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Application and Characteristics of Titanium alloy

items	No.	Chemical composition		Room temperature mechanical properties			High temperature mechanical properties			Application
				Heat treatment	σ b/Mpa	δ /%	Test temperature/℃	σ b/MPa	σ 100/MPa	
Industrial pure titanium	TA1	Ti(Very small impurities		Annealing	300～500	30～40				Parts that work below 350 ℃ and have low strength requirements
	TA2	Ti(Very small impurities		Annealing	450～600	25～30				
	TA3	Ti(Very small impurities		Annealing	500～700	20～25				
α Titanium	TA4	Ti-3Al Al2.0～3.3		Annealing	700	12				Parts operating below 500 ° C, missile fuel tanks, supersonic aircraft turbines
	TA5	Ti-4Al-0.005B	Al3.3～4.7 B0.005	Annealing	700	15				
	TA6	Ti5Al Al4.0～5.5	Al4.0～5.5	Annealing	700	12～20	350	430	400	
β Titanium	TB2	Ti-5Mo-5V-8Cr-3A	o4.7 ～ 5.7 V4.7 ～5.7 Cr7.5～8.5 Al2.5～3.5	Quenching	100	20				Parts that work below 400 ° C, engine parts with high temperature strength, parts for low temperature
				Quenching + aging	1350	8				
α + β Titanium	TC1	Ti-2Al-1.5Mn	Al1.0～2.5 Mn0.7～2.0	Annealing	600～800	20～25	350	350	350	Parts that work below 400 ° C, engine parts with high temperature strength, parts for low temperature
	TC2	Ti-3Al-1.5Mn	Al3.5～5.0 Mn0.8～2.0	Annealing	700	12～15	350	430	400	
	TC3	Ti-5Al-4V	Al4.5～6.0 V3.5～4.5	Annealing	900	8～10	500	450	200	
	TC4	Ti-6Al-4V	Al5.5～6.8 V3.5～4.5	Annealing	950	10	400	630	580	
				Quenching + aging	1200	8				

As a leading manufacturer of Oilless Bushings and Bimetal bushings, we use high-quality titanium alloys for specific high-performance applications. Below are the technical characteristics of common titanium grades used in our production process.

Common Questions on Titanium Alloy Applications & Characteristics

Q: What are the main applications for Industrial Pure Titanium (TA1, TA2, TA3)?

A: According to the technical chart, Industrial Pure Titanium grades like TA1, TA2, and TA3 are primarily used for parts that work at temperatures below 350°C and have low strength requirements. They are valued for their excellent corrosion resistance in various environments.

Q: Which titanium alloy grade is recommended for high-temperature aerospace components?

A: For high-performance applications like missile fuel tanks and supersonic aircraft turbines, TA5 (Ti-4Al-0.005B) is highly recommended as it can operate effectively at temperatures up to 500°C. Additionally, TC4 (Ti-6Al-4V) is a versatile choice for engine parts requiring high temperature strength up to 400°C.

Q: How do the mechanical properties of TC4 titanium alloy change with heat treatment?

A: The chart shows that TC4 (Ti-6Al-4V) alloy's tensile strength (σb/Mpa) is approximately 900 after Annealing. However, when undergoing Quenching + aging, its strength can be significantly enhanced to reach 1200 Mpa, providing superior load-bearing capacity for demanding industrial components.

Q: What is the typical use for β Titanium alloys like TB2?

A: TB2 (Ti-5Mo-5V-8Cr-3Al) is an ideal material for engine parts that require high temperature strength while working below 400°C. It offers a unique balance of plasticity and high strength, especially after specialized heat treatments like quenching.