General observations on fatigue:
Fatigue life decreases with increasing temperature.
Vanadium alloys are superior to 316 SS.

Some general observations:
Fatigue life decreases with increasing temperature.
Vanadium alloys are superior to 316SS in fatigue.

(Liu, 1981)

Vanadium alloys have been shown to be superior to 316SS at room temperature.

(Gieseke et al. 1995)

(316 annealed: Jaske, 1980)

(V-15Cr-5Ti: Liu, 1981)

Fatigue crack growth rates are perhaps higher in vanadium alloys than in stainless steel.

(van Witzenburg, 1994)

(316: Michel, 1975)

Conclusions and Recommendations

- Fatigue properties of vanadium alloys are usually superior to those of stainless steel
- Fatigue is a time consuming, expensive test that is alloy and microstructure sensitive
- Irradiation and He does not have a large effect in steels
- In general, low cycle fatigue is correlated with ductility and high cycle fatigue is correlated with strength, thus tensile tests can serve as a guide in predicting fatigue life.

- Fatigue testing should not be conducted until engineering data are required on the final alloy.

V-5Cr-5Ti has a longer fatigue life than 20% CW 316 SS at 400 °C.

(Gieseke et.al., 1995)

Vanstar alloys demonstrate lower life in low-cycle fatigue (air)

Vanstar alloys are hardened by ZrC.

(Vanstar: Korth, 1979)

(316SS: Grossbeck, 1982)