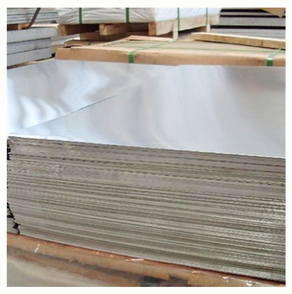
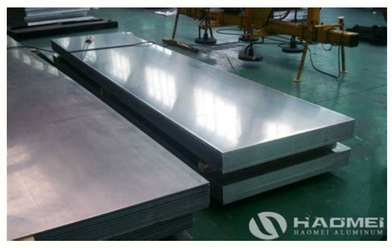
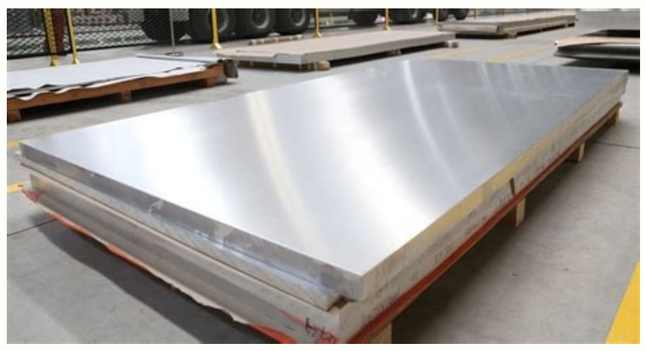
7075- t6 aluminum sheet properties







What is 7075 t6 aluminum used for. 7075-t6 aluminum sheet properties. 6061-t6 aluminum vs 7075. 7075 t6 aluminum price.

"Ergal" redirects here. For other uses, see Ergal (disambiguation). A7075 T6Physical propertiesDensity (ρ)2.81 g/cc (0.102 lb/cu in)Mechanical propertiesYoung's modulus (E)71.7 GPa (10,400 ksi)Tensile strength (σt)572 MPa (83.0 ksi)Elongation (ε) at break11%Poisson's ratio (ν)0.33Hardness—Rockwell87 HRBThermal propertiesMelting temperature (Tm)477 °C (891 °F)Thermal conductivity (k) [1]130–150 W/m*KLinear thermal expansion coefficient (α)2.36*10−5 K−1Specific heat capacity (c)714.8 J/kg*KElectrical propertiesVolume resistivity (ρ)51.5 nOhm*m 7075 aluminium alloy (AA7075) is an aluminium alloy with zinc as the primary alloying element. It has excellent mechanical properties and exhibits good ductility, high strength, toughness, and good resistance to fatigue. It is more susceptible to embrittlement than many other aluminium alloys because of microsegregation, but has significantly better corrosion resistance than the alloys from the 2000 series. It is one of the most commonly used aluminium alloys for highly stressed structural applications and has been extensively used in aircraft structural parts.[2] 7075 aluminium alloy's composition roughly includes 5.6–6.1% zinc, 2.1–2.5% magnesium, 1.2–1.6% copper, and less than a half percent of silicon, iron, manganese, titanium, chromium, and other metals. It is produced in many tempers, some of which are 7075-0, 7075-T6, 7075-T651. The first 7075 was developed in secret by a Japanese company, Sumitomo Metal, in 1935,[3] but introduced by Alcoa in 1943 and was standardized for aerospace use in 1945.[4] 7075 was eventually used for airframe production in the Imperial Japanese Navy. Basic properties Aluminium 7075A has a density of 2.810 g/cm3.[5] Mechanical properties The mechanical properties of 7075 depend greatly on the tempering of the material.[6] 7075-0 Un-heat-treated 7075 (7075-0 temper) has a maximum tensile strength of no more than 280 MPa (40,000 psi), and maximum yield strength of no more than 140 MPa (21,000 psi). The material has an elongation (stretch before ultimate failure) of 9–10%. As is the case for all 7075 aluminum alloys, 7075-0 is highly corrosion-resistant combined with generally acceptable strength profile. 7075-T6 T6 temper 7075 has an ultimate tensile strength of 510–540 MPa (74,000–78,000 psi) and yield strength of at least 430–480 MPa (63,000–69,000 psi). It has a failure elongation of 5–11%.[7] The T6 temper is usually achieved by homogenizing the cast 7075 at 450°C for several hours, quenching, and then ageing at 120°C for 24 hours. This yields the peak strength of the 7075 alloys. The strength is derived mainly from finely dispersed eta and eta' precipitates both within grains and along grain boundaries.[8] 7075-T651 T651 temper 7075 has an ultimate tensile strength of 570 MPa (83,000 psi) and yield strength of 500 MPa (73,000 psi). It has a failure elongation of 3–9%. These properties can change depending on the form of material used. The thicker plates may exhibit lower strengths and elongation than the numbers listed above. 7075-T7 T7 temper has an ultimate tensile strength of 505 MPa (73,200 psi) and a yield strength of 435 MPa (63,100 psi). It has a failure elongation of 13%.[9] T7 temper is achieved by overaging (meaning aging past the peak hardness) the material. This is often accomplished by aging at 100–120 °C for several hours and then at 160–180 °C for 24 hours or more. The T7 temper produces a microstructure of mostly eta precipitates. In contrast to the T6 temper, these eta particles are much larger and prefer growth along the grain boundaries. This reduces the susceptibility to stress corrosion cracking. T7 temper is equivalent to T73 temper.