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Chrome-Film Meets Light: Challenges and Solutions in the Illuminated Frontpanel

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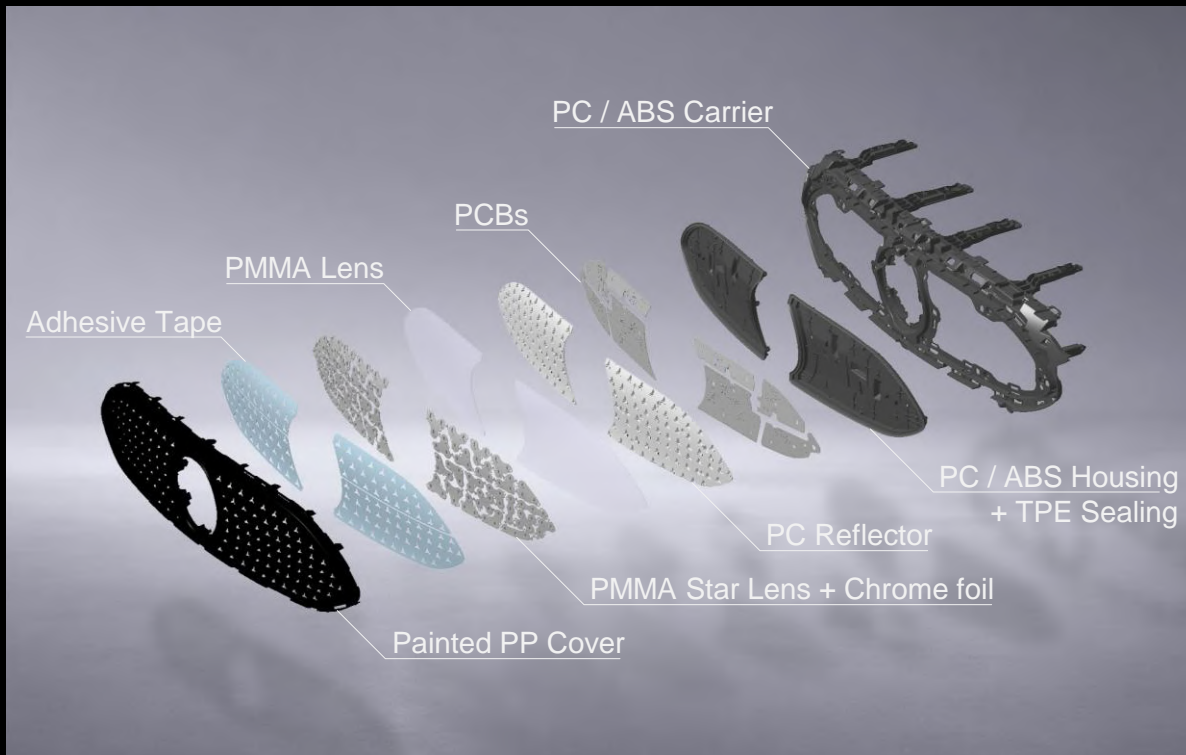


