



Ocean™ optical simulation

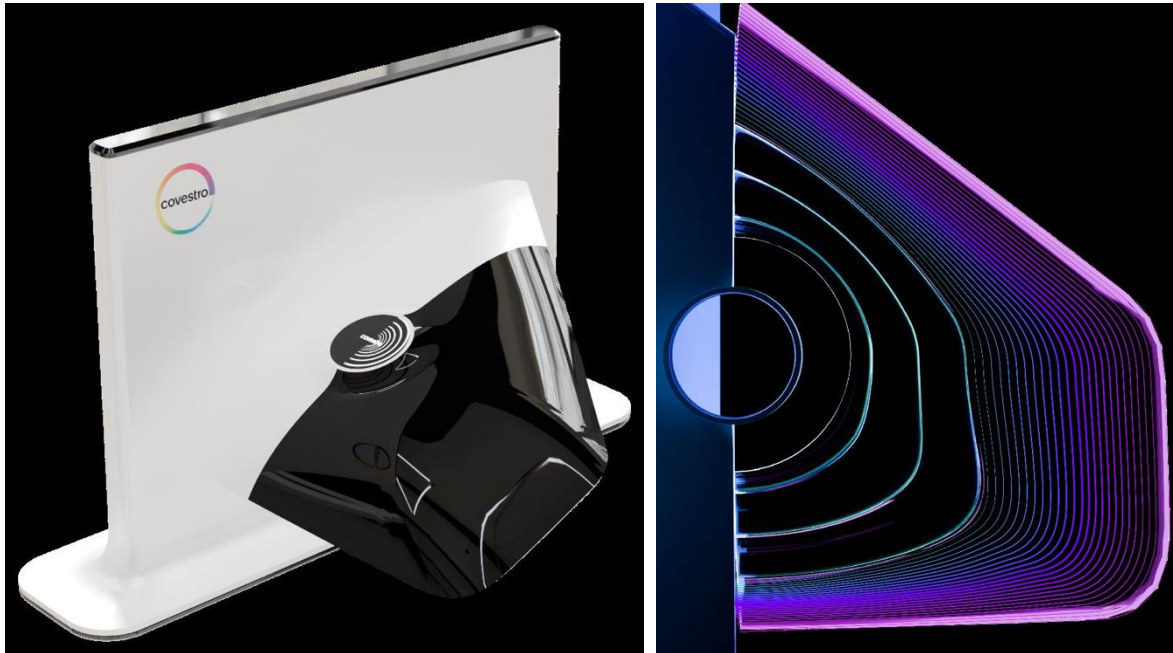
From Pixel to Real Part - Eliminate guesswork in design with predictive optical simulation

