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**NATIONAL STANDARD OF THE
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**X-ray digital radiography of carbon fibre composite sandwich
structures**

碳纤维复合材料夹芯结构制件X射线数字成像检测

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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. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document is proposed and coordinated by the National Carbon Fiber Standardization Technical Committee (SAC/TC572). This document was drafted by: Chengdu Aircraft Industry (Group) Co., Ltd., Nanjing Fiberglass Research and Design Institute Co., Ltd., China Aviation Industry Corporation Aircraft Comprehensive Technology Research Institute, AVIC Beijing Aeronautical Materials Research Institute, China Aviation Manufacturing Technology Research Institute, AVIC Xi'an Aircraft Industry Group Co., Ltd., Shanghai Aircraft Design and Research Institute, Anhui Jialiqi Advanced Composite Materials Technology Co., Ltd., Changzhou Xinchuang Aviation Technology Co., Ltd. company. The main drafters of this document are. Yang Yang, Yu Yongjie, Zhong Bo, Luo Shao'an, Yi Yuan, Wang Jiaqing, Song Nan, Zheng Peiqi, Wang Juntao, Ma Haiquan, Wang Bingyang, Li Guoxiang, Chen Ziyang, Chen Bohu, and Zhu Wei. X-ray of carbon fiber composite sandwich structure parts Digital imaging detection

1 Scope

China's national method for the X-ray digital radiography of carbon fibre composite sandwich structures. A sandwich structure is two thin composite skins bonded to a light core - honeycomb or foam - and it gives the highest bending stiffness per unit weight of any construction, which is why aircraft control surfaces, radomes, satellite panels and rotor blades are made this way. Its failure modes are all internal and none is visible: disbonding between skin and core, crushed or distorted core cells, water ingress into the honeycomb, and inclusions or voids in the adhesive. Radiography sees them because the core is a regular structure whose image shows any disturbance, and because water in the cells is dense enough to appear plainly - the classic finding on an aircraft panel. Digital detection rather than film is what makes it practical at production rates and allows the image to be enhanced and archived.

This document specifies the general requirements, process technology requirements, inspection Analysis and evaluation of test results, test records and reports. This document is applicable to X-ray digital imaging detection of internal defects in carbon fiber composite sandwich structure parts. Sandwiches made of other materials X-ray digital imaging inspection of core structural parts can be carried out for reference.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This

document.

GB/T 9445 Qualification and certification of non-destructive testing personnel

GB/T 12604.2 Nondestructive testing terminology Radiographic testing

GB/T 12604.11 Nondestructive testing terminology X-ray digital imaging testing

GB 18871 Basic Standard for Ionizing Radiation Protection and Radiation Source Safety

GB/T 23901.5 Non-destructive testing - Radiographic testing - Image quality - Part

3 Terms and definitions

The terms and definitions defined in GB/T 12604.2, GB/T 12604.11 and GB/T 40724 apply to this document.

4 Symbols

The symbols given in Table 1 apply to this document.

5 Dual-wire image quality meter image unsharpness Determination

GB/T 35388 Non-destructive testing - X-ray digital imaging testing methods

GB/T 35389 Guidelines for non-destructive testing - X-ray digital imaging

GB/T 35394 Non-destructive testing X-ray digital imaging detection system characteristics

GB/T 40724 Terminology of carbon fiber and its composite materials