SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS-DTL-23053/6 REV. A

Issued 1999-07
Revised 2012-08

Superseding AMS-DTL-23053/6

Insulation Sleeving, Electrical, Heat Shrinkable, Polyolefin, 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 a polyolefin.

Continuous operating temperature range: -67 °F (-55 °C) to +275 °F (+135 °C).

Classification: The heat shrinkable sleeving shall be furnished in the following classes, as specified (See 6.4 and 6.8):

Class 1 - Flame resistant
Class 2 - Flammable (clear only)

Color: Class 2 shall be furnished in clear. Class 1 shall be furnished in colors only. Colors shall conform to the requirements of Class 1 of MIL-STD-104. (See 1.2.1 and 3.4.2.1)

Longitudinal change: ± 5 percent.

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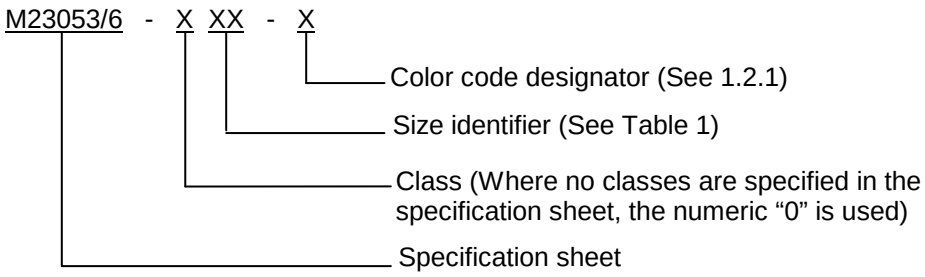
Military part number: The Military part number shall consist of the basic number of this specification sheet and dash numbers as follows:



Example: Class 2, 0.125 inch (3.18 mm) as supplied ID sleeving shall be identified as M23053/6-204-C.

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

Military part number 3/	As supplied ID minimum	After unrestricted shrinkage	
		ID maximum	Wall Thickness 2/
Class 1			
M23053/6-101-4	0.046(1.17)	0.023(0.58)	0.020 ± 0.003(0.508 ± 0.076)
M23053/6-102-9	0.063(1.60)	0.031(0.79)	0.020 ± 0.003(0.508 ± 0.076)
M23053/6-103-6	0.093(2.36)	0.046(1.17)	0.020 ± 0.003(0.508 ± 0.076)
M23053/6-104-2	0.125(3.18)	0.062(1.58)	0.020 ± 0.003(0.508 ± 0.076)
M23053/6-105-5	0.187(4.75)	0.093(2.36)	0.025 ± 0.003(0.635 ± 0.076)
M23053/6-106-8	0.250(6.35)	0.125(3.18)	0.025 ± 0.003(0.635 ± 0.076)
M23053/6-107-1	0.375(9.53)	0.187(4.75)	0.030 ± 0.005(0.762 ± 0.127)
M23053/6-108-9	0.500(12.70)	0.250(6.35)	0.030 ± 0.005(0.762 ± 0.127)
Class 2			
M23053/6-201-C	0.046(1.17)	0.023(0.58)	0.020 ± 0.003(0.508 ± 0.076)
M23053/6-202-C	0.063(1.60)	0.031(0.79)	0.020 ± 0.003(0.508 ± 0.076)
M23053/6-203-C	0.093(2.36)	0.046(1.17)	0.020 ± 0.003(0.508 ± 0.076)
M23053/6-204-C	0.125(3.18)	0.062(1.58)	0.020 ± 0.003(0.508 ± 0.076)
M23053/6-205-C	0.187(4.75)	0.093(2.36)	0.025 ± 0.003(0.635 ± 0.076)
M23053/6-206-C	0.250(6.35)	0.125(3.18)	0.025 ± 0.003(0.635 ± 0.076)
M23053/6-207-C	0.375(9.53)	0.187(4.75)	0.030 ± 0.005(0.762 ± 0.127)
M23053/6-208-C	0.500(12.70)	0.250(6.35)	0.030 ± 0.005(0.762 ± 0.127)

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.
3/ The color codes cited above for Class 1 sleevings are preferred acquisition colors. Class 1 sleevings are also available in other colors (See 1.2.1) and 3.4.2.1.

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

TABLE 2 - PHYSICAL PROPERTIES 1/

Characteristic	Requirement	Test procedure and condition
As supplied:		
ID, minimum	Table 1	4.6.3.1.1
Heat shock	No cracks, flowing or dripping	4.6.8 482 °F ± 6 (250 °C ± 3)
Secant modulus, psi (MPa), minimum	25 000 (172.4)	4.6.12.1, 2 percent strain, ASTM D 882
Color stability	Pass	4.6.15 347 °F ± 4 (175 °C ± 2), 24 hours
Concentricity	70% minimum	4.6.3.3
Clarity stability, Class 2	Pass	4.6.16, 347 °F ± 4 (175 °C ± 2), 24 hours
Restricted shrinkage	No cracks	4.6.6 347 °F ± 4 (175 °C ± 2)
Voltage withstand	Pass	4.6.6.3
After unrestricted shrinkage:		
ID, maximum	Table 1	4.6.3.1.2
Wall thickness	Table 1	4.6.3.2
Tensile strength, psi (MPa), minimum	2000 (13.8)	4.6.13 ASTM D 638, 2 inches/minute
Ultimate elongation, percent, minimum	200	4.6.13 ASTM D 638, 2 inches/minute
Dielectric strength, volts/mil (Kv/mm), minimum	500 (19.7)	4.6.2 ASTM D 2671
Volume resistivity, 0hm-cm, minimum	10^{14}	4.6.2 ASTM D 876
Dielectric constant, maximum 3/	Class 1 – 3.2; Class 2 – 2.7	4.6.2 ASTM D 150
Specific gravity, maximum	Class 1 – 1.35; Class 2 – 1.00	4.6.2 ASTM D 792
Water absorption, percent, maximum	Class 1 – 0.5; Class 2 – 0.2	4.6.2 ASTM D 570, 24 hrs at 73 °F (23 °C)
Corrosion	No corrosion	4.6.10.1 and 4.5.10.2, 302 °F ± 4 (150 °C ± 2), 16 hours
Low temperature flexibility	No cracking	4.6.7.1 -67 °F ± 2 (-55 °C ± 1)

TABLE 2 - PHYSICAL PROPERTIES 1/ (CONT.)

Characteristic	Requirement	Test procedure and condition
Heat resistance, properties after:		4.6.9 347 °F ± 4 (175 °C ± 2) for 168 hours
Ultimate elongation, percent, minimum	100	
Fluid resistance, properties after:		4.6.11
Tensile strength, psi (MPa), minimum	1600 (11.1)	
Dielectric strength, volts/mil (Kv/mm), minimum	400 (15.8)	
Flammability	Class 1 only – self-extinguishing within one minute and no more than 25 percent of indicator flag burned or charred. No dripping or flowing or large sizes; Class 2 – N/A	4.6.14 Procedure B ASTM D 2671
Fungus resistance 2/	No Growth or	4.6.2 ASTM G 21
properties after:		4.6.17
Tensile Strength, psi (MPa), minimum	2000 (13.8)	
Ultimate elongation, percent, minimum	200	
Dielectric strength, volts/mil (Kv/mm), minimum	500 (19.7)	

1/ Unless otherwise specified, the stated requirements, test procedures and conditions are for all classes.

2/ MIL-I-23053/6 materials do not normally support fungus growth. Performance of this requirement is only when specified by the acquisition activity (See 6.2).

3/ Dielectric constant is a requirement only when specified in the acquisition document (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.