Tube & Pipe Alloy 5052

Technical Data

ALLOY DESCRIPTION[1]

One of the magnesium alloys. Typically used in hydraulic tube applications. Good corrosion resistance and good weldability.

1 Alloy subject to cast lot quantity restriction

TYPICAL MECHANICAL PROPERTIES

Temper	Tensile					Hardness	Shear		Fatigue		Modulus	
	Ultimate		Yield		Elongation/4D	Brinell 500kg 10 mm	Ultimate Shearing Strength		Endurance Limit - R.R. Moore Type		Modulus of Elasticity	
	KSI	MPa	KSI	MPa	%		KSI	MPa	KSI	MPa	KSI x 10^3	Gpa
O	28	195	13	90	25	47	18	125	16	110	10.2	70
H32	33	230	28	195	12	60	20	140	17	115	10.2	70
H34	38	260	31	215	10	68	21	145	18	125	10.2	70

COMPARATIVE CHARACTERISTICS

Temper	Corrosion Resistance		Cold Workability[3]	Machinability[3]	Anodize Response[3]	Brazeability[4]	Weldability[4]		
	General[1]	Stress[2]					Gas	Arc	Spot
O	A	A	A	D	*	C	A	A	B
H32	A	A	B	D	*	C	A	A	A
H34	A	A	B	C	*	C	A	A	A

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.

* DATA NOT AVAILABLE

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APPLICABLE SPECIFICATIONS

Cold Drawn	Extruded
ASTM B210	ASTM B221
ASME SB210	ASTM B241
ASTM B234	ASME SB241
ASTM B483	
AMS 4069	
AMS 4070	
AMS 4071	
AMS-WW-T-700/4	

CHEMICAL COMPOSITION LIMITS

										Others	
Weight %	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Each	Total
Nominal	0.25	0.4	0.1	0.1	2.2 – 2.8	0.15 – 0.35	…	0.1	…	0.05	0.15

TYPICAL PHYSICAL PROPERTIES

Characteristic			English	Metric
Nominal Density (68 ℉/20 ℃)			0.097	g/cm^3
Melting Range			1125 °F - 1200 °F	605 °C – 650 °C
Specific Heat (212 ℉/100 ℃)				
Coefficient of Thermal Expansion	Linear 68 ℉-212 ℉ 20 ℃-100 ℃		13.2	23.8
	Volumetric 68 ℉/20 ℃			
Thermal Conductivity (68 ℉/20 ℃)	O		960	138 W/m x K
Electrical Conductivity (68 ℉/20 ℃)	Equal Volume	O	35	20
	Equal Weight	O	116	67

* DATA NOT AVAILABLE