SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS-DTL-23053/8 REV. A

Issued 1999-07
Revised 2012-10

Superseding AMS-DTL-23053/8

Insulation Sleeving, Electrical, Heat Shrinkable, Polyvinylidene Fluoride, Semi-Rigid, Crosslinked

FSC 5970

RATIONALE

Revise to include comments received by the government and industry, update references, align specification with SAE guidelines, and review specification for known technical problems.

The requirements for acquiring the sleeving described herein shall consist of this specification sheet and the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: MIL-DTL-23053.

REQUIREMENTS

Polymer type: The base polymer used in formulating this sleeving shall be polyvinylidene fluoride homopolymer. (See 23053/18 for co- and ter-polymers of this material.

Continuous operating temperature range: -67 °F (-55 °C) to +347 °F (+175 °C).

Color: The heat shrinkable sleeving shall be furnished transparent to translucent light tan (clear). Colors are available and shall conform to requirements of Class 1, MIL-STD-104. (See 1.2.1 and 3.4.2.1)

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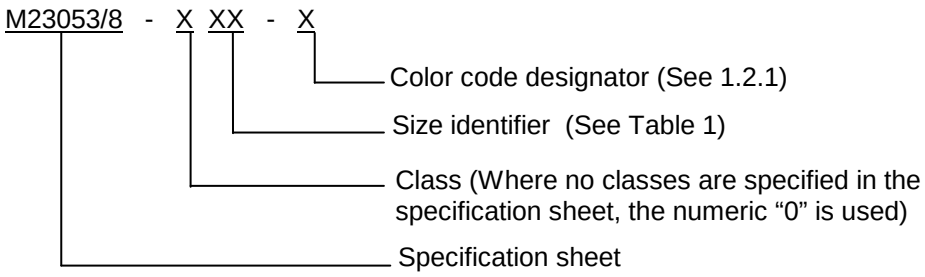
Military part number: The Military part number shall consist of the basic number of this specification sheet and dash numbers as follows:



Example: 0.093 inch (2.36 mm) as supplied ID sleeving shall be identified as M23053/8-003-C.

TABLE 1 - CONSTRUCTION DETAILS, INCHES (MM) 1/

Military part number	As supplied ID minimum	After unrestricted shrinkage	
		ID maximum	Wall Thickness 2/
M23053/8-001-C	0.046 (1.17)	0.023 (0.58)	0.010 ± 0.002 (0.254 ± 0.051)
M23053/8-002-C	0.063 (1.60)	0.031 (0.79)	0.010 ± 0.002 (0.254 ± 0.051)
M23053/8-003-C	0.093 (2.36)	0.046 (1.17)	0.010 ± 0.002 (0.254 ± 0.051)
M23053/8-004-C	0.125 (3.18)	0.062 (1.58)	0.010 ± 0.002 (0.254 ± 0.051)
M23053/8-005-C	0.187 (4.75)	0.093 (2.36)	0.010 ± 0.002 (0.254 ± 0.051)
M23053/8-006-C	0.250 (6.35)	0.125 (3.18)	0.012 ± 0.003 (0.305 ± 0.076)
M23053/8-007-C	0.375 (9.53)	0.187 (4.75)	0.012 ± 0.003 (0.305 ± 0.076)
M23053/8-008-C	0.500 (12.70	0.250 (6.35)	0.012 ± 0.003 (0.305 ± 0.076)
M23053/8-009-C	0.750 (19.05)	0.375 (9.53)	0.017 ± 0.003 (0.432 ± 0.076)
M23053/8-010-C	1.000 (25.40)	0.500 (12.70)	0.019 ± 0.003 (0.483 ± 0.076)
M23053/8-011-C	1.500 (38.10)	0.750 (19.05)	0.020 ± 0.003 (0.508 ± 0.076)

1/ Diameter limits for object to be enclosed shall be as recommended in technical data.
2/ Wall thickness values are less when shrinkage is restricted.

Unrestricted shrinkage: Test method 4.6.5, 392 °F ± 4 (200 °C ± 2) for 3 minutes.

TABLE 2 - PHYSICAL PROPERTIES

Characteristic	Requirement	Test procedure and conditions
As supplied:		
ID, minimum	Table 1	4.6.3
Heat shock	No cracks, flowing or dripping	4.6.8 572 °F ± 7.2 (300 °C ± 4)
Secant modulus, psi (MPa), minimum	120 000 (828)	4.6.12.1 ASTM D 882, 2 percent strain
Restricted shrinkage	No cracks	4.6.6 347 °F ± 4 (175 °C ± 2)
Voltage withstand	Pass	4.6.6.3

TABLE 2 - PHYSICAL PROPERTIES(CONT.)

