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ISO 13584-1

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Industrial automation systems and integration — Parts library —

Part 1: Overview and fundamental principles

Systèmes d'automatisation industrielle et intégration — Bibliothèque de composants —

Partie 1: Aperçu et principes fondamentaux

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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 3.

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.

Attention is drawn to the possibility that some of the elements of this part of ISO 13584 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 13584-1 was prepared by Technical Committee ISO TC184, *Industrial automation systems and integration*, Subcommittee SC 4, *Industrial data.*

ISO 13584 consists of the following parts under the general title *Industrial automation systems and integration — Parts library:*

— *Part 1: Overview and fundamental principles*

— *Part 10: Conceptual description: Conceptual model of parts library*

— *Part 20: Logical resource: Logical model of expressions*

— *Part 24: Logical resource: Logical model of supplier library*

— *Part 26: Logical resource: Information supplier identification*

— *Part 31: Implementation resource: Geometric programming interface*

— *Part 42: Description methodology: Methodology for structuring part families*

— *Part 101: View exchange protocol: Geometric view exchange protocol by parametric program*

— *Part 102: View exchange protocol: View exchange protocol by ISO 10303 conforming specification*

The structure of ISO 13584 is described in ISO 13584-1. The numbering of the parts of ISO 13584 reflects its structure:

— Parts 10 to 19 specify the conceptual descriptions;

— Parts 20 to 29 specify the logical resources;

— Parts 30 to 39 specify the implementation resources;

— Parts 40 to 49 specify the description methodology;

— Parts 100 to 199 specify the view exchange protocol.

Should further parts of ISO 13584 be published, they will follow the same numbering pattern.

Annex A forms a normative part of this part of ISO 13584. Annex B is for information only.

Introduction

ISO 13584 is an International Standard for the computer-interpretable representation and exchange of parts library data. The objective is to provide a neutral mechanism capable of transferring parts library data, independent of any application that is using a parts library data system. The nature of this description makes it suitable not only for the exchange of files containing parts, but also as a basis for implementing and sharing databases of parts library data.

ISO 13584 is organized as a series of parts, each published separately. The parts of ISO 13584 fall into one of the following series: conceptual descriptions, logical resources, implementation resources, description methodology, and view exchange protocol. The series are described in this part of ISO 13584, which also provides an overview of ISO 13584 and its structure.

Industrial automation systems and integration – Parts library – Part 1: Overview and fundamental principles

1 Scope

ISO 13584 provides a representation of parts library information together with the necessary mechanisms and definitions to enable parts library data to be exchanged, used and updated. The exchange may be between different computer systems and environments associated with the complete life cycle of the products where the library parts may be used, including product design, manufacture, use, maintenance, and disposal. The standard provides a generalized structure for a parts library system and does not define a fully detailed implementable parts library system.

This part of ISO 13584 provides an overview of the ISO 13584 standard and its structure.

The following are within the scope of this part of ISO 13584:

— a summary of the content of the other parts of the ISO 13584 standard series;

— fundamental principles upon which the ISO 13584 standard is based.

The following are outside the scope of this part of ISO 13584:

— the information models defined for capturing parts library data;

— the definition of the implementation resources needed to process parts library data.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 13584. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 13584 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references the latest edition of the publication referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 10303-1:1994*, Industrial automation systems and integration — Product data representation and exchange — Part 1: Overview and fundamental principles.*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purpose of this part of ISO 13584, the following terms and definitions apply. Some of these terms and definitions are repeated for convenience from ISO 10303-1:1994.

3.1.1

abstract part
a part that is only defined by a partial specification and that cannot be materially provided by the organization that defines the specification

3.1.2

dictionary
a table consisting of a series of entries. One meaning corresponds to each entry in the dictionary and one dictionary entry identifies one single meaning

3.1.3

functional model
the library data that represent one representation category of a part in an integrated library

EXAMPLE A functional model of a precisely defined screw may consist of parametric programs which may be used to generate different geometric functional views of the screw in a CAD system database.

3.1.4

functional view
a data that represent one representation category of a part in product data

EXAMPLE The structure of a functional view corresponding to geometry is not dependent on the part to be represented. This structure is specified as a functional view class.

3.1.5

general model
library data that carries the definition and identity of a part in an integrated library

3.1.6

implementation method
a technique used by computers to exchange data that is described using the EXPRESS data specification language

NOTE Adapted from ISO 10303-1:1994.

3.1.7

information model
a formal model of a set of facts, concepts or instructions to meet a specific requirement
[ISO 10303-1:1994, definition 3.2.21]

3.1.8

integrated library
operational system consisting of a library management system and a user library

3.1.9

library data
a set of data that represents information about a set of parts

3.1.10

library data supplier
supplier
an organization that delivers a library in the standard format defined in ISO 13584 and is responsible for its content

3.1.11

library end-user
user
the user of an integrated library

NOTE The library end-user:
— consults the data contained in the library;
— selects a given part;
— requests the transmission of a selected view of this part from the library system.

3.1.12

library management system
LMS
a software system enabling the library end-user to use the content of an integrated library

NOTE This software system is not standardized.

