



VACUUM TEMPER FURNACES

The C.I. Hayes “VMH-T/R” Vacuum Temper Furnace is a vacuum purge inert atmosphere furnace that is designed to provide exceptional temperature uniformity, rapid heating and rapid cooling performance in a single chamber design.

The furnace can process a wide range of materials for aging, annealing, brazing, joining, stress relieving and tempering, in single or multiple step programmable cycles.

The VMH-T/R’s cold wall shell does not discharge heat into the room while ensuring vacuum integrity.

Heating/Cooling Chamber

The combination heating and cooling chamber is constructed of high density ceramic fiber board insulation backed with fiber blanket material and supported by a perforated steel cage structure. Incorporated into the cage are movable rungs that are opened during the cooling phase.

Heating Elements

Wire wound coil heating elements are mounted on the inner cylindrical wall of the heating chamber in a 360° arrangement. The elements are supported by ceramic insulators and constructed of heavy cross section material yielding long life. The mounting method allows for superior heat distribution to all locations within the workload.

Circulating Fan

A vacuum tight fan is used to circulate inert atmosphere throughout the workload during both the heating and cooling cycles. It is the combination of radiant and convective heat transfer to the work that provides excellent uniformity. This assembly is mounted as an integral part of the vacuum chamber on the rear head.

Work Support Assembly

The hearth consists of either pier or roller rails that are supported off the bottom of the vessel. The work and/or work baskets are loaded on an alloy grid that is rolled or placed into the furnace.

Cooling

At the completion of the heating portion of the cycle, a rear “bung” and a front insulating panel open. This allows the circulating atmosphere out of the heating chamber, along the cold vessel walls for heat transfer, and back through the heating chamber.

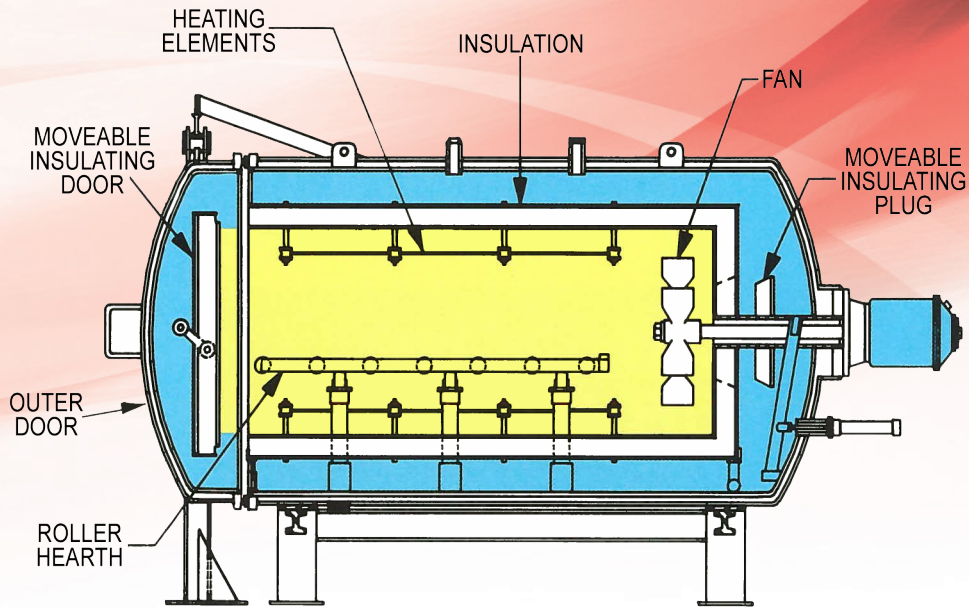
Component Design

Each component section of the furnace has been engineered for ease of equipment operation, maintenance and long life under full production conditions.

The VMH-T/R Vacuum Temper Furnace can be provided in a variety of standard sizes to meet a variety of production rates.

Standard options extend the performance of these units and provide additional operator convenience.

SPECIFICATIONS



Models:	VMH-T/R-242436	VMH-T/R-363648
Working Dimensions:	24"H x 24" W x 36"L (609mm x 609mm x 914mm)	36"H x 36" W x 48"L (914mm x 914mm x 1219mm)
Hearth Level:	40" (1016mm)	40" (1016mm)
Maximum Operating Temperature:	1450°F (787°C)	1450°F (787°C)
Uniformity:	20°F Spread (10°C)	30°F Spread (17°C)
Heating Elements:	Nickel-Chromium	Nickel-Chromium
Load Capacity (Nominal):	800# (362kg)	1500-3000# (680-1360kg)
Connected Load:	60KW	120KW
Heat-Up Rate:	800# Load of 1" (25mm) Diameter Steel Bars to: 1000°F in 75 mins or 350°F in 20 mins (537°C in 75 mins or 176°C in 20 mins)	1600# Load of 1" (25mm) Diameter Steel Bars to: 1000°F in 75 mins or 350°F in 20 mins (537°C in 75 mins or 176°C in 20 mins)
Operating Pressure:	0.5 PSIG Positive Pressure to Below 100 microns	0.5 PSIG Positive Pressure to Below 100 microns
Vacuum Components:	6" (152mm) Pneumatically Operated Vacuum Valve Mechanical Pump 150 CFM (7.5HP Motor) Roots Type Blower 850 CFM (3HP Motor)	6" (152mm) Pneumatically Operated Vacuum Valve Mechanical Pump 150 CFM (7.5HP Motor) Roots Type Blower 1285 CFM (10HP Motor)
Fan Assembly:	Vacuum Tight with 15HP Motor	Vacuum Tight with 10HP Motor
Cooling Water:	Steady State -10 GPM (37 LPM) Quench Cycle - 30 GPM (113 LPM)	Steady State -10 GPM (37 LPM) Quench Cycle - 30 GPM (113 LPM)
Cool Down Rate:	800# Load of 1" (25mm) Diameter Steel Bars from: 1000°F to 150°F in 45 mins (537°C to 65°C in 45 mins)	1500# Load of 1" (25mm) Diameter Steel Bars from: 1000°F to 150°F in 60 mins (537°C to 65°C in 45 mins)
Nitrogen Backfill:	144 ft ³ (43 m ³)	330 ft ³ (100 m ³)
Compressed Air Requirements:	Small Demand at 90 PSIG (0.62 MPa)	Small Demand at 90 PSIG (0.62 MPa)
Floor Space:	102"H x 210"W x 204"L (2590mm x 5334mm x 5181mm)	115"H x 276"W x 203"L (2921mm x 7010mm x 5156mm)