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## Cutting tool data representation and exchange —

### Part 4: Reference dictionary for adaptive items

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

*Partie 4: Dictionnaire de référence pour les éléments relatifs aux  
attachements*



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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](http://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*.

This second edition cancels and replaces the first edition (ISO/TS 13399-4:2007), which has been technically revised.

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 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 accessory and auxiliary 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]
- *Part 150: Usage guidelines* [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]
- *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 51: Designation system for customer solution cutting tools*

- *Part 80: Concept for the design of 3D models based on properties according to ISO 13399: Overview and principles* [Technical Specification]
- *Part 201: Concept for the design of 3D models based on properties according to ISO/TS 13399-2: Modelling of regular inserts* [Technical Specification]
- *Part 202: Concept for the design of 3D models based on properties according to ISO/TS 13399-2: Modelling of irregular inserts* [Technical Specification]
- *Part 203: Concept for the design of 3D models based on properties according to ISO/TS 13399-2: Modelling of exchangeable inserts for drilling* [Technical Specification]
- *Part 204: Concept for the design of 3D models based on properties according to ISO/TS 13399-2: Modelling of inserts for reaming* [Technical Specification]
- *Part 303: Concept for the design of 3D models based on properties according to ISO/TS 13399-3: Modelling of end mills with non-indexable cutting edges* [Technical Specification]
- *Part 304: Concept for the design of 3D models based on properties according to ISO/TS 13399-3: Modelling of milling cutters with arbor hole and non-indexable cutting edges* [Technical Specification]
- *Part 307: Concept for the design of 3D models based on properties according to ISO/TS 13399-3: Modelling of end mills for indexable inserts* [Technical Specification]
- *Part 308: Concept for the design of 3D models based on properties according to ISO/TS 13399-3: Modelling of milling cutter with arbor hole for indexable inserts* [Technical Specification]
- *Part 309: Concept for the design of 3D models based on properties according to ISO/TS 13399-3: Tool holders for indexable inserts* [Technical Specification]
- *Part 311: Concept for the design of 3D models based on properties according to ISO/TS 13399-3: Modelling of solid reamers* [Technical Specification]
- *Part 312: Concept for the design of 3D models based on properties according to ISO/TS 13399-3: Modelling of reamers for indexable inserts* [Technical Specification]
- *Part 401: Concept for the design of 3D models based on properties according to ISO/TS 13399-4: Modelling of converting, extending and reducing adaptive items* [Technical Specification]
- *Part 405: Concept for the design of 3D models based on properties according to ISO/TS 13399-4: Modelling of collets* [Technical Specification]

## Introduction

This part of ISO 13399 defines the terms, properties, and definitions for those portions of a cutting tool that remove material from a workpiece. Cutting items include replaceable inserts, brazed tips, and the cutting portions of solid cutting tools. The purpose of this part of 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 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 (all parts) include, but are not limited to, 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 drilling chuck), components (e.g. shims, screws and clamps) and their relationships can be represented by ISO 13399. Possible assemblies of the components of a cutting tool are illustrated in [Figure 1](#).

The objective of ISO 13399 (all parts) 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 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.

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 is expected to 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.

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, 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 International Standards developed by ISO/TC 184/SC 4:

- the EXPRESS language defined in ISO 10303-11 for defining the information model in ISO 13399-1;
- the file format for data exchange derived from the model and defined in ISO 10303-21;
- the data dictionary defined in the ISO 13584 series.

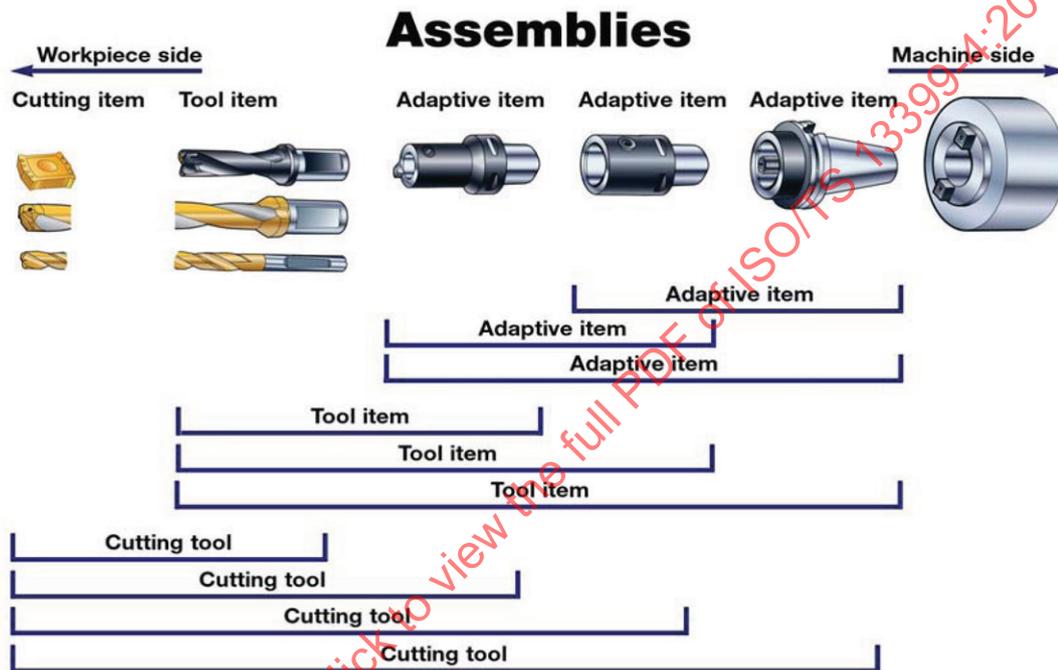
The ISO 13399 series is intended for use by, among others, tool producers and vendors, manufacturers, and developers of manufacturing software. ISO 13399 provides a common structure for exchanging data about cutting tools with defined cutting edges. ISO 13399 is intended to provide for, or improve, several manufacturing activities, including

- the integration and sharing of data for cutting tools and assemblies between different stages for the manufacturing cycle and between different software applications,

- the direct import of data from cutting tool suppliers into a customer's database, and
- the management of cutting tool information from multiple sources and for multiple applications.

Different companies use different business models that 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 in ISO 13399.

ISO 13399 defines only the information that could be communicated, but does not specify what information shall be communicated.



**Figure 1 — Possible assemblies of the components of a cutting tool**

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, and
- migrating the dictionary to subsequent editions of ISO 13399 (all parts).

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.

## ISO/TS 13399-4:2014(E)

The website of the Maintenance Agency is available at: [http://www.unm.fr/main/core.php?pag\\_id=135](http://www.unm.fr/main/core.php?pag_id=135)

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 part of ISO 13399; 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 4: Reference dictionary for adaptive items

### 1 Scope

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

This part of ISO 13399 specifies a reference dictionary containing:

- definitions and identifications of the classes of adaptive items, with an associated classification scheme;
- definitions and identifications of the data element types that represents the properties of adaptive items;
- definitions and identifications of domains of values for describing the above-mentioned 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.

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 defined in ISO 13584-24 and ISO 13584-25.

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

- standard data that represent the various classes of adaptive items;
- standard data that represent the various properties of adaptive items;
- standard data that represent domains of values used for properties of adaptive items;
- one implementation method by which the standard data defined in this part of ISO 13399 can be exchanged.

NOTE 1 The implementation method by which the standard data defined in this part of ISO 13399 can be exchanged is specified in ISO 10303-21.

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

- specialized or expert knowledge in the design and use of cutting tools;
- rules to determine what information should be communicated;
- applications where these standard data can be stored or referenced;
- implementation methods other than the one defined in this part of ISO 13399 by which the standard data can be exchanged and referenced;

- information model for cutting tools;
- definitions of classes and properties for cutting items;
- definitions of classes and properties for tool items;
- definitions of classes and properties for assembly items;
- definitions of classes and properties for connection systems;
- definitions of classes and properties for reference systems.

NOTE 2 The information model for cutting tools is defined in ISO 13399-1.

NOTE 3 The definitions of classes and properties for cutting items, tool items, and assembly items are provided in ISO 13399-2, ISO 13399-3, and ISO 13399-5.

NOTE 4 The definitions of classes and properties for connection systems and reference systems are provided in ISO 13399-50.

## 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 13399-100, *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 in ISO/TS 13399-100 (structure and contents of the dictionary) and the following apply.

NOTE The main collection of the terms and their definitions in the reference dictionary is provided in [Annexes B to D](#).

