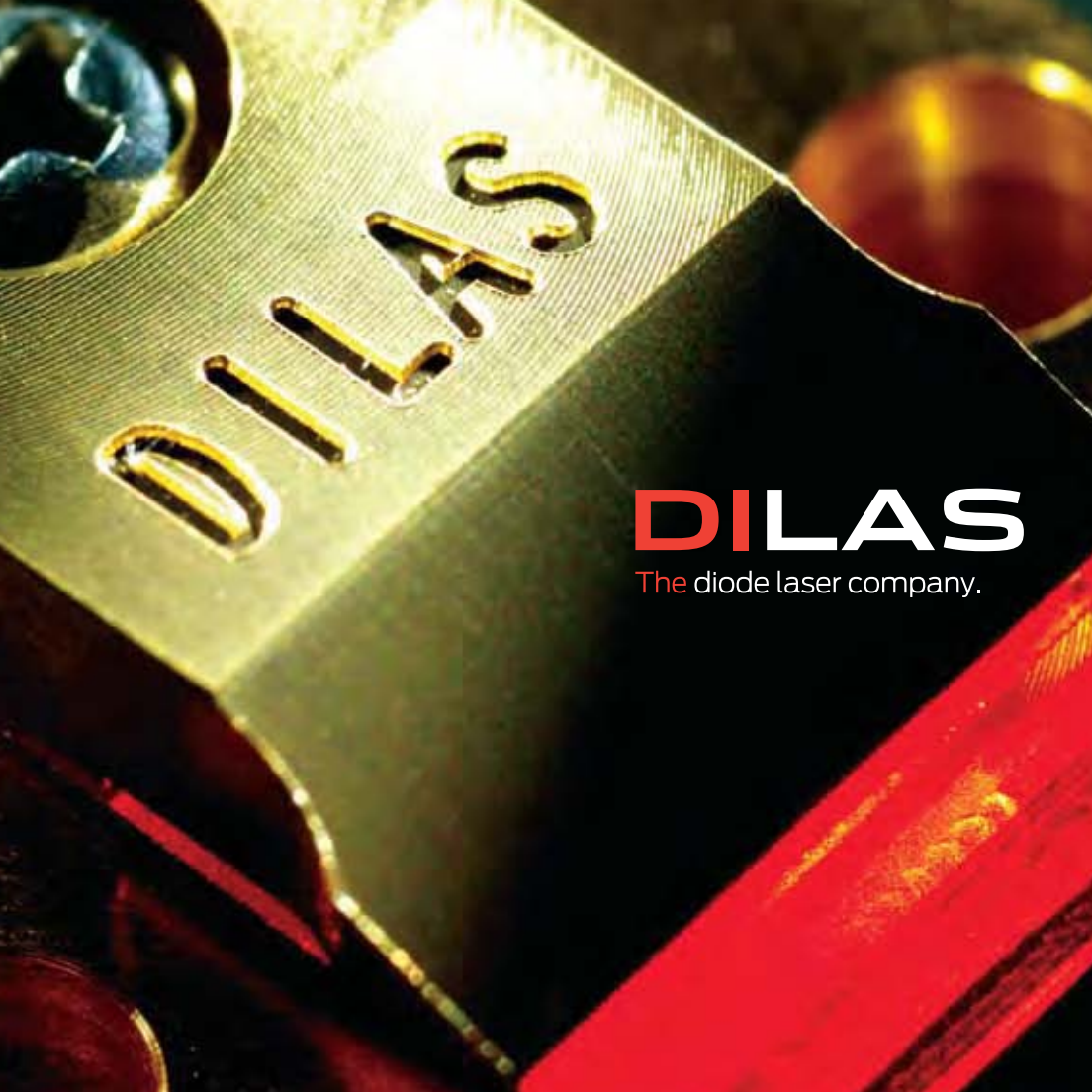




DILAS

DILAS

The diode laser company.

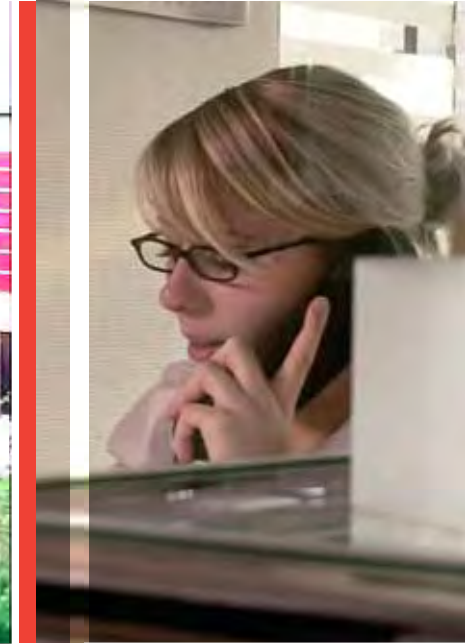


DILAS, the diode laser company, manufactures high-power diode laser components and systems in a wide range of output powers and wavelengths including fiber-coupled, direct beam and integrated solutions.

Today, with over 200 employees, DILAS' strengths are in quality engineering, process control, product development and volume manufacturing of a world-class product line for medical, diode-pumped solid-state lasers, defense, graphic arts and materials processing applications.

The Company

Origins



Founded in 1994 in Mainz, Germany, DILAS looks back at a record of continued growth.

Long Standing Commitment



DILAS' product development goes hand in hand with market needs always in accordance with customer specification.



DILAS maintains ISO-9001 certified facilities with the highest standards for quality, reliability and performance.

Global Presence



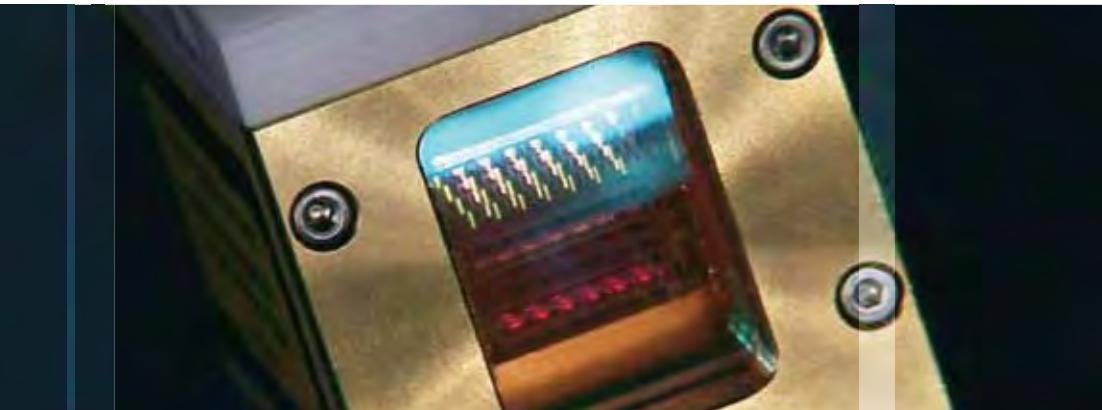
In 2005 DILAS Diode Laser Incorporated was founded in Tucson, Arizona, to serve the North American market and to manufacture for U.S. government programs.



