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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 44922-2024

**Additive manufacturing - Qualification principles - Qualifying
machine operators of laser metal powder bed fusion machines
and equipment used in aerospace applications**

(English Translation)

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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 modified to adopt ISO/ASTM52942:2020 "Principles for Qualification of Additive Manufacturing - Metal Laser Powder Bed Fusion for Aerospace "Qualification Assessment of Financial Equipment Operators".

The technical differences between this document and ISO/ASTM52941:2020 and their

reasons are as follows.

- Replaced ISO/ASTM52900 and ISO/ASTM52921 with normative references GB/T 35351 and GB/T 41507 (see Chapter 3) follows the commonly used definition of terms in the field of additive manufacturing in my country for ease of use;
- Added the content of Class E materials (see 4.2.2). Iron-based high-temperature alloys are commonly used materials for additive manufacturing;
- Replaced ISO 18490 with the normative reference GB/T 40117 (see 4.3); deleted ISO/ASTM52942:2020 EN4179 and NAS410 (see 4.3) to adapt to the test methods of near vision in my country;
- The signature of the examiner (see Chapter 5) has been replaced by the seal of the examiner or the examination institution to adapt to the current situation of additive manufacturing enterprises in my country.

The following editorial changes were made to this document.

- Replaced ISO 14732:1998 with the informative reference GB/T 19805-2005 (see Chapter 3);
- Modified the numbering of Appendix A to Appendix D (see 4.1, 4.4, 4.5, Chapter 5) to comply with the requirements of GB/T 1.1-2020;
- The content of informative Appendix D in ISO/ASTM52942:2020 has been modified, and the metal laser powder bed fusion equipment in my country has been adopted.

Example of an operator qualification certificate.

Introduction

At present, additive manufacturing technology continues to mature, and metal additive manufacturing has been widely used in aircraft, spacecraft and other parts in the aerospace field.

Metal laser powder bed fusion equipment is the mainstream equipment used in metal additive manufacturing technology.

The huge difference in the number of metal powder bed fusion processes has put forward special requirements for the training and qualification of operators.

The personnel identification standards cannot standardize the evaluation of the operator's business capabilities and cannot guarantee the stability of printed parts, which is not conducive to its Applications in high value-added areas.

This document provides criteria and basis for the qualification of operators of metal laser powder bed fusion equipment for aerospace applications.

The operator's perspective ensures the stability of the manufacturing process and quality, which is of great significance for promoting its application in the aerospace field.

This document aims to establish the competency assessment standards for operators and repairers of metal material laser powder bed fusion equipment in order to guide the development and Production applications provide support for enterprise safety production and talent education and training.

Additive Manufacturing Qualification Principles for Aerospace Metals Qualification of operators of laser powder bed fusion equipment

1 Scope

This document specifies the qualifications and certification of personnel engaged in the operation of metal laser powder bed fusion equipment for aerospace applications and their Effectiveness.

This document is applicable to the qualification of operators engaged in metal laser powder bed fusion equipment for aerospace applications.

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 35351 Terminology for Additive Manufacturing GB/T 40117 Non-destructive testing - Evaluation of vision of non-destructive testing personnel (GB/T 40117-2021, ISO 18490:2015, IDT) GB/T 41507 Additive manufacturing terminology coordinate system and test methods

3 Terms and definitions

The terms and definitions defined in GB/T 35351 and GB/T 41507 and the following apply to this document.

examiner

A person who assesses compliance with the requirements of the applicable standards and is recognized by the contracting party.

[Source. GB/T 19805-2005, 3.11] 3.2 Examination body an organization that assesses compliance with the requirements of an applicable standard and is recognized by the contracting parties.

[Source. GB/T 19805-2005, 3.11] 3.3 Operator Personnel operating metal laser powder bed fusion equipment.

Provide qualification documents that provide the parameters required for the additive manufacturing process and ensure production repeatability.

Additive manufacturing process specifications pre-set for examination.

4.1 General requirements

An auditor shall be designated in writing to be responsible for the qualification and requalification of operators. The auditor shall be authorized by the examination body.