
**Cutting tool data representation and
exchange —**

Part 150:
Usage guidelines

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

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Foreword

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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:

- 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order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn.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again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.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 13399-150 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]
- *Part 150: Usage guidelines* [Technical Specification]

Cutting tool data representation and exchange —

Part 150: Usage guidelines

1 Scope

This part of ISO 13399 gives guidelines for the application of ISO 13399 as a whole, including guidance on the instantiation of the EXPRESS schema as described in ISO 13399-1, and the use of the reference data described in ISO/TS 13399-2, ISO/TS 13399-3, ISO/TS 13399-4, ISO/TS 13399-5, ISO/TS 13399-50 and ISO/TS 13399-60.

This part of ISO 13399 does not define the terms and properties for cutting items, tool items, adaptive items assembly items, reference systems or common features and connection systems.

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 639-2, *Codes for the representation of names of languages — Part 2: Alpha-3 code*
ISO/TS 13399-150:2008

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*
<http://standards.iteh.ai/catalog/standards/iso-ts-13399-150-2008>

ISO 13584, *Industrial automation systems and integration — Parts library*

ISO 10303-21, *Industrial automation systems and integration — Product data representation and exchange — Part 21: Implementation methods: Clear text encoding of the exchange structure*

3 Usage guidelines

This section explains the usage of ISO 13399. It is divided into several subsections, each with a specific topic related to the usage of ISO 13399.

3.1 Legend

In the guidelines different style will be used to indicate different concepts related to ISO 13399. The styles used are the following:

- EXPRESS entity: *item*
- Important concepts: *concept*
- Attributes in entity context: *item.description*

IMPORTANT — The illustrations in this document are simplified and do not include all information included in a ISO 10303-21 file. The illustrations are kept as simple as possible to provide a schematic overview. Complete examples are provided in the ISO 10303-21 examples.

3.2 Fundamental assumptions

3.2.1 Item representation

In ISO 13399 the things about which information is represented are called *items*. There are four types of *items*:

- *Cutting item*
- *Tool item*
- *Adaptive item*
- *Assembly item*

In the EXPRESS-schema in ISO 13399-1 these different types of items are all represented using the entity *item*. They are differentiated through the use of *specific_item_classification*. In the schema this type of classification is used to classify the information type of an *item*.

When building an assembly of items the assembly will be of one of the types of items listed previously. This is illustrated in Figure 1.

3.2.2 Reference data library

ISO 13399 uses a reference data library based on P-Lib (ISO 13584), for definitions of classes and properties. The use of reference data enables the information model in Part 1 to stay general, while still allowing explicitly defined standardized concepts in data exchange.

