FLN2-4400

Density: 7.45 g/cm^3

Material: Prealloyed Steel (0.85% Mo, 0.20% Mn, balance Fe) + mixed additions of 2% Regular Ni, 0.25%Graphite and 0.75% Acrawax.

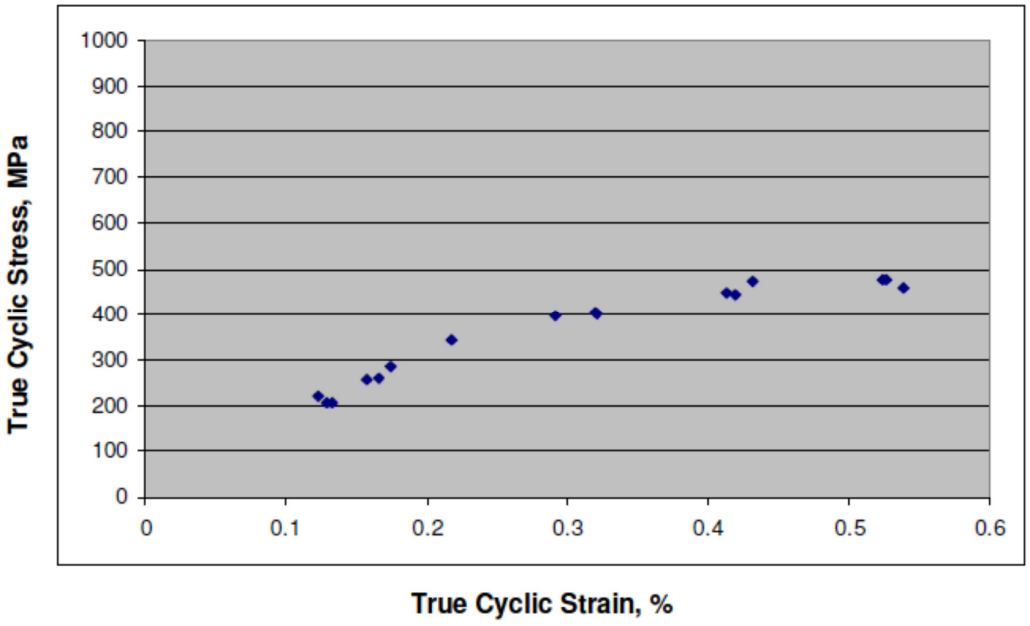
Treatment: Warm Die Compact, Sinter at 1290°C

