INCH-POUND

MIL-DTL-85891C
W/AMENDMENT 1
22 JUNE 2026

SUPERSEDING
MIL-DTL-85891C
23 JUN 2025

DETAIL SPECIFICATION

ENGINEERED MEDIA FOR REMOVAL OF ORGANIC COATINGS

This specification is approved for use by all Departments and Agencies of the Department of Defense.

Comments, suggestions, or questions on this document should be addressed to AFLCMC/EZSS, 2145 Monahan Way, Bldg. 28, Wright-Patterson AFB OH, 45433-7017 or e-mailed to ENGINEERING.STANDARDS@US.AF.MIL. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil/.

AMSC N/A FSC 5350

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1. SCOPE

1.1 Scope.

This specification covers five types of engineered media used for removal of organic coatings in an abrasive blast operation.

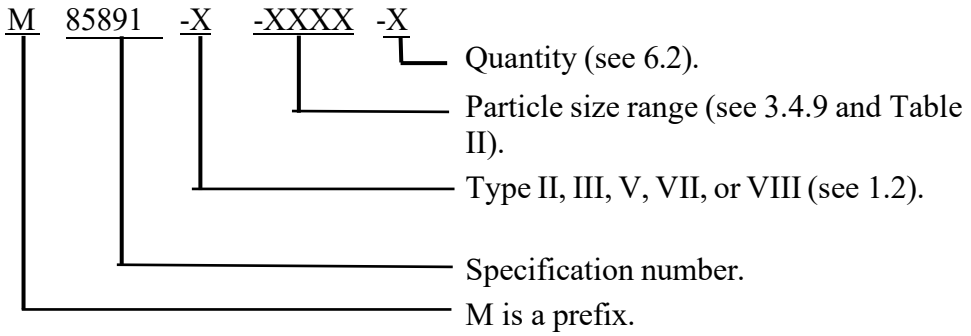
1.2 Classification.

The engineered media are of the following types, as specified (see 6.2):

Type I	DELETED
Type II	Urea Formaldehyde (Thermoset)
Type III	Melamine Formaldehyde (Thermoset)
Type IV	DELETED
Type V	Acrylic (Thermoplastic)
Type VI	DELETED
Type VII	Starch Polymer
Type VIII	Multi-Plastic Chemical Blends

1.3 Part or identifying number (PIN).

PINs to be used for the plastic media acquired to this specification are created as follows:



2. APPLICABLE PUBLICATIONS

2.1 General.

The publications listed in this section are specified in sections 3 and 4 of this specification. This section does not include publications cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, users of this document are cautioned that they must meet all specified requirements of publications cited in sections 3 and 4 of this specification, whether or not they are listed.

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2.2 Government publications.

2.2.1 Specifications, standards, and handbooks.

The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these publications are those cited in the solicitation or contract.

FEDERAL SPECIFICATIONS

CCC-C-440	Cloth, Cheesecloth, Cotton, Bleached and Unbleached

FEDERAL STANDARDS

FED-STD-313	Material Safety Data, Transportation Data, and Disposal Data for Hazardous Materials Furnished to Government Activities

COMMERCIAL ITEM DESCRIPTION

A-A-58054	Abrasive Mats, Non-Woven, Non-Metallic

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-23377	Primer Coatings: Epoxy, High-Solids
MIL-DTL-81706	Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys
MIL-PRF-85285	Topcoat, Aircraft and Support Equipment

(Copies of these publications are available online at https://quicksearch.dla.mil/.)

2.2.2 Other Government publications.

The following other Government publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these publications are those cited in the solicitation or contract.

AIR FORCE TECHNICAL ORDER (TO)

TO 1-1-8	Application and Removal of Organic Coatings, Aerospace and Non-Aerospace Equipment

(Copies of this publication are available online at https://www.e-publishing.af.mil.)

NAVAL CIVIL ENGINEERING LABORATORY (NCEL)

NCEL Contract Report (CR) 87.011	Explosibility and Ignitability of Plastic Abrasive Media

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(Copies of this publication are available online at https://login.dtic.mil/.)

2.2.3 Non-Government publications.
The following publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these publications are those cited in the solicitation or contract.

ASTM INTERNATIONAL

ASTM D792	Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D1921	Standard Test Methods for Particle Size (Sieve Analysis) of Plastic Materials
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D2583	Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM D5630	Standard Test Method for Ash Content in Plastics
ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E70	Standard Test Method for pH of Aqueous Solutions with the Glass Electrode
ASTM E2941	Standard Practices for Extraction of Elements from Ores and Related Metallurgical Materials by Acid Digestion

(Copies of these publications are available online at https://www.astm.org/.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO/IEC 17025	General Requirements for the Competence of Testing and Calibration Laboratories
ISO 21627-3	Plastics – Epoxy Resins – Determination of Chlorine Content

(Copies of this publication is available online at https://www.iso.org.)

SAE INTERNATIONAL

SAE-AMS-QQ-A-250/4	Aluminum Alloy 2024, Plate and Sheet

(Copies of this publication are available online at https://www.sae.org/.)

2.2.4 Order of precedence.
Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this

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document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification.

The engineered media furnished under this specification shall be products authorized by the qualifying activity for listing on the applicable qualified products list before the contract award (see 4.2).

3.2 Safety Data Sheet (SDS).

An SDS shall be prepared and submitted to the independent testing laboratory in accordance with (IAW) FED-STD-313.

3.3 Materials.

The finished product for plastic media shall be made from cured plastic stock of urea formaldehyde for Type II, melamine formaldehyde for Type III, or acrylic plastic for Type V, by processing to the desired size distribution specified herein. The finished product for Type VII engineered media shall be made from wheat- or corn-based starch polymer by processing to the desired size distribution specified herein. The finished product for Type VIII engineered media shall be a multi-plastic blend (or urea/acrylic/melamine). All finished products shall be magnetically cleaned prior to shipment.

3.3.1 Composition of plastic stock.

The finished plastic media product shall be manufactured from selected plastic stock of the exact chemical type required by this specification. The finished product shall be manufactured from virgin plastic stock or from plastic stock formed from scrap plastic (material produced as a by-product of the manufacture of plastic items such as shirt buttons, dinnerware, etc.). Mixtures of different types of plastics or plastic stock material shall not be permitted except Type VIII. The use of antistatic agents, fillers, or other foreign materials for performance enhancement or product stability must be identified by the manufacturer and reported to the Government customer.

