AZ TECHNOLOGY

SPECIALISTS IN MATERIALS AND APPLICATIONS

Spacecraft Thermal Control and Conductive Paints/Coatings* and Services Catalog

Effective January 2008

AZ Technology, Inc., 7047 Old Madison Pike, Suite 300, Huntsville, AL 35806
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***Note**: In this catalogue, paint refers to a liquid coating prior to its application, while coating refers to a fully cured applied coating.

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[1]No data sheet available. Call for details.

Call for quote on prices

COATING THERMAL OPTICAL PROPERTY SUMMARY SHEET

MATERIAL	DESCRIPTION	α_s	ε_t
WHITE THERMAL CONTROL AND CONDUCTIVE PAINTS/COATINGS			
Inorganic			
AZ-93	Inorganic white**,** nonspecular thermal control paint/coating.	0.15 ± 0.02	0.91 ± 0.02
AZW/LA-II	Inorganic **Low Alpha White,** nonspecular thermal control paint/coating.	0.09 ± 0.02	0.91 ± 0.02
AZ-70-WIST	Inorganic white**,** nonspecular thermal control paint/coating.	0.10 ± 0.02	0.91 ± 0.02
AZ-2000-IECW	Inorganic white, electrically conductive ($1X10^4$-$1X10^6$ Ω/sq.) thermal control paint/coating; can be tailored for resistance.	0.25 ± 0.02	0.90 ± 0.02
AZ-2100-IECW	Inorganic white, electrically dissipative ($1X10^8$-$1X10^9$ Ω/sq.) thermal control paint/coating.	0.19 ± 0.02	0.90 ± 0.02
Organic			
AZ-400-LSW	Silicone white**,** thermal control paint/coating; Self priming paint/coating.	0.15 ± 0.02	0.91 ± 0.02
RM-400	Epoxy-based electrically conductive white thermal control paint/coating (tailorable up to 10^5 Ω/sq.)	0.45 ± 0.02	0.88 ± 0.02
BLACK NON-CONDUCTIVE AND CONDUCTIVE PAINTS/COATINGS			
Inorganic			
ML-210-IB	Inorganic optical black, nonspecular paint/coating.	0.98 ± 0.02	0.91 ± 0.02
RM-550-IB	Inorganic optical black paint/coating, AO resistant, NASA 1443 VCMO compatible.	0.97 ± 0.02	0.91 ± 0.02
TMD-560-IB	Inorganic black, nonspecular baffle paint/coating.	0.95 ± 0.02	0.91 ± 0.02
AZ-1000-ECB	Inorganic black, electrically conductive ($1X10^2$-$1X10^4$ Ω/sq.) paint/coating; can be tailored for resistance.	0.97 ± 0.02	0.89 ± 0.02
Organic			
RM-550-LSB	Silicone; optical black paint/coating, AO resistant, space and vacuum compatible.	0.97 ± 0.02	0.91 ± 0.02
MLS-85-SB	Silicone optical black paint/coating; space and vacuum compatible.	0.98 ± 0.02	0.91 ± 0.02
MLS-85-SB-c	Silicone optical black, electrically conductive ($6X10^5$ Ω/sq.) paint/coating; space and vacuum compatible.	0.98 ± 0.02	0.91 ± 0.02

MATERIAL	DESCRIPTION	α_s	ε_t
HIGH TEMPERATURE LOW EMITTANCE PAINT/COATING			
Organic			
AZ-3700-LSW	High temperature low emittance gray paint/coating	0.22-0.25	0.25-0.33
COLORED MARKER PAINTS/COATINGS			
Inorganic			
AMJ-400-IG	Inorganic green, nonspecular marker paint/coating.	~0.56	0.90 ± 0.02
AMJ-600-IR	Inorganic red, nonspecular marker paint/coating.	~0.45	0.91 ± 0.02
AMJ-700-IBU	Inorganic blue, nonspecular marker paint/coating.	~0.75	0.88 ± 0.02
AMJ-710-IBU	Inorganic skyblue, nonspecular marker paint/coating.	~0.54	0.89 ± 0.02
TMS-800-IY	Inorganic yellow, nonspecular marker paint/coating.	~0.36	0.89 ± 0.02
TMJ-810-ICY	Inorganic yellow, electrically conductive (~10^8 Ω/sq.) nonspecular marker paint/coating.	~0.30	0.86 ± 0.02
Organic			
TMJ-20-LSB	Silicone black, semi-flat marker paint/coating	~0.96	0.91 ± 0.02
AMJ-450-LSG	Silicone green, nonspecular marker paint/coating	~0.56	0.85 ± 0.02
AMJ-650-LSR	Silicone red, nonspecular marker paint/coating	~0.48	0.89 ± 0.02
AMJ-750-LSBU	Silicone blue, nonspecular marker paint/coating	~0.76	0.81 ± 0.02
AMJ-760-LSBU	Silicone skyblue, nonspecular marker paint/coating	~0.54	0.89 ± 0.02
TMJ-850-LSY	Silicone yellow, nonspecular marker paint/coating	~0.60	0.86 ± 0.02
PRIMERS[1]			
MLP-100-AZ	Epoxy-based primer paint/coating; RF reflective.	N/A	N/A
MLP-300-AZ	Epoxy-based primer paint/coating; RF transparent.	N/A	N/A
TAPES			
AZT-4000-ALICO	AZ-93 coated Aluminum foil tape with Y966 adhesive	0.15±0.01	0.91 ± 0.02
AZT-4000-KICO	AZ-93 coated Kapton tape with 966 adhesive	0.15±0.01	0.91 ± 0.02
PROTECTIVE COATINGS			
AZO-5000-PF	Fluoropolymer protective paint/coating for contamination protection of inorganic porous coatings during ground handling. When exposed to atomic oxygen in Low Earth Orbit, the overcoat is etched away leaving the primary coating pristine. Overcoat is transparent, non-conductive and cleanable with normal solvents.		

[1]Primers provide an interface between inorganic coatings and non-compatible substrates such as stainless steel, composites and/or polymer films.

SALE CONDITIONS

Shipments will be made after receipt and acceptance of a written purchase order (FAX acceptable).

All Thermal Control (TC) paints are priced Ex-Works (origin) Huntsville, AL. Due to shelf life and extremes of environmental conditions encountered during transport, AZ Technology highly recommends shipment by overnight express delivery. Customers are encouraged to designate a preferred carrier and provide an account number for shipping. We recommend Federal Express Priority Overnight. Alternatively, AZ Technology will pre-pay and bill shipping charges if so authorized by the Purchase Order.

Organic based paints are shipped as hazardous materials. When selecting a designated carrier, please be aware that not all carriers will accept hazardous materials.

AZ TECHNOLOGY will provide the appropriate document(s) with each shipment certifying the product meets the appropriate AZ TECHNOLOGY, NASA or purchaser's specification. Documents certifying compliance with, or conformance to, individual clients specifications will also be furnished; however, the latest revision of the applicable specifications must be furnished.

The product prices when quoted do not include consultation or product testing. AZ TECHNOLOGY will provide these services at additional cost. Reviews of specifications, visits by clients or their representatives, or others in connection with TC coating services, witnessing and/or inspection or records or hardware likewise are not included.

It is the responsibility of the user to determine the applicability of any specific paint/coating to meet their requirements.

It is the responsibility of the user to apply the paints properly. AZ Technology, Inc., can provide detailed application instructions when requested. Also training in application of AZ Technology paints either on site or at AZ Technology can be provided at additional costs.

Coating Warranty: AZ Technology will repair coatings which are defective due to materials and/or workmanship.
Any coating repairs must be completed by AZ Technology only.
This warranty will no longer be valid if the coating is tampered with, altered and/or mishandled by anyone other than AZ Technology.
Your acceptance of this quote states you agree with the above terms and agreements.

To order materials or services, or to obtain further information, please contact:

Jim Zwiener – 256.837.9877, Ext. 145

Amy Alvis – 256.837.9877, Ext. 147 or

Steve Jones – 256.837.9877, Ext. 189

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SPECIAL ORDERS

Special or experimental formulations can be developed to fill particular requirements, including:

Tailored broadband absorber paints/coatings

Tailored emittance paints/coatings

AZ TECHNOLOGY is developing a series of paints/coatings with controlled emittance. These paints/coatings have an emittance range of 0.30-0.90 and a solar absorptance range of 0.25-0.50 dependent on the specific paint/coating formulation.

Tailored electrical resistivity paint/coatings

AZ TECHNOLOGY is developing a series of paint/coatings with tailored electrical resistivity. These paint/coatings have a solar absorptance range of 0.20-0.97 and electrical resistance range of approximately $1x10^{4}$-$1x10^{10}$ ohms per square.

Primers

AZ TECHNOLOGY's primers for inorganic type paint/coatings are a highly cost effective method for overcoming the bonding problems associated with these materials. This material system for bonding inorganic paint/coatings to incompatible substrate materials such as graphite epoxy composites, polyimides, and other similar materials, can greatly reduce the failure rate found in depositing ceramic coatings onto organic substrates. These material systems can also significantly reduce the cost of hardware development through the elimination of the highly expensive and arduous VDA step generally used to help form a coupling surface for inorganic coatings.

These primers are currently still developmental materials and are available in two basic forms. One form is RF reflective and the other is RF transparent.* Both are sprayable paints coating systems which allows them to be deposited over complex and large surfaces with relative ease of deposition. Both conventional and HVLP deposition systems can be used with these materials. The paints are solvent based systems and therefore, normal safety and health precautions need to be used.

PRIMER	MLP-100AZ	MLP-300AZ
Thickness	1 + 1 Mil	1+1 Mil
Viscosity (No. 4 Ford cup)	17-30 seconds	17-30 seconds
Appearance/Color	light gray	amber or straw
Thermal emittance	0.90 0.02	0.90 0.02
Tack free	2-6 Hrs.	2-6 Hrs.
Full cure	3 Days	3 Days

*The RF reflectance or transmittance of the coating is dependent upon the frequency being used

AZ TECHNOLOGY

Product Data Sheet
INORGANIC WHITE

MATERIAL DESIGNATION: AZ-93

PRODUCT DESCRIPTION:

AZ-93 is an inorganic white thermal control paint developed for use on spacecraft surfaces exposed to the deleterious effects of the space environment. Application of AZ-93 creates a nonspecular white coating that provides superior thermal protection by allowing only 14-16% of the solar radiation impinging on the spacecraft external surface to be absorbed through to the interior systems while emitting 89-93% of the internal heat generated to the cold vacuum of space. By incorporating a highly stabilized pigment system with a silicate binder, AZ-93 forms a bendable ceramic coating that has been tested time and again and has proven itself stable in the harshness of the space environment. AZ-93 has been exposed by NASA to atomic oxygen (AO) fluence of 5.6 x 1022 atoms/cm2, charged particle radiation of 4.5 x 1015 e-/cm2, and vacuum ultraviolet (VUV) radiation (from 118 nm to 170 nm) of 701 equivalent solar hours with less than 4% deterioration in solar absorptance (α_s) and less than 1% change in thermal emittance (ε_t).

AZ-93 has been thoroughly tested and is currently being used on external surfaces of the International Space Station. A pre-cursor to AZ-93 was flown on the Long Duration Exposure Facility (LDEF) and returned after 5.8 years in orbit with only a 0.01 overall degradation in solar absorptance from pre-flight measurements. AZ-93 was flown on the Optical Properties Monitor (OPM), the MIR MEEP POSA-I experiment and the Materials International Space Station Experiment (MISSE).

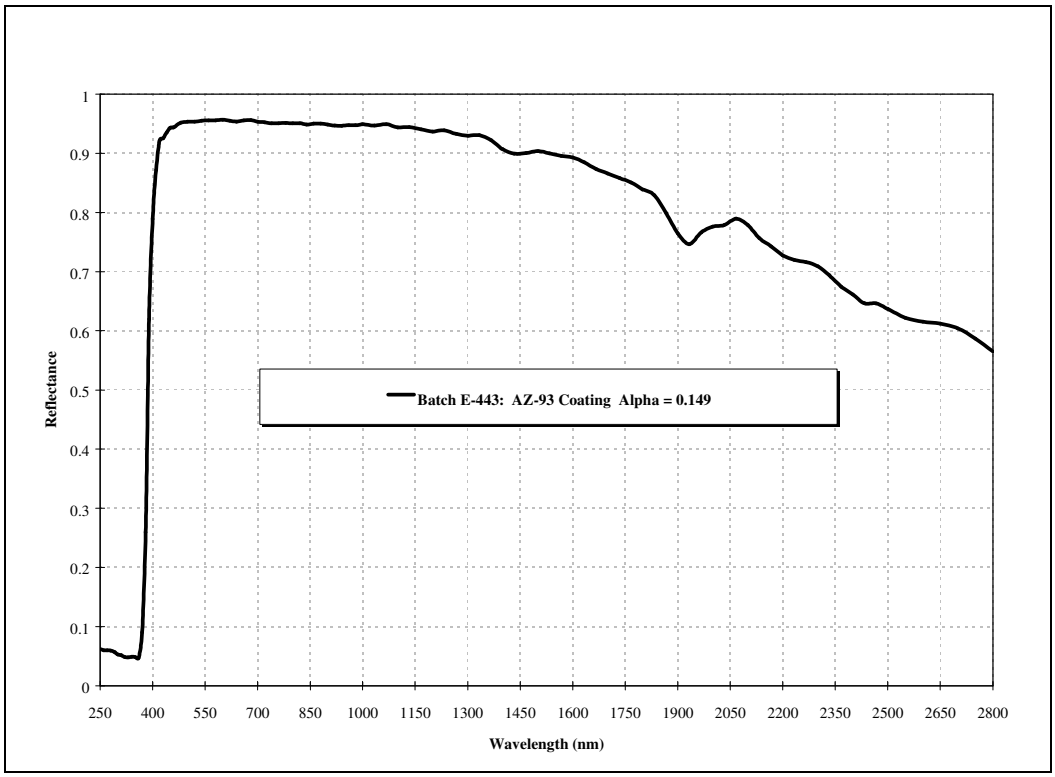
The table below lists the optical and application parameters of cured AZ-93:

Nominal Surface Resistivity	~10^{13} Ω/sq
Thermal Emittance (ε_t)	0.91 ± 0.02
Solar Absorbance (α_S)	0.15 ± 0.02 at ≥ 5.0 mils thickness
Use Temperature Range	-180 C to 1400 C
Appearance/Color	Nonspecular white
Nominal Dry Thickness	5.0 ± 1.5 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 days

AZ Technology has provided specialized coatings to many major aerospace corporations and to NASA. We have also consulted with spacecraft manufacturers in the development and application of thermal control coatings for flight hardware. AZ Technology personnel have the background and experience to provide all your spacecraft coating needs. For more information or to place an order, contact Jim Zwiener (256) 837-9877 ext. 145 or Amy Alvis at ext. 147, 8:00 AM to 5:00 PM Central Time, Monday through Friday.

Typical spectral reflectance curve for AZ-93 coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for AZ-93 White Inorganic Thermal Control Coating



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Product Data Sheet

INORGANIC LOW ALPHA WHITE

MATERIAL DESIGNATION: AZW/LA-II

PRODUCT DESCRIPTION:

AZW/LA-II is an inorganic white thermal control paint developed for use on spacecraft surfaces exposed to the deleterious effects of the space environment. The resulting nonspecular white coating provides superior thermal protection by allowing only 7-11% of the solar radiation impinging on the spacecraft external surface to be absorbed through to the interior systems while emitting 89-93% of the internal heat generated to the cold vacuum of space. AZW/LA-II incorporates a stabilized pigment system with a silicate binder. AZW/LA-II forms a ceramic coating that has tested and proven itself stable in the harshness of the space environment. AZW/LA-II has been exposed by NASA to atomic oxygen (AO) fluence of 7.4 x 1020 atoms/cm2, and ultraviolet (UV) of approximately 832 equivalent solar hours with less than 4% deterioration in solar absorptance (α_s) and less than 1% change in thermal emittance (ε_t).

AZW/LA-II was flown on the Materials International Space Station Experiment (MISSE) and returned after 4 years in orbit with only a 0.03 overall degradation in solar absorptance from pre-flight measurements.

