

**SEMINAR FOR SWISS PHOTONICS
MUTTENZ
MARCH 2014**

PRESENTATION FISBA OPTIK

About FISBA

Technology vision

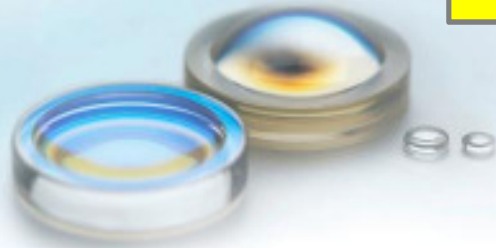
Examples with micro-optic components and systems



WHO WE ARE

- Established in 1957
- Leading supplier of optical systems, micro systems and components
- Strong focus with micro optics for medical applications since 1965
- Head office in St. Gallen, Switzerland
- Branch office in Berlin, Germany
- 350 employees FTE
- Family business privately owned by Huber and Fischbacher families





NEW BUILDING FOR OPTICS PRODUCTION

NEW SPACE in building south 5'200 m²

Existing space in building north 3'800 m²

Existing space in building west 5'500 m²

Investment volume CHF 25 Mio.

- process infrastructure CHF 4 Mio
- 4 floors with usable height of 4m
- Fully process oriented design
- Airconditioning and used air separate
- 2 connections to existing building

- Moved in September 2012 and fully operative after 3 weeks



FACTS AND FIGURES

Customers from the High-tech Industry

- Systems manufacturers
- OEM customers

Branch Profil

- Life Sciences (biophotonic/medical optics)
- Machine and laser industry
- Security and defence
- Aerospace and Institutes

