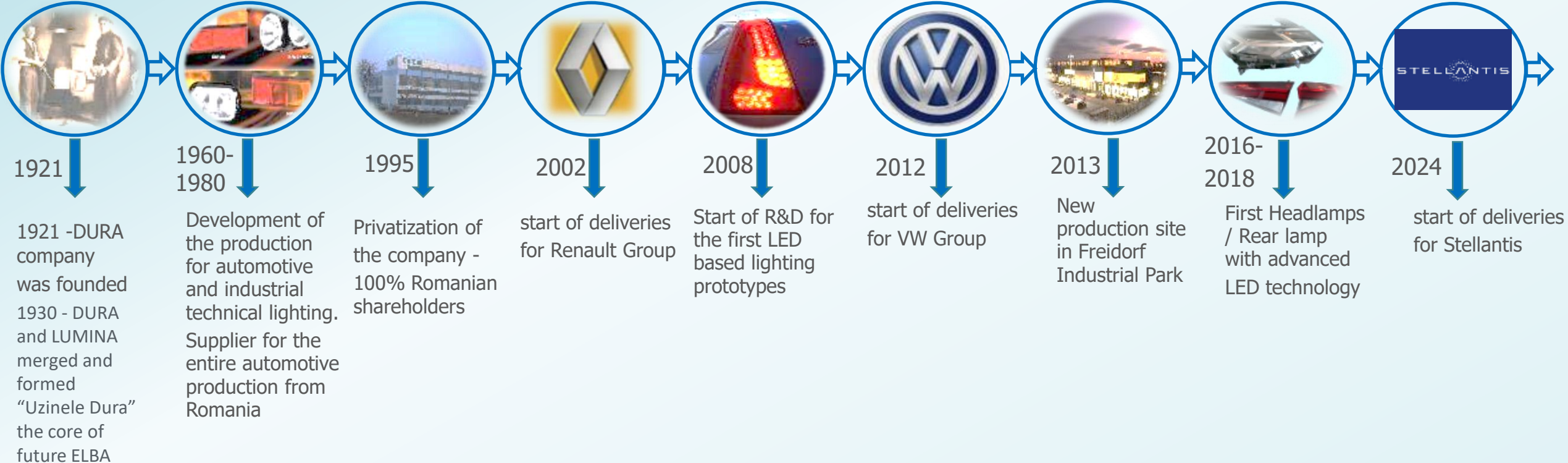


ELBA

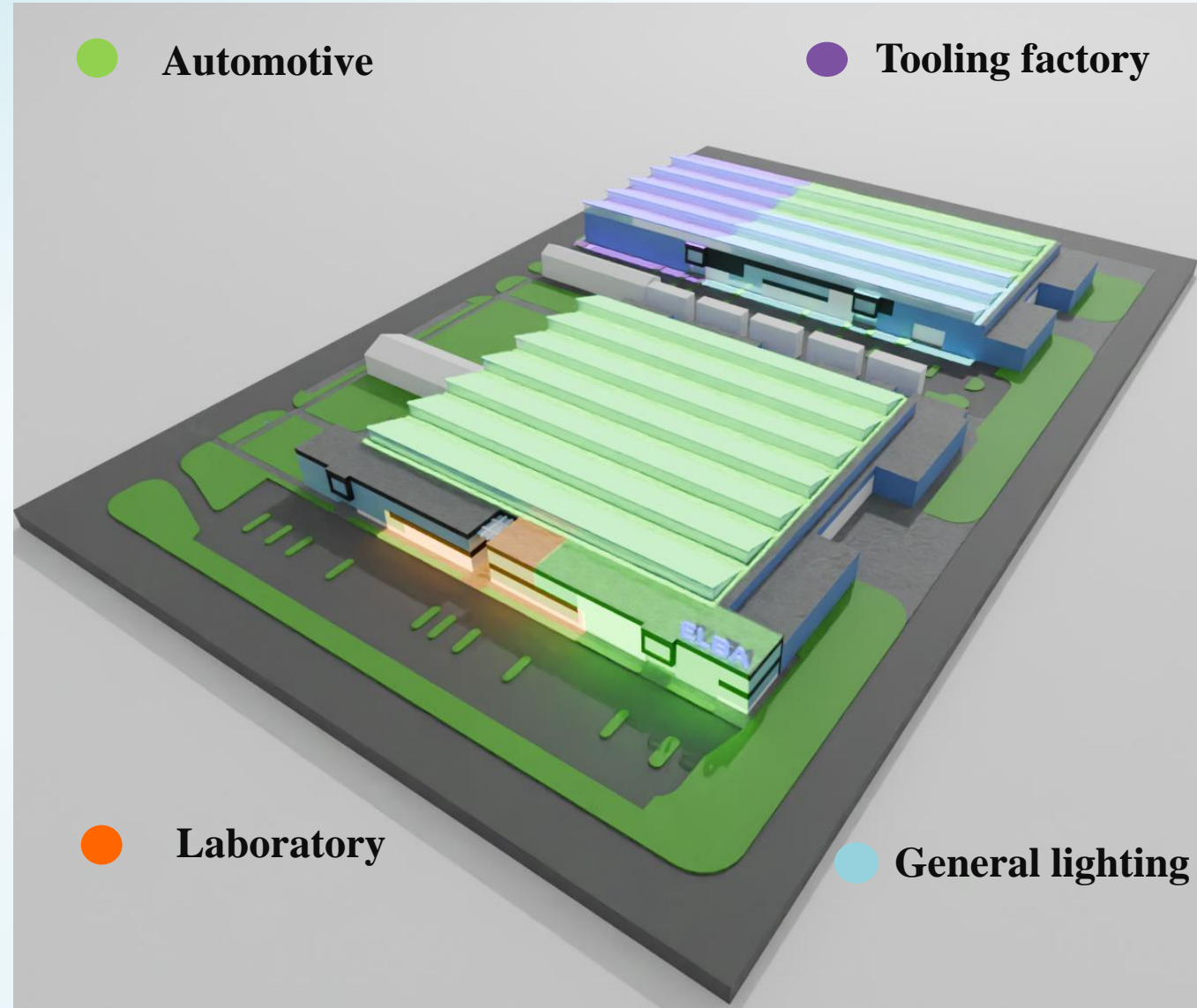
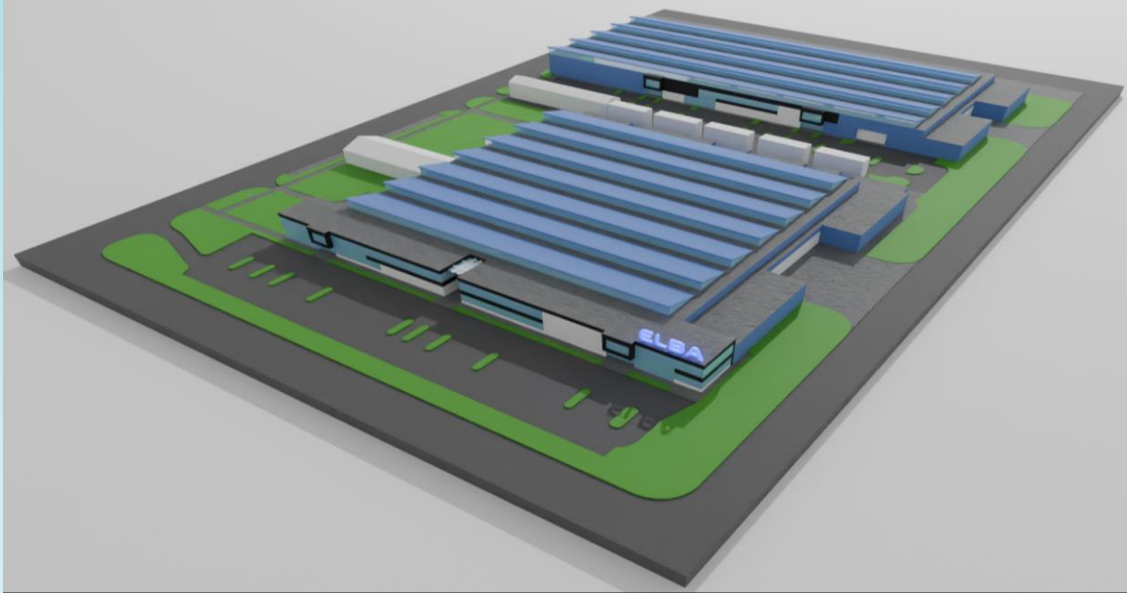
Advanced Solutions for Automotive Lighting

- 1 R&D Ability / Competencies of design product & process**
- 2 Product Analysis - Elba Technical Level for Rearlamp**
- 3 Product Analysis - Elba Technical Level for Headlamp**
- 4 Product Analysis - Elba small lamp and parts**
- 5 Status and intention in 2024**

Short history - 100 years of tradition and innovation in lighting industry – main milestones regarding automotive production



Elba Company & divisions



● Automotive

● Tooling factory

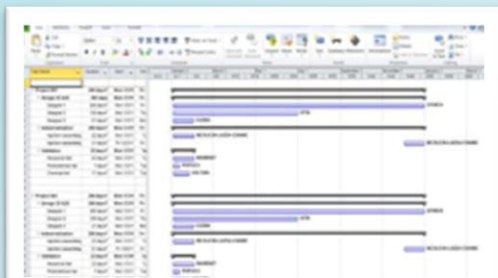
● Laboratory

● General lighting

1

R&D Competencies - Overview

End to End Project Management from concept to production



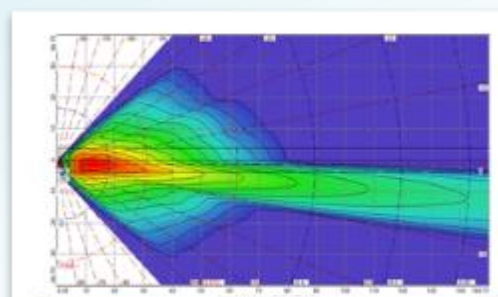
Project management

Soft: MS Project, MS Office,
Secured data transmission
(ex. KVS, Connect, Bilbao)



3D, 2D Conception

Soft: Catia V5 R24 SP9



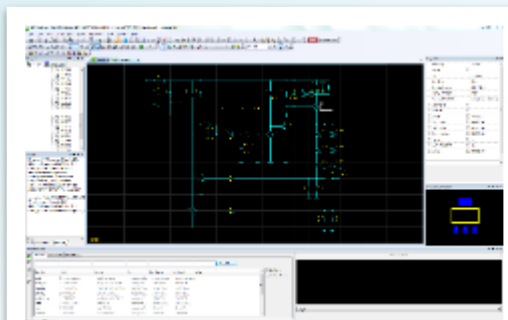
Conception optical simulation

Soft: Lucidshape; Speos



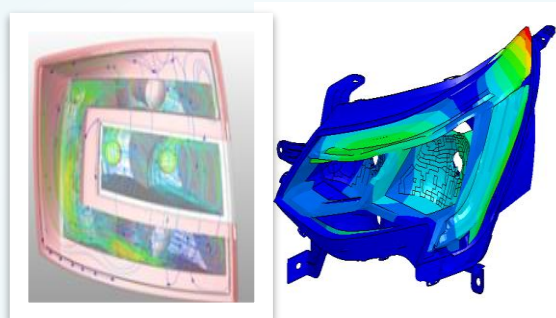
Homogeneity simulation

Soft: Lucidshape; Speos



Electronic concept for PCBA

Soft: PADS; Fusion 360



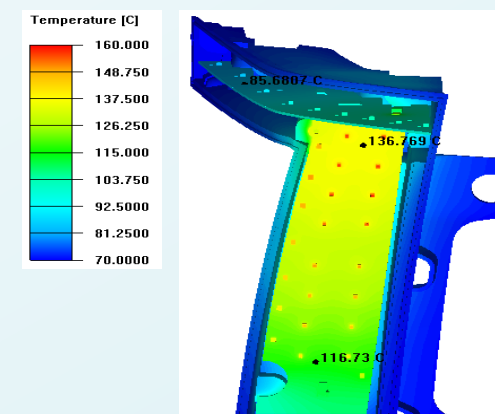
FEA simulation:

vibrations, condensation, sun load etc.



