

CHEMICAL COMPOSITION

C	Cr	Mo	W	Co	V
0.83	3.8	8.5	1.8	-	1.2

SAFETY DATA SHEET SDS: A

STANDARDS

- USA: AISI M1
- Europe: HS 2-9-1
- Germany: 1.3346
- France: AFNOR Z85DCWV.8.4.2.1
- UK: BM1

DELIVERY HARDNESS

- Typical soft annealed hardness is 250 HB
- Cold drawn and cold rolled material is typically 10-40 HB harder

DESCRIPTION

EM1 is molybdenum-based grade which has a good machinability, a good performance and is used for many applications.

APPLICATIONS

- Twist drills
- Taps
- Reamers
- Rolls
- Dies

FORM SUPPLIED

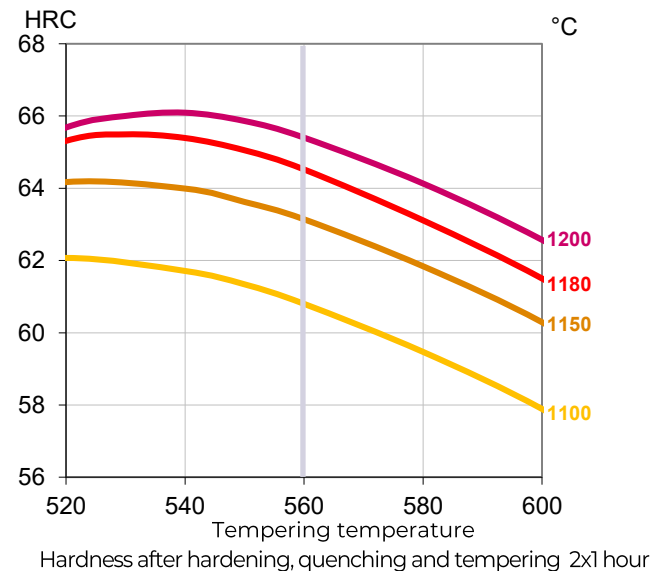
- Drawn wire
- Round bars
- Square bars
- Sheets
- Discs
- Flat bars

Available surface conditions: hot rolled, drawn, ground, peeled, 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 preheating in 2 steps at 450-500°C and 850-900°C and austenitising at a temperature suitable for chosen working hardness.
- 2 tempers at 560°C are recommended with at least 1 hour holding time each time.

GUIDELINES FOR HARDENING



Tool	Hardening	Tempering
Single-edge cutting tools	1200°C	560°C
Multi-edge cutting tools	1180-1200°C	550-570°C
Cold work tools	1100-1150°C	550-570°C

PROCESSING

EM1 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

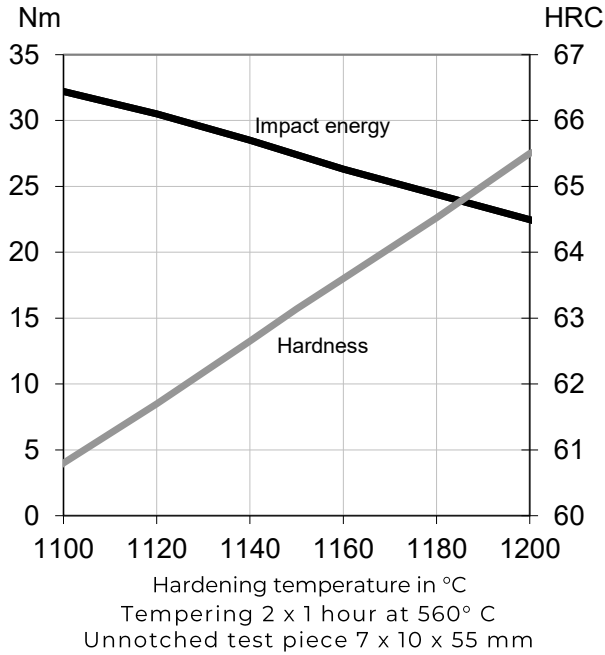
The steel grade is a perfect substrate material for PVD coating. If nitriding is requested, a small diffusion zone is recommended but avoid compound and oxidized layers.

PROPERTIES

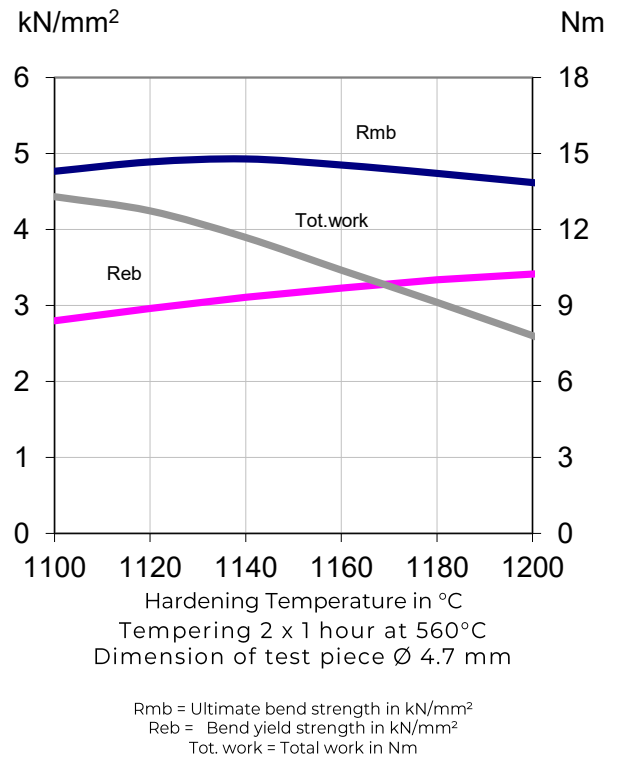
PHYSICAL PROPERTIES

Temperature	20°C
Density g /cm ³	8.0

IMPACT TOUGHNESS



4-POINT BEND STRENGTH



COMPARATIVE PROPERTIES

