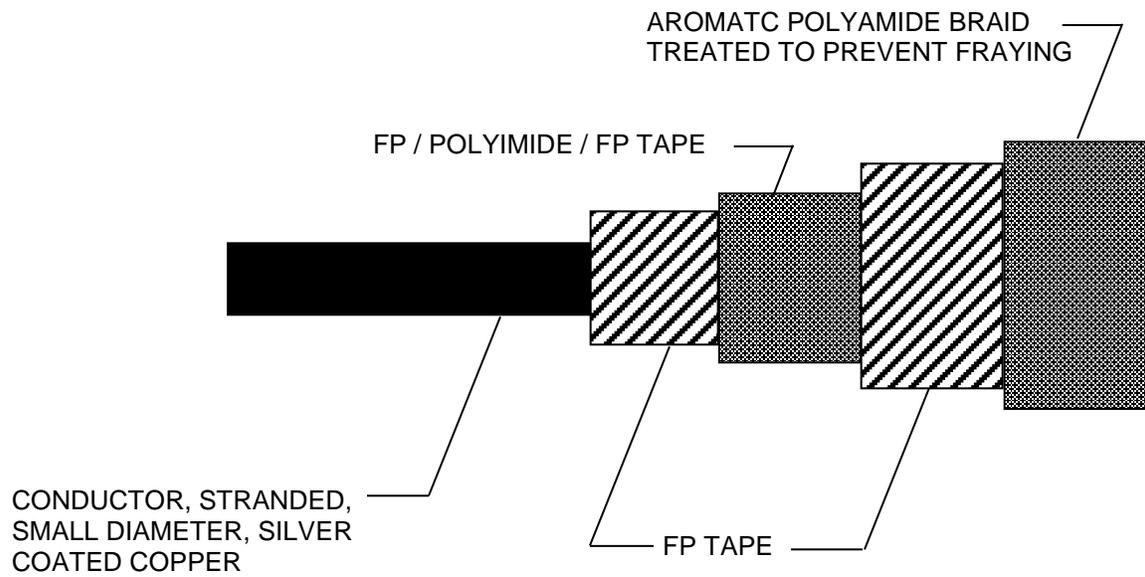


REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Technical modifications to agree with SAE-AS22759/83 and SAE-AS22759/86. Editorial changes throughout. Updated format. Added approved supplier.	1 March 2009	Abdo Abdouni
B	Added approved supplier.	8 September 2010	Abdo Abdouni
C	Technical modifications to agree with SAE. Add SAE- AS22759/183 and SAE-AS22759/186. Amended paragraph section 3.4.2. Increase 2 to 3 J/g. Updated Table I finish wire weight. Amended the government and non-government contact information. Removed ASME Y14.100 and selected item drawing. Vendor name change.	26 June 2015	Abdo Abdouni

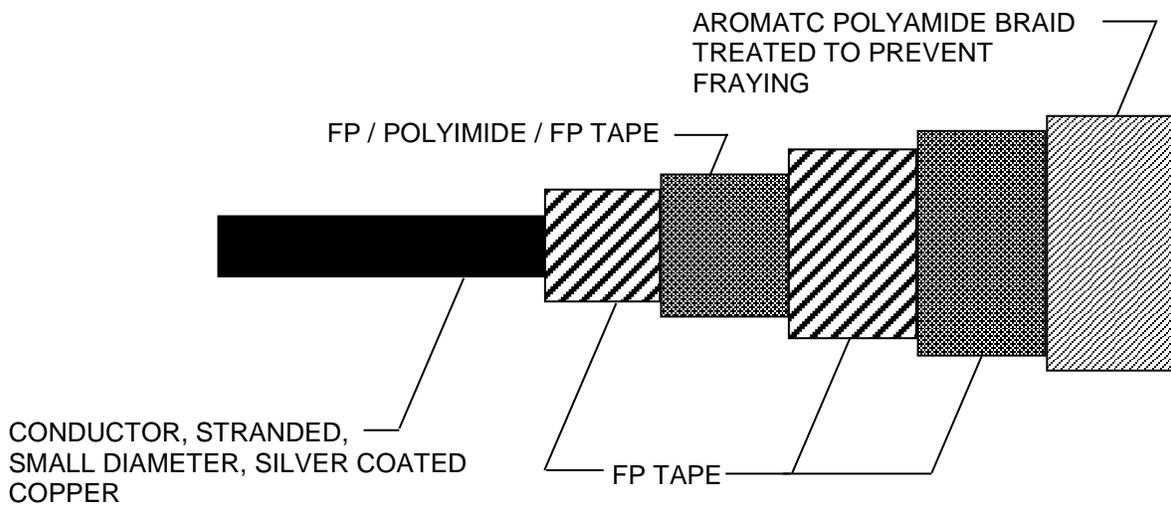
CURRENT DESIGN ACTIVITY CAGE CODE  
037Z3 HAS CHANGED NAMES TO:  
DLA LAND AND MARITIME  
COLUMBUS, OHIO 43218-3990



