Cutting tool data representation and exchange

Part 72: Creation of documents for the standardized data exchange — Definition of properties for drawing header and their XML-data exchange

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National foreword

This Published Document is the UK implementation of ISO/TS 13399-72:2016.

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TECHNICAL SPECIFICATION

ISO/TS 13399-72

Cutting tool data representation and exchange —

Part 72:
Creation of documents for the standardized data exchange — Definition of properties for drawing header and their XML-data exchange

Représentation et échange des données relatives aux outils coupants —

Partie 72: Création de la documentation pour l'échange de données normalisées — Définition des propriétés des cartouches de plans et leur échange de données en XML

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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The committee responsible for this document is ISO/TC 29, *Small tools.*

ISO/TS 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 70: Graphical data layout — Layer settings for tool layout* [Technical Specification]

— *Part 71: Graphical data layout — Creation of documents for the standardized data exchange — Graphical product information* [Technical Specification]

— *Part 72: Creation of documents for the standardized data exchange — Definition of properties for drawing header and their XML-data exchange* [Technical Specification]

— *Part 150: Usage guidelines* [Technical Specification]

— *Part 201: Creation and exchange of 3D models — Regular inserts* [Technical Specification]

— *Part 202: Creation and exchange of 3D models — Irregular inserts* [Technical Specification]

— *Part 203: Creation and exchange of 3D models — Replaceable inserts for drilling* [Technical Specification]

— *Part 204: Creation and exchange of 3D models — Inserts for reaming* [Technical Specification]

— *Part 301: Concept for the design of 3D models based on properties according to ISO/TS 13399-3: Modelling of thread-cutting taps, thread-forming taps and thread-cutting dies* [Technical Specification]

— *Part 302: Concept for the design of 3D models based on properties according to ISO/TS 13399-3: Modelling of solid drills and countersinking tools* [Technical Specification]

— *Part 303: Creation and exchange of 3D models — Solid end mills* [Technical Specification]

— *Part 304: Creation and exchange of 3D models — Solid milling cutters with arbor hole* [Technical Specification]

— *Part 307: Creation and exchange of 3D models — End mills for indexable inserts* [Technical Specification]

— *Part 308: Creation and exchange of 3D models — Milling cutters with arbor hole for indexable inserts* [Technical Specification]

— *Part 309: Creation and exchange of 3D models — Tool holders for indexable inserts* [Technical Specification]

— *Part 311: Creation and exchange of 3D models — Solid reamers* [Technical Specification]

— *Part 312: Creation and exchange of 3D models — Reamers for indexable inserts* [Technical Specification]

— *Part 401: Creation and exchange of 3D models — Converting, extending and reducing adaptive items* [Technical Specification]

— *Part 403: Creation and exchange of 3D models — Modelling of driven tool units* [Technical Specification]

— *Part 405: Creation and exchange of 3D models — Collets* [Technical Specification]

— *Part 406: Creation and exchange of 3D models — Modelling of connection interface* [Technical Specification]

The following parts are under preparation:

— *Part 80: Creation and exchange of 3D models — Overview and principles* [Technical Specification]

— *Part 100: Definitions, principles and methods for reference dictionaries* [Technical Specification]

— *Part 305: Creation and exchange of 3D models — Modular tooling systems with adjustable cartridges for boring* [Technical Specification]

— *Part 310: Creation and exchange of 3D models — Turning tools with carbide tips* [Technical Specification]

— *Part 313: Creation and exchange of 3D models — Creation and exchange of 3D models — Burrs* [Technical Specification]

— *Part 314: Creation and exchange of 3D models — Creation and exchange of 3D models — Cartridges for indexable inserts* [Technical Specification]

— *Part 315: Creation and exchange of 3D models — Modelling of machine operated feed out tools* [Technical Specification]

Introduction

This part of ISO/TS 13399 defines the terms, properties and definitions of the drawing frame and drawing content of a computer-aided design. The purpose of this part of ISO/TS 13399 is to provide a common way of an electronic data exchange of graphical product information. However, the aim is the simplified communication during the phase of documentation — namely on the basis of 2D drawings.

Within the 2D drawing, the aim is to separate the proper product description (2D graphic) from the users specific presentation (drawing header). Most of the design orders are forced to use the individual drawing frames of the users. Therefore, a big portion of the design expenditure is used for the creation of the documentation and not for the proper problem solution.

Drawings are one of the most important communicative devices of a producing company. Besides the description of complex workpiece geometries, most cases are request for correspondent documentation, e.g. to support NC-programming or production facilities.

This part of ISO/TS 13399 defines a standardized data exchange format for documentations. Therefore, the effort for maintenance of the documentation is reduced because the product drawing of the supplier or manufacturer is merged automatically into the individual drawing frames of the end users. This concept provides advantage for both supplier/manufacturer and end user, since the particular template is centrally maintained once only.

To support a standardized electronic product data exchange, the content of drawing headers have been examined by means of their common basic elements and the applicability. The identified data fields have been consolidated and may be used for a universal application because of a unified definition of their attributes. Thus, in a defined use case, the graphical product description (2D graphic) and the descriptive data of the product (content of the drawing header) can be merged and be filed as a complete drawing documentation.

TECHNICAL SPECIFICATION   ISO/TS 13399-72:2016(E)

Cutting tool data representation and exchange —

Part 72:
Creation of documents for the standardized data exchange — Definition of properties for drawing header and their XML-data exchange

1 Scope

This part of ISO/TS 13399 defines the necessary text elements of a drawing frame and determines a standardized data exchange format. Therefore, the effort is reduced for the maintenance of documentation because the content of a drawing header is mated into a specific drawing frame by means of using XML technology and an individual mapping table. The benefit of this concept for manufacturer/supplier and end user is the advantage of a central maintenance of the appropriate templates.