Rheological analysis

Soft: Moldflow



Thermal simulation

R&D Capabilities – competencies , technologies, investments

Development, prototyping & testing



Licenses 3D design, rendering, thermal & electronic simulations



Specialized 3D printer – 2 machines



Dedicated Prototype workshop



3D scanning installation (GOM)



Photometry installation

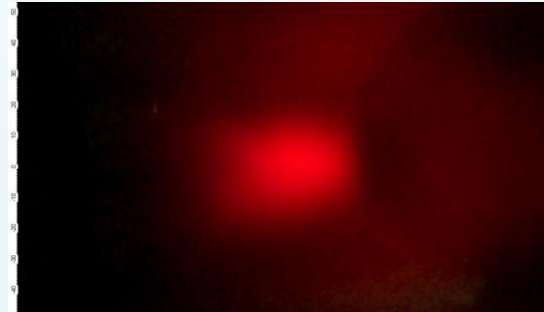
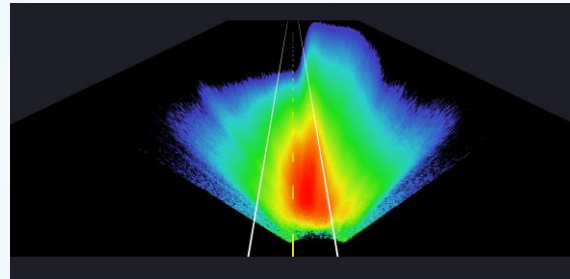
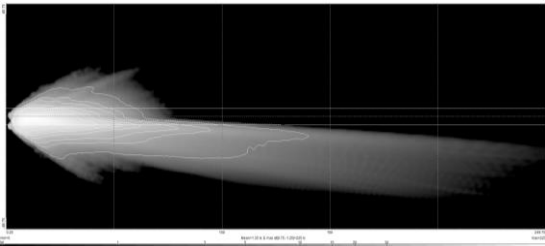
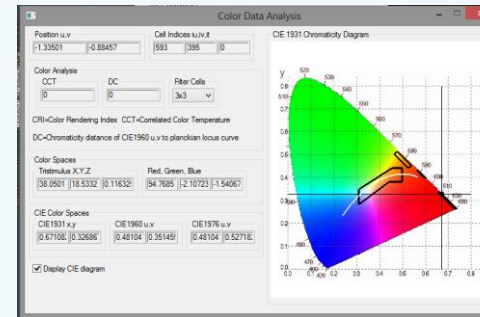
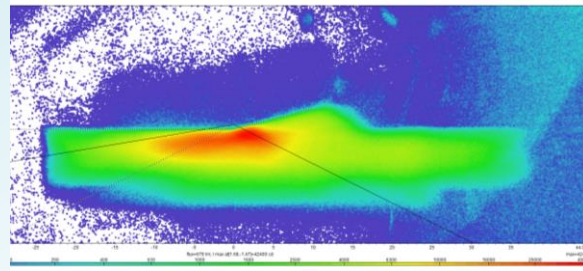


Climatic chambers

Optical Design construction and simulation

Development of automotive lighting products,
following the latest trends in automotive lightning and LED technology;

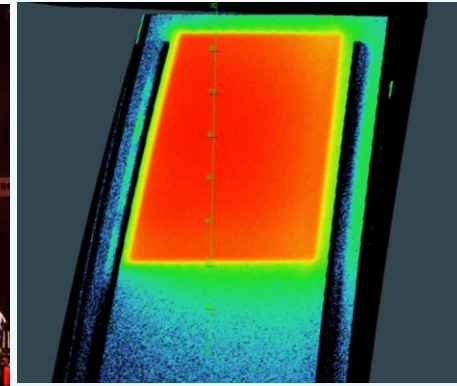
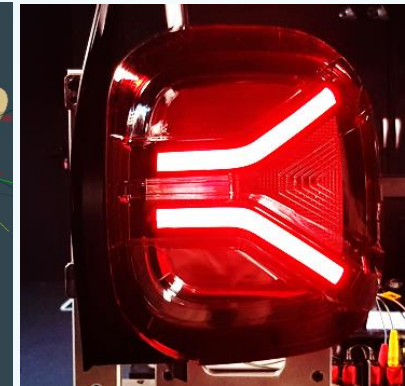
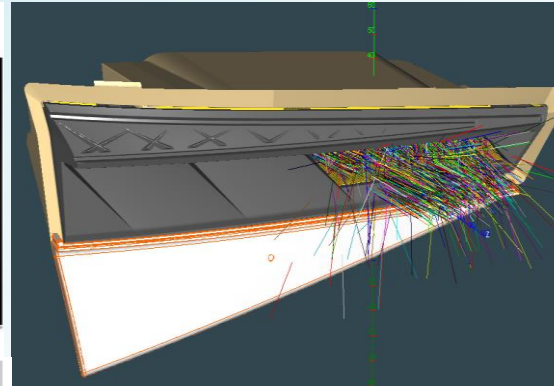
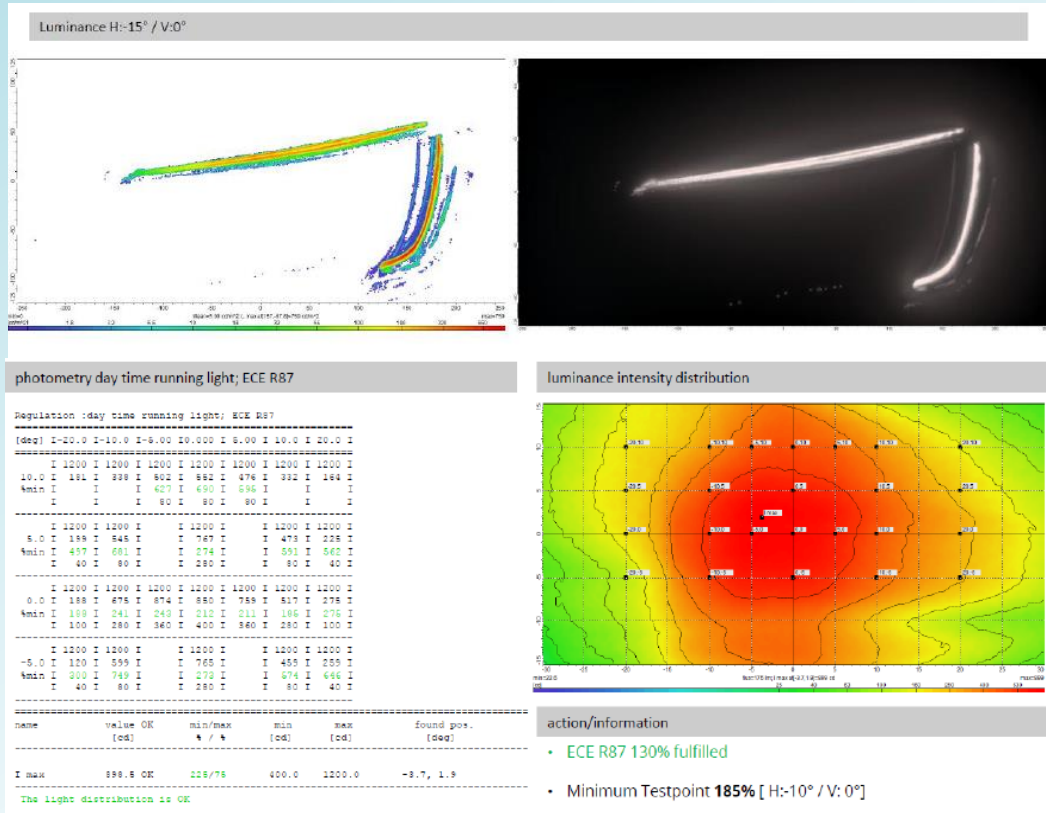
standalone or incorporated modules for different functions,
for headlights: daytime running DRL, Position, turn indicator TI, Fog, High Beam, Low Beam;
for rear-lamps: Stop, Position, turn indicator TI, Rear Fog, Reverse, retroreflector; CHMSL



Headlamps Optic design and street simulation

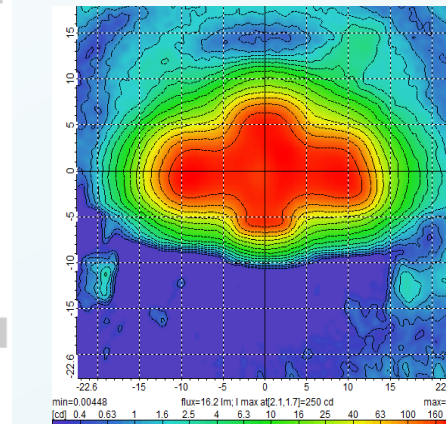
Rear Lamps Optic design full LED, realistic lit appearance, renderings and colorimetry analysis

