

SVENSK STANDARD

SS-ISO 16792:2021

Teknisk produktdokumentation – Regler för presentation av produktdefinierande data i 3D-miljö (ISO 16792:2021, IDT)

Technical product documentation — Digital product definition data practices (ISO 16792:2021, IDT)



sis Svenska
Institutet för
Standarder

Language: engelska/English

Edition: 3

This preview is downloaded from www.sis.se. Buy the entire standard via <https://www.sis.se/std-80029550>

Den här standarden kan hjälpa dig att effektivisera och kvalitetssäkra ditt arbete. SIS har fler tjänster att erbjuda dig för att underlätta tillämpningen av standarder i din verksamhet.

SIS Abonnemang

Snabb och enkel åtkomst till gällande standard med SIS Abonnemang, en prenumerationstjänst genom vilken din organisation får tillgång till all världens standarder, senaste uppdateringarna och där hela din organisation kan ta del av innehållet i prenumerationen.

Utbildning, event och publikationer

Vi erbjuder även utbildningar, rådgivning och event kring våra mest sålda standarder och frågor kopplade till utveckling av standarder. Vi ger också ut handböcker som underlättar ditt arbete med att använda en specifik standard.

Vill du delta i ett standardiseringsprojekt?

Genom att delta som expert i någon av SIS 300 tekniska kommittéer inom CEN (europeisk standardisering) och/eller ISO (internationell standardisering) har du möjlighet att påverka standardiseringsarbetet i frågor som är viktiga för din organisation. Välkommen att kontakta SIS för att få veta mer!

Kontakt

Skriv till kundservice@sis.se, besök [sis.se](https://www.sis.se) eller ring 08 - 555 523 10

© Copyright/Upphovsrätten till denna produkt tillhör Svenska institutet för standarder, Stockholm, Sverige. Upphovsrätten och användningen av denna produkt regleras i slutanvändarlicensen som återfinns på [sis.se/slutanvandarlicens](https://www.sis.se/slutanvandarlicens) och som du automatiskt blir bunden av när du använder produkten. För ordlista och förkortningar se [sis.se/ordlista](https://www.sis.se/ordlista).

© Copyright Svenska institutet för standarder, Stockholm, Sweden. All rights reserved. The copyright and use of this product is governed by the end-user licence agreement which you automatically will be bound to when using the product. You will find the licence at [sis.se/enduserlicenseagreement](https://www.sis.se/enduserlicenseagreement).

Upplysningar om sakinnehållet i standarden lämnas av Svenska institutet för standarder, telefon 08 - 555 520 00. Standarder kan beställas hos SIS som även lämnar allmänna upplysningar om svensk och utländsk standard.

Standarden är framtagen av kommittén för Teknisk dokumentation, SIS/TK 507/AG 01.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

Den internationella standarden ISO 16792:2021 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 16792:2021.

Denna standard ersätter SS-ISO 16792:2015, utgåva 2

The International Standard ISO 16792:2021 has the status of a Swedish Standard. This document contains the official English version of ISO 16792:2021.

This standard supersedes the SS-ISO 16792:2015, edition 2

LÄSANVISNINGAR FÖR STANDARDER

I dessa anvisningar behandlas huvudprinciperna för hur regler och yttre begränsningar anges i standardiseringsprodukter.

Krav

Ett krav är ett uttryck i ett dokumentets innehåll som anger objektivet verifierbara kriterier som ska uppfyllas och från vilka ingen avvikelse tillåts om efterlevnad av dokumentet ska kunna åberopas. Krav uttrycks med hjälpverbet ska (eller ska inte för förbud).

Rekommendation

En rekommendation är ett uttryck i ett dokumentets innehåll som anger en valmöjlighet eller ett tillvägagångssätt som bedöms vara särskilt lämpligt utan att nödvändigtvis nämna eller utesluta andra. Rekommendationer uttrycks med hjälpverbet bör (eller bör inte för avrådanden).

Instruktion

Instruktioner anges i imperativ form och används för att ange hur något görs eller utförs. De kan underordnas en annan regel, såsom ett krav eller en rekommendation. De kan även användas självständigt, och är då att betrakta som krav.

Förklaring

En förklaring är ett uttryck i ett dokumentets innehåll som förmedlar information. En förklaring kan uttrycka tillåtelse, möjlighet eller förmåga. Tillåtelse uttrycks med hjälpverbet får (eller motsatsen behöver inte). Möjlighet och förmåga uttrycks med hjälpverbet kan (eller motsatsen kan inte).

