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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 41979.4-2022

Friction stir spot welding - Aluminium and its alloys - Part 4: Specification and qualification of welding procedures

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foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1.Structure and Drafting Rules for Standardization Documents"

drafting.

This document is part 4 of GB/T 41979 "Friction Stir Spot Welding of Aluminum and Aluminum Alloys". GB/T 41979 has issued the following

part.

--- Part 1.Terms and definitions;

--- Part 2.Design of welded joints;

--- Part 3.Skill assessment of welding operators;

--- Part 4.Welding procedure specification and qualification;

--- Part 5.Quality and inspection requirements.

This document is modified to adopt ISO 18785-4.2018 "Friction Stir Welding Aluminum Part 4.Welding Procedure Specification and Evaluation".

This document has structural adjustments compared with ISO 18785-4.2018, and the structure number changes between the two documents are listed in the appendix

Record A.

The technical differences between this document and ISO 18785-4.2018 and their reasons are as follows.

--- Replaced ISO 18785-1 with the normative reference GB/T 41979.1, and added the normative reference GB/T 3375 (see

Chapter 3), in order to facilitate the practical application in our country;

--- Replace GB/T 39165, GB/T 39166, GB/T 39082, GB/T 39081, GB/T 39167 respectively

Changed ISO 10447, ISO 14270, ISO 14271, ISO 14272, ISO 14273 (see 5.2, 6.2.1) to adapt to my country's

Technical conditions, increase operability;

--- Replaced ISO 18785-5 (see 6.1.1) with the normatively quoted GB/T 41979.5 to adapt to the technical conditions of our country, adding

Operability;

--- Merge the relevant content of welding setters and welding operators (see 7.1, Table B.1, Table D.1 and Table D.2), which is more in line with our country

national conditions;

--- Merge the relevant content of mechanized and automated welding [see 4.2i)], which is more in line with my country's national conditions.

The following editorial changes have been made to this document.

--- Change the name of the standard to "Friction Stir Spot Welding of Aluminum and Aluminum Alloys Part 4.Welding Procedure Specification and Evaluation".

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

Friction stir spot welding, as a solid-phase point joining process, is more and more widely used in aerospace, automobiles, rail vehicles, etc.

Various industrial fields. It has the advantages of no need for filling materials, no melting of materials, small heat input, small welding deformation, and high mechanical properties. The method works

It is used for solid-phase welding of various materials, and is currently the most mature and

widely used in aluminum and aluminum alloys. The application of this technology greatly

It improves the reliability and manufacturing accuracy of the components and plays an important role. It is important to formulate general standards for friction stir spot welding of aluminum and aluminum alloys.

Want meaning.

In terms of friction stir spot welding of aluminum and aluminum alloys, there is no standard to follow in my country at present, and the standard specification is in a blank state.

and the standard specifications for friction stir spot welding of aluminum and aluminum alloys, which is conducive to unifying the relevant specifications and guiding the specifics of friction stir spot welding of aluminum and aluminum alloys.

Implementation work. GB/T 41979 "Friction Stir Spot Welding of Aluminum and Aluminum Alloys" is a general standard for friction stir spot welding of aluminum and aluminum alloys.

The following parts are composed.

--- Part 1.Terms and definitions. The aim is to define terms and definitions for friction stir spot welding.

--- Part 2.Design of welded joints. The purpose is to unify the joint design standard.

--- Part 3.Skill assessment of welding operators. The purpose is to establish common terms of use for operator skill assessment.

--- Part 4.Welding procedure specification and evaluation. The purpose is to provide guidance for welding procedure specification and qualification.

--- Part 5.Quality and inspection requirements. The purpose is to provide technical basis for the production and inspection of friction stir spot welding products.

This document is a general standard for friction stir spot welding of aluminum and aluminum alloys, and specifies the relevant welding procedure specifications and evaluation.

It is beneficial to unify the welding process specification of friction stir spot welding and the evaluation of relevant specifications and guide the friction stir spot welding of aluminum and aluminum alloys nationwide.

The specific implementation of spot welding will provide standard support for the promotion and application of friction stir spot welding technology in my country.

Friction stir spot welding of aluminum and aluminum alloys

Part 4.Welding procedure specification and qualification

1 Scope

This document specifies the welding procedure specification and welding procedure qualification for friction stir spot welding of aluminum and aluminum alloys.

This document applies to friction stir spot welding of aluminum and its aluminum alloys.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references

For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

this document.

GB/T 3375 Welding Terminology

GB/T 39081 Cross tensile test method for resistance spot and projection welded joints (GB/T 39081-2020, ISO 14272-2016,

MOD)

GB/T 39082 Vickers hardness test method for resistance spot welding, projection welding and seam welding joints (GB/T 39082-2020, ISO 14271-

2017, MOD)

GB/T 39165 Peeling and gouging test methods for resistance spot and projection welded joints (GB/T 39165-2020, ISO 10447-

2015, MOD)

GB/T 39166 Mechanical peeling test method for resistance spot welding, projection welding and seam welding joints (GB/T 39166-2020, ISO 14270-

2016, MOD)

GB/T 39167 Tensile shear test method for resistance spot and projection welded joints (GB/T 39167-2020, ISO 14273-2016,

MOD)

GB/T 41979.1 Friction stir spot welding of aluminum and aluminum alloys Part 1.Terms and definitions (GB/T 41979.1-2022,

ISO 18785-1.2018, MOD)

GB/T 41979.5 Friction stir spot welding of aluminum and aluminum alloys Part 5.Quality