

ALLOY DESCRIPTION

This alloy is used in aircraft structural parts. The alloy has characteristics of high strength and good machinability. Good resistance to stress corrosion cracking in -T7 type temper.

TYPICAL MECHANICAL PROPERTIES (LONGITUDINAL)

Temper	Tensile (.500" Dia. Specimen)					Hardness Brinell 500kg 10 mm	Shear		Fatigue		Modulus	
	Ultimate		Yield		Elongation/4D %		Ultimate Shearing Strength	Endurance Limit - R.R. Moore Type		Modulus of Elasticity		
	KSI	MPa	KSI	MPa				KSI	MPa	KSI x 10 ³	Gpa	
T6, T6511	94	648	86	592	5	170	-	-	-	-	10.5	72.5
T74, T74511	85	586	77	530	7	160	43	296	-	-	10.5	72.5
T76, T76511	78	538	70	483	7	150	45	310	-	-	10.5	72.5
T73, T73511	74	510	64	411	7	140	40	276	43*	295*	10.5	72.5

*In 10E7 cycles, axially loaded specimens tested at R = 0.1

COMPARATIVE CHARACTERISTICS

Temper	Corrosion Resistance		Cold Workability ³	Machinability ³	Anodize Response ³	Brazeability ⁴	Weldability ⁴		
	General ¹	Stress ²					Gas	Arc	Spot
T6, T6511	C	C	D	C	B	D	D	D	B
T73, T73511	C	B	D	B	B	D	D	D	B
T74, T74511									
T76, T76511									

- Ratings A through E are relative ratings in decreasing order of merit, based on exposures to sodium chloride solution by intermittent spraying or immersion. Alloys with A and B ratings can be used in industrial and seacoast atmospheres without protection. Alloys with C, D and E ratings generally should be protected at least on faying surfaces.
- Stress-corrosion cracking ratings are based on service experience and laboratory tests of specimens exposed to the 3.5% sodium chloride alternate immersion test.
 - A= No known instance of failure in service or in laboratory tests.
 - B= No known instance of failure in service; limited failures in laboratory tests of short transverse specimens.
 - C= Service failures with sustained tension stress acting in short transverse direction relative to grain structure; limited failures in laboratory tests of long transverse specimens.
 - D= Limited service failures with sustained longitudinal or long transverse
- Ratings A through D for Workability (cold), A through E for Machinability and A through C for Anodize Response, are relative ratings in decreasing order of merit.
- Ratings A through D for Weldability and Brazeability are relative ratings defined as follows:
 - A= Generally weldable by all commercial procedures and methods.
 - B= Weldable with special techniques or for specific applications that justify preliminary trials or testing to develop welding procedure and weld performance.
 - C= Limited weldability because of crack sensitivity or loss in resistance to corrosion and mechanical properties.
 - D= No commonly used welding methods have been developed.

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APPLICABLE SPECIFICATIONS

Cold Finished	Extruded
	AMS 4157
	AMS 4159

CHEMICAL COMPOSITION LIMITS

									Others	
Weight %	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Each	Total
Minimum	-	-	1.2	-	2.0	0.10	7.2	-	-	-
Maximum										
7049	0.25	0.35	1.90	0.20	2.9	0.22	8.2	0.10	0.05	0.15
7149	0.15	0.20	-	-	-	-	-	-	-	-

TYPICAL PHYSICAL PROPERTIES

Characteristic		English	Metric
Nominal Density (68 °F/20 °C)		0.103 lbs./in. ³	2.84 Mg/m ³
Melting Range		890 °F - 1175 °F	476 °C - 635 °C
Specific Heat (212 °F/100 °C)		0.23 BTU/lb. - °F	960 J/kg - °K
Coefficient of Thermal Expansion	Linear 68 °F-212 °F 20 °C-100 °C	13.0 micro in./in.-°F	23.4 micro m/m -°K
	Volumetric 68 °F/20 °C	3.78 x 10 ⁻⁵ in. ³ /in. ³ -°F	68 x 10 ⁻⁶ m ³ /m ³ -°K
Thermal Conductivity (68 °F/20 °C)	T6, T651	75 BTU/ft. - hr. - °F	130 W/m - °K
	T7, T7351	89 BTU/ft. - hr. - °F	154 W/m - °K
Electrical Conductivity (68 °F/20 °C)	Equal Volume	T6, T651	33% IACS
		T7, T7351	38% IACS
	Equal Weight	T6, T651	105% IACS
		T7, T7351	-