FOCUSLIGHT

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Overview

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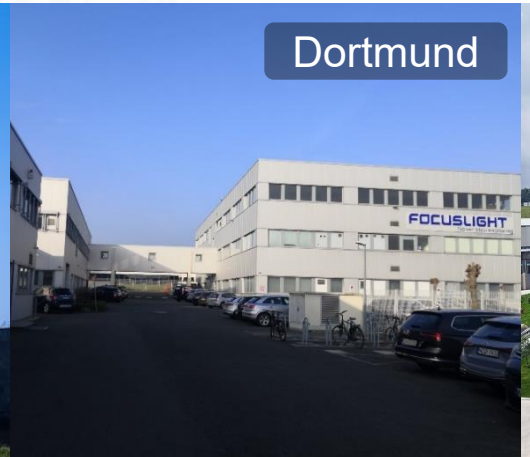
- Founded in 2007 by Dr. Victor X. Liu, headquartered in Xi'an, China.
- A fast-growing company that develops and manufactures ***high-power diode laser components and materials*** (photon generation) and ***laser optics*** (photon control) used in various industries and applications.
- Business scope is being extended by developing and manufacturing ***photonic application modules, assemblies, and sub-systems*** (photonics application solutions) with a focus on automotive, pan-semiconductor, and medical & health application solutions.



Milestones

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2007-2008
- Founding of Focuslight
- CS series released – Our very first laser

2009-2011
- ISO9001 certified
- Full-scale application of indium-free bonding

2012-2014
- Entered processional medical and health market
- GS series released – Ultra-light conduction-cooled diode laser: QCW 3kW = 2g

2015-2017
- World's first monograph on packaging of HPDL published
- Vshiny, the world's most shipped hard-solder packaged microchannel laser hair removal engine, launched
- Technology breakthrough of gold-tin film preparation

2018
- Acquisition of LIMO
  Started providing photon control and photonics application solutions
- UV-L750 Ultraviolet Line Laser System won Prism Award

2019
- Dongguan delivery and high-volume manufacturing center officially in operation
- Establishment of Automotive BU
  Entered LiDAR market
- Automotive LiDAR transmitter project awarded from international Tier 1
- Production of micro-optics on world's largest glass wafer (300 x 300 mm²)

2020
- Exclusive cooperation with world-famous device manufacturer
  Entered consumer medical and health market
- IATF16949 certified
- Fast Axis Collimator (FAC) monthly shipment exceeded 1M pcs.

2021
- Breakthrough using solid-state line laser in annealing process of FPDs
- Successful IPO at SSE Star Market
- Laser system for wafer annealing in semiconductor manufacturing processes launched

2022
- Brand unified globally
- Invested in new facility in Shaoguan focused on medial and health application solutions
- Invested in new facility in Hefei focused on pan-semiconductor application solutions

Key Facts & Figures

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5

Business Units*

> 790

Employees

~ 16%

R&D Investment Proportion**

LIMO
A Focuslight Company

Acquisition of LIMO in 2017

* Five business units: Diode Laser BU, Laser Optics BU, Automotive BU, Pan-Semiconductor Solutions BU, Medical & Health BU.

** Overall R&D investment accumulates to about 16% of overall revenue in the past three years

Key Facts & Figures

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> 890

Patents Applied

> 420

Patents Valid

> 38,000 m²

Facility Building

> 10,000 m²

Clean Room

ISO 9001, ISO 14001, ISO 45001 and IATF 16949 certified + ERP implemented, fully equipped for HVM

Corporate Management Team

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Dr. Victor X. Liu

Chairman & CEO

- Research and management experience in America (Virginia Tech, Corning, Coherent, nLight)
- 100+ publications, 300+ patents, 30+ invited papers internationally
- Committee Member of SPIE and IEEE, served or serving as chair or committee member of international conferences

CORNING COHERENT nLIGHT

Dr. Chung-En Zah

CTO

- 30+ years of research experience in America (Corning, Bellcore)
- 300+ publications, 50+ patents in optoelectronics and telecommunication
- IEEE Fellow, OSA Fellow, 2x R&D 100 award winner

THORLABS CORNING Bellcore Bell Communications Research

Dr. Noel Moore

Corporate VP, Chief Commercial Officer

- 25+ years photonics experience, 20+ years international business and management experience
- Experienced high technology senior business development professional
- Business experience in market penetration/capture, turnarounds, commercialization, fundraising, VCs

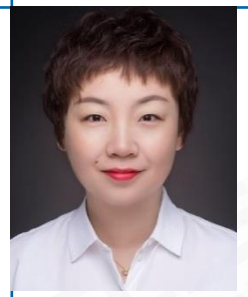
Continuum COHERENT HISTOINDEX OEwaves

Mr. Guowei Zhu

Corporate VP of Quality, President of Automotive BU

- Over 20 years experience in international automotive companies
- Rich plant P&L and operations management experience
- Familiar with IATF quality management system, KPI management, team building and plant operations management by World Class Manufacturing (WCM) & Lean manufacturing

MAGNETI MARELLI BorgWarner GST SETON AUTOLEATHER



Ms. Yiping Ye

Chief Administration Officer

- Over 15 years management experience and multi-field business practices, familiar with LTC, IPD and intercultural cooperation
- In-depth understanding and rich operational experience in market development, project operation and business management

HUAWEI Hanergy 汉能

Ms. Xuefeng Zhang

Board Secretary, Marketing Director

- 13 years photonics industry international business experience
- In-depth understanding and rich experience in sales, marketing and business development.

RMD A Dynasil Company RAYSUNG Photonics Inc

Corporate Management Team

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Mr. Ye Tian

Board Director, Corporate VP, President of Diode Laser BU, President of Medical and Health BU

- Over 15 years' experience in market development, product marketing and sales
- Received the certificate of CEIBS' Leadership Acceleration Program

PHILIPS Lighting

Mr. Dirk Walter Bogs

President of Laser Optics BU

- Over 25 years' experience in ultra-precision tooling, optic manufacturing, engineering & project management
- More than 20 years' experience in operational management
- Very deep knowledge of technology development and optimization
- Experienced and familiar in international cooperation

LIMO
A Focuslight Company

Mr. Yong Tian

Vice President of Laser Optics BU

- 20+ years of operation & R&D management
- Very deep knowledge with organic optical materials and optical coating technology, published SCI articles and owns patented technologies
- Experienced in Lean Manufacturing & Industry 4.0

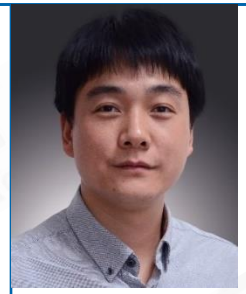
IBM ZEISS

Mr. Yong Li

Head of Automotive BU, VP of Business and Strategy of Laser Optics BU

- Outstanding leadership in previous roles: Overseas Sales Manager, Product Line Manager, and Head of the Automotive LiDAR Strategic Project
- Led the team to the successful automotive-grade SOP of the world's first all-solid-state LiDAR transmitter module
- Winner of Laser Focus World 2021 Rising Stars Award
- Experienced in international cooperation and strategic planning

Sumavision HUAWEI



Mr. Ye Dai

President of Pan-Semiconductor Solutions BU

- Excellent track record in worldwide sales & product line management leadership roles
- 20+ patents granted

IVO APPLIED MATERIALS

Products and Businesses

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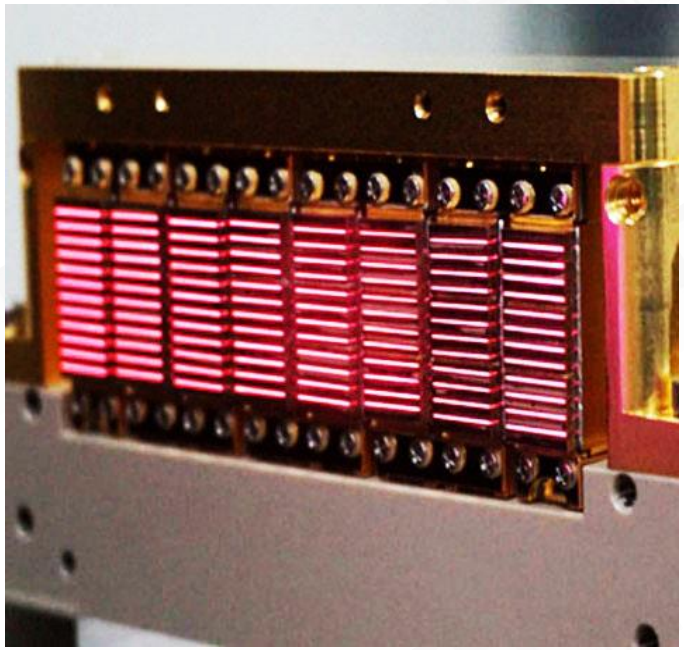

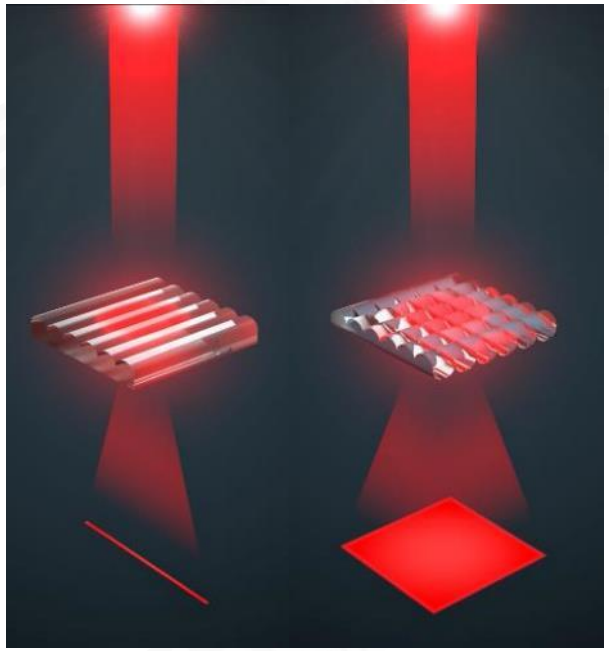

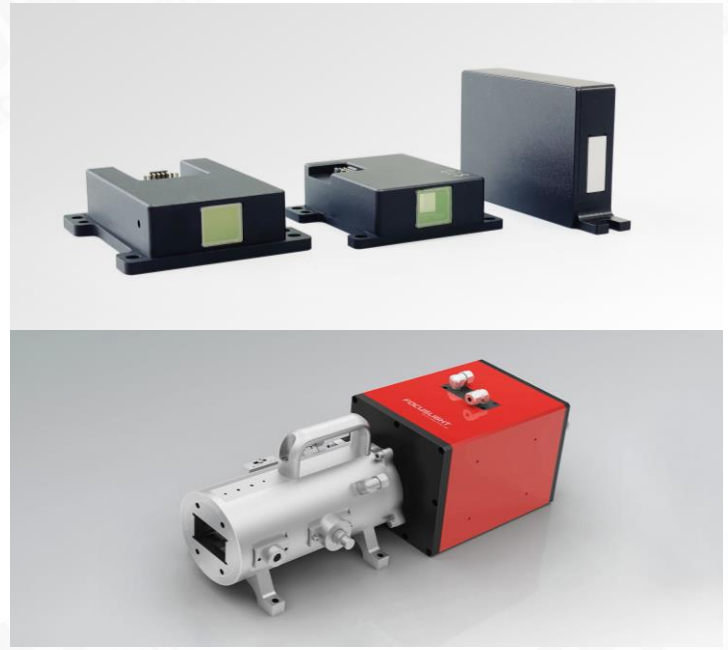

Photon Generation + **Photon Control** + **Photonics Application Solutions**

Markets

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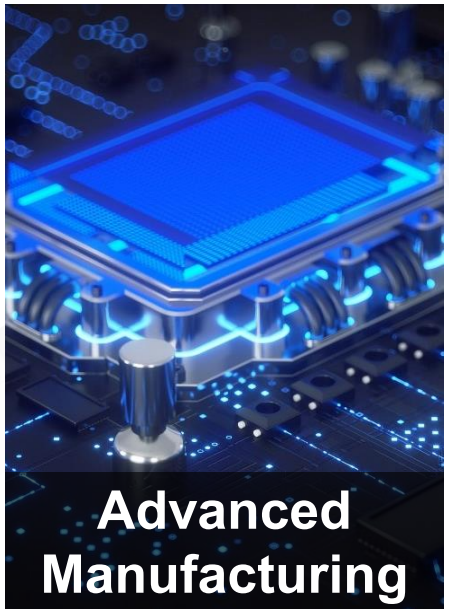

