



**International
Standard**

ISO 14306-2

**Industrial automation systems
and integration — JT file format
specification for 3D visualization —**

**Part 2:
Vocabulary**

*Systèmes d'automatisation industrielle et intégration —
Spécification de format de fichier JT pour visualisation 3D —*

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 document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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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 14306 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 14306 series format is an industry focused, high-performance, lightweight, flexible file format for capturing and repurposing 3D product definition data for visualization to enable collaboration and validation throughout the extended enterprise. The ISO 14306 series format is capable of being streamed and contains compression for compact and efficient representation.

The ISO 14306 format file is based upon the JT file format and is stored on disk with a file extension of “.jt”.

This document provides a listing of the terms and definitions and required to understand the ISO 14306 series.

This document also acts as a terminology reference for the development of related standards outside of the ISO 14306 series.

[Annex A](#) contains an identifier that conforms to ISO/IEC 8824-1. The identifier unambiguously identifies this document in an open information system.

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Industrial automation systems and integration — JT file format specification for 3D visualization —

Part 2: Vocabulary

1 Scope

This document defines terms relating to the JT file format specification for 3D visualization.

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 3D visualization

visual presentation on a screen or another media of graphical and textual three-dimensional representation of a set of data representing an object, information or results of a computational process in order to facilitate the understanding of the object, for visual information sharing with users and to assist in decision processes by a human reviewing the visualized data

3.2 streaming

sequentially loading data from a disk based medium

Note 1 to entry: The motivation for streaming is to more efficiently manage system memory.

Note 2 to entry: Transfer of data in a stream of packets, over the internet on an on-demand basis, where the data is interpreted in real-time by the application as the data packets arrive.

Note 3 to entry: The motivation for streaming is that the user can begin using or interacting with the data almost immediately, therefore no waiting for the entire data file(s) to be transferred before starting.

Note 4 to entry: The desired end result of streaming is to deliver only the ISO 14306 data that the user needs, where the user needs it, when the user needs it.

3.3 boundary representation solid model b-rep

type of geometric model in which the size and shape of a solid is defined in terms of the faces, edges and vertices which make up its boundary

3.4

collaboration

working practice whereby individuals work together for a common purpose to achieve business benefit

Note 1 to entry: Collaboration often takes place across functional, organizational, geographic or other boundaries enabling individuals to work together to achieve a defined and common business purpose.

3.5

extended enterprise

associated entities that collaborate directly, formally or informally, in the design, development, production and delivery of a product or service to the end user

Note 1 to entry: Associated entities include customers, employees, suppliers and distributors

[SOURCE: ISO 44001:2017, 3.22, modified — Note 2 to entry was deleted.]

3.6

logical scene graph assembly

LSG assembly

related collection of model parts, represented in an ISO 14306 series format logical scene graph as a logical graph branch

3.7

attribute

objects associated with nodes in a logical scene graph, specifying one of several appearances, positioning, or visual characteristics of a shape

3.8

coordinate system

reference system that associates a unique set of parameters with each point in an n-dimensional space

Note 1 to entry: If not otherwise specified in a data field's description, it is assumed that the data is defined in the Local Coordinate System.

3.9

degenerated surface

place where a region of the parameter space of the surface is mapped to a single of Cartesian space

Note 1 to entry: This means that there are several (u,v) parameters defining the same 3D point of the surface. In this region, one or both partial derivatives are zero. The tip of a cone or the poles of a sphere are common examples.

3.10

directed acyclic graph

graph that consists of a set of nodes and a set of edges that connect the nodes in a tree like structure

Note 1 to entry: A directed graph is one in which every edge has a direction such that edge (u,v), connecting node-u with node-v, is different from edge (v,u).

Note 2 to entry: A directed acyclic graph is a directed graph with no cycles, where a cycle is a path (sequence of edges) from a node to itself.

Note 3 to entry: With a directed acyclic graph, there is no path that can be followed within the graph such that the first node in the path is the same as the last node in the path.

3.11

level of detail

LOD

alternative graphical representation for a model component such as a part

3.12

local coordinate system

LCS

coordinate system that is used to specify the raw data of the shape geometry with no transforms applied

3.13

logical scene graph

LSG

scene graph representing the logical organization of a model

Note 1 to entry: A scene graph contains shapes and attributes representing the model's physical components, properties identifying arbitrary metadata (for example names, semantic roles) of those components, and a hierarchical structure expressing the component relationships.

3.14

mipmap

reduced resolution version of a texture map

Note 1 to entry: Mipmaps are used to texture a geometric primitive whose screen resolution differs from the resolution of the source texture map originally applied to the primitive.

3.15

model

representation, in the ISO 14306 series format, of a physical or virtual product, part, assembly; or collections of such objects

3.16

model coordinate system

MCS

local coordinates transformed by a value specified as attributes at or above the node

3.17

product and manufacturing information

PMI

non-geometric attributes in 3D CAD and collaborative product development systems necessary for manufacturing product components and assemblies

Note 1 to entry: PMI may include geometric dimensions and tolerances, symbols, notes, surface finish, and material specifications.

Note 2 to entry: PMI may also include supplier identifications, welding notations, inspection instructions and assembly build sequences.

3.18

logical scene graph property

LSG property

object associated with a logical scene graph node and identifying arbitrary application or enterprise specific information (for example meta-data) related to that node

3.19

quantize

constrain something to a discrete set of values, such as an integer or integral multiplier of a common factor, rather than a continuous set of values, such as a real number

3.20

scene graph

directed acyclic graph that arranges the logical and often (but not necessarily) spatial representation of a graphical scene

3.21

shader

user-definable program expressed directly in a target assembly language or in a high-level form to be compiled, that calculates colour values at a pixel based upon data such as lighting, surface colour and texture

Note 1 to entry: A shader program replaces a portion of the otherwise fixed-functionality graphics pipeline with a user-defined function.

Note 2 to entry: It is possible to run a shader for each vertex that is processed or each pixel that is rendered.

3.22

shape

logical scene graph leaf node containing or referencing the geometric shape definition data (for example vertices, polygons and normals) of a model component

3.23

texture channel

texture unit with the addition of the texture environment

Note 1 to entry: The ISO 14306 series format definition for texture channel is the same as in OpenGL^[5].

3.24

texture unit

piece of hardware that takes a sample of a texture

Note 1 to entry: The ISO 14306 series format meaning for texture unit is the same as in OpenGL^[5].

3.25

view coordinate system

world coordinates transformed by a view matrix

3.26

world coordinate system

WCS

node coordinates transformed by values inherited from a node parent (therefore the coordinate system at the root of the graph)

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Annex A
(normative)

Information object registration

To provide for unambiguous identification of an information object in an open system, the object identifier
{ iso standard 14306 part(2) version(1) }
is assigned to this document. The meaning of this value is defined in ISO/IEC 8824-1.

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