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**Technical specification of qualification for metal powder bed
fusion machines**

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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.

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Introduction

Metal powder bed fusion is an additive manufacturing process that selectively melts metal materials in a powder bed area through thermal energy.

The bed fusion process includes laser selective melting, laser selective sintering and electron beam melting. The process of metal powder bed fusion technology is highly automated.

Automation, complex process parameters, many factors affect product quality, among which machine tools have a key impact on the final forming quality, and product quality is closely related to the machine tools. The bed is highly dependent.

This document specifies a series of activities related to the qualification of metal powder bed fusion forming machine tools. Machine tool qualification is different from machine tool acceptance.

The difference is that the purpose of the appraisal is to improve the consistency of product quality, control the fluctuation of forming quality, solve the problem of machine tool status and process control.

The purpose of acceptance is to solve the problems of inconsistent machine tool parameters and their test items and methods.

The acceptance standard specifies the inspection methods and requirements for the main systems of the machine tool, focusing on the characteristics of the machine tool itself and applicable to the machine tool.

The system performance and reliability test after the machine tool is delivered, regularly re-inspected or maintained, and repaired shall be based on the machine tool indicators.

In addition to the acceptance of the machine tool, the control measures and process matching during the operation of the machine tool should also be considered, and the machine tool should be checked after a period of time.

The mechanical properties of the forming test are used as the judgment index to examine the operation status of the machine tool, ensuring that the user is satisfied with the product quality during the use of the machine tool. Meets expectations.

The appraisal is mainly carried out by the machine tool user (user), by examining the various performance indicators of the machine tool and the formed samples, focusing on the user's Acceptance usually refers to the process of the machine tool being tested and confirmed to be qualified after the supplier and buyer complete the purchase technical agreement.

The process of fulfilling the technical agreement.

The machine tool appraisal stipulated in this document is divided into installation appraisal and operation appraisal according to the appraisal links, which can be used in the fields of aviation, aerospace, medical treatment, etc.

Ensure the consistency and stability of metal powder bed fusion product quality.

Technical specification for qualification of metal powder bed fusion forming machine tools

1 Scope

This document specifies the identification principles of metal powder bed fusion forming machine tools and the requirements for installation identification and operation identification.

Verification method for the specified process.

This document is applicable to the appraisal of laser selective melting forming machine tools, electron beam selective melting forming machine tools, and laser selective sintering forming machine tools. Activity.

2 Normative references

GB/T 14896.7

GB/T 35351

GB/T 39254

GB/T 43141

GB/T 43233

GB/T 43411

3 Terms and Definitions

The terms and definitions defined in GB/T 14896.7 and GB/T 35351 and the following apply to this document.

3.1

Specifications for metal powder raw materials used in the metal powder bed fusion process.

Note. These include technical indicators such as chemical composition, powder particle size, and sphericity.