[8] 7075-RRA The retrogression and reage (RRA) temper is a multistage heat treatment temper. Starting with a sheet in the T6 temper, it involves overaging past peak hardness (T6 temper) to near the T7 temper. A subsequent reaging at 120 °C for 24 hours returns the hardness and strength to or very nearly to T6 temper levels.[8] RRA treatments can be accomplished with many different procedures. The general guidelines are retrogressing between 180 and 240 °C for 15 min 10 s.[10] Equivalent materials Table of equivalent materials[11] US ISO European Union Germany Japan Australia China Standard AISI (UNS) Standard Designation Standard Numerical (Chemical symbols) Standard Designation (Material number) Standard Grade Standard Designation Standard Grade ASTM B209, ASTM B210, ASTM B211, ASTM B221, AMS-QQ-A-225/9, AMS-QQ-A-200/11, AMS-QQ-A-250/12, AMS-WW-T-700/7 7075 (A97075) ISO 209 AW-7075 EN 573-3 EN AW-7075 (EN AW-AlZn5,5MgCu) DIN 1725-1 AlZnMgCu1,5 (3.4365) JIS H4000; JIS H4040 7075 AS 2848.1, AS/NZS 1734, AS/NZS 1865, AS/NZS 1866 7075 GB/T 3190; GB/T 3880.2 7075 Uses The world's first mass-production usage of the 7075 aluminum alloy was for the Mitsubishi A6M Zero fighter. The aircraft was known for its excellent maneuverability which was facilitated by the higher strength of 7075 compared to previous aluminum alloys. 7000 series alloys such as 7075 are often used in transport applications due to their high specific strength, including marine, automotive and aviation.[6][12] These same properties lead to its use in rock climbing equipment, bicycle components, inline-skating-frames and hang glider airframes are commonly made from 7075 aluminium alloy. Hobby-grade RC models commonly use 7075 and 6061 for chassis plates. 7075 is used in the manufacturing of M16 rifles for the U.S. military as well as AR-15 style rifles for the civilian market. In particular high-quality M16 rifle lower and upper receivers, as well as extension tubes, are typically made from 7075-T6 alloy. Desert Tactical Arms, SIG Sauer, and French armament company PGM use it for their precision rifles. It is also commonly used in shafts for lacrosse sticks, such as the STX sabre, and camping knife and fork sets. It is a common material used in competition yo-yos as well. Due to its high strength, low density, thermal properties, and its ability to be highly polished, 7075 is widely used in mold tool manufacturing. This alloy has been further refined into other 7000 series alloys for this application, namely 7050 and 7020. Aerospace applications 7075 was used in the Space Shuttle SRB nozzles, and the external tank SRB beam in the Inter-tank section. Applications Aircraft fittings Gears and shafts Missile parts Regulating valve parts Worm gears Aerospace/defense applications Automotive Trade names 7075 has been sold under various trade names including Zicral, Ergal, and Fortal Constructal. Some 7000 series alloys sold under brand names for making molds include Alumec 79, Alumec 89, Contal, Certal, Alumould, and Hokotol. See also Northwest Airlines Flight 421 WHAT ARE THE DIFFERENCES BETWEEN 6061 AND 7075 ALUMINUM? 7075 Aluminum: Get to Know its Properties and Uses Properties of 7075 aluminum alloy Archived 2018-10-16 at the Wayback Machine Properties of 7075 aluminum alloy 7075 aluminum References ^ Juan J. Valencia, Peter N. Quested, "Thermophysical Properties" ^ ASM Handbook Volume 2: Properties and Selection: Nonferrous Alloys and Special-Purpose Materials, 1990 pp. 137–38 ^ Yoshio, Baba."Extra super duralumin and successive aluminium alloys for aircraft." Journal of Japan Institute of Light Metals (Sumitomo Light Metal Ind. Ltd., Japan), Volume 39, Issue 5, p. 378. Retrieved: 22 November 2015. ^ Canadian Aeronautics and Space Journal, 1989 vol 35-36 p. 129 ^ "7075 (AlZn5.5MgCu, 3.4365, 2L95, A97075) Aluminum :: MakeItFrom.com". www.makeitfrom.com. 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