This part of ISO/TS 13399 covers the following:

— identification and definition of the data fields;

— identification and definition of the structure of the data fields;

— structure of the data exchange file.

The standardization of drawing formats, e.g. drawing frame, structure of the bill of material, are outside the scope of this part of ISO/TS 13399 which is rather more intended to standardize the data exchange of the product documentations.

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

— layer settings as defined in ISO/TS 13399-70;

— structure of the tool documentation as defined in ISO/TS 13399-71;

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

— concept of the classification of cutting tool data and their properties;

— concept of the design of 2D drawings for cutting tools;

— concept of the design of 3D models for cutting tools;

— application data for the use of those cutting tools;

— information about the reconditioning of cutting tools;

— information about additional application and usage data (e.g. coolant supply).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10303-28, *Industrial automation systems and integration — Product data representation and exchange — Part 28: Implementation methods: XML representations of EXPRESS schemas and data, using XML schemas*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE   The names and the definitions of the data fields are determined. The data fields and their attributes are listed in Tables 1 and 2. Also, the data fields are put together in groups that are identical to the tags of the XML file. Fields are optional by default. In other cases, mandatory (M) or conditional (C) are set (see column "type of field" in Tables 1 and 2).

3.1 Main data

3.1.1
supplier
official name of the organization that deals with the sales and/or distribution of products and services

3.1.2
manufacturer
official name of the organization that deals with the production of products and services

Note 1 to entry: See ISO 13399-1:2006, schema: organization.organization_name.

3.1.3
drawing file
unique name of the file that files electronically the drawing content in two-dimensional directions

Note 1 to entry: This field can be specified as a file name or URL.

Note 2 to entry: See ISO 13399-1:2006, schema: external_file_id_and_location.external_id in case of file name and document_location_property.location_name + external_file_id_and_location.external_id in case of URL.

3.1.4
3D model file
unique name of either the basic 3D model or detailed 3D model file that files electronically a solid or wire frame model in three-dimensional directions

Note 1 to entry: Each of 3D model can be represented in Table 1.

Note 2 to entry: This field can be specified as a file name or URL.

Note 3 to entry: See ISO 13399-1:2006, schema: external_file_id_and_location.external_id in case of file name and document_location_property.location_name + external_file_id_and_location.external_id in case of URL.

3.1.5
geometrical data file
unique name of the file that files electronically the properties according to the specifications of ISO/TS 13399-2, ISO/TS 13399-3 and ISO/TS 13399-4

Note 1 to entry: This field can be specified as a file name or URL.

3.1.6
application data file
unique name of a file that files electronically data of cutting parameters for defined machining operations in a defined structure

Note 1 to entry: This file is outside the scope of a standardized data exchange format.

Note 2 to entry: This field can be specified as a file name or URL.

3.2 Drawing data

3.2.1
manufacturer's drawing number
numerical or alphanumerical identification for a drawing of the manufacturer's product design

Note 1 to entry: This field is mandatory.

3.2.2
drawing description 1
first line of maximum four lines of an uncoded verbal description of an object, in which the importance of the description decreases at higher line number and which is always indicated

3.2.3
drawing description 2
second line of maximum four lines of a description, in which the importance of the description decreases at higher line number and which is always indicated

Note 1 to entry: This field is mandatory.

3.2.4
drawing description 3
third line of maximum four lines of a description, in which the importance of the description decreases at higher line number and which is always indicated

3.2.5
drawing description 4
fourth and last line of maximum four lines of a description, in which the importance of the description decreases at higher line number and which is always indicated

3.2.6
drawing format
designation of a paper or drawing surface size according to ISO or any other valid national standard

3.2.7
scale
ratio of the drawing size to the real size of the object

3.2.8
drawing unit base
information about the units in which the object is drawn either in millimetres (mm) or in inches (in)

3.2.9
drawing design date
calendar date when the object had been recorded by design or drawing at the first time and which cannot be changed even if the object had been later modified

3.2.10
drawing designer name
name of that person responsible for the design and drawing of the object

3.2.11
drawing approved date
calendar date when the object had been checked by design or drawing at the first time and which cannot be changed even if the object had been later modified

3.2.12
drawing approver name
name of that person responsible for the first check of the object

3.3   Revision data

3.3.1
revision number
sequential differentiation of an object with the same content but different change conditions

Note 1 to entry: This field is conditional (mandatory in case revision > 0).

3.3.2
revision change number
identifier for the descriptive content of a modification

3.3.3
revision change description
textual subsumption of the modifications done on the object

3.3.4
revision date
calendar date when the revision took place on the object

3.3.5
revision designer name
name of that person responsible for the revision of the object

3.4   Item data

3.4.1
item ID
unique identification for an item

Note 1 to entry: See ISO 13399-1:2006, schema: item.id.

3.4.2
item name
manufacturer's name of an item

Note 1 to entry: See ISO 13399-1:2006, schema: item.name.

3.4.3
item description
manufacturer's description of an item

Note 1 to entry: See ISO 13399-1:2006, schema: item.description.

