

MIM Ti-10V-2Fe-3Al Injection Molding

Titanium Alloy Injection Molding

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Technical Data: MIM Ti-10V-2Fe-3Al Titanium Alloy

Product Description



Ti-10V-2Fe-3Al, known as Titanium Grade 20, exhibits exceptional properties when employed in metal injection molding (MIM) processes. In MIM applications, Grade 20's specific properties shine, as it offers exceptional precision with a typical dimensional accuracy of up to $\pm 0.5\%$, ensuring that intricate components are manufactured with minimal variance.

Moreover, Grade 20's corrosion resistance is vital in applications such as Lighting Solutions, ensuring long-lasting and reliable performance, even in harsh environments. Its high modulus of elasticity, typically around 107 GPa, makes it a preferred material for components in Power Tools, enhancing their durability and structural integrity. In summary, Ti-10V-2Fe-3Al (Grade 20) is a versatile material for MIM, excelling in precision, strength, and corrosion resistance, making it an excellent choice across a spectrum of industries, including Consumer Electronics, Telecommunication, Lighting Solutions, and Power Tools.

Chemical Composition

Element	Titanium (Ti)	Vanadium (V)	Iron (Fe)	Aluminum (Al)
Composition (Weight %)	87.5	10	2	3

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 Ti-6Al-7Nb	As Sintered	950	860	12	28	108	0.35	10	4.51

Typical Properties

Titanium Ti-10V-2Fe-3Al (Grade 20) MIM Sintered Power Tool Parts

Ti-10V-2Fe-3Al (Grade 20) sintered parts, manufactured through Metal Injection Molding (MIM), help produce power tool components. A key component where Grade 20 shines is creating durable, high-strength cutting blades. The material's exceptional tensile and yield strength, typically around 950 MPa and 860 MPa, respectively, make it ideal for withstanding the mechanical stresses encountered during cutting and machining operations. These blades maintain their sharpness for longer durations, contributing to the longevity of the power tools.

Another vital application lies in the development of robust tool holders and chucks. Grade 20's high Young's Modulus of approximately 108 GPa ensures that these components maintain structural integrity even under demanding conditions, providing the clamping force and stability required for precise and efficient power tool operation.



Note

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Typical Properties

Titanium Ti-10V-2Fe-3Al (Grade 20) MIM Sintered Consumer Electronic Parts



Titanium Ti-10V-2Fe-3Al (Grade 20) MIM sintered parts exhibit their versatility and excellence in manufacturing various consumer electronic components. One critical application is in the production of precision connectors. The material's exceptional dimensional accuracy, with a typical tolerance of up to $\pm 0.5\%$, ensures that connectors fit seamlessly, enhancing the reliability of electronic devices. Grade 20's precision plays a crucial role in maintaining uninterrupted data transmission, whether it's USB or intricate internal circuitry connectors.

Additionally, Grade 20 finds use in housing and enclosures for consumer electronic devices. Its high corrosion resistance ensures these casings remain resilient even in harsh environments, protecting delicate electronic components. Furthermore, the material's high Young's Modulus, typically around 108 GPa, contributes to the structural integrity of these housings, safeguarding the internal electronics.

Titanium Ti-10V-2Fe-3Al (Grade 20) MIM Sintered E-mobility Parts

In E-mobility, applying Titanium Ti-10V-2Fe-3Al (Grade 20) MIM sintered parts is instrumental in several critical components. One prominent use is in developing electric vehicle (EV) motor components. Grade 20's high tensile strength, typically around 950 MPa, and impressive Young's Modulus of approximately 108 GPa ensure that motor parts, such as rotor cores and stators, can withstand the rigors of high-speed rotation and maintain their structural integrity, contributing to the overall efficiency and reliability of electric motors in EVs.

Moreover, Grade 20 plays a significant role in producing battery terminals and connectors. Its precision and low dimensional variation, with typical tolerances of up to $\pm 0.5\%$, are crucial in ensuring reliable electrical connections within the battery system. The material's corrosion resistance further enhances the durability of these components, which is essential for the longevity and safety of E-mobility solutions.



Titanium Ti-10V-2Fe-3Al (Grade 20) MIM Sintered Energy Industry Fasteners



In the energy industry, applying Titanium Ti-10V-2Fe-3Al (Grade 20) MIM sintered parts creates high-strength bolts and fasteners in power generation equipment, such as gas turbines and wind turbines. Grade 20's exceptional tensile strength, typically around 950 MPa, and impressive Young's Modulus of approximately 108 GPa ensure that these fasteners can securely hold together critical components, even in high-stress environments.

Furthermore, Grade 20's corrosion resistance is vital in energy applications, especially in offshore wind farms and power plants where exposure to harsh weather conditions is expected. These fasteners maintain their integrity over time, reducing the need for frequent maintenance and replacements.

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