READING INSTRUCTIONS FOR STANDARDS

These instructions cover the main principles for the use of provisions and external constraints in standardization deliverables.

Requirement

A requirement is an expression, in the content of a document, that conveys objectively verifiable criteria to be fulfilled, and from which no deviation is permitted if conformance with the document is to be claimed. Requirements are expressed by the auxiliary shall (or shall not for prohibition).

Recommendation

A recommendation is an expression, in the content of a document, that conveys a suggested possible choice or course of action deemed to be particularly suitable, without necessarily mentioning or excluding others. Recommendations are expressed by the auxiliary should (or should not for dissuasion).

Instruction

An instruction is expressed in the imperative mood and is used in order to convey an action to be performed. It can be subordinated to another provision, such as a requirement or a recommendation. It can also be used independently and is then to be regarded as a requirement.

Statement

A statement is an expression, in the content of a document, that conveys information. A statement can express permission, possibility or capability. Permission is expressed by the auxiliary may (its opposite being need not). Possibility and capability are expressed by the auxiliary can (its opposite being cannot).

Contents

Page

Foreword	viii
Introduction	ix
1 Scope.....	1
2 Normative references	1
3 Terms and definitions.....	2
3.1 General terms and definitions.....	2
3.2 Classification codes for drawings and data sets (see Annex B).....	2
4 Data set identification and control.....	3
4.1 General.....	3
4.2 Related data	4
4.3 Data management.....	4
5 Data set requirements.....	6
5.1 General.....	6
5.1.1 Introduction	6
5.1.2 Fundamental requirements.....	6
5.1.3 Design model requirement (classification codes 3, 4 and 5)	8
5.2 General model requirements.....	9
5.2.1 Associativity	9
5.2.2 Model coordinate systems.....	9
5.2.3 Applications of supplemental geometry	10
5.2.4 Part features not fully modelled	10
5.3 General method requirements.....	10
5.3.1 Data set methods.....	10
5.3.2 Model-only method.....	10
5.3.3 Model and drawing method.....	11
5.4 Management data	11
5.4.1 General.....	11
5.4.2 Management data in the data set	11
5.4.3 Management data on a model.....	11
5.5 Protection marking	12
5.5.1 General.....	12
5.5.2 Location on models	12
5.6 Saved views on models.....	12
5.6.1 General.....	12
5.6.2 Sections	12
6 Design model requirements	15
6.1 General	15
6.2 Geometric scale, units and precision.....	15
6.3 Model completeness.....	15
6.4 Assembly model completeness.....	16
6.5 Part reference numbers	16
6.6 Identification method	17
6.6.1 General.....	17
6.6.2 Colour	18
6.6.3 Greyscale.....	18
6.6.4 Mapping.....	18
6.6.5 Transparency	18
6.7 Installation model completeness.....	18
7 Common requirements for product definition data.....	19
7.1 General	19
7.2 Common requirements	19
7.3 Model requirements	22

SS-ISO 16792:2021 (E)

7.3.1	General.....	22
7.3.2	Associativity	23
7.3.3	Attributes.....	25
7.3.4	Annotation planes.....	26
7.3.5	Leader lines	27
7.3.6	Direction-dependent specifications.....	28
7.3.7	Indicating of restricted area	28
7.3.8	Query types.....	29
7.4	Drawing requirements	34
7.4.1	General.....	34
7.4.2	Orthographic views.....	37
7.4.3	Axonometric views.....	37
8	Notes and special notations	39
8.1	Common requirements	39
8.2	Model requirements	39
8.3	Drawing requirements	40
9	Model values and dimensions	40
9.1	General	40
9.2	Common requirements	40
9.2.1	Model value queries	40
9.2.2	Resolved dimensions	40
9.3	Model requirements	41
9.3.1	General.....	41
9.3.2	Theoretically exact dimensions (TEDs).....	41
9.3.3	Size values	42
9.3.4	Examples of general applications.....	43
9.3.5	Chamfers	43
9.3.6	Depth specification.....	46
9.4	Drawing requirements for axonometric views.....	49
10	Datum applications	49
10.1	General	49
10.2	Model requirements	49
10.2.1	Datum systems and model coordinate systems.....	49
10.2.2	Identification of datums	51
10.2.3	Identification of restricted area application.....	53
10.2.4	Associativity of datum features and design data.....	54
10.2.5	Datum target identification and attachment.....	54
10.2.6	Multiple features establishing a datum	56
10.3	Drawing requirements	61
11	Geometric tolerances	62
11.1	General	62
11.2	Drawing requirements	62
11.2.1	General.....	62
12	Welds	63
12.1	General	63
12.2	Common requirements	63
12.2.1	Application of supplemental geometry.....	63
12.2.2	Arrow lines.....	63
12.3	Model requirements	64
12.3.1	Annotation plane.....	64
12.3.2	Associativity	64
12.3.3	Indicating extents of the weld	64
12.3.4	Query of weld path	66
12.4	Drawing requirements	67
13	Surface texture	67

