

WSD 1734 Issue 5
**Automotive 150°C Rated MPCB Cable
Specification**
July 2013

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1 SCOPE

This specification covers the requirements for 150°C rated MPCB power cable. The detailed requirements of the individual products within the range are defined on the Specification Control Drawing (SCD). Where a difference occurs between this document and the SCD, the SCD shall take precedence. This specification has been based on the documents as listed in section 2.

2 RELATED DOCUMENTS

Reference is made in this document to the following specifications:

Ford WSK-1A348-
A4 03/06/03

Primary Low Tension Cable 150°C

3 QUALITY ASSURANCE PROVISIONS

The tests detailed in section 5 are to be carried out at the frequencies described below. Where appropriate, individual test frequencies may be modified through the use of statistically derived data.

3.1 Quality Assurance

The supplier shall provide reasonable access to facilities for quality audit and control purposes on customer request.

3.2 Test Frequency

Tests are divided into three frequency categories. These are routine, lot/batch and qualification tests.

3.2.1 Routine Tests (100%)

Performed on 100% of the production length.

3.2.2 Lot/Batch Tests (Lot)

Performed on each production batch. A batch is any quantity of material manufactured on a substantially continuous basis, under conditions that are presumed uniform.

3.2.3 Qualification Tests (Q)

These are performed:

- i) Prior to first shipment of a new product.
- ii) Whenever any significant change is made to the materials or manufacturing process.

4 CABLE CONSTRUCTIONS AND MATERIALS

4.1 Conductors

4.1.1 Copper Conductors

Strands shall be clean, bright and free from surface irregularities. Constructions shall show no kinks, joints or other irregularities in the completed conductor. They shall comply with section 5 and the SCD.

4.2 Cable Insulation

The insulation system shall meet the requirements of section 5 of this specification. It shall be extruded to cover the conductor uniformly and be homogeneous, smooth and free from flaws. The insulation shall not be loose, but be capable of stripping cleanly without damage to the conductor.

4.2.1 Colour

The colours shall be defined as in Table 1.

Reference Number	Colour
0	Black
2	Red

Table 1.

5 TESTS AND TEST METHODS

5.1 Tests Taken From Ford WSK-1A348-A4

Clause	Frequency	Method	Definition	Test Requirements
5.1.1	Lot	-	Insulation thickness	See SCD
5.1.2	Lot	-	Cable diameter	See SCD
5.1.3	Lot	-	Conductor diameter	See SCD
5.1.4	Lot	WSK-1A348-A4 clause 3.10.1	Conductor resistance	See SCD
5.1.5	100%	WSK-1A348-A4 clause 3.10.4	Insulation faults	No breakdown
5.1.6	Q	WSK-1A348-A4 clause 3.10.2	30 Minute withstand voltage	No breakdown
5.1.7	Q	WSK-1A348-A4 clause 3.10.5	Insulation volume resistivity	>10 ⁹ Ωmm
5.1.8	Q	WSK-1A348-A4 clause 3.11.1	Pressure test at high temperature	No breakdown
5.1.9	Q	WSK-1A348-A4 clause 3.11.2	Low temperature winding	No cracks, No breakdown
5.1.10	Q	WSK-1A348-A4 clause 3.11.3	Low temperature impact	No cracks, No breakdown
5.1.11	Q	WSK-1A348-A4 clause 3.11.5	Short term heat ageing	No cracks, No breakdown
5.1.12	Q	WSK-1A348-A4 clause 3.11.6	Long term heat ageing	No cracks, No breakdown
5.1.13	Q	WSK-1A348-A4 clause 3.11.7	Thermal overload	No cracks, No breakdown
5.1.14	Q	WSK-1A348-A4 clause 3.11.8	Shrinkage by heat	≤2 mm either end
5.1.15	Q	WSK-1A348-A4 clause 3.11.10b	Flexibility	As per Table 2
5.1.16	Q	WSK-1A348-A4 clause 3.11.12	Notching resistance	Record

Clause	Frequency	Method	Definition	Test Requirements
5.1.17	Q	WSK-1A348-A4 clause 3.11.13	Resistance to flame propagation	Self extinguish within 70s, >50mm unburnt at top
5.1.18	Q	WSK-1A348-A4 clause 3.11.15	Hydrolysis test – 16mm ² only	>10 ⁹ Ωmm, No cracks, No breakdown
5.1.19	Q	WSK-1A348-A4 clause 3.12	Compatibility tests - 25mm ² only	No cracks, No breakdown
5.1.20	Q	WSK-1A348-A4 clause 3.13	PVC Compatibility test - 25mm ² only	No cracks, No breakdown
5.1.21	Q	WSK-1A348-A4 clause 3.14	Environmental cycling - 25mm ² only	No cracks, No breakdown
5.1.22	Q	WSK-1A348-A4 clause 3.15	Resistance to ozone – 16mm ² only	No cracks
5.1.23	Q	WSK-1A348-A4 clause 3.16	Mycological – 16mm ² only	No mould growth, No cracks

5.2 Additional Tests

Clause	Frequency	Definition	Test Requirements
5.2.1	Lot	Tensile strength & elongation	Dumbbells or tubes of cable insulation, shall be cut and tested in a Tensometer. Using a jaw distance of 50 mm, a gauge length of 20 mm and a jaw separation speed of 250 mm/minute. The minimum requirement for tensile strength = 12.4 MPa and elongation = 200%.
5.2.2	Lot	Heat shock	A length of finished cable shall be wound around a mandrel having a diameter equal to the diameter of the cable or back upon itself for a minimum of 6 turns and secured to prevent unwinding. The sample shall be placed in an air-circulating oven at 250°C for one hour. After this period the sample shall be removed from the oven and allowed to return to ambient temperature. The sample shall be visually inspected and shall show no signs of cracking or melting.

Table 2

Wire Size (mm ²)	Flexibility maximum	
	With reel set (N)	Against reel set (N)
10.0	15	20
16.0	20	25
25.0	30	35
35.0	40	45
50.0	60	65

6 REVISION HISTORY

Issue No.	Amendment No.	CR No.	Date	Incorporated By
1	-	-	December 2004	Guy Mundy
2	-	CR05-DP-262	May 2005	Guy Mundy
3	-	CR07-DP-483	October 2007	Guy Mundy
4		CR12-DP-040	October 2012	Keith Carter
5		CR13-DP-033	July 2013	Paul Francis

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