Optical Design construction and simulation



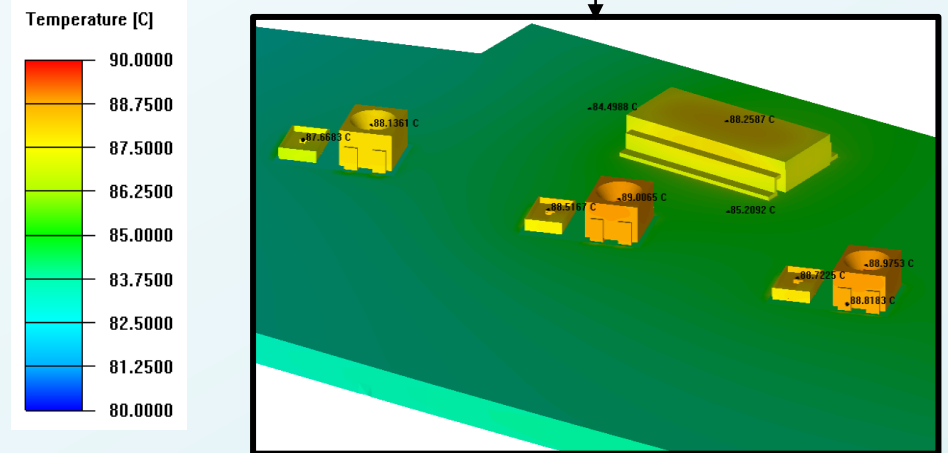
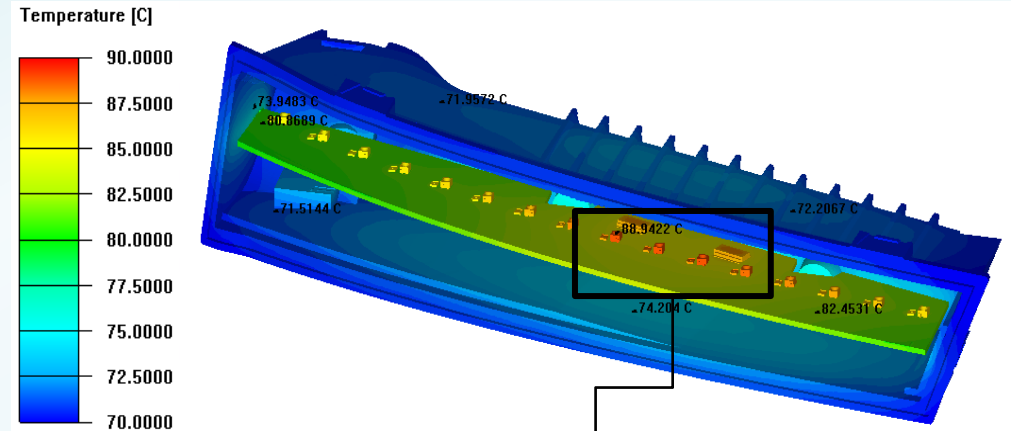
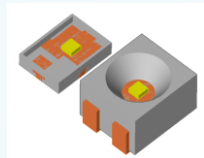
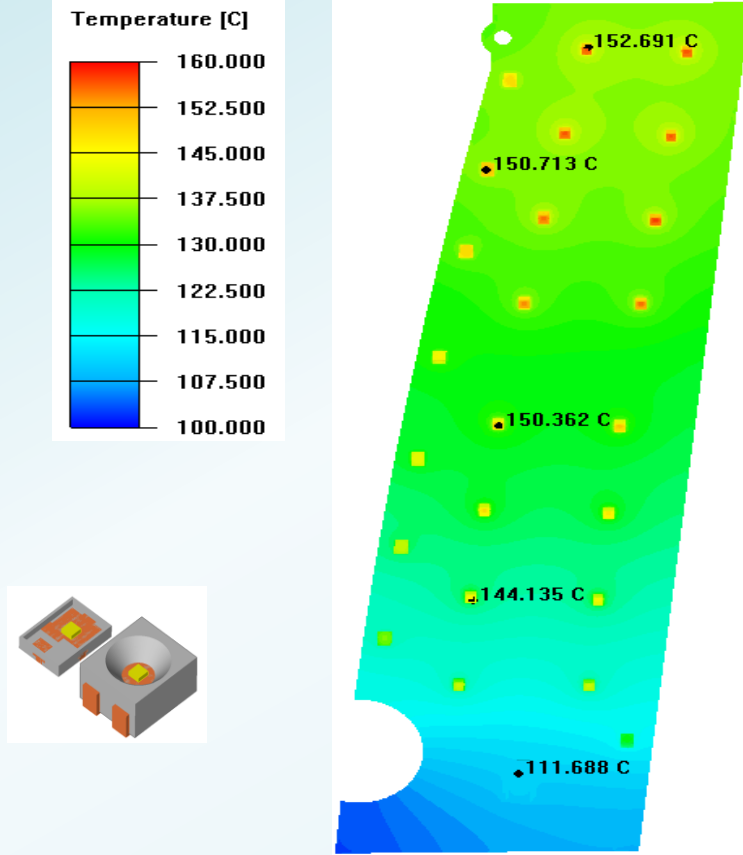
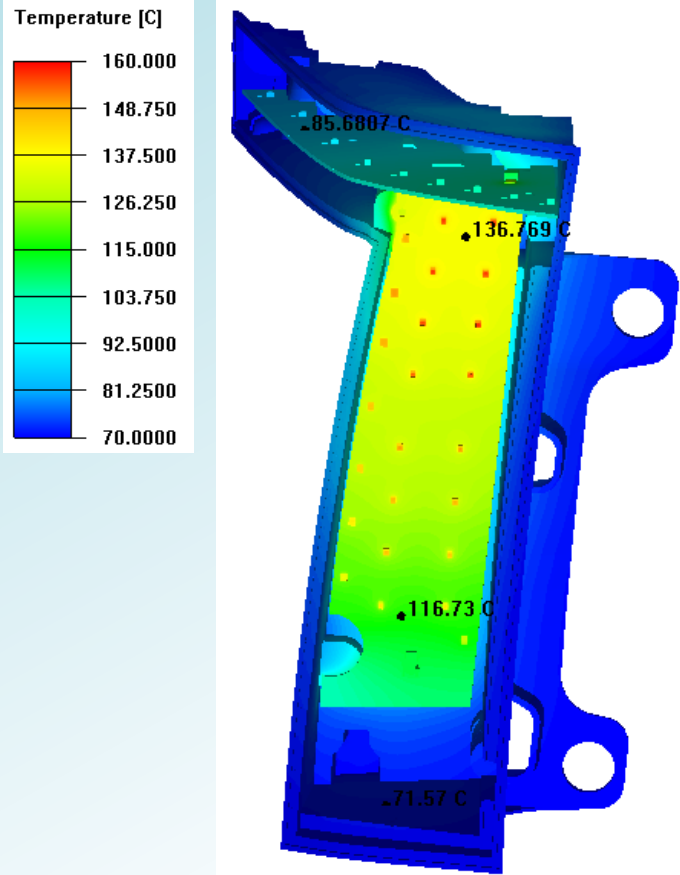
Luminance & Camera luminance analysis

Ray tracing, light leakage & optical problems analysis

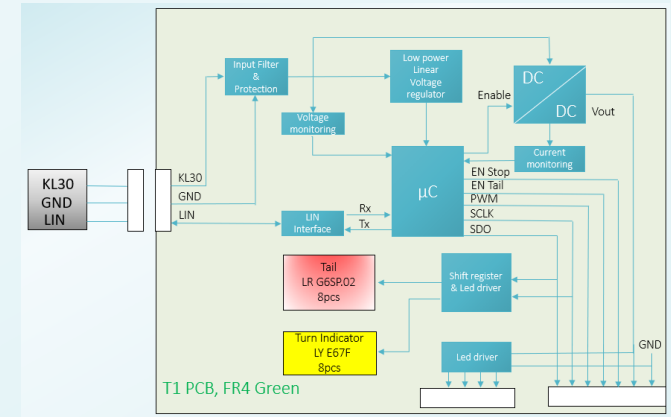
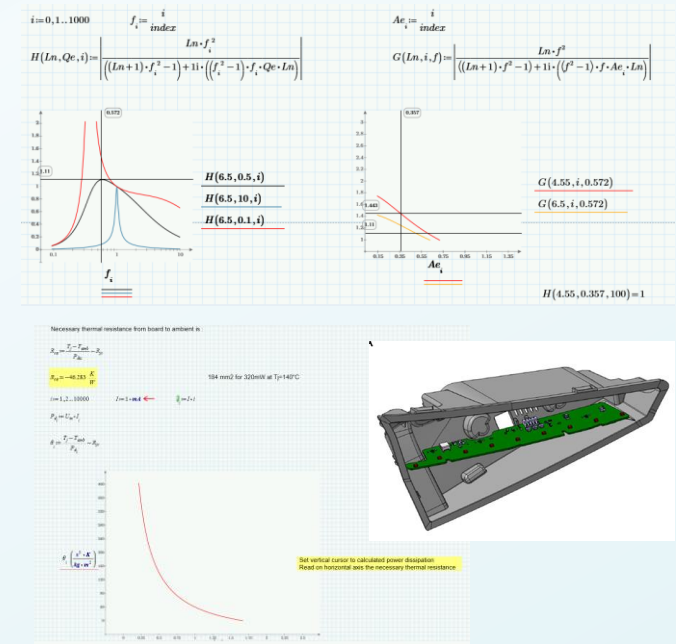
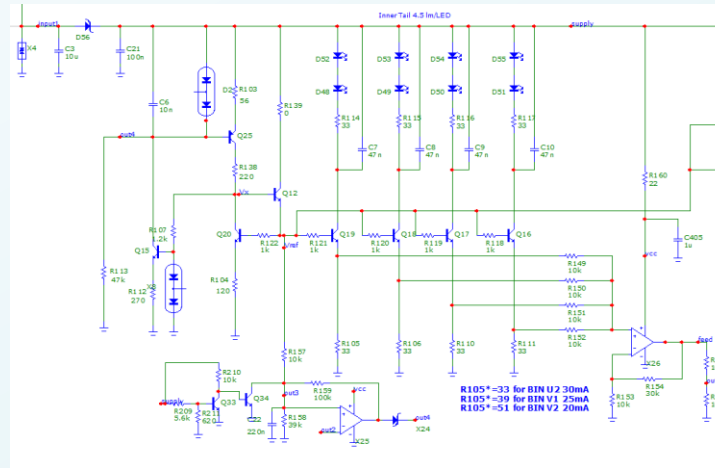
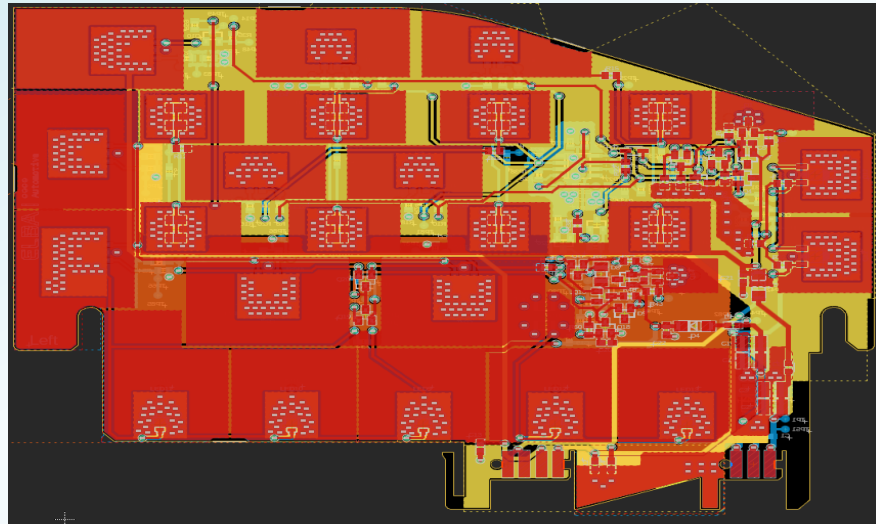
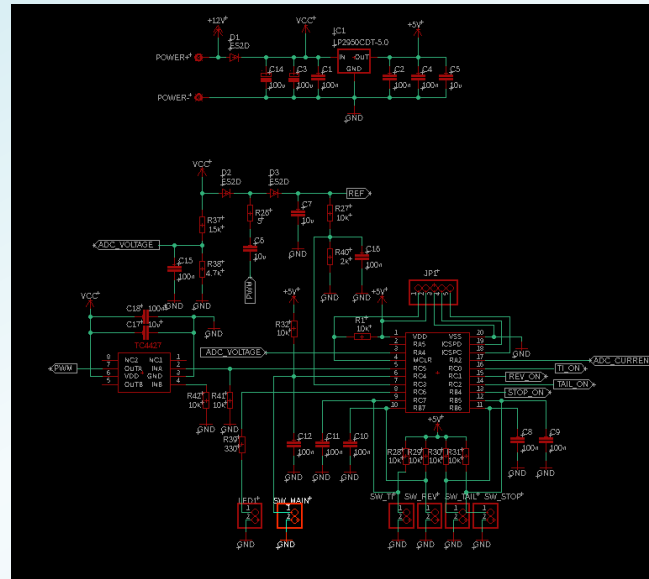
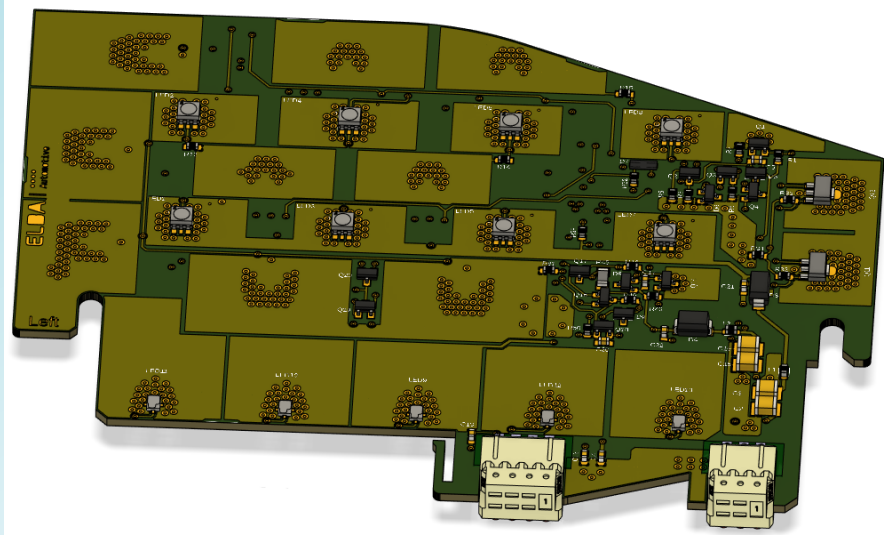


