

ASP® APZ10 is a martensitic chromium Powder Metallurgy grade designed for applications where high wear resistance and high corrosion resistance are needed.

STANDARDS

> Not standardized

DELIVERY HARDNESS

> Typical soft annealed hardness is 280 HB

CHEMICAL COMPOSITION

Safety datasheet available

C	Cr	Mo	W	Co	V	N
1.25	19.0	2.1	-	-	0.8	0.1

APPLICATIONS

- > Plastic moulding applications
- > Food-related applications
- > Medical related applications
- > Industrial knives

FORM SUPPLIED

- > Round bars
- > Flat & square bars

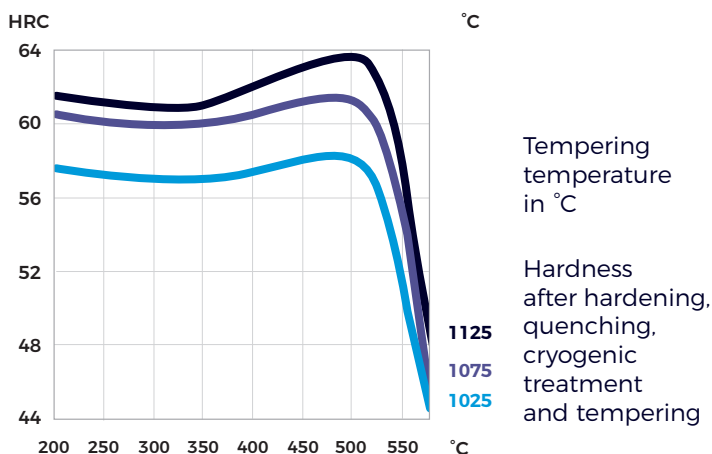
Available surface conditions: peeled, hot-rolled, rough-machined.

HEAT TREATMENT

- > Soft annealing in a protective atmosphere at 870-900°C for 3 hours, followed by slow cooling at 10°C/h down to 700°C, then air cooling.
- > For applications requiring maximum corrosion resistance and where the temperature does not exceed 150°C, the following heat treatment is recommended:
 - **Austenitization:** 1075°C
 - **Cooling:** oil or gas pressure depending on the section and shape of the parts
 - **Cryogenic treatment:** 2 hours at -80°C
 - **Tempering:** 2 hours at 180-210°C
- > For applications requiring high wear resistance or in which the temperature is likely to exceed 150°C in service or during surface coating operations, the following heat treatment is recommended:
 - **Austenitization:** 1125°C
 - **Cooling:** oil or gas pressure depending on the section and shape of the parts
 - **Cryogenic treatment:** 2 hours at -80°C.
 - **Tempering:** 2 hours at 500-525°C two times. Cooling to room temperature < 25°C between temperings.

This treatment provides a lower level of corrosion resistance than the first treatment.

GUIDELINES FOR HARDENING



Application	Hardening	Tempering
Requiring maximum corrosion resistance	1075°C	180-210°C
Requiring maximum wear resistance	1125°C	500-525°C



PROCESSING

- ASP® APZ10 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 may 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 good substrate material for PVD coating as long as the temperature during coating does not exceed the tempering temperature.

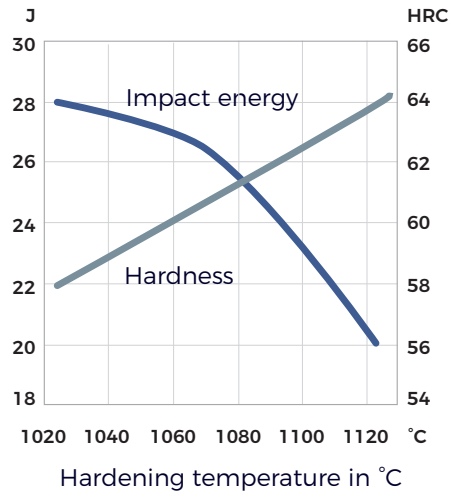
PROPERTIES

PHYSICAL PROPERTIES

Temperature	20 °C	400 °C	600 °C
Density g/cm ³ ⁽¹⁾	7.6	7.5	7.5
Thermal expansion ratio per °C ⁽²⁾	-	12.2x10 ⁻⁶	12.9x10 ⁻⁶
Thermal conductivity W/m°C ⁽²⁾	15	19	21
Specific heat J/kg°C ⁽²⁾	450	590	700

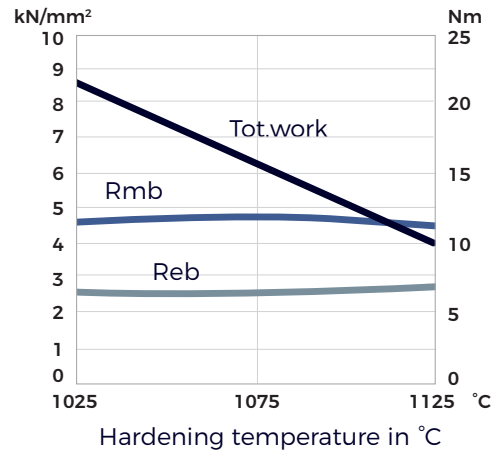
(1) Soft annealed
 (2) Hardened 1125°C and tempered 510°C, 2 x 2 hours

IMPACT TOUGHNESS



Original dimension Ø15 mm
 Tempering 2 x 2 hours at 510° C
 Unnotched test piece 7 x 10 x 55 mm

4-POINT BEND STRENGTH



Tempering 2 x 2 hours at 510°C
 Dimension of test piece 4.7 x 65 mm

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

COMPARATIVE PROPERTIES

