

Typical Analysis

C	0.36	Si	0.30
Mn	0.40	Cr	5.20
Mo	1.90	V	0.55

Lowest possible levels of trace elements

Colour Code



Characteristics

TQ1 embodies an entirely new technology that has resulted in a hot work steel with properties far in advance of the best premium hot work steels such as those meeting the NADCA specification. The key properties of this new steel are its ability to combine toughness with hardness, low sensitivity to thermal shock and resistance to heat-checking.

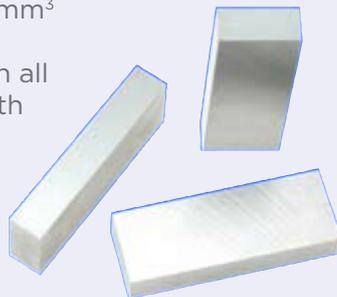
KIND & CO
EDELSTAHLWERK

Stock

TQ1 is stocked in various thickness' as forged plate and is cut to customers specifications.

READYMILLED.COM

Rectangular sections from 25mm³ up to 430 X 430 X 150mm can be delivered fine milled on all six faces to - 0+0.1mm and with squareness guaranteed to 0.1mm/m.



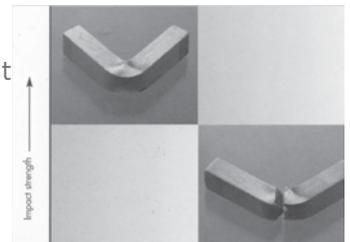
Typical Applications

- Diecasting tools for longer runs, arduous applications and difficult designs such as small sections.
- Extrusion tools.
- Die forging tools.



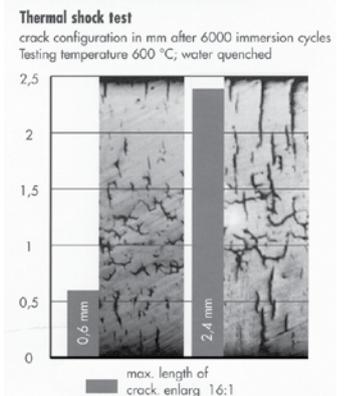
Impact Strength

The pictures on the right contrast the results of an impact test on samples of TQ1 (left) and H13 (right). The H13 material is Electro Slag Refined steel and complies with the Diecasting Quality Standard NADCA 207-97.



Resistance To Thermal Shock

The pictures on the right show the difference in resistance to thermal shock between TQ1 and H13 of a similar standard to that used in the impact test above.



HEAT TREATMENT

Stress Relieving

- a) Inert gas atmosphere (preferred)
 Raise temperature to the last tempering temperature minus 30°C. Hold for a minimum of 6 hours. Cool slowly in still air without the use of forced draught or grids.
- b) Conventional furnace
 Raise temperature to 480°C max. hold for a minimum of 6 hours. Cool slowly in still air without the use of forced draught or grids.

Hardening

Preheat in two stages to 650°C and 850°C allowing sufficient time for equalisation at each stage (minimum 30 minutes). Raise to the hardening temperature of 1,010/1,020°C, allow to equalise then hold for 45 minutes.

Quenching

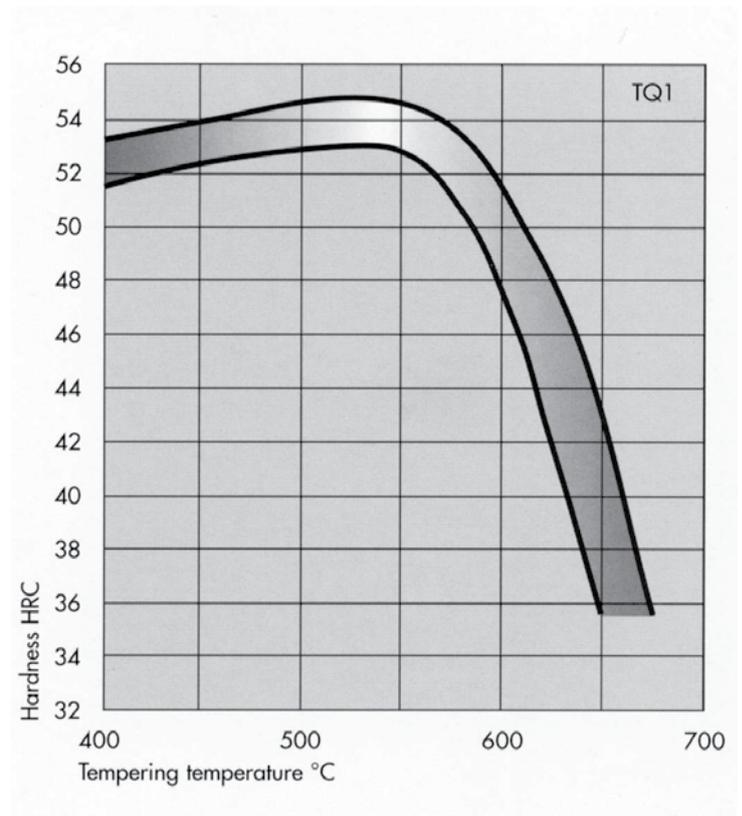
Quench in a vacuum furnace in Nitrogen to 100°C. To reduce stress, interrupt quench at 440°C for 30 mins. Temper immediately while tools are still warm.

Always Preheat Before Use

For optimum performance, it is vitally important that tools be preheated to between 100 and 350°C depending on use, and allowed to equalise.

Tempering

Double tempering is essential and triple tempering beneficial.



CASE STUDY

The picture on the left shows part of the 80,000th component from a diecasting tool in H11 material produced to a standard in excess of NADCA 207-97 (the diecasting industry benchmark specification). Considerable break-up is evident and the tool would not be expected to continue long in production. The picture on the right is of the same part of the 80,000th component from a tool in TQ1. Note that there is no evidence of significant wear or break-up and there is clearly much life left in the tool.

