TECHNICAL SPECIFICATION

ISO/TS 13399-4

First edition
2007-01-15

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

Reference number
ISO/TS 13399-4:2007(E)

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Published in Switzerland

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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order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn.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 13399-4 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]

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 enable the connection of components of a cutting tool, except the cutting items, and the connection of the tool to the machine. Adaptive items include, but are not limited to, and chucks and arbors. 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*.

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.

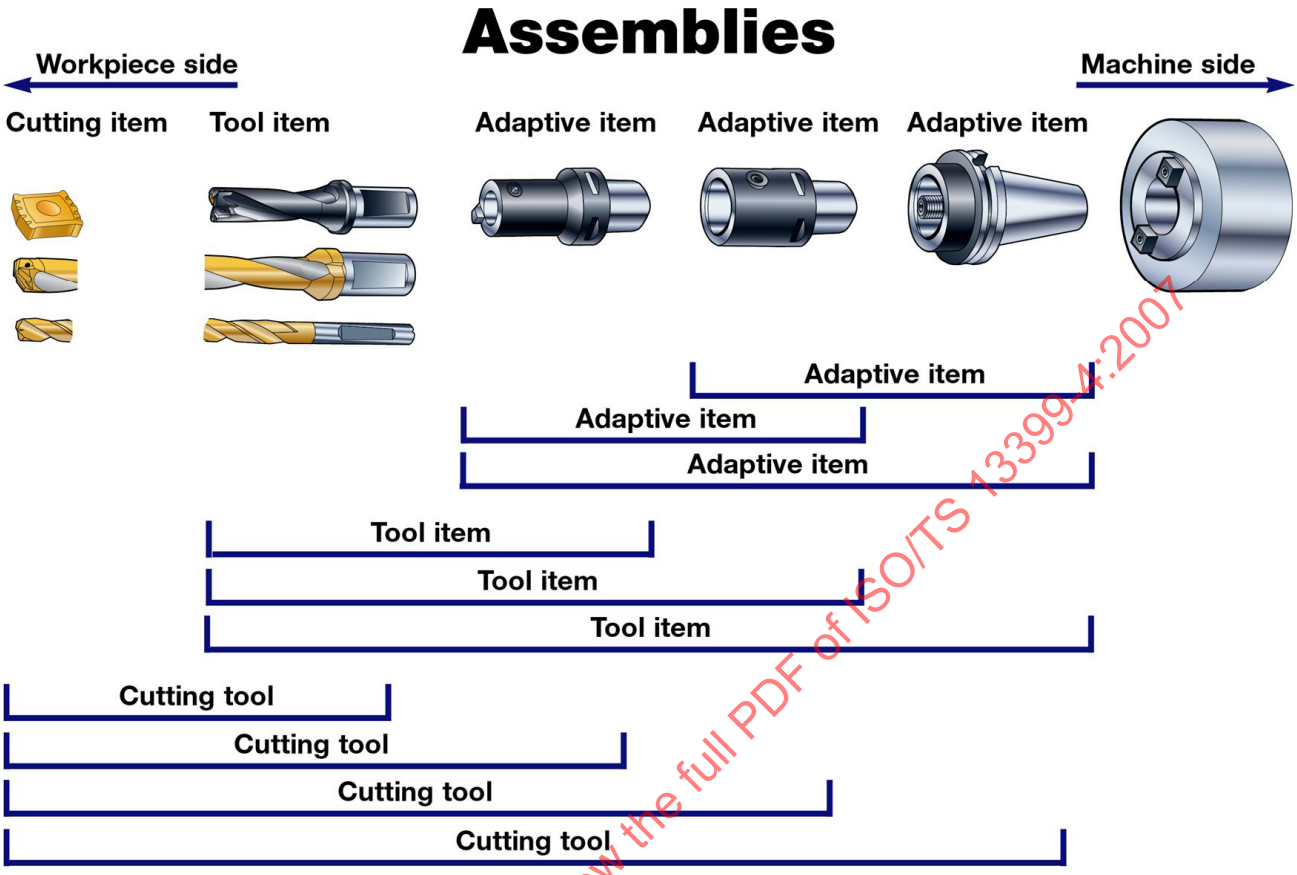

Figure 1 — Examples of different types of assemblies of items

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 that contains

a) definitions and identifications of the classes of adaptive items, with an associated classification scheme,

b) definitions and identifications of the data element types that represent the properties of adaptive items,

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 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;

— 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;

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

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.

