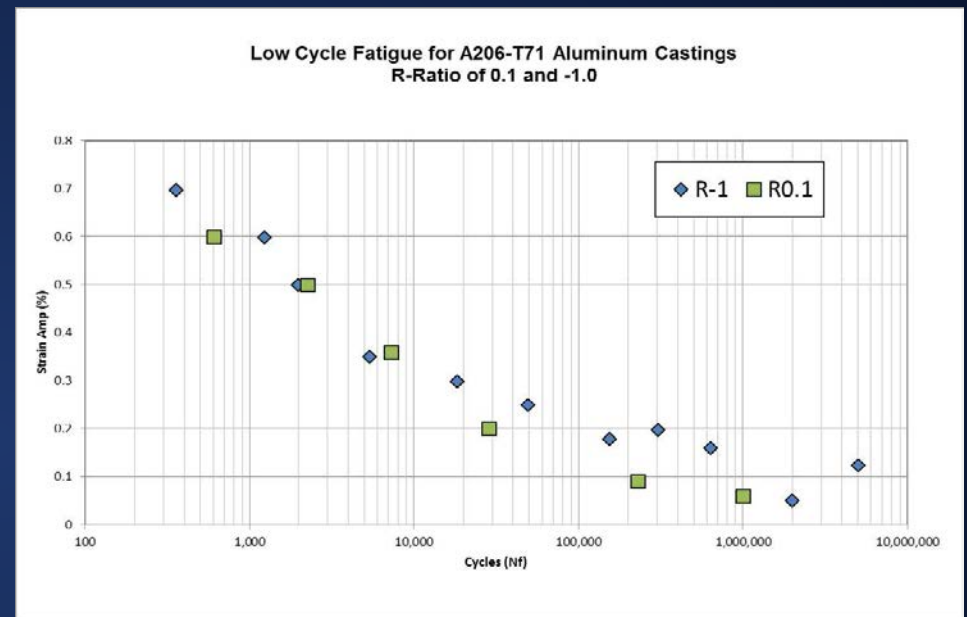
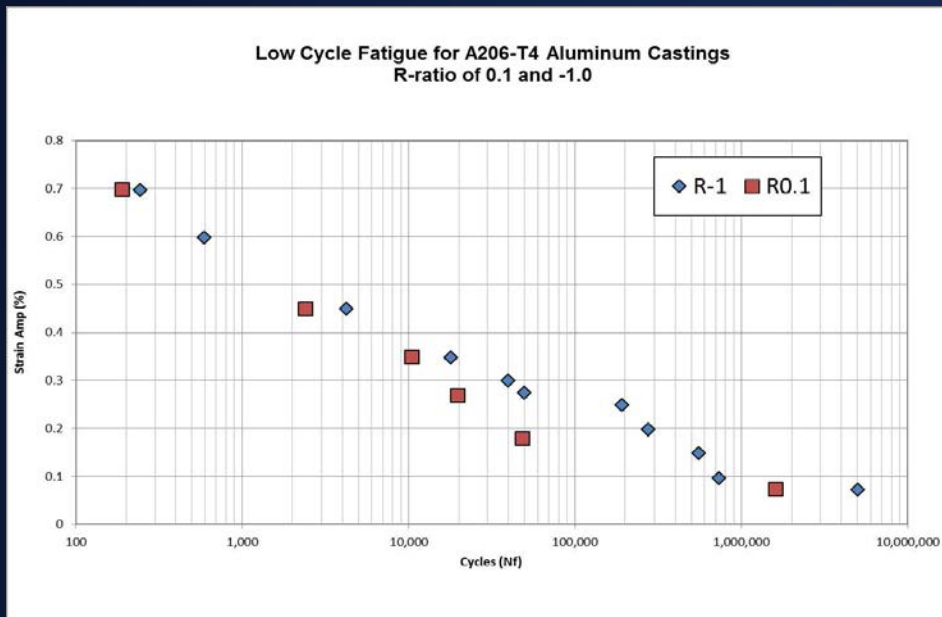


A206 Aluminum – Fatigue Constants



Material Source: Test specimens machined from chilled sand cast test plates

Produced by Jiten Shah, PDA LLC, March 9, 2018.

Description:

Uniaxial Low cycle fatigue (LCF) testings were done at room temperature per ASTM E606 per the test parameters using 1" cast thick plates. Standard 0.4375" Ø round smooth fatigue were used for this testing. A total of (2) Curves were created using a minimum of (10) sample per curve for an R-ratio of -1 and minimum of (6) samples per curve at an R-ratio of 0.1 for both the T4 and the T71 tempers. The LCF test results graphs are shown below. Strain vs No. of cycles curves were used to extract fatigue constants and exponents. Out of phase properties requires multi-axial testing, hence not able to provide.



A206 Aluminum – Fatigue Characteristics

R= -1	A206-T4	
Fatigue Strength Coefficient (σ'_f):	249,704 psi	RSquared=0.8857
Fatigue Strength Exponent (b):	-0.1964	n=10
Fatigue Ductility Coefficient (ϵ'_f):	0.5736	RSquared=1.0000
Fatigue Ductility Exponent (c):	-1.0449	n=2
Strain Hardening Coefficient (K')	77,535 psi	RSquared=1.0000
Strain Hardening Exponent (n')	0.0412	n=2
Cyclic Yield Strength:	60,021 psi	

R= -1	A206-T7	
Fatigue Strength Coefficient (σ'_f):	141,253 psi	RSquared=0.9544
Fatigue Strength Exponent (b):	-0.1509	n=9
Fatigue Ductility Coefficient (ϵ'_f):	4.3261	RSquared=0.8642
Fatigue Ductility Exponent (c):	-1.076	n=4
Strain Hardening Coefficient (K')	61,589 psi	RSquared=0.7782
Strain Hardening Exponent (n')	0.0625	n=4
Cyclic Yield Strength:	41,765 psi	

R= 0.1	A206-T4	
Fatigue Strength Coefficient (σ'_f):	322,246 psi	RSquared=0.9511
Fatigue Strength Exponent (b):	-0.2439	n=6
<i>(Missing data, samples lacked plastic strain)</i>		

R= 0.1	A206-T71	
Fatigue Strength Coefficient (σ'_f):	586,325 psi	RSquared=0.9730
Fatigue Strength Exponent (b):	-0.3137	n=6
Fatigue Ductility Coefficient (ϵ'_f):	0.6671	RSquared=0.9026
Fatigue Ductility Exponent (c):	-0.8905	n=3
Strain Hardening Coefficient (K')	99,426 psi	RSquared=0.9891
Strain Hardening Exponent (n')	0.1136 n=3	
Cyclic Yield Strength:	49,079 psi	

Source: Test specimens machined from chilled sand cast test plates

