

# CR14 Titanium Alloy

## Product Data Sheet

## New generation Ti Alloy CR14

For motorsport, defence & aerospace applications

**CR14 Titanium Alloy is a combination of proprietary chemistry, thermomechanical processing and heat treatment.**

The material offers a unique balance of low density, high strength, ductility and stiffness, which results in performance exceeding that of all known production titanium alloys. Initially developed for inlet valves in race engines, further process developments have successfully established the product for use in very high performance connecting rods.



### Motorsport Applications:

- Proven Inlet valves, showing improved durability and valve control
- High level connecting rods, showing a 15% mass reduction when compared to competitive designs in 6Al 4V and SP700 Titanium
- Gudgeon pins; lower mass than hollow steel and solid TiAl applications
- Turbocharger impellers, quill shafts
- Valvetrain top retainers
- Chassis components

### Aerospace Applications

For components requiring high specific strength, high specific stiffness and excellent ductility.

- Replacement for 6 Al 4V / 6242 / 6246
- Fuselage components & struts
- Aircraft engine CFRC fan blade leading edges, compressor blades and impellers
- Gun components and armour
- Satellite structural components

### About Smiths High Performance

Smiths High Performance is a leading stockholder and supplier of high-performance engineering materials to the global motorsport sector. We are supply partners in a range of specialist motorsport markets including Formula 1, Formula E, NASCAR, MOTO GP, WEC & WRC.

Further technical data available on the reverse of this Datasheet

## Mechanical Properties

Data for Single Extruded Condition

Temperature (°C)	RT	200
0.2% PS (MPa)	937	
UTS (MPa)	1100	
El (%)	16.3	
E (GPa)	131.8	
10 <sup>5</sup> cycle FS (MPa)	675	525
10 <sup>6</sup> cycle FS (MPa)	625	495
10 <sup>7</sup> cycle FS (MPa)	580	465
Density (g/cm <sup>3</sup> )	4.35	--

High ductility, good strength at low temperature.

Data for Double Extruded Condition

Temperature (°C)	RT	500	600
0.2% PS (MPa)	1350	910	920
UTS (MPa)	1360	1040	980
El (%)	9	20	20
E (GPa)	135	---	119
10 <sup>5</sup> cycle FS (MPa)	725	640	580
10 <sup>6</sup> cycle FS (MPa)	700	610	520
10 <sup>7</sup> cycle FS (MPa)	675	580	460
Density (g/cm <sup>3</sup> )	4.35	---	---

High ductility, good strength at medium temperature.

Fatigue testing is axial, R=-1, 100Hz.

## Product Summary

- A unique combination of chemistry, microstructure and process route resulting in a competitive balance of engineering properties
- Properties include low density, high stiffness, fatigue life, ductility and strength
- Lighter, stiffer, improved life components should be achieved when compared to those made in Ti6242, Ti6246, SP700 and Ti64
- Short lead-time available for prototype quantities
- Manufacturing accomplished with no additional difficulty compared to common wrought Titaniums
- Machining techniques such as milling, turning, gun drilling, honing and grinding applications have all been established for the material
- Thread cold forming techniques have been developed successfully, demonstrating the ample ductility of the material
- Surface engineering methods such as super finishing techniques, shot peening, molybdenum flame spray, PVD CrN and DLC established.

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When you purchase high-performance materials from **Smiths High Performance**, you will be joining some of the biggest and best global engineering companies. We are a Tier 1 supply chain partner to the world's leading motorsport companies. Our unique business structure and ethos allows us to offer services which are otherwise unavailable in this market sector.

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