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Heat Treatment of Steel

Hardening and tempering of steels

The **HRF furnace** is suitable for hardening and tempering steel by increasing the mechanical resistance through heat treatment. Powerful recirculating air turbines ensure excellent temperature homogeneity for optimum heat distribution, thus complying with requirements according to **AMS 2750E Nadcap**.



Fig. 1: Air Recirculating Oven HRF

Annealing

For typical soft annealing temperatures under vacuum up to 750°C and inert or reactive gas up to 1100°C, the **annealing furnace range GLO** is recommended. This helps to reduce precipitations in the steel to decrease the strength and hardness of the material and increase the plasticity to facilitate further process steps. The additional quick cooling option offers the possibility to precisely maintain material-specific temperature profiles, thus ensuring high product quality.



Fig. 2: Annealing Furnace GLO

Special steels and surface hardening

For the production and processing of special steels and steel alloys, different types of heat treatment are required. The **HTK chamber furnace series** offers a variety of solutions in terms of size, temperature range and gas packages. They furnaces can be operated up to a maximum temperature of 2200°C; the **HTKW/22 model**, for example, is suitable for operation in ultrahigh vacuum, under hydrogen partial pressure or with other reactive gases.

It is also possible to carry out surface hardening by nitriding or carburization in a nitrogen-rich (ammonia) or carbon-rich atmosphere with slight overpressure at which nitrogen or carbon diffuses into the steel. The maximum temperature for carburizing is 3000°C in a **HTK GR/30**.

Data recording is possible for all furnaces, ensuring compliance with and monitoring of quality standards in process operation.



Figure 3: HTK chamber furnace with molybdenum insulation