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Lets dive deep into the properties and specifications of 4130 steel so you know what youre up against! Understanding this is a great way to know if theyre really what youre looking for.4130 Steel PropertiesMechanical Strength First things firsthow strong is it really? 4130 steel is a low-alloy steel known for its excellent strength-to-weight ratio.It exhibits high tensile strength, making it capable of withstanding heavy loads while remaining lightweight.Additionally, it offers good toughness and fatigue resistance, ensuring durability even in demanding environments.Heat Resistance If theres one thing these steels and alloys are good at, its resisting heat. 4130 steel performs well at elevated temperatures, maintaining its structural integrity and mechanical properties.Its heat resistance makes it a reliable choice for applications where exposure to high temperatures is inevitable, such as in aircraft engines or industrial machinery.Weldability and MachinabilityOne of the key features of 4130 steel is its exceptional weldability, enabling seamless joining without sacrificing strength. Welders can enjoy anything from arc welding, GMAW, GTAW, soldering, and many more!Its good machinability allows precise cutting, shaping, and drilling, making it a favorite for custom and intricate designs.Corrosion and Wear ResistanceDont confuse yourself. 4130 is not naturally excellent in resisting chemicals. Yes, theyre corrosion and chemically-resistant, but only to some extent. There are known treatments such as galvanization or chromium plating help enhance its protective properties.NOTE: It exhibits moderate wear resistance, especially after proper heat treatment, making it suitable for components exposed to friction or abrasion.Impact ResistanceAnd last but definitely not least is its impact resistance. Even at lower temperatures, 4130 steel retains impressive impact resistance, minimizing the risk of sudden failure.This property makes it valuable for environments where unpredictable forces, impacts, or shocks are common and usual.Applications of 4130 Steel SAE/AISI 4130 alloy steel is renowned for its exceptional strength-to-weight ratio, toughness, and fatigue resistance. Enriched with chromium and molybdenum, this low-alloy steel delivers outstanding mechanical properties and versatility, making it a preferred choice for diverse engineering and industrial applications worldwide.Looking to buy steel? Check pricing and availability through our trusted partner:Chemical CompositionElementMinMaxIron97.0%98.2%Carbon0.28%0.33%Chromium0.80%1.10%Manganese0.40%0.60%Molybdenum0.15%0.25%Phosphorous0.035%Silicon0.15%0.35%Sulfur0.04%The following table provides a list of SAE/AISI 4130 properties in both SI and US customary/Imperial units. Click on the button to switch between Metric and Imperial units.Table of SAE/AISI 4130 PropertiesPhysical PropertiesDensity7850 kg/m3Mechanical PropertiesMetricTensile Strength (Ultimate)670 MPaTensile Strength (Yield)435 MPaYoungs Modulus (E)190 - 210 GPaBulk Modulus (K)140 GPaShear Modulus (G)80 GPaElongation at Break25.5%Reduction of Area60%Poissons Ratio ()0.27 - 0.30Brinell Hardness197Thermal PropertiesMetricThermal Conductivity42.7 W/mKSpecific Heat Capacity (Cp)470 J/kgKCoefficient of Thermal Expansion (L)1.310-5 1/CElectrical PropertiesMetricElectrical Conductivity4.18106 S/mElectrical Resistivity2.410-7 m The values in this table are approximate and can vary depending on various factors such as the specific manufacturing process and heat treatment applied to the alloy.AISI 4130 steel finds applications in a wide range of industries due to its desirable properties, including:Aerospace: Widely used for manufacturing aircraft components such as landing gear, structural tubing, brackets, and fittings.Automotive: Employed in fabricating components including chassis and roll cages.Oil and Gas: Commonly applied in drill collars, drilling tools, and downhole equipment.Bicycle Frames: Favored for constructing frames due to its excellent strength and lightweight nature.Structural Applications: Used in construction equipment, machinery frames, and supports owing to its high strength and formability.Racing and Motorsports: Preferred for its strength, durability, and weldability in racing industries.Tooling and Equipment: Utilized in tooling applications such as jigs, fixtures, and molds.Steel provides the essential strength behind cities, trains, cars, and airplanes, making it one of the most essential materials in modern infrastructure and transportation. This alloy of iron and carbon offers exceptional durability and versatility, making it a cornerstone of the global metals markets. 