

# Titanium Investment Cast

Cast Titanium Alloys

NEWAY PRECISION WORKS

NewayPrecision

[www.newayprecision.com](http://www.newayprecision.com)

## Technical Data: Cast Titanium Alloys

### Product Description

In Consumer Electronics, titanium investment castings are used in lightweight yet robust components like smartphone casings. In Telecommunication, they enable the development of efficient antenna brackets. For Lighting Solutions, these castings enhance the longevity of fixtures in harsh environments. They also contribute to the ruggedness of Power Tools, ensuring reliability in demanding tasks. Moreover, the Locking system benefits from its exceptional wear resistance and reliability.

Typical Cast Titanium We Use:

Grade 2 Ti (Ti-CP)

Grade 5 Ti (Ti-6Al-4V)

Grade 19 Ti (Beta-C)

Grade 23 Ti (Ti-6Al-4V ELI)



### Chemical Comparison of Cast Stainless Steel

Alloy Grade	Titanium (Ti)	Aluminum (Al)	Vanadium (V)	Tin (Sn)	Iron (Fe)	Oxygen (O)	Other Elements
Grade 2 Ti	99.20%	-	-	-	0.30%	0.25%	-
Grade 5 Ti	90.70%	6.00%	4.50%	-	0.25%	0.20%	-
Grade 19 Ti	90.90%	6.00%	4.00%	0.25%	0.25%	0.15%	-
Grade 23 Ti	90.00%	6.00%	4.00%	-	0.25%	0.13%	0.1% Al, 0.4% Sn

### Physical and Mechanical

Grade	Tensile Strength	Yield Strength	Hardness	Shear Strength	Impact Strength	Fatigue Strength	Thermal Conductivity	Density	Melting Range
	(MPa)	(MPa)	(Brinell)	(MPa)	(J)	(MPa)	(W/m·K)	(g/cm <sup>3</sup> )	(°C)
Grade 2 Ti	345	275	120	205	60	215	20.9	4.51	1670-1700
Grade 5 Ti	895	830	330	550	85	330	6.7	4.43	1635-1650
Grade 19 Ti	485	345	135	295	70	230	11.8	4.49	1660-1680
Grade 23 Ti	828	759	320	545	110	315	6.7	4.51	1630-1650

### Note

The above data are reference material science data. This data reference is not binding and is not considered as authoritative test data. If your material requirements are extremely precise, please contact our material engineers. Tel | +86 18926788217 | Web | [www.newayprecision.com](http://www.newayprecision.com) | Contact Neway



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### Typical Properties

#### Grade 2 Titanium (Ti-CP)

Grade 2 Titanium (Ti-CP), with its impressive 99% titanium composition, boasts exceptional characteristics that make it a valuable choice for investment casting applications. Its primary attributes include remarkable corrosion resistance, making it well-suited for harsh industrial environments. In investment casting, where precision is paramount, this corrosion resistance ensures the longevity and reliability of the cast components. Moreover, Grade 2 Titanium's high formability and weldability are advantageous for intricate casting processes, allowing for the creation of intricate, high-precision parts.

One prominent application of Grade 2 Ti in investment casting is in the aerospace industry. It finds use in producing intricate components, such as turbine blades and structural elements, whose corrosion resistance and lightweight nature are pivotal. This titanium grade is also employed in the medical device sector to craft biocompatible and durable implants. Its non-reactive properties ensure patient safety and long-term functionality. Grade 2 Titanium's ability to maintain its integrity in demanding conditions makes it an exceptional choice for investment casting in both industries.



### Typical Properties

#### Grade 5 Ti (Ti-6Al-4V)



Grade 5 Titanium, commonly called Ti-6Al-4V, is an illustrious titanium alloy admired for its high-strength properties. Comprising 90% titanium, 6% aluminum, and 4% vanadium, it offers a perfect blend of strength, heat resistance, and corrosion resistance. These characteristics make it a prime choice for investment casting, particularly in industries where precision and reliability are paramount.

One noteworthy application of Grade 5 Ti in investment casting is within the aerospace sector. It is pivotal in creating critical components such as aircraft engine parts and structural elements. Its remarkable strength and heat resistance ensure that the components can withstand extreme conditions, contributing to enhanced flight safety. Furthermore, this titanium alloy in the medical industry is utilized to craft implants that necessitate strength and biocompatibility.

### Typical Properties

#### Grade 19 Ti (Beta-C)

Grade 19 Titanium, also known as Beta-C titanium, exhibits several vital features that make it a valuable material in investment casting. Comprising 3% aluminum and 8% vanadium, this titanium alloy belongs to the beta-titanium alloy family. Its noteworthy attributes include exceptional formability and high-temperature stability. These characteristics are highly advantageous in investment casting processes, where precision and durability are paramount.

In investment casting, Grade 19 titanium shines in applications that demand intricate and complex shapes. Its ability to withstand high temperatures with poise makes it a prime choice for crafting critical components within the aerospace industry. Aircraft engine parts and airframe structures benefit significantly from Beta-C titanium, as it facilitates intricate casting and offers the resilience needed to endure demanding flight conditions. The combination of formability and high-temperature stability makes Grade 19 Titanium an exceptional choice for investment casting applications in the aerospace sector, aligning perfectly with the stringent requirements of this industry.



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