Lighting up your Brand

The impact of illuminated elements

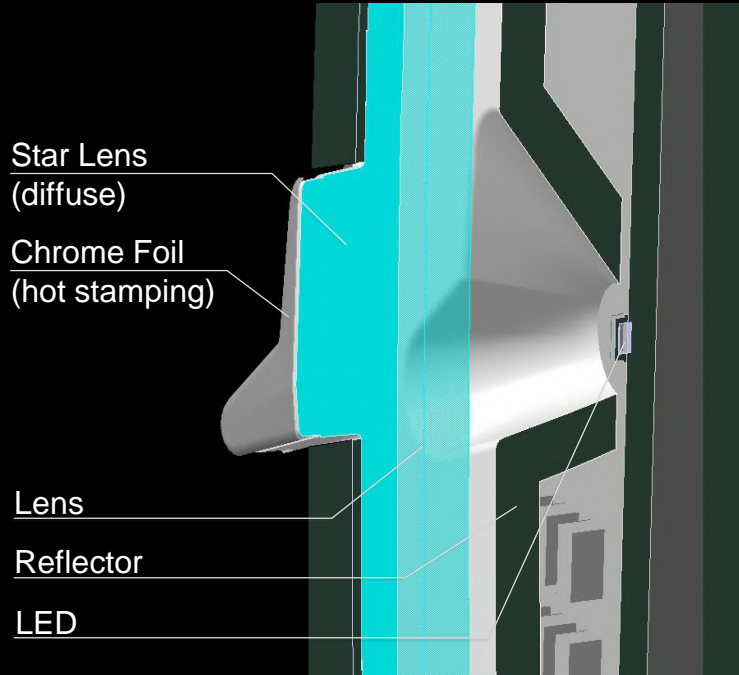


- Premium exterior element with integrated animated lighting
- Distinctive brand signature in both day and night conditions
- Light-transmitting foil delivering a chrome off-state and uniform illuminated on-state



**A seamless blend
of lighting
performance and
decorative
elegance.**

Details of the optical system



Light Off
Chrome visible

Light On

Challenges

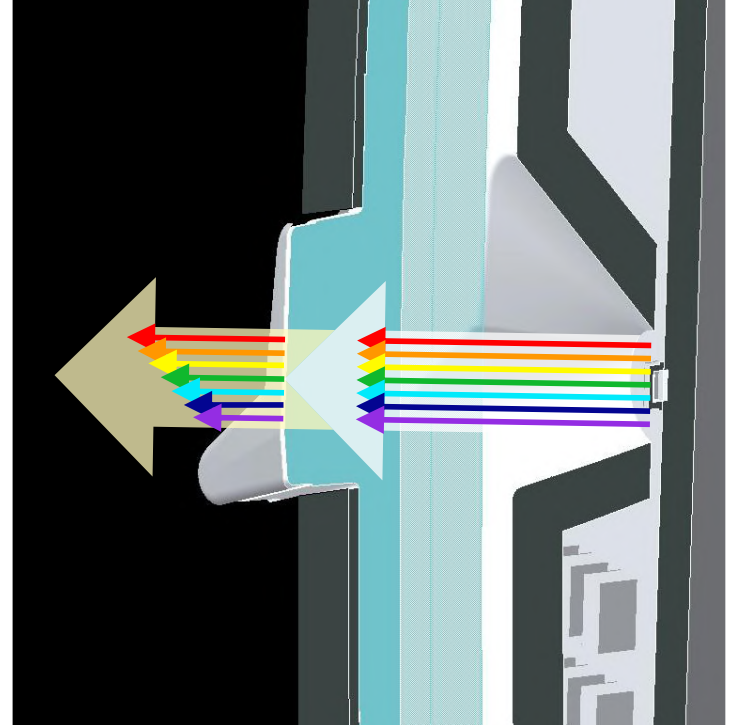
Chrome Foil Optical Impact

Color Shift ($\Delta x / \Delta y$)