3.1.13

library part
a part associated with a set of data that represents it in a library

3.1.14

library part data
data that represent a part in a library

3.1.15

library system
a structure designed to facilitate the storage and retrieval of parts or views of parts

3.1.16

part
a material or functional element that is intended to constitute a component of different products

3.1.17

parts library
library
an identified set of data and possibly programs which may generate information about a set of parts

3.1.18

physical part
a part that can exist in several equivalent copies and which is capable of being supplied by the library data supplier who describes the library data for this part

NOTE compare to: abstract part.

3.1.19

product
a thing or substance produced by a natural or artificial process
[ISO 10303-1:1994, definition 3.2.26]

3.1.20

representation category
an abstraction used to distinguish between various possible user requirements regarding a part representation

NOTE In the model defined in this International Standard, this distinction is formally expressed in terms of a view logical name and in terms of the view control variables.

3.1.21

resource construct
a collection of EXPRESS language entities, types, functions, rules and references that together define a valid description of data

NOTE Adapted from ISO 10303-1:1994.

3.1.22

supplier library
a set of data, and possibly of programs, for which the supplier is identified and that describes in the standard format defined in ISO 13584 a set of parts and/or a set of representations of parts

3.1.23

user library
information that results from the integration of one or more supplier libraries by the library management system and possibly from a later adaptation performed by the user

3.1.24

view control variable
a variable of enumerated type that may be associated with a view logical name and intended to further specify the perspective adopted by the user regarding a part

EXAMPLE The possible values for a view control variables for geometry are: 2D, wire frame, and solid.

3.1.25

view logical name
an identifier of a representation category corresponding to a perspective that can be adopted by a user regarding a part

EXAMPLE View logical names are for example: geometry, inertia, kinematics, etc.

3.2 Abbreviated terms

— CAD: Computer Aided Design;

— CAx: Computer Aided Tools.

NOTE The abbreviation CAx is used for all computer systems that may be used as an aid in engineering and need not include a graphic capability.

4 Overview of ISO 13584

4.1 Purpose

ISO 13584 specifies the structure of a library system which provides an unambiguous representation and exchange of computer interpretable parts library information. The data held in the library are a description that enables the library system to generate various representations of the parts held in the library.

The structure is independent of any particular computer system and permits any kind of digital representation of part representation. The structure will enable consistent implementations to be made across multiple applications and systems. Different implementation technologies may be used for the storage, accessing, transference and archiving of parts library data. Implementations of ISO 13584 can be tested for conformance to ISO 13584.

ISO 13584 does not specify the content of a supplier library. The content of a supplier library is the responsibility of the library data supplier. The library management system used in the implementation of the structure defined in ISO 13584, and any interface between this system and a user of the system is the responsibility of the library management system vendor and is not specified in ISO 13584.

4.2 Components of a library system

The components that form a library system may be split into a number of functional areas, which are illustrated in Figure 1.

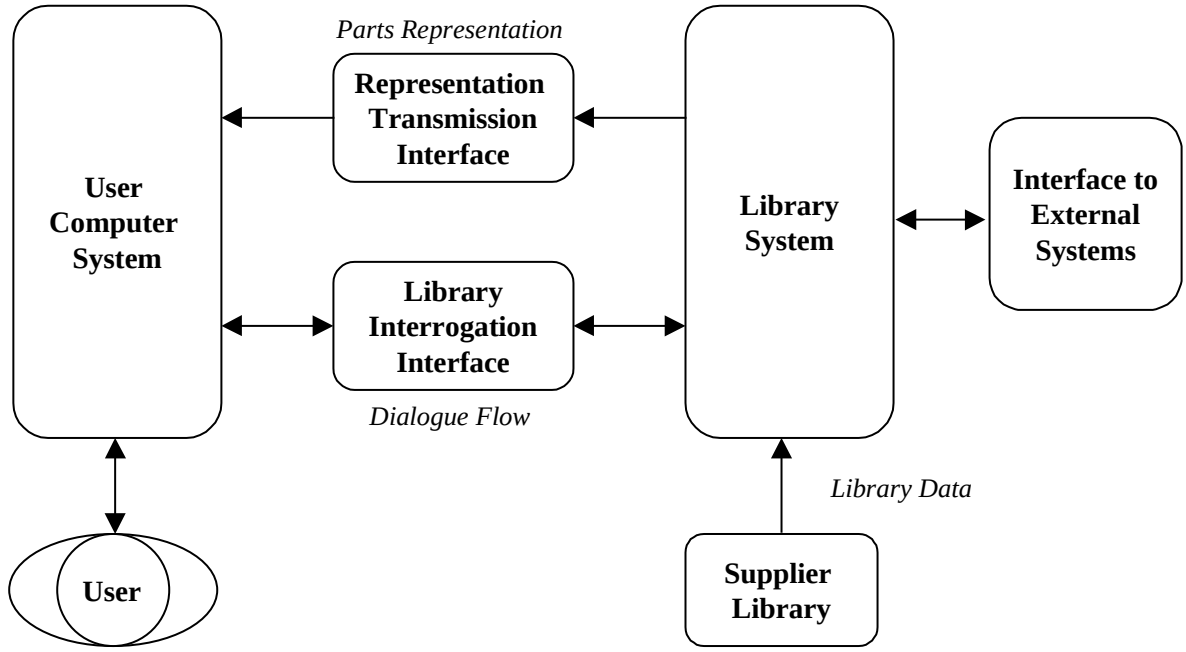

Figure 1 — Functional areas of library usage

4.2.1 User to computer system communication

The interface between the user and his computer system is not defined in this International Standard.