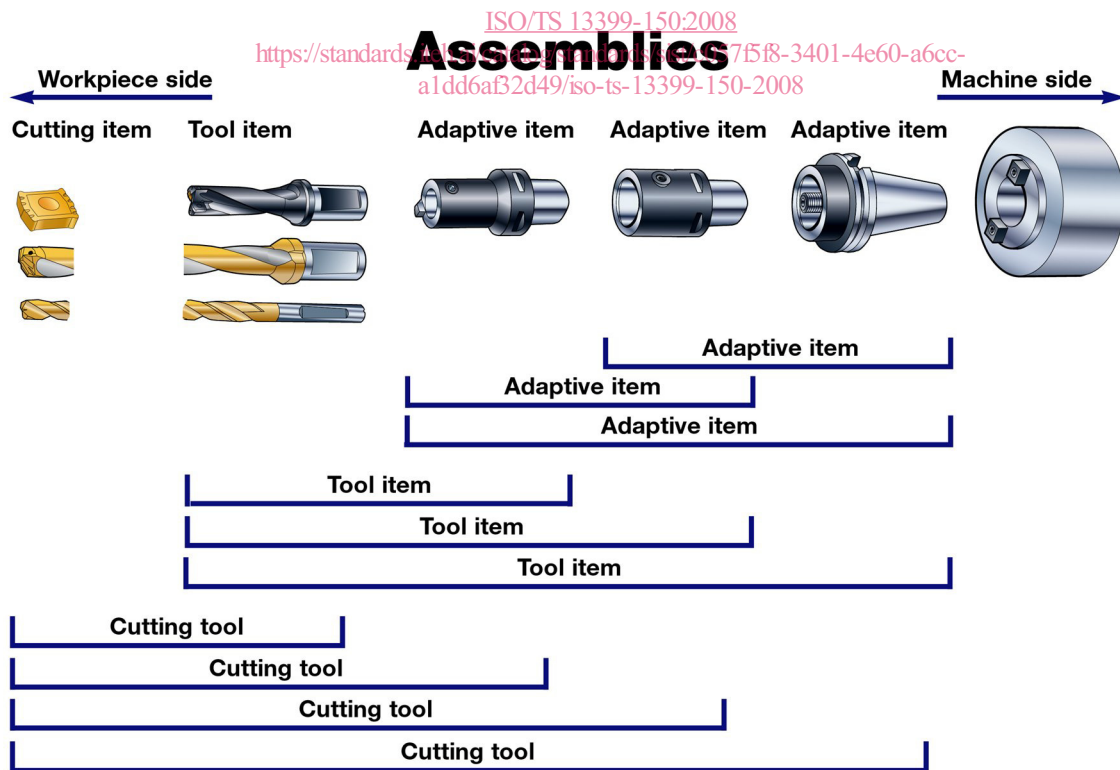


Figure 1 — Assemblies of different types of items

The current reference data library is based on ISO 13584. This will be referred to as P-Lib in this document.

When using reference data many attributes in the cutting_tool_schema are externally defined. In order not to duplicate information and create ambiguity (which is the master, the explicit data in the ISO 13399 file or the referenced data in the reference data library?), most attributes are set to "/IGNORE" when using reference data. This string tells an implementation that the data can be found in an external source. Based on the context the data that needs to be retrieved is known.

Table 1 — Description of special attribute values used in the ISO 10303-21 (or ISO 10303-28)¹⁾ file

Value	Description
"	Indicates user data managed by the sending system but not provided for data exchange.
'/NULL'	Indicates user data in a mandatory attribute that is not managed by the sending system or currently not known.
\$	\$ is used in the physical file, if an optional attribute is not instantiated.
'/IGNORE'	Attribute values are set to '/IGNORE' when the information that could be held by the attribute is instead assigned to the instance of the entity.

3.3 Representing basic item information

3.3.1 Required cutting_tool_schema entities

— item

— item_definition

— item_version

— language

— multi_language_string

— organization

— person_organization_assignment

— specific_item_classification

— string_with_language

3.3.2 Representation

Basic item information includes information about the type of item being created, identifier for the item, name of the item, organization which owns the identifier, and the basic item, item_version, and item_definition entities.

IMPORTANT — The representation for basic item information is the core representation of ISO 13399 and is an assumed starting point for all following representation descriptions.

1) *Industrial automation systems and integration — Product data representation and exchange — Part 28: Implementation methods: XML representations of EXPRESS schemas and data, using XML schemas*

The recommendation is to represent descriptions and names as `multi_language_string` in order to always have support for multiple languages. Cf. Section 3.4 Representing information in multiple languages for further details on multiple languages.

IMPORTANT — The owner of the id of an item shall be specified using a `person_organization_assignment` with a role of 'id owner'.

An example instantiation diagram of basic item information is shown below.

