

ULTRA HIGH EMISSIVITY COATINGS FROM UV TO FIR


VANTABLACK®

S-IR

ULTRA BLACK SPRAY-APPLIED  
COATING

DATA SHEET

[www.surreynanosystems.com](http://www.surreynanosystems.com)



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Vantablack S-IR is an ultra black absorptive coating based on carbon nanotube technology.

It has been designed to give optimal performance from NIR to FIR, with excellent performance to 300µm.

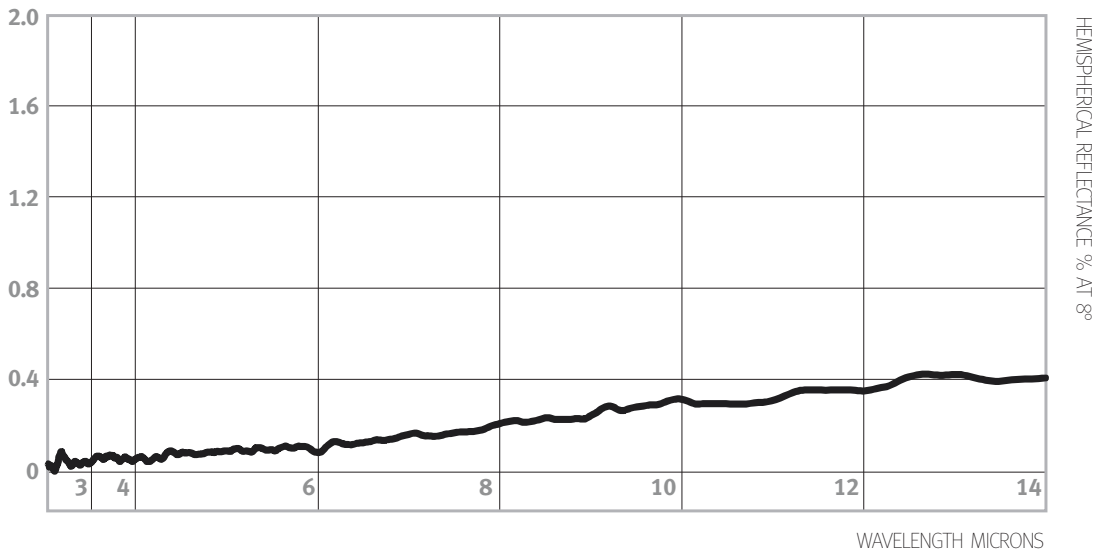
It is applied using a proprietary spray process which permits application to a wide range of substrate materials and to complex shapes.

## KEY FEATURES

- The world's blackest IR coating
- Excellent performance across NIR-FIR
- Excellent BRDF performance
- Low temperature coating process
- Low outgassing
- Extremely resilient to shock & vibration
- Wide operating temperature range in air and vacuum

# VANTABLACK S-IR PERFORMANCE

## Infrared - Hemispherical reflectance



## TYPICAL APPLICATIONS

Vantablack S-IR is used for stray light control and calibration in a wide range of systems, for example as a stray light suppression coating in baffles, an absorber layer for thermal and optical sensors, in cavity blackbodies and as a blackbody calibration source.

**Infrared cameras + sensors** → Stray light, cold shields, IR sensors, baffles, lens barrels

**Electro-optical systems** → Stray light baffles, apertures, housings

**Satellite systems** → Cavity blackbodies and thermal control

**Astronomy** → Stray light control, apertures, lens barrels, housings

**Metrology** → IR spectrum stray light control for spectrometers, cavity black bodies, and calibration source plates

## TYPICAL PERFORMANCE DATA

<b>Total Hemispherical Reflectance %</b> Typical observed performance measured at 8° AOI	NIR (0.75-1.4µm) MWIR (3-8µm) LWIR (8-15µm)	0.2 % at 1.4µm 0.2 % at 5µm 0.4 % at 14µm
<b>Angle Dependent Reflectance (3-5um)</b> Typical values	AOI 10° AOI 30° AOI 50° AOI 70°	0.13 % 0.16 % 0.24 % 0.42 %
<b>Coating thickness (average)</b>	Typical 40µm (locally up to 100µm)	
<b>Operating temperature range in air</b>	-196° to 300°C	
<b>Operating temperature range in vacuum or inert atmosphere</b>	-196°C to 700°C	
<b>Thermal Shock</b>	-196° to 300°C temperature swing over 5 minutes	
<b>Shock resistance</b>	MIL STD 810 G Method 516.6	
<b>Vibration resistance</b>	MIL STD 810 G Method 514.6	
<b>Humidity resistance</b>	Hydrophobic	
<b>Mass / substrate area</b>	0.7 mg/cm <sup>2</sup>	
<b>Abrasion resistance</b>	Low resistance to direct impact or abrasion	

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## OTHER CHARACTERISTICS

<b>Suitable substrate selection</b>	Suitable for coating of a wide range of non-volatile substrates where melting point is > 280°C
<b>Handling considerations</b>	Component design should incorporate suitable features to allow handling and also fastening during transit
<b>Shape / form considerations</b>	Complex 3D shapes can be coated
<b>As-supplied form</b>	Coating to be deposited directly to target component(s)

## SAFETY DATA

<b>Material Safety Data Sheet</b>	<a href="http://www.surreynanosystems.com/resources">www.surreynanosystems.com/resources</a>
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