

ISO 14306-4:2026-04 (E)

Industrial automation systems and integration - JT file format specification for 3D visualization - Part 4: Version 3

Contents		Page
	Foreword	vii
	Introduction	ix
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.....	6
4.3	Empty field.....	8
5	File format	9
5.1	General.....	9
5.2	Object types.....	9
5.3	File structure.....	9
5.3.1	File header.....	10
5.3.2	TOC segment.....	11
5.3.3	Data segment.....	12
5.4	Data segments.....	17
6	LSG segment	18
6.1	Segment overview.....	18
6.2	Graph elements.....	18
6.3	Node elements.....	19
6.3.1	Base node element.....	19
6.3.2	Base node data.....	19
6.3.3	Partition node element.....	20
6.3.4	Group node element.....	22
6.3.5	Instance node element.....	23
6.3.6	Part node element.....	24
6.3.7	Metadata node element.....	25
6.3.8	LOD node element.....	25
6.3.9	Range LOD node element.....	26
6.3.10	Switch node element.....	27
6.3.11	Base shape node element.....	28
6.3.12	Vertex shape node element.....	31
6.3.13	Tri-strip set shape node element.....	32
6.3.14	Polyline set shape node element.....	32
6.3.15	Point set shape node element.....	33
6.3.16	Polygon set shape node element.....	34
6.3.17	NULL shape node element.....	34
6.3.18	Primitive set shape node element.....	34
6.4	LSG attribute elements.....	36
6.4.1	Material attribute element.....	38
6.4.2	Texture image attribute element.....	42
6.4.3	Draw style attribute element.....	54
6.4.4	Light set attribute element.....	56
6.4.5	Linestyle attribute element.....	57
6.4.6	Pointstyle attribute element.....	59

6.4.7	Geometric transform attribute element.....	60
6.4.8	Palette map attribute element.....	62
6.4.9	Infinite light attribute element.....	63
6.4.10	Point light attribute element.....	65
6.5	Property atom elements	68
6.5.1	Base property atom element	68
6.5.2	String property atom element.....	69
6.5.3	Integer property atom element.....	70
6.5.4	Floating point property atom element.....	70
6.5.5	JT object reference property atom element	71
6.5.6	Date property atom element.....	72
6.5.7	Late loaded property atom element.....	73
6.5.8	Vector4f Property atom element.....	74
6.6	Property table	74
7	Shape LOD segment.....	76
7.1	Shape LOD segment overview	76
7.1.1	Tri-strip set shape LOD element.....	76
7.1.2	Polyline set shape LOD element.....	77
7.1.3	Point set shape LOD element.....	77
7.1.4	Polygon set LOD element.....	78
7.1.5	Null shape LOD element.....	89
7.1.6	Primitive set shape element.....	89
8	Geometry segments.....	96
8.1	Geometry segments overview.....	96
8.2	STEP B-Rep segment.....	96
8.3	Wireframe segment.....	96
8.4	XT B-Rep element.....	97
9	MetaData segment.....	97
9.1	MetaData segment overview	97
9.2	Property proxy MetaData element.....	97
9.3	PMI manager MetaData element.....	100
9.3.1	PMI design group entities.....	101
9.3.2	PMI associations.....	103
9.3.3	PMI user attributes	105
9.3.4	PMI string table	106
9.3.5	PMI model views.....	107
9.3.6	Generic PMI entities.....	109
9.3.7	PMI CAD tag data	119
9.3.8	PMI polygon data.....	120
9.3.9	PMI model view sort orders	123
9.3.10	PMI association properties	123
9.3.11	Generic PMI additions.....	125
10	Info segment.....	128
11	Data compression and encoding.....	129
11.1	Data compression and encoding overview.....	129
11.2	Common compression data collection formats.....	130
11.2.1	Int32 compressed data packet.....	130
11.2.2	Int64 compressed data packet.....	135
11.2.3	Compressed vertex coordinate array.....	137
11.2.4	Compressed vertex normal array.....	138
11.2.5	Compressed vertex texture coordinate array.....	140
11.2.6	Compressed vertex colour array.....	141
11.2.7	Compressed vertex flag array	143
11.2.8	Compressed auxiliary fields array	143
11.2.9	Point quantizer data.....	147
11.2.10	Texture quantizer data.....	147
11.2.11	Colour quantizer data.....	148
11.2.12	Uniform quantizer data.....	149
11.2.13	Compressed entity list for non-trivial knot vector	149
11.2.14	Compressed control point weights data.....	153
11.2.15	Compressed curve data.....	153

11.2.16	Compressed CAD Tag Data	156
11.3	Encoding algorithms	158
11.3.1	Uniform data quantization	158
11.3.2	Bitlength CODEC	158
11.3.3	Arithmetic CODEC	159
11.3.4	Deering normal CODEC	164
11.4	LZMA compression	166
12	Conformance requirements	166
12.1	General conformance	166
12.2	Conformance classes	166
12.2.1	Approximated geometry visualization (CC01)	167
12.2.2	Precise geometry visualization (CC02)	167
13	Common data conventions and constructs	167
13.1	Overview	167
13.2	Late-loading data	167
13.3	TOC segment location	167
13.4	Bit fields	167
13.5	Empty field	168
13.6	Hash value	168
13.7	Scene graph construction	168
13.8	Metadata conventions	169
13.8.1	Property key naming conventions	169
13.8.2	PMI properties	170
13.8.3	CAD properties	171
13.8.4	Tessellation properties	172
13.8.5	Miscellaneous properties	173
13.8.6	The SUBNODE property and reference sets	174
13.8.7	Material and surface designation properties	178
13.9	LSG attribute accumulation semantics	178
13.10	LSG part structure	179
13.11	Range LOD node alternative rep selection	179
13.12	B-Rep face group associations	180
13.13	Smart topology table (STT) segment	180
13.14	Watermark image	181
13.15	State flags	181
	Annex A (normative) Information object registration	182
	Annex B (informative) Object type identifiers	183
	Annex C (informative) Coding algorithms – An implementation	185
	Annex D (informative) Hashing – An Implementation	208
	Annex E (informative) Polygon mesh topology coder	211
	Annex F (informative) Per face group attributes	229
	Annex G (normative) STEP B-Rep	233
	Annex H (normative) STEP schema	236
	Annex I (informative) XT B-Rep data segment	303
	Annex J (informative) Smart topology table (STT) segment	405
	Annex K (normative) Wireframe segment	431
	Annex L (informative) Mapping table 14306-4 XT B-Rep to STEP	434
	Annex M (informative) Procedural geometry – Evaluation and approximation	440
	Annex N (normative) Information Object Registration Scheme	475
	Annex O (informative) Change history	477
	Bibliography	479