

## **SPEOS** for Pro/ENGINEER®

The integrated software solution for the physics based simulation of light and human vision

**SPEOS for Pro/ENGINEER®** This dedicated light simulation solution enables users to analyze, optimize and visualize illumination and sensor systems throughout the design process. Based on our powerful and accurate SPEOS technology developed over more than 15 years, this fully integrated software is now available directly inside Pro/ENGINEER®.

## THE ONLY FULLY INTEGRATED LIGHTING SOLUTION

SPEOS by OPTIS is the only optical technology available in the market to be fully integrated in Pro/ENGINEER®

Integrated technology means you use exactly the same software for your mechanical design, lighting and color analysis, optical design and rendering.

Reusable simulation during the design iteration phase offers an 80% time saving



### Completing the design process

- First software to integrate optics, light and human vision in a PLM environment
- Allows Pro/ENGINEER users to master light throughout design process
- Fast photometric, colorimetric virtual measurement and analysis
- Product is simulated as perceived in real lit environment
- Based on industry proven, physics-based SPEOS technology
- Fast learning curve

Merge light, optics and mechanics...  
... in one PLM software



# LIGHT MODELING

THE MARKET LEADING TOOLSET FOR OPTIMIZING THE LIGHT PERFORMANCE OF YOUR SYSTEMS DIRECTLY IN **Pro/ENGINEER®**

**SPEOS Light Modeling** enables complete simulation of all of the photometric and colorimetric characteristics of light on products of any size, from electronic goods to white goods, cars and aircraft.

SPEOS Light Modeling provides all of the pertinent information related to light such as quantity, propagation, distribution in 3D space, color, as well as compliance with standards and specifications.

SPEOS handles the full spectrum of light from ultraviolet to infrared in your system, supporting you in designing lighting systems, remote control systems, and UV insulation systems.

SPEOS solutions include powerful Analysis tools which allow you to verify compliance with International Standards and customer specifications. Our Virtual Photometric Laboratory (VP Lab) provides a wide range of tools (cross section, contrast, iso-curves, spectral and chromaticity coordinates...) for comprehensive analysis.



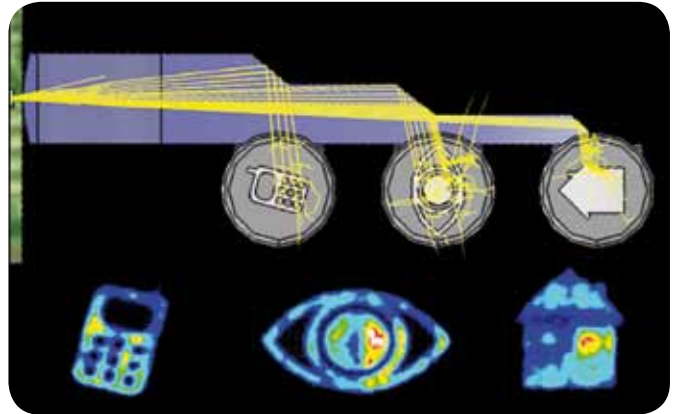


# LIGHT MODELING

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## OPTICS & PHOTOMETRY

- Illumination analysis
- Check efficiency with active 3D ray tracing in opto-mechanical systems
- Simulate and analyze photometric properties
- Measure illuminance, intensity and luminance
- Perform radiometry and colorimetry analysis



- Optimize photometric results
- Iterate between virtual lighting prototypes
- Use source, material & surface libraries
- Check compliance with international standards
- Easy to use / Intuitive interface
- Obtain 2D & 3D map results for easy analysis





# RENDERING FOR ENGINEERS

*SIMULATE, OPTIMIZE & VALIDATE ANY HUMAN-MACHINE INTERFACE TO  
MAXIMIZE VISIBILITY, READABILITY, AND VISUAL COMFORT*

SPEOS Rendering for Engineers brings added value by providing high quality lighting visualization simulations of any product for early design validation and consequently reduces the number of physical prototypes required.

Renderings for Engineers enables designers to validate material choice, light colors, and see the final working appearance of the product, guaranteeing the design intent and optimizing perceived quality.

The final picture takes into account all optical properties even for brushed surfaces and iridescent paints, which guarantees exact colors and aspect of your future product inside a show room or in any environment, day or night.

SPEOS is the only software to provide lit appearance representation combined with a human vision model : ensuring your final product will be perceived exactly how you designed it to be.





