AC-2014

Density: 2.50 g/cm^3

Material: Pre-alloyed aluminium alloy powder (3.5-5.5% Cu, 0.5-1.2% Si, 0.2-1.0% Mg, 1.5% max. other elements, balance Al)

Treatment: Die Compact at 100/150 MPa, Sinter, T2 condition (cold worked through sizing and naturally aged at room temperature)

Table – Strain and Stress Amplitudes vs. Reversals to Failure

Group A -- AC-2014-23-T2 - Density 2.50 g/cm^3

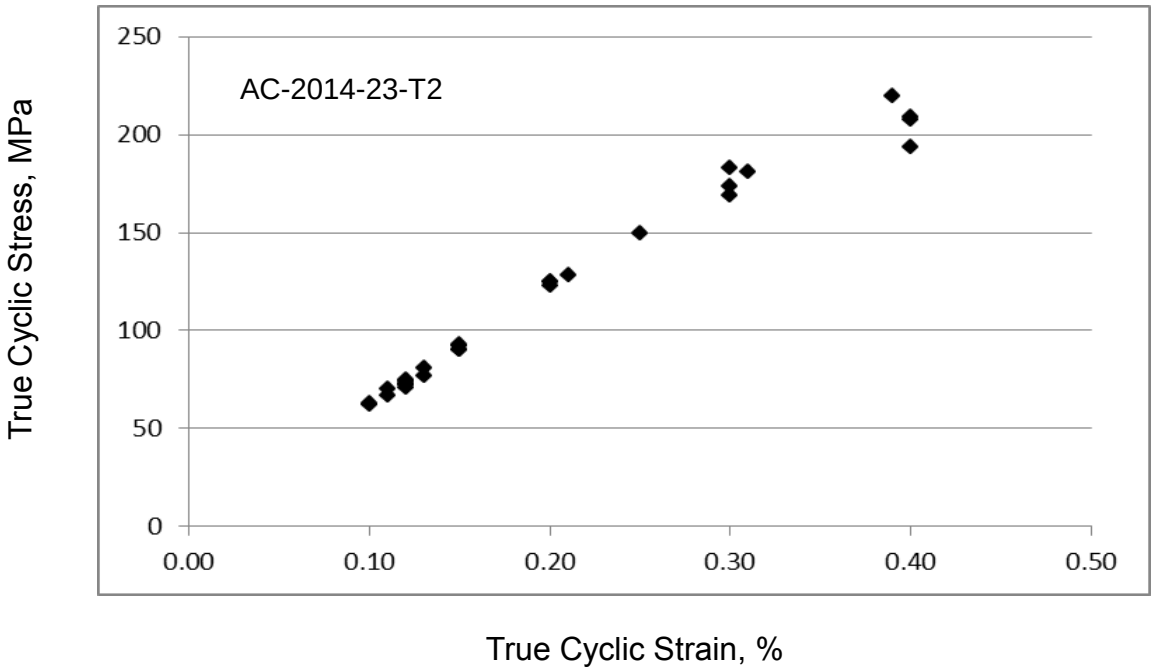
Sp. #	True Stress Amplitude (MPa)	True Strain Amplitude	True Elastic Strain Amplitude	True Plastic Strain Amplitude	Life (2Nf)	Hardness (HRB)	Notes
22	209	0.004	0.0006	0.00342	570		
35	181	0.0031	0.00009	0.00297	1,958		
38	125	0.002	-0.00005	0.00205	14,642		
20	90	0.0015	0.00002	0.00147	201,382		
31	63	0.001	-	-	20,000,000		Runout
34	77	0.0013	0.00001	0.00126	1,926,748		
39	72	0.0012	0	0.00118	6,253,378		
41	174	0.003	0.00015	0.00285	5,090		
44	183	0.003	0	0.003	4,048	17*	
43	125	0.002	-0.00002	0.00204	37,608	15*	
26	128	0.0021	0	0.00209	23,446		
42	90	0.0015	0.00004	0.00147	257,582		
19	92	0.0015	0.00004	0.0015	236,852		
21	71	0.0012	-	-	20,000,000		Runout
21B	194	0.004	0.00079	0.00318	352		
24	75	0.0012	0	0.00123	2,323,122		
25	208	0.004	0.00058	0.0034	1,084		
28	81	0.0013	-0.00002	0.00133	1,852,766		
32	74	0.0012	0.00121	0	6,000,000		
45	70	0.0011	-	-	20,000,000	18*	Runout