The table below lists the optical and application parameters of cured AZW/LA-II.

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.91 ± 0.02
Solar Absorbance (α_S)	0.09 ± 0.02 at ≥ 10.0 mils thickness
Use Temperature Range	-180 C to 1400 C
Appearance/Color	Nonspecular white
Nominal Dry Thickness	7 to 13 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	14 days

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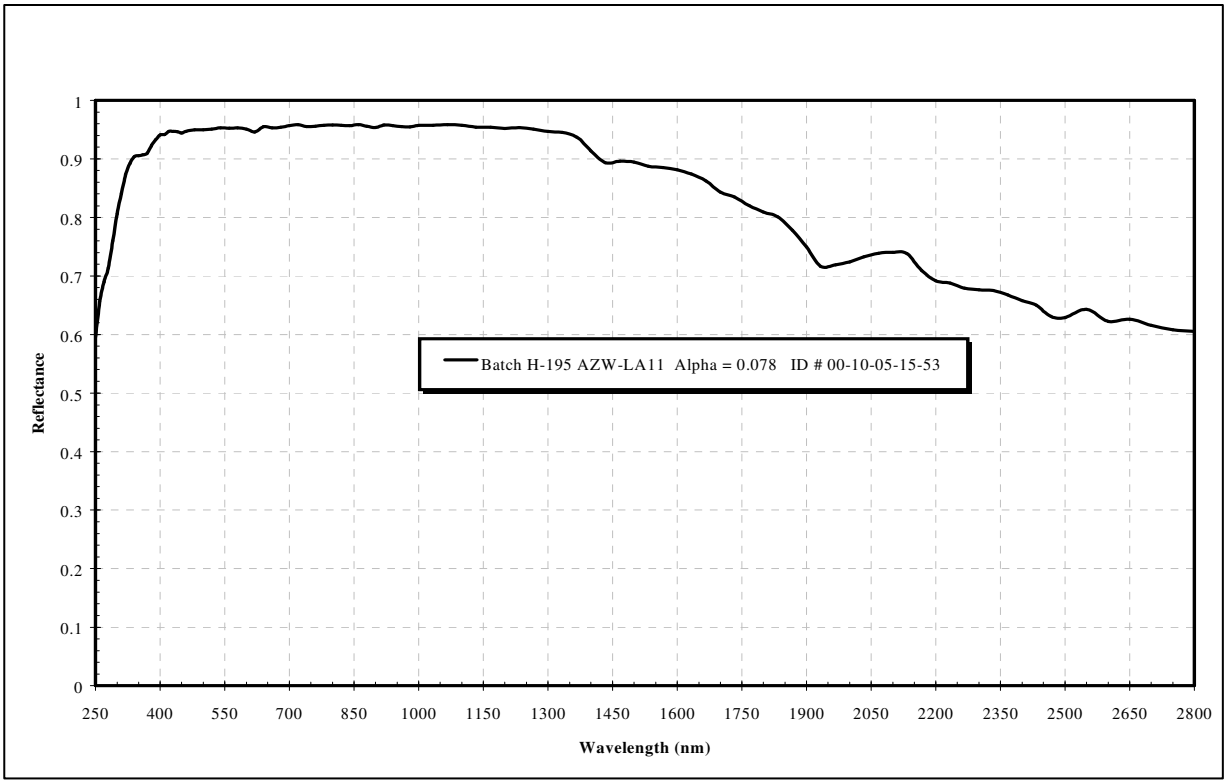
Typical spectral reflectance curve for AZW/LA-II coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for AZW/LA-II White Inorganic Thermal Control Coating



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Product Data Sheet
INORGANIC WHITE

MATERIAL DESIGNATION: AZ-70-WIZT

PRODUCT DESCRIPTION:

AZ-70-WIZT is an inorganic white thermal control paint developed for use on spacecraft surfaces exposed to the deleterious effects of the space environment. The resulting nonspecular white coating provides superior thermal protection by allowing only 8-12% of the solar radiation impinging on the spacecraft external surface to be absorbed through to the interior systems while emitting 89-93% of the internal heat generated to the cold vacuum of space. AZ-70-WIZT incorporates a highly stabilized pigment system with a silicate binder. AZ-70-WIZT is a ceramic coating that has tested and proven itself stable in the harshness of the space environment. AZ-70-WIZT has been exposed by NASA to atomic oxygen (AO) fluence of 5.6 x 1022 atoms/cm2, charged particle radiation of 4.5 x 1015 e-/cm2, and vacuum ultraviolet (VUV) radiation (from 118 nm to 170 nm) of 701 equivalent solar hours with less than 4% deterioration in solar absorptance (α_s) and less than 1% change in thermal emittance (ε_t).

AZ-70-WIZT has been thoroughly tested in space. AZ-70-WIZT was flown on the MIR MEEP POSA-I experiment and the Materials International Space Station Experiment (MISSE).

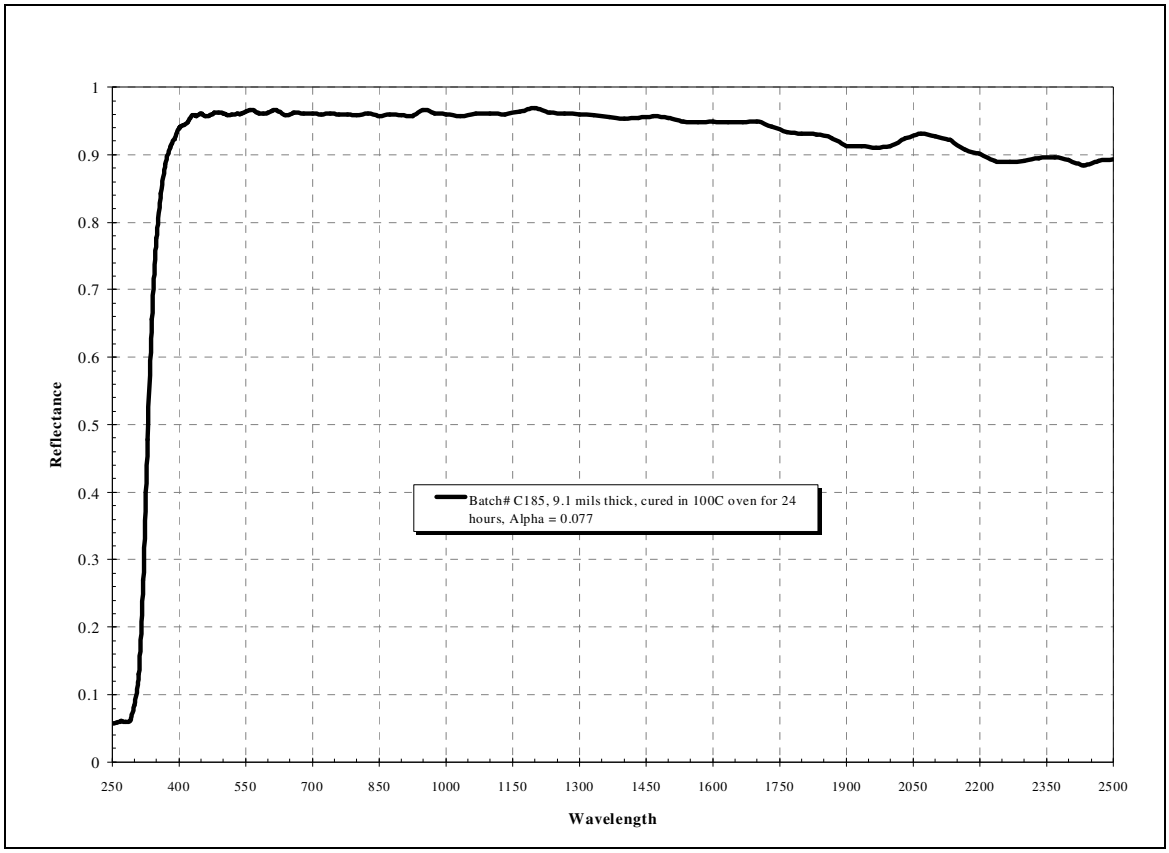
The table below lists the optical and application parameters of cured AZ-70-WIZT.

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.91 ± 0.02
Solar Absorbance (α_S)	0.10 ± 0.02 at ≥ 10.0 mils thickness
Use Temperature Range	-180 C to 1400 C
Appearance/Color	Nonspecular white
Nominal Dry Thickness	7 to 12 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 days

AZ Technology has provided specialized coatings to many major aerospace corporations and to NASA. We have also consulted with spacecraft manufacturers in the development and application of thermal control coatings for flight hardware. AZ Technology personnel have the background and experience to provide all your spacecraft coating needs. For more information or to place an order, contact Jim Zwiener (256) 837-9877 ext. 145 or Amy Alvis at ext. 147, 8:00 AM to 5:00 PM Central Time, Monday through Friday.

Typical spectral reflectance curve for AZ-70-WIZT coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for AZ-70-WIZT White Inorganic Thermal Control Coatings



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AZ TECHNOLOGY

Product Data Sheet
INORGANIC SEMI-CONDUCTIVE WHITE

MATERIAL DESIGNATION: AZ-2000-IECW

PRODUCT DESCRIPTION:

AZ-2000-IECW is a conductive white thermal control paint developed for use on spacecraft surfaces exposed to the deleterious effects of the space environment. This paint is designed to be deposited onto large complex surfaces with minimal difficulty or environmental impact to form a nonspecular coating that maintains optical and electrical properties when exposed to the space environment. This thermal control coating possesses several orders of magnitude greater electrical conductivity than currently available thermal control coatings while providing atomic oxygen protection and surface charge dissipation for spacecraft and terrestrial applications.

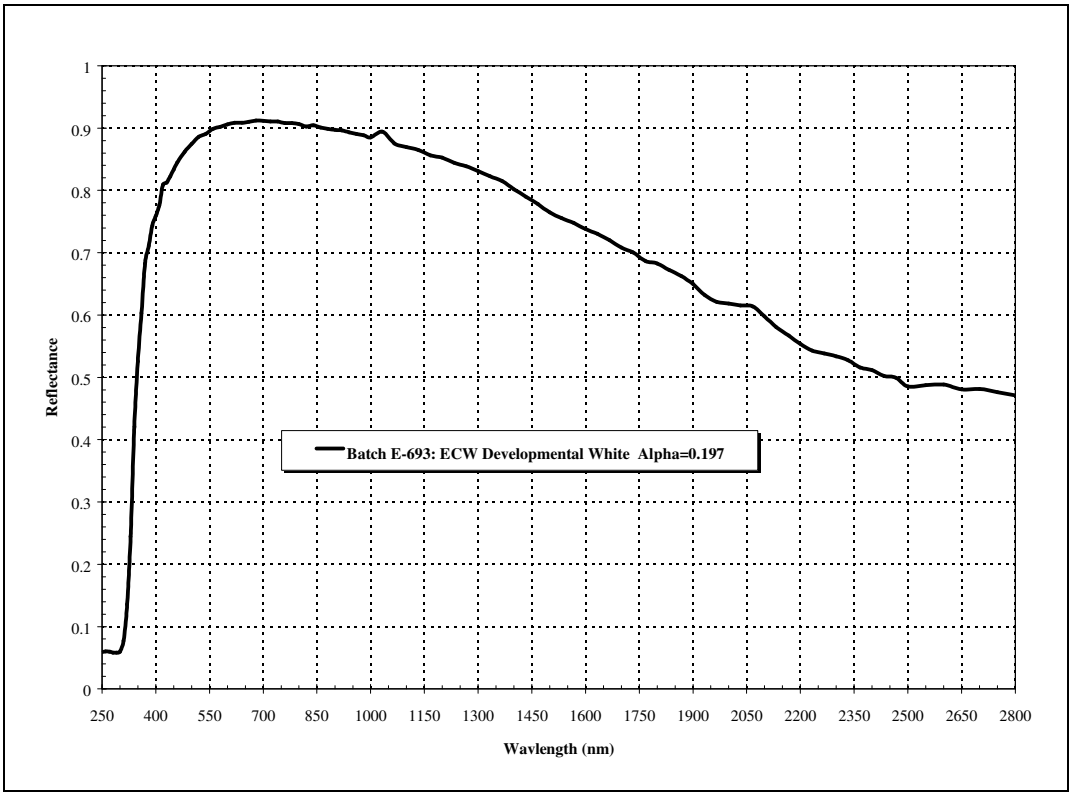
The table below lists the optical and application parameters of cured AZ-2000-IECW:

Nominal Surface Resistivity	10^4-10^6 Ω/sq
Thermal Emittance (ε_t)	0.88 ± 0.02
Solar Absorbance (α_S)	0.25 ± 0.02 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 1000 C
Appearance/Color	Nonspecular white
Nominal Dry Thickness	4.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion GradeE	Not less than 3A
Full Cure	7 days

AZ Technology has provided specialized coatings to many major aerospace corporations and to NASA. We have also consulted with spacecraft manufacturers in the development and application of thermal control coatings for flight hardware. AZ Technology personnel have the background and experience to provide all your spacecraft coating needs. For more information or to place an order, contact Jim Zwiener (256) 837-9877 ext. 145 or Amy Alvis at ext. 147, 8:00 AM to 5:00 PM Central Time, Monday through Friday.

Typical spectral reflectance curve for AZ-2000-IECW electrically conductive white thermal control coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for AZ-2000-IECW Electrically Conductive White Inorganic Thermal Control Coating



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AZ TECHNOLOGY

PRODUCT DATA SHEET

MATERIAL DESIGNATION: AZ-2100-IECW

PRODUCT DESCRIPTION:

AZ-2100-IECW is a conductive white thermal control paint developed for use on spacecraft surfaces exposed to the deleterious effects of the space environment. This paint is designed to be deposited onto large complex surfaces with minimal difficulty or environmental impact to form a nonspecular white coating that maintains optical and electrical properties when exposed to the space environment. This thermal control coating possesses several orders of magnitude greater electrical conductivity than currently available thermal control coatings while providing atomic oxygen protection and surface charge dissipation for spacecraft and terrestrial applications.

AZ-2100-IECW has been thoroughly tested in space, having been flown on the Optical Properties Monitor (OPM), the MIR MEEP POSA-I experiment and the Materials International Space Station Experiment (MISSE).