3.3.2 Fourier transform infrared spectroscopy (FTIR) attenuated total reflection (ATR).

All engineered media shall undergo FTIR-ATR analysis to confirm that the material matches the description of the media type. The finished product shall be prepared for analysis by grinding to a 200-mesh or smaller powder with a suitable grinder. A background scan should always be run before analyzing the sample. For the most accurate results, ensure the sample covers the entire crystal and gently tightens the pressure anvil over the sample. The spectrum should then be obtained IAW the instructions for the FTIR-ATR. The finished product's spectrogram shall be similar in shape (peak intensities may differ slightly) to those on Figures 1-5 when verified IAW 4.11. The relevant peaks of interest have been highlighted in red on Figures 1-5.

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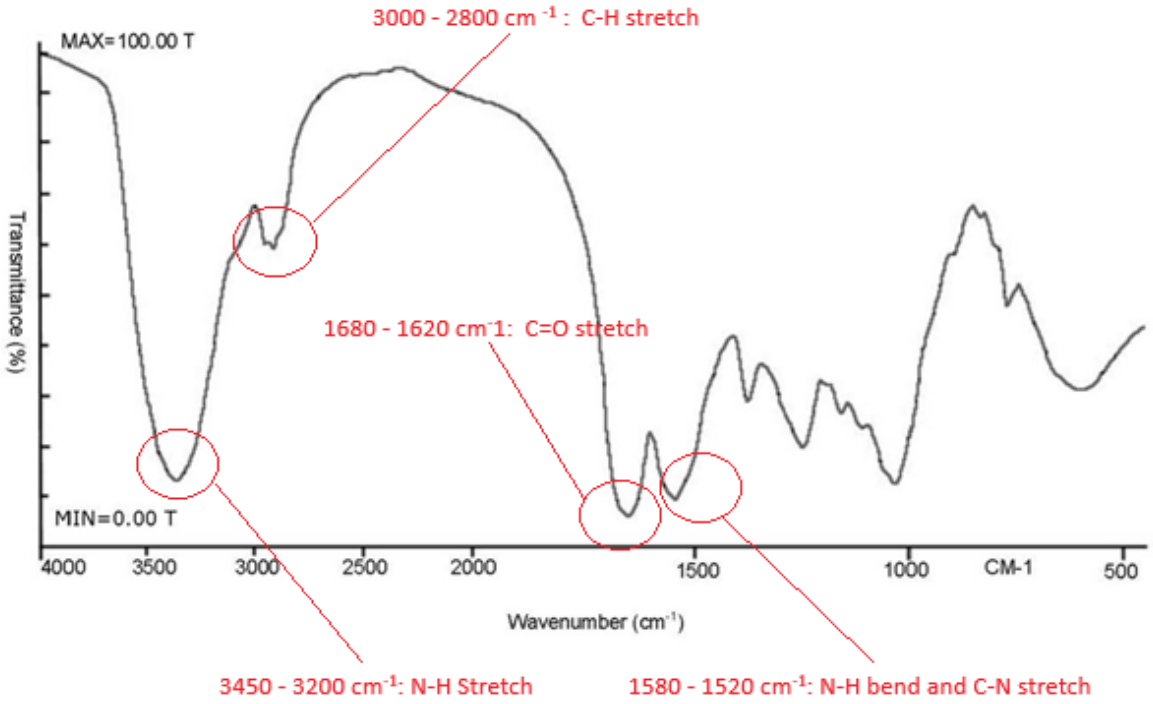


FIGURE 1. Type II urea formaldehyde.

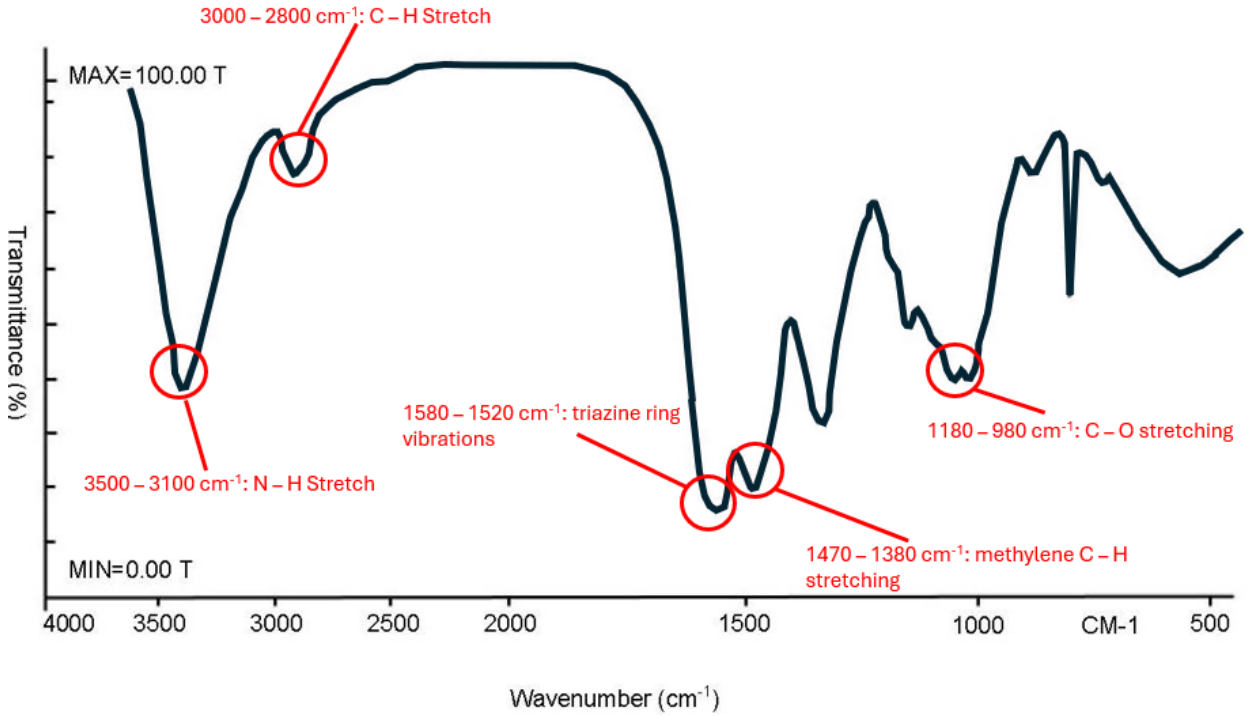


FIGURE 2. Type III melamine formaldehyde.