In 2008 DILAS Diodelaser China Co., Ltd. was founded in Nanjing City to serve the growing Asian markets. DILAS establishes a worldwide network of sales and service partners.



Innovations



Through extensive research and development, we are working to transform the world through innovative products and solutions that meet the needs of customers.



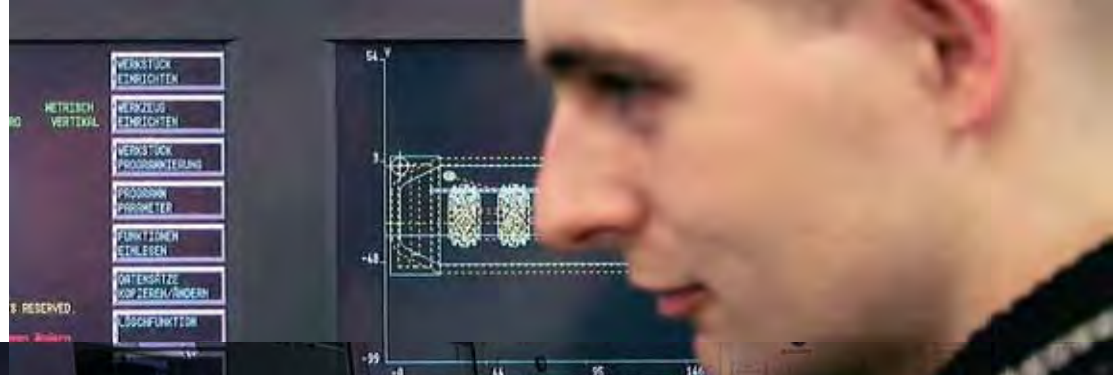
We invest ten percent of our annual revenue in research and development.



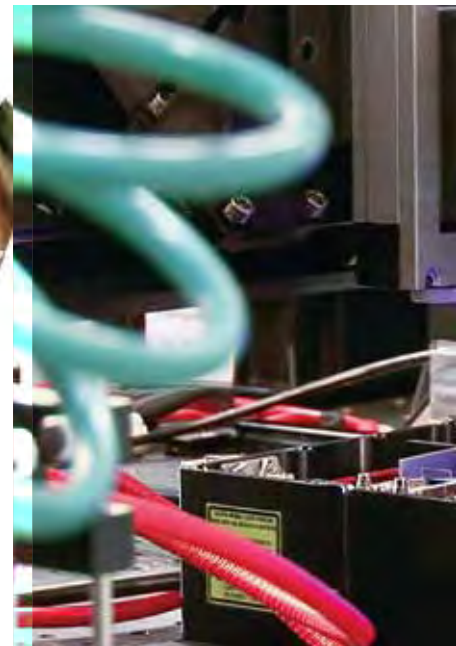
Engineering



Product development is supported by an in-house machine shop to facilitate fast and precise manufacturing.



Manufacturing



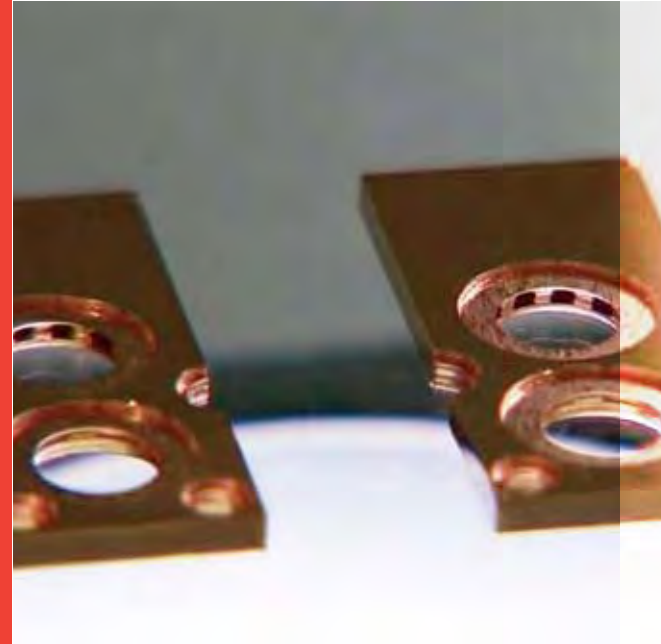
Our strength lies in our fully automated state-of-the-art facilities for precision manufacturing needed to meet the requirements for high-power diode lasers.



DILAS has an edge when it comes to giving its customers the best yields of our products. We are determined in solving customer needs and providing quality products in the marketplace.

Quality

The Manufacturing



Quality is the highest priority at DILAS and is controlled throughout the entire manufacturing process.