The table below lists the electrical, optical and application parameters of cured AZ-2100-IECW:

Nominal Surface Resistivity	10^{8}-10^{9} Ω/sq
Thermal Emittance (ε_t)	0.90±0.02
Solar Absorbance (α_S)	0.19±0.02 at ≥ 5.0 mils thickness
Use Temperature Range	-180 C to 1000 C
Appearance/Color	Nonspecular white
Nominal Dry Thickness	5.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 days

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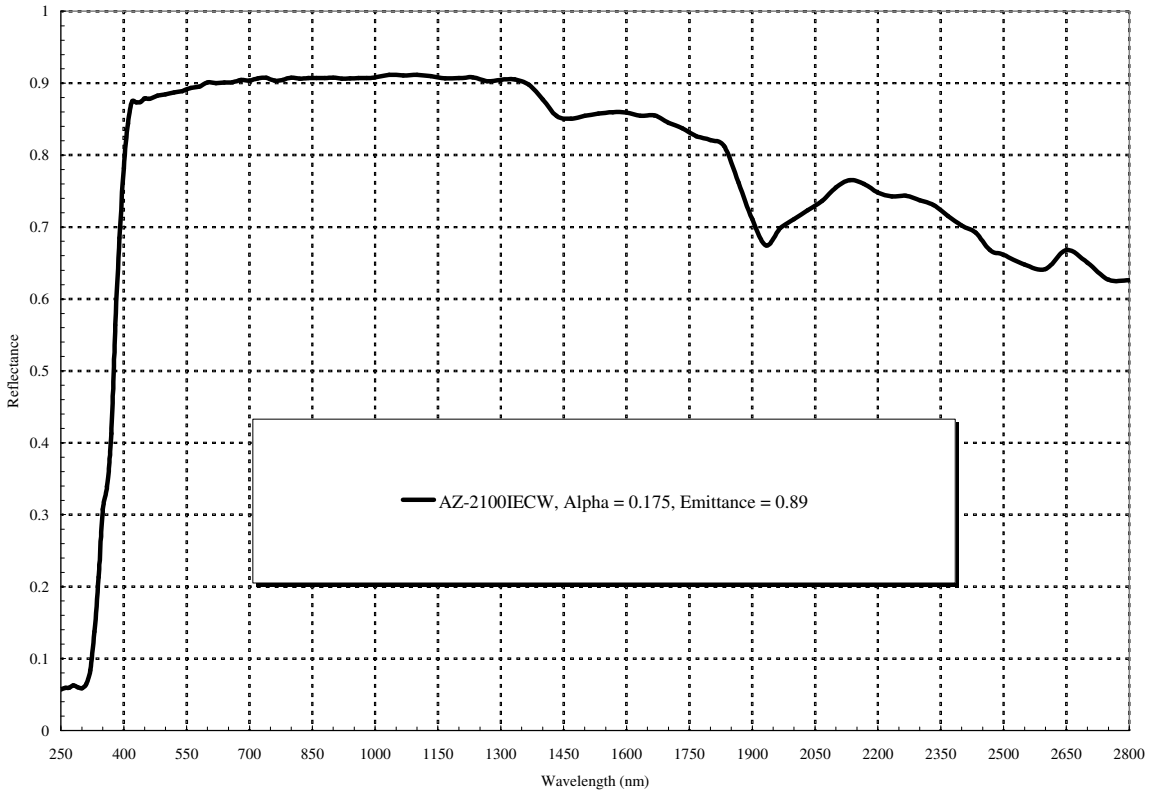
Typical spectral reflectance curve for AZ-2100-IECW electrically conductive white thermal control coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for AZ-2100-IECW Electrically Conductive White Inorganic Thermal Control Coating



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Product Data Sheet
SILICONE WHITE COATING

MATERIAL DESIGNATION: AZ-400-LSW

PRODUCT DESCRIPTION:

AZ-400-LSW is an organic white paint developed for use on spacecraft to coat hard anodized aluminum. A specialized pigment in a silicone binder, AZ-400-LSW can be spray deposited with an air brush or high-volume low-pressure system with the ease of other silicone paints to form a flexible organic nonspecular white marker paint. AZ-400-LSW meets flammability and toxicity requirements of NHB 8060.1C.

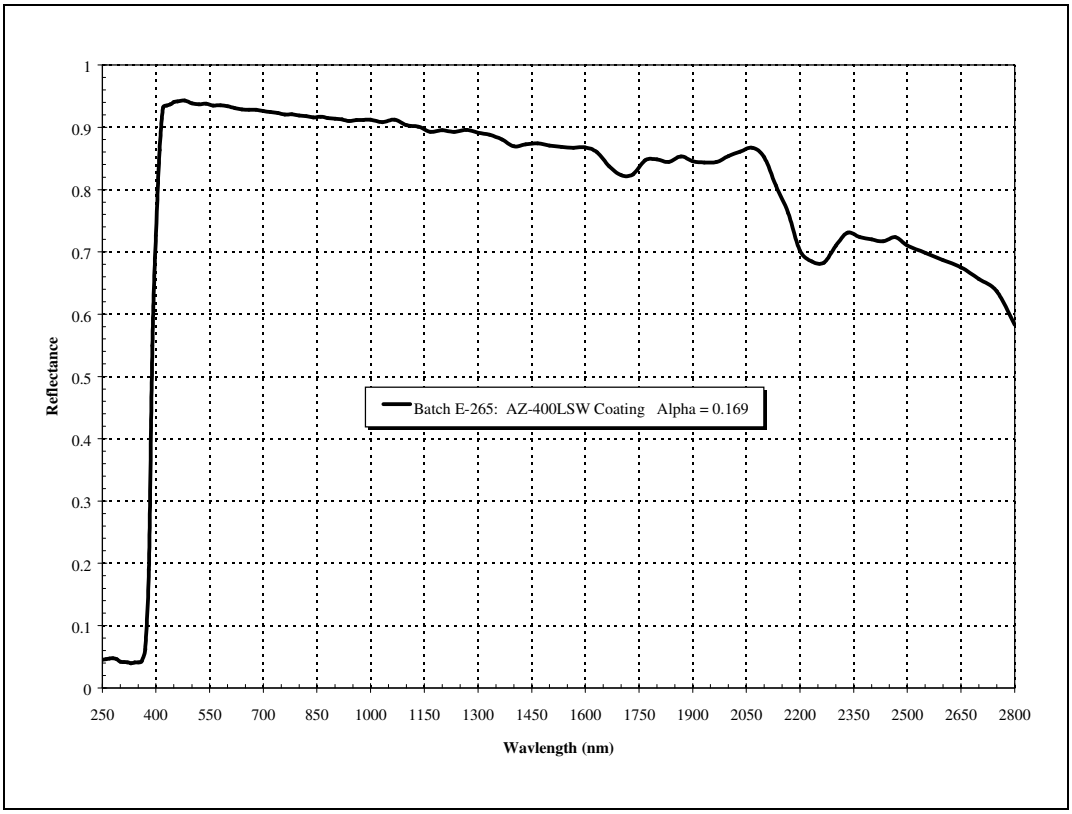
The table below lists the optical and application parameters of cured AZ-400-LSW.

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.91 ± 0.02
Solar Absorbance (α_S)	0.17 ± 0.02 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 700 C
Appearance/Color	Nonspecular optical white
Nominal Dry Thickness	3.0 ± 1.0mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	48 to 72 hours

AZ Technology has provided specialized coatings to many major aerospace corporations and to NASA. We have also consulted with spacecraft manufacturers in the development and application of thermal control coatings for flight hardware. AZ Technology personnel have the background and experience to provide all your spacecraft coating needs. For more information or to place an order, call Jim Zwiener at (256) 837-9877 ext. 145 or Amy Alvis at ext. 147, 8:00 AM to 5:00 PM Central Time, Monday through Friday.

Typical spectral reflectance curve for AZ-400-LSW coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for AZ-400-LSW, White Silicone Semi-flat Marker Coating



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AZ TECHNOLOGY

PRODUCT DATA SHEET

MATERIAL DESIGNATION: RM-400

PRODUCT DESCRIPTION:

RM-400 is an organic electrically conductive thermal control white to off white paint developed for use on spacecraft and other equipment which contain sensitive electronic circuitry. Due to the ceramic nature of conventional thermal control coatings, charge buildup and subsequent electrostatic discharges from the surface of the coating to conductive components (skin panels, circuitry, exposed metal, etc.) can cause damage to sensitive electronic components. Epoxy-based RM-400 provides electrical conductivity such that any accumulated charges can be safely drained off and therefore avoid an electrostatic discharge that could cause catastrophic damage. The thermal protection provided by RM-400 is of secondary importance to the conductivity. Typically, RM-400 is ony a good choice for short-duration flights as it will not maintain its properties for extended flights.

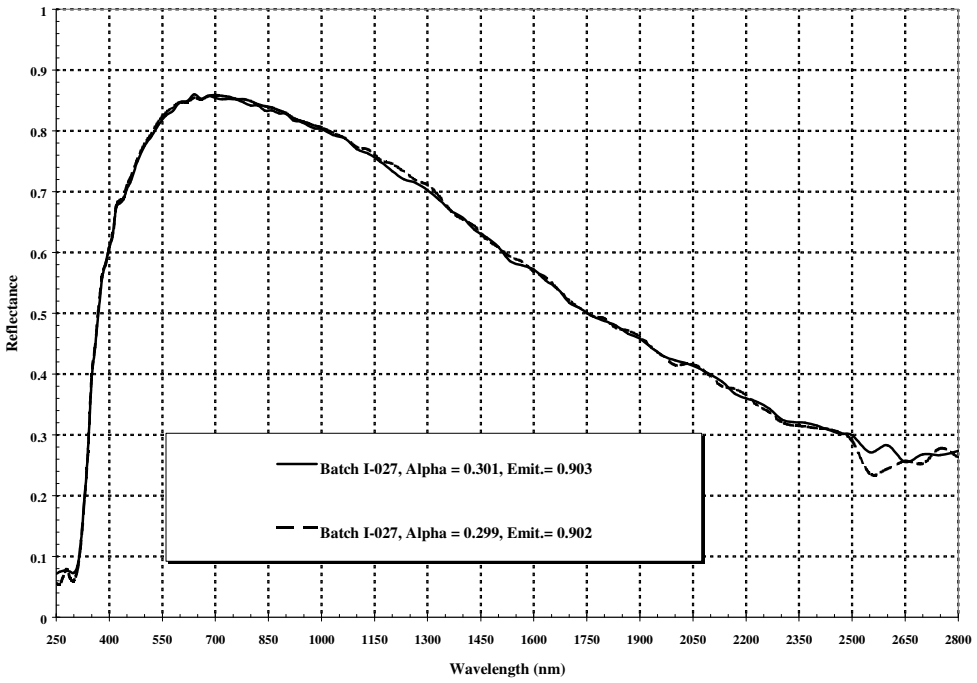
The table below lists the electrical, optical and application parameters of cured RM-400.

Nominal Surface Resistivity	Tailorable up to 10^5 Ω/sq
Thermal Emittance (ε_t)	~0.88
Solar Absorbance (α_S)	~0.45 at ≥ 5.0 mils thickness
Use Temperature Range	-180 C to 260 C
Appearance/Color	White to off-white
Nominal Dry Thickness	4.0 ± 1.5 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	48 to 72 hours

AZ Technology has provided specialized coatings to many major aerospace corporations and to NASA. We have also consulted with spacecraft manufacturers in the development and application of thermal control coatings for flight hardware. AZ Technology personnel have the background and experience to provide all your spacecraft coating needs. For more information or to place an order, contact Jim Zwiener at (256) 837-9877 ext. 145 or Amy Alvis at ext. 147, 8 AM to 5 PM Central Time, Monday through Friday.

Typical spectral reflectance curve for RM-400 coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for RM-400, Electrically Conductive White Thermal Control Coating



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AZ TECHNOLOGY

Product Data Sheet
INORGANIC OPTICAL BLACK

MATERIAL DESIGNATION: ML-210-IB

PRODUCT DESCRIPTION:

ML-210-IB is an inorganic black paint. A specialized phosphate glass pigment in a silicate binder, ML-210-IB is an inorganic paint that can be spray deposited over complex surfaces using an airbrush or a high-volume, low pressure system to form an inorganic nonspecular optical black coating. This coating has been ground tested for the rigorous environment of Low Earth Orbit (LEO). Exposure to the Atomic Oxygen (AO) flux found in LEO does not significantly effect thermal and optical performance of ML-210-IB. Samples of this coating were exposed to AO for a duration equivalent to about fifteen (15) years of time. VUV exposure of the coating was about 130 times that of normal exposure. For Geosynchronous Earth Orbit (GEO) and LEO applications as a baffle absorptance coating, ML-210-IB provides excellent service in optical and/or thermal applications.

The table below lists the optical and application parameters of cured ML-210-IB:

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.91 ± 0.02
Solar Absorbance (α_S)	0.98 ± 0.02 at ≥ 1.5 mils thickness
Use Temperature Range	-180 C to 600 C
Appearance/Color	Nonspecular optical black
Nominal Dry Thickness	2.5+1.0, -1.5 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 days

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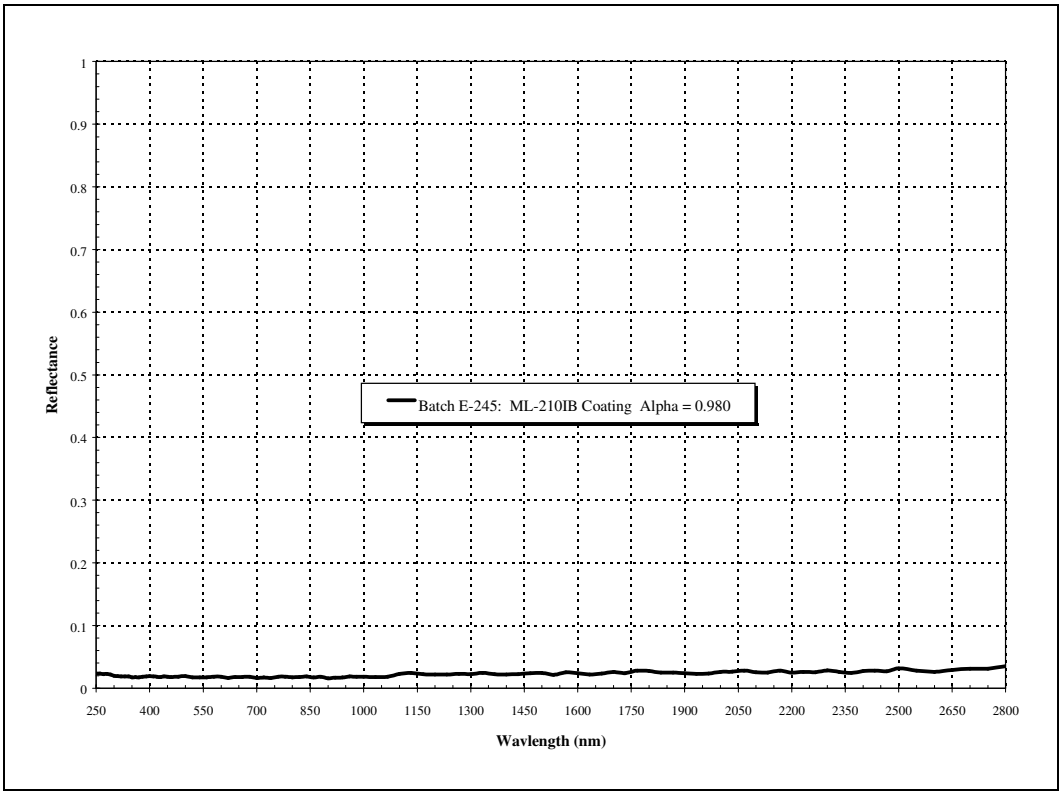
Typical spectral reflectance curve for ML-210-IB coating.Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for ML-210-IB Inorganic Black Nonspecular Coating



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AZ TECHNOLOGY

Product Data Sheet
INORGANIC OPTICAL BLACK

MATERIAL DESIGNATION: RM-550-IB

PRODUCT DESCRIPTION:

RM-550-IB is an inorganic black paint. A highly specialized pigment with a silicate binder ensures that RM-550-IB that can be applied over complex surfaces with relative ease compared to other inorganic thermal control paints and forms a bendable ceramic nonspecular black coating when processed properly. RM-550-IB can be utilized in the Low Earth Orbit (LEO) space environment due to its resistance to the deleterious effects of the Atomic Oxygen (AO) flux found there.

