Natural convection/forced air circulation

A thermal oven or drying oven usually has a chamber volume of between 20 and 800 litres and a temperature range from +5 °C above room temperature to +300 °C (details on the basic operation and fittings of a temperature control chamber) the inner chambers are generally made of corrosion-free stainless steel 1.4301 (acc. to standard ASTM 304), resistant to most acids.

Heating and ventilation

Thermal energy is transferred by convection and radiation to the chamber load. The heating of the chamber is usually achieved by ring heaters in the rear wall, heating coils in the lower third of the drying oven or heating systems behind the entire surface of the chamber walls. Drying takes place faster the higher the temperature, and the drier the air within the chamber. Via a switchable fan (speed adjustable from 0 to 100%), heat transfer (convection) and air exchange are accelerated and the temperature is distributed homogeneously within the chamber (for details see heat transfer by means of convection).

Safety

If flammable materials such as gas, dust, fog or fumes are released during the drying process, a special explosion-proof thermal oven or drying oven must be used. The classification of appliances into different categories, depending on hazards, safety requirements, substance groups and potentially explosive zones is regulated for Europe in the ATEX directives.

Overview Glossary Temperature control chamber

Picture credit: Memmert GmbH + Co. KG