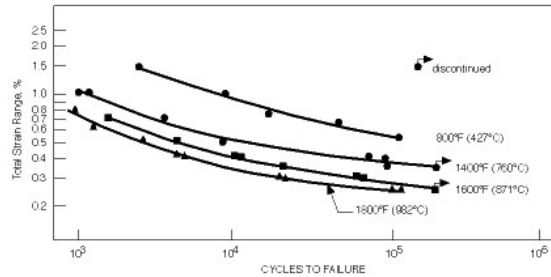


# HAYNES<sup>®</sup> 230<sup>®</sup> alloy

## Low Cycle Fatigue

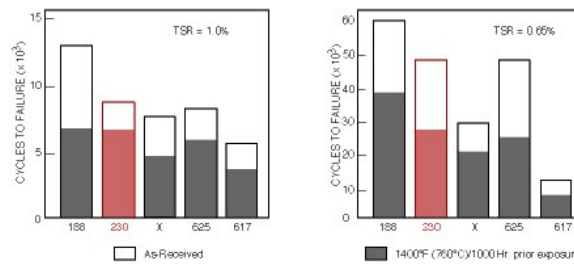
HAYNES<sup>®</sup> 230<sup>®</sup> alloy exhibits excellent low cycle fatigue properties at elevated temperature. Results shown below are for strain-controlled tests run in the temperature range from 800 to 1800°F (425 to 980°C). Samples were machined from plate. Tests were run with fully reversed strain (R=-1) at a frequency of 20 cpm (0.33 Hz).



### Comparative Low Cycle Fatigue Properties

The graph below compares the low cycle fatigue lives of a number of alloys tested at 800°F (427°C) in both the as-received and 1400°F (760°C)/1000 hour pre-exposed condition. Samples were machined from plate or bar, after exposure for exposed samples. Tests were again run with fully reversed strain (R=-1) at a frequency of 20 cpm (0.33 Hz). TSR=Total Strain Range.

#### 800°F (425°C) LCF Life for Various Alloys



#### Compilation of axial LCF test results (R=-1, f=0.33 Hz)

Temperature		$\Delta\epsilon_{tot}/\%$	$N_i$ , Cycles to Initiation	$N_f$ , Cycles to Failure
°F	°C			
800	427	1.50	2230	2398
		1.00	8480	8742
		0.80	14,918	16,575
		0.65	45,127	46,523
		0.55	103,910	115,456
1000	538	1.50	1329	1540
		1.25	1974	2368
		1.00	3330	4413
		0.80	7864	8734
		0.70	8423	9876
		0.60	38,696	40,604
		0.56	73,014	74,132

		0.53	--	200,005*
		0.50	--	201,190*
1200	649	1.25	1022	1257
		1.00	1852	2254
		0.80	3431	4248
		0.60	8962	11,058
		0.50	82,275	85,563
		0.45	--	200,002*
		0.40	--	200,005*
		1400	760	0.80
0.40	20,519			21,564
0.40	43,915			45,279
0.30	--			203,327*
1400	760	1.00	870	1097
		1.00	827	990
		0.70	3166	3622
		0.50	8153	8490
		0.40	51,285	57,819
		0.40	68,451	75,470
		0.38	95,165	96,844
		0.37	91,879	97,612
		0.35	--	202,920*
		0.30	--	150,000*
1600	871	0.70	1279	1504
		0.50	3939	4299
		0.50	3176	3473
		0.40	9712	10,837
		0.40	9296	10,781
		0.35	19,179	20,964
		0.31	61,898	63,253
		0.30	65,691	66,926
		0.25	--	200,770*
1800	982	0.60	818	1218
		0.50	1506	2582
		0.40	3520	4223
		0.40	3070	4784
		0.30	19,810	21,311
		0.30	13,904	19,200
		0.25	105,140	106,020
		0.25	116,960	119,890

\* Indicates a run-out.