
**Resistance welding — Destructive tests
on welds in metallic materials — Torsion
test of resistance spot welds**

*Soudage par résistance — Essais destructifs des soudures sur matériaux
métalliques — Essai de torsion de soudure par résistance par points*

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

ISO 17653:2012

<https://standards.iteh.ai/catalog/standards/iso/e4d61408-3352-4cad-9fa1-565e514e3add/iso-17653-2012>



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

ISO 17653:2012

<https://standards.iteh.ai/catalog/standards/iso/e4d61408-3352-4cad-9fa1-565e514e3add/iso-17653-2012>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2012

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Specimens	1
5 Testing equipment and testing procedure	2
5.1 Non-instrumented torsion test (workshop test)	2
5.2 Instrumented torsion test	3
6 Evaluation of test results whenever applying the instrumented torsion tests	4
7 Test report	5

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

[ISO 17653:2012](https://standards.iteh.ai/catalog/standards/iso/e4d61408-3352-4cad-9fa1-565e514e3add/iso-17653-2012)

<https://standards.iteh.ai/catalog/standards/iso/e4d61408-3352-4cad-9fa1-565e514e3add/iso-17653-2012>

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 17653 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 6, *Resistance welding and allied mechanical joining*.

This second edition cancels and replaces the first edition (ISO 17653:2003), which has been technically revised.

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

[ISO 17653:2012](https://standards.iteh.ai/catalog/standards/iso/e4d61408-3352-4cad-9fa1-565e514e3add/iso-17653-2012)

<https://standards.iteh.ai/catalog/standards/iso/e4d61408-3352-4cad-9fa1-565e514e3add/iso-17653-2012>

Resistance welding — Destructive tests on welds in metallic materials — Torsion test of resistance spot welds

1 Scope

This International Standard specifies specimen dimensions, testing equipment and the procedure for torsion testing of resistance spot welds with single sheet thicknesses ranging from 0,5 mm to 6,0 mm in steels. It can be used for non-ferrous materials in certain circumstances.

The aim of this International Standard is to determine the weld diameter and the failure type of fractured specimens, and to evaluate the influence of different steel types, welding parameters and other factors on the deformation characteristics of a resistance spot weld.

2 Normative references

The following referenced documents are indispensable for the application 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 14329, *Resistance welding — Destructive tests of welds — Failure types and geometric measurements for resistance spot, seam and projection welds*

ISO 17677-1, *Resistance welding — Vocabulary — Part 1: Spot, projection and seam welding*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14329 and ISO 17677-1 and the following apply.

3.1

non-instrumented torsion test

test used to determine weld diameter and failure type of welds without measuring torque or torsion angle

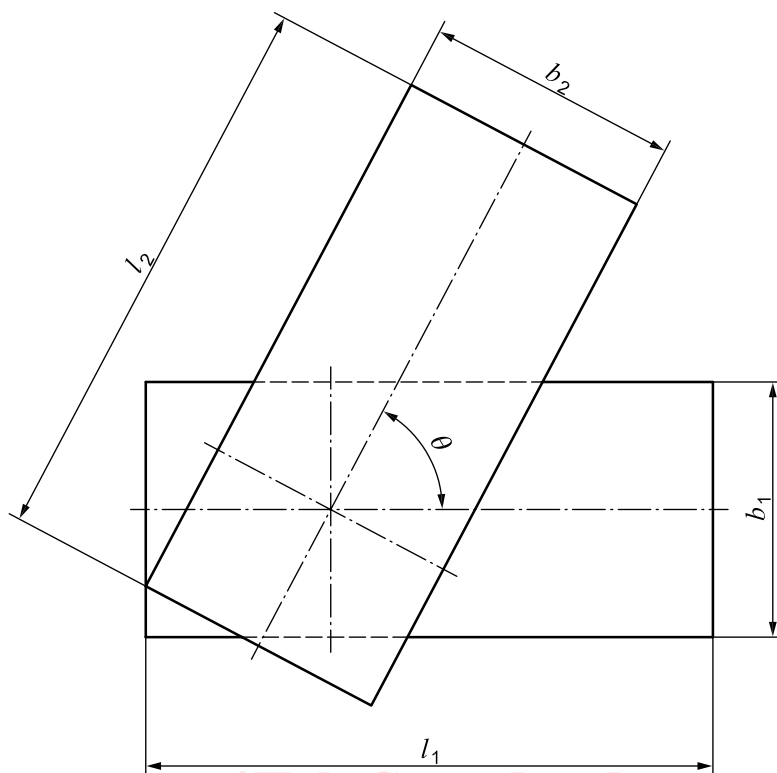
3.2

instrumented torsion test

torsion test with measuring instruments for torque or torsion angle to evaluate the mechanical properties of welds as well as the weld diameter and failure type

4 Specimens

Specimens for torsion testing are welded individually. The two coupons with a minimum width of 40 mm and a minimum length of 60 mm shall be welded together such that they can be rotated relative to each other (see Figure 1). The distance of the centre of the spot weld from outer edge in longitudinal direction shall be minimum 20 mm.

**Key** l_1, l_2 length of coupons (≥ 60 mm) b_1, b_2 width of coupons (≥ 40 mm) θ stacking angle between both coupons before testing

The distance of the centre of the spot weld from outer edge of the coupon in longitudinal direction shall be ≥ 20 mm.

Figure 1 — Specimen

5 Testing equipment and testing procedure

5.1 Non-instrumented torsion test (workshop test)

For the non-instrumented torsion test (workshop test), the lower sheet of the specimen is gripped as shown in Figure 2. The upper sheet of the specimen is held in a plier or flattened end pipe as shown in Figure 2 a), and rotated steadily in one direction until failure of the spot weld. The testing device shall be designed to minimize the bending of the two sheets of the specimen during testing in order to maintain pure torsional loading of the spot weld. This is necessary to increase the comparability of the test results. This test method determines the weld diameter and the failure type.

NOTE In the case of sheet material thicker than 2,0 mm the other sheet of the specimen can be gripped with the movable specimen gripper, and rotated until failure.