

NANO TEC



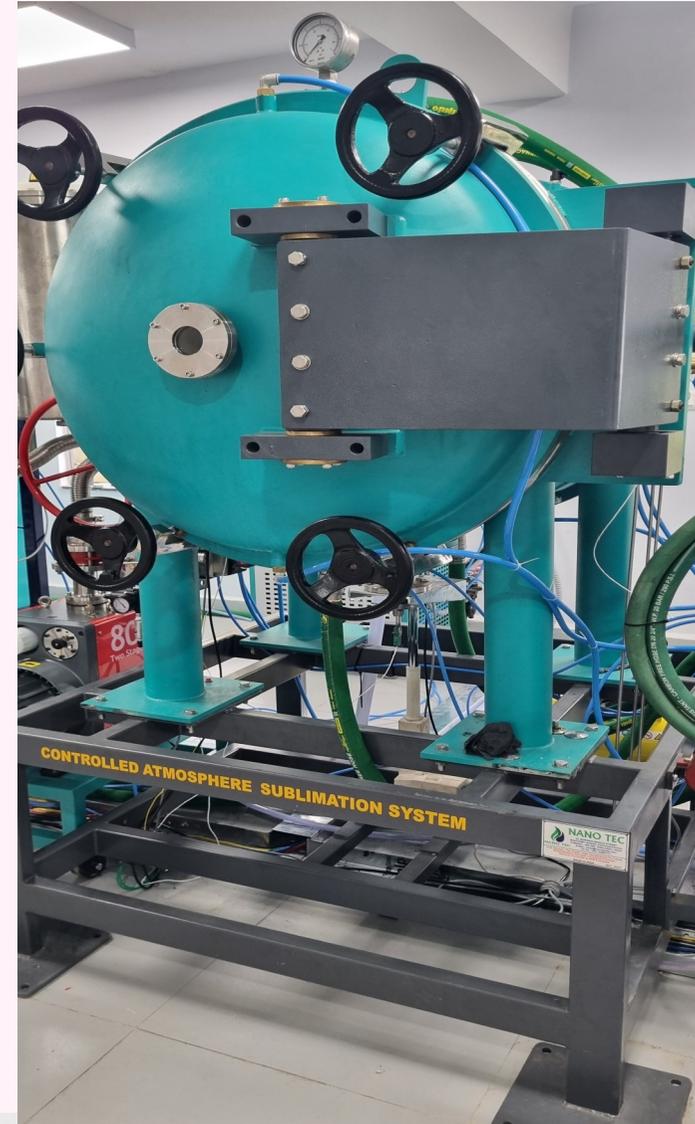
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NANO TEC

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Manufacturer of Lab Equipment's



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NANO TEC

Golden Parameters

Precision Vacuum Melting & Distillation for Advanced Materials

The Nano Tec Vacuum Induction Furnace with Distillation Unit is a laboratory / pilot-scale system designed for high-purity melting and vacuum distillation of metals such as Al, Cu, Ni, Mg, Ti, Co, and alloys under high vacuum or inert gas atmosphere.

Engineered for materials research, purification, and critical metal processing, the system integrates induction melting, multi-stage graphite condensation, and high-vacuum technology into a compact, floor-mounted, semi-automatic unit.

Key Applications

- High-purity metal melting and refining
- Vacuum distillation & impurity separation
- R&D on critical and strategic materials
- Academic, defence, space & semiconductor labs
- Pilot-scale process development

Why Nano Tec

- ✓ Complete in-house design & fabrication
- ✓ Proven vacuum + induction integration
- ✓ IEC / IS compliant safety & performance
- ✓ Designed for stable ≥ 2 -hour continuous operation

Core Highlights

- 1 kg graphite crucible capacity
- Maximum temperature: 1800 °C, Vacuum up to $\leq 1 \times 10^{-6}$ mbar
- Vacuum / Argon / Nitrogen operation
- Semi-automatic interlocked control system
- High-purity 3-stage graphite condenser

System Configuration

- Chamber-type vacuum induction melting furnace
- SS 304L double-walled, water-cooled chamber
- Vertical cylindrical design with low outgassing finish
- Two quartz viewing ports with isolation valves

High-purity graphite crucible (~500 ml, ≥ 1 kg)

Heating & Power

- Solid-state medium-frequency induction heating
- Power: ≥ 20 kW (continuous duty), 415 V, 3-Ph, 50 Hz
- Frequency: 10–20 kHz (auto-tuned), Digital / analog indication of voltage, current & frequency
- Comprehensive electrical & thermal protections

Vacuum & Distillation

- Two-stage vacuum system
 - Rotary vane pump ≥ 150 LPM, Oil diffusion pump ≥ 250 L/s
 - Ultimate vacuum: $\leq 1 \times 10^{-6}$ mbar
 - High-purity 3-stage graphite condenser
 - SS vacuum lines, HV valves, butterfly & needle valves
 - Pirani + Penning gauges with dual display

Cooling & Utilities

3 TR closed-loop water chiller

Independent cooling for furnace, chamber & vacuum system

All hoses, valves, fittings & interconnections included

Designed for stable thermal control and long service life

Control, Safety & Compliance

- Enclosed control panel with full interlocks
 - Monitoring of temperature, vacuum, power & water flow
 - Emergency stop, over-temp, over-pressure protection
- IEC / IS compliant, fully earthed system

