

## Overview

At **HySA Infrastructure**, a S++ Printed Circuit Board (PCB) is used to map both the current and temperature density distribution profiles of the electrolyser cell while it is in operation in order to evaluate the performance of a particular flow field design for optimization. Optimizing the flow field to obtain an even current and temperature density distribution profile for all current densities will increase the reliability of the device because the water in the anode of the electrolyser cell, acts as the active coolant. Uneven current and thermal distribution over the MEA could cause high heat spots and pin hole formation which could lead to critical failures.

## Measurement principle

**HySA Infrastructure** has two different methods to measure the current distribution:

- **Current Scan Lin** is based upon the dependence of the permeability of a magnetic material
- **Current Scan Shunt** is based upon a low ohmic shunt resistor

## S++ sensor plate

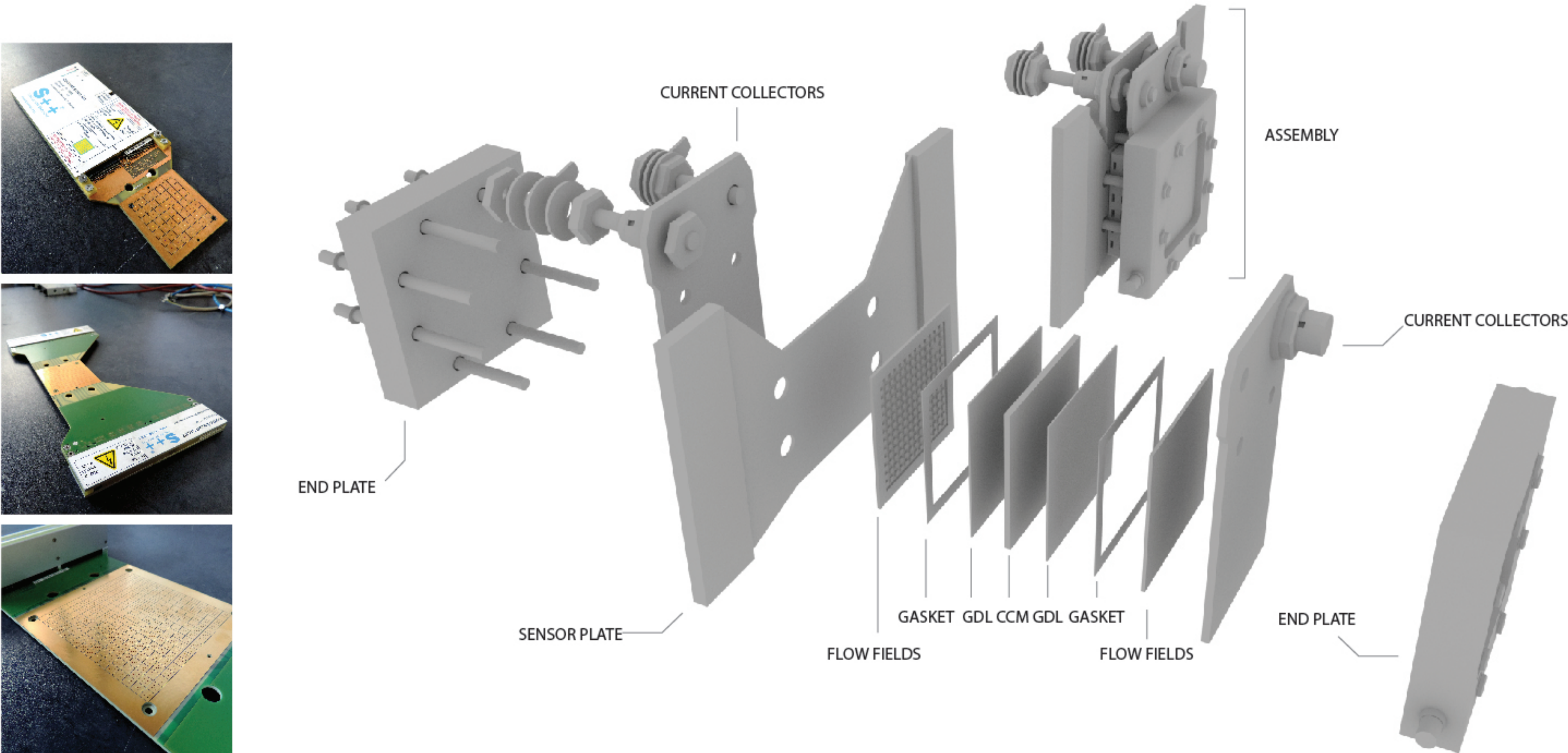
Consist of the following components:

Two current-carrying gold-plated back-plates (Anode and Cathode).

