Rod & Bar Alloy 7068

Technical Data

ALLOY DESCRIPTION

Alloy 7068 offers some of the highest strength mechanical properties available in an extruded product. Intended for aerospace, ordnance and light weight recreational applications where extremely high strength is required. Property levels are typically in the 100 ksi range for ultimate strengths.

TYPICAL MECHANICAL PROPERTIES

Temper	Tensile (.500" Dia. Specimen)					Hardness	Shear		Fracture Toughness	
	Ultimate		Yield		Elongation/4D	Brinell 500kg 10 mm	Ultimate Shearing Strength		ksi √in.	
	KSI	MPa	KSI	MPa	%		KSI	MPa	L-T	T-L
T6,T6511	103	710	99	683	9	190	53	365	25	15
T6,T651	100	698	94	648	9	185	-	-	-	-
T76, T76511	89	614	83	572	9	170	-	-	-	-

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
T76, T76511	C	B	D	C	B	D	D	D	B

1 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.

2 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

3 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.

4 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.

APPLICABLE SPECIFICATIONS

Cold Finished	Extruded
	AMS 4331

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CHEMICAL COMPOSITION LIMITS

										Others	
Weight %	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Zr	Each	Total
Minimum	-	-	1.6	-	2.2	-	7.3	-	0.05	-	-
Maximum	0.12	0.15	2.4	0.10	3.0	0.05	8.3	0.10	0.15	0.05	0.15

TYPICAL PHYSICAL PROPERTIES

Characteristic		English	Metric
Nominal Density (68 °F/20 °C)		0.103 lbs./in.^{3}	2.85 Mg/m^3
Melting Range		890 °F - 1175 °F	476 °C - 635 °C
Specific Heat (212 °F/100 °C)		0.25 BTU/lb. - °F	1050 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, T6511	110 BTU/ft. - hr. - °F	190 W/m - °K
Electrical Conductivity (68 °F/20 °C)	Equal Volume	T6, T6511	31% IACS
		T76, T76511	39% IACS
Electrical Resistivity (68 °F/20 °C)	T6, T6511		49.4 micro ohm meter