ANSYS SPEOS ENTERPRISE

Perform visual ergonomic reviews for perceived quality, safety and comfort. Virtually simulate visual aspect, reflection, visibility and information legibility observed in real-world vehicle environments.

The ANSYS SPEOS Enterprise package contains all the features of the ANSYS SPEOS Premium and ANSYS SPEOS Pro packages, plus the following features:

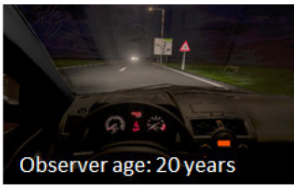
Human Vision

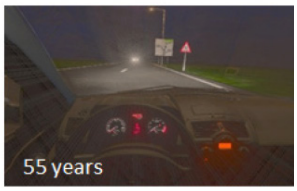
With SPEOS Enterprise, users can simulate the visual perception of a human observer within a virtual, illuminated environment (e.g., an aircraft cockpit or vehicle interior), and visualize the lit and unlit real-world appearance of virtual products. The software reproduces the appearance of product designs, based on spectral luminance results, algorithms for the dynamic adaptation and glare aspects of human vision — while considering the limitations of display capabilities. It enables users to evaluate and optimize any design to achieve quality levels for homogeneity, color differences and stray light issues.

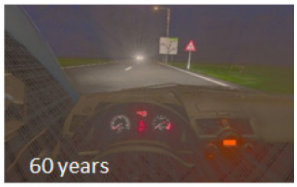
SPEOS Enterprise provides access to the human vision algorithm for luminance and 360-degree immersive or observer results. SPEOS Enterprise offers a refined human eye sensor model. The human vision simulation accounts for pupil diameter and other parameters to accurately reproduce how pupils react to changes in brightness. To accelerate results generation, the focalization point is directly considered during the simulation, preventing time-consuming post-processing.

Visibility and Legibility

Users can virtually address visibility and legibility studies. SPEOS Enterprise includes a full set of expert tools for performing advanced, visual ergonomic analyses. It provides the user with previously unavailable information by evaluating the percentage of the population that detects or reads a specific area of the 3D scene. In post-processing, results may be further enhanced with the sunglass and colored filter features. Vision and visual performance models are correlated with the **International Commission on Illumination (CIE) 145:2002 standard.**







SPEOS Enterprise permits users to express the relative visual performance according to different human and environmental parameters, such as contrast (background/foreground luminance) and observer age.

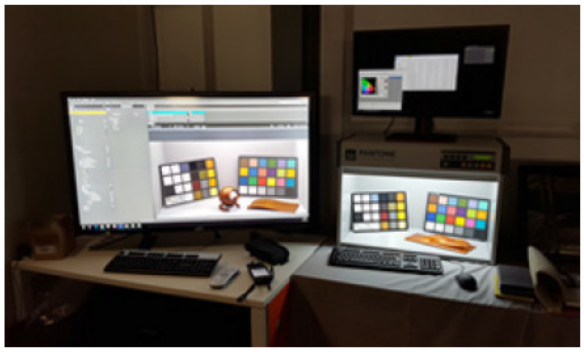
High Dynamic Range

SPEOS Enterprise increases the contrast of low luminance levels for reliable high dynamic results. Users can capitalize on the latest screen luminance capabilities, to better represent what the human eye perceives of the on-screen prototype. The results are based on real-world values, but because screens have limited dynamic and color rendering capabilities, part of the information is above the maximum luminance that screens can reach and/or the color outside their gamut. The software allows users to manage screen properties to achieve simulation results closest to reality. It can directly display true color maps and appearance on any screen type (simple, projector or cave).

SPEOS Enterprise enhances luminance restitution by loading the profile HDR10 standard (SMPTE 2084) with gamma correction. It also enables the setting of JVC projector profiles for 16-bit displays and for SIM2 screen displays.

Virtual BSDF Bench

With SPEOS Enterprise, users can simulate an optical property without any type of real sample and without any hardware limitations. This allows for the creation and simulation of any complex material, including sparkling car paints and 3D-printed materials and composites. It acts like a test bench with a virtual scene, generating a file that describes the optical properties of all materials.



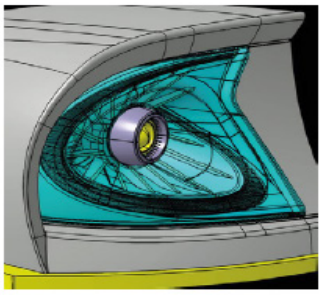
Users can define and measure expected results and their accuracy for generating BSDF natively compatible with any ANSYS optical simulations.
Using the virtual BSDF bench, generate any kind of optical properties (BRDF, anisotropic BSDF, BSDF 180, unpolished) for any ANSYS optical simulation.

