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Standard**

ISO 10303-2

**Industrial automation systems
and integration — Product data
representation and exchange —**

**Part 2:
Vocabulary**

*Systèmes d'automatisation industrielle et intégration —
Représentation et échange de données de produits —*

Partie 2: Vocabulaire

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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.

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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights. Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 4, *Industrial data*.

A list of all parts in the ISO 10303 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The ISO 10303 series of International Standards describe the computer-interpretable representation of product information and product data. The objective is to provide a neutral mechanism capable of describing products throughout their life cycle. This mechanism is suitable not only for neutral file exchange, but also as a basis for implementing and sharing product databases, and as a basis for archiving.

This document provides a listing of concepts, including terms and EXPRESS entity type definitions required to understand the ISO 10303 series. When a concept is used in more than one industrial domain, each usage includes a domain-specific definition of the concept. This document does not include all relevant concepts, yet. Future editions of this document will add concepts from recently published parts of ISO 10303. Due to the dynamic nature of the vocabulary of the ISO 10303 series, future editions of this document will be published as a standard in database form.

By providing a single source of concepts across the ISO 10303 series, this document facilitates concept reference and encourages standards developers, also those outside of the ISO 10303 series or outside of ISO/TC 184/SC 4, to reuse existing EXPRESS entity types.

The electronic insert, as described in Annex A, provides all concepts of the document that can be used to populate vocabulary dictionaries, to perform analysis on, and as a basis for development of architectural models and applications.

NOTE This document uses bold type to distinguish EXPRESS construct names from the generic concept being represented by that concept.

Industrial automation systems and integration — Product data representation and exchange —

Part 2: Vocabulary

1 Scope

This document specifies the vocabulary for the ISO 10303 series.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org>

3.1 General terms

3.1.1

ISO 10303 application module

concrete syntax used to specify the domain of the entry included in an application module

3.1.2

application construct

collection of entities, types, functions, rules and references that are based on resource constructs and that specialize those resource constructs as necessary to define a valid description of an aspect of product data for specific application areas

3.1.3

saved view

stored and retrievable specific orientation and magnification factor of a model

3.1.4

subassembly

constituent that is an assembly

3.1.5

supplemental geometry

geometric elements included in product definition data to communicate design requirements but not intended to represent a portion of the manufactured product

3.1.6

proxy

object that acts in the role of another object defined in an external data set

3.1.7

activity

action that has taken place, is taking place, or is expected to take place in the future

3.1.8

port

access mechanism

3.1.9

notional solid

cube of which edges have a unit-size length and are aligned to the coordinate axes

3.1.10

bounding box

cuboid as an envelope of the shape, whose edges are aligned to the coordinate axes

3.1.11

centroid

volumetric center of the shape

3.1.12

product definition information

definition of the product requirements and attributes

3.1.13

application context

subset of an application activity model

3.1.14

product operational information

procedures and technical information derived from the product definition information for use by operators and support personnel in the operation, maintenance and disposal of the product

3.1.15

product configuration information

combination of product definition and operational information

3.1.16

configuration status accounting

process of managing the capture and maintenance of product configuration information necessary to account for the configuration of a product throughout the products life cycle

3.1.17

solid model

complete 3D representation of the nominal shape of a product so that any point in space can be determined to be inside, on the boundary, or outside the solid model

3.1.18

attachment slot

position in which a part is or can be attached to an assembly, when it is necessary to record the history of usage of that attachment slot

3.1.19

integrated circuit

miniature die of substrate material that is etched or imprinted with a complex of electronic components and their interconnections

3.1.20

chemical compound

substance formed from two or more chemical elements, with a fixed ratio determining the composition

3.1.21

chemical element

type of substance that cannot be divided or changed into different substances by ordinary chemical methods

3.1.22

physical particle

type of substance from physics covering radiation and all kinds of subatomic and elementary particles

3.1.23

substance

idealized representation of pure matter that possesses definite properties or characteristics

3.1.24

application data planning model

ADPM

model that describes the primary concepts of an application domain and the relationships among the concepts

3.1.25

condition

definition of the precedent that must be fulfilled before a statement or relationship becomes valid

3.1.26

element

general term for portion or aspect of something

3.1.27

shape element

feature

general term for any aspect or element of a shape which need not lie on the boundary nor even within the material of the shape

3.1.28

integral shape element

integral feature

portion of the shape that lies entirely on the surface of the shape

3.1.29

derived shape element

shape element that is related to an *integral shape element* (3.1.28)

3.1.30

document

information and its support medium

3.1.31

envelope

wrapper for a message providing addressee and acknowledgement information

3.1.32

experience

knowledge or skill acquired over time through practical contact with and observation of facts or events