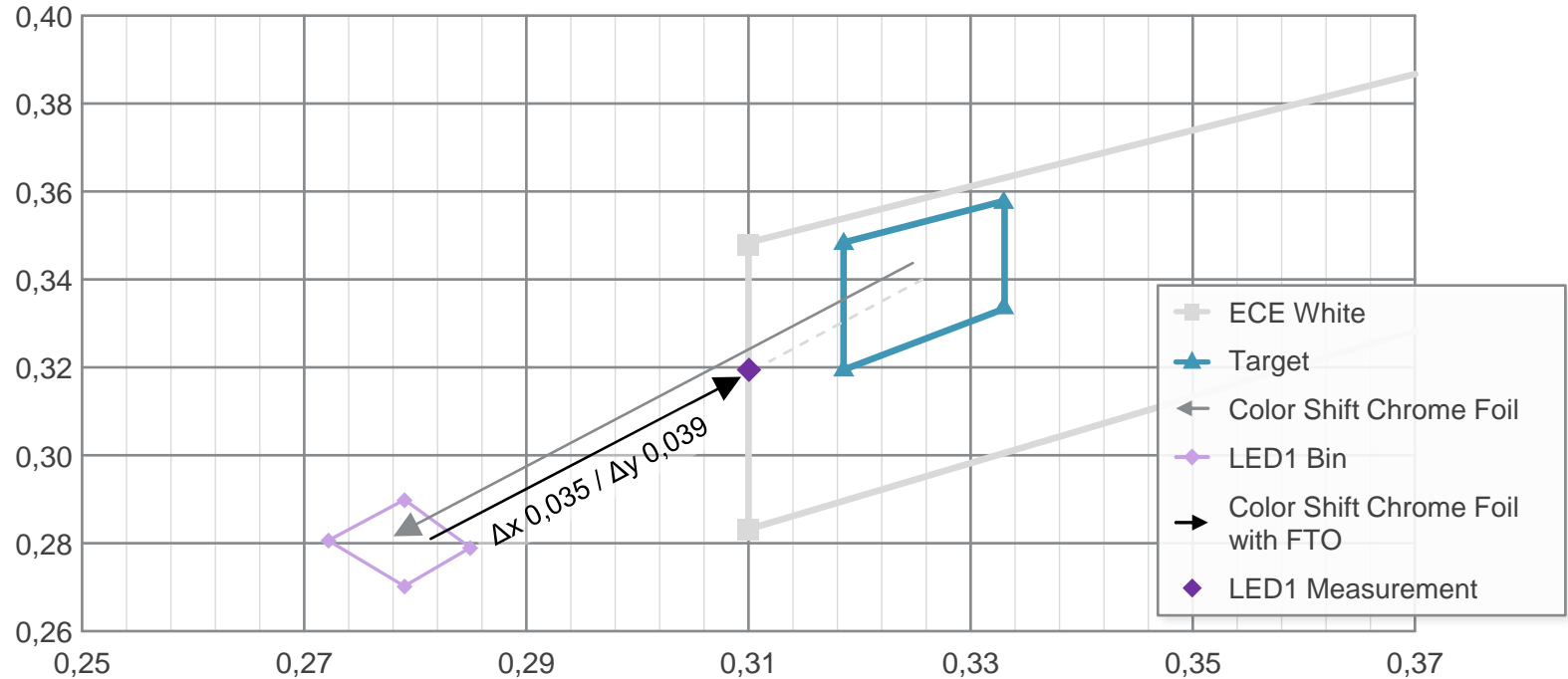
- Spectral filtering of the LED spectrum
- Chromaticity shift after foil
- Risk to approach or leave the CIE_{xy}-target

Transmission & Luminance

- Reduced transmission $T(\lambda)$, especially in the blue/green region
- Luminance loss
- Homogeneity affected