— information models for cutting tools;

— definitions of classes and properties for cutting items, tool 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.

[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]

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.

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
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]

3.26
workpiece
object on which a cutting action is performed

[ISO/TS 13399-2]

3.27
workpiece side
identification of a direction pointing towards the workpiece

[ISO/TS 13399-2]

3.28
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]

3.29
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]

3.30
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]

3.31
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]

3.32
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]

3.33
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 ontology concepts as dictionary entries

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 "adaptive item type" is the name of a concept in the ontology. **adaptive_item_type** 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 coordinate axis system. The coordinate system is the same for adaptive items, cutting items and tool items and is defined in ISO/TS13399-50. The applications of this system to adaptive items are described in this part of ISO 13399.

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 adaptive item classes are provided in Annex C. The properties applicable to adaptive items are defined in Annex D.

5.1 Adaptive_item_type

adaptive_item_type is a generic family of items capable of forming connections between the components of a cutting tool, excluding cutting items, and between the cutting tool and the machine tool.

adaptive_item_type has the following simple families and items as subclasses:

— **converter**;

— **driver**;

— **extender**;

— **reducer**.

5.1.1 converter

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

converter has the following items as subclasses:

— **prismatic_prismatic**;

— **prismatic_round**;

— **round_prismatic**;

— **round_round**.

5.1.1.1 prismatic_prismatic

A **prismatic_prismatic** is a type of adaptive item that transforms a connection from one planar sided cross section to another.

NOTE The sequence of the change is from the machine side to the workpiece side.

5.1.1.2 prismatic_round

A **prismatic_round** is a type of adaptive item that transforms a connection from planar sided cross section to round cross section.

NOTE The sequence of the change is from the machine side to the workpiece side.

5.1.1.3 round_prismatic

A **round_prismatic** is a type of adaptive item that transforms a connection from a round cross section to a planar sided connection.

NOTE The sequence of the change is from the machine side to the workpiece side.

5.1.1.4 round_round

A **round_round** is a type of adaptive item that transforms from one round cross section to another.

NOTE The sequence of the change is from the machine side to the workpiece side.

5.1.2 driver

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

5.1.3 extender

An **extender** is a type of 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.

5.1.4 reducer

A **reducer** is a type of 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.

reducer has the following items as subclasses:

— **reducer_prismatic**;

— **reducer_round**.

5.1.4.1 reducer_prismatic

A **reducer_prismatic** is a type of adaptive item that diminishes the size of a connection with a planar sides.

5.1.4.2 reducer_round

A **reducer_round** is a type of adaptive item that diminishes the size of a connection with a non-planar sided cross section

6 Properties for adaptive 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 adaptive 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.

Table 1 — Property names and identification codes

Property name	Identification code (BSU)	Property name	Identification code (BSU)
actuation force	71EBBA9B56D06	actuation method	71EBBA9BCB5F2
adaptor clamp	71CED04F3300A	adaptor tool clamp	71CED04F920EC
adjusting screw protrusion	71EAC0F0EFDB6	adjustment axial property	71D0845BB2310
adjustment radial property	71D0845C34AB9	balance quality code	71DF151EA5CF1
balanced by design	71EAC0CAB861F	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 taper end length	71EADEA2BF8DF	body width	71EBB33230236
bolt hole circle property	71EDCB7490ED5	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	revolutions per minute maximum	71DF153A691F2
rho	71ED6E4B254E5	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		

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 (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 (4) version (1) object (1) adaptative items (1)}

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 class of adaptive item type. The purpose of the table is to show the relationships between the classes related to adaptive items and the other classes in ISO 13399.

NOTE Annex C contains the full definition of all the classes that are relevant to adaptive 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	Class BSU
cutting tool library	Root class	71CE7A72B6DA7
adaptive item type	71CE7A72B6DA7	71EAD37F18F34
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 cutting item features, cutting item types and the reference systems required to define the properties of these classes.

The information for each class is presented as follows:

BSU Code – version number **Revision number**

preferred name **Short name**

Definition

NOTE

REMARKS

Properties:

Subclasses:

71EAD37F18F34-1 **1**

adaptive item type **ait**

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.

