



Stray Light Control in Automotive Lighting with Vantablack Coatings

EPIC Online Technology Meeting on Automotive Lighting · May 2020
Michael Stellmacher · Surrey NanoSystems

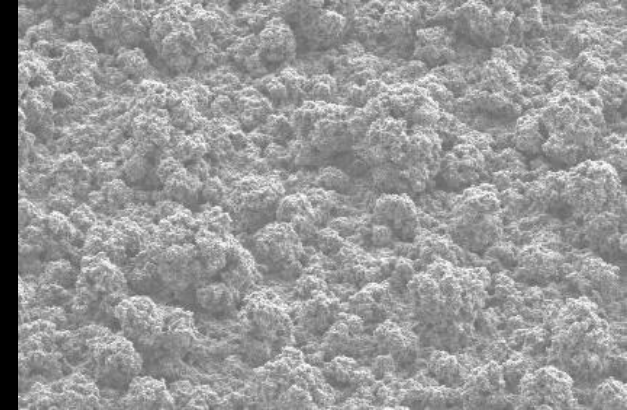
VANTABLACK

Where Vision Makes the Difference

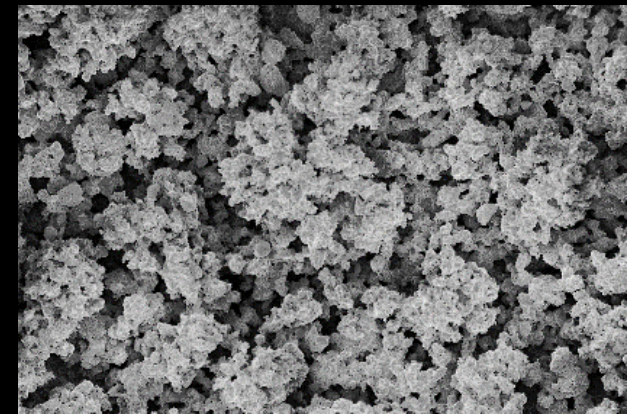


A unique, complementary super-black automotive product portfolio

- **Vantablack S-VIS** – spray-applied wide area coating, exceptional performance across the spectrum from UV-FIR – used for critical stray light control (coated parts require vacuum post spray processing so maximum part size is 650mm x 450mm x 150mm)
 - Exterior Lighting
 - Head Up Displays
 - LiDAR
 - **THR (Total hemispherical Reflectance) – 0.2%**
- **Vantablack VBx2** – Conventional spray application, no scale limitations, used for stray light control in automotive camera shielding, exterior lighting systems , architecture and aesthetic applications
 - Exterior Lighting
 - Camera Shields
 - Head Up Displays
 - **THR (Total hemispherical Reflectance) – 1%**



Vantablack S-VIS



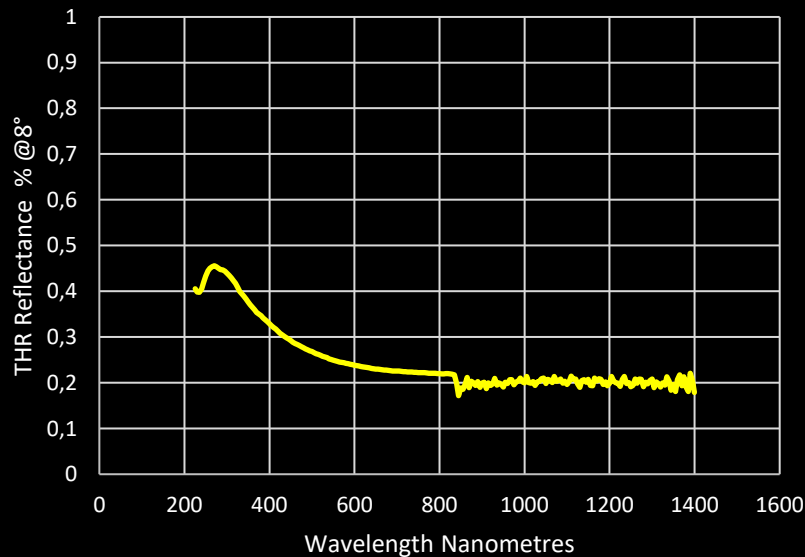
Vantablack VBx2

SEM Micrograph Images

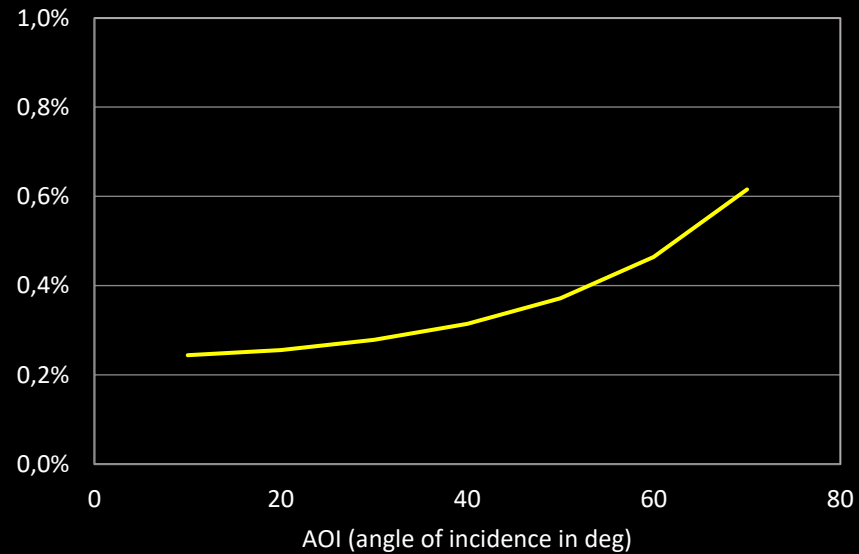
Not Just Another Black Coating

- Vantablack S-VIS provides exceptional performance in ADAS applications because of its very high level of absorption. Uniquely and unlike other paints and flocks, it retains this performance from almost all viewing angles
- This means light hitting the absorber surface from any angle is efficiently captured and unable to interfere with critical elements within the electro optical assembly
- This is not the case with conventional paints and flocks where sunlight frequently blinds the sensor or produces significant artefacts

