



SLOVENSKI STANDARD
oSIST prEN ISO 52950:2019
01-november-2019

Aditivna proizvodnja - Osnovna načela - Pregled obdelave podatkov
(ISO/ASTM/DIS 52950:2019)

Additive manufacturing - General principles - Overview of data processing
(ISO/ASTM/DIS 52950:2019)

Additive Fertigung - Grundlagen - Überblick über die Datenverarbeitung (ISO/ASTM/DIS
52950:2019)

Fabrication additive - Principes généraux - Vue d'ensemble des échanges de données
(ISO/ASTM/DIS 52950:2019)

<https://standards.iteh.ai/catalog/standards/sist/51cf6a05-8490-4ef7-a542-30d0a7f942f4/sist-en-iso-astm-52950-2021>

Ta slovenski standard je istoveten z: prEN ISO 52950

ICS:

25.030 3D-tiskanje Additive manufacturing

oSIST prEN ISO 52950:2019 **en,fr,de**

DRAFT INTERNATIONAL STANDARD

ISO/ASTM DIS 52950

ISO/TC 261

Secretariat: DIN

Voting begins on:
2019-09-05Voting terminates on:
2019-11-28

Additive manufacturing — General principles — Overview of data processing

Fabrication additive — Principes généraux

ICS: 25.030

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO/ASTM 52950:2021

<https://standards.iteh.ai/catalog/standards/sist/51cf6a05-8490-4ef7-a542-30d0a7f942f4/sist-en-iso-astm-52950-2021>

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING



Reference number
ISO/ASTM DIS 52950:2019(E)

© ISO 2019

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO/ASTM 52950:2021](https://standards.iteh.ai/catalog/standards/sist/51cf6a05-8490-4ef7-a542-30d0a7f942f4/sist-en-iso-astm-52950-2021)

<https://standards.iteh.ai/catalog/standards/sist/51cf6a05-8490-4ef7-a542-30d0a7f942f4/sist-en-iso-astm-52950-2021>



COPYRIGHT PROTECTED DOCUMENT

© ISO/ASTM International 2019

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
Fax: +41 22 749 09 47
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	iv
Introduction	v
1 Scope	1
2 Normative reference	1
3 Terms and definitions	1
4 Data exchange	2
4.1 Dataflow.....	2
4.1.1 General.....	2
4.1.2 Explanation of the key terms used in Figure 1	2
4.2 Data formats.....	4
4.2.1 General.....	4
4.2.2 STL.....	4
4.2.3 VRML (WRL).....	4
4.2.4 IGES.....	4
4.2.5 STEP.....	4
4.2.6 AMF.....	5
4.3 Data preparation.....	5
4.3.1 The importance of data quality for part quality.....	5
4.3.2 STL export parameters.....	5
4.3.3 Special considerations in data processing.....	6
Bibliography	7

(standards.iteh.ai)

[SIST EN ISO/ASTM 52950:2021](https://standards.iteh.ai/catalog/standards/sist/51cf6a05-8490-4ef7-a542-30d0a7f942f4/sist-en-iso-astm-52950-2021)

<https://standards.iteh.ai/catalog/standards/sist/51cf6a05-8490-4ef7-a542-30d0a7f942f4/sist-en-iso-astm-52950-2021>

ISO/ASTM DIS 52950:2019(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 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.

This document replaces ISO 17296-4:2014, which has been technically revised and renumbered.

The main changes compared to ISO 17296-4:2014 are as follows:

- change of the number and joint ISO and ASTM International revision acknowledged by change to ISO/ASTM 52950;
- removal of outdated or withdrawn standards ISO 17296-4 and DIN 66301 (VDA-FS);
- revisions to [Figure 1](#) - General overview of traditional data flow from product idea to actual part (terminology).

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

Additive manufacturing are an inherent part of the product development process. They are used to manufacture prototypes, tools, and production parts.

In addition to engineering, the scope of this interdisciplinary technology now covers fields ranging from architecture and medicine to archaeology and cartography.