A segmented S++ sensor board.

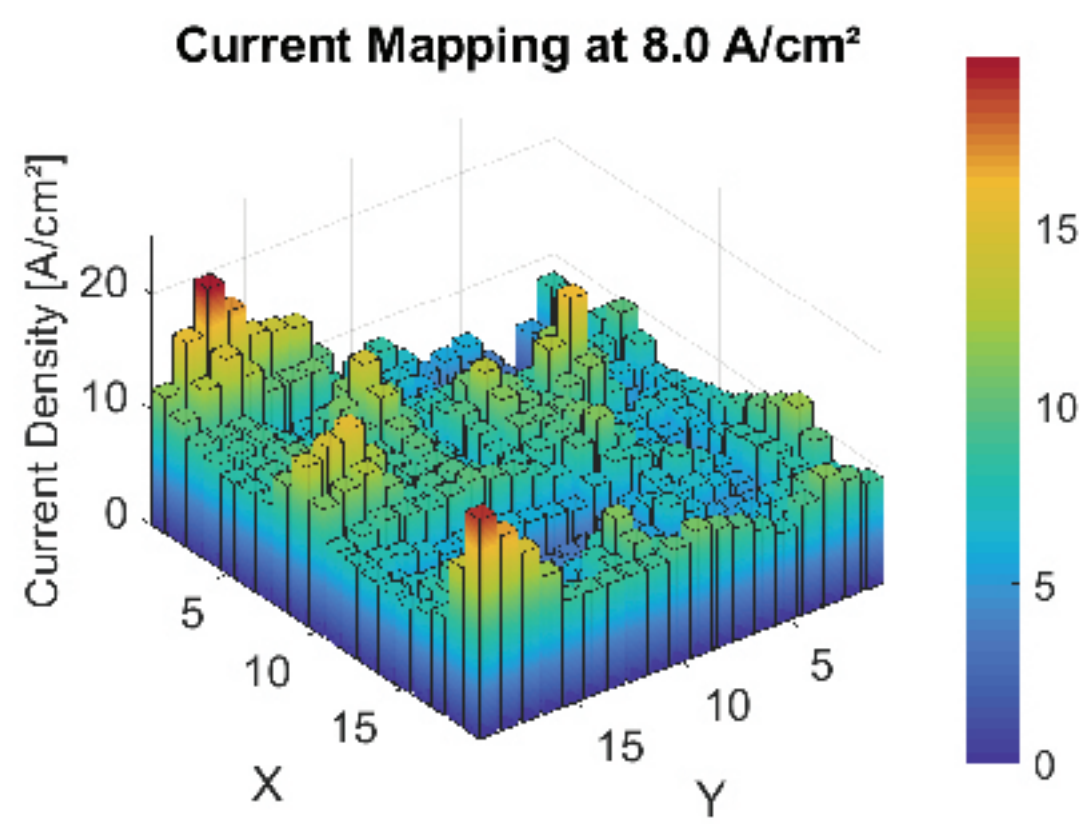
