

AEROSPACE MATERIAL SPECIFICATION



AMS-DTL-23053/12

Issued

JUL 1999

Insulation Sleeving, Electrical, Heat Shrinkable,
Polytetrafluoroethylene

FSC 5970

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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 polytetrafluoroethylene.

Continuous operating temperature range: -67°C (-88°F) to +250°C (+482°F).

Class: The sleeving shall be furnished in the following classes, as specified (see 6.2a):

Class 1 - Thick wall sleeving

Class 2 - Standard wall sleeving

Class 3 - Thin wall sleeving

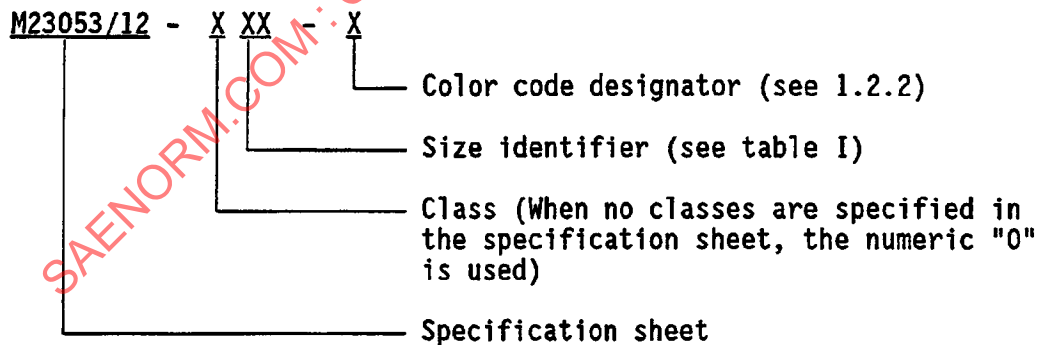
Class 4 - Very thin wall sleeving

Class 5 - High shrink, thin wall

Color: The sleeving shall be furnished in clear (transparent milk white to light tan) or in the color specified by the acquiring activity. Colors shall conform to the requirements of Class I of MIL-STD-104.

Longitudinal change: ± 20 percent

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



Example: Thin walled (Class 3), 0.430 inch (10.9 mm) as supplied ID, clear sleeving shall be identified as M23053/12-327-C.

TABLE I. Construction details, inches (mm). 1/

Military part number	As supplied ID minimum	After unrestricted shrinkage	
		ID maximum	Wall thickness 2/
<u>Class 1</u>			
M23053/12-101-*	.166(4.22)	.130(3.30)	.030 ± .005(.762 ± .127)
M23053/12-102-*	.250(6.35)	.193(4.90)	.030 ± .005(.762 ± .127)
M23053/12-103-*	.333(8.46)	.257(6.53)	.030 ± .005(.762 ± .127)
M23053/12-104-*	.415(10.54)	.320(8.13)	.030 ± .005(.762 ± .127)
M23053/12-105-*	.498(12.65)	.383(9.73)	.030 ± .005(.762 ± .127)
M23053/12-106-*	.580(14.73)	.448(11.38)	.030 ± .006(.762 ± .152)
M23053/12-107-*	.666(16.92)	.510(12.95)	.030 ± .006(.762 ± .152)
M23053/12-108-*	.748(19.00)	.572(14.53)	.030 ± .006(.762 ± .152)
M23053/12-109-*	.830(21.08)	.637(16.18)	.030 ± .006(.762 ± .152)
M23053/12-110-*	.915(23.24)	.700(17.78)	.032 ± .006(.813 ± .152)
M23053/12-111-*	1.000(25.40)	.764(19.41)	.040 ± .007(1.02 ± .178)
M23053/12-112-*	1.170(29.72)	.891(22.63)	.045 ± .007(1.14 ± .178)
M23053/12-113-*	1.330(33.78)	1.020(25.91)	.050 ± .008(1.27 ± .203)
<u>Class 2</u>			
M23053/12-201-*	.050(1.27)	.027(.069)	.012 ± .002(.305 ± .051)
M23053/12-202-*	.055(1.40)	.032(0.81)	.012 ± .002(.305 ± .051)
M23053/12-203-*	.060(1.52)	.039(0.99)	.016 ± .003(.406 ± .076)
M23053/12-204-*	.065(1.65)	.043(1.09)	.016 ± .003(.406 ± .076)
M23053/12-205-*	.076(1.93)	.049(1.24)	.016 ± .003(.406 ± .076)
M23053/12-206-*	.085(2.16)	.054(1.37)	.016 ± .003(.406 ± .076)