Romain Hivet, PhD - Operations Manager: rhivet@eclat-digital.com

Marie Amiel - Sales Manager: mamiel@eclat-digital.com

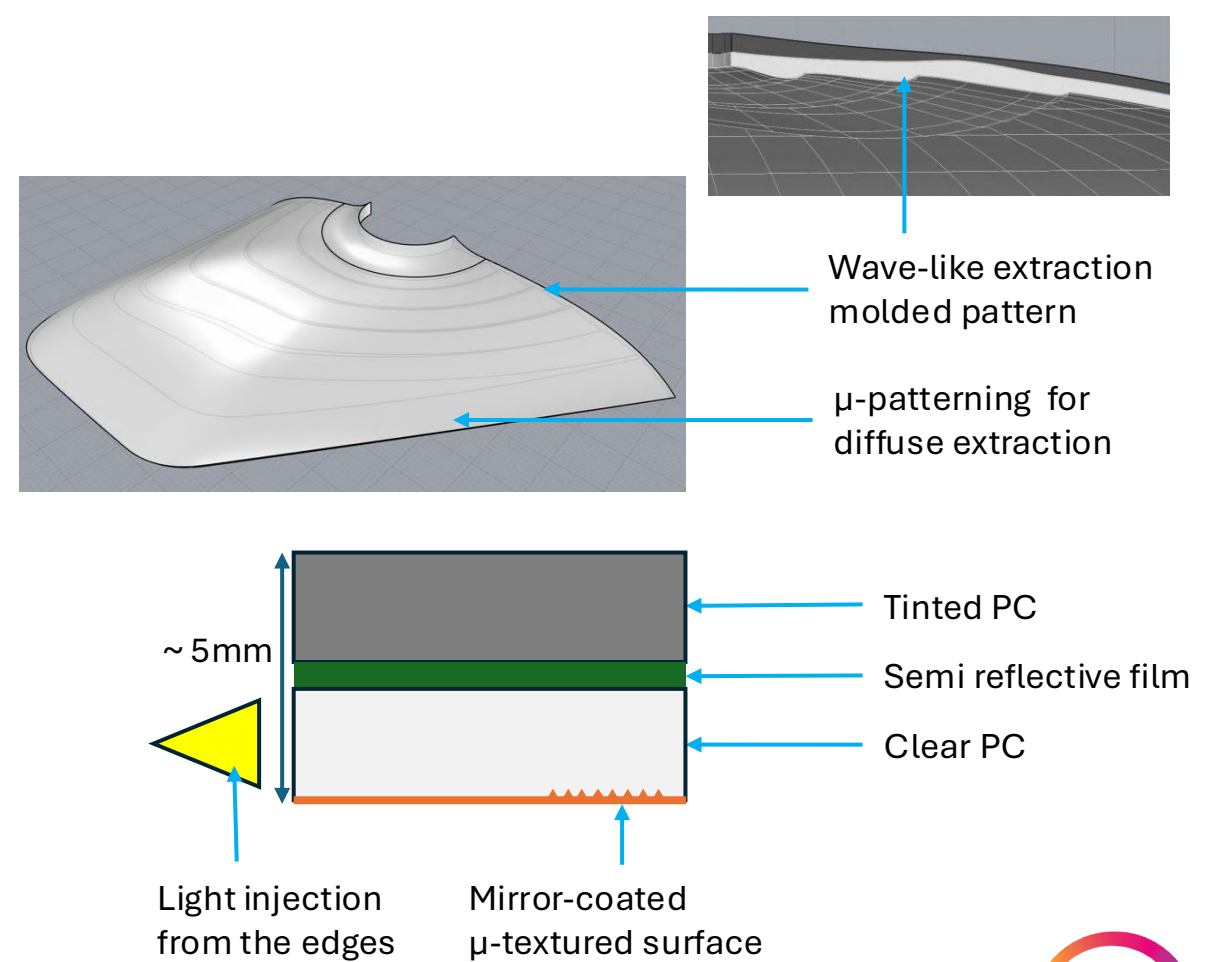


Inspiration & initial design



Goal: Develop digitally infinity light effects with thin, mono-material designs to accelerate time-to-market and ensure efficient, collaborative end-to-end workflows.

