

Teknisk specifikation

SIS-ISO/TS 13399-80:2017

Publicerad/Published: 2017-08-22
Utgåva/Edition: 2
Språk/Language: engelska/English
ICS: 25.100.01; 35.240.50

Skärande verktyg – Representation och utbyte av data – Del 80: Skapande och utbyte av 3D-modeller – Översikt och principer

Cutting tool data representation and exchange – Part 80: Creation and exchange of 3D models – Overview and principles

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Dokumentet ersätter SIS-ISO/TS 13399-80:2014.

This Technical Specification is not a Swedish Standard. This document contains the English version of ISO/TS 13399-80:2017.

The document replaces SIS-ISO/TS 13399-80:2014.

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Dokumentet är framtaget av kommittén för Skärande verktyg, SIS/TK 273.

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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 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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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 Technical Committee ISO/TC 29, *Small tools*.

This second edition cancels and replaces the first edition (ISO/TS 13399-80:2014), which has been technically revised.

A list of all parts in the ISO 13399 series can be found on the ISO website.

Introduction

This document defines the concept, terms, and definitions regarding the creation and exchange of simplified 3D of cutting items, tool items, and adaptive items that can be used for NC-programming, simulation of the manufacturing processes and the determination of collision within machining processes. It is not intended to standardize the design of the items themselves.

Cutting tool data that can be described by the ISO 13399 series include, but are not limited to, everything between the work piece and the machine tool. Information about inserts, solid tools, assembled tools, adaptors, components, and their relationships can be represented by this document. The increasing demand providing the end user with 3D models for the purposes defined above is the basis for the development of this series of International Standards.

The objective of the ISO 13399 series is to provide the means to represent the information that describes cutting tools in a computer sensible form that is independent from any particular computer system. The representation will facilitate the processing and exchange of cutting tool data within and between different software systems and computer platforms and support the application of this data in manufacturing, planning, cutting operations, and the supply of tools. The nature of this description makes it suitable not only for neutral file exchange, but also as a basis for implementing and sharing product databases and for archiving. The methods that are used for these representations are those developed by ISO/TC 184/SC 4, by using standardized information models and reference dictionaries.

Definitions and identifications of dictionary entries are defined by means of standard data that consist of instances of the EXPRESS entity data types defined in the common dictionary schema, resulting from a joint effort between ISO/TC 184/SC 4 and IEC/TC 3 and in its extensions defined in ISO 13584-24 and ISO 13584-25.

Cutting tool data representation and exchange —

Part 80: Creation and exchange of 3D models — Overview and principles

1 Scope

This document specifies the basic principles for the creation and exchange of simplified 3D models of cutting items, tool items, and adaptive items, using related properties and domains of values.

Simplified 3D models contain the following:

- naming and defining of the basic design features of cutting items, tool items, and adaptive items, with an association to the used properties;
- naming and defining of the internal structure of the 3D model that represents the features and the properties of cutting items, tool items, and adaptive items;
- naming and defining of those elements and features that are not defined in ISO/TS 13399-50, but are necessary to design 3D models.

The following are outside the scope of this document:

- applications where these standard data may be stored or referenced;
- creation and exchange of simplified 3D models for cutting tools;
- creation and exchange of simplified 3D models for tool items;
- creation and exchange of simplified 3D models for adaptive items;
- creation and exchange of simplified 3D models for assembly items and auxiliary items.

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/TS 13399-2, *Cutting tool data representation and exchange — Part 2: Reference dictionary for the cutting items*

ISO/TS 13399-60, *Cutting tool data representation and exchange — Part 60: Reference dictionary for connection systems*

ISO/TS 13399-100:2008, *Cutting tool data representation and exchange — Part 100: Definitions, principles and methods for reference dictionaries*

3 Terms and definitions

No terms and definitions are listed in this document.

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ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Abbreviated terms

| | |
|---------|---|
| CRPa | cutting reference point |
| CSWa | coordinate system workpiece side |
| FDP | feed direction primary |
| HEP | head end plane |
| IRPOSa | irregular insert position |
| KAPa | rotation angle “kappa” for the yzw-plane counter clockwise about the y-axis |
| LCFP | chip flute length plane |
| LPRP | protruding length plane |
| LSP | shank length plane |
| LUP | usable length plane |
| MINSTa | master insert |
| MPLANEa | mirror plane |
| PAIPa | prismatic adaptive item position |
| PCSa | primary coordinate system |
| PHIa | rotation angle “phi” for the xzw-plane counter clockwise about the z-axis |
| PTIPOSa | prismatic tool item position |
| REFSYSa | reference system |
| RHOa | rotation angle “rho” for the xyw-plane counter clockwise about the x-axis |
| RIPOSa | regular insert position |
| TCEPa | tool cutting edge plane |
| TEP | tool end plane |
| TFPa | tool feed plane |
| TRPa | tool rake plane |
| TSPa | theoretical sharp point |
| XYPa | xy-plane |
| XYWDa | xyw plane distance |
| XYWPa | xyw-plane |

| | |
|-------|--------------------|
| XZPa | xz-plane |
| XZWDa | xzw plane distance |
| XZWPa | xzw-plane |
| YZPa | yz-plane |
| YZWDa | yzw plane distance |
| YZWPa | yzw-plane |

a Taken from ISO/TS 13399-50.

5 Designation of design elements

5.1 General

The creation of 3D models shall be by means of nominal dimensions.

NOTE Some of the designations are taken from ISO/TS 13399-50.

All designations of 3D design elements (coordinate systems, planes, axes, points, solid design elements) shall be based on the designations and preferred symbols of ISO/TS 13399-2 and ISO/TS 13399-60.

If additional properties are required, they shall be requested through the ISO 13399 Maintenance agency as defined in ISO/TS 13399-100:2008, Annex D.

5.2 Reference system

5.2.1 Primary coordinate system "PCS"

The primary coordinate system, as shown in [Figure 1](#), shall consist of the following standard elements:

- right-handed rectangular Cartesian system in three-dimensional space with three principal axes labelled X, Y, and Z;
- three orthogonal planes built from the three principal axes and named "XYP", "XZP", and "YZP";
- three orthogonal axes built from the planes and named "XA", "YA", and "ZA".