

 | **Wildfire****In Situ TEM Heating Solution**

The Wildfire In Situ TEM Heating Series allows to observe real-time dynamics of any sample under a controllable thermal environment without interfering with the performance of the TEM. Centered around the state of the art Nano-Chips, the Wildfire expands greatly the application space of your TEM converting it into a real-world laboratory at the nano-scale and providing the unique possibility to link the processing conditions with the structure, properties and performances of maintaining the atomic imaging resolution provided by the TEM.

Applications among others include precipitation hardening of metal and alloys, ceramics sintering, stability of catalyst nanoparticles, interdiffusion in semiconductor heterostructures and composites, defect chemistry in low dimensional materials, degradation of solar cells, etc.

*The Wildfire H+ DT In Situ TEM heating systems are upgradable to Biasing and Heating.*

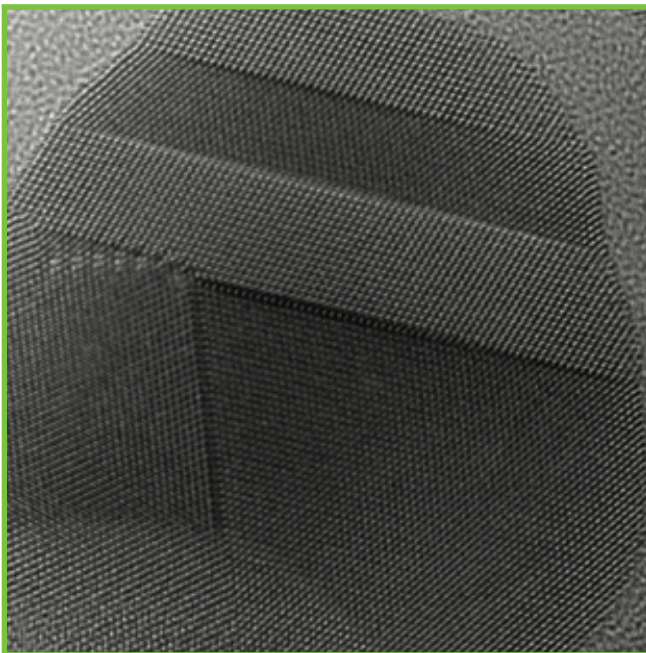


Fig. 1. In Situ Nickel oxidation



Fig. 2. Palladium NP (1 bar He + CO, 500 °C)

Nano-Chip	Wildfire H+ 3D	Wildfire H+ DT
Heater material	Chemically inert encapsulated metal	
Heating range	RT - 1,300 °C	
Temperature control mode	Closed 4-point probe feedback loop	
Temperature stability	± 0,005 °C	
Temperature accuracy	≥ 95 %	
Temperature uniformity	≥ 99.5 %	
Z-displacement T ≤ 500°C	≤ 200 nm	
Sample preparation methods	Drop casting, thin film deposition, 2D materials transfer and FIB	
Sample displacement	≤ 50 nm for ΔT = 600 °C	
Transparent area	850 μm <sup>2</sup>	

## Features and benefits

### 1) Application space

The Wildfire system provides the maximum achievable temperature and mechanical tilt range for In Situ TEM. Making it a versatile tool that can be used to observe temperature-assisted dynamics in a wide variety of applications.

### 2) Sample stability

The improved Nano-Chip design offers the highest lateral and focus stability during heating, keeping the sample in focus and in the line of sight. This prevents the user from missing any important event and achieve the highest resolution for imaging and spectroscopy.

### 3) Temperature control

The 4-point probe temperature control, optimized Nano-Chip design and two-step calibration process ensure accurate and reliable temperature control over the entire temperature range.

	JEOL		Thermo Fisher Scientific	
	Wildfire H+ 3D	Wildfire H+ DT	Wildfire H+ 3D	Wildfire H+ DT
Polepiece compatibility	HRP, WGP	UHR, FHP, SAP, HRP, WGP	TWIN, C-TWIN, S-TWIN, X-TWIN	
Attainable resolution*	≤ 0.6 Å			
Drift rate*	≤ 0.5 nm/min			
EDS compatibility	Yes		Yes, side entry EDS detector	Yes, dual EDS detector
Maximum EDS temperature**	Up to 1000 °C			
EELS compatibility	Yes			
Number of electrical contacts	4	8	4	6
Alpha tilt range***	HRP ≥ ± 42 deg WGP ≥ ± 64 deg	URP, FHP ≥ ±8 deg HRP,WGP ≥ ±20 deg	≥ ± 70 deg	≥ ± 22 deg
Beta tilt range***	NA	URP, FHP ≥ ±15 deg HRP,WGP ≥ ±25 deg	NA	≥ ± 25 deg
Upgradable to Biasing and Heating	NA	Yes	NA	Yes

\*The listed specifications are dependent on the microscope configuration and its performance.

\*\* Depends on the EDS detector configuration.

\*\*\* Tilt ranges are dependent on the exact pole piece gap, microscope configuration and EDX detector used and might vary from the listed specifications.