

**ASP® 2008 is a powder metallurgical tool steel whose unique analysis takes it to a new step by achieving a very good compromise between impact resistance, compressive strength and adhesive/abrasive wear resistance up to 64 HRC.**

## STANDARDS

> No standardized

## DELIVERY HARDNESS

> Typical soft annealed hardness is 260 HB  
> Cold-drawn and cold-rolled material is typically 10-40 HB harder

## CHEMICAL COMPOSITION

Safety datasheet available

C	Cr	Mo	W	Co	V	Nb
1.08	4.0	2.5	2.5	-	1.8	1.8

## APPLICATIONS

ASP® 2008 is particularly recommended for tools that suffer mainly from mixed adhesive/abrasive wear and chipping/cracking. Such failure mechanism can occur with processed materials such as aluminium, austenitic stainless steels, mild steels, copper and with thick and/or Ultra High Strength Steels.

ASP® 2008 is especially efficient in these applications:

- > cold forging
- > blanking and forming
- > fine blanking
- > powder compaction
- > minting of coins
- > rolling rolls
- > rotary cutters
- > slitting knives
- > granulator knives
- > encapsulation

## HEAT TREATMENT

- > Soft annealing in a protective atmosphere at 850-900°C for 3 hours, followed by slow cooling at 10°C/h down to 700°C, then air cooling.
- > Stress-relieving at 600-700°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 austenitizing at a temperature suitable for chosen working hardness. Cooling down to 40-50°C.
- > Tempering at 560°C three times for at least 1 hour each time. Cooling to room temperature < 25°C between temperings.

## FORM SUPPLIED

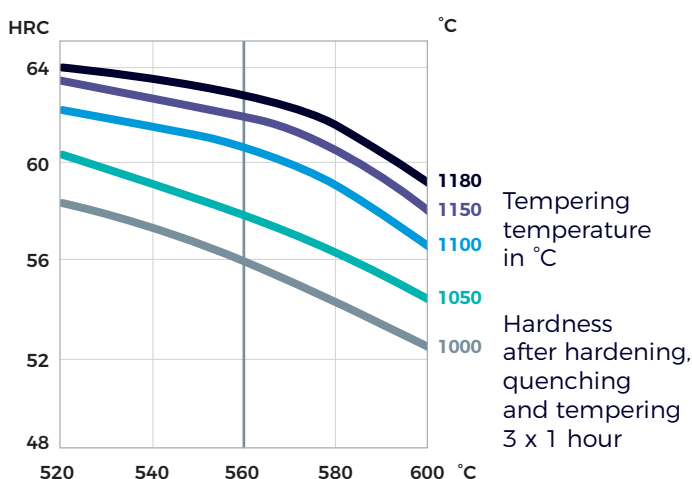
- > Flat & square bars
- > Round bars

## PROCESSING

ASP®2008 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)

## GUIDELINES FOR HARDENING



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



**PROPERTIES**

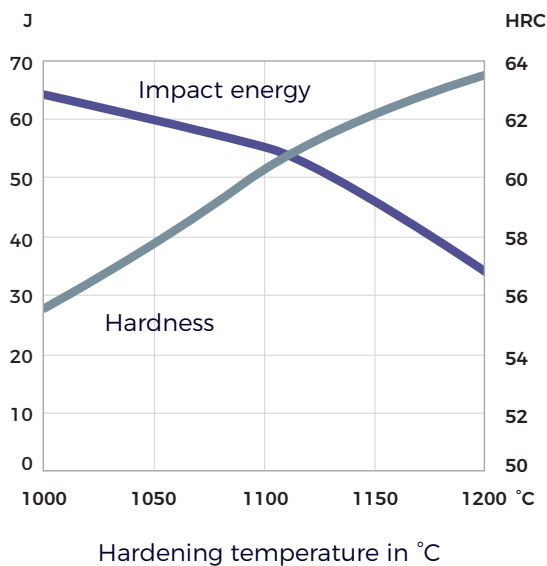
**PHYSICAL PROPERTIES**

Temperature	20 °C	400 °C	600 °C
Density g/cm <sup>3</sup> (1)	7.9	7.8	7.7
Modulus of elasticity kN/mm <sup>2</sup> (2)	220	195	175
Thermal expansion ratio per °C (2)	11.0x10 <sup>-6</sup>	13.2x10 <sup>-6</sup>	12.7x10 <sup>-6</sup>
Thermal conductivity W/m°C (2)	24	28	27
Specific heat J/kg°C (2)	420	510	600

(1) Soft annealed

(2) Hardened 1180°C and tempered 560°C, 3 x 1 hour

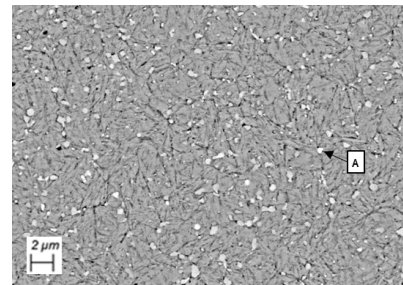
**IMPACT TOUGHNESS**



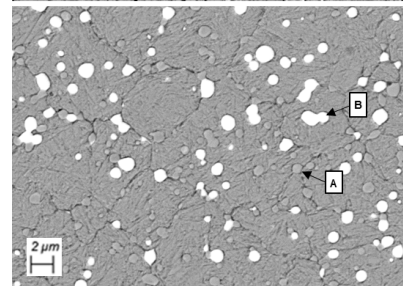
Original dimension Ø 80 mm  
 Tempering 3 x 1 hour at 560°C  
 Unnotched test piece 7 x 10 x 55 mm  
 Tested transversal to the bar length

**MICROSTRUCTURE**

Microstructure comparison of ASP® 2008 and ASP® 2023



ASP® 2008



ASP® 2023

A: MC  
 B: M<sub>6</sub>C

Alloyed with Nb, ASP® 2008 has an outstanding fine and even carbide distribution. Nb gives smaller MC carbides and this is very positive for:

- > a better machinability and grindability
- > higher surface finish after polishing
- > less galling and a good adhesive wear resistance (aluminium, austenitic stainless steels, etc.)
- > reduce the grain growth during heat treatments which lead to a better impact resistance
- > the abrasive wear resistance thanks to the very hard Nb carbides

**COMPARATIVE PROPERTIES**

