

DESCRIPTION

Tool steel with high dissolved Cr content in the steel matrix. Good corrosion resistant in the hardened condition, good polishability, good machinability, low distortion, high wear resistance and high surface finish. This grade can be produced on request by the process ESR and quenched and tempered condition.

CHEMICAL COMPOSITION (IN WEIGHT %)

C	Si	Mn	Cr	Mo	Ni	V	S	Al	Cu	P
0.35	0.40	0.25	13.0	0.20	0.20	-	-	-	-	-

APPLICATION

Moulds for corrosive plastic materials such as PVC, recycled polymers etc., moulds for chemically aggressive plastics and plastics containing abrasive fillers, mould inserts, dies and gauges for PVC extrusions, screws and barrels for extruders, moulds for automotive, food, medical and optical industry such as spectacles, compact discs, lenses.

PHYSICAL PROPERTIES (average values) at ambient temperature

Modulus of elasticity [$10^3 \times \text{N/mm}^2$]:	Density [g/cm^3]	Specific heat capacity [J/g.K]:
220	7.80	0.46

Coefficient of linear thermal expansion $10^{-6} \text{ } ^\circ\text{C}^{-1}$

20-100 °C	20-200 °C	20-300 °C	20-400 °C
10.5	10.9	11.3	11.6

Thermal conductivity [W/m.K]

