

FLN2-4400

Density: 7.40 g/cm³

Material: Prealloyed Steel (0.85% Mo, 0.20% Mn, balance Fe) + mixed additions of 2% Fine Ni, 0.3% Graphite (core composition) and 0.75% lubricant.

Treatment: Double Press Double Sinter, Final Sinter at 1290°C, Carburised (954°C (1750°F), 45 min. boost at 1.2% Cpot, 6.5 hrs. diffusion at 1.0% Cpot, Equalize at 870°C (1600°F) for 30 Min. (1% Cpot), Oil quench – 65°C (150°F))

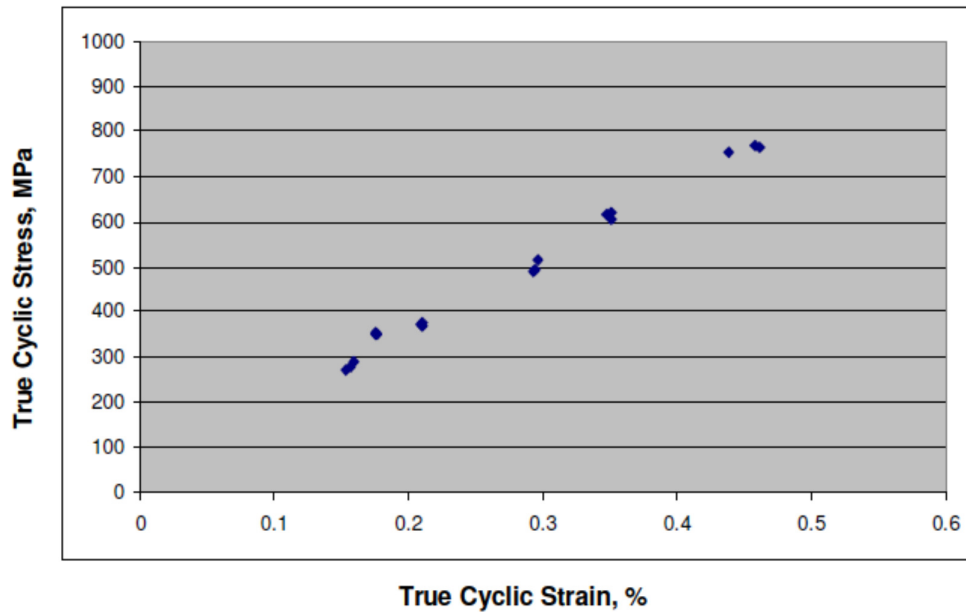
Table – Strain and Stress Amplitudes vs. Reversals to Failure

Test # ID	Stress Amplitude (MPa)	TRUE Stress Amplitude (MPa)	Strain Amplitude (%)	TRUE Strain Amplitude (%)	Plastic Strain Amplitude (%)	Elastic Strain Amplitude (%)	Reversals to Failure
1	ND	765	ND	0.462	0.000	0.462	6,510
2	ND	769	ND	0.458	0.000	0.458	5,654
3	ND	753	ND	0.438	0.000	0.438	3,734
4	ND	621	ND	0.361	0.000	0.361	30,208
5	ND	607	ND	0.351	0.000	0.351	36,518
6	MD	617	MD	0.348	0.000	0.348	35,344
7	ND	516	ND	0.297	0.000	0.297	65,000
8	ND	494	ND	0.294	0.000	0.294	287,234
9	ND	490	ND	0.293	0.000	0.293	65,062
10	ND	370	ND	0.211	0.000	0.211	279,568
11	ND	377	ND	0.211	0.000	0.211	402,398
12	ND	371	ND	0.209	0.000	0.209	889,982
13	ND	349	ND	0.177	0.000	0.177	4,195,468
14	ND	352	ND	0.176	0.000	0.176	6,418,006
15	ND	350	ND	0.175	0.000	0.175	4,213,400
16	ND	289	ND	0.159	0.000	0.159	*20000000
17	ND	277	ND	0.157	0.000	0.157	*20000000
18	ND	270	ND	0.154	0.000	0.154	*20000000

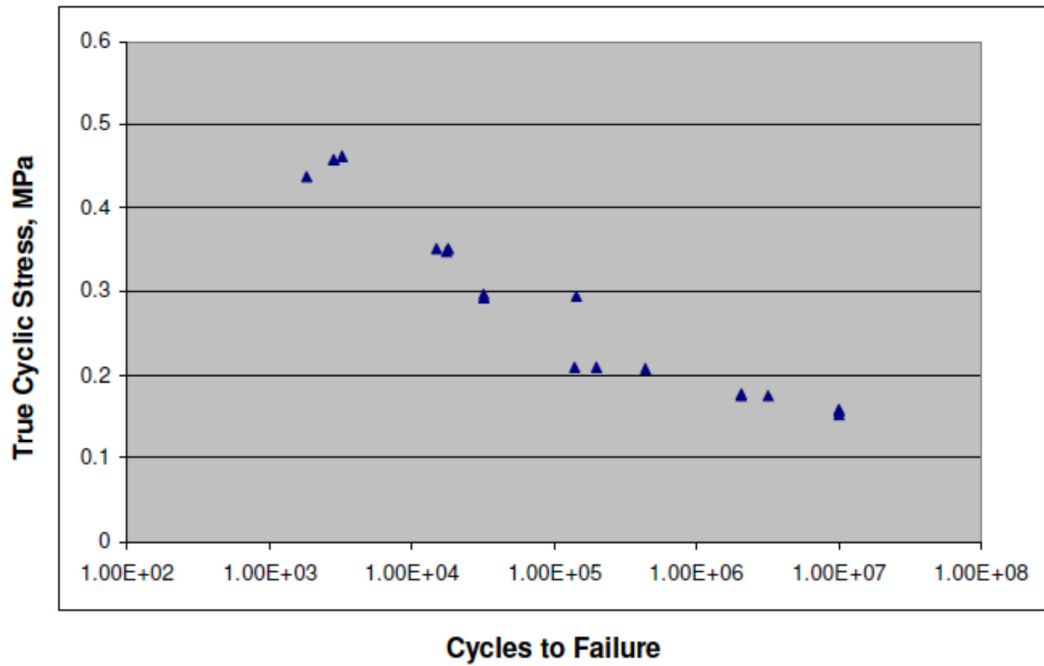
ND – Not Determined

* – run out

True Cyclic Stress-Strain Curve



Constant amplitude Strain-Life Curve



Cyclic Properties (see Row A)

Material Designation	Cyclic Yield Strength 0.2% offset $K'(0.002)^{1/n'}$ MPa (10^3 psi)	Cyclic Strength Coefficient K' MPa (10^3 psi)	Cyclic Strain Hardening Exponent n'	Cyclic Elastic Modulus E_c GPa (10^3 psi)	Fatigue Strength Coefficient σ'_f MPa (10^3 psi)	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: $\Delta\epsilon/2 = \Delta\sigma/2E + (\Delta\sigma/2K')^{1/n'}$
Constant amplitude fatigue life curve: $\Delta\epsilon/2 = \sigma'_f/E (2N_f)^b + \epsilon'_f (2N_f)^c$