
**Cutting tool data representation
and exchange —**

Part 100:
**Definitions, principles and methods
for reference dictionaries**

iTeh STANDARD PREVIEW
*Représentation et échange des données relatives aux outils
coupants —*
(standards.iteh.ai)

*Partie 100: Définitions, principes et méthodes pour les dictionnaires
de référence*

ISO/TS 13399-100:2008

<https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-8f7cfaf81bcd/iso-ts-13399-100-2008>



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/TS 13399-100:2008](https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-8f7cfaf81bcd/iso-ts-13399-100-2008)

<https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-8f7cfaf81bcd/iso-ts-13399-100-2008>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2008

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword.....	v
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	2
4 Data element type specification attributes.....	3
4.1 General.....	3
4.2 Information model of a data element type	4
4.3 Data element types - Identifying attributes	5
4.3.1 General.....	5
4.3.2 Code	5
4.3.3 Version number.....	6
4.3.4 Date of current version.....	6
4.3.5 Revision number.....	7
4.3.6 Date of current revision.....	7
4.3.7 Preferred name.....	7
4.3.8 Synonymous name.....	8
4.3.9 Short name	8
4.3.10 Preferred symbol	8
4.3.11 Synonymous symbol.....	8
4.4 Data element types - Semantic attributes.....	9
4.4.1 General.....	9
4.4.2 Definition	9
4.4.3 Date of original definition	10
4.4.4 Note	10
4.4.5 Remark.....	10
4.4.6 Formula.....	10
4.4.7 Figure	11
4.4.8 Source document of Data Element Type definition	11
4.5 Data element types - value attributes	11
4.5.1 General.....	11
4.5.2 Data type.....	12
4.5.3 Value format	14
4.5.4 Unit of measure.....	15
4.5.5 Value list	15
4.6 Relationship attributes	17
4.6.1 General.....	17
4.6.2 Condition data element type.....	17
4.6.3 Data element type class	18
5 Class specification	18
5.1 General.....	18
5.2 Class specification attributes.....	19
5.3 Information model of a class	19
5.4 Class - Identifying attributes	20
5.4.1 General.....	20
5.4.2 Code	20
5.4.3 Version number.....	20
5.4.4 Date of current version.....	21
5.4.5 Revision number.....	21
5.4.6 Date of current revision.....	21

5.4.7	Preferred name	22
5.4.8	Short name.....	22
5.5	Class – Semantic attributes	22
5.5.1	General	22
5.5.2	Definition.....	23
5.5.3	Date of original definition.....	23
5.5.4	Note	23
5.5.5	Remark	24
5.5.6	Drawing reference.....	24
5.5.7	Source document of class definition	24
5.6	External identification of classes and properties	24
5.6.1	General	24
5.6.2	Organisation identification scheme	25
5.6.3	Organisation identifier	25
5.6.4	Supplier code.....	25
5.6.5	Identification of a class specified in another dictionary.....	25
5.6.6	Identification of a property of a class specified in another dictionary.....	25
Annex A (normative) Information object registration		26
Annex B (informative) Experience of developing a reference dictionary for ISO 13399		27
Annex C (informative) The illustration of classes and properties		39
Annex D (normative) Maintenance procedure.....		43
Annex E (informative) The definition of connection interface features		48
Bibliography		51

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/TS 13399-100:2008](https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-8f7cfaf81bcd/iso-ts-13399-100-2008)

<https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-8f7cfaf81bcd/iso-ts-13399-100-2008>

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 document:

- a) 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;
- b) 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 13399-100 was prepared by Technical Committee ISO/TC 29, *Small tools*.

This second edition cancels and replaces the first edition (ISO/TS 13399-100:2004), 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 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]
- *Part 150: Usage guidelines* [Technical Specification]

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/TS 13399-100:2008](https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-8f7cfaf81bcd/iso-ts-13399-100-2008)
<https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-8f7cfaf81bcd/iso-ts-13399-100-2008>

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 principles and methods for the construction of reference dictionaries for data related to cutting tools with defined cutting edges. The purpose of this part of ISO 13399 is to provide a specification for the creation of the reference dictionaries that support the use of the general information model defined in ISO 13399-1. This specification is based on the example of IEC 61360-1. Informal advice on the creation of the reference dictionaries is provided in Annexes B, C, D and E.

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 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, *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*.^[1]

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.

Cutting tool data representation and exchange —

Part 100: Definitions, principles and methods for reference dictionaries

1 Scope

This part of ISO 13399 defines the principles and methods for creating unambiguous identifications and definitions of the items and their properties relating to cutting tools in computer-sensible dictionaries to be used for reference by the information model defined in ISO 13399-1.

It is applicable to:

- the specification of data element types, their identifying, semantic and value attributes;
- the specification of item classes, their identifying and semantic attributes;
- the specification of feature classes, their identifying and semantic attributes.

It is not applicable to:

- information model for cutting tools; [ISO/TS 13399-100:2008](https://standards.iteh.ai/catalog/standards/sist/9605c5bb-fach-46af-b80f-81/cia81bcd/iso-ts-13399-100-2008)
- classifications and definitions of items and data element types relating to cutting tools;
- the association between properties and items in a classification.