### 3.1 applicable property

property that is defined for some family of items and that shall apply to any member of this family

[SOURCE: ISO 13584-24:2003]

### 3.2 basic semantic unit

entity that provides an absolute and universally unique identification of a certain object of the application domain that is represented as a dictionary element

[SOURCE: ISO 13584-42:2010, 3.4]

### 3.3 chip

material removed from a workpiece by a cutting process

[SOURCE: ISO/TS 13399-2:2014, 3.3]

### 3.4 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

[SOURCE: ISO 13339-1:2006, 3.1]

Note 1 to entry: A cutting tool could be an assembly of one or more adaptive items, a tool item and several cutting items on a tool item. See [Figure 1](#).

### 3.5 data

representation of information in a formal manner suitable for communication, interpretation, or processing by human beings or computers

[SOURCE: ISO 10303-1:1994, 3.2.14]

### 3.6 data element type

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

[SOURCE: ISO 13584-42:2010, 3.13]

### 3.7 data exchange

storing, accessing, transferring, and archiving of data

[SOURCE: ISO 10303-1:1994, 3.2.15]

### 3.8 data type

domain of values

[SOURCE: ISO 10303-11:2004, 3.3.5]

### 3.9 dictionary

table consisting of a series of entries with one meaning corresponding to each entry in the dictionary and one dictionary entry identifying a single meaning

[SOURCE: ISO 13584-511:2006, 3.1.9]

Note 1 to entry: In the ISO 13399 series, a dictionary is a formal and computer-sensible representation of ontology.

### 3.10 entity

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

[SOURCE: ISO/TS 13399-2:2014, 3.10]

### 3.11 entity data type

representation of an entity

[SOURCE: ISO/TS 13399-2:2014, 3.11]

### 3.12 entity instance

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

Note 1 to entry: An entity instance is a member of the domain established by an entity data type.

[SOURCE: ISO/TS 13399-2:2014, 3.12]

**3.13  
family of products**

set of products represented by the same characterization class

[SOURCE: ISO 13584-42:2010, 3.16]

**3.14  
implementation method**

means for computers to exchange data

[SOURCE: ISO/TS 13399-2:2014, 3.14]

**3.15  
information**

facts, concepts, or instructions

[SOURCE: ISO 10303-1:1994, 3.2.20]

**3.16  
information model**

formal model of a bounded set of facts, concepts, or instructions to meet a specific requirement

[SOURCE: ISO 10303-1:1994, 3.2.21]

**3.17  
machine side**

identification of a direction pointing towards the machine

**3.18  
machined surface**

desired surface produced by the action of the cutting tool

[SOURCE: ISO 3002-1:1982, 3.1.2]

**3.19  
mirror plane**

xz plane in the coordinate axis system

[SOURCE: ISO/TS 13399-50:2013, 5.3.7]

**3.20  
ontology**

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

[SOURCE: ISO 13584-511:2006, 3.1.20]

Note 1 to entry: In the ISO 13399 series, a dictionary is the formal and computer-sensible representation of an ontology.

**3.21  
primary coordinate system**

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

[SOURCE: ISO/TS 13399-50:2013, 5.3.1]

**3.22****property**

defined parameter suitable for the description and differentiation of products

[SOURCE: ISO 13584-42:2010, 3.37]

**3.23****visible property**

property that has a definition meaningful in the scope of a given characterization class but does not necessarily apply to the various products belonging to this class

[SOURCE: ISO 13584-42:2010, 3.46]

**3.24****workpiece**

object on which a cutting action is performed

[SOURCE: ISO/TS 13399-2:2014, 3.24]

**3.25****workpiece side**

identification of a direction pointing towards the workpiece

**3.26****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

[SOURCE: ISO/TS 13399-50:2013, 5.3.18]

**3.27****xyw plane**

plane in the coordinate axis system related to the xy plane by the rotation angle  $\Phi$  about the X axis in a anticlockwise (counter-clockwise) direction and by a distance located at a distance XYWD from the origin of the coordinate axis system

[SOURCE: ISO/TS 13399-50:2013, 5.3.19]

**3.28****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

[SOURCE: ISO/TS 13399-50:2013, 5.3.20]

**3.29****xzw plane**

plane in the coordinate 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 primary coordinate system

[SOURCE: ISO/TS 13399-50:2013, 5.3.21]

**3.30****yz plane**

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

[SOURCE: ISO/TS 13399-50:2013, 5.3.22]

### 3.31

#### **yzw plane**

plane in the coordinate 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 primary coordinate system

[SOURCE: ISO/TS 13399-50:2013, 5.3.23]

Note 1 to entry: The xzw plane, the xyw plane, and the yzw plane are mutually perpendicular.

## 4 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

BSU basic semantic unit

DET data element type

## 5 Representation of the ontology concepts as dictionary entries

### 5.1 General

The generic family of adaptive items is divided into several simple families and classes determined by their main function.

NOTE An adaptive item can have one or more than one function.

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 round shape conversion is the name for a function of an adaptive item. **round\_shape\_conversion** is the identifier of the class in the dictionary that represents the concept.

Some of the definitions of properties that are applicable to adaptive items are defined in terms of a primary coordinate 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 system to adaptive items are described in this part of ISO 13399.

Each entry in the dictionary, either 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 adaptive item classes are provided in [Annex C](#). The properties applicable to adaptive items are defined in [Annex D](#).

### 5.2 adaptive\_item\_type

#### 5.2.1 General

Family of objects for the assembly of a cutting tool classified by their main function.

NOTE An adaptive item can have one or more functions.

**adaptive\_item\_type** has the following subclasses:

— **collet**;

- **converter;**
- **driver;**
- **extender;**
- **reducer.**

### 5.2.2 collet

A **collet** is a segmented band that can be expanded or contracted to grip a shaft.

NOTE 1 This class is for general engineering use and is not specific to cutting tools.

NOTE 2 This class can become an **item\_class\_case\_of** an entry in another dictionary conforming to ISO 13584.

### 5.2.3 converter

A **converter** is an adaptive item with a different connection type, style, and size on the machine side from the workpiece side.

### 5.2.4 driver

A **driver** is an adaptive item with the capability to rotate a cutting tool for cutting operations not on the main machine spindle axis.

### 5.2.5 extender

An **extender** is an adaptive item that increases the length of an assembled cutting tool.

NOTE The adaptive item has the same connection type, style, and size on both the machine side and workpiece side.

### 5.2.6 reducer

A **reducer** is an adaptive item that diminishes the size of a connection in an assembled cutting tool.

NOTE 1 The adaptive item has the same connection type and style on the machine side and workpiece side.

NOTE 2 The connections on either side of an item must be different in gender, i.e. male and female.

## 5.3 Reference system for adaptive items

### 5.3.1 General

The primary coordinate system used for adaptive items in this part of ISO 13399 is defined in ISO/TS 13399-50. The additional reference entities relevant for adaptive items are:

- **prismatic\_adaptive\_item\_position;**
- **round\_adaptive\_item\_position.**

### 5.3.2 prismatic\_adaptive\_item\_position

A **prismatic\_adaptive\_item\_position** identifies the location of a prismatic adaptive item where:

- the base of the adaptive item shall be coplanar with the XZ-plane;
- the normal for the base of the item shall be in the -Y direction;
- the rear backing surface shall be coplanar with the YZ-plane;

- the normal for the rear backing surface shall be in the -X direction;
- the end of the item shall be coplanar with the XY-plane;
- the normal for the end of the item shall be in the -Z direction;
- if with a bore, then the vector of the bore of the item that points in the Z direction shall also point towards the workpiece side.

NOTE Applicable to right-handed adaptive items. Left-hand items are defined as for right-hand items but mirrored through the YZ-plane.

### 5.3.3 round\_adaptive\_item\_position

A **round\_adaptive\_item\_position** identifies the location of a round adaptive item where:

- the axis of the adaptive item shall be colinear with the Z axis;
- the vector of the shank that points in the Z direction shall also point towards the workpiece side;
- the drive slots or clamping flats if present shall be parallel with the XZ-plane;
- the contact surface of the coupling, the gauge plane, or the end of the cylindrical shank shall be coplanar with the XY-plane;
- if with a bore, then the vector of the bore of the item that point in the Z direction shall also point towards the workpiece side.

NOTE The conditions listed above apply to right-handed adaptive items. Left-handed adaptive items are defined as for right-handed items but mirrored through the YZ-plane.

## 6 Properties for adaptive items

The properties of adaptive items are defined in [Annex D](#), where the association of a property with a class is 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 can be applicable for adaptive item types, with their identification codes (BSU), are shown in [Table 1](#). The order of names in the table should be read in rows from left to right.

NOTE The BSU can be made unique by the addition of the supplier of the dictionary as a prefix to the identification code.