4130 steel is commonly used for various projects among the many steel alloys. This article explores the properties of 4130 steel, examining its composition, mechanical strengths, and applications to help readers determine whether it meets the demands of their jobs. We will first explore the physical properties of 4130 steel, followed by its mechanical properties and applications, highlighting the areas where this alloy of steel excels. The American Iron & Steel Institute (AISI) and the Society of Automotive Engineers (SAE) use a four-digit classification system to organize and identify steel alloys based on their composition and intended use. The 4130 steel designation comes from this system. 4130 steel belongs to the 4xxx series, specifically the 41xx chromium-molybdenum steel subgroup. According to the SAE-AISI four-digit classification system: The first digit (4) indicates the class of the alloy steel, identifying the molybdenum alloy steel class. The second digit (1) specifies the approximate concentration of alloying elements, which are 1% chromium and molybdenum by mass. The last two digits (30) represent the carbon concentration in the alloy, which is 0.30% In addition to iron, the precise chemical composition of 4130 steel, with tolerances include: 0.28 0.33% Carbon 0.8 1.1% Chromium 0.6 0.9% Manganese 0.15 0.25% Molybdenum 0.035% Phosphorus 0.15 0.35% Silicon 0.04% Sulphur The chemical breakdown of 4130 steel. 4130 steel is a low-carbon, chromium-molybdenum alloy of steel known for strength, toughness, and versatility. It has a density of 7.85 g/cm3 (0.284 lb/in3). 4130 steel responds well to heat treatment, which can significantly enhance its hardness and strength. 4130 steel is highly workable and weldable, accommodating all standard commercial welding methods. It is readily machinable in its normalized or tempered condition, enabling precise shaping finishing. Additionally, it can be cold-worked, hot-worked, and easily forged, though it cannot be aged to enhance its properties. When annealed, it exhibits excellent ductility, allowing for easier forming without cracking. 4130 steel is widely used in structural applications, commonly found in round tube or bar stock forms. Its high strength-to-weight ratio and through-hardening capabilities make it particularly suitable for critical load-bearing components in aerospace, construction, and motorsports industries. Table 1 below summarizes some of the key mechanical properties of 4130 steel. 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This high hardness indicates excellent toughness and stiffness, making 4130 steel suitable for compression applications requiring rigidity. Elongation at break measures a materials ability to undergo plastic deformation before fracture, expressed as the percentage change relative to the original length. 4130 steels elongation at break is 25.5%, demonstrating its exceptional ductility and workability. This high elongation allows 4130 steel to be bent or shaped without fracturing, a critical feature for manufacturing and forming processes. Type 4130 steel is an exceptionally tough and versatile alloy used in manufacturing, welding, cutting, and other high-stress industrial applications. Its ability to undergo heat treatment enhances its toughness, while its excellent workability and machinability make it ideal for various purposes. Although primarily utilized as structural steel, it also has several other notable applications, including: Manufacturing equipment such as bearings, vehicle parts, and gears. Rock-crushing machinery, where strength and durability are essential. Resistance welding products that benefit from the alloys toughness under heat. Drill bits and taps that take advantage of its strength and hardness. Mills and cutters where precision and durability are critical. 4130 steel is a popular and readily available material, making it a reliable choice for numerous projects. If you think 4130 steel might suit your design needs, contact your supplier and ask if they have it in stock. Most suppliers will have it in stock, and if not, can guide you to suitable alternatives. Thomas, a Supplier Discovery Platform, has over 75 suppliers in 4130 Steel. To learn more, view our 4130 Steel Suppliers for your needs. This article provided a concise overview of the properties, strengths, and applications of 4130 steel. For information on other products, consult our additional guides or visit the Thomas Supplier Discovery Platform to locate potential sources of supply or view details on specific products. The heat treatments for 4130 steel include normalizing, annealing, hardening, tempering, and stress relief.4.1 NormalizingThe purpose of normalizing is to refine the grain size and obtain a complete solution of the original structure with the formation of austenite.We suggest that the normalizing temperature be 870-925C (1600-1700F), with a soaking time of at least 1 hour or 15 to 20 minutes per 25 mm (1 inch) of maximum section thickness, followed by air cooling.4.2 AnnealingAnnealing is used to soften AISI 4130, thereby increasing its workability and machinability.The annealing temperature range is 830 to 870C (1525 to 1600F), with the holding time varying depending on the section thickness or furnace load. It is then cooled at a rate of 15 C/h (30 F/h) to 480 C (900 F) and finally air-cooled.4.3 Hardening (Quenching)Hardening aims to transform the 4130 steels microstructure into martensite or bainite, providing high hardness and toughness.The quenching medium is water or oil. The hardening temperature is 860 to 885 C (1575 to 1625 F) for oil quenching or 845 to 870 C (1550 to 1600 F) for water quenching.Because 4130 material has low hardenability, its section thickness must be carefully considered when aiming for high hardness or strength. When compared to 4140 steel, which has higher carbon content and thus greater hardenability, 4130 material are less prone to cracking and distortion during quenching.4.4 TemperingTempering is performed after hardening to reduce internal stresses, increase ductility and toughness, and adjust hardness to the desired level.The tempering temperature range for 4130 steel is broad, from 200 to 700 C (400 to 1300 F). The specific temperature chosen will depend on the desired final properties. Tempering should occur as soon as the 4130 parts reach 52 to 65 C (125 to 150 F) after quenching.Tempering significantly influences the room-temperature mechanical properties of AISI 4130, including tensile strength, yield strength, and Izod impact energy.4.5 Stress RelievingStress relief heat treatment is used to eliminate stresses generated in 4130 material during processing, such as straightening, forming, or machining.We recommend a temperature range of 650 to 675C (1200 to 1250F). For hardened 4130 material, the stress relief temperature should not exceed the tempering temperatures previously applied. AISI 4130 steel (UNS G41300), also known as 4130 Chromoly steel, is a chrome-molybdenum series low alloy steel with high strength, toughness and hardenability, usually used in quenched and tempered condition.UsesAISI SAE 4130 alloy steel can be made into steel plate, steel sheet, round and flat steel bar, steel pipe and tube, etc. and has many uses in pressure vessels, pumps and valves, pinions, shaft gears, ball studs, screws, general purpose profile steel, automotive parts, oil and gas industry, aerospace, and bike frame, etc.Datasheet & SpecificationBelow is material AISI 4130 Chromoly steel datasheet including chemical composition, density, thermal expansion coefficient, thermal conductivity, yield strength, hardness, etc.AISI SAE 4130 Chemical CompositionThe table below lists AISI 4130 chemical composition.AISI 4130 Chemical Composition (%)Steel Grade (UNS)CSiMnP ()S ()CrMo4130 (G41300)0.28-0.330.15-0.350.40-0.600.0350.0400.80-1.100.15-0.25AISI 4130 Material PropertiesMaterial AISI 4130 steel mechanical properties are given in the table below.Steel (UNS)Tensile strength (Mpa)Yield strength (Mpa)Elongation in 50 mm, %Reduction in area, %Hardness (HB)Sample diameterConditionsAISI 4130 (G41300)67043525.559.519725mm (1 inch)Normalized at 870 C (1600 F)56046021.559.5217Annealed at 865 C (1585 F)104097918.163.9302Water quenched from 855 C (1575 F) & tempered at 540 C (1000 F)AISI SAE 4130 Physical PropertiesNotes: 10-6/K = 10-6.K-1 = (m/m)/CAISI SAE 4130 coefficients of linear thermal expansionValue (10-6/K)Temperature (C)12.220-10013.720-40014.620-600Material 4130 chromoly