Solid modeling is an advanced feature of many CAM systems, allowing for the creation of precise and complex parts.

Why Include Modeling Functionality?
GibbsCAM provides the user with a complete suite of tools necessary to create solid models for toolpath generation and simulation. This capability helps the user design and validate their models before production, significantly enhancing their productivity and efficiency.

Machining
- Pocket machining, with support for non-planar surfaces
- Contour machining with support for planar surfaces
- Contour finishing with support for planar surfaces
- Automatic toolpath generation for 2.5D solids
- Path optimization, with support for non-planar surfaces

Surface Modeling
- Body modeling
- Surface modeling
- Solid modeling

Post Processing
- Pocket CAM for GibbsCAM
- Multiple toolpaths can be generated for optimized toolpaths
- Toolpath optimization
- Toolpath simulation

Customer Support
- Raiser Distribution Channel – Support for customers is provided by a worldwide channel of certified Resellers.
- Training – Training is available through local GibbsCAM Resellers or at training classes held at the Gibbs offices in California, USA.

Gibbs Maintenance Program – Annual enrollment in the Gibbs Maintenance Program keeps your Gibbsware software up-to-date, allowing you to take advantage of GibbsCAM’s innovative capabilities as they become available. For more details about this program, contact your local GibbsCAM Reseller.

GibbsCAM Website: www.GibbsCAM.com – If enrolled in the GibbsCAM Maintenance Program, you will download the latest version of GibbsCAM software between major upgrades, including interim releases. The site also contains the latest GibbsCAM product information, technical support file, customer success stories, technical articles, training videos and much more.

GibbsCAM is compatible with Windows® 7 and certified for Windows Vista®.

GibbsCAM is certified by Autodesk, providing additional capabilities to handle complex surfaces, planing, roughing, multi-surface capabilities and advanced 3D capabilities.

The solid modeling options are completely compatible with GibbsCAM Production Milling, 5-Axis Turning and Turret and MFE configurations as well as their post processors.

GibbsCAM is certified on the Autodesk Inventor Certified Application Program, ensuring compatibility with the standard use of solid models, cores, dies and aerospace, medical and automotive components. (2.5D solids option is required.)

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GibbsCAM is certified by Autodesk, providing additional capabilities to handle complex surfaces, planing, roughing, multi-surface capabilities and advanced 3D capabilities.
GibbsCAM’s solids-based options provide a full suite of capabilities to import, manipulate, create and machine surfaces and solid models. Whether starting from an external IGES file (.igs, .iges), Parasolid (.x_t) or Pro/ENGINEER (.ipt), GibbsCAM provides powerful solids-based options, as well as tools to design and manufacture parts.

**CAD Import**

[For a full description of GibbsCAM’s data import capabilities, see the CAD Interoperability Guide.](

**CAD Model Formats Supported**

- DXF and DWG
- IGES, importing all 2D and 3D wireframe, geometry alignment, planar, and B-Hip solid files
- Parasolid (.x_t) solid model files generated by Unigraphics, Solid Edge, SolidWorks and others
- Solid Edge and SolidWorks native formats
- CAD format support for ACIS SAT solid model files generated by A solid Vellum, AutoDesk Mechanical Desktop, AutoDesk Inventor, CoCreate Solid Designers and others
- Optional support for native formats including AutoDesk Inventor, CATIA V4 and V5, and Pro/E ENGINEER
- Optional support for STEP AP214 and AP216 and VDAF standard formats

**Geometry Creation**

- Solids-based and surface modeling
- NURBS-based solid and surface models
- Interactive object-based interface
- Full associativity for quick and easy changes
- Solid models history to track and change part creation. Also, Snap, Replace and Clear History
- Fast rendering of surfaces and solid models
- Reorient solids with alignment utility
- Automatic corner rounding and chamfering
- Variable radius blending
- Flexible solids into solid bodies
- Nice and written a body
- Offset and shell a body
- Create planar line curves
- Apply Diet to a solid model
- Automatic core and cavity creation
- Primitive body creation, including:
  - Sphere
  - Cuboid (blocks, rectangular solids)
  - Extruded shape with taper
  - Revolved shape
  - Lofted NURBS solids through multiple shapes
  - Swept NURBS solids through multiple shapes
- Local editing of solids
- Provision for slanting factors
- Solid and surface manipulations
- Integration of module properties, including surface area, perimeter and volume (including sheet metal)
- Surface import, export and automatic solidification
- Surface creation functions include:
  - Swept NURBS surfaces through multiple shapes/curve
  - Lofted NURBS solids through multiple shapes
  - Planes
  - Revolved shape
  - Composite shapes
  - Trimmed planes
  - Stitch/Surface
  - Intersect surfaces
  - Create solids from selected body face
- Extend surface

**Machining**

- Fast, go-to-groove toolpaths over multiple surfaces and/or complex bodies
- Apply multiple tool paths to surfaces in a single step
- Fully associative to update all changes throughout the entire part

**Why Is Associativity Important?**

The entire GibbsCAM product line is built with one primary objective – ease of use. Associativity is an important part of that, so as you make changes to the part file, all affected aspects of the part update automatically. All types of changes – tooling, geometry, machining parameters – are completely incorporated into the part with one simple mouse click. This gives you the freedom to experiment, completely incorporated into the part with one simple mouse click. This gives you the freedom to experiment, change or develop your design.

- Optimization of toolpaths into NURBS, smoothed line segments or arcs (G17, G18, G19)
- Machines from complex 3D stock bodies, with “material only” cutting
- Automatic feature avoidance
- Create patch
- Surface faces, bullnose, chamfers and fillets
- Constant and variable cut width

**2D Solids Option**

The 2D solids option provides significant surface and solid modeling capabilities. Functionality to draw 2.5D solid model and solid model from 2D drawing. With this option, you have the ability to create, import and modify solids and surface models, and then generate toolpaths and machine code.