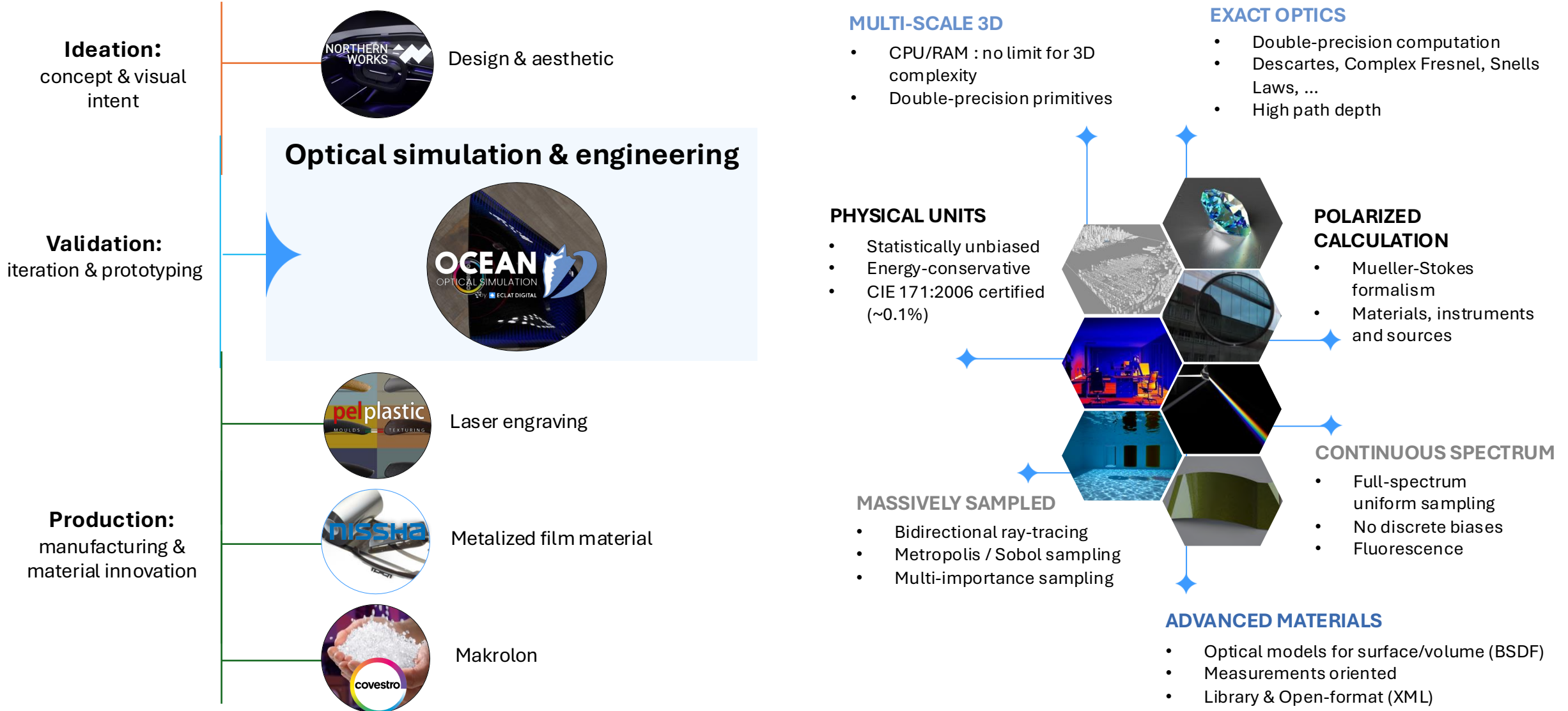
Initial design: Assembly of a thin tinted polycarbonate part and a mirror coated clear part laminated with a semi reflective film.



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Collaborative