DRAFT FOR DEVELOPMENT

DD ISO/TS 13399-3:2007

Incorporating corrigendum March 2011

Cutting tool data representation and exchange —

Part 3: Reference dictionary for tool items

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British Standards

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National foreword

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This publication is not to be regarded as a British Standard.

It is being issued in the Draft for Development series of publications and is of a provisional nature. It should be applied on this provisional basis, so that information and experience of its practical application can be obtained.

Comments arising from the use of this Draft for Development are requested so that UK experience can be reported to the international organization responsible for its conversion to an international standard. A review of this publication will be initiated not later than 3 years after its publication by the international organization so that a decision can be taken on its status. Notification of the start of the review period will be made in an announcement in the appropriate issue of *Update Standards*.

According to the replies received by the end of the review period, the responsible BSI Committee will decide whether to support the conversion into an international Standard, to extend the life of the Technical Specification or to withdraw it. Comments should be sent to the Secretary of the responsible BSI Technical Committee at British Standards House, 389 Chiswick High Road, London W4 4AL.

The UK participation in its preparation was entrusted to Technical Committee MTE/18, Tools tips and inserts for cutting applications.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This Draft for Development was published under the authority of the Standards Policy and Strategy Committee on 31 May 2007

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Date	Comments
30 June 2011	Implementation of ISO corrigendum March 2011: addition of text in introduction

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TECHNICAL SPECIFICATION

ISO/TS 13399-3

First edition
2007-01-15

Cutting tool data representation and exchange —

Part 3: Reference dictionary for tool items

Représentation et échange des données relatives aux outils coupants —

Partie 3: Dictionnaire de référence pour les éléments relatifs aux outils

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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.

ISO/TS 13399-3 was prepared by Technical Committee 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 100: Definitions, principles and methods for reference dictionaries* [Technical Specification]

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Introduction

ISO 13399 provides the means to achieve an electronic representation of cutting tool data by providing the information structure needed to describe various data about cutting tools and cutting tool assemblies. It is intended to facilitate the use, manipulation and exchange of cutting tool data within and between manufacturing, distribution and usage.

This part of ISO 13399 defines the terms, properties and definitions for those portions of a cutting tool that support one or more cutting items with defined cutting edges. Tool items include, but are not limited to, turning tools, milling tools, drilling tools, and threading tools. The purpose of this part ISO 13399 is to provide a reference dictionary to support the use of the general information model defined in ISO 13399-1.

A cutting tool with defined cutting edges is used on a machine tool to remove workpiece material through a shearing action at the cutting edge(s) of the tool. Cutting tool data are characteristics of the cutting tool and its use that must be known and evaluated in order to make manufacturing decisions and to perform manufacturing operations.

ISO 13399 includes the data representation of everything between the workpiece and the machine tool. Information about inserts (e.g. regular and irregular shaped replaceable cutting items), solid tools (e.g. solid drill and solid endmill), assembled tools (e.g. boring bars, indexable drills and indexable milling cutters), adaptors (e.g. milling arbor and chucks), components (e.g. shims, screws and clamps) or any combination of the above can be exchanged.

Possible assemblies of the components of a cutting tool are illustrated in Figure 1.

The cutting tool data described include, but are not limited to, geometrical and dimensional data, identification and designation data, miscellaneous and spare part data, cutting material data, and component connectivity.

The use of the tool information model established by ISO 13399 will provide increased productivity for the user in the same way as do the tools. The effective management of tool information will improve the management of the tools themselves. Use of the tool information model will enable the identification of the “right” tool in every operation — from tool purchase, through planning, set-up in machine-tools, maintenance and reuse of the tools — with short lead times and with high reliability and product quality. Tool users will benefit from improved support from the tool vendors who will be able to provide a standard information product to accompany the tool products. Computer interfaces for information exchange will be more efficient.

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 of any particular computer system. Such a 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, *Industrial automation systems and integration*, SC 4, *Industrial data*, for the representation of product data by using standardized information models and reference dictionaries.

An information model is a formal specification of types of ideas, facts and processes which together describe a portion of interest of the real world and which provides an explicit set of interpretation rules. Information is knowledge of ideas, facts and/or processes. Data are symbols or functions that represent information for processing purposes. Data are interpreted to extract information by using rules for how that should be done and a dictionary to define the terms that identify the data. Everyone in a communication process must use the same information model, the same set of explicit rules and the same dictionary in order to avoid misunderstanding. If an information model and its dictionary are written in a computer-sensible language then there is the additional benefit that they can be *computer-processable*.

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An engineering information model is therefore a specification for data that establishes the meaning of that data in a particular engineering context. A model has to be developed by formal methods to ensure that it meets the needs of the situation that it represents. An engineering information model defines: the information objects that represent the concepts in an engineering application, the attributes of the objects and their relationships and the constraints that add further meaning. An information model is an abstract concept that can be used repeatedly for any example of the real-world situation that it represents. An instance of the model is produced when it is populated with the data items and their values that are applicable to a particular example of that situation.

This part of ISO 13399 uses the following resources developed by ISO TC 184/SC 4:

a) the EXPRESS language according to ISO 10303-11 for defining the information model;

b) the file format for data exchange derived from the model and defined in ISO 10303-21;

c) the data dictionary defined in ISO 13584.

ISO 13399 is intended for use by manufacturers, tool vendors or producers, and developers of manufacturing software, among others. It provides a common structure for exchanging data about cutting tools (see Figure 1), and is intended to allow or improve several capabilities, including

— provision of a common set of definitions for use in describing cutting tools and cutting tool assemblies,

— the integration and sharing of cutting tool and assembly data between software applications,

— direct import of vendor cutting tool data into customer databases or applications, and

— a reduction in the level of effort required for manufacturers to maintain accurate and current cutting tool information from multiple sources and for multiple applications.

Different companies use different business models to determine their need for the communication of information about their products. For example, one cutting tool manufacturer could regrind its customers' tools while another could allow its customers to do the regrinding and provide the information to enable them to do so. Therefore, the two cutting tool manufacturers could have a different set of cutting tool properties to communicate using the information model and dictionaries provided by ISO 13399.

ISO 13399 defines only that information which could be communicated; it does not specify what information must be communicated.

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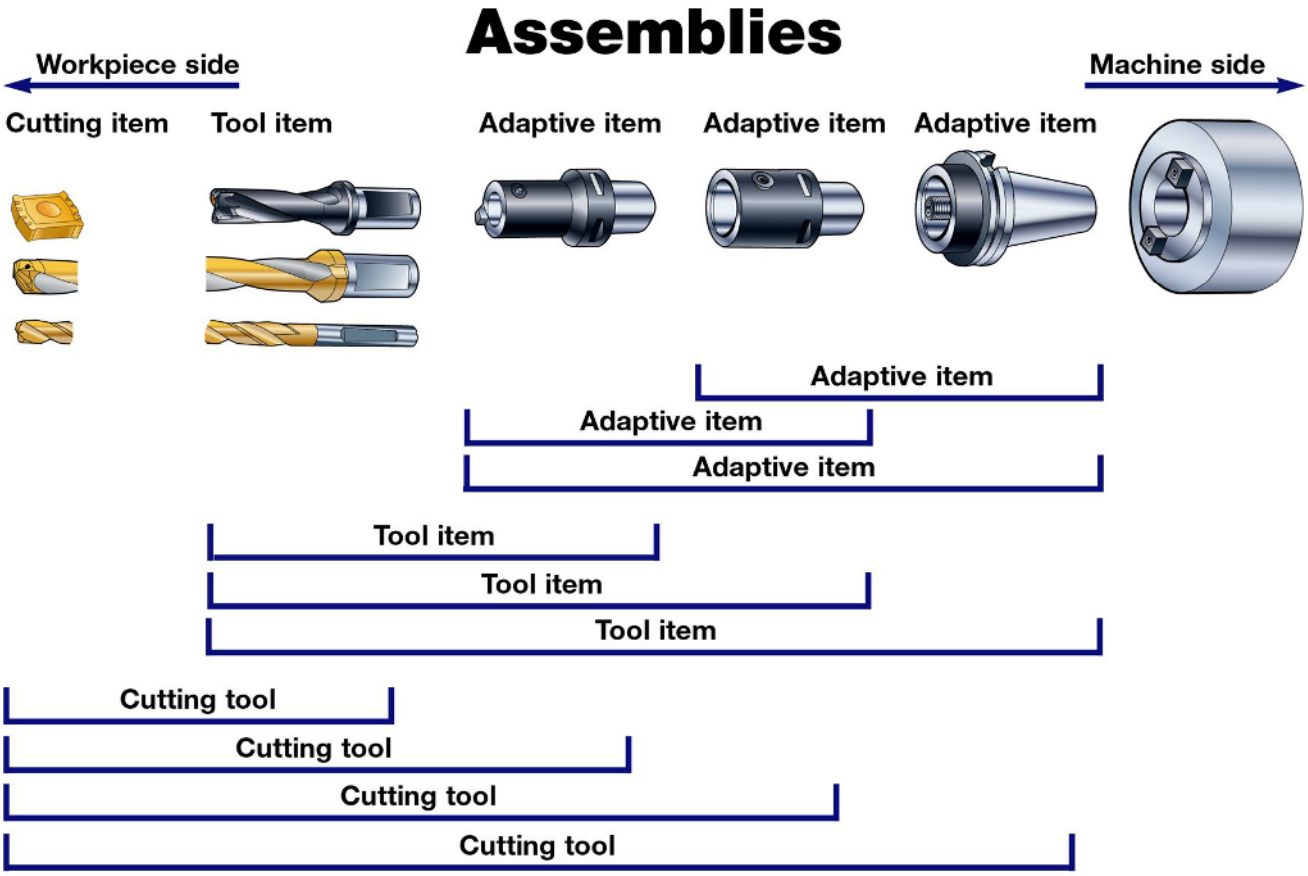

