



Product Sheet XRD 40

MTC-FURNACE - Best Temperature Homogeneity

The MTC-FURNACE is designed for high temperature X-ray diffraction in reflection mode on a vertical goniometer.

The MTC-FURNACE features a large homogeneous temperature field thanks to the combination of an omega-shaped radiation heater with a sample spinner. This setup is ideal for heating any type of sample: powders, thin films or even small bulk samples. Different metallic heaters are available. An AlCr heater can be used under inert and oxidative atmospheric conditions up to 1100°C. A Ta heater can be used up to 1300°C, but requires high vacuum ($\leq 10^{-4}$ mbar).

The sample temperature is accurately measured by a thermocouple close to the sample.

The sample holder is an Al₂O₃ ceramic crucible that fits to the sample spinner. The ceramic spinner unit is chemically

- Radiation heater
- RT to 1300°C
- Sample spinner
- Inert sample holder material Al₂O₃
- For operation in vacuum, inert gas or air



MTC-FURNACE chamber with motorized height alignment stage



MTC-FURNACE interior with the corundum sample spinner moved out of the way

inert, but shows by design a large thermal elongation. This effect can be automatically compensated for when the motorized height alignment adapter is selected. This ensures a constant sample position over the full temperature range.

Sample spinning improves the temperature uniformity and enhances crystallite statistics. For changing the sample, the spinner unit can be moved down and the crucible easily removed.

The MTC-FURNACE is an integral part of the DAVINCI design. The stage mounts to the D8 goniometer through a bayonet interface, which allows fast and reproducible exchange with other sample stages.

As a member of our MTC family of modular non-ambient chambers, the MTC-FURNACE can be easily reconfigured to other MTC-type chambers by simply exchanging the heater and sample holder unit.

As you may expect of an integrated solution, setting up a measurement to the final data evaluation is fully supported by our DIFFRAC.SUITE software.

MTC-FURNACE - Technical Data	
Temperature Range	RT to 1300°C
Atmosphere	Vacuum, air, inert gas (He, N ₂)
Heater Material	AlCr (max. temperature 1100°C in vacuum, inert gas or air) Ta (max. temperature 1300°C in vacuum)
Sample Holder Material	Al ₂ O ₃
Thermocouple	Type S close to the sample
X-Ray Window Opening	12 mm wide, -10° to 190° 2Theta (chamber body) 0° to 85° 2Theta (heater)
X-Ray Window Material	Kapton, additional graphite foil for operation above 1200°C
Required Accessories	
	Temperature controller: Control Unit TCPU1
	Height alignment adapter (manual or motorized)
Options	
	Vacuum pump unit
	Ta-heater
	Valves and stainless steel tubes for inert gas operation

*) better than 10⁻⁴ mbar (turbo molecular pump required)