Wideye
by AGC

SOLVING LIDAR INTEGRATION CHALLENGES

GLASS SOLUTIONS TO COPE WITH PERFORMANCE, DESIGN & RELIABILITY

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SOLVING LIDAR INTEGRATION CHALLENGES

Glass solutions to cope with Performance, Reliability & Design

- **AGENDA**
  - Wideye Intro
  - Product Portfolio
  - Lidar Integration Trends
  - Zoom-in : Roof integration
  - Zoom-in : Windshield integration
  - Wideye Design studio
  - CES2024

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In a Glimpse

AGC

GLOBAL FOOTPRINT
(56k employees, +14bn $ sales, 206 sites)

GLASS **42%** ELECTRONICS **18%**
CHEMICALS **36%** OTHERS **4%**

AGC AUTOMOTIVE

25% global market share in automotive glazing

Top 100 automotive parts supplier
Automotive OEM Glass
Automotive replacement glass
Transport & Industrial

CASE
CONNECTED AUTONOMOUS SHARED ELECTRIC

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Drive the world the safest way

"Our ambition is to enable ADAS deployment and bring fully autonomous drive to reality"

Maximize sensor **performance**

With a **reliable and resistant product**

While allowing for an **aesthetically and pleasing solution**

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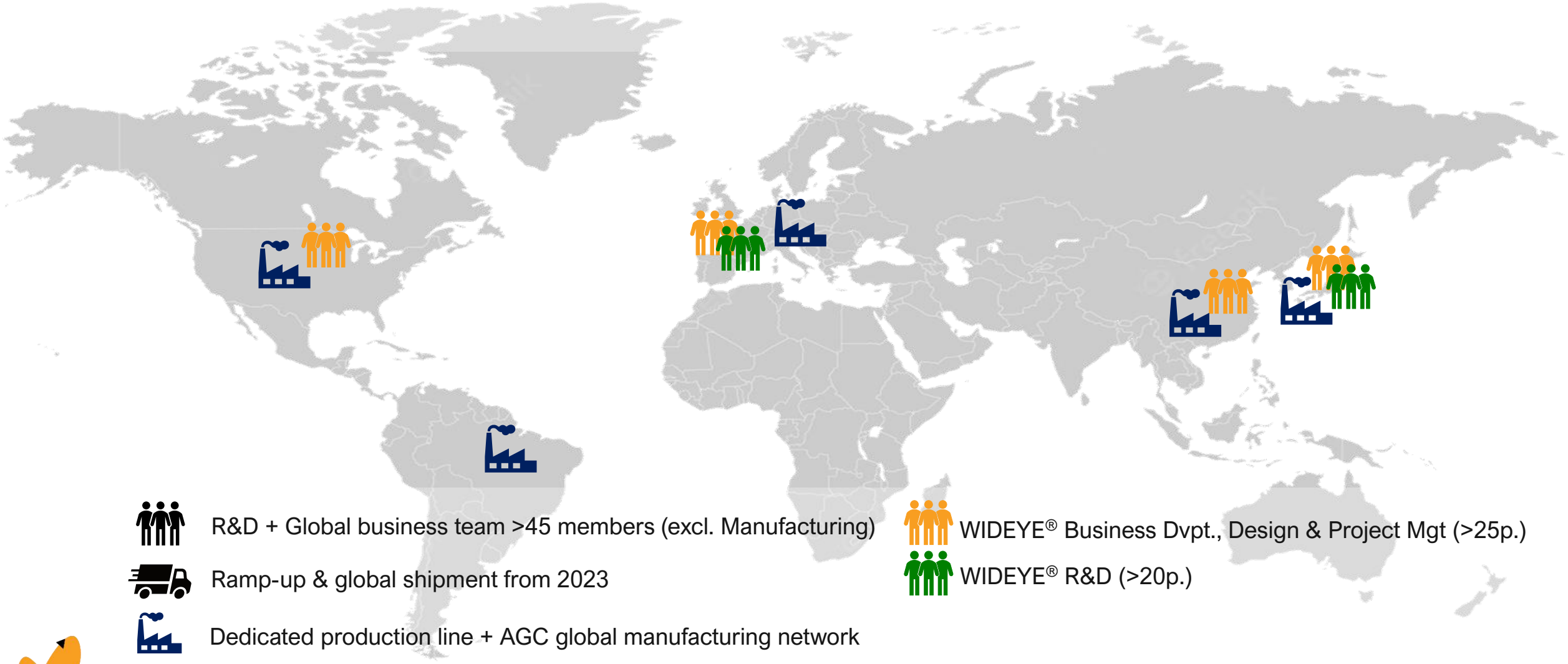
GLOBAL FOOTPRINT



R&D + Global business team >45 members (excl. Manufacturing)

Ramp-up & global shipment from 2023

Dedicated production line + AGC global manufacturing network

WIDEYE® Business Dvpt., Design & Project Mgt (>25p.)

WIDEYE® R&D (>20p.)

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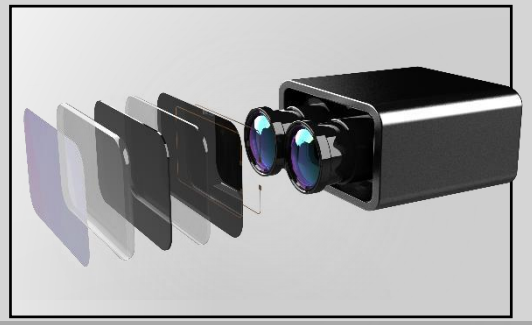
Glass solutions for **smart, safe and robust ADAS** sensor integration



OPTICAL COVER :

- **High optical quality**
- **Automotive grade**
- **High level of functionality** such as IR transparent black glass, heating, AR & water repellant coatings, resistance to stone chip impact, …

Mass Production Development
Design Maturity : C-Sample

GLASS TRIM :

