

ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

COPPER WIRE - BATTERY CABLE - #3 GAGE

EST-M1L103-A

1. SCOPE

The material defined by this specification is stranded insulated battery cable.

2. APPLICATION

This specification was released originally for battery cables on heavy duty installations.

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 CABLE SIZES

The finished cable diameter shall not exceed 0.48 in (12.2 mm).

3.2 CABLE QUALITY

Shall meet all the requirements listed herein and must be equal to the original approved samples.

3.3 CABLE CONSTRUCTION

Shall consist of 518 strands (nominal of #30 gage round wire layed in rope construction and served with 1 x 0.003 in (25.4 x 0.08 mm) minimum paper tape with 12-1/2% minimum overlap. Absolute minimum number of strands at any one time to be 515. No individual group is to contain more than 20% of the total strands. Minimum area is 51 548 cmil (26.12 mm²).

3.4 WIRE QUALITY

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

3.5 INSULATION COLOR

Black, unless otherwise specified on the engineering drawing.

Date	Action	Revisions
2003 04 29	Revised	Para 3.0 inserted; Para 3.9 & 4 deleted
1978 08 30		Metricated & Retyped
1976 09 14		Released HG2-00NA-250 Orig./s/K. Gillis

Printed copies are uncontrolled

3.6 INSULATION QUALITY

The neoprene or vinyl-nitrile insulation must meet all basic SAE J 558 type SGR requirements and have a nominal wall thickness of 0.080 in (2.03 mm).

3.7 RESISTIVITY at 20 °C, max

211 $\mu\Omega$ /ft (692 $\mu\Omega$ /m)

3.8 PHYSICAL AND ELECTRICAL PROPERTIES

Three samples of cable are required. One for high temperature, low temperature and oil absorption tests. All samples are subjected to the dielectric breakdown test at the completion of their respective tests. These samples are 24 in (0.6 m) in length with 1 in (25 mm) of insulation stripped from both ends.

3.8.1 High Temperature Resistance

Suspend sample over a 10 in (254 mm) mandrel with a 6 lb (2.72 kg) weight at each end. Soak at 121 +/- 1 °C for 120 h in a circulating air oven. Cool to room temperature, remove the weight and bend the sample around the mandrel in a reverse direction at a rate not exceeding 1 turn per minute until a 180° bend is completed. Insulation shall not fracture or split.

3.8.2 Low Temperature Resistance

Lower the temperature on a straight piece of sample to -34 °C at a rate not to exceed 68 °C per minute. Hold for 3 h and then wrap around a 10 in (254 mm) mandrel at 6 turns per minute for 180°. Insulation shall not fracture.

3.8.3 Oil Absorption Resistance

Immerse sample to within 1-1/2 in (38 mm) from the ends into a solution of 50% kerosene, 50% SAE 10W engine oil for 20 h at 49 +/- 1 °C. The cable diameter shall not increase more than 15%. Wrap sample around a 10 in (254 mm) mandrel for 180°. Insulation shall not fracture or split.

3.8.4 Dielectric Resistance

Join exposed ends of sample and immerse loop to within 6 in (150 mm) of ends in a 5% salt bath (salt content weight at 27 °C). Soak 5 h and then apply 500V (RMS) 60 cps (Hz) between sample conductor and salt bath for 1 minute. Insulation shall not rupture.