3.1.33

class library

managed collection of class definitions

3.1.34

external class library

class library whose content is specified separately to any data exchange file

3.1.35

agree

to state that all the partners of product data exchange or sharing reach the same understanding of the quality, its measurement and assessment of transferred or shared data

3.1.36

agreement

result of negotiations between the partners of product data exchange or sharing that ensures that all of them have the same understanding of the quality, its measurement and assessment of transferred or shared data

3.1.37

B-stage

intermediate stage in the reaction of a thermosetting resin in which the material melts when heated and dissolves in certain solvents

3.1.38

conformal coat

protective, dielectric coating designed to conform to the surface of a PWA or PCA

3.1.39

C-stage

final stage of the curing of a thermosetting resin in which the material has become infusible and insoluble in common solvents

3.1.40

glue mask

rigid plate with a pattern of voids to create glue patterns during a manufacturing process

3.1.41

laminated

product made by bonding together two or more layers of material or materials

3.1.42

paste mask

rigid plate with a pattern of voids used to create solder paste patterns during a manufacturing process

Note 1 to entry: Solder paste is deposited only where there are voids in the plate.

3.1.43

silkscreen

material layer realized by transferring an image to a surface by forcing suitable media through a stencil screen with a squeegee

3.1.44

solder mask

insulating layer of a printed circuit board (PCB) or printed wiring board (PWB) that exposes only the areas to be soldered

3.1.45

application interpreted construct

AIC

logical grouping of interpreted constructs that supports a specific function for the usage of product data across multiple application contexts

Note 1 to entry: See also *interpretation* (3.1.230).

3.1.46

solder paste

specially blended paste consisting of carefully graded solder powder particles, and a flux medium designed to give the paste particular printing and reflow characteristics

3.1.47

preimpregnated

combination of mat, fabric, nonwoven material, or roving with resin, usually advanced to the B-stage, ready for curing

3.1.48

semi-cured

B-stage

3.1.49

semi-fluid

material flow properties intermediate between liquids and solids

3.1.50

stratum

layer of material in the sequence of materials that compose a printed circuit board (PCB)

Note 1 to entry: A stratum usually has an aspect ratio that is very large, typically 1,000:1.

3.1.51

insulating substrate material

material with a high resistance to the flow of electrical current that is used as a base for the formation of conductive patterns

3.1.52

physical quantity instance

aspect of a physical thing that can be observed or measured, or deduced from observations or measurements

3.1.53

information right

permitted type of usage applicable to a piece of information

3.1.54

printed circuit board layout

geometric patterns and layered configurations of a bare printed circuit board

3.1.55

interface

product attributes that exist at a common boundary of two or more products

3.1.56

application interpreted model

AIM

information model that includes the application constructs necessary to satisfy the requirements of an application reference model

3.1.57

life cycle

generic term for the phases in the life of a product from concept to disposal

3.1.58

issue

record of a misgiving, objection, or complaint referred to an appropriate authority that it may be resolved

3.1.59

breakout

conductive pattern whose purpose is to provide a transition from a tightly arranged conductive pattern that mates with a component to the circuit routing areas on a printed circuit board (PCB)

3.1.60

cutout

void or passage in a printed circuit board (PCB) that penetrates the entire PCB from top to bottom and whose projected shape is usually non-circular

3.1.61

keepout

area on a printed circuit board (PCB) or internal to a PCB inside of which components or patterns might be prohibited from being placed

3.1.62

double-sided printed circuit board

printed circuit board (PCB) with a conductive pattern on both of its sides

3.1.63

flexible printed circuit board

printed circuit board (PCB) that utilizes flexible insulating substrate materials with or without flexible insulating cover layers

3.1.64

multi-layer printed circuit board

printed circuit board (PCB) that consists of rigid or flexible insulation materials and with three or more alternate printed wiring or printed circuit layers that have been bonded together and electrically interconnected

3.1.65

rigid-flex printed circuit board

printed circuit board (PCB) that utilizes both rigid and flexible insulating substrate materials

3.1.66

rigid printed circuit board

printed circuit board (PCB) that utilizes only rigid insulating substrate materials

3.1.67

application module

AM

reusable collection of a scope statement, information requirements, mappings and module interpreted model that supports a specific usage of product data across multiple application contexts

3.1.68

single-sided printed circuit board

printed circuit board (PCB) with a conductive pattern on only one side

3.1.69

printed component

part manufactured during printed circuit board (PCB) fabrication

3.1.70

message

collection of information recorded at a particular date and time with the intent of sending it to a third party

3.1.71

functional object

type of product design representation described as an assembly of functions or implied function