Figure 1 — Examples of different types of assemblies of items

Since the content of those dictionaries evolves according to industrial innovations and constant improvement of technology in cutting tools, a Maintenance Agency has been established for the purposes of:

— correcting errors in the entries of existing classes and properties;

— adding new properties to existing classes;

— adding new classes and their properties;

— managing the status of those properties and classes;

— migrating the dictionary to subsequent editions of ISO 13399 (all parts).

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The secretariat of this Maintenance Agency has been assigned to

Union de Normalisation de la Mécanique

F-92038 Paris La Défense CEDEX

France

by the ISO Technical Management Board.

The website of the Maintenance Agency is available at:
http://www.unm.fr/en/general/iso13399/default.htm.

The reference dictionaries are available in the form of EXPRESS files on the website of the Maintenance Agency. These files are considered complementary to this Technical Specification; they can be freely downloaded and used for cutting tool data representation and exchange.

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Cutting tool data representation and exchange —

Part 3:
Reference dictionary for tool items

1 Scope

This part of ISO 13399 specifies a reference dictionary for tool items, together with their descriptive properties and domains of values.

This part of ISO 13399 specifies a reference dictionary that contains

a) definitions and identifications of the classes of tool items and their features, with an associated classification scheme,

b) definitions and identifications of the data element types that represent the properties of tool items and their features,

c) definitions and identifications of domains of values for describing the above data element types.

Each class, property or domain of values of this application domain constitutes an entry of the reference dictionary defined in this part of ISO 13399. It is associated with a computer-sensible and human-readable definition, and with a computer-sensible identification. Identification of a dictionary entry allows unambiguous reference to it from any application that implements the information model defined in ISO 13399-1.[1)]

The following is within the scope of this part of ISO 13399:

— standard data that represent the various classes of tool items and tool item features;

— standard data that represent the various properties of tool items and tool item features;

— standard data that represent domains of values used for properties of tool items and tool item features;

— a single implementation method by which the standard data defined in this part ISO 13399 can be exchanged (see ISO 10303-21).

The following is not within its scope:

— specialized or expert knowledge on the design and use of cutting tools;

— rules used to determine the information that should be communicated;

— applications where these standard data may be stored or referenced;

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1) 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 SC 3D, and in its extensions according to ISO 13584-24 and ISO 13584-25.

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— implementation methods other that the one defined in this part of ISO 13399 by which the standard data can be exchanged and referenced;

— information models for cutting tools;

— definitions of classes and properties for cutting items, adaptive items, assembly items, reference systems and common concepts, or for connection systems, these being covered by other parts of ISO 13399.

2 Normative references

The following referenced documents are indispensable for the application 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 13399-100, *Cutting tool data representation and exchange — Part 100: Definitions, principles and methods for reference dictionaries*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TS 13399-100 and the following apply.

3.1
applicable property
property that is defined for some family of items and that applies to any member of this family

[ISO 13584-24]

3.2
basic semantic unit
entity that provides an absolute and universal identification of classes and data element types in an application domain

[ISO 13584-42]

3.3
chip
material removed from a workpiece by a cutting process

[ISO/TS 13399-2]

3.4
coordinate axis system
right-handed rectangular Cartesian coordinate system in three-dimensional space with three principal axes labelled X, Y and Z

[ISO/TS 13399-50]

3.5
cutting tool
device or assembly of items for removing material from a workpiece through a shearing action at the defined cutting edge or edges of the device

NOTE A cutting tool could be the assembly of one or more adaptive items, a tool item and several cutting items on a tool item. See Figure 1.

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[ISO 13399-1]

3.6
data
representation of facts concepts or instructions in a formal manner suitable for communication, interpretation or processing by human beings or computers

[ISO 10303-1]

3.7
data element type
unit of data for which the identification, description and value representation have been specified

[ISO 13584-42]

3.8
data exchange
storing, accessing, transferring and archiving of data

[ISO 10303-1]

3.9
data type
domain of values

[ISO 10303-11]

3.10
dictionary
structured set of entries with one and only one meaning corresponding to each entry and one and only one entry identifying a single meaning

[ISO 13584-511]

NOTE In ISO 13399, a dictionary is a formal and computer-sensible representation of an ontology.

3.11
entity
class of information defined by its attributes that establishes a domain of values defined by common attributes and constraints.

NOTE Adapted from ISO 10303-11.

3.12
entity data type
representation of an entity

[ISO 10303-11]

3.13
entity instance
named unit of data that represents a unit of information within the class defined by an entity

NOTE It is a member of the domain established by an entity data type.

[ISO 10303-11]

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3.14
family of items
simple or generic family of items

[ISO 13584-42]

3.15
generic family of items
grouping of simple or generic families of items for the purpose of classification or for associating common information

[ISO 13584-42]

3.16
implementation method
means for computers to process or exchange data

[ISO 10303-1]

3.17
information
facts, concepts or instructions

[ISO 10303-1]

3.18
information model
formal description of a bounded set of information to meet a specific requirement

[ISO 10303-1]

3.19
machine side
identification of a direction pointing towards the machine

3.20
machined surface
surface produced by the action of a cutting tool

[ISO 3002-1]

3.21
mirror plane
xz plane in the coordinate axis system

[ISO/TS 13399-50]

3.22
ontology
explicit and consensual specification of concepts of an application domain independent of any use of these concepts

[ISO 13584-511]

NOTE In ISO 13399 a dictionary is the formal and computer-sensible representation of an ontology.

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3.23
property
characteristic of a product or process that may be represented by a data element type

NOTE Adapted from ISO 13584-42.

3.24
simple family of items
set of items in which each item may be described by the same group of properties

[ISO 13584-42]

3.25
transient surface
part of the surface which is formed on the workpiece by the cutting operation and is removed during the following cutting action either during the following revolution of the tool or the workpiece or by the following cutting edge

[ISO 3002-1]

3.26
visible property
property that is defined for some family of items that may or may not be applicable to the different members of the family

[ISO 13584-42]

3.27
workpiece
object on which a cutting action is performed

[ISO/TS 13399-2]

3.28
workpiece side
identification of a direction pointing towards the workpiece

[ISO/TS 13399-2]

3.29
work surface
surface that is to be removed on the workpiece

[ISO 3002-1]

3.30
xy plane
plane in the coordinate axis system that contains the X and Y axes with the normal of the plane in the positive Z direction

[ISO/TS 13399-50]

3.31
xyw plane
plane in the coordinate axis system related to the xy plane by the rotation angle PHI about the X axis in a counter clockwise direction and located at a distance XYWD from the origin of the coordinate axis system

[ISO/TS 13399-50]

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3.32
xz plane
plane in the coordinate axis system that contains the X and Z axes with the normal of the plane in the positive Y direction

[ISO/TS 13399-50]

3.33
xzw plane
plane in the coordinate axis system related to the xz plane by the rotation angle KAPPA about the Z axis in a counter clockwise direction and located at a distance XZWD from the origin of the coordinate axis system

[ISO/TS 13399-50]

3.34
yz plane
plane in the coordinate axis system that contains the Y and Z axes with the normal of the plane in the positive X direction

[ISO/TS 13399-50]

3.35
yzw plane
plane in the coordinate axis system related to the yz plane by the rotation angle RHO about the Y axis in a counter clockwise direction and located at a distance YZWD from the origin of the coordinate axis system

[ISO/TS 13399-50]

NOTE The xzw plane, the xyw plane and the yzw plane are mutually perpendicular.

