SHP 834 Ultimate

Product Data Sheet

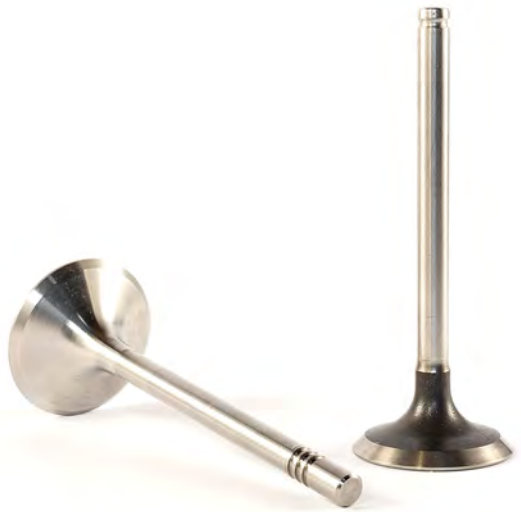
Enhancing Performance

SHP 834 Ultimate is a titanium product which takes performance to another level

Designed originally for use in the aerospace sector, SHP 834 Ultimate is a high-performance alloy which is also highly suitable for motorsport applications. Our product offers improved temperature capability when compared to 6242 titanium.

Titanium is a product that can be modified by alloying to offer different performance characteristics. In the case of SHP 834 Ultimate (near-alpha alloy), small amounts of beta-phase stabilisers; Niobium, Molybdenum and Silicon and increased alpha stabilisers; Aluminium, Zirconium and Carbon, introduced during the alloying process, change the performance characteristics of the material. Increases in tensile strength, creep resistance and fatigue resistance is the result.

SHP 834 Ultimate undergoes solid-solution strengthening and precipitation strengthening to achieve its performance characteristics which are superior to 6242. During production, the material also benefits from heat treatment high in the alpha plus beta phase field. Resulting features include increased creep resistance (up to 110° F (600° C)) and an overall increase in tensile strength. Fatigue resistance is also much improved when compared to 6242 titanium. Properties of this alloy are maintained to a reasonable level up to bar thicknesses of 75mm (3 inches) - in greater diameters, a small reduction in overall strength may be observed.



Other Characteristics

SHP 834 Ultimate can be welded using well-established welding techniques specific to titanium products.

Motorsport Applications:

- High-performance racing engine parts
- Applications where good tensile strength combined with good creep and fatigue resistance is essential
- Exhaust valves

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

SHP 834 Ultimate

Chemical Composition

	Min	Max
Aluminium	5.50	6.10
Tin	3.00	5.00
Zirconium	3.00	5.00
Niobium	0.50	1.00
Molybdenum	0.25	0.75
Silicon	0.20	0.60
Carbon	0.04	0.08
Iron	-	0.05
Oxygen	0.075	0.15
Nitrogen	-	0.03
Hydrogen	-	0.006
Residual elements, each	-	0.05
Residual elements, total	-	0.20
Titanium	Remainder	

Physical Properties

Property	Values	
Density	0.164lb in^{-3}	4.55g cm^{-3}
Beta Transus	1913°F	1045°C
Thermal Conductivity*	4.08 Btu $hr^{-1}ft^{-1}°F^{-1}$	7.06 W $m^{-1}K^{-1}$
Magnetic Permeability	Nonmagnetic	
Mean Coefficient of Thermal Expansion		
68-392°F (20-200°C)	5.9 x 10^{-6}in $in^{-1}°F^{-1}$	10.6 x 10^{-6} $mm^{-1}°C^{-1}$
68-752°F (20-400°C)	6.1 x 10^{-6}in $in^{-1}°F^{-1}$	10.9 x 10^{-6} $mm^{-1}°C^{-1}$
68-1112°F (20-600°C)	6.1 x 10^{-6}in $in^{-1}°F^{-1}$	10.9 x 10^{-6} $mm^{-1}°C^{-1}$
Elastic Modulus*	~17.4Msi	~120 GPa

* Typical values at room temperature of about 68-78°F (20-25°C)

Mechanical Properties (minima)

Test Temperature	UTS ksi (MPa)	0.2% YS ksi (MPa)	Elongation 5D %in	Reduction Area %	Notched Tensile Strength K_t=3	Fracture Toughness K_{1c} ksi√in (MPa√m)
68°F (20°C)	149 (1030)	132 (910)	6	15	1.45 x actual tensile strength	40 (45)
1112°F (600°C)	85 (585)	65 (450)	9	20	–	–

Availability

We stock SHP 834 Ultimate in bar and forgings

...where performance matters...

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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