EXAMPLE The unique BSU for **adaptor clamp** would be: 0112/1///13399\_2-71CED04F3300A for version two of the dictionary.

**Table 1 — Names of properties for adaptive items**

| Property name              | Identification code (BSU) |
|----------------------------|---------------------------|
| adaptor clamp              | 71CED04F3300A             |
| adaptor tool clamp         | 71CED04F920EC             |
| adjusting screw protrusion | 71EAC0F0EFDB6             |
| balance quality code       | 71DF151EA5CF1             |
| balanced by design         | 71EAC0CAB861F             |
| body diameter              | 71ED6A9AF7D1D             |
| body diameter maximum      | 71D08462F8185             |
| body half taper angle      | 71EAC472BD116             |
| body height                | 71EBB332C60EB             |

Table 1 (continued)

| Property name                           | Identification code (BSU) |
|---|---------------------------|
| body length                             | 71ED6AA478A3D             |
| body length maximum                     | 71DCD3B16750B             |
| body material code                      | 71DF1523224D8             |
| body taper end length                   | 71EADEA2BF8DF             |
| body width                              | 71EBB33230236             |
| cartridge size code                     | 71DF1523EE184             |
| clamping force maximum                  | 71CED05149532             |
| clamping length                         | 71EBAF896BE9A             |
| clamping length maximum                 | 71ED6E54B15C4             |
| clamping length minimum                 | 71EBB339ED2BD             |
| clamping width                          | 71EBAF85006BD             |
| connection bore depth                   | 71EAC48CAD407             |
| connection bore diameter                | 71E01D92C41E8             |
| connection bore diameter maximum        | 71EBDBF4D0F49             |
| connection bore diameter minimum        | 71EBDBF49F96C             |
| connection code machine side            | 71D102AE3B252             |
| connection code workpiece side          | 71D102AE8A5A9             |
| connection count workpiece side         | 71EDD2C17746F             |
| connection diameter                     | 71EBDBF5060E6             |
| connection retention knob thread size   | 71CF298A76B66             |
| connection size code                    | 71FC193318002             |
| connection unit basis                   | 71ED6E16D5978             |
| contact surface diameter machine side   | 71D087D97FCE3             |
| contact surface diameter workpiece side | 71EAC0DD5D650             |
| coolant supply property                 | 71EBB342CC751             |
| damping property                        | 71CED03D70452             |
| data chip provision                     | 71CF29869CA0F             |
| driving key type                        | 71EC5E1ECC776             |
| functional height                       | 71CF29994E737             |
| functional length                       | 71DCD39338974             |
| functional length minimum               | 71EBC1EB8456A             |
| functional width                        | 71CF29984CDA7             |
| kappa                                   | 71ED6E4A7EFBA             |
| keyway property                         | 71DF5C0761888             |
| overall height                          | 71D078EB73E87             |
| overall length                          | 71D078EB7C086             |
| overall width                           | 71CF299257986             |
| phi                                     | 71ED6E4AE850B             |
| protruding length                       | 71DCD394BB20E             |
| rho                                     | 71ED6E4B254E5             |
| rotational speed maximum                | 71DF153A691F2             |

**Table 1** (continued)

| Property name                              | Identification code (BSU) |
|--|---------------------------|
| shank diameter                             | 71CF29862B277             |
| shank height                               | 71CF29883E014             |
| shank length                               | 71CF298870946             |
| shank width                                | 71CF298751FCF             |
| side                                       | 71EBDBF130AE6             |
| tool changer interference diameter maximum | 71CF298A3A99A             |
| tool changer interference length minimum   | 71CF2989AF0E0             |
| tool style code                            | 71D078FBF6C68             |
| unit system                                | 71EBBA9ED6C0A             |
| usable length                              | 71EBB33490FDA             |
| usable length maximum                      | 71CF2992BDBCC             |
| weight of item                             | 71CED03C97AAB             |

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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 (4) version (2)}

is assigned to this part of ISO 13399. The meaning of this value is defined in ISO/IEC 8824-1 and is described in ISO 13584-1.

#### A.2 Dictionary identification

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

{iso standard 13399 part (4) version (2) object (2) adaptive items (2)}

## Annex B (informative)

### Classification tables

[Table B.1](#) shows the classification structure of the generic families in the dictionary with an expanded structure for the classes of adaptive item types. The purpose of [Table B.1](#) is to show the relationships between the classes of cutting items and the other classes in the ISO 13399 series.

NOTE [Annex C](#) contains the definition of all the classes that are relevant to adaptive items and definitions of those classes of reference systems that are used in the definition of the properties of adaptive item types.

**Table B.1 — Classification tables**

| Classification structure     | Parent        | BSU           |
|------------------------------|---------------|---------------|
| cutting tool library         | Root          | 71CE7A72B6DA7 |
| adaptive item type           | 71CE7A72B6DA7 | 71EAD37F18F34 |
| collet                       | 71EAD37F18F34 | 726F59BDC3B08 |
| converter                    | 71EAD37F18F34 | 71EAD3871D313 |
| driver                       | 71EAD37F18F34 | 71EAD388173EE |
| extender                     | 71EAD37F18F34 | 71EEBDADB63BE |
| reducer                      | 71EAD37F18F34 | 71EAD385E51A0 |
| 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 |
| tool item type               | 71CE7A72B6DA7 | 71E01A004C775 |
| tool thread external         | 71CE7A72B6DA7 | 71FC1D22BF4CD |
| tool thread internal         | 71CE7A72B6DA7 | 71FC1D25097D7 |

## Annex C (informative)

### Class definitions

The content of this Annex is limited to the classes of adaptive items and the reference systems required defining the properties of these classes.

The layout of the information for each class in this Annex is:

| <b>BSU code-version number</b>   | <b>Revision number</b>         |
|--|--------------------------------|
| <b>Preferred name</b>  | <b>Short name</b>              |
| Definition   |                                |
| NOTE   |                                |
| REMARKS  |                                |
| <b>Subclasses:</b>   |                                |
| <b>Properties:</b>   |                                |
| <b>71EAD37F18F34-002</b>   | <b>001</b>                     |
| <b>adaptive item type</b>  | <b>ait</b>                     |
| family of objects for the assembly of a cutting tool classified by their main function |                                |
| NOTE An adaptive item can have one or more functions.                                  |                                |
| <b>Subclasses:</b>   |                                |
| 726F59BDC3B08-002  | collet                         |
| 71EAD3871D313-002  | converter                      |
| 71EAD388173EE-001  | driver                         |
| 71EEBDADB63BE-002  | extender                       |
| 71EAD385E51A0-002  | reducer                        |
| <b>Properties:</b>   |                                |
| 71CED04F3300A-001  | adaptor clamp                  |
| 71CED04F920EC-001  | adaptor tool clamp             |
| 71DF1523224D8-001  | body material code             |
| 71D102AE3B252-001  | connection code machine side   |
| 71D102AE8A5A9-001  | connection code workpiece side |
| 71EBDBF5060E6-001  | connection diameter            |
| 71FC193318002-001  | connection size code           |
| 71ED6E16D5978-001  | connection unit basis          |

|                   |                          |
|-------------------|--------------------------|
| 71EBB342CC751-001 | coolant supply property  |
| 71CF29869CA0F-001 | data chip provision      |
| 71DCD39338974-001 | functional length        |
| 71D078EB7C086-002 | overall length           |
| 71DCD394BB20E-002 | protruding length        |
| 71DF153A691F2-002 | rotational speed maximum |
| 71CF29862B277-001 | shank diameter           |
| 71EBDBF130AE6-001 | side                     |
| 71D078FBF6C68-001 | tool style code          |
| 71EBBA9ED6C0A-001 | unit system              |
| 71CED03C97AAB-001 | weight of item           |

**726F59BDC3B08-002 003**

**collet collet**

segmented band that can be expanded or contracted to grip a shaft

NOTE 1 This class is for general engineering use and is not specific to cutting tools.

NOTE 2 This class can become an **item\_class\_case** of an entry in another dictionary conforming to ISO 13584.