innovation process – Experts in each domains

Covestro's inspirations meeting Ocean™ performances

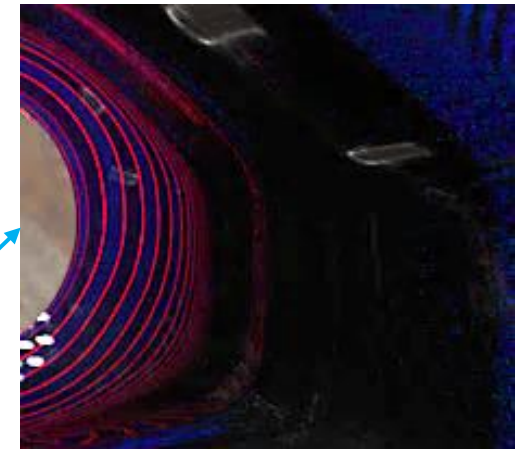
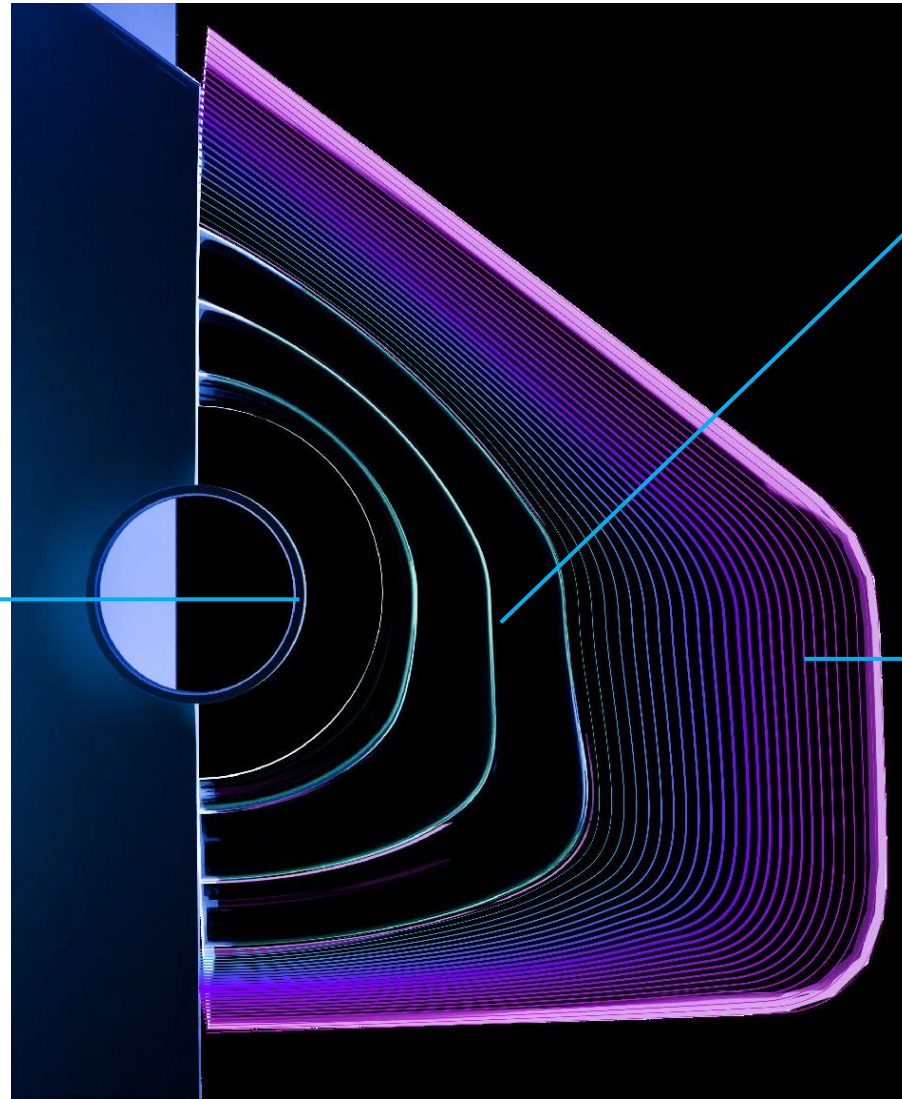


