



CABLE, BATTERY, CROSS LINKED POLYETHYLENE JACKET

ESF-M1L92-A

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ESF-M1L92-A2

1. SCOPE

The materials defined by this specification are stranded, flame retardant cross-linked polyethylene covered low tension cables, which shall have a maximum continuous service temperature of 125 °C.

2. APPLICATION

This specification was released originally for material used for higher temperature battery cables.

3. REQUIREMENTS

Shall conform to SAE J1127 except as follows:

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 SIZE

The wire size shall be specified on engineering drawings and/or releases according to the SAE wire size numbers appearing in Table I.

Example: #4 gage ESF-M1L92-A

3.2 CABLE QUALITY

The materials shall meet all of the requirements listed herein and shall be equal to the original approved sample.

3.3 WIRE QUALITY

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

3.4 CABLE CONSTRUCTION

See Tables I and II

Date	Action	Revisions
2010 12 08	Revised	Inserted Minimum Diameter of Finished Cable to Table II M. Gramlich, NA
2003 04 28	Revised	Para 3.0 inserted; Para 3.6, 3.7, 3.8, 3.9, 3.10, 4 deleted
1973 12 14	AC4-39	Released (Was XF-M1LX13)

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3.5 INSULATION QUALITY

Shall be a good grade of flame retardant cross-linked polyethylene which will pass the following test requirements:

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 Table II for the various wire sizes 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 average wall thickness. For any cross section of a test specimen, the minimum wall thickness shall not be less than 50% of the maximum wall thickness.

3.5.1 Mechanical Properties

A test specimen of the flame retardant cross-linked polyethylene insulation prepared as in the SAE J200 section on sampling, shall be used. The dumbbell cut sample shall have marks placed upon it 60 mm apart. The sample shall then be stretched at the rate of 300 mm/minute. The tensile strength shall be calculated upon the original cross section of the test specimen before stretching. Testing shall be conducted at 23 ± 2 °C. Care should be exercised in cutting samples to obtain uniform cross section. The physical properties shall be as follows:

Tensile Strength, min	10.4 MPa
Elongation, min	200%

3.5.2 High Temperature Resistance

One test specimen 25 mm long of the insulation shall be removed from each end of a 610 mm sample of the finished cable. The sample shall be suspended around a cylindrical mandrel having a diameter specified in Table III. Each end of the conductor shall have suspended from it, the weight shown in Table III. This condition shall be maintained for 120 h in a mechanical convection oven maintained at a temperature of 177 ± 3 °C.

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 the diameter specified for the bend test in Table III at a rate not to exceed one complete turn/minute and then be subjected to the dielectric test, para 3.5.3.

3.5.3 Dielectric Test

A specimen of the cable 610 mm long shall be formed into a loop. One test specimen 25 mm long 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 23 ± 2 °C, so that not more than 152 mm 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 volts (rms) at 60 Hz between the conductor and the water for 1 minute without rupture of the insulation.