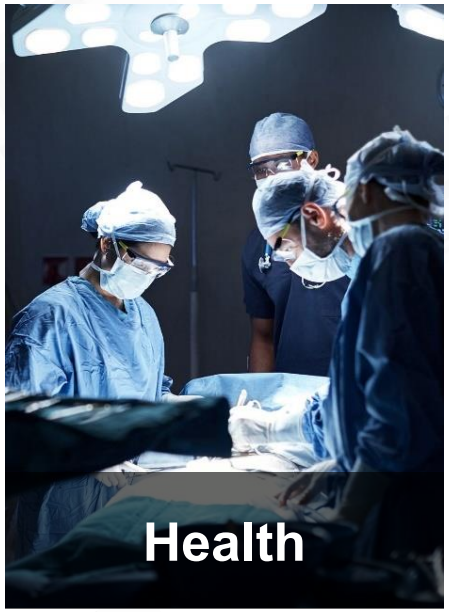

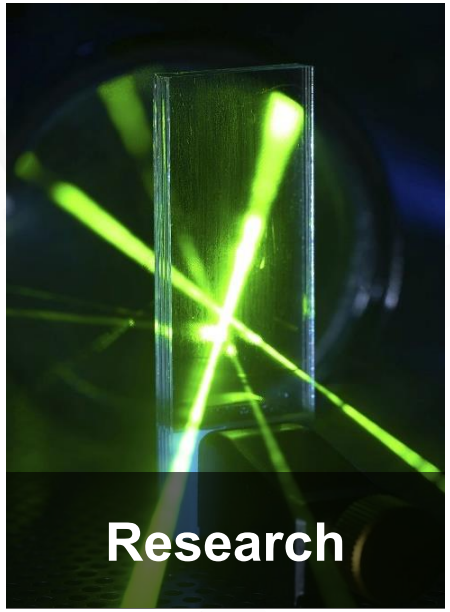

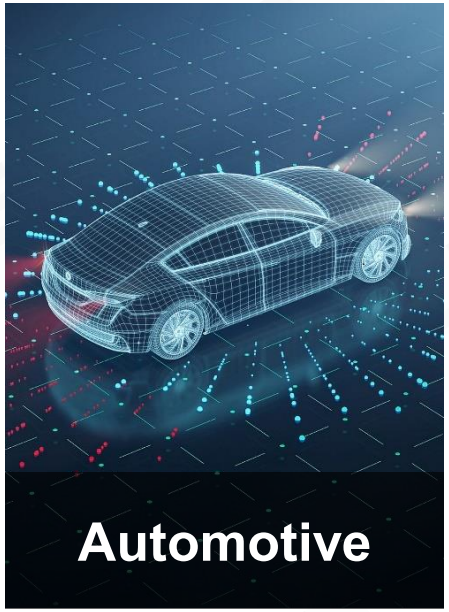

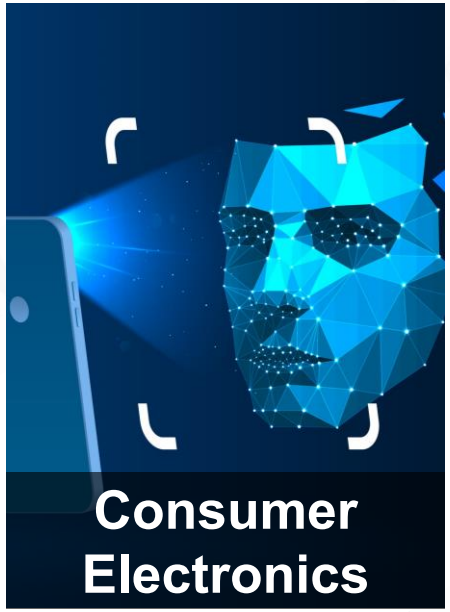

Be the global trusted photonics solution provider

through innovation, manufacturing excellence and fast response

Value Proposition

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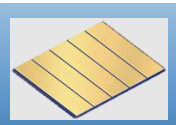
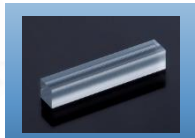
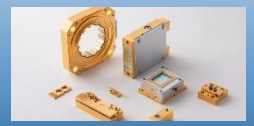
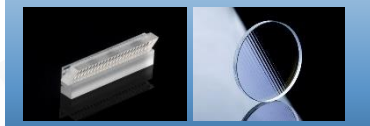
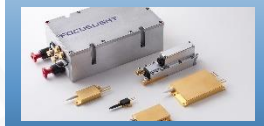
Full Value Chain

Raw Materials	 Chips (Strategic collaboration with Suppliers)	 Packaging Materials	 Optics Substrate
Components & Devices	 Light Sources	 Optical Components	 Fiber coupled Modules
Modules / Subsystems & Application Systems	 Laser Subsystems	 Optical Subsystems	 Integrated Modules
Solution, Support & Service	Application Centers	Technical Support	Field Service Centers

Total Solution & Service

Industry Leader
Strong Financial Backing
Healthy Stable Company, Invest in the Future

Value Proposition

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- ***Quality First*** philosophy
- Strong ***IP position***
- Customer ***commitment*** and willing to ***invest***
- Advanced ***technical strengths*** and ***"know-how"***
- Extensive ***engineering*** capability and high-volume ***manufacturing***
- ***Low-cost production*** ensured by high yield, low RMA & high productivity
- Comprehensive ***quality assurance system including IATF 16949 Automotive QMS standards***
- ***Full range of product portfolio*** from components to modules or subassembly
- Application support and ***total solutions***
- Versatile ***customization service***

Vision

To unlock the potential of photonics to enhance and enrich people's life

Company Organization

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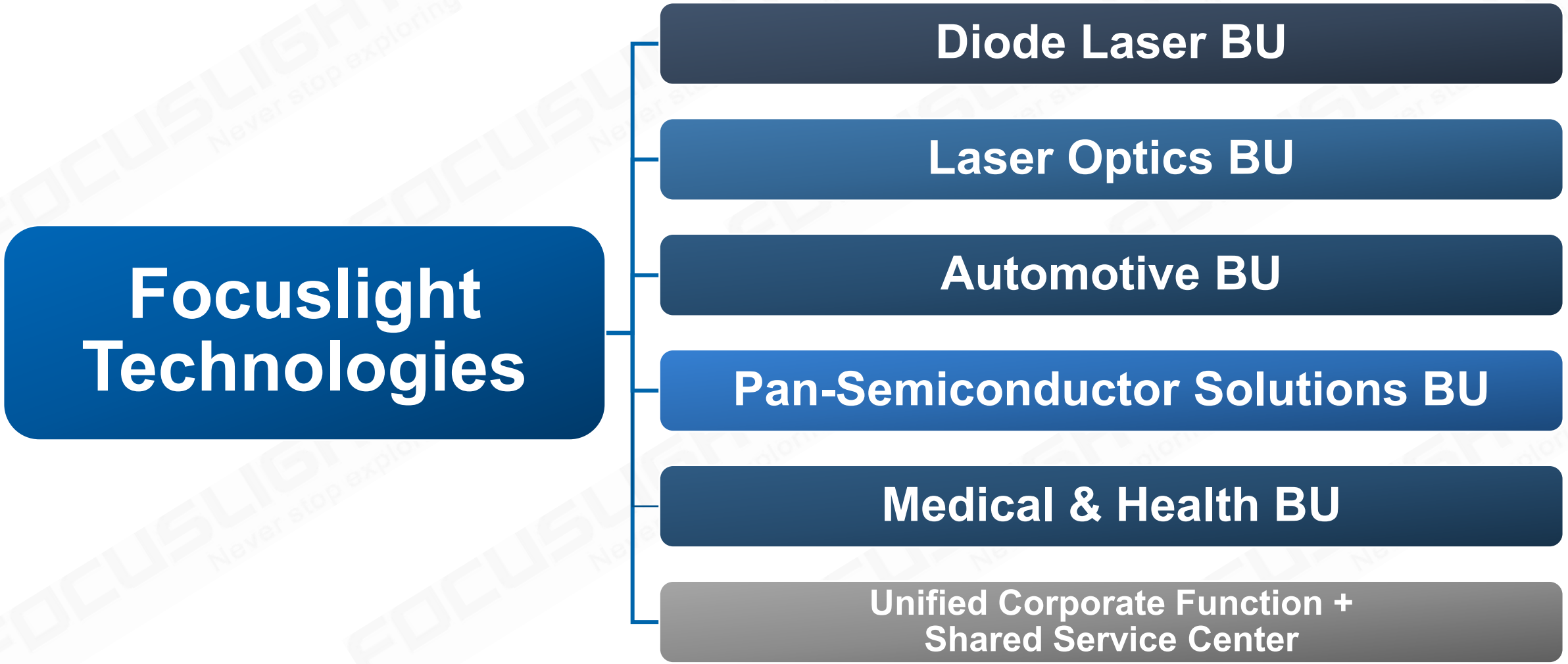

** BU: Business Unit*

Products – Diode Laser Components and Materials

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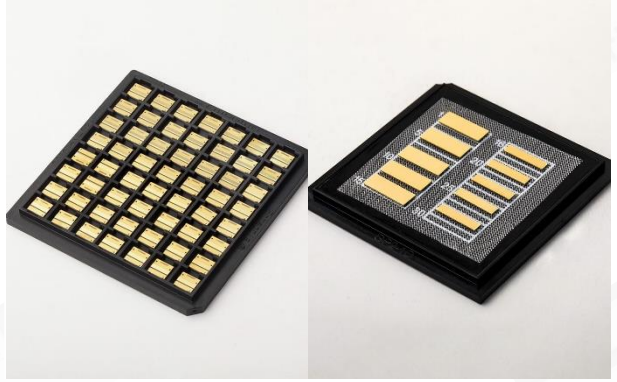
Advanced Materials



- AuSn Pre-Deposited AlN Ceramic Submounts
- AuSn Pre-Deposited CuW Submounts
- Thin Film Metallization Service

Active Devices

- Single Emitter Components
- Single Bar Components
- Micro-Channel Cooled Stacks
- Conduction Cooled Stacks
- Pumped Modules

Modules & Passive Components

- Emitter-Based FCM
- Bar-Based FCM
- Patch Cords

Professional Medical Application Components

- Laser Hair Removal Modules
- Medical Lasers

- Focuslight offers our customers a variety of products.
- Focuslight is committed to providing our customers with reliable, high-performance laser products and superior services

