FS PRECISION TECH

3025 East Victoria Street
Rancho Dominguez, CA 90221
Tel: 310-638-0595
www.fs-precision.com

FS-2S
High Strength, Machinable Titanium Casting Alloy

US Patent Number: ***Pending***

General

FS-2S is a high strength, fatigue resistant titanium alloy designed for superior castability and machinability. FS Precision Tech's proprietary composition yields a microstructure with enhanced machining characteristics compared to Ti-6Al-4V. Most applications require no post-machining deburring operations. Mechanical properties of FS-2S exceed those of Ti-6Al-4V at temperatures to 1110F (600 C) and the beta rich structure reduces as-cast alpha case by a factor of two.

Chemical Composition

Chemical Composition Wt%	Min	Max
Aluminum	3.5	6.3
Vanadium	3.0	4.5
Chromium	1.0	2.5
Manganese	0.0	0.04
Iron	0.25	0.50
Silicon	0.06	0.12
Oxygen	0.15	0.25
Nitrogen	-	0.04
Hydrogen	-	0.013
Carbon	-	0.08
Titanium	Bal	Bal

Physical Properties

Physical Properties	
Density g/cm^3 (LBS/in^3)	4.46 (0.161)

Casting, Heat Treatment, & Weldability

FS-2S is readily castable by vacuum electric arc or induction methods. Enhanced fluidity produces exceptionally sound castings. Critical applications may benefit from hot isostatic pressing (HIP). Castings are stress relief annealed at 1025F for 8 hours. The alloy is easily welded with standard fillers and techniques with little effect on mechanical properties.

Mechanical Properties

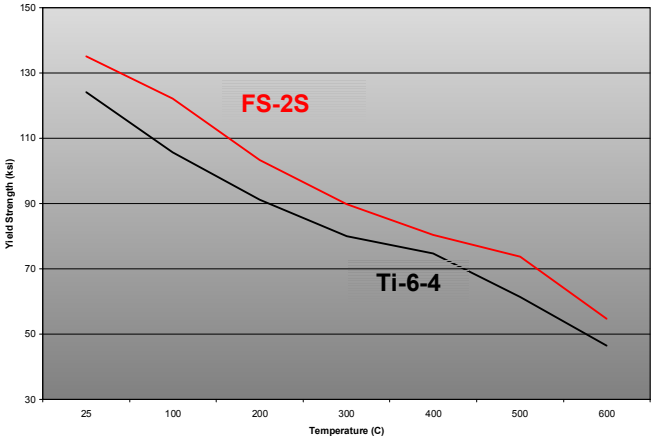
Typical room temperature mechanical properties of alloy FS-2S are 10% greater than Ti-6Al-4V with i improved ductility. High temperature strength is superior to Ti-6AL-4V to 1110F (600C).

Typical Room Temperature Mechanical Properties

Condition: Cast, HIP'd, and Vacuum Stress Relief Annealed

Alloy	Ultimate Tensile Strength (ksi)	0.2% Yield Strength (ksi)	elongation %
FS-2S	148	135	12
Ti-6Al-4V	135	120	9

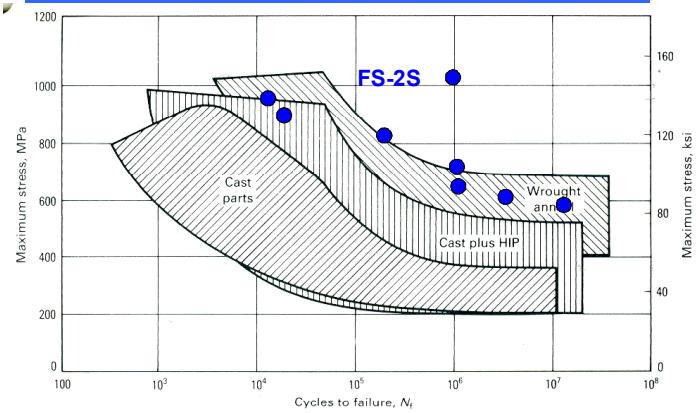
Elevated Temperature Properties of FS-2S vs Ti-6-4 Castings



Fatigue Properties

FS-2S exhibits superior fatigue resistance to cast & HIP'd Ti-6Al-4V. Smooth bar axial fatigue resistance is comparable to wrought, annealed titanium alloys.

Smooth Bar Axial Fatigue Behavior of FS-2S vs. Ti-6-4 (R=+0.1) FS-2S HIP'd & Stress Relief Annealed



Mechanical properties data presented herein were independently verified by Stork Materials Technology, Huntington Beach, CA
Comparative data from ASM International, Metals Handbook, Volume 2, 10th ed. 1990.