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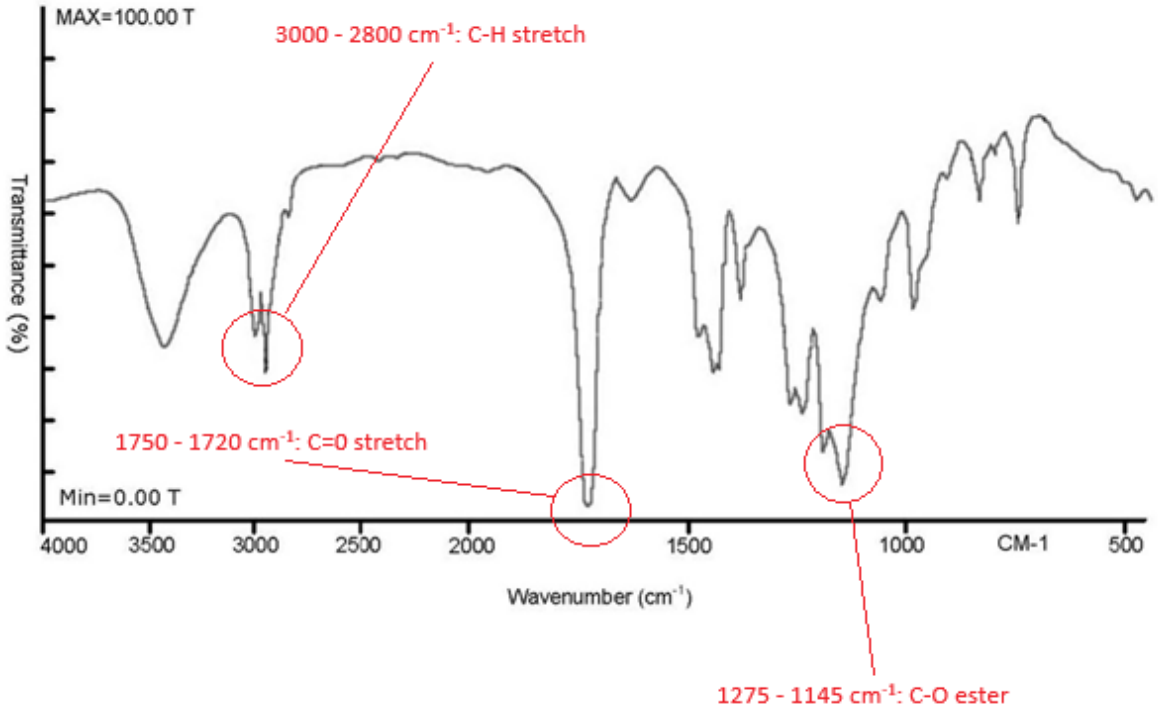


FIGURE 3. Type V acrylic.

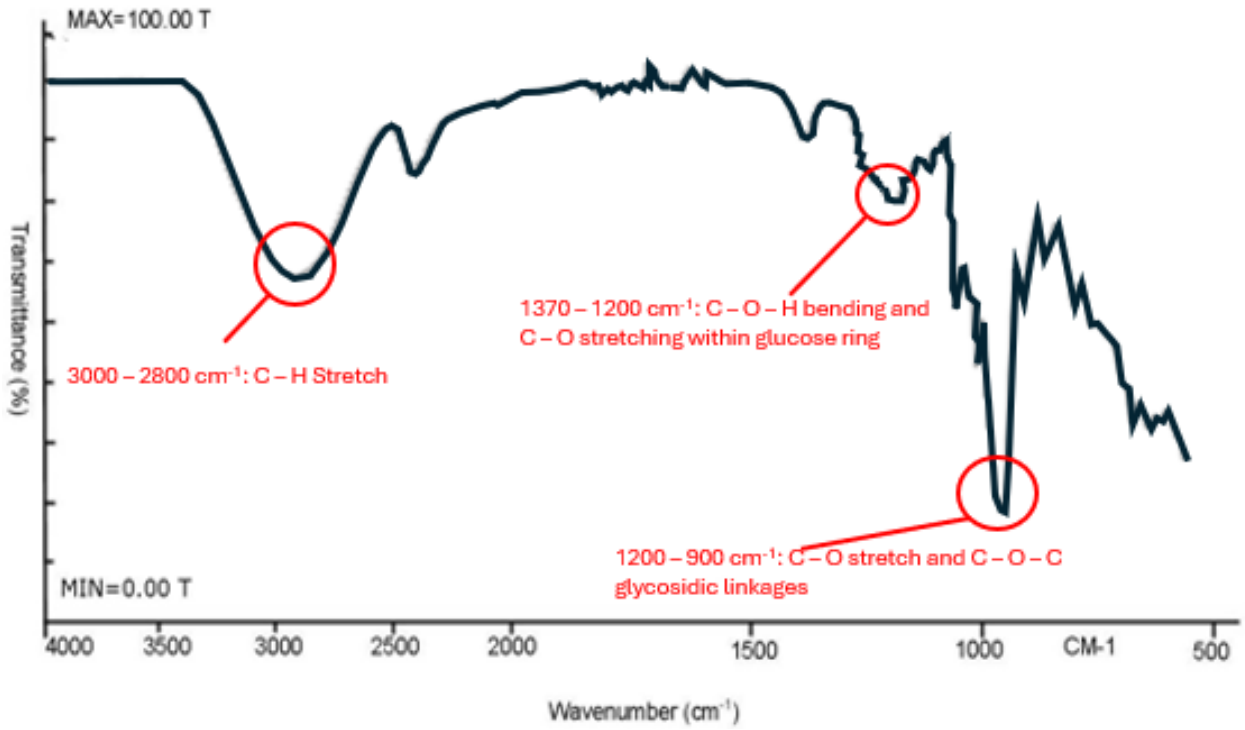


FIGURE 4. Type VII starch polymer.