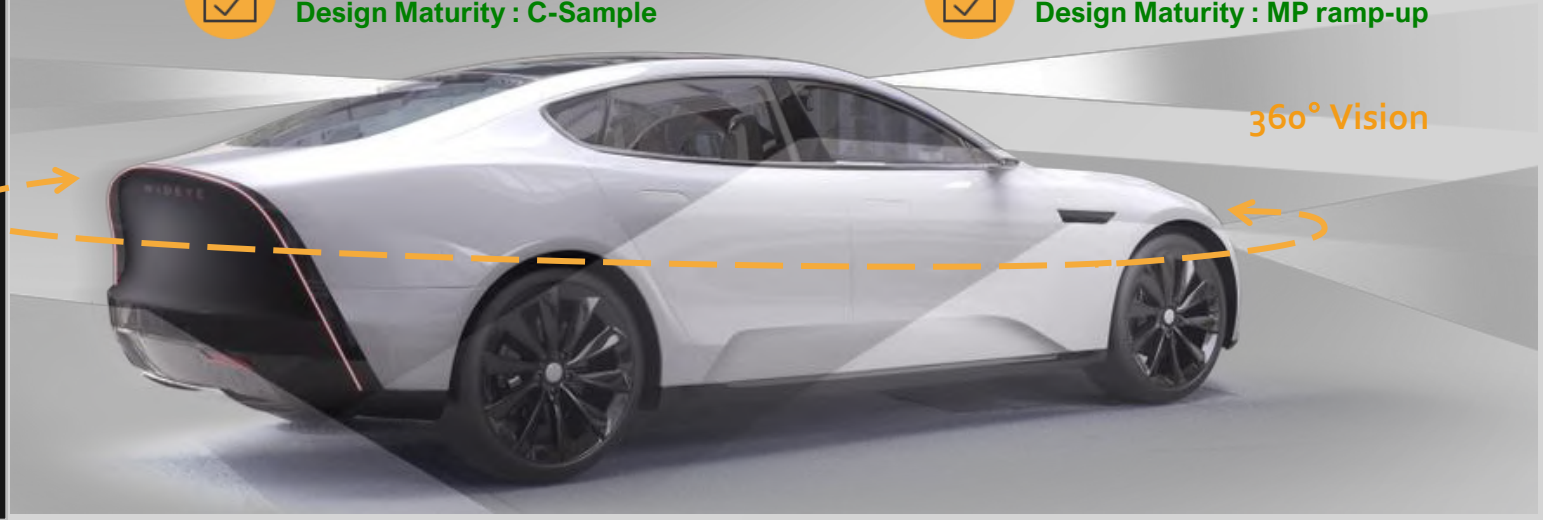
- Optical cover, with **seamless integration**
- As additional protective skin or direct mount, for LiDAR and camera
- 2D or 3D bending
- **Roof, Fender, Grille, B-Pillar, …**
- **Black IR transparent glass for LiDAR**

Mass Production Development
Design Maturity : MP ramp-up

VISION GLAZING :

- Integration of **LiDAR and Camera**
- Optimum use of exterior glass surface such as **windshield, backlite**
- high IR transmission Wideye glass in combination with IR reflective coating

Mass Production Development
Design Maturity : C-Sample



ONGOING DEVELOPMENT:

- Multi-sensors integration
- Module integration
- System design & validation

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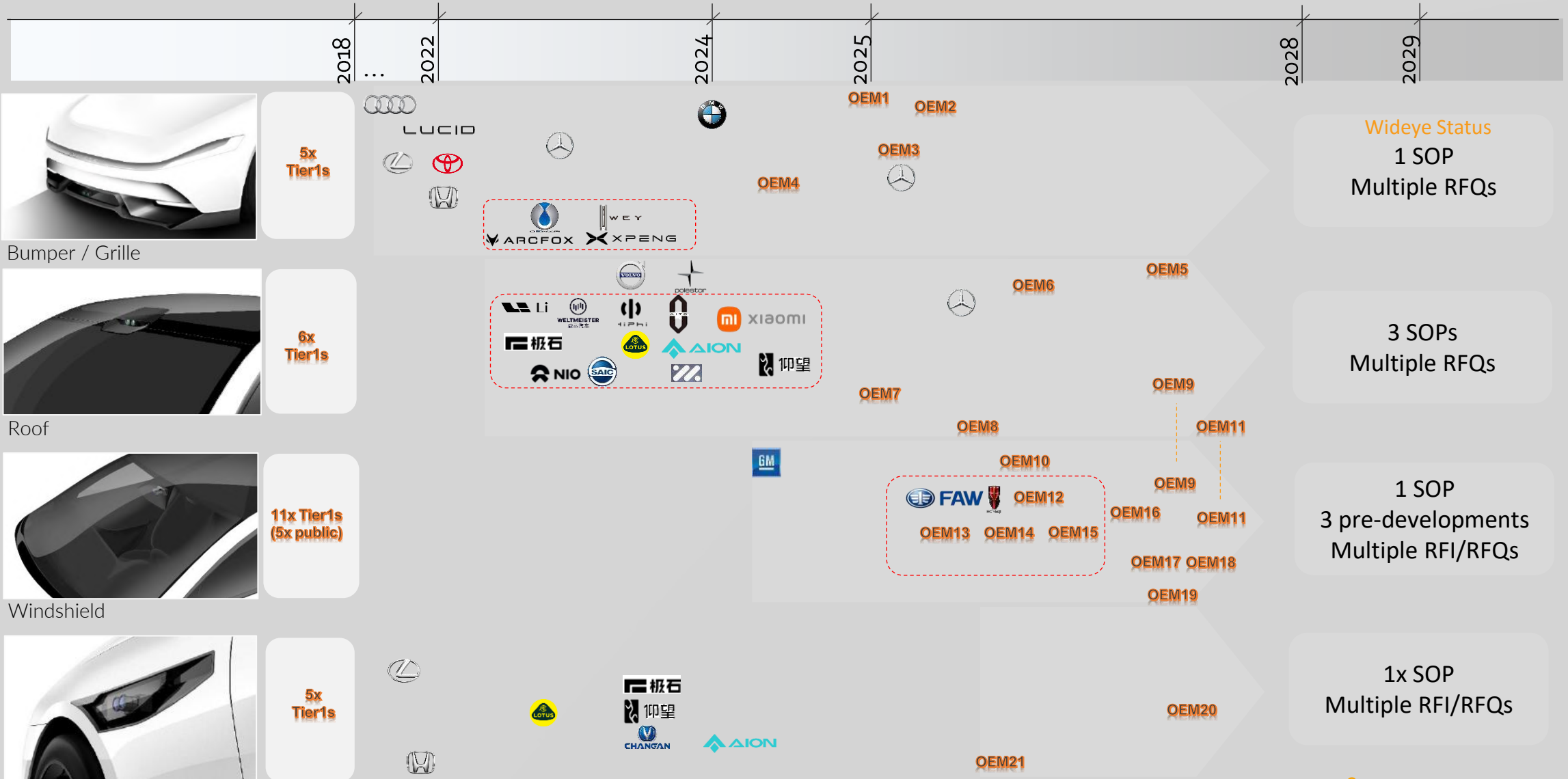
LIDAR INTEGRATION TREND

WHERE ARE WE HEADING ?

