



CABLE, PRIMARY LOW TENSION, POLYETHYLENE INSULATED-THIN WALL

WSS-M1L135-A1

1. SCOPE

The material defined by this specification is a low tension stranded cable insulated with cross-linked polyethylene. The cable is similar to SAE J1128, type TXL, but with a reduced insulation wall thickness.

2. APPLICATION

This specification was released for automotive applications requiring the use of cross-linked insulation.

Note: The assemblers of electrical wire harnesses shall use the bulk wire suppliers as shown in the Ford Motor Company Materials Approved Source List.

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).

3.3 CONDUCTOR (ASTM B 1/ASTM B 174)

- 3.3.1 The individual strands of the conductor shall be soft or annealed copper (hard copper wire may be used for wire sizes smaller than SAE wire size 0.5 mm² (No. 20)). Annealed copper strand elongation shall conform to ASTM B 174. Hard copper strand elongations shall conform to ASTM B 1. Strand dimensions shall be controlled to yield the cross-sectional area listed for the conductor of the finished cable per Table 1. Conductor area shall be determined by measuring individual strand diameters and calculating the sum of the individual strand areas. As an alternate method, conductor area may also be determined in accordance with ASTM B 263.
- 3.3.2 The strands shall be bunched per ASTM B 174. The maximum lay length shall be as specified in ASTM B 174, Table 3, Column A. Conductor strand count shall comply with Table 1 of this specification. Missing strands are not allowed.
- 3.3.3 Conductor resistance shall be measured by stripping 30 mm of insulation from each end of a 1050 mm cable (use of a longer specimen is optional). Solder (optional) 25 mm along each end of the specimen. Condition the specimen for a minimum of 4 hours at 23 +/- 5 °C. Measure the unsoldered length, the ambient temperature, and the resistance of the specimen. Calculate the resistance per meter. Calculate the resistance at 20 °C using the temperature correction method outlined in ASTM B 193. The maximum resistance values shall conform to those shown in Table 1.

Date	Action	Revisions
2006 09 29	Revised	Para 3.4 and 3.4.1 M. Trapp
2003 08 12	Revised	Para 3.0 inserted; Para 3.1, 3.2, 3.6, 4 deleted
1995 12 06	Activated	





3.4 INSULATION (SAE J1128)

- 3.4.1 The color of the insulation shall be specified on the engineering drawing of the component utilizing this material. Base and stripe color codes shall correspond to SAE J1128. Where striping is specified, the stripe shall be a minimum of 0.3 mm. wide, but not more than 15% of the circumference of the wire. The stripe shall be of the same material as the insulation. If the insulation is dyed or painted, all the cable quality tests in section 3.4 and 3.5 must be performed on the finished product. The insulation and the color may show no evidence of peeling or cracking and must conform to the color tolerances specified.
- 3.4.2 The insulating material shall be flame retardant, homogeneous, cross-linked polyethylene, similar to SAE J1128, Type TXL. The material shall adhere closely to, but strip readily from the conductors, leaving them free of insulation and in suitable condition for applying terminals.
- 3.4.3 Insulation thickness shall comply with the requirements of Table 2. Measure the minimum wall thickness of a 2000 mm specimen with an optical measurement device accurate to ± 0.01 mm (other devices may be used but the referee method will be the optical device). Move the sample approximately 400 mm and repeat the procedure for a total of five readings. The minimum insulation thickness shall comply with the values listed in Table 2.

3.5 CABLE QUALITY (TESTS) (SAE J1128)

The Mechanical Properties, Dielectric, Flame, Crosslinking, and Cold Bend Tests shall all be conducted in accordance with SAE J1128, Type TXL.

Note: The following paragraphs shall be tested in accordance with SAE J1128, but with exceptions to the requirements as indicated.

3.5.1 Cable Diameter

Measure the outside diameter of a 2000 mm specimen with an optical measurement device accurate to ± 0.01 mm (other devices may be used but the referee method will be the optical device) by taking a minimum of 2 readings approximately 90° apart at each cross section. Move the sample approximately 400 mm and repeat the procedure for a total of five cross-sections. The mean of all the readings will determine the outside diameter of the cable. The outside diameter will conform to the values listed in Table 2.

3.5.2 Pinch Test (SAE J1128)

Values as specified in Table 3 of this document.

3.5.3 Heat Shrinkage (FLTM BB 101-15)

Use a 200 mm sample for the test. The maximum insulation shrinkage shall not exceed 4%.