Properties:

71CED03C97AAB-1 weight of item

71CED04F3300A-1 adaptor clamp

71CED04F920EC-1 adaptor tool clamp

71CF29869CA0F-1 data chip provision

71D078EB7C086-1 overall length

71D078FBF6C68-1 tool style code

71D102AE3B252-1 connection code machine side

71D102AE8A5A9-1 connection code workpiece side

71DCD39338974-1 functional length

71DCD394BB20E-1 protruding length

71DF1523224D8-1	body material code
71DF153A691F2-1	revolutions per minute maximum
71EBB342CC751-1	coolant supply property
71EBBA9B56D06-1	actuation force
71EBBA9BCB5F2-1	actuation method
71EBBA9ED6C0A-1	unit system
71EBDBF130AE6-1	side
71EBDBF5060E6-1	connection diameter
71ED6E16D5978-1	connection unit basis
71FC193318002-1	connection size code
71FC29862B277	shank diameter

Sub-classes:

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

71EAD3871D313-1 1

converter cnvtr

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

Properties:

71CED03D70452-1	damping property
71CED05149532-1	clamping force maximum
71CF298751FCF-1	shank width
71CF29883E014-1	shank height
71CF298870946-1	shank length
71CF2989AF0E0-1	tool changer interference length minumum
71CF298A3A99A-1	tool changer interference diameter maximum
71CF298A76B66-1	connection retaining knob thread size
71CF299257986-1	overall width

71CF2992BDBCC-1	usable length maximum
71CF29984CDA7-1	functional width
71CF29994E737-1	functional height
71D078EB73E87-1	overall height
71D0845BB2310-1	adjustment axial property
71D0845C34AB9-1	adjustment radial property
71D08462F8185-1	body diameter maximum
71D087D97FCE3-1	contact surface diameter machine side
71DCD3B16750B-1	body length maximum
71DF151EA5CF1-1	balance quality code
71DF1523EE184-1	cartridge size code
71DF5C0761888-1	keyway property
71E01D92C41E8-1	connection bore diameter
71EAC0CAB861F-1	balanced by design
71EAC0DD5D650-1	contact surface diameter workpiece side
71EAC0F0EFDB6-1	adjusting screw protrusion
71EAC472BD116-1	body half taper angle
71EAC48CAD407-1	connection bore depth
71EADEA2BF8DF-1	body taper end length
71EBAF85006BD-1	clamping width
71EBAF896BE9A-1	clamping length
71EBB33230236-1	body width
71EBB332C60EB-1	body height
71EBB33490FDA-1	usable length
71EBB339ED2BD-1	clamping length minimum
71EBC1EB8456A-1	functional length minimum
71EBDBF49F96C-1	connection bore diameter minimum
71EBDBF4D0F49-1	connection bore diameter maximum
71EC5E1ECC776-1	driving key type
71ED6A9AF7D1D-1	body diameter

71ED6AA478A3D-1	body length
71ED6E4A7EFBA-1	kappa
71ED6E4AE850B-1	phi
71ED6E4B254E5-1	rho
71ED6E54B15C4-1	clamping length maximum
71EDCB7490ED5-1	bolt hole circle property
71EDD2C17746F-1	connection count workpiece side

71EAD388173EE-1 **1**

driver **drvr**

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

Properties:

71CED05149532-1	clamping force maximum
71CF298751FCF-1	shank width
71CF29883E014-1	shank height
71CF298870946-1	shank length
71CF299257986-1	overall width
71CF29984CDA7-1	functional width
71CF29994E737-1	functional height
71D078EB73E87-1	overall height
71DCD3B16750B-1	body length maximum
71DF5C0761888-1	keyway property
71E01D92C41E8-1	connection bore diameter
71EAC0DD5D650-1	contact surface diameter workpiece side
71EAC48CAD407-1	connection bore depth
71EBB33230236-1	body width
71EBB332C60EB-1	body height
71EBC1EB8456A-1	functional length minimum
71EC5E1ECC776-1	driving key type
71ED6AA478A3D-1	body length

71ED6E4A7EFBA-1 kappa

71ED6E4AE850B-1 phi

71ED6E4B254E5-1 rho

71EDCB7490ED5-1 bolt hole circle property

71EEBDADB63BE-1 1

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:

71CED03D70452-1 damping property

71CED05149532-1 clamping force maximum

71CF298A76B66-1 connection retaining knob thread size

71CF299257986-1 overall width

71D078EB73E87-1 overall height

71D0845BB2310-1 adjustment axial property

71D0845C34AB9-1 adjustment radial property

71D08462F8185-1 body diameter maximum

71D087D97FCE3-1 contact surface diameter machine side

71DCD3B16750B-1 body length maximum

71DF151EA5CF1-1 balance quality code

71DF5C0761888-1 keyway property

71E01D92C41E8-1 connection bore diameter

71EAC0CAB861F-1 balanced by design

71EAC0DD5D650-1 contact surface diameter workpiece side

71EAC472BD116-1 body half taper angle

71EAC48CAD407-1 connection bore depth

71EADEA2BF8DF-1 body taper end length

71EBB33230236-1 body width

71EBB332C60EB-1 body height

71EBC1EB8456A-1 functional length minimum

71EC5E1ECC776-1 driving key type

71ED6A9AF7D1D-1 body diameter

71ED6AA478A3D-1 body length

71EDCB7490ED5-1 bolt hole circle property

71EAD385E51A0-1 1

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:

71CED03D70452-1 damping property

71CED05149532-1 clamping force maximum

71CF298751FCF-1 shank width

71CF29883E014-1 shank height

71CF298870946-1 shank length

71CF2989AF0E0-1 tool changer interference length minumum

71CF298A3A99A-1 tool changer interference diameter maximum

71CF298A76B66-1 connection retaining knob thread size

71CF299257986-1 overall width

71CF29984CDA7-1f unctional width

71CF29994E737-1 functional height

71D078EB73E87-1 overall height

71D0845BB2310-1 adjustment axial property

71D0845C34AB9-1 adjustment radial property

71D08462F8185-1 body diameter maximum

71D087D97FCE3-1 contact surface diameter machine side

71DCD3B16750B-1 body length maximum

71DF151EA5CF1-1 balance quality code

71DF5C0761888-1	keyway property
71E01D92C41E8-1	connection bore diameter
71EAC0CAB861F-1	balanced by design
71EAC0DD5D650-1	contact surface diameter workpiece side
71EAC48CAD407-1	connection bore depth
71EBAF85006BD-1	clamping width
71EBB33230236-1	body width
71EBB332C60EB-1	body height
71EBB33490FDA-1	usable length
71EBC1EB8456A-1	functional length minimum
71EC5E1ECC776-1	driving key type
71ED6A9AF7D1D-1	body diameter
71ED6AA478A3D-1	body length
71ED6E4A7EFBA-1	kappa
71ED6E4AE850B-1	phi
71ED6E4B254E5-1	rho
71EDCB7490ED5-1	bolt hole circle property

Annex D
(informative)

Adaptive item property definitions

The presentation of the entries in this annex is as follows:

BSU – version number **Revision number** **Value format**

data type group data type unit identifier

preferred name **short name** 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:

Illustration reference: Figure <Annex.illustration number>

Visible class:

Applicable classes:

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

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

71EBBA9B56D06-1 **1** **NR2 S..3.3**

simple real measure N

actuation force **lmaf** LMAF

linear force needed to actuate a locking mechanism

NOTE The actuation force could be applied either to lock or unlock the mechanism.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD37F18F34-1 adaptive item type

71EBAB85BB5FA-1 locking mechanism

71EBBA9BCB5F2-1 **1** **X 17**

simple non-quantitative code

actuation method **lam** LAM

description of how the locking mechanism is actuated

auto = automatic

man = manual

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD37F18F34-1 adaptive item type

71EBAB85BB5FA-1 locking mechanism

71CED04F3300A-1 **1** **X 17**

simple string

adaptor clamp **adc** ADC

method of retaining an adaptor

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD37F18F34-1 adaptive item type

71CED04F920EC-1 **1** **X 17**

simple string

adaptor tool clamp **atc** ATC

method of holding a tool item in an adaptive item

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD37F18F34-1 adaptive item type

71EAC0F0EFDB6-1 **1** **NR2 S..3.3**

simple real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD3871D313-1 converter