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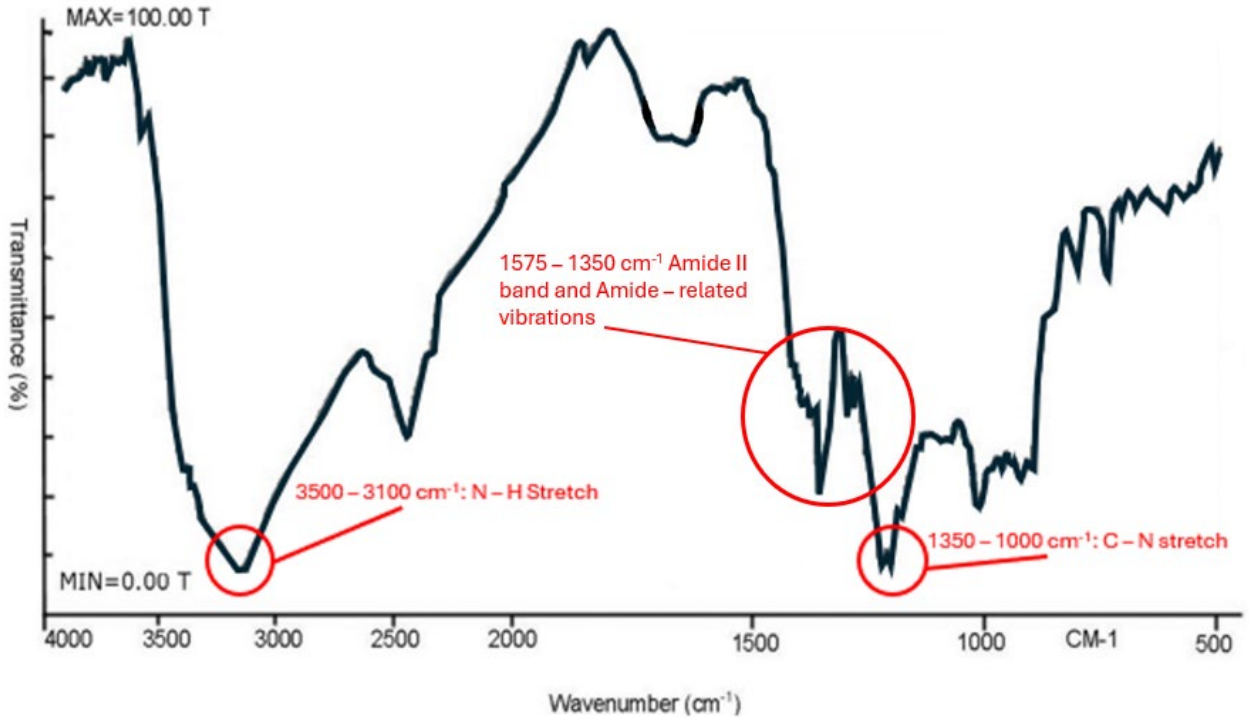


FIGURE 5. Type VIII Urea/melamine multi-plastic blends.

3.3.3 Explosibility and ignitability.

The Naval Civil Engineering Laboratory (NCEL) Contract Report (CR) 87.011 of June 1987 covers an investigation of Types II, III, V, VII, and VIII materials that shall be required prior to procurement. Finished products which satisfies the following criteria and verified IAW 4.12 are not considered explosive or ignitable hazards when used in a properly designed blast system:

Equipment	Media size	Parameter	Limit
1.2-L Furnace	200 mesh or smaller	Minimum auto ignition temperature (MAIT)	350 °C (662 °F)
20-L Chamber with 2500 J igniter	200 mesh or smaller	Lean flammability limit (minimum)	40 g/cu M.
20-L Chamber with 2500 J igniter	200 mesh or smaller	Maximum explosible size	40 mesh

3.3.4 Toxicity.

The finished product shall have no adverse effect on the health of personnel when used for its intended purpose when verified by reviewing the SDS. SDSs for the dyes or pigments used in the media, the media itself, and for any material added to the media after curing (such as antistatic agents) shall be prepared and submitted IAW FED-STD-313. When used for its intended purpose, questions pertinent to the finished product's effect on the health of personnel shall be referred by the acquiring activity to the appropriate medical service of the procuring agency as listed in FED-STD-313.

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3.4 Physical and chemical requirements.

The physical and chemical properties of the finished product shall be IAW Table I, when tested as specified in 4.5 through 4.10 and 4.14. The chemical and physical property requirements are strict and non-negotiable. Failure to comply with any requirement will result in automatic rejection.

TABLE I. Physical and chemical properties.

Property	II	III	V	VII	VIII	Test Para
Hardness Minimum Maximum	Barcol 54 62	Barcol 64 74	Barcol 46 54	Shore D 72 90	Barcol[1/] 46 74	3.4.1
Cl content, max (ppm or mg/L), max (% by weight)	400 0.04	400 0.04	400 0.04	400 0.04	400 0.04	3.4.2
Ash content, max (% by wt.)	4.0	4.0	0.5	1.0	4.0	3.4.3
Iron content, max (ppm or mg/L) Max (% by weight)	1000 0.10	1000 0.10	500 0.05	500 0.05	1000 0.10	3.4.4
pH of Water Extract Minimum Maximum	 5.5 8.5	 6.5 9.5	 4.5 7.5	 6.0 9.0	 6.5 9.5	3.4.5
Specific Gravity Minimum Maximum	 1.40 1.57	 1.47 1.63	 1.10 1.25	 1.30 1.40	 1.43 1.60	3.4.6
Heavy particulates (% by wt.), max[2/, 3/] (ref. 4.10.4)	0.02	0.02	0.02	0.02	0.02	3.4.7
Light particulates (% by wt.), max	1.0	1.0	0.1	1.0	1.0	3.4.8

NOTES:

1. Hardness values for Type VIII are a range encompassing Types II, III, and V medias.
2. Heavy particulates: LST Heavy Fluid 100 (Density = 2.85 ±1%) for all media types except Type VII.
3. Mixture B for light particulates: subtract 0.10 from the minimum specific gravity of the finished product.

3.4.1 Hardness of plastic stock.

The Barcol hardness (Shore D hardness for Type VII) of the plastic stock (approx. 5 in. by 5 in. by 1 in. stock) prior to crushing shall meet the limits specified in Table I when tested IAW 4.14.

3.4.2 Chlorine content.

The finished product shall contain no more chlorine than specified in Table I when tested IAW 4.5. Excessive chlorine content on an aluminum substrate can harm the material's integrity and performance over time.

3.4.3 Ash content.

The purpose of ash content testing is to burn off the organic matter and determine the inorganic matter, i.e., minerals, remaining in the finished product. The finished product shall have an ash content no greater than the allotted amount in Table I for each media type when tested IAW 4.6.

3.4.4 Iron content.

The finished product shall have an iron content no greater than the allotted amount in Table I for

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each media type when tested IAW 4.7. The purpose of iron content testing is to determine the amount of iron in the finished product. Excessive iron content can compromise substrate integrity and contribute to part failure over time.

3.4.5 pH of water extract.
The pH of water extract is essential to understanding the chemical composition and potential reactivity of materials. The pH of the water extract shall meet the requirements of Table I when tested IAW 4.8.

3.4.6 Specific gravity.
The finished product shall have a specific gravity with the range allotted in Table I for each media type when tested IAW 4.9. Be cautious that significant changes in pressure and temperature could affect specific gravity of the sample.

3.4.7 Heavy particulates.
The finished product shall have a heavy particle content no greater than 0.02% when tested IAW 4.10. This stringent requirement underscores the commitment to delivering a product free from excessive heavy particulate matter, affirming the purity of the product received.

