

INCH-POUND

MIL-W-16878F  
AMENDMENT 1  
8 June 1994MILITARY SPECIFICATION  
WIRE, ELECTRICAL, INSULATED,  
GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-W-16878F(NAVY), dated 11 September 1992 and is approved for use by the Department of the Navy and is available for use by all Departments and Agencies of the Department of Defense.

## PAGE 1

Superseding information delete and substitute the following: " SUPERSEDING  
MIL-W-16878E(NAVY)  
10 August 1981"

1.2.1, delete and substitute the following:

"1.2.1 Part or Identifying Number (PIN). The PIN shall consist of the following form:

|                  |             |             |             |              |
|------------------|-------------|-------------|-------------|--------------|
| <u>M16878/05</u> | <u>B</u>    | <u>C</u>    | <u>B</u>    | <u>*</u>     |
| (see 1.2.2)      | (see 1.2.3) | (see 1.2.4) | (see 1.2.5) | (see 1.2.6)" |

## PAGE 2

1.2.6, line 3; delete; "strips" and substitute "stripes". Line 4; delete; "strip" and substitute "stripe". Line 5; delete; "strip" and substitute "stripe".

## PAGE 3

2.1, Military specifications, delete: "MIL-E-917 and associated title."

## PAGE 4

2.2, American Society For Testing and Materials (ASTM); delete: "D 4314 and associated title."

## PAGE 5

2.2, National Electrical Manufacturers Association (NEMA); add the following document:

"WC 56 - 3.0 kHz Insulation Continuity Proof Testing of Hook-up Wire."

The attached insertable replacement pages listed below are replacements for stipulated pages. When the new pages have been entered in the document, insert the amendment as a cover sheet to the specification.

| <u>Replacement page</u> | <u>Page replaced</u> |
|-------------------------|----------------------|
| 29                      | 29                   |
| 30                      | 30                   |
| 31                      | 31                   |
| 32                      | Blank                |

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PAGE 6

3.4.1.5, 3rd line, delete "thicjness" and substitute "thickness".

PAGES 7, 8, 9

TABLE I, column one, delete: "(see 1.2.1.3)" and substitute "(see 1.2.4)".

PAGE 10

3.4.2.7, delete in its entirety.

PAGE 12

3.6, delete "(see 3.6.1 through 3.6.18)" and substitute "(see 3.6.1 through 3.6.17)".

PAGE 13

3.6.17, TABLE IV, and 3.6.18, delete and substitute.

"3.6.17 Partial discharge test. Test shall be made prior to the ac and dc voltage tests on the lead wire. The applied voltage shall be raised to a value equal to 20% greater than the minimum partial-discharge extinction level but shall not exceed the required ac test voltage for the lead wire. This test shall be as specified in 4.5.20.

PAGE 14

3.9, delete in its entirety.

PAGE 16

4.4.3.1.3, delete in its entirety.

TABLE V, delete in its entirety.

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PAGE 17

TABLE V, delete and substitute the following:

TABLE V. First article and quality conformance inspections.

| Inspection                        | Requirement                               | Test Method | Classification of defect 1/ |
|-----------------------------------|---|-------------|-----------------------------|
| Group A                           |   |             |                             |
| Visual and mechanical examination | 3.1, 3.4, 3.4.1, 3.5, 3.5.6, 3.7, and 3.8 | 4.5.1       | Major                       |
| Insulation flaws:                 |   | 4.5.2       |                             |
| Spark                             | 3.6.1                                     | 4.5.2.1     | Critical                    |
| Impulse dielectric                | 3.6.1                                     | 4.5.2.2     | Critical                    |
| (or 3 kHz spark test)             |   | (4.5.2.1)   | Critical                    |
| Group B                           |   |             |                             |
| Dielectric withstanding voltage   | 3.6.2                                     | 4.5.3       | Critical                    |
| Insulation resistance             | 3.6.3                                     | 4.5.4       | Major                       |
| Conductor resistance              | 3.6.4                                     | 4.5.5       | Major                       |
| Cold bend                         | 3.6.5                                     | 4.5.6       | Major                       |
| Concentricity                     | 3.6.6                                     | 4.5.7       | Critical                    |
| Wrap back                         | 3.6.8                                     | 4.5.9       | Critical                    |
| Insulation tensile strength       | 3.6.13                                    | 4.5.14      | Critical                    |
| Insulation elongation             | 3.6.14                                    | 4.5.15      | Critical                    |
| Marking and stripe durability     | 3.6.15                                    | 4.5.16      | Minor                       |
| Group C                           |   |             |                             |
| Surface resistance                | 3.6.7                                     | 4.5.8       | Major                       |
| Heat resistance                   | 3.6.9                                     | 4.5.10      | Major                       |
| Flammability                      | 3.6.10                                    | 4.5.11      | Minor                       |
| Shrinkage                         | 3.6.11                                    | 4.5.12      | Major                       |
| Heat Aging                        | 3.6.12                                    | 4.5.13      | Major                       |
| Fungus resistance                 | 3.6.16                                    | 4.5.17      | Minor                       |

PAGE 18

4.5.2.1, delete and substitute the following:

"4.5.2.1 Spark test. The spark test shall be performed in accordance with method 6211 of FED-STD-228 at a rate that subjects each point on the wire to 9 cycles (minimum) of voltage at 60 hertz (Hz) or performed in accordance with NEMA WC-56 for 12 cycles (minimum) at 3 kHz. The test voltage shall be as specified (see 3.1)."