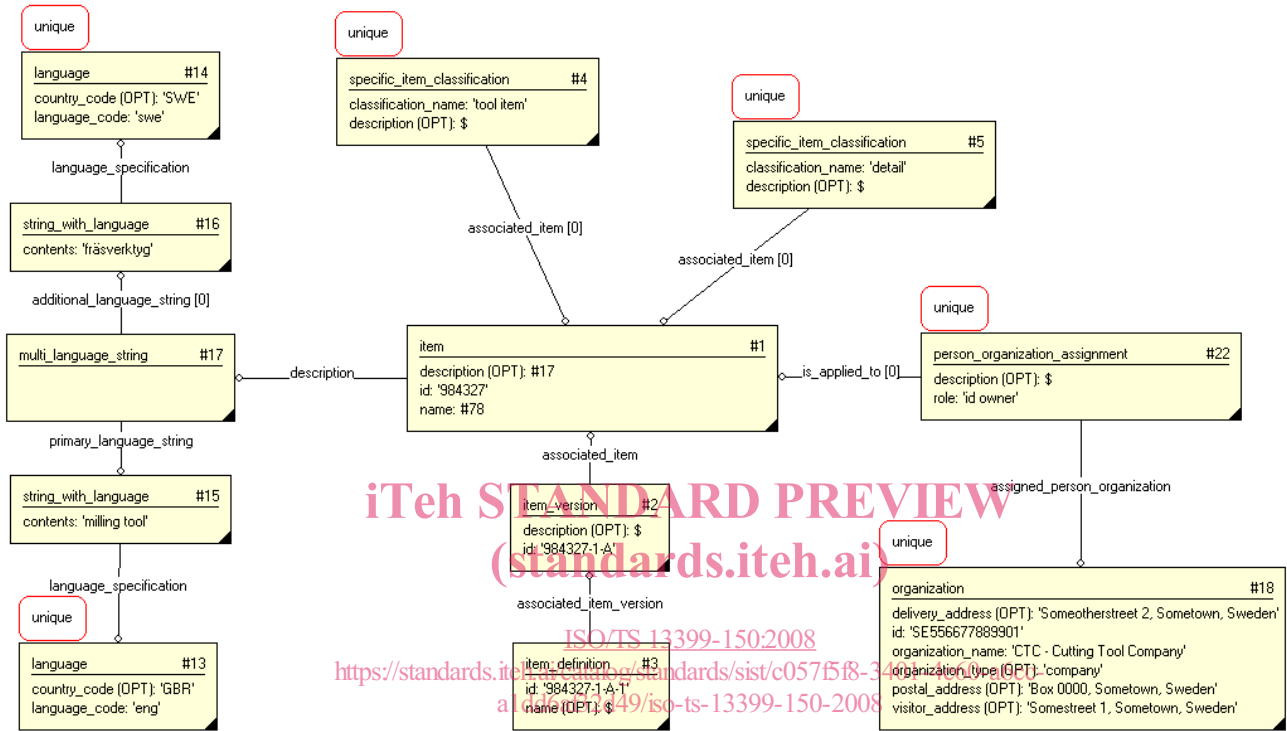


Figure 2 — Representing basic item information

An `item` will always be represented using a triplet of `item`, `item_version`, and at least one `item_definition`.

3.3.3 ISO 10303-21 example

```

ISO-10303-21;
HEADER;
FILE_DESCRIPTION(('Description'),'2;1');
FILE_NAME('Representing basic item information.p21','2007-02-20T10:52:10',
('someone'),(''),'','GraphicalInstance 1.0 Beta 5 [1.0.5.17]','');
FILE_SCHEMA(('CUTTING_TOOL_SCHEMA_ARM'));
ENDSEC;

DATA;
#1 = ITEM(#17,'984327',#78);
#2 = ITEM_VERSION(#1,$,'984327-1-A');
#3 = ITEM_DEFINITION((),#2,'984327-1-A-1',$);
#4 = SPECIFIC_ITEM_CLASSIFICATION((#1,#23,#38,#102,#99,#105,#108,#141),'tool
item',$);
#5 = SPECIFIC_ITEM_CLASSIFICATION((#1,#8,#23,#69,#102,#99,#105,#108),'detail',$);
#13 = LANGUAGE('GBR','eng');
#14 = LANGUAGE('SWE','swe');
#15 = STRING_WITH_LANGUAGE('milling tool',#13);
#16 = STRING_WITH_LANGUAGE('fr\S\dsverktyg',#14);
#17 = MULTI_LANGUAGE_STRING((#16),#15);
#18 = ORGANIZATION('Someotherstreet 2, Sometown, Sweden','SE556677889901','CTC -
Cutting Tool Company','company','Box 0000, Sometown, Sweden','Somestreet 1,
Sometown, Sweden');
#22 = PERSON_ORGANIZATION_ASSIGNMENT(#18,$,(#1,#8,#38,#69,#99,#105,#108),'id
owner');
ENDSEC;
END-ISO-10303-21;

