

CHEMICAL COMPOSITION

C	Cr	Mo	W	Co	V
1.2	3.9	5.2	7	-	2.7

SAFETY DATA SHEET SDS: A

STANDARDS

- Europe: HS 7-5-3
- Germany: W.Nr.1.3347

DELIVERY HARDNESS

- Typical soft annealed hardness is 265 HB
- Cold drawn and cold rolled material is typically 10-40 HB harder

DESCRIPTION

GRINDAMAX™V3 is a vanadium-based grade which has been developed to bridge the gap between conventional & PM high speed steels in terms of both performance and grindability. Its chemistry is a very effective combination of alloying elements allowing high wear resistance and excellent toughness.

APPLICATIONS

- Taps & Dies
- Reamers
- Punches
- Knives

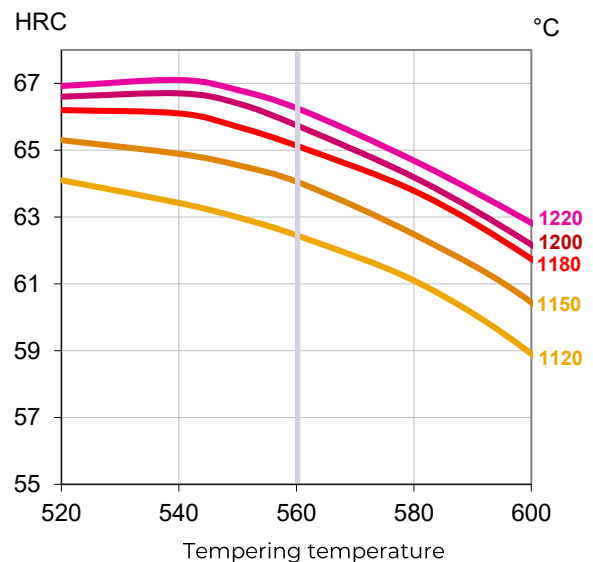
FORM SUPPLIED

- Drawn bars
- Peeled bars
- Flat bars
- Square bars
- Ground bars

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

GRINDAMAX™V3 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

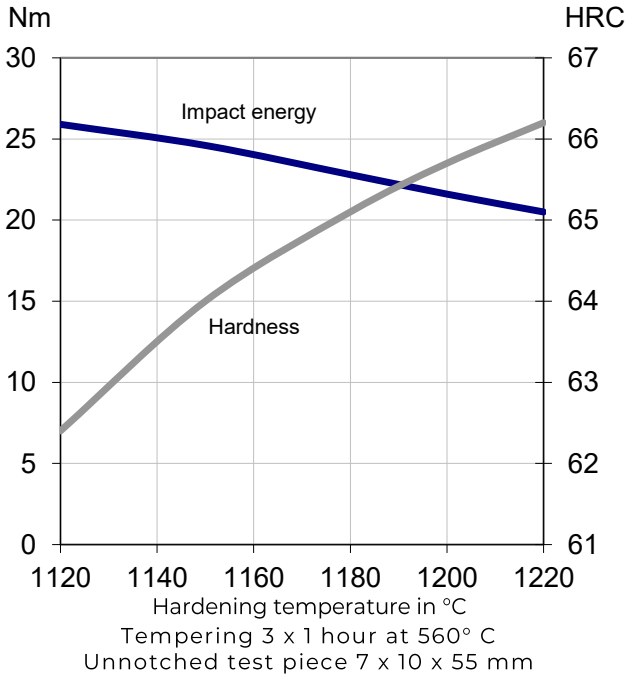
The steel grade is a perfect substrate material for PVD coating. If nitriding is requested, a small diffusion zone is recommended but avoid compound and oxidized layers.

PROPERTIES

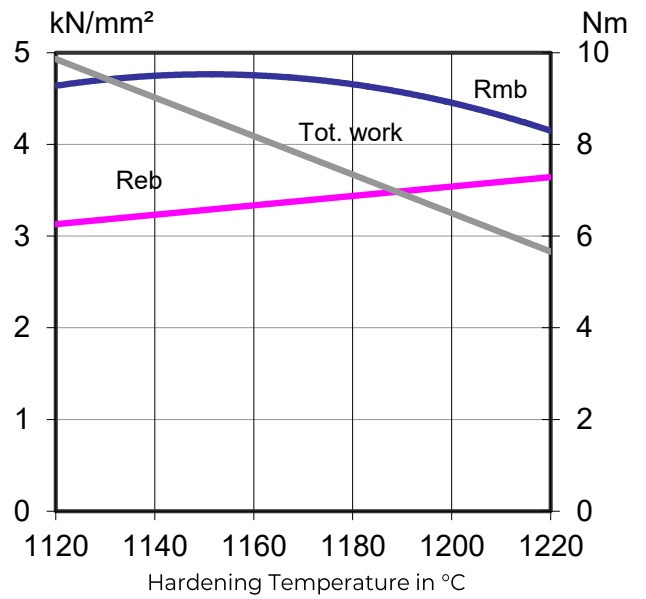
PHYSICAL PROPERTIES

Temperature	20°C
Density g /cm ³	8.0

IMPACT TOUGHNESS



4-POINT BEND STRENGTH



Tempering 3 x 1 hour at 560°C
Dimension of test piece Ø 4.7 mm

Rmb = Ultimate bend strength in kN/mm²
Reb = Bend yield strength in kN/mm²
Tot. work = Total work in Nm

COMPARATIVE PROPERTIES

