



NICKEL WIRE, PTFE INSULATED

ESF-M2L63-A

1. SCOPE

The material defined by this specification is a PTFE insulated nickel wire. The covering shall be 250 C classification.

2. APPLICATION

This specification was released originally for material for sensors.

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).

3.4 WIRE QUALITY

The conductor shall consist of one solid nickel wire and shall be 97.0% nickel, minimum.

3.5 CONSTRUCTION

3.5.1 Conductor

SAE Wire Size	24	30
Nominal Size, mm	0.508	0.255
Area of Conductor, mm ²	0.202	0.05

3.5.2 Insulation Thickness (Nominal), mm 0.127 0.127

3.5.3 Finished Cable Diameter (Nominal), mm 0.760 0.521

Note: Use 30 gage wire for component fabrication unless otherwise specified on Engineering drawing.

3.6 INSULATION

The insulating material shall be a good grade PTFE fluorocarbon which will pass the following test requirements:

The material shall adhere closely to, but strip readily from the conductors, leaving them reasonably clean and in suitable condition for soldering.

Insulation thickness shall be in accordance with para 3.5.1 and shall be determined by measuring the diameter over the insulation, then removing the insulation and measuring the diameter of the conductor. Half of the difference of the two measurements shall be considered as the wall thickness.

Date	Action	Revisions
2003 06 30	Revised	Para 3.0 inserted; Para 3.1, 3.2, 3.3, 3.7, 4 deleted
1990 07 11	DE00E00107002060	Revised para 3.5, added 24 gage J. Huebner
1983 04 12	CF4N-RD887294-25	Released (Was XF-M1LX20) J. Huebner

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3.6.1 High Temperature Resistance

Remove 25 mm of the insulation from each end of a 610 mm sample of the finished cable. The sample shall be suspended around a cylindrical mandrel having a diameter of 114 mm. Each end of the conductor shall have suspended from it a weight of 0.45 kg. This condition shall be maintained for 168 h at 248 - 252 °C in a circulating air oven.

When cool, the weight shall be removed from the specimen and it shall be taken off the mandrel, bent in the reverse direction around a mandrel of 76 mm diameter at a rate not to exceed one complete turn/min and then be subjected to the dielectric test (para 3.6.2).

3.6.2 Dielectric Test

A specimen of the cable 610 mm long shall be formed into a loop. Remove 25 mm of the insulation from each end of the wire and the ends twisted together. The loop thus formed shall be immersed in water containing 5% salt by weight at room temperature, so that not more than 152 mm of each end of the specimen protrudes above the solution. After being immersed for 5 h and while still immersed, the specimen shall withstand the application of 1000 V (rms) at 60 Hz frequency between the conductor and the water for 1 minute without rupture of the insulation.

3.6.3 Oil Resistance

A specimen 610 mm long shall be immersed to within 38 mm from the ends in a mixture of equal parts of kerosene and engine lubricating oil at a temperature of 50 +/- 2 °C for a period of 20 h. The sample shall then be removed from the solution, examined for deterioration of the insulating compound, and gaged for swelling.

The outside diameter of the insulation of the cable shall not increase more than 15%. The sample shall then be bent around a mandrel 76 mm in diameter and checked for cracking; after the bend test the cable shall pass the dielectric breakdown test (para 3.6.2).

3.6.4 Cold Resistance

A straight specimen shall be reduced to a temperature of - 40 °C at a rate not to exceed 50 °C/minute. After maintaining this temperature for 3 h and while still at this low temperature, the cable shall be wrapped around a mandrel 76 mm in diameter for 180 ° at the uniform rate of one turn in 10 s. The insulation shall be removed for a distance of 25 mm from each end of the specimen and the specimen subjected to the dielectric test (para 3.6.2).

3.6.5 Flame Test

A 610 mm specimen shall be suspended in a vertical position within a partial enclosure which allows a flow of sufficient air for complete combustion but is free from drafts. The tip of a 50 mm gas flame with an inner cone one-third its height shall then be applied to the end of the specimen for 15 s. After removal of the flame the specimen shall not continue to burn for more than 30 s.

3.6.6 Abrasion Resistance, min (SAE J 1128, Bracket A, 0.45 kg weight)

152 mm of tape