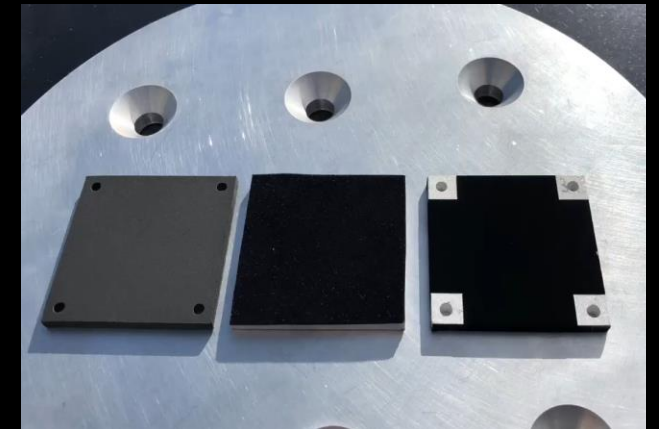
Vantablack S-VIS: Absorption



Change in absorption vs AOI - 400nm – 800nm



Video Clip demonstrating sunlight grazing angle performance on Surrey NanoSystems YouTube Channel

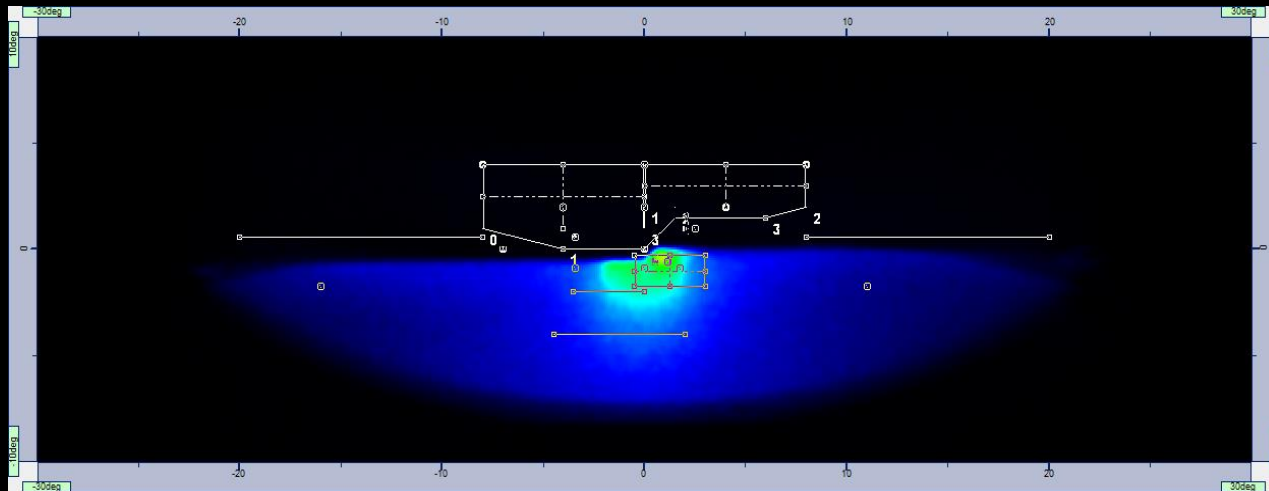


Nextel 81121 – Flocking – Vantablack S-VIS

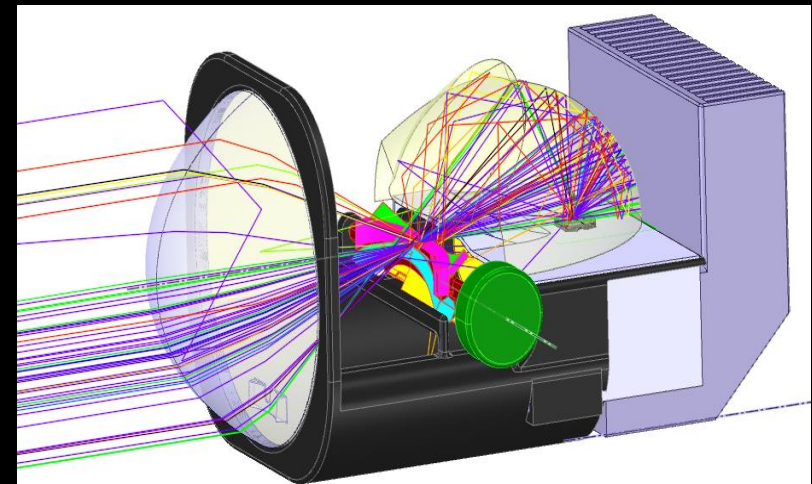
Vantablack in Automotive Lighting

- Headlight glare reduction
- Clean cut-off line, minimal residual reflection
- Precise Adaptive Driving Beam
- High definition road projection
- ...

ECE R123 AFS LB C Regulation Light Intensity Template



Vantablack S-VIS brings the non conforming beam pattern back to EU legal limits without a major redesign of the beam optics



Ansys beam path simulation confirming expected performance benefit

Aesthetic Light Design with Vantablack

- Innovative designs with unique visual effects
- Floating lights on invisible background
- Technology stays hidden



2020 Koenigsegg Jesko Absolute with Vantablack Headlights





surrey nanosystems

To discuss your application in more detail
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