NOTE This would be application dependent and form part of the user interface supplied by a vendor as part of a computer system.

4.2.2 Interface to external systems

The interface between a library system specified in ISO 13584 and other software systems that are considered in ISO 13584 are the following:

— library interrogation interface (see 4.2.2.1);

— representation transmission interface (see 4.2.2.2);

— input interface for library data (see 4.2.2.3).

4.2.2.1 Library interrogation interface

The library interrogation interface is not defined in this International Standard. This International Standard specifies the data that shall be provided by a library data supplier to support user access.

NOTE A library interrogation interface includes facilities to select parts from the library and to define the orientation, position and representation category of the part selected.

4.2.2.2 Representation transmission interface

The representation transmission interface enables the library system to send parts representations to the user computer system. The representation transmission interface depends on the representation required by the user when a part is selected. Possible user requirements are modelled as representation categories. The interface used for each representation category shall be specified in the part of ISO 13584 that defines the representation category. ISO 13584 uses the formats and interfaces specified in other international standards wherever appropriate.

EXAMPLE User requirements that may be modelled in the ISO 13584 standard series as representation categories include symbolic representation and behavioural model.

In particular, a part representation that is defined according to an ISO 10303 application protocol may be exchanged together with an ISO 13584 library and transmitted to the user computer system when the corresponding part and representation category is selected by the user.

A geometric programming interface is specified in ISO 13584-31. This geometric programming interface permits the exchange of parametric shapes that describe the implicit geometry of families of parts in the format of a parametric program.

NOTE This geometric programming interface includes a FORTRAN [1] binding.

4.2.2.3 Input interface for library data

The input interface for library data enables the integration of supplier libraries within a library system. The library data shall consist of a data repository that conforms to an implementation method as specified in ISO 10303. Depending on the representation categories contained in the library, other data repositories may be provided that are in other formats. The information models of these data repositories are defined in ISO 13584-24 and in the view exchange protocol parts of ISO 13584.

4.3 Internal structure of a library system

A library system consists of a dictionary, LMS and library content as shown in Figure 2. ISO 13584 defines these modules by the requirements placed upon their functional behaviour. ISO 13584 does not standardize their implementation.

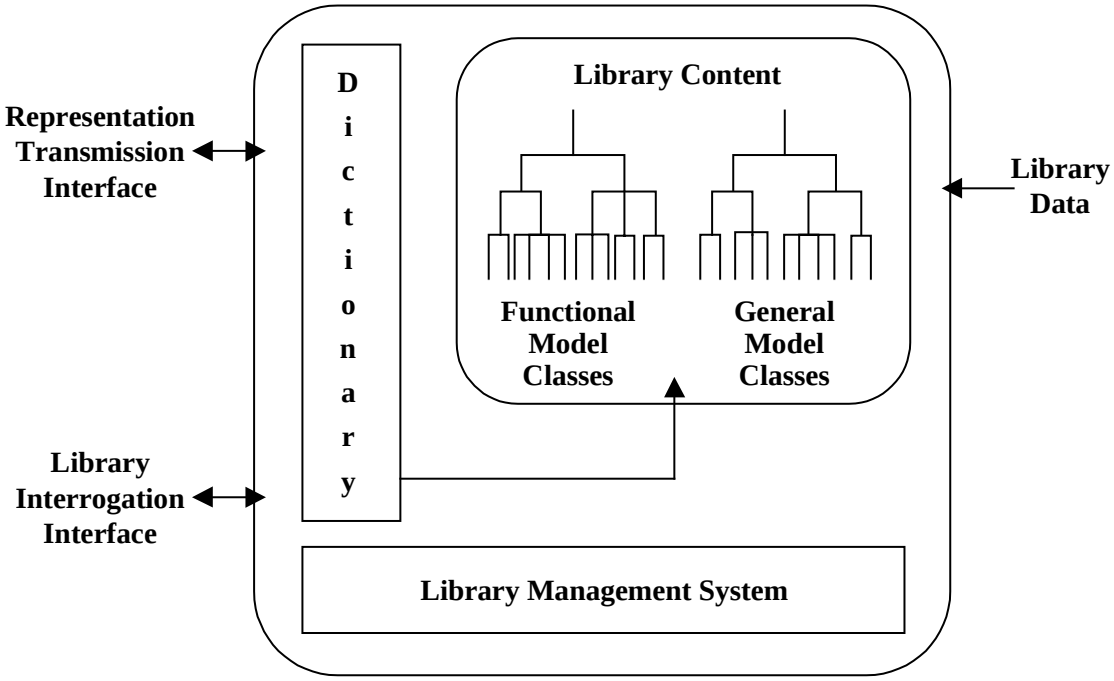

Figure 2 — Library system

4.3.1 Dictionary

The dictionary consists of a set of entries associated with a human-readable and computer-sensible representation of the meaning associated with each entry. The dictionary may be accessed by the user and referenced from library data.