Products – Laser Optics Components

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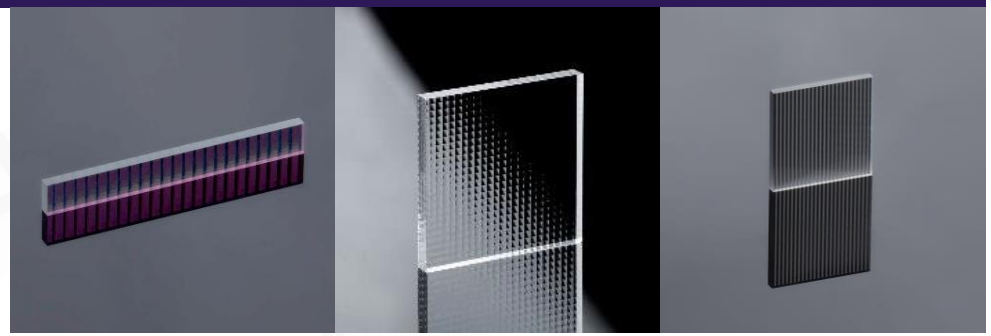
(A)cylindrical Lenses

FAC | SAC | Monolithic lens

(A)spherical Lenses

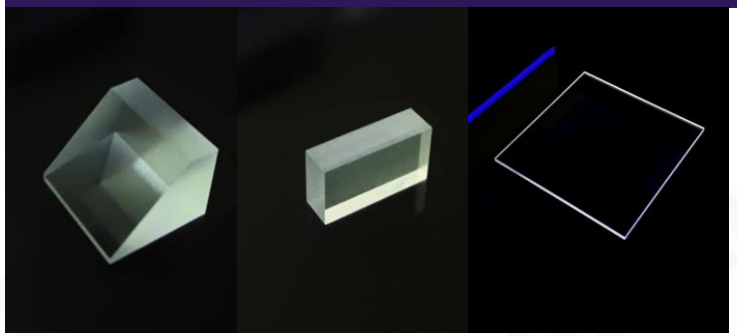
Focusing lens / Collimator

Micro Lens Arrays (MLA)



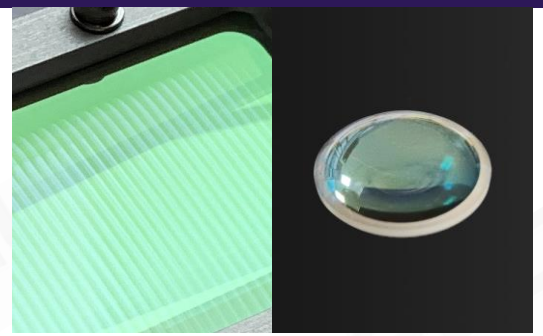
SAC/TEL array | Homogenizer | Wide angle diffuser

Plane Optics

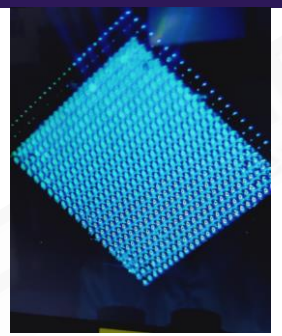


Micro prism | Reflection mirror | Window shield

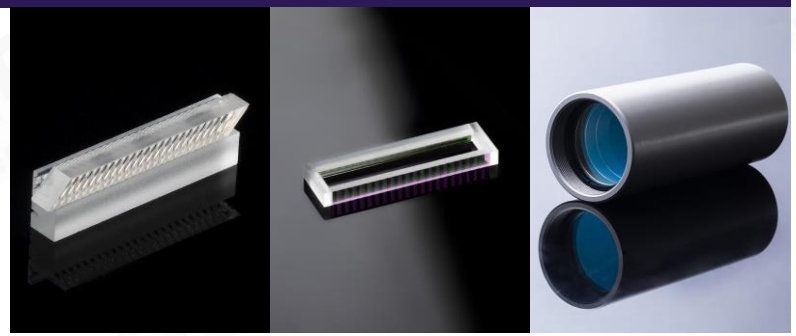
Polymer Optics



Polymer on Glass (PoG) Optics



Optical Subassemblies (OSA)



Beam transfor-mation system (BTS) | Collimation module | Compact beam shaper (CBS)

Products – Automotive Application Solutions

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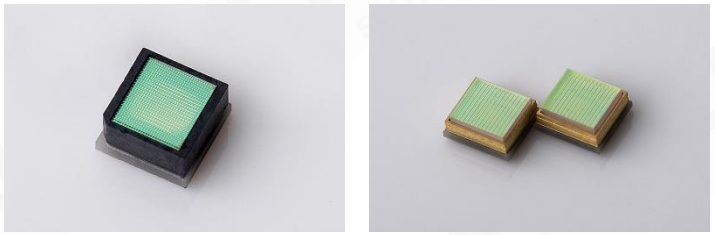
LiDAR Tx F - Flash LiDAR Transmitter Modules

AL01 (Mass Production)

Auto-grade DPSSL

AT01 / AT02 (Engineering Sample)



Auto-grade VCSEL module with wide FOV angles for DMS (Driver Monitoring System)

AX02 Pro (Engineering Sample)

VCSEL Flash Tx 700W

LiDAR Tx L - Line Beam Transmitter Modules

LE02 Pro
(Engineering Sample)

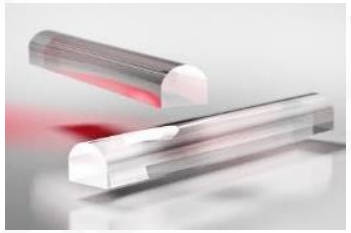
905nm 700W EEL Line Beam Tx

LX02 (Engineering Sample)

VCSEL Line Tx 1000W

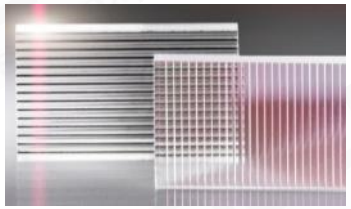
LiDAR Tx OA - Optical Assemblies for LiDAR Transmitters

EEL FAC Collimators
(Mass Production)



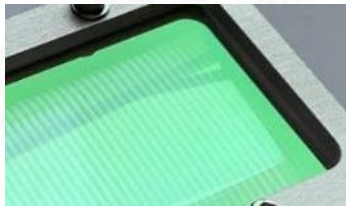
**LO BU Product*

Auto-grade Diffusers and Homogenizers
(Mass Production)



**LO BU Product*

Customized Optical Assemblies
(Engineering Sample)



Products – Pan-Semiconductor Application Solutions

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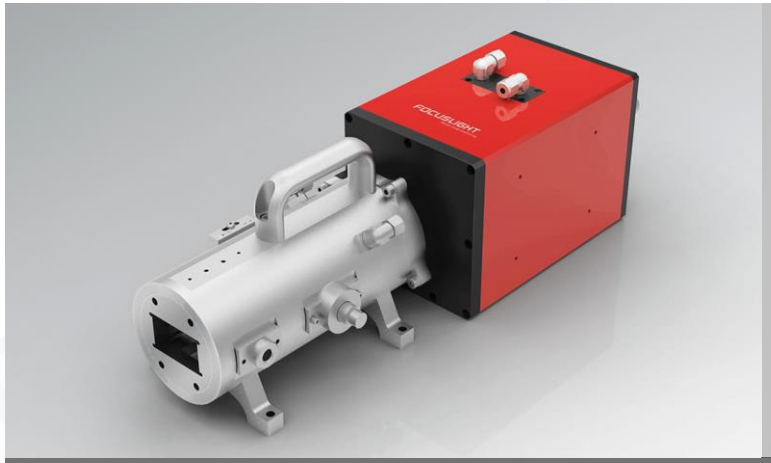

IC Wafer Annealing System

Variable Beam Laser System

Solid-State Laser Lift-Off (LLO) System

IR Line System

Industrial Laser Modules

Solid-State Laser Annealing (SLA) System

Products – Medical and Health Application Solutions

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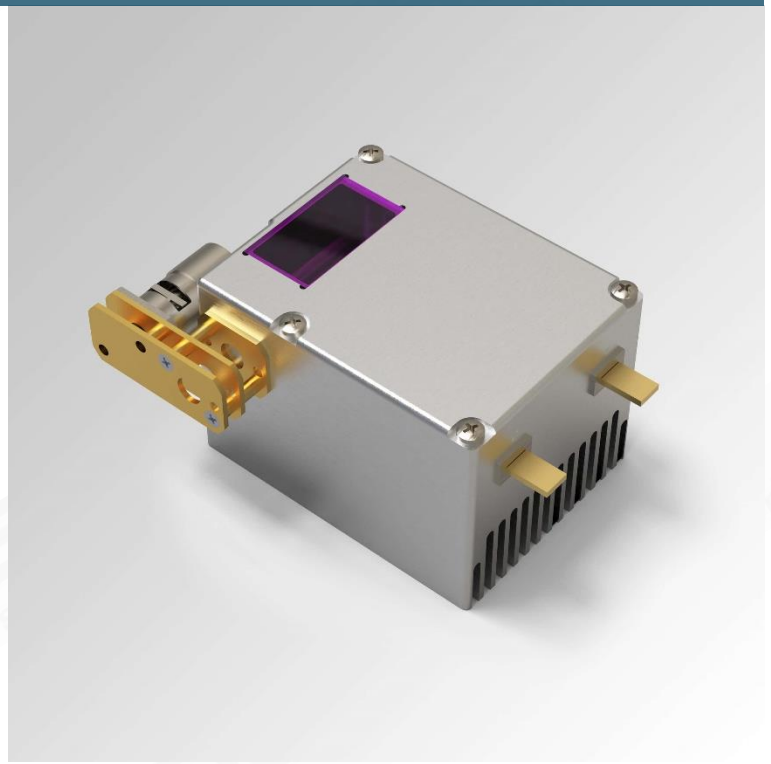
Professional Medical & Health Modules	Consumer Medical and Health Modules	
Laser Body Sculpting Module	Home-use Skin Rejuvenation Module	Home-use Laser Hair Removal Module
		

