

**Friction stir welding - Aluminium - Part 1: Vocabulary  
(ISO 25239-1:2011)**

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ICS 01.040.25, 25.160.10

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EUROPEAN STANDARD

**EN ISO 25239-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English Version

**Friction stir welding - Aluminium - Part 1: Vocabulary (ISO  
25239-1:2011)**

Soudage par friction-malaxage - Aluminium - Partie 1:  
Vocabulaire (ISO 25239-1:2011)

Rührreißschweißen - Aluminium - Teil 1: Begriffe (ISO  
25239-1:2011)

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN ISO 25239-1:2011) has been prepared by the International Institute of Welding in collaboration with Technical Committee CEN/TC 121 "Welding" 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of an identical text or by endorsement, at the latest by June 2012, and conflicting national standards shall be withdrawn at the latest by June 2012.

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### Endorsement notice

The text of ISO 25239-1:2011 has been approved by CEN as a EN ISO 25239-1:2011 without any modification.

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## 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. Then, in 1991, Wayne Thomas at TWI invented friction stir welding (FSW), which is carried out entirely in the solid phase (no melting).

The increasing use of FSW has created the need for this International 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. This International Standard focuses on the FSW of aluminium because, at the time of publication, the majority of commercial applications for FSW involved aluminium. Examples include railway carriages, consumer products, food processing equipment, aerospace structures, and marine vessels.

The parts of this International Standard are listed in the foreword.

Part 1 defines terms specific to FSW.

Part 2 specifies design requirements for FSW joints in aluminium.

Part 3 specifies requirements for the qualification of an operator for the FSW of aluminium.

Part 4 specifies requirements for the specification and qualification of welding procedures for the FSW of aluminium. A welding procedure specification (WPS) is needed to provide a basis for planning welding operations and for quality control during welding. Welding is considered a special process in the terminology of standards for quality systems. Standards for quality systems usually require that special processes be carried out in accordance with written procedure specifications. Metallurgical deviations constitute a special problem. Because non-destructive testing of the mechanical properties is impossible at the present level of technology, this has resulted in the establishment of a set of rules for qualification of the welding procedure prior to the release of the WPS to actual production. ISO 25239-4 defines these rules.

Part 5 specifies a method for determining the capability of a manufacturer to use the FSW process for the production of aluminium products of the specified quality. It defines specific quality requirements, but does not assign those requirements to any specific product group. 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 have to be correctly formulated and qualified to avoid imperfections. To ensure the fabrication of a quality product, management should understand the sources of potential trouble and introduce appropriate quality and inspection procedures. Supervision should be implemented to ensure that the specified quality is achieved.

## Friction stir welding — Aluminium —

### Part 1: Vocabulary

## Soudage par friction-malaxage — Aluminium —

### Partie 1: Vocabulaire

## Rührreibschweißen — Aluminium —

### Teil 1: Begriffe

#### Scope

This part of ISO 25239 defines friction stir welding terms. In this part of ISO 25239, the term “aluminium” refers to aluminium and its alloys.

NOTE In addition to terms in English and French (two of the three official ISO languages), this part of ISO 25239 gives the equivalent terms in German; these are published under the responsibility of the member body for Germany (DIN). However, only the terms and definitions given in the official languages can be considered as ISO terms and definitions.

#### Domaine d'application

La présente partie de l'ISO 25239 définit les termes relatifs au soudage par friction-malaxage. Dans la présente partie de l'ISO 25239, le terme «aluminium» se rapporte à l'aluminium et ses alliages.

NOTE En complément des termes en anglais et en français (deux des trois langues officielles de l'ISO), la présente partie de l'ISO 25239 donne les termes équivalents en allemand; ces termes sont publiés sous la responsabilité du comité membre allemand (DIN). Toutefois, seuls les termes et définitions donnés dans les langues officielles peuvent être considérés comme étant des termes et définitions de l'ISO.

#### Anwendungsbereich

Dieser Teil von ISO 25239 definiert Begriffe für das Rührreibschweißen. Der Begriff „Aluminium“ bezieht sich in diesem Teil von ISO 25239 auf Aluminium und seine Legierungen.

ANMERKUNG Zusätzlich zu den Begriffen in Englisch und Französisch (zwei der drei offiziellen ISO-Sprachen), gibt dieser Teil der ISO 25239 die entsprechenden Begriffe in Deutsch an; diese werden in der Verantwortung der Deutschen Mitgliedsorganisation (DIN) veröffentlicht. Nur Begriffe in den offiziellen Sprachen können als ISO-Begriffe angesehen werden.