The dictionary provides a referencing mechanism between library data obtained from different suppliers and enables the user to obtain an understandable view of the parts held in the library. The dictionary structure is specified in ISO 13584-42.

A supplier library may contain only dictionary entries. These entries provide computer-referable identifiers for the concepts involved in some application domain.

EXAMPLE 1 IEC 61360-4 defines dictionary entries for a large number of component properties in the electrotechnical application domain. A reference to one entry of this dictionary enables the identification of one concept whose definition is contained in IEC 61360-4.

A supplier library may contain both dictionary entries and library content. In this case, the dictionary entries provide an access path to a set of parts that may be selected by the user.

EXAMPLE 2 A supplier of parts may describe these parts as an ISO 13584 library. The dictionary provides the definitions of the components supplied and their properties. Its library content specifies each of the parts that may be provided by this supplier of parts.

4.3.2 Library management system

The library management system is a software system that enables the library end-user to use the content of an integrated library and to load data into that library.

NOTE The library management system is not standardized within ISO 13584.

4.3.3 Library content

Library data are structured into classes in accordance with the object-oriented paradigm. Three kinds of classes are considered in ISO 13584. The contents of the three kinds of classes described below may be exchanged using the structure and exchange format specified in ISO 13584:

— general model classes enable library data suppliers to provide the definitions of collections of similar parts considered as a part family;

— functional model classes enable library data suppliers to provide various representations for these collections of cognate parts;

EXAMPLE Examples of representations are geometric, schematics, and procurement data.

— functional view classes enable the specification of the kind of representation provided in the different functional model classes. Some functional view classes are standardized in the view exchange protocol series of ISO 13584. A library data supplier may also provide the definition of its own functional view class.

These three kinds of classes are illustrated in Figure 3.

A parts library is an extension of a dictionary. A dictionary only defines a hierarchy of classes and the properties associated with each class. The library content of a parts library also defines the set of instances contained within each defined class.

