Identification

Material number	Reference number	AISI
1.2379	X153CrMoV12	D2

Chemical composition Typical analysis in %

C	Si	Mn	Cr	Mo	V
1.55	0.30	0.35	12.00	0.75	0.90

Steel properties

12 % ledeburitic chromium steel. Combines maximum wear resistance, good toughness, outstanding cutting edge retention and tempering resistance. It can be nitrided after special heat treatment.

Physical properties

Coefficient of thermal expansion 10^{-6} m/(m · K)	20 – 100 °C	20 – 200 °C	20 – 300 °C	20 – 400 °C
	10.5	11.5	11.9	12.2

Thermal conductivity W/(m · K)	20 °C	350 °C	700 °C
	16.7	20.5	24.2

Applications

Threading rolls and dies, cold extrusion tools, trimming, cutting and stamping tools for sheet thicknesses up to 6 mm, precision cutting tools for sheet thicknesses up to 12 mm, cold pilger mandrels, circular-shear blades, deep-drawing tools, pressure pads and highly wear-resistant plastic moulds.

Heat treatment

Soft annealing °C	Cooling	Hardness HB
830 – 860	Furnace	max. 250

Stress-relief annealing °C	Cooling
650 – 700	Furnace

Hardening °C	Quenching	Hardness after quenching HRC
1000 – 1050	Air, oil or saltbath (500 – 550 °C)	63

Tempering °C	100	200	300	400	500	525	550	600
HRC	63	61	58	58	58	60	56	50

Special heat treatment

Hardening °C	Quenching	Hardness after quenching HRC
1050 – 1080	Air, oil or saltbath (500 – 550 °C)	61

Tempering °C	100	200	300	400	500	525	550	600
(three times) HRC	61	60	58	59	62	62	57	50

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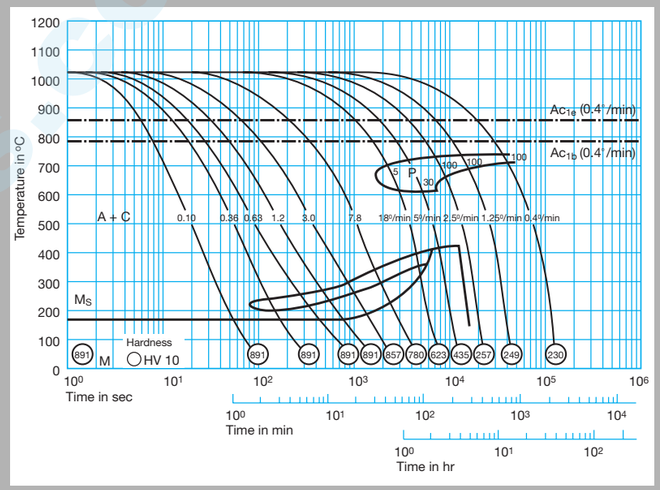
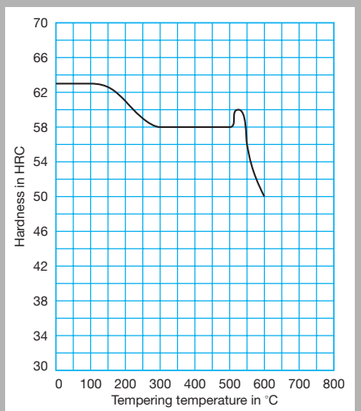
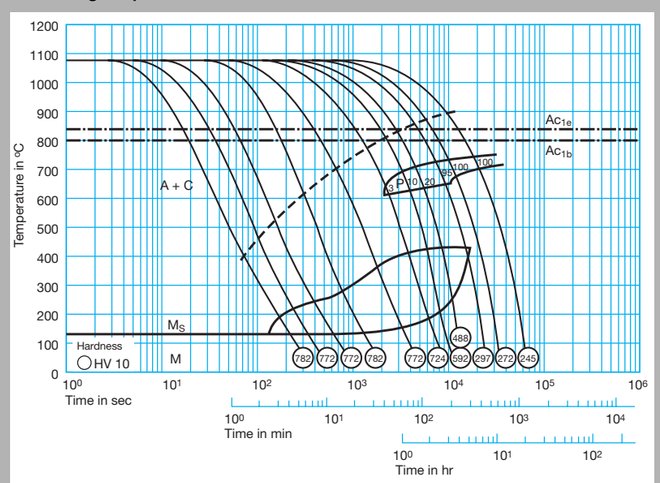
Time-temperature-transformation diagram
Hardening temperature: 1030 °C



Tempering diagram



Time-temperature-transformation diagram
Hardening temperature: 1080 °C



Tempering diagram