3.1.72

functionality

degree to which an object is designed or adapted to a particular function or use

3.1.73

hierarchical decomposition

collection of related items where the graph that represents the collection is a directed acyclic graph in which a node has one or more parent nodes

3.1.74

structural domain

domain in which each model explicitly states only one type of relationship between model elements

3.1.75

observation

historical record about a product or how it is designed, manufactured or supported, and whose scope is outside of predefined reports or records

3.1.76

white-box model

model of an item for which there is some internal physical structure available to support detailed thermal or mechanical evaluation but insufficient detail for manufacture

3.1.77

black-box model

model of an item for which there is not internal physical structure available to support detailed thermal or mechanical evaluation or manufacture

3.1.78

application object

AO

atomic element of an application reference model that defines a unique concept of the application and contains attributes specifying the data elements of the object

3.1.79

non-countable material

material the components of which cannot be counted or do not need to be counted

3.1.80

part

discrete object that can come into existence as a consequence of a manufacturing process

3.1.81

raw material

crude or partially processed material needed to initiate a manufacturing transformation process

3.1.82

connected

joined, related or associated

3.1.83

connection

state of being connected

3.1.84

connectivity

state of being connected

3.1.85

component

product that is not subject to decomposition from the perspective of a specific application

3.1.86

microwave structure

geometric patterns applied to specific material stackup structure in order to achieve a specific function at Microwave frequencies

3.1.87

probability

chance that a particular event or set of events will occur expressed on a linear scale from 0, indicating impossibility to 1, indicating certainty, also expressed as a percentage between 0 and 100 percent

3.1.88

probability distribution

general term for a function that relates all possible outcomes of an observation on a given system with the probability of their occurring

3.1.89

application programming interface

API

set of standard software interrupts, calls, functions, and data formats that can be used by an application program to access network services, devices, or operating systems

3.1.90

random variable

quantity observed to vary randomly

3.1.91

individual product

existing or potential future artefact that is an actual or planned product whose properties can only be known by observation or by derivation from observations

3.1.92

actual product

realized product

existing artefact that is an actual product whose properties can only be known by observation or by derivation from observations

3.1.93

planned product

potential future artefact that is a product that is planned to be made for which properties may be predicted

3.1.94

breakdown

partitioning of a product into a set of related elements to support engineering, analysis and other activities that can be performed in relation to the product

3.1.95

revision

result of a change made on a product or on a characterization of a product, of an activity or of any concept related to a product or an activity

3.1.96

no-word string

sequence of text characters that contains either no character or only control or space characters

3.1.97

product structure

characterization of the composition of a product which can be a hierarchical representation where all assembly relationships are explicit or a partly implicit one where some nodes are not related to a product but to a family of products with relationships conditioned by boolean expressions

3.1.98

physical_quantity space

set of all instances or magnitudes for a physical phenomenon

3.1.99

resource

something that is needed in order to achieve a specified objective

3.1.100

application programming interface implementation

API implementation

<ISO 10303> implementation of ISO 10303 that supplies the services of the application programming interface, in contrast to an implementation of this standard that uses the API implementation

3.1.101

resource event

event or activity that can alter the amount of a resource

3.1.102

scheme

systematic plan or arrangement for a task or activity

3.1.103

scheme entry

item in a scheme

3.1.104

unclassified

classification level for which no security restriction applies

3.1.105

confidential

classification level for which the disclosure of information would cause damage to national or organizational security

3.1.106

selected item

product information identified as being significant for configuration management purposes

3.1.107

nomenclature

list of unique string types

3.1.108

system

element with a well defined boundary with respect to all other elements, outside of it and in the domain of interest, with which it interacts

3.1.109

task method

method for a possible or intended activity

3.1.110

backshell

connector accessory that is closing a connector from the back side and guide the wires and cables

3.1.111

ISO 10303 resource

concrete syntax used to specify the domain of the entry of an ISO 10303 resource

3.1.112

application programming interface instance

API instance

individual execution context and state of an application programming interface implementation

Note 1 to entry: The notion of “execution context” in ISO 10303 is the same as in ECMAScript as defined in ECMA-262.