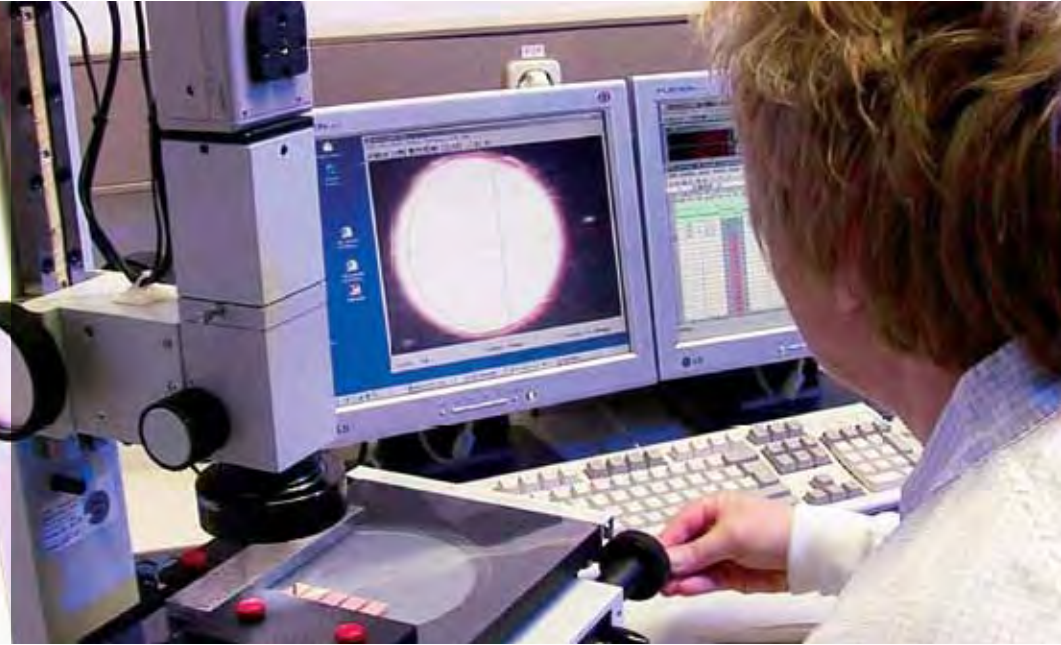
Incoming Inspection



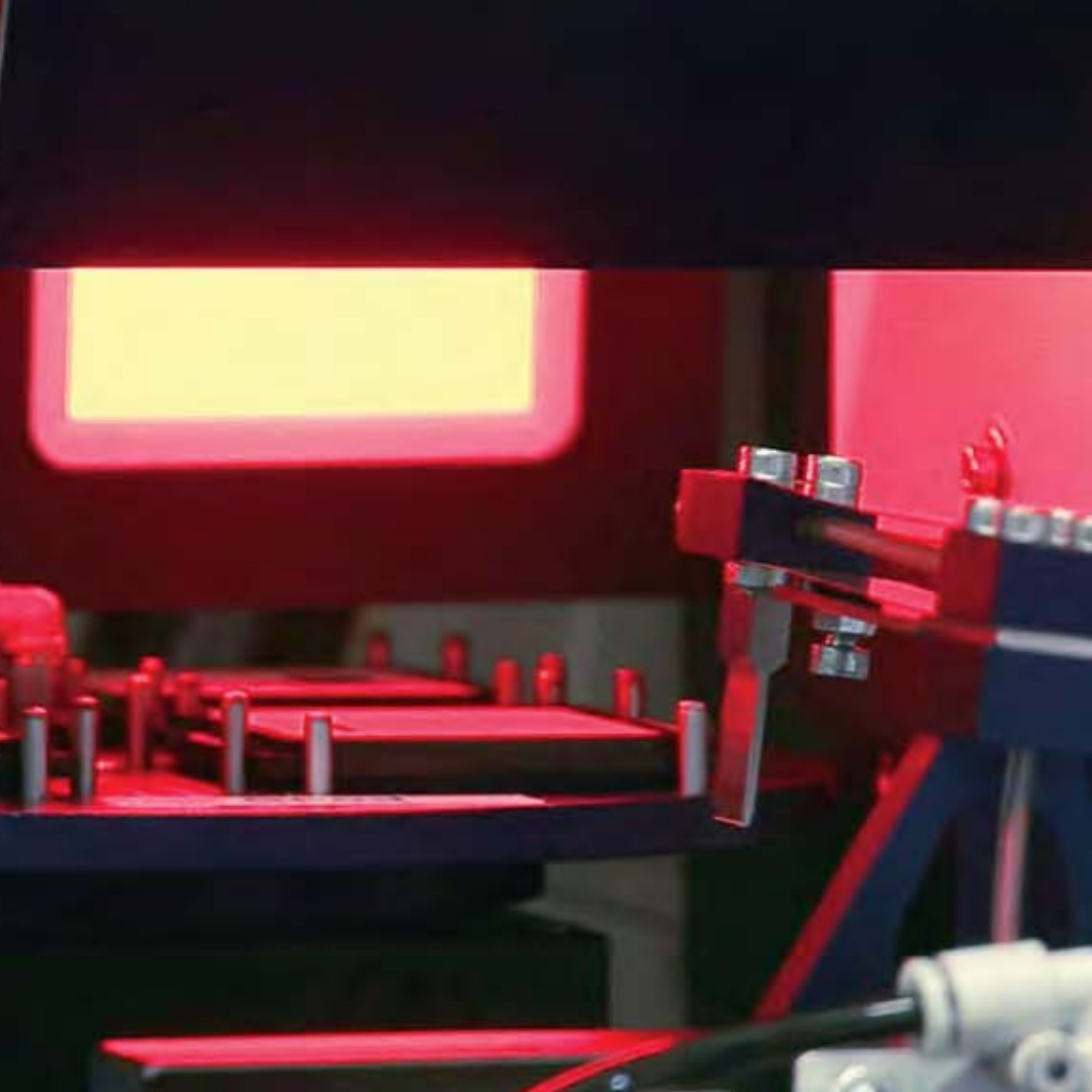
100% inspection of all parts is performed. All supplied parts are measured carefully before they are used in production.



Incoming inspection ensures high consistency and quality. The control of mechanical parts on a micrometer level is a DILAS standard, as well as the surface quality control of all optical components.



Laser Bar Inspection



Robotic handling, pattern recognition and trained production personnel ensure that only the best material is used for production.



Semiconductor laser bars which are not compliant with DILAS' strict performance requirements will be rejected and our chip suppliers will be provided feedback to improve their processes.

Clean Room Production



In the entire production area, cleanliness is key. Each employee wears clean room gowns to ensure an uncontaminated environment.



Via the gowning room the employees reach the clean room production area. A special test ensures that electrostatic discharge is prevented.



Clean surfaces are also a key factor for metal parts which undergo electro-chemical plating procedures.



We maintain class 1000 or better in all areas. A class 100 clean room environment is guaranteed under the flow hoods at the work benches.



Plating



Plating of nickel and gold is commonly used in DILAS' manufacturing.



Heat sinks are placed in special holders with aligned masks to allow the precise deposit of solder material.