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

NOTE 2 The classification of items relating to cutting tools, the definitions of items and data element types and the association of properties to items are defined in ISO 13399-2, ISO 13399-3, ISO 13399-4, ISO 13399-50 and ISO 13399-60.

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 31 (all parts), *Quantities and units*¹⁾

ISO 6093, *Information processing — Representation of numerical values in character strings for information interchange*

ISO 9735, *Electronic data interchange for administration, commerce and transport (EDIFACT) — Application level syntax rules*

1) To be replaced by ISO 80000.

ISO/IEC 10646, *Information technology — Universal Multiple-Octet Coded Character Set (UCS)*

IISO 13584-25, *Industrial automation systems and integration — Parts library — Part 25: Logical resource: Logical model of supplier library with aggregate values and explicit content*

ISO 13584-26, *Industrial automation systems and integration — Parts library — Part 26: Logical resource: Information supplier identification*

ISO 13584-42, *Industrial automation systems and integration — Parts library — Part 42: Description methodology: Methodology for structuring part families*

IEC 61360-1, *Standard data element types with associated classification scheme for electronic components — Part 1: Definitions — Principles and methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61360-1 apply.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/TS 13399-100:2008](https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-8f7cfaf81bcd/iso-ts-13399-100-2008)

<https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-8f7cfaf81bcd/iso-ts-13399-100-2008>

4 Data element type specification attributes

4.1 General

This clause explains and defines the attributes of the data element types that are used to represent properties in a reference dictionary in ISO 13399. The list of attributes is shown in Table 1. These attributes are for the identification, description and value of data element types and for the relationships between data element types.

Table 1 — List of attributes of data element types

attributes	clause number
Code	4.2.1
Version	4.2.2
Date of current version	4.2.3
Revision	4.2.4
Date of current revision	4.2.5
Preferred name	4.2.6
Synonymous name	4.2.7
Short name	4.2.8
Preferred symbol	4.2.9
Synonymous symbol	4.2.10
Definition	4.3.1
Date of original definition	4.3.2
Note	4.3.3
Remark	4.3.4
Formula	4.3.5
Figure	4.3.6
Source document of data element type definition	4.3.7
Data type	4.4.1
Value format	4.4.2
Unit of measure	4.4.3
Value list	4.4.4.
Value	4.4.4.1
Value format	4.4.4.2

4.2 Information model of a data element type

The attributes of a data element type are divided into four main groups:

- identifying attributes;
- semantic attributes;
- value attributes;
- relationship attributes.

In the following sub-clauses the attributes are specified and clarified by using information models. The information models (or entity-association diagrams) of a data element type shall be read as follows:

- from inside outwards starting with the 'Entity' in bold capital letters;
- the associated entities are indicated by ellipses;
- the association between an entity and an associated entity is shown by the line between the two ellipses;
- text beside the line between an entity and an associated entity describing the association;
- the combination of an association and an entity constituting the attribute of a data element type;
- two numerals separated by a dot indicate the occurrence of the attribute: the first digit indicates the minimum number of occurrences, the second one the maximum number of occurrences;
- associations and the corresponding occurrence indications are positioned on the same side of the association line;
- in the information models the name of the entities shall be in uppercase letters and the name of the associated entities shall be in lower case letters.



Entity:	DATA ELEMENT TYPE
Association:	known by
Associated entity:	preferred name
Attribute:	known by preferred name

NOTE The attribute is composed of the association and the relevant entity

Cardinality:	1.1 (one and only one)
--------------	------------------------

Figure 2 — Principle of information models

4.3 Data element types - Identifying attributes

4.3.1 General

In order to identify a data element type uniquely within the ISO 13399 reference dictionaries and for electronic information exchange, a language-independent combination of characters shall be used. Figure 3 shows the possible attributes of a data element used to identify a data element type.