4 Abbreviated terms

BSU basic semantic unit

DET data element type

5 Representation of the ontological concepts as dictionary entries

In the following subclauses, a concept in the ontology is identified by a name in lower-case characters. The name of a class that represents the concept in the dictionary is identified by bold, lower-case characters with multiple words joined by an underscore character.

EXAMPLE "tool item type" is the name of a concept in the ontology: **tool_item_type** is the identifier of the class in the dictionary that represents the concept.

Data for tool items are grouped into two main classes: **tool_item_feature** and **tool_item_type**. The items in the classification of **tool_item_type** are identified by a label that is derived from the main application of a tool. However, it should be recognised that a tool may be used for more than one type of cutting operation. A **tool_item_feature** is an aspect of a **tool_item_type** that could not exist in isolation from the **tool_item_type**.

Some of the definitions of properties that are applicable to tool items are defined in terms of a coordinate axis system. The coordinate system is the same for adaptive items, cutting items and tool items and is defined in ISO/TS 13399-50. The applications of this coordinate system to tool items are described in this part of. All functional dimensions of a tool item that uses replaceable cutting items are defined on the assembly of the tool item and the master insert. The convention followed is "the tool in hand".

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Each entry in the dictionary, whether a class or a property, is identified with a numerical code (BSU) that is generated at random when the dictionary is compiled. A BSU can be made unique by the addition of a code that is a reference to the supplier of the dictionary. Each classified item in the following subclauses is associated with its definition from the dictionary.

The structure of the classification is summarized in Annex B. The complete definitions of the tool item classes are provided in Annex C. The properties applicable to tool item classes are defined in Annex D.

5.1 tool_item_feature

tool_item_feature is a generic family of characteristics of a tool item that cannot exist independently of the tool item. **tool_item_feature** has the following subclasses:

— **chip_management**;

— **drill_point**;

— **guide_pilot_feature**;

— **pilot_drill_feature**;

— **tool_hub**;

5.1.1 chip_management

chip_management is a generic class of features of the tool body or assembly to control the direction of motion of the chip.

5.1.2 drill_point

A **drill_point** is the part of a drill that first makes contact with the workpiece.

5.1.3 guide_pilot_feature

A **guide_pilot_feature is a** portion of a cylindrical tool in front of the cutting portion that acts to limit the sideways movement of the tool in operation.

5.1.4 pilot_drill_feature

A **pilot_drill_feature** is part of a larger drill for guiding the main cutting operation.

5.1.5 tool_hub

A **tool_hub** is the central part of a disk-shaped tool item with increased thickness.

5.2 tool_item_type

A **tool_item_type** is a generic family of items that support or hold one or more cutting items in a cutting operation. **tool_item_type** has the following subclasses:

— **broach**;

— **burr_tool**;

— **cartridge**;

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— **drill**;

— **mill**;

— **ream**;

— **rotating_borer**;

— **threading_die**;

— **threading_tap**;

— **turn**.

5.2.1 broach

broach is a generic family of items designed for use mainly in broaching operations. **broach** has the following subclasses:

— **cylindrical_broach**;

— **disk_ broach**;

— **prismatic_ broach**;

— **tapered_broach**.

5.2.1.1 cylindrical_broach

A **cylindrical_broach** is a tool item used for changing the dimensions of an existing profile that has a constant circular cross section and cutting edges around the whole circumference.

5.2.1.2 disk_broach

A **disk_broach** is a disk-shaped tool item used for changing the dimensions of an existing profile and that has the cutting edges on the periphery of the disk.

5.2.1.3 prismatic_broach

A **prismatic_broach** is a tool item with a rectangular cross section used for changing the dimensions of an existing profile and that has cutting items on one side of the cross section.

5.2.1.4 tapered_broach

A **tapered_broach** is a tool item for changing the dimensions of an existing profile that that has a continuously varying cross section with cutting edges surrounding the cross section.

NOTE The cross section can be rectangular or circular or elliptical.

5.2.2 burr_tool

A **burr_tool** is a small rotating tool for removing areas of roughness from a machined edge

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5.2.3 cartridge

A **cartridge** is a tool item that carries a solid cutting edge or locks a replaceable insert and is designed to be mounted onto either an adaptive item or a tool item.

5.2.4 drill

drill is a generic family of items designed for use mainly in drilling operations. **drill** has the following subclasses:

— **centre_drill**;

— **chamfer_drill**;

— **conical_drill**;

— **core_drill**;

— **counterbore_drill**;

— **countersink_drill**;

— **deep_hole_drill**;

— **pilot_drill**;

— **step_drill**;

— **trepanning_drill**;

— **twist_drill**.

5.2.4.1 centre_drill

A **centre_drill** is a tool item for creating a hole for the location of a subsequent operation.

NOTE This drill is usually a solid drill.

5.2.4.2 chamfer_drill

A **chamfer_drill** is a tool item for creating a chamfer in or on a hole.

5.2.4.3 conical_drill

A **conical_drill** is a tool item for forming a cone shaped hole.

5.2.4.4 core_drill

A **core_drill** is a tool item without a central cutting point or means of starting a hole.

5.2.4.5 counterbore_drill

A **counter_bore_drill** is a tool item for creating a counterbore section of a hole.

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5.2.4.6 countersink_drill

A **countersink_drill** is a tool item for creating a countersink section of a hole.

5.2.4.7 deep_hole_drill

A **deep_hole_drill** is a tool item for creating a hole usually deeper than ten times the diameter of the tool item.

5.2.4.8 pilot_drill

A **pilot_drill** is a tool item that is added to a larger drill for guiding the main cutting operation.

5.2.4.9 step_drill

A **step_drill** is a tool item for creating a stepped hole.

5.2.4.10 trepanning_drill

A **trepanning_drill** is a tool item used to cut a deep face groove leaving a plug of material equal to the inner diameter.

NOTE The tool can be small to leave a boss on a component or large to create a large hole but not produce all the cut material to swarf.

5.2.4.11 twist_drill

A **twist_drill** is a solid tool item with helical chip flutes.

5.2.5 mill

mill is a generic family of items designed for use mainly in milling operations. **mill** has the following subclasses:

— **double_half_side_mill**;

— **end_mill**;

— **face_mill**;

— **half_side_mill**;

— **ring_mill**;

— **slab_mill**;

— **slotting_cutter**;

— **threading_grooving_mill**.

5.2.5.1 double_half_side_mill

A **double_half_side_mill** is a milling cutter that cuts on both sides and part of the periphery and is used for enlarging an existing slot.

NOTE The X axis is perpendicular to the slot being enlarged, the cutting width is less than half the cutting diameter (CW<CD/2) and the mounting is normally a bore mount.

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5.2.5.2 end_mill

An **end_mill** is a milling cutter with an integral shank.

NOTE The X axis is either perpendicular or parallel to the surface being machined and the tool has a cutting diameter of less than 150mm (CD<150mm).

5.2.5.3 face_mill

A **face_mill** is a milling cutter that produces a flat surface on the workpiece although the cutting edges on the periphery remove most of the workpiece material.

NOTE The X axis is perpendicular to the surface being machined, there is one row of inserts, the mounting is usually a bore with transverse keyways and the depth of cut is less than cutting diameter (DOC<CD).

5.2.5.4 half_side_mill

A **half_side_mill** is a milling cutter that cuts on the periphery and one side.

NOTE The X axis is perpendicular to the main workpiece surface being produced, the depth of cut is less than half the cutting diameter (DOC<CD/2) and the mounting is normally a bore mount.

5.2.5.5 ring_mill

A **ring_mill** is a milling cutter that cuts on the internal annular surface and both sides.

NOTE The X axis is perpendicular to the slot being produced and the cutting width is less than half the cutting diameter (CW<CD/2).

