Titanium alloys

Category:

High temperature

Titanium alloy Ti-SF60

Titanium Ti-SF60 is a new generation high temperature Titanium alloy. It is in service for many high temperature aerospace applications. It is also available for casting application.

General properties:

- High strength at elevated temperatures
- Excellent creep resistance
- Wide processing window

Comparison with Standard alloy Ti-6242Si:

Advantages: - Higher fatigue strength
- Higher creep resistance

Disadvantages: - None

Material composition

Chemical Composition: Ti-5.8Al-4.2Sn-1.5Ta-1.0Nb-0.3Si

Mechanical properties

Alloy	UTS	YS	El	UTS	YS	El	Fatigue	Residual	E-Modulus	Microstructure
	Rt			600°C			760°C	Strain*		
	Mpa	Mpa	%	Mpa	Mpa	%	Mpa, 10^7	%	Gpa	
Ti-SF60	**1058**	**989**	**14**	**674**	**553**	**23**	**176**	**0.079**	**121**	**Bi-modal**
Ti-SF61	1068	1050	11	752	655	16	195	0.029	120	Equiaxed, a+btrans
Timetal-834	1040	945	12	654	510	15	142	0.082	119	Equiaxed, a+b_{trans}
Ti-6242	1020	910	12	560	485	15	138	0.154	116	-

*After creep exposure at 600°, 150 Mpa, 100h.

Physical data

Hardness: 32-35 HRC
Density: 4.604 g/cm³
Elastic modulus 20°C: 121 GPa
Elastic modulus 200°C: 110 GPa
Elastic modulus 300°C: 106 GPa
Elastic modulus 400°C: 101 GPa
Elastic modulus 500°C: 97 GPa
Elastic modulus 600°C: 92 GPa
Elastic modulus 700°C: 87 GPa
CTE: 8.6x10-6
Thermal conductivity: 8 W/mK

Applications

- Inlet and outlet valves
- Compressor discs
- Compressor blades

Delivery form

- Bars, Plates, Forgings
- Forged valve blanks

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