
**Road vehicles — Safety glazing
materials — Test methods for
properties of electrically heated
glazing**

*Véhicules routiers — Vitrages de sécurité — Méthodes d'essai pour les
propriétés des vitrages chauffés électriquement*



This document is a preview generated by EBS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, 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
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Specimens	3
5 Conditioning of test specimens	3
6 Application of test	3
7 Requirements	4
7.1 Circuit continuity and heating power	4
7.1.1 Purpose of test	4
7.1.2 Apparatus	4
7.1.3 Procedure	4
7.1.4 Expression of results	4
7.2 Driving visibility	5
7.2.1 Purpose of test	5
7.2.2 Apparatus	5
7.2.3 Procedure	5
7.2.4 Expression of results	5
7.3 Electrical attachment bond performance	5
7.3.1 Purpose of test	5
7.3.2 Apparatus	5
7.3.3 Procedure	6
7.3.4 Expression of results	6
7.4 Electrical attachment bending performance	6
7.4.1 Purpose of test	6
7.4.2 Procedure	6
7.4.3 Expression of results	6
7.5 Hot spot and heating uniformity	6
7.5.1 Purpose of test	6
7.5.2 Apparatus	7
7.5.3 Procedure	7
7.5.4 Expression of results	7
7.6 Defrosting efficiency	7
7.6.1 Purpose of test	7
7.6.2 Apparatus	7
7.6.3 Procedure	8
7.6.4 Expression of results	8
7.7 High voltage durability	8
7.7.1 Purpose of test	8
7.7.2 Procedure	8
7.7.3 Expression of results	9
7.8 Low temperature performance	9
7.8.1 Purpose of test	9
7.8.2 Apparatus	9
7.8.3 Procedure	9
7.8.4 Expression of results	9
7.9 Long term humidity durability	9
7.9.1 Purpose of test	9
7.9.2 Apparatus	9
7.9.3 Procedure	10
7.9.4 Expression of results	10
8 Acceptance criteria	10

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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#).

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 35, *Lighting and visibility*.

Road vehicles — Safety glazing materials — Test methods for properties of electrically heated glazing

1 Scope

This International Standard provides the test methods and acceptance criteria for circuit continuity and heating power, driving visibility, electrical attachment bond performance, electrical attachment bending performance, hot spot identification and heating uniformity, defrosting efficiency, high voltage durability, low temperature performance and long term humidity durability, for all electrically heated safety glazing materials in a road vehicle. This International Standard provides test protocols for the static performance of an electrically heated glazing material; it is not representative of in-vehicle performance.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3538, *Road vehicles — Safety glazing materials — Test methods for optical properties*

IEC 60051-2, *Direct acting indicating analogue electrical measuring instruments and their accessories, Part 2 — Special requirements for ammeters and voltmeters*

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

3.1

heating evaluation area

for *Type 1* (3.7), represented by an area formed by outermost conductors at an extended distance of 20 mm wider than the bus bars (along the edges) and extended to 50 mm on both the top and bottom, in the absence of specific requirements and for a glazing equipped with heating circuits formed by evenly distanced conductive lines and bus bars near to the glass edges

Note 1 to entry: If the extended distance is over the edge of the glass, then take the glass edge as the border of evaluation area. The size of this generated area is calculated using CAD, see [Figure 1](#). For other specifically designed heaters with e.g. circular shaped heater, product specification can be referenced for the heating evaluation area.

for *Type 2* (3.8) and *Type 3* (3.9), shall be the same as the area of the heating elements themselves, in the absence of special requirements

Note 2 to entry: No additional area shall be included.