Identifying issues with Ocean™

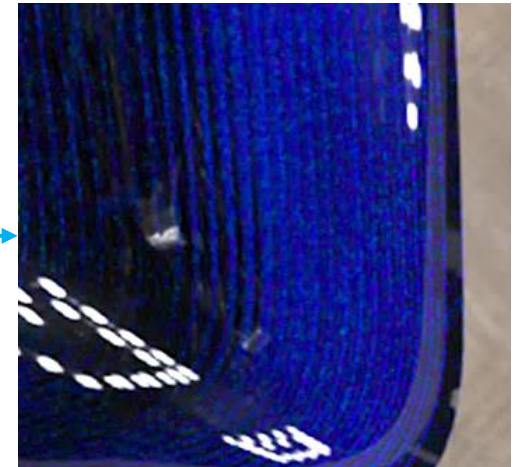
First model simulations revealed discrepancies between goal and actual results



Dot-like wave pattern with real dot-like color led



Short length propagation



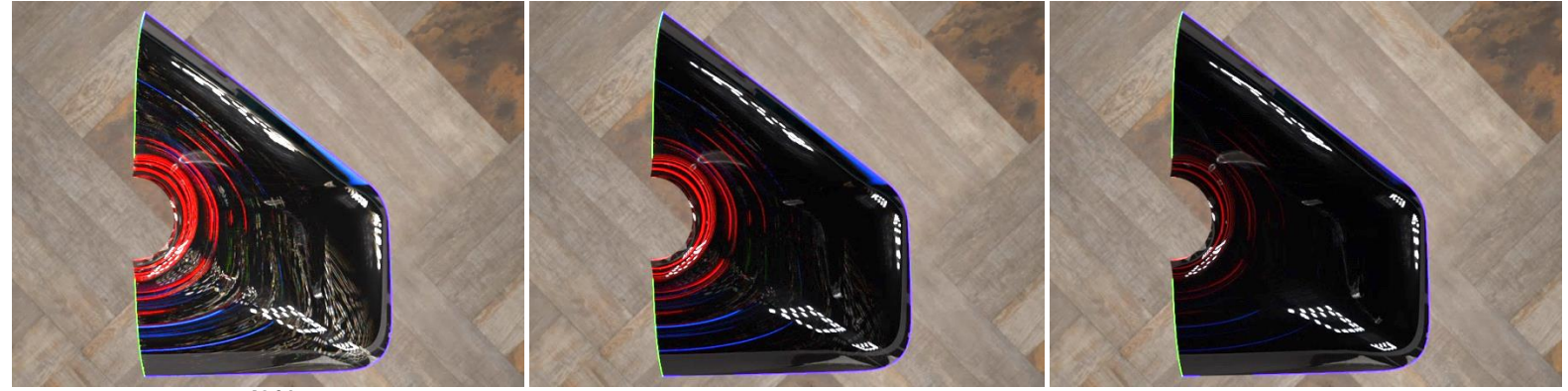
Undistinguishable diffusive pattern

Reliable digital iterations and specifications

Ocean used to iterate digitally

- ◆ On materials properties
- ◆ On μ -patterning
- ◆ On pattern shape
- ◆ On injection strategy
- ◆ On parts thicknesses
- ◆ And more...