3.4.8 Light particulates.
The finished EMB products shall meet the light particulate requirements of Table I when tested IAW 4.11.

3.4.9 Particle size distribution.
Particle size distribution shall meet the requirements of Table II when verified IAW 4.13. All screens used shall be qualified to ASTM E11. The finished product shall have a mesh particle size distribution as specified in Table II. The supplier shall identify the intended particle size for testing. The maximum amount that may pass through or be retained by a given sieve size (left column) is noted is for each particle size distribution.

3.5 Performance properties.
The finished product shall conform to the performance property requirements of Table IV and the anti-static behavior requirements of 3.5.1 when tested using the finished product conforming to the 20-30 particle size distribution for all media types except Type VII, which is 20-50 particle size distribution. Other sizes of finished products shall be manufactured from the same plastic stock and shall differ only in size distribution resulting from the manufacturer's screening operation. Blasting parameters and requirements shall be as specified in Table III.

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TABLE II. Particle size distribution.

	US Standard Particle Size Distribution																			
US Standard Screen Size	12-20		12-16		16-20		20-30		20-40		20-50		30-40		30-60		40-60		60-80	
	Maximum %		Maximum %		Maximum %		Maximum %		Maximum %		Maximum %		Maximum %		Maximum %		Maximum %		Maximum %	
	Retain	Pass	Retain	Pass	Retain	Pass	Retain	Pass	Retain	Pass	Retain	Pass	Retain	Pass	Retain	Pass	Retain	Pass	Retain	Pass
10	0.1		0.1																	
12	5.0		5.0		0.1															
16				20	15		0.1		0.1		0.1									
20		20		5.0		20	15		15		15									
25													0.1		0.1					
30		5.0				5.0		20		60		75	15		5.0					
35																	0.1			
40								5.0		20				20			5.0			
50												20							0.1	
60										5.0				5.0		20		20	5.0	
80																				20
100		1.0		1.0		2.0		2.0		2.0		2.0		3.0		5.0		5.0		5.0

3.5.1 Anti-static behavior.

The finished product shall not cling to the interior walls of a well-grounded blast booth or glove box during the consumption test specified in 4.15.

3.5.2 Storage stability.

After storage for one year under normal storage conditions, the finished product shall meet all the requirements of this specification.

3.5.3 Panel preparation.

An aluminum alloy sheet conforming to QQ-A-250/4 (T3 temper) approximately 12 inches by 12 inches by at least 0.06 inch thick (40 cm by at least 0.15 cm) shall be sheared and used for testing.

3.5.4 Blasting parameters.

Performance testing shall be conducted in a direct pressure blasting device. The blasting parameters shall be as specified in Table III.

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TABLE III. Blasting parameters.

Parameter	Type II	Type III	Type V	Type VII	Type VIII
Nozzle distance from substrate	9-15 inches	12 inches minimum	9-15 inches	6-12 inches	9-15 inches
Nozzle angle (from horizontal)	45-80 degrees	45-80 degrees	45-80 degrees	20-40 degrees	45-80 degrees

3.5.5 Product consumption.

Product consumption requirements shall meet the values for each respective media Type in Table IV when tested IAW 4.15.

TABLE IV. Operational and consumption properties.

Property	Type I	Type II	Type III	Type IV	Type V	Type VI	Type VII	Type VIII	Ref. Para
¼ in. inner diameter nozzle pressure (psi)*	N/A	25	25	N/A	30	N/A	30	25	3.5.4
Consumption % for 4 cycles, max.**	N/A	38	40	N/A	40	N/A	38	40	4.15

NOTES:
*Air pressure in the hose immediately adjacent to the nozzle as measured with a hypodermic needle.
**Consumption rate is based on a 60-mesh screen.

3.5.6 Storage stability.

After storage for one year under normal storage conditions of a climate-controlled environment at 21 ±8 °C (70 ±15 °F) and 50 ±10 percent relative humidity, the finished product shall meet all the requirements of this specification.

4. VERIFICATION

4.1 Classification of inspection.

The inspection requirements specified herein are classified as follows:

a. Qualification inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 Qualification inspection.

Qualification inspection shall be performed on aluminum alloy 2024-T3 material conforming to SAE-AMS-QQ-A-250/4 as specified in each test.

4.2.1 Qualification samples.

The initial qualification will be completed by a laboratory approved by the United States Government, with the request submitted to AFLCMC/EZPT-CPCO (see 6.4). Re-qualification

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will take place at either a lab approved by the United States Government, or an independent third-party lab certified to ISO/IEC 17025. Product sampling shall be conducted utilizing a sampling apparatus such as the Humboldt Riffle Splitter or equivalent. Each sample shall be identified as follows:

a. Qualification test sample.

b. Specification MIL-DTL-85891C.

c. Engineered Media for Removal of Organic Coatings.

d. Manufacturer's name and product type.

4.3 Conformance inspection.
Conformance inspections shall include tests in accordance with 4.6, 4.10, 4.13, and 4.14. Failure to meet any conformance test shall result in rejection of the batch and may constitute justification for removal of the product from the qualified products list. Rejected material shall not be resubmitted for acceptance without prior approval of the procuring activity. Each batch supplied to the US Government shall come with a Certificate of Conformance (CoC) showing passing results to all conformance testing. The resubmission application shall contain full details concerning previous rejections and measures taken to correct the deficiencies.

4.4 Inspection conditions.
Unless otherwise specified, all inspections shall be performed IAW the test conditions IAW this specification.

4.5 Inductively coupled plasma-mass spectrometry (ICP-MS) procedure for chlorine content.

4.5.1 Sample preparation.

a. Under the fume hood, set the hot plate at a temperature of 95 ±5 °C (203 ±9 °F).

b. Using a scale, tare out the weigh boat, weigh 1-2 grams of media, and record weight to the nearest 0.001g.

c. Transfer the media to a 50 mL sample tube and, using a pipette, add 10 mL on nitric acid (HNO_3). Slowly mix the contents, place the sample tube on the hot block, and cover with a disposable watch glass.

d. Let the sample digest for 10-15 minutes.

e. Allow the sample to cool for five minutes and add another 5 mL of nitric acid.

f. Let the sample digest for 30 minutes.

g. After that allow the solution to evaporate to approximately 5 mL; this may take up to two hours.

h. Allow the sample to cool again for five minutes and add 2 mL of deionized (DI) water and 3 mL of 30% hydrogen peroxide (H_2O_2). Put the sample tube back on the hot

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block to start the peroxide reaction.

i. Allow the sample to heat until the volume has evaporated to approximately 5 mL or heat without boiling for two hours.

j. Let the sample cool and dilute the digested product to the 50 mL mark using DI water only.