```

3.4 Representing information in multiple languages

3.4.1 Required cutting_tool_schema entities

- language
- multi_language_string
- string_with_language

3.4.2 Representation

Multiple languages are represented using `multi_language_string`. The actual string values in different languages are represented using `string_with_language` together with a specification of the language.

- `language.language_code` shall be specified using Alpha-3 code as specified in ISO 639-2.

EXAMPLE Possible values for `language_code` are, e.g., 'eng' for English, 'fra' for French, 'rus' for Russian, 'deu' for German, or 'swe' for Swedish.

- `language.country_code` shall if used be specified using Alpha-3 code as specified in ISO 3166-1.

EXAMPLE Possible values for `country_code` are, e.g., 'GBR' for the United Kingdom, 'USA' for the United States of America, or 'SWE' for Sweden.

The language shall be unique within the information base, e.g. ISO 10303-21 file.

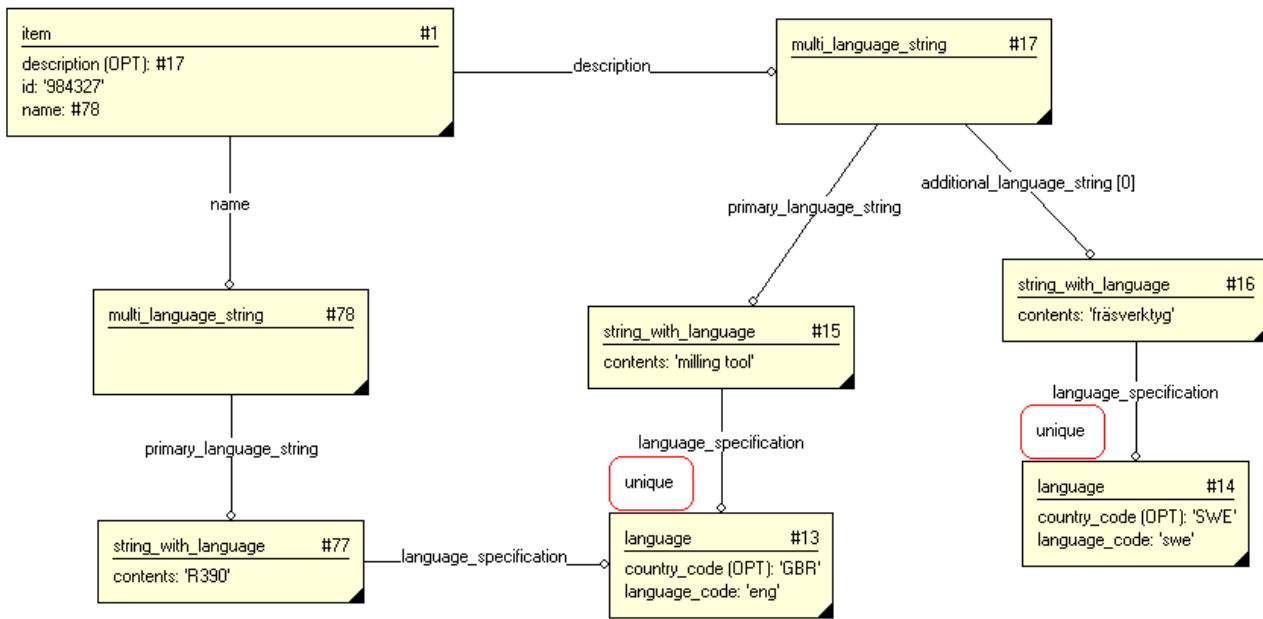


Figure 3 — Representing multiple languages for item.description

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3.4.3 ISO 10303-21 example

```

ISO-10303-21;
HEADER;
FILE_DESCRIPTION(('Description'), 2, 1);
FILE_NAME('Master Data Example.p21', 2007-02-20T10:52:10, ('someone'), (''), '',
'GraphicalInstance 1.0 Beta 5 [1.0.5.17]', '');