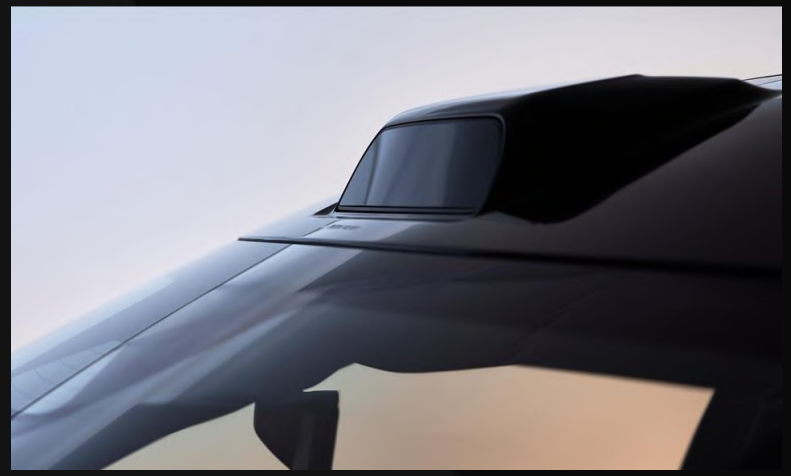
* Estimated SOPs based on PRs & Auto shows

China based



Source: Wideye Market Intelligence

USE CASES



Roof

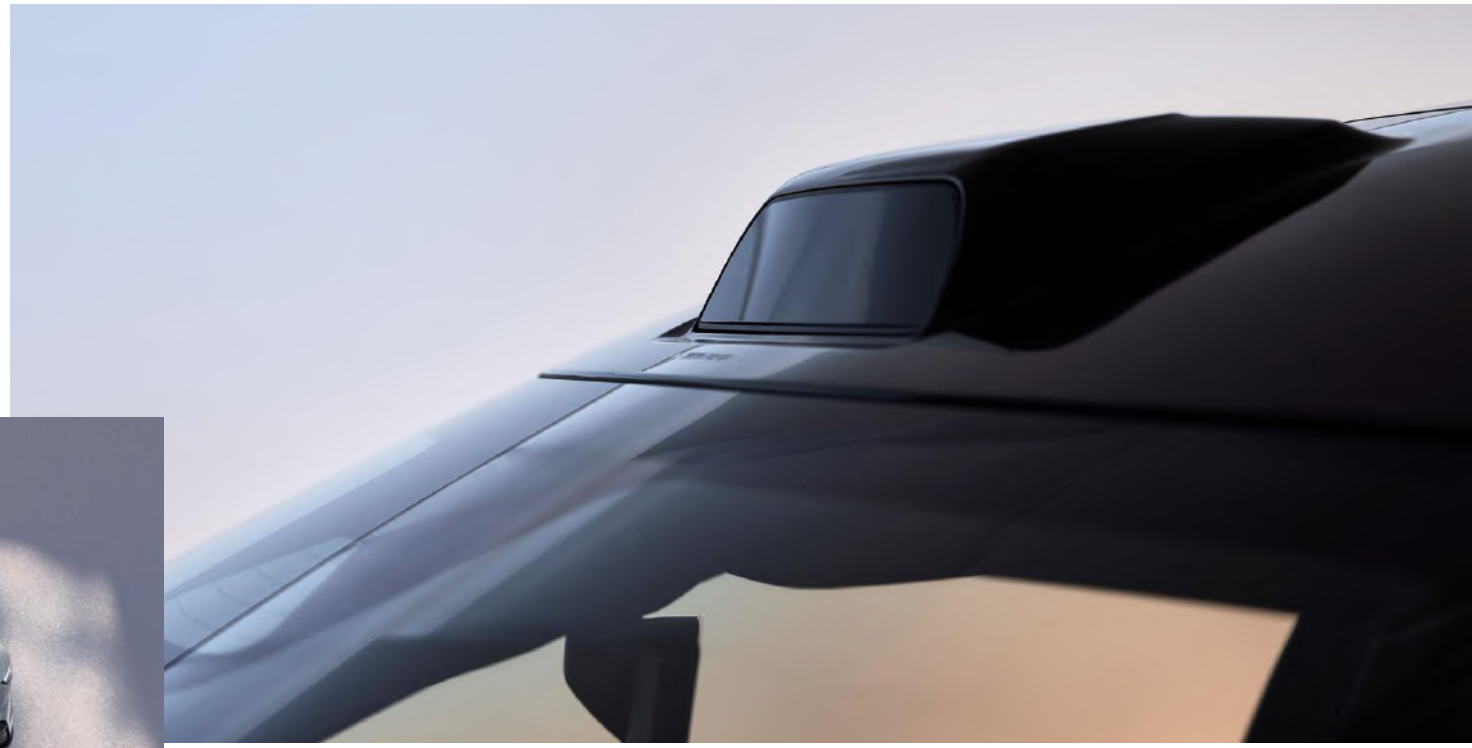
Windshield

LIDAR ROOF INTEGRATION

High viewpoint for perfect traffic overview

Roof integration: combining advantages of glass trim integration with a high vantage point

