HAYNES® 242® alloy

Fatigue Properties

Strain-Controlled LCF Properties (Hot-Rolled Plate)

The following LCF properties were generated from hot-rolled and fully heat-treated plate. Testing was performed in the transverse direction utilizing a smooth, round bar specimen geometry. The specimens were tested by fully reversed axial strain cycling, R-ratio of -1.0, and a cycle frequency of 20 cpm (0.33 Hz) at a strain range of 1%.

Cycles to Failure at 1200°F (650°C), N_F			
242®	**X**	**188**	**HR-120®**
2000	4000	2100	3600

Stress-Controlled Notched LCF Properties (Hot-Rolled Rings)

The following test results were generated from hot-rolled and fully heat-treated rings destined for actual gas turbine engine part applications. Testing was performed in the tangential direction utilizing a round test bar geometry with a double notch design (K_t=2.18). Loading was uniaxial cycling with an R-ratio of 0.05 stress and a cycle frequency of 20 cpm (0.33 Hz).

Maximum Stress		Cycles to Failure at 1200°F (650°C), NF	
ksi	**MPa**	**242®**	**909**
110	760	**845**	2,835
100	690	**12,220**	22,568
95	655	**32,587**	13,796
90	620	**76,763**	55,679; 40,525
85	585	**297,848**	47,707; 43,701
80	550	**304,116***	129,573**

* No crack observed at 198,030 cycles. 8 mil (200µm) crack observed at 200,000 cycles.
**No crack observed at 45,800 cycles. 8 mil (200µm) crack observed at 47,770 cycles.