thermal conductivityValue (W/mK)Temperature (C)Treatment or condition42.7100Hardened andtempered40.630037.350031.0700Specific Heat of AISI 4130 Alloy SteelValue (J/KgK)Temperature (C)Treatment or condition47750-100Hardened andtempered515150-200544250-300595350-400657450-500737550-600825650-700833750-800Electrical Resistivity of AISI SAE 4130 Alloy SteelValue (m)Temperature (C)Treatment or condition0.2220Hardened andtempered0.271000.342000.534000.796001.107001.179001.221000SAE 4130 Steel Heat TreatmentThe following table shows alloy 4130 chromoly steel heat treatment and rockwell hardness.Chromoly 4130 Steel Heat Treatment4130 Heat TreatTemperature ()HardnessCooling/AgentNormalizing885197 HBAirAnnealing865156 HBFurnace coolingQuenching800-855WaterTempering (2 hour)20447 HRCWater hardening26045 HRC31543 HRC37042 HRC42538 HRC48034 HRC54032 HRC59526 HRC64922 HRCNormalizing4130 alloy steel is typically normalized at 900 C (1650), and should be cooled at a specified temperature in still air.Spheroidizing AnnealingFor spheroidizing annealing of 4130 alloy steel, it needs heat treated to 749 C (1380 F), followed by slowly cooling to 666 C (1230 F) at a rate of 6 C (10 F)/hour, or rapid cooling to 675 C for 8 hours isothermal annealing.Full AnnealingHeat treatment to 855 C (1570 F), slow cooling from 760 C (1400 F) at a rate of 18 C (35 F)/hour to 666 C (1230 F), or rapid cooling to 674 C (1245 F) for 4 hours isothermal annealing.TemperingTempering temperature of 4130 alloy steel can be from 204-649 C (400-1200F) after normalizing and water quenching, and the corresponding Rockwell hardness can be obtained.ForgingMaterial 4130 alloy steel forging temperature is about 1204 C (2200 F)Welding 4130 SteelAll common arc welding processes, such as (SAW, SMAW, FCAW, GMAW, GTAW) can be used to weld 4130 alloy steel, but in order to prevent cracking, it must be preheated to 150-290 C before welding, preheating interpass temperature depends on the section thickness of the steel.Equivalent GradeAISI 4130 equivalent to European EN (Germany DIN EN, British BSI, French NF), Chinese GB and Japanese JIS standard.AISI 4130 equivalentUSAEuropean UnionChinaJapanISOStandardGrade (UNS)StandardGradeStandardGrade (Steel Number)StandardGradeStandardGradeStandardGradeAISI;SAE;ASTM A29/A29M4130 (G41300)AMSAMS 6350; AMS 6345EN 10083-325CrMo4(1.7218)GB/T 307730CrMoJISG 4105SCM430Steel provides the essential strength behind cities, trains, cars, and airplanes, making it one of the most essential materials in modern infrastructure and transportation. 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Although primarily utilized as structural steel, it also has several other notable applications, including: Manufacturing equipment such as bearings, vehicle parts, and gears. Rock-crushing machinery, where strength and durability are essential. Resistance welding products that benefit from the alloys toughness under heat. Drill bits and taps that take advantage of its strength and hardness. Mills and cutters where precision and durability are critical. 4130 steel is a popular and readily available material, making it a reliable choice for numerous projects. If you think 4130 steel might suit your design needs, contact your supplier and ask if they have it in stock. Most suppliers will have it in stock, and if not, can guide you to suitable alternatives. Thomas, a Supplier Discovery Platform, has over 75 suppliers in 4130 Steel. To learn more, view our 4130 Steel Suppliers for your needs. This article provided a concise overview of the properties, strengths, and applications of 4130 steel. For information on other products, consult our additional guides or visit the Thomas Supplier Discovery Platform to locate potential sources of supply or view details on specific products. 