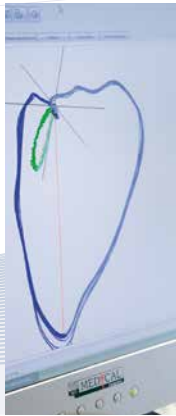


MEDICAL ENGINEERING FROM JENA

Prime Address for Medical Engineering

Development of optical bench for the use in a laser system – Asclepion Laser Technologies

Production of high quality contact glasses for use in refractive surgery – Carl Zeiss Meditec AG



People in Jena already knew a hundred years ago: Medical engineering is a growing market. The world-renowned company Carl Zeiss has developed and produced microscopes since 1847 and medical technology since 1911, specializing in the field of ophthalmology. Medical technology “made in Jena” is in great demand worldwide because it delivers innovative solutions for both diagnostics and therapy.

Cutting-edge technology »made in Jena« ...

Important milestones of medical engineering were and are being achieved in Jena. For example, at the beginning of the 20th century the company Carl Zeiss developed here in cooperation with the Swedish ophthalmologist Allvar Gullstrand an ophthalmoscope to examine the eyeground. Even today, its main optical concept is still being applied to modern examination instruments of ophthalmology. This pioneering spirit remains to this day. Even today the company Carl Zeiss develops highly innovative new products and technologies, for example the optical coherence tomography (1997), the laser scanning microscope (1982) and refractive surgery with femto-second laser (2006).

Jena is an internationally established location for medical engineering. Technology leaders based in Jena include companies such as Carl Zeiss Meditec AG, a worldwide leading supplier of systems for diagnostics and treatment of eye diseases. Carl Zeiss MicroImaging GmbH is also based in Jena and operates globally as leading supplier for microscopy products especially for bioscience. Other important companies in Jena are, for example, Alere Technologies GmbH (e.g. HIV rapid tests), Analytik Jena AG (e.g. solutions for molecular diagnostics), Jenoptik AG, Asclepion Laser Technologies GmbH, biolitec AG and LASOS Lasertechnik GmbH (each with specialized medical laser technologies). Numerous other medium-sized companies add to the innovative diversity of the medical engineering industry in Jena. In total, Jena’s companies in this field generate and account for a worldwide turnover of more than a billion Euros each year – and counting.

In Jena, training of skilled personnel, research and the development of innovative products go hand in hand. The local universities educate qualified junior personnel, who are taught for example at the Institute of Applied Optics and the Institute of Applied Physics of the Friedrich Schiller University Jena as well as at the Departments of Medical Engineering and Biotechnology and at the SciTec Department of the University of Applied Sciences Jena.

Jena is also home to ‘medways’, a network of leading German research institutes, industrial enterprises and universities. They are dedicated to creating new processes for diagnostics and therapy in ophthalmology and to conceiving globally marketable products for medical engineering. For many years the main focus

of research has been the interdependency of light and biological materials. As a result, these days Jena’s researchers are sought-after experts for biophotonics, microscopy and ophthalmology.

Furthermore, the city is home to the Centre for Innovation Competence (CIC) SEPTOMICS. It combines state-of-the-art interdisciplinary fundamental research with cutting-edge clinical expertise in order to develop new techniques of sepsis diagnostics and medication for therapies. In addition, gerontology is another large area of research in Jena.

The Beutenberg Campus hosts a large number of competencies in Jena under the guiding principle „Where Life Science meets Physics“. A number of renowned research institutes are based here, three Leibniz Institutes, two institutes of the Max Planck Society, as well as institutes of the Fraunhofer Society and the Friedrich Schiller University. The BioInstrumentation Centre as well as the Technology and Innovation Park Jena offer founders best opportunities in the immediate vicinity. More than 2300 employees work on this campus.

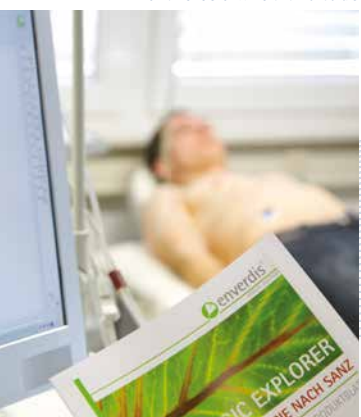
The University Hospital Jena is also taking a leading role in medical research and is an important project partner for Jena’s companies and institutions. Their new concept “Vorteil Jena” (Advantage Jena) has been developed together with the Friedrich Schiller University and the University of Applied Sciences. It describes Jena as health and service region of tomorrow and won funding from the Federal Ministry of Education and Research.

Precisely fitting solutions for high demands ...

