File formats

Material and Technology

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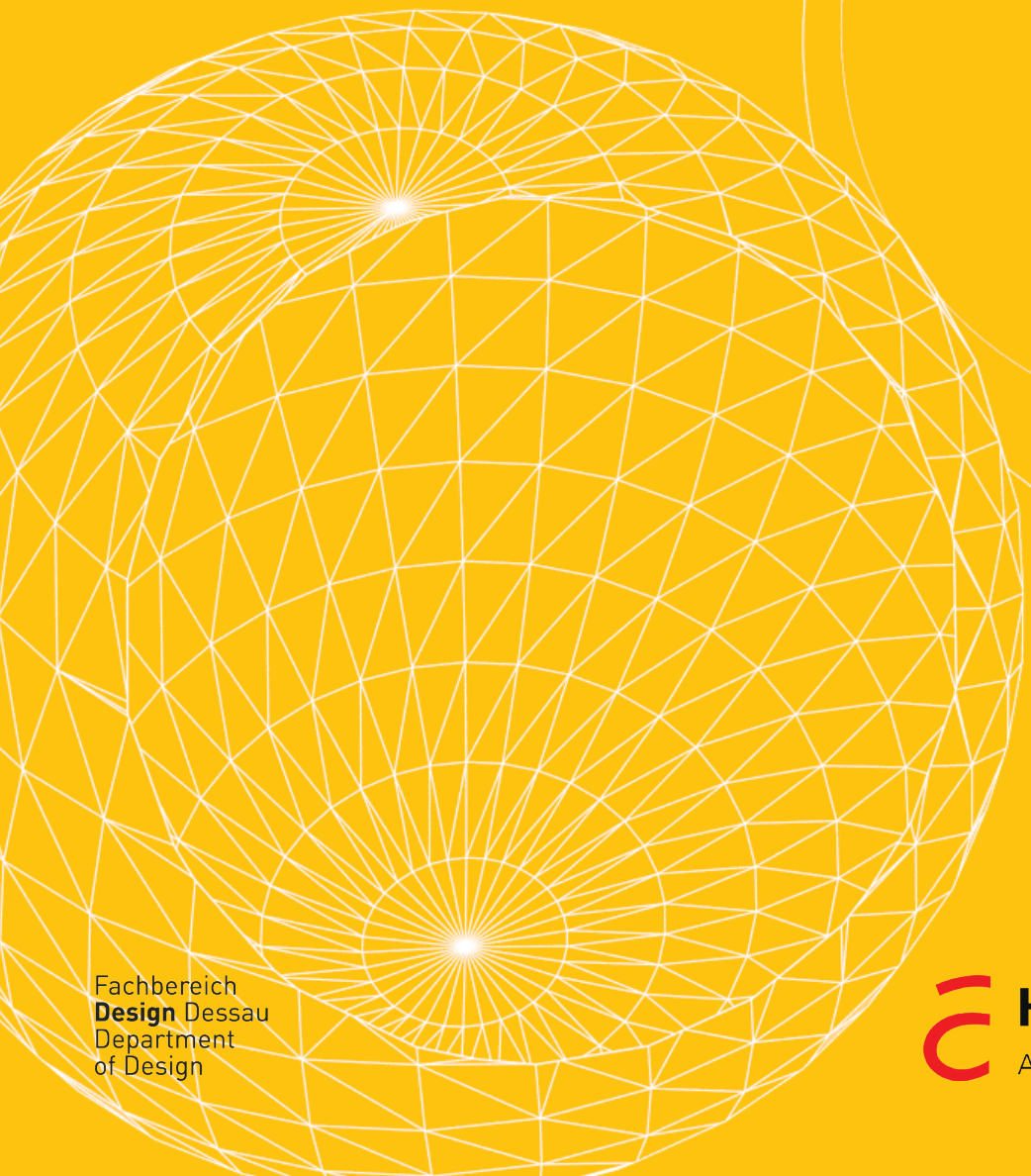

