FL-5305

Density: 7.10 g/cm^3

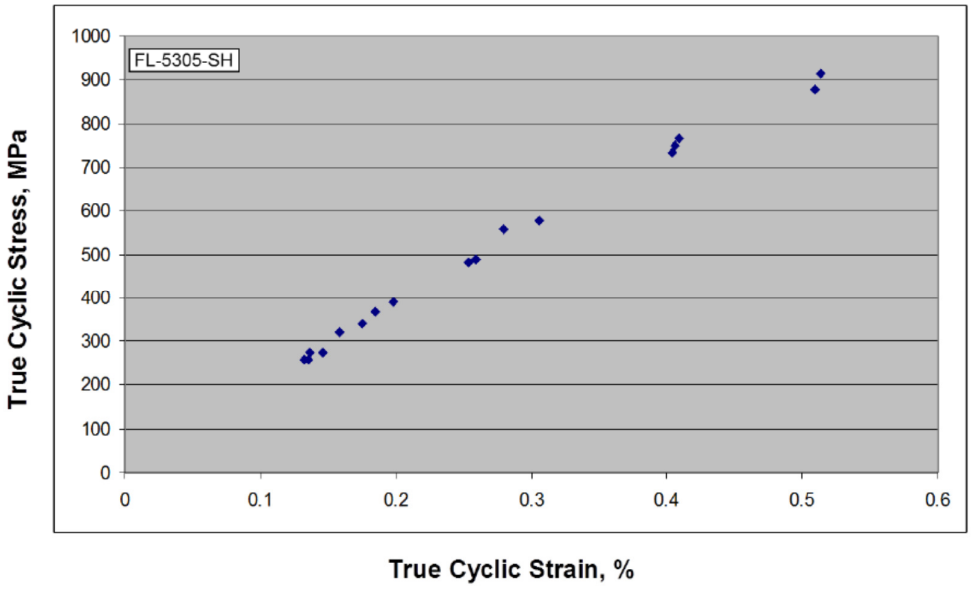
Material: Prealloyed Steel (0.50 Mo, 0.20% Mn, 3.0% Cr, balance Fe) + mixed additions of 0.55%Graphite and 0.40% lubricant

Treatment: Die Compact, Sinter at 1120°C, Sinter harden (cooling rate 15.5°C/sec), Temper at 204°C for 1 hour,

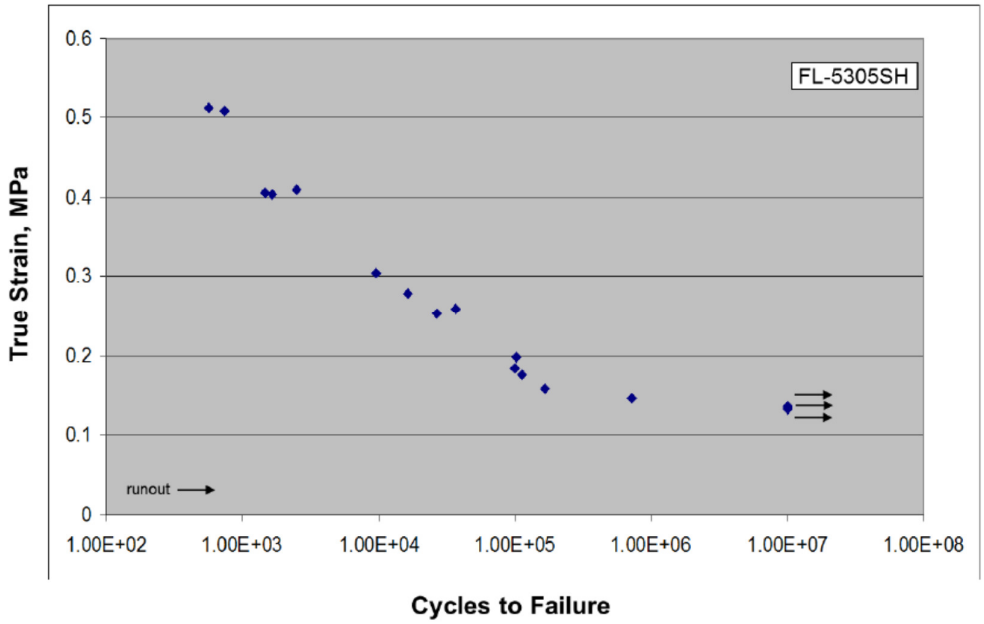
Table – Strain and Stress Amplitudes vs. Reversals to Failure

Test # ID	Stress (MPa)	TRUE Stress (MPa)	Strain (%)	TRUE Strain (%)	Plastic Strain (%)	Elastic Strain (%)	Reversals to Failure
1	908	913	0.5148	0.5135	0.0348	0.4787	1,136
2	873	877	0.5109	0.5096	0.0496	0.46	1,496
7	764	767	0.4103	0.4094	0.007	0.4024	5,060
8	746	749	0.4071	0.4063	0.0134	0.3929	2,914
9	731	734	0.4044	0.4035	0.0183	0.3852	3,300
3	575	577	0.306	0.3055	0.0028	0.3027	19,370
10	557	559	0.2805	0.2801	0	0.293	32,628
6	488	489	0.2589	0.2586	0.0022	0.2564	74,028
5	481	482	0.2539	0.2535	0.0008	0.2528	53,056
11	390	391	0.1986	0.1984	0	0.2052	204,328
12	367	367	0.1845	0.1843	0	0.1927	198,980
13	339	340	0.1758	0.1757	0	0.1783	227,260
14	319	319	0.159	0.1589	0	0.1674	331,634
16	274	274	0.1461	0.146	0.0023	0.1437	1,435,012
17	273	274	0.1363	0.1362	0	0.1435	20,000,000
18	257	257	0.1353	0.1352	0.0003	0.135	20,000,000
15	258	258	0.1327	0.1326	0	0.1355	20,000,000

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'_f (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: $\Delta\varepsilon/2 = \sigma'f/E\ (2Nf)b + \varepsilon'f\ (2Nf)c$

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

NPD = No Plastic Deformation