

CHEMICAL COMPOSITION

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

STANDARDS

- Europe: HS 2-9-1-8
- USA: AISI M42
- Germany: 1.3247
- Sweden: SS2723
- France: AFNOR Z110DKCWV9.8.4.2.1
- Japan: JIS SKH59
- UK: BM42

DELIVERY HARDNESS

- Typical soft annealed hardness is 270 HB
- Cold drawn and cold rolled material is typically 10-40 HB harder

DESCRIPTION

E M42 is a highly cobalt alloyed high speed steel to be used when the demand for hot hardness is of great importance. E M42 has a good machinability and a good wear resistance .

APPLICATIONS

- Twist drills
- Broaches
- Milling cutters
- Reamers
- End mills
- Bandsaws

FORM SUPPLIED

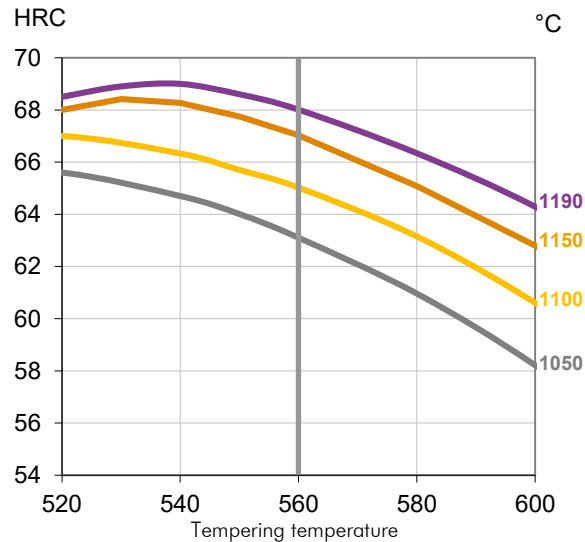
- Wire rod
- Square bars
- Drawn wire
- Sheets
- Round bars
- Discs
- Flat bars
- Bi-metal edge

Available surface conditions: drawn, ground, rolled, hot rolled, cold rolled, 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 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	1190°C	560°C
Multi-edge cutting tools	1150-1180°C	550-570°C
Cold work tools	1050-1150°C	550-570°C

PROCESSING

E M42 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.

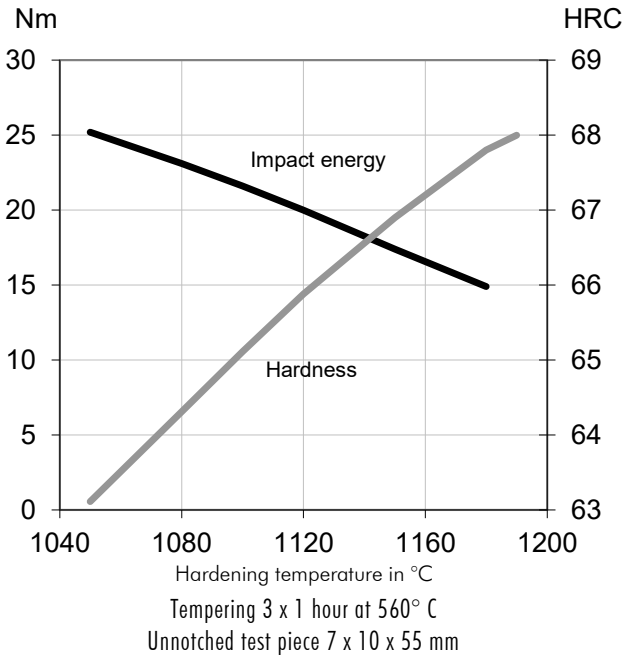
SURFACE TREATMENT

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.

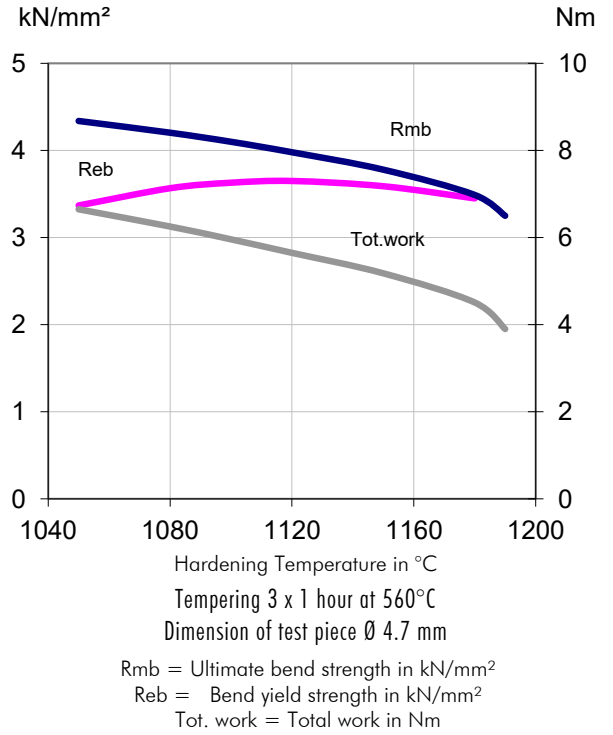
PHYSICAL PROPERTIES

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

IMPACT TOUGHNESS



4-POINT BEND STRENGTH



SAFETY DATA SHEET SDS: B

COMPARATIVE PROPERTIES