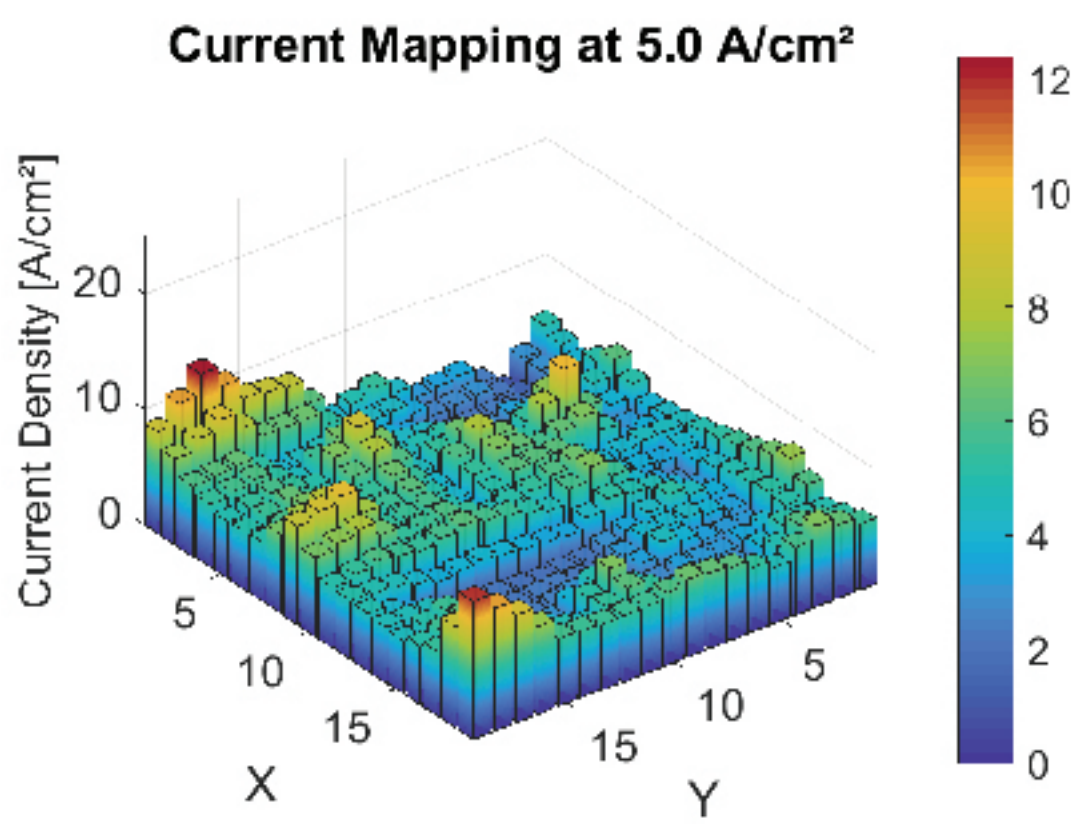
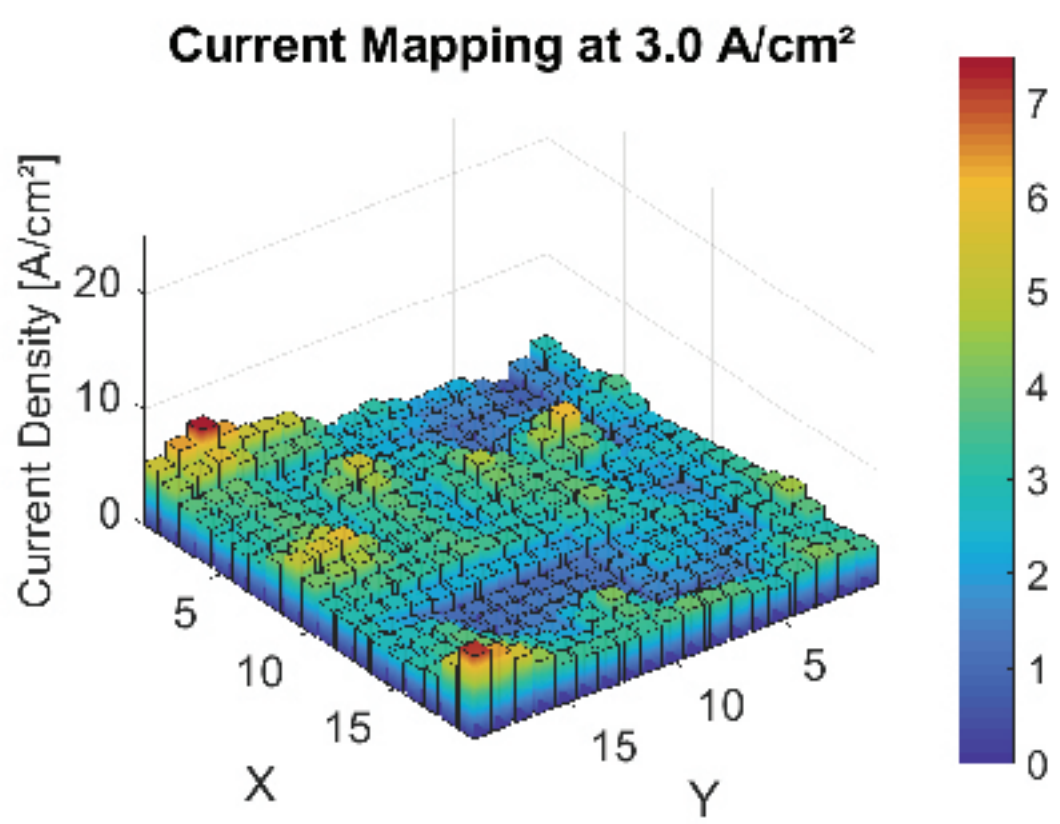
