:28	21.13907	20.44737	20.77114	0.82092	0
1596	15/04/2021 00:54:58	21.13524	20.43986	20.76364	0.82095	0
1597	15/04/2021 00:55:29	21.13117	20.43578	20.74852	0.82093	0
1598	15/04/2021 00:55:59	21.10858	20.41687	20.72593	0.82093	0
1599	15/04/2021 00:56:30	21.112	20.41293	20.72935	0.82091	0
1600	15/04/2021 00:57:01	21.1003	20.41227	20.72133	0.82092	0

Comments	Appendix 3 - 3°C /min heating rate					
UserDefined	Cool-down					
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	V	V
1601	15/04/2021 00:57:32	21.09241	20.40806	20.71712	0.82091	0
1602	15/04/2021 00:58:03	21.09977	20.41174	20.71712	0.8209	0
1603	15/04/2021 00:58:34	21.08452	20.40018	20.71292	0.82091	0
1604	15/04/2021 00:59:05	21.09492	20.41425	20.71227	0.82088	0
1605	15/04/2021 00:59:36	21.09043	20.40608	20.71882	0.82087	0
1606	15/04/2021 01:00:07	21.06784	20.37981	20.69623	0.82087	0
1607	15/04/2021 01:00:38	21.0636	20.38292	20.68831	0.82086	0
1608	15/04/2021 01:01:09	21.06665	20.37862	20.69136	0.82086	0
1609	15/04/2021 01:01:39	21.05494	20.38162	20.68333	0.82085	0
1610	15/04/2021 01:02:10	21.05088	20.37021	20.67927	0.82082	0
1611	15/04/2021 01:02:40	21.05075	20.37376	20.67914	0.8208	0
1612	15/04/2021 01:03:11	21.04312	20.36981	20.67151	0.82081	0
1613	15/04/2021 01:03:42	21.0284	20.36613	20.66415	0.82081	0
1614	15/04/2021 01:04:12	21.04667	20.38072	20.67506	0.82079	0
1615	15/04/2021 01:04:43	21.02435	20.36207	20.65274	0.8208	0
1616	15/04/2021 01:05:13	21.02803	20.36575	20.6601	0.8208	0
1617	15/04/2021 01:05:44	21.02395	20.358	20.65234	0.82078	0
1618	15/04/2021 01:06:15	21.01986	20.34654	20.64089	0.82073	0
1619	15/04/2021 01:06:46	21.01605	20.34273	20.63708	0.82074	0
1620	15/04/2021 01:07:17	21.0125	20.34654	20.64089	0.82075	0
1621	15/04/2021 01:07:48	20.99056	20.32828	20.6263	0.82075	0
1622	15/04/2021 01:08:18	20.99016	20.33524	20.61487	0.82076	0
1623	15/04/2021 01:08:49	20.98554	20.32694	20.61392	0.82069	0
1624	15/04/2021 01:09:19	20.97412	20.31184	20.59883	0.8207	0
1625	15/04/2021 01:09:50	20.97335	20.31843	20.60542	0.82069	0
1626	15/04/2021 01:10:20	20.98017	20.32526	20.61592	0.82071	0
1627	15/04/2021 01:10:51	20.961	20.30241	20.58572	0.82071	0
1628	15/04/2021 01:11:22	20.96006	20.30147	20.58845	0.82069	0
1629	15/04/2021 01:11:53	20.94457	20.28597	20.5656	0.82068	0
1630	15/04/2021 01:12:24	20.94008	20.28516	20.57583	0.82066	0
1631	15/04/2021 01:12:54	20.93576	20.28452	20.56047	0.82065	0
1632	15/04/2021 01:13:25	20.92104	20.2698	20.55311	0.82068	0
1633	15/04/2021 01:13:55	20.92445	20.2769	20.54916	0.82062	0
1634	15/04/2021 01:14:26	20.90974	20.26586	20.54916	0.82066	0
1635	15/04/2021 01:14:57	20.9209	20.26599	20.54194	0.8206	0
1636	15/04/2021 01:15:27	20.92119	20.27731	20.5459	0.82063	0
1637	15/04/2021 01:15:58	20.89502	20.26218	20.52709	0.82065	0
1638	15/04/2021 01:16:29	20.89068	20.25416	20.51539	0.82059	0
1639	15/04/2021 01:16:59	20.89015	20.25363	20.52222	0.82064	0
1640	15/04/2021 01:17:29	20.897	20.2568	20.52171	0.8206	0
1641	15/04/2021 01:18:00	20.88953	20.25301	20.51056	0.82059	0
1642	15/04/2021 01:18:30	20.8887	20.24482	20.50605	0.82059	0
1643	15/04/2021 01:19:01	20.88819	20.24799	20.51658	0.82054	0
1644	15/04/2021 01:19:32	20.87703	20.24051	20.5091	0.82056	0
1645	15/04/2021 01:20:03	20.87373	20.24089	20.5058	0.82056	0
1646	15/04/2021 01:20:33	20.87347	20.24431	20.50922	0.82056	0
1647	15/04/2021 01:21:04	20.85465	20.23285	20.48673	0.82056	0
1648	15/04/2021 01:21:35	20.86188	20.24008	20.49395	0.82058	0
1649	15/04/2021 01:22:06	20.84692	20.21776	20.46795	0.82056	0
1650	15/04/2021 01:22:36	20.84258	20.22078	20.45993	0.82055	0
1651	15/04/2021 01:23:06	20.84207	20.21291	20.4631	0.82053	0
1652	15/04/2021 01:23:37	20.8339	20.2121	20.45861	0.82053	0
1653	15/04/2021 01:24:07	20.83311	20.21131	20.45782	0.82053	0
1654	15/04/2021 01:24:38	20.83311	20.20762	20.45414	0.82051	0
1655	15/04/2021 01:25:08	20.83286	20.21106	20.45389	0.82051	0
1656	15/04/2021 01:25:38	20.83271	20.20355	20.45742	0.82047	0
1657	15/04/2021 01:26:09	20.81826	20.19646	20.43929	0.82048	0
1658	15/04/2021 01:26:39	20.82892	20.21079	20.45363	0.8205	0
1659	15/04/2021 01:27:09	20.8138	20.19936	20.44587	0.82046	0
1660	15/04/2021 01:27:40	20.80277	20.192	20.43116	0.82046	0
1661	15/04/2021 01:28:11	20.79162	20.18453	20.42368	0.82043	0
1662	15/04/2021 01:28:42	20.79135	20.18059	20.42342	0.82044	0
1663	15/04/2021 01:29:12	20.78358	20.18017	20.423	0.82042	0
1664	15/04/2021 01:29:43	20.78699	20.17991	20.41538	0.82047	0

Comments	Apendix 3 - 3°C /min heating rate					
UserDefined	Cool-down					
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	V	V
1665	15/04/2021 01:30:14	20.78292	20.18687	20.4113	0.8204	0
1666	15/04/2021 01:30:45	20.78673	20.18332	20.41512	0.82044	0
1667	15/04/2021 01:31:16	20.78265	20.18292	20.40736	0.82042	0
1668	15/04/2021 01:31:47	20.78265	20.17925	20.40736	0.82039	0
1669	15/04/2021 01:32:18	20.76073	20.14996	20.37808	0.8204	0
1670	15/04/2021 01:32:49	20.76073	20.16836	20.3928	0.82043	0
1671	15/04/2021 01:33:20	20.74912	20.15675	20.38487	0.82042	0
1672	15/04/2021 01:33:50	20.76741	20.17136	20.38844	0.8204	0
1673	15/04/2021 01:34:21	20.74533	20.15296	20.37372	0.82033	0
1674	15/04/2021 01:34:51	20.74533	20.1456	20.3774	0.82038	0
1675	15/04/2021 01:35:22	20.72286	20.14153	20.35861	0.82033	0
1676	15/04/2021 01:35:53	20.72969	20.15204	20.35808	0.82036	0
1677	15/04/2021 01:36:24	20.72878	20.13641	20.36085	0.82033	0
1678	15/04/2021 01:36:54	20.71719	20.11747	20.33455	0.82035	0
1679	15/04/2021 01:37:25	20.71301	20.11328	20.33772	0.82036	0
1680	15/04/2021 01:37:55	20.70904	20.12035	20.34479	0.82035	0
1681	15/04/2021 01:38:26	20.70168	20.10564	20.33007	0.82036	0
1682	15/04/2021 01:38:57	20.71247	20.11643	20.33719	0.82034	0
1683	15/04/2021 01:39:27	20.70432	20.11564	20.32904	0.8203	0
1684	15/04/2021 01:39:57	20.7038	20.11143	20.33219	0.82027	0
1685	15/04/2021 01:40:28	20.69946	20.11077	20.32785	0.82027	0
1686	15/04/2021 01:40:58	20.68817	20.10316	20.31656	0.82029	0
1687	15/04/2021 01:41:29	20.68462	20.11801	20.31669	0.82025	0
1688	15/04/2021 01:42:00	20.68055	20.1029	20.2979	0.82029	0
1689	15/04/2021 01:42:31	20.66543	20.08411	20.2975	0.82028	0
1690	15/04/2021 01:43:01	20.66883	20.0875	20.29354	0.82027	0
1691	15/04/2021 01:43:32	20.66845	20.0908	20.29317	0.82027	0
1692	15/04/2021 01:44:02	20.66426	20.08293	20.28162	0.82025	0
1693	15/04/2021 01:44:32	20.65241	20.07844	20.28081	0.82022	0
1694	15/04/2021 01:45:03	20.64822	20.07793	20.28029	0.82025	0
1695	15/04/2021 01:45:34	20.64426	20.07029	20.26897	0.82018	0
1696	15/04/2021 01:46:05	20.64715	20.08054	20.27554	0.82018	0
1697	15/04/2021 01:46:35	20.64269	20.07976	20.26741	0.8202	0
1698	15/04/2021 01:47:06	20.64547	20.06782	20.27018	0.82021	0
1699	15/04/2021 01:47:37	20.63771	20.06374	20.2661	0.8202	0
1700	15/04/2021 01:48:07	20.6302	20.06359	20.24756	0.8202	0
1701	15/04/2021 01:48:38	20.62652	20.05623	20.24388	0.82017	0
1702	15/04/2021 01:49:08	20.64464	20.07802	20.25831	0.82016	0
1703	15/04/2021 01:49:39	20.6365	20.07357	20.26121	0.82017	0
1704	15/04/2021 01:50:09	20.61771	20.0511	20.23138	0.82017	0
1705	15/04/2021 01:50:40	20.60641	20.0398	20.23848	0.82019	0
1706	15/04/2021 01:51:11	20.61009	20.04347	20.23848	0.82017	0
1707	15/04/2021 01:51:41	20.59852	20.04663	20.23059	0.82014	0
1708	15/04/2021 01:52:12	20.59882	20.03589	20.22354	0.82018	0
1709	15/04/2021 01:52:42	20.5879	20.02496	20.20893	0.82014	0
1710	15/04/2021 01:53:13	20.58737	20.02812	20.21208	0.82016	0
1711	15/04/2021 01:53:43	20.5758	20.02391	20.19684	0.82015	0
1712	15/04/2021 01:54:14	20.58316	20.02759	20.21155	0.82012	0
1713	15/04/2021 01:54:45	20.57909	20.02351	20.2038	0.82015	0
1714	15/04/2021 01:55:16	20.56027	20.00102	20.18131	0.82016	0
1715	15/04/2021 01:55:47	20.55608	20.00051	20.1808	0.82013	0
1716	15/04/2021 01:56:17	20.55939	19.99642	20.18042	0.82012	0
1717	15/04/2021 01:56:48	20.56307	20.00749	20.18778	0.82008	0
1718	15/04/2021 01:57:19	20.54835	19.99642	20.17306	0.82009	0
1719	15/04/2021 01:57:50	20.54073	19.99244	20.16912	0.82009	0
1720	15/04/2021 01:58:20	20.55163	19.99973	20.17266	0.8201	0
1721	15/04/2021 01:58:51	20.5402	19.99933	20.16491	0.8201	0
1722	15/04/2021 01:59:22	20.53625	19.99163	20.16464	0.82007	0
1723	15/04/2021 01:59:52	20.53203	19.98365	20.15674	0.82009	0
1724	15/04/2021 02:00:23	20.52784	19.98313	20.14519	0.82007	0
1725	15/04/2021 02:00:53	20.52731	19.9826	20.14834	0.82003	0
1726	15/04/2021 02:01:24	20.52337	19.9749	20.15176	0.82005	0
1727	15/04/2021 02:01:55	20.51585	19.97475	20.13689	0.82007	0
1728	15/04/2021 02:02:26	20.51218	19.97103	20.14425	0.82004	0

Comments	Apendix 3 - 3°C /min heating rate					
UserDefined	Cool-down					
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	V	V
1729	15/04/2021 02:02:57	20.50114	19.9636	20.13321	0.82002	0
1730	15/04/2021 02:03:28	20.51574	19.97835	20.13677	0.82006	0
1731	15/04/2021 02:03:58	20.50838	19.96349	20.12206	0.82004	0
1732	15/04/2021 02:04:29	20.51195	19.96337	20.1293	0.82005	0
1733	15/04/2021 02:05:00	20.50051	19.9704	20.12523	0.82005	0
1734	15/04/2021 02:05:31	20.48525	19.96242	20.121	0.81999	0
1735	15/04/2021 02:06:02	20.485	19.95102	20.10972	0.81999	0
1736	15/04/2021 02:06:32	20.4737	19.93589	20.09473	0.82	0
1737	15/04/2021 02:07:03	20.46976	19.93934	20.09079	0.81999	0
1738	15/04/2021 02:07:33	20.46132	19.9271	20.08604	0.82002	0
1739	15/04/2021 02:08:04	20.46449	19.92659	20.09288	0.82001	0
1740	15/04/2021 02:08:35	20.46383	19.92592	20.08854	0.81997	0
1741	15/04/2021 02:09:06	20.467	19.92912	20.08803	0.81997	0
1742	15/04/2021 02:09:36	20.45174	19.91742	20.08748	0.81997	0
1743	15/04/2021 02:10:07	20.4511	19.91678	20.07581	0.81996	0
1744	15/04/2021 02:10:38	20.45753	19.91956	20.07856	0.81994	0
1745	15/04/2021 02:11:09	20.43466	19.91132	20.05937	0.81993	0
1746	15/04/2021 02:11:40	20.42285	19.89939	20.06595	0.81995	0
1747	15/04/2021 02:12:11	20.42584	19.90614	20.06159	0.81997	0
1748	15/04/2021 02:12:42	20.43175	19.91582	20.0675	0.81988	0
1749	15/04/2021 02:13:12	20.43046	19.90337	20.05886	0.81994	0
1750	15/04/2021 02:13:42	20.42533	19.89447	20.039	0.81995	0
1751	15/04/2021 02:14:13	20.43152	19.90815	20.06359	0.81993	0
1752	15/04/2021 02:14:43	20.42348	19.89632	20.05187	0.81994	0
1753	15/04/2021 02:15:14	20.4085	19.88862	20.03689	0.81989	0
1754	15/04/2021 02:15:44	20.39718	19.87347	20.02189	0.81989	0
1755	15/04/2021 02:16:15	20.3939	19.8813	20.02597	0.81992	0
1756	15/04/2021 02:16:46	20.40141	19.88145	20.02612	0.8199	0
1757	15/04/2021 02:17:16	20.38629	19.88105	20.00732	0.81986	0
1758	15/04/2021 02:17:46	20.37487	19.86952	20.00695	0.8199	0
1759	15/04/2021 02:18:17	20.37855	19.86952	20.01062	0.81986	0
1760	15/04/2021 02:18:48	20.3818	19.86165	20.01387	0.81982	0
1761	15/04/2021 02:19:19	20.38116	19.86844	20.00219	0.81988	0
1762	15/04/2021 02:19:50	20.38772	19.87507	20.01244	0.81988	0
1763	15/04/2021 02:20:21	20.3797	19.86697	20.00441	0.81985	0
1764	15/04/2021 02:20:52	20.36853	19.84825	19.99318	0.81985	0
1765	15/04/2021 02:21:22	20.35725	19.848	19.9855	0.81984	0
1766	15/04/2021 02:21:52	20.3717	19.85889	19.99638	0.81983	0
1767	15/04/2021 02:22:23	20.36367	19.85449	19.98826	0.81983	0
1768	15/04/2021 02:22:54	20.35648	19.84722	19.981	0.81975	0
1769	15/04/2021 02:23:24	20.3528	19.84722	19.97357	0.81979	0
1770	15/04/2021 02:23:54	20.34895	19.84705	19.96968	0.81983	0
1771	15/04/2021 02:24:24	20.35631	19.86192	19.97711	0.81979	0
1772	15/04/2021 02:24:55	20.34108	19.83911	19.96174	0.81983	0
1773	15/04/2021 02:25:25	20.34855	19.83922	19.96557	0.8198	0
1774	15/04/2021 02:25:55	20.34487	19.84294	19.96185	0.81976	0
1775	15/04/2021 02:26:26	20.3374	19.83911	19.96174	0.81984	0
1776	15/04/2021 02:26:57	20.34461	19.83896	19.96158	0.81979	0
1777	15/04/2021 02:27:27	20.33383	19.8355	19.95813	0.8198	0
1778	15/04/2021 02:27:58	20.33765	19.83564	19.95827	0.81981	0
1779	15/04/2021 02:28:29	20.3344	19.83236	19.96242	0.81979	0
1780	15/04/2021 02:28:59	20.32336	19.82864	19.94384	0.81974	0
1781	15/04/2021 02:29:30	20.31993	19.81775	19.93294	0.81977	0
1782	15/04/2021 02:30:00	20.31951	19.82847	19.93995	0.81979	0
1783	15/04/2021 02:30:31	20.30414	19.81294	19.92814	0.81977	0
1784	15/04/2021 02:31:02	20.30677	19.80817	19.92709	0.81972	0
1785	15/04/2021 02:31:32	20.30625	19.80021	19.92284	0.81978	0
1786	15/04/2021 02:32:03	20.30557	19.79952	19.92215	0.81976	0
1787	15/04/2021 02:32:33	20.29391	19.80261	19.91781	0.81972	0
1788	15/04/2021 02:33:04	20.28655	19.79518	19.91781	0.81973	0
1789	15/04/2021 02:33:35	20.27562	19.78786	19.9142	0.81979	0
1790	15/04/2021 02:34:06	20.27602	19.78454	19.89974	0.81972	0
1791	15/04/2021 02:34:37	20.29821	19.80696	19.91843	0.81974	0
1792	15/04/2021 02:35:08	20.27602	19.78083	19.89231	0.81973	0

Comments	Appendix 3 - 3°C /min heating rate					
UserDefined	Cool-down					
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	V	V
1793	15/04/2021 02:35:39	20.27944	19.79914	19.89948	0.81974	0
1794	15/04/2021 02:36:09	20.26408	19.77992	19.89511	0.81973	0
1795	15/04/2021 02:36:40	20.26408	19.78363	19.88768	0.81971	0
1796	15/04/2021 02:37:10	20.26421	19.77633	19.88038	0.8197	0
1797	15/04/2021 02:37:41	20.25291	19.78349	19.88011	0.81968	0
1798	15/04/2021 02:38:12	20.27826	19.79796	19.89829	0.81972	0
1799	15/04/2021 02:38:43	20.25264	19.7758	19.87984	0.81971	0
1800	15/04/2021 02:39:14	20.26313	19.77524	19.89044	0.81969	0
1801	15/04/2021 02:39:45	20.2483	19.77885	19.87918	0.81969	0
1802	15/04/2021 02:40:15	20.23673	19.77088	19.87121	0.81959	0
1803	15/04/2021 02:40:45	20.24358	19.76293	19.85583	0.81966	0
1804	15/04/2021 02:41:16	20.25451	19.7814	19.87801	0.81965	0
1805	15/04/2021 02:41:47	20.24698	19.77379	19.87413	0.81962	0
1806	15/04/2021 02:42:17	20.23554	19.76225	19.8663	0.81965	0
1807	15/04/2021 02:42:48	20.24213	19.76146	19.86923	0.81966	0
1808	15/04/2021 02:43:19	20.22662	19.75695	19.85728	0.81964	0
1809	15/04/2021 02:43:50	20.2186	19.74885	19.84918	0.8197	0
1810	15/04/2021 02:44:20	20.22952	19.75245	19.85278	0.81966	0
1811	15/04/2021 02:44:51	20.21807	19.73716	19.8375	0.81964	0
1812	15/04/2021 02:45:21	20.22896	19.74444	19.84849	0.81966	0
1813	15/04/2021 02:45:52	20.21386	19.73663	19.8444	0.81973	0
1814	15/04/2021 02:46:23	20.22477	19.74764	19.84426	0.81963	0
1815	15/04/2021 02:46:54	20.21715	19.74366	19.84771	0.81964	0
1816	15/04/2021 02:47:25	20.21296	19.73943	19.84348	0.81951	0
1817	15/04/2021 02:47:55	20.20888	19.73531	19.83564	0.8196	0
1818	15/04/2021 02:48:26	20.20086	19.73836	19.82755	0.81955	0
1819	15/04/2021 02:48:56	20.1965	19.72281	19.82686	0.81961	0
1820	15/04/2021 02:49:27	20.20271	19.73651	19.83313	0.81957	0
1821	15/04/2021 02:49:58	20.19454	19.72826	19.82116	0.8196	0
1822	15/04/2021 02:50:29	20.19744	19.72376	19.82409	0.81962	0
1823	15/04/2021 02:50:59	20.18601	19.73451	19.82369	0.81958	0
1824	15/04/2021 02:51:30	20.18612	19.73091	19.82009	0.81958	0
1825	15/04/2021 02:52:00	20.19727	19.73102	19.81649	0.81961	0
1826	15/04/2021 02:52:31	20.16814	19.70532	19.79821	0.81956	0
1827	15/04/2021 02:53:01	20.18363	19.72839	19.81015	0.81954	0
1828	15/04/2021 02:53:31	20.17271	19.71736	19.80654	0.81958	0
1829	15/04/2021 02:54:01	20.17327	19.72537	19.80712	0.81958	0
1830	15/04/2021 02:54:32	20.17297	19.72134	19.79567	0.81961	0
1831	15/04/2021 02:55:03	20.16946	19.7178	19.79583	0.81957	0
1832	15/04/2021 02:55:34	20.17327	19.72537	19.81083	0.81954	0
1833	15/04/2021 02:56:05	20.16971	19.72548	19.79608	0.81954	0
1834	15/04/2021 02:56:35	20.17297	19.71763	19.79567	0.81951	0
1835	15/04/2021 02:57:06	20.16929	19.70648	19.79195	0.81954	0
1836	15/04/2021 02:57:36	20.16182	19.71008	19.78812	0.81955	0
1837	15/04/2021 02:58:07	20.16591	19.72165	19.79597	0.81958	0
1838	15/04/2021 02:58:37	20.15171	19.7073	19.77791	0.81956	0
1839	15/04/2021 02:59:08	20.14803	19.69987	19.77419	0.81954	0
1840	15/04/2021 02:59:39	20.14763	19.69947	19.7775	0.81952	0
1841	15/04/2021 03:00:10	20.15457	19.71391	19.78823	0.8195	0
1842	15/04/2021 03:00:40	20.14303	19.70225	19.76914	0.81955	0
1843	15/04/2021 03:01:11	20.15721	19.71286	19.77975	0.81962	0
1844	15/04/2021 03:01:42	20.13093	19.69375	19.7532	0.8195	0
1845	15/04/2021 03:02:12	20.14197	19.69746	19.76064	0.81948	0
1846	15/04/2021 03:02:43	20.13053	19.6822	19.75652	0.81948	0
1847	15/04/2021 03:03:13	20.13042	19.6858	19.76384	0.81952	0
1848	15/04/2021 03:03:43	20.12659	19.68565	19.75997	0.8195	0
1849	15/04/2021 03:04:14	20.10819	19.65964	19.73024	0.81948	0
1850	15/04/2021 03:04:45	20.11227	19.66747	19.73808	0.81946	0
1851	15/04/2021 03:05:15	20.10846	19.66362	19.74165	0.81946	0
1852	15/04/2021 03:05:46	20.10006	19.66257	19.72574	0.81948	0
1853	15/04/2021 03:06:17	20.099	19.66522	19.72467	0.81951	0
1854	15/04/2021 03:06:48	20.10898	19.66787	19.73476	0.81947	0
1855	15/04/2021 03:07:18	20.11096	19.66615	19.73675	0.81948	0
1856	15/04/2021 03:07:49	20.09926	19.65805	19.71751	0.81941	0

Comments	Appendix 3 - 3°C /min heating rate					
UserDefined	Cool-down					
Long Name	Time	Furnace Te	Seal Temp	Furnace Te	Cell Voltag	Measured Voltag
Units		°C	°C	°C	V	V
1857	15/04/2021 03:08:19	20.08849	19.65088	19.71777	0.81942	0
1858	15/04/2021 03:08:49	20.09978	19.66228	19.72545	0.81945	0
1859	15/04/2021 03:09:20	20.09625	19.66615	19.72932	0.81945	0
1860	15/04/2021 03:09:51	20.09319	19.65935	19.72623	0.81944	0
1861	15/04/2021 03:10:21	20.08651	19.64517	19.71949	0.81945	0
1862	15/04/2021 03:10:52	20.09072	19.65685	19.72002	0.81943	0
1863	15/04/2021 03:11:22	20.08336	19.64942	19.70888	0.81927	0
1864	15/04/2021 03:11:53	20.07274	19.63869	19.69815	0.81942	0
1865	15/04/2021 03:12:23	20.08023	19.65369	19.69828	0.81942	0
1866	15/04/2021 03:12:53	20.06589	19.63549	19.69123	0.8194	0
1867	15/04/2021 03:13:24	20.081	19.65075	19.69906	0.81934	0
1868	15/04/2021 03:13:54	20.06642	19.63974	19.68805	0.8194	0
1869	15/04/2021 03:14:25	20.06996	19.64332	19.69163	0.81942	0
1870	15/04/2021 03:14:56	20.07732	19.65447	19.70278	0.81939	0
1871	15/04/2021 03:15:26	20.07023	19.63987	19.69561	0.81939	0
1872	15/04/2021 03:15:57	20.06695	19.63284	19.68858	0.81938	0
1873	15/04/2021 03:16:27	20.04883	19.62198	19.67029	0.81936	0
1874	15/04/2021 03:16:58	20.06025	19.63351	19.68553	0.8194	0
1875	15/04/2021 03:17:29	20.05708	19.61916	19.67862	0.81936	0
1876	15/04/2021 03:17:59	20.04642	19.62697	19.67157	0.81937	0
1877	15/04/2021 03:18:30	20.04274	19.62326	19.66785	0.81932	0
1878	15/04/2021 03:19:01	20.04604	19.61173	19.65632	0.81938	0
1879	15/04/2021 03:19:31	20.04159	19.61838	19.65925	0.81933	0
1880	15/04/2021 03:20:02	20.03423	19.60723	19.64811	0.81934	0
1881	15/04/2021 03:20:32	20.03082	19.61121	19.65952	0.8193	0
1882	15/04/2021 03:21:03	20.03844	19.60777	19.65236	0.81937	0
1883	15/04/2021 03:21:33	20.02765	19.60801	19.64889	0.81933	0
1884	15/04/2021 03:22:04	20.04263	19.62315	19.66031	0.81934	0
1885	15/04/2021 03:22:34	20.02434	19.60468	19.64184	0.81931	0
1886	15/04/2021 03:23:05	20.03187	19.60857	19.63829	0.81934	0
1887	15/04/2021 03:23:35	20.03187	19.60485	19.64201	0.81932	0
1888	15/04/2021 03:24:06	20.03906	19.61211	19.66414	0.81937	0
1889	15/04/2021 03:24:36	20.03538	19.61954	19.65299	0.81929	0
1890	15/04/2021 03:25:07	20.02751	19.6116	19.63761	0.81932	0
1891	15/04/2021 03:25:37	20.02346	19.6075	19.64466	0.81932	0
1892	15/04/2021 03:26:08	20.03015	19.61055	19.64399	0.81929	0
1893	15/04/2021 03:26:39	20.01794	19.59078	19.63166	0.81929	0
1894	15/04/2021 03:27:09	20.02436	19.60469	19.63814	0.81935	0
1895	15/04/2021 03:27:40	20.02685	19.60721	19.64437	0.81928	0
1896	15/04/2021 03:28:10	20.02226	19.60258	19.64717	0.81924	0
1897	15/04/2021 03:28:40	20.01085	19.59476	19.62449	0.81929	0

