



**ECLAT
DIGITAL**

www.eclat-digital.com

VIRTUAL PROTOTYPES

for engineering applications

SERVICE PROVIDER

SOFTWARE EDITOR

DRIVEN BY SCIENCE



OCEAN

Virtual prototyping software



- ◆ Improve your glass projects in both design & optical performances.

VIRTUAL PROTOTYPING BUILT ON OPTICAL ENGINEERING

◆ Eclat Digital provides Virtual Prototyping solutions for engineering application in **materials research and digital marketing**. We generate an **accurate digital model** of your material to **predict its appearance** and **quantify its optical performance** under various lighting and environment conditions.

OUR SCIENTIFIC APPROACH:

SOFTWARE'S RELIABILITY IN:	3D Rendering	OCEAN Virtual prototyping	
◆ PROCESS	Manually based	Measurement based	Optical engineering We take a scientific approach, using optical measurements of materials and light sources in our processes to ensure the accuracy of results.
◆ VALIDATION	Visual assessment	Physical data	Physically oriented method We combine measured data of materials, light & environment to calculate their optical behavior according to the laws of geometric optics.
◆ SPECIFICATION	Stakeholders requirements	Stakeholders requirements & Optical information	Materials characterization We offer expertise in material characterization to ensure that each product is measured to high spectral standards for accurate simulation results.
◆ OUTPUTS	AESTHETIC IMAGE suitable for Marketing	RELIABLE IMAGE & DATA suitable for R&D and Marketing	Predictive results Our results go beyond aesthetic images. We deliver accurate optical simulations: physically true images and data suitable for engineering applications.

OUR EXPERTISE:

- PREDICTIVE APPEARANCE
- LIGHT QUANTIFICATION
- MATERIALS CHARACTERIZATION
- SENSITIVITY STUDY & OPTICAL DIAGNOSIS

YOUR BENEFITS:

- EXTENSIVE ITERATIONS CAPABILITIES
- SIMULTANEOUS WORK ON PERFORMANCES AND DESIGN
- IN SITU VISUALIZATION BEFORE SAMPLE PRODUCTION
- RELIABLE RESULTS FOR DECISION-MAKING

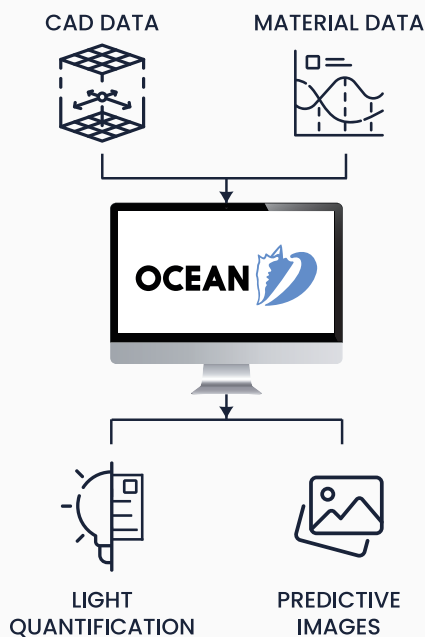
CUTTING EDGE TECHNOLOGY BASED ON SCIENCE

◆ Ocean™ acts as a **light simulator**, using the principles of **geometric optics** to calculate the propagation of light within a 3D scene. This process results in the generation of **physically accurate virtual images**, providing valuable **predictive insights** for engineering applications.

 CIE 171:2006 compliant


WORKFLOW:

Our software Ocean™ combines robust algorithms and methods with solid computational capabilities enabling to accurately calculate the parameters of light, geometry, and optical behavior of materials in a given environment.