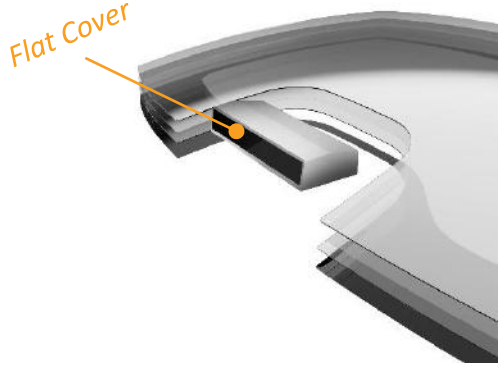
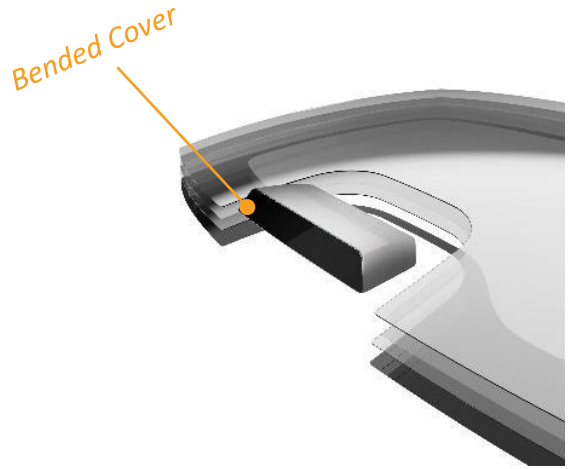
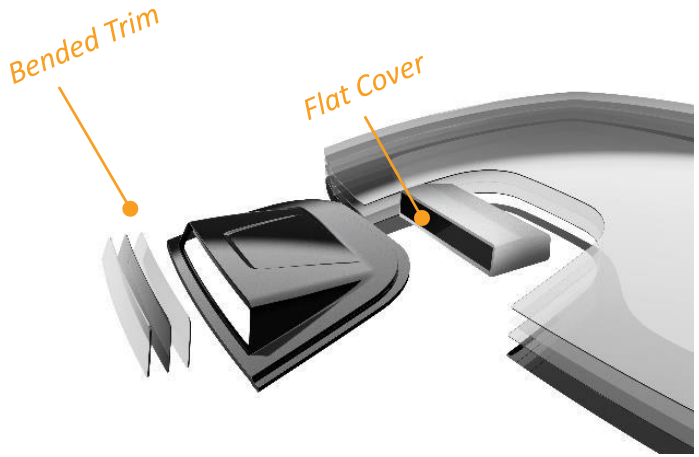
- Glass trim providing a design freedom vs. vehicle styling
- Auto grade solution
- High optical quality
- Integrated heating
- Anti-reflective coating
- Water Repellant Coating
- Black glass solution
- Safety glass, meeting R43 regulation



Example roof module Volvo EX90
© Volvo Cars

LIDAR ROOF INTEGRATION

Potential integration scenarios

	Flat Lidar Cover as A-Surface	**Bended** Lidar Cover as A-Surface	2 Interfaces : **Flat** Lidar Cover as B-Surface + **Bended Trim** as A-Surface
			
Pros	• Incorporated in Lidar Tier1 supply chain • Lidar Tier1 responsible for complete optical path	• Incorporated in Lidar Tier1 supply chain • Lidar Tier1 responsible for complete optical path • 2D/3D bended fits better with vehicle design	• 2D/3D bended fits better with vehicle design • Serviceability : Easier replacement for the A-Surface while Lidar is intact
Cons	• Flat cover styling miss match vs. vehicle design • Serviceability : need to replace full LiDAR	• Serviceability : need to replace full LiDAR	• Supply chain & responsibility sharing • Cleanliness/microclimate in area between both covers
Status Wideye	• Mature product, established production process • LiDAR cover product in development with Tier 1	• Mature product, established production process • RFI/RFQ with several Tier1s	• Mature product, committed Programs • RFI / RFQ with several OEMs

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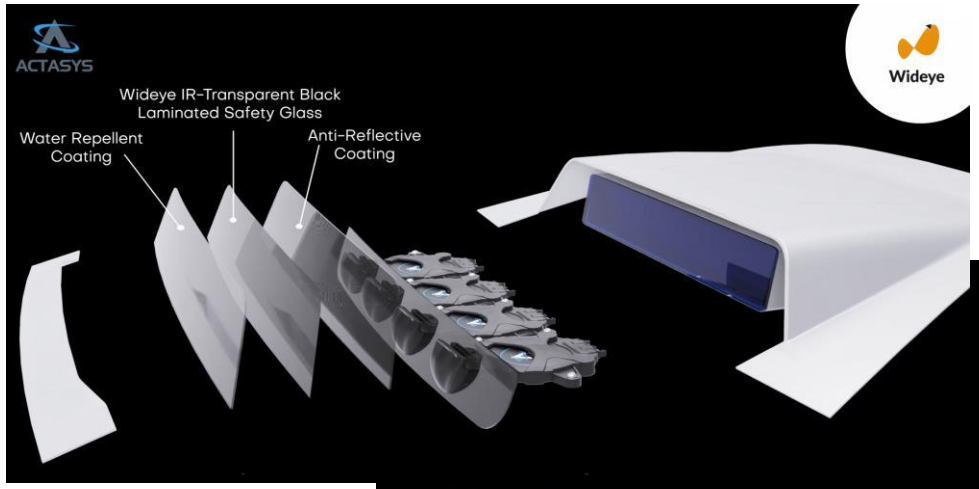
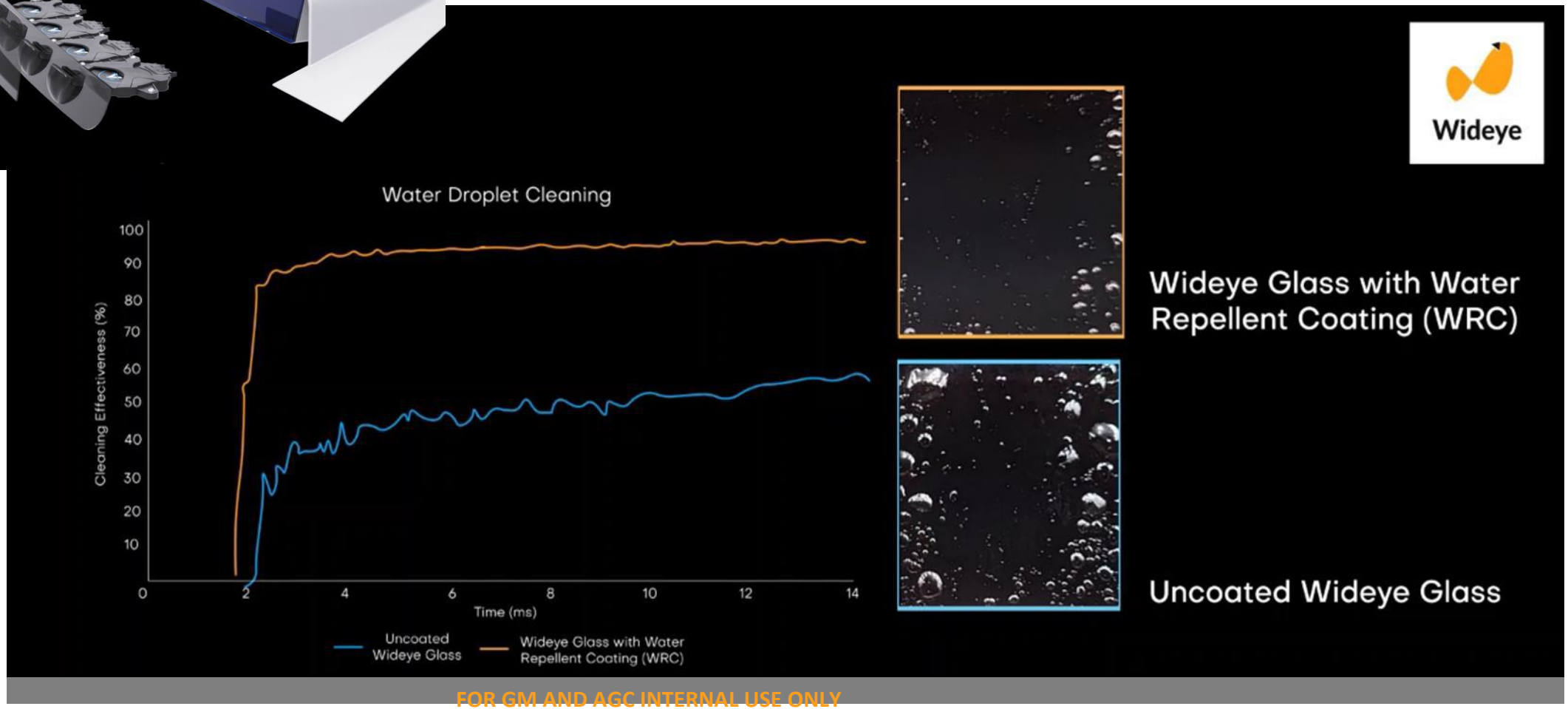
Added Functions - Reliability

