

Substrate Heating

SOLUTIONS FOR EVERY DEPOSITION SYSTEM, APPLICATION AND SPECIFICATION

TSST provides custom heating solutions based on three different heating methods; resistive, radiative and laser heating. Depending on required heating requirements such as sample size, temperature range and gas environment, TSST designs custom suitable solutions in a wide range of possible specifications.

RESISTIVE HEATING

A robust, flexible, low cost solution suitable for most applications. A resistive heating system consists of separate, easily exchangeable resistive heaters which are loaded on a heater holder with power contacts and thermocouple. Samples are glued or clamped onto the heater.

RADIATIVE HEATING

The preferred solution when high temperatures are required combined with larger substrate sizes. In a radiative

heating design the heater itself is fixed on a stage in the vacuum chamber. Samples are glued or clamped on a sample plate and loaded onto the heater.

LASER HEATING

Highest temperatures, fast ramp rates and lowest vacuum contamination. With an infrared laser a sample plate loaded on a sample plate holder is radiated locally, reducing any unintentional outgassing. A laser heating setup is easily combined with resistive heating.

TSST is specialised in customised products. With almost 20 years of experience TSST is able to offer individually designed systems and components adapted to the need of our customer. This includes preparing a system for future upgrades.

Heating solutions

	Temperature			Ramp rate	Sample size			RHEED compatible	O ₂ compatible
	<900°C	<1000°C	<1100°C		<10x10mm	<1"	<2"		
Resistive heating	●			++	●	●		●	●
Radiative heating	●	●		+	●	●	●	●	●
Laser heating	●	●	●	+++	●			●	●



Substrate Heating

* optional

Typical Heater Specifications

RESISTIVE HEATING



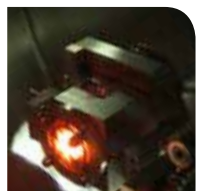
Temperature	Up to 900°C
Sample size	<1" substrates
Sample fixation	Glue, clamping
Sample transfer	Whole heater
Compatible stage	Options for full range motions (X, Y, Z, tilt, azimuth), shutter
RHEED compatible	Yes, with full motion stage and software
Gas environment compatibility	UHV to high pressure oxygen
Temperature readout	Thermocouple, pyrometer*
Temperature control electronics include PID controller and power supply	

RADIATIVE HEATING



Temperature	Up to 1000°C
Sample size	<2" substrates
Sample fixation	Glue, clamping
Sample transfer	Sample holder
Compatible stage	Options for full range motions (X, Y, Z, tilt, azimuth), shutter
RHEED compatible	Yes, with full motion stage and software
Gas environment compatibility	UHV to high pressure oxygen
Temperature readout	Pyrometer
Temperature control electronics include PID controller and power supply	

LASER HEATING



Temperature	Up to 1100°C
Sample size	<10x10mm substrates
Sample fixation	Glue, clamping
Sample transfer	Sample holder
Compatible stage	Options for full range motions (X, Y, Z, tilt, azimuth), shutter
RHEED compatible	Yes, with full motion stage and software
Gas environment compatibility	UHV to high pressure oxygen
Temperature readout	Pyrometer
Temperature control electronics include PID controller and power supply	

COMBINED HEATING SOLUTIONS

Laser heating can be combined with resistive heating where the resistive heater and the sample holder for laser heating can be interchanged

TSST TEMPERATURE CONTROL SOFTWARE

Automated PID temperature control, fixed output to stabilise magnetic fluctuations for optimal RHEED measurements



Institutenweg 25
PO Box 256
7500 AG ENSCHEDE
The Netherlands

T +31 (0) 53 2030 244
F +31 (0) 53 2030 248
info@tsst.nl
www.tsst.nl