



SLOVENSKI STANDARD
SIST EN ISO/ASTM 52925:2023

01-marec-2023

Aditivna proizvodnja polimerov - Surovine - Kvalifikacija materialov za lasersko spajanje prahu v postelji (ISO/ASTM 52925:2022)

Additive manufacturing of polymers - Feedstock materials - Qualification of materials for laser-based powder bed fusion of parts (ISO/ASTM 52925:2022)

Additive Fertigung von Polymeren - Qualifizierungsgrundsätze - Klassifizierung von Teileigenschaften (ISO/ASTM 52925:2022)

Fabrication additive de polymères - Matières premières - Qualification des matériaux pour la fusion laser de pièces sur lit de poudre (ISO/ASTM 52925:2022)

Ta slovenski standard je istoveten z: EN ISO/ASTM 52925:2022

ICS:

25.030 3D-tiskanje Additive manufacturing

SIST EN ISO/ASTM 52925:2023 en,fr,de

EUROPEAN STANDARD

EN ISO/ASTM 52925

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2022

ICS 25.030

English Version

Additive manufacturing of polymers - Feedstock materials - Qualification of materials for laser-based powder bed fusion of parts (ISO/ASTM 52925:2022)

Fabrication additive de polymères - Matières
premières - Qualification des matériaux pour la fusion
laser de pièces sur lit de poudre (ISO/ASTM
52925:2022)

Additive Fertigung von Polymeren
Qualifizierungsgrundsätze - Klassifizierung von
Teileigenschaften (ISO/ASTM 52925:2022)

This European Standard was approved by CEN on 5 April 2022.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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, Turkey 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

| Contents | Page |
|------------------------|------|
| European foreword..... | 3 |

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO/ASTM 52925:2023](https://standards.iteh.ai/catalog/standards/sist/b8657e48-9e27-4c4c-b64d-c991bd9aa12f/sist-en-iso-astm-52925-2023)

<https://standards.iteh.ai/catalog/standards/sist/b8657e48-9e27-4c4c-b64d-c991bd9aa12f/sist-en-iso-astm-52925-2023>

European foreword

This document (EN ISO/ASTM 52925:2022) 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.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2022, and conflicting national standards shall be withdrawn at the latest by November 2022.

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.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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, Turkey and the United Kingdom.

(standard notice) Endorsement notice

The text of ISO/ASTM 52925:2022 has been approved by CEN as EN ISO/ASTM 52925:2022 without any modification.

<https://standards.iteh.ai/catalog/standards/sist/b8657e48-9e27-4c4c-b64d-c991bd9aa12f/sist-en-iso-astm-52925-2023>

INTERNATIONAL STANDARD ISO/ASTM 52925

First edition
2022-04

**Additive manufacturing of polymers —
Feedstock materials — Qualification of
materials for laser-based powder bed
fusion of parts**

*Fabrication additive de polymères — Matières premières —
Qualification des matériaux pour la fusion laser de pièces sur lit de
poudre*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO/ASTM 52925:2023](https://standards.iteh.ai/catalog/standards/sist/b8657e48-9e27-4c4c-b64d-c991bd9aa12f/sist-en-iso-astm-52925-2023)

<https://standards.iteh.ai/catalog/standards/sist/b8657e48-9e27-4c4c-b64d-c991bd9aa12f/sist-en-iso-astm-52925-2023>



Reference number
ISO/ASTM 52925:2022(E)

© ISO/ASTM International 2022

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO/ASTM 52925:2023

<https://standards.iteh.ai/catalog/standards/sist/b8657e48-9e27-4c4c-b64d-c991bd9aa12f/sist-en-iso-astm-52925-2023>



COPYRIGHT PROTECTED DOCUMENT

© ISO/ASTM International 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester. In the United States, such requests should be sent to ASTM International.

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

Published in Switzerland

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

Contents

Page

| | |
|--|-----------|
| Foreword..... | iv |
| 1 Scope..... | 1 |
| 2 Normative references..... | 1 |
| 3 Terms and definitions..... | 1 |
| 4 Symbols and abbreviations..... | 1 |
| 4.1 Symbols..... | 1 |
| 4.2 Abbreviations..... | 2 |
| 5 Sampling..... | 2 |
| 5.1 General..... | 2 |
| 5.2 Characterisation of virgin powder and powder blends..... | 2 |
| 5.3 Characterisation of used powder..... | 2 |
| 6 Factory test report..... | 3 |
| 6.1 General..... | 3 |
| 6.2 Particle size distribution..... | 3 |
| 6.3 Residual monomer content/extract content..... | 3 |
| 6.4 Supplementary data..... | 3 |
| 7 Factors influencing processability..... | 4 |
| 7.1 General..... | 4 |
| 7.2 Spreadability of the powder..... | 4 |
| 7.3 Relative humidity of the powder (surface moisture)..... | 4 |
| 7.4 Particle size distribution..... | 5 |
| 8 Factors affecting part quality..... | 5 |
| 8.1 General..... | 5 |
| 8.2 Melting behaviour, melt flow and MVR..... | 6 |
| 8.2.1 General..... | 6 |
| 8.2.2 Laboratory methods..... | 6 |
| 8.2.3 Melt volume-flow rate (MVR)..... | 6 |
| 8.3 Melting temperature and recrystallisation temperature..... | 7 |
| Annex A (informative) Hausner ratio, H_R..... | 9 |
| Annex B (informative) Determination of the melt volume-flow rate (MVR)..... | 12 |
| Annex C (informative) Round robin MVR test..... | 15 |
| Bibliography..... | 18 |

ISO/ASTM 52925:2022(E)

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 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.

Additive manufacturing of polymers — Feedstock materials — Qualification of materials for laser-based powder bed fusion of parts

1 Scope

This document provides guidance and recommendations for the qualification of polymeric materials intended for laser-based powder bed fusion of polymers (PBF-LB/P). The parameters and recommendations presented in this document relate mainly to the material polyamide 12 (PA12), but references are also made to polyamide 11 (PA11). The parameters and recommendations set forth herein cannot be applicable to other polymeric materials.

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

3 Terms and definitions

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

ISO and IEC maintain terminological 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 Symbols and abbreviations

4.1 Symbols

The following symbols are used throughout this document:

| Symbols | Designation | Unit |
|--------------|---|--------------------|
| D_{V10} | 10 % quantile of particle size based on the sample volume | μm |
| D_{V50} | 50 % quantile of particle size based on the sample volume | μm |
| D_{V90} | 90 % quantile of particle size based on the sample volume | μm |
| H_R | Hausner ratio | — |
| s_r | standard deviation of repeatability | — |
| s_R | standard deviation of reproducibility | — |
| T_B | processing temperature range | $^{\circ}\text{C}$ |
| T_{ic} | initial crystallisation temperature | $^{\circ}\text{C}$ |
| T_{im} | initial melting temperature | $^{\circ}\text{C}$ |
| V_{∞} | bulk volume | mL |
| V_0 | tapped volume | mL |