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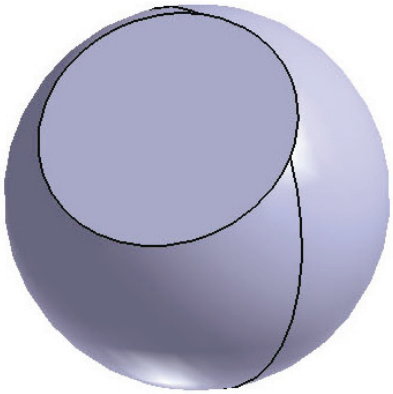
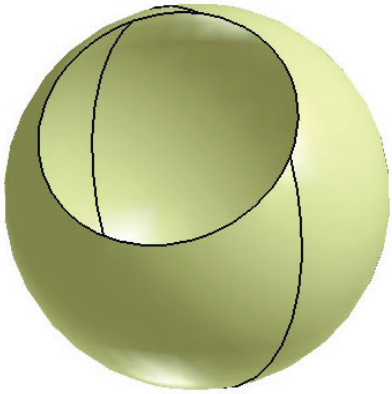
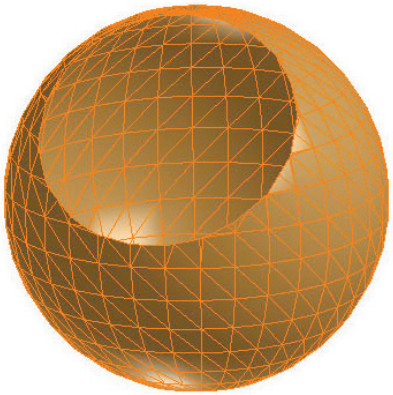
Main types of 3d modeling



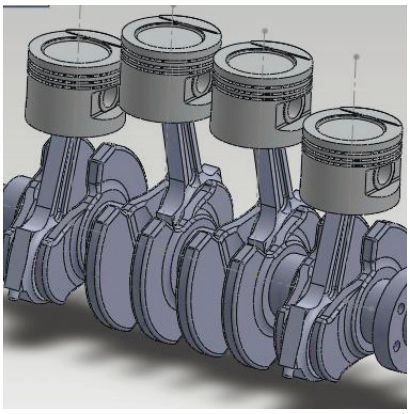
Solid Based on the shells of the bodies. At any moment, they are closed. Boolean operations are used to get the geometry needed.



Surface Based on the surfaces of the bodies. They can be opened. Surfaces can be cut using lines and other surfaces to get the geometry needed.

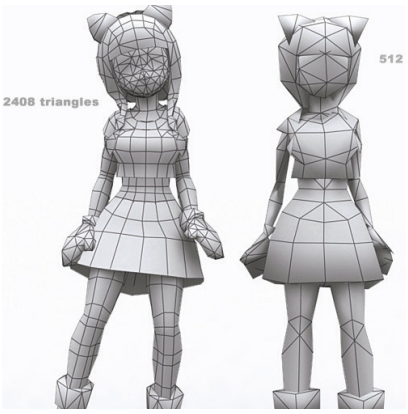


Mesh Based on representing or approximating their surfaces using polygon meshes



Used in mechanical engineering and analysis.

Used for complex yet accurate geometry.



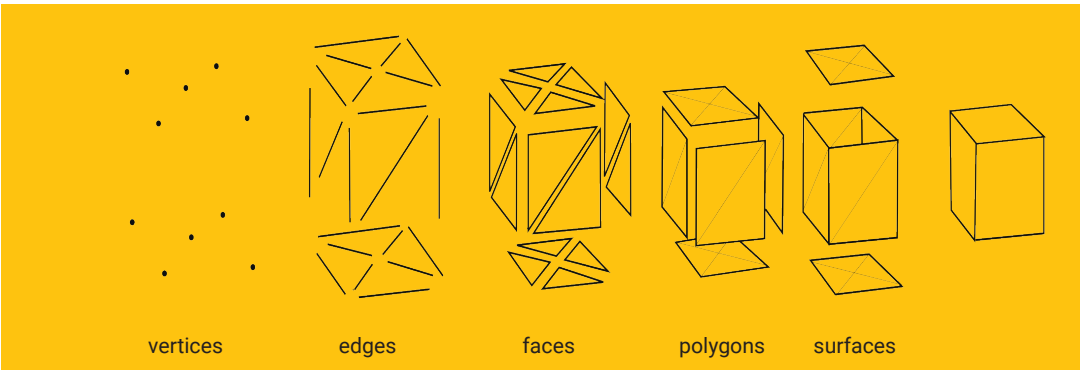
Used for complex geometry like organics, characters in animation, visualization, simulation.

