



Importing and Exporting Data / File format reference (?)

guid=Alias\_ImportExportData\_File\_format\_reference\_html) / STEP file format reference (?guid=GUID-A6F13C9D-9A69-4B72-A25C-55A144B8535F)

## STEP file format reference

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Standard for the Exchange of Product Data (STEP) is a ISO standard industrial automation systems product data representation and exchange format.

The file structure for a STEP file has a modular structure which makes it easier for developers to adapt the format to their own needs. The modules are called “classes” and are classified using numbers as follows:

- 11 to 13: Description methods: These classes describe the languages and methods that are used to create a STEP file. Right now, only two description method classes exist:  
Part 11: The EXPRESS language reference manual.  
Part 12: The EXPRESS-I language reference manual  
The EXPRESS language is a data definition language that is used to represent the structure of data and any constraints that may apply to it. The information models contained in STEP Integrated Resources and Application Protocols are defined using EXPRESS.  
21 to 26: Implementation methods: describe the correspondences between STEP and other formal languages. (text encoding, C++ binding, ...)
- 31 to 35: Conformity tests: used to check the degree of conformity of the software associated with the Application Protocol.
- 41 to 49: Integrated generic resources: the conceptual building blocks for STEP
- 101 to 106: Integrated application resources: contains the actual database, the building block of the file. divided into generic resources and Application resources
- 201 to 233: Application protocols: contain all the branch-specific classes.
- 301 to 332: Abstract test suites
- 501 to 518: Application interpreted constructs Descriptions methods

### STEP Application protocols

- + 201: 2D explicit technical design
- + 202: 2D associative technical design
- + 203: configuration of mechanical parts and assemblies
- + 204: Brep 3D mechanical design
- + 205: Surface 3D mechanical design
- + 206: Wireframe 3D mechanical design
- + 207: Sheet Metal Die Planning
- + 208: Life Cycle Change Process
- + 209: Composite Structures

- + 210: PCA: Design & Manufacture
- + 211: Elect, Test, Diagnostics & Remfg
- + 212: Electrotechnical Plants
- + 213 : NC Process Plans
- + 214: Automotive design
- + 215: Ship Arrangement
- + 216: Ship Moulded Forms
- + 217: Ship Piping
- + 218: Ship Structures
- + 219: Inspection Process Plans
- + 220: PCA: Manufacturing Planning
- + 221: Functional Data & Schematic Rep. for Process Plants
- + 222: Design to Manufacturing for
- Composite Structures
- + 223: Exchange of Design, and Manufacturing Product Information for Cast Parts
- + 224: Mechanical Products Definition for Process Planning Using Form Features
- + 225: Strctrl. Blg. Elements Using Explicit Shape Rep.
- + 226: Ship Mechanical Systems/Moulded Forms
- + 227: Plant Spatial Configuration
- + 228: Building Services: Heating, Ventilation, and AC
- + 229: Exchange of Design and Manufacturing Info for Forged Parts
- + 230: Building Structural Frame: Steelwork
- + 231: Process engineering Data: Proc Design & Proc Specs of Major Equipment
- + 232: Technical Data Packaging

Each AP has its own subset of entities specific for the industry branch the AP was developed for Alias (supports the AP203 and the AP214.)

## **Application protocol support for STEP formats**

The geometric descriptions contained within ISO10303-203 and ISO10303-214 are identical and comprises the core of the implementation of the translator. The following table shows the mappings made by Alias.

## STEP Entity

Cartesian Point

Line

Circle

Ellipse

Parabola

Hyperbola

PolyLine

Composite Curve

Trimmed Curve

B-spline Curve

Plane

Cylindrical Surface

Conical Surface

Spherical Surface

Toroidal Surface

Surface of Linear Extrusion

Surface of Revolution

B-spline Surface

Rectangular Trimmed Surface

Curve Bounded Surface

Offset Surface

Manifold Solid Brep

Shell Based Surface Model

## Alias Entity

Point

B-spline Curve

B-spline Curve

B-spline Curve

B-spline Curve

B-spline Curve

B-spline Curve

B-spline Curve (Grouped)

B-spline Curve

B-spline Curve

B-spline Surface

B-spline Surface

B-spline Surface

B-spline Surface

B-spline Surface

B-spline Surface

B-spline Surface

B-spline Surface

Trimmed Surface

Trimmed Surface

B-spline Surface

Shell (Closed)

Shell (Open/Closed)

## Related Reference

- [STEP import options \(?guid=GUID-1E208676-A24B-439C-AA5D-CCA856F22F62\)](#)
- [STEP export options \(?guid=GUID-6798A550-C2F5-47EF-A31E-A2345AEA06C0\)](#)

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