5.2.5.6 slab_mill

A **slab_mill** is a milling cutter with cutting edges on the periphery for machining large surfaces.

NOTE The tool axis is parallel to the workpiece surface, the mounting surface is a bore and the useable length is greater than cutting diameter (LU>CD).

5.2.5.7 slotting_cutter

A **slotting_cutter** is a milling cutter that cuts on the periphery and both sides.

NOTE The X axis is perpendicular to the slot being produced, the cutting width is less than half the cutting diameter (CW<CD/2) and the mounting is normally a bore mount.

5.2.5.8 threading_grooving_mill

A **threading_grooving_mill** is a milling cutter that cuts on its periphery to produce a groove or a thread.

NOTE The X axis is parallel to the groove width or to the axis of thread being cut and the mill can either be designed with an integral shank or with a bore mount.

5.2.6 ream

ream is a generic family of items designed for use mainly in reaming operations. **ream** has the following subclasses:

— **cylindrical_reamer**;

— **profile_reamer**;

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— **stepped_reamer**;

— **tapered_reamer**.

5.2.6.1 cylindrical_reamer

A **cylindrical_reamer** is a tool item used for reaming a cylindrical surface.

5.2.6.2 profile_reamer

A **profile_reamer** is a tool item for reaming a non-regular surface.

5.2.6.3 stepped_reamer

A **stepped_reamer** is a tool for reaming a hole with more than one diameter.

5.2.6.4 tapered_reamer

A **tapered_reamer** is a tool item for reaming a conical hole.

5.2.7 rotating_borer

A **rotating_borer** is an assembly of cutting item or items, tool item or items and adaptive item or items to enlarge an existing hole.

5.2.8 threading_die

threading_die is a generic family of items used for external threading operations. **threading_die** has the following subclasses:

— **cylindrical_die**;

— **hexagonal_die**.

5.2.8.1 cylindrical_die

A **cylindrical_die** is a threading die whose outside shape is cylindrical.

5.2.8.2 hexagonal_die

A **hexagonal_die** is a threading die whose outside shape is hexagonal.

5.2.9 threading_tap

threading_tap is a generic family of items designed to form an internal thread in an existing hole in a workpiece. **threading_tap** has the following subclasses:

— **conical_tap**;

— **cylindrical_tap**.

5.2.9.1 conical_tap

A **conical_tap** is a tool item that creates tapered internal threads.

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5.2.9.2 cylindrical_tap

A **cylindrical_tap** is a tool item that creates internal cylindrical threads.

5.2.10 turn

turn is a generic family of items designed for use mainly in internal and external turning operations. **turn** has the following subclasses:

— **boring_bar**;

— **prismatic_tool_holder**;

— **system_tool**.

5.2.10.1 boring_bar

A **boring_bar** is a tool item with a cylindrical cross section shank mainly used for internal turning operations.

5.2.10.2 prismatic_tool_holder

A **prismatic_toll_holder** is a tool item with prismatic cross section shank mainly used for external turning operations.

NOTE The class includes, but is not limited to, square shanks, rectangular shanks, cartridges and cut-off blades.

5.2.10.3 system_tool

A **system_tool** is a tool item with a manufacturer's specific connection used for external and, or, internal turning operations.

6 Properties for tool item features and tool item types

The properties that are applicable to items defined in Clause 5 are defined in Annex D, where the association of a property with a class is also specified. In the compilation of the dictionary all properties are visible properties at the root class of the dictionary and are made applicable properties at the class level where they apply. The names of properties that may be applicable to tool item features and tool item types, with their identification codes (BSU), are shown in Table 1. The order of the names in the table should be read in rows from left to right.

NOTE 1 The value domains for properties are specified in ISO/TS 13399-100.

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Table 1 — Property names and identification codes

Property name	Identification code (BSU)	Property name	Identification code (BSU)
a dimension on lf	71D0793ECEF9A	a dimension on wf	71CF299431CAC
adjustability	71EBBA9E78025	adjustment axial property	71D0845BB2310
adjustment radial property	71D0845C34AB9	axial groove outside daimeter maximum	71D07543FD182
axial groove outside diameter minimum	71CF299354332	balance quality code	71DF151EA5CF1
balanced by design	71EAC0CAB861F	ball nosed property	71D1AE0CB32D1
blade reinforcement radius	71CF2992DBC44	body clearance depth	71EAC81F88336
body diameter	71ED6A9AF7D1D	body diameter maximum	71D08462F8185
body half taper angle	71EAC472BD116	body height	71EBB332C60EB
body length	71ED6AA478A3D	body length maximum	71DCD3B16750B
body material code	71DF1523224D8	body width	71EBB33230236
bolt hole circle property	71EDCB7490ED5	burr type code	71DF1523869EE
cartridge size code	71DF1523EE184	clamping length	71EBAF896BE9A
clamping length maximum	71ED6E54B15C4	clamping length minimum	71EBB339ED2BD
clamping type code	71CF298EEB4F5	clamping width	71EBAF85006BD
clearance angle axial	71EAC83CD450B	clearance angle normal	71ED6E5CD0DAE
clearance angle orthogonal	71D08418C3B4D	clearance angle radial	71EAC83B73825
coating property	71DD703B84298	connection code machine side	71D102AE3B252
connection code workpiece side	71D102AE8A5A9	connection retaining knob thread size	71CF298A76B66
connection bore depth	71EAC48CAD407	connection bore diameter	71E01D92C41E8
connection count workpiece side	71EDD2C17746F	connection diameter	71EBDBF5060E6
connection size code	71FC193318002	connection unit basis	71ED6E16D5978
contact surface diameter machine side	71D087D97FCE3	coolant supply property	71EBB342CC751
cutting length minimum bore diameter	71CF299287FD3	cutting depth maximum	71CEAEBD5A66A
cutting diameter internal maximum	71D0846570977	cutting diameter internal minimum	71D084655A2F7
cutting diameter internal	71D0846545C4E	cutting diameter	71D084653E57F
cutting diameter maximum	71D084656CE32	cutting diameter minimum	71D0846556288
cutting diameter size code	71DF1527D828C	cutting edge centre count	71DCD0033973E
cutting edge count	71CEAE9B489F4	cutting end count	71DCD00CBBC2A
cutting item count	71DF8C52B8926	cutting pitch density	71DF15283219C
cutting pitch differential	71DF152D8CF7D	cutting width	71CEAEBE2B825
cutting width maximum	71D07569F8BC3	cutting width minimum	71D0756A28B42

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Table 1 (*continued*)

Property name	Identification code (BSU)	Property name	Identification code (BSU)
damping property	71CED03D70452	data chip provision	71CF29869CA0F
depth of cut maximum	71D07576C0558	design configuration style code	71CF2993DC583
drill back taper	71EAC81AD9AE1	drilling profile property	71D1AE126DEFD
drive angle	71D08096F930C	drive count	71E0306423B2A
drop head design	71EAC49F75413	face effective cutting edge count	71DCD00239812
face mounted insert count	71DCD0029BBE7	flange diameter	71EC61D8A1771
flute count	71DCCFEBB883E	flute design code	71DCCFEC645BD
flute helix angle	71DCCFEC20115	flute helix hand	71DCCFF654756
flute helix pitch	71DCCFF6A1A13	fluted land width	71EAC8210DF36
functional height	71CF29994E737	functional length	71DCD39338974
functional length minimum	71EBC1EB8456A	functional length secondary	71D078F5BEDBE
functional width	71CF29984CDA7	functional width 2	71D193F495583
functional width secondary	71CF299874B1E	groove depth minimum bore diameter	71CF298FB10E4
guide element property	71EE070696F08	guide pilot diameter	71ED6A7A6E6A2
hand	71CF29872F0AB	head back offset length	71D075730A82B
head back offset width	71D075731F172	head bottom offset height	71CF298F073D3
head bottom offset length	71CF298F4E487	head diameter	71E03062EC034
head length	71D07574A61E8	hub diameter	71D087D3B17B0
hub property	71DF5C078FF46	hub thickness	71D087D3F5E07
inclination angle	71D075754F8A3	insert adjustable count	71DF1538E7378
insert interface code	71CE7A9936610	insert seat size code	71CEAEBF2A69F
interlocking capabilty	71DF1526AC952	keyway property	71DF5C0761888
length chip flute	71DCCC27DEF53	master insert identification	71CF298FDE0EF
minimum bore diameter	71D07543367C5	mounting hole angle	71EAC0F064E2D
mounting hole distance	71EAC0E9FA4CD	mounting hole distance 2	71EAC0EF68BB7
mounting hole height	71EAC0EFA1BF3	neck diameter	71EAC48EC5DE0
neck length	71EBC1E026769	overall length minimum	71EBC1E8857BE
overall height	71D078EB73E87	overall length	71D078EB7C086
overall width	71CF299257986	peripheral effective cutting edge count	71DCCFF75E485
peripheral mounted insert count	71DCD00054F65	pilot drill protrusion	71EAC49030828
pilot protruding length	71DCCFD24119E	plug chamfer diameter	71EBC1EA293DC
plug style	71E02C679DC6D	plunge depth maximum	71D08099F1DDC
point angle	71DCCC4FEF366	point length	71DCCFD064042
premachined hole diameter	71DCCC5A4FD18	profile specification	71DF8C5D91804
protruding length	71DCD394BB20E	qualified tool code	71D078ED2C21E