**Properties:**

|                   |                                  |
|-------------------|----------------------------------|
| 71EBDBF4D0F49-001 | connection bore diameter maximum |
| 71EBDBF49F96C-001 | connection bore diameter minimum |
| 71D102AE3B252-001 | connection code machine side     |
| 71D102AE8A5A9-001 | connection code workpiece side   |
| 71EAC4A2B6544-001 | taper angle                      |
| 71CEAEC02FEBD-001 | taper gradient                   |

**71EAD3871D313-002 001**

**converter cnvtr**

adaptive item with a different connection type, style, and size on the machine side from the workpiece side

**Properties:**

|                   |                            |
|-------------------|----------------------------|
| 71EAC0F0EFDB6-001 | adjusting screw protrusion |
| 71DF151EA5CF1-001 | balance quality code       |
| 71EAC0CAB861F-001 | balanced by design         |
| 71ED6A9AF7D1D-001 | body diameter              |

|                   |   |
|-------------------|---|
| 71D08462F8185-001 | body diameter maximum                   |
| 71EAC472BD116-001 | body half taper angle                   |
| 71EBB332C60EB-002 | body height                             |
| 71ED6AA478A3D-002 | body length                             |
| 71DCD3B16750B-002 | body length maximum                     |
| 71EADEA2BF8DF-001 | body taper end length                   |
| 71EBB33230236-002 | body width                              |
| 71DF1523EE184-001 | cartridge size code                     |
| 71CED05149532-001 | clamping force maximum                  |
| 71EBAF896BE9A-001 | clamping length                         |
| 71ED6E54B15C4-001 | clamping length maximum                 |
| 71EBB339ED2BD-001 | clamping length minimum                 |
| 71EBAF85006BD-001 | clamping width                          |
| 71EAC48CAD407-001 | connection bore depth                   |
| 71E01D92C41E8-001 | connection bore diameter                |
| 71EBDBF4D0F49-001 | connection bore diameter maximum        |
| 71EBDBF49F96C-001 | connection bore diameter minimum        |
| 71EDD2C17746F-001 | connection count workpiece side         |
| 71CF298A76B66-001 | connection retention knob thread size   |
| 71D087D97FCE3-001 | contact surface diameter machine side   |
| 71EAC0DD5D650-001 | contact surface diameter workpiece side |
| 71CED03D70452-001 | damping property                        |
| 71EC5E1ECC776-001 | driving key type                        |
| 71CF29994E737-002 | functional height                       |
| 71EBC1EB8456A-001 | functional length minimum               |
| 71CF29984CDA7-001 | functional width                        |
| 71ED6E4A7EFBA-002 | kappa                                   |
| 71DF5C0761888-001 | keyway property                         |
| 71D078EB73E87-002 | overall height                          |
| 71CF299257986-002 | overall width                           |
| 71ED6E4AE850B-002 | phi                                     |
| 71ED6E4B254E5-002 | rho                                     |
| 71CF29883E014-001 | shank height                            |

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|                   |  |
|-------------------|--|
| 71CF298870946-001 | shank length                               |
| 71CF298751FCF-001 | shank width                                |
| 71CF298A3A99A-001 | tool changer interference diameter maximum |
| 71CF2989AF0E0-001 | tool changer interference length minimum   |
| 71EBB33490FDA-001 | usable length                              |
| 71CF2992BDBCC-001 | usable length maximum                      |

### **71EAD388173EE-002 002**

**driver** **drvr**

adaptive item with the capability to rotate a cutting tool for cutting operations not on the main machine spindle axis

#### **Properties:**

|                   |   |
|-------------------|---|
| 71EBB332C60EB-002 | body height                             |
| 71ED6AA478A3D-002 | body length                             |
| 71DCD3B16750B-002 | body length maximum                     |
| 71EBB33230236-002 | body width                              |
| 71CED05149532-001 | clamping force maximum                  |
| 71EAC48CAD407-001 | connection bore depth                   |
| 71E01D92C41E8-001 | connection bore diameter                |
| 71EAC0DD5D650-001 | contact surface diameter workpiece side |
| 71E03063ABD6E-002 | drive size                              |
| 71EC5E1ECC776-001 | driving key type                        |
| 71CF29994E737-002 | functional height                       |
| 71EBC1EB8456A-001 | functional length minimum               |
| 71CF29984CDA7-001 | functional width                        |
| 71ED6E4A7EFBA-002 | kappa                                   |
| 71DF5C0761888-001 | keyway property                         |
| 71D078EB73E87-002 | overall height                          |
| 71CF299257986-002 | overall width                           |
| 71ED6E4AE850B-002 | phi                                     |
| 71ED6E4B254E5-002 | rho                                     |
| 71CF29883E014-001 | shank height                            |
| 71CF298870946-001 | shank length                            |
| 71CF298751FCF-001 | shank width                             |

**71EEBDADB63BE-002**      **001**

**extender**                      **extdr**

adaptive item that increases the length of an assembled cutting tool

NOTE      The adaptive item has the same connection type, style, and size on both the machine side and workpiece side.

**Properties:**

|                   |   |
|-------------------|---|
| 71DF151EA5CF1-001 | balance quality code                    |
| 71EAC0CAB861F-001 | balanced by design                      |
| 71ED6A9AF7D1D-001 | body diameter                           |
| 71D08462F8185-001 | body diameter maximum                   |
| 71EAC472BD116-001 | body half taper angle                   |
| 71EBB332C60EB-002 | body height                             |
| 71ED6AA478A3D-002 | body length                             |
| 71DCD3B16750B-002 | body length maximum                     |
| 71EADEA2BF8DF-001 | body taper end length                   |
| 71EBB33230236-002 | body width                              |
| 71CED05149532-001 | clamping force maximum                  |
| 71EAC48CAD407-001 | connection bore depth                   |
| 71E01D92C41E8-001 | connection bore diameter                |
| 71CF298A76B66-001 | connection retention knob thread size   |
| 71D087D97FCE3-001 | contact surface diameter machine side   |
| 71EAC0DD5D650-001 | contact surface diameter workpiece side |
| 71CED03D70452-001 | damping property                        |
| 71EC5E1ECC776-001 | driving key type                        |
| 71EBC1EB8456A-001 | functional length minimum               |
| 71DF5C0761888-001 | keyway property                         |
| 71D078EB73E87-002 | overall height                          |
| 71CF299257986-002 | overall width                           |

**71EAD385E51A0-002**      **001**

**reducer**                      **red**

adaptive item that diminishes the size of a connection in an assembled cutting tool

NOTE 1      The adaptive item has the same connection type and style on the machine side and workpiece side.

NOTE 2 The connections on either side of an item must be different in gender, i.e. male and female.

**Properties:**

|                   |  |
|-------------------|--|
| 71DF151EA5CF1-001 | balance quality code                       |
| 71EAC0CAB861F-001 | balanced by design                         |
| 71ED6A9AF7D1D-001 | body diameter                              |
| 71D08462F8185-001 | body diameter maximum                      |
| 71EBB332C60EB-002 | body height                                |
| 71ED6AA478A3D-002 | body length                                |
| 71DCD3B16750B-002 | body length maximum                        |
| 71EBB33230236-002 | body width                                 |
| 71CED05149532-001 | clamping force maximum                     |
| 71EBAF85006BD-001 | clamping width                             |
| 71EAC48CAD407-001 | connection bore depth                      |
| 71E01D92C41E8-001 | connection bore diameter                   |
| 71CF298A76B66-001 | connection retention knob thread size      |
| 71D087D97FCE3-001 | contact surface diameter machine side      |
| 71EAC0DD5D650-001 | contact surface diameter workpiece side    |
| 71CED03D70452-001 | damping property                           |
| 71EC5E1ECC776-001 | driving key type                           |
| 71CF29994E737-002 | functional height                          |
| 71EBC1EB8456A-001 | functional length minimum                  |
| 71CF29984CDA7-001 | functional width                           |
| 71ED6E4A7EFBA-002 | kappa                                      |
| 71DF5C0761888-001 | keyway property                            |
| 71D078EB73E87-002 | overall height                             |
| 71CF299257986-002 | overall width                              |
| 71ED6E4AE850B-002 | phi  |
| 71ED6E4B254E5-002 | rho  |
| 71CF29883E014-001 | shank height                               |
| 71CF298870946-001 | shank length                               |
| 71CF298751FCF-001 | shank width                                |
| 71CF298A3A99A-001 | tool changer interference diameter maximum |
| 71CF2989AF0E0-001 | tool changer interference length minimum   |

71EBB33490FDA-001

usable length

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## Annex D (informative)

### Adaptive item property definitions

The layout of the entries in this Annex is as follows.

NOTE 1 An entry might not contain all the information specified.

