

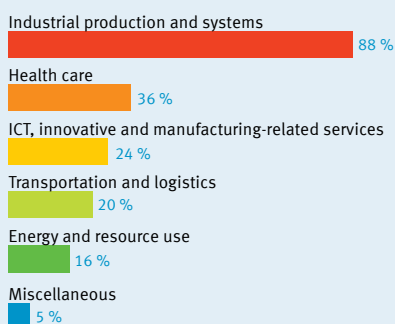
Optics.

Exceptional expertise – wanted worldwide.



High-powered diode lasers, laser scanning microscopes and aspherical lenses for special optical filters are prime examples of sophisticated Thuringian-made technology. Global players such as ZEISS, Schott and JENOPTIK got their start in Thuringia and set the international standard for optics.

Product application areas



*Source: OptoNet e.V. 2019, multiple mentions allowed, percentage share of companies

The Thuringian optics industry at a glance:

- › 187 companies
- › 16,200 employees
- › Around 2,300 students majoring in optics, laser engineering and related fields
- › Roughly 1,600 employees at private and university research institutions
- › Over 520 trainees in optics-related professions
- › € 3.3 billion in revenue
- › 67 % export ratio
- › 10% of German photonics companies are located in Thuringia*.

LEG – The premier partner for direct investment

Seize the opportunities that Thuringia offers. The State Development Corporation of Thuringia (LEG) will support your investment project from start to finish free of charge – from finding a site to implementing your investment project to handling future expansions. Contact us. We're here to help.

 www.invest-in-thuringia.de/en/industries-technologies/optics/



Networking to advance optics.

Modern optics is a key enabling technology that cuts across disciplinary lines. Thuringian clusters effectively link research and production in this field.

OptoNet

A Thuringian optics cluster, OptoNet represents approx. 100 stakeholders in the Thuringian photonics industry and provides a vibrant communication, networking and cooperation platform. Its members include not only ZEISS and JENOPTIK but also a vast number of small and medium-sized technology companies who are global leaders or major players in their product and service markets.

Three Fraunhofer institutes, the Leibniz Institute for Photonic Technologies and numerous university institutions represent the research community in the cluster. Specialized consulting firms and staffing providers contribute their unique skills to the network; banks and investment firms leverage the networking opportunities to offer their services. The membership of technology clusters from other regions and the cooperation of public institutions support site development and drive interregional collaboration. (Source: www.optonet-jena.de)

Skills for success.

As a traditional optics stronghold, Thuringia has a deep pool of specialists for all aspects of optical technology.

Thuringian universities have special degree programs and departments:

- ▶ Photonics at Friedrich Schiller University Jena (FSU)
- ▶ Combined Master's and PhD programs in optics and photonics at the Abbe School of Photonics (FSU)
- ▶ Optical system technology / optronics as well as mechatronics, micro and nanotechnologies at the Ilmenau University of Technology (TU Ilmenau)
- ▶ Laser and opto technologies, ophthalmic optics/optometry and optometry/ophthalmic technology/vision science at the Ernst Abbe University of Applied Sciences Jena

Thuringia's companies put a high priority on ongoing employee training. The Jena Training Center, for example – a joint venture of SCHOTT JENAer Glas GmbH, Carl Zeiss Jena GmbH and JENOPTIK AG – produces highly trained specialists. Various universities provide relevant continuing education programs. Also, OptoNet organizes JENA Optics Colloquium with support from Carl Zeiss AG, JENOPTIK AG and Thuringian research institutions.





Jena-Erfurt-Ilmenau Technology Triangle.

Together with the University of Technology of Ilmenau, the institutes and universities in Jena and Erfurt have long been a hotbed for optical technology research in Thuringia.

Jena is one of the German hubs for optical technologies.