FILE_SCHEMA(('CUTTING_TOOL_SCHEMA_ARM'));
ENDSEC;

DATA;
#1 = ITEM(#17, '984327', #78);
#2 = ITEM_VERSION(#1, $, '984327-1-A');
#3 = ITEM_DEFINITION(( ), #2, '984327-1-A-1', #369);
#4 = SPECIFIC_ITEM_CLASSIFICATION((#1, #23, #38, #102, #99, #105, #108, #141), 'tool
item', $);
#5 = SPECIFIC_ITEM_CLASSIFICATION((#1, #8, #23, #69, #102, #99, #105, #108), 'detail', $);
#13 = LANGUAGE('GBR', 'eng');
#14 = LANGUAGE('SWE', 'swe');
#15 = STRING_WITH_LANGUAGE('milling tool', #13);
#16 = STRING_WITH_LANGUAGE('fr\S\dswerktyg', #14);
#17 = MULTI_LANGUAGE_STRING((#16), #15);
#77 = STRING_WITH_LANGUAGE('R390', #13);
#78 = MULTI_LANGUAGE_STRING(( ), #77);

ENDSEC;
END-ISO-10303-21;

```

3.5 Representing person and organization

3.5.1 Required cutting_tool_schema entities

- organization
- person
- person_in_organization
- person_organization_assignment

3.5.2 Representation

Person and organizational information may be represented for many purposes, e.g. who created the item, which supplier does the item come from. A minimum requirement is set for organizational data; the owner of the id of an item shall be specified.

IMPORTANT — The owner of the id of an item shall be specified.

For companies the id of the organization is typically assigned and controlled by national registration authorities.