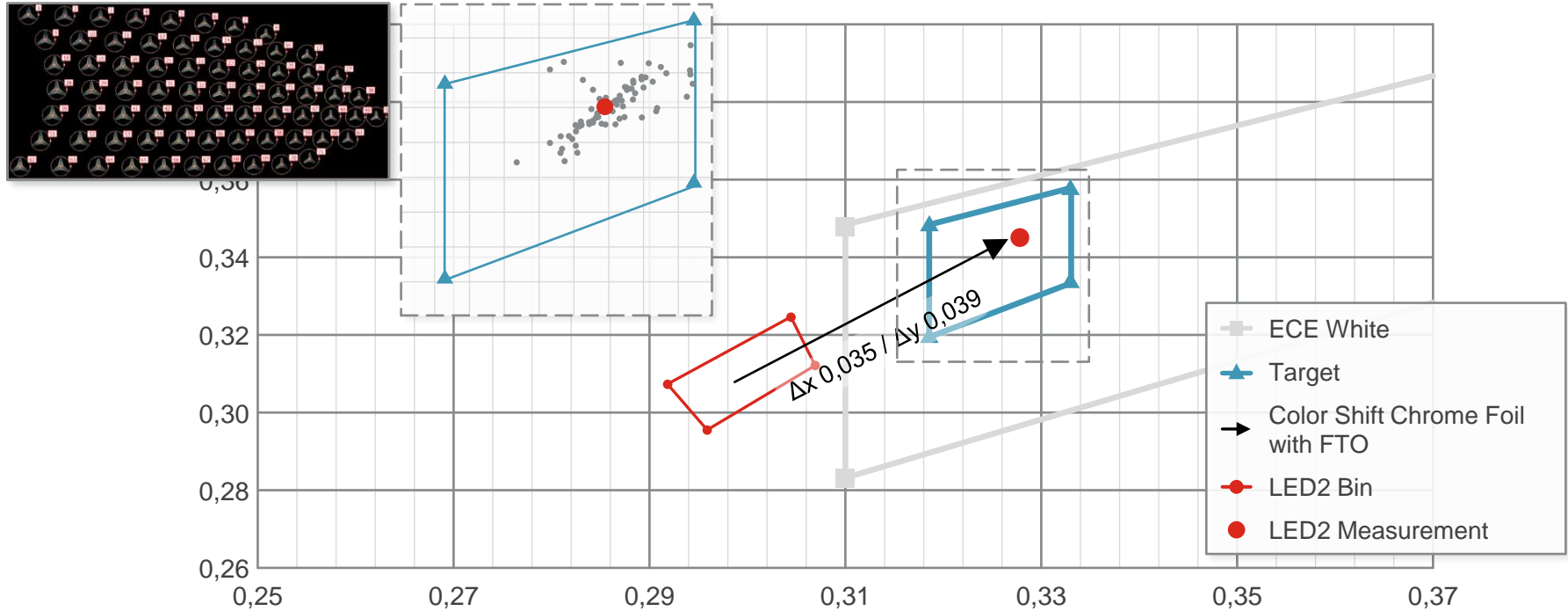


Color Shift



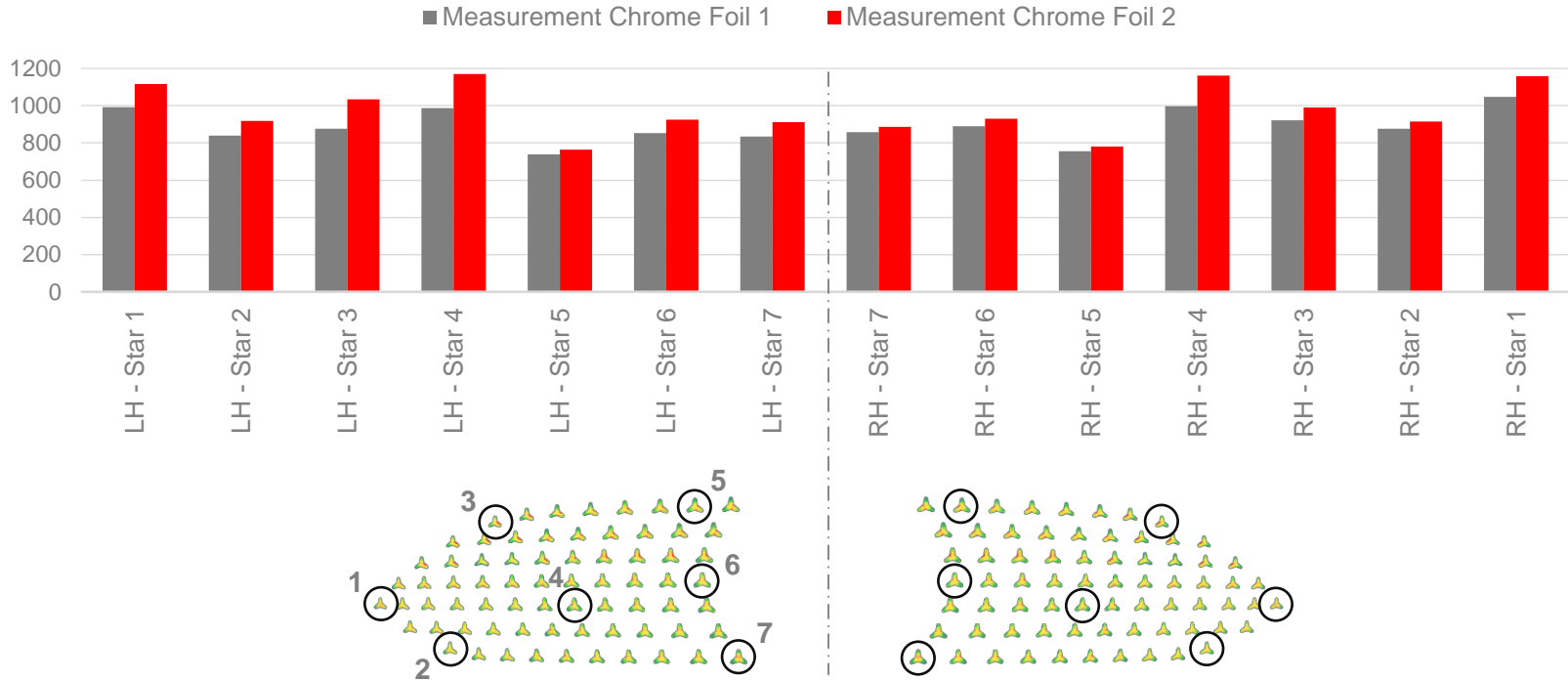
Simulation vs. FTO measurement shows difference in chrome foil characteristics
↳ less color shift