Optical design, simulation & rendering with Lucid Shape optical software, 3D design and verification of optical systems - with attention to customer styling and car body data
 Verification of compliance with various legal regulations: example ECE, etc.

Thermal Simulations

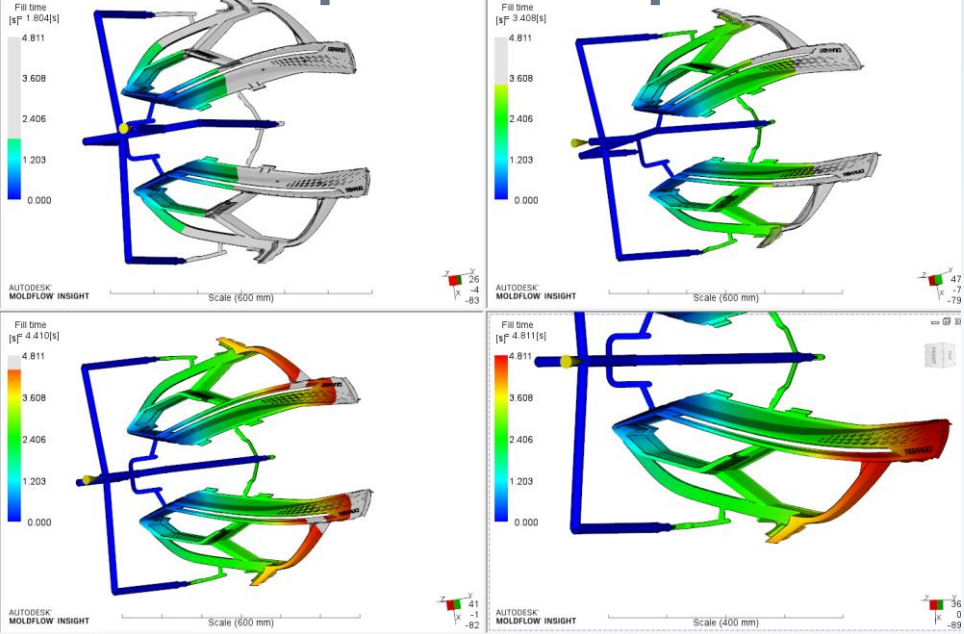


Hardware electronic

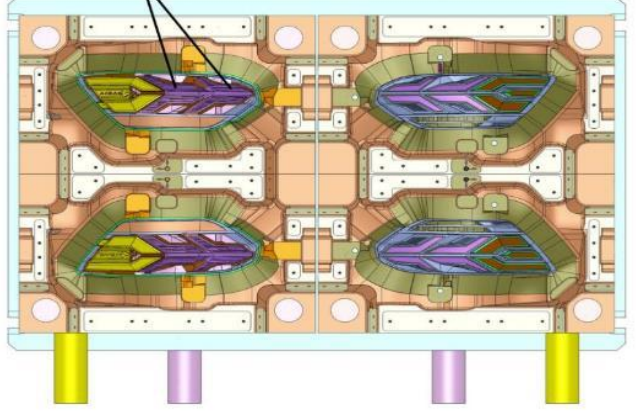
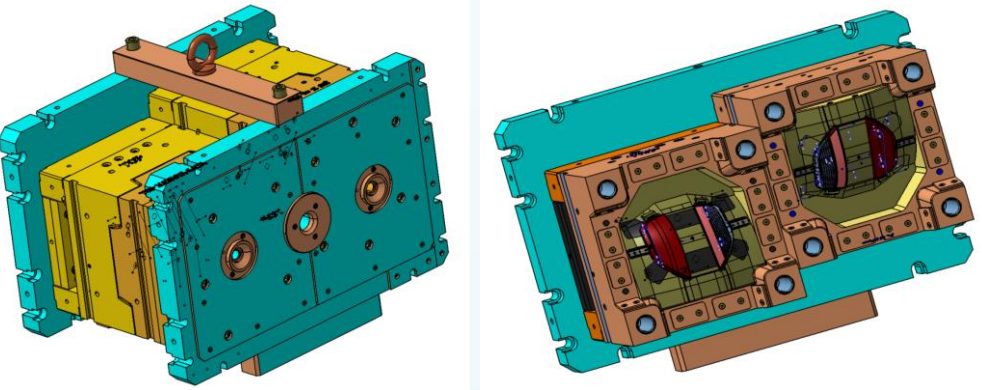
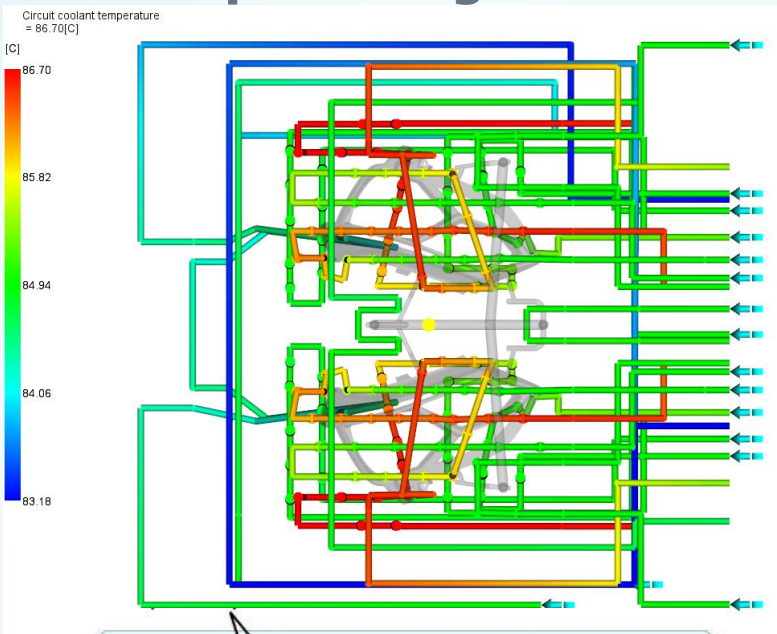


