

# EPIC Online Technology Meeting on Moulded Optics

automotive lighting insights

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# What are the usage ?

Headlamp

Rearlamp

Interior lighting

✦ A long success story with Car Manufacturers & Tier 1's



Extract from Arkema presentation

# What are the stakes ?

Signaling functions

Lighting functions



*XC90 Thors's Hammer*

V O L V O

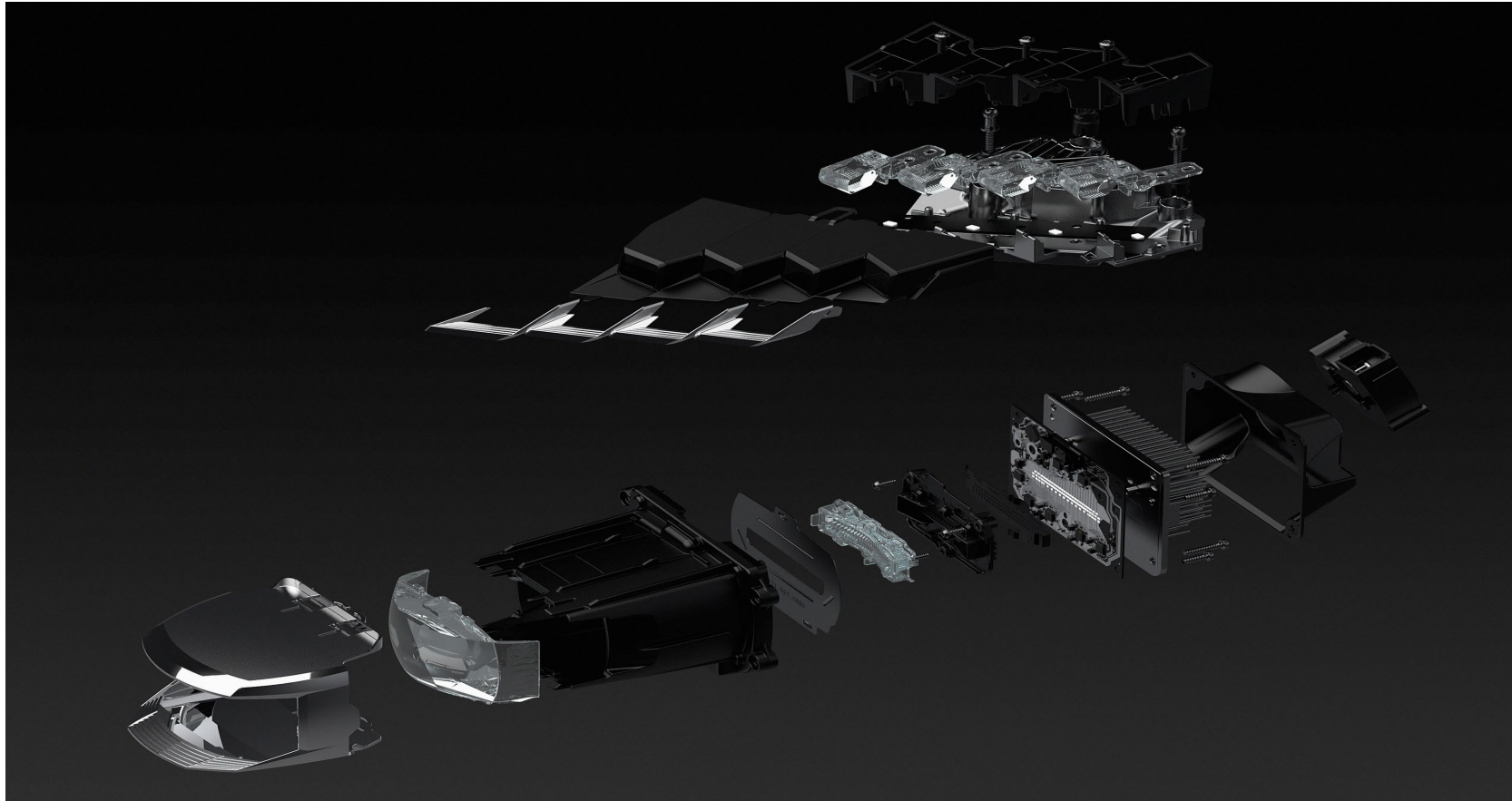
What are the slakes ?

