

Additive Manufacturing, 3D-Printing



Retort furnace NR 150/11 for annealing of metal parts of 3D- printing

Additive manufacturing allows for the direct conversion of design construction files fully functional objects. With 3D-printing objects from metals, plastics, ceramics, glass, sand or other materials are built-up in layers until they have reached their final shape.

Depending on the material, the layers are interconnected by means of a binder system or by laser technology.

Many methods of additive manufacturing require subsequent heat treatment of the manufactured components. The requirements for the furnaces for heat treatment depend on the component material, the working temperature, the atmosphere in the furnace and, of course, the additive production process.

Nabertherm offers solutions from curing for conservation of the green strength up to sintering in vacuum furnaces in which the objects of metal are annealed or sintered.



Oven TR 240 for drying of powders

Metals

Ceramics, Glass, Composites, Sand

Plastics



Debinding
Sintering
Stress-relieving
Solution annealing
Hardening

Debinding
Sintering
Drying
Curing

Curing
Tempering
Drying



under Protective Gases, Reaction Gases or in Vacuum

in Air

in Air



Chamber furnaces with gas-supply boxes
see page 18

Debinding in chamber furnaces with air circulation
Sintering in chamber furnaces
Debinding and Sintering in combi furnaces
Dewaxing Furnaces

Ovens
Chamber dryers
Air circulation chamber furnaces

Hot-wall retort furnaces
see page 58

Cold-wall retort furnaces
see page 62

See also catalog
Thermal Process Technology

See also concepts for drying, debinding, thermal cleaning and wax burnout on page 4

See also concepts for drying, debinding, thermal cleaning and wax burnout as well as catalog Thermal Process Technology



Chamber oven KTR 2000 for curing after 3D-printing



Compact tube furnace for sintering or annealing under protective gases or in a vacuum after 3D-printing



HT 160/17 DB200 for debinding and sintering of ceramics after 3D-printing

Also, concomitant or upstream processes of additive manufacturing require the use of a furnace in order to achieve the desired product properties, such as heat treatment or drying the powder.