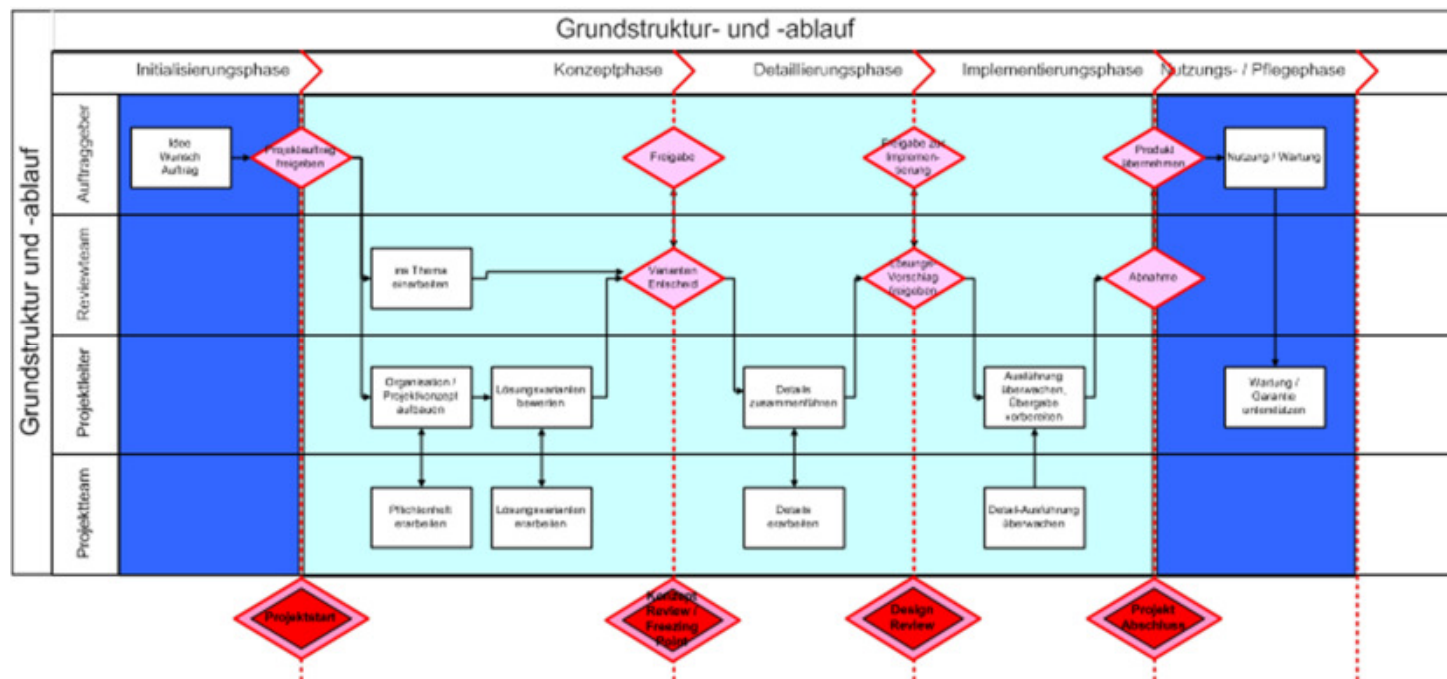


MANAGEMENT AND QUALITY IN PRODUCT DEVELOPMENT

Our product development process fits to your project management process

ISO 9001: → we are driven by customer, staff and processes

→ we develop with a fully implemented project management method





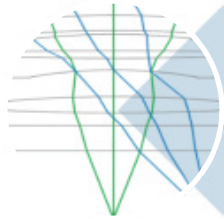
COMPONENTS < INNOVATION > SYSTEMS

<i>Innovation matrix</i>	<i>processes</i>	<i>product technologies</i>
<i>components</i>	new production and measurement technologies	Solutions in fit, form and function
<i>systems</i>	competence in systems engineering and projectmanagement	photonic systems and microsystems in application

- Innovation routes***
 - 
• Technology push by FISBA OPTIK
 - 
• Market pull by customers



FISBA COMPETENCY FOR OPTICAL MICRO SYSTEMS



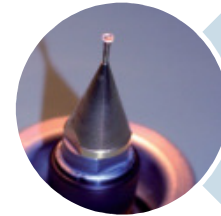
*Optical and
System Design
and Eng.*



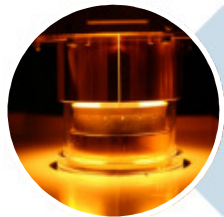
*Micro-parts
handling and
joining*



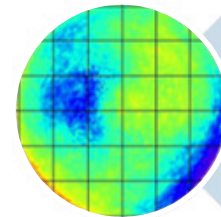
*Process
Design and
Optical
fabrication*