Comments	Appendix 4 - 1st charge cycle									
F(x)=										
Long Name	Time		TC1	TC2	TC3	TC4	Charge Voltage	Charge Cur	Cell Voltage	Cell Current
Units							V	A	V	Ah
129	21/04/2021	22:34:20	355.45688	271.51779	337.07666	358.72452	2.47375	0.38663	2.07181	-0.00588
130	21/04/2021	22:34:51	355.44861	271.57095	337.06119	358.71622	2.47376	0.38648	2.07201	-0.00585
131	21/04/2021	22:35:22	355.45374	271.5798	337.06635	358.7178	2.47373	0.38632	2.07218	-0.00584
132	21/04/2021	22:35:53	355.4628	271.57819	337.08261	358.73041	2.47375	0.38612	2.07239	-0.00588
133	21/04/2021	22:36:24	355.47195	271.50052	337.05612	358.72183	2.47374	0.38591	2.07253	-0.00589
134	21/04/2021	22:36:55	355.46103	271.46402	337.04514	358.71091	2.4738	0.3859	2.07271	-0.00585
135	21/04/2021	22:37:25	355.45697	271.61575	337.06247	358.6962	2.4738	0.38569	2.07287	-0.00587
136	21/04/2021	22:37:56	355.45264	271.65845	337.06882	358.72379	2.47379	0.38553	2.07303	-0.00584
137	21/04/2021	22:38:26	355.45526	271.67929	337.07147	358.70514	2.4738	0.38539	2.07318	-0.00587
138	21/04/2021	22:38:57	355.47546	271.68906	337.08829	358.76083	2.47386	0.38524	2.0734	-0.00588
139	21/04/2021	22:39:28	355.45654	271.62256	337.07632	358.70288	2.47383	0.38505	2.07353	-0.00584
140	21/04/2021	22:39:59	355.44458	271.57413	337.08215	358.7016	2.47388	0.38491	2.07367	-0.00581
141	21/04/2021	22:40:30	355.52512	271.54764	337.10254	358.86371	2.4739	0.38472	2.07381	-0.00575
142	21/04/2021	22:41:01	355.56989	271.51724	337.11188	358.8588	2.47392	0.38458	2.074	-0.00581
143	21/04/2021	22:41:32	355.49408	271.54129	337.06769	358.71558	2.47385	0.3845	2.07416	-0.00584
144	21/04/2021	22:42:03	355.43286	271.54761	337.03818	358.66855	2.47403	0.38425	2.07436	-0.0058
145	21/04/2021	22:42:34	355.40396	271.58695	337.04123	358.65738	2.47394	0.38423	2.07437	-0.00576
146	21/04/2021	22:43:04	355.40698	271.51028	337.04428	358.67105	2.47396	0.38403	2.07461	-0.00583
147	21/04/2021	22:43:35	355.41461	271.55432	337.03409	358.67511	2.47385	0.38393	2.07474	-0.00589
148	21/04/2021	22:44:06	355.45416	271.60922	337.03461	358.75723	2.47397	0.38381	2.07494	-0.00584
149	21/04/2021	22:44:36	355.48291	271.56247	337.05286	358.75406	2.47394	0.38363	2.07511	-0.00582
150	21/04/2021	22:45:07	355.46463	271.60907	337.04157	358.72159	2.47398	0.38346	2.07527	-0.00582
151	21/04/2021	22:45:38	355.45664	271.72418	337.06928	358.70651	2.47396	0.38333	2.07546	-0.00578
152	21/04/2021	22:46:08	355.48407	271.72684	337.07547	358.76236	2.47397	0.38317	2.0756	-0.00584
153	21/04/2021	22:46:38	355.49286	271.79746	337.07718	358.74274	2.47402	0.38302	2.0758	-0.0058
154	21/04/2021	22:47:08	355.48077	271.67996	337.09714	358.75903	2.47402	0.38291	2.07593	-0.00578
155	21/04/2021	22:47:38	355.49747	271.64987	337.09967	358.77216	2.47403	0.38273	2.0761	-0.00581
156	21/04/2021	22:48:09	355.45776	271.54764	337.07037	358.70053	2.47407	0.38263	2.07627	-0.0058
157	21/04/2021	22:48:40	355.4516	271.53775	337.07492	358.6944	2.47411	0.3825	2.07644	-0.0058
158	21/04/2021	22:49:11	355.38159	271.55322	337.02942	358.56403	2.47408	0.38226	2.07665	-0.0058
159	21/04/2021	22:49:42	355.30338	271.59656	337.0007	358.48584	2.47405	0.38214	2.07681	-0.00583
160	21/04/2021	22:50:13	355.31073	271.66571	337.02954	358.56415	2.47405	0.382	2.07696	-0.00577
161	21/04/2021	22:50:44	355.41315	271.66882	337.06476	358.71979	2.47414	0.38186	2.07717	-0.0058
162	21/04/2021	22:51:14	355.4801	271.69016	337.08575	358.77252	2.47414	0.3817	2.07731	-0.0058
163	21/04/2021	22:51:45	355.50073	271.71487	337.06723	358.77902	2.47414	0.38153	2.07751	-0.00578
164	21/04/2021	22:52:16	355.51416	271.72858	337.10577	358.77112	2.4742	0.38142	2.07767	-0.00577
165	21/04/2021	22:52:46	355.48117	271.64771	337.07254	358.73456	2.47409	0.38124	2.0778	-0.00578
166	21/04/2021	22:53:16	355.49457	271.54901	337.09317	358.76215	2.47415	0.3811	2.07794	-0.00579
167	21/04/2021	22:53:46	355.50006	271.58725	337.08444	358.77124	2.47414	0.38098	2.07806	-0.00582

Comments	Apendix 5 - 2nd charge cycle									
F(x)=										
Long Name	Time	TC1	TC2	TC3	TC4	Charge Volt	Charge Cur	Cell Voltag	Cell Current	
Units						V	A	V	Ah	
1	22/04/2021 11:45:50	355.75766	272.05353	337.49399	359.00754	2.47053	0.42793	2.02521	-0.00651	
2	22/04/2021 11:46:21	355.73627	272.07153	337.46527	359.01453	2.47051	0.42724	2.02594	-0.00651	
3	22/04/2021 11:46:52	355.72919	272.03168	337.45453	359.00388	2.47053	0.42665	2.02659	-0.0065	
4	22/04/2021 11:47:23	355.73285	271.95566	337.44394	359.01819	2.47059	0.42625	2.02709	-0.00648	
5	22/04/2021 11:47:54	355.74033	271.95972	337.42291	359.02924	2.47064	0.42582	2.0275	-0.00646	
6	22/04/2021 11:48:25	355.75211	272.01886	337.42404	359.03391	2.47065	0.42544	2.02788	-0.00648	
7	22/04/2021 11:48:56	355.71021	272.02319	337.40686	358.94946	2.47078	0.42524	2.02823	-0.00644	
8	22/04/2021 11:49:27	355.74283	271.98764	337.42184	359.0069	2.47064	0.4249	2.02858	-0.00649	
9	22/04/2021 11:49:57	355.76032	272.03809	337.43228	359.04916	2.47071	0.42467	2.02892	-0.00647	
10	22/04/2021 11:50:28	355.7883	271.97241	337.41403	359.07718	2.47078	0.42445	2.02918	-0.00641	
11	22/04/2021 11:50:59	355.7637	271.95819	337.38568	358.98871	2.4708	0.42423	2.02946	-0.00642	
12	22/04/2021 11:51:29	355.7536	272.10379	337.38983	359.01413	2.47081	0.42396	2.02971	-0.00645	
13	22/04/2021 11:52:00	355.8038	272.07532	337.42969	359.08914	2.47084	0.42369	2.03002	-0.0064	
14	22/04/2021 11:52:31	355.86508	272.08356	337.4342	359.15396	2.47085	0.42348	2.03021	-0.00642	
15	22/04/2021 11:53:01	355.8367	272.11618	337.40918	359.08658	2.47087	0.42319	2.03048	-0.00645	
16	22/04/2021 11:53:32	355.78638	272.07925	337.38351	358.99014	2.47087	0.42301	2.03073	-0.00646	
17	22/04/2021 11:54:03	355.73395	272.15622	337.3736	358.93414	2.47091	0.4228	2.03095	-0.00645	
18	22/04/2021 11:54:34	355.73779	272.20725	337.38101	358.95572	2.47089	0.42261	2.03117	-0.00642	
19	22/04/2021 11:55:05	355.73434	272.14935	337.38831	358.98422	2.47096	0.42241	2.0314	-0.00639	
20	22/04/2021 11:55:36	355.74841	272.05859	337.37744	358.98764	2.471	0.42222	2.03161	-0.00641	
21	22/04/2021 11:56:06	355.74878	272.10251	337.37784	358.99158	2.471	0.42205	2.0318	-0.00643	
22	22/04/2021 11:56:37	355.73749	272.01843	337.35571	358.96606	2.47097	0.42187	2.03202	-0.00644	
23	22/04/2021 11:57:08	355.7226	271.98511	337.35144	358.95831	2.47101	0.42168	2.03221	-0.00643	
24	22/04/2021 11:57:39	355.73575	272.05289	337.36466	358.97144	2.47102	0.42152	2.03239	-0.00644	
25	22/04/2021 11:58:09	355.73492	271.93601	337.36383	358.95993	2.47098	0.42136	2.03262	-0.00645	
26	22/04/2021 11:58:40	355.74115	272.02945	337.36655	358.97684	2.47099	0.42117	2.03286	-0.00643	
27	22/04/2021 11:59:11	355.73587	272.07477	337.36121	358.96802	2.47098	0.42098	2.03304	-0.0064	
28	22/04/2021 11:59:41	355.71732	272.00137	337.35678	358.95651	2.47081	0.42064	2.03318	-0.00644	
29	22/04/2021 12:00:12	355.72055	272.04462	337.34583	358.96332	2.47085	0.42049	2.03336	-0.00644	
30	22/04/2021 12:00:43	355.72342	271.95694	337.34512	358.98041	2.47093	0.4204	2.0336	-0.00642	
31	22/04/2021 12:01:14	355.72656	271.86588	337.33398	358.99063	2.47091	0.42018	2.03373	-0.00638	
32	22/04/2021 12:01:44	355.71603	271.93124	337.32697	358.96591	2.47094	0.42001	2.03396	-0.00635	
33	22/04/2021 12:02:14	355.72766	271.98663	337.33865	358.97397	2.47096	0.41987	2.03414	-0.00643	
34	22/04/2021 12:02:45	355.71018	272.0159	337.30676	358.95651	2.47095	0.41965	2.03431	-0.00635	
35	22/04/2021 12:03:16	355.70294	271.9541	337.31375	358.96344	2.471	0.41954	2.03454	-0.00641	
36	22/04/2021 12:03:46	355.70395	272.01679	337.29334	358.94672	2.471	0.41926	2.03474	-0.00639	
37	22/04/2021 12:04:17	355.70502	271.95624	337.30515	358.95844	2.47099	0.41913	2.03491	-0.00641	
38	22/04/2021 12:04:48	355.70599	271.91373	337.29901	358.95941	2.47104	0.41896	2.03511	-0.0064	
39	22/04/2021 12:05:19	355.69898	271.92831	337.28836	358.94885	2.47102	0.41879	2.03538	-0.00636	
40	22/04/2021 12:05:50	355.68863	271.9903	337.2851	358.93854	2.47103	0.41856	2.03552	-0.00638	
41	22/04/2021 12:06:21	355.68875	271.97229	337.28522	358.93866	2.47106	0.41843	2.03574	-0.00639	
42	22/04/2021 12:06:52	355.69586	271.88525	337.29236	358.95993	2.47109	0.41823	2.03594	-0.00638	
43	22/04/2021 12:07:23	355.70679	271.8819	337.28189	358.96372	2.47112	0.41805	2.03613	-0.0064	
44	22/04/2021 12:07:53	355.72821	271.96542	337.28204	358.99225	2.4711	0.41791	2.03629	-0.00635	
45	22/04/2021 12:08:23	355.71362	272.05203	337.27451	358.95993	2.47113	0.41777	2.03651	-0.00637	
46	22/04/2021 12:08:54	355.67813	271.96503	337.26019	358.91382	2.47117	0.41761	2.03673	-0.00635	
47	22/04/2021 12:09:25	355.65985	271.8956	337.2561	358.89554	2.47118	0.41732	2.03691	-0.00638	
48	22/04/2021 12:09:56	355.64554	271.92807	337.24878	358.89536	2.47108	0.41715	2.03713	-0.00635	
49	22/04/2021 12:10:26	355.65561	271.90936	337.24109	358.89481	2.47119	0.41702	2.0373	-0.00633	
50	22/04/2021 12:10:56	355.64731	271.98425	337.24701	358.90073	2.47117	0.41684	2.03749	-0.00636	
51	22/04/2021 12:11:26	355.66025	272.0011	337.23859	358.91721	2.47115	0.41666	2.03766	-0.0063	
52	22/04/2021 12:11:57	355.65137	271.97394	337.24753	358.90122	2.47116	0.41653	2.03782	-0.00634	
53	22/04/2021 12:12:28	355.63663	271.90448	337.24698	358.88297	2.47119	0.41635	2.03805	-0.00633	
54	22/04/2021 12:12:58	355.65463	271.97366	337.2544	358.90805	2.47123	0.41622	2.03819	-0.00638	
55	22/04/2021 12:13:29	355.65436	271.90811	337.23984	358.90781	2.4712	0.41605	2.03838	-0.00633	
56	22/04/2021 12:13:59	355.63623	271.95847	337.22873	358.88962	2.47123	0.41586	2.03858	-0.00636	
57	22/04/2021 12:14:30	355.62915	271.91495	337.22513	358.86835	2.4713	0.41576	2.03881	-0.00631	
58	22/04/2021 12:15:01	355.61917	271.854	337.20798	358.86194	2.47125	0.41551	2.03899	-0.00632	
59	22/04/2021 12:15:32	355.63364	271.85065	337.20825	358.88705	2.47133	0.41538	2.03917	-0.00635	
60	22/04/2021 12:16:03	355.69409	271.94147	337.24057	358.99365	2.47133	0.41521	2.0394	-0.00633	
61	22/04/2021 12:16:34	355.69095	271.95639	337.21948	358.97275	2.47127	0.41496	2.0396	-0.0063	
62	22/04/2021 12:17:04	355.71198	271.9126	337.23712	358.96896	2.47133	0.41483	2.03974	-0.00631	
63	22/04/2021 12:17:35	355.6687	271.94452	337.22925	358.90796	2.47133	0.41463	2.03996	-0.0063	
64	22/04/2021 12:18:06	355.6264	271.91214	337.21524	358.84079	2.47131	0.41448	2.04013	-0.00628	

Comments	Apendix 5 - 2nd charge cycle									
F(x)=										
Long Name	Time	TC1	TC2	TC3	TC4	Charge Volt	Charge Cur	Cell Voltag	Cell Current	
Units						V	A	V	Ah	
65	22/04/2021 12:18:37	355.60471	271.8501	337.21127	358.82974	2.47137	0.41428	2.04036	-0.0063	
66	22/04/2021 12:19:07	355.61139	271.91132	337.20013	358.84708	2.47137	0.41418	2.04053	-0.00633	
67	22/04/2021 12:19:37	355.62149	271.9035	337.21387	358.87848	2.47141	0.414	2.04072	-0.00623	
68	22/04/2021 12:20:08	355.61383	271.88117	337.19544	358.84952	2.47143	0.4138	2.04092	-0.00632	
69	22/04/2021 12:20:38	355.57846	271.82694	337.18488	358.81061	2.47141	0.41366	2.04109	-0.00631	
70	22/04/2021 12:21:09	355.60672	271.84854	337.20258	358.86014	2.47145	0.41349	2.04132	-0.0063	
71	22/04/2021 12:21:39	355.59964	271.77603	337.17758	358.84241	2.47145	0.41334	2.04146	-0.0063	
72	22/04/2021 12:22:10	355.59625	271.86319	337.17416	358.85321	2.47142	0.4131	2.04162	-0.00631	
73	22/04/2021 12:22:41	355.65326	271.84174	337.19229	358.93863	2.47151	0.41297	2.04184	-0.00623	
74	22/04/2021 12:23:11	355.70963	271.87393	337.21686	358.98789	2.47148	0.41281	2.04199	-0.00631	
75	22/04/2021 12:23:42	355.63474	271.86267	337.18433	358.83496	2.4715	0.41263	2.04223	-0.00629	
76	22/04/2021 12:24:13	355.57767	271.80432	337.159	358.77789	2.47155	0.41248	2.04239	-0.0063	
77	22/04/2021 12:24:43	355.54547	271.86572	337.15518	358.76697	2.47154	0.41235	2.04254	-0.00624	
78	22/04/2021 12:25:14	355.53427	271.82163	337.14392	358.74869	2.47155	0.41219	2.04279	-0.00622	
79	22/04/2021 12:25:45	355.54492	271.76001	337.14392	358.78772	2.47155	0.41199	2.04297	-0.00627	
80	22/04/2021 12:26:16	355.56592	271.79599	337.1615	358.82291	2.47158	0.41186	2.04315	-0.00626	
81	22/04/2021 12:26:46	355.57632	271.76672	337.15765	358.83331	2.4716	0.41173	2.04333	-0.00625	
82	22/04/2021 12:27:17	355.57007	271.75668	337.13705	358.81638	2.47157	0.41148	2.04355	-0.00625	
83	22/04/2021 12:27:48	355.57455	271.84467	337.14157	358.81732	2.47159	0.41134	2.04371	-0.00628	
84	22/04/2021 12:28:19	355.58588	271.88525	337.15299	358.8251	2.47159	0.41117	2.04394	-0.00623	
85	22/04/2021 12:28:49	355.56595	271.82864	337.1329	358.7981	2.47167	0.41101	2.04415	-0.00623	
86	22/04/2021 12:29:19	355.56674	271.76419	337.13373	358.80243	2.47164	0.41084	2.0443	-0.00624	
87	22/04/2021 12:29:49	355.56732	271.82639	337.13788	358.81012	2.47164	0.41065	2.04452	-0.00624	
88	22/04/2021 12:30:20	355.57101	271.79392	337.14517	358.81732	2.47167	0.4105	2.04469	-0.00622	
89	22/04/2021 12:30:50	355.56445	271.85971	337.13498	358.80365	2.47166	0.41033	2.04486	-0.00625	
90	22/04/2021 12:31:21	355.57196	271.81302	337.1247	358.81119	2.47165	0.41015	2.04505	-0.00626	
91	22/04/2021 12:31:52	355.56842	271.80216	337.12112	358.80765	2.47163	0.40998	2.04523	-0.00624	
92	22/04/2021 12:32:23	355.56088	271.87061	337.1171	358.81079	2.47177	0.40987	2.04543	-0.00621	
93	22/04/2021 12:32:53	355.56732	271.79016	337.12714	358.79947	2.47174	0.40967	2.04559	-0.00622	
94	22/04/2021 12:33:23	355.55991	271.84061	337.134	358.80267	2.47173	0.40947	2.04574	-0.00623	
95	22/04/2021 12:33:53	355.55328	271.88818	337.12018	358.79254	2.47172	0.40928	2.04591	-0.00625	
96	22/04/2021 12:34:24	355.56842	271.8493	337.13184	358.80765	2.47172	0.40913	2.04611	-0.00622	
97	22/04/2021 12:34:55	355.55179	271.79239	337.11862	358.77329	2.47173	0.40895	2.0463	-0.00624	
98	22/04/2021 12:35:26	355.58423	271.8038	337.12274	358.827	2.4718	0.4088	2.04653	-0.00623	
99	22/04/2021 12:35:57	355.57086	271.8772	337.11285	358.80301	2.47182	0.40866	2.04671	-0.00622	
100	22/04/2021 12:36:27	355.5994	271.82654	337.13086	358.84216	2.4718	0.40851	2.04687	-0.00623	
101	22/04/2021 12:36:57	355.62491	271.88889	337.14941	358.86414	2.47181	0.40836	2.04706	-0.00621	
102	22/04/2021 12:37:27	355.61441	271.96881	337.146	358.84302	2.47189	0.40825	2.0473	-0.00623	
103	22/04/2021 12:37:58	355.59775	271.90103	337.14352	358.81924	2.47186	0.40803	2.04748	-0.00618	
104	22/04/2021 12:38:29	355.59189	271.85873	337.13046	358.81693	2.47187	0.40787	2.04767	-0.00617	
105	22/04/2021 12:39:00	355.58603	271.9108	337.121	358.80753	2.47187	0.4077	2.04787	-0.00619	
106	22/04/2021 12:39:30	355.59738	271.89334	337.13599	358.81528	2.47187	0.40748	2.04808	-0.00622	
107	22/04/2021 12:40:00	355.61221	271.96292	337.12592	358.83017	2.47187	0.4073	2.04825	-0.0062	
108	22/04/2021 12:40:31	355.58493	271.90241	337.10916	358.80289	2.47191	0.40717	2.04842	-0.00618	
109	22/04/2021 12:41:01	355.57578	271.99097	337.11066	358.80081	2.47184	0.40694	2.04866	-0.00619	
110	22/04/2021 12:41:32	355.58139	271.94955	337.09845	358.80646	2.4719	0.40676	2.04888	-0.00618	
111	22/04/2021 12:42:02	355.59738	272.06378	337.12528	358.8295	2.47191	0.40659	2.04903	-0.00621	
112	22/04/2021 12:42:33	355.5993	272.02585	337.10934	358.82434	2.47192	0.40639	2.04921	-0.00618	
113	22/04/2021 12:43:04	355.59345	272.01263	337.09985	358.80783	2.472	0.40626	2.04941	-0.00618	
114	22/04/2021 12:43:35	355.58756	272.09723	337.10822	358.81967	2.47198	0.4061	2.0496	-0.00618	
115	22/04/2021 12:44:06	355.58902	272.08426	337.13117	358.81409	2.47201	0.40589	2.04976	-0.00617	
116	22/04/2021 12:44:36	355.5769	272.07913	337.11896	358.78421	2.47204	0.40575	2.04996	-0.00617	
117	22/04/2021 12:45:07	355.5477	272.08551	337.11456	358.7692	2.472	0.40563	2.05009	-0.00613	
118	22/04/2021 12:45:38	355.55005	272.04077	337.1026	358.7467	2.472	0.4054	2.05023	-0.00617	
119	22/04/2021 12:46:09	355.53439	272.03201	337.09753	358.76651	2.47203	0.40524	2.05043	-0.00615	
120	22/04/2021 12:46:40	355.57517	272.10272	337.11719	358.82858	2.47204	0.40508	2.05064	-0.00617	
121	22/04/2021 12:47:10	355.63385	272.01404	337.15845	358.88373	2.47198	0.4049	2.05076	-0.00619	
122	22/04/2021 12:47:41	355.66892	272.11877	337.15085	358.92233	2.47197	0.40467	2.05101	-0.00615	
123	22/04/2021 12:48:12	355.65036	272.1832	337.15363	358.8967	2.472	0.40459	2.05118	-0.00617	
124	22/04/2021 12:48:43	355.63129	272.09119	337.13083	358.86697	2.47205	0.40443	2.05137	-0.00614	
125	22/04/2021 12:49:13	355.655	272.18793	337.14758	358.8765	2.47209	0.4043	2.05154	-0.00616	
126	22/04/2021 12:49:43	355.63623	272.12885	337.13937	358.87192	2.47211	0.40418	2.05171	-0.00617	
127	22/04/2021 12:50:14	355.58911	272.10974	337.12412	358.7858	2.47209	0.40397	2.05187	-0.00614	
128	22/04/2021 12:50:44	355.64139	272.07974	337.17319	358.90192	2.4721	0.40385	2.05208	-0.00617	

Comments	Appendix 5 - 2nd charge cycle									
F(x)=										
Long Name	Time	TC1	TC2	TC3	TC4	Charge Volt	Charge Cur	Cell Voltag	Cell Current	
Units						V	A	V	Ah	
129	22/04/2021 12:51:15	355.69367	272.10416	337.18295	358.97192	2.47212	0.40366	2.05228	-0.00618	
130	22/04/2021 12:51:46	355.73175	272.05606	337.18912	359.00644	2.47216	0.40354	2.05247	-0.00615	
131	22/04/2021 12:52:17	355.68811	272.0441	337.16306	358.92377	2.47206	0.40331	2.05264	-0.00612	
132	22/04/2021 12:52:47	355.68985	272.15466	337.17554	358.93976	2.47221	0.40317	2.05284	-0.00616	
133	22/04/2021 12:53:19	355.73532	272.26999	337.19986	358.99939	2.47218	0.40306	2.05302	-0.0061	
134	22/04/2021 12:53:49	355.7135	272.22232	337.19574	358.9527	2.47219	0.40287	2.05319	-0.0061	
135	22/04/2021 12:54:20	355.66995	272.28296	337.17691	358.86661	2.4722	0.40278	2.05337	-0.00619	
136	22/04/2021 12:54:50	355.64429	272.22775	337.19754	358.87289	2.47224	0.40257	2.05354	-0.00614	
137	22/04/2021 12:55:20	355.70728	272.18329	337.21451	358.97134	2.47224	0.40235	2.05371	-0.00619	
138	22/04/2021 12:55:51	355.63123	272.25064	337.18436	358.82788	2.47219	0.40218	2.05389	-0.00615	
139	22/04/2021 12:56:22	355.62302	272.28577	337.19043	358.84808	2.47221	0.40199	2.05401	-0.00614	
140	22/04/2021 12:56:53	355.6004	272.18649	337.18192	358.82187	2.47229	0.4019	2.05424	-0.0061	
141	22/04/2021 12:57:24	355.63437	272.14871	337.19827	358.86652	2.47223	0.4017	2.05444	-0.0061	
142	22/04/2021 12:57:55	355.66876	272.23099	337.21503	358.91156	2.47229	0.40154	2.05456	-0.00616	
143	22/04/2021 12:58:25	355.64627	272.18262	337.21384	358.8642	2.47231	0.40137	2.0548	-0.00614	
144	22/04/2021 12:58:56	355.6026	272.25403	337.18771	358.80991	2.47231	0.40121	2.05493	-0.00609	
145	22/04/2021 12:59:27	355.60193	272.26059	337.18704	358.83408	2.47234	0.40103	2.05517	-0.00613	
146	22/04/2021 12:59:57	355.67603	272.24564	337.23306	358.96494	2.47233	0.40087	2.05536	-0.00608	
147	22/04/2021 13:00:28	355.78571	272.29977	337.26852	359.11011	2.47233	0.40071	2.05553	-0.00611	
148	22/04/2021 13:00:58	355.84946	272.29239	337.26123	359.15967	2.47238	0.40055	2.05573	-0.0061	
149	22/04/2021 13:01:29	355.8562	272.32462	337.27872	359.1167	2.4724	0.40045	2.05589	-0.00612	
150	22/04/2021 13:02:00	355.78497	272.25183	337.25345	358.98517	2.47241	0.40032	2.05602	-0.0061	
151	22/04/2021 13:02:31	355.67102	272.20792	337.22443	358.83926	2.47243	0.40016	2.05621	-0.00611	
152	22/04/2021 13:03:02	355.67102	272.28043	337.23517	358.88895	2.4724	0.39999	2.05642	-0.00608	
153	22/04/2021 13:03:33	355.64661	272.26636	337.22488	358.84683	2.47236	0.39986	2.05659	-0.00607	
154	22/04/2021 13:04:04	355.56134	272.17923	337.18903	358.71539	2.47237	0.39968	2.05679	-0.00611	
155	22/04/2021 13:04:34	355.46756	272.2103	337.15176	358.64291	2.47244	0.39951	2.05694	-0.00611	
156	22/04/2021 13:05:05	355.58002	272.13669	337.215	358.86182	2.47243	0.39935	2.05712	-0.0061	
157	22/04/2021 13:05:36	355.63532	272.13876	337.21704	358.92062	2.4724	0.39913	2.05727	-0.00606	
158	22/04/2021 13:06:06	355.67703	272.09082	337.2341	358.96597	2.47253	0.39903	2.05747	-0.00608	
159	22/04/2021 13:06:36	355.69757	272.09366	337.24402	358.98291	2.47247	0.39886	2.05765	-0.00607	
160	22/04/2021 13:07:06	355.71841	272.14032	337.25073	358.99664	2.47253	0.39869	2.05778	-0.00607	
161	22/04/2021 13:07:36	355.72089	272.11023	337.24609	358.96368	2.47252	0.39852	2.05795	-0.00608	
162	22/04/2021 13:08:07	355.70548	272.17059	337.24484	358.94116	2.47249	0.39837	2.05812	-0.00608	
163	22/04/2021 13:08:38	355.66452	272.11066	337.23221	358.86826	2.4725	0.39819	2.05825	-0.00608	
164	22/04/2021 13:09:09	355.67065	272.09515	337.24554	358.90634	2.4725	0.39804	2.05843	-0.00606	
165	22/04/2021 13:09:40	355.68039	272.18121	337.24817	358.93381	2.47257	0.39791	2.05865	-0.00606	
166	22/04/2021 13:10:10	355.67941	272.11136	337.24722	358.91864	2.47259	0.3977	2.05883	-0.00604	
167	22/04/2021 13:10:40	355.67795	272.12799	337.2529	358.92429	2.47254	0.3976	2.05898	-0.00605	
168	22/04/2021 13:11:10	355.69019	272.22025	337.24374	358.94006	2.47258	0.39746	2.05916	-0.00605	
169	22/04/2021 13:11:40	355.7059	272.21094	337.25601	358.95932	2.4726	0.39725	2.05928	-0.00605	
170	22/04/2021 13:12:11	355.72952	272.24594	337.27268	358.98648	2.47269	0.39717	2.05952	-0.00608	
171	22/04/2021 13:12:42	355.73569	272.18701	337.28244	358.96426	2.47266	0.39701	2.05968	-0.00607	
172	22/04/2021 13:13:13	355.70609	272.14224	337.26337	358.93115	2.47264	0.39684	2.05988	-0.00605	
173	22/04/2021 13:13:44	355.72311	272.19952	337.26621	358.9801	2.47266	0.3967	2.06005	-0.00605	
174	22/04/2021 13:14:15	355.70059	272.16202	337.25421	358.95044	2.47268	0.39653	2.06021	-0.00607	
175	22/04/2021 13:14:46	355.68823	272.05512	337.26321	358.93454	2.47272	0.39638	2.06041	-0.006	
176	22/04/2021 13:15:17	355.71442	272.0311	337.27173	358.95718	2.47273	0.39625	2.06062	-0.00605	
177	22/04/2021 13:15:48	355.70813	272.0863	337.27966	358.96866	2.47272	0.3961	2.06078	-0.00605	
178	22/04/2021 13:16:19	355.70953	272.08411	337.25964	358.95581	2.47276	0.39589	2.06095	-0.00604	
179	22/04/2021 13:16:50	355.71088	272.06372	337.26456	358.96783	2.47278	0.39582	2.06115	-0.00603	
180	22/04/2021 13:17:21	355.7012	272.0502	337.24414	358.95459	2.47275	0.39566	2.0613	-0.00606	
181	22/04/2021 13:17:52	355.72015	272.17114	337.26321	358.97	2.4728	0.3955	2.06146	-0.00602	
182	22/04/2021 13:18:23	355.72751	272.15686	337.28137	358.97385	2.47277	0.39529	2.06164	-0.00602	
183	22/04/2021 13:18:53	355.71375	272.14279	337.27103	358.96713	2.47274	0.39513	2.06183	-0.00606	
184	22/04/2021 13:19:24	355.71771	272.11426	337.27148	358.9747	2.47279	0.39497	2.06196	-0.00604	
185	22/04/2021 13:19:55	355.71185	271.99582	337.27985	358.96881	2.47278	0.39484	2.06212	-0.00602	
186	22/04/2021 13:20:26	355.71021	271.93979	337.27109	358.96719	2.47277	0.39465	2.06224	-0.00602	
187	22/04/2021 13:20:57	355.70844	272.02499	337.26572	358.9725	2.47282	0.39452	2.06249	-0.00599	
188	22/04/2021 13:21:27	355.71704	271.95401	337.26718	358.98462	2.47283	0.39438	2.06268	-0.00601	
189	22/04/2021 13:21:58	355.7225	272.07196	337.2691	358.99008	2.4729	0.39424	2.06279	-0.006	
190	22/04/2021 13:22:29	355.73816	272.03	337.27777	359.00934	2.47284	0.39405	2.063	-0.00602	
191	22/04/2021 13:23:00	355.77829	271.97311	337.31464	359.05298	2.4729	0.39387	2.06319	-0.00603	
192	22/04/2021 13:23:30	355.66956	272.02152	337.24442	358.86975	2.47293	0.39375	2.06335	-0.00599	

