

# «METHODS OF STEEL HEAT TREATMENT»

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Quenching is a heat treatment when metal at a high temperature is rapidly cooled by **immersion** in water or oil. Quenching makes steel harder and more brittle, with small grains structure.



Tempering is a heat treatment **applied** to steel and certain alloys. Hardened steel after quenching from a high temperature is too hard and brittle for many applications and is also brittle. Tempering, that is re-heating to an **intermediate** temperature and cooling slowly, reduces this hardness and brittleness



Tempering temperatures depend on the composition of the steel but are frequently between 100 and 650 °C. Higher temperatures usually give a softer, tougher product. The color of the **oxide film** produced on the surface of the heated metal often serves as the indicator of its



**Annealing** is a heat treatment in which a material at high temperature is cooled slowly. After cooling the metal again becomes malleable and ductile (capable of being bent many times without **cracking**).

All these methods of steel heat treatment are used to obtain steels with certain mechanical properties for certain needs.