Sometimes you need to export your model from one software to another. There are **neutral file formats** for each modeling type. Unlike proprietary formats they can be found in any software. Use them as intermediaries.

STEP (STP)

IGES

OBJ



A polygon mesh is a collection of vertices, edges and faces that defines the shape of a polyhedral object in 3D computer graphics and solid modeling.

The faces usually consist of triangles (triangle mesh), quadrilaterals (quads), or other simple convex polygons (n-gons), since this simplifies rendering, but may also be more generally composed of concave polygons, or even polygons with holes.

Other useful formats

It's better to always ask a manufacturer, what format they use. However, if you know what formats are usually used in each case you might choose a software for your project according to that. Or be ready to to convert your beautiful polygonal model to STEP.

STL A **3d** file format native to the stereolithography. Commonly used in **3d-printing**, although OBJ and 3DS can also often be used. STL ignores appearance, scene, and animations.

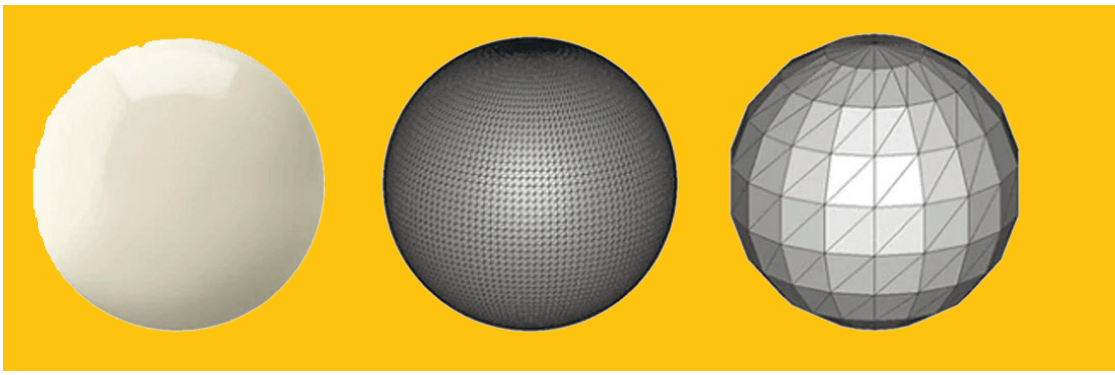
DWG or DXF Derived from "Drawing". A binary file format used for containing **2D and 3D** design data. DWG files are basically CAD (Computer Aided Design) drawings consisting of vector image data and metadata written with binary coding. Used where you need to use contour, e.g. **laser cutting**.

AI A proprietary file format developed by Adobe Systems for representing single-page **vector**-based drawings. Apart from obvious printing preparation usage, can be also used for fabrication based on outlines e.g. **laser cutting**.

EPS Short for Encapsulated PostScript. A **vector** format designed for printing to PostScript printers and imagesetters. It is considered the best choice of graphics format for high resolution printing of illustrations.

BMP A **raster** graphics image file format used to store bitmap digital images, independently of the display device (such as a graphics adapter). Can be asked as a format to export files for **engraving** or **etching**.

You always need to know what data can be stored in every format. Don't expect STL to keep your curves, but DWG can do it so you need to check your file before sending to a manufacturer if it contains an unnecessary piece of information. Rhino is one of the best to checking if everything is ok with your file.



Be careful converting your solid and surface models to mesh. The convertor will ask you to set the resolution of triangles and if it is too small you might lose the details.