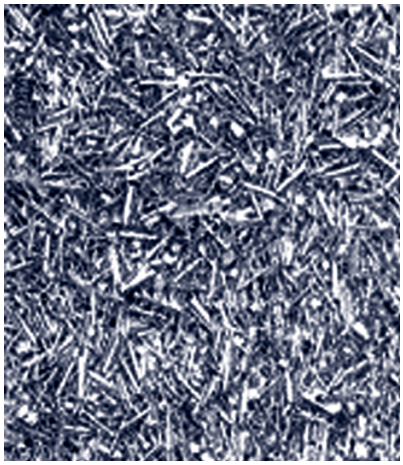
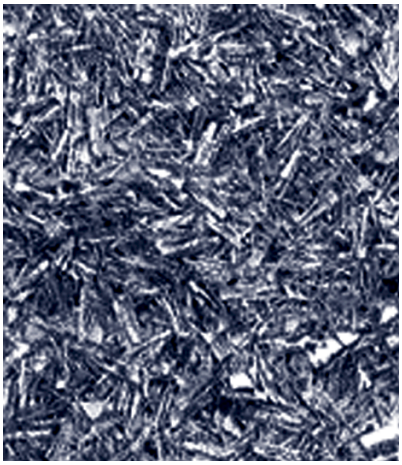
Alcoa Global Cold Finished Products

UltrAlloy® 6020

Understanding Cold Finished Aluminum Alloys



UltrAlloy® 6020



A-rated

B-rated

Alcoa's Global Cold Finished Products introduces UltrAlloy® 6020, the first unleaded* aluminum alloy in the world to give you A-rated machinability.

**Unleaded means no purposeful amounts of lead have been added. As in all metals, trace elements may be present.*

Alcoa UltrAlloy® 6020, a cold finished aluminum wrought product, is suggested for applications requiring a high degree of machinability along with high corrosion resistance. UltrAlloy® 6020 has both good joining characteristics and excellent response to anodizing — parts machined from UltrAlloy® 6020 readily accept all types of anodic coatings.

UltrAlloy® 6020 offers "A" rated machinability without lead additions and produces fine, easily broken chips and a superior surface finish, characteristics that enhance machining productivity for greater profitability. When machining UltrAlloy® 6020 using single-point or multi-spindle carbide tools on screw machines, the use of a chip breaker is not required.

The -T8 temper has good residual stress control for applications requiring tight dimensional control after machining. Superior overall dimensional tolerance control allows for a minimum of waste during machining.

Typical applications include master cylinder brake pistons, connectors, transmission valves, AC charge valves and fittings, and various hydraulic parts commonly used in the Automotive, Fluid Power, and Electronic Industries.

Similar to other 6xxx series alloys, UltrAlloy® 6020 has good to excellent corrosion resistance and susceptibility to general and stress-corrosion cracking is insignificant. As with all aluminum alloys, care must be taken when coupled to dissimilar metals such as steel due to galvanic corrosion. For welding UltrAlloy® 6020, filler alloy 4047 is recommended for joining UltrAlloy® 6020 to itself or other alloys. When brazing, 4145 filler alloy is recommended.

The properties listed in this Alloy Data Sheet represent the best current information for this alloy. In each specific applications, the user is expected to evaluate and test the alloy, temper and finishing method. Consult the Material Safety Data Sheet (MSDS) for proper safety and handling precautions when using UltrAlloy® 6020.

UltrAlloy® 6020 Temper Designations and Definitions

Standard Tempers	Standard Temper Definitions*
T6, T651	Solution heat-treated and then artificially aged. Applies to products that are not cold worked after solution heat-treatment, or in which the effect of cold work in flattening or straightening may not be recognized in mechanical property limits. Temper -T651 applies to products stress-relieved by stretching.
T8	Solution heat-treated, cold worked, then artificially aged. Applies to products that are cold worked to improve strength, or in which the effect of cold work in flattening and straightening is recognized in mechanical property limits.

* For further details of definitions, see Aluminum Association's Aluminum Standards and Data manual and Tempers for Aluminum and Aluminum Alloy Products.

UltrAlloy® 6020 Chemical Analysis

Density: 0.098 lb./ in.^{3}

Percent Weight	Elements												
	Si	Fe	Cu	Mn	Mg	Cr	Zn	Sn	Ti	Pb	Others Each	Others Total	Aluminum
Minimum	.40	—	.30	—	.6	—	—	.9	—	—	—	—	
Maximum	.9	.5	.9	.35	1.2	.15	.20	1.5	.15	.05	.05	.15	Remainder

Average Coefficient of Thermal Expansion (68° to 212° F) = 13.2 x 10^{-6} (inch per inch per °F)

UltrAlloy® 6020: Global Cold Finished Products Capabilities and Mechanical Property Limits

	Specified Section or Wall Thickness[2] (inches)	Tensile Strength (ksi) Ultimate	Tensile Strength (ksi) Yield (0.2% offset)	Elongation[3] Percent Min. in 2 inch or 4D[4]	Typical Brinell Hardness (500 kb load/ 10 mm ball)	Typical Electrical Conductivity (%IACS)
Standard Tempers[1]						
T6, T6511[6]	3.260 - 6.000	38.0	35.0	10.0	95	46
T8[5]	0.250 - 0.375	43.0	40.0	12.0	100	46
T8[5]	0.376 - 1.999	42.0	39.0	12.0	100	46
T8[5]	2.000 - 3.250	39.0	36.0	12.0	100	46

① The mechanical property limits for standard tempers are listed in the "standards section" of the Aluminum Association's Aluminum Standards and Data manual and Tempers for Aluminum and Aluminum Alloy Products. ② The thickness of the cross section from which the tension test specimen is taken determines the applicable mechanical properties. Other sizes/thicknesses may be available upon special request. ③ For material of such dimensions that a standard test specimen cannot be obtained, or for shapes thinner than 0.062", the test for elongation is not required. ④ D = Specimen diameter. ⑤ Hexes available up to 2.000 inches for T8 temper. ⑥ T6/T6511 is an extruded product.

Comparative Characteristics of Related Alloys/Tempers[1]

Alloy	Temper	Formability Low–High	Machinability D C B A	General Corrosion Resistance D C B A	Weldability (Arc with Inert Gas) D C B A	Brazeability D C B A	Anodizing Response D C B A
6020	(Cold Finished) -T8						
6262	(Cold Finished) -T651						
	-T8						
	-T9						
6262	(Extruded) -T6						
2011	(Cold Finished) -T3						
	-T8						

① Rating: A=Excellent B=Good C=Fair D=Poor For further details of explanation of ratings, see Aluminum Association's Aluminum Standards and Data manual.

ALCOA

Everlead Material Co.,Ltd
East Tower,21D-07,High-Tech King World,Shanghai,China
Phone: +8621-53080572
Fax: +8621-53081131
Email:eshan@elmaterial.com.cn
Http://www.elmaterial.com.cn