3.1.113

cable fixing device

fixing device for a cable on a structure

3.1.114

cavity plug

plug for a connector cavity for the purpose of sealing

3.1.115

connector cavity

cavity in a connector, connector housing or insert intended to receive a connector contact or multi-contact

3.1.116

connector contact

contact member that is intended to be contained in a connector

3.1.117

connector kit

collection of connector parts that are intended to be assembled together and that contain at least one connector housing and that may contain alternative parts that may or may not be used in the final assembly

3.1.118

electrified backshell

backshell that is intended to be conductive

3.1.119

EMI connector housing

connector housing that shields against electromagnetic interference

3.1.120

fishnet

material made from fibers woven or otherwise produced in a grid-like structure with fixed mesh size

3.1.121

harness node

element of the topological structure of a wiring harness for the representation of a topological vertex in which one or several harness segments ends and to which a connector or terminal may be associated

3.1.122

harness topology

topological structure of a wiring harness consisting of harness segments for the edges and harness nodes for the vertices

3.1.123

application programming interface signature

APIS

description of the set of functions, protocols, and tools that programmers can use to enhance applications to access network services, devices, or operating systems

3.1.124

harness segment

element of the topological structure of a wiring harness for the representation of a topological edge and that contains wires or cables that may be enwrapped by a sheath

3.1.125

label

part that is intended to attach written information to other parts

3.1.126

overbraid

sheath that is also a braid

3.1.127

seal

mechanical object that helps join other mechanical objects together by preventing leakage, containing pressure, or excluding contamination

3.1.128

stick line drawing

drawing of a wiring harness that represents the harness topology with arbitrary scale factors and proportions

3.1.129

formboard drawing

drawing of a wiring harness that represents the harness topology in real size

3.1.130

connector slot

opening in a connector housing to receive a connector insert

3.1.131

strain relief accessory

connector accessory to guide and provide strain relief to wires and cables

3.1.132

wiring harness

assembly with a harness topology, consisting of cables or wires to enable electrical or optical connectivity, grouped together in one or more harness segments, each between two harness nodes in which the cables or wires either switch to other harness nodes or in which the cables and wires ends in connectors, contact members or terminal lugs

3.1.133

set

class

number of things considered together

3.1.134

application protocol

AP

<ISO 10303> part of ISO 10303 that specifies an application interpreted model or an application domain model satisfying the scope and information requirements for a specific application

Note 1 to entry: This definition differs from the definition used in ISO 7498-2 because the protocols address different contexts of use.

3.1.135

curve swept solid shape representation

shape representation containing solids defined by sweeping a planar area along a directrix curve

3.1.136

ruled surface

surface generated by a family of straight lines joining points with corresponding parameter values on two edge curves

3.1.137

ruled surface swept area solid

solid created by sweeping a planar area along a directrix curve drawn on a ruled surface

3.1.138

callout

depiction of requirements and information about a product

3.1.139

draughting

activity of selecting and configuring appropriate representations of product data for the human-interpretable presentation in the form of a drawing

3.1.140

drawing sheet

subdivision of a drawing having the same identifier as the drawing and its own sheet number

3.1.141

baseline

theoretical line on which the lowest points of the text characters lie, excluding descenders

3.1.142

draughting shape model

graphical representation of a product shape that is used to create a drawing

3.1.143

predefined

explicit description of the definition and physical representation specified within the standard that defines a data model

3.1.144

subfigure

combination of geometric and annotation elements defined in a coordinate system unique to the combination

3.1.145

application reference model

ARM

information model that describes the information requirements and constraints of an application within an application protocol or module

3.1.146

symbol

combination of annotation elements that, as a collection, represents a distinct concept

3.1.147

dimension value

representation of the numerical value of a dimension that describes the magnitude of the dimension

3.1.148

annotated 3D model data

three dimensional shape data together with product and manufacturing information (PMI) data

3.1.149

product and manufacturing information

PMI

non-geometric attributes in 3D CAD and Collaborative Product Development systems necessary for manufacturing product components and assemblies

3.1.150

product data equivalence

equivalence for its purpose of the comparing product data and the compared product data

3.1.151

product data equivalence criterion

requirement for detecting a non-equivalence defect between two sets of product data compared, whose presence can be judged by a logical test or a numerical test

3.1.152

product data equivalence inspection result

data representing the result of inspection for the specified product data equivalence criterion

3.1.153

base

link which is fixed to the ground or whose motion is prescribed along a defined path

3.1.154

frame

coordinate system used in kinematic representations

3.1.155

ground

immobile part of a mechanical product in the world coordinate system

3.1.156

application resource

integrated resource whose contents are related to a group of application contexts

3.1.157

joint

topological aspect of an ordered connection or motion constraint between two and only two links

3.1.158

kinematics

description of movable mechanical structures consisting of joints and links including the number, location, and orientation of the joints

3.1.159

kinematic chain

sequence of kinematic links connected by joints

3.1.160

linear flexible link

link whose shape can bend in one direction

3.1.161

link

<kinematics> rigid kinematic object whose motion is constrained by one or more joints

3.1.162

link frame

local coordinate system of a link, implicitly defined as the geometric context of the link, with respect to which all geometric definitions of the link are defined

3.1.163

loop

part of a mechanical structure whose joints and links together form a closed kinematic chain

