



N<sub>2</sub> Ar He H<sub>2</sub>

2-6-10-12-15-25 bar

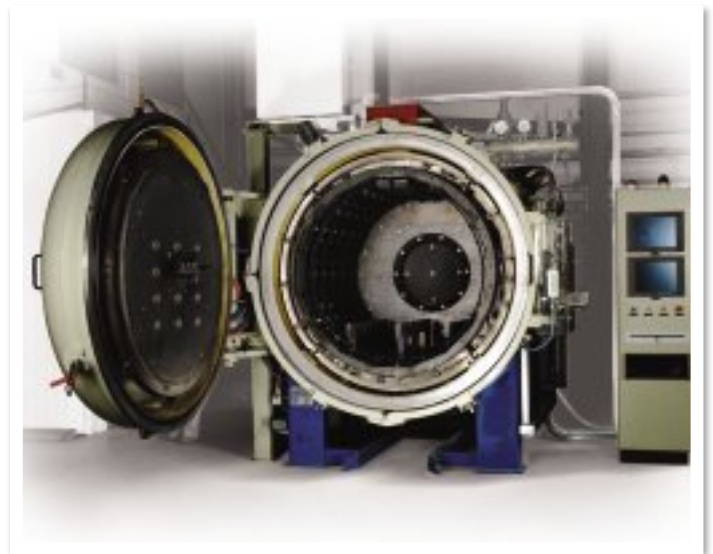
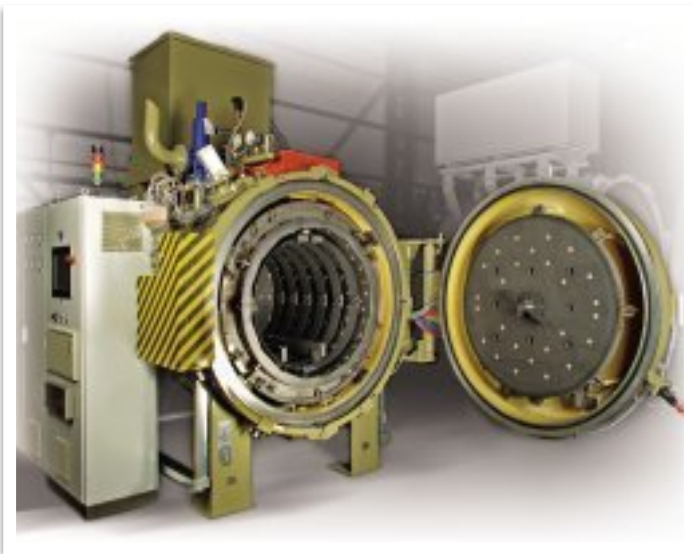
## HIGH PRESSURE QUENCH VACUUM FURNACES TYPE VPT AND VVPT(EH)

- ● ● ● High, medium and low alloy hot working steels
- ● ● ● High, medium and low alloy cold working steels
- ● ● ● High speed steels
- ● ● ● Oil hardened steels (AISI type O1, O2, O6, O7, 4140, 4340 etc.)
- ● ● ● Vacuum Carburizing FineCarb<sup>®</sup>
- ● ● ● Tempering, annealing, solution heat treating, super alloys, brazing and sintering



## ADVANTAGES OF SECO/WARWICK HPQ VACUUM FURNACES VPT/VVPT (EH)

- Shorter cycle times, increased output and precise monitoring of the process.
- Available with horizontal and vertical loading configuration.
- Compact design with internal gas cooling system:
  - reduces installation and start up time,
  - requires minimal plant floor space,
  - reduces power and gas consumption,
- Compact pumping system with easy access for servicing.
- Pressure door closing system with a third clamp and lip seal designed specifically for high pressure operation and increased service life.
- Cylindrical heating chamber enables treatment of oversized loads.



- Graphite heating elements encircling the load from all sides, light and flat, provided for fast and uniform heating of the batch; unique technology warrants stability and durability of the heating system.
- Temperature uniformity according to AMS 2750D is better than  $\pm 5^{\circ}\text{C}$  (or  $\pm 3^{\circ}\text{C}$  at austenitization temperature); the furnace is equipped with test ports to fit the thermocouples to monitor temperature distribution. The furnace satisfies the SAT and TUS requirements as defined by AMS 2750D and is ready for relevant testing.
- Efficient cooling system with specially shaped nozzles distributed around the heating chamber and door provides for uniform quenching.
- Patented convection heating system with pneumatically powered gas nozzle covers, enables different cooling patterns. Depending on the load configuration, it can be quenched with gas flow from all nozzles, or directionally from top and bottom, or from sides only. Pneumatically driven covers assure smooth operation of the system under sublimate contaminated work environment.
  - ConFlap™ system enhances convection heating and provides a 40% time savings when heating densely packed loads in the  $800^{\circ}\text{C}$  temperature range.
  - Convection heating system enables tempering of the load in one process, thus making the furnace more universal.
- Fast and uniform cooling throughout the load, enabling effective use for low alloy steels, steel for carbonizing and HSLA steel.
- Superior quenching rate and uniform gas flow through the load, makes the furnace a perfect tool for heat treatment of low alloyed steels, carburizing and HSLA steel.
- The furnaces meets AMS 2750D, AMS 2769 standards as well as European and US safety requirements.



