PD ISO/TS 13399-203:2015



BSI Standards Publication

# Cutting tool data representation and exchange

## Part 203: Creation and exchange of 3D models — Replaceable inserts for drilling

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## National foreword

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# Cutting tool data representation and exchange —

## Part 203: Creation and exchange of 3D models — Replaceable inserts for drilling

*Représentation et échange des données relatives aux outils coupants —*

*Partie 203: Création et échange de modèles 3D — Plaquettes échangeables pour perçage*



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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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 29, *Small tools*.

ISO 13399 consists of the following parts, under the general title *Cutting tool data representation and exchange*:

— *Part 1: Overview, fundamental principles and general information model*

— *Part 2: Reference dictionary for the cutting items* [Technical Specification]

— *Part 3: Reference dictionary for tool items* [Technical Specification]

— *Part 4: Reference dictionary for adaptive items* [Technical Specification]

— *Part 5: Reference dictionary for assembly items* [Technical Specification]

— *Part 50: Reference dictionary for reference systems and common concepts* [Technical Specification]

— *Part 60: Reference dictionary for connection systems* [Technical Specification]

— *Part 80: Creation and exchange of 3D models — Overview and principles* [Technical Specification]

— *Part 100: Definitions, principles and methods for reference dictionaries* [Technical Specification]

— *Part 150: Usage guidelines* [Technical Specification]

— *Part 201: Creation and exchange of 3D models — Regular inserts* [Technical Specification]

— *Part 202: Creation and exchange of 3D models — Irregular inserts* [Technical Specification]

— *Part 203: Creation and exchange of 3D models — Replaceable inserts for drilling* [Technical Specification]

— *Part 301: Concept for the design of 3D models based on properties according to* ISO/TS 13399-3*: Modelling of thread-cutting taps, thread-forming taps and thread-cutting dies* [Technical Specification]


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— *Part 302: Concept for the design of 3D models based on properties according to* ISO/TS 13399-3*: Modelling of solid drills and countersinking tools* [Technical Specification]

The following parts are under preparation:

— *Part 70: Graphical data layout — Layer settings for tool designs* [Technical Specification]

— *Part 71: Graphical data layout — Creation of documents for the standardized data exchange — Graphical product information* [Technical Specification]

— *Part 72: Creation of documents for the standardized data exchange — Definition of properties for drawing header and their XML-data exchange* [Technical Specification]

— *Part 204: Creation and exchange of 3D models — Inserts for reaming* [Technical Specification]

— *Part 303: Creation and exchange of 3D models — Solid end mills* [Technical Specification]

— *Part 304: Creation and exchange of 3D models — Solid milling cutter with arbor hole* [Technical Specification]

— *Part 307: Creation and exchange of 3D models — End mills for indexable inserts* [Technical Specification]

— *Part 308: Creation and exchange of 3D models — Milling cutters with arbor hole for indexable inserts* [Technical Specification]

— *Part 309: Creation and exchange of 3D models — Tool holders for indexable inserts* [Technical Specification]

— *Part 311: Creation and exchange of 3D models — Solid reamers* [Technical Specification]

— *Part 312: Creation and exchange of 3D models — Reamers for indexable inserts* [Technical Specification]

— *Part 401: Creation and exchange of 3D models — Converting, extending and reducing adaptive items* [Technical Specification]

— *Part 405: Creation and exchange of 3D models — Collets* [Technical Specification]

The designation system for customer solution cutting tools is to form the subject of a future Part 51.

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# Introduction

This part of ISO 13399 defines the concept, terms and definitions regarding the creation and exchange of simplified 3D models of replaceable inserts for drilling that can be used with 3D models of cutting tools for NC-programming, simulation of manufacturing processes and the collision determination within machining processes. It is not intended to standardize the design of the replaceable insert for drilling itself, nor the cutting tool.

A replaceable insert for drilling is used in combination with a cutting tool in a machine to remove material from a workpiece by a shearing action at the cutting edges of the tool. Cutting tool data that can be described by ISO 13399 include, but are not limited to, everything between the workpiece and the machine tool. Information about inserts, solid tools, assembled tools, adaptors, components and their relationships can be represented by this part of ISO 13399. The increasing demand for providing the end-user with 3D models for the purposes defined above is the basis for the development of this ISO 13399 series.

The objective of ISO 13399 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 for the representation of product data 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.


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# Cutting tool data representation and exchange —

# Part 203:
# Creation and exchange of 3D models — Replaceable inserts for drilling

## 1 Scope

This part of ISO 13399 specifies a concept for the design of cutting items, limited to any kind of replaceable inserts for drilling, using related properties and domains of values.

This part of ISO 13399 specifies a common way of designing simplified models that contain the following:

— definitions and identification of the design features of replaceable inserts for drilling, with a link to the properties used;

— definitions and identification of the internal structure of the 3D model that represents the features and properties of replaceable inserts for drilling;

The following are outside the scope of this part of ISO 13399:

— 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 other cutting items not described in this part of ISO 13399;

— 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, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 13399-80, *Cutting tool data representation and exchange — Part 80: Creation and exchange of 3D models — Overview and principles*

## 3 Starting element, coordinate systems planes

### 3.1 General

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

**WARNING — There is no guarantee that the 3D model, created according to the methods described in this part of ISO 13399, is a true representation of the physical tool supplied by the tool**

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