ADVANCED MATERIALS & COATINGS LAB

60+ Years Driving Advanced Coating and Chemistry Solutions

At the Advanced Materials & Coatings Lab (AMCL), we engineer high-performance thermal control systems designed to regulate the external temperature of aerospace components. By minimizing UV radiation absorption, our coatings enhance the operational stability and efficiency of satellite instruments.

Our coatings provide both protective and insulative performance across extreme temperature ranges (-270°C to 800°C) and are available with specialized options for electrostatic-sensitive environments and anti-reflective requirements.

Capabilities

- Design and manufacturing of advanced optical- absorbing coatings.
- Precision application of Thermal Control Material Systems (TCMS) on aerospace hardware, radiators, antennas, solar arrays and lens housing structures- using our on-site climate-controlled labs and spray booths.
- Application of AMCL coatings and other military-specified finishes, including CARC coatings.
- Technical consulting and design support for thermal control systems and performance optimization.
- Comprehensive service and support for all coatings materials, application processes, and system integration.





Advantages

- Premier provider of commercial spacecraft thermal control coatings (ITAR-Compliant).
- In-house precision painting services aligned with customer specifications and technical drawings (on-site available).
- Fully equipped facility with optical testing, mixing, and application equipment.
- end-to-end certification testing and support including ASTM and other industry standard testing.
- Custom tailoring of thermal control coatings to meet unique performance requirements.
- Advanced R&D capabilities focused on developing next-generation materials with tailored properties, building on proven "heritage" technology.
- Expertise in dangerous goods and international shipping.



HII is a global, all-domain defense provider. HII's mission is to deliver the world's most powerful ships and all-domain solutions in service of the nation, creating the advantage for our customers to protect peace and freedom around the world. As the nation's largest military shipbuilder, and with a more than 135-year history of advancing U.S. national security, HII delivers critical capabilities extending from ships to unmanned systems, cyber, ISR, AI/ML and synthetic training. Headquartered in Virginia, HII's workforce is 44.000 strong. For more information, visit: HII.com.



PERFORMANCE OF AEROSPACE COATINGS

STANDARD (NON-ELECTROSTATIC DISSIPATIVE) THERMAL CONTROL MATERIAL SYSTEMS (TCMS)

Coating	Composition / Temperature Capability	Typical Optical Properties	Applications
		a ± 0.02 E _N ± 0.05	
Z-93P	White Inorganic 800°C	0.15 0.90	Highest stability and temperature capability, well-suited for long-term missions (used on ISS)
S13GP:6N/LO-1	White Organic Flexible 200°C	0.15 0.90	High stability, silicone base improves durability and ease of application, ideal for most LEO missions
SI3NT:6N/LO-1	Off-White Organic Flexible 200°C	0.29 0.89	Variation of S13GP:6N/LO-1 for intermediate absorptance needs
MH21:6N/LO	Black Organic Flexible 200°C	0.98 0.90	High absorptance coating, silicone base, made with HII's "black glass" pigment
MH2200	Flat Black Optical Absorber 530°C	0.96 0.90	Best suited for absorbing surfaces to prevent light reflection

ELECTROSTATIC DISSIPATIVE THERMAL CONTROL MATERIAL SYSTEMS (TCMS)

Coating	Composition / Temperature	Typical Optical Properties		Typical Surface Resistivity	Applications
	Capability	a ± 0.02	E _N ± 0.05	(Ω/ [])	
Z93C55	White Inorganic 500°C	0.15	0.90	10° to 10°	Conductive analog to Z-93P, ideal for longer missions outside of LEO (used on Mars Rovers/Reconnaissance, JUNO)
DS13N:6N/LO-HP	White organic flexible 200°C	0.15	0.90	10 ⁷ to 1010	Conductive analog to S13GP:6N/LO-1, ideal for electrostatically sensitive surfaces
MH21:6NC/LO	Black organic flexible 200°C	0.98	0.90	10° to 10°	Conductive analog to MH21:6N/LO for high absorptance/ESD needs

Notes:

a = solar absorbance

 E_{N} = total normal emittance

 Ω **/** = ohms per square

Application by gas spraying: all

Curing at room temperature: all

Good thermal shock resistance: all

Atomic oxygen (AO) resistant: all

Outgassing: inorganic, total mass loss (TML) = 0.10 to 0.25 and collectable volatile condensible material (CVCM) = 0.00 to 0.01

Outgassing: organic, TML \leq 1.00 and CVCM \leq 0.10%



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