

## CHEMICAL COMPOSITION

| C    | Cr   | Mo  | V   | N   |
|------|------|-----|-----|-----|
| 1.25 | 19.0 | 2.1 | 0.8 | 0.1 |

## STANDARDS

- Not yet standardized

## DELIVERY HARDNESS

- Typical soft annealed hardness is 280 HB

## DESCRIPTION

ASP<sup>®</sup>APZ10 is a martensitic chromium PM grade designed for applications where high wear resistance and high corrosion resistance are needed.

## APPLICATIONS

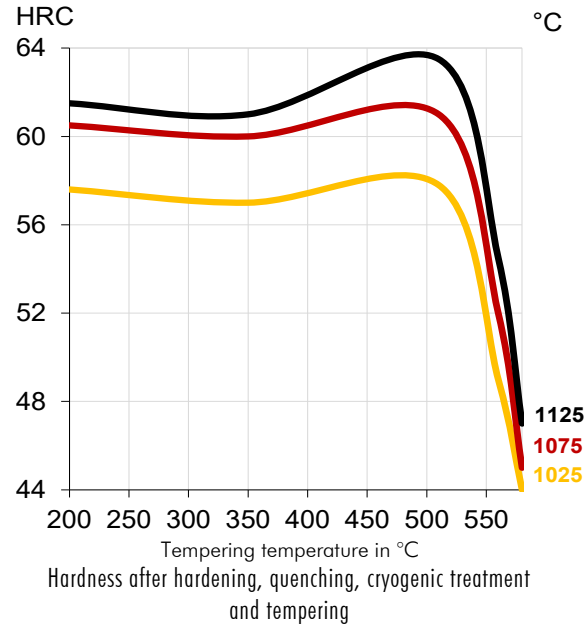
- Plastic moulding applications: (corrosive and abrasive plastics)
- Food-related applications
- Medical related applications
- Industrial knives

## FORM SUPPLIED

- Round bars
- Flat & square bars

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

## GUIDELINES FOR HARDENING



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

## 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.

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**

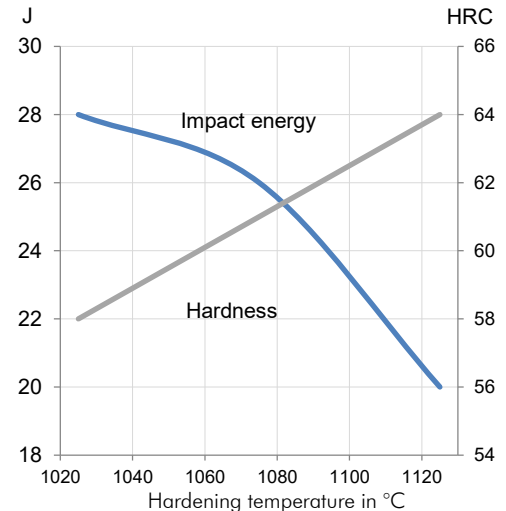
|                                    | Temperature |                       |                       |
|------------------------------------|-------------|-----------------------|-----------------------|
|                                    | 20°C        | 400°C                 | 600°C                 |
| Density g /cm <sup>3</sup> (1)     | 7.6         | 7.5                   | 7.5                   |
| Thermal expansion ratio per °C (2) | -           | 12.2x10 <sup>-6</sup> | 12.9x10 <sup>-6</sup> |
| 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, 2x2 hour

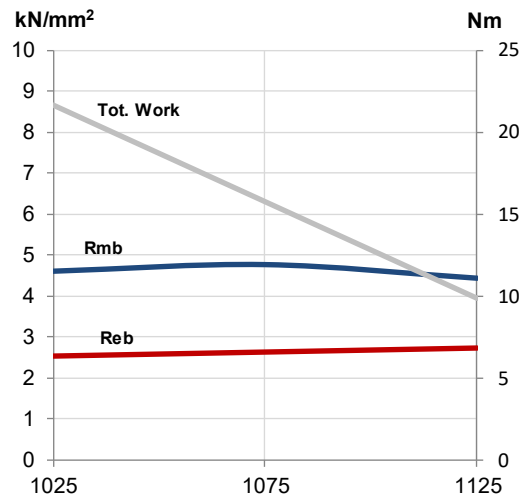
**SAFETY DATA SHEET SDS: B**

**IMPACT TOUGHNESS**



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

**4-POINT BEND STRENGTH**



Hardening Temperature in °C  
Tempering 2 x 2 hour at 510°C  
Dimension of test piece 4.7 x 65mm  
Rmb = Ultimate bend strength in kN/mm<sup>2</sup>  
Reb = Bend yield strength in kN/mm<sup>2</sup>  
Tot. work = Total work in Nm

**COMPARATIVE PROPERTIES**

