Material Name

Specification Number

CABLE, LOW TENSION, PTFE INSULATED, 260 C, THIN WALL, NICKEL PLATED

WSK-M1L127-A

1. SCOPE

The material defined by this specification is a low tension stranded cable, polytetrafluoroethylene (PTFE) or perlfluoro alkoxyl alkane (PFA) insulated conductor. The cable is similar to ISO 6722 with a thin wall insulation thickness.

2. APPLICATION

This specification was released originally for materials used in automotive electrical harnesses.

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

3. REQUIREMENTS

3.1 STATISTICAL PROCESS

Suppliers must conform to the requirements of Ford Quality System Standard Q-101. A mutually acceptable Control Plan as described therein is required for material/source approval. Appropriate statistical tools must be used to analyze process/product data so that variation in the final product is continuously reduced.

3.2 CABLE

3.2.1 Specimen Length 1.2 m

3.2.2 The maximum outside diameter shall be determined by taking measurements at three points along the conductor length separated by at least 100 mm and recording the greatest overall diameter at each point. No single value shall exceed the maximum overall diameter as specified in Table 2.

3.3 CONDUCTOR

3.3.1 The conductor of all cable classes shall consist of bunched or stranded soft annealed copper wires.

Date	Release No.	Release/Revision
1992 10 10	EE00E10176310000	Pages 1,3,4,8 & 9 Rev. MD/FE-12 P. Rade
1992 04 28	EE00E10206442000	Pages 1-8 Revised MD/FE-12 P. Rade
1990 10 23	EE00I0051754002	Released MD/PL-10 U. Schwarz

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3.3.2 Specimen Length 1.2 m

3.3.3 Three sections 10 mm long and separated by at least 400 mm shall be cut from the specimen. Carefully remove the conductor without deformation of the insulation.

3.3.4 The conductor diameter shall be determined by measuring the inside diameter of the insulation taken at three points separated by at least 100 mm and recording the maximum inside diameter at each point. The measurements shall be made with an optical device accurate to at least 0.01 mm. No value shall exceed the maximum diameter of the conductor specified in Table 2.

3.3.5 The conductor area may be determined by measuring individual strand diameters and calculating the sums of the individual strand areas. As an alternate method, conductor area may also be determined in accordance with FLTM BB 105-01 or by measuring the resistance in accordance with table 1.

3.3.6 The strands shall be bunched and the maximum lay length shall be a maximum of 50 times the conductor diameter. Minimum number of wires shall comply with Tables 1 and 2. Maximum variation between individual strand diameters must not exceed 10 percent per the following:

$$\text{Variation} = \frac{\text{max strand dia - min strand dia}}{\text{min strand dia}}$$

Missing strands are not allowed.

3.3.7 Elongation
(ASTM B 3)

for $d \leq 0.287$ mm $e > 15$ %
for $d > 0.287$ mm $e > 20$ %

where: d = individual strand diameter
e = elongation of individual strand.

3.3.8 Resistivity, max 1.7544 microohm.cm
(ASTM B 193, at 20 C)

3.4 INSULATION

3.4.1 The insulating material shall be a polytetrafluoroethylene (PTFE) or perlfluoro alkoxyl alkane (PFA) material, homogeneous in character. The surface shall be smooth and even without cracks, knots, blisters, or other faults.

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3.4.2 The color of the cables are per the Munsell Color Coding System and shall conform to Table 3. The following method shall be used to evaluate the color of the cables.

Comparison must be made by a person with normal or corrected vision, under cool white fluorescent lighting. The surface being inspected and the tolerance set must be in the same plane. Cable samples must be placed flat, overlapping the color standard. Color tolerance Reference Sets are available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

As an alternative, the color of the cables can be per the DIN 47002 or IEC 304 and shall conform to Table 4.

3.4.3 The minimum insulation thickness shall be determined by taking measurements at three points separated by at least 100 mm and recording the minimum insulation thickness at each point. The thickness shall be measured with an optical device accurate to at least 0.01 mm. No single value shall be lower than the minimum insulation thickness specified in Table 2.

3.5 CONDITIONING AND TEST CONDITIONS

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

3.6 FAULT TESTING OF THE COMPLETE DELIVERY (in process testing)

3.6.1 When pulling the grounded dry cable through the test electrodes connected to the test voltage, there must be no punctures. The test electrodes may consist of a coil, a metal tube, metal ball chains or any other type of suitable electrode.

3.6.2 Test Voltage

for wires $\leq$ 0.5 mm2	3 kVeff
for wires > 0.5 mm2	5 kVeff

The power supply shall be a transformer delivering a sinusoidal voltage. The electrode length and the frequency of the AC voltage shall be chosen, considering the speed of cable running through the field of the electrode, so that each point of the cable shall be loaded by at least nine voltage cycles. If in place of a sinusoidal voltage unidirectional pulses are applied, there must be 18 pulses on each point of the cable.

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