71D0845BB2310-1 **1** **X1**

simple boolean

adjustment axial property **adjap** ADJAP

possession of an axial adjustment feature over which a cutting edge can be moved parallel to the axis of the tool item or a tool item can be moved parallel to the axis of an adaptive item

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1 cartridge

71E01A008D13F-1 mill

71E01A00BD93C-1 drill

71E01A04A8AEC-1 ream

71E01A04C377D-1 broach

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EEBDADB63BE-1 extender

71D0845C34AB9-1 **1** **X1**

simple boolean

adjustment radial property **adjrp** ADJRP

possession of an radial adjustment feature over which a cutting edge can be moved perpendicular to the axis of the tool item or a tool item can be moved perpendicular to the axis of an adaptive item

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1 cartridge

71E01A008D13F-1 mill

71E01A00BD93C-1 drill

71E01A04A8AEC-1 ream

71E01A04C377D-1 broach

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EEBDADB63BE-1 extender

71DF151EA5CF1-1 **1** **X 17**

simple string

balance quality code **blq** BLQ

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

ISO 1940-1

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A008D13F-1	mill
71E01A00BD93C-1	drill
71E01A04A8AEC-1	ream
71E0250E32A07-1	cylindrical broach
71E0251F304E1-1	rotating borer
71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EEBDADB63BE-1	extender

71EAC0CAB861F-1 **1** **X1**

simple boolean

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 Balanced by design is not determined by rotational testing.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A008D13F-1	mill
71E01A00BD93C-1	drill
71E01A04A8AEC-1	ream
71E0250E32A07-1	cylindrical broach
71E0251F304E1-1	rotating borer
71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EEBDADB63BE-1	extender

71ED6A9AF7D1D-1 **1** **NR2 S..3.3**

simple real measure 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 identifers.

Illustration reference: Figure E.1.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A008D13F-1 mill

71E01A00BD93C-1 drill

71E01A04A8AEC-1 ream

71E01A081855D-1 tapered broach

71E01A082DE72-1 disk broach

71E0251F304E1-1 otating borer

71E02C544BABE-1 burr tool

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EEBDADB63BE-1 extender

71D08462F8185-1 **1** **NR2 S..3.3**

simple real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A008D13F-1 mill

71E01A00BD93C-1 drill

71E01A04A8AEC-1 ream

71E01A081855D-1 tapered broach

71E01A082DE72-1 disk broach

71E01A0E4EE75-1 cylindrical die

71E0250E32A07-1 cylindrical broach

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EEBDADB63BE-1 extender

71EAC472BD116-1 **1** **NR2 S..3.3**

simple real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A04A8AEC-1 ream

71E01A04E0236-1 threading tap

71E01A05D27A8-1 end mill

71EAD3871D313-1 converter

71EEBDADB63BE-1 extender

71EBB332C60EB-1 **1** **NR2 S..3.3**

simple real measure mm

body height **htb** HTB

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

Illustration reference: Figure E.4.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1	cartridge
71E01A04E0236-1	threading tap
71E01A04F70F7-1	threading die
71E01A082DE72-1	disk broach
71E01A0838E9B-1	prismatic broach
71E01A0E85121-1	prismatic tool holder
71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EAD388173EE-1	driver
71EEBDADB63BE-1	extender

71ED6AA478A3D-1 **1** **NR2 S..3.3**

simple real measure mm

body length **lb** LB

distance measured along the X 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

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

Illustration reference: Figure E.1.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1	cartridge
71E01A04E0236-1	threading tap
71E01A04F70F7-1	threading die
71E01A0540BE7-1	slab mill

71E01A05B627B-1	face mill
71E01A05D27A8-1	end mill
71E01A067F73C-1	step drill
71E01A069566C-1	chamfer drill
71E01A06A8A08-1	countersink drill
71E01A06BF88D-1	counterbore drill
71E01A0769982-1	trepanning drill
71E01A07ECCCF-1	profile reamer
71E01A07FF350-1	stepped reamer
71E01A081855D-1	tapered broach
71E01A0838E9B-1	prismatic broach
71E0251F304E1-1	rotating borer
71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EAD388173EE-1	driver
71EEBDADB63BE-1	extender
71EF07DFC283C-1	double half side mill
71EF07E083383-1	threading grooving mill

