



# LED Integration Solutions for Precision Optics Alignment and Heat Management

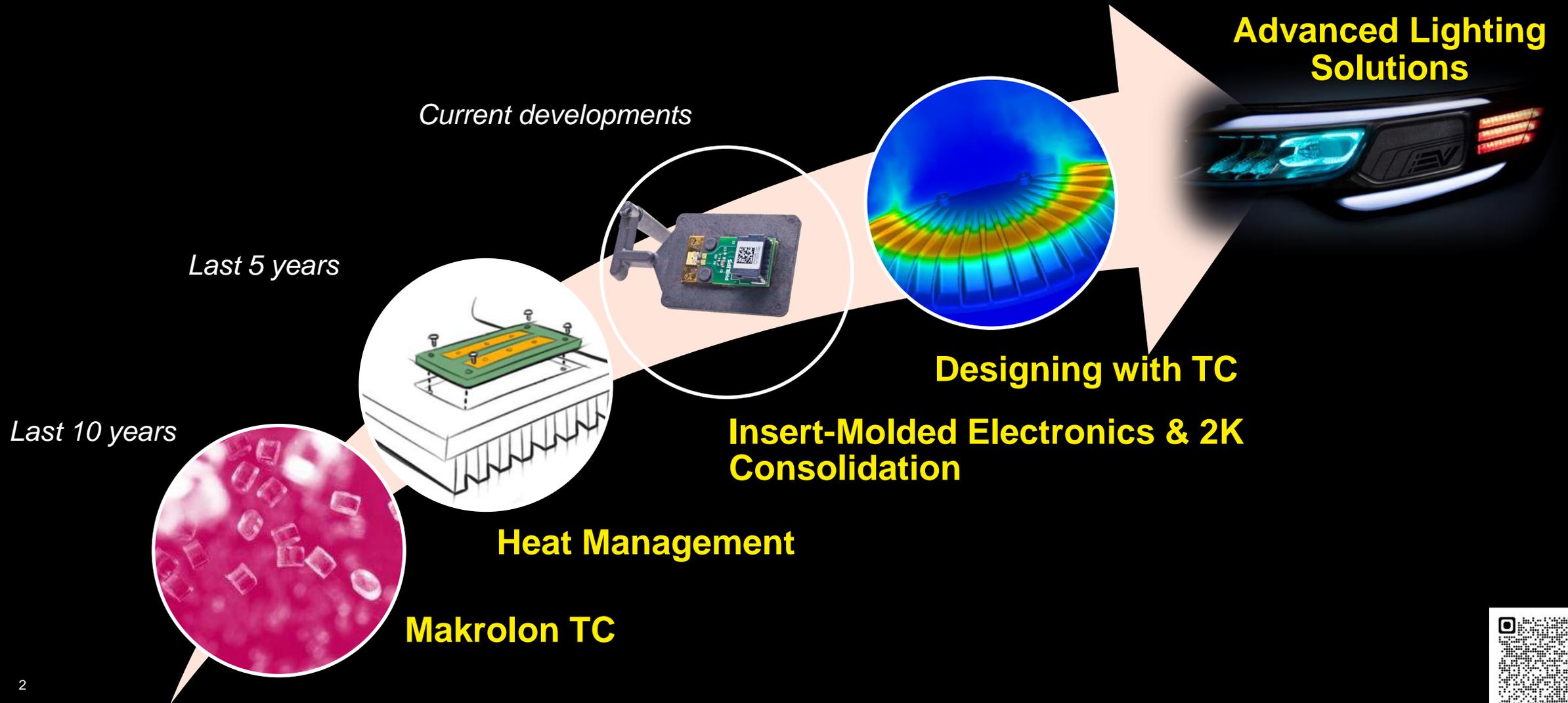
POLYCARBONATE SOLUTIONS FROM COVESTRO

For the entire presentation,  
please contact Covestro  
experts on the last slide