4.5.2 Sample introduction and procedure.

NOTE: Detailed ICP-MS operating instructions are not provided because of differences between Original Equipment Manufacturers (OEMs). Instead, the analyst/operator shall follow the instructions provided by the OEM of the instrument.

a. Shake the digestive sample in the 50 mL tube for at least 15 seconds. Slowly pour contents into the filter funnel.

b. Once the desired amount of sample has been filtered, remove the filter funnel from the tube.

c. Discard the filter paper in the solid-acids waste bin and place the loading tray into the autosampler.

d. Open the valve to the Argon gas tank and open the ICP-MS program. Turn on the plasma and move the autosampler to the tuning solution to condition the instrument for analysis.

e. During this time, the ICP-MS instrument will warm up and do its daily performance tune.

f. Select the chlorine batch template to start analysis.

g. In the sample list, ensure the chlorine standards are in the correct positions and modify the unknown samples to be analyzed.

h. Once the analytical run begins the system will run the “semi auto tune” process. Ensure the autosampler for the Internal Standard (ISTD) is in the 500-ppb chlorine ISTD vial.

i. Review the tune report for sensitivity and RSD’s.

j. After the calibrations are complete, review curves and samples to ensure all data is valid and acceptable. After analysis, the results may need to be reprocessed for accurate data.

k. After analysis, save results in a specified folder.

l. Turn off instrument and close the valves to the argon gas tank.

m. The analyst can either discard the remaining sample in the liquid acids-waste bin or parafilm the sample for reanalysis.

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4.5.3 Alternate qualification or conformance procedure.

a. Weigh 0.05 g of finished product into a disposable glass test tube.

b. Add a piece of sodium metal (about 0.15 g) to the tube, then heat over a Bunsen burner to a dull red.

c. Allow the test tube content to cool, then add 0.50 mL ethanol to the tube and allow it to react until there is no evidence of residual sodium metal.

d. Heat the test tube carefully to evaporate the ethanol and continue to heat until it glows a dull red.

e. Immediately drop the test tube into 50 mL of distilled water, crush the lower end of the tube, and stir to dissolve any sodium chloride that has formed.

f. Filter the solution into a 250 mL beaker, acidify with 10 or more drops of concentrated nitric acid, add ten drops of 0.1 M silver nitrate, and swirl the beaker for several seconds. The presence of chlorine is indicated by the development of a white precipitate (silver chloride), which disappears upon the addition of several drops of concentrated ammonium hydroxide.

The finished product shall be defined as having no more than a trace of chlorine when the white precipitate is less than that produced when 50 mL of a 16.5 ppm sodium chloride solution (0.0165g) in distilled water is treated with acid and silver nitrate as stated. After completion of the analysis, verify the results are IAW 3.4.2.

NOTE: As an alternative if the independent third-party test laboratory has the appropriate equipment, ISO 21627-3 may be used for testing chlorine content.

4.6 Ash content procedure.
The step-by-step procedure for conducting ash content in plastics IAW ASTM D5630 is as follows:

a. Ensure the analytical balance is calibrated.

b. Place a clean, dry ceramic crucible onto the balance and record the weight.

c. Tare the crucible weight, add three grams of the finished product to the nearest 0.001 g (unit may vary based on balance settings), and record weight.

d. The sample should be weighed as quickly as possible to avoid moisture absorption, which could result in an inaccurate sample weight.

e. To remove water and char the sample, the sample shall be ignited with a Fisher burner until no material loss is visually apparent.

f. To ash the sample, the crucible shall be placed in a muffle furnace at 850 °C (1560 °F) for 30 minutes.

g. Remove the crucible from the muffle furnace and allow it to cool in a safe, heat-resistant area.

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h. Once cooled, weigh the crucible and its contents. The ash residue shall be calculated as a percentage of the initial sample weight. Keep ash for iron content determination.

$$Total\ ash\ content\ (\%) = \frac{W3\ (g) - W1\ (g)}{W2\ (g) - W1\ (g)}\ x\ 100\%$$

Where,
W1 = Weight of empty crucible (g)
W2 = Weight of crucible + sample before ashing (g)
W3 = Weight of crucible + ash after ashing (g)

4.7 Iron content procedure.
The step-by-step procedure for conducting iron content IAW ASTM E2941 is as follows:

4.7.1 Sample preparation.

a. Under the fume hood, set the hot plate at a temperature of 95 ±5 °C (203 ±9 °F).

b. Using a scale, tare out the weigh boat, weigh 1-2 grams of media, and record weight to the nearest 0.001g.

c. Transfer the media to a 50 mL sample tube and, using a pipette, add 2 mL on nitric acid (HNO_3). Slowly mix the contents, place the sample tube on the hot block, and cover with a disposable watch glass.

d. Let the sample digest for 10-15 minutes.

e. Allow the sample to cool for five minutes and add another 4 mL of nitric acid.

f. Let the sample digest for 30 minutes.

g. Add 3mL of hydrogen peroxide and let the media digest for 10 more minutes to start peroxide reaction.

h. Allow the sample to cool again for five minutes and add 5 mL of hydrochloric acid and let the media digest for 1 hour or until sample is completely digested.

i. Let the sample cool and dilute the digested product to the 50 mL mark using DI water only.

4.7.2 Sample introduction and procedure.

NOTE: Detailed Flame Atomic Absorption (FAA) operating instructions are not provided because of differences between Original Equipment Manufacturers (OEMs). Instead, the analyst/operator shall follow the instructions provided by the OEM of the instrument.

a. Shake the digestive sample that is in the 50 mL tube for at least 15 seconds. Slowly pour contents into the filter funnel.

b. Once the desired amount of sample has been filtered, you can remove the filter funnel from the tube. Discard the filter paper in the solid-acids waste bin and place the

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loading tray into the autosampler.

c. Open the valves to the air compressor and acetylene gas tank, open the analysis program, and start up FAA instrument.

d. Make sure your burner head is clean, and the tank has no leaks in it.

e. Ignite the burner head.

f. Select the samples you wish to analyze in the Autorun.

g. Click **START** and the autorun will begin with the first selection.

h. After analysis, save results in a specified folder.

i. Turn off the instrument and close the valves to the air compressor and acetylene gas tank.

j. The analyst can either discard the remaining sample in the liquid acids-waste bin or parafilm the sample for reanalysis.

After analysis, the results may need to be reprocessed for accurate data and shall be compared with the requirements of 3.4.4.