*Active
Microassembly*



*Micro-Optics
dicing*

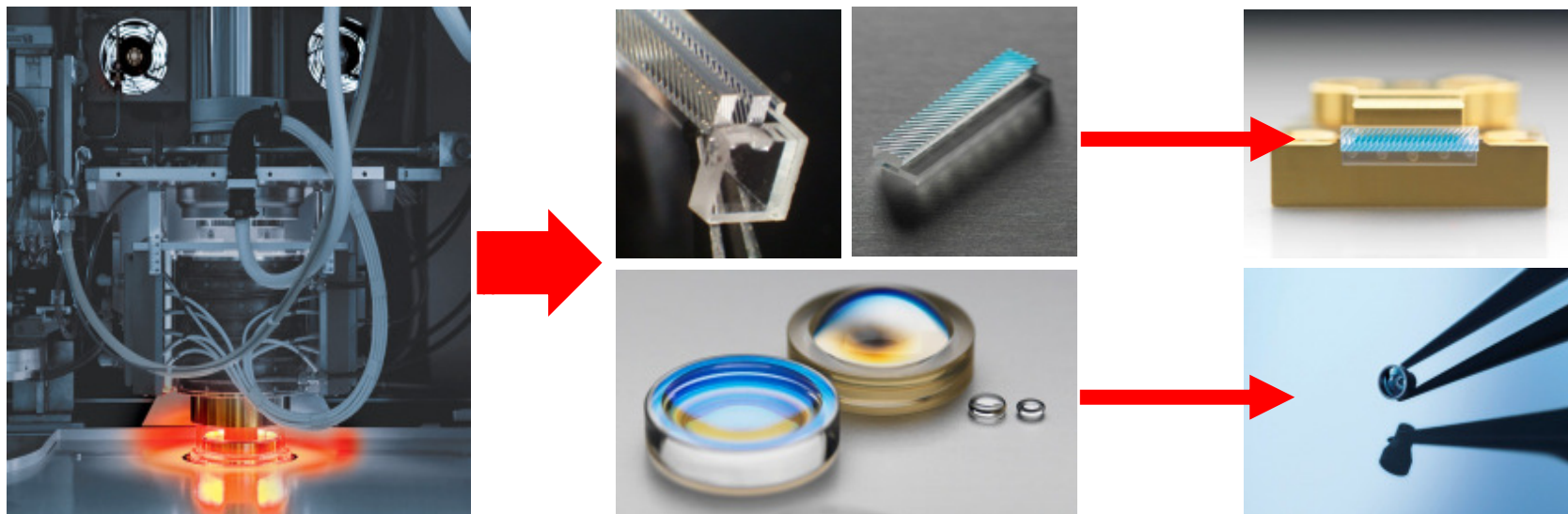


*Qualification
Measurement*

SCALABLE PROCESS FOR PRECISION OPTICAL COMPONENTS

Precisely moulded lenses for high quality imaging applications

- Aspheric lenses, lens arrays, and free-form lenses in large volumes
- Proven high scalability and batch-to-batch uniformity
- Complete production chain from the preform to the qualified optics



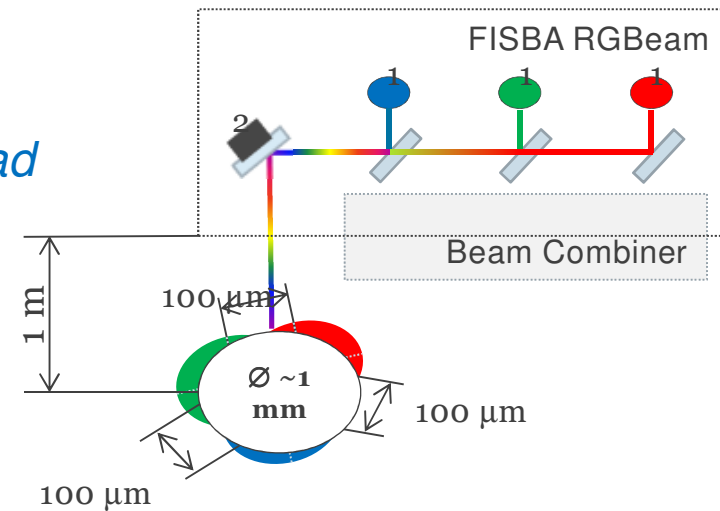
OPTICAL MICROSYSTEMS: ULTRA SMALL RGB LASER MODULE