3.1.164

mechanism

mechanical product whose motion is constrained by joints

3.1.165

motion

change of position and orientation of a rigid body

3.1.166

pair

geometric aspect of either an ordered connection or motion constraint between two and only two links

3.1.167

assembly

product that is decomposable into a set of components or other assemblies from the perspective of a specific application

3.1.168

pair frame

coordinate system of a link that is defined relatively to the link frame, used to establish the geometric relationship of a pair

3.1.169

pair actuation

assignment of a pair value to a kinematic pair by an application

3.1.170

placement

location and orientation of a frame

3.1.171

rigid link

link with a fixed shape that is not deforming in use or where the deformation can be neglected

3.1.172

transform

representation of a placement that is specified with respect to an independent reference frame

3.1.173

SU-parameters

parameters that specify the placement between a pair of frames

3.1.174

world coordinate system

initial coordinate system from which all other frames are defined

3.1.175

yaw

angle of rotation about the z-axis

3.1.176

connected face subset

set of arcwise connected faces whose domain is a portion of the domain of an existing connected face set

3.1.177

manifold subsurface shape representation

shape representation containing connected face sub sets in the form of open shells

3.1.178

atomic element

single irreducible unit or component

3.1.179

subedge

edge whose domain is a connected portion of the domain of another edge

3.1.180

subface

face whose domain is a connected portion of the domain of another face

3.1.181

idealisation

representation of one thing by another thing that in a particular context is both simpler than, and an approximation to, the first thing

3.1.182

persistent identification

mechanism to assign unambiguous identification to an element of an explicit shape model in terms of the procedural operations used to generate that element

3.1.183

accuracy

convergence accuracy

specification to control the convergence condition of an approximate solution

3.1.184

data quality defect

product data quality defect

characteristic of product model data, where the characteristic does not fulfil an applicable requirement according to a threshold specified by a user

3.1.185

Hausdorff distance

HH

distance that measures how far apart are the two sets of points A and B in:

$$H(A, B) = \max\{h(A, B), h(B, A)\} \quad (1)$$

where

$h(A, B)$ is the directed Hausdorff distance from A to B , $\max_{a \in A} \{\min_{b \in B} \{d(a, b)\}\}$

$A \quad \{a_1, \dots, a_m\}$

$B \quad \{b_1, \dots, b_m\}$

$d(a, b)$ is the Euclidean distance between the points a and b

3.1.186

inspection

product data quality inspection

check of the quality of product data by application software against criteria that take account of thresholds specified by a user

3.1.187

inspection result

product data quality inspection result

result of *inspection* (3.1.186) to determine whether or not product data contain data quality defects

3.1.188

location of extreme value

location in inspected model data where a measured value exceeds an allowable tolerance range specified by a user

3.1.189

business object model

single integrated information model for the scope of an AP

3.1.190

measurement requirement

specification of the necessary conditions for a measurement to be capable of ensuring that a quality criterion holds

3.1.191

product data quality

PDQ

degree to which a set of inherent characteristics of product data fulfils requirements

3.1.192

product data quality criterion

requirement that is the basis for detecting a data quality defect in product data and can be judged by a logical or a numerical test

3.1.193

product shape data

data representing product shape with geometric and topological information

3.1.194

quality criterion

criterion for evaluating product data quality

3.1.195

threshold

reference value used for the assessment of a measured value of product data quality by numerical test

3.1.196

state

mode of being

3.1.197

URI

Uniform Resource Identifier

compact sequence of characters that identifies an abstract or physical resource

[SOURCE: ISO/IEC 12785-1:2009, 3.23]

3.1.198

common resources

collection of information models, that can be reused to specify application-specific information models within the domain of industrial data

Note 1 to entry: The resource constructs defined by an application module are those defined in its module interpreted model schema.

Note 2 to entry: The term does not specify a specific part of the ISO 10303 series.

3.1.199

ISO 10303 resource entity

concrete syntax used to specify the domain of a declaration included in an ISO 10303 resource

3.1.200

conformance assessment

analysis of conformance testing results to determine conformance to a particular application protocol's conformance class or option

3.1.201

conformance class

subset of an application protocol for which conformance can be claimed

3.1.202

conformance option requirement

incremental subset of an application protocol for which conformance can be claimed in addition to the conformance claimed for one or more conformance classes

3.1.203

conformance

precise, text definition of a characteristic required to be present in a conforming implementation

3.1.204

conformance testing

testing of a conforming implementation by evaluating its data for the specific characteristics required

3.1.205

core model

CM

complete and comprehensive information model, shared by all ISO 10303 *application domain models* (3.1.1), representing the product data through its entire life cycle

3.1.206

core technical capability

CTC

set of objects and relationships in the *core model* (3.1.205) that may be reused in, or customised by, any application domain model

3.1.207

data

representation of information in a formal manner suitable for communication, interpretation, or processing by human beings or computers

3.1.208

data access

machine to machine sharing of data

Note 1 to entry: The ISO 10303 series separates the representation of product information from the implementation methods used for product data exchange, product data access, and product data archival.