Core Competence – Diode Laser

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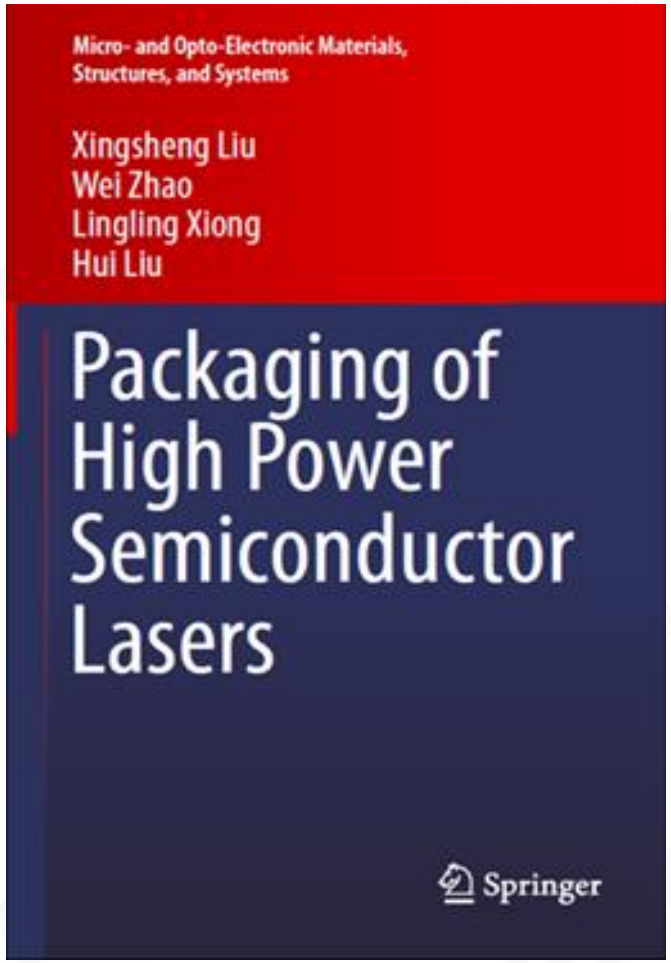
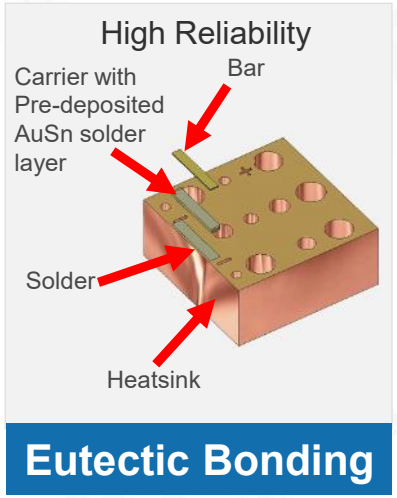
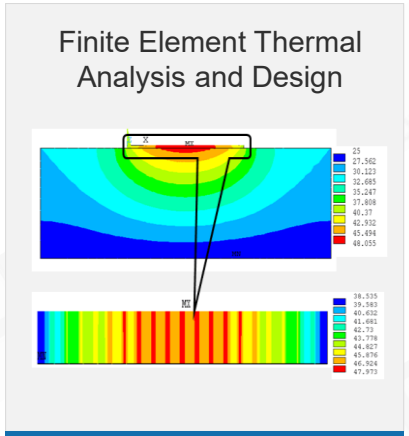
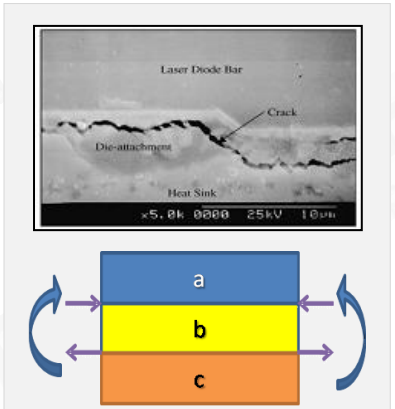




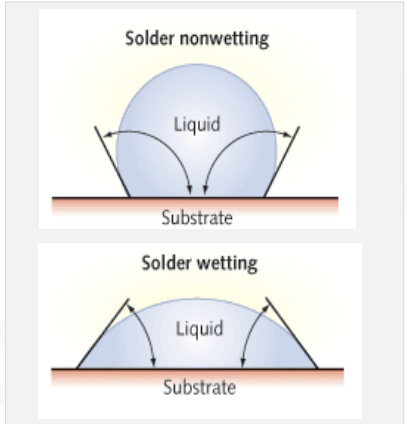
Eutectic Bonding



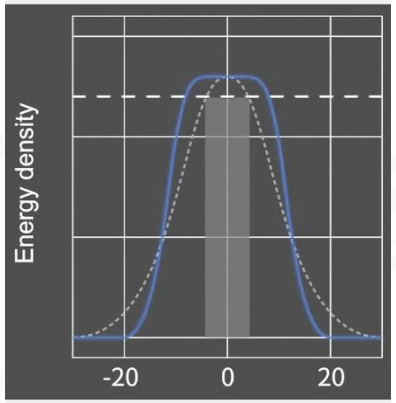
Thermal Management



Thermal Stress Control



Interface Materials and Surface Engineering



Test, Analysis and Diagnosis

Core Competence – Beam Shaping

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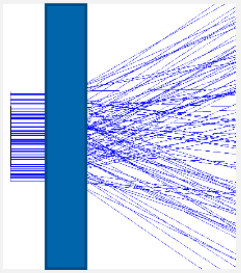
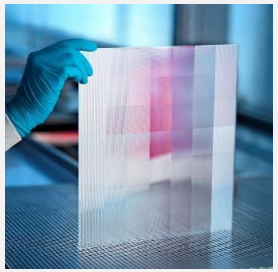
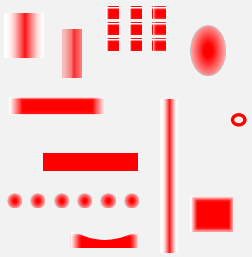
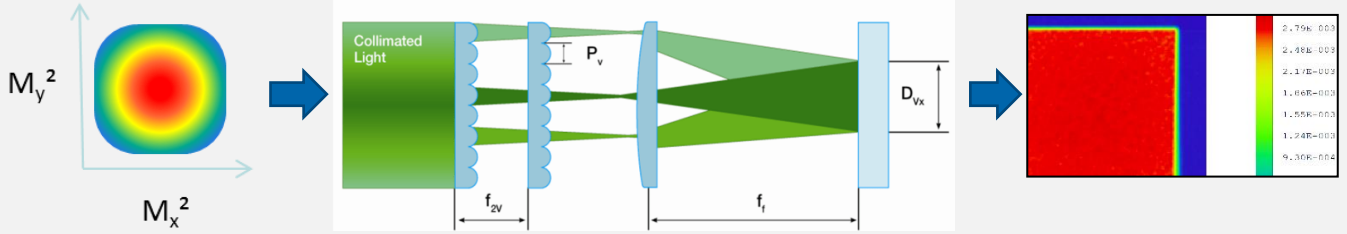
Micro Optics Design and Simulation

Acylindrical free-form micro-optics / arrays / diffusers / DOE splitters / beam shaping systems

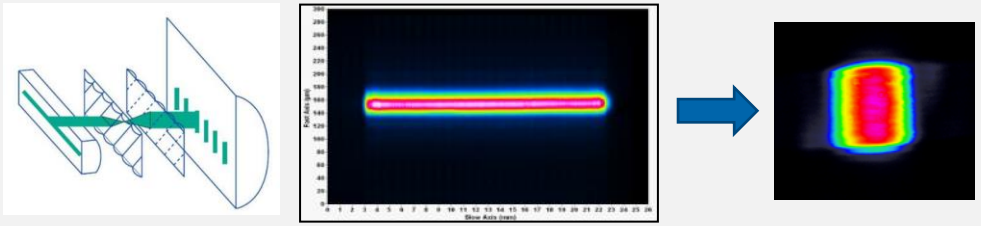
Homogenization

Uniform and homogeneous illumination in any desired shape

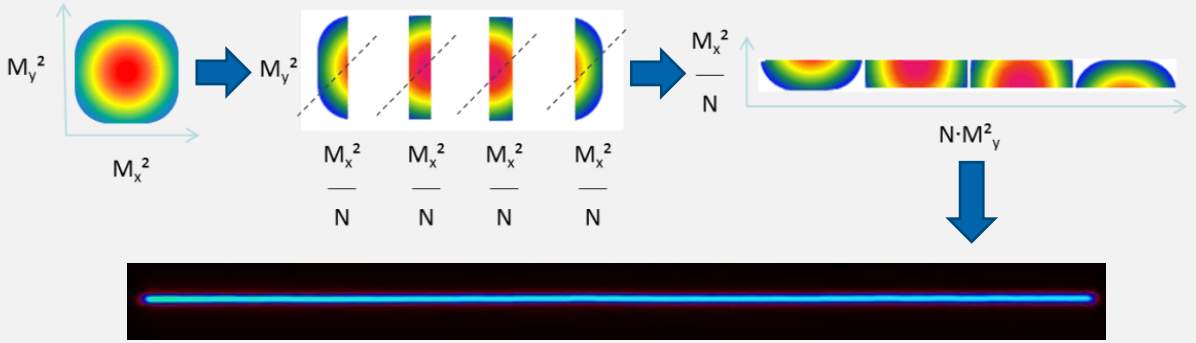


Beam Transformation

Asymmetrical → Symmetrical beam



Symmetrical beam → High density line beam



The right photon at the right place and time!

Core Competence – Optics Manufacturing

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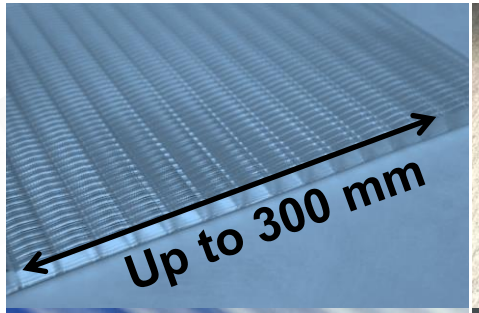
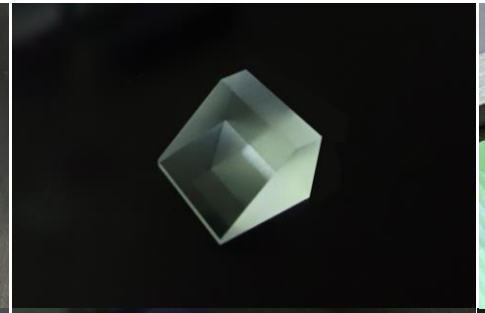
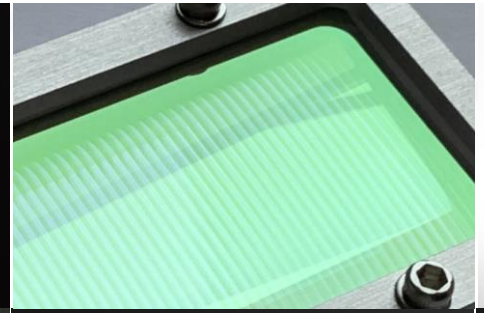
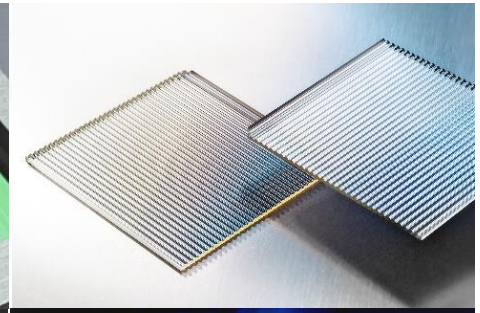
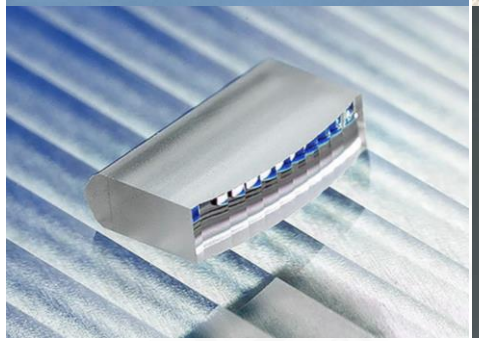
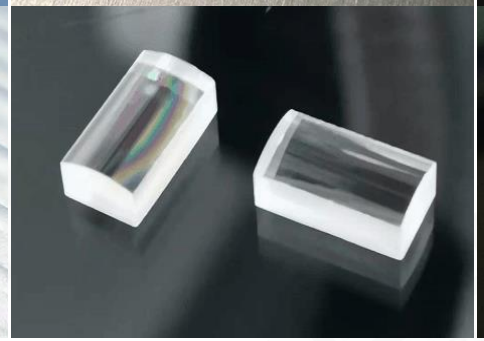
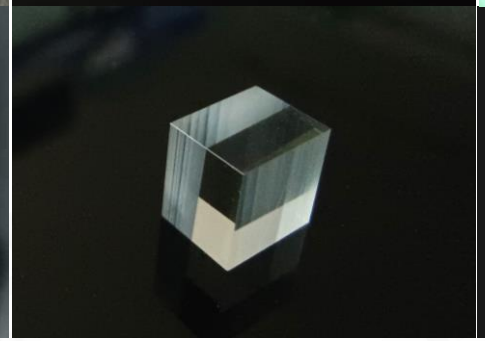
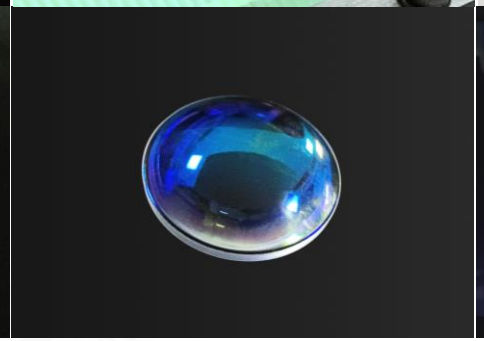
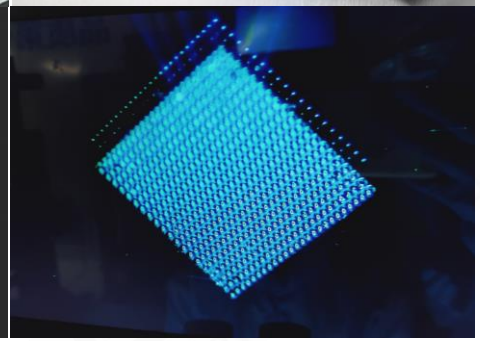
Wafer Level Simultaneous Structuring	Precision Glass Molding	Cold Processing	Polymer Injection	Nanoimprint
				