NOTE 2 The value formats of properties are specified in ISO/TS 13399-100.

| <b>BSU – version number</b>                                       | <b>Revision number</b> | <b>Value format</b> |
|---|------------------------|---------------------|
| data type group   | data type              | unit identifier     |
| <b>preferred name</b>   | <b>short name</b>      | SYMBOL              |
| synonymous name   |                        |                     |
| definition  |                        |                     |
| source of definition  |                        |                     |
| BSU of condition property = name of condition property            |                        |                     |
| Non-quantitative code = meaning of code                           |                        |                     |
| Source of code definition   |                        |                     |
| NOTE  |                        |                     |
| REMARKS   |                        |                     |
| <b>Illustration reference:</b> Figure <Annex.illustration number> |                        |                     |
| <b>Visible class:</b>   |                        |                     |
| <b>Applicable classes:</b>  |                        |                     |
| <b>Allowed values:</b>  |                        |                     |

|                          |            |            |
|--------------------------|------------|------------|
| <b>71CED04F3300A-001</b> | <b>001</b> | <b>X17</b> |
|--------------------------|------------|------------|

STRING\_TYPE

|                      |            |            |
|----------------------|------------|------------|
| <b>adaptor clamp</b> | <b>adc</b> | <b>ADC</b> |
|----------------------|------------|------------|

method of retaining an adaptor

**Visible class:**

|                          |                             |
|--------------------------|-----------------------------|
| <b>71CE7A72B6DA7-002</b> | <b>cutting tool library</b> |
|--------------------------|-----------------------------|

**Applicable classes:**

|                   |                    |
|-------------------|--------------------|
| 71EAD37F18F34-002 | adaptive item type |
|-------------------|--------------------|

**71CED04F920EC-001**      **001**      **X17**

STRING\_TYPE

**adaptor tool clamp**      **atc**      **ATC**

method of holding a tool item in an adaptive item

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

71EAD37F18F34-002      adaptive item type

**71EAC0F0EFDB6-001**      **001**      **NR2 S..3.3**

REAL\_MEASURE\_TYPE      mm

**adjusting screw protrusion** **asp**      **ASP**

distance from the body of the tool item or adaptive item to the end of the adjusting screw.

ISO 5611

**Illustration reference:**      [Figure E.8](#)

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

71EAD3871D313-002      converter

**71DF151EA5CF1-001**      **001**      **X17**

STRING\_TYPE

**balance quality code**      **blq**      **BLQ**

identifier for the residual out-of-balance effect of a rotating tool

ISO 1940-1

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

71EAD3871D313-002      converter

71E0250E32A07-002      cylindrical broach

71E01A00BD93C-002      drill

71EEBDADB63BE-002      extender

|                   |                |
|-------------------|----------------|
| 71E01A008D13F-002 | mill           |
| 71E01A04A8AEC-002 | ream           |
| 71EAD385E51A0-002 | reducer        |
| 71E0251F304E1-002 | rotating borer |

**71EAC0CAB861F-001**      **001**      **X1**

BOOLEAN\_TYPE

**balanced by design**      **bbd**      BBD

identifier whether the tool item or adaptive item is designed with its centre of gravity on the rotational centre line or not

NOTE      Balance by design is not determined by rotational testing.

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

|                   |                    |
|-------------------|--------------------|
| 71EAD3871D313-002 | converter          |
| 71E0250E32A07-002 | cylindrical broach |
| 71E01A00BD93C-002 | drill              |
| 71EEBDADB63BE-002 | extender           |
| 71E01A008D13F-002 | mill               |
| 71E01A04A8AEC-002 | ream               |
| 71EAD385E51A0-002 | reducer            |
| 71E0251F304E1-002 | rotating borer     |

**71ED6A9AF7D1D-001**      **001**      **NR2 S..3.3**

REAL\_MEASURE\_TYPE      mm

**body diameter**      **bd**      BD

distance between parallel tangents on the circular cross section of a tool item or an adaptive item

NOTE      For an item with several changes in external form, the multiple values of body diameter would be aggregated with indexable identifiers.

**Illustration reference:**      [Figure E.1](#)

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

|                   |           |
|-------------------|-----------|
| 71E02C544BABE-002 | burr tool |
|-------------------|-----------|

|                   |                |
|-------------------|----------------|
| 71EAD3871D313-002 | converter      |
| 71E01A082DE72-001 | disk broach    |
| 71E01A00BD93C-002 | drill          |
| 71EEBDADB63BE-002 | extender       |
| 71E01A008D13F-002 | mill           |
| 71E01A04A8AEC-002 | ream           |
| 71EAD385E51A0-002 | reducer        |
| 71E0251F304E1-002 | rotating borer |
| 71E01A081855D-002 | tapered broach |

**71D08462F8185-001**      **001**      **NR2 S..3.3**

REAL\_MEASURE\_TYPE      mm

**body diameter maximum**      **bdx**      BDX

largest diameter of the body of a tool item or an adaptive item

**Illustration reference:**      [Figure E.1](#)

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

|                   |                    |
|-------------------|--------------------|
| 71EAD3871D313-002 | converter          |
| 71E0250E32A07-002 | cylindrical broach |
| 71E01A0E4EE75-001 | cylindrical die    |
| 71E01A082DE72-001 | disk broach        |
| 71E01A00BD93C-002 | drill              |
| 71EEBDADB63BE-002 | extender           |
| 71E01A008D13F-002 | mill               |
| 71E01A04A8AEC-002 | ream               |
| 71EAD385E51A0-002 | reducer            |
| 71E01A081855D-002 | tapered broach     |

**71EAC472BD116-001**      **001**      **NR2 S..3.3**

REAL\_MEASURE\_TYPE      deg

**body half taper angle**      **bhta**      BHTA

angle of the transition between two diameters of the body of a tool item or adaptive item measured from the item axis

NOTE 1 This angle is not used for any connection taper.

NOTE 2 Applicable for both tool items and adaptive items.

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

71EAD3871D313-002 converter  
 71E01A05D27A8-002 end mill  
 71EEBDADB63BE-002 extender  
 71E01A04A8AEC-002 ream  
 71E01A04E0236-002 threading tap

**71EBB332C60EB-002 001 NR2 S..3.3**

REAL\_MEASURE\_TYPE mm

**body height htb HTB**

distance measured along the Y-axis between the extremes of the body excluding any protrusion of the locking mechanisms

**Illustration reference:** [Figure E.4](#)

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

71D1066F279AD-002 cartridge  
 71EAD3871D313-002 converter  
 71E01A082DE72-001 disk broach  
 71EAD388173EE-001 driver  
 71EEBDADB63BE-002 extender  
 71E01A0838E9B-001 prismatic broach  
 71E01A0E85121-001 prismatic tool holder  
 71EAD385E51A0-002 reducer  
 71E01A04F70F7-002 threading die  
 71E01A04E0236-002 threading tap

**71ED6AA478A3D-002 001 NR2 S..3.3**

REAL\_MEASURE\_TYPE mm

**body length** lb LB

distance measured along the Z-axis from that point of the item closest to the workpiece, including the cutting item for a tool item but excluding a protruding locking mechanism for an adaptive item, to a defined change in the external form of a tool item or an adaptive item

REMARKS For an item with several changes in external form, the multiple values of body length would be aggregated with indexable identifiers.

**Illustration reference:** [Figure E.1](#)

**Visible class:**

**71CE7A72B6DA7-002** cutting tool library

**Applicable classes:**

|                   |                         |
|-------------------|-------------------------|
| 71D1066F279AD-002 | cartridge               |
| 71E01A069566C-002 | chamfer drill           |
| 71EAD3871D313-002 | converter               |
| 71E01A06BF88D-002 | counterbore drill       |
| 71E01A06A8A08-002 | countersink drill       |
| 71EF07DFC283C-002 | double half side mill   |
| 71EAD388173EE-001 | driver                  |
| 71E01A05D27A8-002 | end mill                |
| 71EEBDADB63BE-002 | extender                |
| 71E01A05B627B-002 | face mill               |
| 71E01A0838E9B-001 | prismatic broach        |
| 71E01A07ECCCF-001 | profile reamer          |
| 71EAD385E51A0-002 | reducer                 |
| 71E0251F304E1-002 | rotating borer          |
| 71E01A0540BE7-002 | slab mill               |
| 71E01A067F73C-002 | step drill              |
| 71E01A07FF350-001 | stepped reamer          |
| 71E01A0EAF067-001 | system tool             |
| 71E01A081855D-002 | tapered broach          |
| 71E01A04F70F7-002 | threading die           |
| 71EF07E083383-002 | threading grooving mill |
| 71E01A04E0236-002 | threading tap           |
| 71E01A0769982-002 | trepanning drill        |

**71DCD3B16750B-002**      **001**      **NR2 S..3.3**

REAL\_MEASURE\_TYPE      mm

**body length maximum**      **lbx**      **LBX**

distance measured along the Z-axis from that point of the item closest to the workpiece, including the cutting item for a tool item but excluding a protruding locking mechanism for an adaptive item, to either the front of the flange on a flanged body or the beginning of the connection interface feature on the machine side for cylindrical or prismatic shanks

NOTE      If a connection interface feature overlaps with the body of the item, then this dimension of the body length includes the overlapping portion of the connection interface feature.