4.8 pH of water extract procedure.
The step-by-step procedure for conducting the pH test IAW ASTM E70 is as follows:

a. Place the weigh boat on the scale and tare it.

b. Fill the weigh boat with 25 grams of the selected media, rounding to the nearest 0.001 g.

c. Once verified, place the glass funnel on top of the graduated cylinder.

d. Use DI water in a 1000 mL beaker and pour water into the graduated cylinder up to the 100 mL mark.

e. Tightly cover the top of the cylinder with Parafilm.

f. Shake the mixture for five seconds, ensuring all EMB media is dislodged and wet.

g. Allow the mixture to sit for five minutes, verified with a timer.

h. Shake the mixture for an additional five seconds.

i. Use a calibrated pH meter to measure the pH of the solution, noting the temperature reading on the meter.

After analysis, the results shall be compared with the requirements of 3.4.5.

4.9 Specific gravity procedure.
The step-by-step procedure for conducting specific gravity IAW ASTM D792 is as follows:

a. Use n-butyl alcohol as the immersion liquid.

b. Using a scale with a below-balancing weight port apparatus, weigh the specimen, record the results. This result will be the A for the formula provided at the end of

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testing.

c. Fill a 400 mL beaker with approximately 250 mL of n-butanol.

d. Use a density meter to record the specific gravity of n-butanol. Record measurement because it will be required for formula.

e. Take the platform off the scale and assemble density tester using the bracket, density tester platform, and a holder for non-floating solids. Place 400mL beaker with n-butanol on the density tester.

f. Attach the density tester to the weighing port and hit TARE to read zero.

g. Place specimen on holder and record weight. Make sure sample is fully submerged and not touching the sides or bottom of the beaker.

h. Document the weight of the specimen in n-butanol on data collection form. This result will be **B**.

i. Solve for the specific gravity of specimen using formula.

$$S.G.(Solid) = \left(\frac{A}{A-B}\right) * \ S.G(n-butanol)$$

Where,
S.G. (Solid) = specific gravity of specimen
A = weight of specimen
B = weight of specimen in n-butanol
A – B = loss of weight
S.G (n-butanol) = specific Gravity of n-butanol

NOTE: Since we are using n-butanol instead of water, the S.G.(n-butanol) will be 0.81 instead of 1.

4.10 Heavy particulate test procedures.

4.10.1 Heavy particulate sampling procedure.

a. Using weigh boat, measure 400 grams of the selected EMB media.

b. Utilizing the Humbolt Riffle Splitter or equivalent (see 4.2.1) cycle 400 g of the selected media through the riffler.

c. This step will be repeated a minimum of four times to ensure each 100 g sample is randomized.

d. After completion, weigh and record 100 g of the final media to the nearest 0.001g.

4.10.2 Types II, III, V, and VIII - preparation of solvent mixture.

a. Using a graduated cylinder, measure the required amounts (mL) of LST Heavy Fluid and DI water in a 1000 mL beaker. Amounts may vary depending on which media

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type is being utilized.

b. Place the 1000 mL beaker on the hot plate/stirrer.

c. Set stirrer to 300-400 rpm and stir for five minutes.

d. Adjust the specific gravity by adding LST Heavy Liquid to increase specific gravity or DI water to decrease specific gravity.

e. Verify LST Heavy Fluid mixture specific gravity using the Mettler Toledo Density Meter or equivalent.

NOTE: Required Specific Gravity for Heavy Particulate Testing:
Media Type II: 1.6200-1.6250
Media Type III: 1.6200-1.6250
Media Type V: 1.4000-1.4050
Media Type VIII: 1.6200-1.6250

4.10.3 Type VII - preparation of solvent mixture.

a. Using a graduated cylinder, measure 200 mL of DI water in a 1000 mL beaker.

b. Place the 1000 mL beaker on the hot plate/stirrer and set rpm to 200.

c. Tare out a weight boat and weigh 375 grams of LST powder crystal. Transfer contents into the 1000 mL beaker that contains the DI water.

d. Allow the mixture to stir for five minutes or until all solids have dissolved.

e. After five minutes, add 200 mL of acetone into the beaker. Make sure the mixture becomes homogeneous before taking measurement.

f. Adjust the specific gravity by adding LST powder crystal to increase specific gravity or acetone to decrease specific gravity.

g. Verify solvent mixture using the Mettler Toledo Density Meter or equivalent.

NOTE: Required Specific Gravity for Heavy Particulate Testing:
Media Type VII: 1.6200-1.6250

4.10.4 Heavy particulate procedure.

a. Set up ring stand with 2 rings for separatory funnel and glass funnel. Make sure separatory funnel is closed before pouring.

b. Pour 100 grams of the media into the separatory funnel using a glass funnel.

c. Pour 400mL of LST mixture into the separatory funnel using the same glass funnel.

d. Cover the separatory funnel and swirl it for one minute, let the material settle, and repeat until an appreciable amount of heavy particulate material is no longer suspended.

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e. Let it stand for five minutes.

f. Drain settled material onto a 200-mesh sieve with an 800 mL beaker underneath.

If using mixture from 4.10.2 (LST Heavy Liquid) rinse the sieve and settled materials several times with DI water to remove excess of LST Heavy Liquid retained on the sieve. If using mixture from 4.10.3 (LST Heavy Liquid for Type VII) rinse the sieve and settled material several times with acetone to remove excess of LST Heavy Liquid retained on the sieve.

NOTE: Steps a - c can be repeated once using a second funnel to allow any settled material that was not removed during the first pass on the second pass.

g. Dry the material in an oven at 105 ±2 °C (221 ±4 °F) for 4-5 minutes.

h. Weigh the dried media in a weigh boat to the nearest 0.001 gram. Use the following formula for heavy particulate contamination percentage:

$$\text{Particulate Contamination \%} = \left(\frac{Residue\ weight}{Sample\ weight}\right) \times\ 100$$

NOTE: The amount of LST Heavy Liquid to add may vary and can be calculated at the following website: https://www.heavyliquids.com/software.html

After completion of the procedure, the requirements of 3.4.7 have been met for heavy particulates.

4.11 Light particulate test procedures.

4.11.1 Light particulate sampling procedure.

a. Using weigh boat, measure 400 grams of the selected EMB media.

b. Utilizing the Humbolt Riffle Splitter or equivalent (see 4.2.1) cycle 400 g of the selected media through the riffler.

c. This step will be repeated a minimum of four times to ensure each 100 g sample is randomized.

d. After completion, weigh and record 100g of the final media to the nearest 0.001g.