RM-550-IB has been thoroughly tested in space, having been flown on the Optical Properties Monitor (OPM) and the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured RM-550-IB:

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	≥ 0.88 (typically 0.91)
Solar Absorbance (α_S)	≥ 0.94 (typically 0.97) at ≥ 1.5 mils thickness
Use Temperature Range	-180 C to 600 C
Appearance/Color	Nonspecular optical black
Nominal Dry Thickness	3.0+1.0, -1.5 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 days

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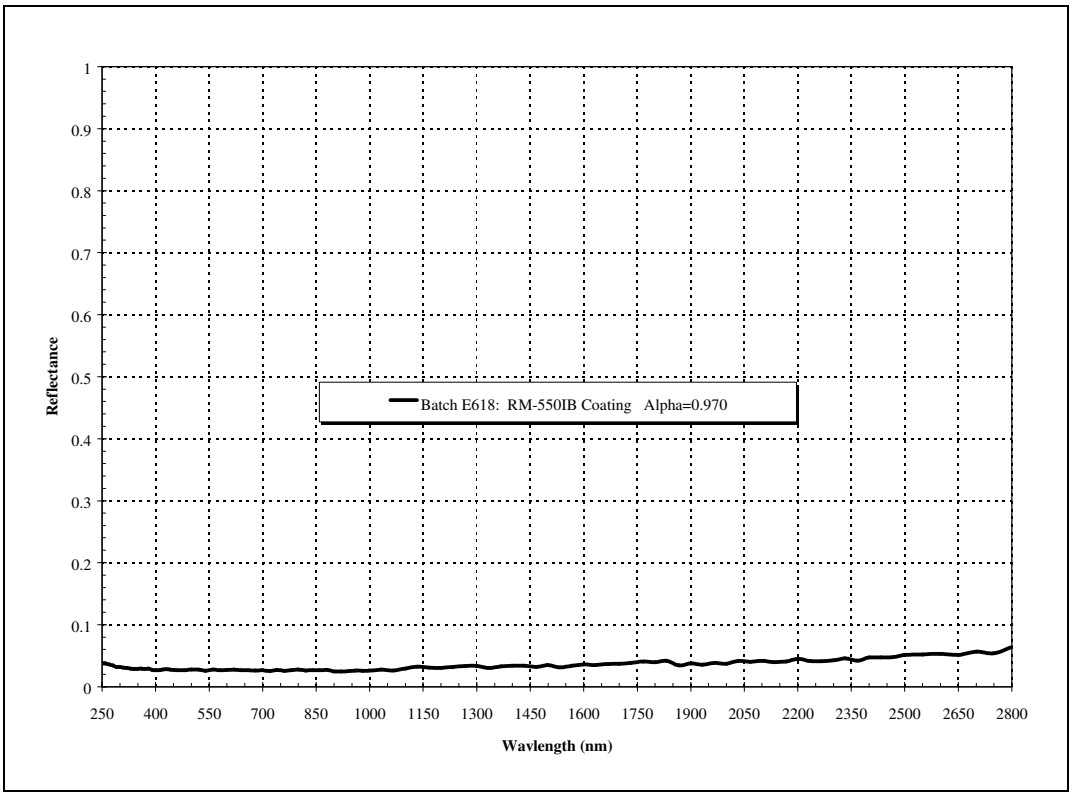
Typical spectral reflectance curve for RM-550-IB coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for RM-550-IB Black Inorganic Coating



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AZ TECHNOLOGY

Product Data Sheet
INORGANIC BLACK BAFFLE COATING

MATERIAL DESIGNATION: TMD-560-IB

PRODUCT DESCRIPTION:

TMD-560-IB is an inorganic black baffle paint. With the use of a specialized mixed metal oxide pigment in a silicate binder, TMD-560-IB is an inorganic coating that can be spray deposited over complex surfaces with minimal difficulty or environmental impact to provide an inorganic nonspecular black baffle coating. This coating has not been fully tested in the rigorous environment of Low Earth Orbit (LEO), so the deleterious effects of long term exposure to the Atomic Oxygen (AO) flux found there may adversely affect the thermal and optical performance of TMD-560-IB. However, for Geosynchronous Earth Orbit (GEO) and terrestrial applications as a baffle absorption coating, TMD-560-IB provides excellent service in optical and/or thermal applications.

The table below lists the optical and application parameters of cured TMD-560-IB:

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.91 ± 0.02
Solar Absorbance (α_S)	0.95 ± 0.01 at ≥ 1.5 mils thickness
Use Temperature Range	-180 C to 1100 C
Appearance/Color	Nonspecular optical black
Nominal Dry Thickness	2.5+1.0, -1.5 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 days

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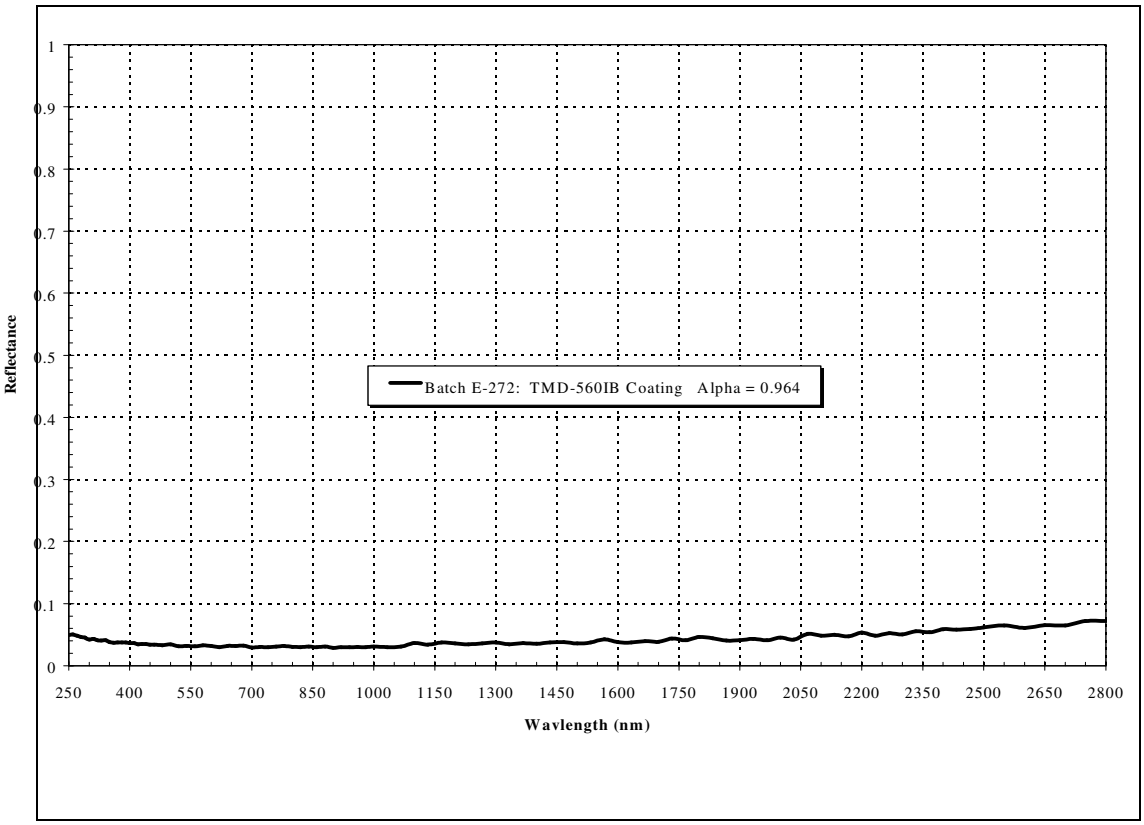
Typical spectral reflectance curve for TMD-560-IB coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for TMD-560-IB Inorganic Black Nonspecular Baffle Coating



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AZ TECHNOLOGY

Product Data Sheet
INORGANIC BLACK SEMI-CONDUCTIVE

MATERIAL DESIGNATION: AZ-1000-ECB

PRODUCT DESCRIPTION:

AZ-1000-ECB is a high absorbance electrically conductive inorganic black thermal control paint developed for use on spacecraft surfaces exposed to the deleterious effects of the space environment. AZ-1000-ECB is designed to be deposited onto large complex surfaces with minimal difficulty or environmental impact to provide a coating that maintains optical and electrical properties when exposed to the space environment. This thermal control coating possesses several orders of magnitude greater electrical conductivity than currently available thermal control coatings while providing atomic oxygen protection and surface charge dissipation for spacecraft applications.

AZ-1000-ECB has been thoroughly tested in space, having been flown on the Optical Properties Monitor (OPM), the MIR MEEP POSA-I experiment and the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured AZ-1000-ECB:

Nominal Surface Resistivity	10^2-10^4 Ω/sq
Thermal Emittance (ε_t)	0.89 ± 0.02
Solar Absorbance (α_S)	0.97 ± 0.01 at ≥ 1.5 mils thickness
Use Temperature Range	-180 C to 1100 C
Appearance/Color	Nonspecular black
Nominal Dry Thickness	2.5 ± 1.5 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 days

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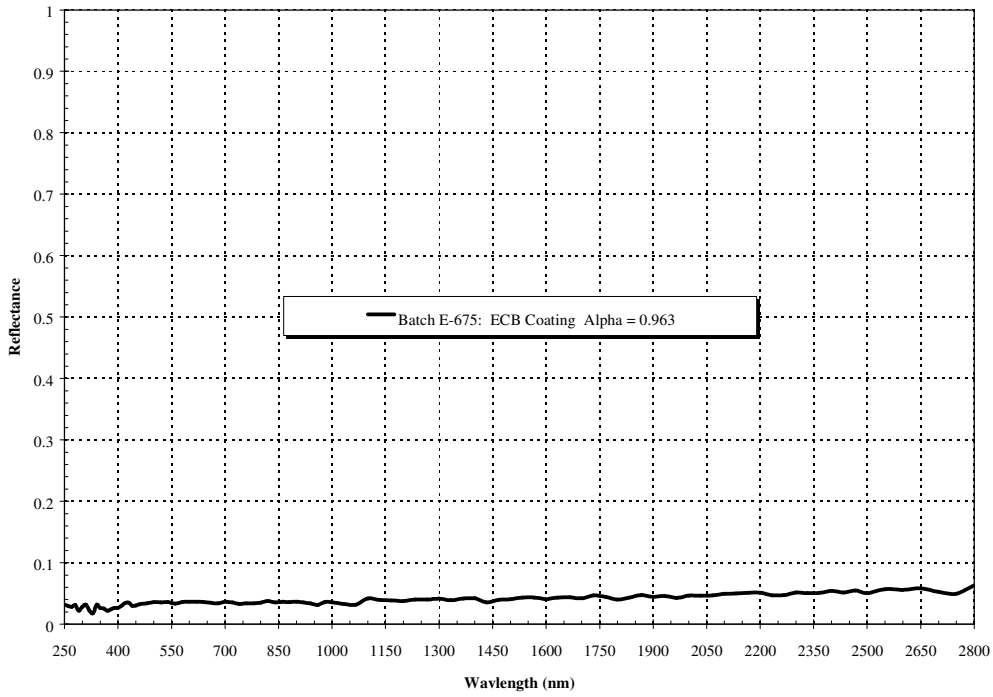
Typical spectral reflectance curve forAZ-1000-ECB coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for AZ-1000-ECB Black Inorganic *Semi-Conductive* Coatings



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AZ TECHNOLOGY

Product Data Sheet
SILICONE OPTICAL BLACK

MATERIAL DESIGNATION: RM-550-LSB

PRODUCT DESCRIPTION:

RM-550-LSB is an organic black nonspecular paint/coating, originally designed for use on spacecraft and satellites. A highly specialized pigment with a silicone binder ensures that RM-550-LSB that can be applied over complex surfaces with relative ease compared to other organic thermal control paints and forms a bendable nonspecular black coating when processed properly. RM-550-LSB can be utilized in the Low Earth Orbit (LEO) space environment due to its resistance to the deleterious effects of the Atomic Oxygen (AO) flux found there.

The table below lists the optical and application parameters of cured RM-550-LSB:

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	≥ 0.88 (typically 0.91)
Solar Absorbance (α_S)	≥ 0.94 (typically 0.97) at ≥ 1.5 mils thickness
Use Temperature Range	-180 C to 400 C
Appearance/Color	Nonspecular optical black
Nominal Dry Thickness	3.0+1.0, -1.5 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	48 to 72 hours

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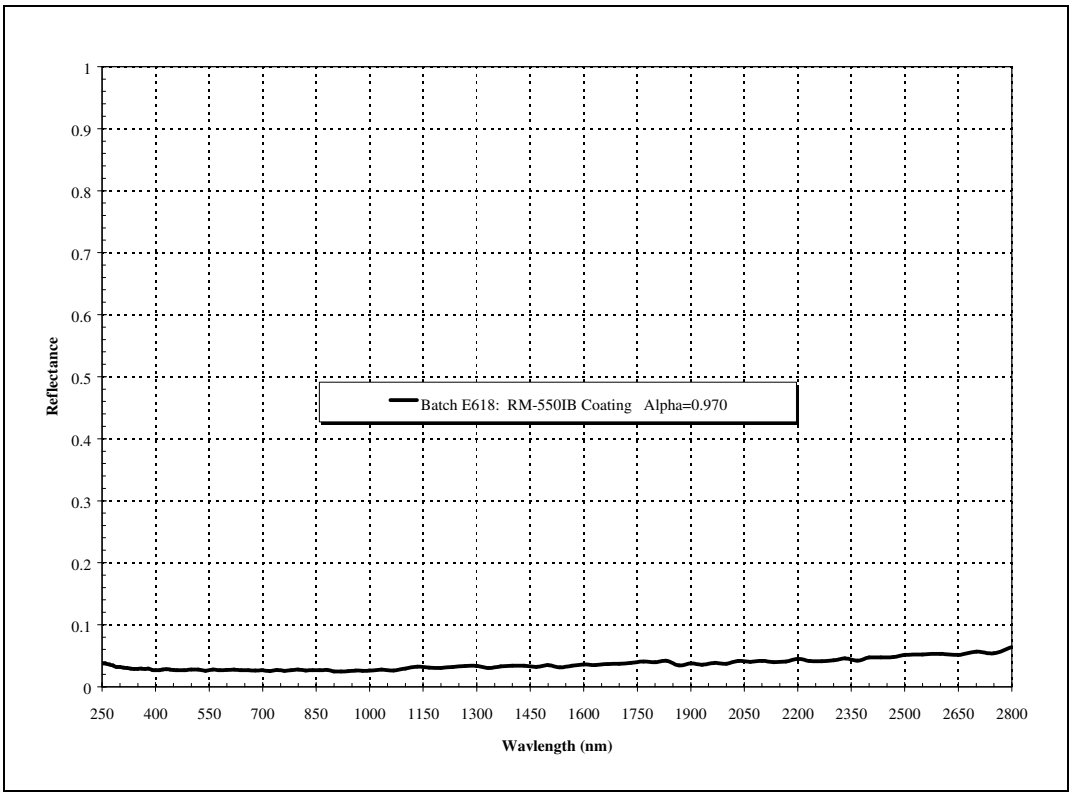
Typical spectral reflectance curve for RM-550-IB coating, the inorganic version of RM-550-LSB.. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for RM-550-IB Black Inorganic Coating



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Product Data Sheet
SILICONE OPTICAL BLACK

MATERIAL DESIGNATION: MLS-85-SB

PRODUCT DESCRIPTION:

A highly specialized pigment with a silicone binder, MLS-85-SB paint can be applied over complex surfaces with relative ease to form a bendable nonspecular black coating. This coating can be utilized in the Low Earth Orbit (LEO) space environment due to its resistance to the deleterious effects of the Atomic Oxygen (AO) flux found there. MLS-85-SB has had limited AO testing, therefore the user should evaluate the performance of this coating for their particular application prior to use. For Geosynchronous Earth Orbit (GEO) and terrestrial applications as a baffle absorptance coating, MLS-85-SB provides excellent service in optical and/or thermal applications. MLS-85-SB may also be applied with a brush, however, solar absorptance (α_s) and thermal emittance (ε_t) values may not fall within the ranges shown below. This is an excellent coating for use with vacuum systems, optical instruments or internal as well as external spacecraft applications.

MLS-85-SB was flown on the Optical Properties Monitor (OPM) and returned after 9 months of exposure.