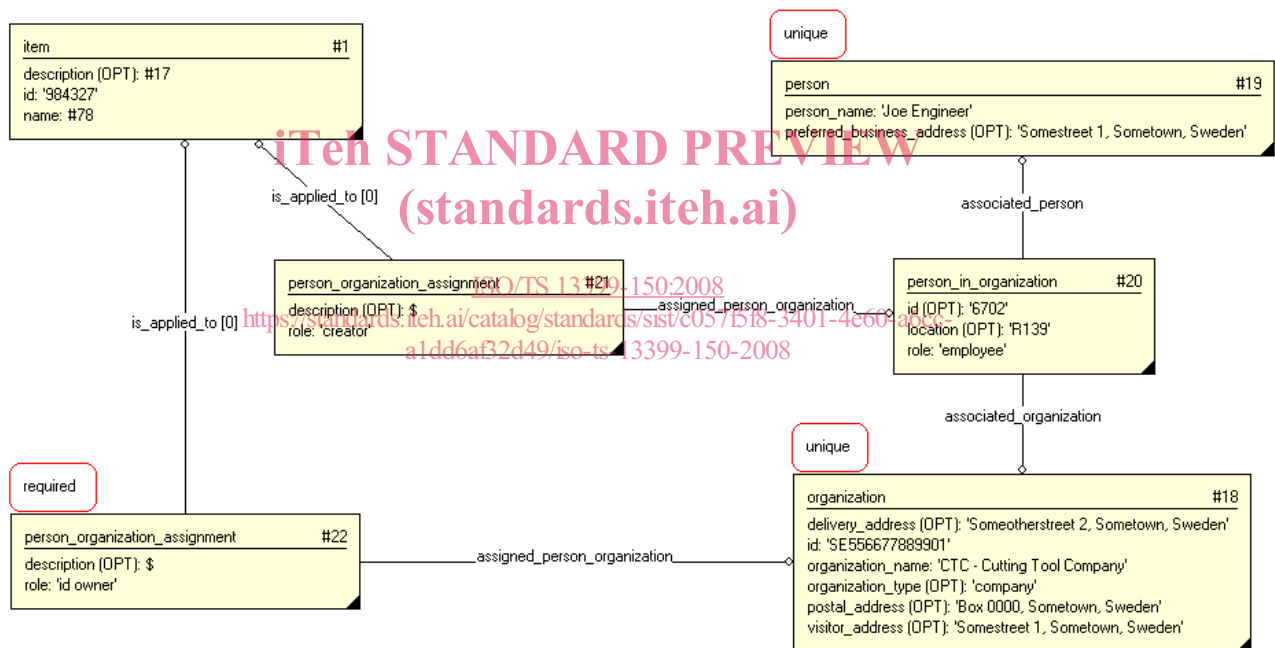


Figure 4 — Representing person and organization

Where applicable the following values shall be used in `person_organization_assignment.role`: 'author', 'classification officer', 'creator', 'custodian', 'customer', 'design supplier', 'editor', 'id owner', 'location', 'manufacturer', 'owner', 'supplier', 'wholesaler'

Depending on the need for specifying organizational data on objects, some aspects are to be considered when instantiating the `person_organization_assignment.role`:

- 'author' should mainly be used for documents.
- 'classification officer' is described in section 3.10 Representing ownership of classifications.
- 'creator' is used for all objects for defining the creator.
- 'id owner' is described in section 3.3 Representing basic item information.
- 'owner' should primarily be used for defining ownership of objects, except documents

3.5.3 ISO 10303-21 example

```
ISO-10303-21;
HEADER;
FILE_DESCRIPTION(('Description'),'2;1');
FILE_NAME('Representing person and organisation.p21','2007-02-20T10:52:10',
('someone'),(''),'','GraphicalInstance 1.0 Beta 5 [1.0.5.17]','');
FILE_SCHEMA(('CUTTING_TOOL_SCHEMA_ARM'));
ENDSEC;

DATA;
#1 = ITEM(#17,'984327',#78);
#2 = ITEM_VERSION(#1,$,'984327-1-A');
#3 = ITEM_DEFINITION((),#2,'984327-1-A-1',#369);
#4 = SPECIFIC_ITEM_CLASSIFICATION((#1,#23,#38,#102,#99,#105,#108,#141),'tool
item',$);
#5 = SPECIFIC_ITEM_CLASSIFICATION((#1,#8,#23,#69,#102,#99,#105,#108),'detail',$);
#18 = ORGANIZATION('Someotherstreet 2, Sometown, Sweden','SE556677889901','CTC -
Cutting Tool Company','company','Box 0000, Sometown, Sweden','Somestreet 1,
Sometown, Sweden');
#19 = PERSON('Joe Engineer','Somestreet 1, Sometown, Sweden');
#20 = PERSON_IN_ORGANIZATION(#18,#19,'6702','R139','employee');
#21 = PERSON_ORGANIZATION_ASSIGNMENT(#20,$,(#1),'creator');
#22 = PERSON_ORGANIZATION_ASSIGNMENT(#18,$,(#1,#8,#38,#69,#99,#105,#108),'id
owner');

ENDSEC;
END-ISO-10303-21;
```

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3.6 Representing a classification based on P-Lib

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3.6.1 Required cutting_tool_schema entities

