

MIM Ti-6Al-4V Injection Molding

Titanium Alloy Injection Molding

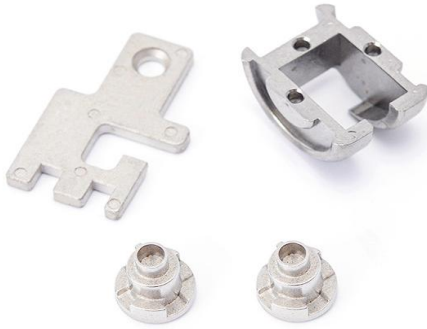
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Technical Data: MIM Ti-6Al-4V Titanium Alloy

Product Description



Ti-6Al-4V (Grade 5) materials exhibit exceptional properties when utilized in metal injection molding (MIM). This alloy combines high strength with a low weight, resulting in a remarkable strength-to-weight ratio that makes it a prime choice for MIM applications. Its corrosion resistance is another standout feature, ensuring longevity and reliability in various environments. Moreover, Ti-6Al-4V is biocompatible, making it invaluable for producing medical and dental implants through MIM processes. Its easy weldability enhances manufacturing flexibility and maintains its properties at elevated temperatures, rendering it suitable for aerospace components requiring heat resistance.

Ti-6Al-4V (Grade 5) in MIM stands out due to its high strength, corrosion resistance, biocompatibility, weldability, and heat resistance. These attributes make it a sought-after material for diverse applications, including aerospace, medical implants, automotive components, sports equipment, and any industry where lightweight, durable, and robust parts are essential.

Chemical Composition

Element	Titanium (Ti)	Aluminum (Al)	Vanadium (V)	Oxygen (O)	Nitrogen (N)
Composition	90.20%	6.00%	4.00%	0.13%	0.05%

Physical and Mechanical

Alloys	Status	Tensile Strength	Yield Strength	Impact Strength	Hardness	Young's Modulus	Poisson's Ratio	Elongation	Density
		Mpa	Mpa	J	HRC	Gpa	Ratio	% in 25.4 mm	g/cm ³
MIM W-Fe	As Sintered	950	860	40	38	115	0.31	12	4.43

Typical Properties

Ti-6Al-4V (Grade 5) Injection Molding Parts In Aerospace

Ti-6Al-4V (Grade 5) injection molding parts find vital applications in the aerospace industry due to their exceptional properties. Firstly, their high strength-to-weight ratio is critical for reducing the weight of aircraft components, enhancing fuel efficiency, and ultimately reducing operational costs. These parts are commonly used in structural elements such as airframe components, landing gear, and engine components.

Secondly, Ti-6Al-4V's corrosion resistance is crucial for aerospace applications, as it ensures the longevity and reliability of components exposed to various environmental conditions. Whether in the harsh conditions of high-altitude flight or the corrosive effects of jet fuel and moisture, this material stands up to the challenge.



Note

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Typical Properties

Ti-6Al-4V (Grade 5) Injection Molding Parts In Medical Implants



Ti-6Al-4V (Grade 5) injection molding parts play a crucial role in medical implants due to their exceptional biocompatibility and mechanical properties. One of the primary applications is in orthopedic implants, such as hip and knee replacements. These implants require materials that can withstand the mechanical stresses of joint movement while remaining biocompatible with the human body. Ti-6Al-4V offers strength and corrosion resistance, making it an ideal choice for these critical applications, ensuring improved patient mobility and comfort.

In addition to joint replacements, dental implants are another significant application area. Ti-6Al-4V's biocompatibility and resistance to corrosion make it suitable for dental implants, where it can seamlessly integrate with the jawbone, providing a stable foundation for dental prosthetics. Moreover, its lightweight nature reduces the load on surrounding tissues.

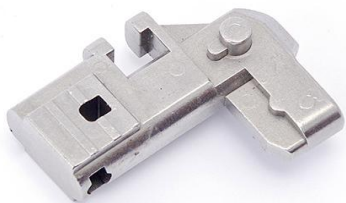
Ti-6Al-4V (Grade 5) Injection Molding High-Performance Automotive Parts

Ti-6Al-4V (Grade 5) injection molding parts have gained significance in the automotive industry for their contribution to high-performance vehicle components. One notable application is in exhaust systems. These parts require materials that can withstand high temperatures corrosion from exhaust gases and provide excellent strength-to-weight ratios. Ti-6Al-4V's heat resistance, corrosion resistance, and lightweight properties make it an ideal choice for manufacturing exhaust components, contributing to improved engine performance and fuel efficiency.

Another crucial application lies in engine components. Ti-6Al-4V creates lightweight and durable engine parts such as valves, connecting rods, and pistons. The alloy's strength, heat resistance, and reduced weight enhance engine efficiency and power output. It, in turn, leads to better overall vehicle performance, making Ti-6Al-4V (Grade 5) injection molding parts a valuable asset in high-performance automotive engineering.



Ti-6Al-4V (Grade 5) Injection Molding Drone Parts



Ti-6Al-4V (Grade 5) injection molding parts find crucial applications in the drone industry, contributing to developing lightweight and high-performance unmanned aerial vehicles (UAVs). One primary application is in the manufacturing of drone frames and structural components. The alloy's excellent strength-to-weight ratio allows for creating robust yet lightweight frames, enhancing the drone's agility and flight performance.

Another vital application lies in drone propulsion systems. Ti-6Al-4V produces motor mounts, propeller hubs, and other critical parts. Its strength, heat resistance, and compatibility with high-speed rotations make it suitable for these components, contributing to drone propulsion systems' efficient and reliable operation. Overall, Ti-6Al-4V (Grade 5) injection molding parts play a pivotal role in advancing drone technology, enabling the creation of more capable and durable UAVs for various applications, from aerial photography to surveillance and beyond.

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