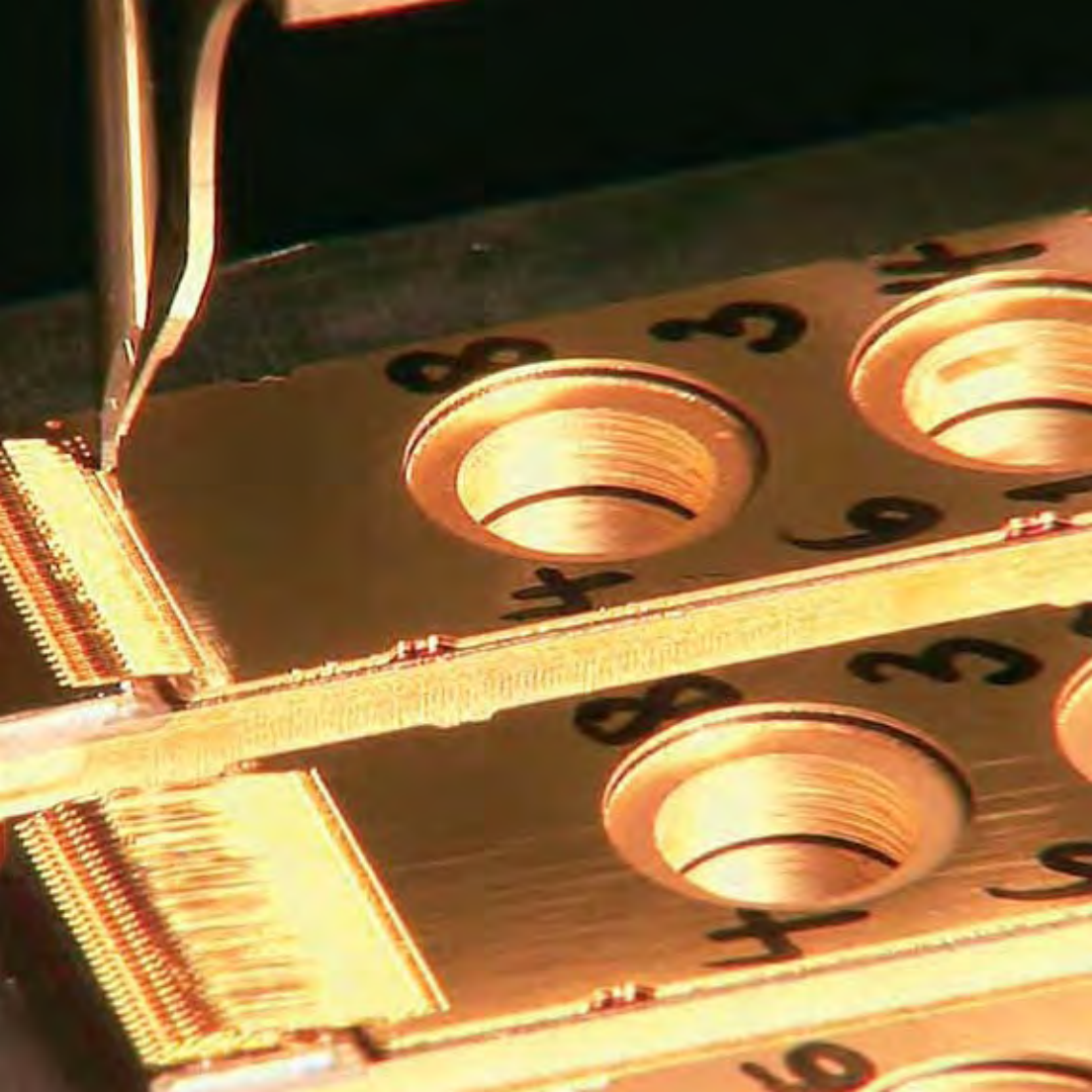
In ultra-high vacuum evaporation systems, the solder material is applied to the heat sinks.



The thickness of the platings and the solder is controlled by x-ray thin-film measurement equipment.



Electro-Optical Assembly



High-precision laser bar placement together with mature soldering processes ensure best laser bar performance and lifetime.



DILAS' mounting procedures guarantee exact positioning and highest flatness of the laser bars.



Electrical contacts to the diode laser chip are made by solder or wire bonds.



DILAS currently delivers up to 2000 laser bars per week with capacity for continued growth.

Visual Inspection



▶▶
100% visual inspection by automation and pattern recognition.

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High-precision equipment is used to measure all relevant electro-optical parameters of diode laser bars and modules.