				

Inorganic material: Glass, Fused Silica, Silicon, CaF_2

Organic material: Polymer, Polymer on Glass

Core Competence – Automotive

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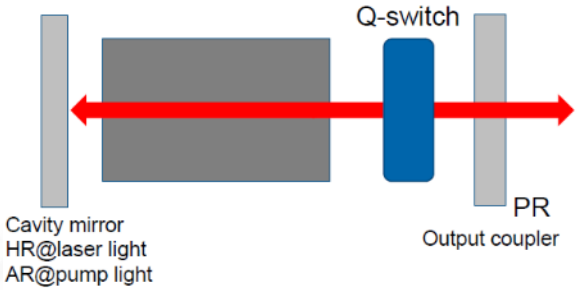
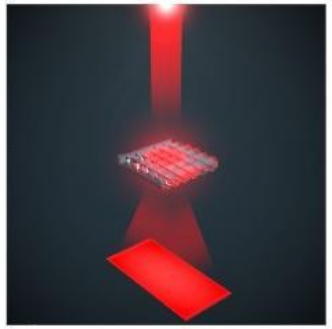
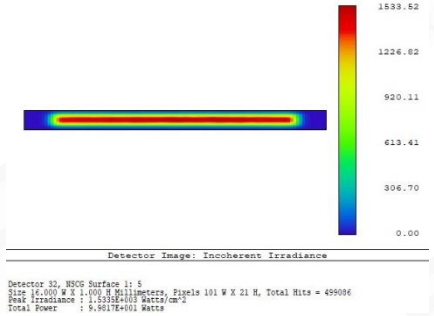


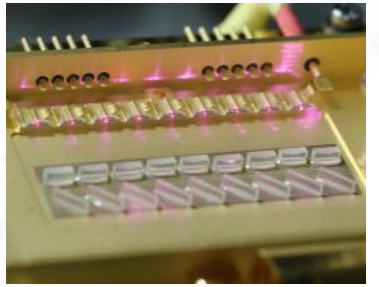
Q-switch DPSS Laser Transmitter Design



Advanced ROE Beam Shaping Optics Design



Design and Simulation



High Power Diode Laser Design and Assembling

Automotive Grade Laser Design and Qualification

Optical Assembly Automation

Laser Testing and Characterization

Laser Assembly Automation

Quality & EHS Management Systems

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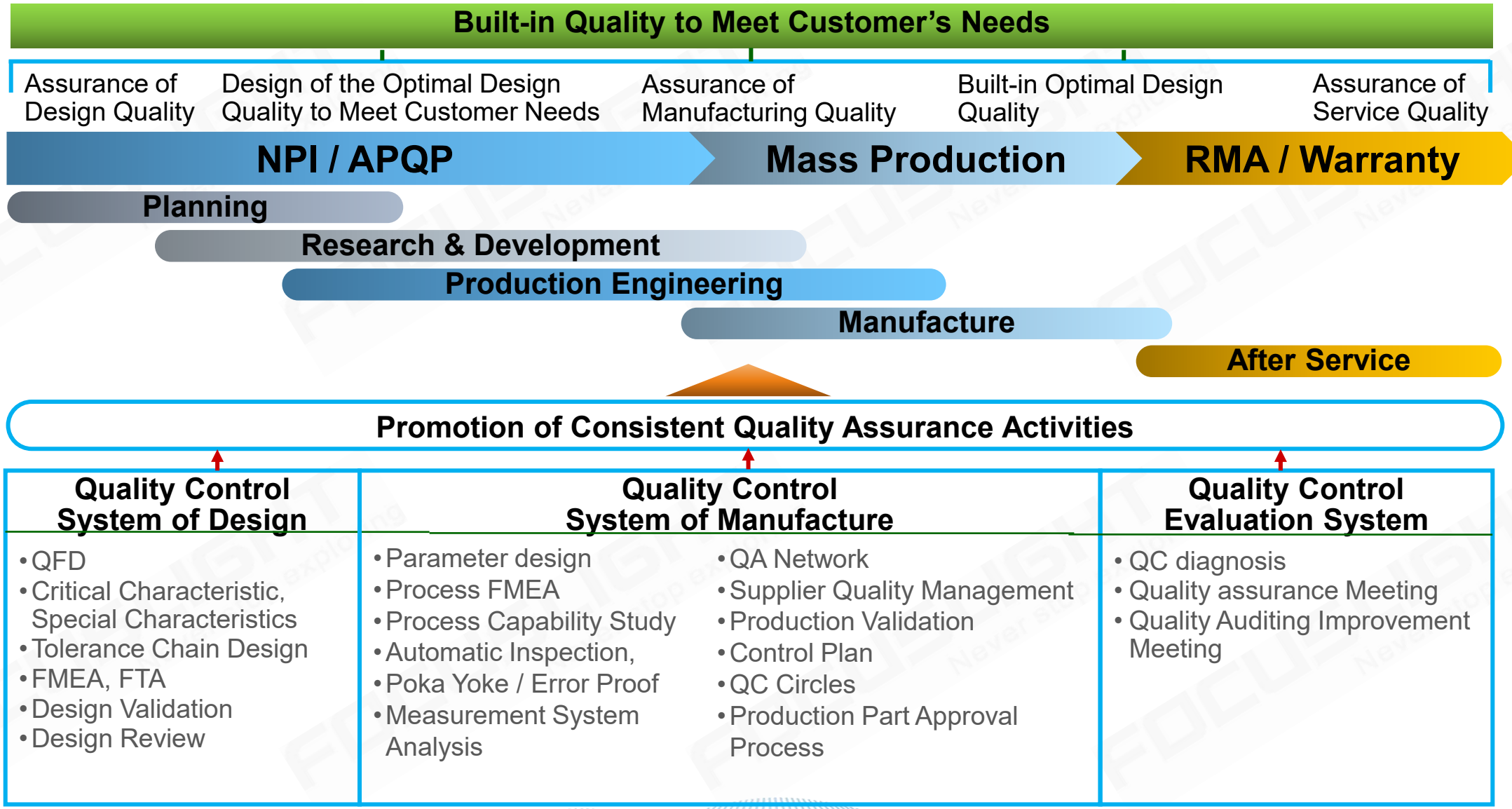
- ISO9001 Certified Quality Management System (QMS)
- ISO14001 Certified Environmental Management System (EMS)
- IATF16949 Certified Automotive Quality Management System
- ISO45001 Certified Occupational Health and Safety Management System
- Failure Mode and Effect Analysis (FMEA)
- Statistical Process Control (SPC)
- Production Traceability Database
- Control Plan (CP)

Quality Assurance System



Auto BU Manufacturing System (FLMS)

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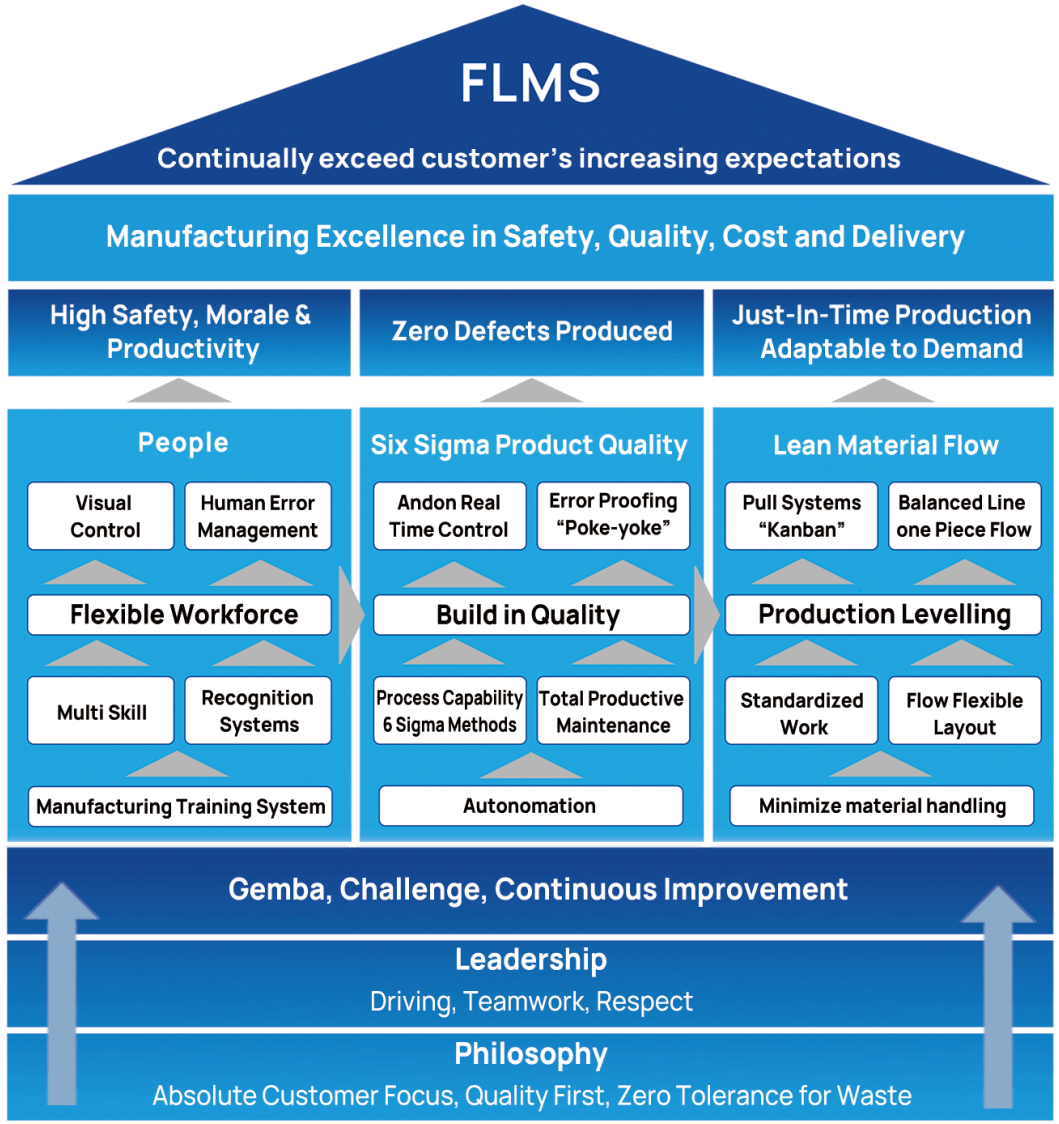
Focuslight Manufacturing System(FLMS)



