Hazard Analysis
Measuring Microstructure Changes During Thermal Treatment

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Table 1: Revision History

Date	Developer(s)	Change
Oct 13, 2022	Abdul Nour Seddiki	Integrated the Template + Added System Boundaries and Components
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Contents

1 Introduction

2 Scope and Purpose of Hazard Analysis

3 System Boundaries and Components

This hazard analysis is conducted on the system that consists of the following components:

1. Thermally treated samples

2. The current source

3. A thermometer

4. The nano-voltmeter

5. Interfaces between above devices and control computer

6. The control computer

7. The software application that will be installed on the control computer

These components comprise the system in question. And they each are also considered the boundaries for this system. Some of the components mentioned are not controllable by ReSprint team, such as the thermally treated samples and all of the measurement devices and hardware including the current source, the thermometer, the nano-voltmeter, the communication interfaces and the control computer. Therefore, the only component controllable by ReSprint team is the software application and its sub-systems.

4 Critical Assumptions

5 Failure Mode and Effect Analysis

Table 2: FMEA Table

Component	Failure Mode	Effects of Failure	Causes of Failure	Recommended Action	Req.	Ref.
Current Source	Current source does not provide current	Nanovoltmeter cannot measure voltage across sample	a. Setup error b. Hardware failure	a. Troubleshoot current source setup b. Replace current source	a. HWR1 b. HWR2	H1-1
Nanovoltmeter	Nanovoltmeter does not read voltage across sample	Voltage data cannot be communicated to App	a. Setup error b. Hardware failure	a. Troubleshoot nanovoltmeter b. Purchase new nanovoltmeter	a. HWR1 b. HWR2	H1-2
Serial Connection	App does not receive data from hardware	Data cannot be communicated to App	a. Setup error b. Hardware failure	a. Troubleshoot serial connection b. Replace serial connection cable	a. HWR1 b. HWR2	H1-3
Windows App	App is not ergonomic for user	User cannot utilise the App	a. Graphics change brightness too rapidly b. Graphics contain colours that are too bright	a. App shall not change screen brightness unless the user chooses b. Graphics shall be designed with dimmed or neutral colours	a. SFR1 b. SFR2	H2
	App does not receive data	Resistivity of sample cannot be calculated	a. Setup error b. Hardware failure c. Software connection error	a. Refer to H1 b. Refer to H1 c. Check that software is accessing the correct serial port	a. HWR1 b. HWR2 c. SWR1	H3
	Calculated values are not correct	User receives inaccurate results	a. User altered measurements through interface b. Software does not calculate values correctly	a. Prevent user from altering measurements received from hardware b. Check that formulas for calculation used by software are correct	a. SCR1 b. SWR2	H4

6 Safety and Security Requirements

[Newly discovered requirements. These should also be added to the SRS. (A rationale design process how and why to fake it.) —SS]

7 Roadmap

[Which safety requirements will be implemented as part of the capstone timeline? Which requirements will be implemented in the future? —SS]