Comments	Appendix 5 - 2nd charge cycle									
F(x)=										
Long Name	Time	TC1	TC2	TC3	TC4	Charge Volt	Charge Cur	Cell Voltage	Cell Current	
Units						V	A	V	Ah	
193	22/04/2021 13:24:00	355.65631	272.06598	337.25967	358.90973	2.47286	0.3936	2.06352	-0.00597	
194	22/04/2021 13:24:30	355.65686	271.99042	337.25308	358.89252	2.47292	0.39344	2.06368	-0.00599	
195	22/04/2021 13:25:01	355.65717	272.02335	337.24262	358.91058	2.47293	0.39327	2.06386	-0.006	
196	22/04/2021 13:25:32	355.673	271.98517	337.25501	358.94412	2.47289	0.3931	2.064	-0.00599	
197	22/04/2021 13:26:03	355.72357	271.94986	337.27026	359.02316	2.47291	0.39291	2.06421	-0.00603	
198	22/04/2021 13:26:34	355.71021	271.97241	337.24963	358.96011	2.47304	0.39281	2.0644	-0.00599	
199	22/04/2021 13:27:05	355.77164	272.06781	337.29364	359.09601	2.47303	0.39268	2.06459	-0.00599	
200	22/04/2021 13:27:35	355.89047	272.02976	337.33472	359.24323	2.47298	0.39251	2.06476	-0.00597	
201	22/04/2021 13:28:06	355.94522	272.16544	337.35413	359.27316	2.473	0.39239	2.06492	-0.00596	
202	22/04/2021 13:28:37	355.89334	272.22119	337.3233	359.12546	2.47308	0.39229	2.06502	-0.00598	
203	22/04/2021 13:29:08	355.73071	272.10944	337.28101	358.87061	2.47305	0.39213	2.06524	-0.00599	
204	22/04/2021 13:29:39	355.67026	272.06577	337.26657	358.87759	2.47304	0.39198	2.06538	-0.00594	
205	22/04/2021 13:30:09	355.70932	272.10202	337.32019	358.95563	2.47303	0.39184	2.06557	-0.00597	
206	22/04/2021 13:30:40	355.73315	272.01401	337.30493	358.97592	2.47304	0.39165	2.06571	-0.006	
207	22/04/2021 13:31:10	355.64777	271.94846	337.26532	358.80536	2.47306	0.39152	2.06585	-0.00599	
208	22/04/2021 13:31:40	355.60571	271.98166	337.2623	358.79526	2.47309	0.39139	2.06599	-0.00599	
209	22/04/2021 13:32:11	355.71939	271.93103	337.30887	359.04376	2.47312	0.39126	2.06615	-0.00594	
210	22/04/2021 13:32:42	355.86047	271.91931	337.34738	359.24164	2.47313	0.39109	2.06634	-0.006	
211	22/04/2021 13:33:13	355.88519	272.02795	337.34009	359.15634	2.47317	0.39094	2.06652	-0.00596	
212	22/04/2021 13:33:44	355.7609	272.07132	337.29349	358.92203	2.47322	0.39085	2.06671	-0.00597	
213	22/04/2021 13:34:15	355.60123	271.97342	337.2399	358.69852	2.47321	0.39067	2.06685	-0.00594	
214	22/04/2021 13:34:45	355.58609	272.01236	337.24966	358.7934	2.47319	0.39046	2.06698	-0.00598	
215	22/04/2021 13:35:15	355.62836	271.94675	337.26007	358.85693	2.47315	0.39032	2.06715	-0.00596	
216	22/04/2021 13:35:46	355.66617	272.03616	337.27313	358.91959	2.47324	0.39013	2.06735	-0.00596	
217	22/04/2021 13:36:17	355.76471	272.00272	337.3045	359.06781	2.47324	0.39001	2.06753	-0.00597	
218	22/04/2021 13:36:48	355.78473	271.92532	337.2854	359.0488	2.47321	0.38981	2.06763	-0.00599	
219	22/04/2021 13:37:19	355.78665	271.93088	337.30515	359.0188	2.47326	0.38968	2.06783	-0.00596	
220	22/04/2021 13:37:50	355.78882	272.03101	337.31094	359.04224	2.47323	0.38957	2.06803	-0.00594	
221	22/04/2021 13:38:20	355.77597	271.93451	337.30158	359.02585	2.4733	0.3894	2.06817	-0.00595	
222	22/04/2021 13:38:50	355.83481	271.97284	337.31793	359.13434	2.47325	0.38924	2.06832	-0.00595	
223	22/04/2021 13:39:21	355.84882	271.92917	337.31064	359.09515	2.47328	0.38909	2.0685	-0.00596	
224	22/04/2021 13:39:51	355.83713	272.01874	337.32739	359.08344	2.4733	0.38896	2.06869	-0.00595	
225	22/04/2021 13:40:22	355.77911	271.96304	337.29044	358.9935	2.4733	0.3888	2.06889	-0.00593	
226	22/04/2021 13:40:52	355.7742	272.04504	337.29263	358.97794	2.47327	0.38868	2.06903	-0.00594	
227	22/04/2021 13:41:23	355.71988	271.9642	337.28439	358.92719	2.47335	0.38853	2.06918	-0.00595	
228	22/04/2021 13:41:53	355.69125	272.02914	337.26267	358.88434	2.4733	0.3884	2.06938	-0.00596	
229	22/04/2021 13:42:24	355.5979	271.9664	337.24728	358.74133	2.47332	0.38826	2.0695	-0.00592	
230	22/04/2021 13:42:55	355.53265	271.89612	337.23877	358.7045	2.47336	0.38813	2.06971	-0.00592	
231	22/04/2021 13:43:25	355.54987	271.95721	337.22751	358.77847	2.47336	0.38802	2.06988	-0.0059	
232	22/04/2021 13:43:56	355.67337	271.93115	337.2554	358.98001	2.47337	0.38783	2.07004	-0.00592	
233	22/04/2021 13:44:27	355.70319	271.94351	337.2533	358.96372	2.47336	0.3877	2.0702	-0.0059	
234	22/04/2021 13:44:58	355.69916	272.0191	337.25632	358.93124	2.47336	0.38755	2.07036	-0.00591	
235	22/04/2021 13:45:29	355.71985	272.06564	337.25577	358.98746	2.47341	0.38742	2.07051	-0.0059	
236	22/04/2021 13:45:59	355.70801	271.98828	337.24027	358.94013	2.4734	0.38726	2.07067	-0.00592	
237	22/04/2021 13:46:30	355.67975	272.03915	337.24753	358.90482	2.47349	0.38708	2.07086	-0.00595	
238	22/04/2021 13:47:01	355.73666	272.02847	337.26556	358.97589	2.47348	0.38697	2.071	-0.00591	
239	22/04/2021 13:47:31	355.73627	272.03891	337.25085	358.99323	2.47351	0.38684	2.07118	-0.00592	
240	22/04/2021 13:48:02	355.73187	272.06708	337.2536	358.96402	2.47347	0.38666	2.07133	-0.00587	
241	22/04/2021 13:48:33	355.70731	272.0202	337.23956	358.92169	2.47348	0.38644	2.0715	-0.00594	
242	22/04/2021 13:49:04	355.69244	271.96875	337.23175	358.90326	2.47354	0.38638	2.07168	-0.0059	
243	22/04/2021 13:49:34	355.68835	272.04074	337.2562	358.89212	2.47351	0.38624	2.07183	-0.00586	
244	22/04/2021 13:50:05	355.67416	271.93561	337.23834	358.90631	2.47353	0.38608	2.07203	-0.00587	
245	22/04/2021 13:50:36	355.67758	271.91007	337.23105	358.89197	2.47356	0.38591	2.07224	-0.00589	
246	22/04/2021 13:51:07	355.66339	272.00433	337.22748	358.87424	2.47349	0.3857	2.07235	-0.00589	
247	22/04/2021 13:51:38	355.65659	272.06625	337.23489	358.87451	2.47351	0.38554	2.07256	-0.00588	
248	22/04/2021 13:52:09	355.66037	272.05563	337.23517	358.89249	2.47361	0.38544	2.0727	-0.00588	
249	22/04/2021 13:52:39	355.67825	272.07752	337.22812	358.91391	2.47359	0.38526	2.07289	-0.00587	
250	22/04/2021 13:53:10	355.68509	272.08817	337.24222	358.90305	2.47362	0.38516	2.07312	-0.00589	
251	22/04/2021 13:53:40	355.68167	272.04114	337.228	358.90668	2.47359	0.38502	2.07324	-0.00588	
252	22/04/2021 13:54:11	355.7027	272.08801	337.23135	358.9632	2.47367	0.38485	2.07338	-0.00587	
253	22/04/2021 13:54:42	355.7178	272.04547	337.2287	358.95703	2.47368	0.38477	2.07355	-0.0059	
254	22/04/2021 13:55:13	355.69736	271.97742	337.22952	358.91531	2.47368	0.38455	2.07369	-0.00588	
255	22/04/2021 13:55:44	355.67581	271.95178	337.21503	358.89377	2.47361	0.38442	2.07387	-0.00586	
256	22/04/2021 13:56:15	355.67456	272.03024	337.2316	358.90314	2.47363	0.38424	2.07401	-0.00585	

Comments	Appendix 5 - 2nd charge cycle									
F(x)=										
Long Name	Time	TC1	TC2	TC3	TC4	Charge Volt	Charge Cur	Cell Voltag	Cell Current	
Units						V	A	V	Ah	
257	22/04/2021 13:56:46	355.67416	272.04797	337.22763	358.90985	2.47364	0.38413	2.07418	-0.00588	
258	22/04/2021 13:57:17	355.65533	271.98883	337.21222	358.86969	2.47373	0.38404	2.07433	-0.00588	
259	22/04/2021 13:57:48	355.62668	271.92334	337.20123	358.86945	2.4737	0.38385	2.0745	-0.00587	
260	22/04/2021 13:58:19	355.65112	271.95554	337.22583	358.87613	2.47375	0.38372	2.07467	-0.00585	
261	22/04/2021 13:58:50	355.65356	272.04868	337.23187	358.89279	2.47384	0.38359	2.0748	-0.00586	
262	22/04/2021 13:59:21	355.64865	272.07263	337.21262	358.88434	2.47375	0.38341	2.07494	-0.00586	
263	22/04/2021 13:59:52	355.64456	272.00684	337.19778	358.88376	2.47378	0.38333	2.07512	-0.00583	
264	22/04/2021 14:00:23	355.64426	271.93765	337.20822	358.86218	2.47378	0.38313	2.07529	-0.00587	
265	22/04/2021 14:00:54	355.63944	271.96539	337.21765	358.86093	2.47379	0.38293	2.07551	-0.00583	
266	22/04/2021 14:01:24	355.64465	271.95618	337.19434	358.84839	2.47388	0.38284	2.07566	-0.00584	
267	22/04/2021 14:01:55	355.55747	271.89246	337.15656	358.7009	2.47386	0.38269	2.07584	-0.00581	
268	22/04/2021 14:02:26	355.54135	271.97754	337.16892	358.7345	2.47386	0.38254	2.07598	-0.00583	
269	22/04/2021 14:02:56	355.60629	271.94965	337.21286	358.85617	2.47389	0.38238	2.07617	-0.00584	
270	22/04/2021 14:03:26	355.67249	272.0354	337.20093	358.94721	2.47386	0.3822	2.07631	-0.00584	
271	22/04/2021 14:03:56	355.7392	272.09998	337.21454	359.02457	2.47394	0.38211	2.07647	-0.00581	
272	22/04/2021 14:04:26	355.69937	272.01209	337.18869	358.89957	2.47382	0.3819	2.07659	-0.00583	
273	22/04/2021 14:04:57	355.64874	272.07272	337.18054	358.82764	2.47391	0.38181	2.07679	-0.00582	
274	22/04/2021 14:05:27	355.62418	271.9679	337.17368	358.81726	2.47394	0.38169	2.07693	-0.00583	
275	22/04/2021 14:05:57	355.63007	272.03192	337.19034	358.85864	2.47393	0.38153	2.07711	-0.00581	
276	22/04/2021 14:06:28	355.63562	271.97235	337.18167	358.85001	2.47396	0.38139	2.07729	-0.00579	
277	22/04/2021 14:06:58	355.63019	272.0719	337.19046	358.85169	2.47393	0.38127	2.07745	-0.00582	
278	22/04/2021 14:07:29	355.62854	271.99408	337.16736	358.85358	2.47396	0.3811	2.07762	-0.00581	
279	22/04/2021 14:08:00	355.63861	271.9754	337.17752	358.853	2.47401	0.38096	2.07777	-0.00583	
280	22/04/2021 14:08:30	355.63464	271.98947	337.1807	358.86325	2.47402	0.38083	2.0779	-0.00584	
281	22/04/2021 14:09:01	355.63452	271.92773	337.18054	358.86664	2.47403	0.38072	2.07804	-0.00582	
282	22/04/2021 14:09:31	355.62347	272.00342	337.18012	358.83786	2.47404	0.38053	2.07819	-0.00579	
283	22/04/2021 14:10:02	355.63019	271.93778	337.17618	358.86234	2.47404	0.38042	2.07835	-0.00582	
284	22/04/2021 14:10:33	355.64056	271.90125	337.1759	358.88333	2.47405	0.38032	2.07854	-0.00578	
285	22/04/2021 14:11:03	355.65433	271.93707	337.17548	358.87222	2.47407	0.38014	2.07875	-0.00581	
286	22/04/2021 14:11:33	355.64462	272.03229	337.17285	358.8732	2.47406	0.38002	2.07882	-0.0058	
287	22/04/2021 14:12:03	355.69577	271.98306	337.19937	358.96344	2.47407	0.37987	2.079	-0.0058	
288	22/04/2021 14:12:33	355.70807	271.97388	337.19748	358.93668	2.47403	0.37977	2.07912	-0.00578	
289	22/04/2021 14:13:04	355.71314	272.01166	337.20252	358.9559	2.4741	0.37963	2.07933	-0.00579	
290	22/04/2021 14:13:35	355.76715	272.10312	337.21765	359.04187	2.4741	0.37946	2.07945	-0.00577	
291	22/04/2021 14:14:06	355.72553	272.14764	337.20435	358.93286	2.47408	0.3793	2.07962	-0.00579	
292	22/04/2021 14:14:37	355.65912	272.06158	337.1767	358.82379	2.47413	0.37917	2.0798	-0.00579	
293	22/04/2021 14:15:08	355.62418	272.00052	337.18082	358.8208	2.47415	0.37902	2.07994	-0.0058	
294	22/04/2021 14:15:39	355.61704	272.01138	337.18796	358.81018	2.47415	0.37886	2.08013	-0.00579	

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Comments	Appendix 6 - 1st discharge cycle									
F(x)=										
Long Name	Time	TC1	TC3	Cell Voltag	NaS Cell Volta	Load Curre	Cell Current	Impedance	Z Check?	
Units				V	V	A	Ah	Z-Ohms		
129	21/04/2021 12:22:08	356.73935	338.53989	2.03684	2.0393	0.1502	0.01	0.17406	0	
130	21/04/2021 12:22:39	356.6684	338.53275	2.03679	2.0391	0.1502	0.0113	0.17406	0	
131	21/04/2021 12:23:09	356.73538	338.56802	2.03668	2.0391	0.1502	0.0126	0.17406	0	
132	21/04/2021 12:23:40	356.75641	338.57849	2.03661	2.039	0.1502	0.0138	0.17406	0	
133	21/04/2021 12:24:10	356.81293	338.57825	2.0365	2.039	0.1502	0.0151	0.17406	0	
134	21/04/2021 12:24:41	356.70236	338.51691	2.03648	2.0388	0.1502	0.0164	0.17406	0	
135	21/04/2021 12:25:12	356.55335	338.46689	2.03636	2.0388	0.1502	0.0177	0.17406	0	
136	21/04/2021 12:25:43	356.44269	338.44119	2.03633	2.0387	0.1502	0.019	0.17406	0	
137	21/04/2021 12:26:13	356.47055	338.46927	2.03627	2.0387	0.1503	0.0202	0.17406	0	
138	21/04/2021 12:26:44	356.66553	338.51556	2.03619	2.0387	0.1502	0.0215	0.17406	0	
139	21/04/2021 12:27:14	356.75763	338.53684	2.03613	2.0385	0.1502	0.0228	0.17406	0	
140	21/04/2021 12:27:45	356.70429	338.50458	2.03607	2.0385	0.1502	0.0241	0.17406	0	
141	21/04/2021 12:28:16	356.69009	338.49384	2.03599	2.0383	0.1502	0.0253	0.17406	0	
142	21/04/2021 12:28:46	356.71832	338.508	2.0359	2.0383	0.1502	0.0266	0.17406	0	
143	21/04/2021 12:29:17	356.67139	338.49646	2.03591	2.0383	0.1502	0.0279	0.17406	0	
144	21/04/2021 12:29:48	356.66705	338.49921	2.03582	2.0382	0.1502	0.0292	0.17406	0	
145	21/04/2021 12:30:18	356.59839	338.46936	2.03574	2.0382	0.1502	0.0305	0.17406	0	
146	21/04/2021 12:30:49	356.64966	338.49249	2.0357	2.0382	0.1503	0.0317	0.17406	0	
147	21/04/2021 12:31:19	356.67276	338.48709	2.03564	2.038	0.1503	0.033	0.17406	0	
148	21/04/2021 12:31:50	356.53684	338.4288	2.03561	2.038	0.1502	0.0343	0.17406	0	
149	21/04/2021 12:32:20	356.49017	338.40683	2.03551	2.0379	0.1502	0.0355	0.17406	0	
150	21/04/2021 12:32:51	356.53189	338.42743	2.03543	2.0379	0.1502	0.0368	0.17406	0	
151	21/04/2021 12:33:22	356.56366	338.44156	2.0354	2.0379	0.1502	0.0381	0.17406	0	
152	21/04/2021 12:33:52	356.52817	338.40582	2.03534	2.0377	0.1502	0.0394	0.17406	0	
153	21/04/2021 12:34:23	356.539	338.40955	2.03529	2.0377	0.1502	0.0407	0.17406	0	
154	21/04/2021 12:34:54	356.62116	338.44943	2.03523	2.0377	0.1503	0.042	0.17406	0	
155	21/04/2021 12:35:25	356.61731	338.43842	2.03515	2.0376	0.1502	0.0433	0.17406	0	
156	21/04/2021 12:35:55	356.59537	338.427	2.03513	2.0376	0.1503	0.0445	0.17406	0	
157	21/04/2021 12:36:26	356.55225	338.39432	2.03509	2.0374	0.1502	0.0458	0.17406	0	
158	21/04/2021 12:36:56	356.49164	338.36545	2.03505	2.0374	0.1502	0.0471	0.17406	0	
159	21/04/2021 12:37:27	356.46997	338.37222	2.03494	2.0374	0.1502	0.0483	0.17406	0	
160	21/04/2021 12:37:58	356.44074	338.35349	2.03492	2.0373	0.1503	0.0497	0.17406	0	
161	21/04/2021 12:38:28	356.45139	338.34992	2.03484	2.0373	0.1502	0.0509	0.17406	0	
162	21/04/2021 12:38:59	356.44101	338.34305	2.03473	2.0373	0.1502	0.0522	0.17406	0	
163	21/04/2021 12:39:30	356.44006	338.32776	2.03474	2.0371	0.1502	0.0534	0.17406	0	
164	21/04/2021 12:40:01	356.43597	338.3201	2.03465	2.0371	0.1502	0.0547	0.17406	0	
165	21/04/2021 12:40:31	356.43555	338.33041	2.03459	2.0371	0.1502	0.056	0.17406	0	
166	21/04/2021 12:41:02	356.44977	338.32324	2.03453	2.0369	0.1502	0.0573	0.17406	0	
167	21/04/2021 12:41:33	356.42917	338.30966	2.0345	2.0369	0.1502	0.0586	0.17406	0	
168	21/04/2021 12:42:04	356.4147	338.30582	2.03443	2.0369	0.1502	0.0599	0.17406	0	
169	21/04/2021 12:42:36	356.40826	338.29932	2.03439	2.0368	0.1502	0.0612	0.17406	0	
170	21/04/2021 12:43:06	356.41565	338.31033	2.03432	2.0368	0.1502	0.0625	0.17406	0	
171	21/04/2021 12:43:37	356.40512	338.28903	2.03429	2.0368	0.1502	0.0638	0.17406	0	
172	21/04/2021 12:44:07	356.40787	338.27393	2.03424	2.0366	0.1502	0.065	0.17406	0	
173	21/04/2021 12:44:38	356.41116	338.26651	2.03415	2.0366	0.1502	0.0663	0.17406	0	
174	21/04/2021 12:45:09	356.41168	338.28491	2.03409	2.0366	0.1502	0.0676	0.17406	0	
175	21/04/2021 12:45:39	356.40228	338.26828	2.03402	2.0365	0.1502	0.0689	0.17406	0	
176	21/04/2021 12:46:10	356.39911	338.26154	2.03403	2.0365	0.1502	0.0701	0.17406	0	
177	21/04/2021 12:46:40	356.37445	338.25452	2.03401	2.0365	0.1502	0.0714	0.17406	0	
178	21/04/2021 12:47:11	356.38196	338.2514	2.03391	2.0363	0.1502	0.0727	0.17406	0	
179	21/04/2021 12:47:42	356.38602	338.26978	2.03385	2.0363	0.1502	0.074	0.17406	0	
180	21/04/2021 12:48:13	356.37116	338.25482	2.03384	2.0362	0.1502	0.0753	0.17406	0	
181	21/04/2021 12:48:44	356.38019	338.25317	2.03377	2.0362	0.1502	0.0766	0.17406	0	
182	21/04/2021 12:49:14	356.35794	338.2522	2.03375	2.0362	0.1502	0.0778	0.17406	0	
183	21/04/2021 12:49:45	356.35004	338.23352	2.03367	2.036	0.1502	0.0791	0.17406	0	
184	21/04/2021 12:50:15	356.34903	338.23251	2.03364	2.036	0.1503	0.0804	0.17406	0	
185	21/04/2021 12:50:46	356.33716	338.21698	2.0336	2.036	0.1502	0.0817	0.17406	0	
186	21/04/2021 12:51:16	356.35419	338.23059	2.03355	2.036	0.1502	0.0829	0.17406	0	
187	21/04/2021 12:51:47	356.35336	338.22977	2.03345	2.0358	0.1502	0.0842	0.17406	0	
188	21/04/2021 12:52:18	356.34589	338.21149	2.03342	2.0358	0.1502	0.0855	0.17406	0	
189	21/04/2021 12:52:48	356.34604	338.22592	2.03335	2.0357	0.1502	0.0868	0.17406	0	
190	21/04/2021 12:53:19	356.33511	338.20065	2.03332	2.0357	0.1502	0.0881	0.17406	0	
191	21/04/2021 12:53:50	356.32816	338.19003	2.03325	2.0357	0.1502	0.0894	0.17406	0	
192	21/04/2021 12:54:21	356.32855	338.20474	2.03325	2.0355	0.1502	0.0906	0.17406	0	

Appendix 6 - 1st discharge cycle

Comments	Appendix 6 - 1st discharge cycle									
F(x)=										
Long Name	Time	TC1	TC3	Cell Voltag	NaS Cell Volta	Load Curre	Cell Current	Impedance	Z Check?	
Units				V	V	A	Ah	Z-Ohms		
385	21/04/2021 14:32:42	355.99371	337.89609	1.99992	2.0033	0.2501	0.0577	0.17006	0	
386	21/04/2021 14:33:13	355.99182	337.90131	1.99982	2.0032	0.2501	0.0598	0.17006	0	
387	21/04/2021 14:33:44	355.96509	337.89584	1.99971	2.0032	0.2501	0.062	0.17006	0	
388	21/04/2021 14:34:15	355.94473	337.88605	1.99961	2.003	0.2501	0.0641	0.17006	0	
389	21/04/2021 14:34:46	355.86411	337.8656	1.99951	2.003	0.2501	0.0663	0.17006	0	
390	21/04/2021 14:35:17	355.87515	337.87671	1.99944	2.0028	0.2501	0.0684	0.17006	0	
391	21/04/2021 14:35:47	356.02878	337.90997	1.99923	2.0027	0.2501	0.0705	0.17006	0	
392	21/04/2021 14:36:18	356.01871	337.88553	1.99917	2.0027	0.2501	0.0727	0.17006	0	
393	21/04/2021 14:36:49	355.96982	337.88635	1.99907	2.0025	0.2501	0.0748	0.17006	0	
394	21/04/2021 14:37:20	356.04846	337.91193	1.99895	2.0024	0.2501	0.077	0.17006	0	
395	21/04/2021 14:37:51	356.0958	337.90601	1.99881	2.0022	0.2501	0.0791	0.17006	0	
396	21/04/2021 14:38:22	356.05078	337.88565	1.99874	2.0021	0.2501	0.0813	0.17006	0	
397	21/04/2021 14:38:52	356.0022	337.87961	1.99859	2.0021	0.2501	0.0834	0.17006	0	
398	21/04/2021 14:39:23	355.97189	337.86697	1.99852	2.0019	0.2501	0.0855	0.17006	0	
399	21/04/2021 14:39:54	355.95664	337.88733	1.99835	2.0018	0.2501	0.0877	0.17006	0	
400	21/04/2021 14:40:25	355.97748	337.89407	1.99827	2.0018	0.2501	0.0898	0.17006	0	
401	21/04/2021 14:40:56	355.95105	337.88528	1.99816	2.0016	0.2501	0.092	0.17006	0	
402	21/04/2021 14:41:27	355.9501	337.90216	1.99801	2.0014	0.2501	0.0941	0.17006	0	
403	21/04/2021 14:41:58	355.98175	337.90192	1.99792	2.0014	0.2501	0.0963	0.17006	0	
404	21/04/2021 14:42:29	355.98779	337.90799	1.99784	2.0013	0.2501	0.0984	0.17006	0	
405	21/04/2021 14:43:00	355.96539	337.88184	1.99773	2.0011	0.2501	0.1006	0.17006	0	
406	21/04/2021 14:43:31	355.96375	337.89096	1.99763	2.0011	0.2501	0.1027	0.17006	0	
407	21/04/2021 14:44:02	355.96881	337.88532	1.99755	2.001	0.2501	0.1049	0.17006	0	
408	21/04/2021 14:44:33	355.96704	337.87637	1.99742	2.001	0.2501	0.107	0.17006	0	
409	21/04/2021 14:45:04	355.97183	337.8812	1.99732	2.0008	0.2501	0.1092	0.17006	0	
410	21/04/2021 14:45:35	355.9729	337.86441	1.99719	2.0007	0.2501	0.1114	0.17006	0	
411	21/04/2021 14:46:06	355.9534	337.86621	1.99711	2.0007	0.2501	0.1135	0.17006	0	
412	21/04/2021 14:46:37	355.97247	337.88901	1.99695	2.0005	0.2501	0.1157	0.17006	0	
413	21/04/2021 14:47:08	355.96735	337.88022	1.99691	2.0003	0.2501	0.1178	0.17006	0	
414	21/04/2021 14:47:39	355.97797	337.89453	1.99676	2.0002	0.2501	0.12	0.17006	0	
415	21/04/2021 14:48:10	355.96393	337.8804	1.99671	2.0002	0.2501	0.1221	0.17006	0	
416	21/04/2021 14:48:41	355.9837	337.9003	1.99663	2	0.2501	0.1243	0.17006	0	
417	21/04/2021 14:49:12	355.98511	337.89813	1.99651	2	0.2501	0.1264	0.17006	0	
418	21/04/2021 14:49:43	355.97327	337.89691	1.99641	1.9999	0.2501	0.1286	0.17006	0	
419	21/04/2021 14:50:13	356.03207	337.92755	1.99633	1.9997	0.2501	0.1307	0.17006	0	
420	21/04/2021 14:50:44	356.05771	337.93195	1.99622	1.9997	0.2501	0.1328	0.17006	0	
421	21/04/2021 14:51:15	356.05484	337.92194	1.99613	1.9996	0.2501	0.135	0.17006	0	
422	21/04/2021 14:51:46	355.94663	337.87726	1.99605	1.9994	0.2501	0.1371	0.17006	0	
423	21/04/2021 14:52:17	355.88071	337.86087	1.99591	1.9994	0.2501	0.1393	0.17006	0	
424	21/04/2021 14:52:48	355.89301	337.86255	1.99582	1.9992	0.2501	0.1415	0.17006	0	
425	21/04/2021 14:53:19	356.02603	337.93225	1.99568	1.9991	0.2501	0.1436	0.17006	0	
426	21/04/2021 14:53:50	356.09143	337.93732	1.99557	1.9991	0.2501	0.1457	0.17006	0	
427	21/04/2021 14:54:21	356.01502	337.91394	1.99554	1.9989	0.2501	0.1479	0.17006	0	
428	21/04/2021 14:54:52	355.94733	337.88156	1.99539	1.9988	0.2501	0.1501	0.17006	0	
429	21/04/2021 14:55:23	355.84418	337.85269	1.99529	1.9988	0.2501	0.1522	0.17006	0	
430	21/04/2021 14:55:54	355.85483	337.85269	1.99516	1.9986	0.2501	0.1544	0.17006	0	
431	21/04/2021 14:56:25	355.89008	337.88101	1.99503	1.9985	0.2501	0.1565	0.17006	0	
432	21/04/2021 14:56:55	355.97113	337.90549	1.99493	1.9985	0.2501	0.1586	0.17006	0	
433	21/04/2021 14:57:26	355.93863	337.86209	1.99486	1.9983	0.2501	0.1608	0.17006	0	
434	21/04/2021 14:57:57	356.01929	337.90399	1.99471	1.9982	0.2501	0.1629	0.17006	0	
435	21/04/2021 14:58:28	356.02911	337.89603	1.99464	1.9982	0.2501	0.1651	0.17006	0	
436	21/04/2021 14:58:59	356.04196	337.90897	1.99455	1.998	0.2501	0.1672	0.17006	0	
437	21/04/2021 14:59:30	356.01221	337.89685	1.9944	1.9978	0.2501	0.1694	0.17006	0	
438	21/04/2021 15:00:01	355.94714	337.87778	1.99428	1.9978	0.2501	0.1715	0.17006	0	
439	21/04/2021 15:00:32	355.98593	337.89539	1.99417	1.9977	0.2501	0.1737	0.17006	0	
440	21/04/2021 15:01:03	355.99994	337.90595	1.99411	1.9977	0.2501	0.1758	0.17006	0	
441	21/04/2021 15:01:34	356.02441	337.91272	1.99399	1.9975	0.2501	0.178	0.17006	0	
442	21/04/2021 15:02:05	356.01691	337.91229	1.99386	1.9974	0.2501	0.1801	0.17006	0	
443	21/04/2021 15:02:36	356.01569	337.92893	1.99371	1.9972	0.2501	0.1823	0.17006	0	
444	21/04/2021 15:03:07	356.00299	337.91614	1.99368	1.9972	0.2501	0.1844	0.17006	0	
445	21/04/2021 15:03:38	356.00473	337.92862	1.99355	1.9971	0.2501	0.1866	0.17006	0	
446	21/04/2021 15:04:09	356.00748	337.91708	1.99342	1.9969	0.2501	0.1888	0.17006	0	
447	21/04/2021 15:04:40	356.02045	337.93375	1.99336	1.9967	0.2501	0.1909	0.17006	0	
448	21/04/2021 15:05:11	355.99155	337.90817	1.99323	1.9967	0.2501	0.1931	0.17006	0	

