

# Heat transfer by means of convection

In heat transfer, thermal energy is transferred from warmer areas to colder ones. This can occur through heat transfer by means of convection, thermal conduction or thermal radiation.

**Heat transfer** takes place when heating or cooling occurs to maintain an even temperature, during the change between states of aggregation (e.g. crystallisation, tempering, polymerisation, distilling) or even material separation (e.g. drying samples).

Materials expand when they are heated, their density decreases. Within a fluid or a gas, materials with less density rise, whereas materials with a higher density fall.

During **heat transfer** by means of **convection**, energy-containing particles are carried along in the flow of gases or fluids. If this occurs unforced, that is without a forced **air circulation**, energy-containing particles in the interior of a **temperature control chamber** are transported solely by lifting and sinking forces on the basis of differences in temperature. If the air flow runs along the chamber load, the heat transfer is thus from warm to cold.

If you want to accelerate the warming-up process in a conventional temperature control chamber, you can either increase the temperature or precisely channel the air flow in the interior by means of a circulation fan. This is called forced **air circulation**, thus ensuring a faster and at the same time more homogeneous **temperature distribution**. The higher the air speed (fan speed), the faster the heat exchange.

[Overview Glossary Temperature control chamber](#)

Autor:

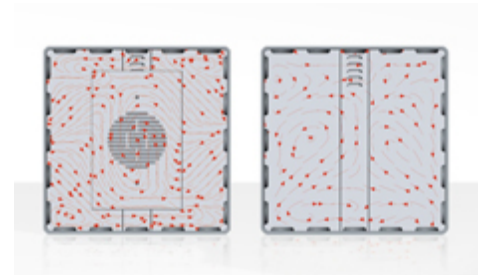


Fig. 1.3.1.1. Forced and natural convection. Apart from convection drying, vacuum drying, infrared, UV light and microwave radiation are particularly used in industry.

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