TABLE I. Construction details, inches (mm). 1/ - Continued

Military part number	As supplied ID minimum	After unrestricted shrinkage	
		ID maximum	Wall thickness 2/
M23053/12-207-*	.110(2.79)	.067(1.70)	.016 ± .003(.406 ± .076)
M23053/12-208-*	.120(3.05)	.072(1.83)	.016 ± .003(.406 ± .076)
M23053/12-209-*	.130(3.30)	.080(2.03)	.016 ± .003(.406 ± .076)
M23053/12-210-*	.140(3.56)	.080(2.03)	.016 ± .003(.406 ± .076)
M23053/12-211-*	.150(3.81)	.089(2.26)	.016 ± .003(.406 ± .076)
M23053/12-212-*	.170(4.32)	.101(2.57)	.016 ± .003(.406 ± .076)
M23053/12-213-*	.191(4.85)	.112(2.84)	.016 ± .003(.406 ± .076)
M23053/12-214-*	.205(5.21)	.124(3.15)	.020 ± .004(.508 ± .102)
M23053/12-215-*	.215(5.46)	.130(3.30)	.020 ± .004(.508 ± .102)
M23053/12-216-*	.240(6.10)	.141(3.58)	.020 ± .004(.508 ± .102)
M23053/12-217-*	.270(6.86)	.158(4.01)	.020 ± .004(.508 ± .102)
M23053/12-218-*	.302(7.67)	.178(4.52)	.020 ± .004(.508 ± .102)
M23053/12-219-*	.320(8.13)	.198(5.03)	.020 ± .004(.508 ± .102)
M23053/12-220-*	.370(9.40)	.224(5.69)	.020 ± .004(.508 ± .102)
M23053/12-221-*	.390(9.91)	.249(6.32)	.020 ± .004(.508 ± .102)
M23053/12-222-*	.410(10.41)	.260(6.60)	.020 ± .004(.508 ± .102)
M23053/12-223-*	.430(10.92)	.278(7.06)	.020 ± .004(.508 ± .102)
M23053/12-224-*	.450(11.43)	.311(7.90)	.020 ± .004(.508 ± .102)
M23053/12-225-*	.470(11.94)	.329(8.36)	.020 ± .004(.508 ± .102)
M23053/12-226-*	.470(11.94)	.347(8.81)	.020 ± .004(.508 ± .102)
M23053/12-227-*	.470(11.94)	.334(8.48)	.025 ± .006(.635 ± .152)
M23053/12-228-*	.560(14.22)	.399(10.13)	.025 ± .006(.635 ± .152)
M23053/12-229-*	.655(16.64)	.462(11.73)	.025 ± .006(.635 ± .152)
M23053/12-230-*	.750(19.05)	.524(13.31)	.025 ± .006(.635 ± .152)
M23053/12-231-*	.930(23.62)	.655(16.64)	.030 ± .006(.762 ± .152)
M23053/12-232-*	1.125(28.58)	.786(19.96)	.035 ± .008(.889 ± .203)
M23053/12-233-*	1.310(33.27)	.911(23.14)	.035 ± .008(.889 ± .203)
M23053/12-234-*	1.500(38.10)	.036(26.31)	.035 ± .008(.889 ± .203)
<u>Class 3</u>			
M23053/12-301-*	.034(0.86)	.015(0.38)	.009 ± .002(.229 ± .051)
M23053/12-302-*	.038(0.97)	.018(0.46)	.009 ± .002(.229 ± .051)
M23053/12-303-*	.046(1.17)	.022(0.56)	.010 ± .003(.254 ± .076)
M23053/12-304-*	.050(1.27)	.027(0.69)	.010 ± .002(.254 ± .076)
M23053/12-305-*	.055(1.40)	.032(0.81)	.012 ± .003(.305 ± .076)
M23053/12-306-*	.060(1.52)	.039(0.99)	.012 ± .003(.305 ± .076)
M23053/12-307-*	.065(1.65)	.043(1.09)	.012 ± .003(.305 ± .076)
M23053/12-308-*	.076(1.93)	.049(1.24)	.012 ± .003(.305 ± .076)
M23053/12-309-*	.085(2.16)	.054(1.37)	.012 ± .003(.305 ± .076)

