

SECO/WARWICK



VECTOR HV

Single-chamber High Vacuum Furnace



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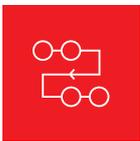
INDUSTRIES

- / Aerospace
- / Energy
- / Nuclear
- / Heat exchanger
- / Automotive
- / Electronic Science
- / R&D
- / Metallurgy
- / Commercial heat treatment
- / Special applications



MATERIALS

- / Alloyed steels
- / Stainless steels
- / Alloys and superalloys
- / Titanium and titanium alloy
- / Metals
- / Ceramics
- / Composites
- / Coatings



PROCESSES

- / Brazing
- / Annealing
- / Normalizing Homogenizing
- / Stress relief
- / Solution heat treating
- / Aging
- / Quenching
- / Diffusion bonding
- / Outgassing
- / Sintering
- / Tempering
- / Special

Vector HV is a horizontally or vertically oriented single-chamber high vacuum furnace using gas cooling which can be used for a wide variety of heat treating processes and applications. It provides important capabilities for producing high-uniformity in heat-treated parts, high process cleanliness, high consistency in workloads, and efficient processing with low consumption of power and process gases.

Vector HV furnaces are equipped with round graphite or metal hot zone and are the ideal solution for highly demanding heat treating in terms of high process purity and part's surface quality. With hundreds of systems installed worldwide, SECO/WARWICK's high vacuum furnaces have a proven record of high-performance technology.



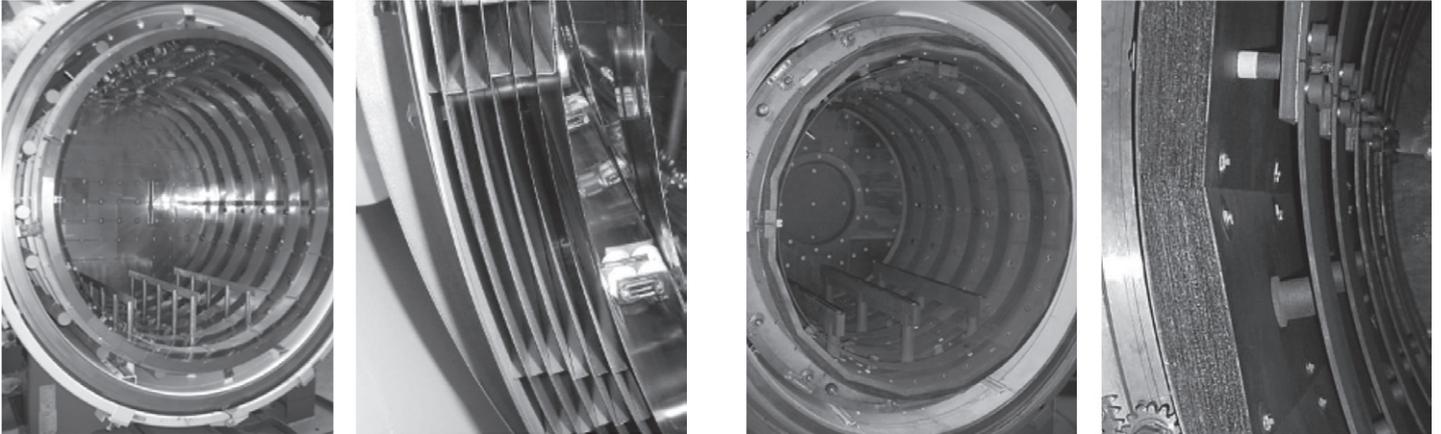
FEATURES

- / High vacuum processing – up to 10⁻⁸ mbar.
- / Operational temperature – 1450°C / 2640°F.
- / Temperature uniformity +/- 6°C / +/- 10°F.
- / Uniform and efficient radiation heating 360°.
- / Partial pressure control.
- / Controlled, forced convection cooling.
- / Cooling gases: N₂, Ar, He up to 15 bar.
- / Computer control system (PLC + IPC), operator-friendly.
- / Remote control and monitoring.
- / NADCAP and AMS specifications readiness.
- / Global industrial standard compatible.



BENEFITS

- / Wide range of heat treatment processes and applications.
- / High quality and ideal parts surface protection.
- / Guaranteed and repeatable process results.
- / Low consumption of energy, process gases, and other utilities.
- / Environmentally friendly with low emissions.
- / Predictive maintenance support.
- / Compact, modular design.
- / Fitted and adjusted to plant conditions.
- / Fast delivery and easy installation.
- / Customizable.