3.4.4
item replacement for
name of the item that is replaced

3.5   Customer data

3.5.1
customer name
linguistic common or copyright protected name of the recipient of an item or a service

3.5.2
customer ID
unique identifier of the receiver of an item or a service created by the manufacturer or supplier

3.5.3
customer item ID
customer unique identifier of an item delivered by the manufacturer or supplier

3.5.4
customer drawing number
customer unique identifier of the drawing delivered by the manufacturer or supplier

3.5.5
customer workpiece description
naming or another useful description of a workpiece integrated into a manufacturing process of the end user

3.5.6
customer workpiece number
unique identifier of a workpiece integrated into a manufacturing process of the end user

3.5.7
customer cost centre
unique identifier according to balance for a differentiated department of the recipient of an object or a service where the object or the service is covered by means of bookkeeping

3.5.8
customer supplier number
identifier for a manufacturer or supplier created by the end user

3.5.9
customer country
country where the customer receives the information at the first delivery of the custom solution product

3.6 Process data

3.6.1
process description
naming or another useful description of a defined working process

3.6.2
process number
unique identifier of a defined working process

3.6.3
process station name
naming or another useful description of a local working place where a defined work sequence takes place

3.6.4
process station number
unique identifier of a local working place where a defined work sequence takes place

3.6.5
machine tool number
unique identifier of a machine tool where the tool is used

3.6.6
workpiece material
naming or another useful description of the material the workpiece component is made of

3.7 Bill of material (BOM) data

3.7.1
BOM item ID
unique identification for the item in the bill of material

Note 1 to entry: See ISO 13399-1:2006, schema: item.id.

3.7.2
BOM item name
manufacturer's name of the item in the bill of material

Note 1 to entry: See ISO 13399-1:2006, schema: item.name.

3.7.3
BOM item description
manufacturer's description of the item in the bill of material

Note 1 to entry: See ISO 13399-1:2006, schema: item.description.

3.7.4
BOM item position
unique identifier for the sequential ordering of the assembly part within the bill of material of the object

3.7.5
BOM item pieces
amount of the part which is assembled in the object

3.7.6
BOM item kind
coded identifier for the kind of the part

Note 1 to entry: Indicator for the lifetime of the BOM item is shorter than the lifetime of the item.

Note 2 to entry: The following entries are allowed:

— " " = no specification;

— W = wear part.

3.7.7
BOM item attribute
coded identifier for the classification of the item in the bill of material

Note 1 to entry: The following entries are allowed:

— A = accessory (e.g. screwdriver);

— B = body;

— F = fixed part (not replaceable);

— I = insert;

— S = spare part (e.g. screw, clamp, etc.).

3.7.8
BOM item included
coded identifier for whether the component is part of the delivery or not

Note 1 to entry: The following entries are allowed:

— F = functional required;

— R = required;

— O = optional.

3.7.9
BOM item material
naming or another useful description of the material the assembly part is made of

3.7.10
BOM item size description
naming or another useful description of size of a component of the bill of material which is not the real measure of that component

3.7.11
BOM item drawing number
numerical or alphanumerical identification for a drawing of the component in the bill of material

3.7.12
BOM customer item ID
customer unique identifier of the item in the bill of material

Note 1 to entry: The item is delivered by the manufacturer or supplier.

3.7.13
BOM item note
remark additional to the item in the bill of material

4   Additional remark to the item in the bill of material

4.1   General

Tables 1 and 2 list the data fields with their identification numbers, sizes and foreign-language names, as defined in Clause 3.

4.2   Data fields of the XML structure

Table 1 lists the possible fields of the drawing header.

Table 1 — Data fields for the drawing frame — Drawing header fields

Field ID number	Type of field	English name	French name	Number of characters
		Main-Data	**Données principales**	
ID10000	O	Supplier	Fournisseur	50
ID10001	M	Manufacturer	Fabricant	50
ID10002	O	Drawing file	Plan	100
ID10003	O	3D basic model file	Modèle 3D	100
ID10006	O	3D detailed model file	Modèle 3D détaillé	100
ID10004	O	Geometrical data file	Fichier des données géométriques	100
ID10005	O	Application data file	Fichier des données d'application	100
		Drawing-Data	**Informations du plan**	
ID12000	M	Manufacturer's drawing number	Numéro de plan fabricant	50
ID12001	M	Drawing description 1	Description 1 du plan	50
ID12002	O	Drawing description 2	Description 2 du plan	50
ID12003	O	Drawing description 3	Description 3 du plan	50
ID12004	O	Drawing description 4	Description 4 du plan	50
ID12005	M	Drawing format	Format du plan	10
ID12006	M	Scale	Echelle	10

M   mandatory

C   conditional

O   optional

Table 1 *(continued)*

Field ID number	Type of field	English name	French name	Number of characters
		Main-Data	**Données principales**	
ID12007	M	Drawing unit base	Unité de base du plan	2
ID12008	M	Drawing design date	Date de création du plan	10
ID12009	M	Drawing designer name	Nom du créateur du plan	50
ID12010	M	Drawing approved date	Date de vérification du plan	10
ID12011	M	Drawing approver name	Nom du vérificateur du plan	50
		Revision-Data	**Informations de révision**	
ID12100	C	Revision number	Indice de version	40
ID12101	O	Revision change number	Indice de révision	40
ID12102	O	Revision change description	Description de la modification	500
ID12103	C	Revision date	Date de révision	10
ID12104	C	Revision designer name	Nom du créateur de la révision	50
		Item-Data	**Données du objet**	
ID13000	M	Item ID	Numéro du objet	50
ID13001	M	Item name	Numéro de catalogue	50
ID13002	O	Item description	Description de la commande	100
ID13003	O	Item replacement for	Remplacé par	50
		Customer-Data	**Zone de données client**	
ID21000	O	Customer name	Nom du client	50
ID21001	O	Customer ID	Numéro client	20
ID21002	O	Customer item ID	Numéro d'outil client	50
ID21003	O	Customer drawing number	Numéro de plan du client	50
ID21004	O	Customer workpiece description	Description client de la pièce à usiner	50
ID21005	O	Customer workpiece number	Numéro client de la pièce à usiner	50
ID21006	O	Customer cost centre	Centre de coût client	10
ID21007	O	Customer supplier number	Numéro fournisseur du client	30
ID21008	O	Customer country	…	30
		Process-Data	**Données du procédé**	
ID22000	O	Process description	Description du procédé	100
ID22001	O	Process number	Numéro du procédé	40
ID22002	O	Process station name	Nom de la station du procédé	50
ID22003	O	Process station number	Numéro de la station du procédé	40
ID22004	O	Machine tool number	Numéro de machine	50
ID22005	O	Workpiece material	Matière à usiner	50
M mandatory				
C conditional				
O optional				

Table 2 lists the possible fields of the bill of material.