Mould flow Simulations

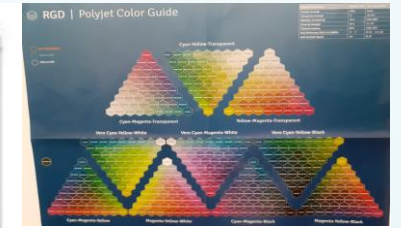
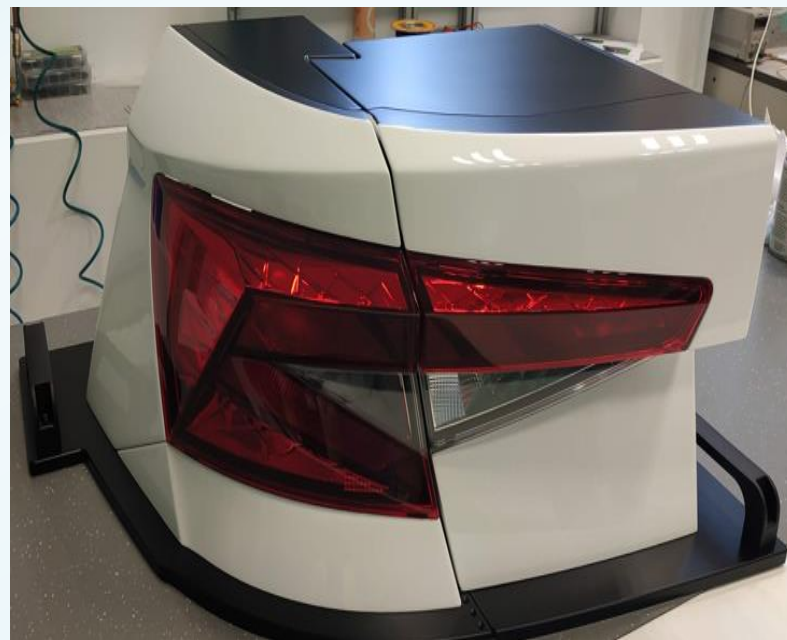
Step 1 first concept



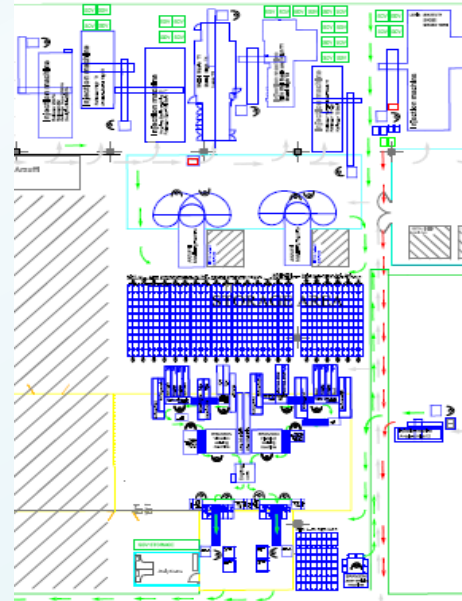
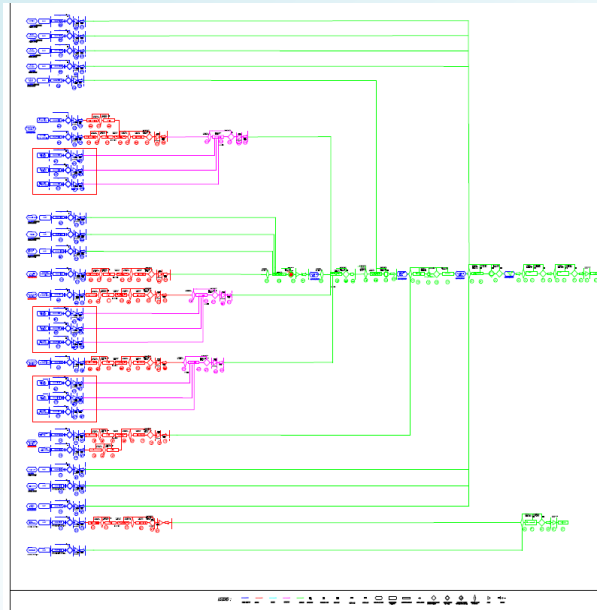
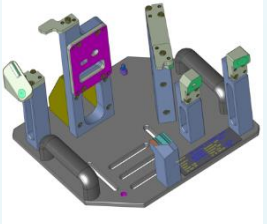
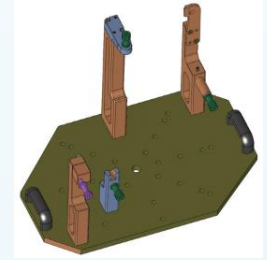
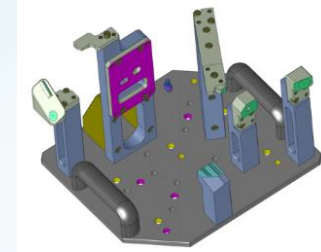
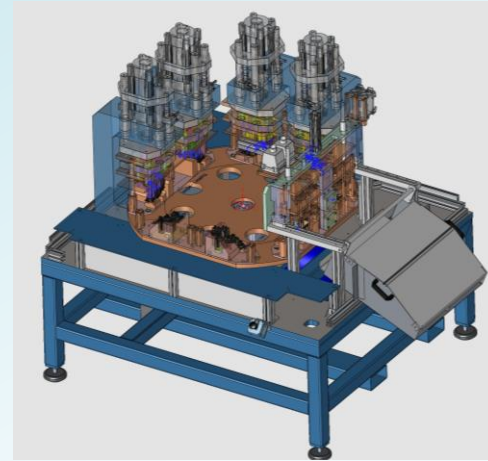
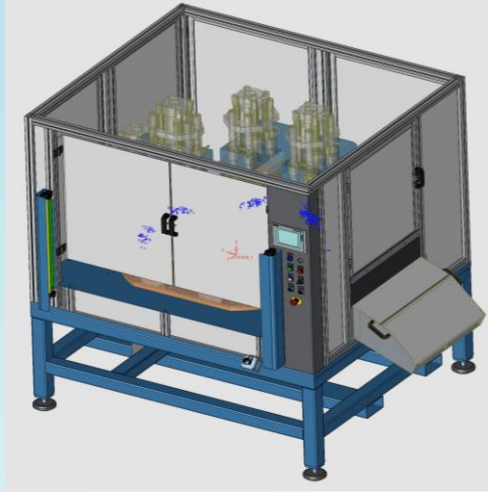
Step 2 cooling circuit



Prototype and Mock up – Elba & Partners



Process design & industrialization



Product Analysis - Elba Technical Level for Rear Lamps

Elba Capabilities for RL Developments and Market Development Trends



Legend:

- Concept in series production
- Technology available to be develop in ELBA
- Concept in early stage of analysis* - target 2025 as prototype concept



RL 3D product Design & Rendering



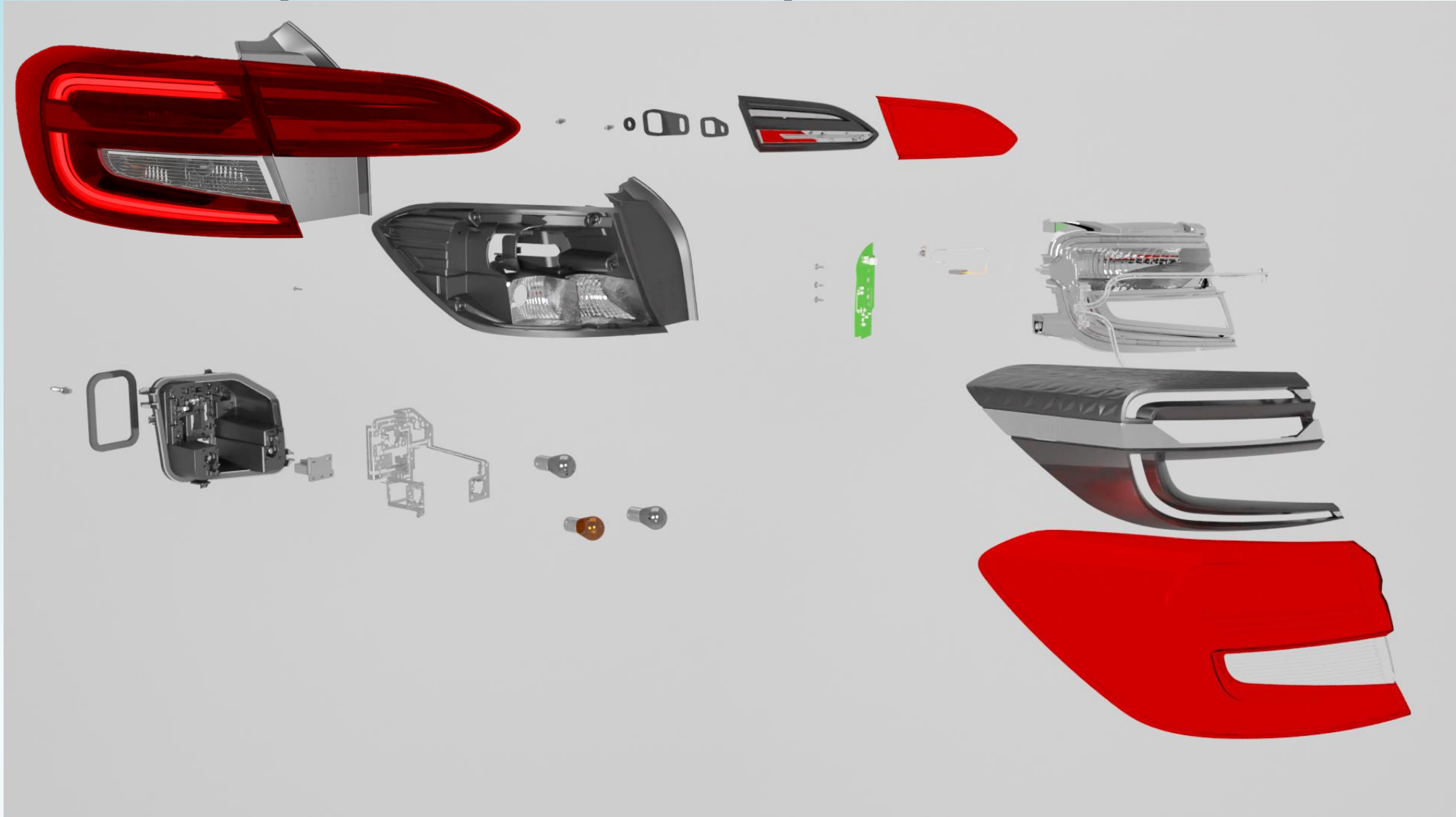
Rear lamps - examples of latest products from our manufacturing program:



Rear lamp Skoda Fabia – Exploded view



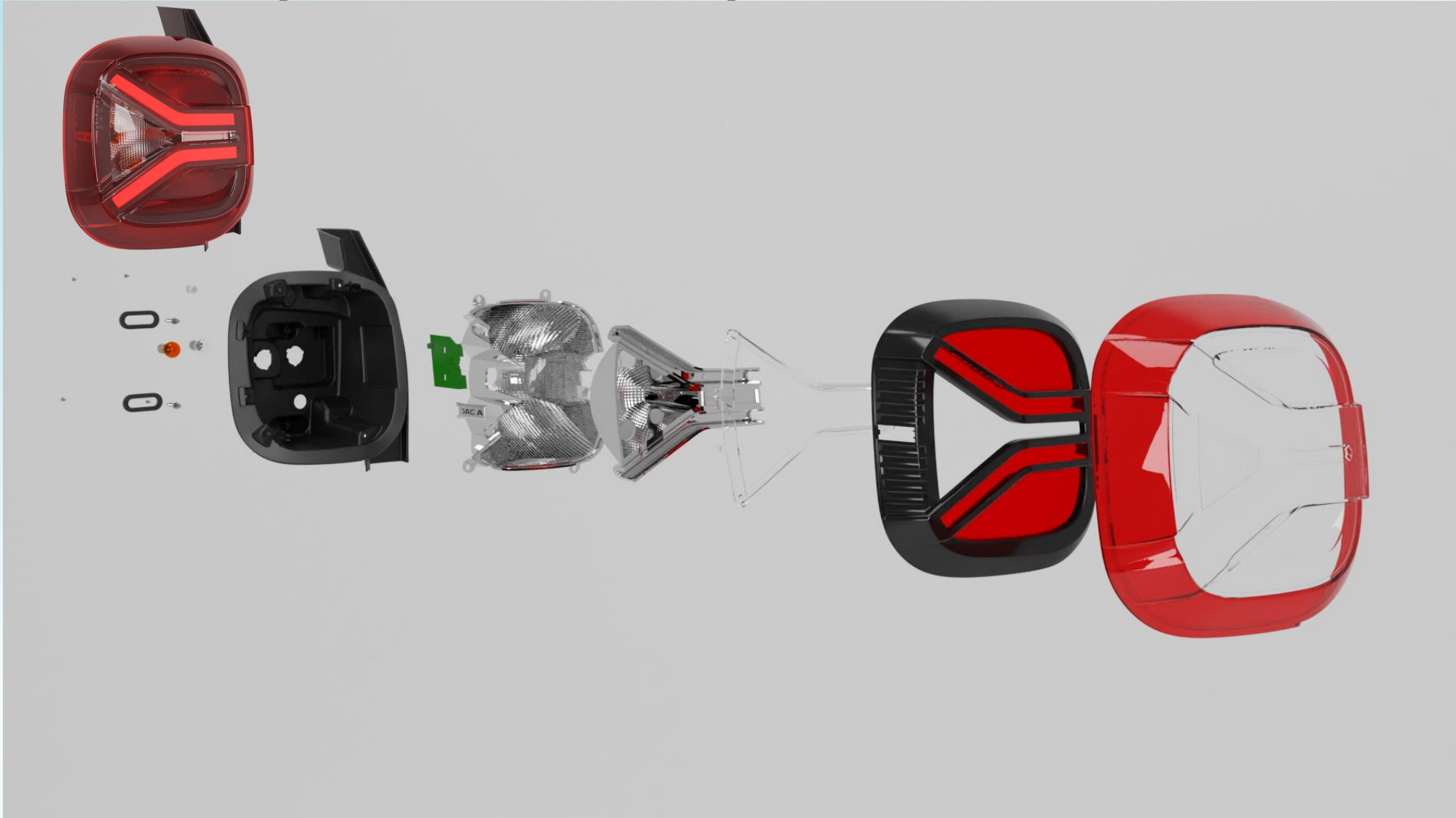
Rear lamp Renault Taliant – Exploded view



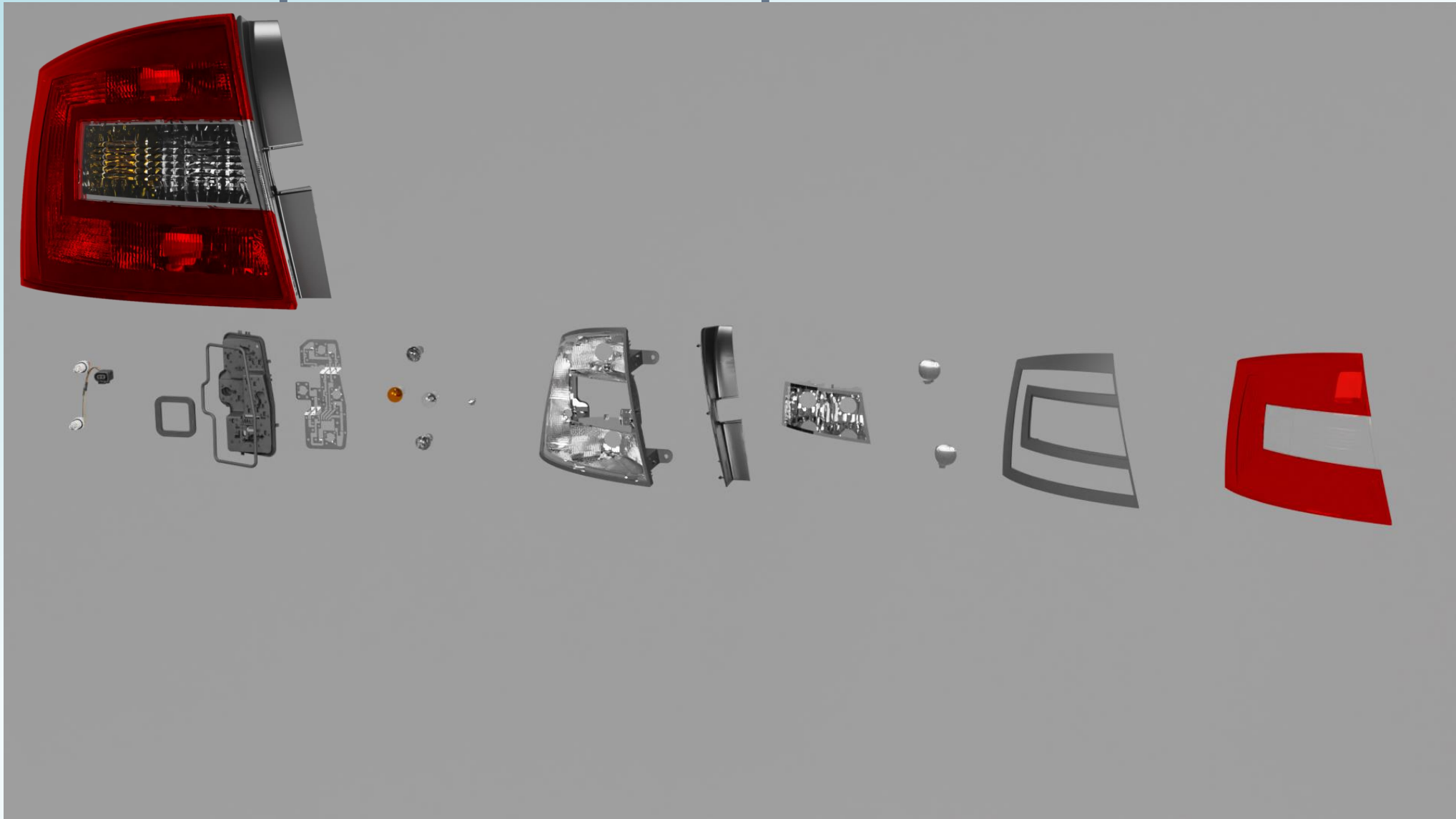
Rear lamp Dacia Sandero – Exploded view



Rear lamp Dacia Duster – Exploded view



Rear lamp Skoda Octavia – Exploded view



Product Analysis - Elba Technical Level for HL

Elba Capabilities for HL Developments and Market Development Trends



Legend:

- Concept in series production
- Technology available to be develop in ELBA
- Concept in stage of analysis* - target 2025 as prototype concept
- Concept in early stage of analysis* - target 2026 as prototype concept



HL 3D product Design & Rendering



Headlamps - examples of latest products from our manufacturing program:



Renault Taliant



Dacia Logan



Ford – VW Alliance



Ford Tourneo Connect



VW Caddy

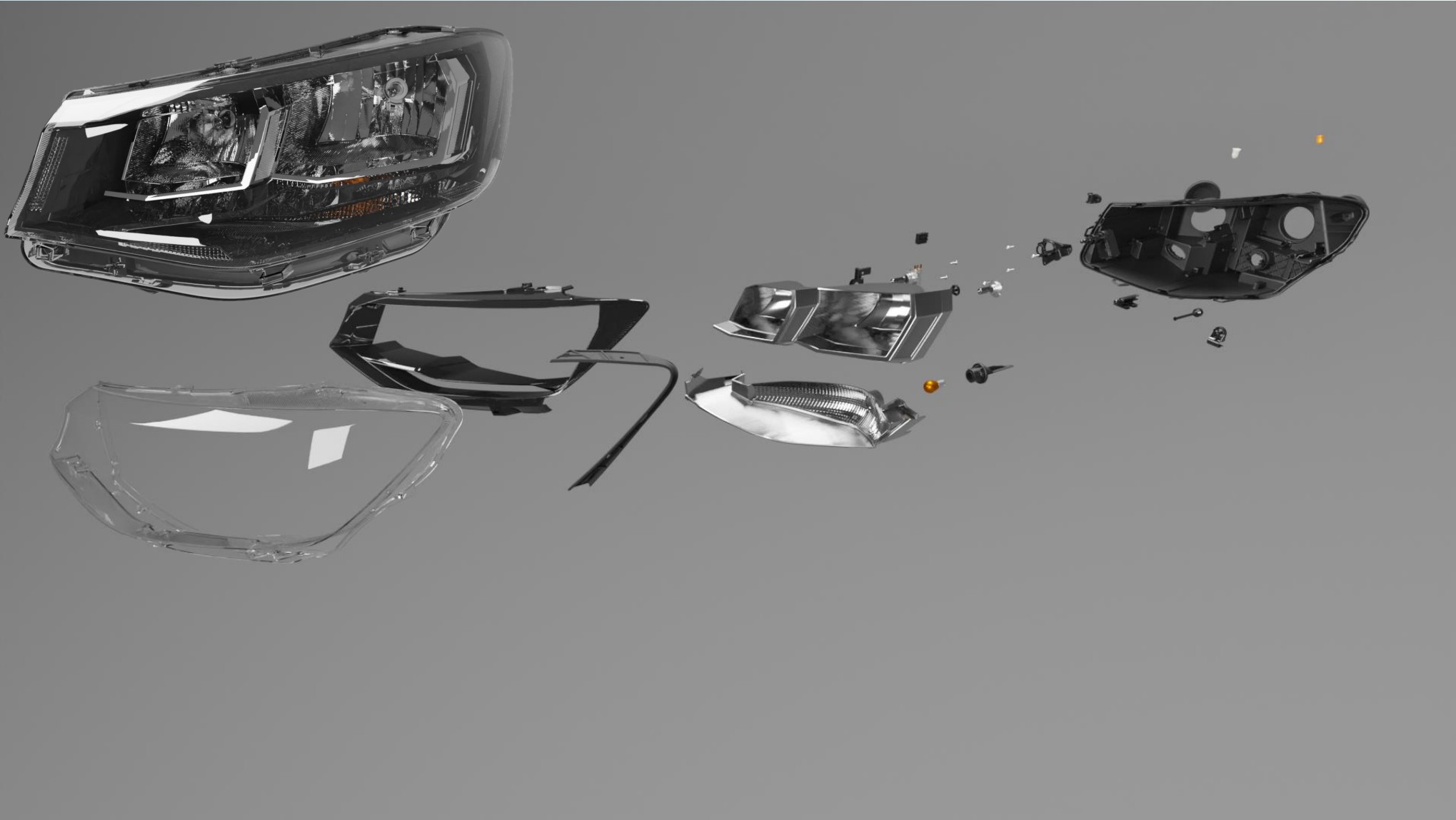
Head Lamp Dacia Logan – Exploded view



Head Lamp Renault Taliant – Exploded view



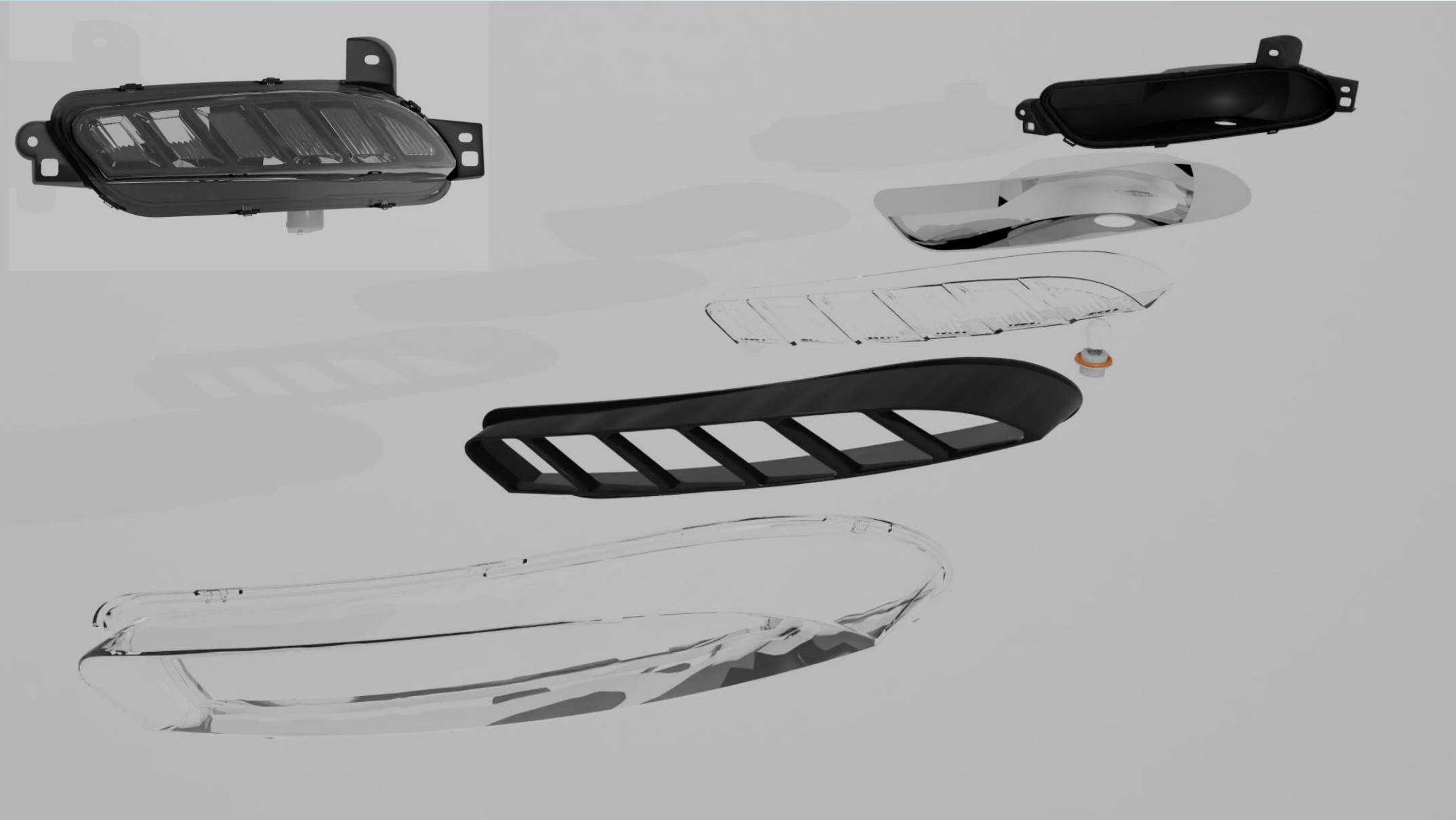
Head Lamp CADDY-5 HL– Exploded view



Head Lamp Ford Tourneo Connect – Exploded view



Front Turn Indicator Renault Espace— Exploded view



4

Small lamps - examples of latest products from our manufacturing program:



Dacia Logan



Dacia Duster



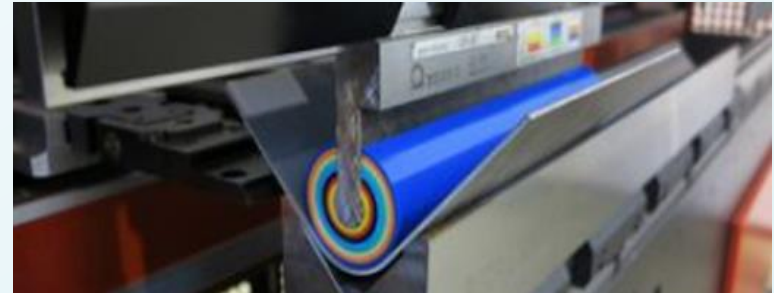
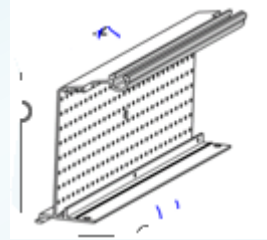
Dacia Duster



Painting in different processes



Small metallic part & process



5 Status and intention in 2024

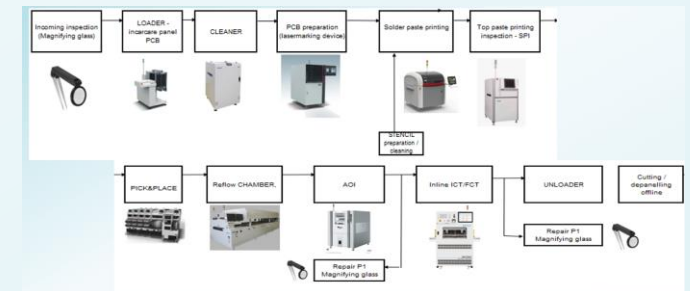
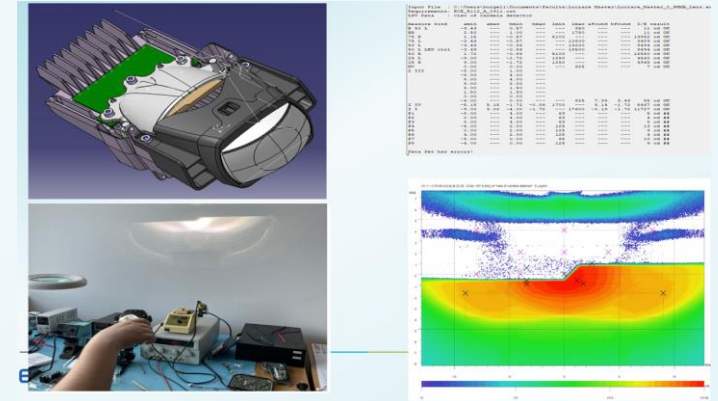
Prototype RL - new functions concept

Dynamic turn indicator in traffic “leaving home” and “coming home”
Concept done – Prototype done

Optical module for LB
concept & prototype –done
Improve the concept – on going

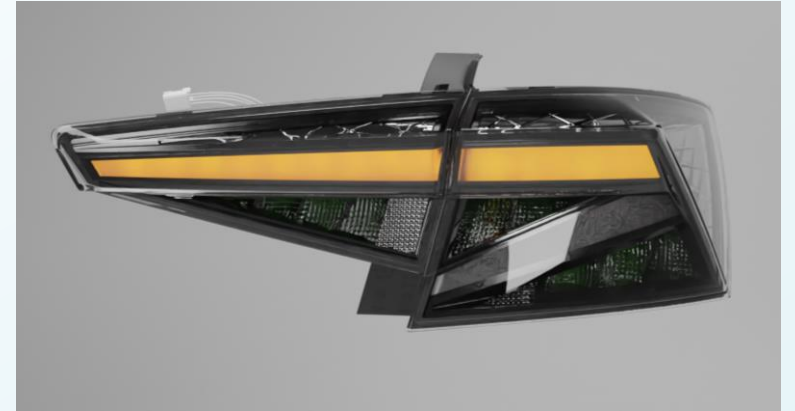
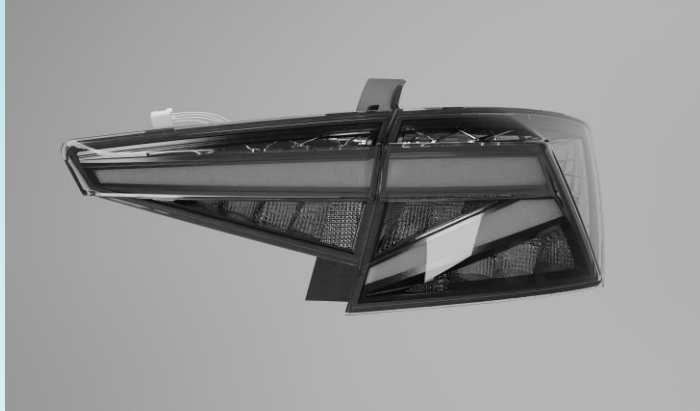
Quote the Automotive PCBA manufacture in Elba
Investment & planning analyze for line update - done
Start to simulate the new RFQ with PCBA in Elba - done

Study new concepts –Dynamic Animation & Soft – OLED – Matrix - Multibeam
Study new process technology – over moulding – antifog – full assembly line/ palletization



