52100 Alloy Steel - AMS 6444

Typical Applications

Bearings

Fasteners

52100 alloy steel is a type of bearing steel prized for its exceptional hardness and wear resistance. 52100 is a carefully crafted high carbon, chromium alloy steel that has been engineered to deliver exceptional durability and robust strength.

When properly heat treated, 52100 steel can achieve incredibly high hardness values, up to 66 Rockwell C. This hardness allows components made from 52100 to better withstand intense mechanical stresses, abrasive wear, and surface fatigue over extended periods of use. It has excellent corrosion resistance due to the high chromium content.

While its hardness makes 52100 incredibly tough and long lasting, it also means the steel is quite brittle compared to other steel grades. While incredibly hard and resilient, the alloy does sacrifice some malleability and resistance to impact forces. Care must be taken during machining and fabrication to avoid introducing microscopic cracks and defects that could lead to catastrophic failures down the line.

For this reason, 52100 is an alloy utilised primarily for parts and components that experience punishing conditions but require little deformation during operation. You'll find it used in a variety of harsh industrial settings like bearings, bushings, cams, shafts, and other high-load, high-wear applications where tremendous hardness and resilience is paramount.

When sourced from a trusted supplier and properly processed through controlled heat treatment, 52100 delivers unparalleled longevity making it the premier steel for ultra-demanding use cases.

Related Products

15Cdv6 Bar Sheet Tube

300M

4130 Bar And Tube

4130 Sheet And Plate

4340

52100

5S99

EN24

Hy Tuf

S156

T45

M50 Steel Bar

4330 Alloy Steel

BS S106

Technical specification

Related Specifications

AMS 6440

AMS 6444

SA5589

AIR 9160C

Specific Gravity

7.81 g/cm3

Chemical Composition (WT %)

	Min	Max
C	0.93	1.05
Mn	0.25	0.45
Si	0.15	0.35
P	-	0.015
S	-	0.015
Si	0.15	0.35
Cr	1.35	1.60
Ni	-	0.25
Mo	-	0.1
Cu	-	0.3

Al	-	0.05
O	-	0.015

Typical Mechanical Properties

		Round Bar
0.2% Yield Strength	MPA	427
Tensile Strength	MPA	651
Elongation	%	27
Reduction of area	%	62.5
Hardness	HBW	179

What is 52100 Steel? +

52100 is an incredibly robust alloy steel that makers turn to when only the highest levels of hardness and durability will do. It's a finely tuned chromium and carbon blend that, through meticulous heat treatment, can achieve astonishing hardness ratings up to 66 Rockwell C. This unique metallurgical makeup allows components forged from 52100 to simply shrug off the kind of punishing conditions that would quickly deteriorate lesser steels.

While its incredible hardness does limit some flexibility, 52100 excels in harsh, unforgiving industrial environments where maximum wear and fatigue resistance take precedence. You'll find this premium alloy steel hard at work in bearings,

bushings, shafts, and any other application where longevity and resilience under high stress is an absolute must. When your demands are extreme, 52100 delivers in a way that few other materials can match.

What material is AMS 6440? +

AMS 6440 is the aerospace material specification for a premium grade of stainless steel. What sets AMS 6440 apart is its impressive ability to combine corrosion resistance with immense strength and durability - a combination perfectly suited for components that absolutely cannot fail, even under the most extreme conditions.

Developed specifically for aircraft and spacecraft applications, AMS 6440 can easily withstand intense mechanical stresses, temperature extremes, and harsh operating conditions. The stellar durability of AMS 6440 means components can be lighter and thinner than what other steel alloys allow, without sacrificing strength.

You'll find this ultra-tough stainless steel in some of the most critical areas of aircraft and spacecraft - whether turbine engines and landing gear or structural members and fasteners. Across both commercial and military aviation, when uncompromising performance is demanded, AMS 6440 delivers. When safety and reliability are non-negotiable, manufacturers turn to the proven performance of AMS 6440.

What are the typical uses for 52100 Alloy Steel? +

52100 alloy steel excels for severe-duty bearings, bushings, and wear components subjected to intense temperatures, loading, and hostile environments. Its exceptional hardness and wear resistance make it ideal for aircraft engines, machine tooling, offshore equipment, and any application demanding ultra-hard, durable components.

Need more information? ***Get in touch***

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