

**CABLE, TFE OR PFA INSULATED - LOW TENSION - STRANDED WIRE -
NICKEL COATED****ESF-M1L111-A****1. SCOPE**

The material defined by this specification is stranded, TFE or PFA covered low tension cable. The covering shall be 250 °C classification. The individual strands are nickel coated before stranding.

2. APPLICATION

This specification was released originally for material for the EGO sensor.

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).

3.1 WIRE QUALITY

The strands of the conductors prior to stranding shall consist of ESF-M2L1-A, soft or annealed round bare copper wire, nickel coated.

3.2 CABLE CONSTRUCTION

SAE Wire Size	No. of Wires	Nominal Strand Size			Stranded Conductor Dia (approx)		Area of Conductor	
		Awg	in	mm	in	mm	cmil	mm ²
14	37	30	0.0100	0.25	0.071	1.80	3777	1.91
14	19	27	0.0142	0.36	0.071	1.80	3777	1.91
16	19	29	0.0113	0.29	0.057	1.45	2340	1.18
18	19	30	0.0100	0.25	0.048	1.22	1568	0.79

3.2.1 Insulation Thickness (nominal)

SAE 14 Gage	0.016 in (0.41 mm)
SAE 16 Gage	0.016 in (0.41 mm)
SAE 18 Gage	0.016 in (0.41 mm)

Date	Action	Revisions	Rev 03
2013 01 09	Re-Activate	N/A	M. Gramlich,
2010 06 17	INACTIVE	No replacement named	M. Gramlich, NA
1978 12 08		Released (Was XF-M1LX16) F4J-78	



3.2.2 Finished Cable Diameter (nominal)

SAE 14 Gage	0.100 in (2.54 mm)
SAE 16 Gage	0.085 in (2.16 mm)
SAE 18 Gage	0.076 in (1.93 mm)

3.3 INSULATION QUALITY

The insulating material shall be a good grade TFE or PFA 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 3.2.1 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.

3.3.1 High Temperature Resistance

One inch (25 mm) of the insulation shall be removed from each end of a 24 in (610 mm) sample of the finished cable. The sample shall be suspended around a cylindrical mandrel having a diameter of 4.5 in (114 mm). Each end of the conductor shall have suspended from it a weight of 1 lb (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 3.0 in (76 mm) diameter at a rate not to exceed one complete turn/min and then be subjected to the dielectric test (para 3.3.2).

3.3.2 Dielectric Test

A specimen of the cable 24 in (610 mm) long shall be formed into a loop. One inch (25 mm) of the insulation shall be removed 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 6 in (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 min without rupture of the insulation.