Optical Module Die Casting Technology



Overview

Optics Die Casting Elimold offers sand casting, die casting and investment casting processes for optical components to ensure consistent quality assurance.

Key Takeaways

Optical modules can be embedded in die casting molds using insert molding techniques, where the module is fixed in the mold and molten metal is injected around it to form a permanent, integrated part.

Step-by-

Step Process1. Mold and Insert Design Design a mold that accommodates the optical module, ensuring cavities, clamping grooves, and ventilation paths are included. The module is typically placed in a molding insert within the mold core, which may have concave grooves to hold the module securely.

Draft angles and uniform wall thickness should be considered to prevent sticking and ensure smooth metal flow. 2. Module Fixation Use mechanical clamping or negative pressure (vacuum) fixation to hold the optical module in place.

In advanced setups, gas paths in the mold guide negative pressure to the clamping groove, quickly adsorbing and fixing the module before metal injection. This prevents movement during the high-pressure die casting process. 3.

Ventilation and Gas Management Incorporate ventilation blocks and gas paths to allow trapped air to escape. Proper venting reduces defects such as porosity, pinholes, or cold shuts, which are common in thin-walled optical module die casting. 4.

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Material Selection Choose compatible die casting alloys, such as zinc alloys (No. 3, No. 4, No.

5) or aluminum alloys (ADC12, A380), considering thermal conductivity and flow characteristics. For high-performance optical modules, copper inserts may be used for superior thermal conductivity, but care must be taken due to copper's high melting point. 5.

Metal Injection Inject molten metal around the fixed optical module under controlled pressure and temperature. Adjust gate width, injection speed, and mold temperature to minimize defects and avoid mold erosion. Flow simulations can help optimize these parameters before production.

6. Cooling and Ejection Allow the casting to cool while maintaining module position. Cooling channels in the mold help manage temperature and prevent warping.

After solidification, eject the integrated part carefully to avoid damaging the optical module. 7.

Post-

Processing Trim excess metal, remove flash, and inspect for defects. The integrated optical module should be permanently bonded to the die-cast part, eliminating the need for secondary assembly operations.

Key Considerations

Ensure thin-wall design compatibility to reduce cold shuts and porosity. Maintain uniform mold temperature and adequate cooling to prevent sticking and mold erosion. Use negative pressure or mechanical clamping to secure the module during injection.

Optimize injection parameters to balance flow, pressure, and mold longevity. By following these steps, the optical module can be successfully embedded into the die casting process, improving production efficiency, yield, and structural integrity of the final part.

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Article Content

Optics Die Casting

Elimold offers sand casting, die casting and investment casting processes for optical components to ensure consistent quality assurance. We also provide services ranging from simulation verification to

Application Of Die-Casting In Optical Module Housing

Given these requirements, die casting emerges as an ideal manufacturing technique for optical module housing. Its ability to produce high

Custom Die Casting For Optical Communication | GuangWei

At Dongguan GuangWei Communication Technology Co., Ltd., we engineer high-precision zinc and aluminum alloy die-cast housings for next-generation optical transceivers — including SFP, SFP+,

How to achieve outstanding quality, performance and costing of optical ...

In general, the chassis and cover of the optical module are made of die-casting, which has the advantages of high dimensional accuracy and low processing cost, so it is the most commonly

Die Casting Optical Transceiver Housing

Our housings are integrally die-cast from aluminum alloy. Focus on controlling the dimensional accuracy of key mating interfaces and the flatness of contact

Why Die Castings Are Essential for Modern Optical Modules

Optical module die castings are created through a high-pressure metal casting process that injects molten metal into precision molds. This results in components with tight dimensional tolerances,

Custom Precision Die-Cast Aluminum High-Speed Optical Module

Custom precision die-cast aluminum housings designed for high-speed optical modules (CFP/OSFP form factors). Featuring modular snap-fit assembly, full EMI shielding structure, and standard form

Precision die casting for Fiber Optic Components

Precision die casting provides a reliable and efficient solution for fiber optic components that demand tight tolerances, thermal management, and structural durability.

Casting information --optical module

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1.Casting information Casting name: optical module casting requirement□surface requirements casting process: Die Casting machine tonnage:250 punch diameter mm:50 alloy

Precision Die Casting for Optical Transceiver Housings

This blog post discusses the importance of optical transceiver housings, the precision die casting process, and the advantages it offers.

Why Optical Module Manufacturers Choose Zinc Die Casting As

Why Optical Module Manufacturers Choose Zinc Die Casting As optical communication technology continues to evolve, the demand for high-speed and highly reliable optical modules is increasing ...

Why Die Castings Are Essential for Modern Optical Modules

In the fast-evolving world of optical communication, precision, stability, and thermal efficiency are paramount. As data transmission speeds increase and devices become smaller and more integrated,

Die Cast Optical Parts | Precision Solutions for High-End Optics

The die cast optical components mentioned in this article refer to parts manufactured through the die casting process that provide support or protection for your optical equipment. Potential applications

Custom Die Casting For Optical Communication | GuangWei

In the world of optical communication and data centers, every micron of precision matters. At Dongguan GuangWei Communication Technology Co., Ltd., we engineer high-precision zinc and aluminum

Optics Die Casting

Our 3D digitalization technology saves time and costs in the manufacturing and maintenance of optical die casting molds. During the CNC machining of die casting molds and electrodes, wax and ceramic

Chinese Optical Communication Module Shell & Precision Die Casting ...

Dongguan Youngshine Metal Products Co., Ltd. - Affordable China supplier of Optical Communication Module Shell, Precision Die Casting, Hardware Fitting, Molds. Quality products from Chinese

Lighting Industry Die Casting Solutions – Cast-Mold

The die-casting process guarantees exceptional consistency and structural integrity, enabling seamless integration with optical modules, electrical circuits, and

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