The table below lists the optical and application parameters of cured MLS-85-SB:

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.91 ± 0.02
Solar Absorbance (α_S)	0.98 ± 0.01 at ≥ 1.5 mils thickness
Use Temperature Range	-180 C to 600 C
Appearance/Color	Nonspecular optical black
Nominal Dry Thickness	3.0+1.0, -1.5 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	48 to 72 hours

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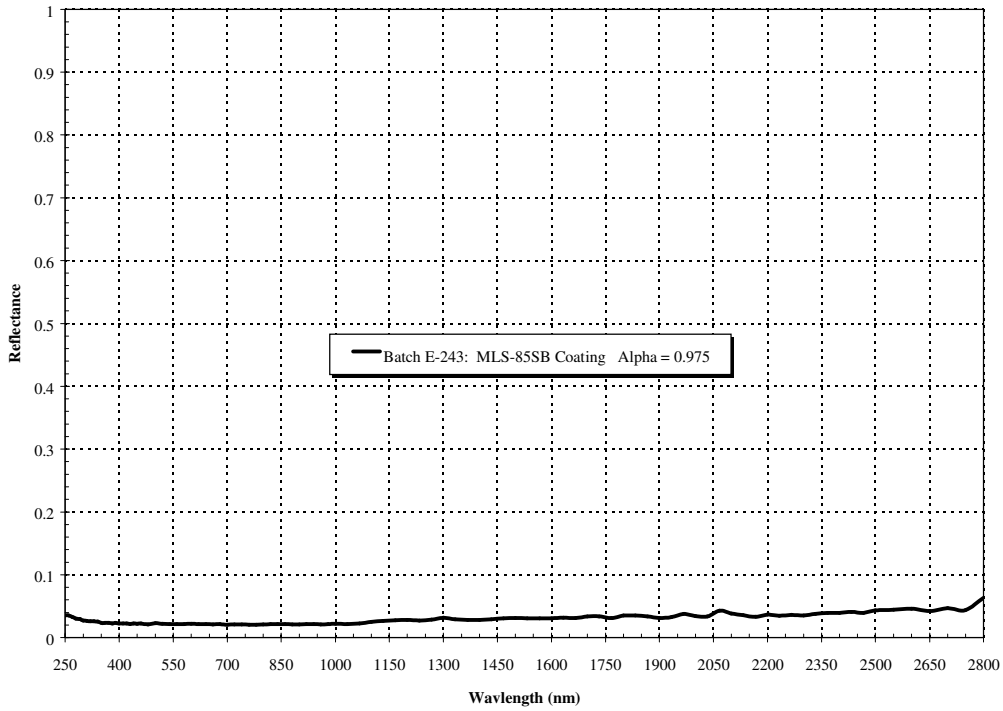
Typical spectral reflectance curve for MLS-85-SB coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for MLS-85-SB Black Silicone Coatings



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AZ TECHNOLOGY

Product Data Sheet
SILICONE OPTICAL BLACK

MATERIAL DESIGNATION: MLS-85-SB-c

PRODUCT DESCRIPTION:

MLS-85-SB-C is a conductive version of MLS_85-SB. A highly specialized pigment with a silicone binder, MLS-85-SB-C paint can be applied over complex surfaces with relative ease to form a bendable conductive nonspecular black coating. This coating can be utilized in the Low Earth Orbit (LEO) space environment due to its resistance to the deleterious effects of the Atomic Oxygen (AO) flux found there. MLS-85-SB-C has had limited AO testing, therefore the user should evaluate the performance of this coating for their particular application prior to use. For Geosynchronous Earth Orbit (GEO) and terrestrial applications as a baffle absorptance coating, MLS-85-SB-C provides excellent service in optical and/or thermal applications where static dissipation is needed. MLS-85-SB-C may also be applied with a brush, however, solar absorptance (α_s) and thermal emittance (ε_t) values may not fall within the ranges shown below. This is an excellent coating for use with vacuum systems, optical instruments or internal as well as external spacecraft applications.

The non-conductive version, MLS-85-SB, was flown on the Optical Properties Monitor (OPM) and returned after 9 months of exposure.

The table below lists the optical and application parameters of cured MLS-85-SB-C:

Nominal Surface Resistivity	~10^5 Ω/sq
Thermal Emittance (ε_t)	0.91 ± 0.02
Solar Absorbance (α_S)	0.98 ± 0.01 at ≥ 1.5 mils thickness
Use Temperature Range	-180 C to 600 C
Appearance/Color	Nonspecular optical black
Nominal Dry Thickness	3.0+1.0, -1.5 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	48 to 72 hours

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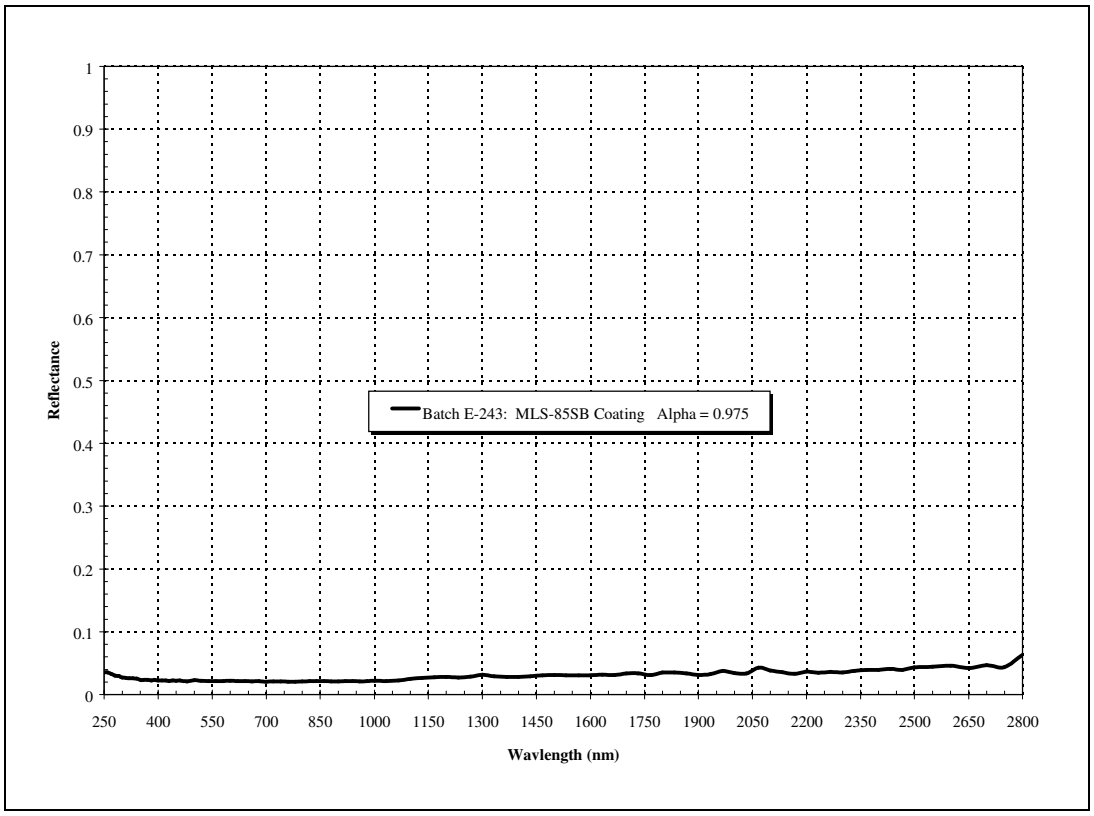
Typical spectral reflectance curve for MLS-85-SB coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for MLS-85-SB Black Silicone Coatings



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AZ TECHNOLOGY

Product Data Sheet
ORGANIC HIGH TEMPERATURE LOW EMITTANCE METALLIC GRAY ESD PAINT/COATING

MATERIAL DESIGNATION: AZ-3700-LSW

PRODUCT DESCRIPTION:

AZ Technology's new low thermal emittance paint/coating was developed for use on spacecraft surfaces exposed to the deleterious effects of vehicle launch and space environment. Design objectives were to produce an electrostatic dissipative low emittance coating with an alpha over emittance value close to one.

AZ-3700-LSW is a high temperature ESD type coating, based on a low offgasing organic silicone type binder, that can be spray deposited with high-volume low-pressure systems onto large complex surfaces with minimal difficulty. AZ-3700-LSW uses a self priming binder, so that use of a primer is not required.

The table below lists the typical electrical, thermal optical and application parameters of cured AZ-3700-LSW coating.

*Nominal Surface Resistivity	$1x10^6$ - $1x10^9$ Ω/sq
*Thermal Emittance (ε_t)	Typically: 0.25 to 0.33
*Solar Absorptance (α_S)	Typically 0.22 to 0.25 at ≥ 1.25 mils thickness
Max Service Temperature	600°C (no long duration test data available)
Appearance/Color	Nonspecular metallic gray
Nominal Dry Thickness	1.00 to 2.00 mils
ASTM D3359A Adhesion Grade	Not less than 3A (Al Substrate)
Full Cure	7 Days at ambient
**ASTM 595 TWL/WVR/CVM %	0.047 % / 0.035 % / 0.010 %

*Tailorable property **Based on similarity

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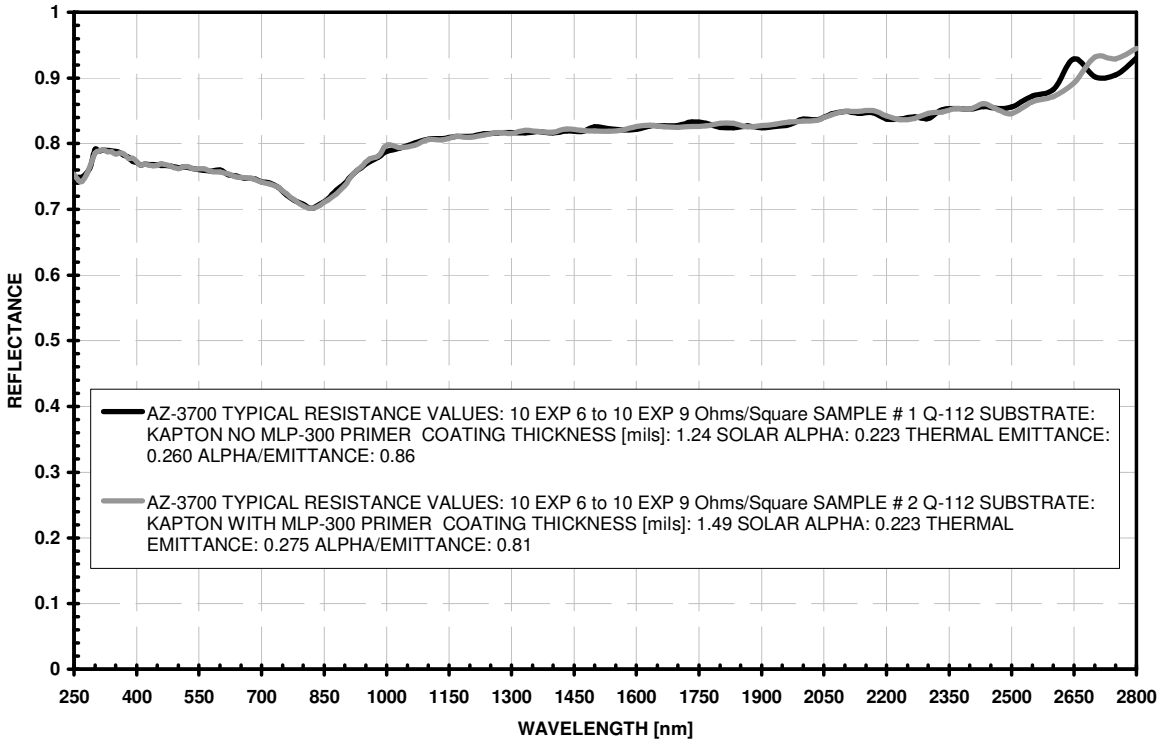
Spectral reflectance curve for two samples of AZ-3700-LSW coating, with typical resistance values, α_S, ε_t and α_S/ε_t.

Total Hemispherical Spectral Reflectance for AZ-3700-LSW, Organic Metallic Gray Coating



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AZ TECHNOLOGY

Product Data Sheet
INORGANIC GREEN MARKER COATING

MATERIAL DESIGNATION: AMJ-400-IG

PRODUCT DESCRIPTION:

AMJ-400-IG is an inorganic green paint developed for use on spacecraft and Beta cloth utilized in the manufacture of MLI blankets. A specialized pigment in a silicate binder, AMJ-400-IG can be spray deposited with standard air spray coating equipment or high-volume low-pressure systems to form a bendable inorganic nonspecular green marker coating use on emblems, logos, signs etc.

AMJ-400-IG has been thoroughly tested in space, having been flown on the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured AMJ-400-LSR

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.90 ± 0.02
Solar Absorbance (α_S)	~0.56 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 900 C
Appearance/Color	Nonspecular green
Nominal Dry Thickness	3.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 Days

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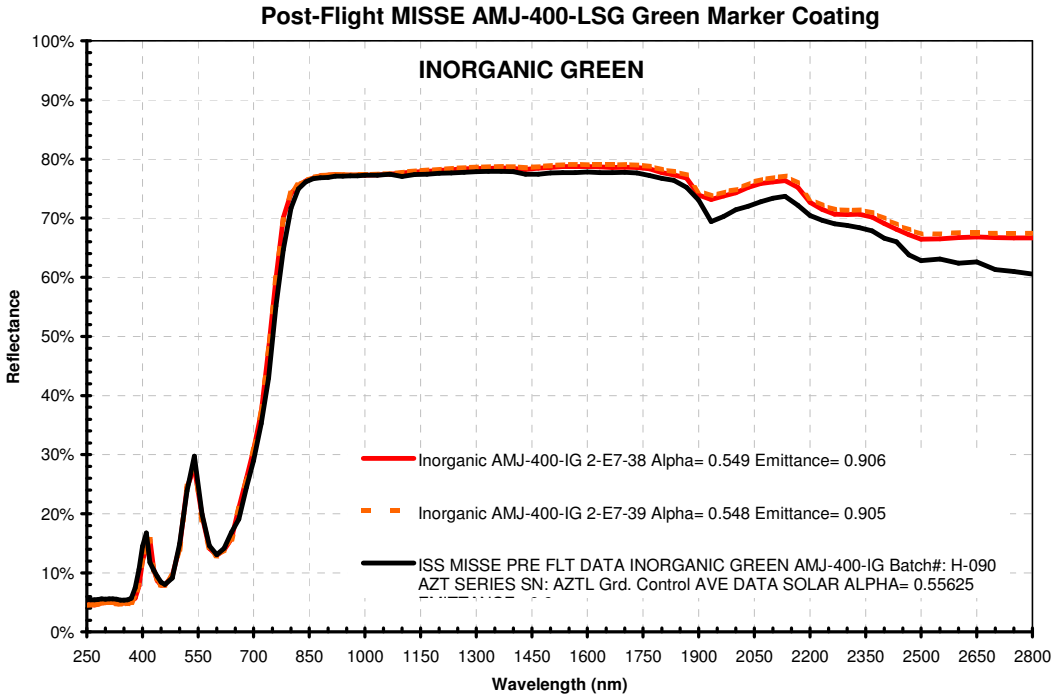
Spectral reflectance curve for AMJ-400-IG coating showing pre- and post-flight on MISSE.

Total Hemispherical Spectral Reflectance for AMJ-400-IG, Inorganic Green Nonspecular Marker Coating



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AZ TECHNOLOGY

Product Data Sheet
INORGANIC GREEN MARKER COATING

MATERIAL DESIGNATION: AMJ-600-IR

PRODUCT DESCRIPTION:

AMJ-600-IR is an inorganic red paint developed for use on spacecraft and Beta cloth utilized in the manufacture of MLI blankets. A specialized pigment in a silicate binder, AMJ-600-IR can be spray deposited with standard air spray coating equipment or high-volume low-pressure systems to form a bendable organic nonspecular red marker coating for use on emblems, logos, signs etc.

