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Additive manufacturing of metals — Powder bed fusion — Presentation of material properties in material data sheets

Fabrication additive de métaux — Fusion sur lit de poudre — Présentation des propriétés des matériaux dans les fiches de données de matériaux

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Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Abbreviations ... **1**
5 Material properties to be displayed ... **2**
6 Optional material properties to be displayed ... **2**
7 Boundary conditions for the determination of material properties ... **3**
7.1 General ... 3
7.2 Applied PBF machine(s) ... 3
7.3 Applied feedstock ... 3
7.4 Applied process parameters ... 4
7.5 Applied shielding gas ... 4
7.6 Applied powder spreading device ... 4
7.7 Post-processing applied ... 4
8 Material property testing ... **5**
8.1 General ... 5
8.2 Tensile testing ... 5
8.3 Hardness testing ... 6
8.4 Density testing ... 6
9 Generating and handling test data ... **6**
9.1 Number of specimens and build jobs ... 6
9.2 Combination of data ... 7
10 Reporting of characteristic values ... **8**
Annex A (informative) **Example of a material data sheet** ... **10**
Bibliography ... **14**

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Foreword

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This document was prepared by Technical Committee ISO/TC 261, Additive manufacturing, in cooperation with ASTM Committee F42, Additive Manufacturing Technologies, on the basis of a partnership agreement between ISO and ASTM International with the aim to create a common set of ISO/ASTM standards on additive manufacturing, and in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 438, Additive manufacturing, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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Introduction

Equipment manufacturers and service providers publish material properties for additively manufactured components or specimens produced by powder bed fusion of metals using laser or electron beams.

Such published material properties are not always comparable, due to missing specifications on how associated measurements were conducted. For example, the number of specimens tested, the number of build jobs used, the specimen´s geometry and variations due to orientation are individually determined and usually not published.

The objective of this document is to specify the minimum requirements for the determination and reporting of material properties to support transparency and uniformity of material data sheets.

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Additive manufacturing of metals — Powder bed fusion — Presentation of material properties in material data sheets

1 Scope

This document specifies minimum content to be reported in material data sheets to justify the published material property values. This document does neither aim to define compulsory test quantities nor to define any basis for qualification purposes. Individual additions and extensions are permissible. This document is intended for use by organisations throughout the additive manufacturing supply-chain, e.g., manufacturers of PBF-LB/M or PBF-EB/M machines or comparable metal-powder-bed equipment, powder suppliers, service providers and users of the additively manufactured components.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3534-1, *Statistics — Vocabulary and symbols — Part 1: General statistical terms and terms used in probability*

ISO 17295:2023[1)], *Additive manufacturing — General principles — Part positioning, coordinates and orientation*

ISO/ASTM 52900, *Additive manufacturing — General principles — Fundamentals and vocabulary*

ISO/ASTM 52927, *Additive manufacturing — General principles — Main characteristics and corresponding test methods*

ASTM E2586, *Standard Practice for Calculating and Using Basic Statistics*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/ASTM 52900 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Abbreviations

For this document, the following abbreviations apply:

PBF-LB/M	powder bed fusion of metals with laser beam
PBF-EB/M	powder bed fusion of metals with electron beam

1) ISO 17295 cancels and replaces ISO/ASTM 52921:2013 which is still available at https://www.astm.org/f2921-13r19.html

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