

**CHEMICAL COMPOSITION**

C	Cr	Mo	W	Co	V
1.20	4.1	5.0	6.2	-	3.0

SAFETY DATA SHEET SDS: A

**STANDARDS**

- USA: AISI M3:2
- Europe: HS 6-5-3
- Germany: 1.3344
- France: AFNOR Z120WDCV6.5.4.3
- Sweden: SS2785
- Japan: JIS SKH53

**DELIVERY HARDNESS**

- Typical soft annealed hardness is 255 HB
- Cold drawn and cold rolled material is typically 10-40 HB harder

**DESCRIPTION**

EM3:2 is a highly alloyed high speed steel for good wear resistance and high hardness.

**APPLICATIONS**

- Taps & dies
- Reamers
- Power hacksaws
- Punches
- Bi-metal saws
- Hole saws

**FORM SUPPLIED**

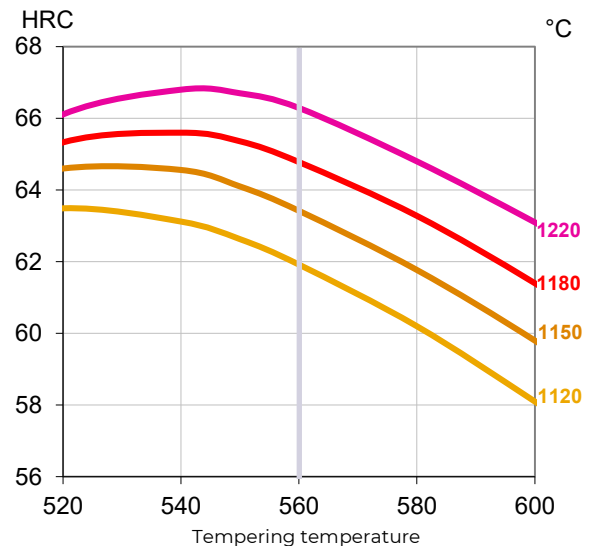
- Drawn wire
- Round bars
- Bi-metal edges
- Square bars
- Flat bars

Available surface conditions: drawn, ground, peeled, hot rolled, turned.

**HEAT TREATMENT**

- Soft annealing in a protective atmosphere at 850-900°C for 3 hours, followed by slow cooling 10°C per hour down to 700°C, then air cooling.
- Stress-relieving at 600°C to 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.
- 3 tempers at 560°C are recommended with at least 1 hour holding time each time.

**GUIDELINES FOR HARDENING**



Hardness after hardening, quenching and tempering 3x1 hour

Tool	Hardening	Tempering
Single-edge cutting tools	1220°C	550-570°C
Multi-edge cutting tools	1180-1220°C	550-570°C
Cold work tools	1120-1180°C	550-570°C

**PROCESSING**

E M3:2 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 can alter the temper, must be avoided. Grinding wheel manufacturers can provide advice on the choice of grinding wheels.

**SURFACE TREATMENT**

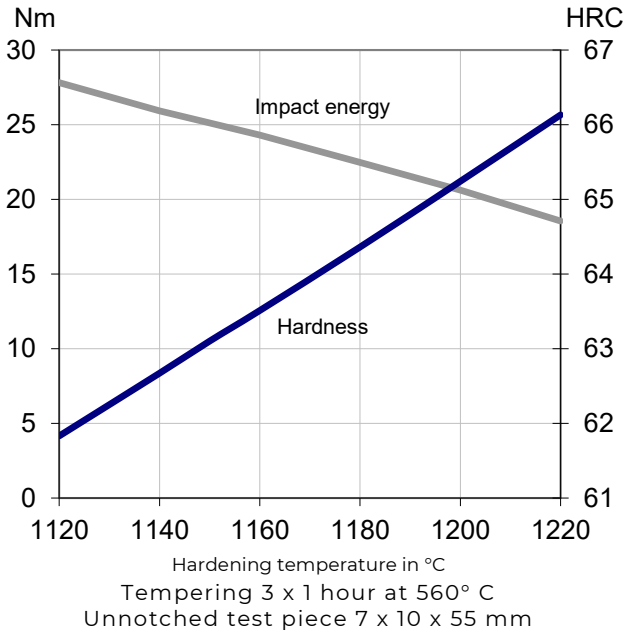
The steel grade is a perfect substrate material for PVD coating. If nitriding is requested, a small diffusion zone is recommended but avoid compound and oxidized layers.

**PROPERTIES**

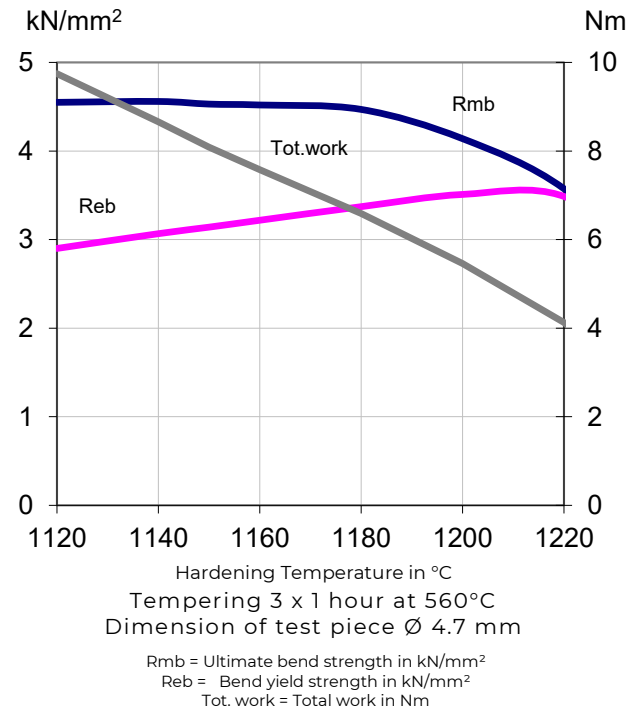
**PHYSICAL PROPERTIES**

Temperature	20°C
Density g /cm <sup>3</sup>	8.0

**IMPACT TOUGHNESS**



**4-POINT BEND STRENGTH**



**COMPARATIVE PROPERTIES**