*Polestar 2*



# What are the slakes ?

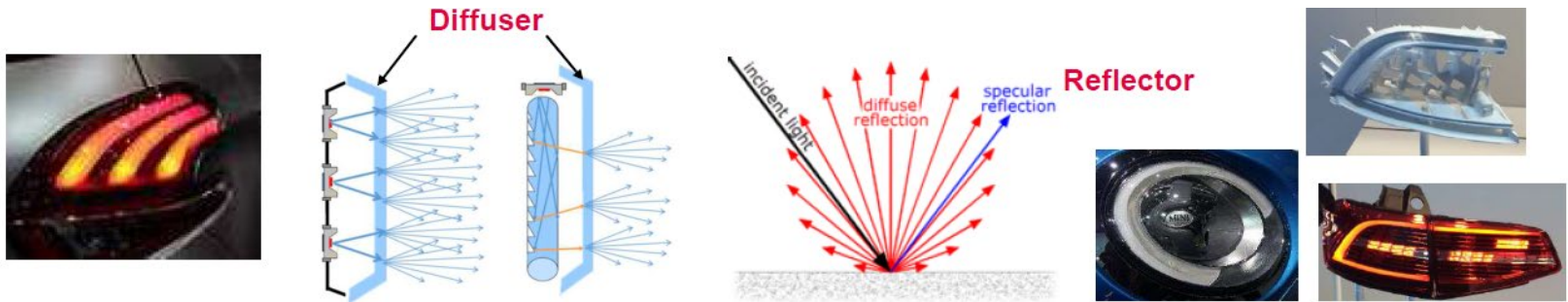
*Polestar 2, headlamp exploded view*



# Optical properties

Diffuser or Reflector technology :

- Transmittance
- Reflectivity
- Diffusive material with high optical efficiency
- No color shift when long plastic part ( $> 500$  mm)



*Extract from Arkema presentation*

# Example of DRL power consumption



**Bulb**

50 W / car

**LED reflector**

10-20 W / car  
Optical efficiency ~ 50%

**LED light guide / multi screen**

30W – 60W / car  
Optical efficiency ~ 10%

# Example of Low beam power consumption



Height 100mm – light source ~ 1500 lm



Height 50 - 70mm  
light source ~ 1000 -1500lm  
Renault Captur 2020



Height 20mm – 40mm  
light source ~ 2000 -3000 lm  
Volvo S90

Bulb	LED system - Entry	LED system – Premium
137 W / car	20-40 W / car Optical efficiency ~ 40 -50%	60W – 120W / car Optical efficiency ~ 20-30%



# What are the stakes for OEM

Power consumption : state of the art figures :

50W = 1gCO<sub>2</sub> in WLTP homologation for I(nternal) C(ombustion) E(nGINE)

50W = 1% of the range for B(attery) E(lectrical) C(ar)

Lumen output / watt or Cd output /watt

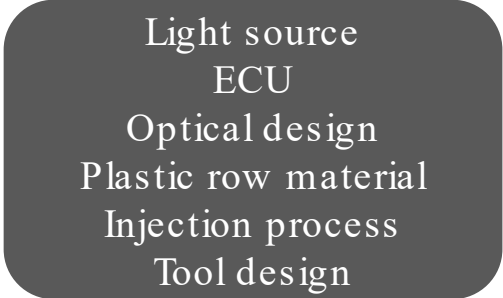
State of the art :

Lighting : between 20% to 50%

Signaling : around 10%

What we need :

- to develop more efficient solution : less watt for the same amount of lumen
- To multiply by 2 the efficiency



Light source  
ECU  
Optical design  
Plastic row material  
Injection process  
Tool design