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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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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 ~~of~~included in an ~~ISO 10303~~ 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

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3.1.41
laminate
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 ~~PCB~~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 ~~PCB~~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 ~~PCB~~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
~~PCB~~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
~~PCB~~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
~~PCB~~printed circuit board (PCB) that utilizes both rigid and flexible insulating substrate materials

3.1.66
rigid printed circuit board
~~PCB~~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

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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 ~~could~~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