



Product Sheet XRD 41

MTC-LOWTEMP - Low and Medium Sample Temperatures

The MTC-LOWTEMP is designed for low and medium temperature X-ray diffraction in reflection mode on a vertical goniometer.

The MTC-LOWTEMP combines low (-180°C) and medium (450°C) sample temperatures in one setup. The sample holder made of Ni-coated copper is fixed on the cooling block. For temperatures below room temperature, this block is cooled by a continuous liquid nitrogen flow. The preselected sample temperature is achieved by controlled heating of the cooling block using a heating strip made of AlCr. Accurate temperature measurement is done by a thermocouple, mounted directly at the sample holder.

The liquid nitrogen dewar is connected to the MTC-LOWTEMP cooling block by a flexible, vacuum-insulated stainless steel bellows. For continuous nitrogen

- Heating and cooling chamber
- -180°C to 450°C
- Wide temperature range with one set-up
- For operation in air, inert gas or vacuum
- Modular chamber design



MTC-LOWTEMP chamber with motorized height alignment stage



MTC-LOWTEMP interior

flow, the dewar is pressure loaded. Low temperature operation needs vacuum atmosphere to avoid icing at the sample and to reduce thermal connectivity to the chamber housing.

A screen can be positioned just above the sample to reduce scattering by air and the X-ray window at low angles.

The MTC-LOWTEMP 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-LOWTEMP 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-LOWTEMP - Technical Data

Temperature Range	-180°C to 450°C in vacuum RT to 300°C in air or inert gas
Atmosphere	Vacuum, air, inert gas (He, N ₂)
Heater Material	AlCr strip
Sample Holder Material	Ni-plated copper
Thermocouple	Type K
X-Ray Window Opening	12 mm wide, -10° to 190° 2Theta
X-Ray Window Material	Kapton
Required Accessories	
	Temperature controller: Control Unit TCPU1
	Height alignment adapter (manual or motorized)
	Liquid nitrogen dewar vessel, vacuum insulated metal hose for LN ₂ supply, pressure controller
Options	
	Vacuum pump unit
	Valves and stainless steel tubes for inert gas operation

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

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