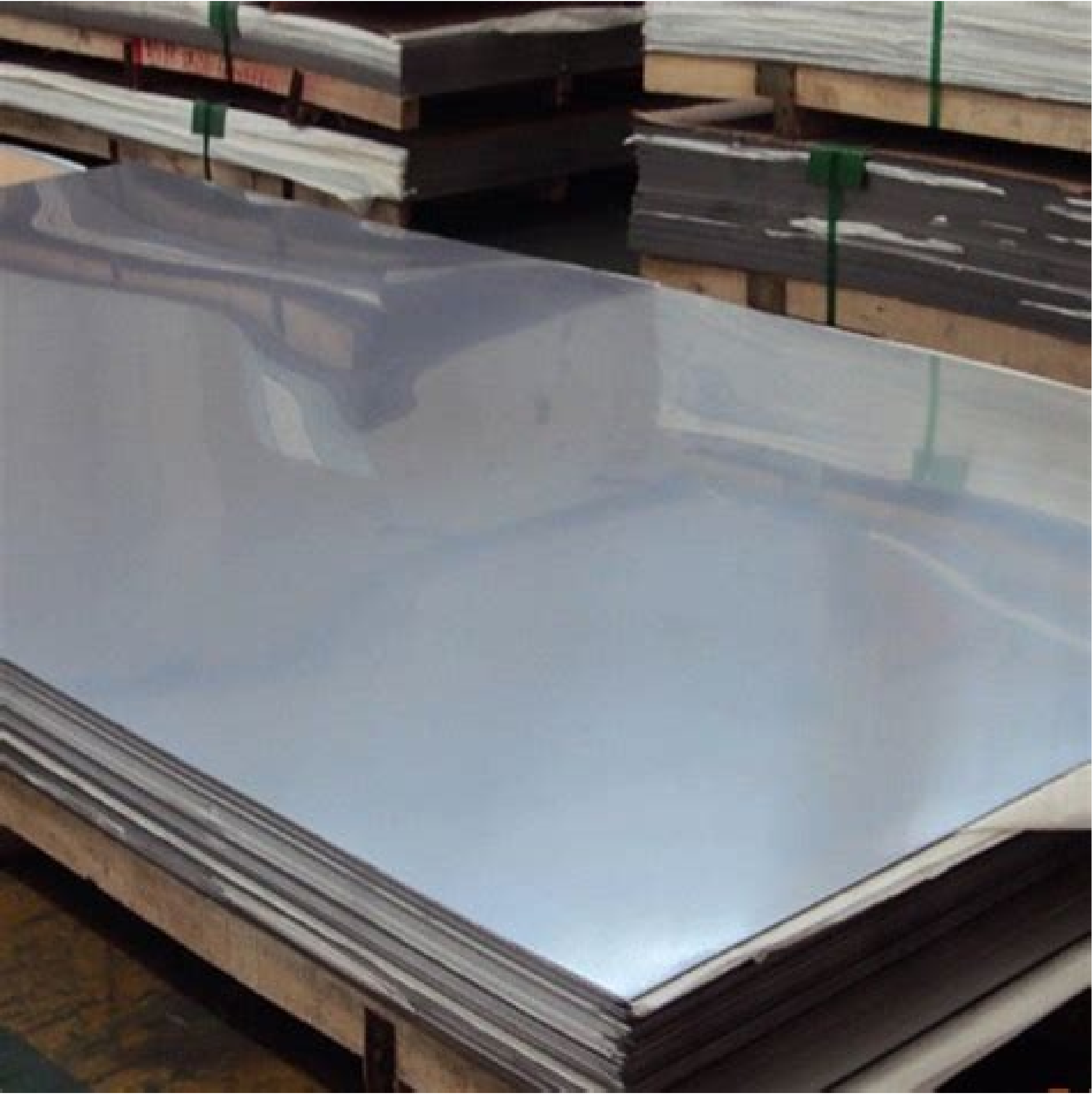
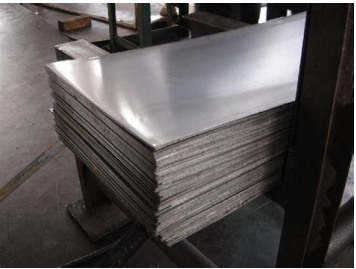


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What are the differences between 18-8, type 304, and type 316 stainless steels? To answer this question, you first need to know some basic information about stainless steel. "Stainless Steel" is the general name for a large family of alloy steels that contain at least 10.5% chromium as part of their composition. At and above this level of chromium, a complex chrome-oxide surface layer forms that prevents further oxygen atoms from penetrating into the steel and thus protects the iron in the matrix from rusting. This layer is what makes the steel "stainless." Higher levels of chromium and the addition of other alloying elements such as molybdenum and nickel enhance this protective barrier and further improve the corrosion resistance of the stainless steel. There are many different types of stainless, but by far the most popular and widely used are the 300 series stainless steels, also known as the austenitic stainless steels. The 300 series designation contains many different compositions of alloy steel (303, 304, 305, 316, 321, 347, etc.) but the common factors among them are: Their carbon content is generally held to a maximum of 0.08% They (generally) have 18% chromium They (generally) have 8% nickel They are non-magnetic They cannot be hardened by heat treatment They can be hardened by cold working the material ("work hardening.") The term "18-8" is often used to designate products made from 300 series stainless. This "18-8" call out is referring to the 18% chromium/8% nickel alloy mixture of the steel. "18-8" is not an actual specification, as it only refers to two different alloys in the steel. While all 300 series stainless steels share this 18/8 mix, slight differences in chemical composition between the different

grades of the 300 series do make other grades more resistant than others against particular types of corrosion. In the fastener industry the term "18-8" is often used as a designation for a bolt, nut, or washer manufactured from 300 series stainless steel material that has the 18% chromium/8% nickel alloy mixture. However, a fastener manufactured from stainless material that meets the 18/8 alloy mix does not necessarily meet the other slight differences in chemistry required to certify it as Type 304 stainless. Type 304 is by far the most popular of the 300 series stainless steels. The second most popular type of stainless, after Type 304, is Type 316. In Type 316 stainless, the chromium content is lowered from 18% to 16%, however, the nickel content is raised to 10% and 2% molybdenum is added to the mixture. This change in the chromium/nickel ratio and the addition of the molybdenum increases the resistance to chlorides. This is why Type 316 stainless is often used in more corrosive environments where the material will be exposed to chemical, solvent, or salt water corrosion and makes it the preferred material for marine construction. Although fasteners can (and often are) ordered as simply Type 304 or Type 316 stainless, the actual ASTM specifications that cover stainless steel fasteners are A193, A320, and F593. A discussion of the differences between these ASTM specifications can be found in another FAQ. Portland Bolt can manufacture stainless steel bolts, rods, and bent bolts from both Type 304 and Type 316. If you would like a