

DAYE JINGCHENG MOULD CO., LTD

TOOL STEEL PRODUCT

H10 Hot Work Tool Steel

Identification

Mat. No.	Designation by Standards			AISI
	DIN	JIS		
1.2365	32CrMoV12-28	SKD7		H10

Chemical Composition

C	Si	Mn	Cr	Mo	V	P&S
0.28	0.10	0.15	2.70	2.60	0.40	0.03
0.35	0.40	0.45	3.20	3.00	0.70	MAX

General Information

Properties

Hot work tool steel featuring a fine combination of heat checking resistance, hot strength and impact strength; admits water cooling.

Application

Highly stressed hot work tools, mainly for the processing of heavy alloys, such as mandrels, dies and containers for metal tube and rod extrusion; hot extrusion tools; tools for the manufacture of hollows, screws, rivets, nuts and bolts. Die casting tools, forming dies, die inserts, hot shear blades.

Heat Treatment

Annealing

750 to 800°C (1382 to 1472°F)

Slow controlled cooling in furnace at a rate of 10 to 20°C/hr (50 to 68°F/hr) down to approx. 600°C, (1112°F) further cooling in air. Hardness after annealing: max. 205 HB.

Stress relieving

600 to 650°C (1112 to 1202°F)

Slow cooling in furnace; intended to relieve stresses set up by extensive machining, or in complex shapes. After through heating, hold in neutral atmosphere for 1 - 2 hours.

Hardening

1010 to 1050°C (1850 to 1922°F)

Oil, salt bath (500-550°C / 932-1022°F), Holding time after temperature equalization: 15 to 30 minutes. Obtainable hardness: 52 - 56 HRC

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Tempering

Slow heating to tempering temperature immediately after hardening / time in furnace 1 hour for each 20 mm of workpiece thickness but at least 2 hours / cooling in air. It is recommended to temper at least twice.

A third tempering cycle for the purpose of stress relieving may be advantageous
1st tempering approx. 30°C (86°F) above maximum secondary hardness.

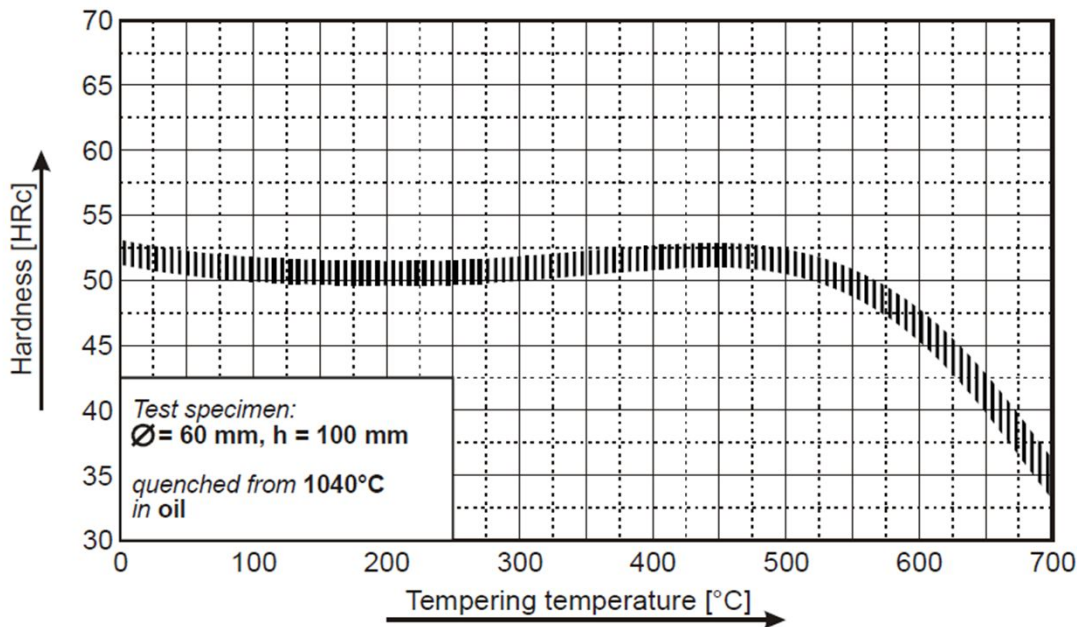
2nd tempering to desired working hardness.

The tempering chart shows average tempered hardness values.

3rd for stress relieving at a temperature

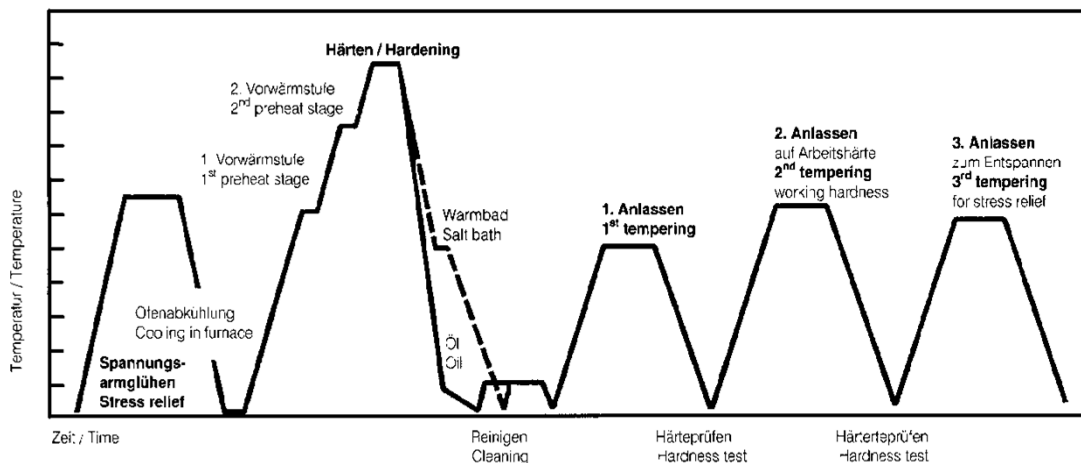
30 - 50°C (86 to 122°F) below highest tempering temperature