REV																				
PAGE																				
REV STATUS OF PAGES	REV	C	A	C	C	C	C	C	C	C	C									
	PAGE	1	2	3	4	5	6	7	8	9										
PMIC	PREPARED BY William Carpenter						DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO 43218-3990													
Original date of drawing  12 July 2004	CHECKED BY Lee Surowiec						TITLE WIRE, ELECTRICAL, COMPOSITE, POLYAMIDE BRAID, POLYTETRAFLUOROETHYLENE/POLYIMIDE INSULATED, SMOOTH SURFACE, NORMAL WEIGHT, SILVER COATED, COPPER CONDUCTOR, 200°C, 600 VOLT													
	APPROVED BY Richard L. Taylor																			
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8 AWG through 6 AWG



4 AWG through 4/0 AWG

FP – Fluorocarbon Polymer, modified Polytetrafluoroethylene (PTFE)

FIGURE 1. General configuration.

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1 SCOPE

1.1 Scope. This drawing covers the performance characteristics for a composite wire using a seamless polytetrafluoroethylene/ hydrolysis resistant polyimide tape wrap insulation system, with a normal weight stranded conductor.

1.2 Part or Identifying Number (PIN). The complete PIN should be as follows:

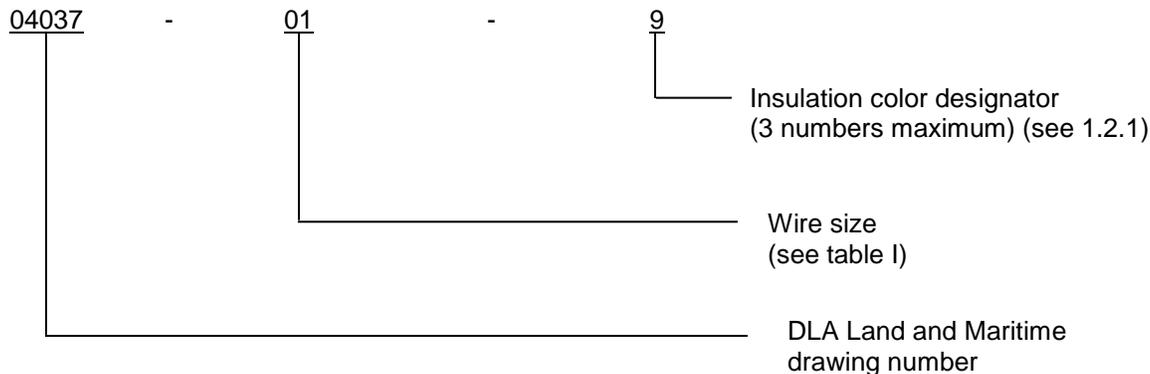


TABLE I. Details of construction.

1/ PIN	Wire size (AWG)	Conductor			Finished wire			
		Stranding (number of strands X gauge (AWG) of strands)	Diameter (inches)		Resistance at 20°C ohms/1000ft. (max)	Diameter (inches)		2/ Weight lb/1000ft. (max)
			Min	Max		Min	Max	
04037-8-*	8	133 X 29	.158	.166	.658	.196	.216	62.0/62.6
04037-6-*	6	133 X 27	.198	.208	.418	.235	.255	95.5/93.0
04037-4-*	4	133 X 25	.250	.263	.264	.292	.312	150/150
04037-2-*	2	665 X 30	.320	.340	.170	.360	.380	227/231
04037-1-*	1	817 X 30	.366	.380	.139	.400	.420	295/298
04037-01-*	0	1045 X 30	.395	.425	.108	.442	.462	351/357
04037-02-*	00	1330 X 30	.440	.475	.085	.498	.528	438/454
04037-03-*	000	1665 X 30	.500	.540	.068	.554	.584	554/550
04037-04-*	0000	2109 X 30	.565	.605	.054	.615	.655	689/696

1/ The asterisks in the part number column of table I shall be replaced by color code designator in accordance with 1.2.1. Example: 04037-26-9 is white.

