

 **SYSTHERMS**

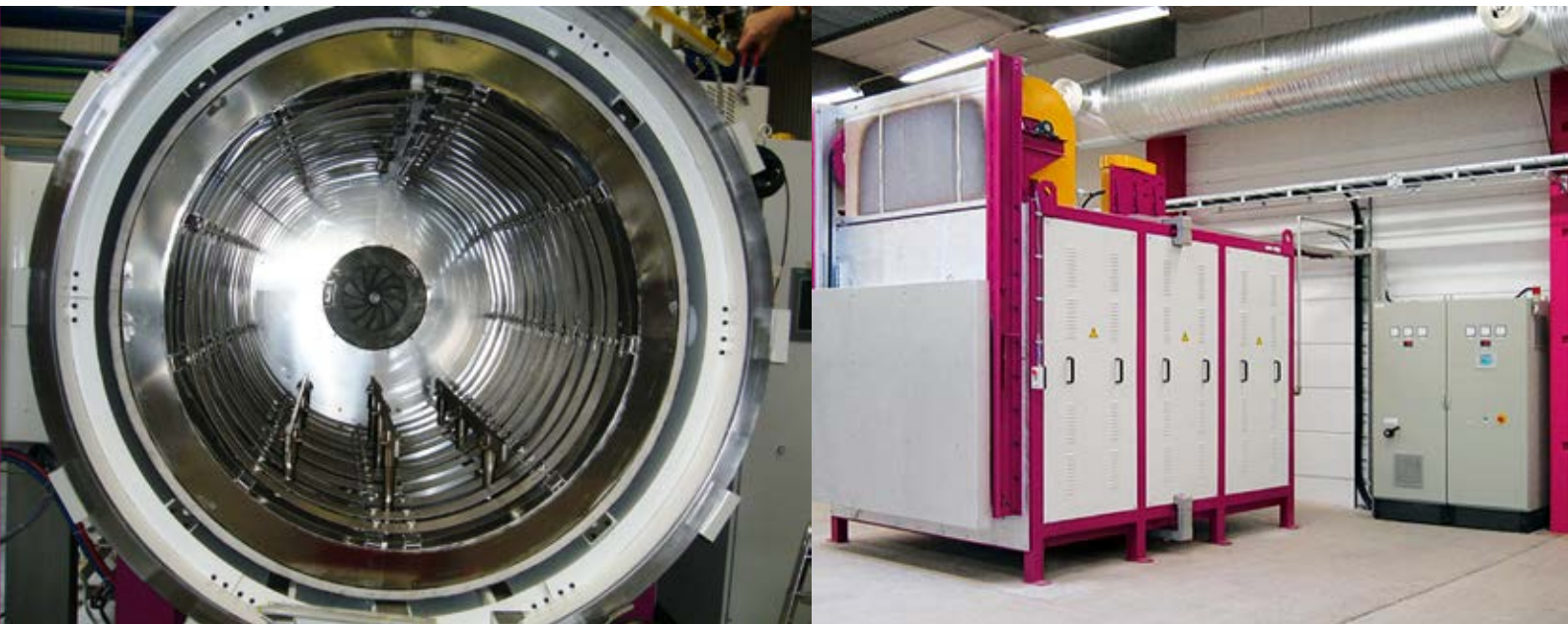


Furnaces for
tempering,
sub-zero treatment
and nitriding



Furnaces for tempering, sub-zero treatment and nitriding





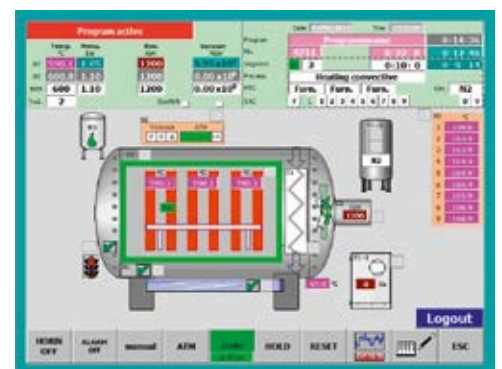
Chamber furnace type GWQ 151124

Standard or customized? Tempering furnaces for every need

SYSTHERMS offers for your tempering processes vacuum furnaces as well as furnaces with inert gas or air atmosphere in different designs. All furnaces are equipped with electrical heating elements made of graphite or Cr-Ni steel and a powerful gas circulation. Thus an unmatched temperature homogeneity is reached in the whole furnace chamber.

For fully automatic control of your processes our furnaces are equipped with a programmable logic controller (PLC). The user-friendly operation is carried out with a touch-sensitive screen.

Many applications can be solved with our standard furnaces. The benefits for you: sophisticated models, proven in practice; excellent cost-performance ratio, short delivery times. However, if you do not even find what you need, do not hesitate to contact us on it. Because of course we also supply the tempering furnace tailored on your application. In close consultation with you, a furnace system will be evolved that meets your challenging heat treatment tasks reliably and economically.



Consulting and service

With our qualified staff we offer you a wide range of professional services around the furnace, for your safety right from the start. The Systherms GmbH is your competent partner for your diverse and demanding tempering applications.