Characteristic	Requirement	Test procedure and conditions
Clarity stability	Pass	4.6.16 347 °F ± 4 (175 °C ± 2) for 24 hours
Concentricity	70% min.	4.6.3.3
Crystalline melt point, °F (°C), min	150 (302)	ASTM D 4951 1/
After unrestricted shrinkage:		
ID, maximum	Table I	4.6.3
Wall thickness	Table I	4.6.3
Low temperature flexibility 2/	No cracking	4.6.7.1 –67 °F ± 2 (–55 °C ± 1)
Tensile strength, psi (MPa), minimum	5000 (34.5)	4.6.13 ASTM D 638, 2 inches/minute
Ultimate elongation, percent, minimum	150	4.6.13 ASTM D 638, 2 inches/minute
Dielectric strength, volts/mil (Kv/mm), minimum	800 (31.5) – up to an "as supplied ID" of 0.500 600 (23.6) – an "as supplied ID" of 0.500 and above	4.6.2 ASTM D 2671
Volume resistivity, Ohm-cm, minimum	10^{13}	4.6.2 ASTM D 876
Specific gravity, max.	1.8	4.6.2 ASTM D 792
Water Absorption, percent, maximum	0.5	4.6.2 ASTM D 570, 24 hrs at 73 °F (23 °C)
Heat resistance, properties after:		4.6.9 482 °F ± 4 (250 °C ± 3), 168 hours
Ultimate elongation percent, minimum	50	
Fluid resistance, properties after:		4.6.11
Tensile strength, psi (MPa), minimum	5000 (34.5)	
Dielectric strength, volts/mil (Kv/mm), minimum	500 (19.7)	
Flammability	3/	4.6.14 Procedure C ASTM D 2671
Corrosion 4/	No corrosion	

TABLE 2 - PHYSICAL PROPERTIES(CONT.)

Characteristic	Requirement	Test procedure and conditions
Fungus resistance 5/	No growth or	4.6.2 ASTM G 21
properties after:		4.6.17
Tensile Strength, psi (MPa), minimum	5000 (34.5)	
Ultimate elongation, percent, minimum	150	
Dielectric strength, volts/mil (Kv/mm), minimum	800 (31.5) – up to an "as supplied ID" of 0.500 600 (23.6) – an "as supplied ID" of 0.500 and above	

1/ Test procedure in accordance with ASTM D 4591. Melting point calculated as specified in "Melting endotherm peak" of ASTM D 3222.

2/ Low temperature flexibility test specimens and mandrels: Specimens of size 0.187 inch (4.75 mm) and smaller shall be tested as whole sections of sleeving without shrinking on conductors supplied without shrinking on conductors. Specimens of larger sizes larger than 0.187 inch (4.75 mm) shall be 0.250 inch (6.35 mm) inch wide strip cut from as supplied sleeving, then shrunk. Mandrels shall be 10 times the specimen O.D. ± 10% for tubular specimens or 10 times the specimen thickness ± 10% for strip specimens.

3/ Record whether any flaming or glowing particles or flaming drops fall from the specimen. If more than 25 percent of the indicator flag is burned away or charred (brown scorching and soot shall be ignored) after all of the five applications of flame or if flaming or glowing particles or flaming drops fall from the specimen at any time and ignite the cotton (flameless charring of the cotton shall be ignored), the specimen shall be judged to have conveyed flame and shall be considered as failing. In addition, any specimen which continues to flame or glow from one flame application longer than one minute shall not be acceptable.

4/ MIL-I-23053/8 materials are non-corrosive at operating temperatures. Performance of this requirement is at the option of the acquiring activity (See 6.2).

5/ MIL-I-23053/8 materials do not support fungus growth. Perfomance of this requirement is at the option of the acquiring activity (See 6.2).

Storage life conditions: Supplier shall certify to storage at 65 to 95 °F (18 to 35 °C) for 5 years. Conformance to 3.5. See 3.5.2 for storage life extension.

Intended use: Heat shrinkable semi-rigid polyvinylidene fluoride sleeving is intended for wire or termination strain relief.

NOTES

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