SLOVENSKI STANDARD
SIST-TP CEN ISO/ASTM TR 52952:2023

01-september-2023

Aditivna proizvodnja kovin - Surovine - Korelacija med meritvami rotirajočega bobna in raztresljivostjo prahu v strojih za lasersko spajanje prahu v postelji (PBF-LB) (ISO/ASTM TR 52952:2023)

Additive Manufacturing of metals - Feedstock materials - Correlating of rotating drum measurement with powder spreadability in PBF-LB machines (ISO/ASTM TR 52952:2023)

Additive Fertigung von Metallen - Ausgangsmaterialien - Korrelation zwischen der Messung der rotierenden Trommel und der Pulververteilbarkeit in PBF-LB-Maschinen (ISO/ASTM TR 52952:2023)

Fabrication additive de métaux - Matières premières - Corrélation de la mesure du tambour rotatif avec la capacité d'étalement de la poudre dans les machines PBF-LB (ISO/ASTM TR 52952:2023)

Ta slovenski standard je istoveten z: **CEN ISO/ASTM TR 52952:2023**

ICS:

25.030	3D-tiskanje	Additive manufacturing

SIST-TP CEN ISO/ASTM TR 52952:2023 en

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER REPORT

CEN ISO/ASTM TR 52952

July 2023

ICS 25.030

English Version

Additive Manufacturing of metals - Feedstock materials - Correlating of rotating drum measurement with powder spreadability in PBF-LB machines (ISO/ASTM TR 52952:2023)

Fabrication additive de métaux - Matières premières - Corrélation de la mesure du tambour rotatif avec la capacité d'étalement de la poudre dans les machines PBF-LB (ISO/ASTM TR 52952:2023)

Additive Fertigung von Metallen - Ausgangsmaterialien - Korrelation zwischen der Messung der rotierenden Trommel und der Pulververteilbarkeit in PBF-LB-Maschinen (ISO/ASTM TR 52952:2023)

This Technical Report was approved by CEN on 13 June 2023. It has been drawn up by the Technical Committee CEN/TC 438.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. CEN ISO/ASTM TR 52952:2023 E

Contents

Page

European foreword

This document (CEN ISO/ASTM TR 52952:2023) has been prepared by Technical Committee ISO/TC 261 "Additive manufacturing" in collaboration with Technical Committee CEN/TC 438 “Additive Manufacturing” the secretariat of which is held by AFNOR.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

Endorsement notice

The text of ISO/ASTM TR 52952:2023 has been approved by CEN as CEN ISO/ASTM TR 52952:2023 without any modification.

TECHNICAL REPORT

ISO/ASTM TR 52952

First edition
2023-06

Additive manufacturing of metals — Feedstock materials — Correlating of rotating drum measurement with powder spreadability in PBF-LB machines

Fabrication additive de métaux — Matières premières — Corrélation de la mesure du tambour rotatif avec la capacité d'étalement de la poudre dans les machines PBF-LB

Reference number
ISO/ASTM TR 52952:2023(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11

Email: copyright@iso.org
Website: www.iso.org

ASTM International
100 Barr Harbor Drive, PO Box C700
West Conshohocken, PA 19428-2959, USA
Phone: +610 832 9634
Fax: +610 832 9635
Email: khooper@astm.org
Website: www.astm.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Granular materials and fine powders are widely used in industrial applications. To support control and optimize processing methods, these materials have to be precisely characterized. Characterization methods are related either to the properties of the grains (granulometry, morphology, chemical composition, etc.) or to the behaviour of the bulk powder (flowability, density, blend stability, electrostatic properties, etc.). The complex behaviours of granular and powder materials have motivated the development of numerous techniques to obtain reproducible and interpretable results. Many industries are concerned in different fields: additive manufacturing, food processing, pharmaceuticals, bulk material handling. This document is focused on Additive Manufacturing (AM).

Metallic powders are widely used in AM processes involving powder bed fusion (PBF-LB/M PBF-EB/M etc.) or binder jetting. During such operations, successive thin layers of powder are deposited with a blade or with a rotating cylinder. Each layer is then fused (most commonly melted) by an energy beam or joined by an adhesive binder to build the parts. The layer thickness defines the vertical resolution of the process; a thin layer leads to a better resolution. In order to obtain a thin layer, the powder is as fine as possible. However, if it is assumed that among the cohesive forces, the Van der Waal forces are predominant, it can be stated that as the grain size decreases, cohesiveness typically increases[25]. This increase in cohesiveness could have an impact on the spreadability of a powder.

The quality of the parts built with AM is thus directly influenced by powder flow properties.

According to ISO/ASTM 52900, spreadability is the ability of a feedstock material to be spread out in layers that fulfil the requirements for the AM process; this includes the ability to form a flat powder-atmosphere interface without waves and irregularities.

Visual observation of layer homogeneity is usually the only way for operators to assess the spreadability of powders during the spreading of new layers. However, linking the powder characteristics to its spreadability during the layer deposition beforehand can provide a more cost-effective way to classify and select the optimal powder and layer deposition speed combinations.