**Illustration reference:**      [Figure E.1](#)

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

- 71EAD3871D313-002      converter
- 71E0250E32A07-002      cylindrical broach
- 71E01A00BD93C-002      drill
- 71EAD388173EE-001      driver
- 71EEBDADB63BE-002      extender
- 71E01A008D13F-002      mill
- 71E01A0838E9B-001      prismatic broach
- 71E01A04A8AEC-002      ream
- 71EAD385E51A0-002      reducer
- 71E0251F304E1-002      rotating borer
- 71E01A0EAF067-001      system tool
- 71E01A081855D-002      tapered broach
- 71E01A04E0236-002      threading tap

**71DF1523224D8-001**      **001**      **X17**

STRING\_TYPE

**body material code**      **bmc**      **BMC**

identifier for the main material constituent of the tool item or adaptive item

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

71EAD37F18F34-002 adaptive item type  
 71E01A004C775-002 tool item type

**71EADEA2BF8DF-001 001 NR2 S..3.3**

REAL\_MEASURE\_TYPE mm

**body taper end length btel BTEL**

dimension from the front of a tool item or adaptive item to the end of the tool body taper measured along the tool item axis or adaptive item axis

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

71EAD3871D313-002 converter

71EEBDADB63BE-002 extender

**71EBB33230236-002 001 NR2 S..3.3**

REAL\_MEASURE\_TYPE mm

**body width wb WB**

distance measured along the X-axis between the extremes of the body excluding any protrusion of the locking mechanisms

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

71D1066F279AD-002 cartridge

71EAD3871D313-002 converter

71EAD388173EE-001 driver

71EEBDADB63BE-002 extender

71E01A0E79239-001 hexagonal die

71E01A0838E9B-001 prismatic broach

71E01A0E85121-001 prismatic tool holder

71EAD385E51A0-002 reducer

**71DF1523EE184-001 001 X17**

STRING\_TYPE

**cartridge size code casc CASC**

## ISO/TS 13399-4:2014(E)

identifier for the size of a cartridge

ISO 5608, ISO 5611

### Visible class:

**71CE7A72B6DA7-002**      **cutting tool library**

### Applicable classes:

71E01A04C377D-002      broach  
71D1066F279AD-002      cartridge  
71EAD3871D313-002      converter

**71CED05149532-001**      **001**      **NR2 S..3.3**

REAL\_MEASURE\_TYPE      MPa

**clamping force maximum**      **mx**      **MXC**

greatest force that can be applied by an assembly item

### Visible class:

**71CE7A72B6DA7-002**      **cutting tool library**

### Applicable classes:

71EAD3871D313-002      converter  
71EAD388173EE-001      driver  
71EEBDADB63BE-002      extender  
71EAD385E51A0-002      reducer

**71EBAF896BE9A-001**      **001**      **NR2 S..3.3**

REAL\_MEASURE\_TYPE      mm

**clamping length**      **lsc**      **LSC**

dimension of the length of that portion of a tool item or an adaptive item that can participate in a connection

**Illustration reference:**      [Figure E.1](#)

### Visible class:

**71CE7A72B6DA7-002**      **cutting tool library**

### Applicable classes:

71E01A0E9CBA9-001      boring bar  
71DF8C37D9115-002      connection interface feature  
71EAD3871D313-002      converter

**71ED6E54B15C4-001**                      **001**                      **NR2 S..3.3**

REAL\_MEASURE\_TYPE                      mm

**clamping length maximum**                      **lscx**                      LSCX

greatest portion of the connection feature that is necessary to ensure the normal function of the tool item or the adaptive item

**Visible class:**

**71CE7A72B6DA7-002**                      **cutting tool library**

**Applicable classes:**

71E01A0E9CBA9-001                      boring bar

71DF8C37D9115-002                      connection interface feature

71EAD3871D313-002                      converter

**71EBB339ED2BD-001**                      **001**                      **NR2 S..3.3**

LEVEL\_TYPE                      mm

**clamping length minimum**                      **lscn**                      LSCN

smallest portion of the connection feature that is necessary to ensure that no damage is caused neither to the tool item nor to the adaptive item

**Visible class:**

**71CE7A72B6DA7-002**                      **cutting tool library**

**Applicable classes:**

71E01A0E9CBA9-001                      boring bar

71DF8C37D9115-002                      connection interface feature

71EAD3871D313-002                      converter

**71EBAF85006BD-001**                      **001**                      **NR2 S..3.3**

REAL\_MEASURE\_TYPE                      mm

**clamping width**                      **wsc**                      WSC

dimension of the width of that portion of a tool item or an adaptive item that can participate in a connection

**Visible class:**

**71CE7A72B6DA7-002**                      **cutting tool library**

**Applicable classes:**

71EAD3871D313-002                      converter

71E01A0838E9B-001                      prismatic broach

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71E01A0E85121-001 prismatic tool holder

71EAD385E51A0-002 reducer

**71EAC48CAD407-001 001 NR2 S..3.3**

REAL\_MEASURE\_TYPE mm

**connection bore depth cbdp CBDP**

depth of the hole in the centre of a tool or adaptive item used for making a connection

71EBDBF130AE6-1 = side

**Illustration reference:** [Figure E.3](#)

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

71DF8C37D9115-002 connection interface feature

71EAD3871D313-002 converter

71E01A06BF88D-002 counterbore drill

71E01A06A8A08-002 countersink drill

71E0250E32A07-002 cylindrical broach

71E01A082DE72-001 disk broach

71EF07DFC283C-002 double half side mill

71EAD388173EE-001 driver

71EEBDADB63BE-002 extender

71E01A05B627B-002 face mill

71E01A05EA320-002 half side mill

71E01A04A8AEC-002 ream

71EAD385E51A0-002 reducer

71E0251F304E1-002 rotating borer

71E01A0540BE7-002 slab mill

71EF07E037025-002 slotting cutter

**71E01D92C41E8-001 001 NR2 S..3.3**

REAL\_MEASURE\_TYPE mm

**connection bore diameter dcb DCB**

diameter of the hole in the centre of a tool or adaptive item used for making a connection

71EBDBF130AE6-1 = side

**Illustration reference:** [Figure E.3](#)

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

|                   |                       |
|-------------------|-----------------------|
| 71EAD3871D313-002 | converter             |
| 71E01A06BF88D-002 | counterbore drill     |
| 71E01A06A8A08-002 | countersink drill     |
| 71E0250E32A07-002 | cylindrical broach    |
| 71E01A082DE72-001 | disk broach           |
| 71EF07DFC283C-002 | double half side mill |
| 71EAD388173EE-001 | driver                |
| 71EEBDADB63BE-002 | extender              |
| 71E01A05EA320-002 | half side mill        |
| 71E01A04A8AEC-002 | ream                  |
| 71EAD385E51A0-002 | reducer               |
| 71E0251F304E1-002 | rotating borer        |
| 71E01A0540BE7-002 | slab mill             |
| 71EF07E037025-002 | slotting cutter       |

**71EBDBF4D0F49-001 001 NR2 S..3.3**

LEVEL\_TYPE mm

**connection bore diameter maximum dcbx DCBX**

greatest internal diameter of an adaptive item that can participate in a connection

71EBDBF130AE6-1 = side

**Illustration reference:** [Figure E.5](#)

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

|                   |           |
|-------------------|-----------|
| 726F59BDC3B08-002 | collet    |
| 71EAD3871D313-002 | converter |

**71EBDBF49F96C-001 001 NR2 S..3.3**

LEVEL\_TYPE mm  
**connection bore diameter minimum** **dcbn** DCBN

least internal diameter of an adaptive item that can participate in a connection.

71EBDBF130AE6-1 = side

**Illustration reference:** [Figure E.5](#)

**Visible class:**

**71CE7A72B6DA7-002** **cutting tool library**

**Applicable classes:**

726F59BDC3B08-002 collet  
 71EAD3871D313-002 converter

**71D102AE3B252-001** **001** **X14**

STRING\_TYPE

**connection code machine side** **ccms** CCMS

identifier for the capability to connect a component of a cutting tool to another component on the machine side

NOTE 1 The value of a code is constructed from the combination of the item feature class short name and the values of connection size code, variant, connection units basis, coolant supply property and form type.

NOTE 2 Two items can be connected together if they have the same value of the code.

NOTE 3 The connection code is not applicable to assembly items in general but is applicable to the collet class.