Group B -- AC-2014-23-T2 - Density 2.50 g/cm^3 (additional data - included in cyclic stress-strain curves and strain-life curves)

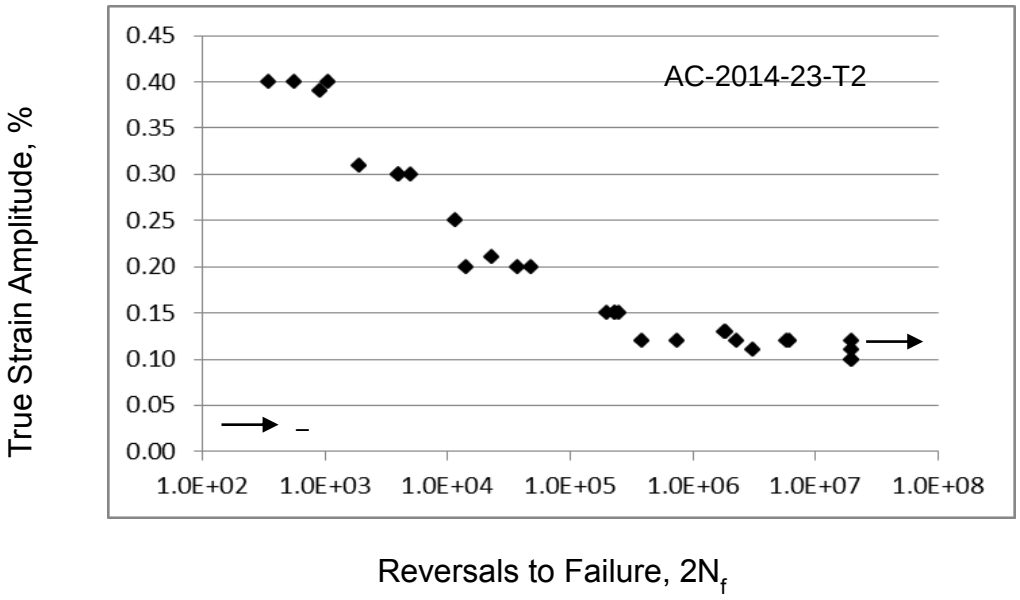
Sp. #	True Stress Amplitude (MPa)	True Strain Amplitude	True Elastic Strain Amplitude	True Plastic Strain Amplitude	Life (2Nf)	Hardness (HRB)	Notes
19	73	0.0012	0.00001	0.00119	392,178		
39	62	0.001	-	-	20,000,000		Runout
39B	169	0.003	0.00025	0.00275	4,106		
31	150	0.0025	0.00006	0.00243	11,904		
36	123	0.002	0	0.002	49,588	20*	
43	220	0.0039	0.00033	0.00358	936	21*	
40	93	0.0015	-0.00002	0.00152	236,962		
47	67	0.0011	0	0.00109	3,157,502	20*	
44	73	0.0012	0.00002	0.12%	759,454		

** Hardness obtained from average of three tests*

True Cyclic Stress-Strain Curve



Constant amplitude Strain-Life Curve



Cyclic Properties

AC-2014-23-T2

Cyclic Yield Strength, (0.2% offset)= K' $(0.002)^{n'}$ (MPa)	285
Cyclic strength coefficient, K' (MPa)	1362
Cyclic strain hardening exponent, n'	0.251
Cyclic elastic modulus, E_c (GPa)	61.1
Fatigue strength coefficient, σ'_f (MPa)	472
Fatigue strength exponent, b	-0.127
Fatigue ductility coefficient, ε'_f	0.015
Fatigue ductility exponent, c	-0.516