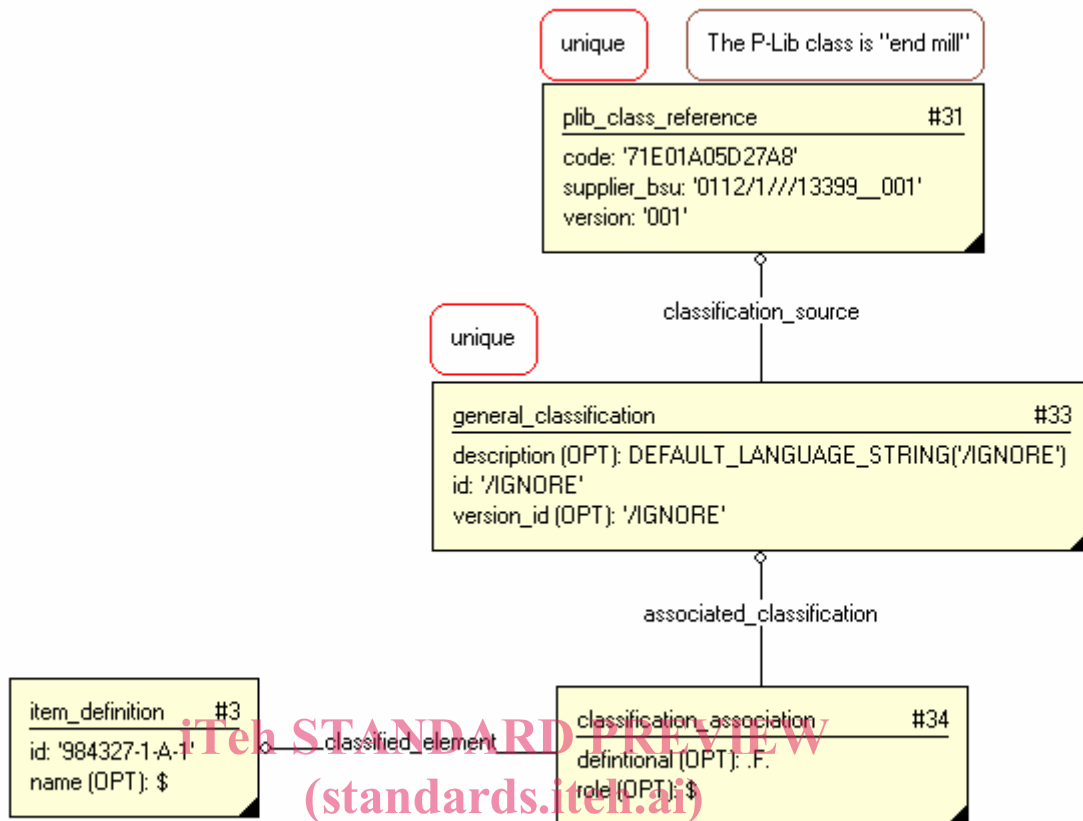
<https://standards.iteh.ai/catalog/standards/sist/c057f5f8-3401-4e60-a6cc-a1dd6aB2d49/iso-ts-13399-150-2008>

- classification_association
- general_classification
- plib_class_reference

3.6.2 Representation

ISO 13399 uses a reference data library based on P-Lib (ISO 13584), for definitions of properties and classes. In the following example all data attributes of `general_classification` are set to `"/IGNORE"`. These pieces of data shall be retrieved from P-Lib by using the `plib_class_reference.supplier_bsu` and `plib_class_reference.code` attributes. (See Section 3.2 Fundamental assumptions for an explanation)

- The `general_classification.description` attribute shall be a concatenation of the "Definition", "Note" and "Remark" from P-Lib.
- The `general_classification.id` shall be retrieved from `plib_class_reference.code`
- The `general_classification.version_id` shall be retrieved from `plib_class_reference.version`



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<https://standards.iteh.ai/catalog/standards/sist/c057f5f8-3401-4e60-a6cc-a1dd6aB2d49/iso-ts-13399-150-2008>

Figure 5 — Representing a classification based on P-Lib

The `classification_association` that assigns a `general_classification` to an *item* shall be associated to an `item_definition` of the item.

IMPORTANT — Classifications shall in general be associated to items at the `item_definition` level.

The format of the attribute `plib_class_reference.supplier_bsu` is defined in ISO 13584. For the reference data library in ISO 13399 the attribute shall be "0112/1///13399__"+library version, at the time of writing this is "001" which gives the complete string "0112/1///13399__001". ISO 13584 specifies the format for the identifier, and mandates the double underscore characters used.

IMPORTANT — The `supplier_bsu` must contain version information to be able to validate the version of the library being used when interpreting the information.