3.1.209

data archival

persistent storage of machine-interpretable data and associated defining schema

Note 1 to entry: The ISO 10303 series separates the representation of product information from the implementation methods used for product data exchange, product data access, and product data archival.

3.1.210

STEP

ISO 10303 series which describes the computer-interpretable representation of product information and product data

Note 1 to entry: STEP is an abbreviation for “STandard for the Exchange of Product model data”.

3.1.211

abstract test case

ATC

specification, encapsulating at least one test purpose, that provides the formal basis from which executable test cases are derived and that is independent of both the implementation and the values

3.1.212

data exchange

exchange of machine-interpretable files

Note 1 to entry: The ISO 10303 series separates the representation of product information from the implementation methods used for product data exchange, product data access, and product data archival.

3.1.213

data mapping language

computer interpretable language that specifies how one information set relates to another

3.1.214

data planning object

atomic element of an *application data planning model* (3.1.24) that defines a primary concept of an application domain

3.1.215

data specification language

set of rules for defining data and their relationships suitable for communication, interpretation, or processing by computers

3.1.216

description method

systematic procedure for specifying elements of a domain

EXAMPLE ISO 10303-11 is a description method that specifies the elements of the EXPRESS language.

3.1.217

domain

area of knowledge, influence, or activity

3.1.218

domain practise standard

industry or national or international standard that provides primary source of data exchange requirements for a data exchange standard

EXAMPLE ISO 1101 is a geometrical product specification standard that provides requirements on how practitioners represent geometrical tolerancing in drawings. An AP doesn't specify these requirements verbatim, but it provides information model elements required to unambiguously represent that information.

3.1.219

exchange agreement

document that formalizes an additional layer of information requirements for data exchange beyond that provided by an application protocol

Note 1 to entry: This may be considered as an enterprise to enterprise exchange layer above the application layer defined in the OSI stack.

3.1.220

exchange structure

computer-interpretable format used for storing, accessing, transferring, sharing, and archiving data

3.1.221

abstract test method

ATM

description of how an implementation is tested, given at the appropriate level of abstraction to make the description independent of any specific implementation of testing tools or procedures, but with sufficient detail to enable these tools and procedures to be produced

3.1.222

externally defined

explicit identification of the definition given within another source

Note 1 to entry: That source provides all the information necessary to unambiguously recreate the element; the information can be referenced rather than recreated.

3.1.223

generic resource

integrated resource whose contents are independent of a specific application

EXAMPLE ISO 10303-42 is a generic resource.

3.1.224

implementation

instantiation of an algorithm by a computer system

Note 1 to entry: In STEP an implementation refers to an implementation of a pre-processor or post-processor in an exchange scenario, or a client or server in a services scenario.

3.1.225

implementation method

<ISO 10303> part of ISO 10303 that specifies a technique used by computer systems to exchange product data

3.1.226

implementation under test

IUT

part of an application that is studied under testing

Note 1 to entry: This is normally an implementation of one or more characteristics of the standard(s) based on a given implementation method.

3.1.227

information

facts, concepts, or instructions

3.1.228

information model

formal model of information

EXAMPLE ISO 10303-242 provides an information model.

Note 1 to entry: In ISO 10303, an information model is based on the object-relationship modeling technique that organizes the product data as represented in different system aspects.

Note 2 to entry: In ISO 10303, information models are developed using EXPRESS or SysML.

3.1.229

integrated resource

IR

<ISO 10303> part of ISO 10303 that defines a group of resource constructs used as the basis for product data

EXAMPLE 1 ISO 10303-42 is an integrated generic resource.

EXAMPLE 2 ISO 10303-104 is an integrated application resource.

Note 1 to entry: An integrated resource is classified into two types of resource parts: generic resources and application resources.

Note 2 to entry: The 4x to 6x numbering is reserved for integrated generic resources and the 1xx numbering is reserved for integrated application resources.

3.1.230

interpretation

process of adapting a resource construct to satisfy an application-specific requirement of an application protocol

Note 1 to entry: The interpretation process can involve the addition of restrictions on attributes, the addition of constraints, and the addition of assignments.

3.1.231

module interpreted model

MIM

information model that uses the common resources necessary to satisfy the information requirements and constraints of an application reference model, within an application module

EXAMPLE Three-dimensional geometry information models are common resources used in many MIMs. However, an application module describing colour will not use three-dimensional geometry information models as a resource.

