

FL-05M1/FL-4405

Density: 7.46 g/cm³

Material: Prealloyed Steel (0.85% Mo, 0.20% Mn, balance Fe)+ mixed additions of 0.38% Graphite and 0.75% lubricant.

Treatment: Warm Die Compact, Sinter at 1120°C

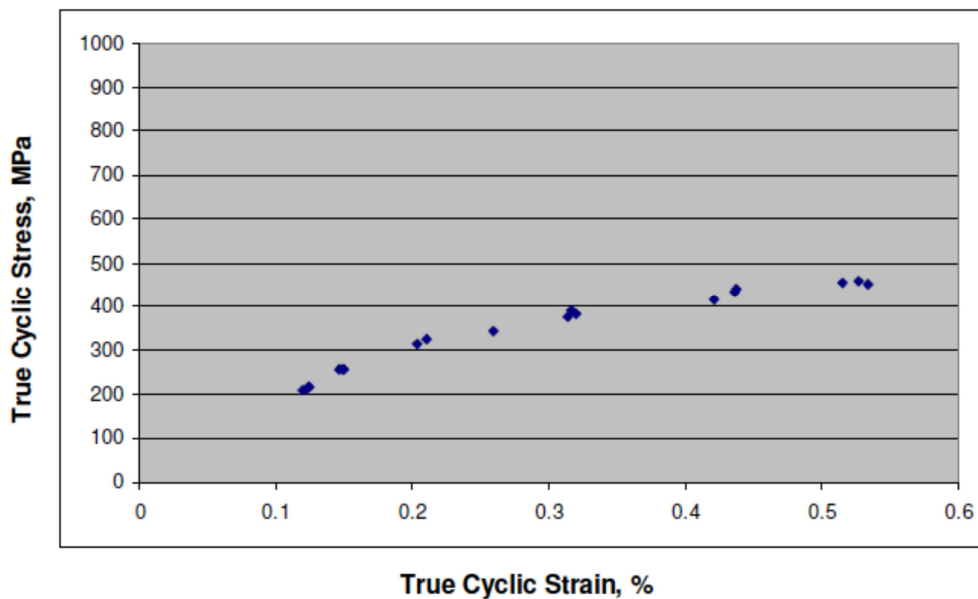
Table – Strain and Stress Amplitudes vs. Reversals to Failure

Test # ID	Stress Amplitude (MPa)	TRUE Stress Amplitude (MPa)	Strain Amplitude (%)	TRUE Strain Amplitude (%)	Plastic Strain Amplitude (%)	Elastic Strain Amplitude (%)	Reversals to Failure
8	451	453	0.536	0.534	0.276	0.259	784
9	455	458	0.528	0.527	0.266	0.261	832
5	453	455	0.516	0.515	0.255	0.26	806
7	438	440	0.438	0.437	0.186	0.251	1900
6	431	433	0.437	0.436	0.189	0.247	1460
4	413	415	0.421	0.421	0.184	0.237	2080
3	382	383	0.32	0.32	0.101	0.219	7600
2	388	389	0.317	0.316	0.094	0.222	5600
1	373	374	0.315	0.314	0.1	0.214	7200
17	342	342	0.259	0.259	0	0.259	15602
18	324	325	0.208	0.21	0	0.21	46700
16	314	314	0.204	0.204	0.024	0.18	70976
10	255	256	0.15	0.15	0.004	0.146	445252
13	258	258	0.149	0.149	0.002	0.148	686258
14	254	255	0.147	0.147	0.002	0.145	502314
12	217	217	0.124	0.124	0.001	0.124	*20000000
15	212	212	0.123	0.123	0.002	0.121	*20000000
11	208	208	0.12	0.12	0.001	0.119	*20000000

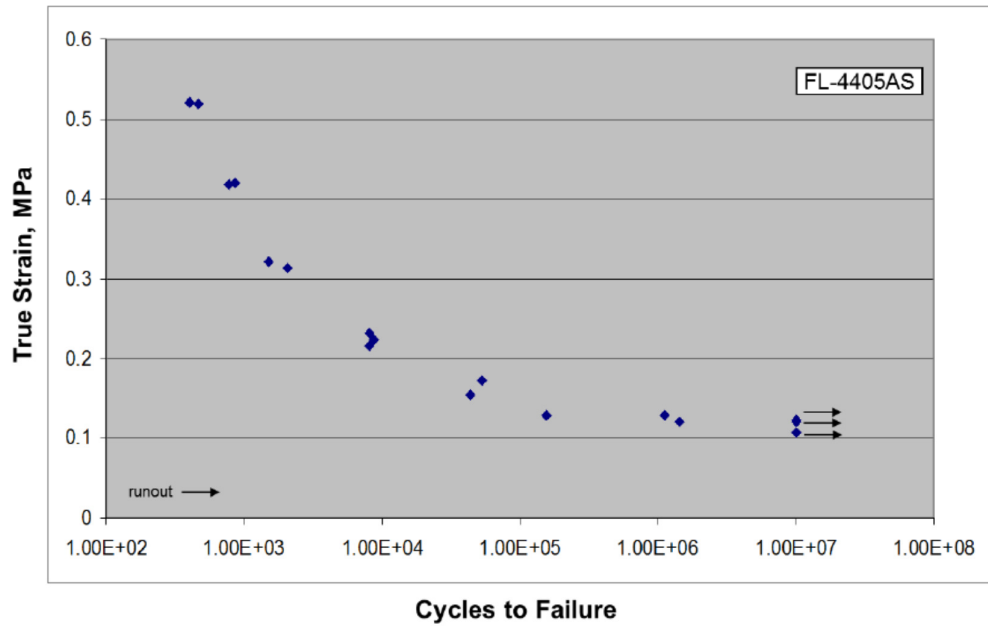
ND = Not Determined

* = run out

True Cyclic Stress-Strain Curve



Constant amplitude Strain-Life Curve



Cyclic Properties (see relevant column)

Cyclic Properties	FL-4405AS	FL-4405HT	FLN2-4405AS	FL-5305SH
Cyclic Yield Strength, (0.2% offset) $K'(0.002)^{n'}$	407.8	NPD	395	NPD
Cyclic Strength Coefficient, K' (MPa)	1071	NPD	2961	NPD
Cyclic Strain Hardening Exponent, n'	0.1573	NPD	0.3395	NPD
Fatigue Strength Coefficient, s' (MPa)	834	1727	727.7	3265
Fatigue Strength Exponent, b	-0.102	-0.141	-0.114	-0.177
Fatigue Ductility Coefficient, e'_f	0.106	NPD	0.017	NPD
Fatigue Ductility Exponent, c	-0.5	NPD	-0.3	NPD

Constant amplitude fatigue life curve: $\Delta\epsilon/2 = \sigma'/E (2Nf)^b + \epsilon'_f (2Nf)^c$

Cyclic stress-strain curve: $\Delta\epsilon/2 = \sigma/2E + (\Delta\sigma/2K')^{1/m'}$

NPD = No Plastic Deformation