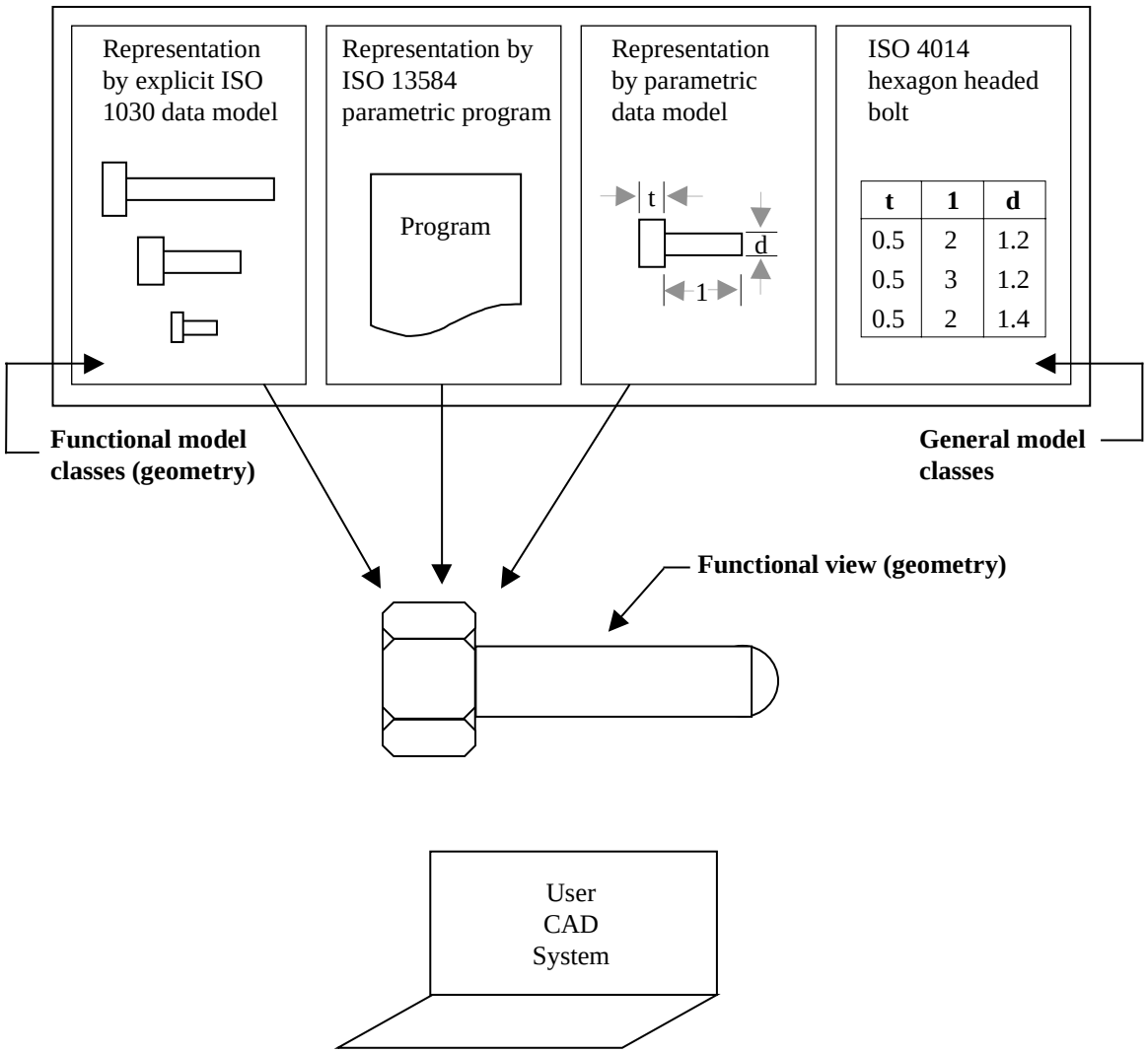

Figure 3 — Structure of library contents

When the user CAx system conforms to an ISO 10303 application protocol(s), the provisions contained in ISO 13584 ensure that it is possible from a library content to generate a functional view that conforms to an ISO 10303 application protocol.

5 Fundamental principles

ISO 13584 separates the representation of information held in a parts library from the implementation method used in data exchange.

ISO 13584 uses a formal data specification language, EXPRESS, to specify information about the structure of a library.

ISO 13584 separates information about the structure of a parts library from the information about different representations of each part or family of parts in the library. ISO 13584 permits information about part representation to be specified by different standards, and includes mechanisms which enable references to such descriptions.

EXAMPLE 1 The definition document which uses text to describe a family of parts may be exchanged using the ISO 8879 SGML [2] format. ISO 13584 is intended to permit reference to such a description.

EXAMPLE 2 The behaviour of a family of electronic parts may be exchanged using the VHDL [3] format. ISO 13584 is intended to permit the use of such a format.

ISO 13584 uses a methodology derived from the methodology defined in ISO 10303-31 for conformance testing of implementations of ISO 13584.

5.1 Fundamental concepts and assumptions

5.1.1 User requirements regarding a part representation

Data that should be generated to describe a library part within a product depends upon the user's requirements about the use of the part representation.

EXAMPLE The data that are generated in a computer aided engineering system during the functional design of an electronic circuit board are different from those generated for the representation of that part in a 2D drafting system.

5.1.2 Representation category

The user's requirements regarding a part representation may be modelled by a representation category. Within ISO 13584, each representation category:

— is identified by a view logical name and may be further qualified by view control variable values;

— is associated with an information model that specifies the data that shall be generated for each representation of a library part within a product;

NOTE Such an information model is called a functional view.

— is associated with one or more information models which specify the library data, called the functional model, required to enable the library to generate a functional view of a library part;

— is associated with a representation transmission interface that defines how a view is created from a model;

EXAMPLE In ISO 13584, the geometry perspective defined in ISO 13584-101:

— has the view logical name of ”basic_geometry” and has four view control variables (”geometrical_level”, ”detail_level”, ”variant” and ”side”);

— is intended to be represented in product model data as a geometrical view that is a representation in a manner that is consistent with ISO 10303-43;

— is associated with functional models that include parametric programs;

— requests the representation transmission interface specified in ISO 13584-31 to be implemented on the user system for the creation of geometric views from parametric programs.

5.1.3 Library model

A user library may be modelled, through the object-oriented paradigm, as hierarchies of classes. General model classes, carry the part identities and their definition properties. Functional model classes, provide for creation of the different part representations associated with the different representation categories. Both class hierarchies are organized according to the generalization/specialization relationship.

EXAMPLE 1 ISO 4014 defines a set of standardized head machine bolts. Following the object oriented paradigm, this set may be modelled as a general model class whose instances model each of the parts conforming to ISO 13584.

EXAMPLE 2 The set of data and parametric programs required to produce the geometrical views of these parts may be gathered in a class that refers to the previous class and that supports geometrical view creation of these parts.

5.1.4 Incorporation of libraries from different sources

A user parts library consists of parts libraries coming from one or more library data suppliers that are automatically incorporated in the user library. The structures and exchange format specified in ISO 13584 permits parts libraries originating from different library data suppliers to be managed consistently within the same software system.

ISO 13584 permits the description of libraries of abstract parts such as the standard parts specified in international or national standards, and libraries of physical parts, such as the parts usually described in supplier catalogues. Hence, both categories of parts may exist in a same user library and may be selected according to user needs.

5.1.5 Semantic dictionary

A dictionary, populated by library data suppliers, provides computer-referencable entries associated with each class and property defined in a supplier library. It also provides a referencing mechanism between libraries of different suppliers.

NOTE It is intended to define progressively standardized dictionary entries which may be referenced by supplier libraries. This work will be done inside different standardization committees following the methodology specified in the description methodology series of parts of ISO 13584. Standardized dictionaries will provide for multi-supplier search in a user library that contains library data from several sources.

EXAMPLE IEC 61360-4 is an example of a semantic dictionary. This dictionary was developed by IEC SC 3D.

5.1.6 Part selection

The parts described in parts libraries are intended to be selected by a library end-user and to be inserted within the model of some product. The information required to support this selection process shall be provided by the library data supplier and shall be stored in the user library.