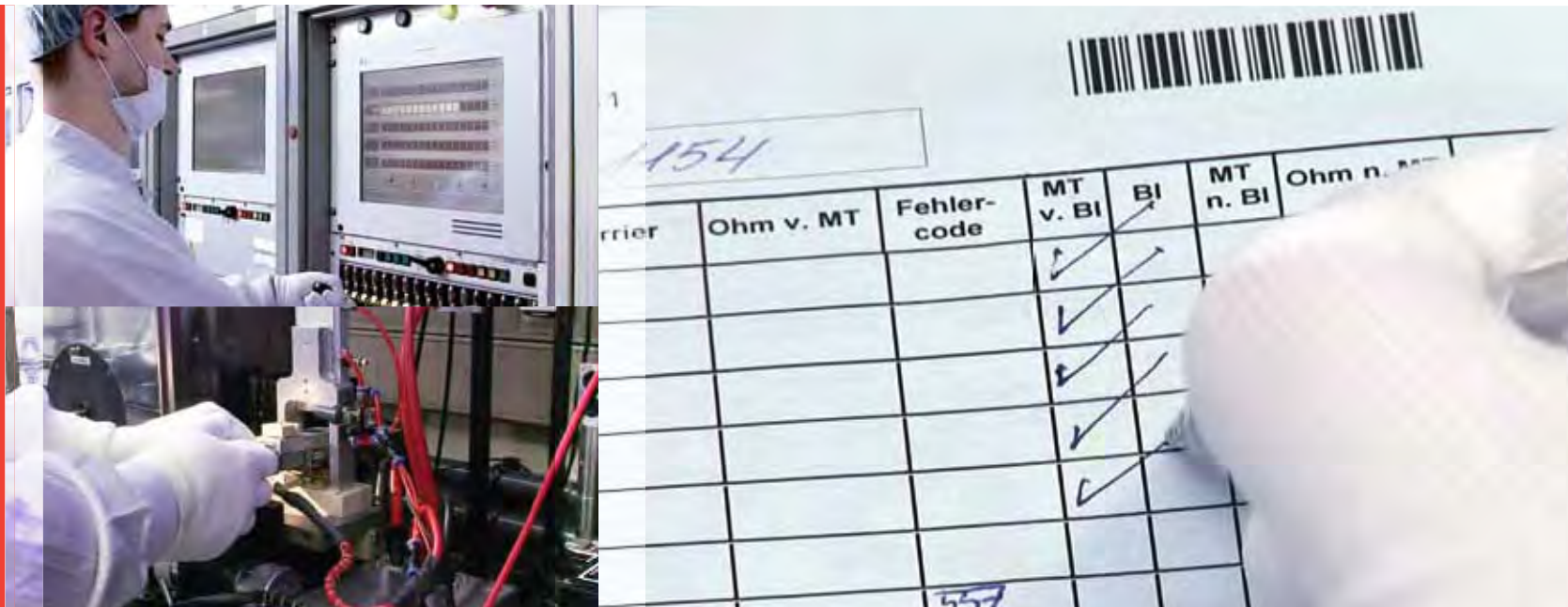
Measurement



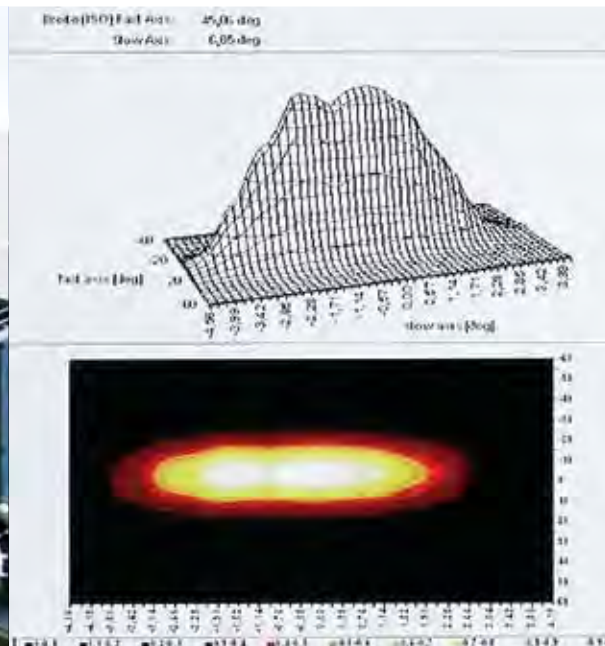
Automated measurement is done before and after burn-in which eliminates handling, ensuring high throughput.



In DILAS' burn-in racks all diode laser bars and modules are operated according to customer conditions.



Documentation



The electro-optical performance history for each diode laser bar and module are recorded in the DILAS database.



Results before and after burn-in are compared and reviewed.



Automated photo documentation for each single diode laser bar can be performed prior to shipment or before further usage in module production.



Once the bars have passed each quality gate, they are released to the customer or for integration into diode laser modules.

Optics Mounting



High-precision semi-automated alignment of optical elements ensures consistency and high-performance beam shaping.



DILAS' micro-optical mounting ensures fast-axis or both-axis collimation, homogenization and fiber coupling of laser bars and modules.



Six-axis control and sophisticated processes combined with the experience of DILAS' employees are the basis for the consistent volume production of diode laser modules.

Fiber Coupling



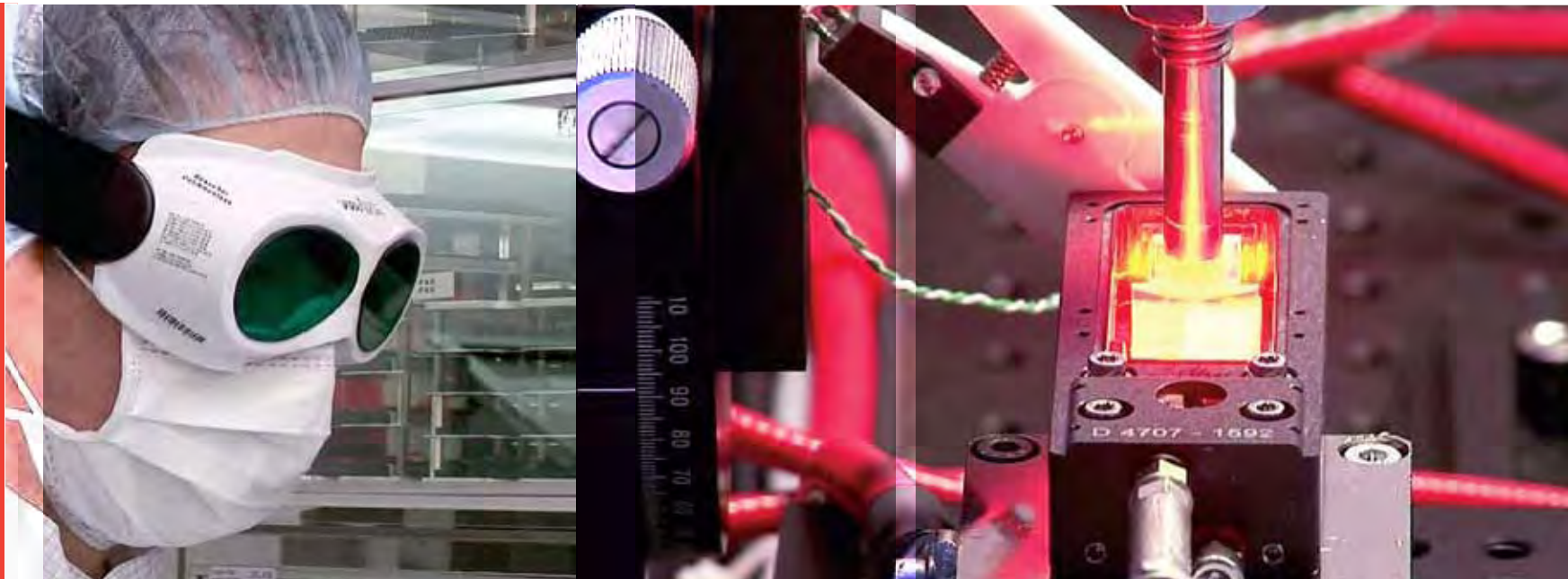
Whether it is a single-bar or multi-bar arrangement, DILAS performs fiber coupling for applications in medical laser treatment, solid-state and fiber-laser pumping, and materials processing.



DILAS' products offer highest output powers in smallest fiber core diameters.



Precise beam properties are measured for high-precision applications.