KEY FEATURES:

- **FULL-SPECTRAL CALCULATIONS**
- **EXACT SOLUTION OF GEOMETRIC OPTICS**
- **LIGHT POLARIZATION**
- **PHOTOMETRY & RADIOMETRY**
- **FULLY DETAILED CAD MODELS**

	 Virtual prototyping	3D Rendering	Optical simulation
APPEARANCE ACCURACY			
◆ Spectral data	✓ Yes	✗ No	✓ Yes
◆ Polarization effects	✓ Yes	✗ No	✓ Yes
◆ Material complexity	✓ Very high	✗ Basic	✗ Standard
PHYSICAL ORIENTED			
◆ Physical units	✓ Yes	✗ No	✓ Yes
◆ Optical measurements	✓ Yes	✗ No	✗ No
◆ Colorimetry	✓ Accurate	✗ Unreliable	✗ Average
3D MANAGEMENT			
◆ Scene complexity	✓ Very high	✓ Very high	✗ Very low
◆ Polygon number	✓ Very high	✓ Very high	✗ Poor
SERVICES			
◆ Optics expert support	✓ Yes	✗ Sometimes	✗ Sometimes
◆ Dedicating training	✓ Yes	✗ Sometimes	✗ Sometimes

OCEAN

Virtual prototyping software



USE CASES

Virtual prototyping applications for the glass industry

**MORE RESOURCES
& USE CASES ON:**

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NEED TO ACCURATELY PREDICT COLOR SHIFTS AND REFLECTIONS?

USE CASE 1 | OPTIMIZING COATED GLASS APPEARANCE

CONTEXT

The client want to accurately predict the **optical behavior & visual appearance** of coated glass components in full-scale architectural designs. A robust visualization tool to assess & validate material choices effectively before production is needed

GOALS

Predict how glass coatings interacts with light and identify potential issues with reflections or color deviations at different viewing angles.

ECLAT DIGITAL SOLUTIONS

- Incorporation of both **angular & polarization data**.
- Physically true simulation of light interactions with coated glass under different angles and lighting conditions.
- Management of **complex 3D scenes** enabling observation in real word environements.

OUTCOMES



Predictive images for **extensive material testing** & comparison.



Informed choices **meeting aesthetic & performance needs**.



Reduction of unwanted reflections, improved appearance.

STRUGGLING WITH SLOW & COSTLY PROTOTYPING?

USE CASE 2 | CONFIGURATOR - COATING ON DEMAND

CONTEXT

AGC Glass Europe aimed to **accelerate the process** of addressing the need for customized glass designs tailored to the specific requirements of architects, façade constructors, investors, and other stakeholders involved in building design.

GOALS

The goal of CoD is to **reduce the time & cost** associated with developing new glass coatings while providing an **accurate visual representation** of the glass in various conditions, enabling customers to make informed decisions quickly and efficiently.

ECLAT DIGITAL SOLUTIONS

- Consideration of detailed material characterization.
- Calculation of **physically true images** under a wide range of environmental conditions.
- **Multiple virtual iterations** available in short time.

