SLOVENSKI STANDARD
SIST EN ISO/ASTM 52924:2023

01-november-2023

Aditivna proizvodnja polimernih izdelkov - Kvalifikacija - Razvrščanje lastnosti polimernih izdelkov (ISO/ASTM 52924:2023)

Additive manufacturing of polymers - Qualification principles - Classification of part properties (ISO/ASTM 52924:2023)

Additive Fertigung - Qualifizierungsgrundsätze - Güteklassen für additiv gefertigte Kunststoffbauteile (ISO/ASTM 52924:2023)

Fabrication additive des polymères - Principes de qualification - Classification des propriétés de la pièce (ISO/ASTM 52924:2023)

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ICS:

25.030	3D-tiskanje	Additive manufacturing
83.080.01	Polimerni materiali na splošno	Plastics in general

SIST EN ISO/ASTM 52924:2023 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO/ASTM 52924

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English Version

Additive manufacturing of polymers - Qualification principles - Classification of part properties (ISO/ASTM 52924:2023)

Fabrication additive des polymères - Principes de qualification - Classification des propriétés de la pièce (ISO/ASTM 52924:2023)

Additive Fertigung - Qualifizierungsgrundsätze - Güteklassen für additiv gefertigte Kunststoffbauteile (ISO/ASTM 52924:2023)

This European Standard was approved by CEN on 16 July 2023.

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

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

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Contents

Page

European foreword

This document (EN ISO/ASTM 52924:2023) 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.

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of an identical text or by endorsement, at the latest by February 2024, and conflicting national standards shall be withdrawn at the latest by February 2024.

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Endorsement notice

The text of ISO/ASTM 52924:2023 has been approved by CEN as EN ISO/ASTM 52924:2023 without any modification.

INTERNATIONAL STANDARD

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Additive manufacturing of polymers — Qualification principles — Classification of part properties

Fabrication additive des polymères — Principes de qualification — Classification des propriétés de la pièce

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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).

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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).

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

The goal of this document is to improve the communication between providers and users of additive manufactured polymer parts in relation to the part quality to be supplied. For this purpose, quality criteria and part properties are categorised into a system of quality classes.

In the additive manufacturing processes relevant for polymers, the part properties depend very heavily on the machine systems, the material and the process control used. Typically, the process control can be optimised for productivity or quality. These goals are in principle contradictory in the context of the performance of a specific machine.

The property classes listed in this document help to make clear the differences in quality. The property classes enable the user to define part specifications for manufacturing.

Along with the specification of the property classes, this document states which property classes can be achieved with typical materials. Test specimens and their arrangement in the build space are specified (the related CAD data are included with this document as positioned STL data and AMF data and available on: https://standards.iso.org/iso/52924/ed-1/en/). The determination of the mechanical tensile properties, the dimensional accuracy and the part density with the aid of these test specimens is described to make possible the assignment to property classes for the related characteristic values.

This document refers to parts produced by PBF and MEX processes. Certain processes within these categories have also been known under different process names and trademarks. For example, (for PBF) laser sintering when the fusion is enabled by a laser, -trademarked as SLS®, (selective laser sintering)[1)]. Other thermoplastic PBF trademarks include multi jet fusion (MJF) or high speed sintering where the fusion is enabled by infra-red light. MEX processes for thermoplastic polymers are also known by names such as fused layer modelling (FLM), fused layer manufacturing or fused filament fabrication (FFF). FDM (fused deposition modelling) is an existing trademark for this type of process. The mentioning of trademarks in this document are only for informative reasons and does not intend any form of endorsement of the mentioned products.

Rather than comparing capabilities of hardware, material solutions based on common parameter set inputs, are compared based on part property outcomes. This document supplies a framework for comparison of those outcomes. The goal of such a comparison exercise is one of “what does it take to get to a particular class outcome". The benefit of this approach is to decouple the nuances of different hardware solution providers from the comparison process, allowing a focus on material property outcomes, which are much more impactful in terms of end user value.

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