

This is a preview of "ISO 18592:2009". [Click here to purchase the full version from the ANSI store.](#)

First edition
2009-12-15

Resistance welding — Destructive testing of welds — Method for the fatigue testing of multi-spot-welded specimens

Soudage par résistance — Essais destructifs des soudures — Méthode d'essai de fatigue des échantillons soudés par points multiples



Reference number
ISO 18592:2009(E)

© ISO 2009

This is a preview of "ISO 18592:2009". [Click here to purchase the full version from the ANSI store.](#)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2009

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

This is a preview of "ISO 18592:2009". [Click here to purchase the full version from the ANSI store.](#)

Contents

Page

Foreword	iv
Introduction.....	v
1 Scope	1
2 Normative references	2
3 Terms and definitions	3
4 Symbols and abbreviated terms	5
5 Specimens	7
5.1 General	7
5.2 Selection of suitable specimens	8
5.3 Specimen fabrication	10
5.4 Specimen geometry	11
6 Requirements for testing machine	21
7 Specimen grips and alignment	22
7.1 General	22
7.2 Shear and peel loading	23
8 Test procedure	24
8.1 General	24
8.2 Mounting the H-specimens.....	24
8.3 Clamping procedure for the H-specimens.....	24
8.4 Fatigue test	24
8.5 Test termination.....	25
9 Test report.....	27
9.1 Basic information	27
9.2 Presentation of fatigue test results	28
Annex A (informative) Calibration specimen for verifying the load distribution in H-specimens	30
Annex B (informative) Hydraulic grips for the fatigue testing of H-specimens.....	31
Annex C (informative) Grip for the fatigue testing of H-specimens.....	32
Annex D (informative) Flow chart — Data acquisition	33
Bibliography.....	36

This is a preview of "ISO 18592:2009". [Click here to purchase the full version from the ANSI store.](#)

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 18592 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 6, *Resistance welding and allied mechanical joining*.

Requests for official interpretations of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 6 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

This is a preview of "ISO 18592:2009". [Click here to purchase the full version from the ANSI store.](#)

Introduction

This International Standard has been prepared because welding engineers (and most design engineers) are not familiar with fatigue testing and the influence of factors such as load type (e.g. shear load, peel load), and failure criteria.

Tests are used to investigate the existence of specific properties and their qualitative and quantitative evaluation. Fatigue tests, in general, are used to investigate the behaviour of structures and components subjected to cyclic loads. For welded components, fatigue tests are used to determine the influence of different parameters such as joining methods, pitch, material thickness and material combinations type of load (e.g. shear load, peel load), overlap, location of weld on flange, edge distance, loading condition (e.g. quasi-static, cyclic, load ratio R), and the combination of environment and corrosion on the fatigue behaviour (life) of spot welds and/or specimens subjected to various types of loads. Fatigue tests should, if their results are to be used for design purposes, as far as possible, take into consideration such boundary conditions as encountered in a real life environment. This applies to load types, load amplitudes, and load ratios as well as load distributions and failure criteria (Reference [7]).

The test specimen selected for the fatigue test should simulate, as closely as possible, the loads and the boundary conditions as they are encountered in service. Furthermore, the failure criterion used should conform to the application in hand. Although the type of primary load is identical in some specimens, e.g. shear load in flat multi-spot specimens, shear H-specimens, KS-2 specimens, and double disc specimens, the results of fatigue tests differ significantly because of the secondary load types resulting from varying degrees of local deformation due to the differences in the local stiffness in the area of the joints. The local deformation, responsible for the magnitude of the peel component, for example, is a function of the local stiffness, increasing with a decrease in stiffness.

This International Standard offers a framework within which the different specimens, described herein, can be modified such that design specifics and production constraints, e.g. flange width and overlap, weld nugget size, pitch, bending radius, and sub-standard welds, can be given due consideration. This helps towards enhancing the significance of the results very appreciably.

Note that if welds could be subjected to identical amplitudes of shear and peel loads, their lives would differ by a factor of approximately 10^4 (References [8] to [11]). This explains the necessity to use different specimens for the simulation of different load types.

Conformance tests on *real* components serve the verification of design calculations and are necessary for the qualification of structures. It is therefore necessary to maintain their number at an absolute minimum.