AMJ-600-IR has been thoroughly tested in space, having been flown on the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured AMJ-600-IR

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.91 ± 0.02
Solar Absorbance (α_S)	~0.45 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 900 C
Appearance/Color	Nonspecular red
Nominal Dry Thickness	3.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 Days

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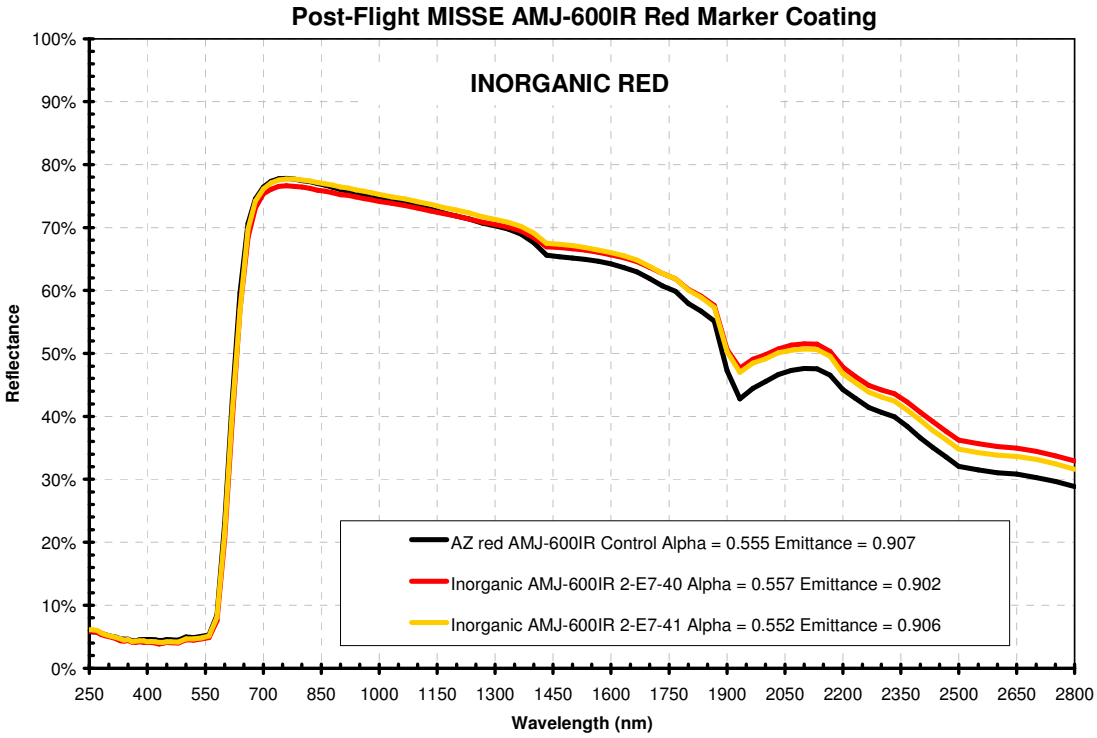
Spectral reflectance curve for AMJ-600-IR coating showing pre- and post-flight on MISSE.

Total Hemispherical Spectral Reflectance for AMJ-600-IR, Inorganic Red Nonspecular Marker Coating



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AZ TECHNOLOGY

Product Data Sheet
INORGANIC BLUE MARKER COATING

MATERIAL DESIGNATION: AMJ-700-IBU Blue

PRODUCT DESCRIPTION:

AMJ-700-IBU is an inorganic blue paint developed for use on spacecraft. A specialized pigment in a silicate binder, AMJ-700-IBU can be spray deposited with standard air spray painting equipment or high-volume low-pressure system to form a bendable inorganic nonspecular blue marker coating for use on emblems, logos, signs etc. NASA has tested AMJ-700-IBU exposed to atomic oxygen (AO) fluence of 5.6 x 1022 atoms/cm2 and vacuum ultraviolet (VUV) energy. It has also be tested for resistance to ultraviolet (UV) radiation for a duration of 566 equivalent solar hours. Less than 2% deterioration in solar absorptance (α_s) and less than 1% change in thermal emittance (ε_t). AMJ-700-IBU will be tested in the near future for flammability and toxicity requirements per NHB 8060.1C and being completely inorganic this coating is expected to pass these tests.

AMJ-700-IBU has been thoroughly tested in space, having been flown on the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured AMJ-700-IBU:

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.88 ± 0.02
Solar Absorbance (α_S)	~0.76 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 900 C
Appearance/Color	Nonspecular optical blue
Nominal Dry Thickness	3.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 Days

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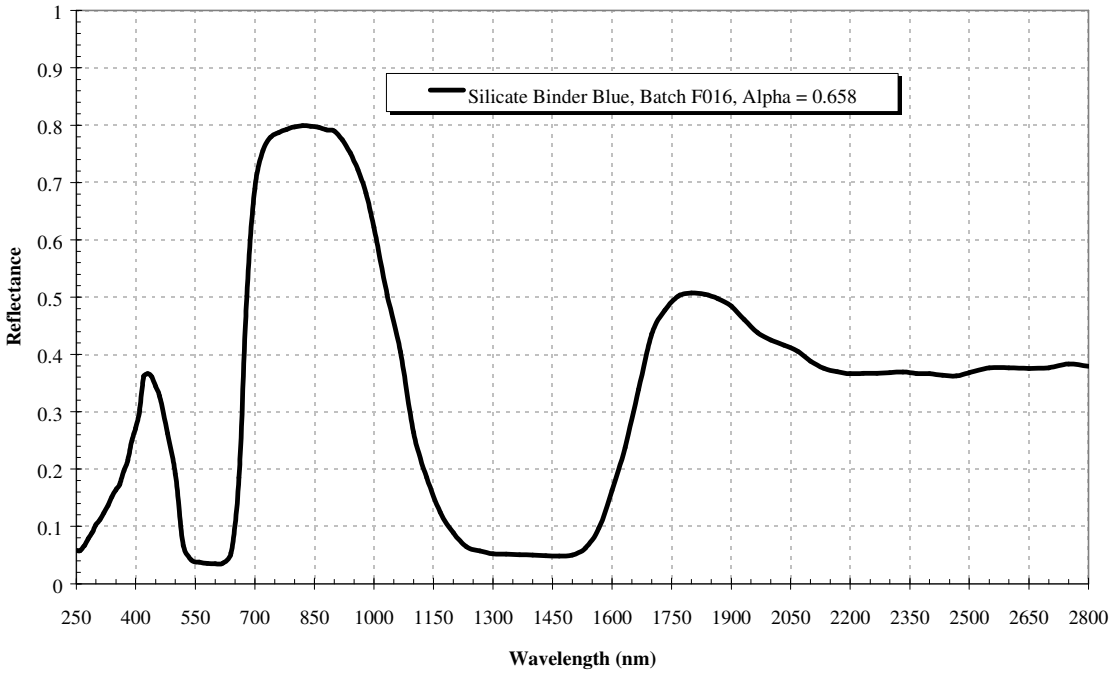
Typical spectral reflectance curve for AMJ-700-IBU coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for AMJ-700IBU, Inorganic Blue Nonspecular Marker Coating



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Product Data Sheet
INORGANIC SKYBLUE MARKER COATING

MATERIAL DESIGNATION: AMJ-710-IBU Blue

PRODUCT DESCRIPTION:

AMJ-710-IBU is an inorganic skyblue paint developed for use on spacecraft. A specialized pigment in a silicate binder, AMJ-710-IBU can be spray deposited with standard air spray coating equipment or high-volume low-pressure system to form a bendable inorganic nonspecular skyblue marker coating for use on emblems, logos, signs etc. AMJ-710-IBU will be tested in the near future for flammability and toxicity requirements per NHB 8060.1C and being completely inorganic this coating is expected to pass these tests.

AMJ-710-IBU has been thoroughly tested in space, having been flown on the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured AMJ-710-IBU.

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.89 ± 0.02
Solar Absorbance (α_S)	~0.54 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 900 C
Appearance/Color	Nonspecular optical skyblue
Nominal Dry Thickness	3.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 Days

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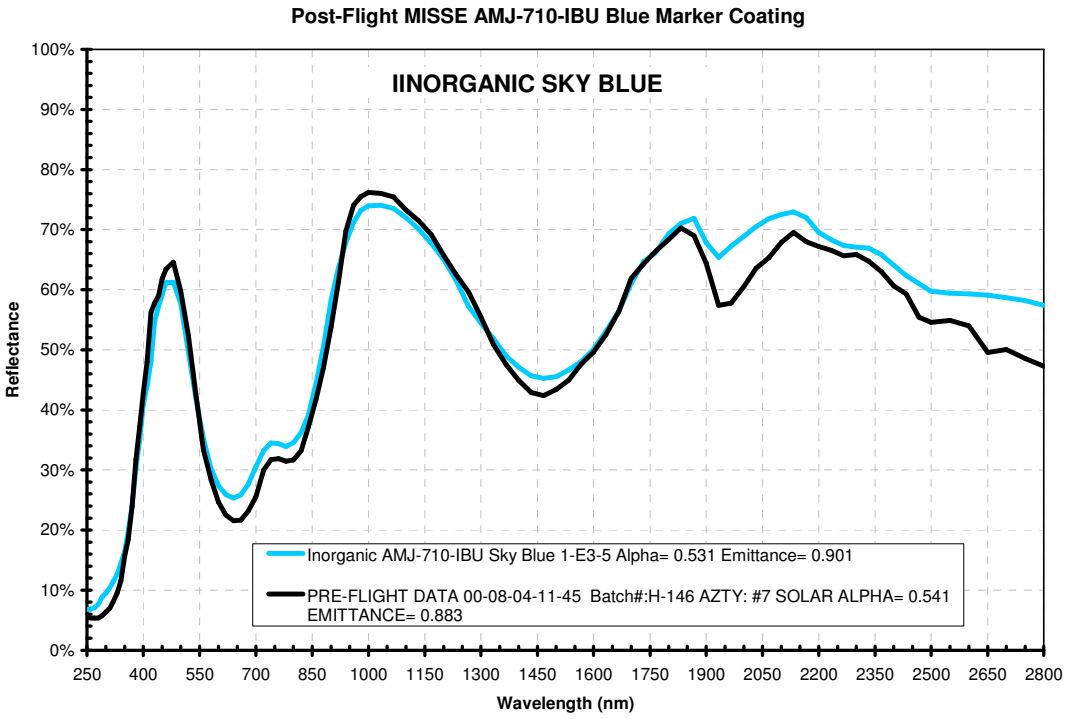
Spectral reflectance curve for AMJ-710-IBU coating showing pre- and post-flight on MISSE.

Total Hemispherical Spectral Reflectance for AMJ-710-IBU, Inorganic SkyBlue Nonspecular Marker Coating



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Product Data Sheet
INORGANIC YELLOW MARKER COATING

MATERIAL DESIGNATION: TMS-800-IY

PRODUCT DESCRIPTION:

TMS-800-IY is an inorganic yellow paint developed for use on spacecraft EVA handrails and for Beta cloth utilized in the manufacture of MLI blankets. If the Beta cloth is Teflon coated, the surface should be prepared with a suitable etchant prior to coating application for best results. This material has good adhesion on hard anodized aluminum. A specialized pigment in a silicate binder, TMS-800-IY can be spray deposited with an air brush or high-volume low-pressure system to form a flexible inorganic yellow nonspecular marker coating for use on emblems, logos, signs etc.

TMS-800-IY meets flammability and toxicity requirements of NHB 8060.1C.TMS-800-IY has been thoroughly tested in space, having been flown on the Optical Properties Monitor (OPM), the MIR MEEP POSA-I experiment and the Materials International Space Station Experiment (MISSE).

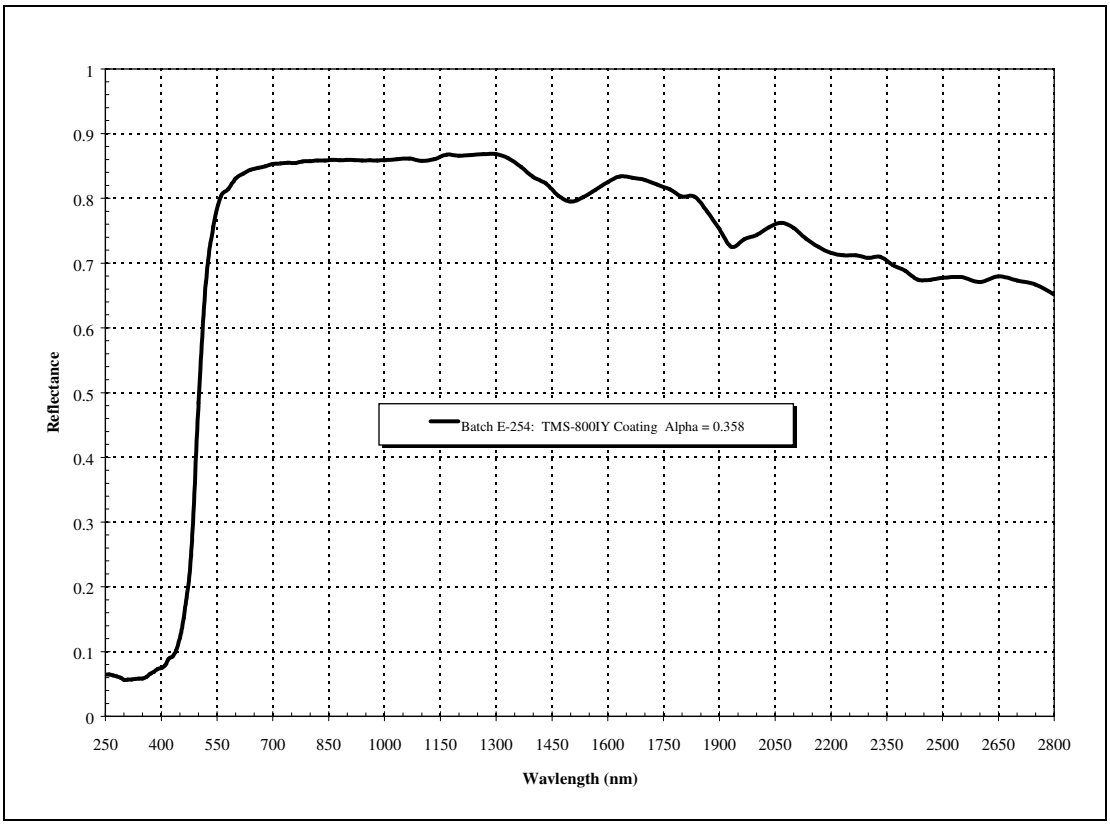
The table below lists the optical and application parameters of cured TMS-800-IY.

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.89 ± 0.02
Solar Absorbance (α_S)	~0.36 at ≥ 4.0 mils thickness
Use Temperature Range	-180 C to 900 C
Appearance/Color	Nonspecular optical yellow
Nominal Dry Thickness	4.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A

AZ Technology has provided specialized coatings to many major aerospace corporations and to NASA. We have also consulted with spacecraft manufacturers in the development and application of thermal control coatings for flight hardware. AZ Technology personnel have the background and experience to provide all your spacecraft coating needs. For more information or to place an order, call Jim Zwiener at (256) 837-9877 ext. 145 or Amy Alvis at ext. 147, 8:00 AM to 5:00 PM Central Time, Monday through Friday.

Typical spectral reflectance curve for TMS-800-IY coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for TMS-800-IY, Yellow Inorganic Nonspecular Marker Coating



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Product Data Sheet
INORGANIC YELLOW CONDUCTIVE *MARKER COATING*

MATERIAL DESIGNATION: **TMJ-810-ICY**

PRODUCT DESCRIPTION:

TMJ-810-ICY is a developmental conductive inorganic yellow thermal control paint for use on spacecraft surfaces exposed to the deleterious effects of the space environment. This material provides high color contrast, atomic oxygen protection and surface charge dissipation for spacecraft EVA handrail applications. This paint was designed to be deposited onto complex surfaces with minimal difficulty or environmental impact to form a coating that maintains optical and electrical properties when exposed to the space environment.

