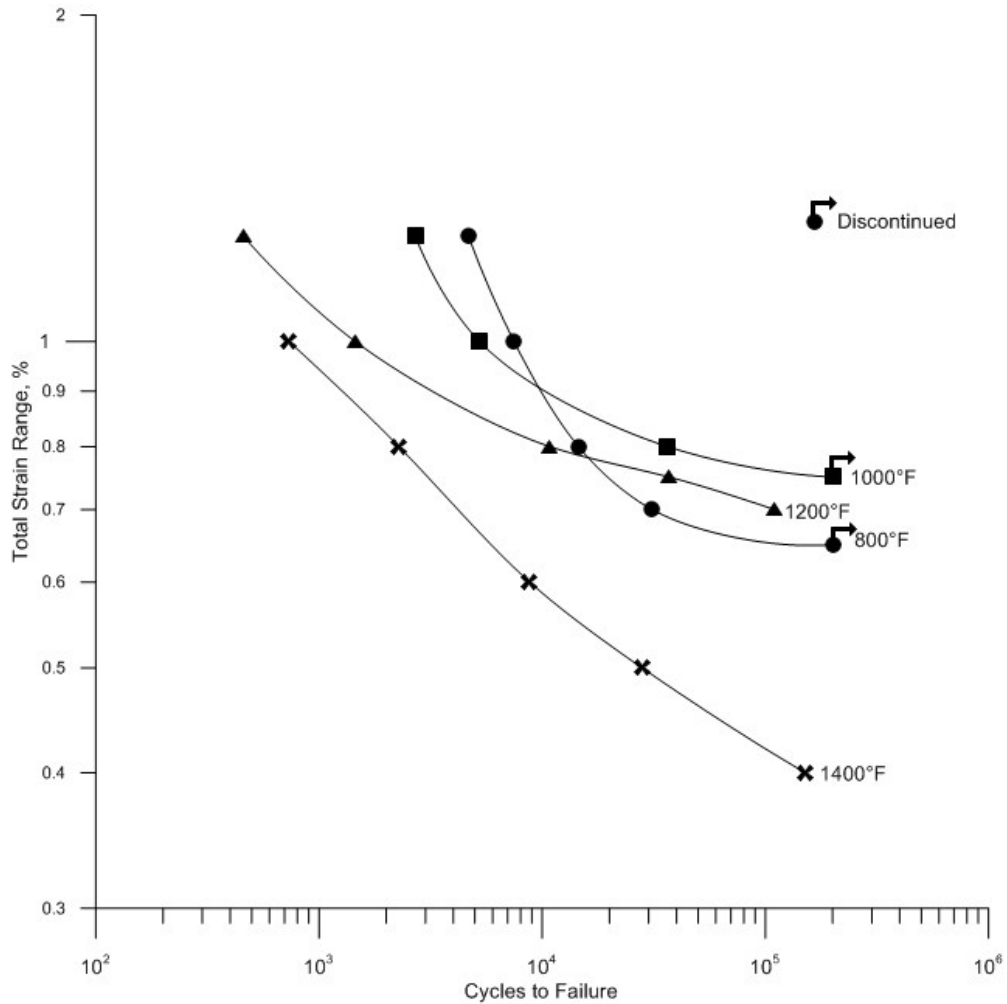


# HAYNES<sup>®</sup> 242<sup>®</sup> alloy

## Fatigue Properties

### Strain-Controlled LCF Properties (Hot-Rolled Plate)

HAYNES<sup>®</sup> 242<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 1400°F (425 to 760°C). Samples were machined from plate. Tests were run with fully reversed strain ( $R=-1$ ) at a frequency of 20 cpm (0.33 Hz).



## 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 <sup>®</sup>	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 (200 $\mu$ m) crack observed at 200,000 cycles.

\*\*No crack observed at 45,800 cycles. 8 mil (200 $\mu$ m) crack observed at 47,770 cycles.