

SPECTER is an optical design and analysis software bringing a valuable help for optical designers, engineers and researchers working in lighting, automobile and aerospace industries. SPECTER assists the designers involved in the development of various optical devices, such as an LCD backlight and lighting fixtures, through the three-dimensional optical simulations.

Introducing SPECTER into the design process allows a designer to virtually reproduce the devices and simulate various optical phenomena for analysis of optical characteristics. Involving a virtual trial-and-error process until the results are satisfactory, a designer significantly reduces cost and time required to manufacture innovative optical products.

◀ Evaluation of optical characteristics without making trial product

Applications

Design and analysis of light emission

- Luminance distribution of LCD backlights and frontlights
- State of illumination for car and aircraft instrument panels (panel meters, etc.)
- Light intensity distribution of lighting fixtures (luminaires with reflector, LED lamps, etc.)
- Visibility of automotive lamps (taillight, etc.)
- Luminance distribution of flat light-emitting devices (ad boards, sign boards, etc.)

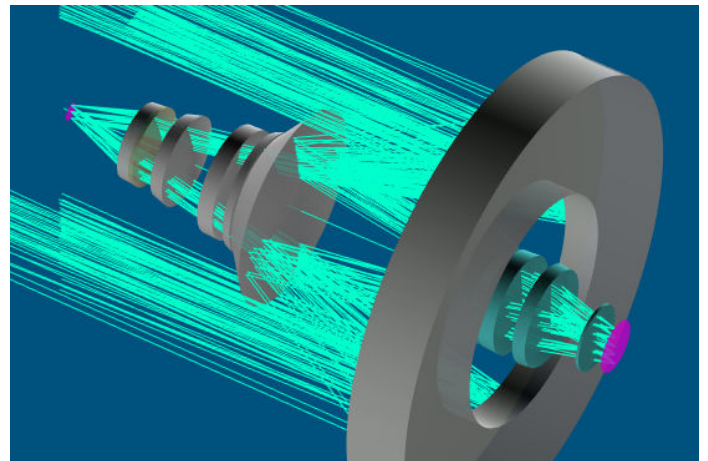
Design and analysis of light reflection / transmission

- Efficiency of light guides (light guiding plates, etc.)
- State of light incidence onto light detectors (photo diodes, CCD, etc.)
- Light transformation by optical films (prism sheets, etc.)
- Influence of mirror reflection on a glass surface (car windshield, rear/side windows, etc.)
- State of polarization with polarization filters (linear polarizers, phase shifters, etc.)
- Efficiency of light incidence on the surface of solar battery cells

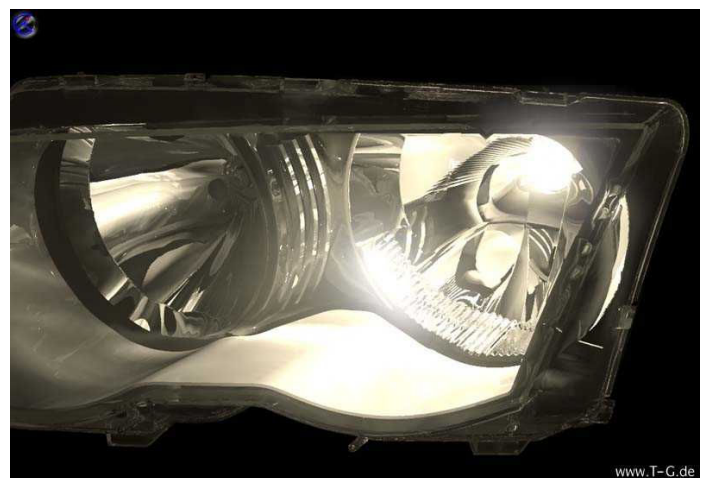
Other applications

- Reproduction of coating (metallic, pearlescent, etc.) appearance
- Analysis of object visibility under specified illumination conditions
- Analysis of influences caused by enclosure of a lens system
- Reproduction of glare effect caused by direct viewing of illuminating objects

* Please feel free to consult us for customization of our products.



▲ An example of simulation for a projection device



▲ Design of a reflector shape for an automobile headlight

Features

Simulation mechanisms

- Fast and accurate bi-directional Monte Carlo ray tracing method reproduces the behavior of light in 3D space
- Progressive processing allows a user to suspend calculation and present results step by step

Building models

- Support for reflection and transmission when characteristics change depending on incident or emitting direction (BRDF/BTDF)
- Definition of a huge number of microelements formed on the surface varying element size and density
- Description of scattering inside media (volume scattering) through the size, concentration and optical properties of the embedded particles
- Support for direction-dependent polarization in addition to the common polarization elements (linear polarizer, phase shifter, etc.)
- Assignment of measured light intensity distribution to the light sources realizing arbitrary light emitting characteristic
- Interface to the external CAD (e.g. IGES converter) allowing to build models using existing CAD data