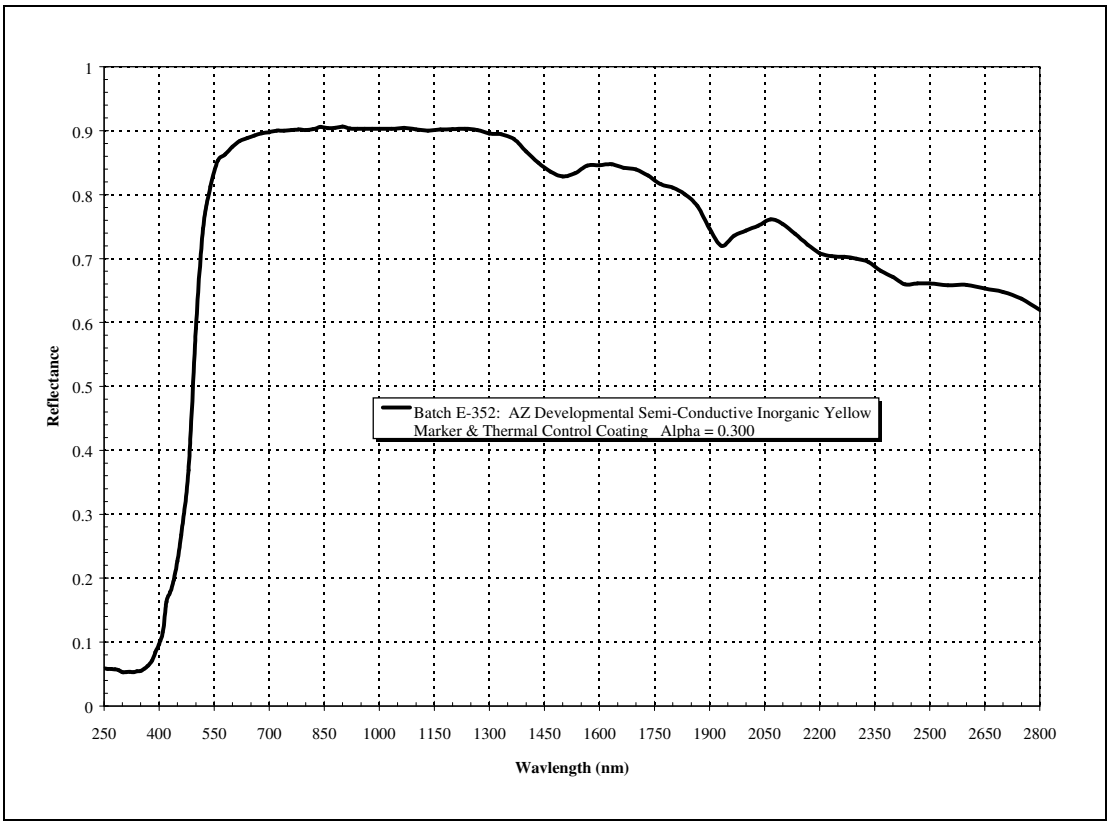
The table below lists the optical and application parameters of cured TMJ-810-ICY.

Nominal Surface Resistivity	10^8-10^9 Ω/sq
Thermal Emittance (ε_t)	0.86 ± 0.02
Solar Absorbance (α_S)	~0.30 at ≥ 4.0 mils thickness
Use Temperature Range	-180 C to 900 C
Appearance/Color	Nonspecular yellow
Nominal Dry Thickness	4.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 days

AZ Technology has provided specialized coatings to many major aerospace corporations and to NASA. We have also consulted with spacecraft manufacturers in the development and application of thermal control coatings for flight hardware. AZ Technology personnel have the background and experience to provide all your spacecraft coating needs. For more information or to place an order, contact Jim Zwiener (256) 837-9877 ext. 145 or Amy Alvis at ext. 147, 8:00 AM to 5:00 PM Central Time, Monday through Friday.

Typical spectral reflectance curve for TMJ-810-ICY coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for TMJ-810-ICY, Inorganic Yellow Conductive Marker & Thermal Control Coating



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Product Data Sheet
SILICONE BLACK MARKER COATING

MATERIAL DESIGNATION: TMJ-20-LSB

PRODUCT DESCRIPTION:

TMJ-20-LSB is an organic black paint developed for use on spacecraft hardware that has been coated with inorganic thermal control coatings. It can also be applied to Beta cloth utilized in the manufacture of MLI blankets. If the Beta cloth is Teflon coated, the surface should be prepared with a suitable etchant prior to coating application for best results. This coating material also exhibits good adhesion on hard anodized aluminum. A specialized pigment in a silicone binder, TMJ-20-LSB can be spray deposited with an air brush or high-volume low-pressure system with the ease of other silicone paints to form a flexible organic black nonspecular marker coating for use on emblems, logos, signs etc. TMJ-20-LSB meets flammability and toxicity requirements of NHB 8060.1C.

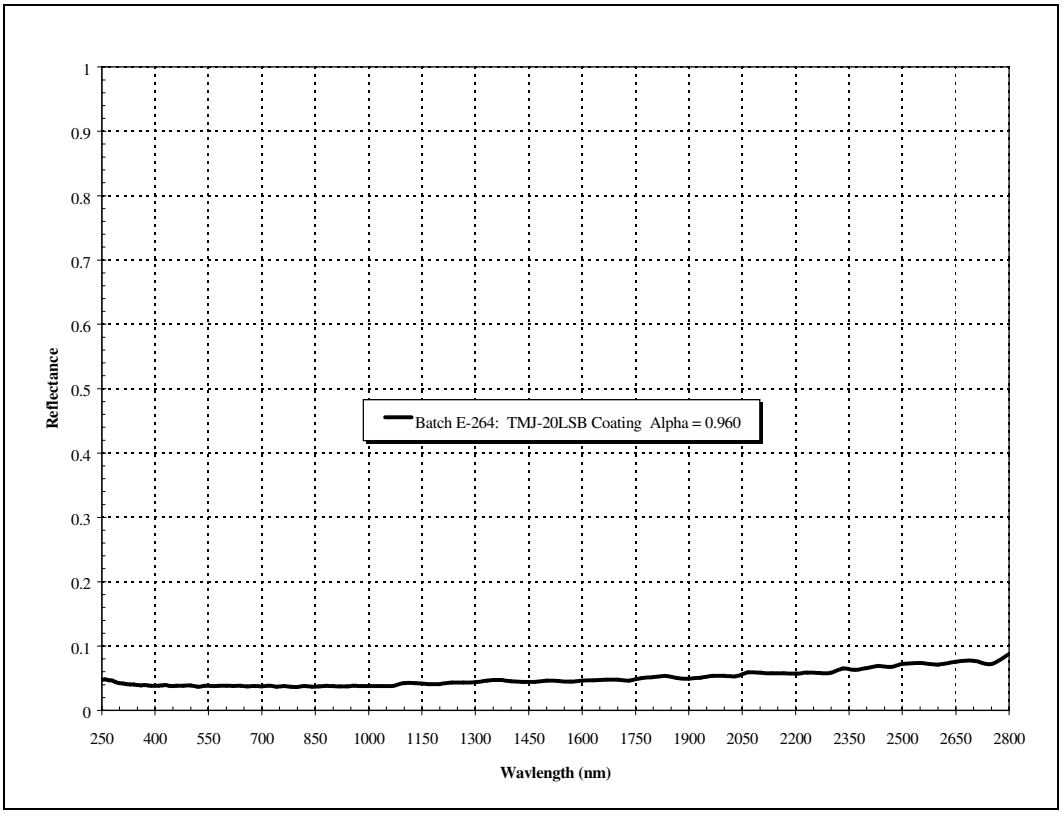
The table below lists the optical and application parameters of cured TMJ-20-LSB.

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.91 ± 0.02
Solar Absorbance (α_S)	~0.96 at ≥ 1.5 mils thickness
Use Temperature Range	-180 C to 600 C
Appearance/Color	Nonspecular optical black
Nominal Dry Thickness	2.0 ± 0.5 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure, ambient	24 hours

AZ Technology has provided specialized coatings to many major aerospace corporations and to NASA. We have also consulted with spacecraft manufacturers in the development and application of thermal control coatings for flight hardware. AZ Technology personnel have the background and experience to provide all your spacecraft coating needs. For more information or to place an order, call Jim Zwiener at (256) 837-9877 ext. 145 or Amy Alvis at ext. 147, 8:00 AM to 5:00 PM Central Time, Monday through Friday.

Typical spectral reflectance curve for TMJ-20-LSB coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for TMJ-20-LSB Silicone Black Semi-flat Marker Coating



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Product Data Sheet

SILICONE GREEN MARKER COATING

MATERIAL DESIGNATION: AMJ-450-LSG Green

PRODUCT DESCRIPTION:

AMJ-450-LSG is an organic green paint developed for use on spacecraft and Beta cloth utilized in the manufacture of MLI blankets. A specialized pigment in a silicone binder, AMJ-450-LSR can be spray deposited with standard air spray painting equipment or high-volume low-pressure systems with the ease of other silicone paints to form a bendable organic green nonspecular marker coating for use on emblems, logos, signs etc. AMJ-450-LSR will be tested in the near future for flammability and toxicity requirements per NHB 8060.1C.

AMJ-450-LSG has been thoroughly tested in space, having been flown on the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured AMJ-450-LSG:

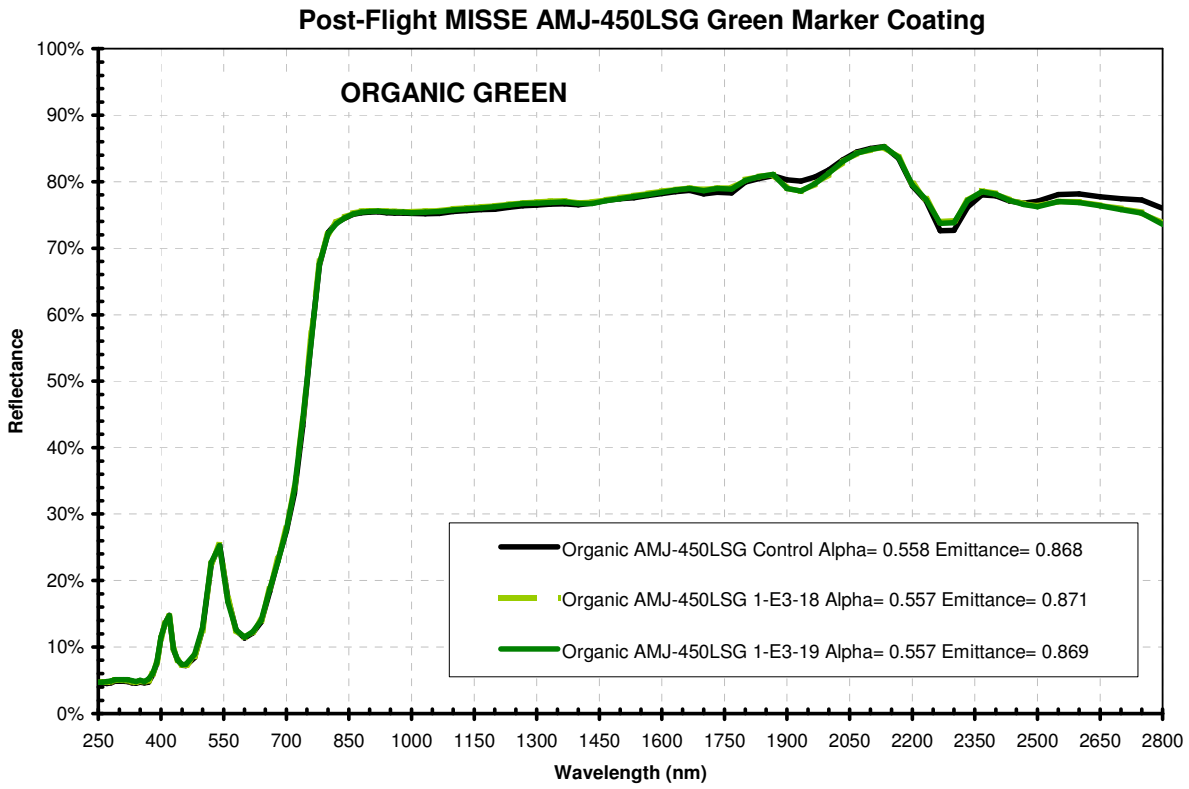
:

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.85 ± 0.02
Solar Absorbance (α_S)	~0.56 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 600 C
Appearance/Color	Nonspecular green
Nominal Dry Thickness	3.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure, ambient	48 to 72 hours

AZ Technology has provided specialized coatings to many major aerospace corporations and to NASA. We have also consulted with spacecraft manufacturers in the development and application of thermal control coatings for flight hardware. AZ Technology personnel have the background and experience to provide all your spacecraft coating needs. For more information or to place an order, contact Jim Zwiener (256) 837-9877 ext. 145 or Amy Alvis at ext. 147, 8:00 AM to 5:00 PM Central Time, Monday through Friday.

Spectral reflectance curve for AMJ-450-LSG coating showing pre- and post-flight on MISSE.

Total Hemispherical Spectral Reflectance for AMJ-450-LSG, Silicone Green Nonspecular Marker Coating



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Product Data Sheet

SILICONE RED MARKER COATING

MATERIAL DESIGNATION: AMJ-650-LSR Red

PRODUCT DESCRIPTION:

AMJ-650-LSR is an organic red paint developed for use on spacecraft and Beta cloth utilized in the manufacture of MLI blankets. A specialized pigment in a silicone binder, AMJ-650-LSR can be spray deposited with standard air spray painting equipment or high-volume low-pressure systems with the ease of other silicone paints to form a bendable organic red nonspecular marker coating for use on emblems, logos, signs etc. AMJ-650-LSR will be tested in the near future for flammability and toxicity requirements per NHB 8060.1C.

AMJ-650-LSG has been thoroughly tested in space, having been flown on the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured AMJ-650-LSR:

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.89 ± 0.02
Solar Absorbance (α_S)	~0.48 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 600 C
Appearance/Color	Nonspecular optical red
Nominal Dry Thickness	3.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure, ambient	48 to 72 hours

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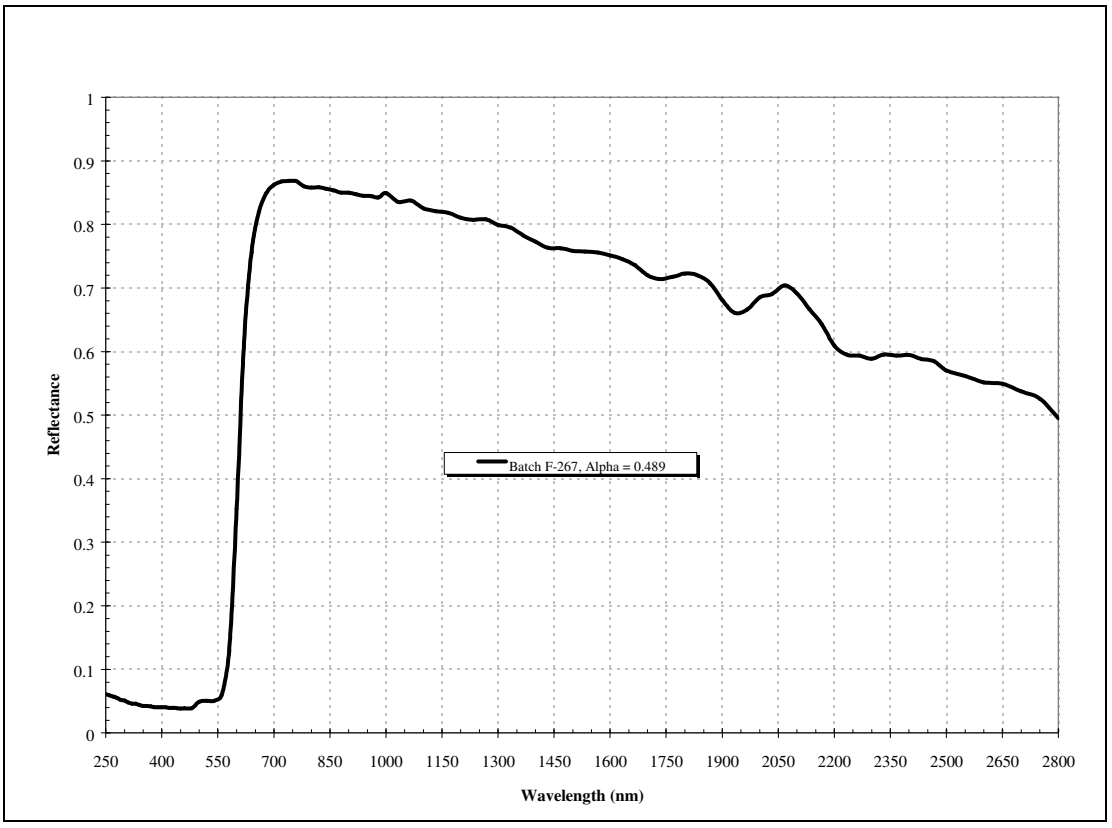
Typical spectral reflectance curve for AMJ-650-LSR coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for AMJ-650-LSR, Silicone Red Nonspecular Marker Coating



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Product Data Sheet
SILICONE BLUE MARKER COATING

MATERIAL DESIGNATION: AMJ-750-LSBU Blue

PRODUCT DESCRIPTION:

AMJ-750-LSR is an organic blue paint developed for use on spacecraft and Beta cloth utilized in the manufacture of MLI blankets. A specialized pigment in a silicone binder, AMJ-750-LSR can be spray deposited with standard air spray painting equipment or high-volume low-pressure systems with the ease of other silicone paints to form a bendable organic blue nonspecular marker coating for use on emblems, logos, signs etc. AMJ-750-LSR will be tested in the near future for flammability and toxicity requirements per NHB 8060.1C.

