



SLOVENSKI STANDARD
SIST-TP CEN ISO/ASTM/TR 52906:2022

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Aditivna proizvodnja - Neporušitveno preskušanje - Namerno vnešene nepravilnosti v kovinskih delcih (ISO/ASTM TR 52906:2022)

Additive manufacturing - Non-destructive testing - Intentionally seeding flaws in metallic parts (ISO/ASTM TR 52906:2022)

Additive Fertigung - Zerstörungsfreie Prüfung und Bewertung - Bewusstes Einbringen von Fehlern in Bauteilen (ISO/ASTM TR 52906:2022)

Fabrication additive - Essais non destructifs - Implantation intentionnelle de défauts dans les pièces métalliques (ISO/ASTM TR 52906:2022)

Ta slovenski standard je istoveten z: CEN ISO/ASTM/TR 52906:2022

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52906**

May 2022

ICS

English Version

**Additive manufacturing - Non-destructive testing -
Intentionally seeding flaws in metallic parts
(ISO/ASTM/TR 52906:2022)**

Fabrication additive - Essais non destructifs -
Implantation intentionnelle de défauts dans les pièces
métalliques (ISO/ASTM/TR 52906:2022)

Additive Fertigung - Zerstörungsfreie Prüfung und
Bewertung - Bewusstes Einbringen von Fehlern in
Bauteilen (ISO/ASTM/TR 52906:2022)

This Technical Report was approved by CEN on 28 April 2022. It has been drawn up by the Technical Committee CEN/TC 438.

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European foreword

This document (CEN ISO/ASTM/TR 52906:2022) 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.

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Additive manufacturing — Non-destructive testing — Intentionally seeding flaws in metallic parts

Fabrication additive — Essais non destructifs — Implantation intentionnelle de défauts dans les pièces métalliques

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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 can 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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For an explanation on 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 the following URL: 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.

Introduction

This document provides information for intentionally seeding flaws in additively manufactured parts and complements ISO/ASTM TR 52905¹⁾.

The different AM building descriptions can be found readily in published standards (see ISO 17296-2) and scientific papers.

Jargon commonly used in the literature describing AM metal process defects includes “balling”, “fireworks”, “smoke” and often are not specific to the morphology of the defect and often result from widely differing mechanisms of formation.

When defining terms specific to AM metal flaws it may be useful to review some examples related to welding technology.

This document is for the creation of seeded replicas supports the user’s understanding not only for the characterization of actual flaws with respect to physical morphology but also for the materials and mechanisms of formation, location, and orientation. In addition, the fundamentals of the processes creating the replica (e.g. PBF or DED with regard to the heat sources electron beam (EB), laser beam (LB) or AP (arc processes) also need to be considered). The intentional seeding to produce flaw replicas can match the character of the actual flaw as closely as possible.

The reference photomicrographs or non-destructive testing images included in this document are in no way to be construed as specifications. These reference photomicrographs and non-destructive testing images are offered primarily to permit examples of “flaws” or replicate images thereof. They can be used for comparison of reports. Flaw seeding will be discussed without context to a specific part, location, or dimension. The material alloy will be provided as known. With some flaws the material alloy may not be as important, for example, a pore may reside in any number of alloys. It can be noted that there is currently no proven method for controlled and replicable seeding of intimate disbonds (sometimes known as “kissing bonds”) – where two surfaces are in intimate or close contact, but with compromised adhesion – in AM parts so this feature is, therefore, currently out of scope.

This document will not go into the fundamentals of each process but rather identify the parameters within each process that can lead to the intentional seeding of AM structures.

1) In preparation. Stage at the time of publication ISO/ASTM DTR 52905:2022.

