

Furnaces and Accessories for Heat Treatment of Metals



Chamber furnace N 7/H

Generally, metals are heat treated under protective or reaction gases or in vacuum to prevent or minimize oxidation of the components.

Nabertherm offers an extensive range of graduated solutions for the heat treatment of metals. This catalog provides a description of the different furnace concepts and the accessories that are available for the different processes.

Which Furnace is Suitable for Which Application?

Essentially, the requirements with respect to the furnace type depend on following factors:

- Required temperature range
- Charge dimensions
- Type of protective or reaction gas
- Required leak rate of the work space/required surface quality of the charge
- Safety requirements, i. e. when working under flammable gases
- Required heating and cooling times

Depending on the process requirements, adapted solutions can be offered for heat treatment, including quenching.

Sealed Furnace

Sealed furnaces are standard furnaces with a protective gas connection in which the housing is sealed and the door design is adapted. These furnaces are suitable for processes without high requirements with respect to residual oxygen, or for heat treatment of components that are to be processed afterwards.

Furnaces with Protective Gas Boxes, Protective Gas Boxes with an Evacuation Lid, or Annealing Bags

Heat treatment furnaces with protective gas boxes or annealing bags offer a good price/performance ratio and can be used for many processes that have to be carried out in a non-flammable protective or reaction gas atmosphere.

By using a protective gas box with the corresponding process gas supply, a standard furnace can be upgraded to a protective gas furnace. Depending on the type of process gas, the preflushing rate, the process flushing rate, and the condition of the box, it is possible to achieve residual oxygen concentrations in the low ppm range.

Depending on the application, the protective gas boxes are removable, remain in the furnace, or are especially designed for heat treatment of bulk materials. Annealing bags are another gassing variant.



Chamber furnace N 41/H

For charges with complex shapes or drilled holes, bulk materials, or sensitive materials, such as titanium, it is recommended to use a protective gas box with an additional evacuation lid for cold stage evacuation.

Protective gas boxes can be used in forced convection furnaces at temperatures up to 850 °C and in radiation heated furnaces for working temperatures up to 1100 °C. This catalog describes in detail the different furnace ranges and the associated accessories.

Hot-Wall Retort Furnaces

Retort furnaces are the perfect solution if the process requires a furnace chamber with a pure atmosphere. The retort is not water cooled and is therefore restricted in maximum temperature. Water cooling is used only for the door seal. Hot-wall retort furnaces can be used for maximum working temperatures of 1100 °C, and with special retort material, up to 1150 °C.

These gas tight retort furnaces are ideal for heat treatment processes that require a defined protective or reaction gas atmosphere. The compact models can also be designed for heat treatment in vacuum up to 600 °C. Equipped with corresponding safety technology, retort furnaces are also suitable for applications under reaction gases such as hydrogen.

Cold-Wall Retort Furnaces

Cold-wall retort furnaces can be used for heat treatment processes in defined protective or reaction gas atmospheres or high temperature processes under vacuum. The VHT retort furnaces are designed as electrically heated chamber furnaces with graphite, molybdenum, tungsten, or MoSi₂ heating.

The vacuum-tight retort is completely water-cooled and allows for heat treatment processes either in protective or reaction gas atmospheres or under vacuum up to 10⁻⁵ mbar.

This furnace series can also be equipped with suitable safety packages for flammable gases.

Furnaces for Continuous Processes

Nabertherm also has compact furnaces for continuous processes that require a protective or reaction gas atmosphere.



Forced convection chamber furnace N 250/85 HA with protective gas box



Retort furnace NRA 25/06



Retort furnace VHT 100/16-MO