

CHEMICAL COMPOSITION

C	Cr	Mo	W	Co	V
1.08	3.8	9.4	1.5	8.0	1.2

SAFETY DATA SHEET SDS: B

STANDARDS

- USA: AISI M42
- Europe: HS 2-9-1-8, ~1.3247
- Japan : JIS SKH59

DELIVERY HARDNESS

- Typical soft annealed hardness is 280 HB
- Cold drawn and cold rolled material is typically 10-40 HB harder

DESCRIPTION

ASP[®]2042 is a PM HSS grade with high hardness and high toughness. It is an upgraded material in particular in applications where standard M42 is traditionally used e.g. for laser-welded bimetal saws with improve saw performance, thanks to its higher hardness and toughness. It is also recommended for high performance components.

APPLICATIONS

- Bandsaws, jig & sabre saws, hole saws
- High performance components
- Flat thread rolling dies for screws and bolts
- Cold forming dies for screws and bolts

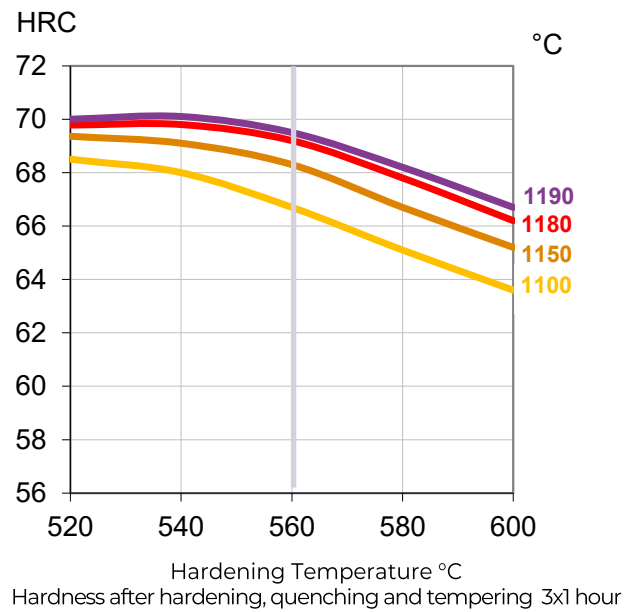
FORM SUPPLIED

- Bimetal edge wire
- Round bars
- Flat bars

HEAT TREATMENT

- Soft annealing in a protective atmosphere at 850-900°C for 3 hours, followed by slow cooling at 10°C/h down to 700°C, then air cooling.
- Stress-relieving at 600-700°C for approximately 2 hours, slow cooling down to 500°C.
- Hardening in a protective atmosphere with pre-heating in 2 steps at 450-500°C and 850-900°C and austenitising at a temperature suitable for chosen working hardness. Cooling down to 40-50°C.
- Tempering at 560°C three times for at least 1 hour each time. Cooling to room temperature (25°C) between temperings.

GUIDELINES FOR HARDENING



PROCESSING

ASP[®]2042 can be worked as follows:

- machining (grinding, turning, milling)
- polishing
- hot forming
- electrical discharge machining
- welding (special procedure including preheating and filler materials of base material composition).

GRINDING

During grinding, local heating of the surface, which may alter the temper, must be avoided. Grinding wheel manufacturers can provide advice on the choice of grinding wheels.

SURFACE TREATMENT

The steel grade is a perfect substrate material for PVD coating. If nitriding is requested, a small diffusion zone is recommended but avoid compound and oxidized layers.

PROPERTIES

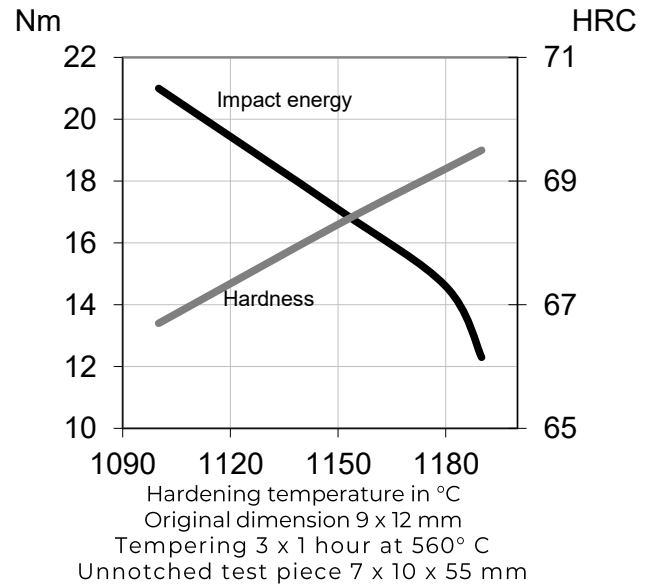
PHYSICAL PROPERTIES

Temperature	20°C	400°C	600°C
Density g /cm ³ (1)	8.0	7.9	7.9
Modulus of elasticity kN/mm ² (2)	225 33x10 ⁶	200 29x10 ⁶	180 26x10 ⁶
Thermal expansion ratio per °C (2)	-	11.5x10 ⁻⁶	11.8x10 ⁻⁶
Thermal conductivity W/m°C (2)	24	28	27
Specific heat J/kg °C (2)	420	510	600

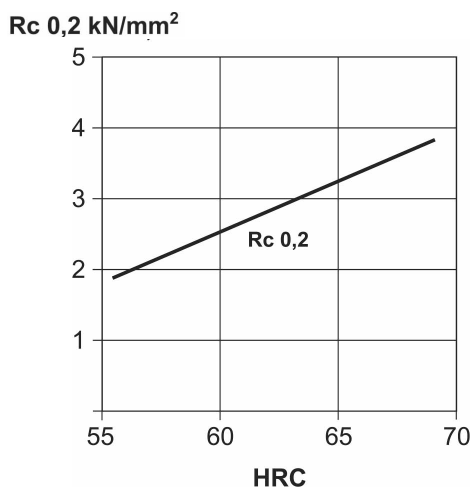
(1)=Soft annealed

(2)=Hardened 1180°C and tempered 560°C, 3x1 hour

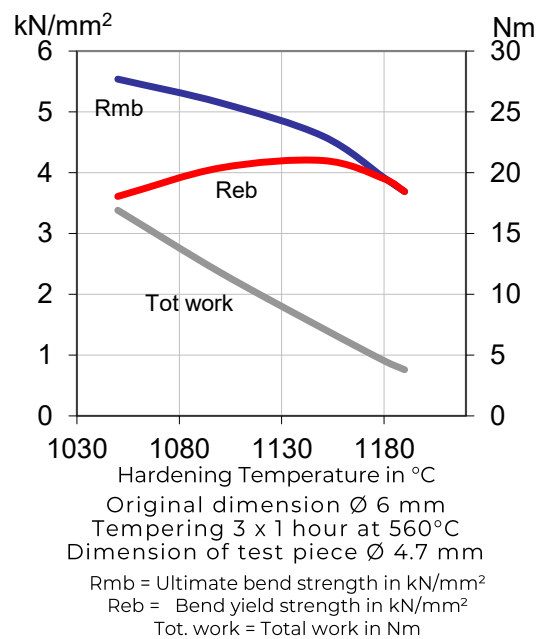
IMPACT TOUGHNESS



COMPRESSION YIELD STRESS



4-POINT BEND STRENGTH



COMPARATIVE PROPERTIES

