Aluminum Selection and Substitution Guide

		Typical Characteristics							Typical Mechanical Properties *			NON HEAT TREATABLE
						Weldability			Tension			
Alloy	**Temper**	Corrosion Resistance	Cold Workability	Machinability	Brazability	Gas	Arc	Resistance, spot and seam	Strength Ksi (kg/mm^2)		Elogation Percent in 2 in.	
									Ultimate	Yield	1/16 in. thick specimen	
1100	O	A	A	E	A	A	A	B	13 (9.1)	5 (3.5)	35	
	H14	A	A	D	A	A	A	A	18 (12.7)	17 (12.0)	9	
3003	O	A	A	E	A	A	A	B	16 (11.2)	6 (4.2)	30	
	H14	A	B	D	A	A	A	A	22 (15.5)	21 (14.8)	8	
5005	H34(H14)	A	B	D	B	A	A	A	23 (16.2)	20 (14.1)	8	
5052	H32	A	B	D	C	A	A	A	33 (23.2)	28 (19.7)	12	
	H34	A	B	C\	C	A	A	A	38 (26.7)	31 (21.8)	10	
	H36	A	C	C	C	A	A	A	40 (28.1)	35 (24.6)	8	
5086	H112	A	B	D	D	A	A	A	39 (27.4)	19 (13.4)	14	
	H32	A	B	D	D	A	A	A	42 (29.5)	30 (21.1)	12	
	H116	A	C	C	C	A	A	A	42 (29.5)	30 (21.1)	12	
5454	O	A	A	D	D	C	A	B	38 (25.3)	17 (12.0)	22	
	H32	A	B	D	D	C	A	A	40 (28.1)	30 (21.1)	10	

* NOT FOR DESIGN USE – call us for guaranteed mechanical properties for specific product-alloy-temper combinations.

Ratings A, B, C, D, E are relative in decreasing order of merit. Weldability and brazability are specifically defined as:

A – Generally weldable by all commercial procedures and methods.
B – Weldable with special techniques or specific applications which justify preliminary trails or testing to develop welding procedure and weld performance.
C – Limited weldability because of crack sensitivity pr loss in resistance to corrosion and all mechanical properties.
D – No commonly used welding methods have so far been developed.

		Typical Characteristics							Typical Mechanical Properties *			HEAT TREATABLE
						Weldability			Tension			
Alloy	**Temper**	Corrosion Resistance	Cold Workability	Machinability	Brazability	Gas	Arc	Resistance, spot and seam	Strength Ksi (kg/mm^2)		Elogation Percent in 2 in.	
									Ultimate	Yield	1/16 in. thick specimen	
2011	T3	D	C	A	D	D	D	D	55 (38.7)	43 (30.2)	-	
	T8	D	D	A	D	D	D	D	49 (41.5)	45 (31.8)	-	
2024	O	C	B	D	D	D	C	B	27 (19.0)	11 (7.7)	20	
	T3	D	C	B	D	D	B	B	70 (49.2)	50 (35.2)	18	
	T4,T351	D	C	B	D	D	B	B	68 (47.8)	47 (33.0)	20	
	T6	D	D	B	D	D	B	B	69 (48.5)	57 (40.1)	-	
	T8	D	D	B	D	D	B	B	70 (49.2)	57 (40.1)	30	
Alclad 2024	O	A	B	D	D	D	C	B	26 (18.3)	11 (7.7)	20	
	T3	A	D	B	D	D	C	A	65 (45.7)	45 (31.6)	18	
	T4,T351	A	D	B	D	D	C	A	64 (45.0)	42 (29.5)	19	
6061	O	B	A	D	A	A	A	B	18 (12.7)	8 (5.6)	25	
	T4,T351	B	B	C	A	A	A	A	35 (24.6)	21 (14.8)	22	
	T6,T651	B	C	C	A	A	A	A	45 (31.6)	40 (28.1)	12	
6063	O	A	A	D	A	A	A	B	13 (9.1)	7 (4.9)	-	
	T#	A	B	D	A	A	A	A	25 (17.6)	13 (9.1)	22	
	T5,T52	A	C	C	A	A	A	A	27 (19.0)	21 (14.8)	12	
	T6	A	C	C	A	A	A	A	35 (24.6)	31 (21.8)	12	
	T832	A	C	C	A	A	A	A	42 (29.5)	39 (27.4)	12	
6101	T61	A	C	D	A	A	A	A	25 (17.6)	20 (14.1)	-	
6262	T9	B	D	B	A	A	A	A	58 (40.8)	55 (38.7)	-	
7075	O	C	D	D	D	D	D	B	33 (23.2)	15 (10.5)	17	
	T6	C	D	B	D	D	D	B	83 (58.4)	73 (51.3)	11	
	T651	C	D	B	D	D	D	B	83 (58.4)	73 (51.3)	11	
Alclad 7075	O	A	B	C	D	D	D	B	32 (225)	14 (9.8)	17	
	T6	A	D	B	D	D	D	B	76 (53.4)	67 (47.1)	11	
	T651	A	D	B	D	D	D	B	76 (53.4)	67 (47.1)	11	
7079	O	C	D	D	D	D	C	B	33 (23.2)	15 (10.5)	17	
	T6,T651	C	D	B	D	D	C	B	78 (54.8)	68 (47.8)	-	
7178	O	C	D	B	D	D	C	B	33 (23.2)	15 (10.5)	15	
	T6,T651	C	D	B	D	D	C	B	88 (61.9)	78 (54.8)	10	

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