SPEOS Enterprise supports structured geometries and thin stacks of layer, anisotropic or iridescent surfaces. New surface finishings and materials can be tested directly by the designer at the styling stage by obtaining a BSDF measurement from a virtual texture on a 3D surface.

Thanks to ANSYS SPEOS Enterprise, user scan apply a measure treatment on any optical properties such as:

- Interpolation enhancement
- Healing
- Symmetry

Integrated with the ANSYS SPEOS platform, SPEOS Enterprise allows users to obtain the optical properties of hard-tomeasure, rare material samples. Engineering departments can directly measure the impact of surface finishing quality to evaluate different supplier proposals with respect to designer criteria.



ANSYS SPEOS Packages:

- Pro
- Premium
- Enterprise

See chart on next page.

ANSYS SPEOS	PrepPost / Solver Bundle Packages			Add-Ons				
	Pro	Premium	Enterprise	Optical Part Design	Optical Sensor Test	HUD Design & Analysis	Far Infrared Extension	Optical Design Optimizer
General Solver Capabilities								
Monte-Carlo Forward Ray Tracing	●	●	●					
Monte-Carlo Backward Ray Tracing		●	●					
Deterministic Simulation	▲	●	●					
Spectral Propagation	●	●	●					
Polarization propagation	●	●	●					
Dispersion	●	●	●					
Surface Diffusion	●	●	●					
Volumic Diffusion	●	●	●					
Ambiant Material	●	●	●					
SPEOS Live Preview (GPU acceleration)		● (2)	● (2)					
Virtual BSDF			● (1)					
Photometry								
Intensity	●	●	●					
Illuminance	●	●	●					
3D Illuminance	●	●	●					
Luminance	▲	●	●					
3D Energy Density		●	●					
360° View - Observer		●	●					
360° View - Immersive		●	●					
Human Vision								
Dynamic Adaptation			●					
Glare Simulation			●					
High Dynamic Range Screen support			●					
Wavelength Range								
Visible (360nm - 830nm)	●	●	●					
UV (50nm-360 nm)		●	●					
Near IR (830nm - 2.5µm)		●	●					
Far Infra-Red (2.5µm - 100µm)							●	
Optical Design								
Parabolic Surface	●	●	●					
TIR Lens	●	●	●					
Projection Lens	●	●	●					
Optical Lens				●				
Optical Surface				●				
Light Guide				●				
Sharp Cut-Off Reflector				●				
Poly-Ellipsoidal Surface				● (1)				
Micro Optical Stripes				● (1)				
Honeycomb lens				● (1)				

● Fully Support ▲ Limited Capability ☐ Requires more than 1 product

(1) Not available for ANSYS SPEOS (2) Only for ANSYS SPEOS

ANSYS SPEOS	PrepPost / Solver Bundle Packages			Add-Ons				
	Pro	Premium	Enterprise	Optical Part Design	Optical Sensor Test	HUD Design & Analysis	Far Infrared Extension	Optical Design Optimizer
Optical Sensors								
Field of View					●			
Export Sensor Grid as Geometry					● (1)			
Camera Sensor					●			
LiDAR Sensor					●			
Camera Sensor Post Processing					●			
Head-up Display								
HUD Optical Analysis					●			
HUD Optical Design					●			
HUD Visualization					●			
HPC - SPEOS								
Default Number of Cores	4	4	4					
Parallel Solving on Local PC	●	●	●					
Parallel Solving on Cluster	●	●	●					
ANSYS RSM compability	●	●	●					
Simulation Preparation								
Source Group	● (1)	● (1)	● (1)					
Geometry Group	● (1)	● (1)	● (1)					
Local Meshing	● (1)	● (1)	● (1)					
3D Textures	●	●	●					
Polarization Plate		● (1)	● (1)					
Fluorescent Converter		●	●					
Texture Mapping (bump, multi-layer)		● (1)	● (1)					
Sky		●	●					
Thermic Source							●	
Earth Atmosphere model							□	
Post Processing								
Virtual Lighting Controller		●	●					
Photometric Numerical Certification	●	●	●					
Colorimetric Analysis	●	●	●					
Spectral Analysis		●	●					
Light Expert	●	●	●					
Layer by Source		●	●					
Layer by Face		●	●					
Layer by Sequence		●	●					
Stray Light Analysis		●	●					
Layer by Polarization		●	●					
Visibility & Legibility			●					
Night Vision Goggle							●	
Script Automation	●	●	●					
Optimization								
Parameters	●	●	●					
Design of Experiment	●	●	●					
Design Optimization (1)								●
ANSYS DesignXplorer (2)	●	●	●					
ANSYS optiSLang interface (2)	□	□	□					

● Fully Support ▲ Limited Capability □ Requires more than 1 product

(1) Not available for ANSYS SPEOS (2) Only for ANSYS SPEOS

ANSYS, Inc.
www.ansys.com
ansysinfo@ansys.com
866.267.9724