Note 1 to entry: The term common resources is not meant to imply that all such information models are required to be used in a module interpreted model regardless of domain or application.

3.1.232

abstract test suite

ATS

<ISO 10303> part of ISO 10303 that contains the set of abstract test cases necessary for conformance testing of an implementation of an application protocol

3.1.233

neutral

independent of a specific computer system

3.1.234

presentation

recognizable visual representation of product data intended for use by humans

3.1.235

product

thing or substance or information produced by a process

EXAMPLE A computer-interpretable model.

Note 1 to entry: In ISO 10303, it is common to include a product that is not a physical thing or substance, but that is information.

3.1.236

product data

data that is a representation of product information

3.1.237

product information

information about a product

Note 1 to entry: In ISO 10303, it is common to describe product information with respect to a specific industrial domain.

3.1.238

product information model

formal model of product information

3.1.239

protocol implementation conformance statement

PICS

statement of which capabilities and options are supported within an implementation of a given standard

Note 1 to entry: This statement is produced by completing a PICS proforma.

3.1.240

protocol implementation conformance statement proforma

PICS proforma

standardized document in the form of a questionnaire, which, when completed for a specific implementation, becomes the protocol implementation conformance statement

3.1.241

syntax-compliant recommended practice

document that provides instantiation patterns that are verified by an independent agent to be in compliance with the formally defined syntax of the standard

3.1.242

rules-compliant recommended practice

document that provides instantiation patterns that are verified by an independent agent to be in compliance with the formally declared rules of the standard

Note 1 to entry: The formally declared rules of the standard may not completely control the universe of discourse of the standard.

3.1.243

agreement of common understanding

result of discussions between the partners of product *data exchange* (3.1.212), that ensures that all of them have the same understanding of the transferred or shared information

3.1.244

semantics-compliant recommended practice

document that provides instantiation patterns that are verified by an independent agent to be in compliance with the formally declared semantics of the standard

Note 1 to entry: The formally declared semantics of the standard completely controls the universe of discourse of the standard and includes the rules and syntax requirements as well as the semantic requirements

3.1.245

non-compliant recommended practice

document that provides instantiation patterns that are found by an independent agent to not be in compliance with one or more of the formally declared (syntax, rules, semantics) requirements of the standard

3.1.246

reference data

RD

data that represents information about classes or individuals which are common to many users

Note 1 to entry: Reference Data provides a tailorable structured vocabulary that extends an information model with business specific semantics.

Note 2 to entry: This is a generic version of the definition provided in ISO 15926-1:2004, 3.1.18.

3.1.247

reference data library

RDL

managed collection of reference data

3.1.248

resource construct

collection of entities, types, functions, rules and references that together define a valid description of an aspect of product data

3.1.249

short name

abbreviation for an entity name in the EXPRESS-based implementation namespace in ISO 10303

Note 1 to entry: Short names are registered in a database controlled by ISO TC 184/SC 4 to prevent an abbreviation from being used for more than one entity name.

3.1.250

short-to-long-form generation; SHTOLO

transformation process of generating an EXPRESS schema that does not contain interfaces, taking as input any EXPRESS schema or schemata compliant with any version of ISO 10303-11

Note 1 to entry: The original implementation methods included in the ISO 10303 series presupposed a data model consisting of a single schema, termed the longform schema.

Note 2 to entry: The algorithm that defines the transformation process is specified in ISO 10303-11.

3.1.251

standard data access interface

SDAI

abstract API to work on application data according to a given data model defined in EXPRESS

Note 1 to entry: SDAI, which is specified in ISO 10303-22, is intended to be independent of programming language used.

3.1.252

STEP modules and resource library

SMRL

collection of application modules, domain models, and integrated resources intended to support one or more application protocols

3.1.253

STEP framework

integrated development and publishing environment for STEP

3.1.254

application

one or more processes creating or using product data

3.1.255

STEPlib

STEP library

data and tools needed for the development and publication of the components of the STEP extended architecture

Note 1 to entry: STEPlib allows users to:

- manage the SysML models during the development of the models;
- prepare content to be fed into STEPmod: AntPub;
- implement the SysML to XSD binding: AntImp;
- transform the ARM EXPRESS model into the ARM-in-SysML model to build the SysML mappings from SysML models to EXPRESS models: Reaper;
- check the quality of the SysML source content: CheckXML.

STEPlib does not deprecate STEPmod. This document assumes that STEPmod is a stable development and publication environment.

STEPlib has the sole purpose of managing the development of the models and producing the associated documentation subsets which will be assembled in STEPmod for ISO publication.

