
International Standard



3808/1

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Road vehicles — Unscreened high-tension ignition cables — Part 1 : Dimensions, general requirements and test methods

Véhicules routiers — Câbles d'allumage haute tension non blindés — Partie 1 : Dimensions, spécifications générales et méthodes d'essai

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3808/1 was developed by Technical Committee ISO/TC 22, *Road vehicles*, and was circulated to the member bodies in October 1978.

It has been approved by the member bodies of the following countries :

Austria	Japan	Sweden
Belgium	Korea, Dem. P. Rep. of	Switzerland
Bulgaria	Korea, Rep. of	United Kingdom
Czechoslovakia	Mexico	USA
France	Netherlands	USSR
Germany, F.R.	Romania	Yugoslavia
Iran	South Africa, Rep. of	
Italy	Spain	

No member body expressed disapproval of the document.

Road vehicles — Unscreened high-tension ignition cables — Part 1 : Dimensions, general requirements and test methods

1 Scope

This International Standard specifies the dimensions, general requirements and test methods for unscreened high-tension ignition cables.

NOTE — Cable classes, types, applicable tests and special requirements will be specified in ISO 3808/2.

2 Field of application

This International Standard applies to all types of unscreened high-tension ignition cables used in automotive vehicle applications.

3 Reference

ISO 1817, *Vulcanized rubbers — Resistance to liquids — Methods of test*.

4 Cable dimensions

The outside diameters¹⁾ of the finished cables shall be :

$$8 \pm 0,3 \text{ mm}$$

$$7 \pm 0,3 \text{ mm}$$

$$5 \begin{smallmatrix} + 0,3 \\ 0 \end{smallmatrix} \text{ mm}$$

5 Test methods

5.1 Test for insulation faults of the total delivery

5.1.1 Principle

When the earthed dry cable is drawn through a coiled wire to which a voltage is being applied, no breakdown shall occur.

5.1.2 Apparatus

Coiled wire : internal diameter equal to the cable outside diameter plus 1 mm, pitch approximately 3 mm, wire diameter 1,5 mm.

5.1.3 Test voltages (root mean square)

For 8 mm cable : 30 kV(r.m.s.), 50 Hz or 60 Hz.

For 7 mm cable : 25 kV(r.m.s.), 50 Hz or 60 Hz.

For 5 mm cable : 20 kV(r.m.s.), 50 Hz or 60 Hz.

5.1.4 Duration of test

At least 1 s for each part of the cable.

NOTE — For this test other types of installation may be used provided that insulation faults are detected with the same degree of certainty.

5.2 Thirty minute test voltage and breakdown voltage

(For test apparatus see annex, clause A.1.)

5.2.1 Specimen length

Approximately 1 200 mm.

5.2.2 Procedure

Immerse the specimen for 4 h in salt solution [3 % (*m/m*) of NaCl in water] at room temperature 23 ± 5 °C with the ends emerging, and then immediately apply the test voltage specified in 5.2.3 for 30 min between the conductor and the solution. The cable shall not break down.

Then increase the voltage at a rate of 500 V/s until the value specified in 5.2.4 is reached. Breakdown shall not occur.

5.2.3 Test voltages (root mean square)

For 8 mm cable : 20 kV(r.m.s.), 50 Hz or 60 Hz.

For 7 mm cable : 20 kV(r.m.s.), 50 Hz or 60 Hz.

For 5 mm cable : 15 kV(r.m.s.), 50 Hz or 60 Hz.

1) The outside diameter is the average value of three measurements on the circumference because during transportation and storage of the wire coils, deformations caused by pressure might have occurred.

5.2.4 Breakdown voltages (root mean square)

For 8 mm cable : at least 40 kV(r.m.s.), 50 Hz or 60 Hz.

For 7 mm cable : at least 35 kV(r.m.s.), 50 Hz or 60 Hz.

For 5 mm cable : at least 25 kV(r.m.s.), 50 Hz or 60 Hz.

5.3 Capacity

5.3.1 Specimen length

Approximately 1 200 mm.

5.3.2 Procedure

Soak the specimen in salt solution [3 % (*m/m*) of NaCl in water] at 70 ± 2 °C for 24 h, with each end of the cable emerging 100 mm from the water. Measure the cable capacity between the conductor and the water.

Immerse the specimen in a bath containing tap water at a temperature of 23 ± 2 °C for 1 h, with each end of the cable emerging 100 mm from the water. Again, measure the cable capacity between the conductor and the water.

The cable capacities shall not exceed the values agreed between the engine and the cable manufacturer.

5.3.3 Measuring frequency

1 000 Hz.

5.4 Resistance to corona effect

(For test apparatus see annex, clause A.2.)

5.4.1 Specimen length

Approximately 1 200 mm.

5.4.2 Procedure

Fix the specimen, at room temperature 23 ± 5 °C between mandrel and sleeve and apply the voltage specified in ISO 3808/2. After 8 h under test, there shall be no breakdown of the specimen nor shall the surface of the specimen show cracks or other alterations or defects.

5.5 Pressure test at high temperature

(For test apparatus see annex, clause A.3.)

5.5.1 Specimen length

Approximately 100 mm.

5.5.2 Procedure

Mount the specimen in the test apparatus, load with the

specified mass and maintain for 4 h at the temperature specified in ISO 3808/2 in a hot-air oven with natural draught. Remove the specimen from the test apparatus and cool within 10 s by immersing in cold water. Then measure the depth of the indentation at a cross- or length-section in the area of application of the load, using a measuring microscope. The depth of the indentation shall not exceed 50 % referred to the average wall thickness, determined by six measurements distributed around the circumference of the specimen at a suitable distance from the area of indentation.

5.5.3 Test masses

For 8 mm cable : 510 g (including mass of test frame)

For 7 mm cable : 450 g (including mass of test frame)

For 5 mm cable : 312 g (including mass of test frame)

5.6 Thermal overload test

(For test apparatus see annex, clause A.4.)

5.6.1 Specimen length

Approximately 500 mm.

5.6.2 Procedure

Suspend a 500 mm specimen vertically for 48 h in air at the temperature specified in ISO 3808/2 in a hot-air oven with natural draught.

After cooling to room temperature 23 ± 5 °C, wind this specimen according to clause A.4 of the annex.

After this test, the specimen shall show neither cracks, fractures nor other defects.

For resistive cables, measure the resistance before and after the test with the same 500 mm specimen at a temperature of 23 ± 5 °C. The difference between the two measured values shall lie within the limits defined in ISO 3808/2.

5.7 Shrinkage by heat

Where shrinkage of the insulation is important relative to the connector attachment, the following test shall apply.

5.7.1 Specimen length

Approximately 200 mm.

5.7.2 Procedure

Measure the exact length of the specimen at room temperature 23 ± 5 °C prior to the test. Put the specimen in a hot-air oven with natural draught, in a horizontal position, so that air may circulate freely from all sides. Test duration shall be 15 min. Test temperatures shall be as specified in ISO 3808/2.