

ISO 14306-3:2025-06 (E)

Industrial automation systems and integration - JT file format specification for 3D visualization - Part 3: Version 2

Contents

Page

- Foreword vi
- Introductionviii
- 1 Scope 1
- 2 Normative references 1
- 3 Terms, definitions and abbreviated terms 2
 - 3.1 Terms and definitions 2
 - 3.2 Abbreviated terms 2
- 4 Notational conventions 3
 - 4.1 Diagrams and field descriptions 3
 - 4.2 Data Types 8
 - 4.3 Empty field 11
- 5 File Format 12
 - 5.1 General File Format 12
 - 5.2 File Structure 12
 - 5.2.1 File Header 12
 - 5.2.2 TOC Segment 14
 - 5.2.3 Data Segment 16
 - 5.3 Logical Element Header ZLIB 20
 - 5.4 Data Segments 21
- 6 LSG Segment 23
 - 6.1 LSG Data Collection 23
 - 6.2 Graph Elements 23
 - 6.2.1 Node Elements 24
 - 6.2.2 Attribute Elements 49
 - 6.3 Property Atom Elements 93
 - 6.3.1 Base Property Atom Element 93
 - 6.3.2 String Property Atom Element 94
 - 6.3.3 Integer Property Atom Element 95
 - 6.3.4 Floating Point Property Atom Element 96
 - 6.3.5 JT Object Reference Property Atom Element 96
 - 6.3.6 Date Property Atom Element 97
 - 6.3.7 Late Loaded Property Atom Element 99
 - 6.3.8 Vector4f Property Atom Element 100
 - 6.4 Property Table 101
 - 6.4.1 Element Property Table 102
- 7 Shape LOD Segment 103
 - 7.1 General Shape Lod Segment 103
 - 7.2 Shape LOD Element 103
 - 7.2.1 Base Shape LOD Element 103
 - 7.2.2 Vertex Shape LOD Element 104
 - 7.2.3 Tri-Strip Set Shape LOD Element 119
 - 7.2.4 Polyline Set Shape LOD Element 119
 - 7.2.5 Point Set Shape LOD Element 120

7.2.6	Null Shape LOD Element	121
7.3	Primitive Set Shape Element	121
7.3.1	Lossless Compressed Primitive Set Data	123
7.3.2	Lossy Quantized Primitive Set Data	125
8	Geometry Segments.....	130
8.1	General Geometry Segments	130
8.2	STEP B-Rep Segment	130
8.3	XT B-Rep Segment.....	130
8.4	JT ULP Segment.....	130
8.5	JT LWPA Segment.....	130
8.6	Wireframe Segment.....	130
8.7	JT B-Rep Element (deprecated).....	131
9	Meta Data Segment.....	132
9.1	General Meta Data Segment.....	132
9.2	Property Proxy Meta Data Element.....	132
9.2.1	Date Property Value	134
9.3	PMI Manager Meta Data Element.....	135
9.3.1	PMI Entities	138
9.3.2	PMI Associations.....	160
9.3.3	PMI User Attributes	162
9.3.4	PMI String Table	163
9.3.5	PMI Model Views	164
9.3.6	Generic PMI Entities.....	166
9.3.7	PMI CAD Tag Data.....	171
9.3.8	PMI Polygon Data	173
10	Data Compression and Encoding.....	177
10.1	General Data Compression and Encoding	177
10.2	Common Compression Data Collection Formats.....	177
10.2.1	Int32 Compressed Data Packet.....	177
10.2.2	Int32 Compressed Data Packet Mk. 2	183
10.2.3	Float64 Compressed Data Packet	189
10.2.4	Compressed Vertex Coordinate Array.....	193
10.2.5	Compressed Vertex Normal Array.....	194
10.2.6	Compressed Vertex Texture Coordinate Array	197
10.2.7	Compressed Vertex Colour Array	198
10.2.8	Compressed Vertex Flag Array	201
10.2.9	Point Quantizer Data.....	201
10.2.10	Texture Quantizer Data.....	202
10.2.11	Colour Quantizer Data	202
10.2.12	Uniform Quantizer Data.....	204
10.2.13	Compressed Entity List for Non-Trivial Knot Vector	204
10.2.14	Compressed Control Point Weights Data	208
10.2.15	Compressed Curve Data	209
10.2.16	Compressed CAD Tag Data	212
10.3	Encoding Algorithms.....	215
10.3.1	Uniform Data Quantization.....	215
10.3.2	Bitlength CODEC	216
10.3.3	Arithmetic CODEC	217
10.3.4	Deering Normal CODEC	222
10.4	zlib compression	224
11	Common Data Conventions and Constructs.....	225
11.1	General Data Conventions and Constructs.....	225
11.2	Late-Loading Data	225
11.3	TOC Segment Location	225
11.4	Bit Fields	225
11.5	Empty Field	225
11.6	Local version numbers	225
11.6.1	Version numbers	226

11.7	Hash Value.....	228
11.8	Scene graph construction.....	228
11.9	Metadata Conventions.....	229
11.9.1	CAD Properties.....	229
11.9.2	PMI Properties.....	234
11.9.3	Tessellation Properties.....	331
11.9.4	Miscellaneous Properties.....	332
11.10	LSG Attribute Accumulation Semantics.....	333
11.11	LSG Part Structure.....	334
11.12	Range LOD Node Alternative Rep Selection.....	334
11.13	Brep Face Group Associations.....	334
11.14	Handling of different states / variants in a ISO 14306 file.....	335
11.14.1	Reference Sets.....	336
11.15	Watermarks.....	337
11.15.1	Background.....	337
11.15.2	Issue – Missing specification in the ISO.....	337
11.15.3	Recommended Solution.....	337
11.15.4	Issue – Protection of data.....	339
12	Conformance requirements.....	341
	Annex A (normative) Information object registration.....	342
	Annex B (informative) Object Type Identifiers.....	343
	Annex C (normative) STEP B-Rep.....	346
	Annex D (normative) STEP schema.....	350
	Annex E (informative) Coding Algorithms – An Implementation.....	422
	Annex F (informative) Hashing – An Implementation.....	458
	Annex G (informative) Polygon Mesh Topology Coder.....	461
	Annex H (informative) XT B- Rep segment.....	480
	Annex I (informative) XT B- Rep data segment.....	486
	Annex J (informative) PMI Data Segment.....	570
	Annex K (informative) Mapping table from ISO 10303-42 to XT B-Rep.....	571
	Annex L (informative) JT B-rep Segment.....	577
	Annex M (informative) Wireframe Segment.....	604
	Annex N (informative) JT ULP Segment.....	608
	Annex O (informative) Change History.....	663
	Bibliography.....	664