EXAMPLE Example of a cylindrical shank conforming to ISO 3338-2 with shank diameter of 25 mm, with internal coolant would be: ZYL025010M1EXT.

**Illustration reference:** [Figure E.1](#)

**Visible class:**

**71CE7A72B6DA7-002** **cutting tool library**

**Applicable classes:**

71EAD37F18F34-002 adaptive item type  
 726F59BDC3B08-002 collet  
 71DF8C37D9115-002 connection interface feature  
 71E01A004C775-002 tool item type

**71D102AE8A5A9-001** **001** **X14**

STRING\_TYPE

**connection code workpiece side** **ccws** CCWS

identifier for the capability to connect a component to another component of a cutting tool on the workpiece side

NOTE 1 The value of a code is constructed from the combination of the item feature class short name and the values of connection size code, variant, connection units basis, coolant supply property, and form type.

NOTE 2 Two items can be connected together if they have the same value of the code.

NOTE 3 The connection code is not applicable to assembly items in general but is applicable to the collet class.

EXAMPLE Example of a collet chuck adaptor fitting a collet conforming to DIN 6499 with a size of 16 mm without coolant would be: SZD016002M0INT.

**Illustration reference:** [Figure E.1](#)

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

71EAD37F18F34-002 adaptive item type

71E01A04C377D-002 broach

726F59BDC3B08-002 collet

71DF8C37D9115-002 connection interface feature

71E01A00BD93C-002 drill

71E01A008D13F-002 mill

71E0251F304E1-002 rotating borer

71E01A05104CF-002 turn

**71EDD2C17746F-001 001 NR1..4**

INT\_TYPE

**connection count workpiece side cconws CCONWS**

effective numbers of connections that can participate in a connection between any component of a cutting tool, except cutting items and assembly items, on the workpiece side

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

71EAD3871D313-002 converter

71E0251F304E1-002 rotating borer

**71EBDBF5060E6-001 001 NR2 S..3.3**

LEVEL\_TYPE mm

**connection diameter dcon DCON**

nominal dimension of the diameter of a cylindrical portion of a tool item or an adaptive item that can participate in a connection.

71EBDBF130AE6-1 = side

**Illustration reference:** [Figure E.1](#)

**Visible class:**

**71CE7A72B6DA7-002** cutting tool library

**Applicable classes:**

- 71EAD37F18F34-002 adaptive item type
- 71E01A04C377D-002 broach
- 71E01A00BD93C-002 drill
- 71E01A008D13F-002 mill
- 71E01A04A8AEC-002 ream
- 71E0251F304E1-002 rotating borer
- 71E01A04F70F7-002 threading die
- 71E01A04E0236-002 threading tap
- 71E01A05104CF-002 turn

**71CF298A76B66-001** **001** **X17**

STRING\_TYPE

**connection retention knob thread size** **crks** **CRKS**

identifier for the size of the thread size of the device that pulls a cutting tool into the machine tool

71EBDBF130AE6-1 = side

**Illustration reference:** [Figure E.2](#)

**Visible class:**

**71CE7A72B6DA7-002** cutting tool library

**Applicable classes:**

- 71EAD3871D313-002 converter
- 71E0250E32A07-002 cylindrical broach
- 71E01A00BD93C-002 drill
- 71EEBDADB63BE-002 extender
- 71E01A008D13F-002 mill
- 71E01A04A8AEC-002 ream
- 71EAD385E51A0-002 reducer
- 71E0251F304E1-002 rotating borer

71E01A081855D-002 tapered broach

**71FC193318002-001 001 X17**

STRING\_TYPE

**connection size code czc CZC**

identifier for the size of the connection between items of a cutting tool, excluding cutting items.

NOTE The connection to the machine tool is included.

71EBDBF130AE6-1 = side

**Illustration reference:** [Figure E.1](#)

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

71EAD37F18F34-002 adaptive item type

71DF8C37D9115-002 connection interface feature

71E01A004C775-002 tool item type

**71ED6E16D5978-001 001 X1**

NON\_QUANTITATIVE\_CODE\_TYPE

**connection unit basis cub CUB**

label to identify the system of units in which the design of the connection is defined.

**Visible class:**

**71CE7A72B6DA7-002 cutting tool library**

**Applicable classes:**

71EAD37F18F34-002 adaptive item type

71DF8C37D9115-002 connection interface feature

71E01A004C775-002 tool item type

**Allowed values:**

M = metric

N = inch

C = coded neither metric nor inch

**71D087D97FCE3-001 001 NR2 S..3.3**

REAL\_MEASURE\_TYPE mm

**contact surface diameter machine side dcsfms DCSFMS**

diameter of the surface on the machine side forming the contact between a tool item and an adaptor item

NOTE See diagram.

Illustration reference: [Figure E.10](#)

Visible class:

**71CE7A72B6DA7-002** cutting tool library

Applicable classes:

- 71EAD3871D313-002 converter
- 71E0250E32A07-002 cylindrical broach
- 71E01A00BD93C-002 drill
- 71EEBDADB63BE-002 extender
- 71E01A008D13F-002 mill
- 71E01A04A8AEC-002 ream
- 71EAD385E51A0-002 reducer
- 71E0251F304E1-002 rotating borer
- 71E01A0EAF067-001 system tool

**71EAC0DD5D650-001** 001 NR2 S..3.3

REAL\_MEASURE\_TYPE mm

**contact surface diameter workpiece side** dcsfws DCSFWS

diameter of the surface on the workpiece side forming the contact between a tool item and an adaptor item

NOTE See diagram.

Visible class:

**71CE7A72B6DA7-002** cutting tool library

Applicable classes:

- 71EAD3871D313-002 converter
- 71EAD388173EE-001 driver
- 71EEBDADB63BE-002 extender
- 71EAD385E51A0-002 reducer

**71EBB342CC751-001** 001 X1

BOOLEAN\_TYPE

**coolant supply property** csp CSP

identification for whether a tool item or an adaptive item has a coolant supply

**Visible class:**

**71CE7A72B6DA7-002**                    **cutting tool library**

**Applicable classes:**

71EAD37F18F34-002            adaptive item type  
 71DF8C37D9115-002            connection interface feature  
 71E01A004C775-002            tool item type

**71CED03D70452-001**            **001**                    **X1**

BOOLEAN\_TYPE

**damping property**                **dpc**                    DPC

ability to reduce the amplitude of vibrations

**Visible class:**

**71CE7A72B6DA7-002**            **cutting tool library**

**Applicable classes:**

71EAD3871D313-002            converter  
 71E0250E32A07-002            cylindrical broach  
 71E01A05D27A8-002            end mill  
 71EEBDADB63BE-002            extender  
 71EAD385E51A0-002            reducer  
 71E01A05104CF-002            turn

**71CF29869CA0F-001**            **001**                    **NR1 S..1**

BOOLEAN\_TYPE

**data chip provision**                **dcp**                    DCP

indication of provision for a data chip on a tool item or an adaptive item

**Visible class:**

**71CE7A72B6DA7-002**            **cutting tool library**

**Applicable classes:**

71EAD37F18F34-002            adaptive item type  
 71E01A004C775-002            tool item type

**71EC5E1ECC776-001**            **001**                    **X17**

NON\_QUANTITATIVE\_CODE\_TYPE

**driving key type**                      **dkty**                      DKTY

form of a driving key

**Visible class:**

**71CE7A72B6DA7-002**                      **cutting tool library**

**Applicable classes:**

71EAD3871D313-002                      converter  
 71EAD388173EE-001                      driver  
 71EEBDADB63BE-002                      extender  
 71EAD385E51A0-002                      reduce

**Allowed values:**

Woodruff = Woodruff  
 parallel = parallel sides  
 tenon = tenon

**71CF29994E737-002**                      **001**                      **NR2..7.3**

REAL\_MEASURE\_TYPE                      mm

**functional height**                      **hf**                      HF

distance from the XZ-plane of the tool item to the cutting point

**Illustration reference:**                      [Figure E.4](#)

**Visible class:**

**71CE7A72B6DA7-002**                      **cutting tool library**

**Applicable classes:**

71D1066F279AD-002                      cartridge  
 71EAD3871D313-002                      converter  
 71EAD388173EE-001                      driver  
 71E01A0838E9B-001                      prismatic broach  
 71EAD385E51A0-002                      reducer  
 71E01A05104CF-002                      turn

**71DCD39338974-001**                      **001**                      **NR2 S..3**

REAL\_MEASURE\_TYPE                      mm

**functional length**                      **lf**                      LF

distance from the gauge plane or from the end of the shank, if a gauge plane does not exist, to the cutting reference point determined by the main function of the tool

NOTE                      The functional length is multiplied on stepped tools.