# RENDERING FOR ENGINEERS

*SIMULATE, OPTIMIZE & VALIDATE ANY HUMAN-MACHINE INTERFACE TO  
MAXIMIZE VISIBILITY, READABILITY, AND VISUAL COMFORT*

## HUMAN VISION

- Simulate visual perception based on a physiological human vision model including day and night vision
- Improve perceived quality by optimizing color, contrast, harmony, light uniformity, intensity...
- Take into account ambient lighting conditions, sun, LED, fluorescent, tungsten
- Check compliance with industry-specific standards



## PHYSICS-BASED RENDERING

- Spectral, BRDF and real material based libraries
- Realistic rendering takes into account your display properties
- Access to image analysis (photometry, colorimetry...)
- One shot processing time with multithreading capabilities during calculations; allows you to work on other tasks
- Unlit and Lit appearance to render your product switched on





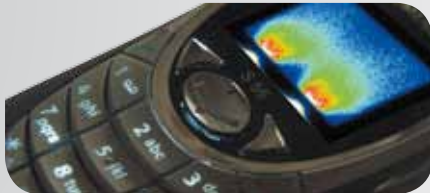
# CREATE YOUR OWN SOLUTION

*Tailor your software to meet your specific requirements by adding modules & expert applications*

**SPEOS Colorimetry** analysis allows you to measure the light spectrum and to obtain the colorimetry-chromaticity coordinates in the tri-chromatic graph (xyY, Lab, Luv...), simply and quickly by pointing the mouse anywhere in the result. More than displaying colors, choosing a reference color allows you to detect whether the final user will perceive any differences between your reference color and your finished product. A colorimetric error value informs of any differences between the simulated color and the one displayed on your monitor.

## Optimization & Tolerancing

Automatically modifies geometry and optical parameters including source power, spectrum, surface quality and material to reach your target first time.



- Multi-configuration tool  
Optimization
- Genetic & gradient optimizer  
Tolerancing
- Automation  
Automatic task management



## SPEOS Light expert

Understand light behavior and detect which components could generate hot spots. Interactively modify the shape and materials of these system components to adapt light effects.

- **Light Path Finder**  
Stray light tracking
- **3D Ray Tracing Filtering**  
Hot-spot analysis
- **Surface Contribution Analyser**  
Ghost image detection



# CREATE YOUR OWN SOLUTION

*Tailor your software to meet your specific requirements by adding modules & expert applications*

## Physics based simulation

SPEOS is based on advanced high speed Monte-Carlo non-sequential light propagation which perfectly reproduces photon behavior from the light source to the eye.

## High speed simulation

The fastest technology available in the world benefiting from distributed calculation, 64 bits, multithreads- all available in SPEOS technology.

- Network calculations to distribute tasks
- Concurrent simulations Work on another file or software during the calculation

## Reduce time to market

Optimize competitive advantage with a powerful simulation platform.



## **Libraries**

*Unique realistic input to be sure of perfect output results*

**All the input data from our libraries are:**

- Totally measured
- Accurately and fully modeled
- Downloadable on-line
- Regularly updated
- 25 standards references
- 715 material references
- 320 source references
- 105 surface references

# 20 YEARS OF INNOVATION

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## OPTIS - Headquarters

ZE La Farlede • BP 275  
83078 Toulon cedex 9  
FRANCE

- Phone : +33 494 086 690
- Fax : +33 494 086 694

[www.optis-world.com](http://www.optis-world.com)

### **OPTIS North America**

100 W. Big Beaver Road  
Suite 200  
Troy, MI 48084  
USA

- Phone : +1 248 524 0373
- Fax : +1 248 524 0376

### **OPTIS Paris**

13 Camille Desmoulins  
92441 Issy  
Les Moulineaux  
FRANCE

- Phone : +33 1 58 04 23 78
- Fax : +33 1 58 04 23 00

### **OPTIS Germany**

Zettachring 10  
70567 Stuttgart  
GERMANY

- Phone : +49 711 49097-116
- Fax : +49 711 49097 - 202

### **OPTIS Asia - Pacific**

Kotobuki Bldg. 6F  
1-1-3, Yaesu, Chuo-ku,  
Tokyo, 103-0028  
JAPAN

- Phone : +81 3 3274 1160
- Fax : +81 3 3274 1162