# Our Journey

From Advanced Materials to Innovative Solutions

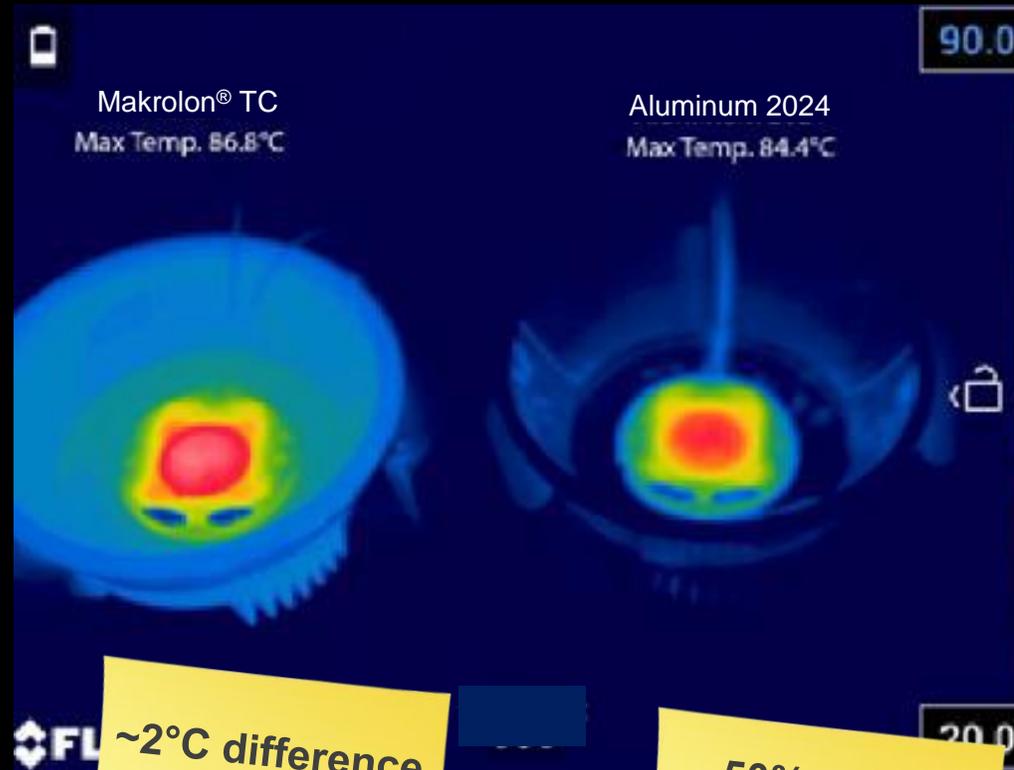


# Case Study | 1

## Heat Management: Reflective heat-sink for consolidated automotive LED lamps



Makrolon® TC  
14 W/mK



Aluminum 2024  
~130 W/mK



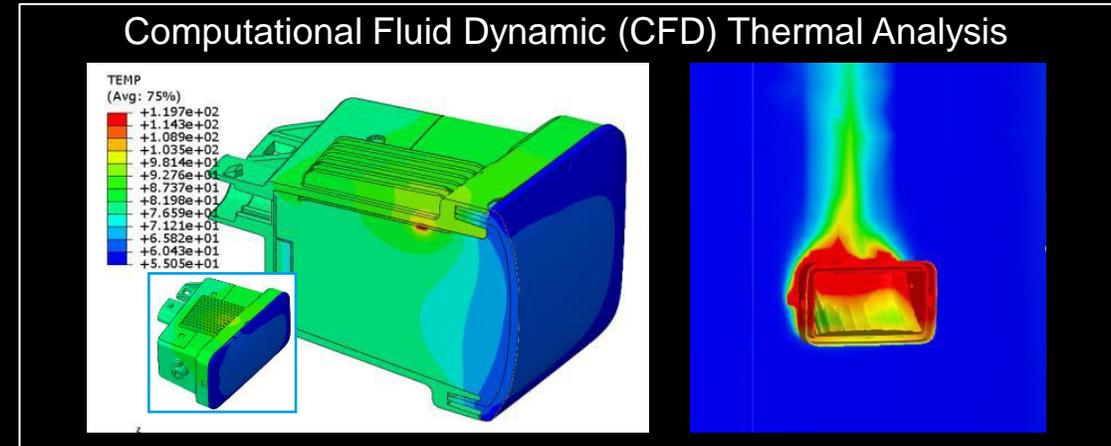
# Case Study

## Heat Management: LED Fog Lamp Housing | Light Truck (in-production)



### Makrolon® TC advantages over aluminum:

- Good thermal management of 9 W LED
- 46% weight-savings
- 20% cost reduction
- 30 lumen increase
- Vibration durability
- Mono-material solution

