ICS 25.160.40
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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 41979.2-2022

Friction stir spot welding - Aluminium and its alloys - Part 2: Design of weld joints

Issued on: October 12, 2022 **Implemented on: October 12, 2022**

Issued by: State Administration for Market Regulation, China National Standardization Administration

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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 the second part 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 18785-2.2018 "Friction Stir Welding Aluminum Part 2.Welding Joint Design".

The technical differences between this document and ISO 18785-2.2018 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;

--- Replaced ISO 2553 (see 4.1) with the normatively quoted GB/T 324 to adapt to my country's technical conditions and increase operability;

--- Replaced ISO 18785-5 (see 4.3.2.3, 4.3.2.4, 4.3.3) with the normatively quoted GB/T

41979.5 to adapt to my country's

Technical conditions, increase operability;

--- Replaced ISO 18785-4 (see 4.3.2.3) with the normatively quoted GB/T 41979.4 to adapt to the technical conditions of our country, adding

Increase operability.

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 2.Design of Welded Joints".

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, as a general standard for friction stir spot welding of aluminum and aluminum alloys, stipulates the design of welded joints and other aspects, which is beneficial to the whole world.

It is beneficial to improve the friction stir spot welding of aluminum and aluminum alloys in my country by uniformly specifying joint design specifications and guiding the implementation of joint design.

Component product quality.

Friction stir spot welding of aluminum and aluminum alloys

Part 2.Welded joint design

1 Scope

This document specifies the design requirements for friction stir spot welded joints 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 324 Weld symbol representation (GB/T 324-2008, ISO 2553.1992, MOD)

GB/T 3375 Welding Terminology

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 41979.4 Friction stir spot welding of aluminum and aluminum alloys - Part 4.Welding procedure specification and qualification (GB/T 41979.4-2022,

ISO 18785-4.2018, MOD)

GB/T 41979.5 Friction stir spot welding of aluminum and aluminum alloys Part 5.Quality and inspection requirements (GB/T 41979.5-2022,

ISO 18785-5.2018, MOD)

3 Terms and Definitions

The terms and definitions defined in GB/T 41979.1 and GB/T 3375 apply to this document.

4.1 Design files

The design documents (such as drawings, etc.) shall clearly specify the basic and all special requirements of the joint, such as the fracture critical value above the general requirements,

useful life, reliability or safety. The design documents shall specify the main process control to ensure that the welding is performed according to the welding procedure specification and inspection requirements.

Fittings meet all design requirements.

Weld symbols should comply with GB/T 324 regulations.

4.2 Joint design

Weldments should be designed according to the specified requirements to ensure that they can meet the final performance requirements.

The design of welded joints should take into account the necessary material performance data, and some examples of welded joints are shown in Table 1.

The distance from the center of the solder joint to the edge of the workpiece and the distance between the solder joints shall be clearly specified in the welding procedure specification, and shall be consistent with the design requirements (such as drawings).

unanimous.