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Table 1 (*continued*)

Property name	Identification code (BSU)	Property name	Identification code (BSU)
rake angle axial	71CF29990C41F	rake angle normal	71CF2998EBD46
rake angle orthogonal	71D0808F8F719	rake angle radial	71CF2998A1609
ramping angle maximum	71DF1538632D9	revolutions per minute maximum	71DF153A691F2
row identifier	71CED04867743	runout axial adjustment	71D0845C77193
runout axial property	71EDD2B883F77	runout radial	71DF8C660035E
runout radial adjustment	71D0846298D19	runout radial property	71EDD2B8B8C5B
shank cross sectional shape code	71CF2988A5874	shank diameter	71CF29862B277
shank height	71CF29883E014	shank length	71CF298870946
shank width	71CF298751FCF	step count	71DCCC3BD1B96
step diameter length	71DCCC3DFA23A	step distance	71DCCC47221E0
step included angle	71DF151D6E547	stock removal maximum	71EBC1EC0BB22
stock removal minimum	71EBC1EBC839F	stock removal recommended	71EBC1EC3E8B6
tangentially mounted insert	71EAC496E7425	tap type identifier	71DF153B4ABCD
taper angle	71EAC4A2B6544	tapered	71EC659C9B3CE
thread diameter	71E02C5C2EED3	thread diameter size	71EBBAA3BCA70
tool changer interference diameter maximum	71CF298A3A99A	tool changer interference length minimum	71CF2989AF0E0
tool cutting edge angle type code	71D078F6E9893	tool cutting edge angle	71D078F683C9B
tool holder shape code	71D078FD4E7BE	tool lead angle	71D078F77616B
tool style code	71D078FBF6C68	torque	71DF153B14F02
unit system	71EBBA9ED6C0A	usable length	71EBB33490FDA
usable length diameter ratio	71DCCC62CD9EE	usable length maximum	71CF2992BDBCC
web taper	71EAC823D95A7	web thickness	71EAC82313165
weight of item	71CED03C97AAB		
work piece parting diameter maximum	71D0757C787B8		

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Annex A
(normative)

Information object registration

A.1 Document identification

In order to provide for unambiguous identification of an information object in an open system, the object identifier:

{ISO technical specification 13399 part (3) version (1)}

is assigned to this part of ISO 13399.

The meaning of this value is as defined in ISO/IEC 8824-1 and described in ISO 13584-1.

A.2 Dictionary identification

The dictionary defined in this part of ISO 13399 is assigned the object identifier:

{ISO technical specification 13399 part (3) version (1) object (1) tool items (1)}

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Annex B
(informative)

Classification structure

Table B.1 shows the classification structure of the generic families in the dictionary with an expanded structure for the classes of tool item feature and tool item type. The purpose of the table is to show the relationships between the classes related to tool items and the other classes in ISO 13399.

NOTE Annex C contains the full definition of all the classes that are relevant to tool items. Definitions of reference systems that are used in the definition of some properties can be found in ISO 13399-50.

Table B.1 — Classification structure

Classes	Parent class	Subclass
cutting tool library	Root class	71CE7A72B6DA7
adaptive item type	71CE7A72B6DA7	71EAD37F18F34
adjustment	71CE7A72B6DA7	71ED884159C90
assembly item type	71CE7A72B6DA7	71CE7A795C05C
bolt hole circle	71CE7A72B6DA7	71E02520881F1
connection interface feature	71CE7A72B6DA7	71DF8C37D9115
coolant supply	71CE7A72B6DA7	71DF8C3C065EB
cutting item feature	71CE7A72B6DA7	71DD6C82F72DA
cutting item type	71CE7A72B6DA7	71D1AA6C8FC75
cutting operation	71CE7A72B6DA7	71DFF83D21D50
cutting tool	71CE7A72B6DA7	71CE7A7A5038B
flange	71CE7A72B6DA7	71EC5A767182E
keyway	71CE7A72B6DA7	71DF5C026BCE7
locking mechanism	71CE7A72B6DA7	71EBAB85BB5FA
reference system	71CE7A72B6DA7	71CF2968F7A9E
runout axial	71CE7A72B6DA7	71EDD2B84143C
runout radial	71CE7A72B6DA7	71EDD2B858274
tool item feature	71CE7A72B6DA7	71DD70376771D
chip management	71DD70376771D	71DF8C3FD03AF
drill point	71DD70376771D	71DF8C5B8F7B5
guide pilot feature	71DD70376771D	71E019C497CDF
pilot drill feature	71DD70376771D	71EE070754DE2
tool hub	71DD70376771D	71DF5C02D0271
tool item type	71CE7A72B6DA7	71E01A004C775
broach	71E01A004C775	71E01A04C377D
cylindrical broach	71E01A04C377D	71E0250E32A07
disk broach	71E01A04C377D	71E01A082DE72
prismatic broach	71E01A04C377D	71E01A0838E9B

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Table B.1 (*continued*)

Classes			Parent class	Subclass
		tapered broach	71E01A04C377D	71E01A081855D
	burr tool		71E01A004C775	71E02C544BABE
	cartridge		71E01A004C775	71D1066F279AD
	drill		71E01A004C775	71E01A00BD93C
		centre drill	71E01A00BD93C	71E01A073CA28
		chamfer drill	71E01A00BD93C	71E01A069566C
		conical drill	71E01A00BD93C	71E01A0751456
		core drill	71E01A00BD93C	71FAE7AAE8247
		counterbore drill	71E01A00BD93C	71E01A06BF88D
		countersink drill	71E01A00BD93C	71E01A06A8A08
		deep hole drill	71E01A00BD93C	71E01A065F635
		pilot drill	71E01A00BD93C	71E01D8A88F65
		step drill	71E01A00BD93C	71E01A067F73C
		trepanning drill	71E01A00BD93C	71E01A0769982
		twist drill	71E01A00BD93C	71E01A0608FE4
	mill		71E01A004C775	71E01A008D13F
		double half side mill	71E01A008D13F	71EF07DFC283C
		end mill	71E01A008D13F	71E01A05D27A8
		face mill	71E01A008D13F	71E01A05B627B
		half side mill	71E01A008D13F	71E01A05EA320
		ring mill	71E01A008D13F	71E01A0600702
		slab mill	71E01A008D13F	71E01A0540BE7
		slotting cutter	71E01A008D13F	71EF07E037025
		threading grooving mill	71E01A008D13F	71EF07E083383
	ream		71E01A004C775	71E01A04A8AEC
		cylindrical reamer	71E01A04A8AEC	71E01A07BC535
		profile reamer	71E01A04A8AEC	71E01A07ECCCF
		stepped reamer	71E01A04A8AEC	71E01A07FF350
		tapered reamer	71E01A04A8AEC	71E01A07D2A1B
	rotating borer		71E01A004C775	71E0251F304E1
	threading die		71E01A004C775	71E01A04F70F7
		cylindrical die	71E01A04F70F7	71E01A0E4EE75
		hexagonal die	71E01A04F70F7	71E01A0E79239
	threading tap		71E01A004C775	71E01A04E0236
		conical tap	71E01A04E0236	71E01A0E34C7F
		cylindrical tap	71E01A04E0236	71E01A0A5355D
	turn		71E01A004C775	71E01A05104CF
		boring bar	71E01A05104CF	71E01A0E9CBA9

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Table B.1 (*continued*)

Classes	Parent class	Subclass
prismatic tool holder	71E01A05104CF	71E01A0E85121
system tool	71E01A05104CF	71E01A0EAF067
tool thread external	71CE7A72B6DA7	71FC1D22BF4CD
tool thread internal	71CE7A72B6DA7	71FC1D25097D7

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Annex C
(informative)

Class definitions

The content of this annex is limited to the classes of tool item features and tool item types.

