

ENGINEERING MATERIAL SPECIFICATION

Material Name	Specification Number
COPPER WIRE, SOFT ROUND, MODIFIED POLYESTER INSULATION WITH POLYAMIDE-IMIDE OVERCOAT, 200 °C	ESF-M2L68-A
COPPER WIRE, SOFT ROUND, MODIFIED POLYURETHANE INSULATION WITH POLYAMIDE OVERCOAT, SOLDERABLE, 155 °C	ESF-M2L68-A2

1. SCOPE

The material defined by this specification is a soft round copper wire with a single film high temperature insulation and an overcoat.

2. APPLICATION

This specification was released originally for material used for the DIS coil primary winding.

3. REQUIREMENTS

3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

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

3.2 COLOR

The color of the high temperature coating shall be:

ESF-M2L68-A Brown

ESF-M2L68-A2 Red

3.3 BARE WIRE

3.3.1 Size 0.691 - 0.701 mm

3.3.2 Electrical Resistivity, max
(ASTM B 193, at 20 °C) 1.7241 micro ohm.m

Date	Action	Revisions
2003 05 15	Revised	Para 3.0 inserted ; Para 3.1, 3.8, 3.9, 3.10, 4 deleted
1991 12 28	CF0DE00107002082	Revised 3.4, 3.6.3 L. Rumao
1988 10 31	CF4SRD107602201	Released J. B. Huebner

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3.3.3 Resistance

Resistance for any given wire must fall within the range obtained by calculating resistance for both the high and low diameter. The following formula may be used:

$$\text{Resistance} = \frac{\text{Resistivity} \times \text{Length}}{\text{Cross Section}}$$

Resistance – micro ohms
Resistivity - 1.7241 micro ohm/cm
Length - centimeters
Cross Section - square centimeters

3.3.4 Tensile Strength, max **265 MPa**
(ASTM B 3)

3.3.5 Elongation, min **25%**
(ASTM B 3, 254 mm gage length)

3.4 JOINTS

Each spool of wire shall be one continuous length without any joints.

3.5 COATING

3.5.1 Type

ESF-M2L68-A: Modified polyester insulation with a polyamide-imide overcoat.

ESF-M2L68-A2: Modified polyurethane
insulation with a polyamide overcoat (solderable).

3.5.2 Dimensions

Thickness, min 0.014 mm

Overall diameter, max 0.746 mm

Test Method: Discard approximately 3.5 m of wire from the spool. Measure the diameter of the coated wire on the spool at 2 points 1.2 m apart. Remove the coating by suitable means not injurious to the bare wire at approximately the same position on the wire and repeat the measurements around the bare wire. In each set of measurements, the diameter shall be measured at 4 points on the circumference approximately 45 degrees apart. The difference between the average diameter of the coated wire and the average diameter of the bare wire shall be considered addition due to the coating.