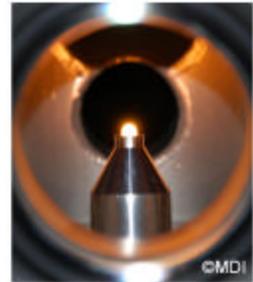




## High Temperature Conical Nozzle Levitator (HT-CNL™)

Conical Nozzle Levitation (CNL) has been used for more than 20 years for non-contact extreme environment processing and to study liquids at high temperatures. MDI is offering the new 4<sup>th</sup> generation HT-CNL™ instrument that can be used for work at temperatures up to ~3000°C (sample size and composition dependent) and with samples from ~0.5-3 mm diameter. This instrument has been perfected through R&D at beamlines and in the laboratory and provides a convenient research tool.

The HT-CNL is ideally suited to synthesis of novel glass and amorphous phases, high-purity processing of liquids at extreme temperatures, investigation of undercooled and non-equilibrium melts, and accessing pristine liquid surfaces. The HT-CNL uses a 240 Watt carbon dioxide laser that can be operated in “Class I conditions (enclosed, interlocked beam path) to heat materials. The compact footprint of the levitator “head” allows it to be integrated with X-ray and neutron beamlines and other diagnostic instrumentation. The temperature of the hot material is measured with an optical pyrometer aligned using integrated video cameras. Data acquisition and control are *via* computer.



A picture of a hot sample levitated in the HT-CNL

The HT-CNL is supplied for laboratory use. Users also frequently plan to use the instrument as an extreme sample environment for research at beamlines or integrated with other diagnostic instrumentation. MDI specializes in working with customers to optimize the system installation to meet specific objectives and requirements. Approximate dimensions and the utility requirements for the HT-CNL are given below.

### Dimensions and utilities

Floor area, laser frame and power supply	0.6 x 1.5 m (24" x 60")
Height, levitator system and frame	1.8 m (74")
Weight	300 kg (650 lb)
Laser (other voltages available)	180-264V, 50/60Hz 3Phase, 24 amps
Ancillary equipment	100/120V, 20 amps
Laser cooling water	1000 liter/hr (240 gal./hr)
Levitation gas	50 liter/hr (2 cu.ft./hr)

The standard levitator enclosure enables work in process gases including air, argon, oxygen and redox mixtures at a total pressure of one atm. A sealed chamber can be specified for use in the pressure range 0.5 to 5 atm. for work at reduced pressure or to increase the fugacity of chemically active process gases. Samples can be prepared from powder mixtures using the laser hearth melter<sup>#</sup> that is supplied with the system.

# J.K.R. Weber, J.J. Felten and P.C. Nordine, "Laser Hearth Melt Processing of Ceramic Materials," Rev. Sci. Instrum., **67**, 522-24 (1996).

PLEASE VISIT MDI'S WEB SITE AT [www.matsdev.com](http://www.matsdev.com) TO REQUEST DETAILED SPECIFICATIONS, DELIVERY AND PRICING INFORMATION