AC-2014

Density: 2.60 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 300 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-2014-25-T2 - Density 2.60 g/cm^3

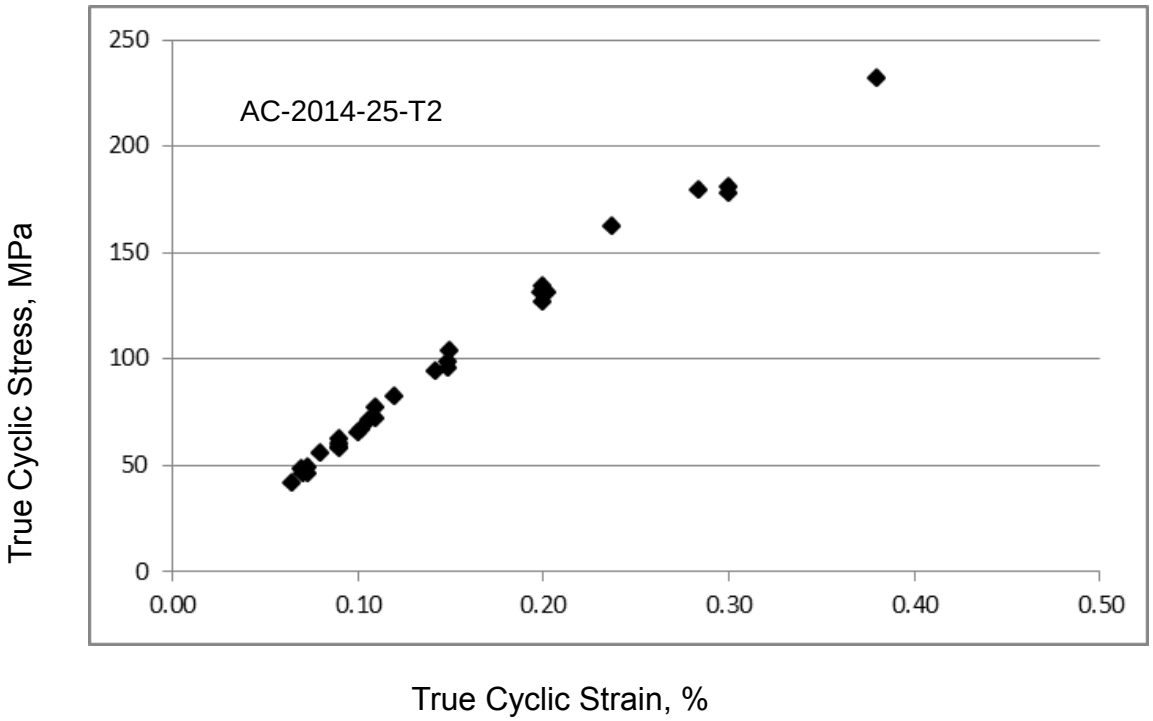
Sp. #	True Stress Amplitude (MPa)	True Strain Amplitude	True Elastic Strain Amplitude	True Plastic Strain Amplitude	Life (2Nf)	Hardness (HRB)	Notes
128	179	0.00284	0.00276	0.00008	1,568		
139	162	0.00237			254		
130	94	0.00142	0.00144	-0.00002	109,050		
135	71	0.00106	0.0011	-0.00004	421,664		
145	46	0.00073	0.00071	0.00002	7,437,890		
143	42	0.00065			20,000,000		Runout
143B	127	0.002	0.00195	0.00005	5,448		
141	131	0.00199	0.00201	-0.00002	20,656		
131	96	0.00149	0.00148	0.00002	99,822		
151	99	0.00149	0.00152	-0.00003	66,778		
156	131	0.00202	0.00202	0.00001	22,002		
149	67	0.00102	0.00103	-0.00001	746,694		
150	49	0.00073			20,000,000		Runout
150B	181	0.003	0.00279	0.00021	2,654		
138	65	0.001	0.001	0	1,160,040	27*	
132	58	0.0009	0.0009	0.00001	4,230,054		
144	178	0.003	0.00275	0.00025	2,732		
142	60	0.0009	0.00092	-0.00002	4,493,822		
144	59	0.0009	0.00091	-0.00001	2,211,662	28*	
133	46	0.00071	-	-	20,000,000		Runout