Table 2 — Data fields for the drawing frame — Bill of material fields

Field ID number	Type of field	English name	French name	Number of characters
		Bill of material data (BOM-Data)	**Nomenclature**	
ID31000	O	BOM item position	Position de nomenclature	5
ID31001	O	BOM item pieces	Nombre de pièce de nomenclature	3
ID31002	O	BOM item description	Désignation de nomenclature	100
ID31003	O	BOM item material	Matière de nomenclature	50
ID31004	O	BOM item name	Numéro de produit de nomenclature	50
ID31005	O	BOM customer item ID	Numéro de nomenclature client de la pièce	50
ID31006	O	BOM item size_description	Description de nomenclature	30
ID31007	O	BOM item kind	Nom de la pièce de nomenclature	1
ID31008	O	BOM item attribute	Attribut de nomenclature	1
ID31009	O	BOM item included	Partie de nomenclature incluse dans la livraison	1
ID31010	O	BOM item drawing number	Numéro de plan de nomenclature	30
ID31011	O	BOM item ID	...	50
ID31012	O	BOM item note	...	200
O optional				

4.3 Special data field

Table 3 lists data fields not contained in the drawing frame structure, but necessary for the data exchange using XML schemas.

Table 3 — Special data fields for XML data exchange

Field ID number	Type of field	English name	French name	Number of characters
DATE	M	Document creation date	Date de création le document	10
M mandatory				

5 XML file

5.1 General

XML documents include an XML instruction with the element name "xml" at the beginning of the file to define the type of document, followed by the version number "1.0" according to ISO 10303-28 and additional attributes. This results with the following determination:

```
<?xml version="1.0" encoding="UTF-8"?>
```
The document-type definition (DTD) is shown in Annex B.

5.2 XML tags

All XML tags determined in 5.5 shall have a start and an end element, which shall match exactly by name.

EXAMPLE   begin element   `<tag name>`

                     end element   `</tag name>`

5.3 Root element

Every XML document contains exactly one XML tag playing the role of the root element that covers all other elements. Elements covered by the root element are named "Child-elements".

EXAMPLE   For Child-elements *"Element 1"* and Child-element *"Element 2"*:

```
<root element>
    Element 1
    Element 2
</root element>
```

The number of elements covered by the root element shall be arbitrary. The number of sub-elements covered by the elements shall be open as well.

5.4 Data element

XML tags that contain values shall have a start element and an end element as well.

EXAMPLE 1   For the value *"information"*:

```
<tag-name>information</tag-name>
```

For a better description or understanding, it is allowed to add attributes to the elements which shall be covered by quotation marks.

EXAMPLE 2   For the attribute to describe an element:

```
<tag-name Desc="Description">information</tag-name>
```

5.5 XML schema determinations

5.5.1 XML tag <Admin-Data>

The reproduction of automatically calculated information of administration shall be necessary for a proper documentation and transparent traceability.

At the current time, this block contains the data field "document creation date" with its field-ID number "DATE" solely.

EXAMPLE

```
<Admin-Data>
    <DATE Desc_EN="Document creation date" FORMAT="YYYY-MM-DD">2013-10-30</DATE>
</ Admin-Data>
```

5.5.2 XML tag <Tool>

All information necessary for the creation of the document of one object shall be covered by the XML tag "Tool" within the XML file. This enables a clear differentiation between different information blocks if the XML file shall be extended later.

5.5.3 XML tag <Main-Data>

The XML tag "Main-Data" encapsulates all general data of a documentation drawing. The individual data elements are defined with their field-ID numbers "ID10###". The additional included attribute "Desc_xx=" (description) shall improve the readability.

EXAMPLE   `<ID10000 Desc_EN="Supplier" Desc_FR=" Fournisseur">`**`supplier name`**`</ ID10000>`

If the entries of ID10000 "supplier" and ID10001 "manufacturer" are identical, the data element ID10000 shall be omitted.

5.5.4 XML tag <Drawing-Data>

The XML tag "Drawing-Data" contains all the information necessary to fill out the drawing header. The necessary revision data shall be covered with the XML child-tag "Revision-Data", if applicable.

EXAMPLE

```
<Drawing-Data>
    <ID12000 Desc_EN="Manufacturer's drawing number">PCLCR2525M12</ID12000>
    <ID12001 multilang="true" Desc_EN="Drawing description 1">
        <Text lang="en">turning tool</Text>
    </ID12001>
    <ID12002 multilang="true" Desc_EN="Drawing description 2">
        <Text lang="en">style L</Text>
    </ID12002>
    <ID12003 multilang="true" Desc_EN="Drawing description 3">
        <Text lang="en">offset</Text>
    </ID12003>
    <ID12004 multilang="true" Desc_EN="Drawing description 4">
        <Text lang="en">#</Text>
    </ID12004>
    <ID12005 Desc_EN="Drawing format">A3</ID12005>
    <ID12006 Desc_EN="Scale">1:1</ID12006>
    <ID12007 Desc_EN="Drawing unit base">mm</ID12007>
    <ID12008 Desc_EN="Drawing design date" Format="YYYY-MM-DD">2006-03-06</ID12008>
    <ID12009 Desc_EN="Drawing designer name">Designer</ID12009>
    <ID12010 Desc_EN="Drawing approved date" Format="YYYY-MM-DD">2006-03-06</ID12010>
    <ID12011 Desc_EN="Drawing approver name">Admin</ID12011>
</Drawing-Data>
```

The block "Drawing-Data" appears once in the XML file. Data elements not necessarily needed for the creation of the drawing header are allowed to be listed as optional.