Table – Strain and Stress Amplitudes vs. Reversals to Failure

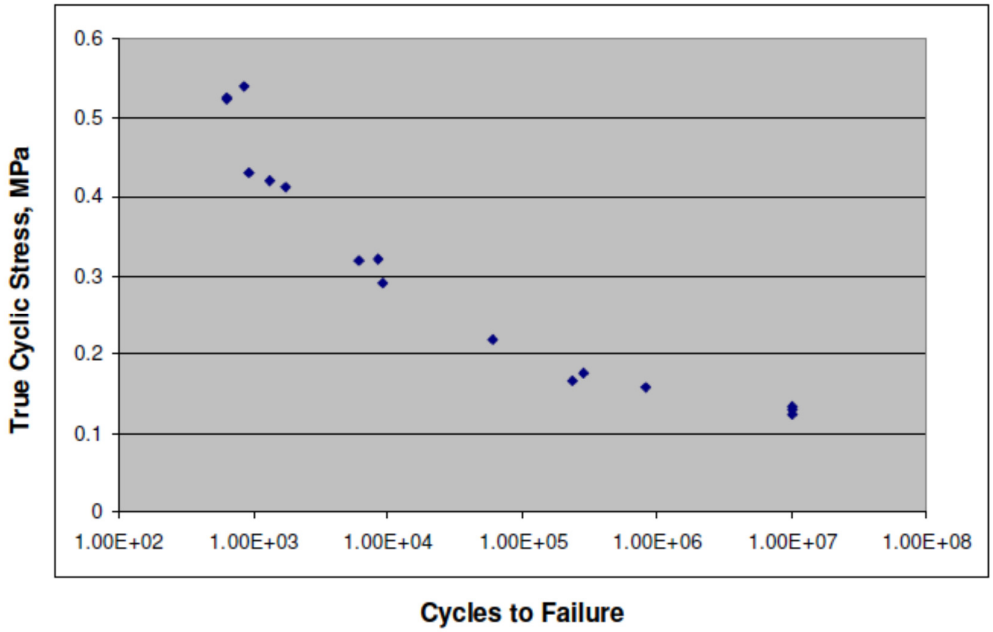
Test # ID	Stress Amplitude (MPa)	TRUE Stress Amplitude (MPa)	Strain Amplitude (%)	TRUE Strain Amplitude (%)	Plastic Strain Amplitude (%)	Elastic Strain Amplitude (%)	Reversals to Failure
13	455	458	0.54	0.5385	0.2861	0.2524	1740
4	475	478	0.5275	0.5261	0.2627	0.2634	1280
3	473	475	0.5251	0.5237	0.2615	0.2622	1292
11	471	473	0.4321	0.4312	0.1696	0.2616	1878
6	443	445	0.4207	0.4198	0.1737	0.2461	2684
2	445	446	0.4135	0.4126	0.1657	0.247	3500
16	399	401	0.3218	0.3213	0.0992	0.2221	17000
15	402	403	0.3204	0.3198	0.0962	0.2236	12200
1	396	397	0.2923	0.2919	0.0717	0.2201	18210
12	343	343	0.2183	0.2181	0.0273	0.1908	122398
5	287	287	0.1752	0.1751	0.0154	0.1597	565440
10	258	259	0.1657	0.1656	0.0218	0.1438	467126
7	257	257	0.1577	0.1575	0.0147	0.1429	1647152
14	204	205	0.1327	0.1326	0.0188	0.1138	*20000000
9	207	207	0.1294	0.1293	0.0142	0.1151	*20000000
17	221	221	0.1244	0.1226	0.0013	0.1231	*20000000

ND – Not Determined * – run out

True Cyclic Stress-Strain Curve



Constant amplitude Strain-Life Curve



Cyclic Properties (see Row E)

Material Designation	Cyclic Yield Strength 0.2% offset $K'(0.002)^{n'}$ MPa (10^3psi)	Cyclic Strength Coefficient K' MPa (10^3psi)	Cyclic Strain Hardening Exponent n'	Cyclic Elastic Modulus E_c GPa (10^3 psi)	Fatigue Strength Coefficient σ'_f MPa (10^3psi)	Fatigue Strength Exponent b	Fatigue Ductility Coefficient ε'_f	Fatigue Ductility Exponent c	Modulus E GPa (10^3 psi)
A	NPD	NPD	NPD	180 (26107)	2561 (371.4)	-0.136	NPD	NPD	ND
B	432 (62.7)	1299 (188.4)	0.177	ND	819(118.8)	-0.089	0.063	-0.5	175 (25.4)
C	NPD	NPD	NPD	180 (26107)	1610 (233.5)	-0.188	NPD	NPD	ND
D	455 (66.0)	1141	0.148	ND	928 (134.6)	-0.091	0.078	-0.5	179 (26.0)
E	NPD	NPD	NPD	180 (26107)	2225 (322.7)	-0.144	NPD	NPD	ND
F	483 (70.1)	776 (112.5)	0.074	ND	725 (105.2)	-0.042	1.110	-0.7	183 (26.5)

NPD = No Plastic Deformation
ND = Not Determined

Cyclic stress-strain curve: $\Delta\varepsilon/2 = \Delta\sigma/2E + (\Delta\sigma/2K')^{1/n'}$
Constant amplitude fatigue life curve: $\Delta\varepsilon/2 = \sigma'_f/E\,(2N_f)^b + \varepsilon'_f\,(2N_f)^c$