2/ The first/second numbers are the wire weight lb/1000ft. maximum for the SAE-AS22759/83 or SAE-22759/86 / SAE-AS22759/183 or SAE-22759/186 respectively.

1.2.1 Color. The color of the finished wire shall be as indicated by the insulation color designator (see 1.2) of the wire part number and the color specified in the contract or order. The color designator should indicate the color of the braid. The preferred color is should be dark green with the Munsell color limits of 5Y 3/2 and 5B 2/0.5 color designator 5D. White is an acceptable alternative color, designator 9.

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2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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 documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE STANDARDS

- MIL-STD-104 - Limits for Electrical Insulation Color
- MIL-STD-202 - Test Method Standard Electronic and Electrical Component Parts
- MIL-STD-681 - Identification Coding and Application of Hookup and Lead Wire

(Copies of these documents are available online at <http://quicksearchdla.mil> )

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

ASTM INTERNATIONAL

- ASTM B298 - Standard Specification for Silver Coated Soft or Annealed Copper Wire
- ASTM D4591 - Standard Test Method for Determining Temperatures and Heats of Transitions of Fluoropolymers by Differential Scanning Calorimetry

(Copies of these documents are available from <http://www.astm.org> )

NCSL INTERNATIONAL

- NCSL Z540.3 - General Requirements for Calibration of Measuring and Test Equipment

(Copies of these documents are available from <http://www.ncsli.org> )

SAE INTERNATIONAL

- SAE AS4373 - Test Methods for Insulated Electric Wire
- SAE AS22759 - Wire, Electrical, Fluoropolymer-Insulated, Copper or Copper Alloy
- SAE AS22759/83 - Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Silver Coated, Copper Conductor, 200°C, 600 Volt
- SAE AS22759/86 - Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Normal Weight, Silver Coated, Copper Conductor, 200°C, 600 Volts
- SAE AS22759/183 - Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Normal Weight, Silver Coated, Copper Conductor, 200°C, 600 Volt ROHS
- SAE AS22759/186 - Wire, Electrical, Polytetrafluoroethylene/Polyimide Insulated, Smooth Surface, Normal Weight, Silver Coated, Copper Conductor, 200°C, 600 Volts

(Copies of these documents are available from <http://www.sae.org> )

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### 3. REQUIREMENTS

3.1 DLA Land and Maritime requirements. Items described in this drawing shall meet the requirements of SAE AS22759, SAE AS22759/83 (2 - 4/0 AWG) or SAE AS22759/86 (8 - 4 AWG), and SAE AS22759/183 (2 - 4/0 AWG) or SAE AS22759/186 (8 - 4 AWG) except as specified herein. Any requirements included in this drawing shall be in addition to, or supersede those requirements specified in SAE AS22759, SAE AS22759/83 (2 - 4/0 AWG) or SAE AS22759/86 (8 - 4 AWG), and SAE AS22759/183 (2 - 4/0 AWG) or SAE AS22759/186 (8 - 4 AWG). In case of conflict between the requirements in this drawing and those specified in SAE AS22759, SAE AS22759/83 (2 - 4/0 AWG) or SAE AS22759/86 (8 - 4 AWG), and SAE AS22759/183 (2 - 4/0 AWG) or SAE AS22759/186 (8 - 4 AWG), the requirements of this drawing shall take precedence.

3.2 Design configuration. The design, construction, and physical dimensions shall be as specified in this drawing.

3.2.1 Design documentation. Design documentation shall be retained by the manufacturer, and shall be available upon request for review by the contracting activity, DLA Land and Maritime, or contractor.

### 3.3 Material.

3.3.1 Conductor. The conductors shall be made of soft annealed copper in accordance with ASTM B298 and table I of this drawing. All strands shall be free from lumps, kinks, splits, scarred or corroded surfaces and skin impurities. Strands shall be silver coated. The silver coating shall not be less than 40 microinches (1.02  $\mu\text{m}$ ) of silver when tested in accordance with ASTM B298.

3.3.2 Braid. The braid shall be made of bright aromatic polyamide yarn, 200 Denier, 100 filaments, tightly formed. The braid shall be uniform in appearance and treated with a clear finisher coating. The finisher coating shall be compatible with the temperature rating and performance requirements of the insulated wire.

3.3.3 Insulation. Insulation shall be polytetrafluoroethylene and polytetrafluoroethylene/polyimide tape in tables II and III. The polyimide tape shall be hydrolysis resistant.