5.5.5 XML tag <Revision-Data>

Necessary modification notices of a drawing documentation shall be grouped and exchanged within the XML tag "Revision-Data".

EXAMPLE

```
<Revision-Data>
    <ID12100 Desc_EN="Revision number">11</ID12100>
    <ID12101 Desc_EN="Revision change number">ECN123456</ID12101>
    <ID12102 multilang="true" Desc_EN="Revision change description">
        <Tet lang="en">change rake angle to -6°</Text>
    </ID12102>
    <ID12103 Desc_EN=" Revision date" Format="YYYY-MM-DD">2007-10-04</ID12103>
    <ID12104 Desc_EN="Revision designer name">Sysadmin2</ID12104>

</Revision-Data>
```

The block "Revision-Data" appears also once in the XML file. Its use is mandatory only if revision data are exchanged.

5.5.6 XML tag <Item-Data>

The XML tag "Item-Data" is mandatory for the XML file because the data shall be used for the identification of the item, which is documented.

EXAMPLE

```
<Item-Data>
    <ID13000 Desc_EN="Item ID">123456789012345678</ID13000>
    <ID13001 Desc_EN="Item name">R220.70-8160-09-10</ID13001>
    <ID13002 Desc_EN="Item description">Milling cutter</ID13002>
```

```
        <ID13003 Desc_EN="Item replacement for">123456789012345677</ID13003>
    </Item-Data>
```

Beside the correct fill out of the drawing header, this data shall also be used, e.g. for an automated ordering process within ERP systems.

NOTE   The value of the data element ID13000 is also used as the identification number of the product within the inventory control system.

5.5.7   XML tag <Customer-Block>

The XML tag "Customer-Block" covers information needed for the user-specific file generation of a documentation drawing. The information is subdivided into the child-tags "Customer-Data" and "Process-Data".

The "Customer-Block" shall be used solely for the creation of customer specific documentations and therefore shall be necessary essential for special custom solution tool or OEM equipment.

```
            <Customer-Block>

                + <Customer-Data>

                + <Process-Data>

            </Customer-Block >
```

Figure 1 — Structure of the Customer-Block

5.5.8   XML tag <Customer-Data>

The XML tag "Customer-Data" contains information about the user and about the usage of the product documented.

EXAMPLE

```
    <Customer-Data>
        <ID21000 Desc_EN="Customer name">Automotive Company</ID21000>
        <ID21001 Desc_EN="Customer ID">080862</ID21001>
        <ID21002 Desc_EN="Customer item ID">F9-123456</ID21002>
        <ID21003 Desc_EN="Customer drawing number">98 765 4321</ID21003>
        <ID21004 multilang="true" Desc_EN="Customer workpiecedescription">
                <Text lang="en">engine block</Text>
        </ID21004>
        <ID21005 Desc_EN="Customer workpiece number">123 456 789</ID21005>
        <ID21006 Desc_EN="Customer cost centre">2255</ID21006>
        <ID21007 Desc_EN="Customer supplier number">5002365</ID21007>
        <ID21008 Desc_EN="Customer country">Zimbabwe</ID21008>
    <Customer-Data>
```

Normally, this information is unknown for the manufacturer/supplier. Therefore, the user has maintained these data for his documentation. For the delivery of special customer tools, the user can provide the necessary data.

5.5.9   XML tag <Process-Data>

The XML tag "Process-Data" contains information about the application of the documented product within the manufacturing process.

EXAMPLE

```
    <Process-Data>
        <ID22000 multilang="true" Desc_EN="Process description">
                <Text lang="en">Cylinder head valve seat</Text>
        </ID22000>
        <ID22001 Desc_EN="Process number">OP10</ID22001>
        <ID22002 multilang="true" Desc_EN="Process station name">
                <Text lang="en">Transfer line 8</Text>
```

```
        </ID22002>
        <ID22003 Desc_EN="Process station number">6543</ID22003>
        <ID22004 Desc_EN="Machine tool number">02468</ID22004>
        <ID22005 Desc_EN="Workpiece material">41 CrMo 4V</ID22005>
    </Process-Data>
```

5.5.10 XML tag <Sparepart-Data>

The XML tag "Sparepart-Data" covers all the XML tags "BOM", which describe the assembly parts and mounting parts used in the documented product.

<Sparepart-Data>

+<BOM>

+<BOM>

+<BOM>

+...

</ Sparepart-Data>

Figure 2 — Structure of the Sparepart-Data

There are as many as needed XML tag "BOM". If the documented product does not have any assembly parts, the entire XML tag shall be omitted.

5.5.11 XML tag <BOM>

The XML tag "BOM" contains the information of exactly one assembly or mounting part.

EXAMPLE

```
<BOM>
    <ID31000 Desc_EN="BOM item position">1</ID31000>
    <ID31001 Desc_EN="BOM item pieces">1</ID31001>
    <ID31002 multilang="true" Desc_EN="BOM item description">
        <Text lang="en">shim</Text>
    </ID31002>
    <ID31003 Desc_EN="BOM item material">#</ID31003>
    <ID31004 Desc_EN="BOM item name">T15-4ST</ID31004>
    <ID31005 Desc_EN="BOM customer item ID">12345678901234566</ID31005>
    <ID31006 Desc_EN="BOM item size_description">T15</ID31006>
    <ID31007 Desc_EN="BOM item kind">W</ID31007>
    <ID31008 Desc_EN="BOM item attribute">S</ID31008>
    <ID31009 Desc_EN="BOM item included">R</ID31009>
    <ID31010 Desc_EN="BOM item drawing number">513.201</ID31010>
    <ID31011 Desc_EN="BOM item ID">12345678901234565</ID31011>
    <ID31012 Desc_EN="BOM item note">Replacable by thinner shim</ID31012>
</BOM>
```