5.2 Relationship between ISO 13584 and other standards

5.2.1 External files

An ISO 13584 conforming supplier library shall consist of one data repository conforming to an implementation method of ISO 10303. This data repository may refer to other data repositories, called external files, conforming to other Standards for part-related information. The following standards have been identified as suitable for exchange of part representation information:

— textual information: ISO 8879 (SGML);

— part model information: ISO 10303 (STEP);

IEEE 1076 (VHDL).

ISO 13584-102 specifies the information model of supplier libraries which reference files conforming to ISO 10303 application protocols.

5.2.2 Use of library parts in product data

When a part is selected from a library, data are inserted into product model of the user product modelling system. Such a user product modelling system may store data about a part in a format that conforms to an ISO 10303 application protocol. In such a case, it was a design goal of ISO 13584 that it should be possible to generate data through the transmission interface (see Figure 1) that complies with the information model of that ISO 10303 application protocol. To achieve this goal:

— an ISO 13584 library may contain part representations that conform to any of the application protocols which form part of ISO 10303;

— the geometric programming interface defined in ISO 13584-31 is specified in terms of the geometry information model defined in ISO 10303-42. The mapping onto the geometry defined in any of the application protocols of ISO 10303 is therefore straightforward.

With regard to the references between product model data and library data, three scenarios have been identified and are discussed in informative annex B. All these scenarios are compatible with the information models defined by ISO 13584.

6 Structure of the ISO 13584 series

Besides this part of ISO 13584, ISO 13584 is divided into various series of parts. Each series of parts has a unique function in ISO 13584. Each series of parts may have one or more parts.

The series are listed below with their numbering scheme:

— conceptual description — parts 10 to 19;

— logical resources — parts 20 to 29;

— implementation resources — parts 30 to 39;

— description methodology — parts 40 to 49;

— view exchange protocol — parts 101 to 199.

6.1 Conceptual descriptions

Parts of ISO 13584 that belong to the conceptual descriptions series define the global conceptual framework and mechanisms developed to allow the portability of multi-supplier and multi-representation parts libraries, for exchanging and for updating. They present a problem domain

analysis of the universe of discourse. They describe the concepts and choices made in the formulation of ISO 13584. The division of the whole task to be performed into a number of logical tasks that may be defined as a separate part of ISO 13584 is accomplished in the conceptual description series of parts. The detailed definition of a part so defined is not given in the conceptual description series of parts.

6.2 Logical resources

The information model of parts library is provided by a set of resources. Each resource is comprised of a set of data descriptions in EXPRESS, known as resource constructs. One set may be dependent on other sets for its definition. Some resources constructs from ISO 10303 may be used to define ISO 13584 resources constructs.

All the ISO 13584 resource constructs are defined in one part of the logical resources series. These resources may be used, but not modified, in a view exchange protocol.

6.3 Implementation resources

Each representation category may require a representation transmission interface to be implemented on a receiving CAx system to be able to interpret part models and to generate part views.

The implementation resources series of parts of ISO 13584 specify the standardized representation transmission interfaces which may be referenced by a view exchange protocol. Each part of this series either specifies an interface, with the requirements for its implementation, or specifies the requirements for the implementation of one interface specified in other standards.

6.4 Description methodology

The description methodology series of parts provides rules and guidelines for library data suppliers, who may be standardization organizations, parts suppliers or functional models suppliers. These rules are intended to ensure consistency of a user library. They are mandatory for the standardization committees, in charge of specifying standardized dictionary data. They provide optional guidelines for part suppliers or functional model suppliers.

6.5 View exchange protocol

Each part of the view exchange protocol series of ISO 13584 specifies one set of requirements for the exchange of one representation category of parts. Several view exchange protocols may refer to the same representation category.

A view exchange protocol may introduce different options that may be selected by an implementation. The options are termed conformance classes. In this case the requirements of the view exchange protocol are specified separately for each conformance class.

Each view exchange protocol shall contain the following:

— the definition of the view that corresponds to the representation category the view exchange protocol refers to;

— when required, the structure of the library external files that shall be used to exchange parts models corresponding to the representation category to which the views exchange protocol refers;

— the representation transmission interface or interfaces that shall be implemented on the receiving system to interpret the part models;

— one or more implementation methods from the set of implementation methods specified in ISO 10303;

— when required, the standardized dictionary entries that shall exist in the semantic dictionary of the receiving system;

— when required, the instance data, called standard data, that shall be recognized by any system that claims conformance to the view exchange protocol.

View exchange protocols are intended to be interoperable. The same supplier library exchange context may contain several view exchange protocol conforming exchanges. If the receiving system does not support some view exchange protocols or view exchange protocol conformance classes used in a supplier library exchange context, the data that correspond to these view exchange protocols or view exchange protocol conformance classes shall be ignored.

Annex A
(normative)

Information object registration

Document identification

In order to provide for unambiguous identification of an information object in an open system, the object identifier

[iso standard 13584 part (1) version (1)]

is assigned to this part of ISO 13584. The meaning of this value is defined in ISO 8824-1.

Annex B
(informative)

Use of library parts in product data

An ISO 13584 conforming exchange context provides for the exchange of library data intended to be stored in a user library.

An ISO 10303 conforming exchange context provides for the exchange of product data.

Three levels of interaction have been identified between these two levels of exchange.

Level 1: All information about a part generated in System A will be transferred to System B by means of ISO 10303 (see Figure B.1).