4130 Alloy Steel: What You Need to Know About This Versatile Alloy If you are looking for a steel that combines strength, toughness, and weldability, you might want to consider 4130 alloy steel. This alloy is widely used for various applications, such as gears, fasteners, structural components, aircraft parts, and more. In this post, we will explain what 4130 steel is, what its properties are, how it is heat treated, and what its common uses are. We will also answer some frequently asked questions about this alloy.What is 4130 Alloy Steel?4130 steel is a low-carbon alloy steel that contains chromium and molybdenum as its main alloying elements. It has a density of 7.85 g/cm3 (0.284 lb/in3) and benefits from heat-treatment hardening. It is also known as AISI 4130 or SAE 4130, which are standards set by the American Iron and Steel Institute (AISI) and the Society of Automotive Engineers (SAE) to classify steels based on their chemical composition and mechanical properties.The name 4130 comes from the following rules:The first digit (4) indicates that it is a molybdenum steel.The second digit (1) indicates that it has a low carbon content (around 0.3%).The last two digits (30) indicate the approximate percentage of chromium (around 1%)The exact chemical composition of 4130 alloy steel is as follows:Carbon: 0.28 0.33Chromium: 0.8 1.1%Manganese: 0.40 0.60%Molybdenum: 0.15 0.25%Phosphorus: 0.035%Silicon: 0.15 0.35%Sulphur: 0.04%What are the Properties of 4130 Steel?4130 steel has excellent mechanical properties that make it suitable for many applications. Some of these properties are:Strength: 4130 steel has a high tensile strength of about 670 MPa (97,200 psi) and a yield strength of about 435 MPa (63,100 psi). This means that it can withstand high stresses and strains without breaking or deforming.Toughness: 4130 steel has a high impact toughness of about 80 J/cm2 (45 ft-lb/in2). This means that it can absorb a lot of energy before fracturing or cracking.Hardness: 4130 steel has a moderate hardness of about Rockwell B92 or Rockwell C22. This means that it can resist wear and abrasion well.Weldability: 4130 steel is an exceptional welding steel, being weldable in all commercial methods. It can be joined by arc welding, gas welding, resistance welding, brazing, or soldering.Machinability: 4130 steel is readily machined in its normalized or tempered condition. It can be cut, drilled, turned, milled, or shaped easily with conventional tools and machines.Formability: 4130 steel is easily cold worked, hot worked, and forged. It can be bent, stretched, hammered, or pressed into various shapes and forms.How is 4130 Steel Heat Treated?4130 steel is a heat-treatable alloy, which means that its properties can be improved by applying different heating and cooling cycles. The most common heat treatments for 4130 alloy steel are:Annealing: This process involves heating the steel to a temperature of about 830C (1525F) and holding it there for a period of time, then cooling it slowly in the furnace. This softens the steel and improves its ductility and machinability.Normalizing: This process involves heating the steel to a temperature of about 900C (1650F) and holding it there for a period of time, then cooling it in air. This refines the grain structure and improves the strength and toughness of the steel.Hardening: This process involves heating the steel to a temperature of about 870C (1600F) and holding it there for a period of time, then quenching it in oil or water. This increases the hardness and wear resistance of the steel.Tempering: This process involves reheating the hardened steel to a lower temperature of about 200C to 650C (400F to 1200F) and holding it there for a period of time, then cooling it in air. This reduces the brittleness and improves the impact toughness of the steel.The exact temperature and time for each heat treatment depend on the desired properties and specifications of the final product.What are the Common Uses of 4130 Alloy Steel?4130 steel is widely used for various applications that require high strength, toughness, and weldability. Some of these applications are:Gears: you can use 4130 steel to make gears for automotive, aerospace, industrial, and military applications . It can withstand high torque and speed without wearing out or breaking.Fasteners: you can make bolts, nuts, screws, studs, pins, rivets, and other fasteners for various industries . It can resist corrosion and fatigue well.Structural components: you could make frames, brackets, supports, beams, columns, trusses, and other structural components for buildings, bridges, cranes, towers, and other structures . It can bear high loads and stresses without buckling or bending.Aircraft parts: 4130 steel is used to make landing gear, fuselage, wings, tail, engine mounts, and other parts for aircrafts. It can withstand high temperatures and pressures without cracking or deforming.Sports equipment: you can also use 4130 steel to make bicycle frames, golf club shafts, skateboards, roller