The information for each class is presented as follows.

BSU Code – version number **Revision number**

preferred name **short name**

Definition

NOTE

REMARKS

Properties:

Subclasses:

71DD70376771D-1 **1**

tool item feature **tif**

characteristic of a tool item that cannot exist independently of the tool item

Subclasses:

71DF5C02D0271-001 tool hub

71DF8C3FD03AF-001 chip management

71DF8C5B8F7B5-001 drill point

71E019C497CDF-001 guide pilot feature

71EE070754DE2-001 pilot drill feature

71DF8C3FD03AF-1 **1**

chip management **chpmg**

feature of the tool body or assembly to control the direction of motion of the chip

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Properties:

71DCCC27DEF53-1	length chip flute
71DCCFEC20115-1	flute helix angle
71DCCFEC645BD-1	flute design code
71DCCFF654756-1	flute helix hand
71DCCFF6A1A13-1	flute helix pitch

71DF8C5B8F7B5-1 **1**

drill point **dpt**

part of a drill that first makes contact with the workpiece

Properties:

71DCCC4FEF366-1	point angle
71DCCFD064042-1	point length
71DF8C660035E-1	runout radial

71E019C497CDF-1 **1**

guide pilot feature **gpy**

portion of a cylindrical tool in front of the cutting portion that acts to limit the sideways movement of the tool in operation

Properties:

71DCCFD24119E-1	pilot protruding length
71ED6A7A6E6A2-1	guide pilot diameter

71EE070754DE2-1 **1**

pilot drill feature **pdrl**

part of a larger drill for guiding the main cutting operation

Properties:

71EAC49030828-1	pilot drill protrusion

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71DF5C02D0271-1 **1**

tool hub **tihub**

central part of a disk-shaped tool item with increased thickness

Properties:

71D087D3B17B0-1 hub diameter

71D087D3F5E07-1 hub thickness

71E01A004C775-1 **1**

tool item type **titp**

family of items that support or hold one or more cutting items in a cutting operation

NOTE Dimensions and properties of tool items assume the presence of at least one master insert.

Properties:

71CE7A9936610-1 insert interface code

71CEAE9B489F4-1 cutting edge count

71CED03C97AAB-1 weight of item

71CF29869CA0F-1 data chip provision

71CF29872F0AB-1 hand

71CF298FDE0EF-1 master insert identification

71D078EB7C086-1 overall length

71D078FBF6C68-1 tool style code

71D102AE3B252-1 connection code machine side

71DD703B84298-1 coating property

71DF1523224D8-1 body material code

71DF153B14F02-1 torque

71DF8C52B8926-1 cutting item count

71EBB342CC751-1 coolant supply property

71EBBA9ED6C0A-1 unit system

71ED6E16D5978-1 connection unit basis

71FC193318002-1 connection size code

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Subclasses:

71D1066F279AD-001	cartridge
71E01A008D13F-001	mill
71E01A00BD93C-001	drill
71E01A04A8AEC-001	ream
71E01A04C377D-001	broach
71E01A04E0236-001	threading tap
71E01A04F70F7-001	threading die
71E01A05104CF-001	turn
71E0251F304E1-001	rotating borer
71E02C544BABE-001	burr tool

71E01A04C377D-1 **1**

broach **broach**

family of items designed for use mainly in broaching operations

Properties:

71CEAEBD5A66A-1	cutting depth maximum
71CEAEBF2A69F-1	insert seat size code
71CF298EEB4F5-1	clamping type code
71CF2998A1609-1	rake angle radial
71CF29990C41F-1	rake angle axial
71D08096F930C-1	drive angle
71D0845BB2310-1	adjustment axial property
71D0845C34AB9-1	adjustment radial property
71D102AE8A5A9-1	connection code workpiece side
71DCCFEBB883E-1	flute count
71DCCFEC20115-1	flute helix angle
71DCCFEC645BD-1	flute design code
71DCCFF654756-1	flute helix hand
71DCCFF6A1A13-1	flute helix pitch

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71DCD39338974-1	functional length
71DCD394BB20E-1	protruding length
71DF1523EE184-1	cartridge size code
71DF15283219C-1	cutting pitch density
71DF152D8CF7D-1	cutting pitch differential
71DF1538E7378-1	insert adjustable count
71DF5C0761888-1	keyway property
71EAC496E7425-1	tangentially mounted insert
71EAC83B73825-1	clearance angle radial
71EAC83CD450B-1	clearance angle axial
71EBBA9E78025-1	adjustability
71EBC1EBC839F-1	stock removal minimum
71EBC1EC0BB22-1	stock removal maximum
71EBC1EC3E8B6-1	stock removal recommended
71EBDBF5060E6-1	connection diameter
71EDD2B883F77-1	runout axial property
71EDD2B8B8C5B-1	runout radial property

Subclasses:

71E01A081855D-001	tapered broach
71E01A082DE72-001	disk broach
71E01A0838E9B-001	prismatic broach
71E0250E32A07-001	cylindrical broach

71E0250E32A07-1 **1**

cylindrical broach **cylbch**

tool item used for changing the dimensions of an existing profile that has a constant circular cross section and cutting edges around the whole circumference

Properties:

71CED03D70452-1	damping property
71CED04867743-1	row identifier

Documents
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Full document details: DD ISO/TS 13399-3:2007

71CF29862B277-1	shank diameter
71CF298870946-1	shank length
71CF2989AF0E0-1	tool changer interference length minimum
71CF298A3A99A-1	tool changer interference diameter maximum
71CF298A76B66-1	connection retaining knob thread size
71CF2992BDBCC-1	usable length maximum
71D07576C0558-1	depth of cut maximum
71D08462F8185-1	body diameter maximum
71D084653E57F-1	cutting diameter
71D087D97FCE3-1	contact surface diameter machine side
71DCCC27DEF53-1	length chip flute
71DCCC5A4FD18-1	premachined hole diameter
71DCCFF75E485-1	peripheral effective cutting edge count
71DCD00054F65-1	peripheral mounted insert count
71DCD00239812-1	face effective cutting edge count
71DCD0029BBE7-1	face mounted insert count
71DCD3B16750B-1	body length maximum
71DF151EA5CF1-1	balance quality code
71E01D92C41E8-1	connection bore diameter
71EAC0CAB861F-1	balanced by design
71EAC48CAD407-1	connection bore depth
71EDCB7490ED5-1	bolt hole circle property

71E01A082DE72-1 **1**

disk broach **dskbroach**

disk shaped tool item used for changing the dimensions of an existing profile and that has the cutting edges on the periphery of the disk

Properties:

71CEAEBE2B825-1	cutting width
71D07569F8BC3-1	cutting width maximum

Documents
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Full document details: DD ISO/TS 13399-3:2007

71D0756A28B42-1	cutting width minimum
71D08462F8185-1	body diameter maximum
71D084653E57F-1	cutting diameter
71D0846556288-1	cutting diameter minimum
71D084656CE32-1	cutting diameter maximum
71E01D92C41E8-1	connection bore diameter
71EAC48CAD407-1	connection bore depth
71EBB332C60EB-1	body height
71ED6A9AF7D1D-1	body diameter

71E01A0838E9B-1 **1**

prismatic broach **psmbroach**

tool item with a constant rectangular cross section used for changing the dimensions of an existing profile and that has cutting items on one side of the cross section

Properties:

71CEAEBE2B825-1	cutting width
71CF298751FCF-1	shank width
71CF29883E014-1	shank height
71CF298870946-1	shank length
71CF299257986-1	overall width
71CF2992BDBCC-1	usable length maximum
71CF29994E737-1	functional height
71D078EB73E87-1	overall height
71D08418C3B4D-1	clearance angle orthogonal
71DCD3B16750B-1	body length maximum
71EBAF85006BD-1	clamping width
71EBB33230236-1	body width
71EBB332C60EB-1	body height
71EBB33490FDA-1	usable length
71ED6AA478A3D-1	body length
71ED6E5CD0DAE-1	clearance angle normal

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71E01A081855D-1 **1**

tapered broach **tpbroach**

tool item for changing the dimensions of an existing profile and that has continuously varying cross section with cutting edges surrounding the cross section

NOTE The cross section can be rectangular or circular or elliptical.