During its somewhat turbulent development, different terms and definitions have emerged which are frequently ambiguous and confusing. Moreover, there are different processes available on the market and it is not always clear what opportunities and limitations they offer in terms of application.

This document aims to offer field-tested recommendations and advice to users (customers) and manufactures (both external and internal service providers), to improve communication between customer and supplier, and to contribute to an authoritative performance design and a smooth handling of the project.

It assumes that the reader has a basic understanding of the process flow of different additive processes. It explains the processes used in practice in only much detail as it necessary to understand the statements.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO/ASTM 52950:2021

<https://standards.iteh.ai/catalog/standards/sist/51cf6a05-8490-4ef7-a542-30d0a7f942f4/sist-en-iso-astm-52950-2021>

Additive manufacturing — General principles — Overview of data processing

1 Scope

This document covers the principal considerations which apply to data exchange for additive manufacturing. It specifies terms and definitions which enable information to be exchanged describing geometries or parts such that they can be additively manufactured. The data exchange method outlines file type, data enclosed formatting of such data and what this can be used for.

This document

- enables a suitable format for data exchange to be specified,
- describes the existing developments for additive manufacturing of 3D geometries,
- outlines existing file formats used as part of the existing developments, and
- enables understanding of necessary features for data exchange, for adopters of this document.

This document is aimed at users and producers of additive manufacturing processes and associated software systems. It applies wherever additive processes are used, and to the following fields in particular:

- production of additive manufacturing systems and equipment including software;
- software engineers involved in CAD/CAE systems;
- reverse engineering systems developers;
- test bodies wishing to compare requested and actual geometries.

2 Normative reference

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*

ISO/ASTM 52915, *Specification for additive manufacturing file format (AMF) Version 1.2*

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 <http://www.electropedia.org/>

ISO/ASTM DIS 52950:2019(E)

4 Data exchange

4.1 Dataflow

4.1.1 General

A complete 3D data set of the part forms the basis of additive manufacturing. Most commonly, this is created by direct 3D CAD modelling. The data sets can also be generated by 3D Scanned data if the parts exist in a physical form (see [Figure 1](#)).

A representation based on facets is then generated from the volume or area model through polygonization or triangulation (see [4.1.2.4](#)) and transferred to the additive manufacturing process in STL or VRML format (see [4.2.2](#) and [4.2.3](#)). This software-assisted process runs automatically as far as possible.

4.1.2 Explanation of the key terms used in [Figure 1](#)

4.1.2.1 3D CAD modelling (solid modelling)

3D CAD modelling is the process most commonly used during design to produce a digital 3D model. The starting point can be an idea for a product, which takes shape and becomes increasingly defined directly on the computer screen during the process, or a previously generated image of the object in the form of sketches, drawings, etc., which are then simply converted to 3D data. Volume can be described using two different techniques, or a combination of both. The object is either composed of basic volumes (shapes) (e.g. cuboid, wedge, cylinder, cone, sphere, and toroid) which generate the actual object via a sequence of Boolean operations, or the volume is described by its surrounding boundary surfaces and the location of the material relative to the boundary surfaces.

4.1.2.2 3D digitalization (reverse engineering) ASTM 52950:2021

3D digitalization is the process in which the surface geometry of a physical object is measured using appropriate hardware and software and recorded in a digital point cloud model. The objects can be manually produced or finished models which need to be copied in digital form. The use of 3D digitalization is particularly efficient if the model has empirically drafted, freeform surface areas, since these are difficult to reproduce through direct 3D CAD modelling.

4.1.2.3 Surface reconstruction

Surface reconstruction is a means of processing data generated through 3D digitalization. Starting from the computer-generated point cloud, mathematically described curves and surfaces are generated with sufficient topological information to adequately recreate the object surface. These data can then be stored separately or integrated into an existing CAD volume model. Reverse engineering thus creates a bridge between 3D digitalization and CAD modelling.