Cryodur 2379

X153CrMoV12

C 1.55 **Si** 0.30 **Mn** 0.35 **Cr** 12.00 **Mo** 0.75 **V** 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.

Standards

AISI D2 — **AFNOR** Z160CDV12

Physical properties

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

Thermal conductivity			
at °C	20	350	700
W/(m • K)	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

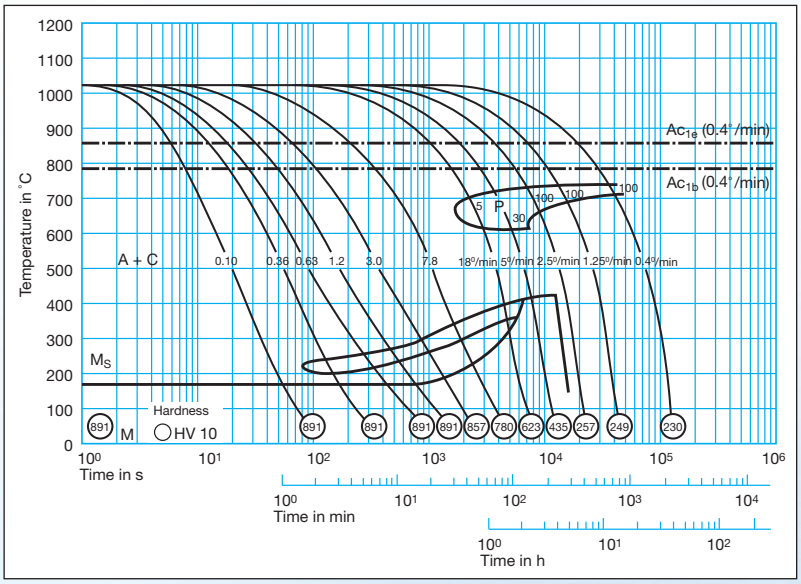
Soft annealing °C	**Cooling**	**Hardness HB**
830 – 860	Furnace	max. 250

Stress-relief annealing °C	**Cooling**
650 – 700	Furnace

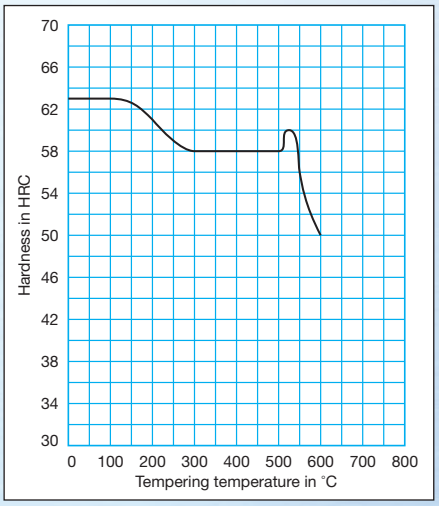
Hardening °C	**Quenching**	**Hardness after quenching HRC**
1000 – 1050	Air, oil or saltbath, 500 – 550 °C	63

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

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



Tempering diagram



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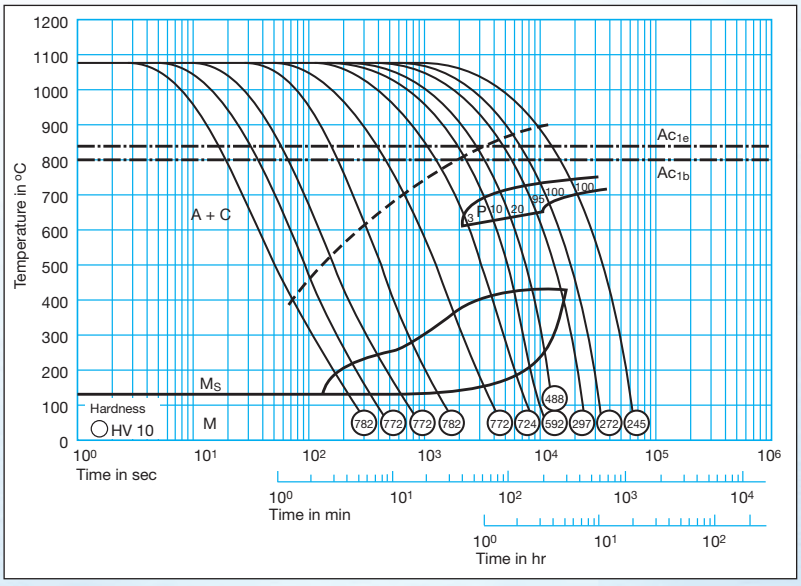
Special heat treatment

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

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

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



Tempering diagram