skates, and other sports equipment. It can provide light weight and durability without compromising performance.ConclusionIn conclusion, 4130 alloy steel is a low-carbon alloy steel that contains chromium and molybdenum as its main alloying elements. It has excellent mechanical properties that make it suitable for many applications that require high strength, toughness, and weldability. It can be heat treated to improve its properties further and can be easily machined and formed into various shapes and forms.If you are interested in buying or using 4130 steel for your project, please contact us today. We are a professional and reliable steel supplier that can provide you with high-quality and affordable steel products and services. FAQsHere are some frequently asked questions about 4130 steel:Q: What is the difference between 4130 alloy steel and 4140 steel?A: Both are chromium-molybdenum alloy steels, but they have different carbon contents. 4140 steel has a higher carbon content than 4130 steel, which makes it harder and stronger, but also more brittle and less weldable.Q: How do you weld 4130 steel?A: You can weld 4130 steel using any commercial welding method, such as arc welding, gas welding, resistance welding, brazing, or soldering. However, you need to preheat and postheat the welded area to avoid cracking or embrittlement.Q: How do you harden 4130 steel?A: You can harden 4130 steel by heating it to a temperature of about 870C (1600F) and holding it there for a period of time, then quenching it in oil or water. This increases the hardness and wear resistance of the steel.Q: How do you temper 4130 steel?A: You can temper hardened 4130 steel by reheating it to a lower temperature of about 200C to 650C (400F to 1200F) and holding it there for a period of time, then cooling it in air. This reduces the brittleness and improves the impact toughness of the steel.Q: Where can I buy 4130 steel?A: You can buy 4130 steel from us at Otai Special steel. We are a leading supplier of high-quality and affordable steel products for various industries. We can provide you with customized sizes and shapes of steel plates, bars, tubes, pipes, sheets, or customized sizes per drawings. : +8613610149979: Jeremy@otaisteel.com Steel provides the essential strength behind cities, trains, cars, and airplanes, making it one of the most essential materials in modern infrastructure and transportation. This alloy of iron and carbon offers exceptional durability and versatility, making it a cornerstone of the global metals markets. 4130 steel is commonly used for various projects among the many steel alloys. This article explores the properties of 4130 steel, examining its composition, mechanical strengths, and applications to help readers determine whether it meets the demands of their jobs. We will first explore the physical properties of 4130 steel, followed by its mechanical properties and applications, highlighting the areas where this alloy of steel excels. 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Yield strength is crucial for structural applications, which must not be exceeded to maintain integrity. 4130 steels yield strength is 435 MPa (63,100 psi), which is lower than other steels but still far exceeds the strength of most aluminum alloys. This balance of strength and ductility makes 4130 steel a versatile material. The elastic modulus measures a materials ability to resist elastic deformation and return to its original shape after removing stress. It is a critical parameter for understanding stiffness and is commonly used to compare engineering metals. 4130 steel has an elastic modulus of 205 GPa (29,700 ksi), higher than high-strength spring steels like 9260 steel. This high modulus indicates that 4130 steel does not bend easily and can endure significant stresses while maintaining its original form. These qualities make it an excellent choice for structural applications, where rigidity and resistance to deformation are essential. Hardness describes a materials resistance to local surface deformation. While there are various hardness testing methods, the Rockwell hardness test is commonly used for metals, and results are assigned to scales such as A, B, and C. 4130 steel has a Rockwell B hardness of 92, significantly higher than that of softer metals like copper (Rockwell B hardness of 51). This high hardness indicates excellent toughness and stiffness, making 4130 steel suitable for compression applications requiring rigidity. Elongation at break measures a materials ability to undergo plastic deformation before fracture, expressed as the percentage change relative to the original length. 