In Situ TKD stage
For Heating and/or Biasing
The DENSsolutions TKD stage enables In Situ heating and/or biasing experiments inside a Scanning Electron Microscope (SEM) or Focused Ion Beam (FIB) instrument.

The stage allows SEM and FIB users to conduct In Situ micro-structural characterization using TKD (on-axis/off-axis) or conventional EBSD techniques. And specifically for TEM users, the stage can save valuable TEM time by allowing users to perform a relatively quick preliminary In Situ sample characterization inside the SEM in order to develop a work flow for further TEM experiments.

**Compatibility**

**Nano-Chips**

- **wildfire**
  - Thermo Fisher (FEI) Heating
    - RT - 1300 °C
  - JEOL Heating
    - RT - 1300 °C
  - Thermo Fisher (FEI) Biasing
    - 0 - 100 V
  - JEOL Biasing
    - 0 - 100 V
  - Thermo Fisher (FEI) 4 biasing & 2 heating
    - 0 - 100 V
    - RT - 900 °C
  - Thermo Fisher (FEI) 4 heating & 2 biasing
    - 0 - 100 V
    - RT - 900 °C
  - JEOL 4 heating & 4 biasing
    - 0 - 100 V
    - RT - 900 °C

- **lightning**
  - Thermo Fisher (FEI) Heating
    - RT - 1300 °C
  - JEOL Heating
    - RT - 1300 °C
  - Thermo Fisher (FEI) Biasing
    - 0 - 100 V
  - JEOL Biasing
    - 0 - 100 V
  - Thermo Fisher (FEI) 4 biasing & 2 heating
    - 0 - 100 V
    - RT - 900 °C
  - Thermo Fisher (FEI) 4 heating & 2 biasing
    - 0 - 100 V
    - RT - 900 °C
  - JEOL 4 heating & 4 biasing
    - 0 - 100 V
    - RT - 900 °C

**SEM/FIB devices**

- **Zeiss** Ultra and Gemini
- **FEI (TF)** Nove NanoSem 600 (ESEM) & Helios G4 plasma FIB
- **JEOL** 4600

*a stage adapter might be required

**Detectors**

- **Bruker** Optimus On-axis TKD detector
- **Oxford** Symmetry EBSD detector

**Application example**

Performing In Situ heating and microstructural analysis to observe austenite formation and retention.

Research done by the University of Sydney.

*Fig. 1. Electropolished Mn steel. Planar lift out onto heating chip.*

*Fig. 2. Phase colour maps of the selected ROI of a steel sample is at RT, 650°C, 700°C, 800°C and after 5 minutes at 800°C. Blue and Red color denote BCC and FCC phases, respectively.*