Group B -- AC-2014-25-T2 - Density 2.60 g/cm^3 (additional data - included in cyclic stress-strain curves and strain-life curves)

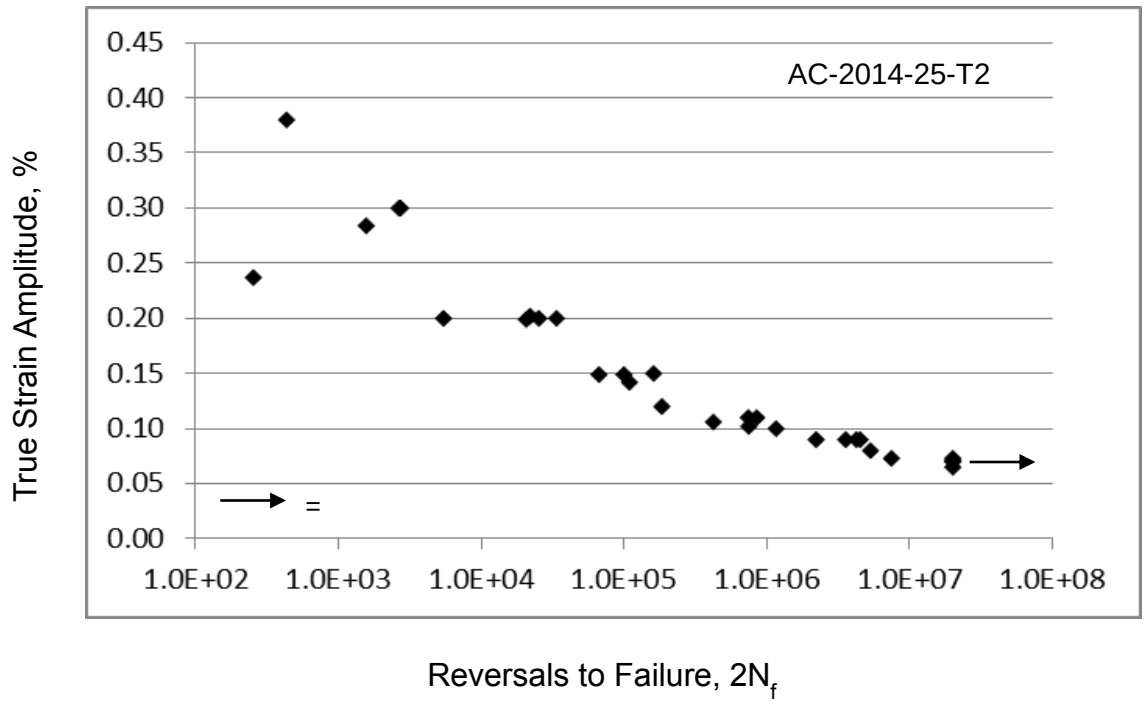
Sp. #	True Stress Amplitude (MPa)	True Strain Amplitude	True Elastic Strain Amplitude	True Plastic Strain Amplitude	Life (2Nf)	Hardness (HRB)	Notes
138	232	0.0038	0.00343	0.00033	434		
137	134	0.002	0.00198	0.00004	25,294		
135	104	0.0015	0.00153	-0.00003	160,878		
156	82	0.0012	0.00121	0	183,924		
155	77	0.0011	0.00114	-0.00004	741,198		
130	131	0.002	0.00194	0.00006	33,634	40*	
133	72	0.0011	0.00106	0	848,786		
131	62	0.0009	0.00092	-0.00001	3,563,338		
132	56	0.0008	0.00083	0	5,318,316		

** Hardness obtained from average of three tests*

True Cyclic Stress-Strain Curve



Constant amplitude Strain-Life Curve



Cyclic Properties

AC-2014-25-T2

Cyclic Yield Strength, (0.2% offset) = K' $(0.002)^{n'}$ (MPa)	358
Cyclic strength coefficient, K' (MPa)	1431
Cyclic strain hardening exponent, n'	0.223
Cyclic elastic modulus, E_c (GPa)	63.3
Fatigue strength coefficient, σ'_f (MPa)	597
Fatigue strength exponent, b	-0.159
Fatigue ductility coefficient, ε'_f	0.042
Fatigue ductility exponent, c	-0.785