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Comments	Appendix 6 - 1st discharge cycle									
F(x)=										
Long Name	Time	TC1	TC3	Cell Voltag	NaS Cell Volta	Load Curre	Cell Current	Impedance	Z Check?	
Units				V	V	A	Ah	Z-Ohms		
513	21/04/2021 15:38:20	355.94959	337.88022	1.98671	1.9902	0.2501	0.0791	0.17109	0	
514	21/04/2021 15:38:51	355.96637	337.88281	1.98662	1.99	0.2501	0.0813	0.17109	0	
515	21/04/2021 15:39:22	355.96225	337.87512	1.98653	1.99	0.2501	0.0834	0.17109	0	
516	21/04/2021 15:39:52	355.95337	337.88046	1.98637	1.9899	0.2501	0.0855	0.17109	0	
517	21/04/2021 15:40:23	355.94574	337.87991	1.98626	1.9897	0.2501	0.0877	0.17109	0	
518	21/04/2021 15:40:54	355.98227	337.88101	1.98612	1.9897	0.2501	0.0898	0.17109	0	
519	21/04/2021 15:41:25	355.97968	337.8891	1.98607	1.9896	0.2501	0.092	0.17109	0	
520	21/04/2021 15:41:56	355.93399	337.85736	1.98592	1.9894	0.2501	0.0941	0.17109	0	
521	21/04/2021 15:42:27	355.92728	337.85419	1.98583	1.9894	0.2501	0.0963	0.17109	0	
522	21/04/2021 15:42:59	355.84226	337.81143	1.98572	1.9892	0.2501	0.0985	0.17109	0	
523	21/04/2021 15:43:29	355.76785	337.7901	1.98566	1.9891	0.2501	0.1006	0.17109	0	
524	21/04/2021 15:44:00	355.9028	337.84384	1.98551	1.9889	0.2501	0.1028	0.17109	0	
525	21/04/2021 15:44:31	355.93201	337.83395	1.98541	1.9889	0.2501	0.1049	0.17109	0	
526	21/04/2021 15:45:02	355.82709	337.78546	1.98529	1.9888	0.2501	0.107	0.17109	0	
527	21/04/2021 15:45:33	355.76389	337.78253	1.98517	1.9886	0.2501	0.1092	0.17109	0	
528	21/04/2021 15:46:04	355.83295	337.81992	1.98511	1.9886	0.2501	0.1114	0.17109	0	
529	21/04/2021 15:46:35	355.94757	337.84607	1.98498	1.9885	0.2501	0.1135	0.17109	0	
530	21/04/2021 15:47:06	356.03775	337.86182	1.98485	1.9883	0.2501	0.1157	0.17109	0	
531	21/04/2021 15:47:37	356.0687	337.87872	1.98478	1.9881	0.2501	0.1178	0.17109	0	
532	21/04/2021 15:48:08	356.11716	337.89539	1.9847	1.9881	0.2501	0.12	0.17109	0	
533	21/04/2021 15:48:39	356.10815	337.88986	1.9845	1.988	0.2501	0.1221	0.17109	0	
534	21/04/2021 15:49:10	356.00308	337.85547	1.98442	1.9878	0.2501	0.1243	0.17109	0	
535	21/04/2021 15:49:41	355.95834	337.86044	1.98433	1.9877	0.2501	0.1264	0.17109	0	
536	21/04/2021 15:50:12	355.94586	337.86932	1.9842	1.9877	0.2501	0.1286	0.17109	0	
537	21/04/2021 15:50:43	355.90085	337.8526	1.98407	1.9875	0.2501	0.1307	0.17109	0	
538	21/04/2021 15:51:14	355.922	337.85242	1.98401	1.9874	0.2501	0.1329	0.17109	0	
539	21/04/2021 15:51:45	355.95105	337.85669	1.98386	1.9872	0.2501	0.135	0.17109	0	
540	21/04/2021 15:52:16	355.91614	337.84296	1.98378	1.9872	0.2501	0.1372	0.17109	0	
541	21/04/2021 15:52:47	355.89838	337.85724	1.98362	1.987	0.2501	0.1394	0.17109	0	
542	21/04/2021 15:53:18	355.90259	337.84363	1.98349	1.9869	0.2501	0.1415	0.17109	0	
543	21/04/2021 15:53:49	355.9213	337.85175	1.98331	1.9867	0.2501	0.1437	0.17109	0	
544	21/04/2021 15:54:20	355.93671	337.86014	1.9832	1.9866	0.2501	0.1458	0.17109	0	
545	21/04/2021 15:54:51	355.94202	337.83688	1.9831	1.9866	0.2501	0.148	0.17109	0	
546	21/04/2021 15:55:22	355.93317	337.8458	1.98301	1.9864	0.2501	0.1501	0.17109	0	
547	21/04/2021 15:55:53	355.93546	337.84457	1.98289	1.9863	0.2501	0.1523	0.17109	0	
548	21/04/2021 15:56:24	355.87473	337.80127	1.98274	1.9861	0.2501	0.1544	0.17109	0	
549	21/04/2021 15:56:55	355.84174	337.80734	1.98265	1.9861	0.2501	0.1566	0.17109	0	
550	21/04/2021 15:57:26	355.87662	337.82108	1.98253	1.986	0.2501	0.1587	0.17109	0	
551	21/04/2021 15:57:57	355.86993	337.78928	1.9824	1.9858	0.2501	0.1609	0.17109	0	
552	21/04/2021 15:58:28	355.81986	337.78888	1.98232	1.9858	0.2501	0.163	0.17109	0	
553	21/04/2021 15:58:59	355.74155	337.76001	1.98221	1.9856	0.2501	0.1652	0.17109	0	
554	21/04/2021 15:59:30	355.82983	337.80606	1.98211	1.9855	0.2501	0.1674	0.17109	0	
555	21/04/2021 16:00:01	355.95459	337.84595	1.98195	1.9855	0.2501	0.1695	0.17109	0	
556	21/04/2021 16:00:32	356.01242	337.84345	1.98183	1.9853	0.2501	0.1717	0.17109	0	
557	21/04/2021 16:01:03	356.02374	337.84415	1.98172	1.9852	0.2501	0.1738	0.17109	0	
558	21/04/2021 16:01:34	356.00684	337.83783	1.98161	1.985	0.2501	0.176	0.17109	0	
559	21/04/2021 16:02:05	355.97656	337.83594	1.98152	1.985	0.2501	0.1781	0.17109	0	
560	21/04/2021 16:02:36	355.98169	337.84827	1.9814	1.9849	0.2501	0.1803	0.17109	0	
561	21/04/2021 16:03:07	355.96509	337.84583	1.98132	1.9847	0.2501	0.1824	0.17109	0	
562	21/04/2021 16:03:38	355.96036	337.82675	1.98115	1.9847	0.2501	0.1846	0.17109	0	
563	21/04/2021 16:04:09	355.96591	337.82877	1.98107	1.9845	0.2501	0.1867	0.17109	0	
564	21/04/2021 16:04:40	355.98792	337.85092	1.98094	1.9844	0.2501	0.1889	0.17109	0	
565	21/04/2021 16:05:11	355.96002	337.83716	1.98083	1.9844	0.2501	0.191	0.17109	0	
566	21/04/2021 16:05:42	355.93247	337.83798	1.98075	1.9842	0.2501	0.1932	0.17109	0	
567	21/04/2021 16:06:13	355.94028	337.84583	1.98063	1.9841	0.2501	0.1954	0.17109	0	
568	21/04/2021 16:06:44	355.9483	337.84677	1.98046	1.9839	0.2501	0.1975	0.17109	0	
569	21/04/2021 16:07:15	355.97424	337.87286	1.98036	1.9838	0.2501	0.1997	0.17109	0	
570	21/04/2021 16:07:46	355.93277	337.83469	1.98026	1.9838	0.2501	0.2018	0.17109	0	
571	21/04/2021 16:08:17	355.91937	337.83551	1.98019	1.9836	0.2501	0.204	0.17109	0	
572	21/04/2021 16:08:48	355.94562	337.83334	1.98008	1.9836	0.2501	0.2061	0.17109	0	
573	21/04/2021 16:09:19	355.93277	337.83472	1.97995	1.9835	0.2501	0.2083	0.17109	0	
574	21/04/2021 16:09:50	355.93033	337.85724	1.97989	1.9833	0.2501	0.2104	0.17109	0	
575	21/04/2021 16:10:21	355.90823	337.82425	1.97975	1.9831	0.2501	0.2126	0.17109	0	
576	21/04/2021 16:10:52	355.91519	337.80627	1.97964	1.9831	0.2501	0.2147	0.17109	0	

Comments	Appendix 6 - 1st discharge cycle									
F(x)=										
Long Name	Time	TC1	TC3	Cell Voltag	NaS Cell Volta	Load Curre	Cell Current	Impedance	Z Check?	
Units				V	V	A	Ah	Z-Ohms		
577	21/04/2021 16:11:23	355.9249	337.83749	1.97952	1.983	0.2501	0.2169	0.17109	0	
578	21/04/2021 16:11:54	355.92419	337.81894	1.97939	1.9828	0.2501	0.219	0.17109	0	
579	21/04/2021 16:12:25	355.92642	337.82831	1.97927	1.9827	0.2501	0.2212	0.17109	0	
580	21/04/2021 16:12:56	355.94263	337.86249	1.97915	1.9827	0.2501	0.2234	0.17109	0	
581	21/04/2021 16:13:27	355.92682	337.8251	1.97903	1.9825	0.2501	0.2255	0.17109	0	
582	21/04/2021 16:13:58	355.9361	337.82376	1.97896	1.9824	0.2501	0.2277	0.17109	0	
583	21/04/2021 16:14:29	355.93774	337.8183	1.97885	1.9824	0.2501	0.2298	0.17109	0	
584	21/04/2021 16:15:00	355.95834	337.84619	1.97867	1.9822	0.2501	0.232	0.17109	0	
585	21/04/2021 16:15:31	355.95303	337.83008	1.9786	1.982	0.2501	0.2341	0.17109	0	
586	21/04/2021 16:16:02	355.94788	337.84274	1.97849	1.982	0.2501	0.2363	0.17109	0	
587	21/04/2021 16:16:33	355.94266	337.85181	1.97838	1.9819	0.2501	0.2384	0.17109	0	
588	21/04/2021 16:17:04	355.94376	337.84937	1.97822	1.9817	0.2501	0.2406	0.17109	0	
589	21/04/2021 16:17:35	355.93353	337.85333	1.97816	1.9816	0.2501	0.2427	0.17109	0	
590	21/04/2021 16:18:06	355.92984	337.84247	1.97807	1.9816	0.2501	0.2449	0.17109	0	
591	21/04/2021 16:18:37	355.94733	337.85651	1.97791	1.9814	0.2501	0.247	0.17109	0	
592	21/04/2021 16:19:08	355.94772	337.84976	1.97781	1.9813	0.2501	0.2492	0.17109	0	
593	21/04/2021 16:19:39	355.96201	337.86417	2.02293	1.9813	0.2501	0.2492	0.17109	0	
594	21/04/2021 16:19:47	0	0					0.16658	1	

Appendix 7 - 2nd discharge cycle

Time	TC1	TC3	Cell Voltag V	NaS Cell Voltage V	Discharge C A	Cell Current Ah	Impedance Z-Ohms	Z Check?
21/04/2021 16:25:00	0	0					0.16658	1
21/04/2021 16:25:31	355.94513	337.72208	2.01128	2.0132	0.1002	7E-4	0.16658	0
21/04/2021 16:26:01	355.94019	337.72424	2.01065	2.0125	0.1002	0.0015	0.16658	0
21/04/2021 16:26:32	355.92819	337.71933	2.01023	2.0121	0.1002	0.0024	0.16658	0
21/04/2021 16:27:02	355.9335	337.72107	2.0099	2.0118	0.1002	0.0032	0.16658	0
21/04/2021 16:27:33	355.92465	337.71216	2.00964	2.0114	0.1002	0.0041	0.16658	0
21/04/2021 16:28:03	355.95834	337.73181	2.00939	2.0113	0.1002	0.0049	0.16658	0
21/04/2021 16:28:34	355.95767	337.74185	2.00923	2.011	0.1002	0.0058	0.16658	0
21/04/2021 16:29:04	355.95804	337.74579	2.00908	2.0108	0.1002	0.0066	0.16658	0
21/04/2021 16:29:35	355.95068	337.72769	2.00892	2.0107	0.1002	0.0075	0.16658	0
21/04/2021 16:30:05	355.94003	337.74554	2.00876	2.0105	0.1002	0.0083	0.16658	0
21/04/2021 16:30:36	355.94046	337.74237	2.00865	2.0105	0.1002	0.0092	0.16658	0
21/04/2021 16:31:06	355.95795	337.7457	2.00858	2.0104	0.1002	0.01	0.16658	0
21/04/2021 16:31:37	355.95013	337.75214	2.00845	2.0102	0.1002	0.0109	0.16658	0
21/04/2021 16:32:07	355.94986	337.74469	2.00836	2.0102	0.1002	0.0117	0.16658	0
21/04/2021 16:32:38	355.9458	337.75134	2.00829	2.01	0.1002	0.0126	0.16658	0
21/04/2021 16:33:08	355.95615	337.76892	2.00817	2.01	0.1002	0.0134	0.16658	0
21/04/2021 16:33:39	355.9624	337.7609	2.00811	2.0099	0.1002	0.0143	0.16658	0
21/04/2021 16:34:09	355.95435	337.75638	2.00798	2.0099	0.1002	0.0151	0.16658	0
21/04/2021 16:34:39	355.95697	337.77689	2.00794	2.0097	0.1002	0.016	0.16658	0
21/04/2021 16:35:10	355.95587	337.76505	2.00784	2.0097	0.1002	0.0168	0.16658	0
21/04/2021 16:35:40	355.95734	337.76654	2.00783	2.0096	0.1002	0.0176	0.16658	0
21/04/2021 16:36:11	355.95218	337.76492	2.00771	2.0096	0.1002	0.0185	0.16658	0
21/04/2021 16:36:41	355.95541	337.76459	2.00768	2.0094	0.1002	0.0193	0.16658	0
21/04/2021 16:37:12	355.94507	337.75418	2.00761	2.0094	0.1002	0.0202	0.16658	0
21/04/2021 16:37:43	355.94098	337.74649	2.00754	2.0094	0.1002	0.0211	0.16658	0
21/04/2021 16:38:14	355.95093	337.7565	2.00751	2.0093	0.1002	0.0219	0.16658	0
21/04/2021 16:38:44	355.94794	337.77136	2.00741	2.0093	0.1002	0.0228	0.16658	0
21/04/2021 16:39:15	355.94476	337.75745	2.00736	2.0093	0.1002	0.0236	0.16658	0
21/04/2021 16:39:45	355.94098	337.75363	2.00734	2.0091	0.1002	0.0245	0.16658	0
21/04/2021 16:40:16	355.92596	337.76352	2.00725	2.0091	0.1002	0.0253	0.16658	0
21/04/2021 16:40:46	355.92905	337.76309	2.00724	2.0089	0.1002	0.0262	0.16658	0
21/04/2021 16:41:17	355.93292	337.74554	2.00717	2.0089	0.1002	0.027	0.16658	0
21/04/2021 16:41:47	355.94327	337.75952	2.00708	2.0089	0.1002	0.0279	0.16658	0
21/04/2021 16:42:18	355.93262	337.75235	2.00712	2.0088	0.1002	0.0287	0.16658	0
21/04/2021 16:42:48	355.94928	337.76917	2.00699	2.0088	0.1002	0.0296	0.16658	0
21/04/2021 16:43:19	355.95844	337.78552	2.00698	2.0088	0.1002	0.0304	0.16658	0
21/04/2021 16:43:50	355.93588	337.76282	2.0069	2.0088	0.1002	0.0313	0.16658	0
21/04/2021 16:44:20	355.93835	337.76172	2.00688	2.0086	0.1002	0.0321	0.16658	0
21/04/2021 16:44:51	355.94043	337.76019	2.00683	2.0086	0.1002	0.033	0.16658	0
21/04/2021 16:45:21	355.95609	337.7724	2.00675	2.0086	0.1002	0.0338	0.16658	0
21/04/2021 16:45:52	355.95474	337.77106	2.00671	2.0085	0.1002	0.0347	0.16658	0
21/04/2021 16:46:22	355.95062	337.7598	2.00671	2.0085	0.1002	0.0355	0.16658	0
21/04/2021 16:46:53	355.95352	337.75913	2.00664	2.0085	0.1002	0.0364	0.16658	0
21/04/2021 16:47:23	355.92645	337.76047	2.00657	2.0083	0.1002	0.0372	0.16658	0
21/04/2021 16:47:54	355.92426	337.77255	2.00655	2.0083	0.1002	0.0381	0.16658	0
21/04/2021 16:48:24	355.9285	337.76965	2.00651	2.0083	0.1002	0.0389	0.16658	0
21/04/2021 16:48:55	355.94009	337.78134	2.00644	2.0083	0.1002	0.0398	0.16658	0
21/04/2021 16:49:25	355.94556	337.75824	2.00641	2.0082	0.1002	0.0406	0.16658	0
21/04/2021 16:49:56	355.93753	337.73587	2.00635	2.0082	0.1002	0.0415	0.16658	0
21/04/2021 16:50:26	355.92944	337.75275	2.00631	2.0082	0.1002	0.0423	0.16658	0
21/04/2021 16:50:57	355.93451	337.76498	2.00626	2.008	0.1002	0.0432	0.16658	0
21/04/2021 16:51:27	355.93616	337.75586	2.00623	2.008	0.1002	0.044	0.16658	0
21/04/2021 16:51:58	355.95563	337.75769	2.00618	2.008	0.1002	0.0449	0.16658	0
21/04/2021 16:52:28	355.94962	337.76947	2.00615	2.0079	0.1002	0.0457	0.16658	0
21/04/2021 16:52:59	355.96149	337.76358	2.0061	2.0079	0.1002	0.0466	0.16658	0
21/04/2021 16:53:29	355.94824	337.76096	2.00601	2.0079	0.1002	0.0474	0.16658	0
21/04/2021 16:54:00	355.96039	337.78033	2.006	2.0079	0.1002	0.0483	0.16658	0
21/04/2021 16:54:30	355.96558	337.76764	2.00597	2.0077	0.1002	0.0491	0.16658	0
21/04/2021 16:55:01	355.96314	337.76877	2.0059	2.0077	0.1002	0.05	0.16658	0
21/04/2021 16:55:31	355.89258	337.71918	2.00584	2.0077	0.1002	0.0508	0.16658	0
21/04/2021 16:56:02	355.78723	337.72028	2.00581	2.0077	0.1002	0.0517	0.16658	0

Appendix 7 - 2nd discharge cycle

Time		TC1	TC3	Cell Voltag V	NaS Cell Voltage V	Discharge C A	Cell Current Ah	Impedance Z-Ohms	Z Check?
21/04/2021 16:56:32		355.83139	337.71832	2.00576	2.0075	0.1002	0.0525	0.16658	0
21/04/2021 16:57:03		355.96814	337.77741	2.00574	2.0075	0.1002	0.0534	0.16658	0
21/04/2021 16:57:33		355.99844	337.77933	2.00569	2.0075	0.1002	0.0542	0.16658	0
21/04/2021 16:58:04		355.99692	337.77066	2.00565	2.0074	0.1002	0.0551	0.16658	0
21/04/2021 16:58:34		355.97055	337.77271	2.00563	2.0074	0.1002	0.0559	0.16658	0
21/04/2021 16:59:05		355.95132	337.73908	2.00554	2.0074	0.1002	0.0567	0.16658	0
21/04/2021 16:59:35		355.92911	337.73816	2.00549	2.0074	0.1002	0.0576	0.16658	0
21/04/2021 17:00:06		355.91724	337.73685	2.00546	2.0072	0.1002	0.0584	0.16658	0
21/04/2021 17:00:36		355.92307	337.75348	2.00543	2.0072	0.1002	0.0593	0.16658	0
21/04/2021 17:01:07		355.91492	337.73813	2.00539	2.0072	0.1002	0.0601	0.16658	0
21/04/2021 17:01:37		355.90714	337.73029	2.00534	2.0071	0.1002	0.061	0.16658	0
21/04/2021 17:02:08		355.90179	337.71771	2.00529	2.0071	0.1002	0.0618	0.16658	0
21/04/2021 17:02:38		355.9213	337.74097	2.00529	2.0071	0.1002	0.0627	0.16658	0
21/04/2021 17:03:09		355.90918	337.72162	2.00521	2.0071	0.1002	0.0635	0.16658	0
21/04/2021 17:03:39		355.90836	337.72434	2.00514	2.0069	0.1002	0.0644	0.16658	0
21/04/2021 17:04:10		355.89331	337.72351	2.00514	2.0069	0.1002	0.0652	0.16658	0
21/04/2021 17:04:40		355.89917	337.72943	2.00508	2.0069	0.1002	0.0661	0.16658	0
21/04/2021 17:05:11		355.89877	337.729	2.00502	2.0068	0.1002	0.0669	0.16658	0
21/04/2021 17:05:41		355.90533	337.7356	2.00503	2.0068	0.1002	0.0678	0.16658	0
21/04/2021 17:06:12		355.90082	337.72034	2.00495	2.0068	0.1002	0.0686	0.16658	0
21/04/2021 17:06:42		355.91351	337.73669	2.00493	2.0068	0.1002	0.0695	0.16658	0
21/04/2021 17:07:13		355.91489	337.74164	2.00493	2.0066	0.1002	0.0703	0.16658	0
21/04/2021 17:07:44		355.91977	337.74661	2.00484	2.0066	0.1002	0.0712	0.16658	0
21/04/2021 17:08:14		355.918	337.7269	2.0048	2.0066	0.1002	0.0721	0.16658	0
21/04/2021 17:08:45		355.92291	337.73898	2.00481	2.0066	0.1002	0.0729	0.16658	0
21/04/2021 17:09:15		355.90241	337.72553	2.00471	2.0064	0.1002	0.0737	0.16658	0
21/04/2021 17:09:46		355.89969	337.72275	2.00468	2.0064	0.1002	0.0746	0.16658	0
21/04/2021 17:10:16		355.92221	337.73474	2.00466	2.0064	0.1002	0.0754	0.16658	0
21/04/2021 17:10:47		355.90622	337.73651	2.0046	2.0063	0.1002	0.0763	0.16658	0
21/04/2021 17:11:17		355.9083	337.7457	2.00458	2.0063	0.1002	0.0771	0.16658	0
21/04/2021 17:11:48		355.9147	337.73431	2.00454	2.0063	0.1002	0.078	0.16658	0
21/04/2021 17:12:18		355.91498	337.72745	2.00447	2.0061	0.1002	0.0788	0.16658	0
21/04/2021 17:12:49		355.91754	337.72287	2.00441	2.0061	0.1002	0.0797	0.16658	0
21/04/2021 17:13:20		355.89899	337.69708	2.00436	2.0061	0.1002	0.0806	0.16658	0
21/04/2021 17:13:51		355.89749	337.7027	2.00437	2.0061	0.1002	0.0814	0.16658	0
21/04/2021 17:14:21		355.90991	337.72949	2.00425	2.006	0.1002	0.0823	0.16658	0
21/04/2021 17:14:52		355.91492	337.72742	2.00421	2.006	0.1002	0.0831	0.16658	0
21/04/2021 17:15:22		355.9238	337.73993	2.00423	2.006	0.1002	0.0839	0.16658	0
21/04/2021 17:15:53		355.87958	337.72043	2.00415	2.0058	0.1002	0.0848	0.16658	0
21/04/2021 17:16:24		355.86334	337.69333	2.00412	2.0058	0.1002	0.0857	0.16658	0
21/04/2021 17:16:54		355.82941	337.69486	2.00408	2.0058	0.1002	0.0865	0.16658	0
21/04/2021 17:17:25		355.80902	337.67432	2.00399	2.0057	0.1002	0.0874	0.16658	0
21/04/2021 17:17:55		355.88794	337.69659	2.00397	2.0057	0.1002	0.0882	0.16658	0
21/04/2021 17:18:26		355.8894	337.70169	2.00391	2.0057	0.1002	0.0891	0.16658	0
21/04/2021 17:18:57		355.85172	337.67444	2.00384	2.0057	0.1002	0.0899	0.16658	0
21/04/2021 17:19:27		355.86768	337.67981	2.00378	2.0055	0.1002	0.0908	0.16658	0
21/04/2021 17:19:58		355.88351	337.68503	2.00373	2.0055	0.1002	0.0916	0.16658	0
21/04/2021 17:20:28		355.88843	337.69	2.00369	2.0055	0.1002	0.0925	0.16658	0
21/04/2021 17:20:59		355.93674	337.71362	2.0036	2.0053	0.1002	0.0933	0.16658	0
21/04/2021 17:21:29		355.93524	337.68353	2.00362	2.0053	0.1002	0.0942	0.16658	0
21/04/2021 17:22:00		355.91217	337.68533	2.00362	2.0053	0.1002	0.095	0.16658	0
21/04/2021 17:22:31		355.89661	337.70181	2.00354	2.0053	0.1002	0.0959	0.16658	0
21/04/2021 17:23:01		355.86685	337.6933	2.00347	2.0052	0.1002	0.0967	0.16658	0
21/04/2021 17:23:32		355.86957	337.6853	2.0034	2.0052	0.1002	0.0976	0.16658	0
21/04/2021 17:24:02		355.85864	337.66715	2.00335	2.0052	0.1002	0.0984	0.16658	0
21/04/2021 17:24:33		355.85904	337.66754	2.00336	2.005	0.1002	0.0993	0.16658	0
21/04/2021 17:25:04		355.84204	337.66113	2.00325	2.005	0.1002	0.1001	0.16658	0
21/04/2021 17:25:34		355.82184	337.65863	2.02138	2.0221	0.1002	0.1002	0.16658	0
21/04/2021 17:26:05		355.83057	337.64603	2.02155	2.0222	0.1002	0.1002	0.16658	0
21/04/2021 17:26:12		0	0	1.99446	1.9967	0.1502	0.001	0.16734	1
21/04/2021 17:26:43		355.87177	337.65533	1.99446	1.9967	0.1502	0.001	0.16734	0
21/04/2021 17:27:13		355.80585	337.61401	1.99416	1.9966	0.1502	0.0023	0.16734	0