Manufacturing Excellence

- Apply the **lean manufacturing practices** to all production lines, including automotive, diode laser ones and laser optics business
- **Absolute customer focus, zero tolerance of waste, and continuous improvement** philosophy
- **Significantly reduced** cycle time, improved manufacturing efficiency, and lowered RMA yield and manufacturing cost.
- Adopting **automation and advanced production management system**
- **SOP** of the first LiDAR transmitter project with an international automotive tier 1 customer
- IATF 16949 certified and VDA 6.3 audited

Manufacturing Capacity

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High Volume Production Capability of High-Power Diode Lasers

Manufacturing Capacity

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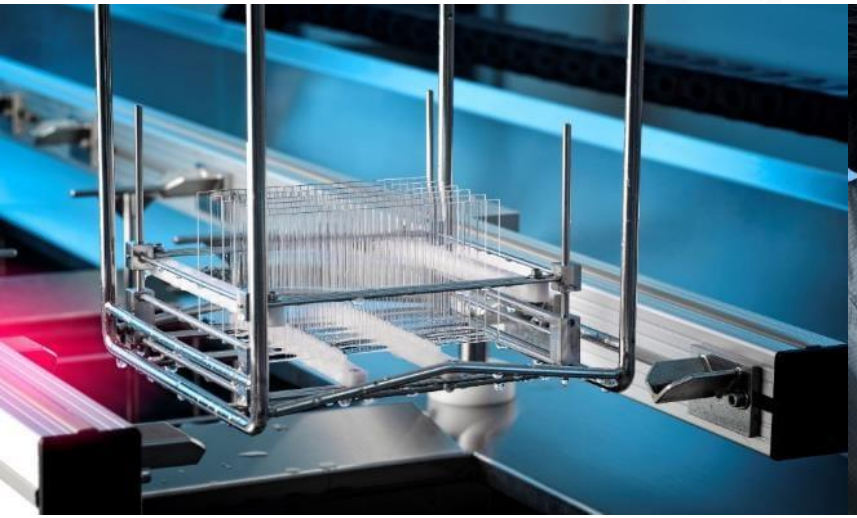
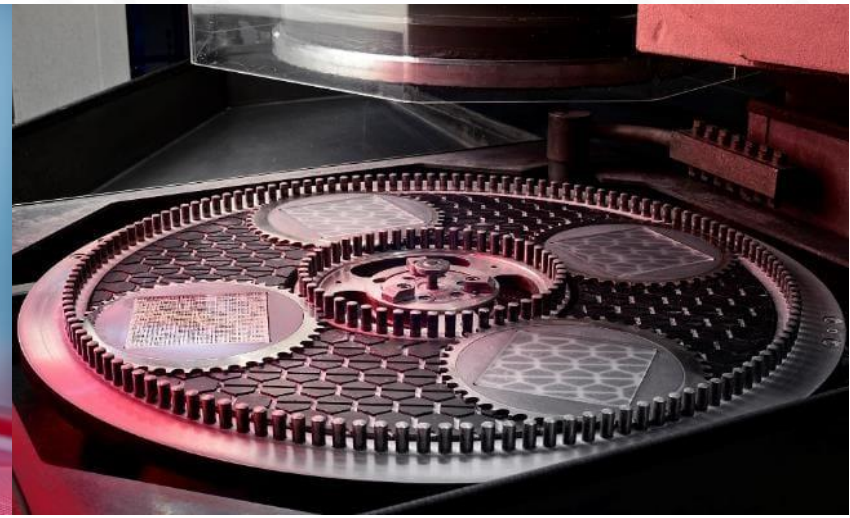
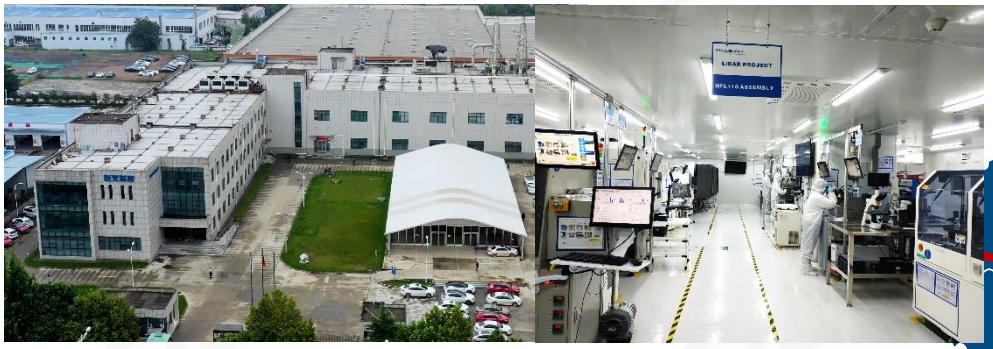




Monthly Micro Optics Manufacturing Capacity > 3 million pcs

Global Facility/Capacity Expansion - China



Focuslight HQ, Xi'an, China
13787m² facility with 3710m² clean room space for **diode laser components & automotive** LiDAR Tx module production lines

Hefei, China
A new facility of ~25,000 m² focused on **pan-semiconductor application solutions** will be constructed.

Haining, China
UV-LLO and UV-SLA systems being fully deliverable from here

Shaoguan, China
A new facility of ~15,000 m² focused on **medical and health application solutions** is being constructed

Dongguan, China
Total 65,000m² of building to be constructed. #1 and #3 buildings with ~6000 m² of clean room space has started operating in September 2022.
Monthly **micro-optics** manufacturing capacity > 3 million pcs

Global Facility/Capacity Expansion – Europe & USA

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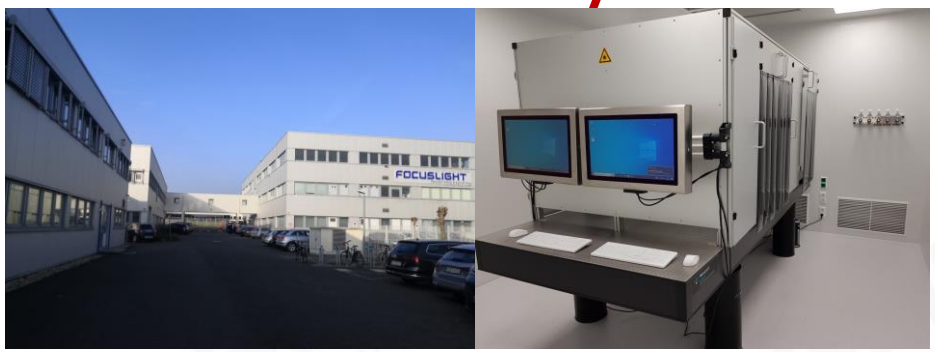
Dublin, Ireland
EMEA Sales office and R&D staff being important parts of our global presence

St. Petersburg, Russia
R&D office with scientists supporting the R&D projects

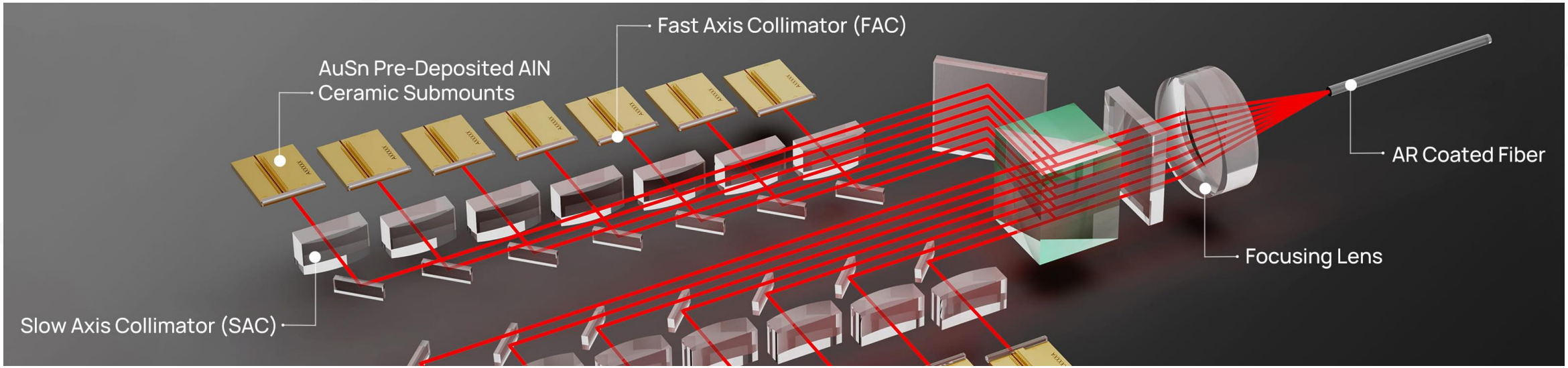


Dortmund, Germany
13000m² facility with 2870m² production area
Extension of **high-volume micro-optics wafer** production line (FAC /SAC) with manufacturing space increased by 150%
Expansion of UV laboratory finished

Silicon Valley, USA
The **new innovation lab** has been set up with our Chief Scientist working here

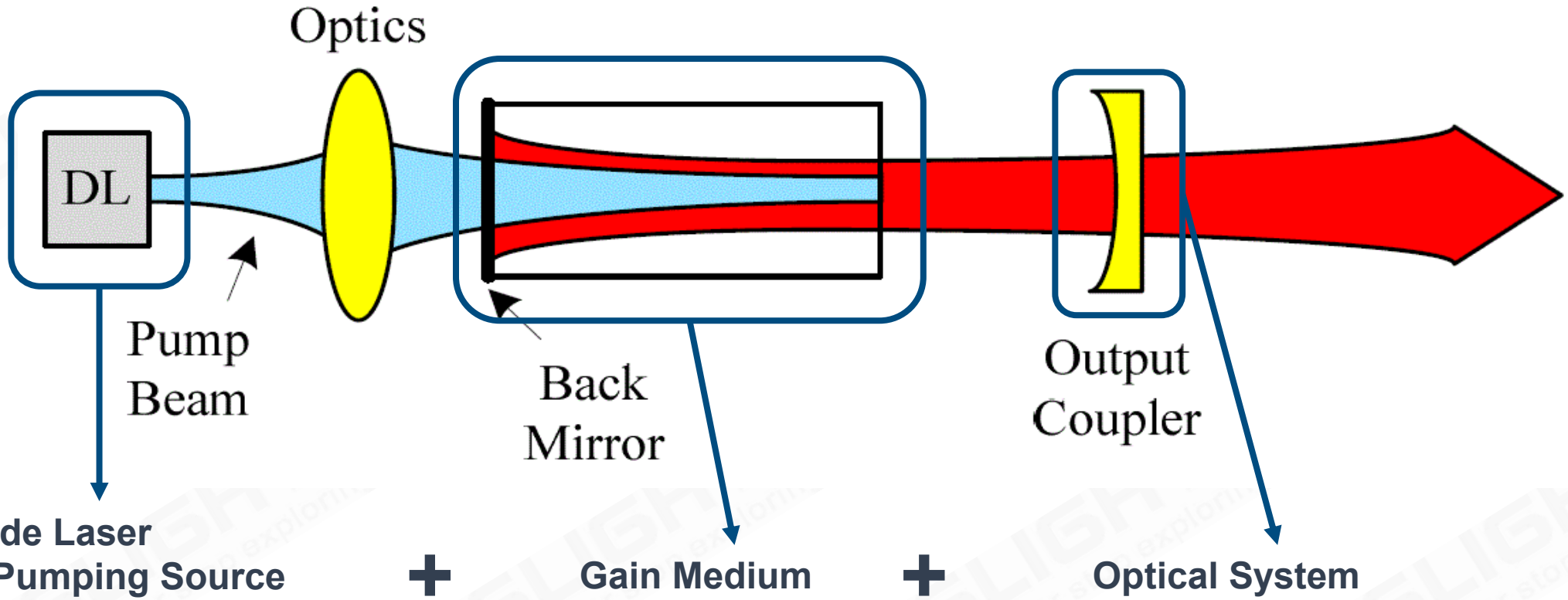
Americas Sales Office
being an important part of our global presence

Applications – Fiber Laser Pumping



- **AuSn pre-deposited ceramic substrates** – stable and reliable thanks to the high thermal conductivity and suitable thermal expansion coefficient;
- **Fast axis collimators (FAC) and slow axis collimators (SAC)** – fundamental and efficient solutions for shaping the beam emitted by the pumping sources;
- **Focusing lenses** – coupling the collimated laser beam precisely into the output fiber;
- **Optically coated fiber attached to the pumping sources** – transmitting the laser energy to the gain medium, enabling the function output of the fiber laser module.

