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GB/T 46815-2025

Superplastic forming and diffusion bonding of titanium alloy sheets - Technological specification

钛合金板材超塑成形和扩散连接 工艺规范

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Forging Standardization (SAC/TC74). This document was drafted by: China Academy of Aeronautical Manufacturing Technology, Beijing Electromechanical Research Institute Co., Ltd. of China Academy of Machinery Science and Technology Group, and Beijing Xing Aviation Electromechanical Equipment Co., Ltd., Northwest Nonferrous Metals Research Institute, Harbin Institute of Technology, BaoTi Group Co., Ltd., Wuhan University of Technology, Taiyuan Polytechnic University. The main drafters of this document are. Li Zhiqiang, Han Xiuquan, Xu Huiyuan, Han Xiaoning, Qu Haitao, Wang Xichang, Jin Hong, Liu Taiying, and Xin Shewei. Wang Guofeng, Li Xiaohua, Li Guangli, Wang Jinglin, Wei Wei, Feng Junning, Qiang Fei, Hua Lin, Wang Bin, Chen Yizhe, Han Jianchao. Superplastic forming and diffusion bonding of titanium alloy sheets Process Specifications

1 Scope

GB/T 46815-2025 is the Chinese national standard covering SPF/DB - heating titanium sheet until it stretches like toffee, forming it with gas pressure and bonding the layers together in the same operation, which produces hollow stiffened aerospace structures that cannot be made any other way. It fixes the material and its preparation, the temperature and strain rate, the bonding pressure and time, and the inspection of a joint that has no weld to examine. First edition. It was issued on 31 December 2025 and has been in force since 1 July 2026, as a first edition. The document is under the responsibility of the Standardization

Administration of China. This page is published from the official record of the 2025 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the general requirements, molds, superplastic forming and diffusion bonding processes for titanium alloy sheets, as well as the procedures involved. Process and finished product inspection and recording. This document applies to superplastic forming and diffusion bonding processes for TA15, TA32, and TC4 titanium alloy sheets. Other titanium alloy sheets... For reference only.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 3375 Welding Terminology

GB/T 3623 Titanium and Titanium Alloy Wire

GB/T 3624 Seamless tubes of titanium and titanium alloys GB/T 4842 Argon

GB/T 6026 Industrial Acetone

GB/T 8541 Forging Terminology

GB/T 9452 Method for determining the effective heating zone of a heat treatment furnace

GB 13318 General Rules for Safety and Environmental Protection in Forging Production GB/T 22865 Kraft Paper

GB/T 45135 General Technical Specification for Superplastic Forming and Diffusion Connectors of Titanium Alloy Sheets

3 Terms and Definitions

The terms and definitions defined in GB/T 3375, GB/T 8541 and GB/T 45135, as well as the following terms and definitions, apply to this document.

3.1 Stop-off agent Coatings used to prevent adhesion or diffusion between molds and titanium alloy sheets, or between sheets.

4 General Requirements

4.1 Personnel Operators should receive basic technical and operational skills training in

superplastic forming and diffusion bonding, and pass the assessment.

4.2 Equipment

4.2.1 The superplastic forming and diffusion bonding equipment shall include, but is not limited to, hydraulic systems, heating systems and air supply systems.