Direct heated vacuum tempering furnaces type VAD

After hardening in a vacuum furnace the most parts are metallic bright and clean. Therefore in such cases for the tempering process a vacuum tempering furnace with direct heating type VAD of the latest generation is recommended in order to prevent oxidation of the component surface reliably.

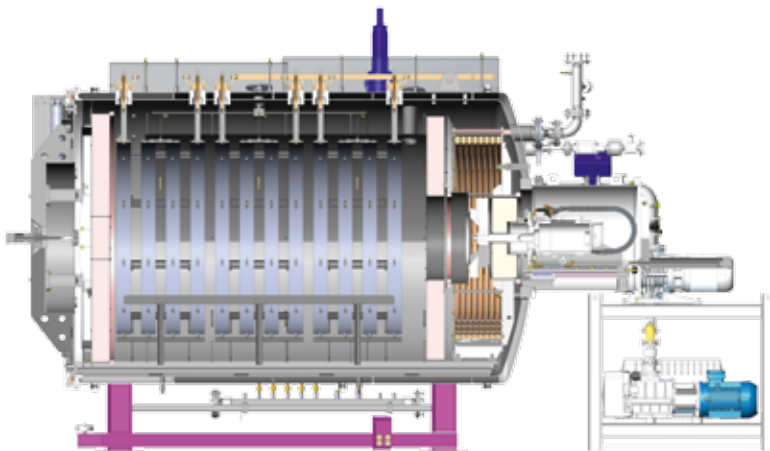
In addition vacuum tempering furnaces type VAD can be used for a wide range of heat treatment processes under vacuum up to temperatures of 850 °C and sub-zero treatments. Especially in high-alloyed tool steels after the hardening process a remarkably amount of retained austenite will occur. By a sub-zero treatment this amount can be reduced to a minimum.



Vacuum - tempering furnace VAD 9812

Benefits tempering furnaces type VAD latest generation:

- Direct heated
- Integrated rapid cooling system
- Integrated sub-zero cooling device
- Temperature range -180° up to $+850^{\circ}\text{C}$
- Low energy consumption
- Bright parts after treatment
- Also available with nitriding option



Vacuum-heat treatment furnace VWC 9812 and vacuum-tempering furnace VAD 9812



Tempering furnaces with vacuum-tight retort type VA

Another possibility offers the use of retort furnaces of the type VA with indirect heating.

Evacuatable protective gas retort furnaces are vacuum-sealed and purging is not necessary after evacuation. This will save time and protective gas. A clean protective gas atmosphere without the risk of explosive gas mixtures is easily adjustable. Processes can be run with low inert gas quantities. The concept of evacuatable protective gas retort furnaces enables the optimization and the reproducibility of the atmospheric composition. Moreover, it is technically possible to exchange the atmosphere. If the furnace is operated with excess air, it is called an oxidizing atmosphere. In contrast, a reducing atmosphere can be achieved by running the furnace with an excess

of gas. An exchange of atmosphere is of importance during tempering of the metals when an oxidation (scaling) of the workpieces is to be reduced or avoided.

The entire furnace body is lined with a multi-layered fiber insulation. By this good insulation a low thermal dissipation loss is achieved.

By using this type of furnace also a very fast, uniform and effective cooling can be performed without affecting the workpiece surface in a negative way. For this, rapid gas cooling systems are provided. Short cycle times mean economic tempering processes. In addition furnaces of this type can be used for nitriding or nitrocarburizing.

This furnace concept is particularly competitive.



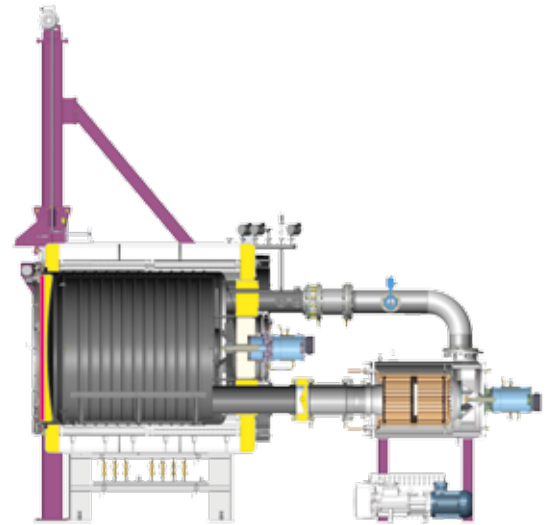
Tempering furnaces with vacuum-tight retort VA 669 and vacuum-heat treatment furnace VWC 669

Nitriding / nitrocarburizing in retort furnaces type VAN

Nitriding operations in evacuable protective gas retort furnaces are performed in such a way that the entire process is run automatically in one furnace without manpower.

A simple and fast exchange of atmosphere in evacuable protective gas retort furnaces is possible without problems. It is easy for this type of furnace to comply with the MAC values for ammonia. The gas is only necessary for the thermo-chemical application. In retort furnaces type VAN due to the high purity of the atmosphere an optimum nitriding process is guaranteed. By specific addition of process gases, it is possible to achieve excellent nitriding results.

The right choice of material of the retort is of essential importance for the nitriding processes. The retort volume must not be too large in relation to the charge surface. By introducing superheated steam or nitrous oxide a simple post-oxidation of the nitrided / nitrocarburized components is possible in a retort furnace type VAN without contaminating the furnace or its insulation.



Standard sizes type VA, VAD and VAN:

Width	Height	Length
400 mm	400 mm	600 mm
600 mm	600 mm	900 mm
900 mm	800 mm	1200 mm

Special sizes on request



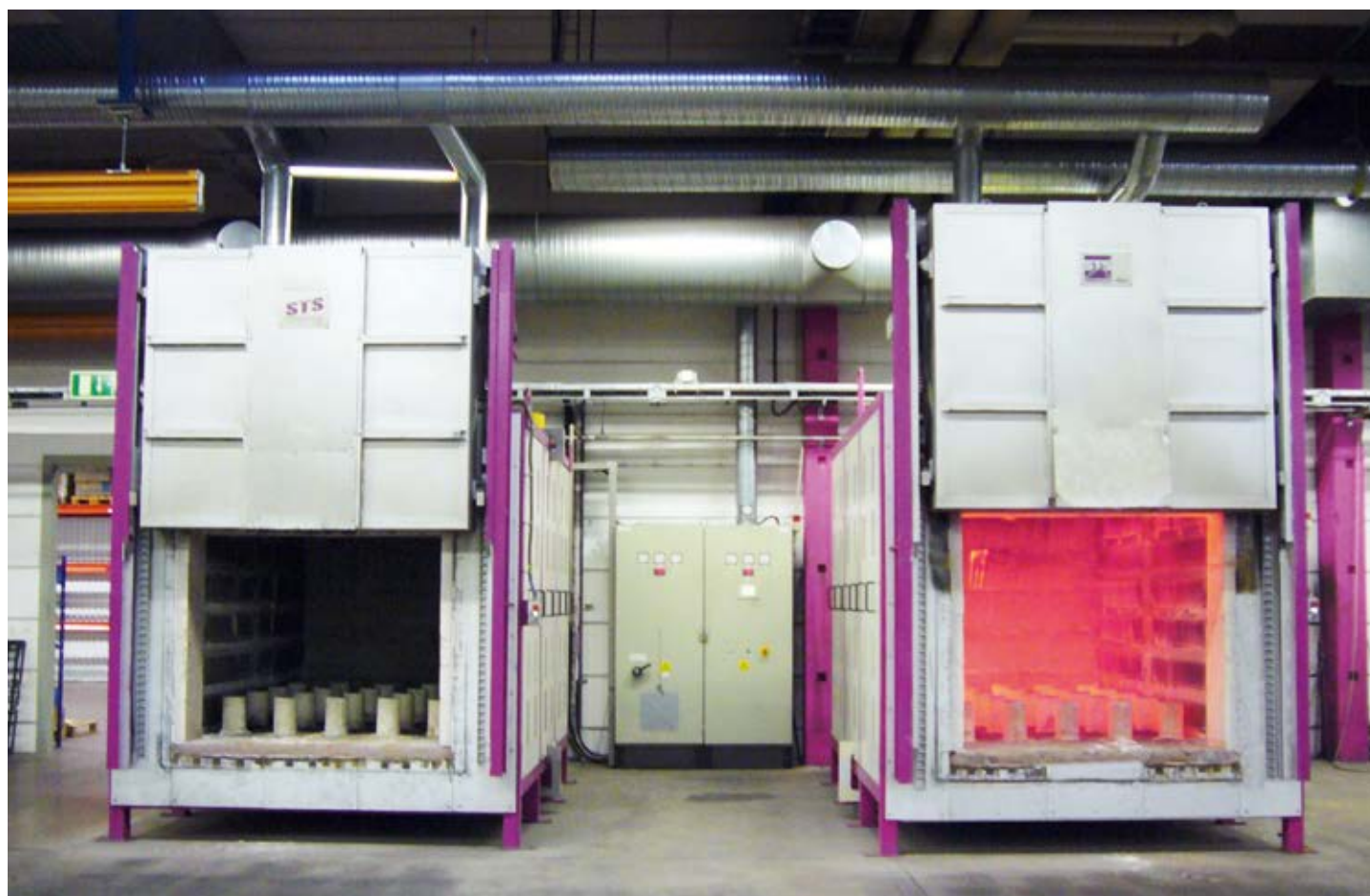
Tempering furnaces with vacuum-tight retort VAN 9812 and chamber furnace LA 9812



Chamber furnace LA 881 I

Electrical heated chamber furnaces type LA

Systherms chamber furnaces with electrical heating are designed especially for the use in heat treatment processes. They are suitable ideal for processes such as hardening, tempering or annealing. Our furnaces are characterized by a robust and compact design. The multilayer structure of insulation ensures a low energy consumption. A swing door can be opened and closed with the support of a user-friendly pneumatic cylinder.



Chamber furnaces GWQ 151122



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