
**Road vehicles — Multi-core connecting
cables —**

Part 1:
**Test methods and requirements for
basic performance sheathed cables**

Véhicules routiers — Câbles de raccordement multiconducteurs —

*Partie 1: Méthodes d'essai et exigences pour les câbles gainés à
performance de base*



This document is a preview generated by EMS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword.....	v
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	2
4 General.....	2
5 Dimensions.....	3
5.1 Outside cable diameter.....	3
5.1.1 Test sample.....	3
5.1.2 Apparatus.....	3
5.1.3 Procedure.....	3
5.1.4 Requirement.....	3
5.2 Ovality.....	3
5.2.1 Test sample and apparatus.....	3
5.2.2 Procedure.....	3
5.2.3 Requirement.....	4
5.3 Thickness of the sheath.....	4
5.3.1 Test samples, apparatus, procedure.....	4
5.3.2 Requirement.....	4
5.4 Lay length.....	4
5.4.1 General.....	4
5.4.2 Test samples.....	4
5.4.3 Apparatus.....	4
5.4.4 Procedure.....	4
5.4.5 Requirement.....	4
6 Electrical characteristics.....	4
6.1 Continuity.....	4
6.2 Withstand voltage.....	4
6.3 Capacitance.....	4
6.3.1 General.....	4
6.3.2 Test samples.....	5
6.3.3 Apparatus.....	5
6.3.4 Procedure.....	5
6.3.5 Requirements.....	6
7 Mechanical characteristics.....	6
7.1 Pressure test at high temperature.....	6
7.2 Adhesion of the sheath.....	6
7.3 Cyclic bending.....	6
7.3.1 General.....	6
7.3.2 Test samples.....	6
7.3.3 Apparatus.....	6
7.3.4 Procedure.....	7
7.3.5 Requirement.....	7
8 Low temperature characteristics.....	7
8.1 Winding.....	7
8.1.1 Test sample.....	7
8.1.2 Apparatus.....	8
8.1.3 Procedure.....	8
8.1.4 Requirements.....	8
8.2 Impact.....	8
8.2.1 Test samples.....	8
8.2.2 Apparatus.....	8
8.2.3 Procedure.....	9

8.2.4	Requirement.....	9
9	Resistance to abrasion.....	9
10	Heat ageing.....	9
10.1	Long term ageing, 3 000 h.....	9
10.2	Short term ageing, 240 h.....	9
11	Resistance to chemicals.....	9
11.1	Fluid compatibility of the sheath.....	9
11.1.1	Test samples.....	9
11.1.2	Apparatus.....	9
11.1.3	Procedure.....	10
11.1.4	Requirements.....	10
11.2	Durability of sheath marking.....	10
11.2.1	General.....	10
11.2.2	Test Samples.....	10
11.2.3	Apparatus.....	10
11.2.4	Procedure.....	10
11.2.5	Requirements.....	10
11.3	Resistance to ozone.....	11
12	Resistance to flame propagation.....	11
13	Artificial weathering.....	11
13.1	General.....	11
13.2	Test sample.....	11
13.3	Apparatus.....	11
13.4	Procedure.....	11
13.5	Requirement.....	11
	Bibliography.....	12

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 32, *Electrical and electronic components and general system aspects*.

This third edition cancels and replaces the second edition (ISO 4141-1:2005), which has been technically revised. The main changes compared to the previous edition are as follows:

- Temperature range of cable defined as Class A and Class B (see [10.1](#) and [10.2](#)).

A list of all parts in the ISO 4141-series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Road vehicles — Multi-core connecting cables —

Part 1:

Test methods and requirements for basic performance sheathed cables

1 Scope

This document specifies the test methods and requirements of basic performance multi-core sheathed cables for the connection of towing and towed vehicles, suitable for a temperature range of class A and class B defined in ISO 6722-1:2011, Table 1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 4141-3, *Road vehicles — Multi-core connecting cables — Part 3: Construction, dimensions and marking of unscreened sheathed low-voltage cables*

ISO 4892-2, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

ISO 4892-4, *Plastics — Methods of exposure to laboratory light sources — Part 4: Open-flame carbon-arc lamps*

ISO 6722-1, *Road vehicles — 60 V and 600 V single-core cables — Part 1: Dimensions, test methods and requirements for copper conductor cables*

ISO 7638-1, *Road vehicles — Connectors for the electrical connection of towing and towed vehicles — Part 1: Connectors for braking systems and running gear of vehicles with 24 V nominal supply voltage*

ISO 7638-2, *Road vehicles — Connectors for the electrical connection of towing and towed vehicles — Part 2: Connectors for braking systems and running gear of vehicles with 12 V nominal supply voltage*

ISO 12098, *Road vehicles — Electrical connections between towing vehicles and trailers — 15 pole connector for commercial vehicles equipped with 24V systems — Dimensional characteristics and contact allocation*

ISO 14572, *Road vehicles — Round, sheathed, 60 V and 600 V screened and unscreened single- or multi-core cables — Test methods and requirements for basic- and high-performance cables*

IEC 60811-1-1, *Common test methods for insulating and sheathing materials of electric cables — Part 1: Methods for general application — Section 1: Measurement of thickness and overall dimensions — Tests for determining the mechanical properties*

EN 14214, *Automotive fuels — Fatty acid methyl esters (FAME) for diesel engines — Requirements and test methods*

DIN V 70070, *Diesel engines — NO_x-reduction additives AUS 32 — Requirements and test methods*