Properties:

71CED04867743-1	row identifier
71CF29862B277-1	shank diameter
71CF298870946-1	shank length
71CF298A76B66-1	connection retaining knob thrd sze
71CF2992BDBCC-1	usable length maximum
71D0846298D19-1	runout radial adjustment
71D08462F8185-1	body diameter maximum
71D084653E57F-1	cutting diameter
71D0846556288-1	cutting diameter minimum
71D084656CE32-1	cutting diameter maximum
71DCCC5A4FD18-1	premachined hole diameter
71DCD3B16750B-1	body length maximum
71EAC4A2B6544-1	taper angle
71EBB33490FDA-1	usable length
71EC659C9B3CE-1	tapered
71ED6A9AF7D1D-1	body diameter
71ED6AA478A3D-1	body length

71E02C544BABE-1 **1**

burr tool **burr**

small rotating tool item for removing areas of roughness from a machined edge

Properties:

71CEAEBD5A66A-1	cutting depth maximum
71CF29862B277-1	shank diameter

Documents
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Full document details: DD ISO/TS 13399-3:2007

71CF298870946-1	shank length
71CF2992BDBCC-1	usable length maximum
71D084653E57F-1	cutting diameter
71DCD39338974-1	functional length
71DF1523869EE-1	burr type code
71EBB33490FDA-1	usable length
71ED6A9AF7D1D-1	body diameter

71D1066F279AD-1 **1**

cartridge **cartridge**

tool item that carries a solid cutting edge or locks a replaceable insert and is designed to be mounted onto either an adaptive item or a tool item

Properties:

71CEAEBE2B825-1	cutting width
71CEAEBF2A69F-1	insert seat size code
71CF298751FCF-1	shank width
71CF29883E014-1	shank height
71CF298870946-1	shank length
71CF2988A5874-1	shank cross sectional shape code
71CF298EEB4F5-1	clamping type code
71CF298F073D3-1	head bottom offset height
71CF298F4E487-1	head bottom offset length
71CF299257986-1	overall width
71CF2992DBC44-1	blade reinforcement radius
71CF299354332-1	axial groove outside diameter minumum
71CF299431CAC-1	a dimension on wf
71CF29984CDA7-1	functional width
71CF299874B1E-1	functional width secondary
71CF2998A1609-1	rake angle radial
71CF2998EBD46-1	rake angle normal

Documents
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Full document details: DD ISO/TS 13399-3:2007

71CF29990C41F-1	rake angle axial
71CF29994E737-1	functional height
71D07543367C5-1	minimum bore diameter
71D07543FD182-1	axial groove outside diameter maximum
71D07569F8BC3-1	cutting width maximum
71D0756A28B42-1	cutting width minimum
71D075730A82B-1	head back offset length
71D075731F172-1	head back offset width
71D07574A61E8-1	head length
71D075754F8A3-1	inclination angle
71D0757C787B8-1	work piece part diam max
71D078EB73E87-1	overall height
71D078F5BEDBE-1	functional length secondary
71D078F683C9B-1	tool cutting edge angle
71D078F6E9893-1	tool cutting edge angle type code
71D078F77616B-1	tool lead angle
71D078FD4E7BE-1	tool holder shape code
71D0793ECEF9A-1	a dimension on lf
71D0808F8F719-1	rake angle orthogonal
71D08418C3B4D-1	clearance angle orthogonal
71D0845BB2310-1	adjustment axial property
71D0845C34AB9-1	adjustment radial property
71D0846298D19-1	runout radial adjustment
71D193F495583-1	functional width 2
71DCD39338974-1	functional length
71DF1523EE184-1	cartridge size code
71EAC0E9FA4CD-1	mounting hole distance
71EAC0EF68BB7-1	mounting hole distance 2
71EAC0EFA1BF3-1	mounting hole height
71EAC0F064E2D-1	mounting hole angle

Documents
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71EAC496E7425-1	tangentially mounted insert
71EAC83B73825-1	clearance angle radial
71EAC83CD450B-1	clearance angle axial
71EBB33230236-1	body width
71EBB332C60EB-1	body height
71EBBA9E78025-1	adjustability
71ED6AA478A3D-1	body length
71ED6E5CD0DAE-1	clearance angle normal

71E01A00BD93C-1 **1**

drill **drill**

family of items designed for use mainly in drilling operations

Properties:

71CEAEBD5A66A-1	cutting depth maximum
71CEAEBF2A69F-1	insert seat size code
71CF29862B277-1	shank diameter
71CF298870946-1	shank length
71CF2989AF0E0-1	tool changer interference length minimum min
71CF298A3A99A-1	tool changer interference diameter maximum
71CF298A76B66-1	connection retaining knob thread size
71CF298EEB4F5-1	clamping type code
71CF2992BDBCC-1	usable length maximum
71CF2998A1609-1	rake angle radial
71CF29990C41F-1	rake angle axial
71D08096F930C-1	drive angle
71D0845BB2310-1	adjustment axial property
71D0845C34AB9-1	adjustment radial property
71D0845C77193-1	runout axial adjustment
71D0846298D19-1	runout radial adjustment
71D08462F8185-1	body diameter maximum

Documents
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71D084653E57F-1	cutting diameter
71D0846556288-1	cutting diameter minimum
71D084656CE32-1	cutting diameter maximum
71D087D97FCE3-1	contact surface diameter machine side
71D102AE8A5A9-1	connection code workpiece side
71DCCC27DEF53-1	length chip flute
71DCCFEBB883E-1	flute count
71DCCFEC20115-1	flute helix angle
71DCCFEC645BD-1	flute design code
71DCCFF654756-1	flute helix hand
71DCCFF6A1A13-1	flute helix pitch
71DCD00239812-1	face effective cutting edge count
71DCD0029BBE7-1	face mounted insert count
71DCD39338974-1	functional length
71DCD394BB20E-1	protruding length
71DCD3B16750B-1	body length maximum
71DF151EA5CF1-1	balance quality code
71DF153A691F2-1	revolutions per minute maximum
71EAC0CAB861F-1	balanced by design
71EAC496E7425-1	tangentially mounted insert
71EAC83B73825-1	clearance angle radial
71EAC83CD450B-1	clearance angle axial
71EBB33490FDA-1	usable length
71EBDBF5060E6-1	connection diameter
71ED6A9AF7D1D-1	body diameter
71EDD2B883F77-1	runout axial property
71EDD2B8B8C5B-1	runout radial property

Subclasses:

71E01A0608FE4-001	twist drill
71E01A065F635-001	deep hole drill

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71E01A067F73C-001	step drill
71E01A069566C-001	chamfer drill
71E01A06A8A08-001	countersink drill
71E01A06BF88D-001	counterbore drill
71E01A073CA28-001	centre drill
71E01A0751456-001	conical drill
71E01A0769982-001	trepanning drill
71E01D8A88F65-001	pilot drill
71FAE7AAE8247-001	core drill

71E01A073CA28-1 **1**

centre drill **cntdrill**

tool item for creating a hole for the location of a subsequent operation

NOTE This drill is usually a solid drill.

Properties:

71D1AE126DEFD-1	drilling profile property
71DCCC3BD1B96-1	step count
71DCCC3DFA23A-1	step diameter length
71DCCC47221E0-1	step distance
71DCCC4FEF366-1	point angle
71DCCFD064042-1	point length
71DCD00CBBC2A-1	cutting end count
71DF151D6E547-1	step included angle

71E01A069566C-1 **1**

chamfer drill **cfdrill**

tool item for creating a chamfer in or on a hole

Properties:

71D1AE126DEFD-1	drilling profile property
71DCCC5A4FD18-1	premachined hole diameter

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71DCCFD24119E-1	pilot protruding length
71DF1538E7378-1	insert adjustable count
71EAC48EC5DE0-1	neck diameter
71EAC81F88336-1	body clearance depth
71EBC1E026769-1	neck length
71EC61D8A1771-1	flange diameter
71ED6AA478A3D-1	body length

71E01A0751456-1 **1**

conical drill **cnldrill**

tool item for forming a cone shaped hole

NOTE This drill is usually a solid drill.

