

CHEMICAL COMPOSITION

C	Cr	Mo	W	Co	V
1.27	4.0	3.6	9.5	10.0	3.2

SAFETY DATA SHEET SDS: B

STANDARDS

- USA: AISI M51
- Europe: HS 10-4-3-10
- France: AFNOR Z130WKCDV10.10.4.4.3
- Japan: JIS SKH57
- Germany: 1.3207
- Sweden: SS2736

DELIVERY HARDNESS

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

DESCRIPTION

WKE42 is a proprietary tungsten high speed steel containing 10 percent cobalt. WKE42 is harder than most high-speed steels and has in addition a reasonably good toughness. WKE42 is used mainly for tools requiring maximum abrasion resistance and medium toughness.

APPLICATIONS

- Toolbits
- Cold work tools
- Milling cutters
- Form tools
- Bandsaws

FORM SUPPLIED

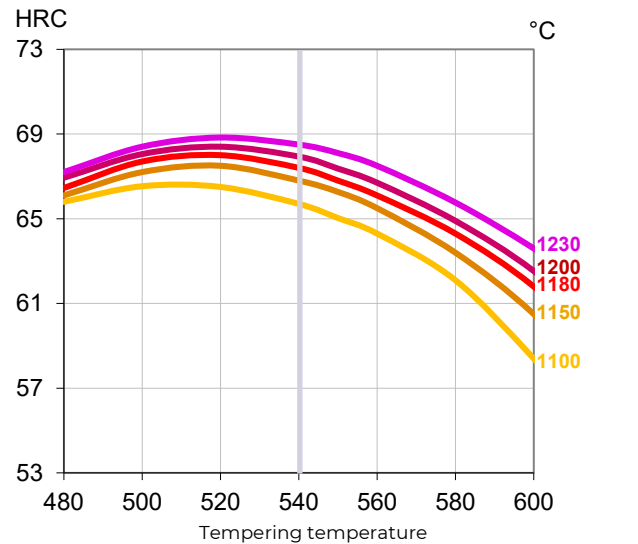
- Wire rod
- Round bars
- Flat bars
- Square bars
- Bi-metal edge

Available surface conditions: ground, hot peeled, rough machined.

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.
- 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	1230°C	550°C
Multi-edge cutting tools	1220-1225°C	560-580°C
Cold work tools	1150-1200°C	560-590°C

PROCESSING

WKE42 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

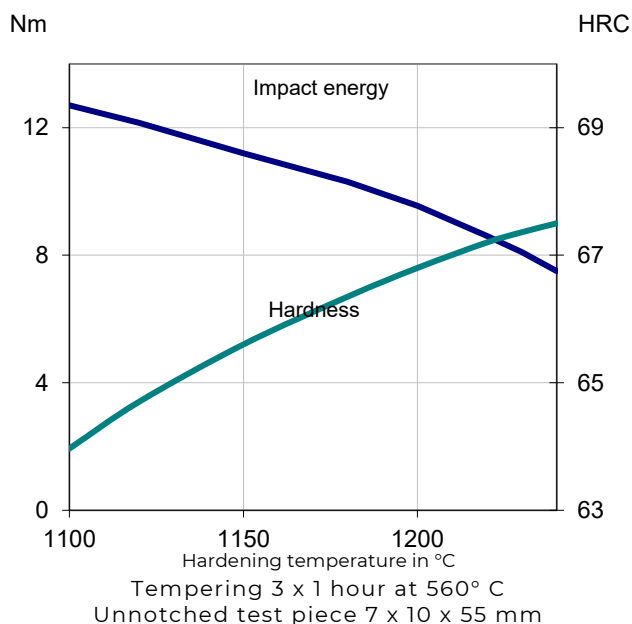
The steel grade is a perfect substrate material for PVD coating. If nitriding is requested, a small diffusion zone is recommended but avoid compound and oxidized layers.

PROPERTIES

PHYSICAL PROPERTIES

Temperature	20°C	400°C	600°C
Density g /cm ³	8.2	8.1	8.1
Modulus of elasticity kN/mm ²	240	215	190
Thermal expansion ratio per °C	-	10.2 x10 ⁻⁶	10.9 x10 ⁻⁶
Thermal conductivity W/m°C	24	28	27
Specific heat J/kg °C	420	510	600

IMPACT TOUGHNESS



COMPARATIVE PROPERTIES