Module Production

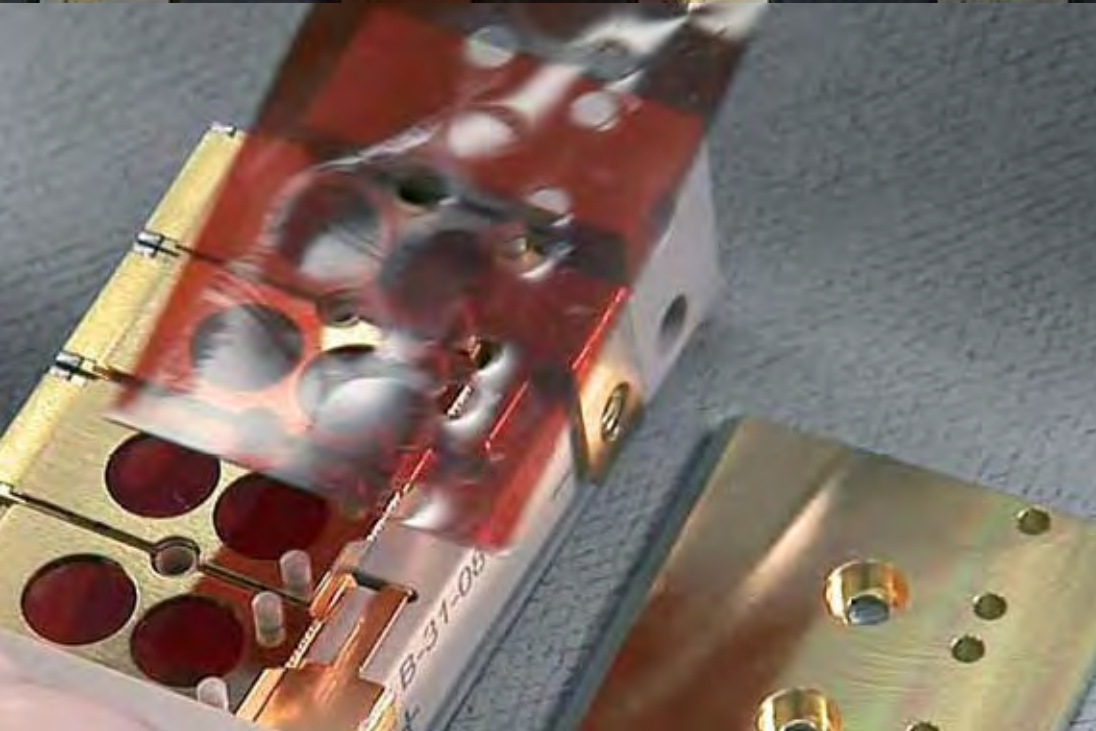
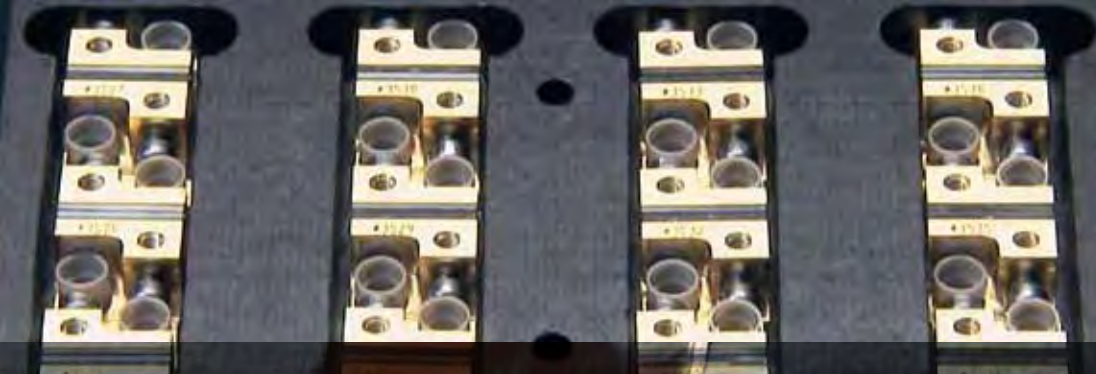


In the module production, single diode laser bars are integrated into diode laser modules.



Fine mechanics and skilled technicians combined with proper handling and the scalability concept allow the combination of up to thousands of laser bars to a single module for very high-power applications.

Module Production



Within our assemblies, pre-tested single bars can be combined to diode laser modules with predictable performance.

The Quality

Quality Management



DILAS' ISO 9001:2000 certification adherence demonstrates compatibility to an international set of standards for quality and continuous improvement that is regularly examined by internal and external audits.



To secure DILAS' position as the diode laser company, we remain committed to meeting our customers' needs with quality products and continual improvement of products and processes.

Quality Assurance



The scanning electron microscope can be used for quality analysis and assurance.



The robustness of the product is tested in harsh environmental stress tests including climate tests, temperature cycling tests or shock and vibration tests.

Product Assurance



To maintain our excellent quality standards, we final check all specifications before releasing a product for shipping to the end customer.