RGBeam

Platform for laser beam alignment <math>< 0.1 \text{ mrad}</math>

Compact design and low weight

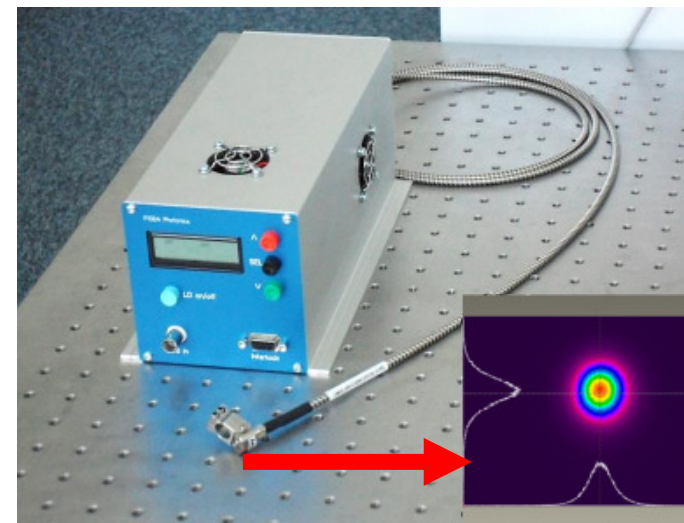
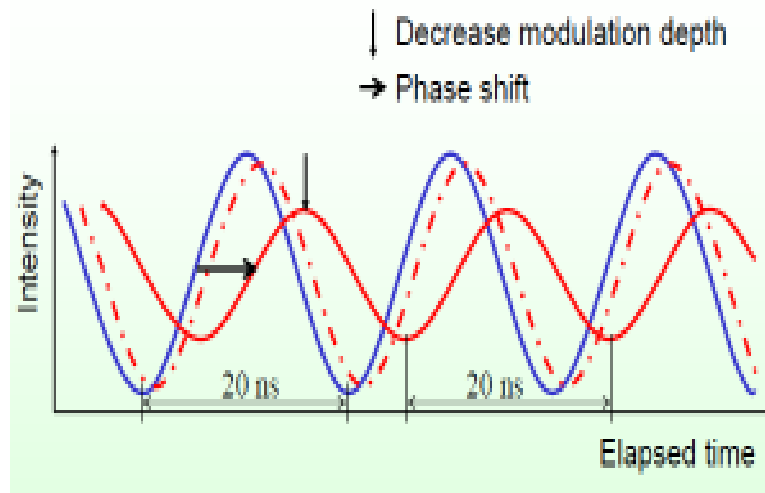
- Laser diodes (1)
Single mode laser in TO38 packaging
- Photo diode (2) standard PD
- Characteristic module designs:
direct emitting module, fiber-coupled module
- Customization
beam shape (Top Hat, Gaussian), wavelength
(UV, VIS, NIR), stabilized frequencies, etc.



RESEARCH EXAMPLE: FLENDOS I ENDOSCOPIC FLUORESCENCE LIFETIME IMAGING

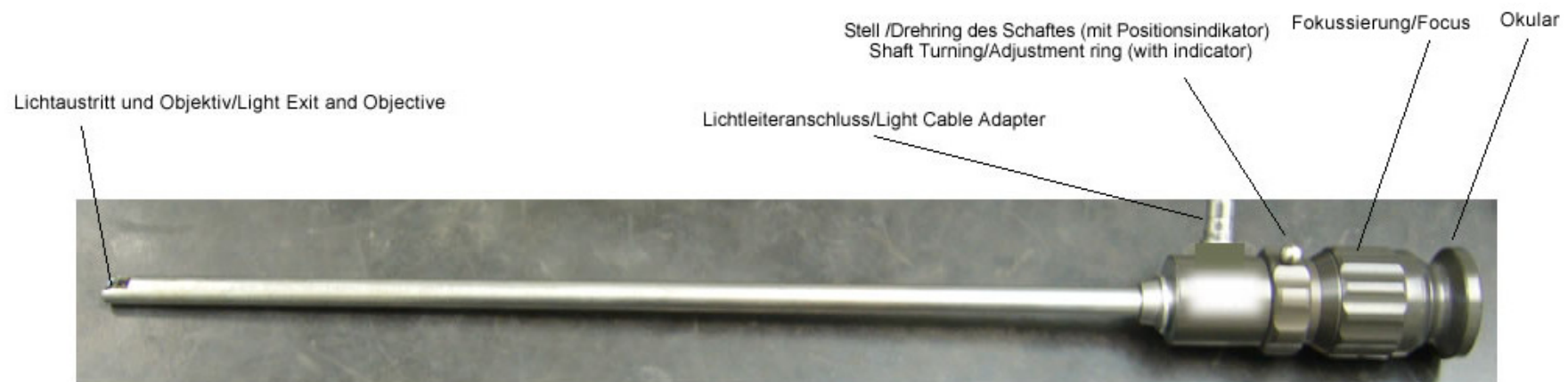
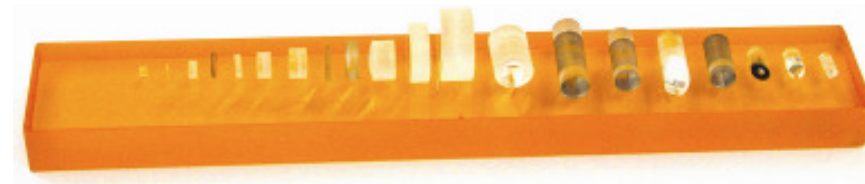
FLENDOS (KARL STORZ / PCO / FISBA PHOTONICS)

- Imaging analysis of in vivo fluorescence lifetime detection by excitation intensity modulation
- FISBA contribution is fibercoupled illumination source at 405 nm with > 1 W output power and modulation frequency up to 70 MHz.



