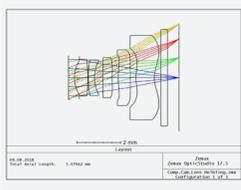


Optics, Embedded Vision and Sensor systems

Our service portfolio:



Optical Design and Calculations



Laser systems & beam shaping



Low-cost Sensor Systems & Modules



Optical Devices



Embedded Vision & Single-Board Computer



Image enhancement & ISP tuning



Camera & Camera Modules: Evaluation & Development



AI and computer vision algorithms



Innovation together we do it

Founded in 1963, the Helbling Group operates internationally and combines engineering and consulting expertise. The Helbling Group is managed by 37 Partners and employs over 630 people at locations in Switzerland, Germany, Poland, the USA and China. The Helbling Group focuses on providing selected services in the areas of innovation and product development, management consulting, mergers & acquisitions, business turnarounds and financial performance management, IT, real estate and construction planning.

Helbling Technik is a division of the Helbling Group and currently employs over 500 professionals. Our vision "Innovation, together we do it" positions Helbling Technik as a trusted long-term partner within its clients' innovation network. Helbling Technik's highly qualified engineers, computer scientists, physicists and human factors experts use state-of-the-art development tools, processes, laboratories and tools to develop innovative and successful products and support clients around the world from idea to market launch.

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Freeform Optics: Generating Innovative Illumination Solutions

Freeform optical surfaces direct light in any direction or area opening a vast array of opportunities.



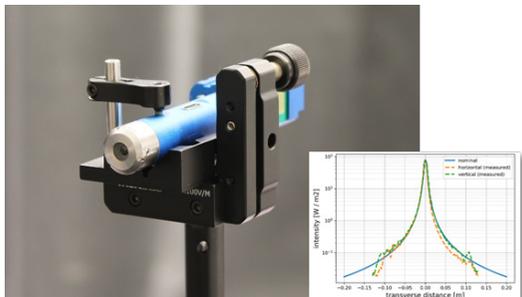
Helbling Technik Wil AG
Innovation, together we do it

Any intensity distribution is possible

With optical freeform surfaces it is possible to direct light in almost any direction or area. Freeform optical elements are suitable for both, very specific and mass-market applications, opening a vast array of opportunities. The optics specialists at Helbling are continuously expanding fields of application making this technology accessible to a growing number of companies.

Typical applications of freeform optics include:

- Illumination optics, e.g., homogeneous illumination for cameras
- Motion sensors in rooms
- Rain/light sensors for automotive industry
- Generation of arbitrary intensity patterns, e.g., for optical distance measurement
- Beam shaping applications



Beam shaping with a freeform lens for a laser application.

Simulation tools enable efficient implementation

Your advantages:

- Optimized light distribution: Precise definition of light intensity and distribution.
- Freeform optics can be used with light sources for illumination applications or with detectors as sensors systems.
- Efficient and accurate design process: The combination of simulation tools like FFOptik, LightTools, and Monte Carlo simulations ensures precise and efficient development of freeform optics.
- Rapid prototyping and low-cost mass production: Functional models of plastic optics can be produced using diamond turning and milling. For mass products, injection molding is possible.



Plastic optics of a rain/light sensor for automotive: A freeform surface was used to realize a solar sensor function.



Camera module with a 3D-ToF-sensor and a freeform optics for optimized illumination.

From ideation to product



Additional services complete the portfolio of Helbling:

- Feasibility study: Python scripts allow the determination of physical limits.
- Mechanical and/or electrical integration of the freeform optics in a device or module.
- Optics laboratory for experimental verification of simulations.
- Measurement of light distributions using a goniometer.

At Helbling, all developments follow an established development process:

- Analysis of the task.
- Definition of requirements.
- Development, implementation, optimization and verification.
- Industrialization.
- Support of market introduction and lifecycle management.
- Helbling is ISO9001/ ISO13485 certified.