STAR RAPID

440C Martensitic Stainless Steel

440C is a high carbon straight chromium high hardenability martensitic stainless steel. Characterised by good corrosion resistance in mild domestic and industrial environments, including fresh water, organic materials, mild acids, various petroleum products, coupled with extreme high strength, hardness and wear resistance when in the hardened and tempered condition. 440C due to its excellent hardenability is capable of being through hardened up to Rc60 depending upon carbon content and section size. Small sections can be air cooled and quite large sections oil quenched for maximum through hardness. Used for parts requiring a combination of excellent wear resistance, plus reasonable corrosion resistance.

Typical Application

Ball Bearings and Races, Bushings, Cutlery, Chisels, Knife Blades, Pump Parts, Surgical Instruments, Valve Seats etc.

Related Specifications

International	ISO	X105CrMo17
China	GB	S44096
Germany	DIN	X105CrMo17
	DIN EN#	1.4125
USA	AISI	440C
	UNS	S44004
EU	EN	X105CrMo17
Japan	JIS	SUS440C

* Note that materials compared are the nearest available grade and might have slight variation in actual chemistry

Stocked Materials Supplied in Condition	Typical Hardness
Annealed	269 HB (max)

Typical Mechanical Properties at Room Temperature - Annealed

Condition	Annealed
Ultimate Tensile Strength (MPa)	**785**
Yield Strength (MPa)	**420**
Elongation (%)	**15**
Hardness (HB)	**240**

Elevated Temperature Properties

440C is not generally recommended for elevated temperature applications due to a reduction in corrosion resistance when tempered above 400 °C

Corrosion Resistance

440C has a corrosion resistance somewhat similar to 410 grade, but lower than 431 grade, also lower than most of the 400 series ferritic stainless steels and all of the 300 series austenitic stainless steels. Note: It has optimum corrosion resistance in the hardened and tempered condition when tempered below 400 °C. Hardening from 1090 °C will ensure better carbide solution, and therefore better corrosion resistance, but minimum soaking time should be allowed at this temperature otherwise excessive grain growth can occur. Polishing will further develop its corrosion resistance. It is not recommended for use in the annealed condition.

Welding

Welding 440C in the annealed as supplied condition is not recommended due to its high air hardening capability which can lead to the formation of brittle martensite, resulting in cold cracking due to contraction stresses within the weld and heat affected zone.

Chemical Composition

SS-440C		Cr		C		Mn		Si		Mo		P		S	
		min	*max*	*min*	*max*	*min*	*max*	*min*	*max*	*min*	*max*	*min*	*max*	*min*	*max*
STAR Standard	**440C**	16%	18%	0.95%	1.2%	-	1%	-	1%	-	0.75%	-	0.04%	-	0.03%