
**Road vehicles — Test methods and
performance requirements for voltage
class B connectors**

*Véhicules routiers — Méthodes d'essai et exigences de performance
pour connecteurs haute tension*

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO 20076:2019](https://standards.iteh.ai/catalog/standards/iso/76eb705c-9920-4be1-868e-f0f89b897a16/iso-20076-2019)

<https://standards.iteh.ai/catalog/standards/iso/76eb705c-9920-4be1-868e-f0f89b897a16/iso-20076-2019>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 20076:2019

<https://standards.iteh.ai/catalog/standards/iso/76eb705c-9920-4be1-868e-f0f89b897a16/iso-20076-2019>



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	vi
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Test and requirements	3
4.1 General.....	3
4.1.1 Preconditioning for environmental and mechanical durability.....	3
4.1.2 Test conditions.....	3
4.1.3 Test sequences and sample quantities.....	4
4.2 Visual examination.....	10
4.2.1 Purpose.....	10
4.2.2 Test.....	10
4.2.3 Requirements.....	10
4.3 Connection and disconnection.....	10
4.3.1 Purpose.....	10
4.3.2 Test.....	11
4.3.3 Requirements.....	11
4.4 Tensile strength between terminal and cable.....	11
4.4.1 Purpose.....	11
4.4.2 Test.....	11
4.4.3 Requirements.....	12
4.5 Tensile strength for shield connections.....	12
4.5.1 Purpose.....	12
4.5.2 Test.....	12
4.5.3 Requirements.....	13
4.6 Locking device strength.....	13
4.6.1 Purpose.....	13
4.6.2 Test.....	13
4.6.3 Requirements.....	13
4.7 Unintentional lever release force.....	14
4.7.1 Purpose.....	14
4.7.2 Test.....	14
4.7.3 Requirements.....	14
4.8 Lock button release force.....	14
4.8.1 Purpose.....	14
4.8.2 Test.....	14
4.8.3 Requirements.....	14
4.9 Locking force of CPA.....	14
4.9.1 Purpose.....	14
4.9.2 Test.....	15
4.9.3 Requirements.....	15
4.10 Disengage force of CPA.....	15
4.10.1 Purpose.....	15
4.10.2 Test.....	15
4.10.3 Requirements.....	15
4.11 Locking force of TPA.....	15
4.11.1 Purpose.....	15
4.11.2 Test.....	15
4.11.3 Requirements.....	16
4.12 Extraction force of TPA.....	16
4.12.1 Purpose.....	16
4.12.2 Test.....	16

4.12.3	Requirements	16
4.13	Connector coding and polarization effectiveness	16
4.13.1	Purpose	16
4.13.2	Test	16
4.13.3	Requirements	17
4.14	Terminal insertion force	17
4.14.1	Purpose	17
4.14.2	Test	17
4.14.3	Requirements	17
4.15	Terminal insertion force with incorrect orientation	17
4.15.1	Purpose	17
4.15.2	Test	17
4.15.3	Requirements	17
4.16	Terminal extraction force	18
4.16.1	Purpose	18
4.16.2	Test	18
4.16.3	Requirements	18
4.17	Connector engagement sound	19
4.17.1	Purpose	19
4.17.2	Test	19
4.17.3	Requirements	19
4.18	Connection resistance (voltage drop)	19
4.18.1	Purpose	19
4.18.2	Test	19
4.18.3	Requirements	19
4.19	Temperature rise	20
4.19.1	Purpose	20
4.19.2	Test	20
4.19.3	Requirements	21
4.20	Insulation resistance	21
4.20.1	Purpose	21
4.20.2	Test	22
4.20.3	Requirements	22
4.21	Withstanding voltage	22
4.21.1	Purpose	22
4.21.2	Test	23
4.21.3	Requirements	23
4.22	Electromagnetic shielding performance	23
4.22.1	Purpose	23
4.22.2	Test	23
4.22.3	Requirements	23
4.23	Water tightness	23
4.23.1	Purpose	23
4.23.2	Test	24
4.23.3	Requirements	26
4.24	Mechanical shock	26
4.24.1	Purpose	26
4.24.2	Test	26
4.24.3	Requirements	27
4.25	Drop	27
4.25.1	Purpose	27
4.25.2	Test	27
4.25.3	Requirements	27
4.26	Vibration with thermal cycling	27
4.26.1	Purpose	27
4.26.2	Test	28
4.26.3	Requirements	29
4.27	Current cycling at environmental temperature	30

4.27.1	Purpose	30
4.27.2	Test	30
4.27.3	Requirements	30
4.28	Thermal aging	30
4.28.1	Purpose	30
4.28.2	Test	30
4.28.3	Requirements	30
4.29	Thermal shock	30
4.29.1	Purpose	30
4.29.2	Test	30
4.29.3	Requirements	31
4.30	Temperature/humidity cycle	31
4.30.1	Purpose	31
4.30.2	Test	31
4.30.3	Requirements	31
4.31	Condensation	32
4.31.1	Purpose	32
4.31.2	Test	32
4.31.3	Requirements	32
4.32	Salt spray	32
4.32.1	Purpose	32
4.32.2	Test	32
4.32.3	Requirements	33
4.33	High-pressure/steam-jet cleaning	33
4.33.1	Purpose	33
4.33.2	Test	33
4.33.3	Requirements	36
4.34	Dust resistance	36
4.34.1	Purpose	36
4.34.2	Test	36
4.34.3	Requirements	36
4.35	Oil and liquid resistance	36
4.35.1	Purpose	36
4.35.2	Test	36
4.35.3	Requirements	36
Annex A (informative) EMC test methods		37
Annex B (informative) Typical sample preparation for environmental tests		55
Bibliography		57

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*.

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.

<https://standards.iteh.ai/catalog/standards/iso/76eb705c-9920-4be1-868e-f0f89b897a16/iso-20076-2019>

Introduction

High voltage connectors differ from low voltage connectors in several ways due to their higher operating voltage and need for shielding. These differences lead to unique failure modes and a need for unique validation tests. This document is a test specification that is unique to high voltage connectors on road vehicles. Some of the unique items that are tested in this document are:

- higher limits on dielectric withstanding voltage,
- more exhaustive testing for airtightness,
- evaluation of EMC compatibility, and
- evaluation of unique components such as shielding and metal housings (also for electrical shielding).

Note that safety features in a connector design to prevent electric shock (such as high voltage interlock) are specific to the connector and the vehicle electrical architecture and therefore must be assessed separately.

iTeh Standards (<https://standards.iteh.ai>) Document Preview

[ISO 20076:2019](https://standards.iteh.ai/catalog/standards/iso/76eb705c-9920-4be1-868e-f0f89b897a16/iso-20076-2019)

<https://standards.iteh.ai/catalog/standards/iso/76eb705c-9920-4be1-868e-f0f89b897a16/iso-20076-2019>