STEPlib is also the name of the top-level model of the SysML model tree used for all the STEP APs.

3.1.256

STEPmod

STEP modules repository

collection of XML building blocks for developing standards from information models defined in EXPRESS

Note 1 to entry: An integral part of the repository's XML vocabulary is its representation of EXPRESS language constructs, i.e. its EXPRESS model. This specification shall refer to this EXPRESS model portion of the repository's XML vocabulary as STEPmod EXPRESS. The STEPmod Specification Reference is available at

3.1.257

structural data mapping language

language elements that allow an unambiguous specification of a relationship between two schemas

Note 1 to entry: The two schemas both conform to the same schema definition language.

Note 2 to entry: The language elements of the structural data mapping language reference language elements of the schema definition language.

3.1.258

structure

set of interrelated parts of any complex thing, and the relationships between them

3.1.259

test purpose

precise description of an objective which an abstract test case is designed to achieve

3.1.260

unit of functionality

UOF

collection of application objects and their relationships that defines one or more concepts within the application context such that removal of any component would render the concepts incomplete or ambiguous

3.1.261

usage of product data

subset of the information flows in an application activity model

3.1.262

usage guide

specification that is a recommendation on applying an application protocol for a specific application domain within the scope of that application protocol

3.1.263

verdict

test verdict

statement of “pass”, “fail”, or “inconclusive” concerning conformance of an implementation under test with respect to an executable test case and the abstract test case from which it was derived

3.1.264

verdict criteria

information defined within an abstract test case which enables the testing laboratory to assign a verdict

3.1.265

application activity model

AAM

model that describes an application in terms of its processes and information flows

3.1.266

class of activity

class that has only *individual activity* (3.1.268) as members

3.1.267

class of product

class that has only *individual products* (3.1.91) as members

3.1.268

individual activity

something that happens

3.1.269

process plant

assembly that is intended to perform a physical, chemical or transport process, or a process that is a combination of these, upon fluids or upon streams of solid material

3.1.270

schematic

schematic drawing

one or more drawing sheets that contains symbols which stand for things, where the forms of the symbols and the spatial relationships between the symbols presents information about the things

3.1.271

decoration project

interior design

information that specifies the placement of furniture products into a room space including evaluation for manufacturing

3.1.272

furniture product definition

information that constitutes a specification sufficient for the evaluation of a furniture catalog in order to completely understand all the features, rules and restrictions involved

3.1.273

programmes of products in catalog

subset of products in a catalog that share some specific features, rules or restrictions

3.1.274

design phase

period during which the engineering representation of a product is dynamic

3.1.275

mechanical part

physical object which can be formed from material into a static shape

3.1.276

configuration management

activity that establishes and maintains consistency of a product with its requirements and configuration information throughout its life cycle

Note 1 to entry: Adapted from ANSI/EIA 649A-2004.

3.1.277

core model object

atomic element of the Core model that defines a unique concept of the Core model and contains attributes specifying the data elements of the object

3.1.278

data sharing

the making of data accessible to others, where the data is structured by a schema

3.2 Terms related to the EXPRESS language

3.2.1

EXPRESS

data specification language that consists of language elements that allow an unambiguous data definition and specification of constraints on the data defined

Note 1 to entry: The elements of the EXPRESS language are specified in ISO 10303-11.

3.2.2

defined data type

data type declared by the user with an identifier

3.2.3

local rule

domain rule (3.2.8) on the domain of every entity data type instance

3.2.4

global rule

domain rule on entity data type instances belonging to one or more entity data types

Note 1 to entry: A rule declaration permits the definition of constraints that apply collectively to the entire domain of an entity data type, or to instances of more than one entity data type.

3.2.5

uniqueness rule

domain rule of an entity attribute or a combination of entity attributes

3.2.6

simple uniqueness rule

domain rule that specifies a value for an attribute where no more than one entity data type instance shall exist in the domain

3.2.7

joint uniqueness rule

domain rule that specifies values for the combination of two or more attributes where no more than one entity data type instance shall exist in the domain

3.2.8

domain rule

rule

where rule

declaration that contains a definition of constraints that apply to one or more entity data types within the scope of a schema

3.2.9

entity

class of information defined by common properties

3.2.10

entity data type

representation of an entity

Note 1 to entry: An entity data type establishes a domain of values defined by common attributes and constraints.

3.2.11

entity data type instance

entity instance

named *entity data type value* (3.2.20)

Note 1 to entry: The name of an entity instance is used for referencing the instance.

3.2.12

enumeration data type

data type that has as its domain a set of names

3.2.13

interface specification

construct which enables an item declared in one schema to be visible in another

Note 1 to entry: There are two interface specifications (use and reference), both of which enable item visibility.