Water Repellent coating



Test done in collaboration with Actasys



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FRONT INTEGRATION

WINDSHIELD USECASE

Performance

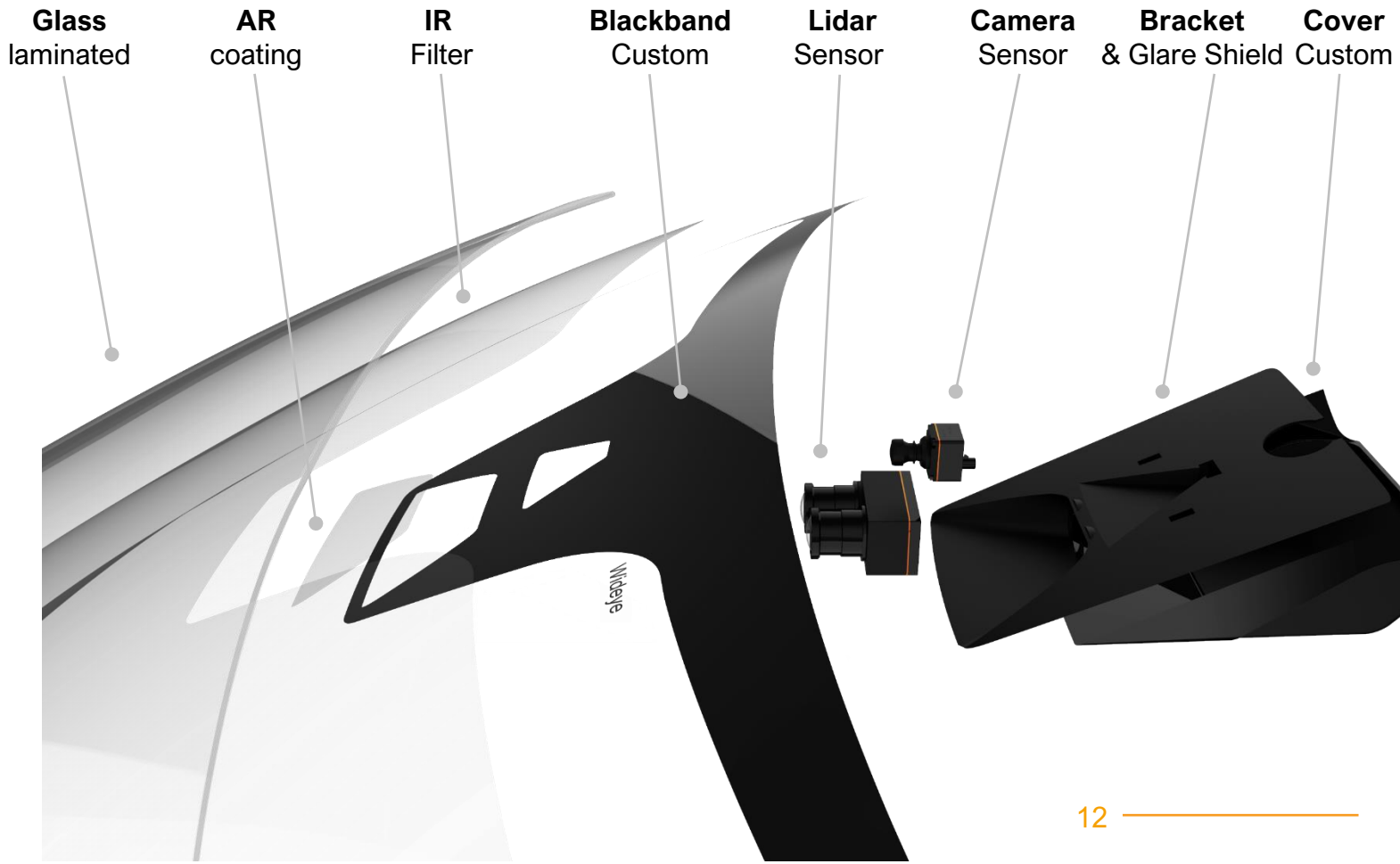
- Long detection range
- High perspective view
- IR transparent