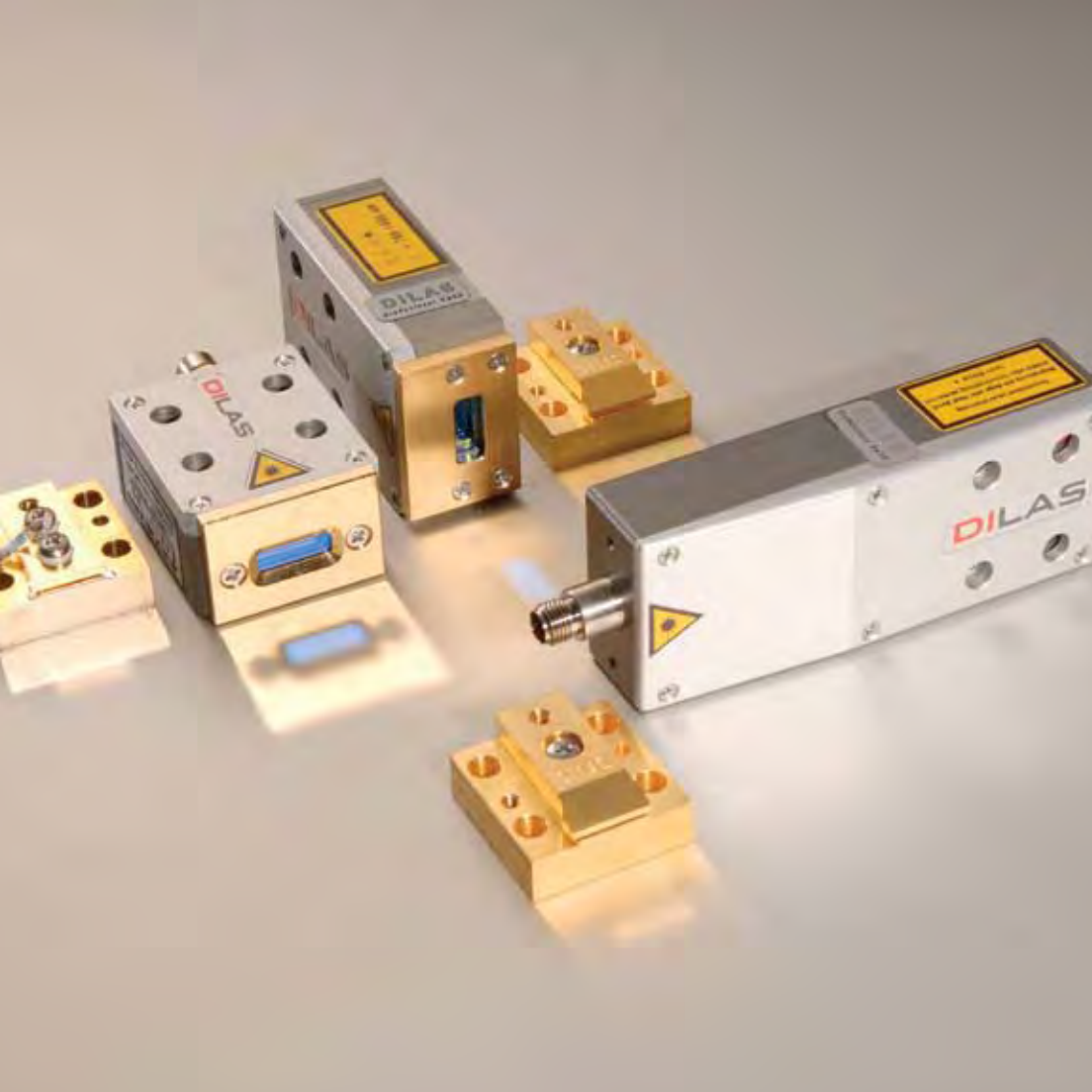
The Solutions



Offering an unparalleled range of wavelengths from 630nm to 2200nm, DILAS continues to deliver the broadest range of products from mounted bars to fully configured turn-key systems. Due to their compact size, high-power and robust optical elements, DILAS' products provide solutions for a wide range of applications including medical, diode-pumped solid-state lasers, defense, graphic arts and materials processing.

Wavelengths

630- 670nm
790-800nm
808nm, 888nm
915nm, 940nm, 976nm
1064nm
1470nm
1530nm, 1550nm
1910-2200nm



Components

Conduction-Cooled Bars

DILAS offers the widest range of diode laser conduction-cooled heatsink configurations in the market.

Fiber-Coupled

DILAS' integrated diode laser fiber-coupled modules provide access to all sensoric options. Based on conduction-cooled, single-bar, fiber-coupled or conduction-cooled, multi-bar, fiber-coupled diode laser modules, the compact, cost-effective packaging design and steady fiber attachments are available in a wide range of output powers and wavelengths.

QCW Stacks

Conduction-cooled QCW stacks with very low pitch (400µm) are produced for applications in the defense market. Peak powers can be reached up to 300W per bar at 2% duty cycle. Fast-axis collimated versions are available with 1.6mm pitch.

Water-Cooled Vertical Stack

Operating conditions can be CW or QCW for the water-cooled, uncollimated and water-cooled, fast-axis collimated types. In addition, both axis collimation is available in CW. At nearly maximum output power levels, the extremely efficient cooling permits duty factors up to 50%. DILAS builds diode laser vertical stacks up to 70 bars within the industry's toughest tolerances. Our advanced housings, optics' mounting and online sensoric-testing give you full control.

Water-Cooled Horizontal Stack

DILAS offers a variety of horizontal diode laser modules from two through thirteen bars in a horizontal line with wavelengths in CW or QCW operations. These extremely powerful arrays can be arranged in either a side-by-side arrangement or any other custom pattern in order to deliver maximum power density needed for side pumping of solid-state laser applications.

Applications

Medical

Medical applications cover the whole diode laser spectrum, starting with photodynamic therapy (PDT) in the visible wavelength range at 630nm-690nm. Cosmetic applications like hair removal, skin rejuvenation and varicose vein removal are achieved within the 800nm to 1000nm wavelength range. This wavelength also applies to the dental and surgical treatment. Dermatological applications at 1470nm as well as further medical applications in the range of 1550nm, 1940nm to 2200nm complete the spectrum.

Diode-Pumped Solid-State Lasers

Covering rod-laser, disk laser and fiber laser pumping, pumping of solid-state laser material is the dominant laser application in the industrial field. Visible red is used with Cr doped laser material. Other lasing materials such as Tm, Nd:Yb and Er require longer pumping wavelengths in the range of 700nm to 1000nm. Additionally, pumping wavelengths at 1470nm and 1532nm require specific output solid-state laser wavelengths. Non-solid-state materials such as Rubidium or Cesium vapor can also be pumped by diode lasers.

Defense

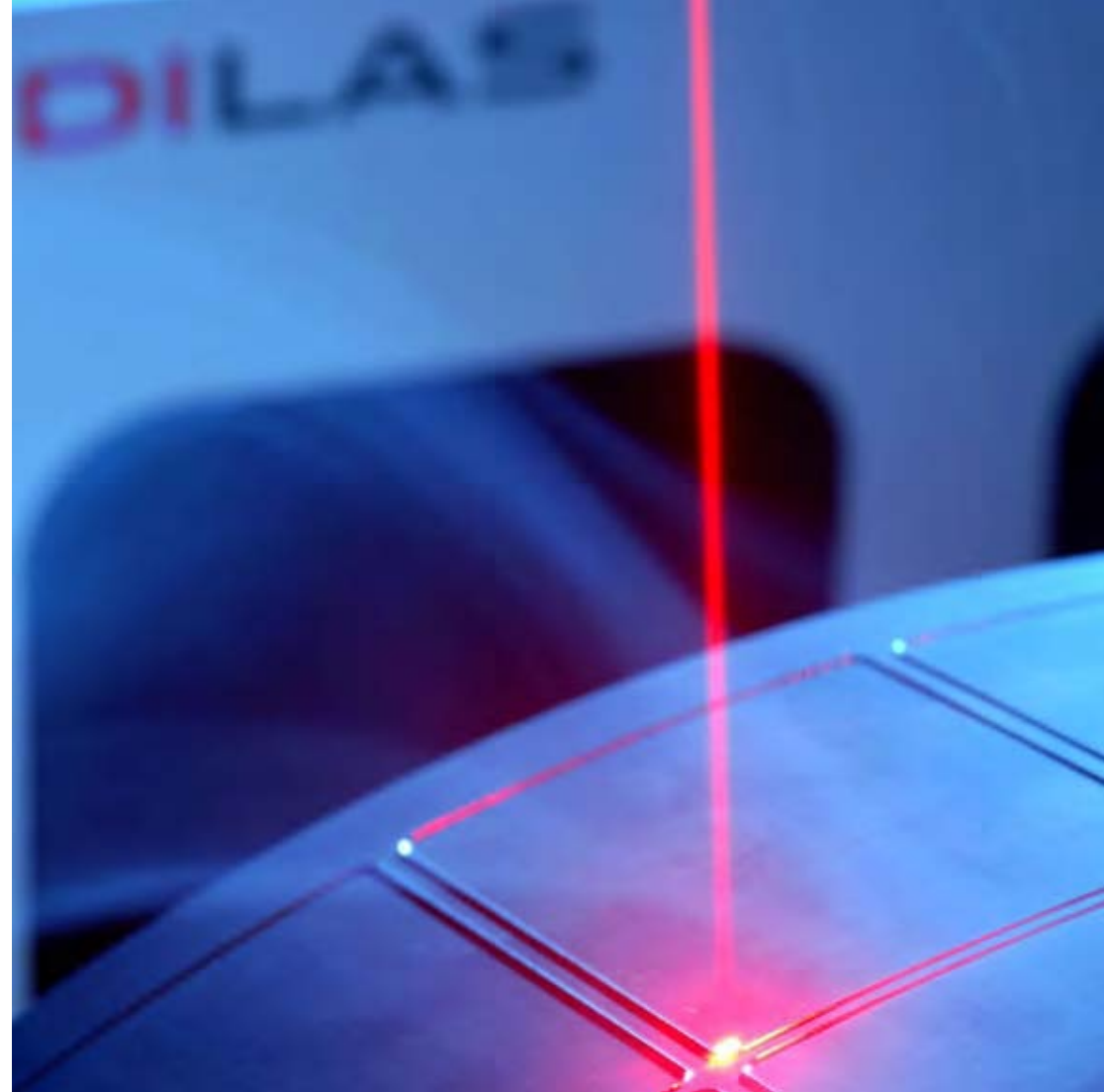
For defense, wavelength and operational parameter requirements vary significantly from application to application. Beside established usage of lasers in range finding and target designation, key hot areas are eye-safe diode lasers used in a number of applications. Other areas are wide-field illumination, high-energy lasers, as well as homeland security detection and instrumentation.

