
**Friction stir spot welding —
Aluminium —**

**Part 3:
Qualification of welding personnel**

Soudage par friction-malaxage par points — Aluminium —

Partie 3: Qualification du personnel en soudage

<https://standards.iteh.ai>
Document Preview

ISO 18785-3:2018

<https://standards.iteh.ai/catalog/standards/iso/2b25154f-2066-4f89-8a0d-09f7ca76e068/iso-18785-3-2018>



Reference number
ISO 18785-3:2018(E)

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

ISO 18785-3:2018

<https://standards.iteh.ai/catalog/standards/iso/2b25154f-2066-4f89-8a0d-09f7ca76e068/iso-18785-3-2018>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2018

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	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Qualification	1
4.1 General	1
4.2 FSSW weld setter qualification	2
4.3 Essential variables and the ranges of qualification	2
4.3.1 General	2
4.3.2 Friction stir spot welding variant	2
4.3.3 Welding equipment	2
4.3.4 Parent materials	2
4.3.5 Weld joint geometry	2
4.3.6 Range of qualification	3
4.4 Qualification methods	3
4.4.1 Qualification based on a standard welding test	3
4.4.2 Qualification based on a welding procedure test	3
4.4.3 Qualification based on a pre-production test or production test	3
4.4.4 Qualification based on a production welding sample test	3
4.5 Test welds	3
4.5.1 General	3
4.5.2 Testing of welds	3
4.5.3 Re-testing	4
4.6 Test record	4
5 Certificate	4
5.1 General	4
5.2 Period of validity	5
5.2.1 Initial qualification	5
5.2.2 Confirmation of the validity	5
5.2.3 Prolongation of the validity	5
Annex A (informative) Functional knowledge of the welding unit	6
Annex B (informative) Weld setter qualification test certificate	7
Bibliography	8

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 the IIW, *International Institute of Welding*, Commission III, *Resistance welding, solid state welding and allied joining processes*.

Any feedback, question or request for official interpretation related to any aspect of this document should be directed to IIW via your national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

A list of all parts in the ISO 18785 series can be found on the ISO website.

Introduction

Welding processes are widely used in the fabrication of engineered structures. During the second half of the twentieth century, fusion welding processes, wherein fusion is obtained by the melting of parent material and usually a filler metal, dominated the welding of large structures. In 1991, friction stir welding (FSW), which is carried out entirely in the solid phase (no melting), was invented.

Friction stir spot welding (FSSW) processes are spot-like variants of the FSW process. Unlike FSW, there is minimal or no traverse motion of the tool. In basic FSSW, the joint is created by plunging a rotating tool into the work piece and retracting the tool out of the overlapping sheets. Other FSSW variants include additional tool movements. Frictional heat is generated from the contact between the tool and the material to be welded resulting in softening of this material. The softened material is stirred to form a metallurgical connection which is aided by the forge action applied by the tool shoulder contacting the upper sheet surface.

The increasing use of FSSW has created the need for a FSSW standard in order to ensure that welding is carried out in the most effective way and that appropriate control is exercised over all aspects of the operation. The ISO 18785 series focuses on the FSSW of aluminium because, at the time this document was developed, the majority of commercial applications for FSW involved aluminium. Examples include railway cars, consumer products, food processing equipment, automotive components, aerospace structures, and marine vessels.

To be effective, welded structures should be free from serious problems in production and in service. To achieve that goal, it is necessary to provide controls from the design phase through material selection, fabrication, and inspection. For example, poor design can create serious and costly difficulties in the workshop, on site, or in service. Incorrect material selection can result in welding problems such as cracking. Welding procedures need to be correctly formulated and approved to avoid imperfections. To ensure the fabrication of a quality product, management needs to understand the sources of potential trouble and introduce appropriate quality and inspection procedures, and supervision should be implemented to ensure that the specified quality is achieved.

ISO 18785-3:2018

<https://standards.iteh.ai/catalog/standards/iso/2b25154f-2066-4f89-8a0d-09f7ca76e068/iso-18785-3-2018>

