Powder Metallurgy High-Speed Steel

ASP® 420H

ERASTEEL

ASP®420H powder manufactured grade combines high wear resistance, from the high V and C content, with corrosion resistance from the high Cr content. Thanks to the high cleanliness obtained with the ASP® process, high toughness, chipping resistance, polishability and corrosion resistance are obtained.

STANDARDS

> No standardized

DELIVERY HARDNESS

> Typical soft annealed hardness is 300 HB

CHEMICAL COMPOSITION

Safety datasheet available

C	Cr	Mo	W	Co	V
2.30	14.5	1.0	-	-	8.7

APPLICATIONS

> Injection moulding (corrosive and abrasive plastics)
> Industrial knives
> Food-related applications
> Powder compaction
> Wear components

FORM SUPPLIED

> Round bars
> Flat & square bars

HEAT TREATMENT

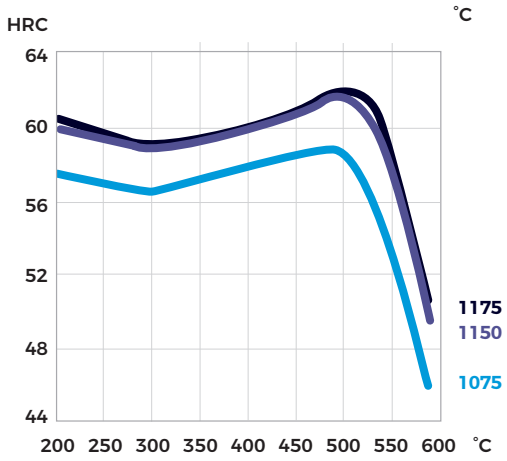
> Soft annealing in a protective atmosphere at 930-970˚C for 3 hours, followed by slow cooling at 10˚C/h down to 750˚C, then air cooling.

> Stress-relieving at 600-700˚C for approximately 2 hours, slow cooling down to 500˚C.

> Harden at 1075˚C to 1175˚C for chosen hardness.

> Temper for best corrosion resistance at 200-400˚C (260˚C recommended) 2 times for 2 hours each (minimum). Deep cooling after first tempering is possible and highly recommended for low temperature tempering to ensure thermal stability. Temper at 530-550˚C can be used for best dimension stability and stress relieving.

GUIDELINES FOR HARDENING



Tempering temperature in ˚C

Hardness after austenitization, quenching and tempering 2 x 2 hours

SURFACE TREATMENT

ASP® 420H can be PVD coated.

If nitriding is required, a small diffusion zone is recommended, but avoid compound and white layers. Nitriding may improve abrasive wear resistance but can also decrease the corrosion resistance.

Application	Hardening	Tempering
Best corrosion resistance	1075-1175˚C	250-270˚C
Best dimension stability and stress relieving	1075-1175˚C	530-550˚C

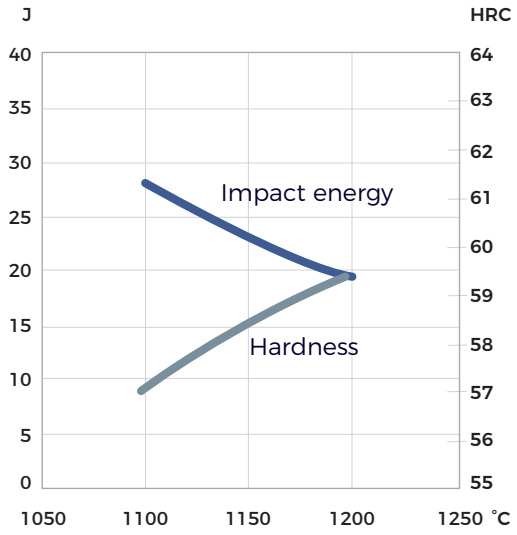
PROPERTIES

PHYSICAL PROPERTIES

Temperature	20˚C
Density g/cm³ (1)	7.4
Modulus of elasticity kN/mm2 (2)	215
Thermal expansion ratio per ˚C (2)	11.0
Thermal conductivity W/m˚C (2)	17
Specific heat J/kg˚C (2)	-

(1) Soft annealed
(2) Hardened 1125˚C and tempered 540˚C, 2 x 2 hours

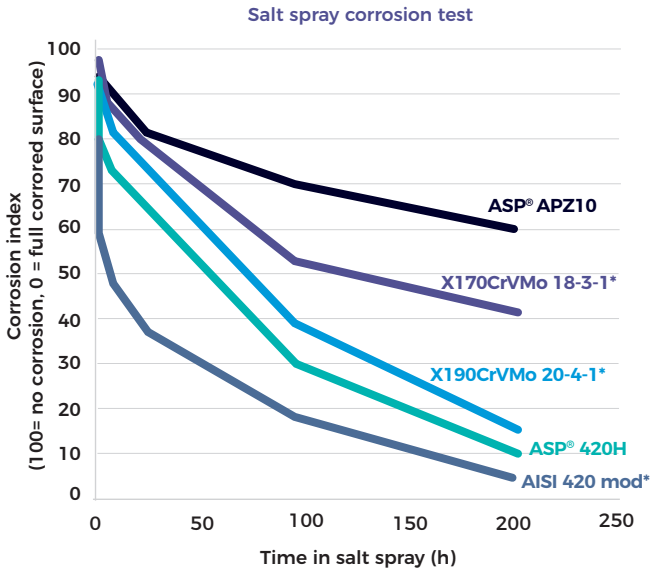
IMPACT TOUGHNESS



Hardening temperature in ˚C

Original dimension 260 x 174 mm
Tempering 2 x 2 hours at 540˚ C
Unnotched test piece 7 x 10 x 55 mm

CORROSION RESISTANCE



Corrosion resistance from salt spray test of different types of Powder Metallurgy martensitic steels tempered < 300˚C.
Thanks to the high cleanliness obtained with ASP® process, the corrosion resistance of ASP® 420H is good compared to other Powder Metallurgy grades of similar composition.

**Powder Metallurgy martensitic stainless steels of non-Erasteel origin with nominal composition 2.3C, 14Cr, 1Mo and 9V; 1.9C, 20Cr, 1Mo and 4V; and 1.7C, 18Cr, 1Mo and 3V.*

COMPARATIVE PROPERTIES