

# LightTools Illumination Design Software

Design, Analyze, Optimize and Deliver Illumination Optics

# LightTools Illumination Design Software Applications

LightTools® is a 3D optical engineering and design software product that supports virtual prototyping, simulation, optimization, and photorealistic renderings of illumination applications. Its complete design and analysis capabilities, combined with ease of use, support for rapid design iterations, and automatic system optimization, help to ensure the delivery of accurate, timely, and cost-effective illumination designs.

Across a broad range of illumination applications, LightTools helps you get high-performance, systems to market faster. View additional LightTools applications at: <https://www.synopsys.com/optical-solutions/lighttools/application-gallery.html>

## Key Capabilities

- Rapid model creation
- Ability to model the embedded phosphor and epoxy covering in an encapsulated LED
- Fully optimizable geometry for designing primary optics
- Sub-micron structures to enhance light extraction efficiency through co-simulation
- Supplied and custom materials for accurate color simulation

## Key Capabilities

- Extensible textures to model paint-dot patterns and as-built extraction features
- Functions to automate system setup and facilitate rapid design studies
- Backlight pattern optimization for uniformity and efficiency
- Library of standard brightness-enhancing, diffusing, and reflective films

**Key Capabilities**

- Library of pre-defined LCD, DMD, and LCoS projector models
- Light source definition by geometric and measured sources, including updated standard ray file formats
- Built-in colorimetry analysis features to evaluate color quality and simulated display appearance
- Creation of complex mixing-rod shapes with minimal effort and optimization capabilities that automatically refine the design form
- Rapid and high-accuracy spatial luminance calculations

**Ky Capabilities**

- Multicolor applications at 0.09scn/prns, 600x600

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### Key Capabilities

- Ray path analysis that visually identifies stray light issues and summarizes energy flux and total power
- Receiver data filtering for multiple analyses from a single simulation
- Aim areas for efficient analysis of stray light in systems
- CAD import and export to leverage existing data

### Key Capabilities

- Interactive construction, parametric editing, and automatic optimization of complex shapes
- Multiple appliqués, dot patterns, fine groove structures, or bump structures for light extraction
- Volume scattering inside a material to simulate the diffusing characteristics of light guides
- Visualization of an optical system's lit and unlit appearance
- Ability to measure luminance at any location in the model space and evaluate display visibility and quality
- Features to optimize task lighting and minimize glare
- Extensible surface scattering to model automotive finishes

### Key Capabilities

- Classical and custom solar collection optics
- Tools for modeling solar collection systems using solar insolation data
- Fluorescence to enhance light capture in luminescent solar concentrators
- Photorealistic renderings to show the effects of daylighting enhancements

### Key Capabilities

- Full suite of volumetric optical effects, including scatter, phosphorescence, and absorption
- Tissue modeling using industry-standard Henyey-Greenstein and Gegenbauer models
- Extensible surface scattering capabilities

### Key Capabilities

- Extensive material modeling and a full complement of geometric laser propagation capabilities
- Accurate modeling of both illumination and detection optics across the electromagnetic spectrum
- Evaluation of illuminator and detection optics from the detector's point of view
- Modeling light-field and dark-field illumination with polarization effects
- Construction of dynamic, time-based models

### Key Capabilities

- Stray light and off-axis rejection analysis
- Easy identification of ghosts and flare
- Blackbody source spectrum
- CAD import for optical mounts and assemblies
- Multiple variance reduction methods for efficient simulations
- Model scattering for surface and cleanliness defects



## Key Capabilities

- Time of flight measurements
- Detection of low signal reflections
- Design feature for hyperspectral instruments

# LightTools 2TIO