Appendix 7 - 2nd discharge cycle

Time		TC1	TC3	Cell Voltag V	NaS Cell Voltage V	Discharge C A	Cell Current Ah	Impedance Z-Ohms	Z Check?
21/04/2021 17:27:44		355.74338	337.61536	1.99401	1.9964	0.1502	0.0036	0.16734	0
21/04/2021 17:28:14		355.84076	337.66345	1.9938	1.9963	0.1502	0.0048	0.16734	0
21/04/2021 17:28:45		355.92789	337.6904	1.99375	1.9961	0.1502	0.0061	0.16734	0
21/04/2021 17:29:15		356.01617	337.70429	1.99364	1.996	0.1502	0.0074	0.16734	0
21/04/2021 17:29:46		356.06531	337.73236	1.99348	1.9958	0.1502	0.0087	0.16734	0
21/04/2021 17:30:16		355.95761	337.69891	1.99337	1.9957	0.1502	0.01	0.16734	0
21/04/2021 17:30:47		355.84653	337.6907	1.99324	1.9957	0.1502	0.0112	0.16734	0
21/04/2021 17:31:17		355.81397	337.66858	1.99317	1.9955	0.1502	0.0125	0.16734	0
21/04/2021 17:31:48		355.81027	337.67563	1.99304	1.9955	0.1502	0.0138	0.16734	0
21/04/2021 17:32:19		355.84918	337.68259	1.99296	1.9953	0.1502	0.0151	0.16734	0
21/04/2021 17:32:49		355.87747	337.69324	1.99292	1.9952	0.1502	0.0163	0.16734	0
21/04/2021 17:33:20		355.90201	337.68579	1.99282	1.9952	0.1502	0.0176	0.16734	0
21/04/2021 17:33:50		355.9252	337.70203	1.99269	1.995	0.1502	0.0189	0.16734	0
21/04/2021 17:34:21		355.89478	337.67853	1.99268	1.995	0.1503	0.0201	0.16734	0
21/04/2021 17:34:51		355.88892	337.69046	1.99259	1.9949	0.1502	0.0214	0.16734	0
21/04/2021 17:35:22		355.89014	337.67743	1.99248	1.9949	0.1502	0.0227	0.16734	0
21/04/2021 17:35:53		355.88168	337.70111	1.9924	1.9947	0.1502	0.024	0.16734	0
21/04/2021 17:36:24		355.86899	337.70258	1.99236	1.9947	0.1502	0.0253	0.16734	0
21/04/2021 17:36:54		355.8645	337.70517	1.99229	1.9946	0.1502	0.0266	0.16734	0
21/04/2021 17:37:25		355.8562	337.68967	1.99224	1.9946	0.1502	0.0278	0.16734	0
21/04/2021 17:37:55		355.86563	337.70993	1.9921	1.9944	0.1502	0.0291	0.16734	0
21/04/2021 17:38:26		355.86124	337.71976	1.99204	1.9944	0.1502	0.0304	0.16734	0
21/04/2021 17:38:57		355.86765	337.70834	1.99195	1.9942	0.1502	0.0317	0.16734	0
21/04/2021 17:39:27		355.87393	337.71112	1.99189	1.9942	0.1502	0.0329	0.16734	0
21/04/2021 17:39:58		355.87668	337.7139	1.9918	1.9941	0.1502	0.0342	0.16734	0
21/04/2021 17:40:28		355.86469	337.71252	1.99173	1.9941	0.1502	0.0355	0.16734	0
21/04/2021 17:40:59		355.85251	337.69315	1.99165	1.9941	0.1502	0.0368	0.16734	0
21/04/2021 17:41:29		355.87875	337.71954	1.99157	1.9939	0.1502	0.038	0.16734	0
21/04/2021 17:42:00		355.85922	337.70346	1.9915	1.9939	0.1502	0.0393	0.16734	0
21/04/2021 17:42:30		355.82935	337.70554	1.99145	1.9938	0.1502	0.0406	0.16734	0
21/04/2021 17:43:01		355.85638	337.70419	1.99138	1.9938	0.1502	0.0418	0.16734	0
21/04/2021 17:43:31		355.90085	337.72397	1.99127	1.9936	0.1502	0.0431	0.16734	0
21/04/2021 17:44:02		355.89981	337.72647	1.99122	1.9936	0.1502	0.0444	0.16734	0
21/04/2021 17:44:32		355.94467	337.74307	1.99113	1.9935	0.1502	0.0456	0.16734	0
21/04/2021 17:45:03		355.95728	337.74503	1.99108	1.9935	0.1502	0.0469	0.16734	0
21/04/2021 17:45:33		355.95548	337.72894	1.99101	1.9933	0.1502	0.0482	0.16734	0
21/04/2021 17:46:04		355.93964	337.74158	1.99095	1.9933	0.1502	0.0495	0.16734	0
21/04/2021 17:46:34		355.9234	337.72879	1.99088	1.9933	0.1502	0.0507	0.16734	0
21/04/2021 17:47:05		355.90402	337.72714	1.99075	1.9931	0.1502	0.052	0.16734	0
21/04/2021 17:47:36		355.88751	337.71765	1.99071	1.993	0.1502	0.0533	0.16734	0
21/04/2021 17:48:06		355.89258	337.72989	1.99065	1.993	0.1502	0.0546	0.16734	0
21/04/2021 17:48:37		355.87662	337.72098	1.99058	1.993	0.1502	0.0559	0.16734	0
21/04/2021 17:49:07		355.82544	337.70514	1.9905	1.9928	0.1502	0.0571	0.16734	0
21/04/2021 17:49:38		355.77759	337.69626	1.99041	1.9928	0.1502	0.0584	0.16734	0
21/04/2021 17:50:08		355.81891	337.7236	1.99034	1.9927	0.1502	0.0597	0.16734	0
21/04/2021 17:50:39		355.89139	337.73584	1.9903	1.9927	0.1502	0.061	0.16734	0
21/04/2021 17:51:09		355.94202	337.74753	1.99024	1.9925	0.1502	0.0622	0.16734	0
21/04/2021 17:51:40		355.96451	337.75946	1.99014	1.9925	0.1502	0.0635	0.16734	0
21/04/2021 17:52:10		355.96918	337.76059	1.99004	1.9924	0.1502	0.0648	0.16734	0
21/04/2021 17:52:41		355.99493	337.78299	1.98994	1.9924	0.1502	0.066	0.16734	0
21/04/2021 17:53:11		355.99634	337.77722	1.98992	1.9922	0.1502	0.0673	0.16734	0
21/04/2021 17:53:42		355.96603	337.75385	1.98982	1.9922	0.1502	0.0686	0.16734	0
21/04/2021 17:54:12		355.95279	337.76553	1.9898	1.9922	0.1502	0.0698	0.16734	0
21/04/2021 17:54:43		355.9502	337.76651	1.98971	1.9921	0.1502	0.0711	0.16734	0
21/04/2021 17:55:13		355.96603	337.76816	1.98961	1.9921	0.1502	0.0724	0.16734	0
21/04/2021 17:55:44		355.96347	337.76914	1.98954	1.9919	0.1502	0.0737	0.16734	0
21/04/2021 17:56:14		355.9718	337.77753	1.98946	1.9919	0.1502	0.0749	0.16734	0
21/04/2021 17:56:45		355.95557	337.77905	1.98943	1.9917	0.1502	0.0762	0.16734	0
21/04/2021 17:57:15		355.94855	337.77557	1.98936	1.9917	0.1502	0.0775	0.16734	0
21/04/2021 17:57:46		355.90192	337.77148	1.98924	1.9917	0.1502	0.0788	0.16734	0
21/04/2021 17:58:16		355.9086	337.76035	1.9891	1.9916	0.1502	0.08	0.16734	0
21/04/2021 17:58:47		355.92172	337.77353	1.98912	1.9916	0.1502	0.0813	0.16734	0

Appendix 7 - 2nd discharge cycle

Time		TC1	TC3	Cell Voltag V	NaS Cell Voltage V	Discharge C A	Cell Current Ah	Impedance Z-Ohms	Z Check?
21/04/2021 17:59:18		355.9314	337.76541	1.98909	1.9914	0.1502	0.0826	0.16734	0
21/04/2021 17:59:48		355.92075	337.77612	1.98898	1.9914	0.1502	0.0839	0.16734	0
21/04/2021 18:00:19		355.9209	337.75485	1.98895	1.9913	0.1502	0.0852	0.16734	0
21/04/2021 18:00:50		355.9314	337.77255	1.98885	1.9913	0.1502	0.0864	0.16734	0
21/04/2021 18:01:20		355.94952	337.77652	1.9888	1.9911	0.1502	0.0877	0.16734	0
21/04/2021 18:01:51		355.94708	337.78122	1.98874	1.9911	0.1502	0.089	0.16734	0
21/04/2021 18:02:22		355.94098	337.76077	1.98869	1.991	0.1502	0.0903	0.16734	0
21/04/2021 18:02:53		355.95352	337.77338	1.98857	1.991	0.1502	0.0916	0.16734	0
21/04/2021 18:03:23		355.97562	337.78137	1.98856	1.991	0.1502	0.0928	0.16734	0
21/04/2021 18:03:54		355.94409	337.7746	1.98855	1.9908	0.1502	0.0941	0.16734	0
21/04/2021 18:04:25		355.93372	337.75705	1.98844	1.9908	0.1502	0.0954	0.16734	0
21/04/2021 18:04:56		355.92648	337.76404	1.98837	1.9906	0.1502	0.0967	0.16734	0
21/04/2021 18:05:26		355.91284	337.75745	1.98831	1.9906	0.1502	0.098	0.16734	0
21/04/2021 18:05:57		355.91272	337.76807	1.98821	1.9906	0.1502	0.0993	0.16734	0
21/04/2021 18:06:27		355.92047	337.78659	1.98818	1.9905	0.1502	0.1005	0.16734	0
21/04/2021 18:06:58		355.93506	337.79416	1.9881	1.9905	0.1502	0.1018	0.16734	0
21/04/2021 18:07:28		355.91327	337.81506	1.98807	1.9903	0.1502	0.1031	0.16734	0
21/04/2021 18:07:59		355.90424	337.81311	1.98798	1.9903	0.1502	0.1043	0.16734	0
21/04/2021 18:08:29		355.91556	337.78165	1.98784	1.9902	0.1502	0.1056	0.16734	0
21/04/2021 18:09:00		355.94135	337.80759	1.98778	1.9902	0.1502	0.1069	0.16734	0
21/04/2021 18:09:31		355.91486	337.79523	1.98775	1.99	0.1502	0.1082	0.16734	0
21/04/2021 18:10:01		355.91254	337.77502	1.98763	1.99	0.1502	0.1095	0.16734	0
21/04/2021 18:10:32		355.90326	337.79428	1.98762	1.99	0.1502	0.1107	0.16734	0
21/04/2021 18:11:03		355.89264	337.79071	1.98752	1.9899	0.1502	0.112	0.16734	0
21/04/2021 18:11:34		355.88907	337.7728	1.98745	1.9899	0.1502	0.1133	0.16734	0
21/04/2021 18:12:05		355.88565	337.78366	1.98737	1.9897	0.1502	0.1146	0.16734	0
21/04/2021 18:12:35		355.89731	337.7883	1.98728	1.9897	0.1502	0.1159	0.16734	0
21/04/2021 18:13:06		355.89569	337.76877	1.98723	1.9896	0.1502	0.1172	0.16734	0
21/04/2021 18:13:36		355.89624	337.76575	1.9872	1.9896	0.1502	0.1184	0.16734	0
21/04/2021 18:14:07		355.89981	337.79434	1.98711	1.9894	0.1502	0.1197	0.16734	0
21/04/2021 18:14:38		355.89227	337.76532	1.98704	1.9894	0.1502	0.121	0.16734	0
21/04/2021 18:15:09		355.8913	337.77148	1.98694	1.9892	0.1502	0.1223	0.16734	0
21/04/2021 18:15:39		355.87973	337.75983	1.98686	1.9892	0.1502	0.1236	0.16734	0
21/04/2021 18:16:10		355.86862	337.76294	1.98682	1.9892	0.1502	0.1248	0.16734	0
21/04/2021 18:16:41		355.87927	337.76297	1.98673	1.9891	0.1502	0.1261	0.16734	0
21/04/2021 18:17:11		355.87494	337.76218	1.98666	1.9891	0.1502	0.1274	0.16734	0
21/04/2021 18:17:42		355.88104	337.77545	1.98662	1.9889	0.1502	0.1287	0.16734	0
21/04/2021 18:18:12		355.86945	337.76019	1.98651	1.9889	0.1502	0.1299	0.16734	0
21/04/2021 18:18:43		355.86423	337.76926	1.98645	1.9888	0.1502	0.1312	0.16734	0
21/04/2021 18:19:13		355.85877	337.76373	1.9864	1.9888	0.1502	0.1325	0.16734	0
21/04/2021 18:19:44		355.8559	337.73584	1.98633	1.9886	0.1502	0.1338	0.16734	0
21/04/2021 18:20:15		355.85815	337.75601	1.98622	1.9886	0.1502	0.1351	0.16734	0
21/04/2021 18:20:46		355.85654	337.75082	1.98618	1.9886	0.1502	0.1363	0.16734	0
21/04/2021 18:21:16		355.83652	337.73773	1.98607	1.9885	0.1502	0.1376	0.16734	0
21/04/2021 18:21:47		355.84918	337.72189	1.98598	1.9885	0.1502	0.1389	0.16734	0
21/04/2021 18:22:17		355.84055	337.70609	1.98596	1.9883	0.1502	0.1402	0.16734	0
21/04/2021 18:22:48		355.84094	337.69931	1.98588	1.9883	0.1502	0.1414	0.16734	0
21/04/2021 18:23:18		355.8588	337.7316	1.98585	1.9881	0.1502	0.1427	0.16734	0
21/04/2021 18:23:49		355.8479	337.7135	1.98577	1.9881	0.1502	0.144	0.16734	0
21/04/2021 18:24:19		355.84882	337.7287	1.98564	1.9881	0.1502	0.1453	0.16734	0
21/04/2021 18:24:50		355.88812	337.75757	1.9856	1.988	0.1502	0.1465	0.16734	0
21/04/2021 18:25:20		355.87936	337.73804	1.98553	1.988	0.1502	0.1478	0.16734	0
21/04/2021 18:25:51		355.87814	337.71179	1.98549	1.9878	0.1502	0.1491	0.16734	0
21/04/2021 18:26:21		355.84116	337.69238	2.01226	2.013	0.1502	0.1502	0.16734	0
21/04/2021 18:26:52		355.81195	337.69516	2.0127	2.0133	0.1502	0.1502	0.16734	0
21/04/2021 18:26:59		0	0	1.9767	1.9795	0.2001	0.0014	0.17308	1
21/04/2021 18:27:30		355.7999	337.69016	1.9767	1.9795	0.2001	0.0014	0.17308	0
21/04/2021 18:28:00		355.81314	337.71066	1.97642	1.9794	0.2001	0.0031	0.17308	0
21/04/2021 18:28:31		355.80362	337.6796	1.97624	1.9791	0.2001	0.0048	0.17308	0
21/04/2021 18:29:01		355.81598	337.70276	1.97605	1.9789	0.2001	0.0064	0.17308	0
21/04/2021 18:29:32		355.80002	337.69028	1.97591	1.9788	0.2001	0.0082	0.17308	0
21/04/2021 18:30:02		355.8244	337.70413	1.97579	1.9786	0.2001	0.0098	0.17308	0

Appendix 7 - 2nd discharge cycle

Time		TC1	TC3	Cell Voltag V	NaS Cell Voltage V	Discharge C A	Cell Current Ah	Impedance Z-Ohms	Z Check?
21/04/2021	18:30:33	355.81854	337.70181	1.9756	1.9784	0.2001	0.0116	0.17308	0
21/04/2021	18:31:04	355.83371	337.72064	1.97546	1.9783	0.2001	0.0133	0.17308	0
21/04/2021	18:31:34	355.80191	337.69217	1.97539	1.9783	0.2001	0.015	0.17308	0
21/04/2021	18:32:05	355.80759	337.70502	1.97527	1.9781	0.2001	0.0167	0.17308	0
21/04/2021	18:32:36	355.80258	337.69641	1.97514	1.978	0.2001	0.0184	0.17308	0
21/04/2021	18:33:06	355.79108	337.67056	1.97502	1.9778	0.2001	0.0201	0.17308	0
21/04/2021	18:33:37	355.78726	337.68457	1.97489	1.9778	0.2001	0.0218	0.17308	0
21/04/2021	18:34:07	355.76309	337.66739	1.97479	1.9777	0.2001	0.0235	0.17308	0
21/04/2021	18:34:38	355.75641	337.67136	1.97469	1.9775	0.2001	0.0252	0.17308	0
21/04/2021	18:35:09	355.77301	337.6702	1.97456	1.9775	0.2001	0.0269	0.17308	0
21/04/2021	18:35:39	355.77206	337.67285	1.97449	1.9774	0.2001	0.0286	0.17308	0
21/04/2021	18:36:10	355.75977	337.63901	1.97432	1.9772	0.2001	0.0303	0.17308	0
21/04/2021	18:36:41	355.73798	337.65277	1.97425	1.9772	0.2001	0.032	0.17308	0
21/04/2021	18:37:11	355.73056	337.64533	1.97414	1.977	0.2001	0.0337	0.17308	0
21/04/2021	18:37:42	355.71567	337.64462	1.97403	1.9769	0.2001	0.0354	0.17308	0
21/04/2021	18:38:13	355.73682	337.66596	1.97392	1.9769	0.2001	0.0371	0.17308	0
21/04/2021	18:38:44	355.71127	337.64377	1.97379	1.9767	0.2001	0.0388	0.17308	0
21/04/2021	18:39:14	355.71881	337.63705	1.97373	1.9766	0.2001	0.0405	0.17308	0
21/04/2021	18:39:45	355.76148	337.65863	1.97362	1.9766	0.2001	0.0422	0.17308	0
21/04/2021	18:40:15	355.83179	337.67221	1.97352	1.9764	0.2001	0.0439	0.17308	0
21/04/2021	18:40:45	355.81049	337.6615	1.97339	1.9763	0.2001	0.0456	0.17308	0
21/04/2021	18:41:16	355.78531	337.65045	1.97328	1.9763	0.2001	0.0473	0.17308	0
21/04/2021	18:41:47	355.75995	337.68207	1.97325	1.9761	0.2001	0.049	0.17308	0
21/04/2021	18:42:18	355.83102	337.68939	1.97309	1.9759	0.2001	0.0507	0.17308	0
21/04/2021	18:42:49	355.81656	337.66049	1.97302	1.9759	0.2001	0.0525	0.17308	0
21/04/2021	18:43:19	355.77792	337.65732	1.9729	1.9758	0.2001	0.0542	0.17308	0
21/04/2021	18:43:50	355.7677	337.647	1.9728	1.9756	0.2001	0.0559	0.17308	0
21/04/2021	18:44:20	355.76468	337.66898	1.97271	1.9756	0.2001	0.0576	0.17308	0
21/04/2021	18:44:51	355.75131	337.65549	1.9726	1.9755	0.2001	0.0592	0.17308	0
21/04/2021	18:45:21	355.75879	337.65234	1.97254	1.9755	0.2001	0.0609	0.17308	0
21/04/2021	18:45:52	355.7308	337.62054	1.97244	1.9753	0.2001	0.0626	0.17308	0
21/04/2021	18:46:22	355.71744	337.63925	1.97234	1.9753	0.2001	0.0643	0.17308	0
21/04/2021	18:46:53	355.73355	337.65909	1.97226	1.9752	0.2001	0.066	0.17308	0
21/04/2021	18:47:24	355.73926	337.63626	1.97217	1.975	0.2001	0.0678	0.17308	0
21/04/2021	18:47:55	355.74841	337.61685	1.97207	1.975	0.2001	0.0695	0.17308	0
21/04/2021	18:48:26	355.76794	337.63654	1.972	1.9748	0.2001	0.0712	0.17308	0
21/04/2021	18:48:57	355.78278	337.64792	1.9719	1.9747	0.2001	0.0729	0.17308	0
21/04/2021	18:49:28	355.76126	337.63336	1.9718	1.9747	0.2001	0.0746	0.17308	0
21/04/2021	18:49:59	355.75357	337.65067	1.97167	1.9745	0.2001	0.0764	0.17308	0
21/04/2021	18:50:30	355.72476	337.62878	1.97157	1.9744	0.2001	0.0781	0.17308	0
21/04/2021	18:51:00	355.72083	337.62839	1.97149	1.9744	0.2001	0.0798	0.17308	0
21/04/2021	18:51:31	355.73172	337.6322	1.97141	1.9742	0.2001	0.0815	0.17308	0
21/04/2021	18:52:01	355.73633	337.62613	1.97133	1.9742	0.2001	0.0832	0.17308	0
21/04/2021	18:52:32	355.75079	337.64426	1.97123	1.9741	0.2001	0.0849	0.17308	0
21/04/2021	18:53:02	355.73691	337.63385	1.97108	1.9741	0.2001	0.0866	0.17308	0
21/04/2021	18:53:33	355.71997	337.62036	1.97096	1.9739	0.2001	0.0883	0.17308	0
21/04/2021	18:54:04	355.71774	337.61813	1.9709	1.9738	0.2001	0.09	0.17308	0
21/04/2021	18:54:34	355.71845	337.61884	1.9708	1.9736	0.2001	0.0917	0.17308	0
21/04/2021	18:55:05	355.71655	337.59189	1.97072	1.9736	0.2001	0.0934	0.17308	0
21/04/2021	18:55:36	355.7269	337.61304	1.97056	1.9734	0.2001	0.0951	0.17308	0
21/04/2021	18:56:06	355.74231	337.59998	1.97049	1.9734	0.2001	0.0968	0.17308	0
21/04/2021	18:56:37	355.70834	337.60864	1.97035	1.9733	0.2001	0.0985	0.17308	0
21/04/2021	18:57:08	355.71353	337.61032	1.97029	1.9731	0.2001	0.1002	0.17308	0
21/04/2021	18:57:38	355.71051	337.60013	1.97021	1.9731	0.2001	0.1019	0.17308	0
21/04/2021	18:58:09	355.71921	337.60175	1.97011	1.973	0.2001	0.1036	0.17308	0
21/04/2021	18:58:39	355.71704	337.6174	1.97002	1.973	0.2001	0.1053	0.17308	0
21/04/2021	18:59:10	355.69247	337.59622	1.96994	1.9728	0.2001	0.107	0.17308	0
21/04/2021	18:59:41	355.70459	337.61917	1.96983	1.9727	0.2001	0.1087	0.17308	0
21/04/2021	19:00:11	355.75864	337.63077	1.96975	1.9727	0.2001	0.1104	0.17308	0
21/04/2021	19:00:42	355.76056	337.62198	1.96962	1.9725	0.2001	0.1121	0.17308	0
21/04/2021	19:01:13	355.68387	337.61975	1.96952	1.9723	0.2001	0.1138	0.17308	0
21/04/2021	19:01:44	355.75592	337.62799	1.9694	1.9723	0.2001	0.1156	0.17308	0

Appendix 7 - 2nd discharge cycle

Time		TC1	TC3	Cell Voltag V	NaS Cell Voltage V	Discharge C A	Cell Current Ah	Impedance Z-Ohms	Z Check?
21/04/2021	19:02:15	355.77225	337.60516	1.96929	1.9722	0.2001	0.1173	0.17308	0
21/04/2021	19:02:45	355.72833	337.60736	1.96925	1.972	0.2001	0.119	0.17308	0
21/04/2021	19:03:16	355.69434	337.59097	1.96915	1.972	0.2001	0.1207	0.17308	0
21/04/2021	19:03:47	355.67069	337.57431	1.96904	1.9719	0.2001	0.1224	0.17308	0
21/04/2021	19:04:17	355.67838	337.59992	1.96892	1.9719	0.2001	0.1241	0.17308	0
21/04/2021	19:04:48	355.67975	337.59772	1.96889	1.9717	0.2001	0.1258	0.17308	0
21/04/2021	19:05:19	355.68024	337.61252	1.96875	1.9717	0.2001	0.1275	0.17308	0
21/04/2021	19:05:49	355.69611	337.58203	1.96863	1.9716	0.2001	0.1292	0.17308	0
21/04/2021	19:06:20	355.67914	337.58643	1.96857	1.9714	0.2001	0.1309	0.17308	0
21/04/2021	19:06:51	355.6359	337.58215	1.96847	1.9713	0.2001	0.1326	0.17308	0
21/04/2021	19:07:22	355.63916	337.564	1.96835	1.9713	0.2001	0.1343	0.17308	0
21/04/2021	19:07:53	355.65323	337.56387	1.96827	1.9711	0.2001	0.1361	0.17308	0
21/04/2021	19:08:23	355.68146	337.59229	1.96817	1.9711	0.2001	0.1378	0.17308	0
21/04/2021	19:08:54	355.69559	337.57083	1.96809	1.9709	0.2001	0.1395	0.17308	0
21/04/2021	19:09:24	355.71295	337.59546	1.96804	1.9708	0.2001	0.1412	0.17308	0
21/04/2021	19:09:55	355.71991	337.59888	1.96794	1.9708	0.2001	0.1429	0.17308	0
21/04/2021	19:10:26	355.70993	337.59241	1.96781	1.9706	0.2001	0.1446	0.17308	0
21/04/2021	19:10:57	355.70328	337.58926	1.9677	1.9706	0.2001	0.1463	0.17308	0
21/04/2021	19:11:27	355.68903	337.58209	1.96765	1.9705	0.2001	0.148	0.17308	0
21/04/2021	19:11:58	355.67813	337.57108	1.96755	1.9703	0.2001	0.1497	0.17308	0
21/04/2021	19:12:29	355.67798	337.55664	1.96745	1.9703	0.2001	0.1514	0.17308	0
21/04/2021	19:13:00	355.67685	337.56979	1.96731	1.9702	0.2001	0.1531	0.17308	0
21/04/2021	19:13:31	355.67535	337.55399	1.96729	1.9702	0.2001	0.1549	0.17308	0
21/04/2021	19:14:02	355.67423	337.55646	1.96719	1.97	0.2001	0.1566	0.17308	0
21/04/2021	19:14:33	355.66782	337.5643	1.96707	1.9698	0.2001	0.1583	0.17308	0
21/04/2021	19:15:04	355.6583	337.5368	1.96696	1.9698	0.2001	0.16	0.17308	0
21/04/2021	19:15:34	355.66754	337.54974	1.96684	1.9697	0.2001	0.1617	0.17308	0
21/04/2021	19:16:05	355.68375	337.55176	1.96677	1.9695	0.2001	0.1634	0.17308	0
21/04/2021	19:16:36	355.70648	337.56033	1.96666	1.9695	0.2001	0.1651	0.17308	0
21/04/2021	19:17:07	355.7146	337.56851	1.96654	1.9694	0.2001	0.1669	0.17308	0
21/04/2021	19:17:38	355.68256	337.57553	1.96645	1.9692	0.2001	0.1686	0.17308	0
21/04/2021	19:18:09	355.68543	337.57129	1.9664	1.9692	0.2001	0.1703	0.17308	0
21/04/2021	19:18:40	355.69849	337.56656	1.96623	1.9691	0.2001	0.172	0.17308	0
21/04/2021	19:19:11	355.68842	337.56714	1.96623	1.9691	0.2001	0.1738	0.17308	0
21/04/2021	19:19:42	355.69196	337.58142	1.96607	1.9689	0.2001	0.1755	0.17308	0
21/04/2021	19:20:12	355.68878	337.55322	1.96595	1.9687	0.2001	0.1772	0.17308	0
21/04/2021	19:20:43	355.67828	337.54263	1.96584	1.9687	0.2001	0.1789	0.17308	0
21/04/2021	19:21:14	355.67514	337.5502	1.96575	1.9686	0.2001	0.1806	0.17308	0
21/04/2021	19:21:45	355.711	337.55417	1.96565	1.9684	0.2001	0.1823	0.17308	0
21/04/2021	19:22:16	355.72943	337.5799	1.96557	1.9684	0.2001	0.184	0.17308	0
21/04/2021	19:22:47	355.73746	337.58795	1.96547	1.9683	0.2001	0.1858	0.17308	0
21/04/2021	19:23:18	355.69205	337.54578	1.96535	1.9681	0.2001	0.1875	0.17308	0
21/04/2021	19:23:49	355.67944	337.5545	1.96521	1.9681	0.2001	0.1892	0.17308	0
21/04/2021	19:24:19	355.65561	337.54837	1.9651	1.968	0.2001	0.1909	0.17308	0
21/04/2021	19:24:50	355.58051	337.50851	1.96503	1.968	0.2001	0.1926	0.17308	0
21/04/2021	19:25:21	355.60071	337.53598	1.96496	1.9678	0.2001	0.1944	0.17308	0
21/04/2021	19:25:52	355.728	337.5856	1.96487	1.9677	0.2001	0.1961	0.17308	0
21/04/2021	19:26:23	355.79947	337.5968	1.9647	1.9677	0.2001	0.1978	0.17308	0
21/04/2021	19:26:54	355.79663	337.60111	1.96468	1.9675	0.2001	0.1995	0.17308	0
21/04/2021	19:27:26	355.72238	337.55487	2.00069	2.0013	0.2001	0.2001	0.17308	0
21/04/2021	19:27:34	0	0	0	1.9592	0.2501	0.0017	0.16904	1
21/04/2021	19:28:05	355.57446	337.50955	1.9559	1.9592	0.2501	0.0017	0.16904	0
21/04/2021	19:28:36	355.55014	337.51721	1.95557	1.9589	0.2501	0.0039	0.16904	0
21/04/2021	19:29:07	355.54254	337.49167	1.95532	1.9587	0.2501	0.006	0.16904	0
21/04/2021	19:29:38	355.58524	337.50256	1.95511	1.9584	0.2501	0.0082	0.16904	0
21/04/2021	19:30:09	355.64224	337.50992	1.9549	1.9583	0.2501	0.0103	0.16904	0
21/04/2021	19:30:40	355.68222	337.5502	1.95474	1.9581	0.2501	0.0125	0.16904	0
21/04/2021	19:31:11	355.71088	337.55762	1.95456	1.958	0.2501	0.0146	0.16904	0
21/04/2021	19:31:42	355.71402	337.56436	1.95435	1.9578	0.2501	0.0168	0.16904	0
21/04/2021	19:32:12	355.67905	337.547	1.95418	1.9576	0.2501	0.0189	0.16904	0
21/04/2021	19:32:43	355.69244	337.56049	1.95407	1.9575	0.2501	0.021	0.16904	0
21/04/2021	19:33:14	355.72394	337.56006	1.95387	1.9573	0.2501	0.0232	0.16904	0