OUTCOMES



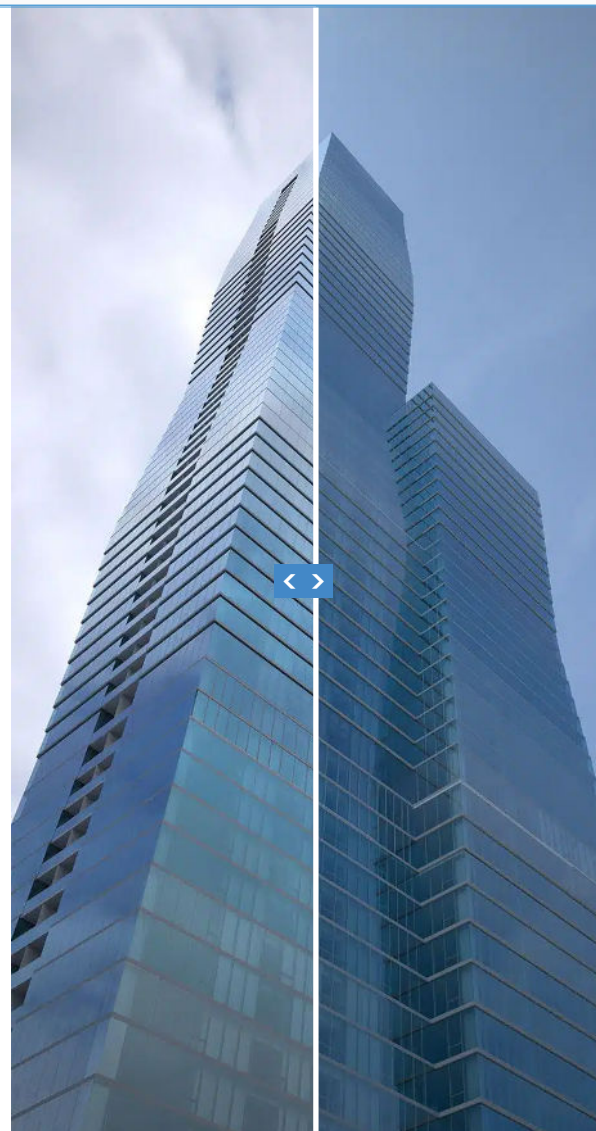
Reliable digital observation of the coating in real conditions.

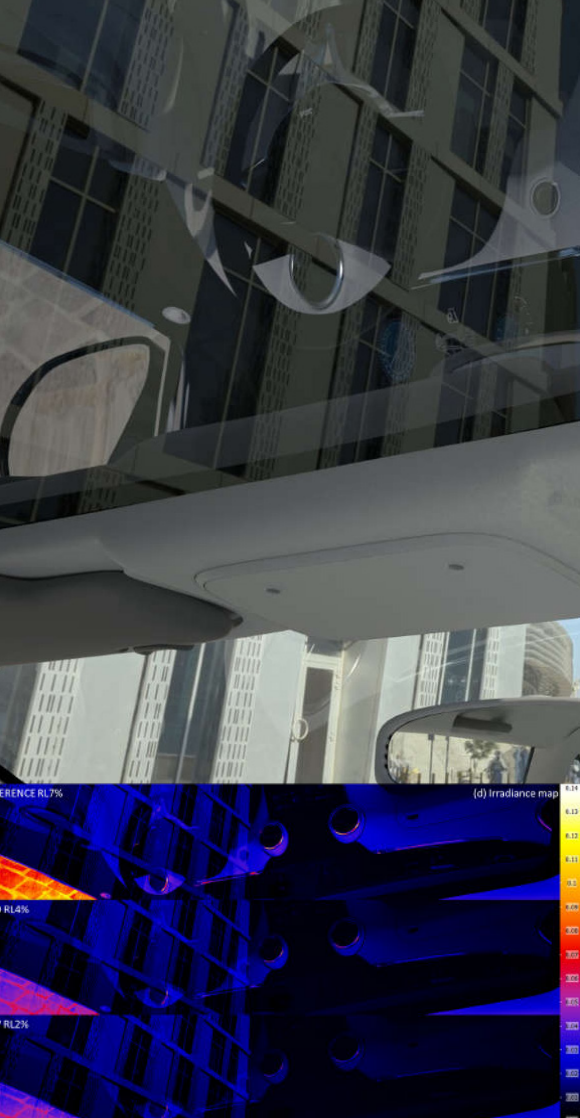


Reduction of development time from 6 months to 1 day.



Elimination of unnecessary physical sampling.





LOOKING TO IDENTIFY & REDUCE PARASITIC REFLECTIONS IN REAL-WORLD CONDITIONS

USE CASE 3 | MATERIALS & LIGHT QUANTIFICATIONS ANALYSIS

CONTEXT

The client needs to **anticipate and reduce parasitic reflections** in the cabin that can distract the driver and are caused by material interactions. They need to mitigate these issues **without access to the entire vehicle**.