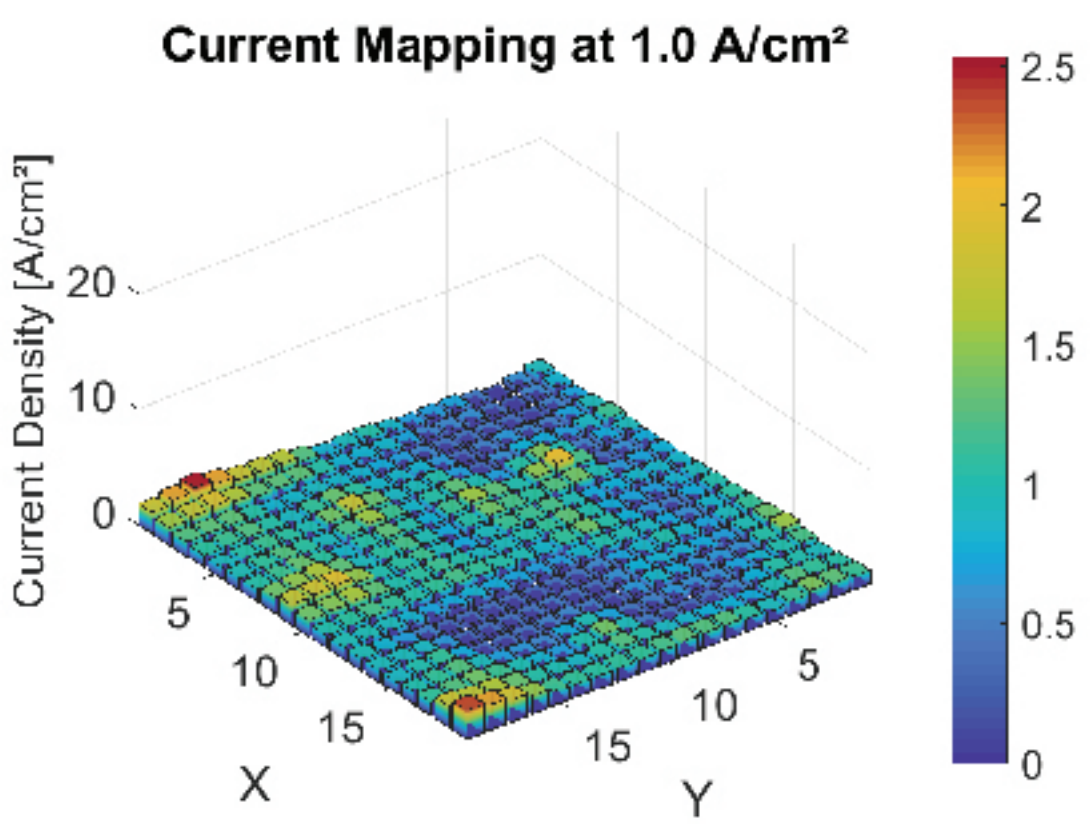
A pair of electrolyser plates containing the flow fields.