PAGE 21

4.5.10 (c), delete in its entirety.

PAGE 22

4.5.16.2, line 11; delete "size 20 and less" and substitute "size 26 and smaller".

4.5.18, delete in its entirety.

4.5.19, delete in its entirety.

PAGE 23

Figures 2, 2A, and 2B, delete in its entirety.

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PAGE 27

6.4, delete in its entirety.

PAGE 28

6.8, delete "Chlorosulfonated polyethylene".

6.9, delete, review, preparing activity and substitute the following:

CONCLUDING MATERIAL

Custodian:  
Navy - SH

Review activities:  
Navy - AS

Preparing activity:  
DLA - ES

(Project 6145-N346-01)

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APPENDIX A

SUPERSESSION AND CROSS REFERENCE DATA

10. SCOPE

10.1 Scope. This appendix provides a guide for supersession of wire types defined in MIL-W-16878D to those covered in MIL-W-16878F.

20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30. SUPERSESSION DATA

|                                | <u>MIL-W-16878D</u> | <u>MIL-W-16878E</u>   | <u>MIL-W-16878F</u>   |
|--------------------------------|---------------------|---|---|
| GENERAL DESCRIPTION            |                     |   |   |
| 600 VOLT, 105°C PVC            | TYPE B              | M16878/1<br>M16878/17   | M16878/1<br>M16878/17   |
| 1000 VOLT, 105°C PVC           | TYPE C              | M16878/2<br>M16878/18   | M16878/2<br>M16878/18   |
| 3000 VOLT, 105°C PVC           | TYPE D              | M16878/3<br>M16878/19   | M16878/3<br>M16878/19   |
| 600 VOLT, 200°C/260°C<br>PTFE  | TYPE E              | M16878/4<br>M16878/21<br>M16878/25<br>M16878/26                           | M16878/4<br>M16878/21<br>M16878/25<br>M16878/26                           |
| 1000 VOLT, 200°C/260°C<br>PTFE | TYPE EE             | M16878/5<br>M16878/22<br>M16878/27<br>M16878/28<br>M16878/34<br>M16878/35 | M16878/5<br>M16878/22<br>M16878/27<br>M16878/28<br>M16878/34<br>M16878/35 |
| 250 VOLT, 200°C/260°C<br>PTFE  | TYPE ET             | M16878/6<br>M16878/20<br>M16878/23<br>M16878/24                           | M16878/6<br>M16878/20<br>M16878/23<br>M16878/24                           |
| 600 VOLT, SILICONE<br>RUBBER   | TYPE F              | M16878/7<br>M16878/29   | M16878/7<br>M16878/29   |
| 1000 VOLT, SILICONE<br>RUBBER  | TYPE FF             | M16878/8<br>M16878/30<br>M16878/31<br>M16878/32                           | M16878/8<br>M16878/30<br>M16878/31<br>M16878/32                           |
| POLYETHYLENE, 75°C             | TYPE J              | M16878/10<br>M16878/33  | M16878/10<br>M16878/33  |

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APPENDIX A

|                        | <u>MIL-W-16878D</u> | <u>MIL-W-16878E</u> | <u>MIL-W-16878F</u> |
|------------------------|---------------------|---------------------|---------------------|
| GENERAL DESCRIPTION    |                     |                     |                     |
| FEP, 600 VOLT, 200°C   | TYPE K              | M16878/11           | M16878/11           |
| FEP, 1000 VOLT, 200°C  | TYPE KK             | M16878/12           | M16878/12           |
| FEP, 250 VOLT, 200°C   | TYPE KT             | M16878/13           | M16878/13           |
| XLPE, 600 VOLT, 125°C  |                     | M16878/14           | M16878/14           |
| XLPE, 1000 VOLT, 125°C |                     | M16878/15           | M16878/15           |
| XLPE, 3000 VOLT, 125°C |                     | M16878/16           | M16878/16           |
| XLPO, 600 VOLT, 105°C  |                     |                     | M16878/36           |
| EPDM, 600 VOLT, 125°C  |                     |                     | M16878/37           |
| EPDM, 5000 VOLT, 125°C |                     |                     | M16878/38           |

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APPENDIX B

PACKAGING FOR CONTINUOUS WIRE LENGTHS

10. SCOPE

10.1 Scope. This appendix establishes the minimum continuous wire lengths for polytetrafluoroethylene (PTFE) wire constructions. The information contained herein is intended for compliance unless there is an alternative specified in 6.2.

20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30. REQUIREMENTS

30.1 Put-up Tabulation. Due to the nature of the PTFE wire-forming process, TABLE VI specifies the minimum continuous lengths and percentage quantity per spool or reel that are acceptable unless otherwise specified (see 6.2).

TABLE VI. Minimum continuous wire lengths.

| AWG size  | Required minimum percent of the total inspection lot footage in continuous lengths greater than |          |         |         |
|-----------|---|----------|---------|---------|
|           | 300 feet  | 100 feet | 50 feet | 25 feet |
| 32 to 20  | 50%   | 80%      | 100%    | ---     |
| 18 to 14  | 30%   | 80%      | 100%    | ---     |
| 12 to 10  | ---   | 50%      | 80%     | 100%    |
| 8 to 4    | ---   | 20%      | 50%     | 100%    |
| 2 to 1    | ---   | ---      | 50%     | 100%    |
| 0 to 0000 | ---   | ---      | 30%     | 100%    |

30.2 Special Marking. Each spool or reel shall be marked accordingly with the length in feet and location of each piece.

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