Reliability

- Optimal protection by the windshield
- Low exposure to dirt and damages
- Existing cleaning and heating solutions
- Rigid mounting system

Design

- Seamless integration
- Efficient aerodynamics
- Shared resources with camera



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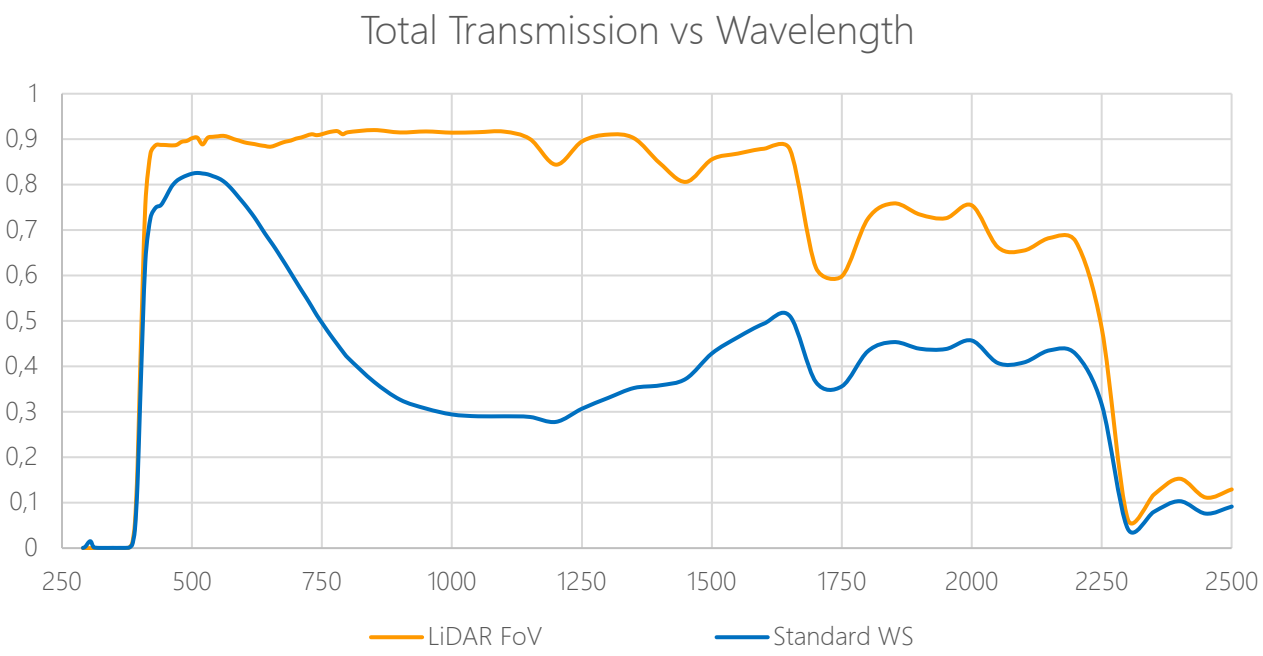
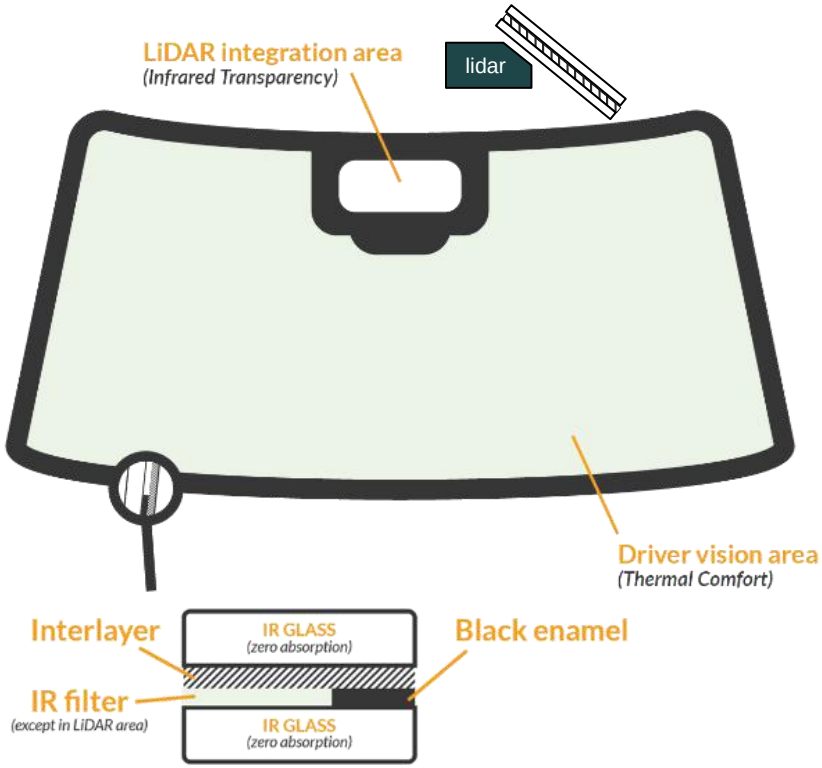
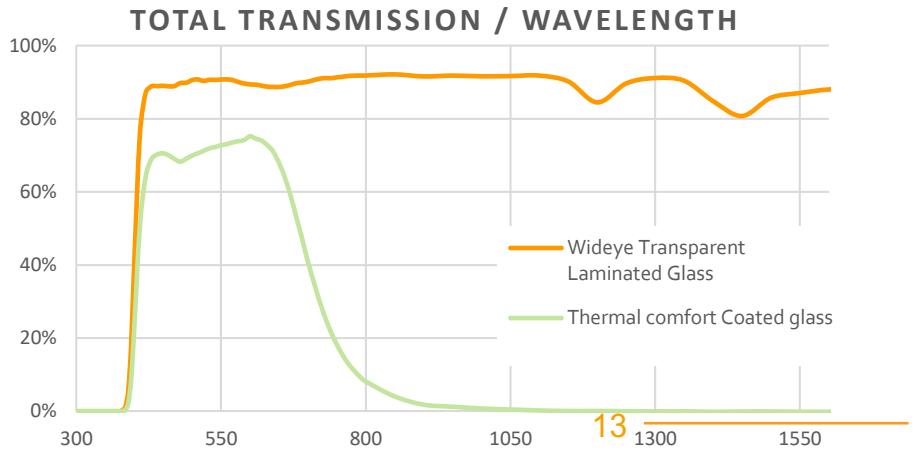
WINDSHIELD Integration