quote on stainless product, you can submit a quote request through our website right now! Written June 30, 2010, modified October 27, 2014 Customers often ask us about the differences between hot rolled steel and cold rolled steel. There are some fundamental differences between these two types of metal. The differences between hot rolled steel and cold rolled steel relates to the way these metals are processed at the mill, and not the product specification or grade. Hot rolled steel involves rolling the steel at high temperatures, where cold rolled steel is processed further in cold reduction mills where the material is cooled followed by annealing and/or tempers rolling. Hot Rolled Steel Hot rolling is a mill process which involves rolling the steel at a high temperature (typically at a temperature over 1700° F), which is above the steel's recrystallization temperature. When steel is above the recrystallization temperature, it can be shaped and formed easily, and the steel can be made in much larger sizes. Hot rolled steel is typically cheaper than cold rolled steel due to the fact that it is often manufactured without any delays in the process, and therefore the reheating of the steel is not required (as it is with cold rolled). When the steel cools off it will shrink slightly thus giving less control on the size and shape of the finished product when compared to cold rolled. Uses: Hot rolled products like hot rolled steel bars are used in the welding and construction trades to make railroad tracks and I-beams, for example. Hot rolled steel is used in situations where precise shapes and tolerances are not required. Cold Rolled Steel Cold rolled steel is essentially hot rolled steel that has had further processing. The steel is processed further in cold reduction mills, where the material is cooled (at room temperature) followed by annealing and/or tempers rolling. This process will produce steel with closer dimensional tolerances and a wider range of surface finishes. The term Cold Rolled is mistakenly used on all products, when actually the product name refers to the rolling of flat rolled sheet and coil products. When referring to bar products, the term used is "cold finishing", which usually consists of cold drawing and/or turning, grinding and polishing. This process results in higher yield points and has four main advantages: Cold drawing increases the yield and tensile strengths, often eliminating further costly thermal treatments. Turning gets rid of surface imperfections. Grinding narrows the original size tolerance range. Polishing improves surface finish. All cold products provide a superior surface finish, and are superior in tolerance, concentricity, and straightness when compared to hot rolled. Cold finished bars are typically harder to work with than hot rolled due to the increased carbon content. However, this cannot be said about cold rolled sheet and hot rolled sheet. With these two products, the cold rolled product has low carbon content and it is typically annealed, making it softer than hot rolled sheet. Uses: Any project where tolerances, surface condition, concentricity, and straightness are the major factors. Don't have time to read the blog? You can check out our video below to find out the difference between hot rolled steel and cold rolled steel: Metal Supermarkets is the world's largest small-quantity metal supplier with over 100 brick-and-mortar stores across