5.6 Structure of the XML file

The basic structure of the XML file for a drawing documentation is shown in Figure 3.

```
<?xml version="1.0" encoding="UTF-8"?>          General (5.1)
-<Tool_Data>                                    Root element (5.3)
      +<Admin-Data>                             Administration data (5.5.1)
      -<Tool>                                   Tool data (5.5.2)
            -<Main-Data>                        General information (5.5.3)

                  -<Drawing-Data>              Drawing data (5.5.4)
                        +<Revision-Data>       Revision data (5.5.5)
                    </Drawing-Data>
                    +<Item-Data)               Item data (5.5.6)
              </Main-Data>
              -<Customer-Block>                Customer information (5.5.7)
                    +<Customer-Data>           Customer data (5.5.8)
                    +<Process-Data>            Process data (5.5.9)
              </Customer-Block>
              -<Sparepart-Data>                Bill of material information (5.5.10)
                    +<BOM>                     Sparepart data (5.5.11)
                    +<BOM>
                    +<BOM>
                    …
                </Sparepart-Data>
        -</Tool>
  -</Tool_Data>
```

Figure 3 — Basic structure of an XML file

Annex A
(informative)

Example of an XML file of a turning tool

The following XML file of a tool holder with rectangular shank for indexable inserts according to ISO 5610-9 is documented as follows.

Figure A.1 — Tool holder SCLCR2020K12

XML file structure

```
<?xml version="1.0" encoding="UTF-8" ?>

<Tool_Data>
 <Admin-Data>
   <DATE Desc_EN="Document creation date" Format="YYYY-MM-DD">2013-09-30</DATE>
 </Admin-Data>
 <Tool>
   <Main-Data>
     <id10000 Desc_EN="Supplier">Tool-supplier</id10000>
     <id10001 Desc_EN="Manufacturer">Tools Ltd</id10001>
     <id10002 Desc_EN="Drawing file">75011878.dxf</id10002>

       <Drawing-data>
           <id12000 Desc_EN="Manufacturer's drawing number">123456789</id12000>


           <id12001 multilang="true" Desc_EN="Drawing description 1">
                 <Text lang="en">Tool holder</Text>
           </id12001>
           <id12002 multilang="true" Desc_EN="Drawing description 2">
                 <Text lang="en">SCLCR2020K12</Text>
           </id12002>
           <id12005 Desc_EN="Drawing format">A3</id12005>
           <id12006 Desc_EN="Drawing Scale">1:1</id12006>
           <id12007 Desc_EN="Drawing unit base">mm</id12007>
           <id12008 Desc_EN="Drawing design date" Format="YYYY-MM-DD">2006-03-06</
id12008>
           <id12009 Desc_EN="Drawing designer name">Sysadmin</id12009>
           <Revision-Data />
       </Drawing-data>

       <Item-data>
           <id13000 Desc_EN="Item ID"> 123456789012345678</id13000>
           <id13001 Desc_EN="Item name">SCLCR2020K12</id13001>
```
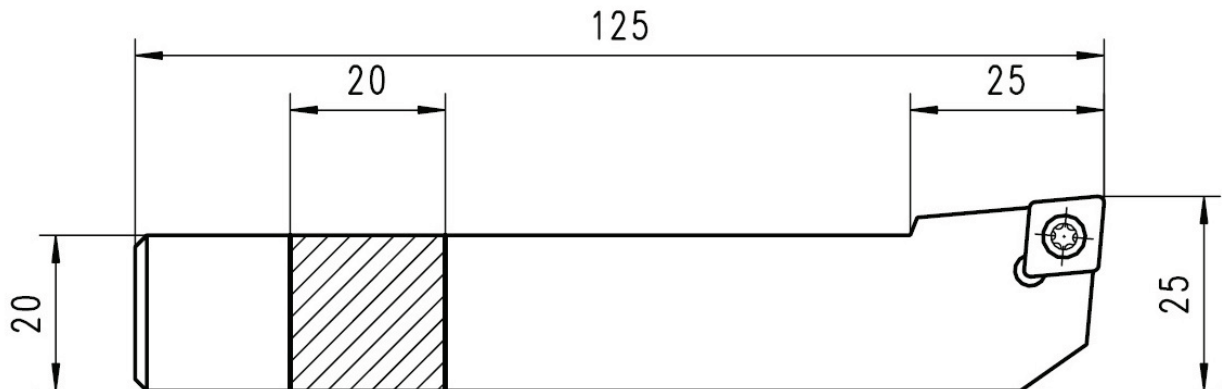
```
            <id13002 Desc_EN="Item description">Turning tool holder</id13002>
        </Item-data>
    </Main-Data>
    <Customer-Block>
        <Customer-Data />
        <Process-Data />
    </Customer-Block>
    <Sparepart-Data>
        <BOM>
            <id31000 Desc_EN="BOM item position">1</id31000>
            <id31001 Desc_EN="BOMitem pieces">1</id31001>
            <id31002 multilang="true" Desc_EN="BOM item description">
                <Text lang="en">shim</Text>
            </id31002>
            <id31004 Desc_EN="BOM item name">123.19-621</id31004>
            <id31007 Desc_EN="BOM item kind">W</id31007>
            <id31008 Desc_EN="BOM item attribute">S</id31008>
            <id31009 Desc_EN="BOM item included">R</id31009>
        </BOM>
        <BOM>
            <id31000 Desc_EN="BOM item position">2</id31000>
            <id31001 Desc_EN="BOM item pieces">1</id31001>
            <id31002 multilang="true" Desc_EN="BOM item description">
                <Text lang="en">insert screw</Text>
            </id31002>
            <id31004 Desc_EN="BOMitem name">C05012</id31004>
            <id31007 Desc_EN="BOMitem kind">W</id31007>
            <id31008 Desc_EN="BOMitem attribute">S</id31008>
            <id31009 Desc_EN="BOM item included">R</id31009>
        </BOM>
        <BOM>
            <id31000 Desc_EN="BOM item position">3</id31000>
            <id31001 Desc_EN="BOM item pieces">1</id31001>
            <id31002 multilang="true" Desc_EN="BOM item description">
                <Text lang="en">shim screw</Text>
            </id31002>
            <id31004 Desc_EN="BOM item name">CA5008</id31004>
            <id31007 Desc_EN="BOMitem kind">W</id31007>
            <id31008 Desc_EN="BOM item attribute">S</id31008>
            <id31009 Desc_EN="BOM item included">R</id31009>
        </BOM>
        <BOM>
            <id31000 Desc_EN="BOM item position">4</id31000>
            <id31001 Desc_EN="BOM item pieces">1</id31001>
            <id31002 multilang="true" Desc_EN="BOM item description">
                <Text lang="en">wrench</Text>
            </id31002>
            <id31004 Desc_EN="BOM item name">T15-2</id31004>
            <id31007 Desc_EN="BOM item kind">W</id31007>
            <id31008 Desc_EN="BOM item attribute">S</id31008>
            <id31009 Desc_EN="BOM item included">R</id31009>
        </BOM>
    </Sparepart-Data>
 </Tool>
</Tool_Data>
```