Nearly Zero absorption



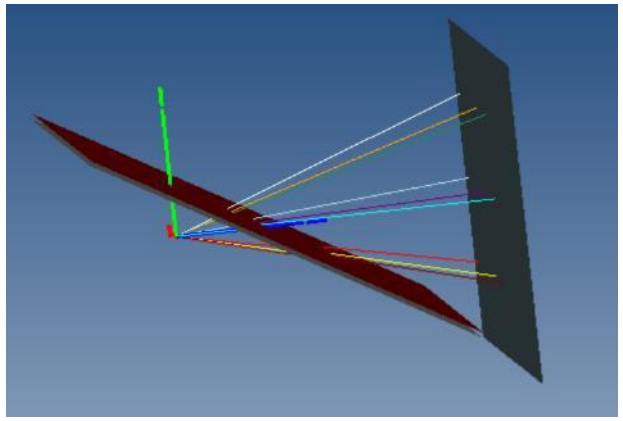
AGC patent





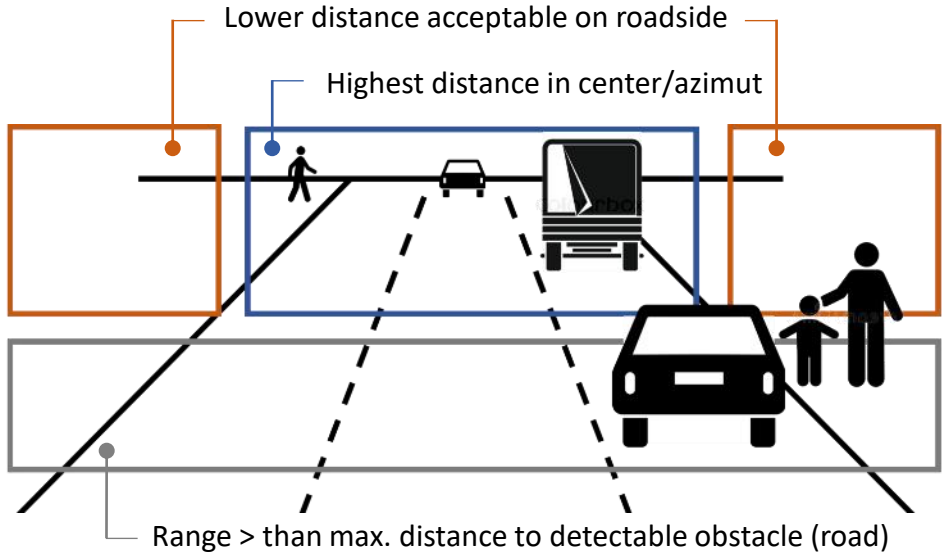
CASE STUDY – LIDAR on WS simulation

DESIGN FOR OPTIMUM PERFORMANCE

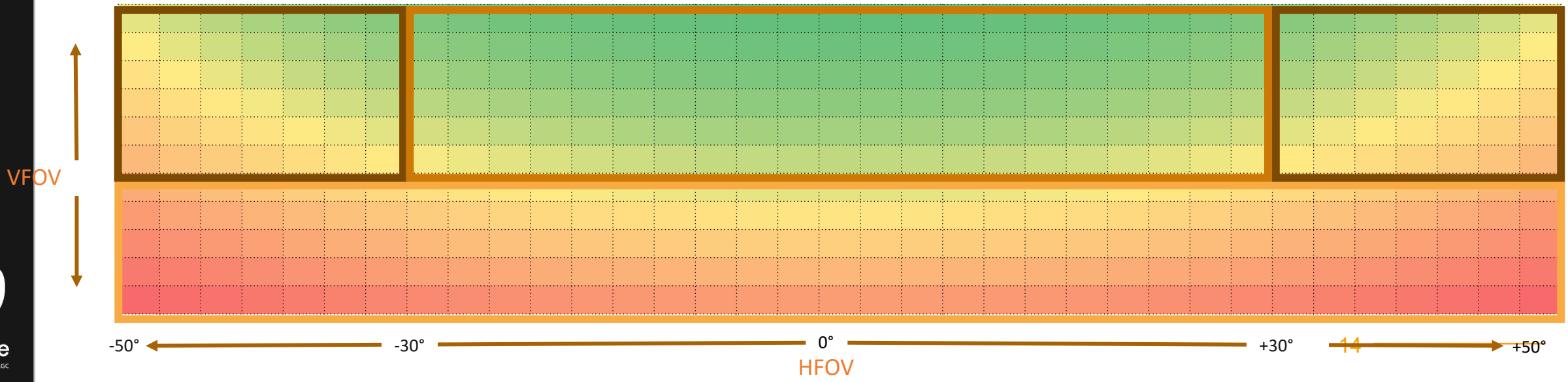


Ray-Tracing simulation model:

- Inclined window: Wideye 4.46mm
- Installation angle: 30 degrees
- FOV: H100° / V30°
- Wavelength: 1.550nm
- Random polarization