4130 steels elongation at break is 25.5%, demonstrating its exceptional ductility and workability. This high elongation allows 4130 steel to be bent or shaped without fracturing, a critical feature for manufacturing and forming processes. Type 4130 steel is an exceptionally tough and versatile alloy used in manufacturing, welding, cutting, and other high-stress industrial applications. Its ability to undergo heat treatment enhances its toughness, while its excellent workability and machinability make it ideal for various purposes. Although primarily utilized as structural steel, it also has several other notable applications, including: Manufacturing equipment such as bearings, vehicle parts, and gears. Rock-crushing machinery, where strength and durability are essential. Resistance welding products that benefit from the alloys toughness under heat. Drill bits and taps that take advantage of its strength and hardness. Mills and cutters where precision and durability are critical. 4130 steel is a popular and readily available material, making it a reliable choice for numerous projects. If you think 4130 steel might suit your design needs, contact your supplier and ask if they have it in stock. Most suppliers will have it in stock, and if not, can guide you to suitable alternatives. Thomas, a Supplier Discovery Platform, has over 75 suppliers in 4130 Steel. To learn more, view our 4130 Steel Suppliers for your needs. This article provided a concise overview of the properties, strengths, and applications of 4130 steel. For information on other products, consult our additional guides or visit the Thomas Supplier Discovery Platform to locate potential sources of supply or view details on specific products. Did you know that 4130 alloy steel plays a crucial role in everything from jet engines to heavy-duty construction equipment? This steel is highly versatile. It can be heat-treated to achieve specific hardness and toughness levels, making it perfect for demanding components like gears, crankshafts, and drill collars.At SteelPro Group, we provide certified 4130 steel that meets the toughest industrial standards. But before we dive into how to source it, lets first take a look at why this alloy is so widely used.4130 steel, also known as Chromoly, is a low-alloy steel made with chromium and molybdenum. It typically contains 0.8% to 1.1% chromium and 0.15% to 0.25% molybdenum, which strengthen the material. This steel is known for its combination of strength, toughness, and fatigue resistance. Classified as low-carbon steel, it is easy to weld and machine especially in its annealed or normalized state. However, once hardened, it becomes more difficult to work with.What is 4130 Max Operating TemperatureIt can operate at temperatures up to 315C (600F), further enhancing its versatility.Automotive Industry: Connecting rods, steering arms, steering joints, half shafts, bolts, studs, screws, gears, structural components. Aerospace Industry: Aircraft exterior components, structural parts, landing gear components, fasteners, shafts. Oil & Gas Industry: Drill rods, downhole tools, wellhead equipment, pumps, valves, pressure vessels, flanged pipe fittings, self-locking nuts. Manufacturing & Machinery: Hydraulic cylinders, shafts, tool holders, machine frames, gears, bearings, spindles, and structural components. Construction & Infrastructure: Structural beams, bridges, rail components, heavy machinery, crane components, bolts, nuts, fasteners.The following table outlines the equivalent grades and standards for 4130 steel across different global systems. At SteelPro Group, we provide high-quality 4130 steel that complies with these recognized standards.Country/RegionStandardGradeChinaYB25CrMoISCA30252JapanJISSCM430USAASTM4130GermanyDIN EN/DIN25CrMo4W-Nr.1.7218L-Nr.1.7214ElementsContentCarbon (C)0.28~0.33Silicon (Si)0.15~0.35Manganese (Mn)0.4~0.6Phosphorus (P)0.035Sulfur (S)0.04Chromium (Cr)0.8~1.1Nickel (Ni)0.25Copper (Cu)0.35Molybdenum (Mo)0.15~0.25Mechanical PropertiesValue (Metric)Value (English)Hardness (Brinell)255 HB255 HBTensile Strength930 MPa135 ksiYield Strength725 MPa105 ksiElongation16%16%Reduction of