**Illustration reference:** [Figure E.1](#)

**Visible class:**

**71CE7A72B6DA7-002** cutting tool library

**Applicable classes:**

|                   |                    |
|-------------------|--------------------|
| 71EAD37F18F34-002 | adaptive item type |
| 71E01A04C377D-002 | broach             |
| 71E02C544BABE-002 | burr tool          |
| 71D1066F279AD-002 | cartridge          |
| 71E01A00BD93C-002 | drill              |
| 71E01A008D13F-002 | mill               |
| 71E01A04A8AEC-002 | ream               |
| 71E01A04E0236-002 | threading tap      |
| 71E01A05104CF-002 | turn               |

**71EBC1EB8456A-001** 001 NR2 S..3.3

REAL\_MEASURE\_TYPE mm

**functional length minimum** lfn LFN

least distance from the gauge plane or from the end of the shank, if a gauge plane does not exist, to the cutting reference point determined by the main function of the tool

**Visible class:**

**71CE7A72B6DA7-002** cutting tool library

**Applicable classes:**

|                   |                       |
|-------------------|-----------------------|
| 71E01A0E9CBA9-001 | boring bar            |
| 71EAD3871D313-002 | converter             |
| 71EAD388173EE-001 | driver                |
| 71EEBDADB63BE-002 | extender              |
| 71E01A0E85121-001 | prismatic tool holder |
| 71EAD385E51A0-002 | reducer               |

**71CF29984CDA7-001** 001 NR2..7.3

REAL\_MEASURE\_TYPE mm

**functional width** wf WF

distance between the cutting reference point and the rear backing surface of a turning tool or the axis of a boring bar

ISO 5609, ISO 5610

**Illustration reference:** [Figure E.6](#)

**Visible class:**

**71CE7A72B6DA7-002** **cutting tool library**

**Applicable classes:**

71D1066F279AD-002 cartridge

71EAD3871D313-002 converter

71EAD388173EE-001 driver

71EAD385E51A0-002 reducer

71E01A05104CF-002 turn

**71ED6E4A7EFBA-002** **002** **NR2 S..3.3**

REAL\_MEASURE\_TYPE deg

**kappa** **kapr** KAPR

rotation angle for the yzw-plane counter clockwise about the Y-axis

**Visible class:**

**71CE7A72B6DA7-002** **cutting tool library.**

**Applicable classes:**

71EAD3871D313-002 converter

71EAD388173EE-001 driver

71EAD385E51A0-002 reducer

71ED6E3F84723-001 yzw-plane

**71DF5C0761888-001** **001** **X1**

BOOLEAN\_TYPE

**keyway property** **kyp** KYP

possession of a keyway by either a tool item or an adaptive item

**Visible class:**

**71CE7A72B6DA7-002** **cutting tool library**

**Applicable classes:**

71E01A04C377D-002 broach

71EAD3871D313-002 converter

71E01A06BF88D-002 counterbore drill

|                   |                       |
|-------------------|-----------------------|
| 71E01A06A8A08-002 | countersink drill     |
| 71EF07DFC283C-002 | double half side mill |
| 71EAD388173EE-001 | driver                |
| 71EEBDADB63BE-002 | extender              |
| 71E01A05B627B-002 | face mill             |
| 71E01A05EA320-002 | half side mill        |
| 71E01A04A8AEC-002 | ream                  |
| 71EAD385E51A0-002 | reducer               |
| 71E0251F304E1-002 | rotating borer        |
| 71E01A0540BE7-002 | slab mill             |
| 71EF07E037025-002 | slotting cutter       |
| 71E01A0769982-002 | trepanning drill      |

**71D078EB73E87-002**      **001**      **NR2 S..7.3**

REAL\_MEASURE\_TYPE      mm

**overall height**      **oah**      OAH

largest dimension of an item in the direction of the Y-axis that would cause interference, including the master insert and clamping where applicable

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

|                   |                  |
|-------------------|------------------|
| 71D1066F279AD-002 | cartridge        |
| 71EAD3871D313-002 | converter        |
| 71EAD388173EE-001 | driver           |
| 71EEBDADB63BE-002 | extender         |
| 71E01A0838E9B-001 | prismatic broach |
| 71EAD385E51A0-002 | reducer          |
| 71E01A05104CF-002 | turn             |

**71D078EB7C086-002**      **001**      **NR2 S..7.3**

REAL\_MEASURE\_TYPE      mm

**overall length**      **oal**      OAL

largest dimension of an item in the direction of the Z-axis

**Illustration reference:**      [Figure E.6](#)

**Visible class:**

**71CE7A72B6DA7-002** cutting tool library

**Applicable classes:**

71EAD37F18F34-002 adaptive item type

71E01A004C775-002 tool item type

**71CF299257986-002** **001** **NR2 S..3.3**

REAL\_MEASURE\_TYPE mm

**overall width** **oaw** OAW

largest dimension of an item in the direction of the X-axis including the master insert where applicable

**Visible class:**

**71CE7A72B6DA7-002** cutting tool library

**Applicable classes:**

71D1066F279AD-002 cartridge

71EAD3871D313-002 converter

71EAD388173EE-001 driver

71EEBDADB63BE-002 extender

71E01A0838E9B-001 prismatic broach

71EAD385E51A0-002 reducer

71E01A05104CF-002 turn

**71ED6E4AE850B-002** **02** **NR2 S..3.3**

REAL\_MEASURE\_TYPE deg

**phi** **phi** PHI

rotation angle for the xzw-plane counter clockwise about the Z-axis

**Visible class:**

**71CE7A72B6DA7-002** cutting tool library

**Applicable classes:**

71EAD3871D313-002 converter

71EAD388173EE-001 driver

71EAD385E51A0-002 reducer

71ED6E3E9AECB-001 xzw-plane

**71DCD394BB20E-002**      **001**      **NR2 S..3.3**

REAL\_MEASURE\_TYPE      mm

**protruding length**      **lpr**      LPR

dimension from the XY-plane to the furthest point of the tool item or adaptive item measured in the Z direction

NOTE 1 For tool items, the protruding length can be equal to the functional length if the furthest point is the cutting reference point.

NOTE 2 For adaptive items, the protruding length can be equal to the functional length if the furthest point is the origin of the coordinate system workpiece side.

**Illustration reference:**      [Figure E.1](#)

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

71EAD37F18F34-002      adaptive item type

71E01A04C377D-002      broach

71E01A00BD93C-002      drill

71E01A008D13F-002      mill

71E01A04A8AEC-002      ream

71E0251F304E1-002      rotating borer

71E01A0EAF067-001      system tool

71E01A04E0236-002      threading tap

**71ED6E4B254E5-002**      **002**      **NR2 S..3.6**

REAL\_MEASURE\_TYPE      deg

**rho**      **rho**      RHO

rotation angle for the xyw-plane counter-clockwise about the X-axis

**Visible class:**

**71CE7A72B6DA7-002**      **cutting tool library**

**Applicable classes:**

71EAD3871D313-002      converter

71EAD388173EE-001      driver

71EAD385E51A0-002      reducer

71ED6E3F268C6-001      xyw plane

**71DF153A691F2-002**      **001**      **NR2 S..3.3**

LEVEL\_TYPE rpm  
**rotational speed maximum rpmx** RPMX  
 maximum rotational speed allowed for an item

**Visible class:**

**71CE7A72B6DA7-002** **cutting tool library**

**Applicable classes:**

71EAD37F18F34-002 adaptive item type  
 71E01A00BD93C-002 drill  
 71E01A008D13F-002 mill  
 71E01A04A8AEC-002 ream  
 71E0251F304E1-002 rotating borer  
 71E01A04F70F7-002 threading die  
 71E01A04E0236-002 threading tap

**71CF29862B277-001** **001** **NR2 S..7.3**

REAL\_MEASURE\_TYPE mm  
**shank diameter** **dmm** DMM

dimension of the diameter of a cylindrical portion of a tool item or an adaptive item that can participate in a connection

**Visible class:**

**71CE7A72B6DA7-002** **cutting tool library**

**Applicable classes:**

71EAD37F18F34-002 adaptive item type  
 71E01A0E9CBA9-001 boring bar  
 71E02C544BABE-002 burr tool  
 71E0250E32A07-002 cylindrical broach  
 71E01A00BD93C-002 drill  
 71E01A008D13F-002 mill  
 71E01A04A8AEC-002 ream  
 71E0251F304E1-002 rotating borer  
 71E01A0EAF067-001 system tool  
 71E01A081855D-002 tapered broach  
 71E01A04E0236-002 threading tap