Major research institutions include:

- › Institute for Applied Optics and Biophysics, FSU Jena
- › Institute for Optics and Quantum Electronics, FSU Jena
- › Institute of Condensed Matter Theory and Optics, FSU Jena
- › Institute of Applied Physics, FSU Jena
- › Otto Schott Institute of Materials Research (OSIM), FSU Jena
- › Abbe Center of Photonics, FSU Jena
- › Leibniz Institute of Photonic Technology, Jena
- › Fraunhofer Institute for Applied Optics and Precision Engineering (IOF), Jena
- › Günter Köhler Institute for Joining Technology and Materials Testing, Jena
- › Lighting Engineering Department, TU Ilmenau
- › Technical Optics Department, TU Ilmenau
- › Fraunhofer Microelectronic and Optical Systems for Biomedicine Project Hub (MEOS), Erfurt
- › Inorganic Nonmetallic Materials Department at the Institute of Materials Engineering, TU Ilmenau

Innovation centers:

- › Innovation Center for Quantum Optics and Sensing (InQuoSens), Jena and Ilmenau
www.acp.uni-jena.de/inquosens.html

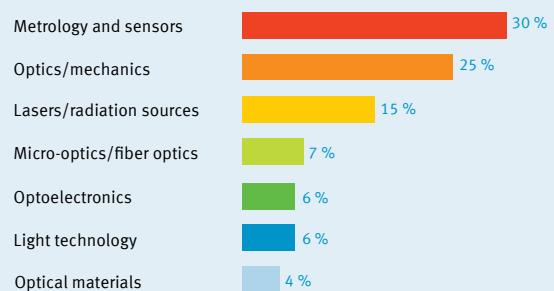
Other research outfits and companies in Thuringia:

- › Institute of Microelectronic and Mechatronic Systems (IMMS), Ilmenau and Erfurt
- › CiS – Research Institute for Microsensors, Erfurt

Technology for demanding applications

Thuringian organizations cover key optical technologies in a breadth that is unmatched anywhere else in Germany: from generating and transmitting light to modulating it over space and time.

Product and technology focuses



Source: OptoNet e. V. 2019, multiple mentions allowed, percentage share of companies



Thuringia: where success is made.

The Free State is home to world-class companies that set international standards in optical technologies.

ZEISS

ZEISS is a global leader in the optical and optoelectronic industry. The company, which was founded in Jena in 1846, is now headquartered in Oberkochen, Germany. Jena plays host to all four ZEISS divisions: Semiconductor Manufacturing Technology, Medical Technology and Research Microscopy Solutions, the Planetariums unit and Central Research. It is also home to the central provider of production services for the ZEISS Group. The company is investing over € 300 million in a new integrated high-tech site in Jena.

JENOPTIK AG

Jenoptik is a globally active technology group that operates three photonics-based divisions – Light & Optics, Light & Production and Light & Safety – as well as VINCORION for mechatronics solutions. (Source: www.jenoptik.com)

LEONI Fiber Optics GmbH

LEONI Fiber Optics GmbH is a leading provider of fiber optic cables for special applications in manufacturing, sensor technology, analytics, science, communications and laser medicine.

Docter Optics SE

Docter Optics is the international market leader in optical glass projection lenses for automotive applications and a recognized supplier of optical components and systems to premier OEMs in various industries, including biometrics, digital projection, printing and machine vision.

GÖPEL electronic GmbH

Jena-based GÖPEL electronic GmbH is one of the leading providers of testing and inspection systems for electronic assemblies and printed circuit boards used primarily in the automotive, aviation, medical device and industrial electronics industries.

Jena-Optronik GmbH

Products and technologies from Thuringia play key roles in space missions that are as spectacular as they are pioneering. Customers around the globe trust Jena-Optronik GmbH to supply high-precision sensors for satellite attitude and orbit control and optical components for Earth observation. Over 300 satellites have Jena-made technology on board.

Selected companies

ADVA Optical Networking SE,
Meiningen

Allied Vision Technologies GmbH,
Stadtraa

ams Sensors Germany GmbH, Jena

ASKION GmbH, Gera

asphericon GmbH, Jena

CDA GmbH, Suhl

Grintech GmbH, Jena

HELLMA Optik GmbH, Jena

Jabil Optics Germany GmbH, Jena

**Laser Imaging Systems GmbH –
Orbotech, Jena**

LASOS Lasertechnik GmbH, Jena

LAYERTEC GmbH, Mellingen

NOBLEX GmbH, Eisfeld

Optics Balzers Jena GmbH, Jena

ORAFOL Fresnel Optics GmbH, Apolda

**POG Präzisionsoptik Gera GmbH,
Löbichau**

**Schott Technical Glass Solutions
GmbH, Jena**

Vision & Control GmbH, Suhl

Vistec Electron Beam GmbH, Jena



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