Properties:

71DCCC4FEF366-1	point angle
71DCCC62CD9EE-1	usable length diameter ratio
71DCCFD064042-1	point length
71DF1538E7378-1	insert adjustable count
71EAC4A2B6544-1	taper angle
71EAC81F88336-1	body clearance depth
71EAC8210DF36-1	fluted land width
71EAC82313165-1	web thickness
71EAC823D95A7-1	web taper
71EC61D8A1771-1	flange diameter
71EC659C9B3CE-1	tapered

71FAE7AAE8247-1 **1**

core drill **crdrl**

tool item without a central cutting point or means of starting a hole

NOTE The tool is used to enlarge an existing hole, for example in a casting, and has the characteristics of a reamer.

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Properties:

71DCCC62CD9EE-1	usable length diameter ratio
71DF1538E7378-1	insert adjustable count
71EAC81F88336-1	body clearance depth
71EAC8210DF36-1	fluted land width

71E01A06BF88D-1 **1**

counterbore drill **cbdrill**

tool item for creating a counterbore section of a hole

Properties:

71D07574A61E8-1	head length
71DCCC5A4FD18-1	premachined hole diameter
71DCCC62CD9EE-1	usable length diameter ratio
71DCCFD24119E-1	pilot protruding length
71DF1538E7378-1	insert adjustable count
71DF5C0761888-1	keyway property
71E01D92C41E8-1	connection bore diameter
71E03062EC034-1	head diameter
71EAC48CAD407-1	connection bore depth
71EAC48EC5DE0-1	neck diameter
71EAC81F88336-1	body clearance depth
71EBC1E026769-1	neck length
71EC61D8A1771-1	flange diameter
71ED6AA478A3D-1	body length
71EE070696F08-1	guide element property

71E01A06A8A08-1 **1**

countersink drill **cskdrill**

tool item for creating a countersunk section of a hole

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Full document details: DD ISO/TS 13399-3:2007

Properties:

71D07574A61E8-1	head length
71DCCC5A4FD18-1	premachined hole diameter
71DCCC62CD9EE-1	usable length diameter ratio
71DCCFD24119E-1	pilot protruding length
71DF1538E7378-1	insert adjustable count
71DF5C0761888-1	keyway property
71E01D92C41E8-1	connection bore diameter
71E03062EC034-1	head diameter
71EAC48CAD407-1	connection bore depth
71EAC48EC5DE0-1	neck diameter
71EAC49030828-1	pilot drill protrusion
71EAC4A2B6544-1	taper angle
71EAC81F88336-1	body clearance depth
71EBC1E026769-1	neck length
71EC61D8A1771-1	flange diameter
71EC659C9B3CE-1	tapered
71ED6AA478A3D-1	body length
71EE070696F08-1	guide element property

71E01A065F635-1 **1**

deep hole drill **dhdrill**

tool item for creating a hole usually deeper than ten times the diameter of the tool item

Properties:

71D07574A61E8-1	head length
71DCCC62CD9EE-1	usable length diameter ratio
71DCCFD24119E-1	pilot protruding length
71DF1538E7378-1	insert adjustable count
71E03062EC034-1	head diameter
71EE070696F08-1	guide element property

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Full document details: DD ISO/TS 13399-3:2007

71E01D8A88F65-1 **1**

pilot drill **pilot**

tool item that is added to a larger drill for guiding the main cutting operation

Properties:

71DCCC4FEF366-1	point angle
71DCCFD064042-1	point length
71DF1538E7378-1	insert adjustable count

71E01A067F73C-1 **1**

step drill **stpdrill**

tool item for creating a stepped hole

Properties:

71DCCC3BD1B96-1	step count
71DCCC3DFA23A-1	step diameter length
71DCCC47221E0-1	step distance
71DCCC4FEF366-1	point angle
71DCCC62CD9EE-1	usable length diameter ratio
71DCCFD064042-1	point length
71DCCFD24119E-1	pilot protruding length
71DF151D6E547-1	step included angle
71DF1538E7378-1	insert adjustable count
71EAC81F88336-1	body clearance depth
71EAC8210DF36-1	fluted land width
71EAC82313165-1	web thickness
71EAC823D95A7-1	web taper
71EC61D8A1771-1	flange diameter
71ED6AA478A3D-1	body length
71EE070696F08-1	guide element property

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71E01A0769982-1 **1**

trepanning drill **trpdrill**

tool item used to cut a deep face groove leaving a plug of material equal to the inner diameter

NOTE The tool can be small to leave a boss on a component or large to create a large hole but not produce all the material as swarf.

Properties:

71D0846545C4E-1	cutting diameter internal
71D084655A2F7-1	cutting diameter internal minimum
71D0846570977-1	cutting diameter internal maximum
71DF1538E7378-1	insert adjustable count
71DF5C0761888-1	keyway property
71EC61D8A1771-1	flange diameter
71ED6AA478A3D-1	body length

71E01A0608FE4-1 **1**

twist drill **twdrill**

solid tool item with helical chip flutes

Properties:

71DCCC4FEF366-1	point angle
71DCCC62CD9EE-1	usable length diameter ratio
71DCCFD064042-1	point length
71DF1527D828C-1	cutting diameter size code
71DF1538E7378-1	insert adjustable count
71EAC81AD9AE1-1	drill back taper
71EAC81F88336-1	body clearance depth
71EAC8210DF36-1	fluted land width
71EAC82313165-1	web thickness
71EAC823D95A7-1	web taper
71EC61D8A1771-1	flange diameter

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71E01A008D13F-1 **1**

mill **mill**

family of rotating tool items intended mainly for use in milling operations

Properties:

71CEAEBD5A66A-1	cutting depth maximum
71CED04867743-1	row identifier
71CF29862B277-1	shank diameter
71CF298870946-1	shank length
71CF2989AF0E0-1	tool changer interference length minimum lgth min
71CF298A3A99A-1	tool changer interference diameter maximum
71CF298A76B66-1	connection retaining knob thread size
71CF298EEB4F5-1	clamping type code
71CF2992BDBCC-1	usable length maximum
71CF2998A1609-1	rake angle radial
71CF29990C41F-1	rake angle axial
71D07576C0558-1	depth of cut maximum
71D078F683C9B-1	tool cutting edge angle
71D078F77616B-1	tool lead angle
71D08096F930C-1	drive angle
71D0845BB2310-1	adjustment axial property
71D0845C34AB9-1	adjustment radial property
71D0845C77193-1	runout axial adjustment
71D0846298D19-1	runout radial adjustment
71D08462F8185-1	body diameter maximum
71D084653E57F-1	cutting diameter
71D0846556288-1	cutting diameter minimum
71D084656CE32-1	cutting diameter maximum
71D087D97FCE3-1	contact surface diameter machine side
71D102AE8A5A9-1	connection code workpiece side
71DCCFEBB883E-1	flute count

Documents
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Full document details: DD ISO/TS 13399-3:2007

71DCCFEC20115-1	flute helix angle
71DCCFEC645BD-1	flute design code
71DCCFF654756-1	flute helix hand
71DCCFF6A1A13-1	flute helix pitch
71DCCFF75E485-1	peripheral effective cutting edge count
71DCD00054F65-1	peripheral mounted insert count
71DCD00239812-1	face effective cutting edge count
71DCD0029BBE7-1	face mounted insert count
71DCD39338974-1	functional length
71DCD394BB20E-1	protruding length
71DCD3B16750B-1	body length maximum
71DF151EA5CF1-1	balance quality code
71DF15283219C-1	cutting pitch density
71DF152D8CF7D-1	cutting pitch differential
71DF1538E7378-1	insert adjustable count
71DF153A691F2-1	revolutions per minute maximum
71EAC0CAB861F-1	balanced by design
71EAC496E7425-1	tangentially mounted insert
71EAC83B73825-1	clearance angle radial
71EAC83CD450B-1	clearance angle axial
71EBDBF5060E6-1	connection diameter
71ED6A9AF7D1D-1	body diameter
71EDD2B883F77-1	runout axial property
71EDD2B8B8C5B-1	runout radial property

Subclasses:

71E01A0540BE7-001	slab mill
71E01A05B627B-001	face mill
71E01A05D27A8-001	end mill
71E01A05EA320-001	half side mill
71E01A0600702-001	ring mill

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