



CONCENTRATOR OPTICS

Design and Optimization of Concentrator Optics

We offer professional assistance in the design of concentrating optics for Concentrated Solar Thermal Power (CSP) and Concentrator Photovoltaic (CPV) applications.

Design and Evaluation

We assess single- and multistage optical concepts using reflective optics (parabolic mirrors, heliostats) as well as refractive optics (Fresnel lenses, dielectric secondary optics) for line focus and point focus systems in low, intermediate and high concentrating applications.

Techno-Economical Approach

Our approach is based on an integrated assessment of material properties, cost structure, manufacturing, tolerancing and overall performance.

From Raytracing to Plant Output

Our tools range from pure optical simulation to techno-economical optimization routines of e.g. entire Concentrated Solar Thermal Power Plants.

Characterization, Qualification and Quality Control

Using sophisticated instrumentation and procedures, we characterize optical materials, optical surface properties, reflector panels, multistage optics (CSP/CPV) and entire CSP collectors.

Thorough characterization of materials and components uncovers potentials for further optimization of the manufacturing process. Optical qualification allows for appropriate quality control.

Our Measurement Services – Examples

- indoor and outdoor measurements
- reflectivity of mirrors (spectral, solar, specular and beam spread, varying angle of incidence)
- shape and surface accuracy of mirrors and reflector panels
- FEM simulation of deformations
- refractive index (spectral dispersion, varying temperature)
- soiling, ageing, durability
- distribution of flux/intensity/concentration factor

Fraunhofer Institute for Solar Energy Systems ISE

Heidenhofstr. 2
79110 Freiburg
Germany

Contact

Dr. Peter Nitz
Phone +49 761 4588-5410
Fax +49 761 4588-9410
peter.nitz@ise.fraunhofer.de

www.ise.fraunhofer.de