Appendix 7 - 2nd discharge cycle

Time		TC1	TC3	Cell Voltag V	NaS Cell Voltage V	Discharge C A	Cell Current Ah	Impedance Z-Ohms	Z Check?
21/04/2021	19:33:44	355.7059	337.55618	1.9538	1.9572	0.2501	0.0253	0.16904	0
21/04/2021	19:34:15	355.70233	337.56332	1.95362	1.957	0.2501	0.0274	0.16904	0
21/04/2021	19:34:46	355.6984	337.55219	1.95342	1.9569	0.2501	0.0296	0.16904	0
21/04/2021	19:35:17	355.69086	337.56247	1.95334	1.9567	0.2501	0.0317	0.16904	0
21/04/2021	19:35:47	355.67017	337.55231	1.95324	1.9566	0.2501	0.0339	0.16904	0
21/04/2021	19:36:18	355.66617	337.55542	1.95307	1.9564	0.2501	0.036	0.16904	0
21/04/2021	19:36:49	355.63452	337.54144	1.9529	1.9564	0.2501	0.0381	0.16904	0
21/04/2021	19:37:20	355.6315	337.53842	1.95287	1.9562	0.2501	0.0403	0.16904	0
21/04/2021	19:37:53	355.54388	337.51804	1.95264	1.9561	0.2501	0.0426	0.16904	0
21/04/2021	19:38:24	355.44873	337.46869	1.95258	1.9559	0.2501	0.0447	0.16904	0
21/04/2021	19:38:55	355.41373	337.45126	1.95241	1.9558	0.2501	0.0469	0.16904	0
21/04/2021	19:39:25	355.55203	337.51914	1.95224	1.9556	0.2501	0.049	0.16904	0
21/04/2021	19:39:56	355.7189	337.5621	1.95217	1.9556	0.2501	0.0511	0.16904	0
21/04/2021	19:40:27	355.77896	337.5976	1.95205	1.9555	0.2501	0.0533	0.16904	0
21/04/2021	19:40:57	355.74649	337.57202	1.95197	1.9553	0.2501	0.0554	0.16904	0
21/04/2021	19:41:28	355.67181	337.53616	1.95183	1.9551	0.2501	0.0575	0.16904	0
21/04/2021	19:41:59	355.54068	337.48264	1.9517	1.955	0.2501	0.0597	0.16904	0
21/04/2021	19:42:29	355.61234	337.51553	1.95157	1.955	0.2501	0.0618	0.16904	0
21/04/2021	19:43:00	355.63812	337.52722	1.95147	1.9548	0.2501	0.0639	0.16904	0
21/04/2021	19:43:31	355.67496	337.54642	1.95133	1.9547	0.2501	0.0661	0.16904	0
21/04/2021	19:44:02	355.71872	337.55481	1.95117	1.9545	0.2501	0.0682	0.16904	0
21/04/2021	19:44:33	355.70929	337.54889	1.95106	1.9544	0.2501	0.0704	0.16904	0
21/04/2021	19:45:03	355.68185	337.52841	1.95091	1.9544	0.2501	0.0725	0.16904	0
21/04/2021	19:45:34	355.66498	337.53281	1.95079	1.9542	0.2501	0.0746	0.16904	0
21/04/2021	19:46:05	355.66293	337.55219	1.95066	1.954	0.2501	0.0768	0.16904	0
21/04/2021	19:46:35	355.73138	337.57828	1.95056	1.9539	0.2501	0.0789	0.16904	0
21/04/2021	19:47:06	355.63925	337.51767	1.95038	1.9537	0.2501	0.081	0.16904	0
21/04/2021	19:47:37	355.52286	337.5076	1.9503	1.9536	0.2501	0.0832	0.16904	0
21/04/2021	19:48:08	355.55469	337.52536	1.95016	1.9536	0.2501	0.0853	0.16904	0
21/04/2021	19:48:39	355.54318	337.51376	1.95001	1.9534	0.2501	0.0875	0.16904	0
21/04/2021	19:49:10	355.68085	337.56671	1.94991	1.9533	0.2501	0.0896	0.16904	0
21/04/2021	19:49:41	355.82318	337.61353	1.94977	1.9531	0.2501	0.0918	0.16904	0
21/04/2021	19:50:12	355.86343	337.58261	1.94961	1.953	0.2501	0.0939	0.16904	0
21/04/2021	19:50:43	355.81891	337.57712	1.94955	1.9528	0.2501	0.0961	0.16904	0
21/04/2021	19:51:14	355.65805	337.53299	1.94942	1.9528	0.2501	0.0982	0.16904	0
21/04/2021	19:51:45	355.60931	337.51254	1.94925	1.9526	0.2501	0.1004	0.16904	0
21/04/2021	19:52:16	355.54413	337.48615	1.94917	1.9525	0.2501	0.1025	0.16904	0
21/04/2021	19:52:47	355.55621	337.51263	1.94902	1.9525	0.2501	0.1047	0.16904	0
21/04/2021	19:53:18	355.65939	337.5379	1.94888	1.9523	0.2501	0.1068	0.16904	0
21/04/2021	19:53:49	355.69241	337.54617	1.94869	1.9522	0.2501	0.109	0.16904	0
21/04/2021	19:54:20	355.63959	337.54303	1.9486	1.952	0.2501	0.1111	0.16904	0
21/04/2021	19:54:51	355.64273	337.55682	1.94845	1.9519	0.2501	0.1133	0.16904	0
21/04/2021	19:55:22	355.63864	337.53845	1.94832	1.9517	0.2501	0.1155	0.16904	0
21/04/2021	19:55:53	355.64163	337.54147	1.94817	1.9515	0.2501	0.1176	0.16904	0
21/04/2021	19:56:24	355.60956	337.51276	1.94809	1.9514	0.2501	0.1198	0.16904	0
21/04/2021	19:56:55	355.51773	337.47742	1.94796	1.9514	0.2501	0.1219	0.16904	0
21/04/2021	19:57:26	355.54779	337.522	1.94785	1.9512	0.2501	0.1241	0.16904	0
21/04/2021	19:57:57	355.55264	337.50546	1.94778	1.9511	0.2501	0.1262	0.16904	0
21/04/2021	19:58:27	355.66376	337.54947	1.94765	1.9509	0.2501	0.1284	0.16904	0
21/04/2021	19:58:58	355.7995	337.57184	1.94748	1.9509	0.2501	0.1305	0.16904	0
21/04/2021	19:59:29	355.80396	337.57275	1.94736	1.9508	0.2501	0.1326	0.16904	0
21/04/2021	20:00:00	355.69501	337.51663	1.94728	1.9506	0.2501	0.1348	0.16904	0
21/04/2021	20:00:31	355.5936	337.4931	1.94714	1.9505	0.2501	0.1369	0.16904	0
21/04/2021	20:01:02	355.58081	337.5231	1.94699	1.9503	0.2501	0.1391	0.16904	0
21/04/2021	20:01:33	355.60336	337.52792	1.94694	1.9503	0.2501	0.1412	0.16904	0
21/04/2021	20:02:04	355.60809	337.52914	1.94673	1.9501	0.2501	0.1434	0.16904	0
21/04/2021	20:02:34	355.62671	337.53003	1.94661	1.95	0.2501	0.1455	0.16904	0
21/04/2021	20:03:05	355.61987	337.53388	1.94649	1.9498	0.2501	0.1476	0.16904	0
21/04/2021	20:03:36	355.60944	337.53052	1.94644	1.9498	0.2501	0.1498	0.16904	0
21/04/2021	20:04:07	355.62521	337.51062	1.94625	1.9497	0.2501	0.1519	0.16904	0
21/04/2021	20:04:38	355.61337	337.50589	1.94613	1.9495	0.2501	0.1541	0.16904	0
21/04/2021	20:05:09	355.61087	337.49262	1.94599	1.9494	0.2501	0.1562	0.16904	0

Appendix 7 - 2nd discharge cycle

Time	TC1	TC3	Cell Voltag V	NaS Cell Voltage V	Discharge C A	Cell Current Ah	Impedance Z-Ohms	Z Check?
21/04/2021 20:05:40	355.62347	337.51248	1.94585	1.9492	0.2501	0.1584	0.16904	0
21/04/2021 20:06:11	355.62451	337.52066	1.94574	1.949	0.2501	0.1605	0.16904	0
21/04/2021 20:06:42	355.63239	337.52142	1.94562	1.949	0.2501	0.1627	0.16904	0
21/04/2021 20:07:13	355.62235	337.52206	1.94544	1.9489	0.2501	0.1649	0.16904	0
21/04/2021 20:07:44	355.66165	337.55804	1.94527	1.9487	0.2501	0.167	0.16904	0
21/04/2021 20:08:15	355.68338	337.54422	1.94522	1.9486	0.2501	0.1692	0.16904	0
21/04/2021 20:08:46	355.71323	337.56357	1.94509	1.9484	0.2501	0.1713	0.16904	0
21/04/2021 20:09:17	355.70361	337.56458	1.94497	1.9483	0.2501	0.1735	0.16904	0
21/04/2021 20:09:47	355.65945	337.54511	1.94485	1.9483	0.2501	0.1756	0.16904	0
21/04/2021 20:10:18	355.61188	337.5079	1.94469	1.9481	0.2501	0.1777	0.16904	0
21/04/2021 20:10:49	355.54627	337.50263	1.94461	1.9479	0.2501	0.1799	0.16904	0
21/04/2021 20:11:20	355.53116	337.49451	1.94439	1.9478	0.2501	0.182	0.16904	0
21/04/2021 20:11:51	355.57651	337.50449	1.94434	1.9478	0.2501	0.1842	0.16904	0
21/04/2021 20:12:22	355.62161	337.5213	1.94426	1.9476	0.2501	0.1863	0.16904	0
21/04/2021 20:12:53	355.64114	337.5267	1.94412	1.9475	0.2501	0.1885	0.16904	0
21/04/2021 20:13:24	355.66782	337.53568	1.94399	1.9473	0.2501	0.1906	0.16904	0
21/04/2021 20:13:55	355.69116	337.52704	1.94385	1.9472	0.2501	0.1928	0.16904	0
21/04/2021 20:14:26	355.70026	337.5755	1.94373	1.947	0.2501	0.1949	0.16904	0
21/04/2021 20:14:57	355.68039	337.55191	1.94362	1.947	0.2501	0.1971	0.16904	0
21/04/2021 20:15:28	355.58209	337.49936	1.94351	1.9469	0.2501	0.1992	0.16904	0
21/04/2021 20:15:59	355.56097	337.50314	1.94336	1.9467	0.2501	0.2014	0.16904	0
21/04/2021 20:16:30	355.56943	337.50449	1.94322	1.9465	0.2501	0.2035	0.16904	0
21/04/2021 20:17:01	355.56979	337.48343	1.94314	1.9464	0.2501	0.2057	0.16904	0
21/04/2021 20:17:32	355.59183	337.5199	1.94301	1.9462	0.2501	0.2079	0.16904	0
21/04/2021 20:18:03	355.71704	337.55673	1.9429	1.9462	0.2501	0.21	0.16904	0
21/04/2021 20:18:34	355.74619	337.53958	1.94274	1.9461	0.2501	0.2122	0.16904	0
21/04/2021 20:19:05	355.61636	337.49457	1.94261	1.9459	0.2501	0.2143	0.16904	0
21/04/2021 20:19:36	355.53961	337.4816	1.94252	1.9458	0.2501	0.2165	0.16904	0
21/04/2021 20:20:07	355.58334	337.50418	1.94237	1.9456	0.2501	0.2186	0.16904	0
21/04/2021 20:20:38	355.70828	337.56574	1.9422	1.9454	0.2501	0.2208	0.16904	0
21/04/2021 20:21:09	355.72327	337.56293	1.94208	1.9454	0.2501	0.2229	0.16904	0
21/04/2021 20:21:40	355.68146	337.52441	1.94193	1.9453	0.2501	0.2251	0.16904	0
21/04/2021 20:22:11	355.61121	337.53229	1.94185	1.9451	0.2501	0.2273	0.16904	0
21/04/2021 20:22:42	355.52319	337.48294	1.9417	1.945	0.2501	0.2294	0.16904	0
21/04/2021 20:23:13	355.51306	337.4906	1.94155	1.9448	0.2501	0.2316	0.16904	0
21/04/2021 20:23:44	355.52475	337.48807	1.9415	1.9447	0.2501	0.2337	0.16904	0
21/04/2021 20:24:15	355.53705	337.48975	1.94127	1.9447	0.2501	0.2359	0.16904	0
21/04/2021 20:24:46	355.57446	337.48456	1.94116	1.9445	0.2501	0.238	0.16904	0
21/04/2021 20:25:17	355.58014	337.47238	1.941	1.9444	0.2501	0.2402	0.16904	0
21/04/2021 20:25:48	355.55728	337.48154	1.94091	1.9442	0.2501	0.2423	0.16904	0
21/04/2021 20:26:19	355.57712	337.5015	1.94079	1.944	0.2501	0.2445	0.16904	0
21/04/2021 20:26:50	355.61035	337.50995	1.94062	1.9439	0.2501	0.2466	0.16904	0
21/04/2021 20:27:21	355.69601	337.55335	1.94048	1.9437	0.2501	0.2488	0.16904	0
21/04/2021 20:27:52	355.7504	337.55093	1.98525	1.986	0.2501	0.2501	0.16904	0
21/04/2021 20:28:00	0	0	0	1.944	0.2501	0.0017	0.16974	1
21/04/2021 20:28:31	355.6376	337.50525	1.94071	1.944	0.2501	0.0017	0.16974	0
21/04/2021 20:29:02	355.61011	337.50617	1.94046	1.9437	0.2501	0.0039	0.16974	0
21/04/2021 20:29:33	355.54361	337.48917	1.94029	1.9436	0.2501	0.006	0.16974	0
21/04/2021 20:30:04	355.53766	337.46533	1.94009	1.9434	0.2501	0.0082	0.16974	0
21/04/2021 20:30:35	355.56775	337.47778	1.93999	1.9433	0.2501	0.0103	0.16974	0
21/04/2021 20:31:06	355.58032	337.46542	1.93987	1.9431	0.2501	0.0125	0.16974	0
21/04/2021 20:31:37	355.60126	337.48294	1.93973	1.9429	0.2501	0.0146	0.16974	0
21/04/2021 20:32:07	355.60767	337.4751	1.93951	1.9428	0.2501	0.0168	0.16974	0
21/04/2021 20:32:38	355.59256	337.46704	1.93944	1.9426	0.2501	0.0189	0.16974	0
21/04/2021 20:33:09	355.58807	337.46249	1.93929	1.9426	0.2501	0.021	0.16974	0
21/04/2021 20:33:40	355.57925	337.46439	1.93918	1.9425	0.2501	0.0232	0.16974	0
21/04/2021 20:34:11	355.58804	337.48749	1.93904	1.9423	0.2501	0.0253	0.16974	0
21/04/2021 20:34:42	355.59314	337.50336	1.93886	1.9422	0.2501	0.0275	0.16974	0
21/04/2021 20:35:13	355.59079	337.48673	1.93875	1.942	0.2501	0.0297	0.16974	0
21/04/2021 20:35:44	355.60495	337.51169	1.93865	1.942	0.2501	0.0318	0.16974	0
21/04/2021 20:36:15	355.59876	337.48401	1.93849	1.9418	0.2501	0.034	0.16974	0
21/04/2021 20:36:46	355.5889	337.48123	1.93838	1.9417	0.2501	0.0361	0.16974	0

Appendix 7 - 2nd discharge cycle

Time	TC1	TC3	Cell Voltag V	NaS Cell Voltage V	Discharge C A	Cell Current Ah	Impedance Z-Ohms	Z Check?
21/04/2021 20:37:17	355.57925	337.45364	1.93819	1.9415	0.2501	0.0383	0.16974	0
21/04/2021 20:37:48	355.59106	337.45483	1.93807	1.9414	0.2501	0.0404	0.16974	0
21/04/2021 20:38:19	355.58911	337.45282	1.93794	1.9412	0.2501	0.0426	0.16974	0
21/04/2021 20:38:50	355.6026	337.46643	1.93782	1.9411	0.2501	0.0447	0.16974	0
21/04/2021 20:39:21	355.60278	337.46661	1.93771	1.9411	0.2501	0.0469	0.16974	0
21/04/2021 20:39:52	355.59854	337.48737	1.93753	1.9409	0.2501	0.049	0.16974	0
21/04/2021 20:40:23	355.60336	337.48154	1.93742	1.9408	0.2501	0.0512	0.16974	0
21/04/2021 20:40:54	355.59088	337.46536	1.93731	1.9406	0.2501	0.0533	0.16974	0
21/04/2021 20:41:25	355.59927	337.48096	1.93719	1.9404	0.2501	0.0555	0.16974	0
21/04/2021 20:41:56	355.57153	337.46732	1.937	1.9403	0.2501	0.0577	0.16974	0
21/04/2021 20:42:27	355.57584	337.46805	1.9369	1.9403	0.2501	0.0598	0.16974	0
21/04/2021 20:42:58	355.57437	337.46661	1.9368	1.9401	0.2501	0.062	0.16974	0
21/04/2021 20:43:29	355.59396	337.46487	1.93667	1.94	0.2501	0.0641	0.16974	0
21/04/2021 20:43:59	355.60709	337.47095	1.93653	1.9398	0.2501	0.0662	0.16974	0
21/04/2021 20:44:30	355.60605	337.46274	1.93635	1.9397	0.2501	0.0683	0.16974	0
21/04/2021 20:45:01	355.58041	337.44409	1.93626	1.9395	0.2501	0.0705	0.16974	0
21/04/2021 20:45:32	355.57123	337.45267	1.93615	1.9395	0.2501	0.0727	0.16974	0
21/04/2021 20:46:03	355.58368	337.48666	1.93598	1.9393	0.2501	0.0748	0.16974	0
21/04/2021 20:46:34	355.58551	337.44922	1.93589	1.9392	0.2501	0.077	0.16974	0
21/04/2021 20:47:05	355.60483	337.48294	1.93572	1.939	0.2501	0.0791	0.16974	0
21/04/2021 20:47:36	355.6023	337.48395	1.93571	1.9389	0.2501	0.0813	0.16974	0
21/04/2021 20:48:07	355.59753	337.47922	1.93551	1.9387	0.2501	0.0834	0.16974	0
21/04/2021 20:48:38	355.59555	337.46649	1.93542	1.9387	0.2501	0.0856	0.16974	0
21/04/2021 20:49:09	355.60846	337.48303	1.9353	1.9386	0.2501	0.0877	0.16974	0
21/04/2021 20:49:40	355.60318	337.47055	1.9351	1.9384	0.2501	0.0899	0.16974	0
21/04/2021 20:50:10	355.59882	337.46265	1.93503	1.9383	0.2501	0.092	0.16974	0
21/04/2021 20:50:41	355.61224	337.47611	1.93491	1.9383	0.2501	0.0941	0.16974	0
21/04/2021 20:51:12	355.61853	337.46106	1.93477	1.9381	0.2501	0.0963	0.16974	0
21/04/2021 20:51:43	355.70682	337.49634	1.9346	1.9379	0.2501	0.0984	0.16974	0
21/04/2021 20:52:14	355.72391	337.51355	1.93451	1.9378	0.2501	0.1006	0.16974	0
21/04/2021 20:52:45	355.66644	337.48785	1.93438	1.9376	0.2501	0.1028	0.16974	0
21/04/2021 20:53:16	355.5939	337.49698	1.93428	1.9375	0.2501	0.1049	0.16974	0
21/04/2021 20:53:47	355.62753	337.5094	1.93413	1.9375	0.2501	0.107	0.16974	0
21/04/2021 20:54:18	355.6781	337.5246	1.93396	1.9373	0.2501	0.1092	0.16974	0
21/04/2021 20:54:49	355.65421	337.51483	1.93385	1.9372	0.2501	0.1114	0.16974	0
21/04/2021 20:55:20	355.62622	337.50092	1.9337	1.937	0.2501	0.1135	0.16974	0
21/04/2021 20:55:51	355.59897	337.50208	1.93354	1.9368	0.2501	0.1157	0.16974	0
21/04/2021 20:56:22	355.57553	337.47492	1.93342	1.9367	0.2501	0.1178	0.16974	0
21/04/2021 20:56:53	355.55298	337.4772	1.93334	1.9367	0.2501	0.12	0.16974	0
21/04/2021 20:57:24	355.54166	337.45148	1.93323	1.9365	0.2501	0.1221	0.16974	0
21/04/2021 20:57:55	355.55573	337.46207	1.93306	1.9364	0.2501	0.1243	0.16974	0
21/04/2021 20:58:26	355.56842	337.46414	1.93292	1.9362	0.2501	0.1264	0.16974	0
21/04/2021 20:58:57	355.58496	337.47726	1.93282	1.9361	0.2501	0.1286	0.16974	0
21/04/2021 20:59:28	355.5972	337.50028	1.93265	1.9359	0.2501	0.1307	0.16974	0
21/04/2021 20:59:59	355.63071	337.509	1.93249	1.9357	0.2501	0.1329	0.16974	0
21/04/2021 21:00:30	355.63239	337.49286	1.93236	1.9357	0.2501	0.135	0.16974	0
21/04/2021 21:01:01	355.58072	337.4801	1.93226	1.9356	0.2501	0.1372	0.16974	0
21/04/2021 21:01:32	355.54681	337.46387	1.93216	1.9354	0.2501	0.1394	0.16974	0
21/04/2021 21:02:03	355.53403	337.44742	1.93204	1.9353	0.2501	0.1415	0.16974	0
21/04/2021 21:02:34	355.53967	337.44592	1.93185	1.9351	0.2501	0.1437	0.16974	0
21/04/2021 21:03:05	355.54587	337.45929	1.9318	1.9351	0.2501	0.1458	0.16974	0
21/04/2021 21:03:35	355.56363	337.46643	1.93161	1.935	0.2501	0.148	0.16974	0
21/04/2021 21:04:06	355.57398	337.45905	1.93149	1.9348	0.2501	0.1501	0.16974	0
21/04/2021 21:04:37	355.57001	337.43359	1.93137	1.9347	0.2501	0.1522	0.16974	0
21/04/2021 21:05:08	355.55963	337.45532	1.93122	1.9345	0.2501	0.1544	0.16974	0
21/04/2021 21:05:39	355.55527	337.43662	1.93114	1.9345	0.2501	0.1565	0.16974	0
21/04/2021 21:06:10	355.55438	337.46793	1.93096	1.9343	0.2501	0.1587	0.16974	0
21/04/2021 21:06:41	355.54175	337.45517	1.93088	1.9342	0.2501	0.1608	0.16974	0
21/04/2021 21:07:12	355.56763	337.47052	1.93072	1.934	0.2501	0.163	0.16974	0
21/04/2021 21:07:43	355.58917	337.47437	1.93063	1.9339	0.2501	0.1651	0.16974	0
21/04/2021 21:08:14	355.57925	337.45007	1.93048	1.9337	0.2501	0.1673	0.16974	0
21/04/2021 21:08:45	355.5769	337.44055	1.9304	1.9337	0.2501	0.1694	0.16974	0

Appendix 7 - 2nd discharge cycle

Time	TC1	TC3	Cell Voltag V	NaS Cell Voltage V	Disharge C A	Cell Current Ah	Impedance Z-Ohms	Z Check?
21/04/2021 21:09:16	355.55414	337.4212	1.93023	1.9336	0.2501	0.1716	0.16974	0
21/04/2021 21:09:47	355.53598	337.42792	1.93011	1.9334	0.2501	0.1737	0.16974	0
21/04/2021 21:10:18	355.56003	337.44855	1.92994	1.9332	0.2501	0.1759	0.16974	0
21/04/2021 21:10:49	355.58685	337.44696	1.92984	1.9331	0.2501	0.1781	0.16974	0
21/04/2021 21:11:20	355.60693	337.46722	1.92969	1.9329	0.2501	0.1802	0.16974	0
21/04/2021 21:11:51	355.6051	337.46893	1.92951	1.9328	0.2501	0.1824	0.16974	0
21/04/2021 21:12:22	355.59946	337.46323	1.92951	1.9328	0.2501	0.1845	0.16974	0
21/04/2021 21:12:53	355.65036	337.47165	1.92927	1.9326	0.2501	0.1867	0.16974	0
21/04/2021 21:13:24	355.70752	337.50064	1.92917	1.9325	0.2501	0.1888	0.16974	0
21/04/2021 21:13:55	355.65469	337.48669	1.92901	1.9323	0.2501	0.191	0.16974	0
21/04/2021 21:14:26	355.56766	337.42767	1.92894	1.9323	0.2501	0.1931	0.16974	0
21/04/2021 21:14:57	355.5632	337.45889	1.92876	1.9322	0.2501	0.1953	0.16974	0
21/04/2021 21:15:28	355.57608	337.44687	1.92866	1.932	0.2501	0.1975	0.16974	0
21/04/2021 21:15:59	355.51114	337.39929	1.92852	1.9318	0.2501	0.1996	0.16974	0
21/04/2021 21:16:30	355.46314	337.39746	1.92838	1.9317	0.2501	0.2018	0.16974	0
21/04/2021 21:17:01	355.46478	337.39908	1.92826	1.9315	0.2501	0.2039	0.16974	0
21/04/2021 21:17:32	355.49234	337.42325	1.92819	1.9315	0.2501	0.2061	0.16974	0
21/04/2021 21:18:03	355.5303	337.43649	1.92802	1.9314	0.2501	0.2082	0.16974	0
21/04/2021 21:18:34	355.54379	337.44293	1.92789	1.9312	0.2501	0.2104	0.16974	0
21/04/2021 21:19:05	355.59924	337.44159	1.92773	1.9311	0.2501	0.2126	0.16974	0
21/04/2021 21:19:36	355.61163	337.45407	1.92767	1.9309	0.2501	0.2147	0.16974	0
21/04/2021 21:20:07	355.60724	337.43539	1.92756	1.9307	0.2501	0.2168	0.16974	0
21/04/2021 21:20:38	355.61316	337.45206	1.92739	1.9306	0.2501	0.219	0.16974	0
21/04/2021 21:21:09	355.6218	337.44647	1.92731	1.9306	0.2501	0.2211	0.16974	0
21/04/2021 21:21:40	355.67041	337.46683	1.92719	1.9304	0.2501	0.2233	0.16974	0
21/04/2021 21:22:11	355.64926	337.45627	1.92707	1.9303	0.2501	0.2255	0.16974	0
21/04/2021 21:22:42	355.63547	337.45667	1.92693	1.9301	0.2501	0.2276	0.16974	0
21/04/2021 21:23:13	355.55414	337.41406	1.92672	1.93	0.2501	0.2297	0.16974	0
21/04/2021 21:23:44	355.49347	337.4101	1.92662	1.93	0.2501	0.2319	0.16974	0
21/04/2021 21:24:15	355.49594	337.43048	1.92654	1.9298	0.2501	0.234	0.16974	0
21/04/2021 21:24:46	355.52982	337.44672	1.92638	1.9296	0.2501	0.2362	0.16974	0
21/04/2021 21:25:17	355.52533	337.42792	1.9264	1.9295	0.2501	0.2384	0.16974	0
21/04/2021 21:25:48	355.53638	337.4426	1.92612	1.9293	0.2501	0.2405	0.16974	0
21/04/2021 21:26:19	355.55713	337.43137	1.92607	1.9292	0.2501	0.2427	0.16974	0
21/04/2021 21:26:50	355.56332	337.43399	1.92573	1.929	0.2501	0.2448	0.16974	0
21/04/2021 21:27:21	355.55841	337.42194	1.92574	1.929	0.2501	0.247	0.16974	0
21/04/2021 21:27:52	355.55084	337.40714	1.92555	1.9289	0.2501	0.2491	0.16974	0
21/04/2021 21:28:23	355.54672	337.39227	1.97035	1.9709	0.2501	0.2501	0.16974	0
21/04/2021 21:28:31	0	0					0.16589	1

NaS Cell Charge-Discharge Program V2.0.vi
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Last modified on 24/10/2019 at 09:26
Printed on 19/03/2020 at 11:02

NaS Cell Charge-Discharge Program V2.0.vi



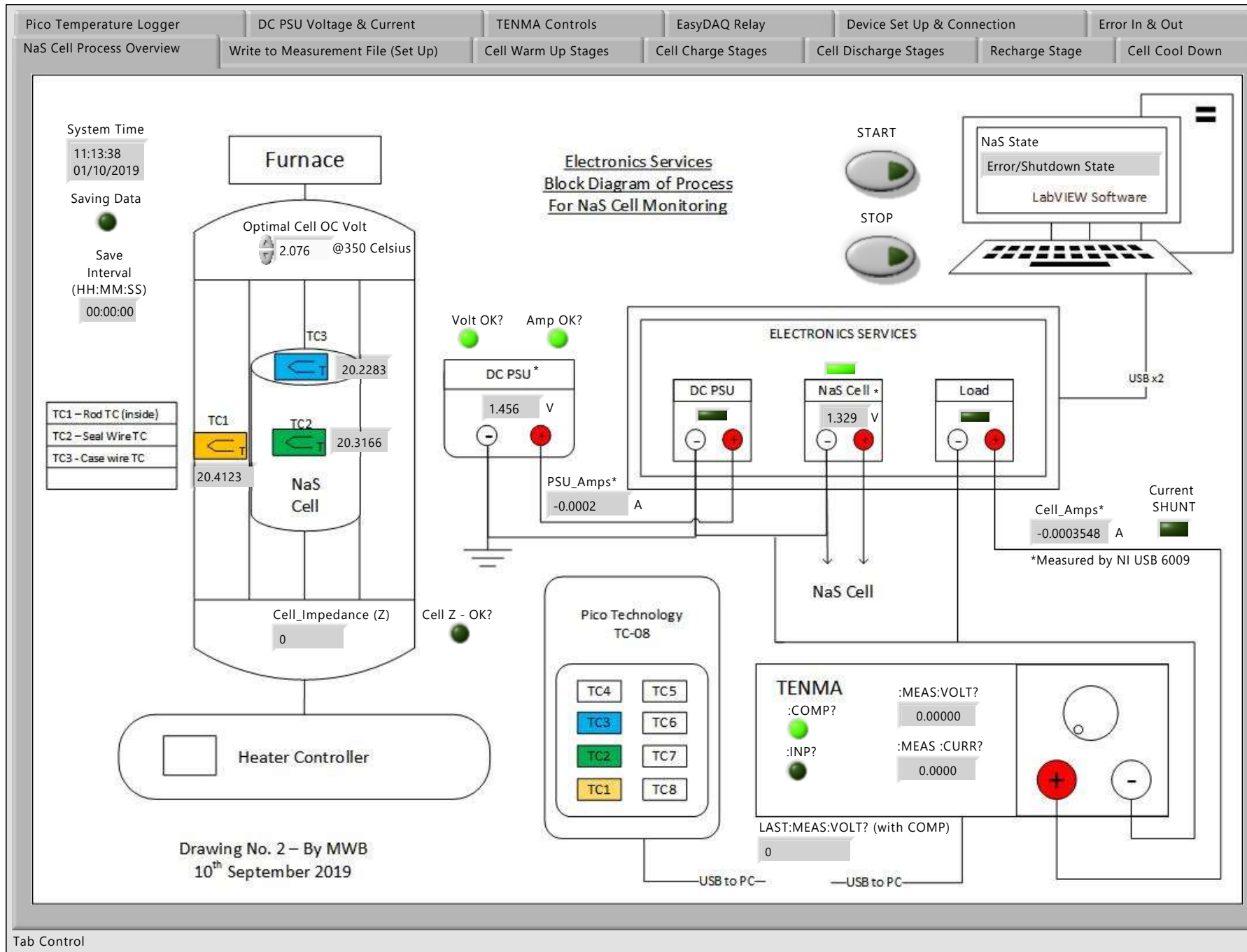
Electronics Services Job 4771 by M.W.Buckley 1st October 2019.