MEDICAL APPLICATION RIGID ENDOSCOPE

- Medium to large quantities
(> 100'000 pces / month)
- Highest precision, coating and cleanliness needed
- Traditional grinding and polishing
-> some to be replaced by precision molded lenses

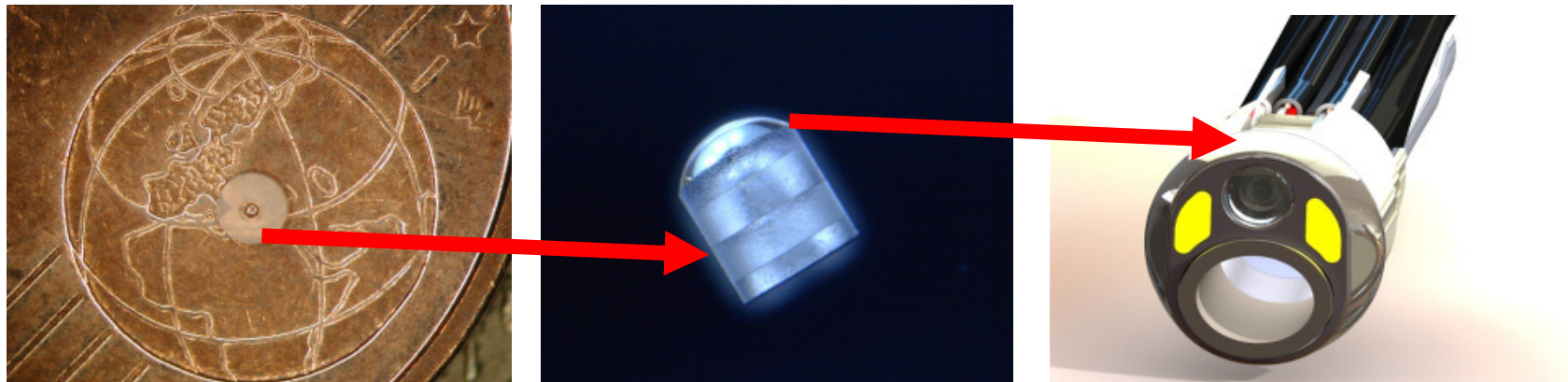


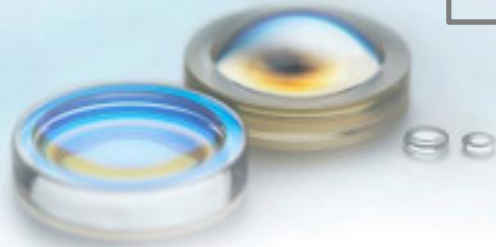
Source: KARL STORZ AG

FLEXIBLE ENDOSCOPY FROM DESIGN OVER PML TO ASSEMBLED PRODUCT

Micro optics for chip on tip

- Single Precise Moulded “concave” Lens (diameter < 0.8 mm)
- Miniature objectives for applications in measurement and vision
- Development, design, and production of lenses and sub-units as well as final assembly of the micro camera unit





SUMMARY

Photonic systems and solutions based on expert optical design and system engineering and solid competencies in refractive microsystems production and assembly

FISBA is targeting a cooperative approach to demanding system requirements for innovative markets with global impact and local costumers and volume scaling in microoptics and systems

Technologies necessary for a complete service provider are successfully sourced with partner companies (eg. polymer optics / lasers / sensors)

Proven full project management capability and built up of complete supply and assembly chains are features of excellence you can rely on.



THE SPIRIT OF PARTNERSHIP