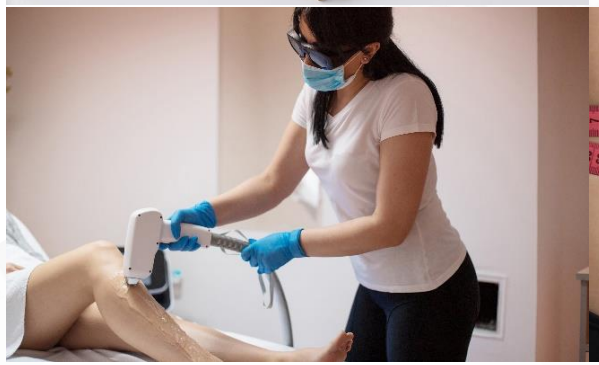
Applications – Solid State Laser Pumping



Diode Laser: ↓ Footprint ↑ Reliability ↑ Efficiency ↓ Cost

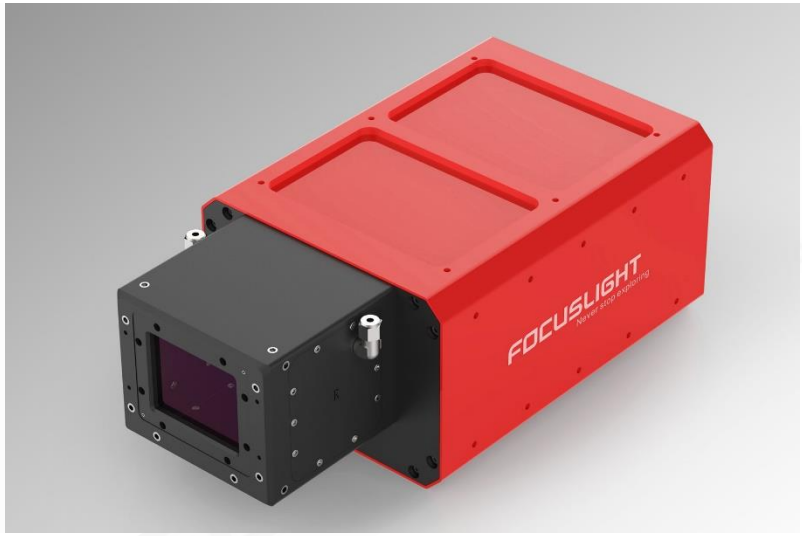
Application – Health

- **Direct diode laser solutions** and **fiber coupled laser solutions** for medical and aesthetic uses including laser hair removal, laser body sculpting, dental, surgery, laser fluorescein angiography (LFA) etc.
- Strong positioning in **professional hair removal** industry worldwide
- Fast growth (>300%) in **consumer health solution** and **body sculpting** laser modules
- Massive production project awarded from world-class home-use aesthetic equipment manufacturer



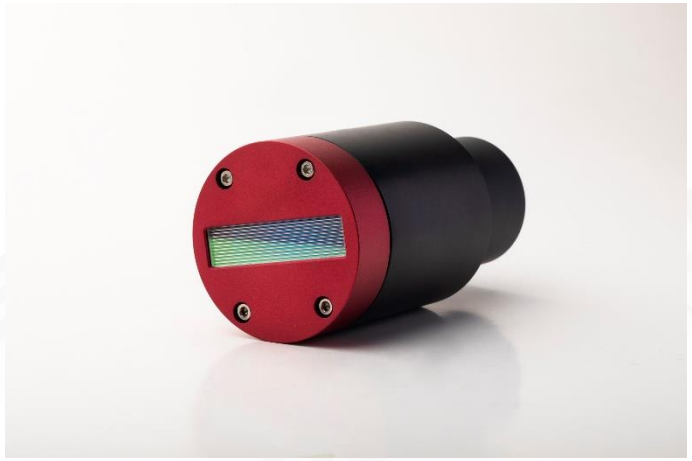
Applications – Cladding

- Dlight ® high power direct diode laser systems integrate diode laser stack and precision micro optical systems into laser head directly.
- High output power and optimized spot configurations are specially designed for big area treatment applications with high throughput and high surface quality.



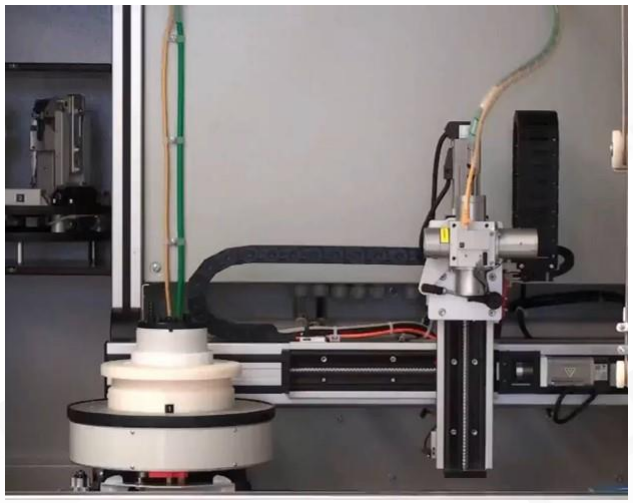
Applications – Imaging

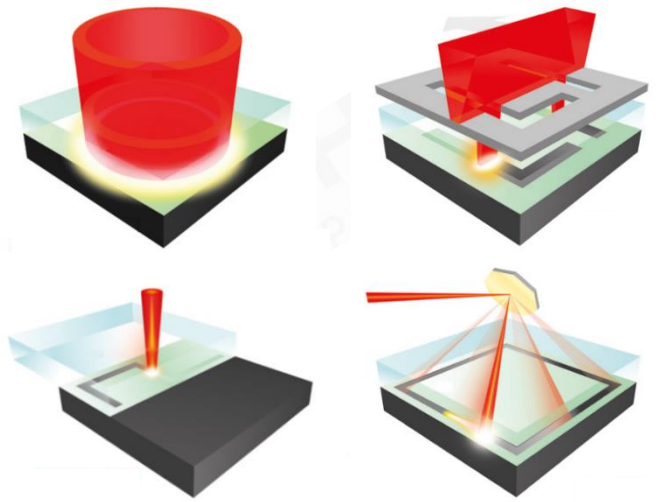
- IR Illumination
- IR Imaging
- Machine Vision



Applications – Welding

- Laser transmission welding of thermoplastics in the wavelength range 808nm-980nm
- Simultaneous welding of thermoplastics with Focuslight Line Beam Technology
- Cutting, welding and soldering of metals
- Metal surface finishing with Focuslight Line Beam Technology
- Corrosion- and abrasion-resistant hard metal coatings on steel





Applications – Laser Optics

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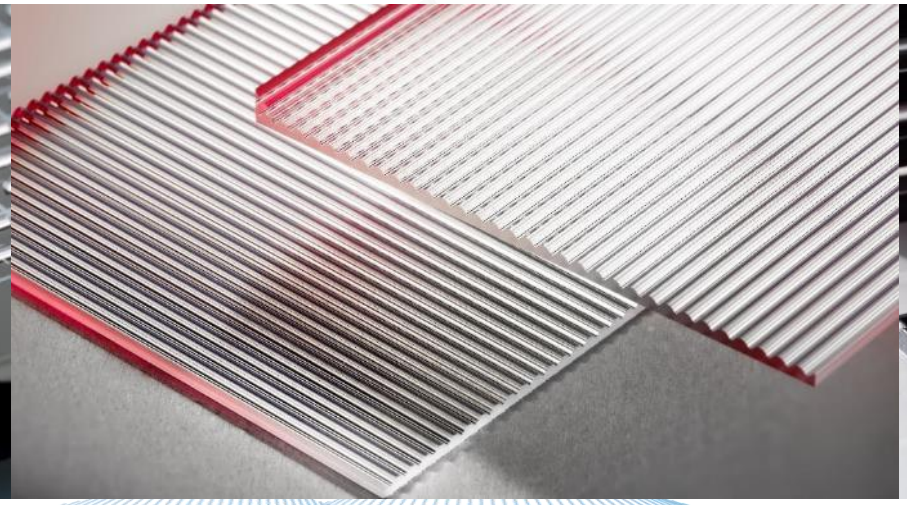
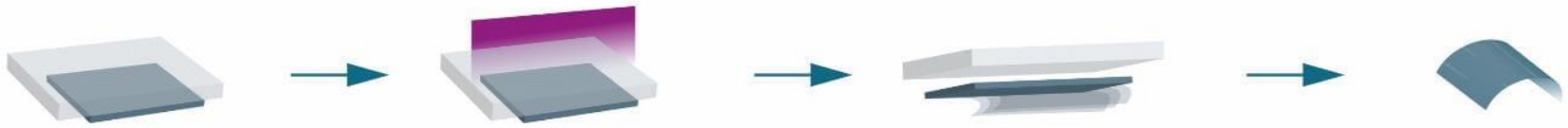
- Fast axis collimation (FAC)
- Slow axis collimation (SAC and SAC arrays)
- Beam transformation system (BTS)
- Blue optics
- Customized optics
- Contract assembly
- Design studies




Applications – Display

- Several tens of beam shapers (plasma display pixel structuring)
- Several green 100 mm line beam systems (laser lift-off)
- > 600 mm UV line beam production system (laser lift-off)



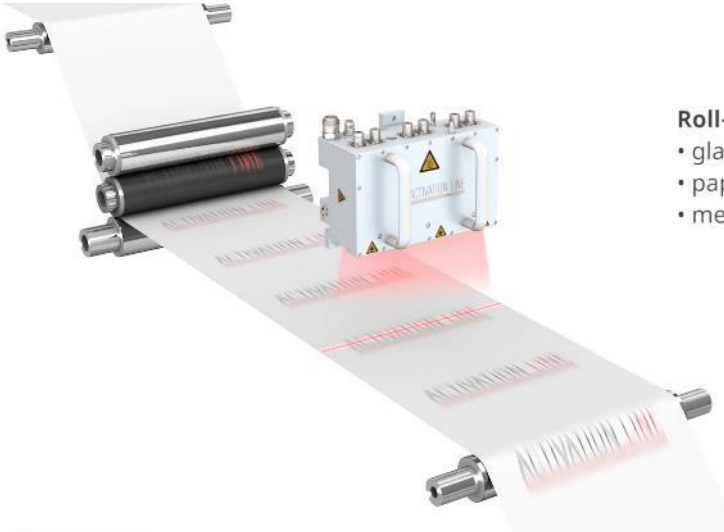
This graphic shows the laser lift off process.