NaS Cell Charge-Discharge Program V2.0.vi

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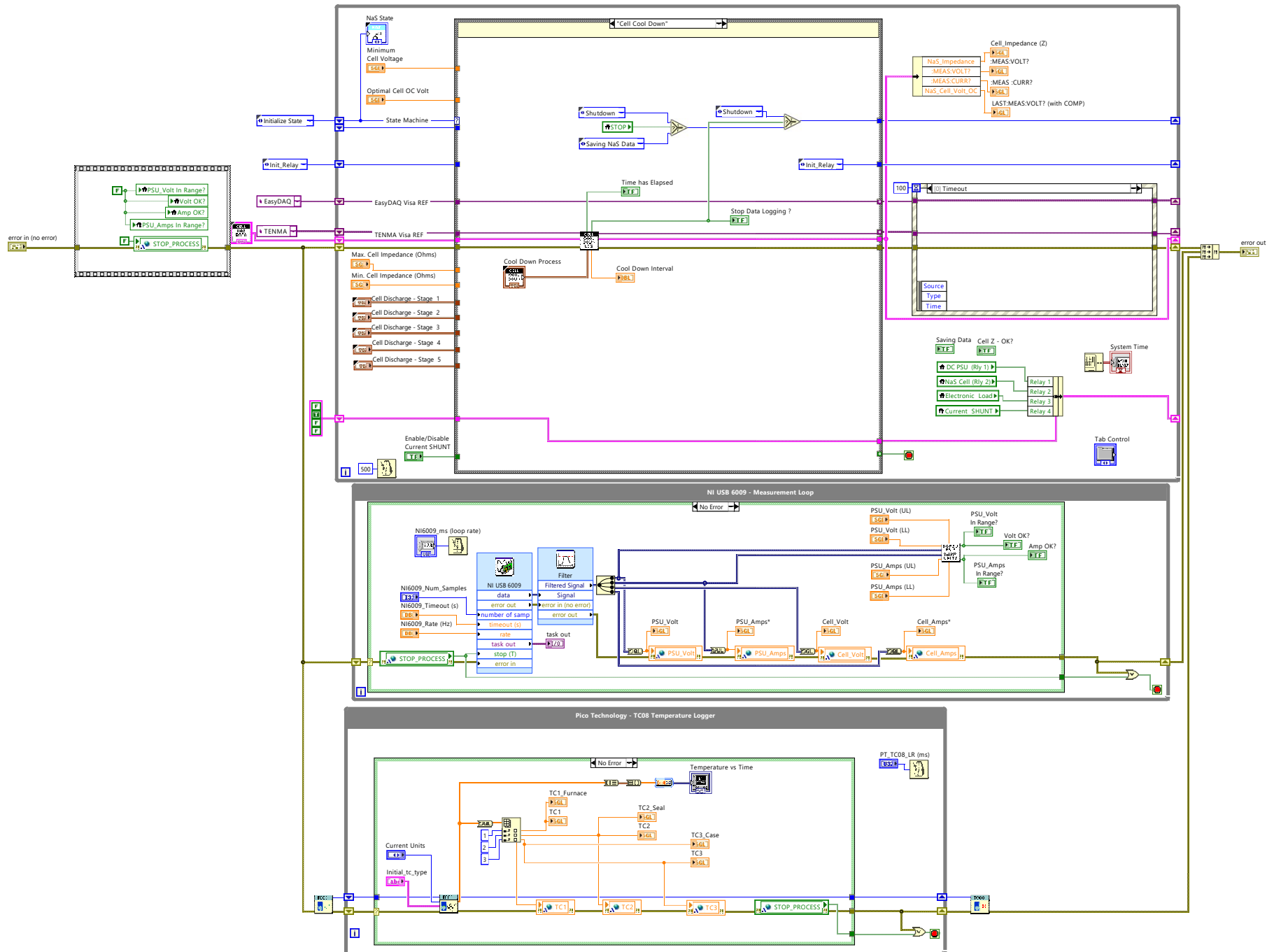


NaS Cell Charge-Discharge Program V2.0.vi

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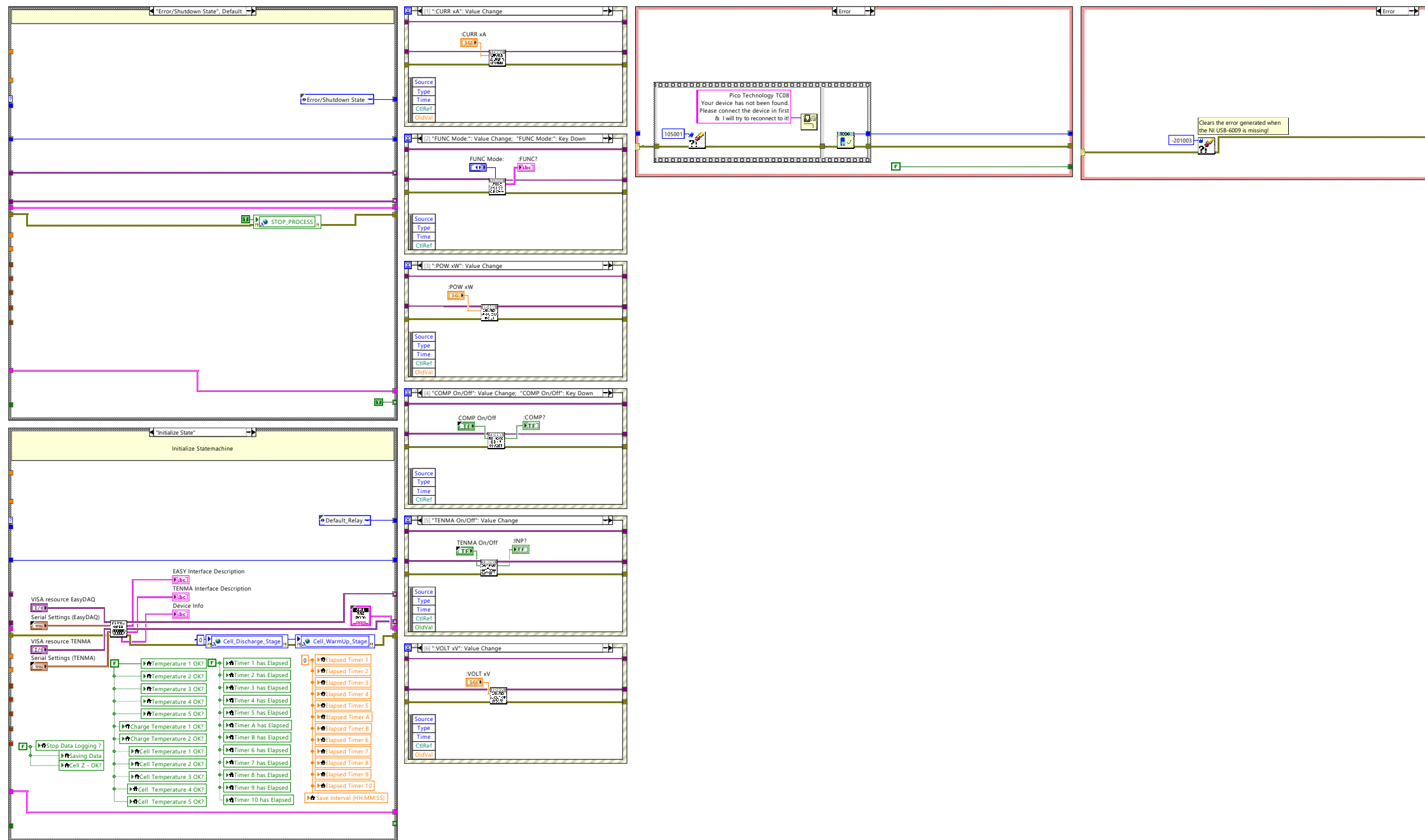


NaS Cell Charge-Discharge Program V2.0.vi

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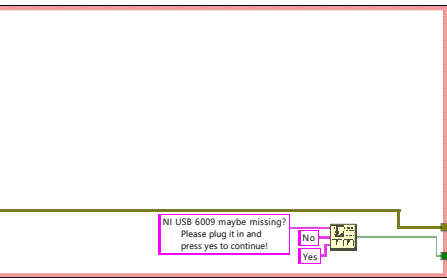


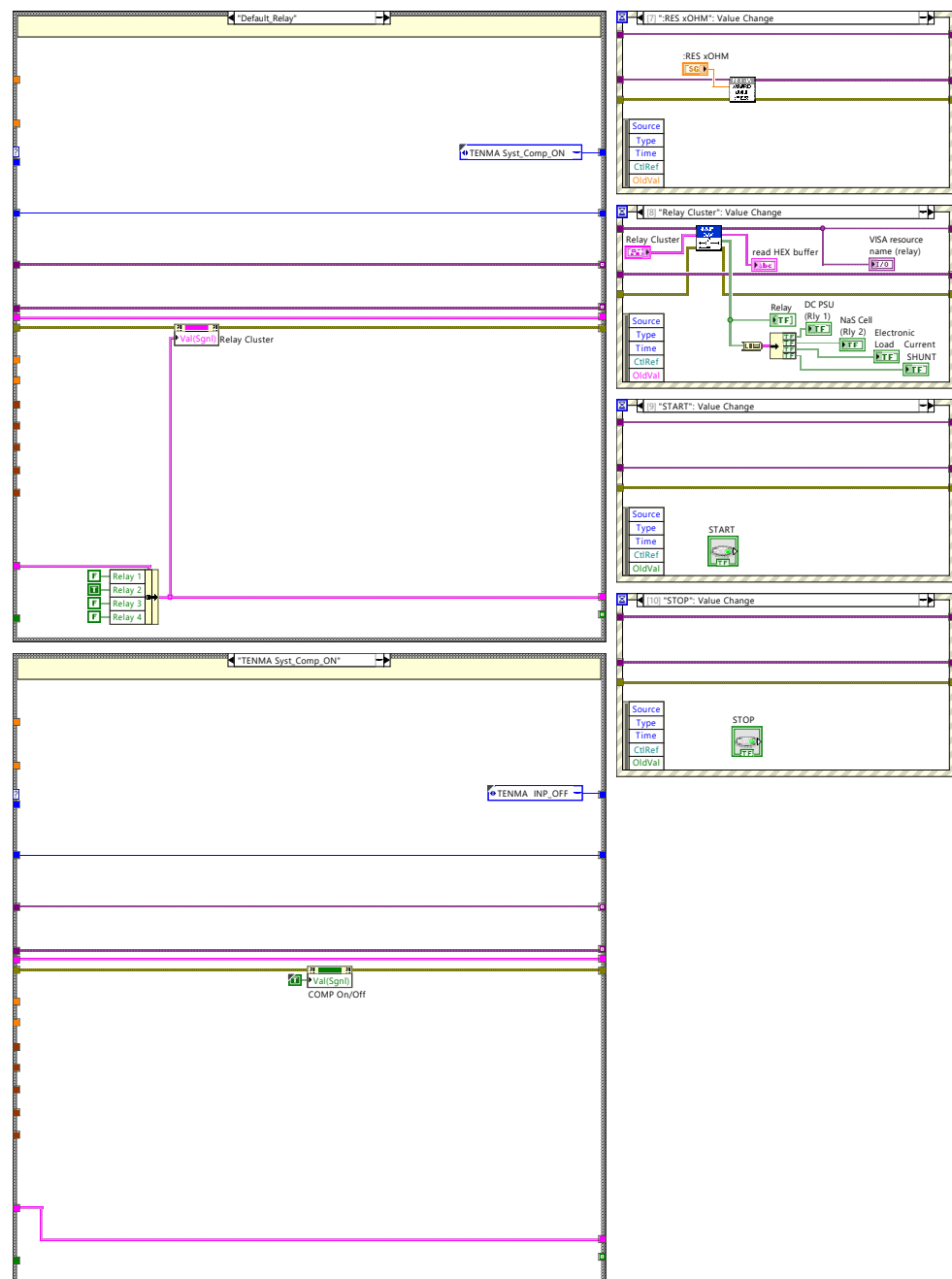
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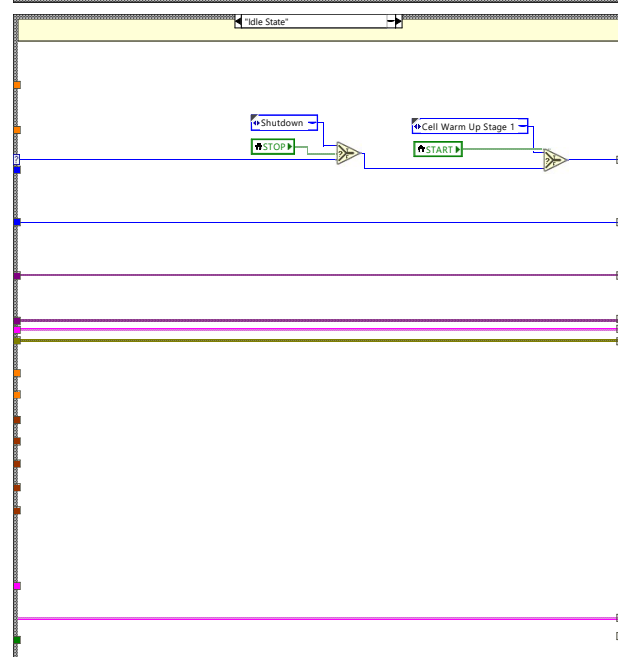
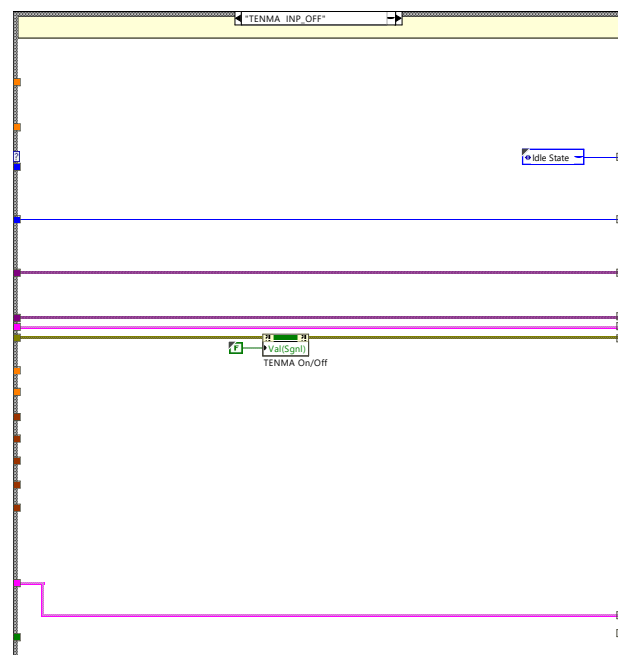
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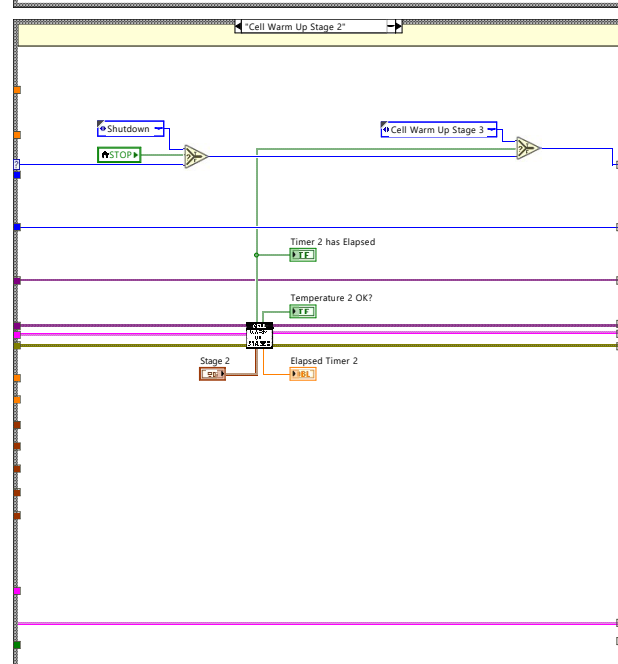




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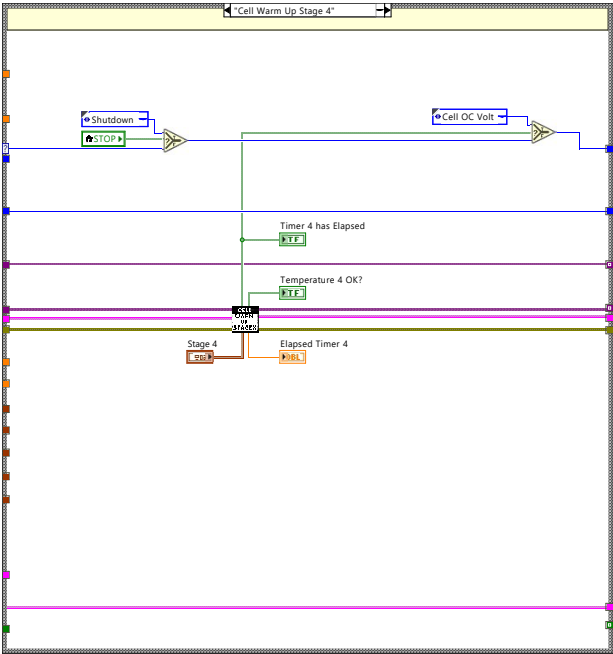
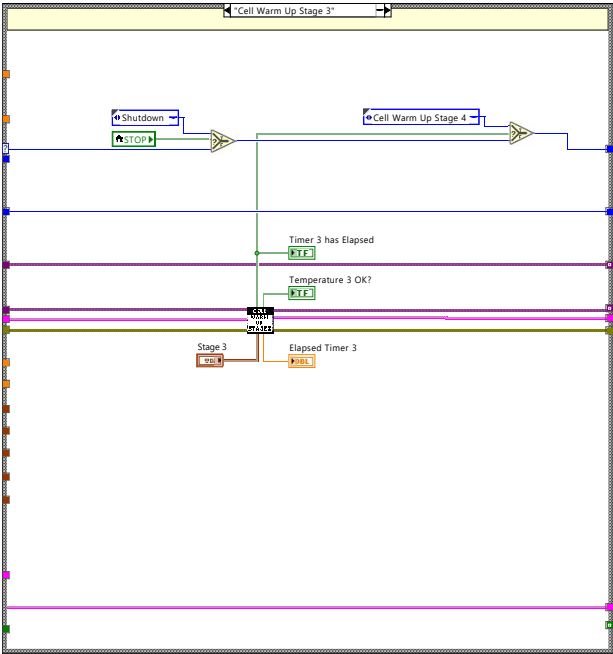


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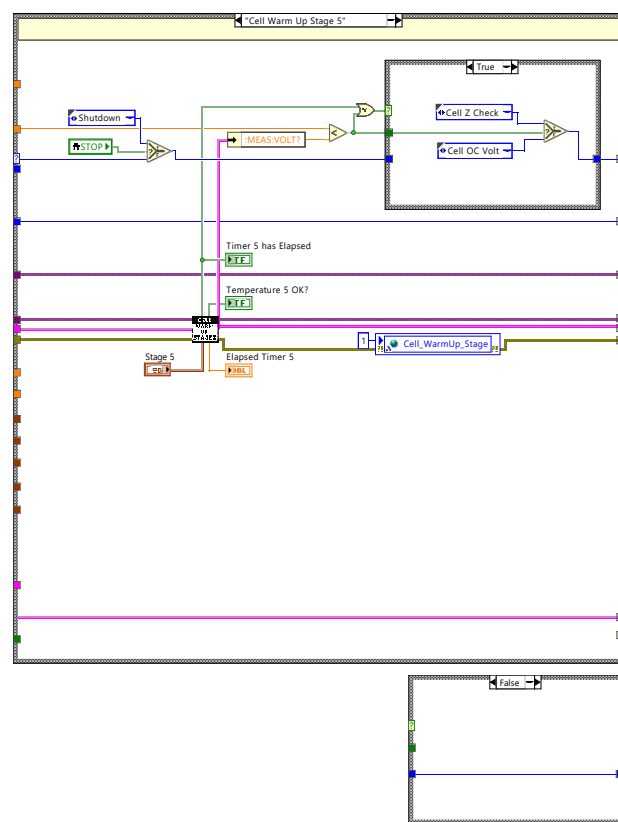
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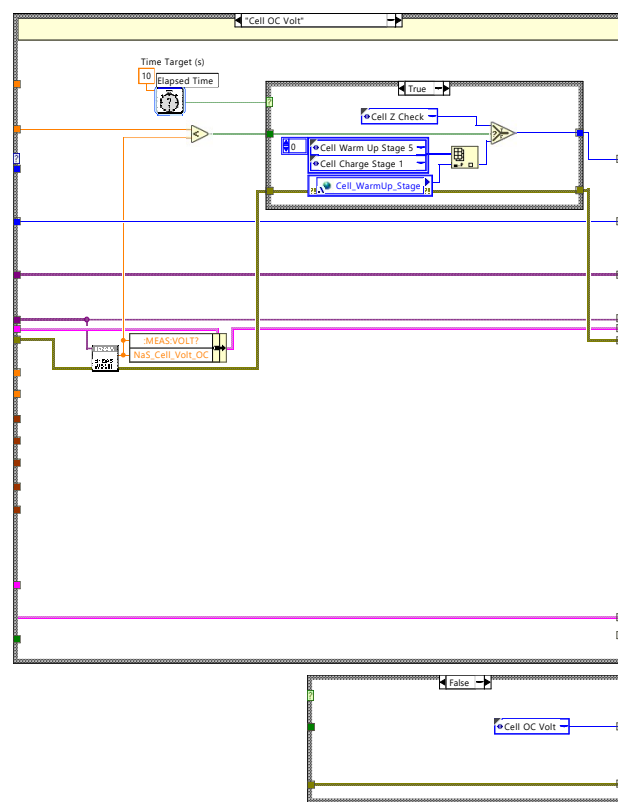


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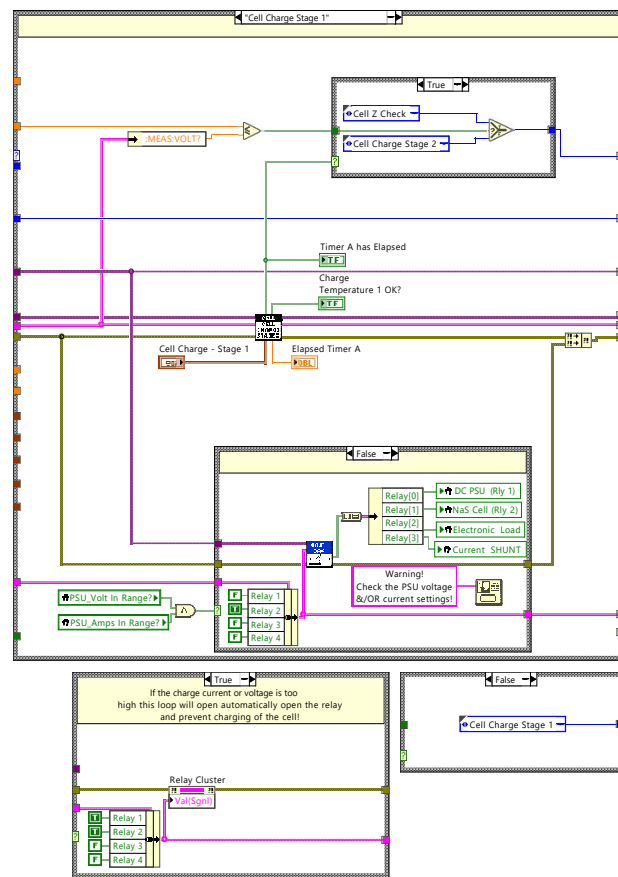
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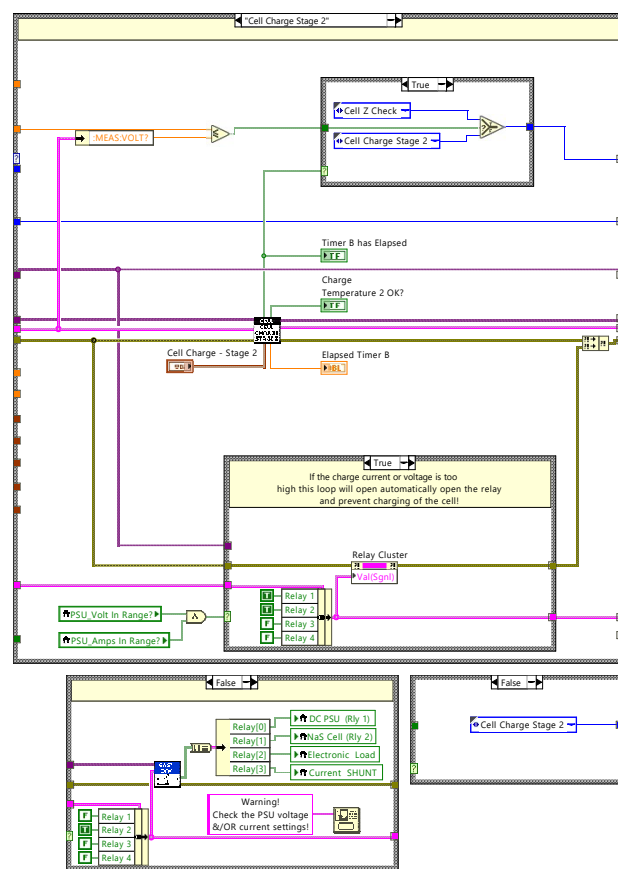