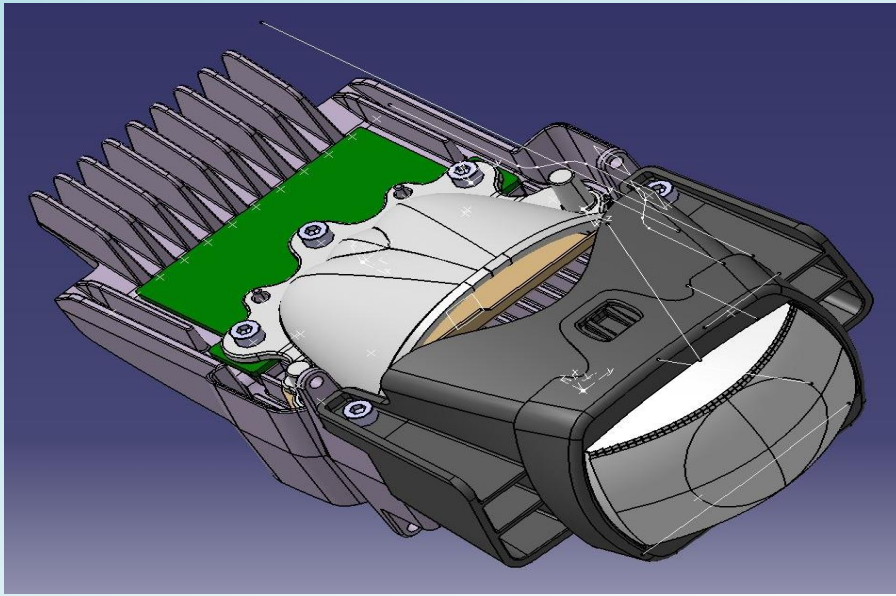
Prototype RL - new functions concept

Dynamic turn indicator in traffic



leaving home” and “coming home”

Optical module for LB - learning concept & prototype

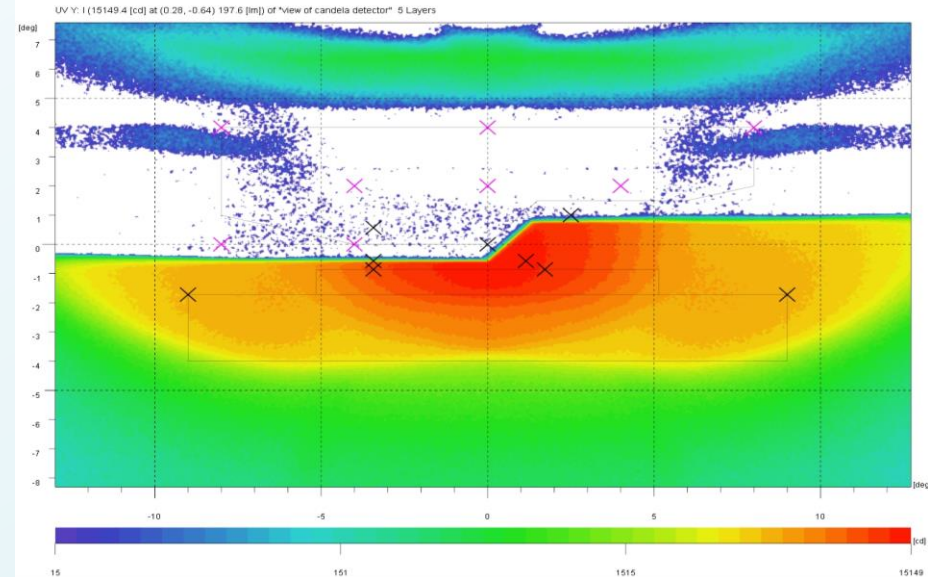


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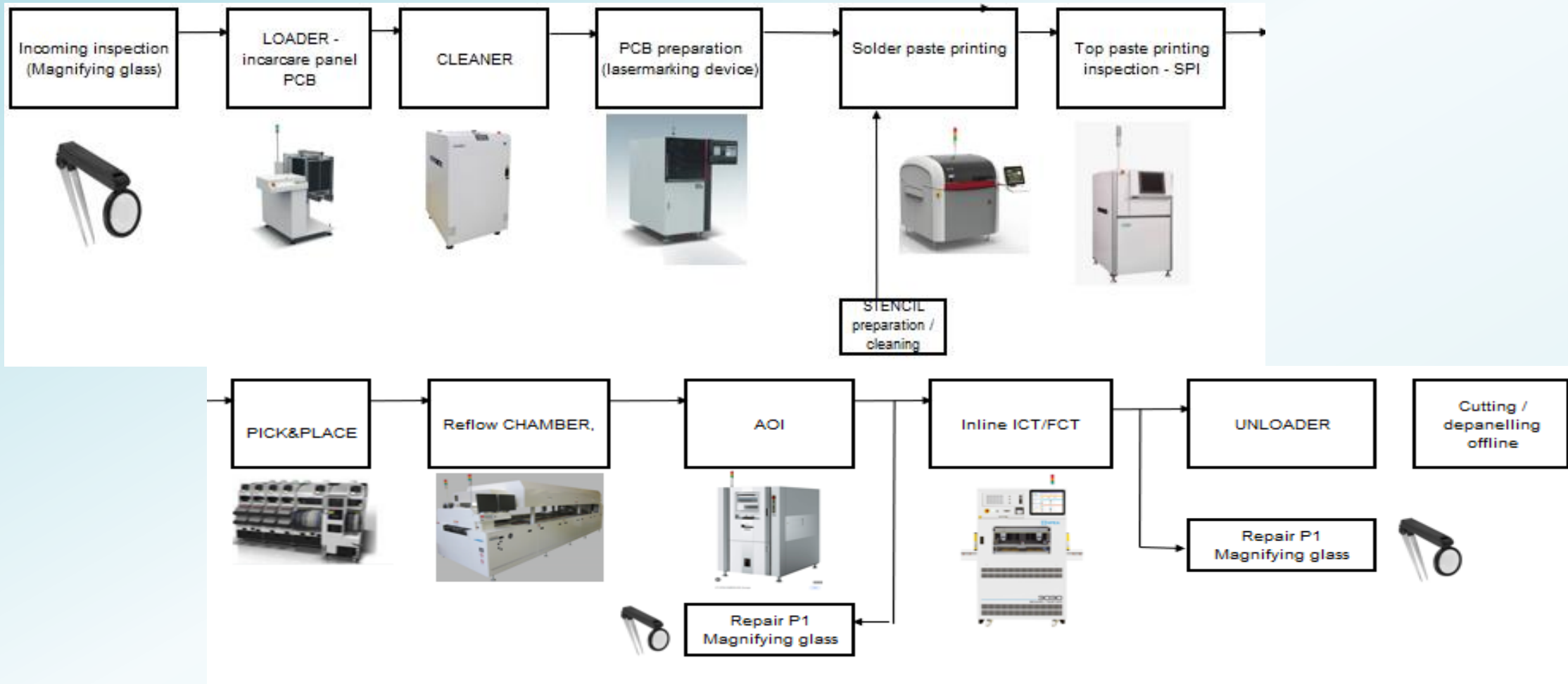
Input File : C:\Users\burgell\Documents\Faculta\Lucrare Master\Lucrare_Master_2_PMDA_Lens.exp
Requirements: ECE_R112_A_0311.cst
LSV Data : view of Candela detector
    
```

measure kind	amin	amax	bmin	bmax	lmin	lmax	afound	bfound	I/E	result
B 50 L	-3.43	---	0.57	---	---	350	---	---	11	cd OK
BR	2.50	---	1.00	---	---	1750	---	---	11	cd OK
75 R	1.15	---	-0.57	---	5100	---	---	---	13952	cd OK
75 L	-3.43	---	-0.57	---	---	10500	---	---	3489	cd OK
50 L	-3.43	---	-0.86	---	---	13200	---	---	9494	cd OK
50 L LED ctrl	-3.43	---	-0.86	---	---	18500	---	---	9494	cd OK
50 R	1.72	---	-0.86	---	5100	---	---	---	12550	cd OK
25 L	-9.00	---	-1.72	---	1250	---	---	---	4560	cd OK
25 R	9.00	---	-1.72	---	1250	---	---	---	4945	cd OK
HV	0.00	---	0.00	---	---	625	---	---	7	cd OK
Z III	-8.00	---	1.00	---	---	---	---	---	---	---
	-8.00	---	4.00	---	---	---	---	---	---	---
	8.00	---	4.00	---	---	---	---	---	---	---
	8.00	---	2.00	---	---	---	---	---	---	---
	6.00	---	1.50	---	---	---	---	---	---	---
	1.50	---	1.50	---	---	---	---	---	---	---
	0.00	---	0.00	---	---	---	---	---	---	---
	-4.00	---	0.00	---	---	625	7.99	3.46	55	cd OK
Z IV	-5.15	5.15	-1.72	-0.86	1700	---	5.14	-1.72	5467	cd OK
Z I	-9.00	9.00	-4.00	-1.72	---	17600	-0.19	-1.72	11727	cd OK
P1	-8.00	---	4.00	---	63	---	---	---	5	cd ##
P2	0.00	---	4.00	---	63	---	---	---	4	cd ##
P3	8.00	---	4.00	---	63	---	---	---	8	cd ##
P4	-4.00	---	2.00	---	125	---	---	---	13	cd ##
P5	0.00	---	2.00	---	125	---	---	---	3	cd ##
P6	4.00	---	2.00	---	125	---	---	---	4	cd ##
P7	-8.00	---	0.00	---	65	---	---	---	10	cd ##
P8	-4.00	---	0.00	---	125	---	---	---	9	cd ##

Data Set has errors!



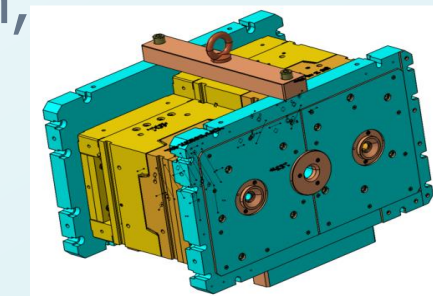
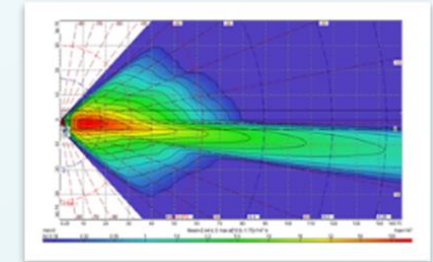
Process design PCBA with LED's for automotive lighting products.



Part of SMT line exist for Industrial PCBA , we are in phase to analyze the possibility to make the extension also for PCBA Automotive.

Possible perspectives B2B between customer and ELBA

- **Developing** products for **automotive** and/or non-automotive
- **Production** of parts: components and/or **finished products**
- **Development** and **production** of **moulds** and **devices/jigs** for diverse applications
- **Taking over** **existing projects** for implementation in ELBA (**design** and/or **industrialization** and/or **production**)
- **On going study** to extend production/or delivery in another location, for example **foot print in Morocco and and in another zone.**





Thank you!