Area55%55%Modulus of Elasticity205 GPa29,700 ksiBulk Modulus160 GPa23,200 ksiShear Modulus80.0 GPa11,600 ksiPoissons Ratio0.290.29Machinability70%70%Physical PropertiesValue (Metric)Value (English)Density7.85 g/cm0.284 lb/inMelting Point1425C2600FCoefficient of Thermal Expansion12.6 m/m-C7.0 10 in/in-FThermal PropertiesValue (Metric)Temperature (Metric)Value (English)Temperature (English)Specific Heat Capacity0.477 J/g-C100C0.114 BTU/lb-F212F0.523 J/g-C150-200C0.125 BTU/lb-F302-392F0.837 J/g-C750-800C0.200 BTU/lb-F1380-1470FThermal Conductivity30.1 W/m-K1200C209 BTU-in/hr-ft-F2190F40.7 W/m-K300C282 BTU-in/hr-ft-F572F42.7 W/m-K100C296 BTU-in/hr-ft-F212FForging is done at temperatures between 954C and 1204C (1750F and 2200F). At this range, the steel becomes malleable and can be shaped under high pressure. Forging at lower temperatures may result in a non-uniform grain structure, requiring additional treatment. A lower finishing temperature generally results in finer grain size.This process is typically performed at 843C (1550F). The steel is held at this temperature and then cooled slowly at a rate of less than 50F per hour (28C per hour) to 900F (482C), followed by air cooling. This makes it easier to work with.4130 steel is heated to 900C (1650F) and then quenched in oil. This refines the grain structure, ensuring uniform properties throughout. The temperature may vary by about 50F (10C) depending on the desired outcome.4130 is heated to 815C to 870C (1500F to 1600F) and then quenched in oil or water, depending on section size. This hardening process improves strength and wear resistance.This is done between 398C and 565C (750F and 1050F) to adjust strength and toughness. Lower tempering temperatures increase strength but should avoid the range of 200C to 420C (400F to 790F) to prevent brittleness.Cold working involves shaping the steel at room temperature, usually after its been normalized or annealed. This strengthens the steel through strain hardening, but it can make further shaping more difficult as hardness increases.Cutting 4130 steel is done using tools like high-speed steel or carbide-tipped tools. Typical techniques include laser cutting, water jet cutting, or band sawing. Laser cutting is precise and minimizes the need for post-processing.4130 steel is easily welded using commercial methods. Preheating the steel to 150C to 260C (300F to 500F) is recommended, and low-hydrogen electrodes should be used. After welding, a post-weld stress relief heat treatment may be needed, especially for thicker sections, to reduce internal stresses. The steel should cool slowly to prevent distortion.Surface treatments, like carburizing, are used to enhance the steels wear resistance by creating a hardened outer layer. This process improves durability while keeping the core tougher. Additionally, plating, coating, or painting are applied to protect the steel from corrosion, especially in harsh environments.Product TypeSize Range (Metric)Size Range (English)Round Bars5 mm to 300 mm (Diameter)0.20 in to 12 in (Diameter)Square Bars5 mm to 150 mm (Side Length)0.20 in to 6 in (Side Length)Hexagonal Bars10 mm to 100 mm (Side Length)0.39 in to 4 in (Side Length)Flat Bars10 mm to 200 mm (Width/Thickness)0.39 in to 8 in (Width/Thickness)Plate3 mm to 100 mm (Thickness)0.12 in to 4 in (Thickness)Tube19 mm to 150 mm (OD)0.75 in to 6 in (OD)Welded Pipe10 mm to 50 mm (Wall Thickness)0.39 in to 2 in (Wall Thickness)Seamless Pipe15 mm to 200 mm (OD)0.59 in to 8 in (OD)No, 4130 steel is not stainless. It is a low-alloy steel, which means it does not have the high chromium content required for corrosion resistance like stainless steel.The main difference is the carbon content. 4130 has less carbon, making it more weldable and easier to machine. 4140 has a higher carbon content, which gives it greater strength and wear resistance, making it more suitable for heavy-duty applications.If youre looking for reliable 4130 alloy steel for your next project, SteelPro Group offers premium-grade 4130 steel that meets the highest industry standards. We offer a variety of sizes and can assist you in selecting the ideal material for your unique requirements. Reach out today for a quote or to find out more about our 4130 steel options.

What type of material is 4130. What type of metal is 4130. 4130 vs mild steel. What is 4130 steel. How hard is 4130 steel. Is 4130 a stainless steel.