Super Series™
Vacuum Furnace System

Above: The Super Series SS12-24/13MX

It's super-precise and super-fast.

The T-M Vacuum Super Series Vacuum Furnace System is the high-vacuum, high-temperature technically advanced vacuum furnace to satisfy all your heat-treating needs. Within its all-stainless steel chamber is a two cubic foot work zone capable of holding up to 200 pounds of material for tempering, austenitizing, hardening, stress relieving, brazing, sintering, bonding, annealing, and many other custom vacuum processes.

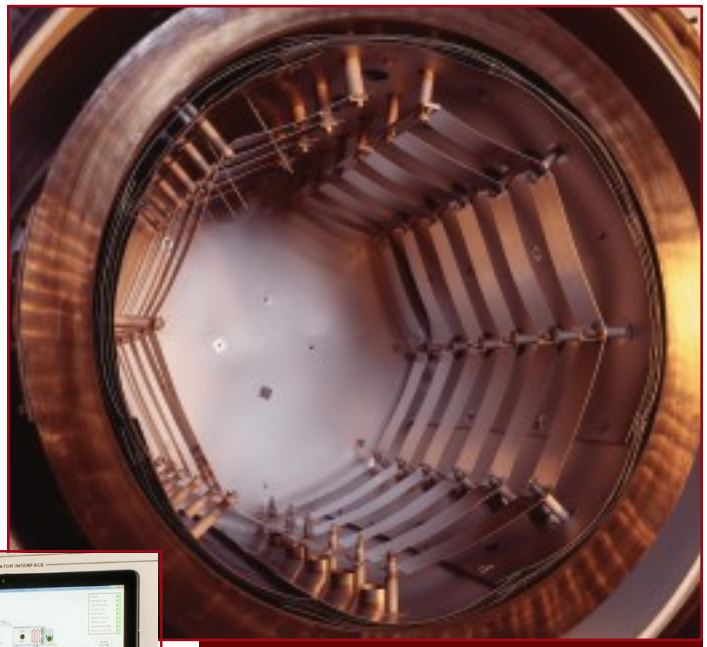
With the standard three-zone heat control package and electro-pneumatically operated "heat pack" door shield assembly, a precision heating environment is created that can attain a consistent temperature uniformity of ± 3˚C or better.

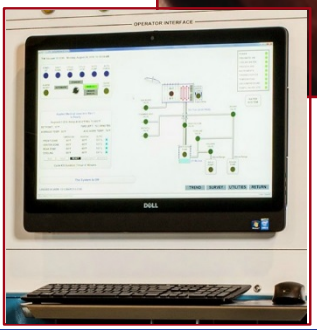
The specially designed Hot Zone-to-chamber ratio enables the high-speed pumping system to reach high vacuum quicker, maximizing your productivity and quality with a cleaner work zone. With its inert gas on board quick cool system, the metallurgical gas quench decreases your cycle times by rapidly cooling the chamber and increasing your product output. The Super Series HMI software system can be configured with our controlled cooling, allowing the user to precisely control the cooling environment. The Super Series Vacuum Furnace System can also be configured to accept multiple process gases.

Once you determine your specific process parameters, the computerized control system takes over to completely automate the process and archive all system data. An operator needs only to load and unload the chamber and press the start button.

The Super Series Vacuum Furnace System is a completely contained unit with no exposed wires, cables or pumps. This saves you valuable floor space, and keeps your unit clean and easy to maintain. System installation is as simple as connecting the unit to electric service and attaching gas, water and air lines. The Hot Zone is fully removable for service.

If the Super Series work zone is not large enough for your application, please ask about our PACER Series Vacuum Furnace System.





Above: The all metal 12"W x 12"H x 24"D Hot Zone

Left: Full PC control system

HIGH-TEMPERATURE | HIGH-VACUUM SYSTEMS

T (856) 829-2000 ▪ F (856) 829-0990 ▪ www.tmvacuum.com
630 South Warrington Street ▪ PO Box 2248 ▪ Cinnaminson, NJ 08077 USA

T-M Vacuum Products, Inc.