AMJ-750-LSBU has been thoroughly tested in space, having been flown on the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured AMJ-750-LSBU:

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.81 ± 0.02
Solar Absorbance (α_S)	~0.76 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 600 C
Appearance/Color	Nonspecular optical blue
Nominal Dry Thickness	3.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure, ambient	48 to 72 hours

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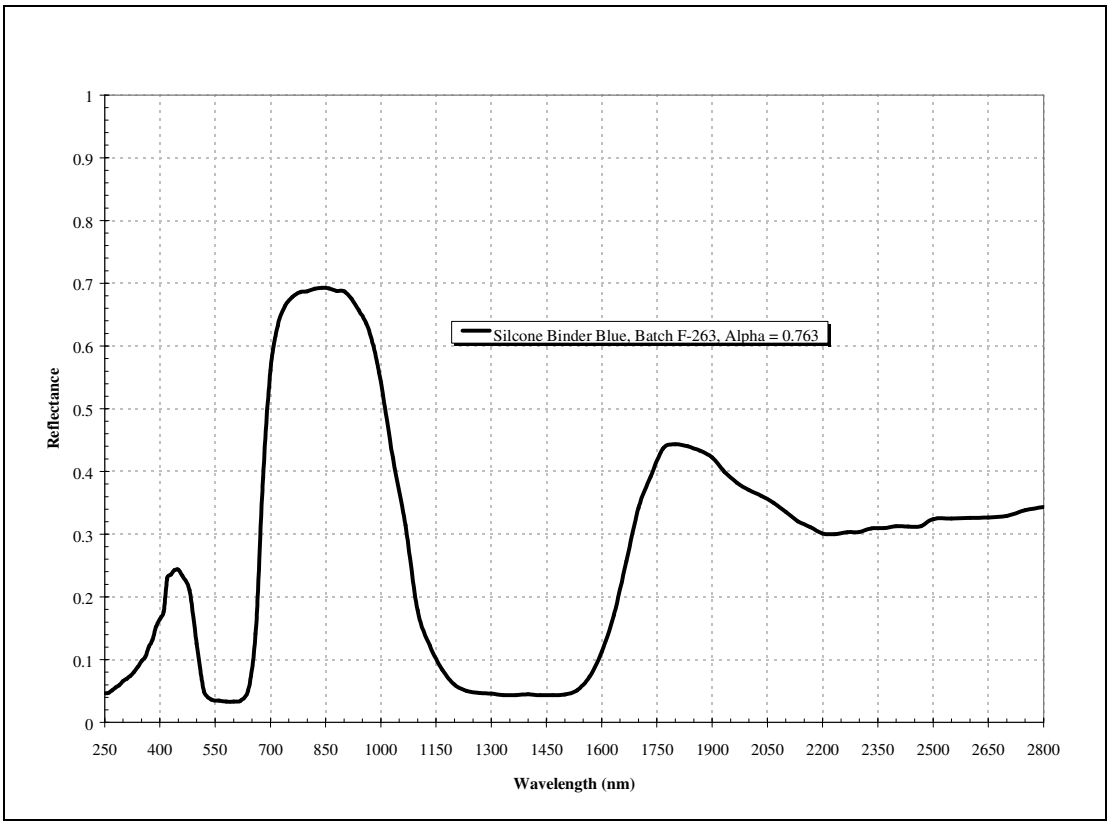
Typical spectral reflectance curve for AMJ-750-LSBU coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for AMJ-750-LSBU,Silicone Blue Nonspecular Marker Coating



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Product Data Sheet
SILICONE SKYBLUE MARKER COATING

MATERIAL DESIGNATION: AMJ-760-LSBU Skyblue

PRODUCT DESCRIPTION:

AMJ-760-LSBU is an organic skyblue paint developed for use on spacecraft and Beta cloth utilized in the manufacture of MLI blankets. A specialized pigment in a silicone binder, AMJ-760-LSBU can be spray deposited with standard air spray painting equipment or high-volume low-pressure systems with the ease of other silicone paints to form a bendable organic skyblue nonspecular marker coating for use on emblems, logos, signs etc. AMJ-760-LSBU will be tested in the near future for flammability and toxicity requirements per NHB 8060.1C.

AMJ-710-IBU, the inorganic version, has been thoroughly tested in space, having been flown on the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured AMJ-760-LSBU:

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.89 ± 0.02
Solar Absorbance (α_S)	~0.54 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 600 C
Appearance/Color	Nonspecular optical skyblue
Nominal Dry Thickness	3.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure, ambient	48 to 72 hours

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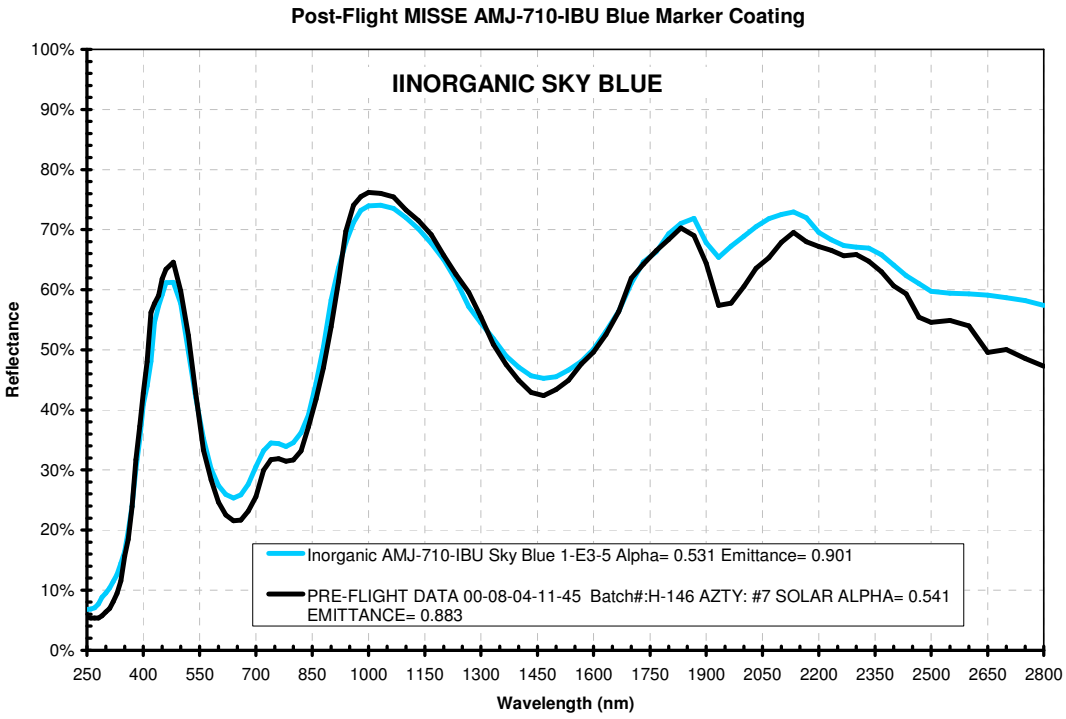
Spectral reflectance curve for AMJ-710-IBU, the inorganic version of AMJ-760-LSBU, coating showing pre- and post-flight on MISSE.

Total Hemispherical Spectral Reflectance for AMJ-710-IBU, Inorganic SkyBlue Nonspecular Marker Coating



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Product Data Sheet
SILICONE YELLOW MARKER COATING

MATERIAL DESIGNATION: TMJ-850-LSY

PRODUCT DESCRIPTION:

AMJ-850-LSR is an organic yellow paint developed for use on spacecraft EVA handrails and Beta cloth utilized in the manufacture of MLI blankets. If the Beta cloth is Teflon coated, the surface should be prepared with a suitable etchant prior to coating application for best results. A specialized pigment in a silicone binder, AMJ-850-LSR can be spray deposited with standard air spray painting equipment or high-volume low-pressure systems with the ease of other silicone paints to form a bendable organic red nonspecular marker coating for use on emblems, logos, signs etc. TMJ-850-LSY meets flammability and toxicity requirements of NHB 8060.1C. TMJ-850-LSY has been tested and approved for use on Space Station hardware by NASA MSFC. The results of these tests were as follows: Total Mass Loss (TML) of 0.05%, Collected Volatile Condensable Material (CVCM) of 0.01% and Water Vapor Recovery (WVR) of 0.01%.

TMJ-850-LSY has been thoroughly tested in space, having been flown on the Materials International Space Station Experiment (MISSE).

The table below lists the optical and application parameters of cured TMJ-850-LSY.

Nominal Surface Resistivity	N/A
Thermal Emittance (ε_t)	0.86 ± 0.02
Solar Absorbance (α_S)	~0.39 at ≥ 3.0 mils thickness
Use Temperature Range	-180 C to 600 C
Appearance/Color	Nonspecular optical yellow
Nominal Dry Thickness	3.0 ± 1.0 mils (over 85% of coated area)
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure, ambient	48 to 72 hours

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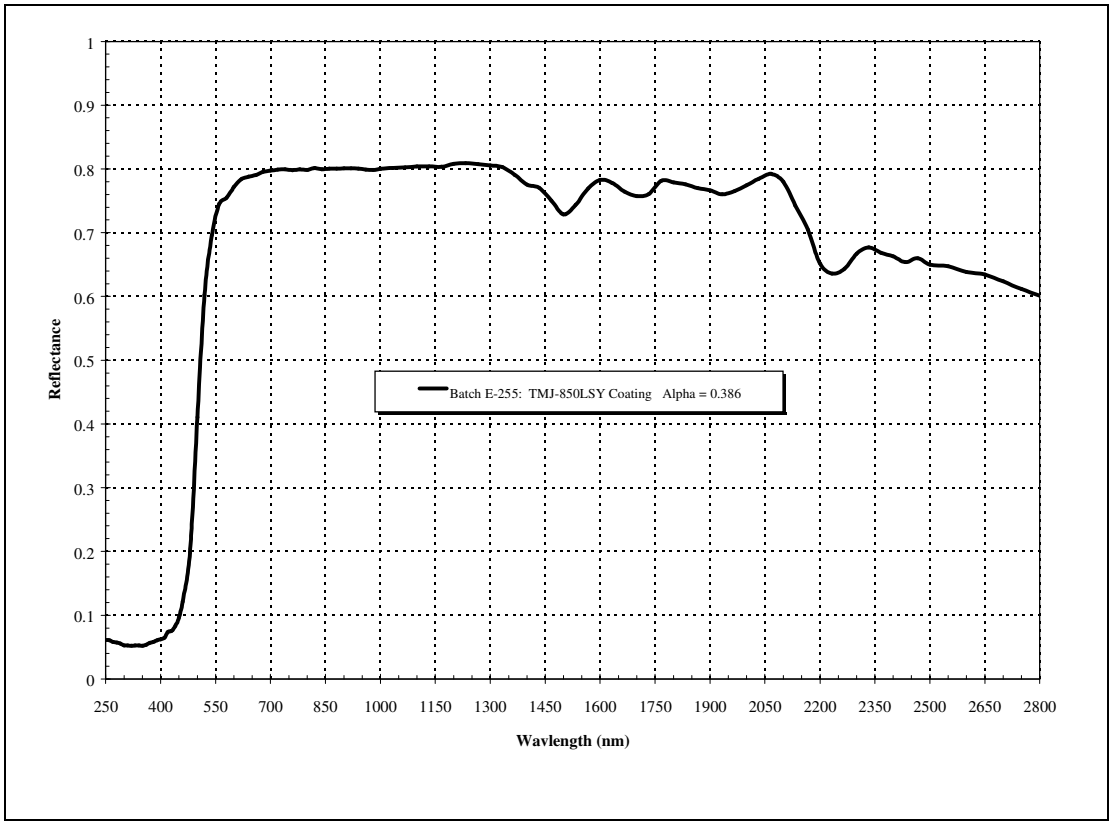
Typical spectral reflectance curve for TMJ-850-LSY coating. Data taken with AZ Technology's Laboratory Portable SpectroReflectometer LPSR-300.

Total Hemispherical Spectral Reflectance for TMJ-850-LSY, Yellow Organic Nonspecular Marker Coating



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Product Data Sheet

MATERIAL DESIGNATION: MLP-100-AZ

PRODUCT DESCRIPTION:

MLP-100-AZ is a RF reflective, sprayable, primer material that provides surface morphology and adhesion to substrates for the application of conventional thermal control paints on spacecraft. The use of MLP-100-AZ allows ceramic thermal control paints such as AZ Technology's AZ-93 white thermal control paint to be used to coat a variety of substrates: alodined and sealed hard anodized 6061-T6, 7075-T352, and other aluminum alloys; stainless steel; epoxy graphite composites; cyanate ester composites; conversion coated titanium; electroless nickel plating; and even 3 mil thick Kapton film.

The table below lists the application parameters of cured MLP-100-AZ.

Use Temperature Range	-180 C to 260 C
Nominal Dry Thickness	0.75 ± 0.25 mils (over 85% of coated area)
Nominal dry film density	1.0 gm/cm^3
Appearance/Color	Silver Gray
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 days

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Product Data Sheet

MATERIAL DESIGNATION: MLP-300-AZ

PRODUCT DESCRIPTION:

MLP-300-AZ is a RF transparent sprayable primer material that provides surface morphology and adhesion to substrates for the application of conventional thermal control paints on spacecraft. The use of MLP-300-AZ allows ceramic thermal control paints such as AZ Technology's AZ-93 white thermal control paint to be used to coat a variety of substrates: alodined and sealed hard anodized 6061-T6, 7075-T352, and other aluminum alloys; stainless steel; epoxy graphite composites; cyanate ester composites; conversion coated titanium; electroless nickel plating; and even 3 mil thick Kapton film.

The table below lists the application parameters of cured MLP-300-AZ:

Use Temperature Range	-180 C to 260 C
Nominal Dry Thickness	0.75 ± 0.25 mils (over 85% of coated area)
Nominal dry film density	1.0 gm/cm^3
Appearance/Color	Light Gray
ASTM D3359A Adhesion Grade	Not less than 3A
Full Cure	7 days

AZ Technology has provided specialized coatings to many major aerospace corporations and to NASA. We have also consulted with spacecraft manufacturers in the development and application of thermal control coatings for flight hardware. AZ Technology personnel have the background and experience to provide all your spacecraft coating needs. For more information or to place an order, contact Jim Zwiener (256) 837-9877 ext. 145 or Amy Alvis at ext. 147, 8:00 AM to 5:00 PM Central Time, Monday through Friday.

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AZ TECHNOLOGY

Product Data Sheet

MATERIAL DESIGNATION: FLUOROPOLYMER PROTECTIVE COATING
PRODUCT NUMBER: AZO-5000-PF

PRODUCT DESCRIPTION:

AZ Technology's fluoropolymer transparent protective paint is a solution based material developed for use on ceramic thermal control coatings. The applied coating provides contamination protection for sensitive ceramic thermal control coatings during assembly and integration. This material is a sacrificial coating that erodes away when exposed to atomic oxygen in low earth orbit leaving the coating being protected in pristine condition. AZO-5000-PF protective coating when used in conjunction with ceramic thermal control coatings, including AZ-93, provides excellent protection against handling and other common ground sources of contamination; including particles and fluids.

The table below lists the optical and application parameters of cured AZO-5000-PF.

Use Temperature Range	-180 C to 260 C
Nominal Dry Thickness	0.25 ± 0.5 mils (over 85% of coated area)
Appearance/Color	Clear
Thermal Emittance (ε_t)	≤0.05 Decrease
Solar Absorbance (α_S)	≤ 1% Increase
Full Cure	24 to 48 hours

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