Color Shift



Measurement of optimized parts confirms the target area has been achieved

Luminance (cd/mm²)



Difference in chrome foil characteristic also influence results of luminance
↳ higher transmittance allow higher luminance

Conclusion

- Color and luminance are **highly sensitive** to chrome-foil properties
- **Stable design boundaries** are essential for optical predictability
- **Close collaboration** between OEM, Tier 1 & Tier 2 ensures robust design



Chrome foil enables a premium chrome appearance when off and a homogeneous illuminated appearance when on - but its optical performance depends on consistent and well-aligned design choices

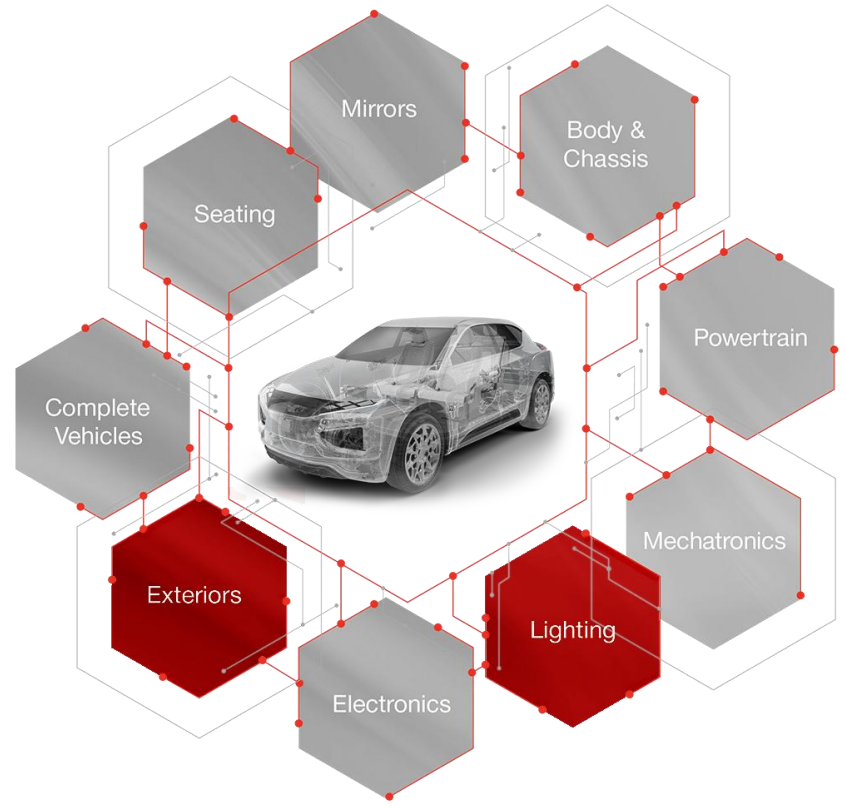
Our full-system approach is your competitive advantage in the new world of mobility.

The Power of Magna

Deep product expertise

Integrated systems level analysis and approach

Complete vehicle engineering and manufacturing





Thanks for listening!

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