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

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**Additive manufacturing - Design - Laser-based powder bed
fusion of polymers**

增材制造 设计 高分子材料激光粉末床熔融

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Foreword

This document was issued on 23 May 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 December 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 25.030, Chinese classification J04.

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 /ASTM52911-2.2019 "Design for Additive Manufacturing Part 2. Laser Powder Bed of Polymer Materials"

Melt.

Compared with ISO /ASTM52911-2.2019, this document has made the following structural adjustments.

---Chapter 5 corresponds to Chapter 5 in ISO /ASTM52911-2.2019, of which 5.1~5.7 corresponds to ISO /ASTM52911-2.

5.2~5.8 in.2019, deleted 5.1 in ISO /ASTM52911-2.2019;

---Chapter 6 and Appendix A correspond to Chapter 6 in ISO /ASTM52911-2.2019, of which 6.1~6.6 correspond to ISO /ASTM

6.2~6.7 in 52911-2.2019, Appendix A corresponds to 6.8 in ISO /ASTM52911-2.2019, appendix is added

A, Deleted 6.1 in ISO /ASTM52911-2.2019.

The technical differences between this document and ISO /ASTM52911-2.2019 and their reasons are as follows.

--- Replaced ISO /ASTM52900 (see Chapter 3) with the normatively quoted GB/T 35351 to continue to use my country's additive manufacturing

Domain terms are defined in a customary way for ease of use;

--- Added the term "secondary sintering" (see 3.5) to unify the industry terms;

--- Deleted the introductory content of Chapter 5.1, 6.1 and Chapter 8 in ISO /ASTM52911-2.2019, and the background introduction does not need to be repeated;

--- An example of a typical complex geometric structure (see 5.2) has been added to adapt to the development of additive manufacturing technology;

--- Deleted the non-typical free geometry, topology optimization structure and filling structure in 5.3 of ISO /ASTM52911-1.2019

Examples or meanings, free geometry, topology optimization structures and infill structures are already examples and very clear, no need to give

Give detailed examples;

---Changed the impact of product height on the positioning method and changed it to "should" (see 5.4), because although the impact of height is the largest, it is not necessary

required;

---Introduction to the process of converting DICOM files to 3D geometric models (see 5.7) has been added to make the process smoother;

--- Increased the relevant content of preheating temperature, including semi-crystalline polymer and amorphous polymer PBF (see 6.1), to improve this document operability;

---Changed the main performance and abbreviation code of LB-PBF/P raw materials (see Table 2), expanded the performance description, and improved the operability of this document

active;

--- Delete the last sentence of 6.3 in ISO /ASTM52911-2.2019 to adapt to the current status of additive manufacturing technology;

--- Added GB/T 41507 (see 6.3.1) for normative references, because the text is a required clause;

--- Deleted the recommended content of font size and type in 6.7.13 inscription printing in ISO /ASTM52911-2.2019 to adapt to

The development of new technologies for additive manufacturing, such as micro-selection printing.

The following editorial changes have been made to this document.

--- In order to coordinate with existing standards, change the name of the standard to "Design of Additive Manufacturing and Laser Powder Bed Fusion of Polymer Materials";

---Delete the informative references to 3.4, 5.6.2, 5.6.4, 6.3, 6.7.6, 6.7.10 in ISO /ASTM52911-2.2019 Germany

Standard VDI3405, to avoid copyright issues;

---Added the abbreviations "3D" and "2.5D", changed the abbreviations "LB-PBF/P" and Another name for "STL"; Deleted the electron beam metal PBF in 4.2 of ISO /ASTM52911-2.2019 which is not relevant to this document

and the related abbreviations "EB-PBF/M" and "LB-PBF/M" for laser metal PBF (see 4.2);

--- Increase the relevant content of the design guide, replace ISO /ASTM52910 with the informative reference GB/T 37698 (see 5.6);

--- Added the relevant content of the file format, and replaced ISO /ASTM52915 with the informative reference GB/T 35352

(see 5.7);

---Delete descriptive sentences such as the pressurization principle of the inner runner in 6.7.6 of ISO /ASTM52911-2.2019;

---Deleted the application case of 6.8 in ISO /ASTM52911-2.2019, and added the application case of my country (see Appendix A).

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

This document is proposed by China Machinery Industry Federation.

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Introduction

Polymer material laser powder bed fusion process (LB-PBF/P) is a kind of non-metallic additive manufacturing process, which has been widely used in aviation

Aerospace, automotive, medical and other fields. LB-PBF/P has a high material utilization rate and does not need supports, which can shorten the product cycle and reduce production costs.