

ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

**COPPER WIRE, SOFT OR ANNEALED ROUND - HEAVY
HIGH TEMPERATURE POLYESTER OR POLYESTER -
IMIDE AND AMIDE - IMIDE INSULATED**

ESF-M2L46-A

1. SCOPE

The material defined by this specification is soft or annealed round copper wire insulated with a heavy film consisting of a high temperature polyester or polyester-imide resin and 20 % minimum amide-imide overcoat in accordance with NEMA MW 1000 & IEC 851 specification.

2. APPLICATION

This specification was released originally for material used for the windshield wiper motor armature winding.

3. REQUIREMENTS

3.1 QUALITY SYSTEM REQUIREMENTS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.2 WIRE SIZE SPECIFICATIONS

The wire size shall be specified on the engineering drawing and/or release according to the American Wire Gage number desired.

Example: #16 gage ESF-M2L46-A.

3.3 COLOR

The color of the soft or annealed round copper wire insulated with a heavy film consisting of a high temperature polyester or polyester-imide resin and 20 % minimum amide-imide overcoat shall be specified on the engineering drawing.

3.4 BARE WIRE

The copper wire used as a base for the high temperature polyester coated wire shall conform to ESF-M2L1-A, except as noted herein.

Date	Action	Revisions
2002 10 14	Revised	Updated & Renumbered
1997 07 31	Revised	Revised para 3.2, 3.5 N. Vallabhanath
1967 07 11	F6-3162	Released (was XF-M2LX14)

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3.5 JOINTS

Joints made in the high temperature polyester insulated wire shall conform to ESF-M2L1-A and shall be covered with a polyester film so as to be equally as well covered as other portions of the wire.

3.6 INSULATION COATING AND THICKNESS

The wire shall be coated with a continuous insulating film of high temperature polyester having an amide-imide overcoat, of such quality as to meet the requirements of this specification. The minimum increase in the diameter of the wire due to the insulating film and the maximum overall diameter shall be as shown in NEMA MW1000, Part 2, Table H MW 35-C.

The addition to the diameter of the bare wire due to the high temperature polyester coating shall be determined utilizing the test method shown in specification NEMA MW1000.

3.7 INTERMEDIATE SIZES

For wire sizes between the American Wire Gage sizes, the increase in diameter due to the high temperature polyester coating shall be the same as for the next larger Awg size, and the test values shall be the same as for the next smaller Awg size.

3.8 INSULATION ADHERENCE
(NEMA 1000, IEC 851)

No cracks in the coating.

3.9 INSULATION FLEXIBILITY
(NEMA 1000, IEC 851)

No cracks in the coating.

3.10 INSULATION AGING, Temperature
index 200 +/- 3 C
(NEMA 1000, IEC 851)

Provide curve for the product.

3.11 ELONGATION
(NEMA 1000, IEC 851)

The insulated wire shall meet the requirements of NEMA Table.

3.12 INSULATION SOLUBILITY
(NEMA 1000, IEC 851)

Insulation shall not soften.