FURNACE OPTIONS

- / Vertical or horizontal.
- / Metal or graphite, cylindrical heating zone.
- / High vacuum by diffusion, cryogenic, or turbomolecular pumps.
- / Higher temperature operation.
- / Improved temperature uniformity to class 1 (AMS2750).
- / Multi-zone temperature control.
- / Convection heating.

Type		VP - horizontal					
		446	646	669	9912	101015	121218
Working zone (WxHxL)	mm inch	400x400x600 16x16x24	600x400x600 24x16x24	600x600x900 24x24x36	900x900x1200 36x36x48	1000x1000x1500 40x40x60	1200x1200x1800 48x48x72
Load	kg lb	200 440	400 880	800 1760	1500 3300	2500 5500	3000 6600

Type		VVP - vertical			Other sizes available
		1313	1515	1818	
Working zone (DxH)	mm inch	Ø1300x1300 Ø52x52	Ø1500x1500 Ø60x60	Ø1800x1800 Ø72x72	Other sizes available
Load	kg lb	1500 3300	2000 4400	2500 5500	



SECO/WARWICK

INVENTION MEETS RELIABILITY

VECTOR

Single-chamber Vacuum Furnace with Gas Cooling



VECTOR

Single-chamber Vacuum Furnace with Gas Cooling



INDUSTRIES

- / Aviation
- / Automotive
- / Machine
- / Tool
- / Energy
- / Nuclear
- / Electronic metallurgy
- / Commercial heat treatment
- / Specialty applications



MATERIALS

- / Tool steels
- / Carburizing steels

- / HSLA
- / Alloyed steels
- / Stainless steels
- / Silloys and super alloys
- / Titanium and titanium alloy



PROCESSES

- / Annealing
- / Brazing
- / Hardening
- / Low pressure carburizing & nitriding (LPC & LPN)
- / Normalizing
- / Solution heat treating
- / Sintering
- / Tempering

Vector is a single-chamber vacuum furnace using gas quench which can be used for wide variety of heat treating processes and applications. It provides important capabilities for producing high-uniformity in heat treated parts, high

consistency in workloads, and high speeds in batch processing with low consumption of power and process gases.

Vector high pressure gas quench furnaces are the ideal solution for heat treating. Vector is a vacuum furnace with round graphite hot zone. These furnaces can be used for most standard hardening, tempering, annealing, solution heat treating, brazing and sintering. Additionally, they can be used with SECO/WARWICK's optional patented vacuum-carburizing technologies (FineCarb®) and prenitriding (PreNit®) and the SimVac® process simulation package is included at no extra charge.

With hundreds of systems installed worldwide, SECO/WARWICK's high pressure quench furnaces have proven record of high performance technology.

The Vector is a single chamber horizontal vacuum furnace that complies industrial standards related to heat treatment equipment and has sold many hundreds of units worldwide. It comes with a full range of options and accessories for performing a wide range of functions for heat treaters and can be customized for special functions.



FEATURES

- / Standard horizontal capacity from 200 to 2,500 kg and more (440 to 5,500 lbs).
- / standard vertical capacity: 1,500 kg (3,300 lbs) and 2,000 kg (4,400 lbs).
- / Graphite or metal hot zone with maximum vacuum of 10⁻² to 10⁻⁵/10⁻⁶ mbar.
- / Quenching pressure: from 2 up to 25 bar.

- / Quenching gases: N₂, Ar, He, H₂.
- / The best operational features including uniform heating and quenching, ability to harden a wide range of materials and cross-sections.
- / ConFlap™ system supporting convection heating.
- / Optional equipment for vacuum carburizing technology: FineCarb® / PreNitLPC® and vacuum nitriding LPN.
- / Computer control system, operator-friendly.
- / AMS2750 specification readiness.



OPTIONS

- / Furnace options.
- / Vertical orientation.
- / Graphite or metal hot zone.
- / Improved temperature uniformity.
- / Multi-zone temperature control.
- / Load thermocouples port and control.
- / High temperature operation.
- / High vacuum or ultra-high vacuum.
- / Low and cryogenic-temperature trap.
- / Partial pressure control.
- / Cooling gas flow direction.



BENEFITS

- / Wide range of heat treatment processes and applications.
- / High speed cycles with high pressure gas quench.
- / Low consumption of energy, process gases and other utilities.
- / Environmentally friendly with low emissions of process gases.
- / Simple design, modular, fitted and adjusted to tasks and plant conditions.
- / Guaranteed quality and repeatable process results.
- / Predictive maintenance.
- / Remote control and monitoring.
- / Fast delivery and simple installation.
- / Customizable.