20 °C	200 °C	300 °C
22.0	24.0	26.0

CONTINUOUS COOLING TRANSFORMATION (CCT) DIAGRAM

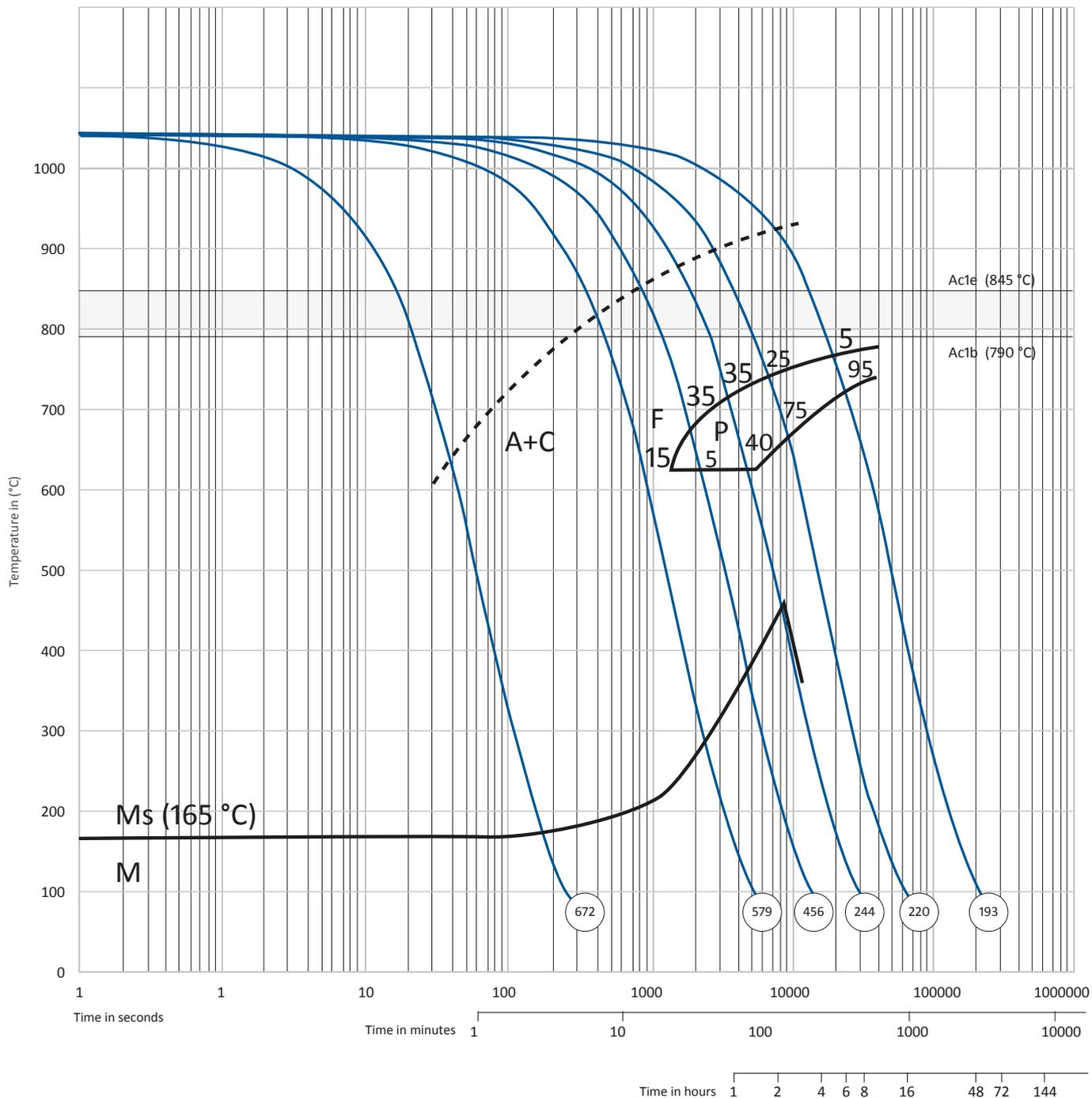


Fig. 1: Continuous cooling transformation (CCT) diagram

↘ SOFT ANNEALING

Heat to 760-800 °C, cool slowly in furnace. Max. hardness 241 HB.

↘ STRESS-RELIEVING

After rough machining the tool should be heated through to 650 °C, holding time 2 hours. Cool slowly to 500 °C, then freely in air.

↘ HARDENING

Preheating temperature: 600–850 °C. Harden from a temperature of 1000-1050 °C followed by oil, vacuum, pressure gas (N₂), air or hot bath air 500-550 C quenching. Protect the part against decarburization and oxidation during hardening. Soaking time: 1020 °C, 30 minutes, 1050 °C, 30 minutes. Soaking time = time at hardening temperature after the tool is fully heated through.

↘ TEMPERING

Tempering temperature: 250-570 °C, see the tempering diagram.

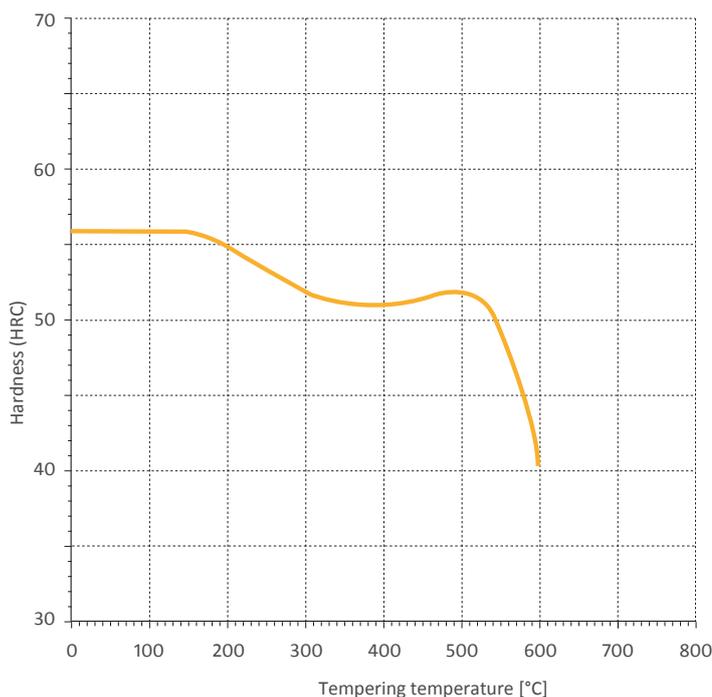


Fig. 2: Tempering Diagram

↘ FORGING

Hot forming temperature: 1050-850 °C.

↘ MACHINABILITY

Similar to machining some of the high carbon tool steel, this alloy has tough, stringy chip build-up.

↘ CORROSION RESISTANCE

SIMOLD 2083 is resistant to the atmosphere, fresh water, dilute acids and alkalis and fruit and vegetable juices.

↘ WELDING

Not commonly welded due to its air hardening characteristics. Welding may be performed after preheating to 149-204 °C with post weld tempering at temperature for 2 hours . Filler metal should be AWS E/ER420.

Note: The hot forming temperature stated should not be exceeded, as harmful grain coarsening and simultaneous formation of a carbide network along the grain boundaries will otherwise occur. This results in poor development of hardness and a decline in toughness and elasticity in hardened condition.

↘ DISCLAIMER

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