



# SLOVENSKI STANDARD SIST EN ISO 18785-4:2021

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## Točkovno varjenje z gnetenjem - Aluminij - 4. del: Popis in kvalifikacija varilnih postopkov (ISO 18785-4:2018)

Friction stir spot welding - Aluminium - Part 4: Specification and qualification of welding procedures (ISO 18785-4:2018)

Rührreibpunktschweißen - Aluminium - Teil 4: Festlegung und Qualifizierung des Schweißverfahrens (ISO 18785-4:2018)

Soudage par friction-malaxage par points - Aluminium - Partie 4: Descriptif et qualification des modes opératoires de soudage (ISO 18785-4:2018)

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Ta slovenski standard je istoveten z: **EN ISO 18785-4:2021**

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25.160.10	Varilni postopki in varjenje	Welding processes
77.120.10	Aluminij in aluminijeve zlitine	Aluminium and aluminium alloys

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EUROPEAN STANDARD

EN ISO 18785-4

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## Friction stir spot welding - Aluminium - Part 4: Specification and qualification of welding procedures (ISO 18785-4:2018)

Soudage par friction-malaxage par points - Aluminium  
- Partie 4: Descriptif et qualification des modes  
opératoires de soudage (ISO 18785-4:2018)

Rührreibpunktschweißen - Aluminium - Teil 4:  
Festlegung und Qualifizierung des Schweißverfahrens  
(ISO 18785-4:2018)

This European Standard was approved by CEN on 6 December 2020.

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## European foreword

The text of ISO 18785-4:2018 has been prepared by Technical Committee ISO/IIW "International Institute of Welding" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 18785-4:2021 by Technical Committee CEN/TC 121 "Welding and allied processes" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2021, and conflicting national standards shall be withdrawn at the latest by July 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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**Friction stir spot  
welding — Aluminium —**

**Part 4:  
Specification and qualification of  
welding procedures**

**iTeh STANDARD PREVIEW**  
*Soudage par friction-malaxage par points — Aluminium —*  
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## ISO 18785-4:2018(E)

### 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](http://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](http://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](http://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](http://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.

The International Organization for Standardization (ISO) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning friction stir welding given in [Clauses 5 to 7](#).

ISO takes no position concerning the evidence, validity and scope of this patent right. The holders of this patent right have assured ISO that they are willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with ISO. Further information may be obtained from: