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

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



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

ISO 14306 was prepared by Technical Committee ISO TC 184/SC 4, *Automation systems and integration*, Subcommittee SC 4 *Industrial data*.

This first edition of ISO 14306 cancels and replaces ISO/PAS 14306:2011, which has been technically revised.

Introduction

The JT format is an industry focused, high-performance, lightweight, flexible file format for capturing and repurposing 3D product definition data that enables collaboration, validation and visualization throughout the extended enterprise.

The JT format is both robust, and streamable, and contains best-in-class compression for compact and efficient representation. The format was designed to be easily integrated into enterprise translation solutions, producing a single set of 3D digital assets that support a full range of downstream processes from lightweight web-based viewing to full product digital mockups.

Some of the highlights of the JT format include:

- built-in support for assemblies, sub-assemblies and part constructs;
- a flexible partitioning scheme, supporting single or multiple files;
- b-rep solid shape representations;
- product manufacturing information in support of paperless manufacturing initiatives;
- precise and imprecise wireframe shape representations;
- discrete purpose-built levels of detail;
- triangle sets, polygon sets, point sets, line sets and implicit primitive sets (such as cylinder, cone and sphere);
- a full array of visual attributes such as for materials, textures, lights, shaders;
- hierarchical bounding box and bounding spheres;
- data compression that allows producers of JT files to fine tune the tradeoff between compression ratio and fidelity of the data.

Beyond the data contents description of the JT format, the overall physical structure/organization of the format is also designed to support operations such as:

- offline optimizations of the data contents, i.e. file granularity and flexibility optimized to meet the needs of enterprise data translation solutions;
- asynchronous streaming of content, i.e. viewing optimizations such as view frustum and occlusion culling and fixed-framerate display modes;
- layers, and layer filters.

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