INTERNATIONAL STANDARD

ISO 19095-4

First edition
2015-08-01

Plastics — Evaluation of the adhesion interface performance in plastic-metal assemblies —

Part 4: Environmental conditions for durability

Plastiques — Évaluation des performances de l'interface d'adhérence dans les assemblages plastique-métal —

Partie 4: Conditions environnementales pour la durabilité

Reference number
ISO 19095-4:2015(E)

© ISO 2015



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**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Test specimen ... **4**
4.1 Form of test specimen ... 4
4.2 Condition of test specimen ... 4
5 Test procedure ... **4**
5.1 Temperature dependence test ... 4
5.1.1 Apparatus ... 4
5.1.2 Test procedure ... 5
5.1.3 Presentation of result ... 5
5.2 Thermal shock test ... 5
5.2.1 Apparatus ... 5
5.2.2 Test procedure ... 5
5.2.3 Presentation of result ... 6
5.3 Temperature/Humidity cyclic test ... 6
5.3.1 Apparatus ... 6
5.3.2 Test procedure ... 6
5.3.3 Presentation of result ... 7
5.4 High temperature and high humidity test ... 7
5.4.1 Apparatus ... 7
5.4.2 Test procedure ... 7
5.4.3 Presentation of result ... 8
5.5 Salt mist test ... 8
5.5.1 Apparatus ... 8
5.5.2 Test procedure ... 8
5.5.3 Presentation of result ... 8
5.6 Fatigue test ... 8
5.6.1 Principle ... 8
5.6.2 General conditions ... 8
5.6.3 Apparatus ... 8
5.6.4 Test procedure ... 9
5.7 Report ... 9
Annex A (normative) **Staircase method (or Dixon and Mood's method)** ... **10**
Annex B (normative) **Data reclassification method** ... **12**

© ISO 2015 – All rights reserved

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 61, *Plastics*, Subcommittee SC 11, *Products*.

ISO 19095 consists of the following parts, under the general title *Plastics — Evaluation of the adhesion interface performance in plastic-metal assemblies*:

—*Part 1: Guidelines for the approach*

—*Part 2: Test specimens*

—*Part 3: Test methods*

—*Part 4: Environmental conditions for durability*

© ISO 2015 – All rights reserved

Introduction

Structures of heterogeneous materials are being manufactured in the automobiles and aerospace industry sectors where higher safety margins are required.

The existing test methods are not appropriate because the evaluation of the adhesive interface is difficult as the polymer material has a relatively low mechanical strength and therefore fractures outside the joints. Therefore, it is necessary to develop a methodology for the evaluation of the adhesive interfaces.

A test method to evaluate accurately the adhesion interface performance or standardization of long-term evaluation under harsh environments is also necessary.

The method in ISO 19095 is intended to ensure that the integrity of the joint is realized through the interface and that traceability of the value improves the data comparison.

This part of ISO 19095 defines the conditions to evaluate the long-term durability.

© ISO 2015 – All rights reserved

Plastics — Evaluation of the adhesion interface performance in plastic-metal assemblies —

Part 4: Environmental conditions for durability

SAFETY STATEMENT — Persons using this part of ISO 19095 should be familiar with normal laboratory practice, if applicable. This part of ISO 19095 does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory conditions. It is recognized that some of the materials permitted in this part of ISO 19095 might have a negative environmental impact. As technological advances lead to more acceptable alternatives for such materials, they will be eliminated to the greatest extent possible. At the end of the test, care should be taken to dispose of all waste in an appropriate manner in accordance with local regulations.

1 Scope

This part of ISO 19095 specifies the environmental conditions to evaluate the durability for the adhesion interface performance in plastic-metal assemblies.

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 472, *Plastics — Vocabulary*

ISO 19095-1:2015, *Plastics — Evaluation of the adhesion interface performance in plastic-metal assemblies —Part 1: Guideline for the approach*

ISO 19095-2, *Plastics — Evaluation of the adhesion interface performance in plastic-metal assemblies — Part 2: Test specimens*

ISO 19095-3, *Plastics — Evaluation of the adhesion interface performance in plastic-metal assemblies — Part 3: Test methods*

IEC 60068-2-11, *Basic environmental testing procedures — Part 2-11: Tests — Test Ka: Salt mist*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472 and the following apply.

3.1
shear stress
τ
<fatigue test> stress determined by dividing the force by the bonded surface area

Note 1 to entry: It is expressed in megapascals (MPa).

© ISO 2015 – All rights reserved