Graphic Arts

Using diode lasers for imaging of sheet-fed printing plates, is a method for fast producing printing plates while avoiding the time consuming and non-environmental friendly chemical processes. These computer-to-plate (CTP) and direct-on-press (DOP) technologies are widely used in modern printing processes.

Materials Processing

DILAS supports customers all over the world in a wide range of different applications, including plastics welding in automotive and medical device manufacturing. Soldering in electronics and the automotive industry, soldering in photovoltaic applications, as well as hardening of metals are also potential applications.





Industrial Laser Systems

DILAS Industrial Laser Systems, a division of DILAS Diodenlaser GmbH, is focused on complete turn-key diode laser systems for the materials processing and other systems' markets.

DILAS Industrial Laser Systems manufactures high-performance industrial laser systems in a wide range of output powers and wavelengths, including fiber-coupled, direct beam or line source solutions. Our light-weight products can be transported easily and only require 230V electrical power. In addition, our air-cooled systems are extremely compact and require no additional cooling units.

With a worldwide service and support network and dedicated application labs located in different regions of the world, DILAS Industrial Laser Systems provides its customers with fast and comprehensive support in developing reliable, high-performance solutions for use in manufacturing.

DILAS Industrial Laser Systems

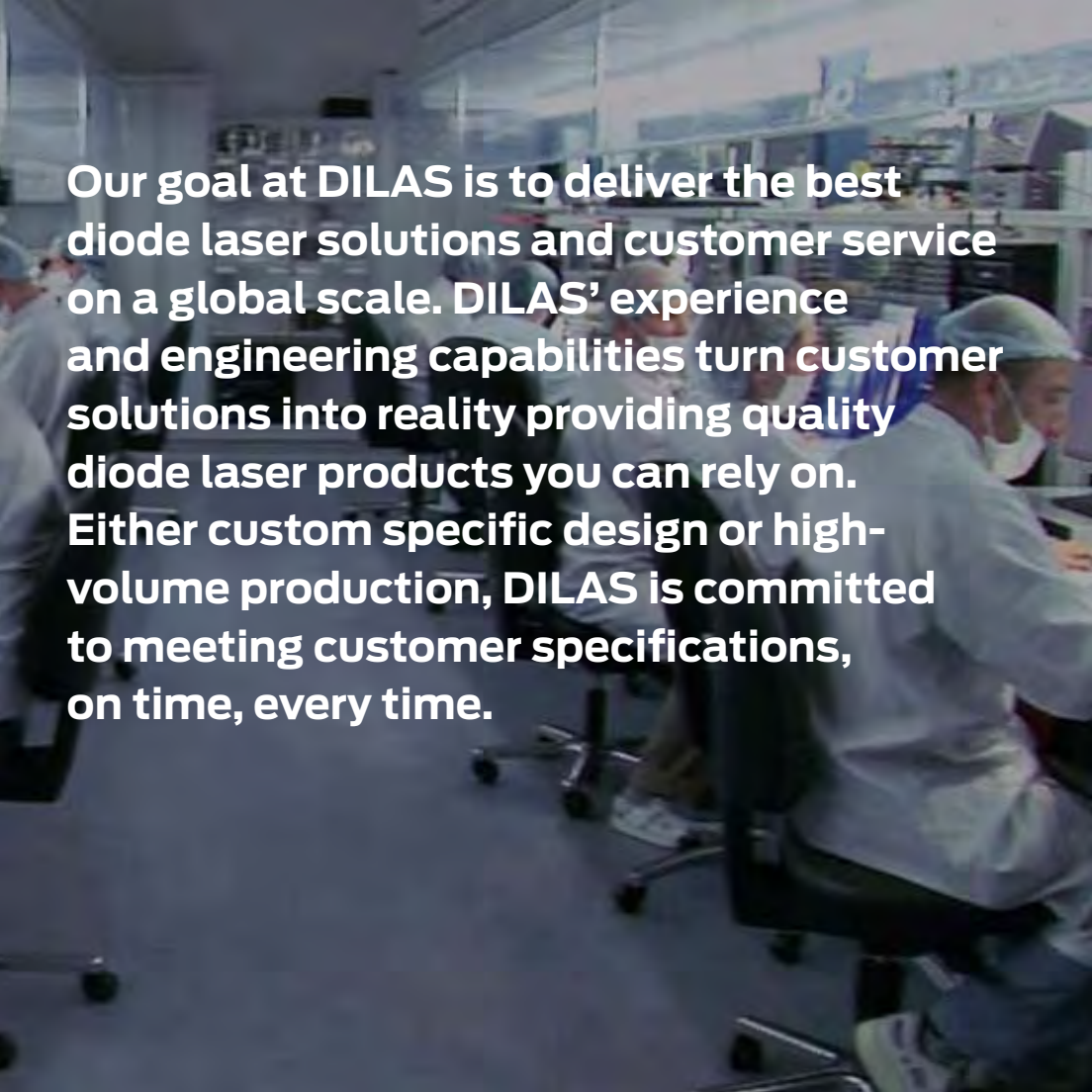
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Our goal at DILAS is to deliver the best diode laser solutions and customer service on a global scale. DILAS' experience and engineering capabilities turn customer solutions into reality providing quality diode laser products you can rely on. Either custom specific design or high-volume production, DILAS is committed to meeting customer specifications, on time, every time.

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