Tempering Diagram



Remarks: All technical information is for reference only.

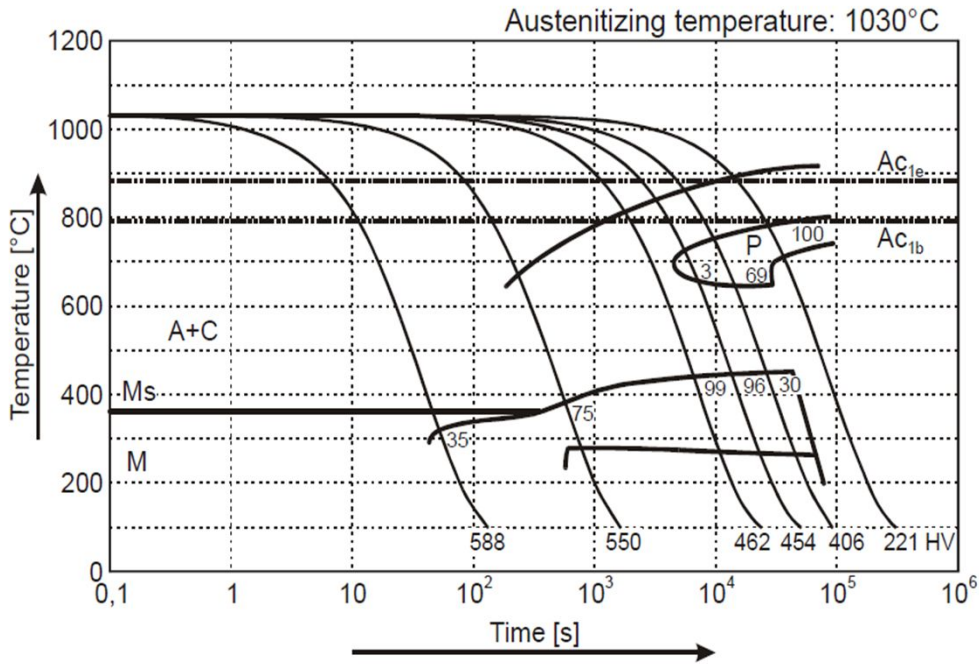
Heat Treatment Sequence



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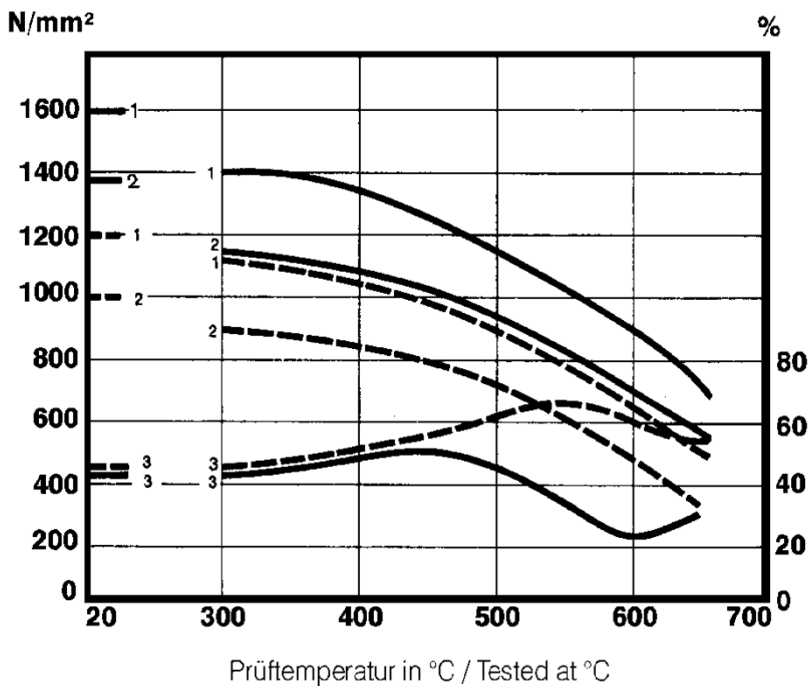
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Continuous Cooling Transformation Diagram (CCT)



Hot strength chart

- _____ heat treated 1600 N/mm²
- - - - heat treated 1200 N/mm²
- 1..... Tensile strength N/mm²
- 2..... 0.2% proof stress N/mm²
- 3..... Reduction of area %



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Other Information

Nitriding

Suited for both bath and gas nitriding.

Repair welding

There is a general tendency for tool steels to develop cracks after welding. If welding cannot be avoided, the instructions of the appropriate welding electrode manufacturer should be sought and followed.