Presentation of simulation results

- Inquiry can be made for spatial distribution of luminance and illuminance on surfaces as well as for luminance and light intensity distribution in various directions
- Propagation of the rays emitted from the light sources can be visualized three-dimensionally
- Advanced rendering capability allows high-quality reproduction of object appearance under specified illumination conditions

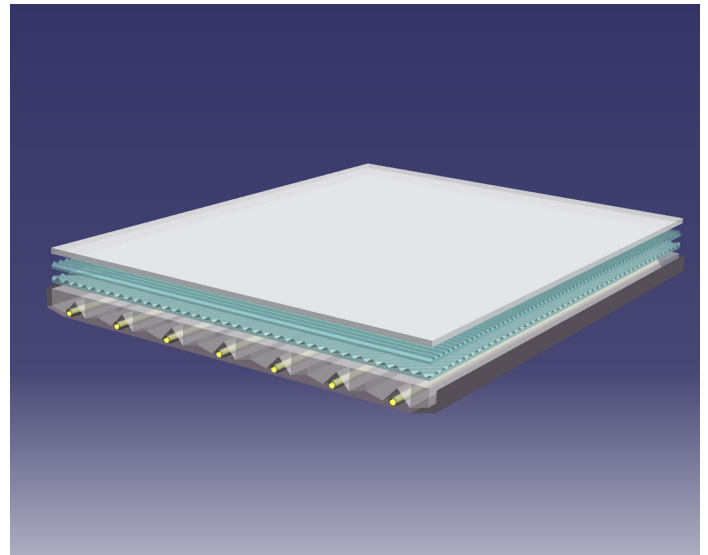
Other features

- In addition to the multiprocessing with on-board CPUs, distributed processing by computers on the network is available*1
- Each program module can be called from within the external programs and works as a part of a user-built system

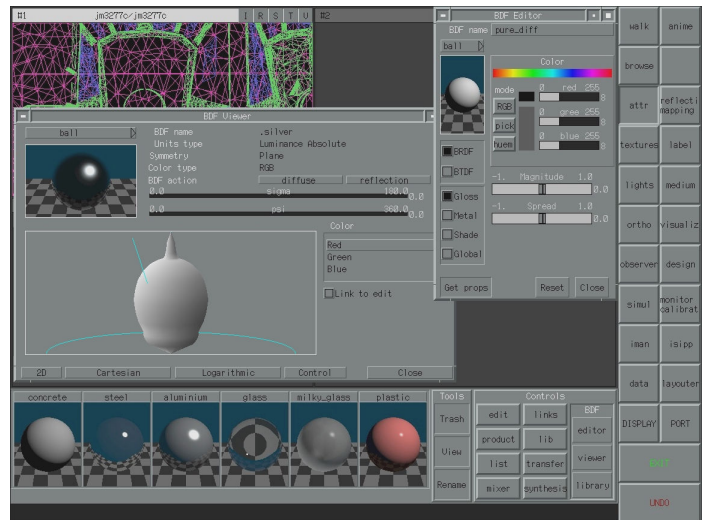
System requirements

CPU	Intel® Pentium® 4 or equivalents
RAM	512 Mbytes or greater
HDD	1 Gbytes or greater
OS	Microsoft® Windows® 2000/XP/Vista
Display	1024 by 768 pixels, True Color (24 bit) or greater Recommended OpenGL® accelerator

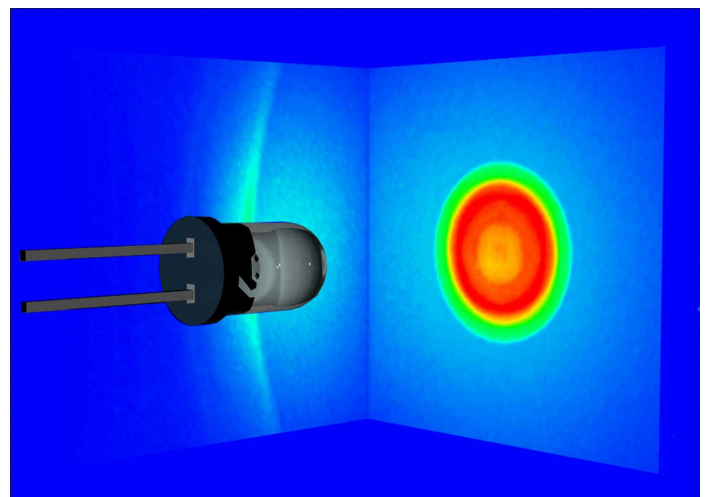
*1 Multiprocessing and network-wide distributed processing are provided as an option.



▲ Performing simulation based on a 3D shape imported from CAD



▲ Reproduction of surface characteristics based on measured BRDF



▲ Assignment of arbitrary light intensity distribution to light sources

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