Tinted PC absorbance

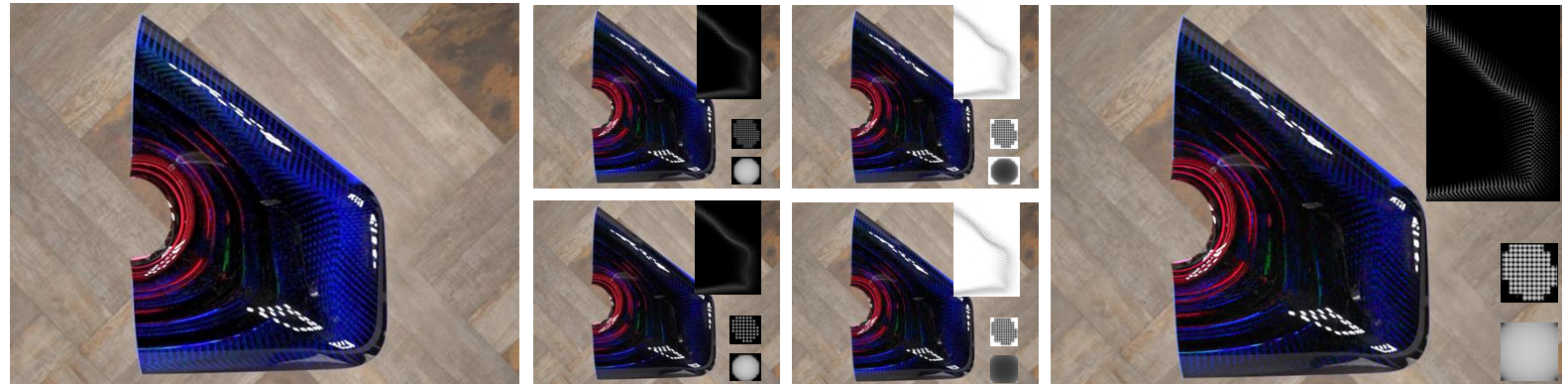


40%

10%

1%

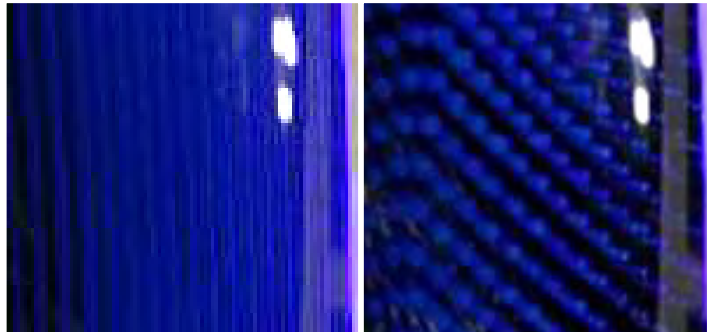
Diffusive pattern μ -structure



Theoretical diffusive surface

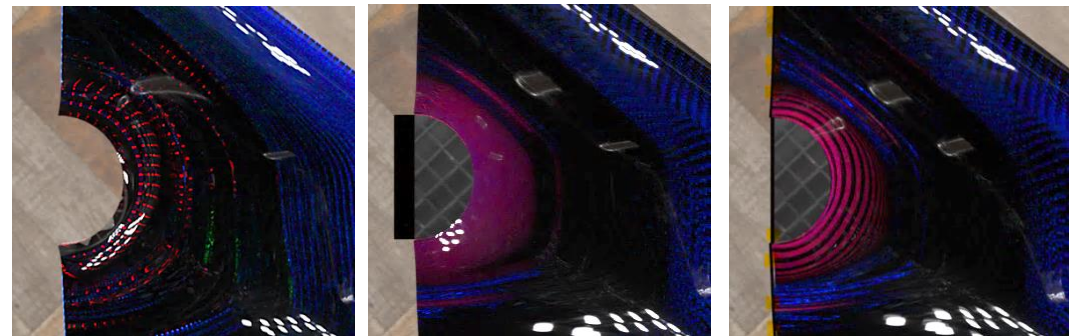