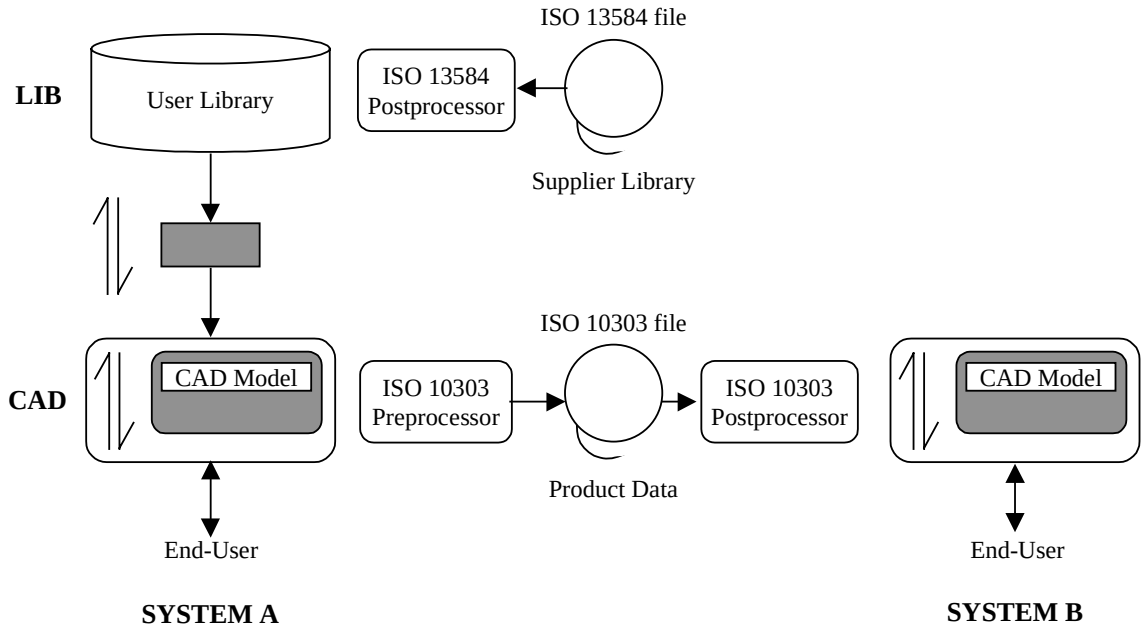

Figure B.1 — Libraries and product data exchange (level 1)

Level 2: Only that information is transferred from System A to System B which is necessary to generate the same part from a Library 2 of the receiving System B at the required position and orientation. Library 1 and Library 2 both contain all the information about the part (see Figure B.2).

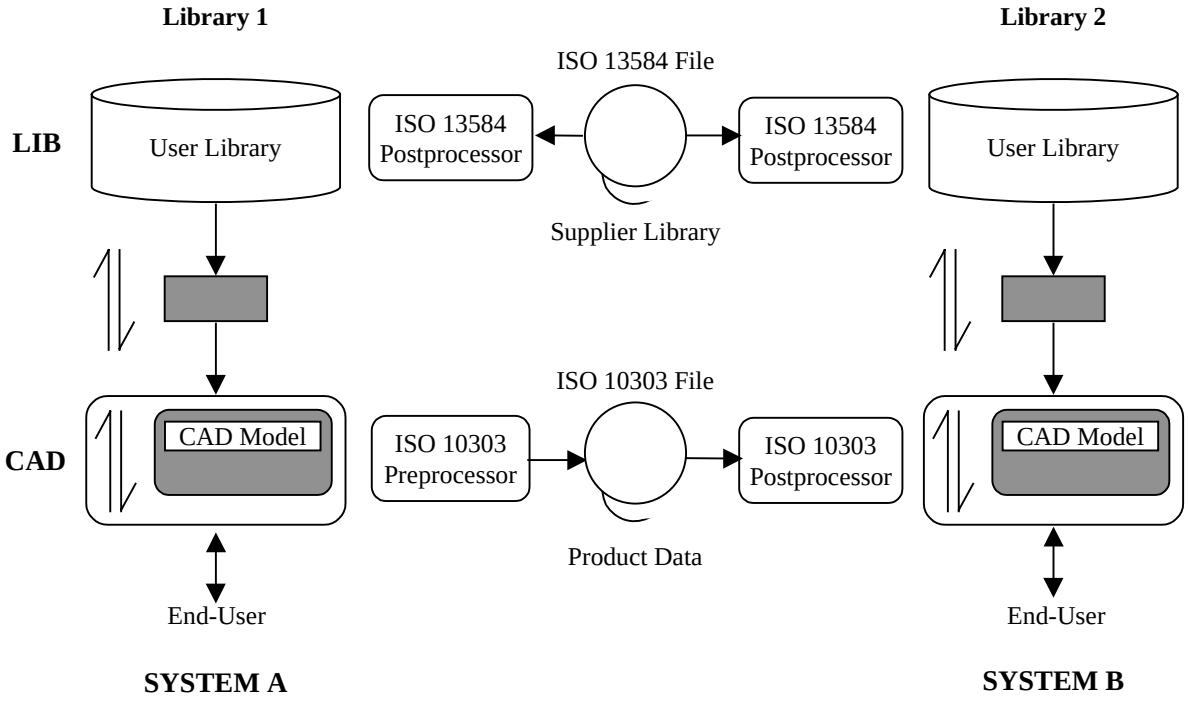

Figure B.2 — Libraries and product data exchange (level 2)

Level 3: That information is transferred from System A to System B which is necessary to generate the same part information on the receiving System B without any assumption about the content of Library 2. This means that the transferred data also contains a subset of Library 1 (see Figure B.3).

