



ALD Vacuum Technologies

High Tech is our Business

MonoTherm[®]

Vacuum Chamber Furnace
for ultimate quality



The modular design principle

The high demands on vacuum heat treatment require greater efficiency of the vacuum chamber furnace. The configuration of the optimal system is based on the heat treatment job which depends, among other things, on the material, treatment temperature, the part's shape and dimensions as well as on the required throughput. Furthermore, the heating and cooling method must be considered. The vacuum chamber furnace ALD MonoTherm® offers a variety of possibilities to fulfill the performance criteria. Make your choice!

Sizes for different charge dimensions:

- 400 x 400 x 600 mm
- 600 x 600 x 900 mm
- 900 x 900 x 1200 mm
- additional sizes on request

Design of the hot zone in cubic or cylindrical shape, depending on the part's composition and type of heat treatment.

Heating circuits:

- one heating circuit
- optional: additional, individually controllable heating circuits

Vacuum:

- fine vacuum (10^{-2} mbar)
- high vacuum (10^{-5} mbar)
- partial pressure (1-15 mbar)
- other pressure ranges

Convective system for homogeneous and rapid heating in the temperature range of up to 950 °C.

Quench parameters:

- various pressure steps between 1.5 and 20 bar
- gas velocity selectable by frequency converter
- marquenching simulation to reduce distortion

Quench gases for various applications: nitrogen, helium or argon.

Cooling direction for high uniformity and optimum quenched parts:

- vertical – from top to bottom
- horizontal – from left to right
- reverse – reverse of the respective flow direction
- vertical / horizontal – four direction cooling
- 360° uniform nozzle cooling

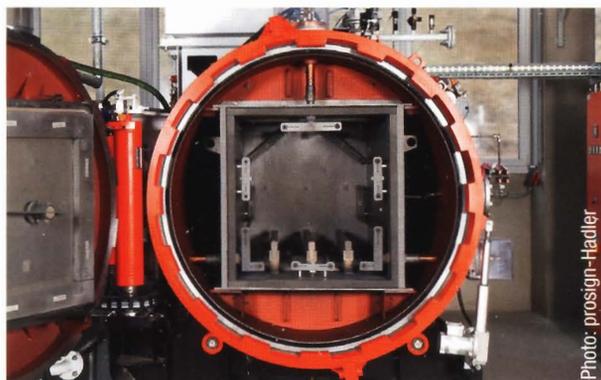
Vacuum carburizing:

- vacuum carburizing system
- carbonitriding system

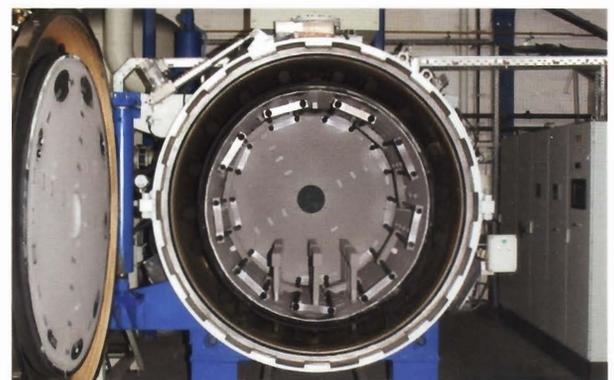
Cryogenic system for transformation of retained austenite.

Accessories to optimize heat treatment plants:

- charging carts
- charging fixtures
- gas storage tanks
- gas purification systems
- gas recovery systems
- tempering furnaces
- cooling water recooling systems



ALD MonoTherm® with cubic hot zone



ALD MonoTherm® with cylindrical hot zone

Technology at a glance

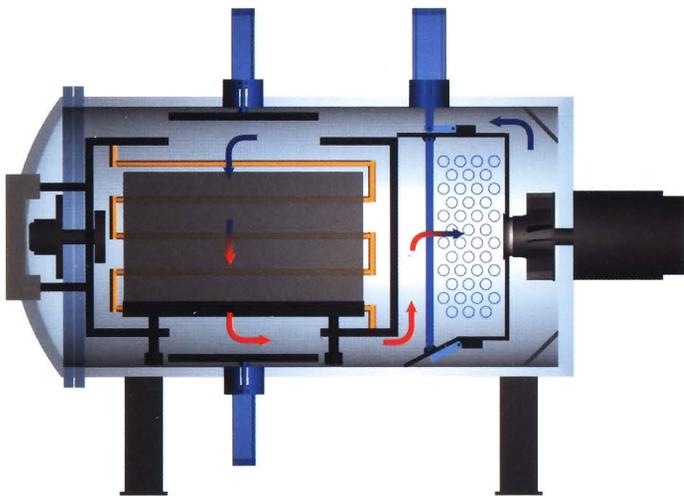
The vacuum chamber furnace ALD MonoTherm[®] is an all-purpose heat treatment system. Different chamber sizes and designs allow customizing of each system to meet specific requirements. The most important technical data of our current systems are listed as follows:

cubic / cylindrical working space

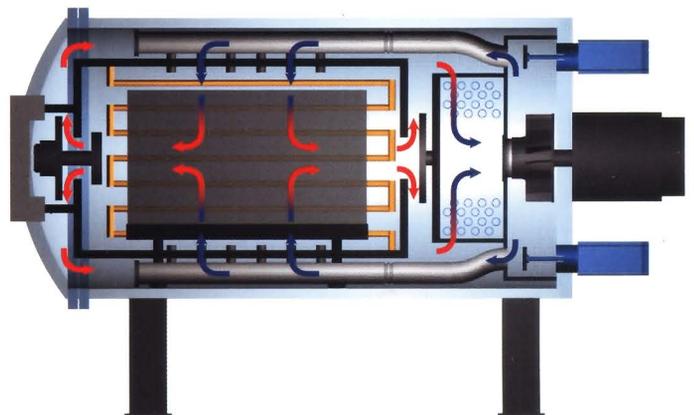
Charge dimensions (mm)			approx. space requirement of the plant (m)			Gross charge weight (kg)
width	height	length	width	height	length	
400	400	600	5	3.5	7	200
600	600	900	5	3.7	8	600 optional 1000
900	900	1200	6	4.5	10	1500

additional sizes on request

quench pressure options (bar _{abs.})	quench gas options
1.5 / 10 / 15 / 20	N ₂ / He / Ar



ALD MonoTherm[®] with cubic hot zone



ALD MonoTherm[®] with cylindrical hot zone