Iterations

200µm diameter half spheres every 150µm



Diffusive pattern repartition

Light injection strategy



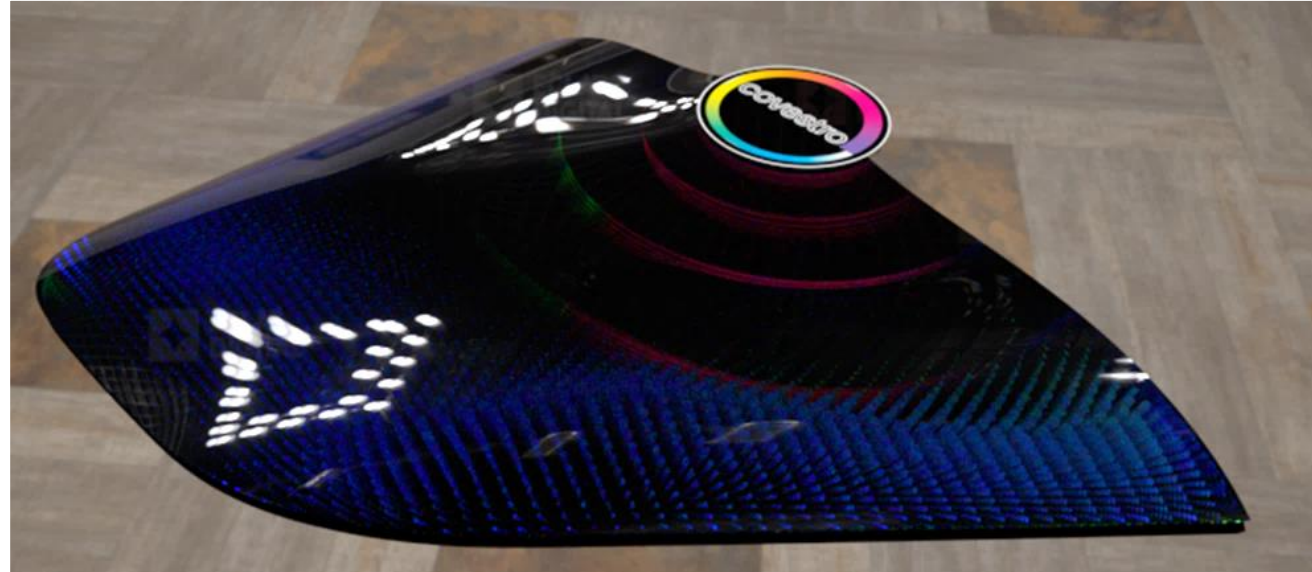
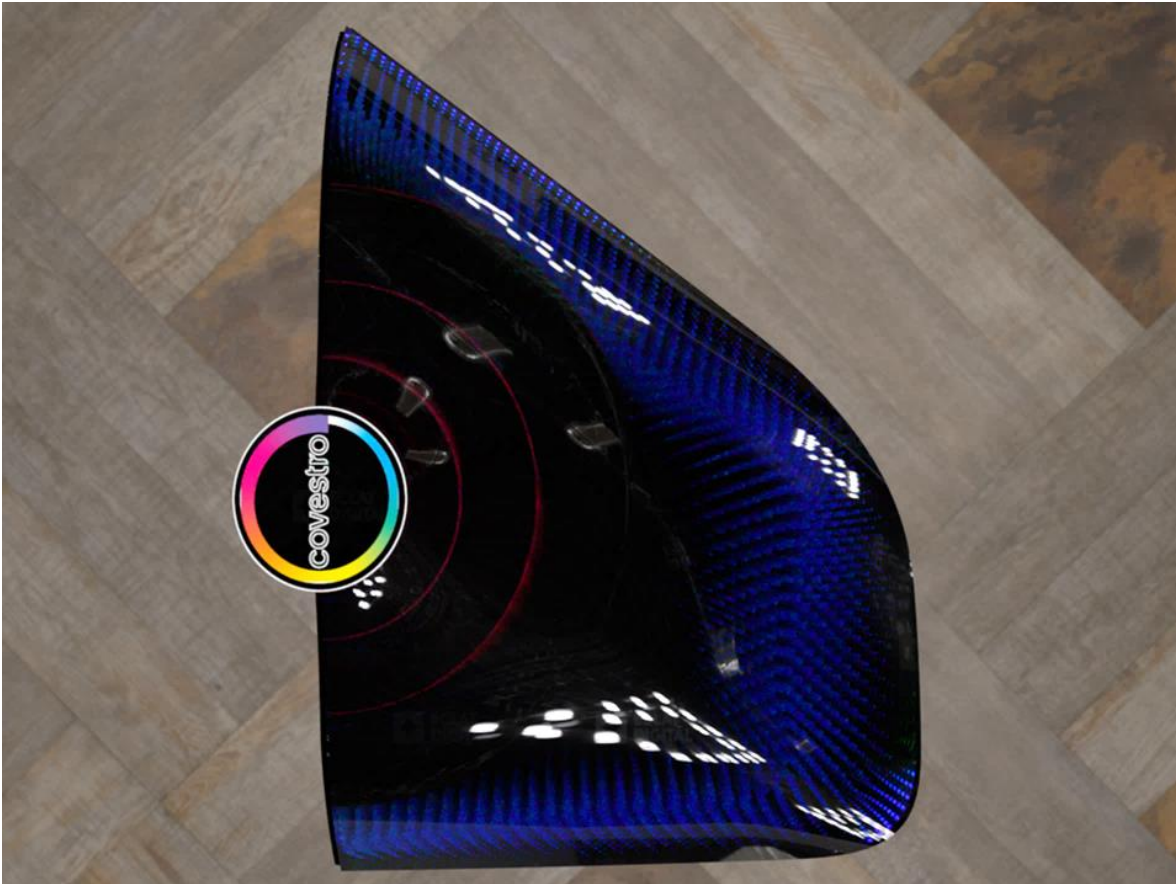
Direct edge injection