Temperature Capabilities and Controllability

10 series	1,000°C (1,832°F)
13 series	1,315°C (2,400°F)
14.5 series	1,415°C (2,650°F)
16.5 series	1,650°C (3,000°F)
20 series	2,000°C (3,632°F)

- ± 1 degree controllability
- < ± 3°C temperature uniformity*
- SCR power supply regulation
- 3-zone heat control with independent PID loop control

Vacuum Pumping System

- Standard pump down time*

Atm. to 0.1 Torr	7 minutes
10^{-5} Torr scale	15 minutes

- High-Vacuum Valve: Two position Gate Valve
- 250mm diffusion pump – net pumping speed: 3,000 l/s
- 46cfm mechanical roughing & backing pump
- 6 cfm mechanical hold pump

Available:

- Upgraded pumping systems – mechanical, dry, diffusion, cryogenic, and turbo-molecular
- Molecular Sieve or refrigerated, optically dense, cold trap in roughing line or liquid nitrogen cryo-trap in high-vacuum line (for prevention of hydrocarbon contamination)

Inert Gas and Quick Cool System

- 10 HP blower – 4,200 cfm free air displacement
- Gas/water heat exchanger
- 18 vents directing quick-cool gas onto workload
- Integral with furnace chamber, no externally mounted components

Available:

- Multiple process gas capability
- Controlled Cooling

System Controls

- The system has state-of-the-art full computer control as standard, enabling automatic control of all system functions. System operation is defined by user created recipes which are stored on the system. More than 40 user friendly screens display all set points and operating data. Process parameters can be accessed and stored on the system in real time for historical reference or as customer required documentation. Operating parameters are displayed on the system's 23˝ flat panel touch screen for the operator's ready reference. Full data logging with print out capability and Ethernet connection is standard.
- Independent over-temperature control
- Digital vacuum display
- Center of load thermocouple standard
- Emergency Stop
- Uninterrupted power supplies (UPS)

Available:

- Multiple-survey thermocouples
- Multiple mass flow controller
- Hydrogen operation
- Controlled cooling

Operating Pressure Range

- High-vacuum to 2 bar (higher pressures available)
- Working pressure at maximum temperature: high-vacuum to 1 torr (higher pressures available)
- Capable of pressures between atmosphere and 2 bar (for quick cool use)
- 6 bar available

Hot Zone Construction

- Usable work zone 12" W x 12" H x 24" D
- Usable work zone volume of 2 cubic feet
- Work load capacity 200 lbs
- Round, horizontally-mounted hot zone comprised of six (6) high temp/low resistance molybdenum 2" band heater elements
- Heat shielding is composed of molybdenum layers backed by stainless steel layers in stainless steel containment and an electro-pneumatically operated "Heat Pack" door shield assembly
- Complete hot zone is easily removed as a unit for fast maintenance and less down time
- Molybdenum hearth assembly is 12" W x 24"D

Available:

- Tungsten insulation in Moly Containment
- Graphite and tungsten heating elements
- Graphite insulation in stainless steel containment

Chamber

- All stainless steel construction including head-end closure and water-jacketing
- Dual-wall chamber configuration designed to allow complete water-to-surface contact
- Stainless steel dual-wall, water-cooled door
- Water cooling for power feed-thru is external to vacuum chamber, eliminating the possibility of water leaking into the chamber
- Six clamp over center pneumatic clamp/locking door
- Working pressure: Full vacuum to 2-bar (6-bar available)

Safety Features

All T-M Vacuum Products, Inc. products are equipped with standard safety features to ensure safe operation.

Please contact T-M Vacuum Products, Inc. at (856) 829-2000 for availability and pricing of these or any other option requirements.

*All times and pressures are for clean, dry, empty, out-gassed furnace, starting from ambient pressure and temperature and may vary. Times and pressure subject to pump size and maximum temperature.

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