71DCD3B16750B-1 **1** **NR2 S..3.3**

simple real measure mm

body length maximum **lbx** LBX

distance measured along the X 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A008D13F-1	mill
71E01A00BD93C-1	drill
71E01A04A8AEC-1	ream
71E01A04E0236-1	threading tap
71E01A081855D-1	tapered broach
71E01A0838E9B-1	prismatic broach
71E0250E32A07-1	cylindrical broach
71E0251F304E1-1	rotating borer
71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EAD388173EE-1	driver
71EEBDADB63BE-1	extender

71DF1523224D8-1 **1** **X 17**

simple string

body material code **bmc** BMC

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

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A004C775-1	tool item type
71EAD37E18F34-1	adaptive item type

71EADEA2BF8DF-1 **1** **NR2 S..3.3**

simple real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD3871D313-1 converter

71EEBDADB63BE-1 extender

71EBB33230236-1 **1** **NR2 S..3.3**

simple real measure mm

body width **wb** WB

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

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1 cartridge

71E01A0838E9B-1 prismatic broach

71E01A0E79239-1 hexagonal die

71E01A0E85121-1 prismatic tool holder

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71EEBDADB63BE-1 extender

71EDCB7490ED5-1 **1** **X1**

simple boolean

bolt hole circle property **bhcp** BHCP

possession of a bolt hole circle

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E0250E32A07-1	cylindrical broach
71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EAD388173EE-1	driver
71EEBDADB63BE-1	extender

71DF1523EE184-1 **1** **X 17**

simple string

cartridge size code **casc** CASC

identifier for the size of a cartridge

ISO 5608, ISO 5611

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1	cartridge
71E01A04C377D-1	broach
71EAD3871D313-1	converter

71CED05149532-1 **1** **NR2 S..3.3**

simple real measure MPa

clamping force maximum **mxc** MXC

greatest force that can be applied by an assembly item

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EAD388173EE-1	driver
71EEBDADB63BE-1	extender

71EBAF896BE9A-1 **1** **NR2 S..3.3**

simple real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A0E9CBA9-1 boring bar

71EAD3871D313-1 converter

71ED6E54B15C4-1 **1** **NR2 S..3.3**

simple real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A0E9CBA9-1 boring bar

71EAD3871D313-1 converter

71EBB339ED2BD-1 **1** **NR2 S..3.3**

level min real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A0E9CBA9-1 boring bar

71EAD3871D313-1 converter

71EBAF85006BD-1 **1** **NR2 S..3.3**

simple real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A0838E9B-1 prismatic broach

71E01A0E85121-1 prismatic tool holder

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71D102AE3B252-1 **1** **X 14**

simple string

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

The value of a code shall be 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 1 Two items can be connected together if they have the same code value.

NOTE 2 The connection code is not applicable to assembly items in general but is applicable to the collet class.

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

Illustration reference: Figure E.1.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71DF8C37D9115-1	connection interface feature
71E01A004C775-1	tool item type
71EAD37F18F34-1	adaptive item type
71EC61E726811-1	collet

71D102AE8A5A9-1 **1** **X 14**

simple string

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

The value of a code shall be 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 1 Two items can be connected together if they have the same value of the code.

NOTE 2 The connection code is not applicable to assembly items in general but is applicable to the collet class.

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

Illustration reference: Figure E.1.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71DF8C37D9115-1	connection interface feature
71E01A008D13F-1	mill
71E01A00BD93C-1	drill
71E01A04C377D-1	broach
71E01A05104CF-1	turn
71E0251F304E1-1	rotating borer
71EAD37F18F34-1	adaptive item type
71EC61E726811-1	collet

71CF298A76B66-1 **1** **X 17**

simple string

connection retaining knob thread size **crks** CRKS

identifer 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A008D13F-1	mill
71E01A00BD93C-1	drill
71E01A04A8AEC-1	ream
71E01A081855D-1	tapered broach
71E0250E32A07-1	cylindrical broach
71E0251F304E1-1	rotating borer
71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EEBDADB63BE-1	extender

71EAC48CAD407-1 **1** **NR2 S..3.3**

simple real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A04A8AEC-1	ream
71E01A0540BE7-1	slab mill
71E01A05B627B-1	face mill
71E01A05EA320-1	half side mill