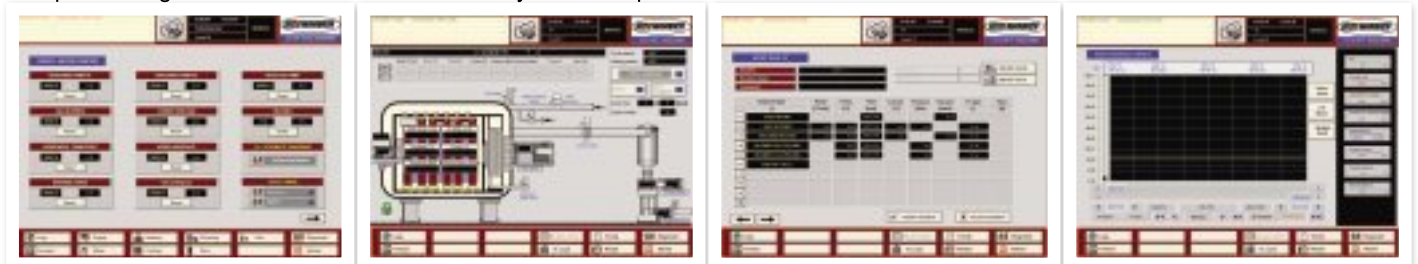


- **Wide range of applicable technologies with different quenching pressures (up to 25 bar for He or 15bar N<sub>2</sub>), various cooling gases (nitrogen, helium, argon, mixtures), broad range of operation temperatures (150-1350°C), and operating vacuum of down to 10<sup>-5</sup>mbar.**
- **Optionally available with FineCarb<sup>®</sup> carburizing and vacuum nitriding technologies.**
- **Available with auto controlled isothermal tempering (martempering) system, supported by convection heating for precise temperature control; essential future in present day thermal processing, particularly for forms and dies.**
- **Available with FineCarb<sup>®</sup> bainitic quenching technology for reduced hardening distortions. With cooling rate of up to 120°C/min, furnace exceeds the requirements of GM and Ford norms (DC9999-1, AMTDDC2010) for heat treatment of H13 steel.**



## ● CONTROL SYSTEM FEATURES

- Fully automatic furnace operation performed via PLC (Programmable Logic Controller) and IPC (Industrial Personal Computer).
- LCD touch screen visually presents all technological parameters of heat treatment processes.
- Large capacity of a hard disc (HDD) enables to record unlimited number of recipes. It eliminates errors resulting from creating new recipes by a furnace operator.
- All process data are recorded as a diagram on a separate screen and can be saved on HDD or a CD.
- Possibility to export historical and alarm data outside the system for further analysis (e.g. to \*.csv).
- Easily integrateable with any data base.
- The furnace is equipped with the internal network of the "Ethernet" type, or a telecommunication modem, enabling remote furnace service.
- Special software installed on the IPC enables remote monitoring and controlling of furnace operation, as well as optionally alarming via telephone or e-mail.
- Optionally the control system may be equipped with reporting and advanced analyzing program of historical data, via Word and Excel ready-made templates.
- A separate diagnostic screen reminds of necessity to service particular elements of the furnace.



## ● TECHNICAL DATA

		Horizontal (VPT-)					Vertical (VVPT-EH-)	
		20/24	25/24	35/36	50/48	56/60	50/50	60/60
Uniform zone (WxHxL)	mm	400x400x600	600x400x600	600x600x900	900x800x1200	1000x1000x1500	Ø1250x1250	Ø1500x1500
	in	16x16x24	24x16x24	24x24x36	36x32x48	40x40x60	Ø50x50	Ø60x60
Max. load	kg	200	400	600	1200	2500	1500	2000
Operating temperature	°C	150 - 1350						
Convection heating	°C	150 - 850						
Temperature uniformity	°C	+/- 5						
Heating power	kW	70	90	150	240	375	270	375
Maximum cooling pressure	bar	2-6-10-12-15-25						
Operating vacuum	mbar	range 10 <sup>-2</sup> (option 10 <sup>-4</sup> )						

Other sizes also available



## ● ADDRESS

### SECO/WARWICK S.A. POLAND

● SECO/WARWICK S.A.  
● ul. Sobieskiego 8  
● 66-200 Świebodzin,  
● Poland

Tel. +48/68 3820 501  
Fax +48/68 3820 555  
info@secowarwick.com.pl  
www.secowarwick.com.pl

### ● ELTERMA S.A.

ul. Świerczewskiego 76  
66-200 Świebodzin,  
Poland

Tel. +48/68 3819 800  
Fax +48/68 3819 805

elterma@elterma.com.pl  
www.elterma.com.pl

### ● SECO/WARWICK Corp.

PO Box 908 180 Mercer Street  
Meadville, PA 16335-6908  
USA

Tel. +1 814 332 8400  
Fax +1 814 724 1407

info@secowarwick.com  
www.secowarwick.com

### ● SECO/WARWICK MOSCOW

Varshavskoje Shosse, 17  
117105 Moscow,  
Russia

Tel/Fax +7(495)786 39 44

moscow@secowarick.com.pl  
www.secowarick.com.pl

### ● SECO/WARWICK CHINA

Industrial Furnace Co. Ltd.  
Beisunzhuang Village,  
Jinwei Road,  
Beichen District, Tianjin,  
China 300402

Tel. +86 22 86853179  
Fax +86 22 86850027

info@secowarwick.com.cn  
www.secowarwick.com.cn

The latest design, materials and equipment specifications should be obtained from the company before any reliance is placed on the enclosed since changes may occur due to product improvement.