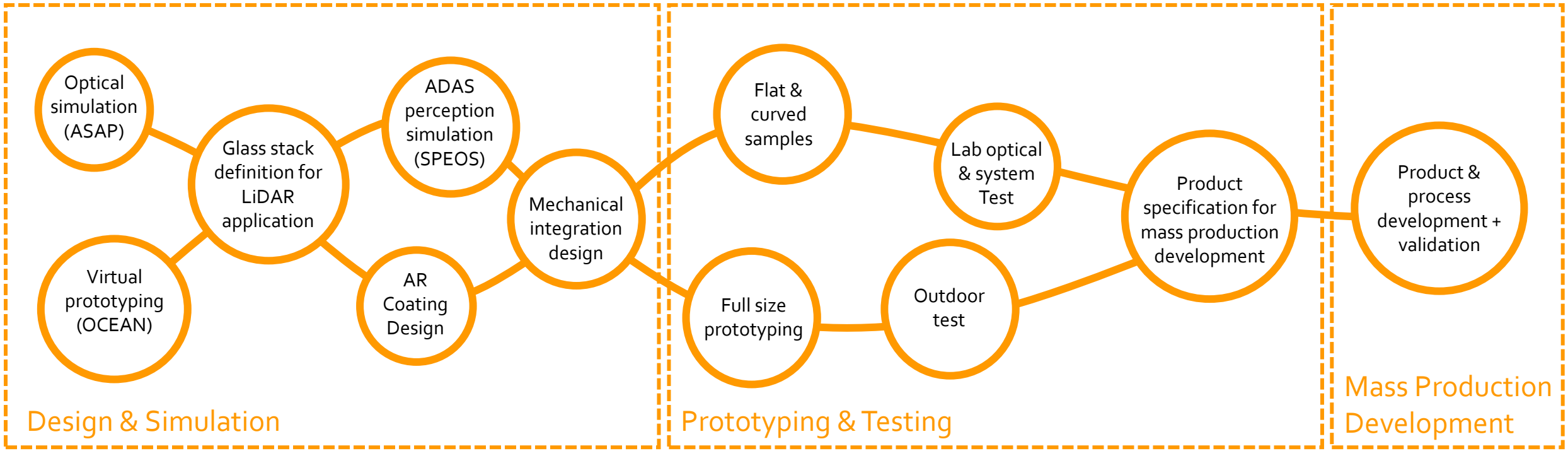


Example of range evaluation for a given LiDAR technology



WIDEYE DESIGN STUDIO

END TO END APPROACH



- In-house know-how to manage LiDAR integration programs from the early development stage
- Comprehensive R&D activity and close collaboration with LiDAR tech-companies, ADAS Tier-1 and several OEM customers
- Design and simulation of the sensor integration solution
- Prototyping and test on small samples and complete parts
- Product development, industrialization and quality control adapted to glass-integrated LiDAR applications
- Sensor agnostic

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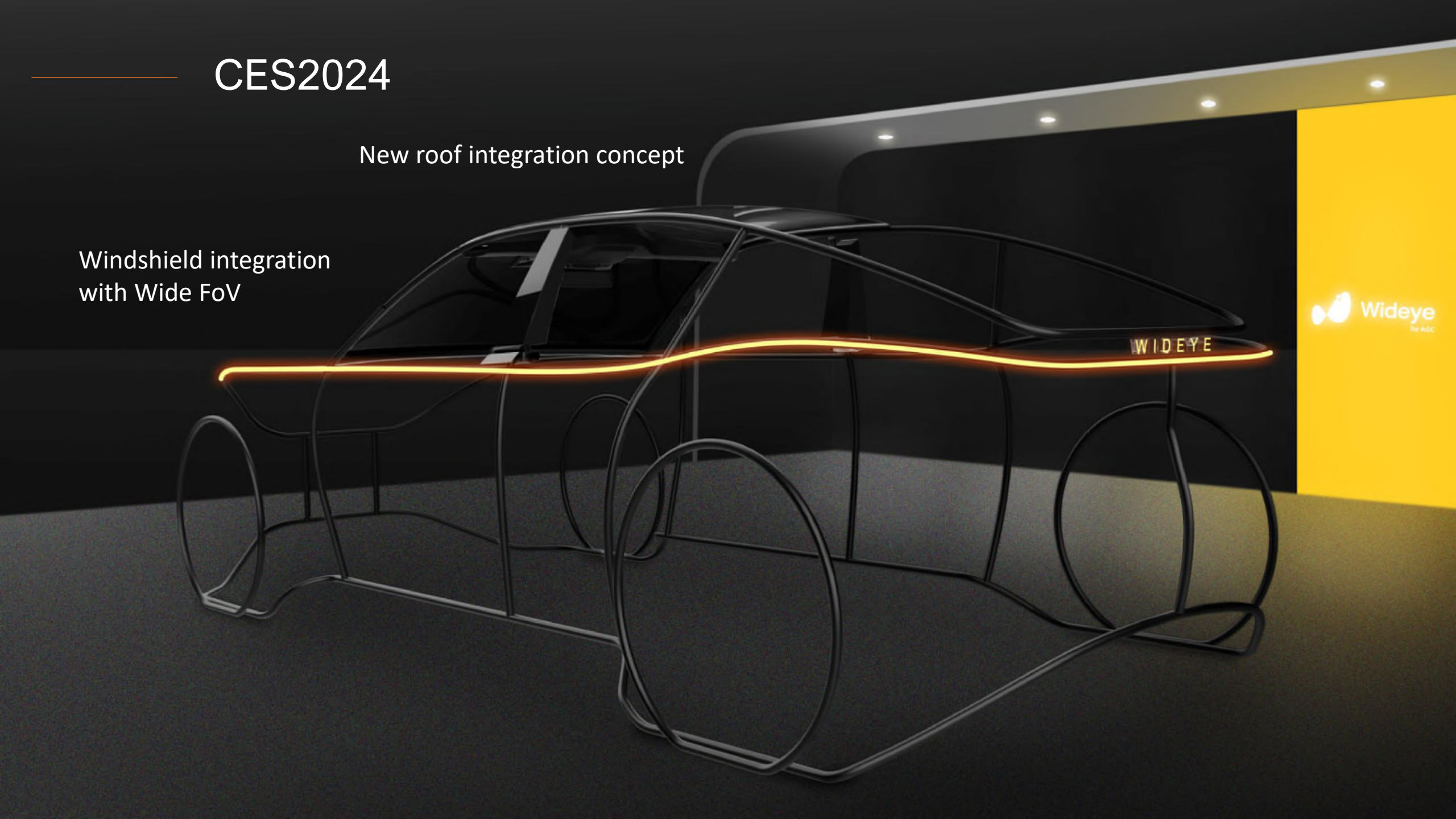
CES2024

New roof integration concept

Windshield integration
with Wide FoV



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