Injection through translucent PC

Thinner translucent injection part



Validation of design and materials



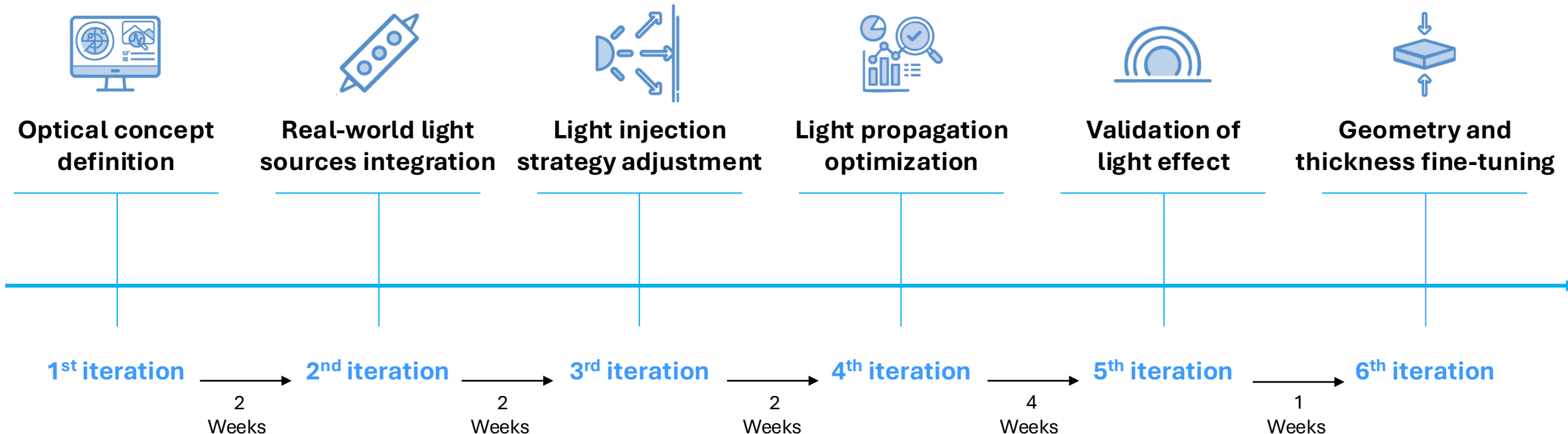
Validation of design and materials



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Covestro light infinity demonstrator – Project's time-line

Fast and reliable digital iterations for materials, lighting & geometry validation



Final results & measurable gains

From Ocean™ predictive optical simulation to proven physical performance



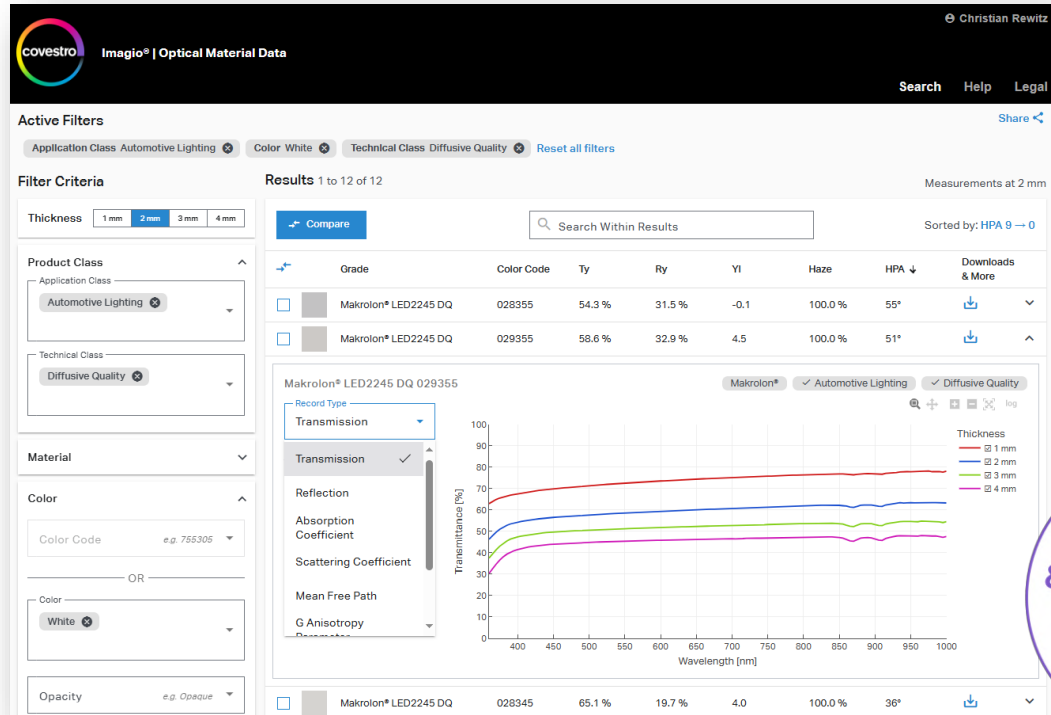
- ◆ **Outcome:** High correlation between simulation and physical reality
- ◆ **Finished product:** Functional infinity-lighting demonstrator
- ◆ **Visual accuracy:** near-perfect match between **Ocean™ digital prediction** & physical result
- ◆ **Measured impact up to:**
 - - **70%** physical prototyping iterations
 - - **40%** time-to-market
 - - **30%** development costs



Fully digital process with Covestro & Ocean™

High-quality optical material data for accurate virtual prototypes

Imagio® Optical Material Data



Compatible, reliable input for Ocean™



Optical Simulations & Optimizations

BRDF, BTDF, spectral absorption and scattering coefficients for a parametric model used by optical simulation software

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Thank you for your attention

Meet us [booth SH8](#)

Validate. Decide. Deliver

▶ Romain Hivet, PhD - Operations Manager: rhivet@eclat-digital.com

▶ Marie Amiel - Sales Manager: mamiel@eclat-digital.com