In Jena, medical engineering benefits greatly from the location’s longstanding optics tradition. Local companies offer a wide range of services and products to their international customers:

- Complete solutions for ophthalmology and eye surgery from diagnosis to therapy including aftercare
- Operating microscopes, visualization solutions and future technologies for microsurgery, allowing for example intra-operative radiation therapy
- Laser scanning microscopes and light microscopes with varied applications in the field of biology, medicine and life sciences, for example as basis for molecular, cell and microbiological research
- Development, production and distribution of individual and system

Examination with the
CARDIOLOGIC EXPLORER – enverdis



Pima CD4 cartridge production – Alere Technologies GmbH



Aesthetic treatment with the erbium laser
Dermablate Effect – Asclepion Laser Technologies



- solutions for the analytics and life sciences industry (for example atomic and molecular spectroscopy, PCR, mobile germ detection)
- Development and production of radiation sources, adaptation of laser systems used in medical devices
 - Innovative testing systems for medical diagnostics as well as portable analysis equipment (Point of care systems), for example to supervise the immune status of patients with a HIV infection
 - Development and production of medical laser systems and optical fiber (photodynamic therapy)
 - Solutions for cardiovascular function diagnostics and methods for the molecular diagnosis of infections

Success stories from Jena ...

3di GmbH www.3di.de
 -4H- JENA Engineering GmbH www.4h-jena.de
 Alere Technologies GmbH www.alere-technologies.com
 Analytik Jena AG www.analytik-jena.com
 Asclepion Laser Technologies GmbH www.asclepion.com
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 biolitec AG www.biolitec.de
 Carl Zeiss Meditec AG www.meditec.zeiss.de
 Carl Zeiss Microscopy GmbH www.zeiss.de/mikro
 CCS Pawlowski GmbH www.ccs-imaging.de
 dentognostics GmbH www.dentognostics.de
 enverdis GmbH www.enverdis.com
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 GRINTECH GmbH www.grintech.de
 IMEDOS Systems UG www.imedos.de
 JeNaCell GmbH www.jenacell.com
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 Jenoptik | Laser & Materialbearbeitung ... www.jenoptik.com/lm
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 Jenpolymer Materials Ltd. & Co. KG www.jenpolymer-materials.de
 LASOS Lasertechnik GmbH www.lasos.com
 Matesy GmbH www.matesy.de
 Occlutech GmbH www.occlutech.de
 Quantifoil Instruments GmbH www.qinstruments.com

Networks, Research and Education ...

Beutenberg-Campus Jena e. V. www.beutenberg.de
 BioCentiv GmbH www.biocentiv.com
 Centre for Innovation Competence (ZIK) SEPTOMICS
 www.septomics.de

Infect Control 2020 www.infectcontrol.de
 InfectoGnostics www.infectognostics.de
 INNOVENT e. V. Technology Development Jena
 www.innovent-jena.de
 Jena Centre for Systems Biology of Ageing (JenAge)
 www.jenage.de
 Leibniz Institute for Age Research – Fritz Lipmann Institute (FLI)
 www.fli-leibniz.de
 Leibniz Institute for Natural Product Research and Infection
 Biology – Hans-Knöll-Institute (HKI):
 • Center for Systems Biology of Infections
 www.sysbio.hki-jena.de
 Leibniz Institute of Photonic Technology e. V. (IPHT)
 www.ipht-jena.de
 medways e. V. www.medways.eu
 PHOTONICS4LIFE www.photonics4life.eu
 Polymet Jena e. V. www.polymet-jena.de
 Prevention through Participation (Vorteil Jena)
 www.vorteiljena.de

Friedrich Schiller University Jena:

• Abbe Center of Photonics (ACP), Biophotonics
 www.acp.uni-jena.de/biophotonics.html
 • Institute of Applied Optics (IAO) www.iao.uni-jena.de
 • Institute of Applied Physics (IAP) www.iap.uni-jena.de
 • Otto Schott Institute of Materials Research (OSIM)
 www.osim.uni-jena.de

University of Applied Sciences Jena

„Ernst-Abbe-Fachhochschule“:

• Medical Engineering and Biotechnology Department
 www.mt.fh-jena.de
 • SciTec Department www.scitec.fh-jena.de

University Hospital Jena:

• Integrated Research and Treatment Center for Sepsis Control
 and Care www.cscck.uniklinikum-jena.de
 • Interdisciplinary Center for Clinical Research
 www.izkf.uniklinikum-jena.de
 • Medical School and University Hospital incl. Research Center
 www.uniklinikum-jena.de
 • Center of Medical Optics and Photonics (ZeMOP)
 www.zemop.uni-jena.de

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 from Jena.**



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