

**ALLOY 420**

ALLOY INFORMATION SHEET

UNS S42000 W Nr 1.4021

- HEAT AND/OR CREEP RESISTANT
- CORROSION RESISTANT
- OTHER

Alloy 420 is a 13% Cr stainless steel that can be hardened to approximately 470 – 500 Brinell. The grade has good ductility in the annealed condition and as supplied which is in condition QT800. As with other heat treatable steels hardening generally reduces the metal's toughness. Alloy 420 has a moderate corrosion resistance which is attained in the hardened condition with a smooth surface finish.

**Related grades to 420 are:**

- 410 which has a lower carbon content and thus a lower strength and hardness when heat treated
- 440 series which have higher carbon and chrome contents and can attain higher strengths and hardness
- 416 a free machining martensitic stainless steel
- 1.4313 which is a very low carbon nickel containing stainless steel which has a much higher toughness than other 13% Cr martensitic stainless steels

The applications for 420 bar are mostly shafting for valves and pumps, fasteners and structural elements. It may be used at moderate temperatures but always below the tempering temperature, not in the range 425 to 600 °C and not below room temperature. As flat rolled product the metal may be used for springs and blades of various types. The properties of this grade are such that it is also of value for tooling in the plastics industry.

*NOTE: Further fabrication, heat treatment and property data available on request.*

COMPOSITION (%) * = Maximum					
	Cr	Mn*	Si*	C	Fe
420	12.0 -14.0	1.0	1.0	0.15 min	Bal
1.4021	12.0 – 14.0	1.50	1.0	0.16 – 0.25	Bal

APPLICABLE SPECIFICATIONS (ASTM / EN)	
PLATE, SHEET & STRIP	
PIPE	
BAR	A276 EN 10088-3
CASTINGS	
FORGINGS	
FITTINGS	
WELDING CONSUMABLES	

MECHANICAL PROPERTIES 1.4021 QT800 #	
TENSILE STRENGTH (MPa) ( min)	800
0.2% PROOF STRENGTH (MPa) (min)	600
ELONGATION (% in 50mm) (min)	12
HARDNESS (Brinell) (max)	

TYPICAL PHYSICAL PROPERTIES #	
DENSITY (kg / cu m.)	7700
YOUNGS MODULUS (GPa)	220
THERMAL CONDUCTIVITY (W/m.°C)	30
THERMAL EXPANSION (per °C)	0.0000105

# - At room temperature

**PLEASE CALL FOR DETAILS OF STOCK, DELIVERY AND PRICE**

**FABRICATION**

Alloy 420 is air hardening and thus certain manufacturing operations need to be approached with caution. Hot working of 420 can be carried out in the range 1200-950 °C followed by furnace cooling from 850 °C. Annealing requires heating to 850 - 900 °C also followed by furnace cooling. Heating and cooling rates are important.

Details of hardening operations and the properties attainable are available separately.

420 has poor weldability and if required, welding must be carried out accordance with a welding procedure that aims to prevent cracking.

The machinability of Alloy 420 is directly related to its hardness. In the as supplied condition, QT800, the hardness is 250-300 Brinell.

**Detailed technical data available upon request**

*Note: Data shown are typical and full research should be done to determine the usefulness in any application or design.*

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