The membrane assembly (membrane, porous transport layer and gaskets).

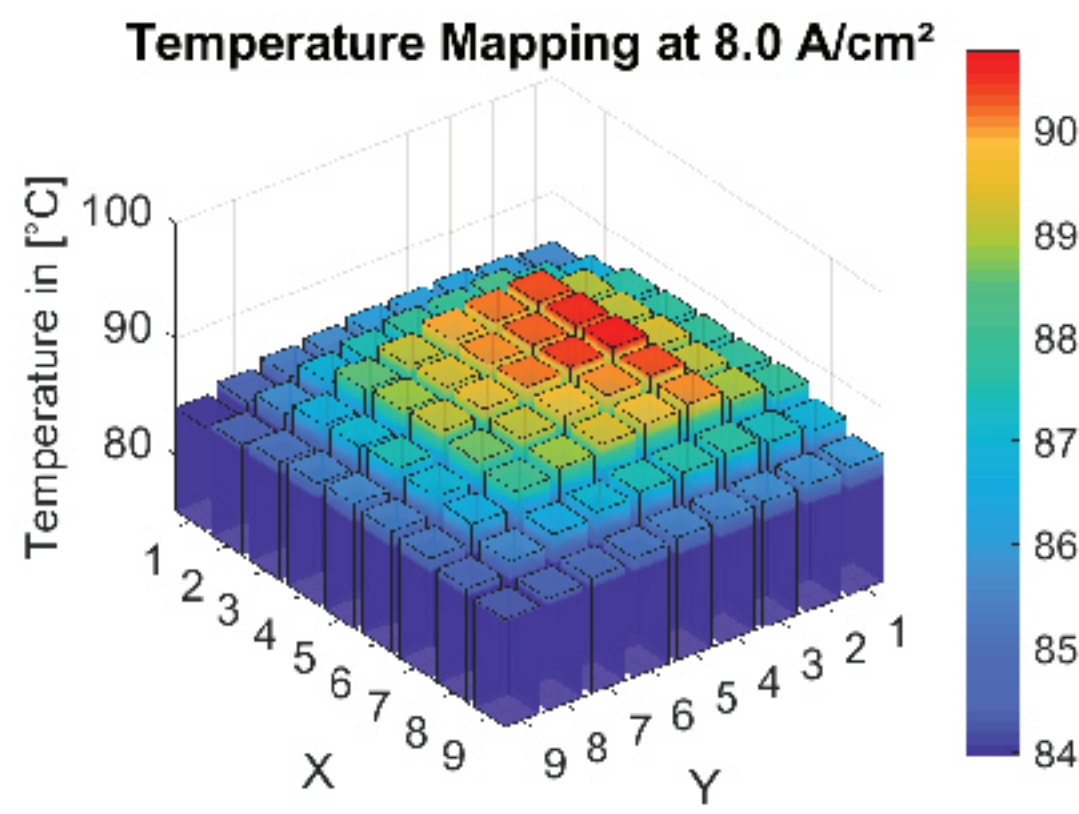
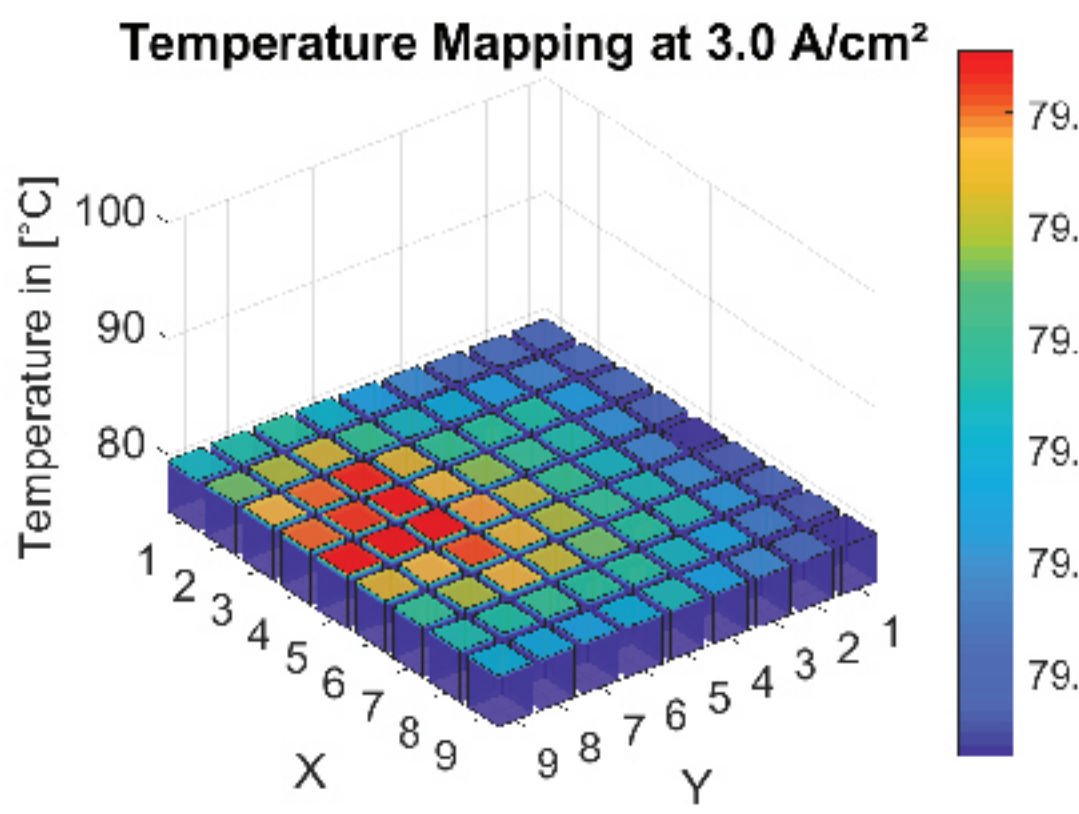
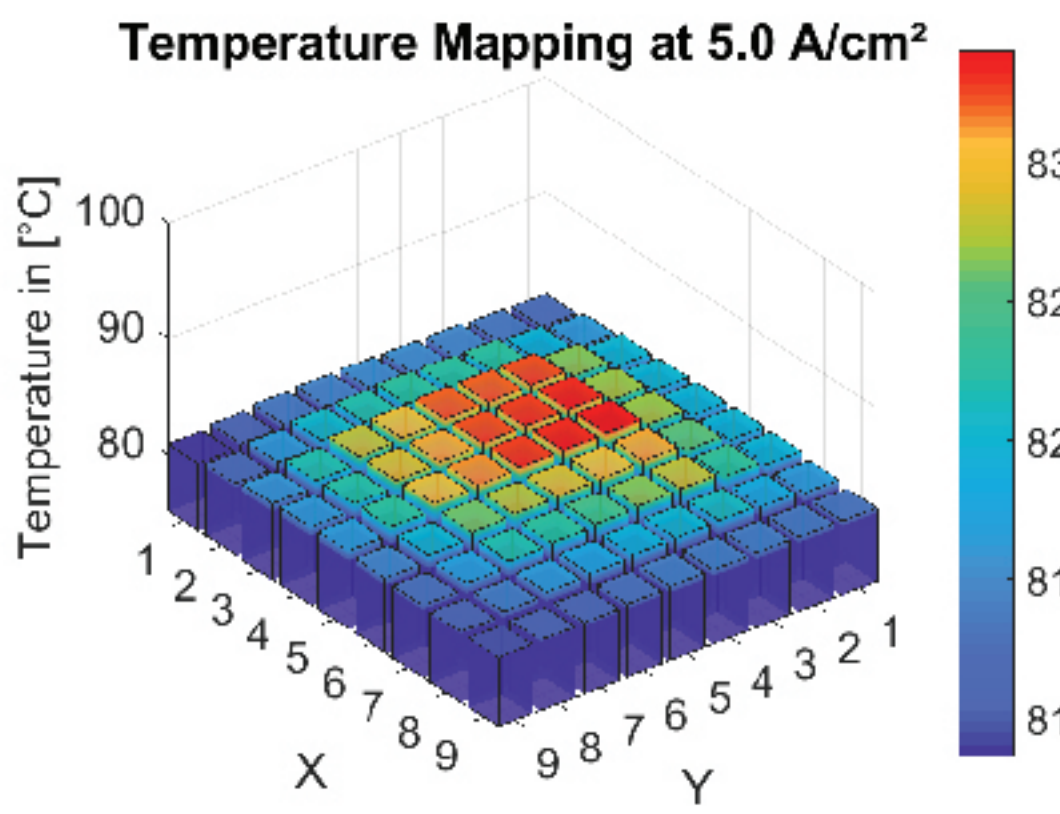
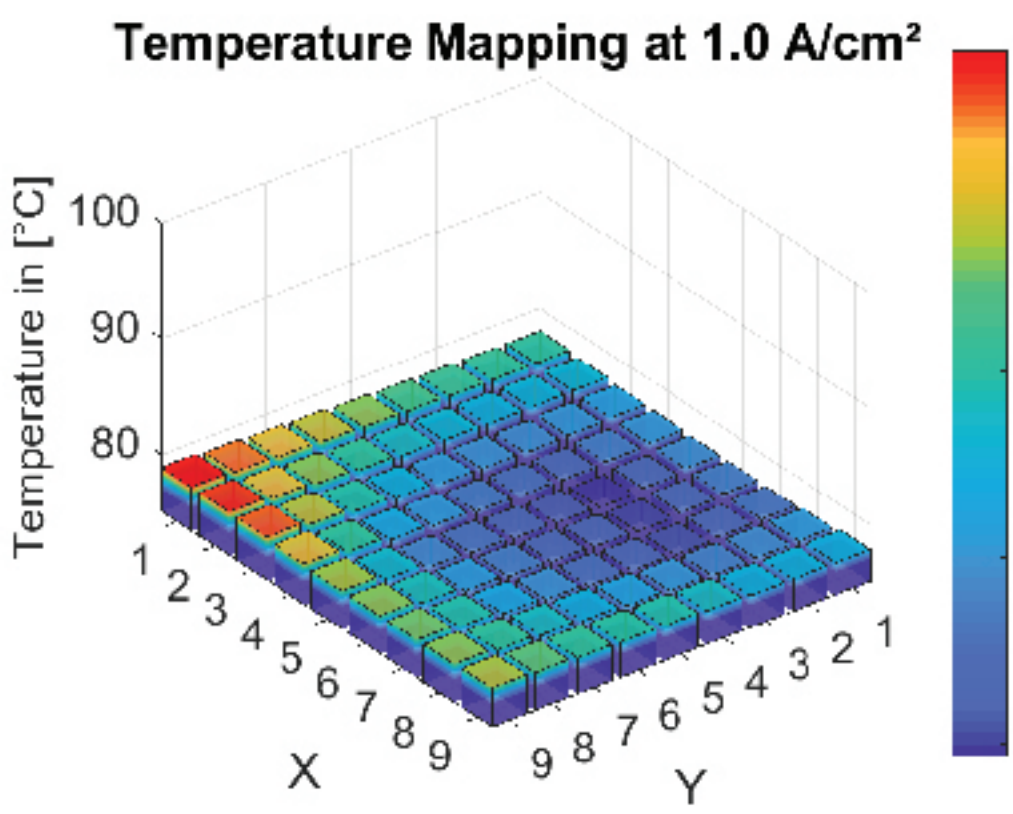


## Mapping Profiles

### CURRENT DENSITY DISTRIBUTION PROFILES



### TEMPERATURE DISTRIBUTION PROFILES



## Current systems used by HySA Infrastructure

SPECIFICATIONS	GEN 1 CURRENT MAPPING	GEN 2 CURRENT MAPPING	GEN 3 CURRENT MAPPING
ACTIVE AREA	25 cm <sup>2</sup>	25 cm <sup>2</sup>	100 cm <sup>2</sup>
CURRENT DENSITY RANGE	0 - 2.5 A/cm <sup>2</sup>	0 - 10 A/cm <sup>2</sup>	0 - 10 A/cm <sup>2</sup>
MAX CURRENT	62.5 A	250 A	1000 A
NUMBER OF CDD SEGMENTS	49	100	256
TEMPERATURE	0 - 100 °C	0 - 100 °C	0 - 100 °C
NUMBER OF TDD SEGMENTS	25	25	64