GOALS

Identify and quantify parasitic reflection issues in automotive interiors, to **optimize material choices** and reduce distractions for drivers. Test different combinations of laminated glass and coatings (PVD & CVD) and **compare the results**.

ECLAT DIGITAL SOLUTIONS

- Simulation & assessment of materials optical characteristics.
- Light quantification considering the material's optical properties.
- **Iterations with real data** from lighting conditions, different laminated glass coatings & other interior materials.

OUTCOMES

-  Reliable data & images **suitable for R&D developments**.
-  **Early detection** of parasitic reflection issues before physical prototyping phase.
-  Improved driver safety by minimizing visual distractions.

WANT TO DETECT & PREVENT GLASS DEFECTS BEFORE FACADE PRODUCTION?

USE CASE 4 | ACCURATE SIMULATION OF VISUAL DISTORTIONS

CONTEXT

The client wants to **detect and reduce visual distortions** caused by the manufacturing process, that affect the aesthetic of glass facades and the **reflections of surrounding structures**. Testing is to be performed prior to construction of the building.




GOALS

Simulate & analyze the effects of optical distortions or glass defects on glass facades and **identify potential solutions** that improve visual aesthetics by minimizing perceived deformations.

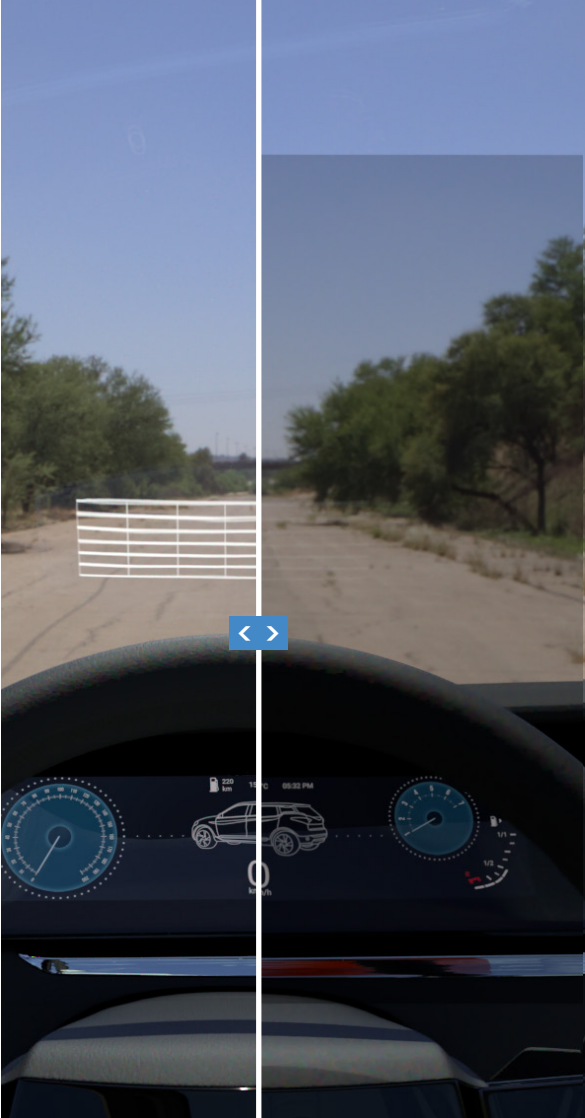
ECLAT DIGITAL SOLUTIONS

- Accurate materials optical characterization.
- Identification & **test of corrective measures**: different materials composition, coatings or production specifications.
- Use of complex city scenes, view angles and light conditions.

OUTCOMES

-  **Better-informed** design and production decisions.
-  **Accelerate the development phase** to meet aesthetic standards while effectively managing distortion issues.
-  **Minimize risks and costs** associated with facade construction.





DOES INACCURATE POLARIZATION VISUALIZATION AFFECT YOUR PRODUCT DEVELOPMENT?