Annex B
(informative)

Structure of the XML schema

The schema of the XML basic structure is listed as follows.

```
<?xml version="1.0" encoding="UTF-8"?>

<!-- DTD created by… -->
<!ELEMENT BOM (id31000, id31001, id31002, id31003, id31004, id31005, id31006, id31007,
id31008, id31009, id31010, id31011,id31012)?>
<!ELEMENT DATE (#PCDATA)>
<!ATTLIST DATE
    Desc_EN CDATA #FIXED "Document creation date"
    FORMAT CDATA #FIXED "YYYY-MM-DD"
>
<!ELEMENT Tool (Main-Data, Customer-Block, Sparepart-Data)>
<!ELEMENT id10000 (#PCDATA)>
<!ATTLIST id10000
    Desc_EN CDATA #FIXED "Supplier"
>
<!ELEMENT id10001 (#PCDATA)>
<!ATTLIST id10001
    Desc_EN CDATA #FIXED "Manufacturer"
>
<!ELEMENT id10002 (#PCDATA)>
<!ATTLIST id10002
    Desc_EN CDATA #FIXED "Drawing file"
>
<!ELEMENT id10003 (#PCDATA)>
<!ATTLIST id10003
    Desc_EN CDATA #FIXED "3D basic model file"
>
<!ELEMENT id10004 (#PCDATA)>
<!ATTLIST id10004
    Desc_EN CDATA #FIXED "Geometrical data file"
>
<!ELEMENT id10005 (#PCDATA)>
<!ATTLIST id10005
    Desc_EN CDATA #FIXED "Application data file"
>
<!ELEMENT id10006 (#PCDATA)>
<!ATTLIST id10006
    Desc_EN CDATA #FIXED "3D detailed model file"
>
<!ELEMENT id12000 (#PCDATA)>
<!ATTLIST id12000
    Desc_EN CDATA #FIXED "Manufacturer&apos;s drawing number"
>
<!ELEMENT id12001 (#PCDATA)>
<!ATTLIST id12001
    Desc_EN CDATA #FIXED "Drawing description 1"
>
<!ELEMENT id12002 (#PCDATA)>
<!ATTLIST id12002
    Desc_EN CDATA #FIXED "Drawing description 2"
>
<!ELEMENT id12003 (#PCDATA)>
<!ATTLIST id12003
    Desc_EN CDATA #FIXED "Drawing description 3"
>
<!ELEMENT id12004 (#PCDATA)>
<!ATTLIST id12004
    Desc_EN CDATA #FIXED "Drawing description 4"
```

```
>
<!ELEMENT id12005 (#PCDATA)>
<!ATTLIST id12005
    Desc_EN CDATA #FIXED "Drawing format"
>
<!ELEMENT id12006 (#PCDATA)>
<!ATTLIST id12006
    Desc_EN CDATA #FIXED "Scale"
>
<!ELEMENT id12007 (#PCDATA)>
<!ATTLIST id12007
    Desc_EN CDATA #FIXED "Drawing unit base"
>
<!ELEMENT id12008 (#PCDATA)>
<!ATTLIST id12008
    Desc_EN CDATA #FIXED "Drawing design date"
>
<!ELEMENT id12009 (#PCDATA)>
<!ATTLIST id12009
    Desc_EN CDATA #FIXED "Drawing designer name"
>
<!ELEMENT id12010 (#PCDATA)>
<!ATTLIST id12010
    Desc_EN CDATA #FIXED "Drawing approved date"
>
<!ELEMENT id12011 (#PCDATA)>
<!ATTLIST id12011
    Desc_EN CDATA #FIXED "Drawing approver name"
>
<!ELEMENT id12100 (#PCDATA)>
<!ATTLIST id12100
    Desc_EN CDATA #FIXED "Revision number"
>
<!ELEMENT id12101 (#PCDATA)>
<!ATTLIST id12101
    Desc_EN CDATA #FIXED "Revision change number"
>
<!ELEMENT id12102 (#PCDATA)>
<!ATTLIST id12102
    Desc_EN CDATA #FIXED "Revision change description"
>
<!ELEMENT id12103 (#PCDATA)>
<!ATTLIST id12103
    Desc_EN CDATA #FIXED "Revision date"
>
<!ELEMENT id12104 (#PCDATA)>
<!ATTLIST id12104
    Desc_EN CDATA #FIXED "Revision designer name"
>
<!ELEMENT id13000 (#PCDATA)>
<!ATTLIST id13000
    Desc_EN CDATA #FIXED "Item ID"
>
<!ELEMENT id13001 (#PCDATA)>
<!ATTLIST id13001
    Desc_EN CDATA #FIXED "Item name"
>
<!ELEMENT id13002 (#PCDATA)>
<!ATTLIST id13002
    Desc_EN CDATA #FIXED "Item description"
>
<!ELEMENT id13003 (#PCDATA)>
<!ATTLIST id13003
    Desc_EN CDATA #FIXED "Item replacement for"
>
<!ELEMENT id21000 (#PCDATA)>
<!ATTLIST id21000
    Desc_EN CDATA #FIXED "Customer name"
>
<!ELEMENT id21001 (#PCDATA)>
<!ATTLIST id21001
```

```