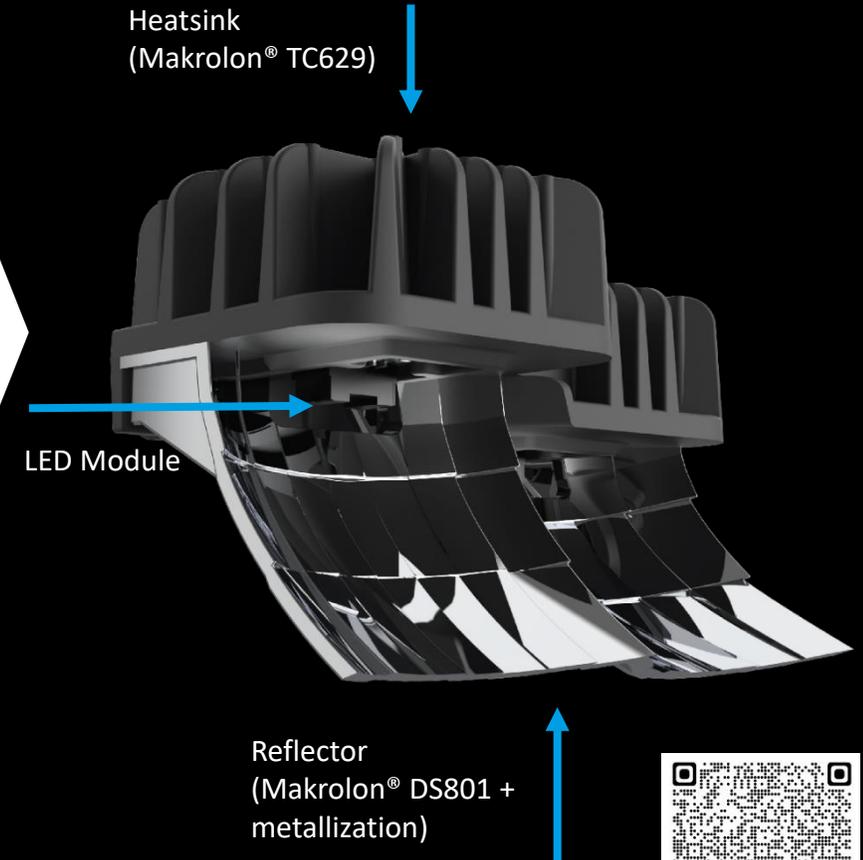


# Part and Process Development

Competence beyond material development



Part Design	Optics Design	
	Filling Simulation	
	Thermal Simulation	
Process KnowHow		



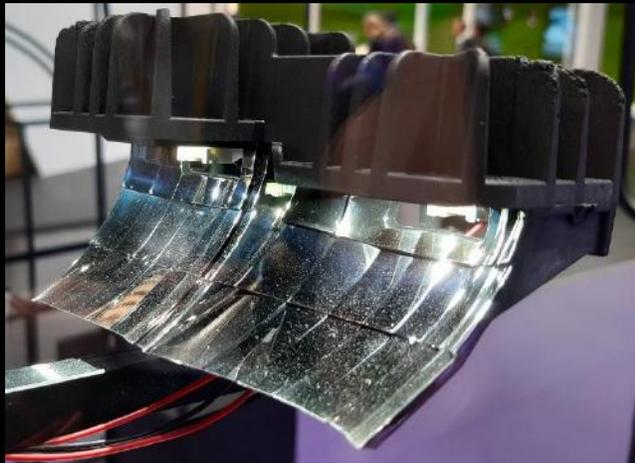
# Concept Achievements



Fully integrated production process with in-mold optical alignment



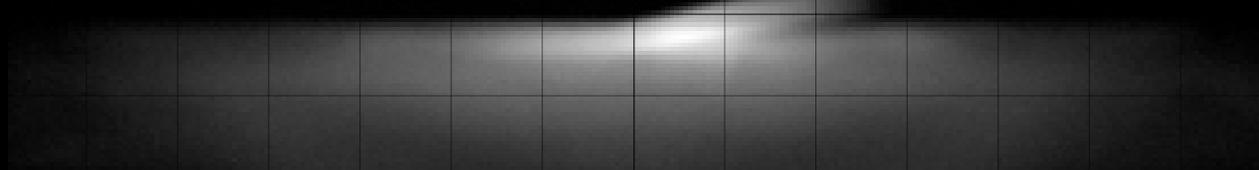
- **Ultra slim design + “Built-In“ heat management**
- **Stable photometrics in small complex optics**
- **20%\* cost reduction**
- **40% weight savings**
- **Part consolidation**



Measured beam



Simulated beam



\* cost comparison by intellcosting

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