

Diode Laser Housing Materials



AI Overview

Diode laser housings are typically made from metals, ceramics, or 3D-printed polymers, chosen for thermal management, mechanical stability, and optical alignment.

Common Materials for Diode Laser Housings

- Metals (Aluminum, Copper, Copper-Tungsten, Copper-Diamond)** Aluminum is widely used for commercial and experimental housings due to its lightweight, machinability, and moderate thermal conductivity. It is often used in extended-cavity diode lasers (ECDLs) to support diffraction gratings and optical components while allowing precise adjustments. Copper and copper composites (Cu/W, Cu/Dia) are used for submounts and housings where high thermal conductivity is critical to dissipate heat from the laser diode and prevent thermal damage. These metals are often chosen to match the thermal expansion coefficient of the laser chip to minimize mechanical stress and maintain alignment.
- Ceramics (Aluminum Nitride, Silicon, Diamond)** Aluminum Nitride (AlN) and silicon are used for submounts and housings requiring low thermal expansion and high thermal conductivity, ensuring stable operation under high power loads. Diamond is occasionally used in high-performance applications due to its exceptional thermal conductivity, which is ideal for high-power diode lasers.
- Polymers and 3D-Printed Materials** PLA (Polylactic Acid) and other 3D-printable polymers are increasingly used for educational and low-power experimental setups. 3D printing allows rapid prototyping of housings for ECDLs without the need for machining tools. While polymers are convenient and inexpensive, they have lower thermal conductivity and may not be suitable for high-power diode lasers.

Considerations for Material Selection

Thermal Management: High thermal conductivity materials like copper, Cu/W, or diamond are preferred for high-power diodes to prevent overheating.

Mechanical Stability: Metals and ceramics provide rigidity to maintain precise optical alignment, which is critical for ECDLs and other frequency-stabilized...

Article Content

Laser diode

Laser diodes form a subset of the larger classification of semiconductor p – n junction diodes. Forward electrical bias across the laser diode causes the two

Mounting of Laser Diodes | Ferdinand-Braun-Institut

At the FBH, diode lasers are either mounted as single emitters or as laser bars onto submounts made from expansion-matched composite

48 Laser Diode Manufacturers in 2026

48 Laser Diode Manufacturers in 2026 This section provides an overview for laser diodes as well as their applications and principles. Also, please take a look at the list of 48 laser diode manufacturers and

Laser diode

High-power laser diodes are used in industrial applications such as heat treating, cladding, seam welding, and for pumping other lasers, such as diode-pumped

Diode Laser Comparison: Glowforge, xTool, WeCreat!

In this diode laser comparison, I'm looking at seven popular diode lasers so you can see which is best for your own needs, budget, and space!

Top 10 Diode Laser Cutters in 2026 | Laser 101

Laser 101 · Buying guide Top 10 diode laser cutters. A reference to the most popular diode laser machines in 2026 — power, strengths, and which are best for

3D printing an external-cavity diode laser housing

The ability to control the frequency of an external-cavity diode laser (ECDL) is an essential component for undergraduate laboratories and atomic physics research. Typically, the housing for

LaserPecker LP4 Dual Laser Engraver with Diode & IR Lasers

LaserPecker LP4 is a fast dual-laser engraver (2W IR & 10W diode laser) with 4000mm/s speed. It can engrave most materials and cut

Diode Laser Materials

As the submount for the heat dissipation of high-power diode laser bar chips, the AuSn pre-deposited CuW material is fabricated through pre-deposition of micron-level AuSn thin film in specific areas of

Best Laser Engraver for Beginners (2026): Diode to Enclosed

The best beginner laser engravers for 2026: an affordable Atomstack 10W diode, the popular Ortur Laser Master 3, and the enclosed xTool M2. Diode power explained, open-frame vs enclosed safety,

Top 10 Materials for Diode Lasers

Optimize your diode laser projects! Explore Lasersheets' top 10 safe & versatile materials specifically chosen for your machine.

Laserland Catalog of Housing for Laser Diodes

Laserland supply laser module, laser diode, green laser, laser pointer, laser safety glasses, laser goggles, laser protection eyewear, 532nm, 650nm, 520nm, 405nm, red laser module, green laser

Diode Lasers – semiconductor lasers, laser diodes

Diode lasers are semiconductor lasers based on laser diodes. In contrast to some other types of semiconductor lasers, they contain a p-n junction.

Laser Diode Tutorial

The information contained within this tutorial will give all the general information necessary to create an excellent laser diode system. For specific questions about laser diodes, mounts, and drivers please

Creality 5W UV Laser Upgrade Kit für Falcon T1

Das ist ein 5 Watt UV-Laser Upgrade Kit für Creality Falcon T1. Der 5 W UV-Laser ist gezielt auf das Markieren empfindlicher Materialien wie Kristall, Glas und Kunststoff ausgelegt.

Laser Engraver Machine, Module, Accessories

Buy laser engravers, modules, engraving accessories and materials on Ortur at competitive prices! High-tech laser engraver manufacturer supplies various

650nm 5mW Red Dot Laser Module User Guide | Wiring & Code

This guide covers setup, wiring, mounting, and use of the 650nm 5mW Red Dot/Point Laser Diode Module — a compact, pre-wired laser module in a 12mm brass housing that projects a

Diode Housing: A Comprehensive Review and Guide for Stage

This blog explains what a diode housing is and its importance in laser modules for stage lighting. It details the role of diode housing in protecting and optimizing laser diodes, ensuring safety,

Laser Diodes – semiconductor, gain, index guiding, high

The article details the many types, from small edge-emitting and surface-emitting diodes (VCSELs) to single-frequency lasers like DFB and DBR lasers, external

materials For Diodelasers – Lasersheets

Here you will only find laser sheet materials who can safely in the diodelaser. So you don't have to worry about burned edges, bad cutting lines or even unsafe situations.

Laserland Catalog of Housing for Laser Diodes

We focus on laser manufacturing and sales for nearly 10 years. We supply laser products like modules of various sizes and wavelength, with reasonable prices, excellent quality for customers all around

Optics Design and Diode Lasers

The main advantages of diode laser modules are their high electro-optical efficiency, compact size and cost-efficiency. At the Fraunhofer ILT, diode laser modules are

3pcs Silver Metal Laser Diode Housing 12x40mm for 5.6mm To-18 Laser ...

About this item Diode housing for TO-18 laser diode! Inner Diameter:10.3 x 40mm, Outside Diameter:12 x 40mm Material: Metal, Color: Silver Lens: With 200-1100nm Plastic lens 10x20mm circuit driver can

Molecular Expressions: Physics of Light and Color

Diode lasers coupled to internal optical systems that improve beam shape and stability are now able to rival helium-neon lasers in many

US-Lasers

The US-Lasers, Inc. Laser Diode Housing Kit allows the user to develop a complete OEM laser module by using all the following components along with laser diode

Contact Us

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