TABLE II. Wire insulation materials. 1/

Tape code	Thickness nominal (inches)	Material
1	.0020	.0005 FP/.0010 polyimide/.0005 FP
2	.0010	FP (Skived)
3	.0020	FP (Skived)
4	.0030	FP (Unsintered)

1/ Physical properties of PTFE unsintered tape shall be in accordance with SAE AS22759.

TABLE III. Physical properties of FP/Polyimide/FP tapes.

Tensile strength	19,000 lb/in <sup>2</sup> (average min)
Tensile modulus	350,000 lb/in <sup>2</sup> (average min)
Elongation	40 percent (average min)
Dielectric strength	4,000 volts/mil (average min)
.0005 FP Layer	Distinguishable color (next to conductor)

3.3.4 Wire construction and physical dimensions. See figure 1 and tables I and IV.

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TABLE IV. Tape overlap requirements. 1/

Wire size	Wrap 1			Wrap 2			Wrap 3			Wrap 4			Nominal wall thickness (mils) 2/
	Tape code	Percent overlap		Tape code	Percent overlap		Tape code	Percent overlap		Tape code	Percent overlap		
		Min	Max		Min	Max		Min	Max		Min	Max	
8	2	20.5	35	1	50.5	55.0	4	67.0	71.0	-	-	-	13.2
6	2	20.5	35	1	50.5	55.0	4	67.0	71.0	-	-	-	13.2
4	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
2	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
1	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
1/0	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
2/0	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
3/0	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
4/0	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2

1/ Wrap 1 is innermost tape which is in contact with the conductor.

2/ Nominal wall thickness does not include the polyamide braid thickness.

3.4 Performance testing. Wire supplied to this drawing shall be qualified in accordance with SAE AS22759/83 (2 – 4/0 AWG) or SAE AS22759/86 (8 – 4 AWG), and SAE AS22759/183 (2 - 4/0 AWG) or SAE AS22759/186 (8 - 4 AWG), and shall meet any additional requirements of this drawing.

3.4.1 Solderability (conformance inspection test). The requirement for acceptable solder coverage of the stranded conductor shall be as specified in MIL-STD-202, method 208. The following details shall apply:

- a. Unless otherwise specified, five specimens shall be prepared and tested for solderability using method 208 of MIL-STD-202.
- b. The specimens shall be tested without steam aging using a type R flux.

3.4.2 Insulation state of sinter (conformance inspection test). FP layers shall be evaluated with a differential scanning calorimeter in accordance with ASTM D4591. This is performed on the sintered wire prior to braiding. The FP layers shall meet the following requirements:

- a. Insulation state of sinter: 3 J/g maximum.
- b. Bonding between FP layers shall be homogenous. No evidence of tape edges or seams shall be present on the outer FP layer when visually examined with the unaided eye. The outer surface will be smooth and free of tape edges at the overlap.

3.4.3 Lamination sealing (conformance inspection test). When tested in accordance with SAE-AS4373 method 809 at 200°C, there shall be no evidence of tape separation or lifting. There shall be no visible tape ridges that can contribute to tearing of the tape. This test is performed on the sintered wire prior to braiding.

3.4.4 Color (conformance inspection test). Conformity of color to the limits of MIL-STD-104 shall not be required after oven exposure.

### 3.5 Ratings.

3.5.1 Temperature rating. 200°C maximum continuous conductor temperature.

3.5.2 Voltage rating. 600 Vrms at sea level.

3.6 Marking. The finished wire shall be identified by a printed marking applied to the outer surface or the wire. The identification mark shall not be applied by hot stamp marking or other methods which significantly penetrate the insulation. The PIN shall be in accordance with 1.2 herein.

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#### 4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.1.1 Equipment calibration. All test equipment and inspection facilities shall be maintained in accordance with NCSL Z540.3 or equivalent.

4.2 Qualification inspection. The product manufactured under this drawing shall be currently listed on the qualified products list QPL-22759 for wire type SAE AS22759/83 (2 - 4/0 AWG) or SAE AS22759/86 (8 - 4 AWG) and SAE AS22759/183 (2 - 4/0 AWG) or SAE AS22759/186 (8 - 4 AWG). The additional performance requirements in paragraph 3.4 shall apply.

4.3 Conformance inspection. Conformance inspection shall be in accordance with SAE AS22759/83 (2 - 4/0 AWG) or SAE AS22759/86 (8 - 4 AWG), SAE AS22759/183 (2 - 4/0 AWG) or SAE AS22759/186 (8 - 4 AWG), and 3.4 herein.