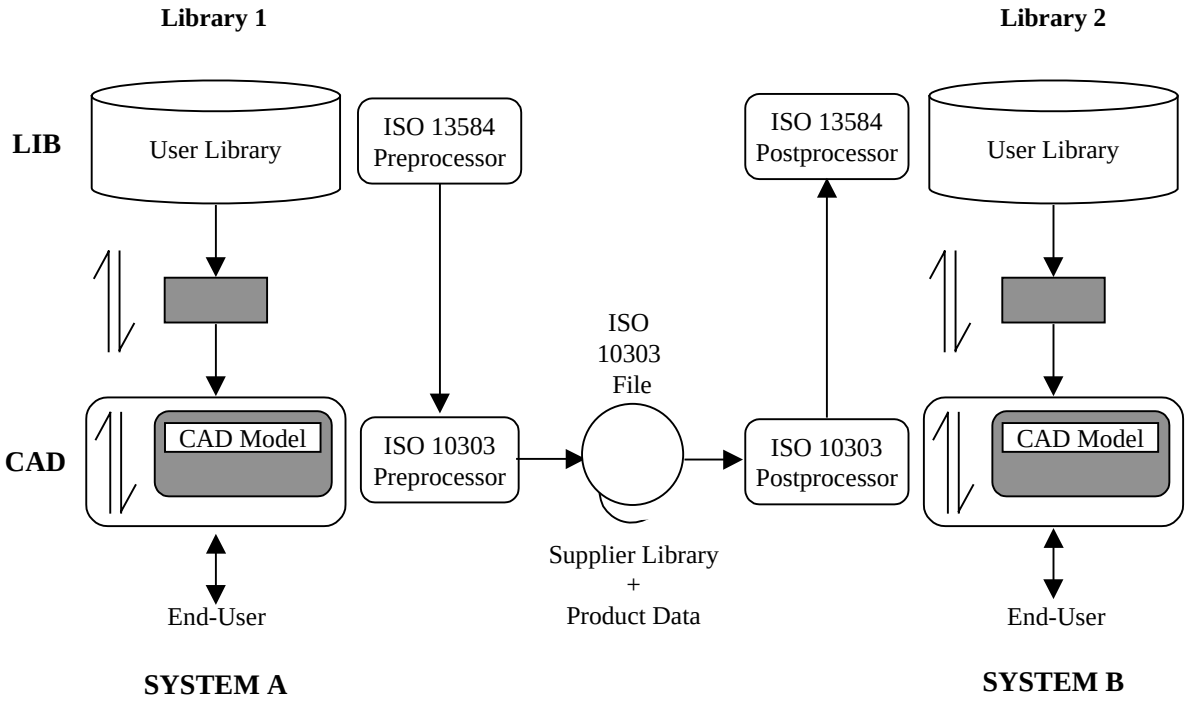

Figure B.3 — Libraries and product data exchange (level 3)

The information models specified in ISO 13584 are intended to enable these three levels of interaction.

Bibliography

[1] ISO 1539, *Information technology — Programming languages — Fortran.*

[2] ISO 8879:1986, *Information processing — Text and office systems — Standard Generalized Mark-up Language (SGML).*

[3] IEEE 1076:1991, *VHDL Language reference manual.*

[4] IEC 61360-4 (1997-05), *Standard data element types with associated classification scheme for electric components — Part 4: IEC reference collection of standard data element types, component classes and terms.*

[5] ISO 10303-31:1994, *Industrial automation systems and integration — Product data representation and exchange — Part 31: Conformance testing methodology and framework: General concepts*.

[6] ISO 10303-42:2000, *Industrial automation systems and integration — Product data representation and exchange — Part 42: Integrated generic resource: Geometric and topological representation*.

[7] ISO 10303-43:2000, *Industrial automation systems and integration — Product data representation and exchange — Part 43: Integrated generic resource: Representation structures*.

[8] ISO 13584-31:1999, *Industrial automation systems and integration — Parts library — Part 31: Implementation resources: Geometric programming interface*.

[9] ISO 13584-10:—[1)], *Industrial automation systems and integration — Parts library — Part 10: Conceptual description: Conceptual model of parts library.*

[10] ISO 13584-102: —[1)], *Industrial automation systems and integration — Parts library — Part 102: View exchange protocol: View exchange protocol by ISO 10303 conforming specification.*

[11] ISO 13584-24:—[1)], *Industrial automation systems and integration — Part 24: Logical resource: Logical model of supplier library*.

[12] ISO 13584-42:1998, *Industrial automation systems and integration — Part 42: Description methodology: Methodology for structuring part families*.

[13] ISO 8824-1:1998, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation*.

[1)] To be published.

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