71E01A06A8A08-1 countersink drill

71E01A06BF88D-1 counterbore drill

71E01A082DE72-1 disk broach

71E0250E32A07-1 cylindrical broach

71E0251F304E1-1 rotating borer

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71EEBDADB63BE-1 extender

71EF07DFC283C-1 double half side mill

71EF07E037025-1 slotting cutter

71E01D92C41E8-1 **1** **NR2 S..3.3**

simple real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A04A8AEC-1 ream

71E01A0540BE7-1 slab mill

71E01A05EA320-1 half side mill

71E01A06A8A08-1 countersink drill

71E01A06BF88D-1 counterbore drill

71E01A082DE72-1 disk broach

71E0250E32A07-1 cylindrical broach

71E0251F304E1-1 rotating borer

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71EEBDADB63BE-1 extender

71EF07DFC283C-1 double half side mill

71EF07E037025-1 slotting cutter

71EBDBF4D0F49-1 **1** **NR2 S..3.3**

level max real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD3871D313-1 converter

71EC61E726811-1 collet

71EBDBF49F96C-1 **1** **NR2 S..3.3**

level min real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD3871D313-1 converter

71EC61E726811-1 collet

71EDD2C17746F-1 **1** **NR1 ..4**

simple integer

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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E0251F304E1-1 rotating borer

71EAD3871D313-1 converter

71EBDBF5060E6-1 **1** **NR2 S..3.3**

level nom real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A008D13F-1 mill

71E01A00BD93C-1 drill

71E01A04A8AEC-1 ream

71E01A04C377D-1 broach

71E01A04E0236-1 threading tap

71E01A04F70F7-1 threading die

71E01A05104CF-1 turn

71E0251F304E1-1 rotating borer

71EAD37F18F34-1 adaptive item type

71FC193318002-1 **1** **X 17**

simple string

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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A004C775-1 tool item type

71EAD37F18F34-1 adaptive item type

71ED6E16D5978-1 **1** **X 1**

simple non-quantitative code

connection unit basis **cub** CUB

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

C = Coded neither metric nor inch

M = Metric

N = Inch

NOTE The C value of this property is used to identify the design basis of tapered shanks such as Steep taper.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A004C775-1 tool item type

71EAD37F18F34-1 adaptive item type

71D087D97FCE3-1 **1** **NR2 S..3.3**

simple real measure 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

Illustration reference: Figure E.10.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A008D13F-1 mill

71E01A00BD93C-1 drill

71E01A04A8AEC-1 ream

71E0250E32A07-1 cylindrical broach

71E0251F304E1-1 rotating borer

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EEBDADB63BE-1 extender

71EAC0DD5D650-1 **1** **NR2 S..3.3**

simple real measure 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

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71EEBDADB63BE-1 extender

71EBB342CC751-1 **1** **X1**

simple boolean

coolant supply property **csp** CSP

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

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A004C775-1 tool item type

71EAD37F18F34-1 adaptive item type

71CED03D70452-1 **1** **X1**

simple boolean

damping property **dpc** DPC

ability to reduce the amplitude of vibrations

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A05104CF-1 turn

71E01A05D27A8-1 end mill

71E0250E32A07-1 cylindrical broach

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EEBDADB63BE-1 extender

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

simple boolean

data chip provision **dcp** DCP

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

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A004C775-1 tool item type

71EAD37F18F34-1 adaptive item type

71EC5E1ECC776-1 **1** **X 17**

simple non-quantitative code

driving key type **dkty** DKTY

form of a driving key

parallel = parallel sides

tenon = tenon

Woodruff = Woodruff

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71EEBDADB63BE-1 extender

71CF29994E737-1 **1** **NR2..7.3**

simple real measure mm

functional height **hf**

cutting height HF

distance from the XY plane of the tool item to the cutting point

Illustration reference: Figure E.4.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1	cartridge
71E01A05104CF-1	turn
71E01A0838E9B-1	prismatic broach
71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EAD388173EE-1	driver

71DCD39338974-1 **1** **NR2 S..3.3**

simple real measure 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 multiplicated on stepped tools.