TABLE I. Construction details, inches (mm). 1/ - Continued

Military part number	As supplied ID minimum	After unrestricted shrinkage	
		ID maximum	Wall thickness 2/
M23053/12-310-*	.093(2.36)	.061(1.55)	.012 ± .003(.305 ± .076)
M23053/12-311-*	.110(2.79)	.067(1.70)	.012 ± .003(.305 ± .076)
M23053/12-312-*	.120(3.05)	.072(1.83)	.012 ± .003(.305 ± .076)
M23053/12-313-*	.140(3.56)	.080(2.03)	.012 ± .003(.305 ± .076)
M23053/12-314-*	.150(3.81)	.089(2.26)	.012 ± .003(.305 ± .076)
M23053/12-315-*	.153(3.89)	.096(2.44)	.012 ± .003(.305 ± .076)
M23053/12-316-*	.170(4.32)	.101(2.57)	.012 ± .003(.305 ± .076)
M23053/12-317-*	.191(4.85)	.112(2.84)	.012 ± .003(.305 ± .076)
M23053/12-318-*	.205(5.21)	.124(3.15)	.015 ± .004(.381 ± .102)
M23053/12-319-*	.215(5.46)	.130(3.30)	.015 ± .003(.381 ± .076)
M23053/12-320-*	.240(6.10)	.141(3.58)	.015 ± .004(.381 ± .102)
M23053/12-321-*	.270(6.86)	.158(4.01)	.015 ± .004(.381 ± .102)
M23053/12-322-*	.302(7.67)	.178(4.52)	.015 ± .004(.381 ± .102)
M23053/12-323-*	.320(8.13)	.198(5.03)	.015 ± .004(.381 ± .102)
M23053/12-324-*	.370(9.40)	.224(5.69)	.015 ± .004(.381 ± .102)
M23053/12-325-*	.390(9.91)	.249(6.32)	.015 ± .004(.381 ± .102)
M23053/12-326-*	.410(10.41)	.260(6.60)	.015 ± .004(.381 ± .102)
M23053/12-327-*	.430(10.92)	.278(7.06)	.015 ± .004(.381 ± .102)
M23053/12-328-*	.450(11.43)	.311(7.90)	.015 ± .004(.381 ± .102)
M23053/12-329-*	.470(11.94)	.329(8.36)	.015 ± .004(.381 ± .102)
M23053/12-330-*	.470(11.94)	.347(8.81)	.015 ± .004(.381 ± .102)
Class 4			
M23053/12-401-*	.050(1.27)	.025(0.64)	.006 ± .002(.152 ± .051)
M23053/12-402-*	.055(1.40)	.031(0.79)	.006 ± .002(.152 ± .051)
M23053/12-403-*	.060(1.52)	.038(0.97)	.006 ± .002(.152 ± .051)
M23053/12-404-*	.065(1.65)	.043(1.09)	.006 ± .002(.152 ± .051)
M23053/12-405-*	.076(1.93)	.046(1.17)	.006 ± .002(.152 ± .051)
M23053/12-406-*	.085(2.16)	.054(1.37)	.006 ± .002(.152 ± .051)
M23053/12-407-*	.093(2.36)	.057(1.45)	.006 ± .002(.152 ± .051)
M23053/12-408-*	.110(2.79)	.063(1.60)	.006 ± .002(.152 ± .051)
M23053/12-409-*	.120(3.05)	.072(1.83)	.008 ± .002(.203 ± .051)
M23053/12-410-*	.140(3.56)	.080(2.03)	.008 ± .002(.203 ± .051)
M23053/12-411-*	.150(3.81)	.089(2.26)	.008 ± .002(.203 ± .051)
M23053/12-412-*	.170(4.32)	.099(2.51)	.008 ± .002(.203 ± .051)
M23053/12-413-*	.191(4.85)	.110(2.79)	.008 ± .002(.203 ± .051)
M23053/12-414-*	.205(5.21)	.122(3.10)	.008 ± .002(.203 ± .051)
M23053/12-415-*	.215(5.46)	.130(3.30)	.008 ± .002(.203 ± .051)
M23053/12-416-*	.240(6.10)	.139(3.53)	.008 ± .002(.203 ± .051)
M23053/12-417-*	.270(6.86)	.154(3.91)	.008 ± .002(.203 ± .051)