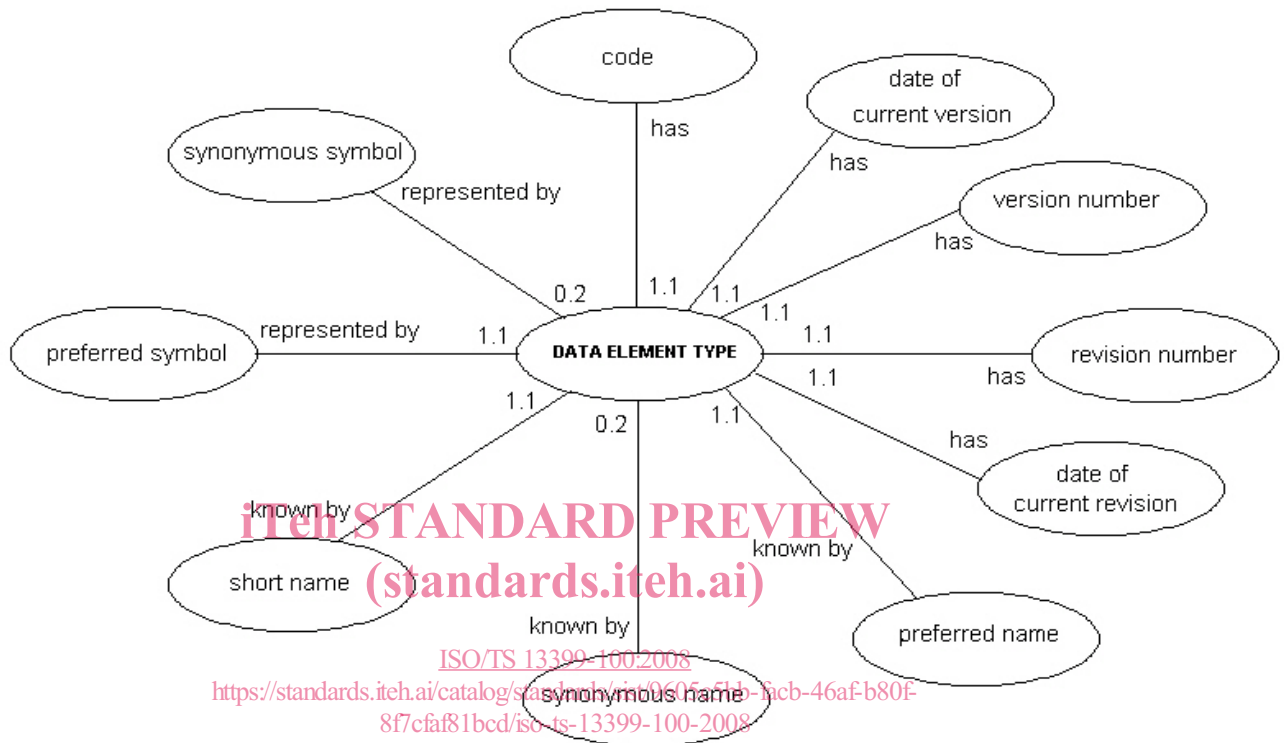


Figure 3 — Identifying attributes for a data element type

4.3.2 Code

Attribute name: code

Attribute definition: unique string of alphabetic and numeric characters.

Comments: the characters in the string shall be generated at random and should not bear any relationship with the meaning of the data element types or the structure of the dictionary. In case of a change in at least one attribute of a data element type which affects the meaning and or communication of the data element type, then a new (other) data type having a new code, shall be defined. Such attributes which affect the meaning are:

- definition;
- unit of measure;
- condition data element type;

- value format;
- data type.

Obligation: mandatory

Character type of values: upper case Latin letters A through Z (except O and I), digits 0 through 9.

4.3.3 Version number

Attribute name: version number

Attribute definition: number used to control the versions of a data element type.

Comments: the version number of a data element type shall consist of three digits. Consecutive version numbers shall be used in ascending order. A new version of the data element type shall be generated if at least one attribute of the data element type is changed which affects the use but which does not affect the meaning of that data element type. These attributes are:

- preferred name;
- short name;
- preferred symbol;
- preferred name of condition data element type;
- value meaning;
- item class.

ITh STANDARD PREVIEW
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-67cfaf81bcd/iso-ts-13399-100-2008>

Obligation: mandatory

Character type of values: digits 0 through 9.

4.3.4 Date of current version

Attribute name: date of current version

Attribute definition: calendar day on which the current version of the data element type was established

Comments: for the first version, the date is the same as the original definition. The format of the representation shall be dd-mm-ccyy, where dd is the identification number of the day in the month, mm is the identification number of the month in the year and ccyy is the identification number of the year.

Obligation: mandatory

Character type of values: digits 0 through 9

4.3.5 Revision number

Attribute name: revision number

Attribute definition: number used for the administrative control of a data element type.

Comments: the revision number of the occurrence of a data element type shall consist of three digits. Consecutive revision numbers shall be in ascending order. Only one revision number per data element type is current at any moment. A new revision number of a data element type shall be generated if an attribute of the data element type is changed which neither affects the use nor the meaning of the data element type, or when editorial changes of typing and spelling errors have been implemented. These attributes are:

- synonymous name;
- synonymous symbol;
- source document of definition;
- remark;
- spelling error in the text of the definition or note.

Obligation: mandatory

Character type of values: digits 0 through 9.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/TS 13399-100:2008](https://standards.iteh.ai/catalog/standards/sist/9605c5bb-facb-46af-b80f-8f7cfaf81bcd/iso-ts-13399-100-2008)

4.3.6 Date of current revision

Attribute name: date of current revision

Attribute definition: calendar day on which the current revision of the data element type was established

Comments: for the first entry, the date is the same as the original definition. The format of the representation shall be dd-mm-ccyy, where dd is the identification number of the day in the month, mm is the identification number of the month in the year and ccyy is the identification number of the year.

Obligation: mandatory

Character type of values: digits 0 through 9

4.3.7 Preferred name

Attribute name: preferred name

Attribute definition: single- or multi-word label to identify a data element type.

Comments: the preferred name shall be identical to the name for the same concept as used in international standards, if available.