BS ISO 10303-2:2024

BSI Standards Publication

Industrial automation systems and integration — Product data representation and exchange

Part 2: Vocabulary

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee AMT/4, Industrial data and manufacturing interfaces.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2024

ISBN 978 0 539 15978 3

ICS 01.040.25; 25.040.40

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2024.

Amendments/corrigenda issued since publication

Date	Text affected

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International Standard

ISO 10303-2

First edition
2024-02

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

Reference number
ISO 10303-2:2024(en)

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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.

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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.

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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

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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

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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

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

3.1.42

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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

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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

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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

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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

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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

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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

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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

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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

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<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

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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

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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

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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

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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:

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

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

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

$d(a,b)$ 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

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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

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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* (3.31.1), 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.

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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 definded 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

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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.

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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

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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

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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

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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: Reeper;

— check the quality of the SysML source content: CheckXMI.

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

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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

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