13.1	General	67
13.2	Common requirements	67
13.3	Model requirements	68
13.3.1	Display techniques	68
13.3.2	Associativity	68
Annex A (informative) Former practices		69
Annex B (informative) Classification codes for drawings and data sets		71
Annex C (informative) Examples		73
Bibliography		78

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 10, *Technical product documentation*.

This third edition cancels and replaces the second edition (ISO 16792:2015), which has been technically revised.

The main changes to the previous edition are as follows:

- information on assembly part identification added;
- information on movable parts in assemblies added;
- figures updated to reflect current International Standards,
- content which is authored in other documents removed;
- former practices moved to [Annex A](#);
- [Annex C](#) with additional examples of applying this document added.

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

Every effort was made during the preparation of this document, adapted from ASME Y14.41:2012, to apply existing requirements developed for two-dimensional (2D) presentation equally to the output from three-dimensional (3D) models. Where new geometrical product specification (GPS) rules have proved essential, these have been drafted with a view to their being equally applicable to both 2D and 3D. Therefore, in order to maintain the integrity of a single system, these new rules are being incorporated in the relevant existing International Standards for cross-reference. Application examples have been included where, due to the specific requirements of 3D modelling in support of model-based definition (MBD), additional guidance was deemed beneficial.

It is recognized that there is a need to support drawings in conjunction with 3D models now and for the foreseeable future. This need has been addressed in this document through the definition of the two methods for documenting digital models and specification of requirements to ensure that the information in a data set is consistent between the model and the drawing.

The figures in this document are intended only as illustrations to aid the user in understanding the practices elaborated in the text. In some cases, figures show a level of detail as needed for emphasis; in others, they are only complete enough to illustrate a concept or facet thereof, including the associativity of annotations in the design model. The absence of figures has no bearing on the applicability of the specified requirement or practice.

Most figures are illustrations of models in a 3D environment. Figures illustrating drawings in digital format include a drawing sheet border.

This document describes general requirements and practices for digital product definition applied for 3D mechanical engineering (MCAD) but which can be also applied to other disciplines and trades (e.g. ECAD).

For former practices, see [Annex A](#).

Technical product documentation — Digital product definition data practices

1 Scope

This document specifies requirements for the preparation, revision and presentation of digital product definition data, hereafter referred to as data sets, complementing existing standards. It supports two methods of application: 3D model-only and 3D model with 2D drawing in digital format. The structure of this document presents requirements common to both methods followed by clauses providing for any essential, differing requirements for each method. Additionally, its use in conjunction with computer-aided design (CAD) systems can assist in the progression towards improved modelling and annotation practices for CAD and engineering disciplines, as well as serving as a guideline for CAx software developers.

The actual definitions for the interpretation, in particular the ISO TPD and ISO GPS rules, are taken from the original definition standards, e.g. ISO 129-1 and ISO 1101.

When the term model is used in this document it applies to both design models and annotated models.

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 128-2, *Technical product documentation (TPD) — General principles of representation — Part 2: Basic conventions for lines*

ISO 128-3:2020, *Technical product documentation (TPD) — General principles of representation — Part 3: Views, sections and cuts*

ISO 129-1, *Technical product documentation (TPD) — Presentation of dimensions and tolerances — Part 1: General principles*

ISO 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 2553, *Welding and allied processes — Symbolic representation on drawings — Welded joints*

ISO 3098-1, *Technical product documentation — Lettering — Part 1: General requirements*

ISO 3098-5, *Technical product documentation — Lettering — Part 5: CAD lettering of the Latin alphabet, numerals and marks*

ISO 5457, *Technical product documentation — Sizes and layout of drawing sheets*

ISO 5459, *Geometrical product specifications (GPS) — Geometrical tolerancing — Datums and datum systems*

ISO 7200, *Technical product documentation — Data fields in title blocks and document headers*

ISO 8015, *Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules*

ISO 10209:2012, *Technical product documentation — Vocabulary — Terms relating to technical drawings, product definition and related documentation*

ISO 11442, *Technical product documentation — Document management*