    Desc_EN CDATA #FIXED "Customer ID"
>
<!ELEMENT id21002 (#PCDATA)>
<!ATTLIST id21002
    Desc_EN CDATA #FIXED "Customer item ID"
>
<!ELEMENT id21003 (#PCDATA)>
<!ATTLIST id21003
    Desc_EN CDATA #FIXED "Customer drawing number"
>
<!ELEMENT id21004 (#PCDATA)>
<!ATTLIST id21004
    Desc_EN CDATA #FIXED "Customer workpiece description"
>
<!ELEMENT id21005 (#PCDATA)>
<!ATTLIST id21005
    Desc_EN CDATA #FIXED "Customer workpiece number"
>
<!ELEMENT id21006 (#PCDATA)>
<!ATTLIST id21006
    Desc_EN CDATA #FIXED "Customer cost centre"
>
<!ELEMENT id21007 (#PCDATA)>
<!ATTLIST id21007
    Desc_EN CDATA #FIXED "Customer supplier number"
>
<!ELEMENT id21008 (#PCDATA)>
<!ATTLIST id21008
    Desc_EN CDATA #FIXED "Customer country"
>

<!ELEMENT id22000 (#PCDATA)>
<!ATTLIST id22000
    Desc_EN CDATA #FIXED "Process description"
>
<!ELEMENT id22001 (#PCDATA)>
<!ATTLIST id22001
    Desc_EN CDATA #FIXED "Process number"
>
<!ELEMENT id22002 (#PCDATA)>
<!ATTLIST id22002
    Desc_EN CDATA #FIXED "Process station name"
>
<!ELEMENT id22003 (#PCDATA)>
<!ATTLIST id22003
    Desc_EN CDATA #FIXED "Process station number"
>
<!ELEMENT id22004 (#PCDATA)>
<!ATTLIST id22004
    Desc_EN CDATA #FIXED "Machine tool number"
>
<!ELEMENT id22005 (#PCDATA)>
<!ATTLIST id22005
    Desc_EN CDATA #FIXED "Workpiece material"
>
<!ELEMENT id31000 (#PCDATA)>
<!ATTLIST id31000
    Desc_EN CDATA #FIXED "BOM item position"
>
<!ELEMENT id31001 (#PCDATA)>
<!ATTLIST id31001
    Desc_EN CDATA #FIXED "BOM item pieces"
>
<!ELEMENT id31002 (#PCDATA)>
<!ATTLIST id31002
    Desc_EN CDATA #FIXED "BOM item description"
>
<!ELEMENT id31003 (#PCDATA)>
<!ATTLIST id31003
    Desc_EN CDATA #FIXED "BOM item material"
>
```

```
<!ELEMENT id31004 (#PCDATA)>
<!ATTLIST id31004
    Desc_EN CDATA #FIXED "BOM item name"
>
<!ELEMENT id31005 (#PCDATA)>
<!ATTLIST id31005
    Desc_EN CDATA #FIXED "BOM customer item ID"
>
<!ELEMENT id31006 (#PCDATA)>
<!ATTLIST id31006
    Desc_EN CDATA #FIXED "BOM item size description"
>
<!ELEMENT id31007 (#PCDATA)>
<!ATTLIST id31007
    Desc_EN CDATA #FIXED "BOM item kind"
>
<!ELEMENT id31008 (#PCDATA)>
<!ATTLIST id31008
    Desc_EN CDATA #FIXED "BOM item attribute"
>
<!ELEMENT id31009 (#PCDATA)>
<!ATTLIST id31009
    Desc_EN CDATA #FIXED "BOM item included"
>
<!ELEMENT id31010 (#PCDATA)>
<!ATTLIST id31010
    Desc_EN CDATA #FIXED "BOM item drawing number"
>

<!ELEMENT id31011 (#PCDATA)>
<!ATTLIST id31011
    Desc_EN CDATA #FIXED "BOM item ID"
>
<!ELEMENT id31012 (#PCDATA)>
<!ATTLIST id31012
    Desc_EN CDATA #FIXED "BOM item note"
>
<!ELEMENT Main-Data (id10000, id10001, id10002, id10003, id10006, id10004, id10005,
Drawing-Data, Item-Data)>
<!ELEMENT Tool_Data (Admin-Data, Tool)>
<!ELEMENT Admin-Data (DATE)>
<!ELEMENT Drawing-Data (id12000, id12001, id12002, id12003, id12004, id12005, id12006,
id12007, id12008, id12009, id12010, id12011, Revision-Data)>
<!ELEMENT Process-Data (id22000, id22001, id22002, id22003, id22004, id22005)>
<!ELEMENT Item-Data (id13000, id13001, id13002, id13003)>
<!ELEMENT Customer-Data (id21000, id21001, id21002, id21003, id21004, id21005, id21006,
id21007,id21008)>
<!ELEMENT Revision-Data (id12100, id12101, id12102, id12103, id12104)>
<!ELEMENT Customer-Block (Customer-Data, Process-Data)>
<!ELEMENT Sparepart-Data (BOM+)>
```

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