the US, Canada, and United Kingdom. We are metal experts and have been providing quality customer service and products since 1985. At Metal Supermarkets, we supply a wide range of metals for a variety of applications. Our stock includes: mild steel, stainless steel, aluminum, tool steel, alloy steel, brass, bronze and copper. We stock a wide range of shapes including: bars, tubes, sheets, plates and more. And we can cut metal to your exact specifications. Visit one of our 100+ locations across North America today. Tags: cold rolled steel, hot rolled steel We'll cut your order to your exact specifications. No need to buy full lengths! Gauge ASTM Nominal max min. 28 Ga mm 0.41 0.45 0.37 Cold Rolled inch 0.0160 0.0175 0.0145 26 Ga mm 0.45 0.49 0.41 Cold Rolled inch 0.0180 0.0195 0.0165 24 Ga mm 0.61 0.66 0.56 Cold Rolled inch 0.0240 0.0260 0.0220 22 Ga mm 0.74 0.79 0.69 Cold Rolled inch 0.0291 0.0311 0.0271 20 Ga mm 0.90 0.96 0.84 Cold Rolled inch 0.0355 0.0380 0.0330 18 Ga mm 1.22 1.30 1.15 Cold Rolled inch 0.0482 0.0512 0.0452 16 Ga mm 1.50 1.58 1.42 Cold Rolled inch 0.0591 0.0621 0.0561 14 Ga mm 1.90 2.00 1.80 Cold Rolled inch 0.0749 0.0789 0.0709 13 Ga mm 2.28 2.38 2.18 Cold Rolled inch 0.0899 0.0939 0.0860 12 Ga mm 2.67 2.80 2.54 Cold Rolled inch 0.1051 0.1101 0.1001 11 Ga mm 3.09 3.26 2.91 Cold Rolled inch 0.1217 0.1287 0.1147 10 Ga mm 3.45 3.62 3.27 Cold Rolled inch 0.1357 0.1427 0.1287 8 Ga mm 4.21 4.38 4.03 Cold Rolled inch 0.1657 0.1727 0.1587 7 Ga mm 4.69 4.86 4.51 Cold Rolled inch 0.1847 0.1917 0.1777 3/16" mm 4.76 5.09 4.51 Hot Rolled inch 0.1875 0.2005 0.1775 1/4" mm 6.35 6.85 6.10 Hot Rolled inch 0.2500 0.2700 0.2400 3/8" mm 9.52 10.27 9.27 Hot Rolled inch 0.3750 0.4044 0.3650 Per ASTM A480/A480M-11b For widths 50" and under To our valued customers: The data provided on our website has been vetted to the best of our availabilities. This site should not be used to determine if a specific material is right for your processes, equipment or end use. Please consult your in house engineers, plant supervisors, etc. prior to a final decision being made. Home / Stainless Steel Chequered Plate Grade 430 is a ferritic, straight chromium, non-hardenable grade, combining good corrosion resistance and formability characteristics with useful mechanical properties. Its ability to resist nitric acid attack permits its use in specific chemical applications but automotive trim and appliance components represents its largest fields of application. Grade 430F is the free-machining version of this grade, available in bar form for use in automatic screw machines. Grade 434 is the molybdenum bearing version of Grade 430 and has the same useful combination of properties. Its molybdenum addition improves corrosion resistance. These properties for 430 are specified for flat rolled product (plate, sheet and coil) in ASTM A240/A240M. Similar but not necessarily identical properties are specified for other products such as forgings and bar in their respective specifications. Properties of Grade 430F are specified for bar in ASTM A582. Applications Typical applications for 430 grade include: Linings for dish washers Refrigerator cabinet panels Automotive trim Lashing Wire Element Supports Stove trim rings Fasteners Chimney Liners Typical applications for 430F grade include: Repetition machined components Specifications: UNS: ASTM/ASTE S43000 DIN: 1.4016

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