4.4 Certification. In order to be certified and listed as an approved source of supply for wire manufactured to this drawing, a manufacturer shall:

- a. Agree to make available to DLA land and Maritime, upon request, all pertinent test data indicating compliance to the tests outlined in SAE AS22759, SAE AS22759/83 (2 - 4/0 AWG) or SAE AS22759/86 (8 - 4 AWG), SAE AS22759/183 (2 - 4/0 AWG) or SAE AS22759/186 (8 - 4 AWG), and this drawing.
- b. Provide to DLA Land and Maritime-VAI, or its designated agent, upon request, free of charge and without obligation, current production samples of the types and quantities requested.
- c. Meet one of the following criteria:
  - (1) Currently be listed on QPL-22759 for at least one wire series (not necessarily the one for which this drawing applies).
  - (2) Be in current production of the subject part.

4.5 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply (see 6.7).

#### 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 packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service 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.

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## 6 NOTES

6.1 Intended use. Wires conforming to this drawing are intended for use when military specifications do not exist for wires that will perform the required function. This drawing is intended to prevent the proliferation of unnecessary duplicate specifications, drawings and stock catalog listings. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-22759, this drawing will be inactivated.

6.2 Acquisition data. The acquisition document should specify the following:

- a. Complete PIN (see 1.2).
- b. Requirements for delivery of a copy of the conformance inspection data for the lot being supplied, if applicable. This data should be supplied with each shipment.
- c. Requirements for certificate of compliance, if applicable.
- d. Requirements for packaging and packing.

6.3 Replaceability. Wires covered by this drawing will replace the same generic wires covered by a contractor-prepared specification or drawing.

6.4 Comments. Comments on this drawing should be directed to DLA Land and Maritime-VAI, Post Office Box 3990, Columbus, Ohio 43218-3990, or e-mail to [WireCable@dla.mil](mailto:WireCable@dla.mil), telephone (614) 692-0530, or facsimile (614) 692-6939.

6.5 Certificate of compliance. The certificate of compliance submitted to DLA Land and Maritime-VAI, prior to listing as an approved source of supply, shall state that the manufacturer's product meets the requirements of this drawing.

6.6 Generic test data. Generic test data may be used to satisfy the requirements of 4.3. Generic test data shall be on date coded wire no more than 1 year old when the wire is made of the same material, of the same design, and is made using the same manufacturing processes. The vendor is required to retain the generic data for a period of not less than 3 years from the date of shipment.

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6.7 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. The vendors listed have agreed to the contents of this drawing and a certificate of compliance has been submitted to DLA Land and Maritime-VAI.

DLA Land and Maritime drawing PIN	Vendor CAGE number	Vendor similar PIN 1/	Vendor CAGE number	Vendor similar PIN 1/	Vendor CAGE number	Vendor similar PIN 1/
04037-8-*	12814	SMLD8-X	12515	HN3S8-*	F1868	DSM8308-*
04037-6-*	12814	SMLD6-X	12515	HN3S6-*	F1868	DSM8306-*
04037-4-*	12814	SMLD4-X	12515	HN3S4-*	F1868	DSM8304-*
04037-2-*	12814	SMLD2-X	12515	HN3S2-*	F1868	DSM8302-*
04037-1-*	12814	SMLD1-X	12515	HN3S1-*	F1868	DSM8301-*
04037-01-*	12814	SMLD01-X	12515	HN3S01-*	F1868	DSM83Z1-*
04037-02-*	12814	SMLD02-X	12515	HN3S02-*	F1868	DSM83Z2-*
04037-03-*	12814	SMLD03-X	12515	HN3S03-*	F1868	DSM83Z3-*
04037-04-*	12814	SMLD04-X	12515	HN3S04-*	F1868	DSM83Z4-*

1/ Caution: Parts must be purchased to this DLA Land and Maritime PIN to assure that all performance requirements and tests are met.

\* Color code designators in accordance with MIL-STD-681 should replace the asterisks in the PIN column of table. Example: 04037-26-93 is white with an orange stripe.

<u>Vendor CAGE number</u>	<u>Vendor name and address</u>
12814	Thermax/CDT 235 North Freeport Drive Nogales, AZ 85621-2428
12515	Nexans Aerospace USA LLC 600 South Parker Street, P.O. Box 909 Elm City, NC 27822
F1868	Draka Fileca Route Nationale 1 60730 Sainte Genevieve France

6.8 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals and additional information is available on their website <http://www.epa.gov/osw/hazard/wastemin/priority.htm>. Included in the EPA list of 31 priority chemicals are cadmium, lead, and mercury. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see Section 3).

6.9 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

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