TABLE I. Construction details, inches (mm). 1/ - Continued

Military part number	As supplied ID minimum	After unrestricted shrinkage	
		ID maximum	Wall thickness 2/
M23053/12-418-*	.302(7.67)	.172(4.37)	.010 ± .003(.254 ± .076)
M23053/12-419-*	.320(8.13)	.192(4.88)	.010 ± .003(.254 ± .076)
M23053/12-420-*	.370(9.40)	.214(5.44)	.010 ± .003(.254 ± .076)
M23053/12-421-*	.390(9.91)	.241(6.12)	.010 ± .003(.254 ± .076)
M23053/12-422-*	.410(10.41)	.260(6.60)	.010 ± .003(.254 ± .076)
M23053/12-423-*	.430(10.92)	.270(6.86)	.010 ± .003(.254 ± .076)
M23053/12-424-*	.450(11.43)	.301(7.65)	.010 ± .003(.254 ± .076)
M23053/12-425-*	.470(11.94)	.329(8.36)	.012 ± .003(.305 ± .076)
M23053/12-426-*	.470(11.94)	.347(8.81)	.012 ± .003(.305 ± .076)
Class 5			
M23053/12-501-*	.078(1.98)	.025(.64)	.009 ± .002(.229 ± .051)
M23053/12-502-*	.125(3.18)	.037(.94)	.012 ± .002(.305 ± .051)
M23053/12-503-*	.187(4.75)	.050(1.27)	.012 ± .002(.305 ± .051)
M23053/12-504-*	.250(6.35)	.063(1.60)	.012 ± .002(.305 ± .051)
M23053/12-505-*	.312(7.92)	.078(1.98)	.012 ± .002(.305 ± .051)
M23053/12-506-*	.375(9.53)	.096(2.44)	.012 ± .002(.305 ± .051)
M23053/12-507-*	.438(11.13)	.112(2.84)	.012 ± .002(.305 ± .051)
M23053/12-508-*	.500(12.70)	.144(3.66)	.015 ± .004(.381 ± .102)
M23053/12-509-*	.562(14.27)	.155(3.94)	.015 ± .004(.381 ± .102)
M23053/12-510-*	.625(15.88)	.178(4.52)	.015 ± .004(.381 ± .102)
M23053/12-511-*	.687(17.45)	.198(5.03)	.015 ± .004(.381 ± .102)
M23053/12-512-*	.750(19.05)	.224(5.69)	.015 ± .004(.381 ± .102)
M23053/12-513-*	.875(22.23)	.244(6.20)	.015 ± .004(.381 ± .102)
M23053/12-514-*	1.000(25.40)	.278(7.06)	.015 ± .004(.381 ± .102)
M23053/12-515-*	1.250(31.75)	.347(8.81)	.015 ± .004(.381 ± .102)
M23053/12-516-*	1.500(38.10)	.400(10.16)	.015 ± .004(.381 ± .102)
M23053/12-517-*	1.750(44.45)	.450(11.43)	.015 ± .004(.381 ± .102)
M23053/12-518-*	2.000(50.80)	.520(13.21)	.020 ± .005(.508 ± .127)
M23053/12-519-*	2.250(57.15)	.585(14.86)	.020 ± .005(.508 ± .127)
M23053/12-520-*	2.500(63.50)	.650(16.51)	.020 ± .005(.508 ± .127)
M23053/12-521-*	2.750(69.85)	.710(18.03)	.020 ± .005(.508 ± .127)
M23053/12-522-*	3.000(88.90)	.775(19.68)	.020 ± .005(.508 ± .127)
M23053/12-523-*	3.250(82.50)	.835(21.21)	.020 ± .005(.508 ± .127)
M23053/12-524-*	3.500(88.90)	.900(22.86)	.020 ± .005(.508 ± .127)
M23053/12-525-*	3.750(92.95)	.960(24.38)	.020 ± .005(.508 ± .127)
M23053/12-526-*	4.000(101.6)	1.025(26.03)	.020 ± .005(.508 ± .127)

- 1/ Diameter limits for the object to be enclosed shall be as recommended in technical data.
- 2/ Wall thickness values are less when shrinkage is restricted.
- 3/ The asterisk (*) in the part number shall be replaced by color code designators (see 1.2.2).

Unrestricted shrinkage: Test method 4.6.5; 350° ± 4°C (662° ± 8°F) for 10 minutes.

TABLE II. Physical properties. 1/

Characteristic	Requirement	Test procedure and conditions
<u>As supplied:</u>		
ID, minimum	Table I	4.6.3
Heat shock	No cracks, flowing or dripping	4.6.8 400° ± 5°C (752° ± 9°F)
Restricted shrinkage	Pass	4.6.6.1.2 350° ± 4°C (662° ± 7.2°F), 5 minutes
Voltage withstand	Pass	4.6.6.2
<u>After unrestricted shrinkage:</u>		
ID, maximum	Table I	4.6.3
Wall thickness	Table I	4.6.3
Tensile strength, psi (MPa), minimum	2,500(17.3)	4.6.13 ASTM D638, 2 inches/minute
Ultimate elongation, percent, minimum	200	4.6.13 ASTM D638, 2 inches/minute
Dielectric strength, volts/mil (Kv/mm), minimum	800(31.5)	4.6.2 ASTM D2671