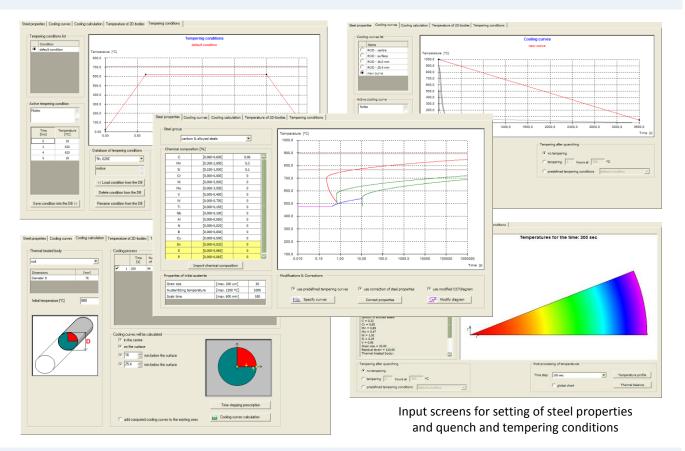# Software QTSteel

## Computer Simulation of the Heat Treatment Response of through Hardened, Carbon and Alloy Steels in Terms of Microstructure and Mechanical Properties



Input screens for setting of steel properties
and quench and tempering conditions

**Standard scope of the software:**

Carbon and structural steels with amount of *C* from 0.1 % to 0.6 % and with the total sum of alloying additions up to 10 % (upper limits: *Mn* 2 %, *Si* 1.8 %, *Cr* 4.5 %, *Ni* 3.5 %, *Mo* 2.5 %, *V* 0.4 %, *B* 0.004 %)
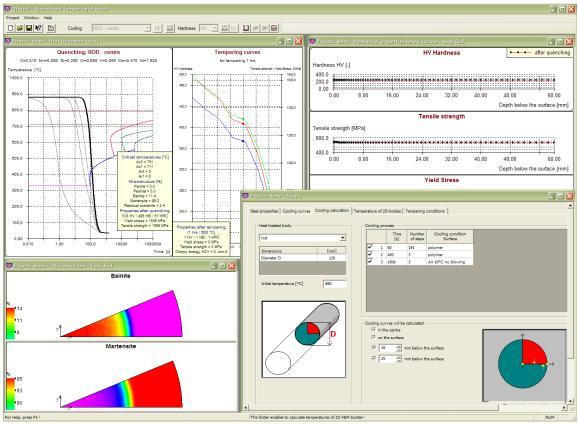
**Input data:**

- **Steel properties** (chemistry, grain size of austenite, austenitizing temperature, soak time),
- **Quench conditions** (dimensions, initial temperature and cooling conditions of standard 2D-bodies),
- **Tempering conditions** (tempering temperature and time, user specified tempering curves possible).

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Results of the heat treatment simulation of the rounded bar

**QTSteel provides the following information:**

- **CCT-diagram of steel** based on chemical composition with the possibility to modify particular CCT-curves,

- **Cooling curves of standard 2D-bodies** (rounded and rectangular bars, cylinders, tubes, rings) for specified cooling conditions and depths below the surface (Quenchant database available),

- **Microstructure of the steel** (shares of ferrite, pearlite, bainite, martensite or residual austenite) **and mechanical properties of the steel** (HV, HB, HRC, HSH, yield stress, ultimate tensile strength) for one selected cooling curve or across the standard 2D-body after quenching and subsequent tempering,

- **Mechanical properties of the steel** after quenching and subsequent tempering in dependence on the depth below the surface of the standard 2D-body.

**QTSteel works on a standard PC under Win7 or Win10!**
**The installation of training version can be downloaded from**
**http://www.ita-tech.cz/sw/QTSteel/setup_34_training_uk.zip**