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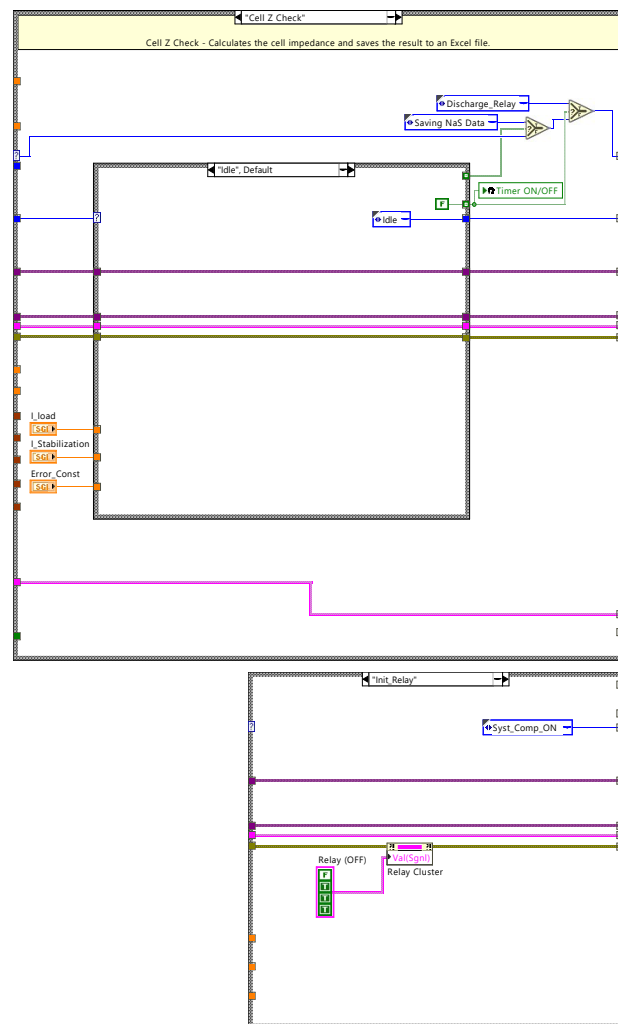
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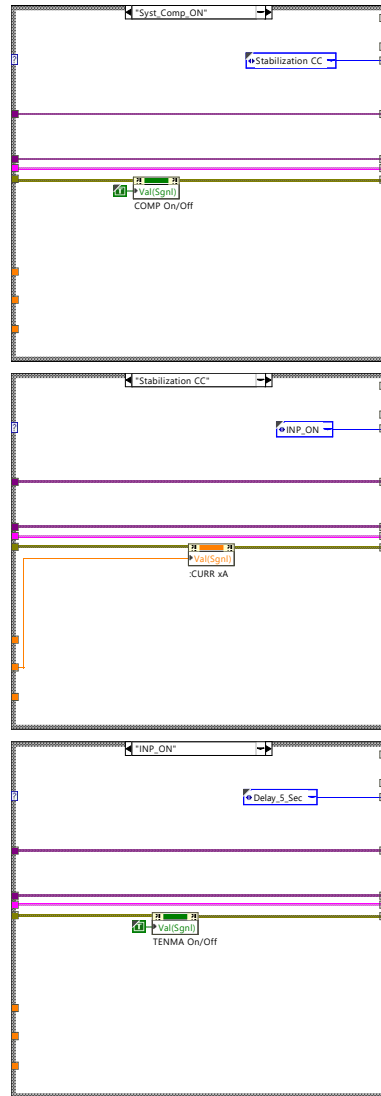


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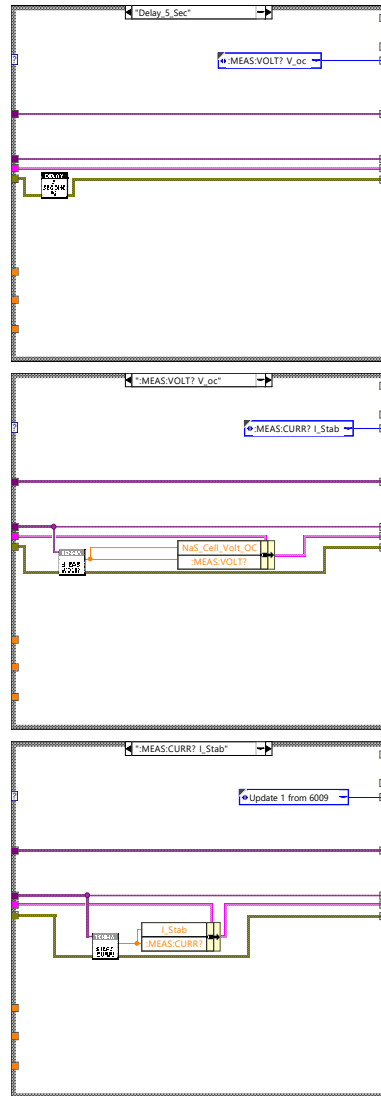


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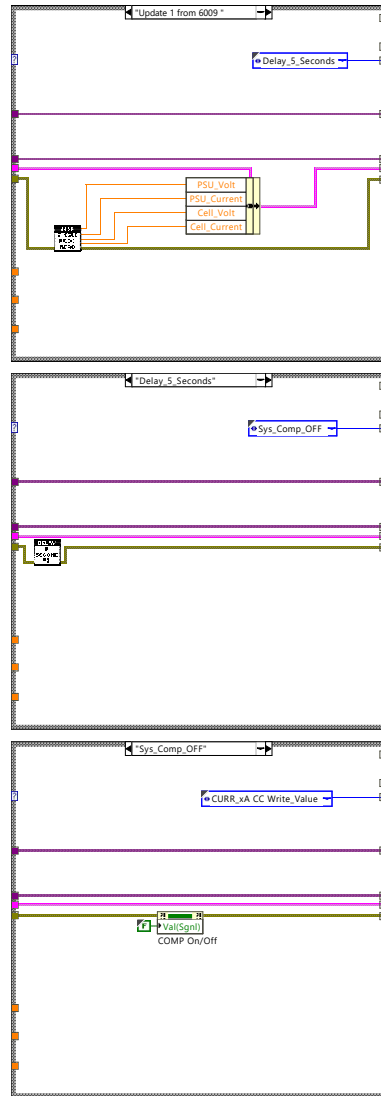


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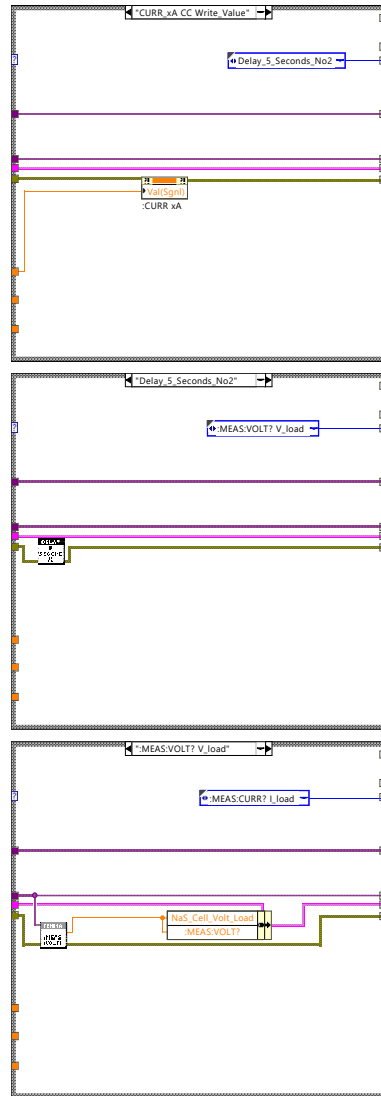


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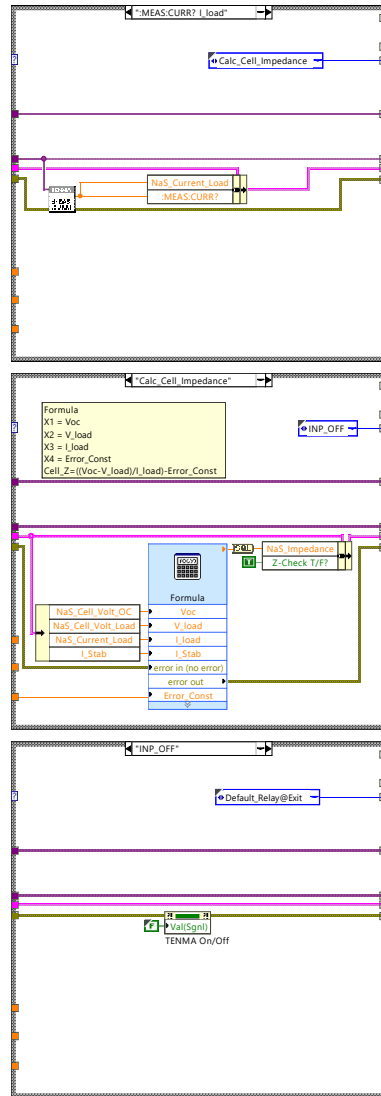


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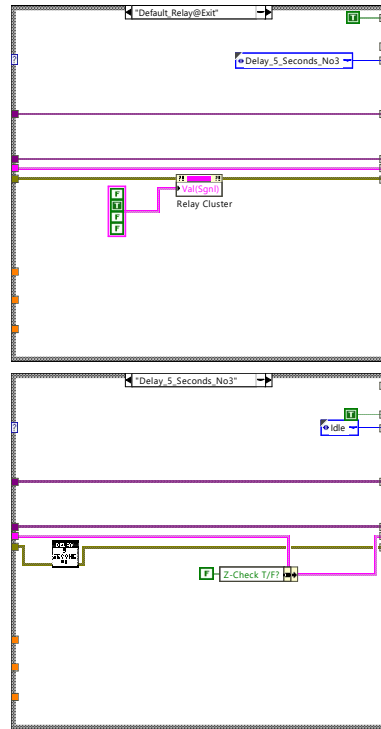


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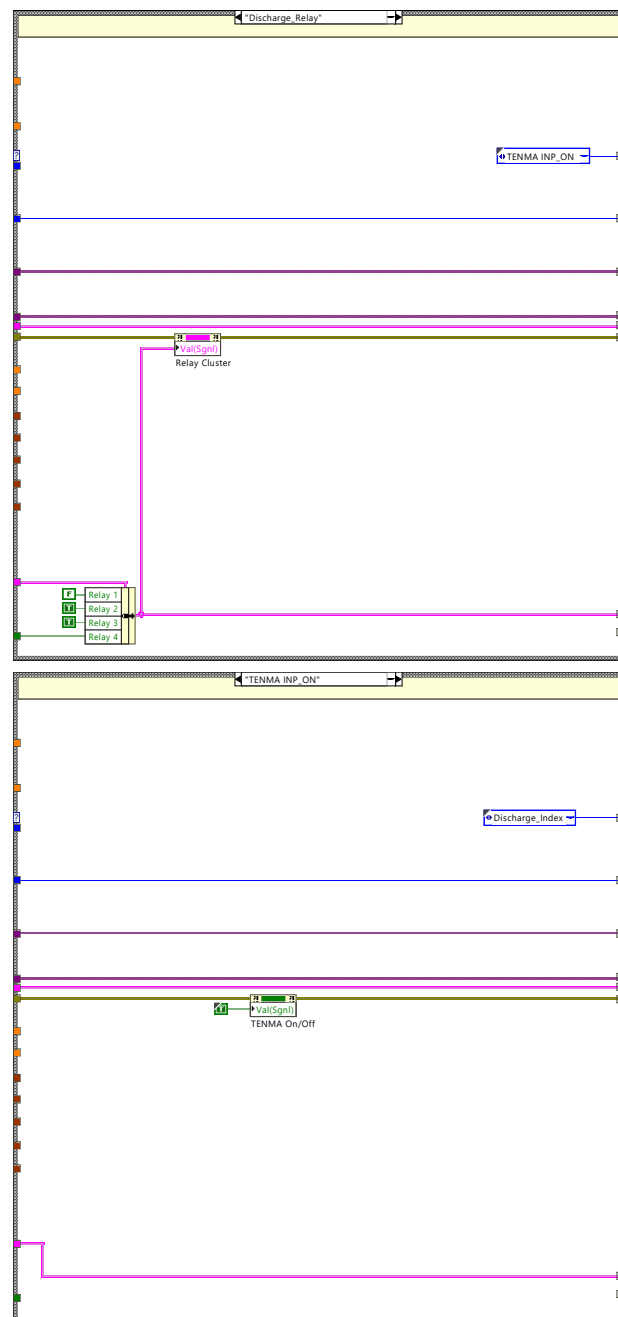


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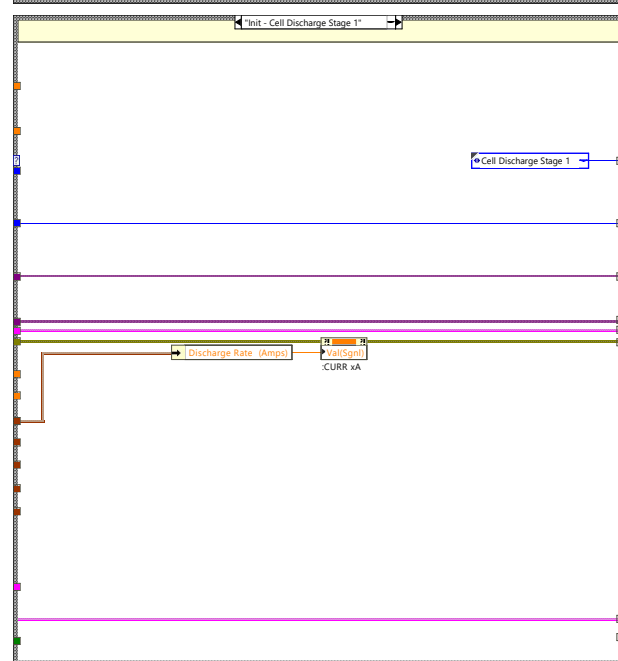
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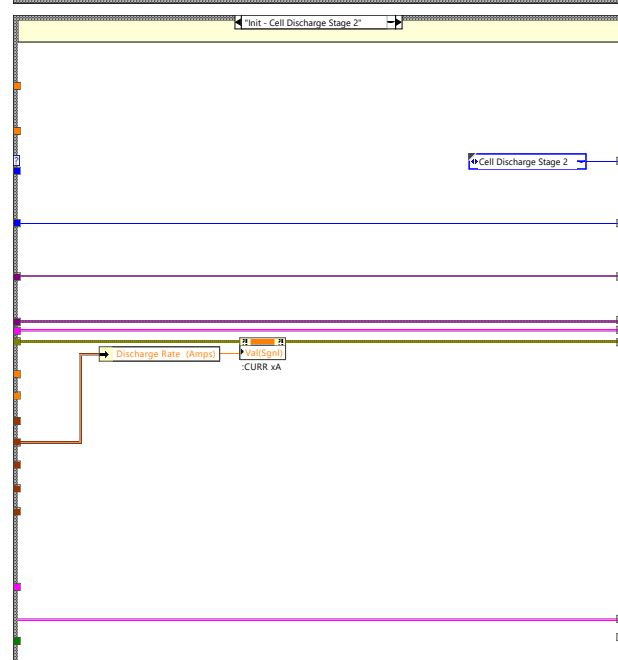


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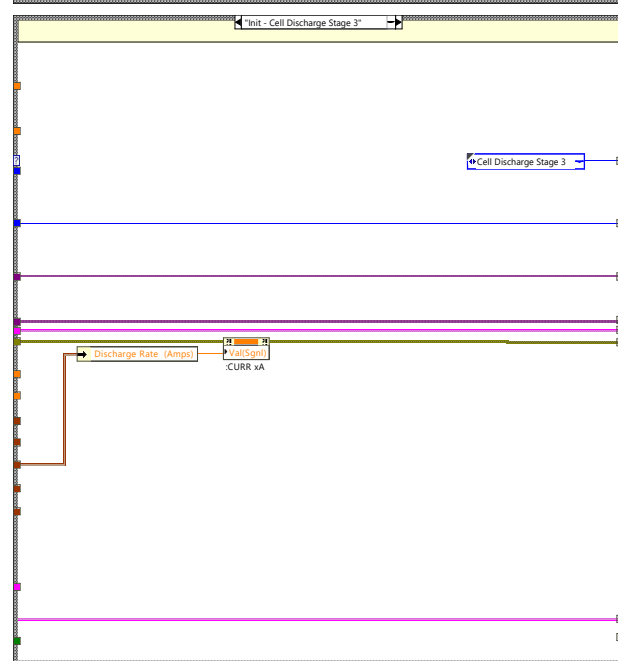
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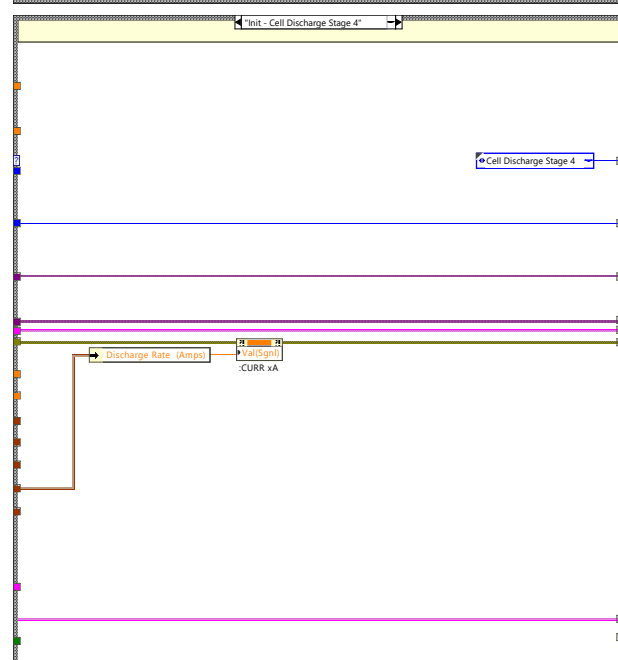
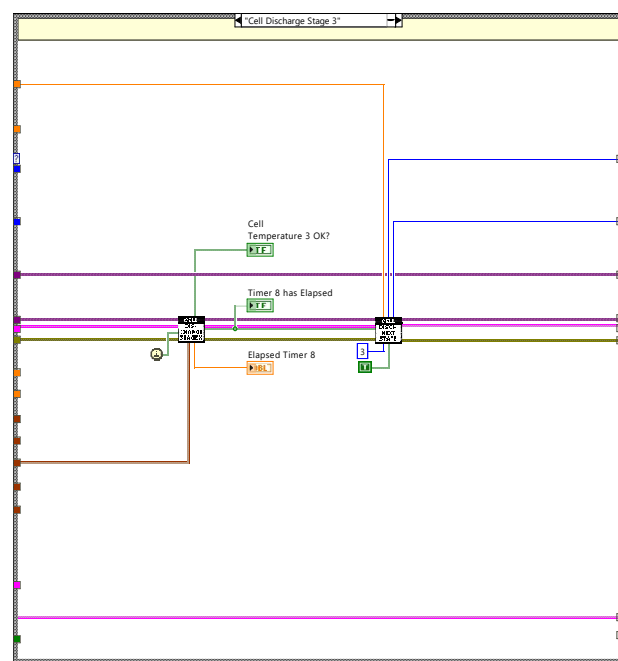


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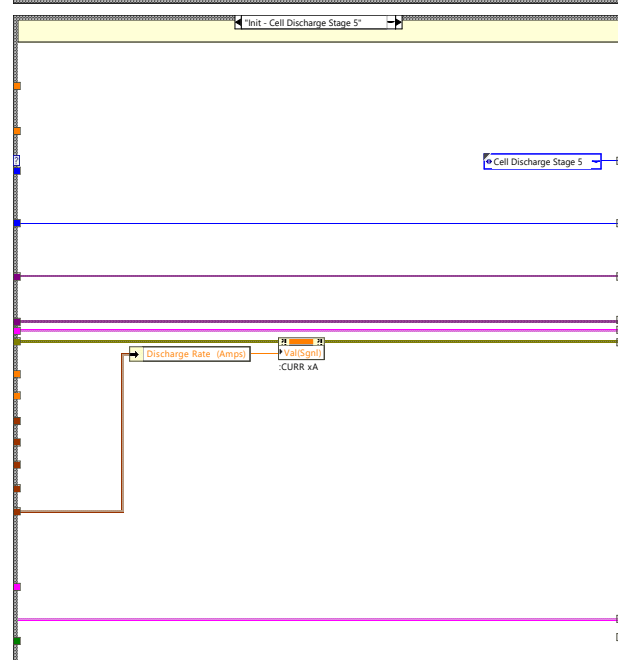
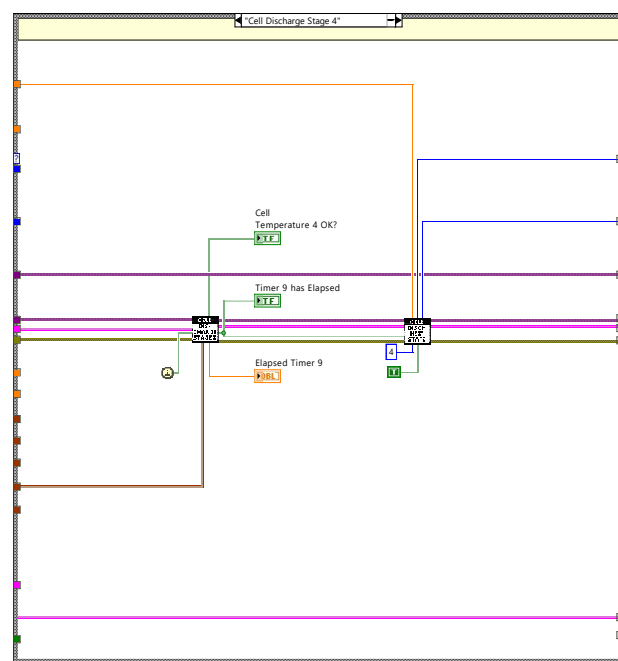


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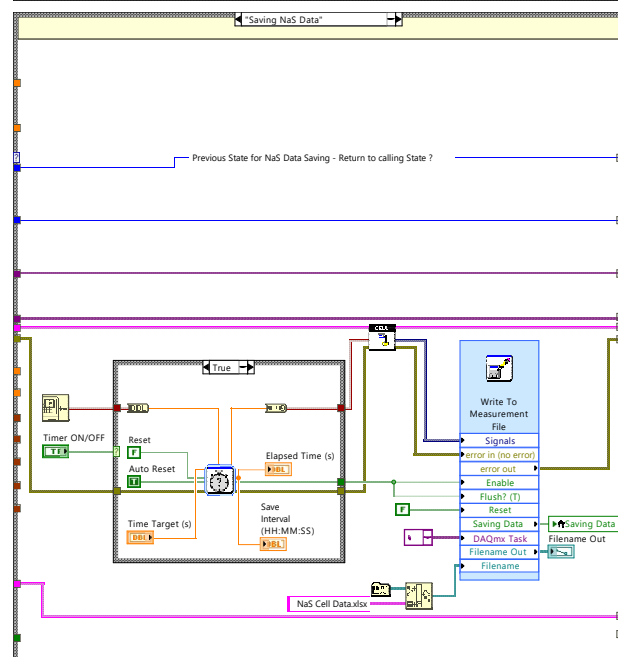
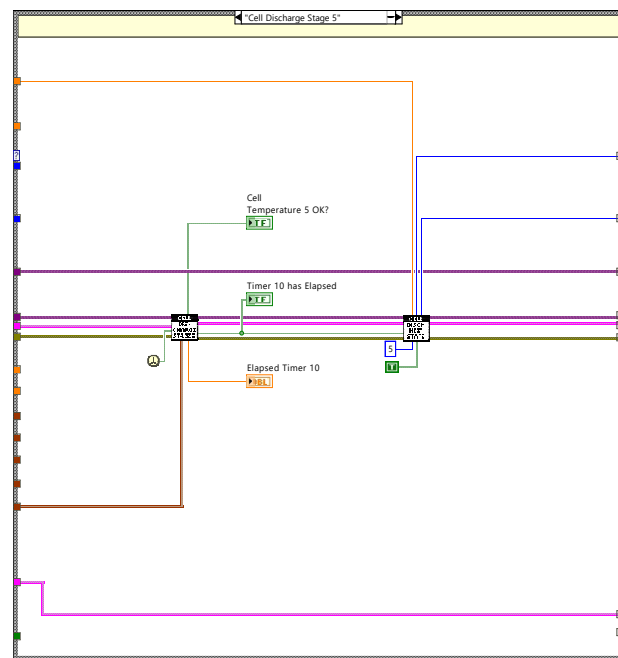
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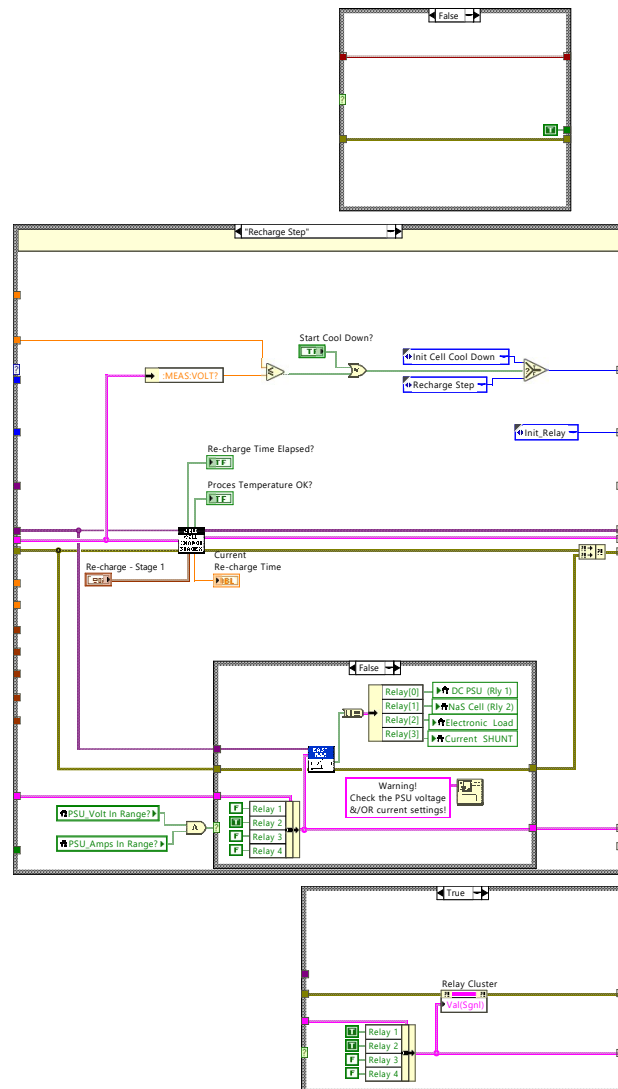
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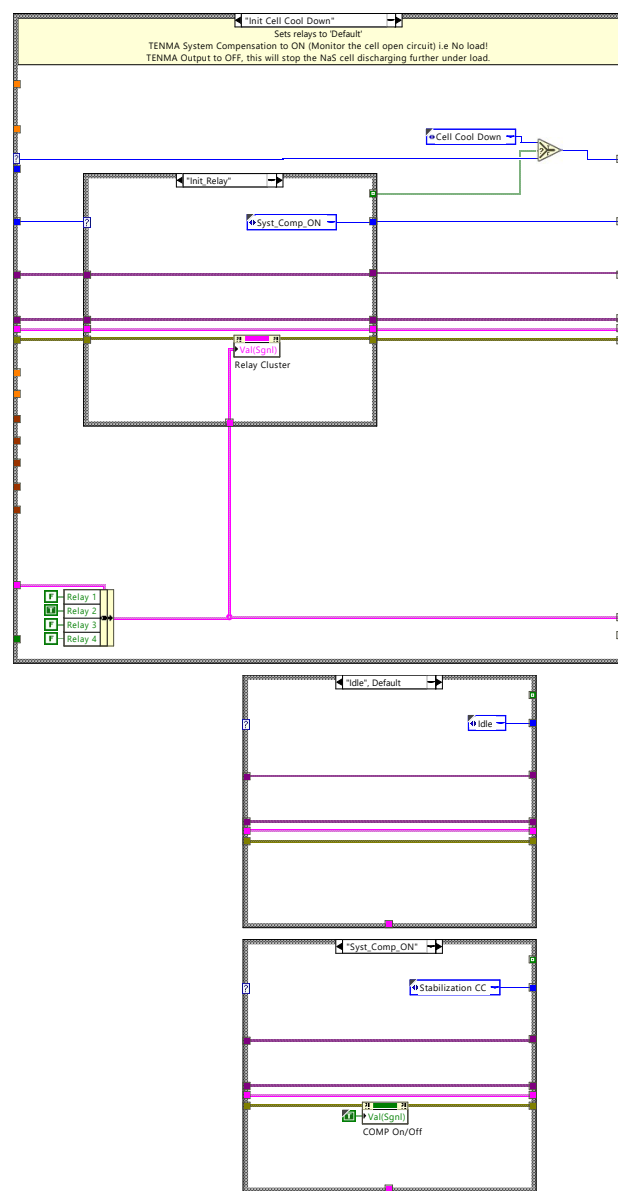


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