



**SECO/WARWICK**

INVENTION MEETS RELIABILITY

Versatile and Flexible

# VECTOR

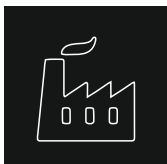
Single-chamber Vacuum Furnace with Gas Cooling for multipurpose  
and dedicated applications



# VECTOR

An Advanced Vacuum Furnace with  
gas cooling

## INDUSTRIES:



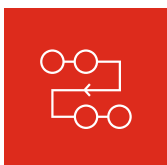
aviation - automotive - machine  
tool - energy - nuclear - electronic  
metallurgy - commercial heat  
treatment - specialty applications

## MATERIALS:



tool steels - carburizing steels - HSLA  
alloyed steels - stainless steels  
alloys 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.

## 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: N<sub>2</sub>, Ar, He
- 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




### 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



SECO/WARWICK GROUP  
a leading global manufacturer  
of heat treatment furnaces and equipment

SECO/WARWICK is a technological leader in innovative heat treatment furnaces. Expertise includes end-to-end solutions in 5 categories: vacuum heat treatment, atmosphere, and aluminum thermal processing, controlled atmosphere brazing of aluminum heat exchangers and vacuum metallurgy. SECO/WARWICK Group with 9 companies located on 3 continents with customers in nearly 70 countries, has its production facilities in Poland and China. In addition, the Group operates a number of service and sales offices in countries such as Germany or Russia. The company provides standard or customized state-of-the-art heat processing equipment and technologies to leading companies in the following industries: automotive, aerospace, electronics, tooling, medical, recycling, energy including nuclear, wind, oil, gas, solar and production of steel, titanium and aluminum.

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