4.11.2 Types II, III, and VIII - preparation of solvent mixture.

a. Using a graduated cylinder, measure the required amounts (mL) of LST Heavy Fluid and DI water in a 1000 mL beaker. Amounts may vary depending on which media type is being utilized.

b. Place the 1000 mL beaker on the hot plate/stirrer.

c. Set stirrer to 300-400 rpm and stir for five minutes.

d. Adjust the specific gravity by adding LST Heavy Liquid to increase specific gravity

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or DI water to decrease specific gravity.

e. Verify LST Heavy Fluid mixture specific gravity using the Mettler Toledo Density Meter or equivalent.

NOTE: Required Specific Gravity for Light Particulate Testing:
Media Type II: 1.3000-1.3050
Media Type III: 1.3700-1.3750
Media Type V: 0.9950-1.005 (Use DI water for Type V only)
Media Type VIII: 1.3300-1.3350

4.11.3 Type VII - preparation of solvent mixture.

a. Using a graduated cylinder, measure 200 mL of DI water in a 1000 mL beaker.

b. Place the 1000 mL beaker on the hot plate/stirrer and set rpm to 200.

c. Tare out a weight boat and weigh 142 grams of LST powder crystal. Transfer contents into the 1000 mL beaker that contains the DI water.

d. Allow the mixture to stir for five minutes or until all solids have dissolved.

e. After five minutes, add 200 mL of acetone into the beaker. Make sure the mixture becomes homogeneous before taking measurement.

f. Adjust the specific gravity by adding LST powder crystal to increase specific gravity or acetone to decrease specific gravity.

g. Verify solvent mixture using the Mettler Toledo Density Meter or equivalent.

4.11.4 Light particulate procedure.

a. One hundred grams of the finished product shall be added to a tall form, 600 mL beaker, followed by 400 mL of Mixture B. Mixture B- follow method 4.10.2 and 4.10.3 with target specific gravity to be 0.10 less than the minimum specific gravity of the finished product (see 4.9).

b. The contents shall be stirred for one minute and then allowed to stand for five minutes.

c. Any floating particulate shall be decanted onto a 200-mesh screen, tared to the nearest 0.001 gram.

d. If testing for Type II, III, V, or VIII, using mixture B from TABLE I, rinse the sieve and materials several times with DI water to remove excess LST Heavy Liquid retained on the sieve. If testing for Type VII, using mixture B from TABLE I, rinse the sieve and settled materials several times with acetone to remove excess of LST Heavy Liquid retained on the sieve for Type VII only.

e. Dry the material in an oven maintained at 105 ±2 °C (221 ±4 °F) for 4 – 5 minutes.

f. The light contaminant particulate shall be calculated as follows:

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$$\text{Particulate Contamination \%} = \left(\frac{Residue\ weight}{Sample\ weight}\right) \times 100$$

After completion of the procedures verify the requirements of 3.4.8 have been met for light particulates.

4.12 Procedure for FTIR/AR.
Using the manufacturer's standard procedures, generate FTIR/AR spectroscopy plots similar to Figures 1-5 for each applicable EMB type as required by 3.3.2. Failure to generate the same peaks and valleys shall be cause for rejection. One hundred twenty-eight scans should be performed at a resolution of 4 with data spacing of 0.241 cm^{-1}.

4.13 Procedure for verifying explosibility and ignitability.
The finished EMB products shall be tested IAW the U.S. Department of the Interior, Bureau of Mines recommended practice for determining such hazards as set forth in NCEL CR 87.011 for meeting the requirements of 3.3.3.

4.14 Particle size distribution verification procedure.
Particle size distribution shall be determined IAW ASTM D1921, Test Method B, and shall conform to the requirements in 3.4.9.

4.15 Hardness testing procedure.
Hardness of the different EMB Types shall be tested to meet the requirements of 3.4.1 when testing IAW ASTM D2583 (Barcol) and ASTM D2240 (Shore D).

4.16 Consumption rate.
A representative sample of the finished product shall be obtained, and the percentage (a) of material retained on a U.S. Standard 60 mesh screen determined IAW 3.4.9.

a. 750 grams, weighed to the nearest 1 gram of finished product shall be charged to the same blast equipment used for stripping rate tests.

b. The blasting equipment shall be operated using the same parameters specified in 3.5.4 and the applicable pressure and feed rate specified in Tables III and IV, with the reclaim system off.

c. The use of a device (i.e., 60 mesh screen) shall be permitted to prevent blow-by losses during recovery of the media.

d. An aluminum plate at least 12 by 12 by 0.25 inch (38 by 38 by 0.6 cm) conforming to SAE-AMS-QQ-A-250/4, T3 temper, shall be blasted until all the charged media is expended.

e. The expended product shall be collected and recharged to the hopper.

f. This procedure shall be repeated for a total of 4 cycles, after which the recycled product shall be recovered and weighed.

g. Using a representative sample of the recycled product, the percentage of material retained on a 60-mesh screen shall be determined as shown in Table IV. Consumption

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shall be calculated as follows to show compliance with 3.5.5:

$$\text{Consumption (\%)} = \left(\frac{Initial\ weight - Final\ Weight}{Initial\ weight}\right)$$

5. PACKAGING

5.1 Packaging.

For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Department or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful but is not mandatory.)

6.1 Intended use.

The engineered media covered by this specification is intended as an abrasive blasting material for paint removal. The requirements for engineered media as detailed in this specification are military unique to ensure media performance is acceptable when used IAW T.O. 1-1-8.

6.2 Acquisition requirements.

Acquisition documents should specify the following:

a. Title, number and date of this specification.

b. Classification (see 1.2).

c. Quantity required. (Used for procurement only (see 1.3)).

d. Certificate of conformance (see 4.3).

e. Packaging requirements (see 5.1).

6.3 Batch definition.

A batch is defined as a homogenous quantity of finished product, manufactured at one time or representing a blend of several manufactured units of finished product of the same formulation.

6.4 Qualification.

With respect to products requiring qualification, awards will be made only for products which are, at the time of the award of contract, qualified for inclusion in Qualified Products List QPL No. 85891 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the

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products they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from AFLCMC/EZPT-CPCO, 325 Richard Ray Blvd, Bldg. 165, Robins AFB, GA 31098-1640 or by email at afcorr@us.af.mil. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at https://assist.dla.mil.

6.5 Subject term (keyword) listing.

Environmental

Media blasting

Plastic media

Paint removal

Thermoset

Thermoplastic

6.6 Amendment notations.

The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

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CONCLUDING MATERIAL

Custodians:
Army - AV
Navy - AS
Air Force - 11

Preparing Activity:
Air Force - 11

(Project 5350-2026-001)

Reviewers:
Air Force - 20
DLA - CQ

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