Pre-production stage:

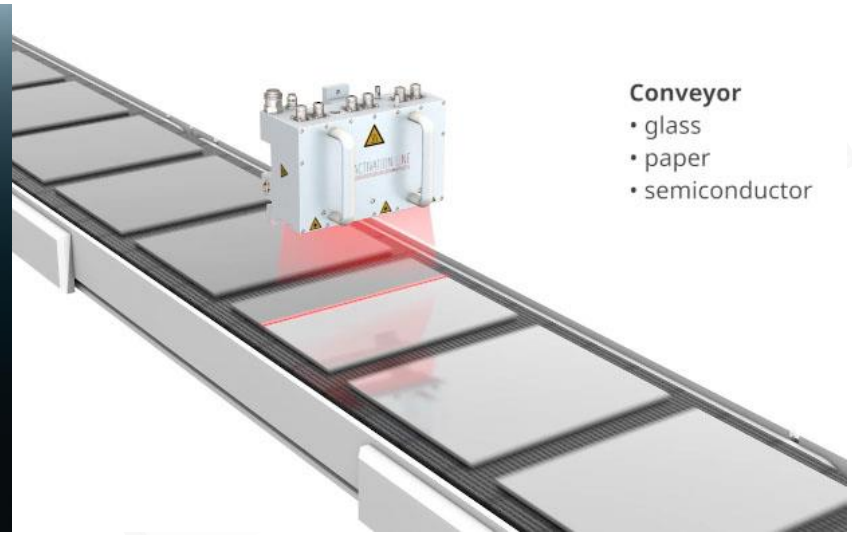
- Laser-induced thermal imaging process (LITI) with IR diode lasers
- Thermal optimization of TCO layers with Focuslight Line Beam Technology
- Low-temperature polysilicon annealing (LTPS) for AMOLED and high-resolution LCDs

Applications – Coating

- vRTP (very Rapid Thermal Processing) of functional coatings with Focuslight Line Beam Technology:
- Large-scale, energy-efficient and precisely controlled processing
- … for a large variety of substrate materials (metal, glass, polymer, paper etc.)
- … for a large variety of processes (annealing, crystallization, drying, sintering etc.)
- … for a large variety of coating materials (semiconductors, metals, TCOs etc.)

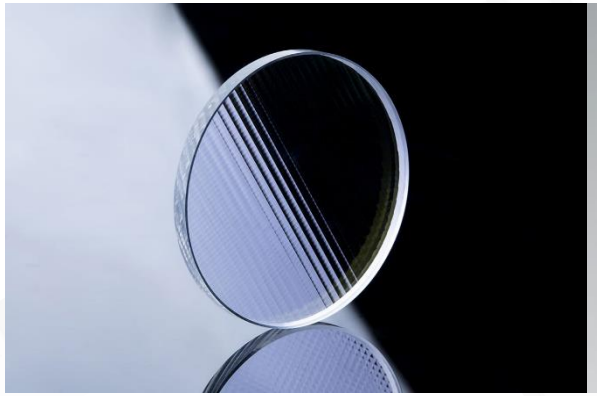


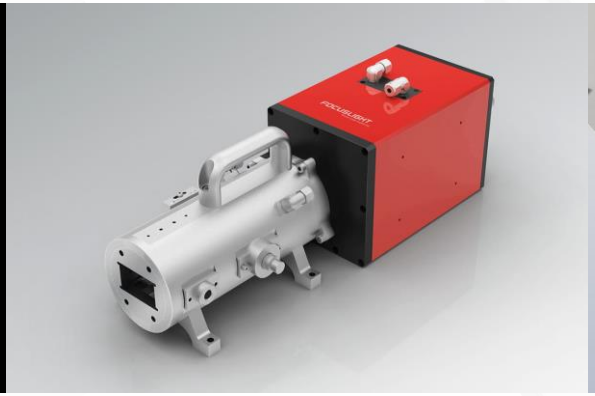
Roll-to-roll
- glass
- paper
- metal

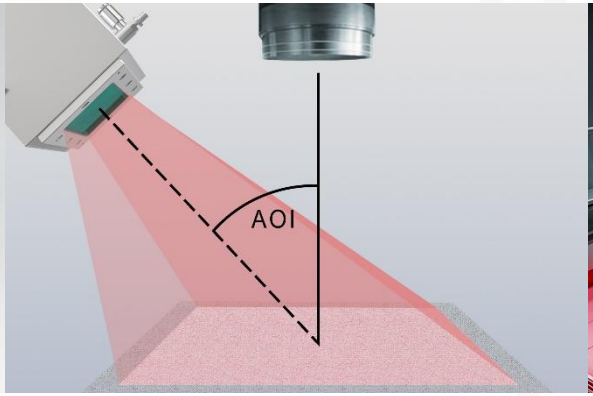


Conveyor
- glass
- paper
- semiconductor

Application – Semiconductor







- Beam homogenization technology powers **lithography** illumination system – key optical component in steppers
- > 15 years supply to the major manufacturer of semiconductor lithography tools

- Laser system solutions with high power density and different beam profiles, designed for various **laser-based wafer annealing**, e.g. DSA, IGBT backside annealing, and SiC annealing

- Off-axis beam shaping technology powers laser surface treatment as well as surface inspection
- Typically used in **solar cell industry**

- Beam shaping on UV solid state laser, 30000:1 aspect ration is achievable
- Up to 1000 mm long UV Line generation system enabling **OLED laser lift-off** process
- Next generation LTPS **solid-state laser annealing** process.

Application – Automotive LiDAR

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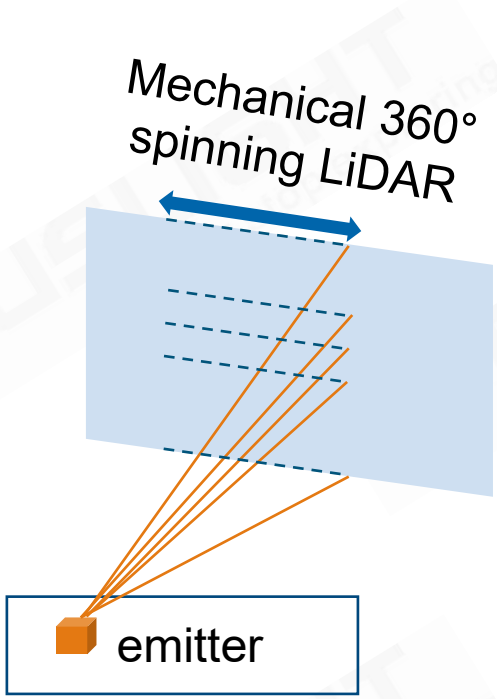
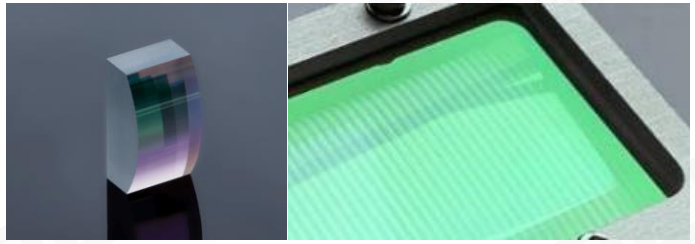
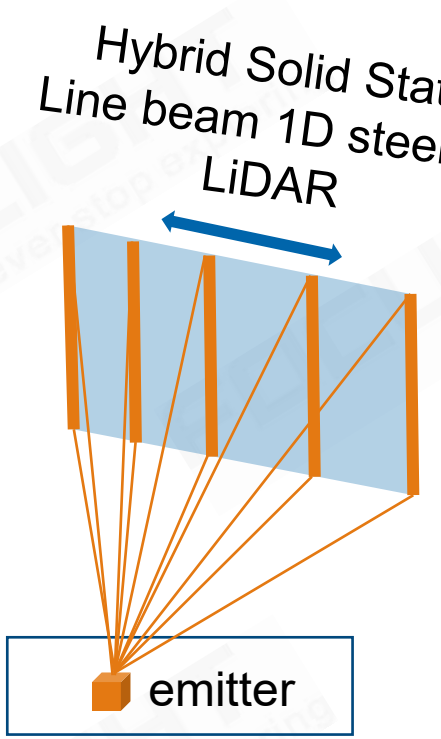
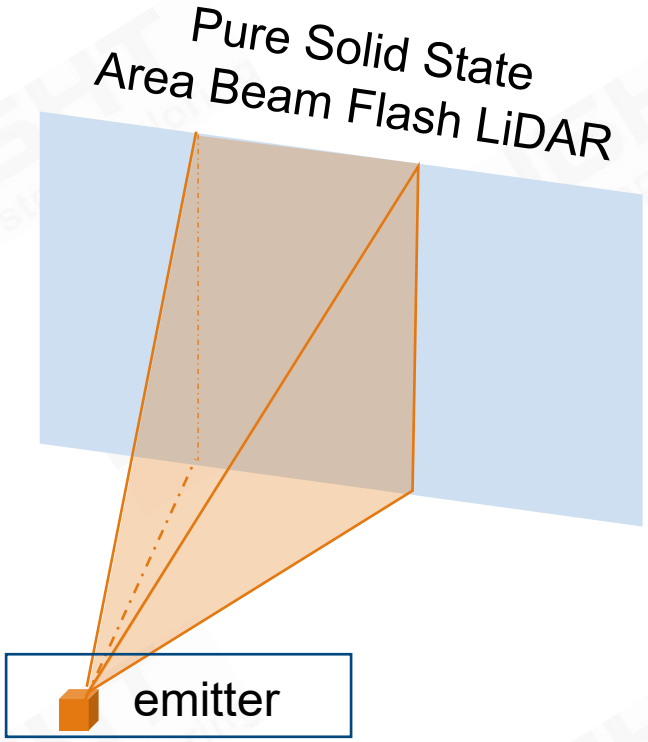


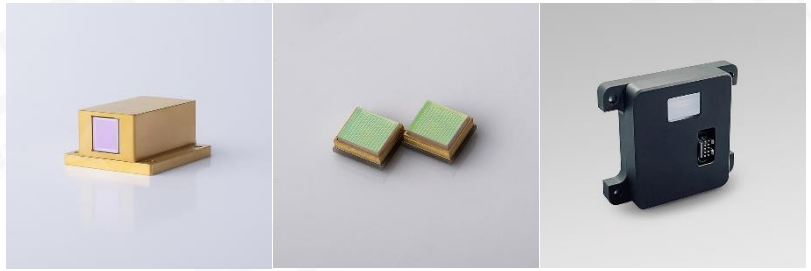


Automotive-grade optics and subassembly



Line Beam Transmitter Modules





Flash Transmitter Modules

Sales Network

- Worldwide established distributors
- Direct sales offices in China, Ireland and US
- Manufacturing site in Xi'an, Dortmund, Dongguan and Haining

Summary

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- Diode laser light source leader and beam shaping expert
- One stop source from active devices to passive optics, from components to modules to application subassemblies
- Total solution, versatile customization service and field service provider
- Strong RDE capability, high volume production capacity and low-cost manufacturing
- Strong IP position in diode lasers and laser optics
- Financially healthy and strong financial backing from investors for long term growth

- **Your committed and reliable long-term partner in diode lasers and laser optics**

THANK YOU

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