USE CASE 5 | REALISTIC RENDERING OF POLARIZATION EFFECTS

CONTEXT

The client is facing challenges in accurately rendering the effects of light polarization in scenarios like automotive Head Up Displays. They want **realistic visualizations** to better understand polarization effects and improve product designs.




GOALS

Visualize the **impact of polarization on driver visibility** to improve product design & material selection. Reduce the costs and time associated with physical testing.

ECLAT DIGITAL SOLUTIONS

- Advanced polarized optics simulation.
- Includes complex scenarios with **reflections and absorptions**.
- **Fast and numerous iterations** in real-world conditions.

OUTCOMES

-  Predictive images and optical data **suitable for R&D needs**.
-  **Reduction of cost & time** of the development phases.
-  Material selection & physical prototype **right the first time**.

TIRED OF COLOR DISCREPANCIES BETWEEN DIGITAL PROTOTYPE AND PHYSICAL SAMPLE?

USE CASE 6 | COLOR MATCHING GLAZING & FRAMING

CONTEXT

The client is looking for **a glazing to match the bronze colored frame**. He needs to test several glazings from different manufacturers in real lighting and environmental conditions.




GOALS

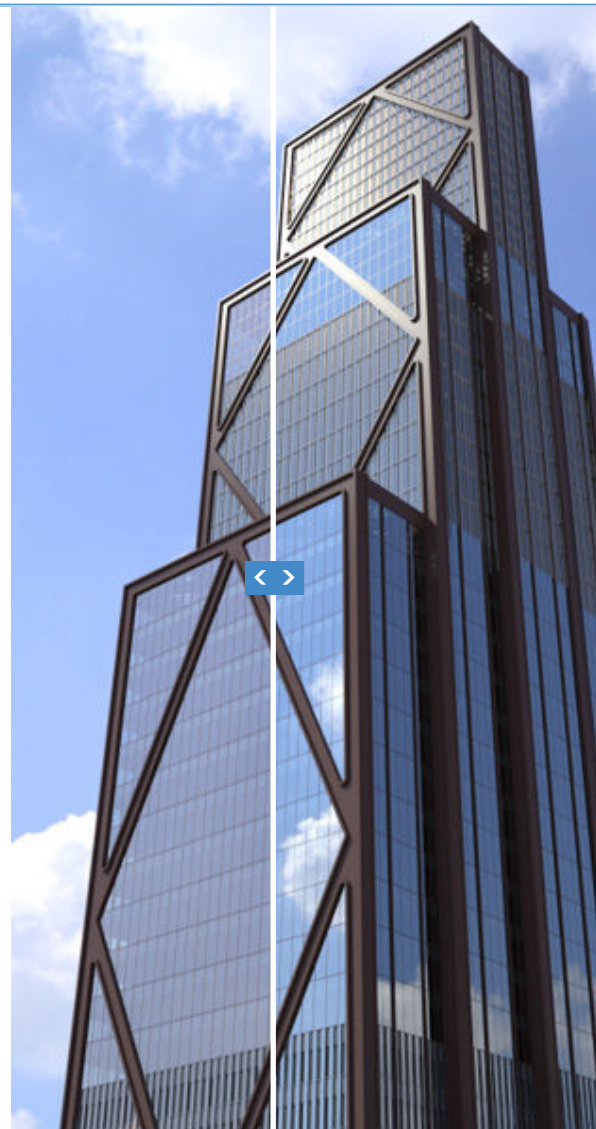
Test more than 10 possible coating candidates under different lighting conditions to make the right product selection. Get accurate visualization to avoid discrepancies with the physical sample.

ECLAT DIGITAL SOLUTIONS

- Precise analysis of the **optical behavior** of materials.
- Light quantification, parameterization and optimization for **accurate color perception**.
- Accurate in-situ simulation with real-world data.

OUTCOMES

-  **Accurate visualization of color** in full-scale & real-world conditions.
-  **Faster decision-making** process.
-  Reduction of physical mockup.





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