Illustration reference: Figure E.1.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1	cartridge
71E01A008D13F-1	mill
71E01A00BD93C-1	drill
71E01A04A8AEC-1	ream
71E01A04C377D-1	broach
71E01A04E0236-1	threading tap
71E01A05104CF-1	turn
71E02C544BABE-1	burr tool
71EAD37F18F34-1	adaptive item type

71EBC1EB8456A-1 **1** **NR2 S..3.3**

simple real measure 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A0E85121-1	prismatic tool holder
71E01A0E9CBA9-1	boring bar
71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EAD388173EE-1	driver
71EEBDADB63BE-1	extender

71CF29984CDA7-1 **1** **NR2..7.3**

simple real measure mm

functional width **wf**

f dimension 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1	cartridge
71E01A05104CF-1	turn
71EAD385E51A0-1	reducer
71EAD3871D313-1	converter
71EAD388173EE-1	driver

71ED6E4A7EFBA-1 **1** **NR2 S..3.3**

simple real measure deg

kappa **kap** KAP

rotation angle for the xzw-plane counterclockwise about the Z-axis

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71ED6E3E9AECB-1 xzw-plane

71DF5C0761888-1 **1** **X1**

simple boolean

keyway property **kyp** KYP

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

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A04A8AEC-1 ream

71E01A04C377D-1 broach

71E01A0540BE7-1 slab mill

71E01A05B627B-1 face mill

71E01A05EA320-1 half side mill

71E01A06A8A08-1 countersink drill

71E01A06BF88D-1 counterbore drill

71E01A0769982-1 trepanning drill

71E0251F304E1-1 rotating borer

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71EEBDADB63BE-1 extender

71EF07DFC283C-1 double half side mill

71EF07E037025-1 slotting cutter

71D078EB73E87-1 **1** **NR2 S..7.3**

simple real measure mm

overall height **oah** OAH

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

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1 cartridge

71E01A05104CF-1 turn

71E01A0838E9B-1 prismatic broach

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71EEBDADB63BE-1 extender

71D078EB7C086-1 **1** **NR2 S..7.3**

simple real measure mm

overall length **oal** OAL

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

Illustration reference: Figure E.6.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A004C775-1 tool item type

71EAD37F18F34-1 adaptive item type

71CF299257986-1 **1** **NR2..7.3**

simple real measure mm

overall width **oaw** OAW

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

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1 cartridge

71E01A05104CF-1 turn

71E01A0838E9B-1 prismatic broach

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71EEBDADB63BE-1 extender

71ED6E4AE850B-1 **1** **NR2 S..3.3**

simple real measure deg

phi **phi** PHI

rotation angle for the xyw-plane counterclockwise about the x-axis

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71ED6E3F268C6-1 xyw-plane

71DCD394BB20E-1 **1** **NR2 S..3.3**

simple real measure mm

protruding length **lpr** LPR

projection length

dimension from the yz-plane to the furthest point of the tool item or adaptive item measured in the -X 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:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A008D13F-1 mill

71E01A00BD93C-1 drill

71E01A04A8AEC-1 ream

71E01A04C377D-1 broach

71E01A04E0236-1 threading tap

71E0251F304E1-1 rotating borer

71EAD37F18F34-1 adaptive item type

71DF153A691F2-1 **1** **NR1 S..6**

level max integer

revolutions per minute maximum **rpmx** RPMX

maximum rotational speed allowed for an item

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71E01A008D13F-1 mill

71E01A00BD93C-1 drill

71E01A04A8AEC-1 ream

71E01A04E0236-1 threading tap

71E01A04F70F7-1 threading die

71E0251F304E1-1 rotating borer

71EAD37F18F34-1 adaptive item type

71ED6E4B254E5-1 **1** **NR2 S..3.3**

simple real measure deg

rho **rho** RHO

rotation angle for the yzw-plane counterclockwise about the Y-axis

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71EAD385E51A0-1 reducer

71EAD3871D313-1 converter

71EAD388173EE-1 driver

71ED6E3F84723-1 yzw-plane

71CF29862B277-1 **1** **NR2..7.3**

simple real measure mm

shank diameter **dmm** DMM

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

Illustration reference: Figure E.1.

Visible class:

71CE7A72B6DA7-1 cutting tool library

Applicable classes:

71D1066F279AD-1 cartridge

71CF29883E014-1 **1** **NR2..7.3**

simple real measure mm

shank height **h** H

dimension of the height of a shank

Illustration reference: Figure E.4.

Visible class:

71CE7A72B6DA7-1 cutting tool library