

TFDS-2537 - Thin Film Deposition on Substrates at Cryogenic Temperatures

This R&D equipment combines high precision thin film deposition technique with extremely low temperatures of a 1" diameter substrate



The lowest achievable temperature is 4.2 K using closed cycle He cryogenic system.
 The temperature can be accurately controlled in the range of 5 to 320 K +/- 0.1K. The temperature reading accuracy is 10^{-3} K.
 Three different evaporation sources are used for thin layer deposition: one e-beam gun and two resistance heater sources. An Ion Gun is used for substrate cleaning and for assisted evaporation.
 One important additional feature is the capability of adjusting the deposition/milling angle from Normal incidence to 30 deg.
 The system is fully automated and has computer interface capability. As a research tool, the system has been design for maximum flexibility. Top plate and base plate lift and swing for full access to evaporation source aria as well as to the cold finger aria, for sample installation. Several feedthroughs are provided for sample electrical test during and after deposition.

Technical Data

Base pressure:	7 x 10 ⁻⁹ Torr
Typical pump down time:	120 min to 10 ⁻⁸ range
Chamber size:	18" dia. 20" high
Top Plate:	Lift height 20" Swing angle 90 deg Sample tilt angle +/- 10 deg.
Base Plate:	Lift height 20" Swing angle 90 deg
View Ports:	4" dia. 1" dia.
Vacuum Valves:	Electro-pneumatically actuated
High Vacuum Pump:	Cryogenic pump CTI 8"
Roughing Pump:	Optional dry or oil sealed 270 l/min
Evaporation Sources:	MDC e-Vap miniature 2cc e-beam Thermal evaporation source 2 KW
Ion Gun:	3 cc cold or hot filament
Cold Roof:	Water cooled dismountable cold roof
Shutters:	Rotating Source Shutter Swinging Sample Shutter
Vacuum Gauges:	Combine digital gauge with two T/C and one cold cathode gauge
Thickness Monitor:	Maxtek 360 Deposition Controller
Control:	Control PLC integrated system