**Surface Modeling**

- Create a flat surface
- Create a span surface
- Create a contour of lofted surface, using two parallel plane curves, with multiple curves, or closed
- Create a Coons 2.5D Patch (using line and curve only)
- Create a variety of swept toolpaths. curves drive. Curve plane is aligned to a 2D, one curve drive, or a 2D curve with a 3D curve drive
- Extract a surface from a solid
- Trim, extend and extend a surface
- Stitch/unstitch surfaces

**Solids-Based Options Details**

**Solids Import Option**

The solids import option provides entry-level support for machining solids and surfaces. Solids models can be read, viewed and manipulated. Geometry can be selected and/or extracted for machining. Using this option you can import a solid, view and extract geometry from selected edges, which can then be machined.

**Solid and Surface Model Interaction**

- Display of solids and surfaces can be toggled on/off.
- Display style can be set to wireframe/hidden/solid/filled/both.
- Edge display can be toggled on/off
- Indicators can be displayed showing surface normals
- Solids and surfaces can be manipulated in combination
- Whole range of options available from right mouse menu on solids/surfaces
- Geometry can be extracted from solids/surfaces
- Hole geometry can be extracted from solids/surfaces
- Cross-section geometry can be created by drawing solids/surfaces

**Solid Modeling**

- Simple solids and complex solids using parametric construction
- Create solid by extruding or revolving a cross-section
- Create solid using a variety of sweeping methods and cross-sections
- Solids models can be read, viewed and manipulated. Geometry can be selected and/or extracted for machining. Using this option you can import a solid, view and extract geometry from selected edges, which can then be machined.

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- Trim, extend and extend a surface
- Stitch/unstitch surfaces
**SolidWorks**’s solid-based options provide a full range of capabilities to import, manipulate, create and machine surface and solid models. Whether starting from an imported IGES surface file, a native CATIA V4 model, or starting from scratch, SolidWorks provides powerful solid modeling features, including:

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### Geometry Creation

**Solid and Surface Modeling**

- **NURBS-based solid and surface models**
- **Interactive object-based interface**
- **Fast associative changes**
- **Solid model history to track changes and part creation**
- **Rapid rendering of surfaces and solid models**
- **Rapid surface selection with alignment utility**
- **Automatic corner rounding and chamfering**
- **Variable radius blending**
- **Smooth surfaces into solid bodies**
- **Nice and written a body**

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### Machining

**General**

- **Fast, gap-free toolpaths over multiple surfaces and/or complex bodies**
- **Apply multiple toolpaths to multiple surfaces in a single step**
- **Full associativity to update all changes throughout the entire part**

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### Why is Associativity Important?

The entire SolidWorks product line is built with one primary objective—ease of use. Associativity is an important part of that, as it allows you to change the tool path and all affected aspects of the part update automatically. All types of changes—tooling, geometry, machining parameters, etc.—are completely incorporated into the part with one simple update, which helps save you time and money (including direct cost, time, and tooling). Build new paths from similar existing parts and create families of parts quickly and easily.

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### 2.5D Solids Option

The 2.5D solid option provides significant surface and solid modeling capabilities. Functionality is designed to align with and extend the 3D modeling tools of the two solids (united, difference, subtract), etc. This allows you the ability to create, import and modify surface and solid models, and then generate toolpaths and machine code.

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### Solid Geometry Intersection

**Solid** model provides simple options and subtle options with parametric constraints

- **Create solid by extruding or revolving a cross-section**
- **Create solid using a variety of sweeping methods**
- **Solid models can be read, viewed and manipulated**
- **Compare the solids and machine part**

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### Machining

**2.5D Solid Option**

- **Utilize a body for finishing, especially for complex parts**
- **Utilize a Boolean operation between two solids (union, difference, subtract), etc.**
- **Marimount modeling history allowing modification and rebasing of solids**

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### Solid Options Details

**Solids Import Options**

- **Display style can be set to wireframe/hidden, shaded, smooth shaded, or etc.**
- **Edge display can be toggled off/on**
- **Indicators can be displayed showing surface normals**
- **Solids and surfaces can be manipulated in either solid or surface mode**
- **Wide range of options available from right-mouse menu on solids/surfaces**
- **Geometry can be extracted from solids/surfaces**
- **Hole can be extracted from solid/surface**
- **Cross-section geometry can be created by slicing solids/surfaces**

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### Machining

**Roughing**

- **Flange Roughing (flattens up flanges) and bottom tool**
- **Cut 2-Level pocketing with plunge, ramp, or helical entrance moves**
- **Surface blending with constant Z steps or constant ridge height steps**

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### Machining

**Other Functions**

- **Detection of toolpaths on multi-surface parts**
- **User control of stock amounts and cutting tolerances**
- **Use variable constant shapes, surfaces and solids**

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### Machining

**General**

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### Machining

**General**

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### Why is Associativity Important?

The entire SolidWorks product line is built with one primary objective—ease of use. Associativity is an important part of that, as it allows you to change the tool path and all affected aspects of the part update automatically. All types of changes—tooling, geometry, machining parameters, etc.—are completely incorporated into the part with one simple update, which helps save you time and money (including direct cost, time, and tooling). Build new paths from similar existing parts and create families of parts quickly and easily.
The 2D Solid option provides significant surface and solid modeling capabilities. Functionality is driven by machine surfaces and solids. With this option, you have the ability to create, import and modify solids and surfaces models, and then generate toolpaths and machine code.

Surfaces Modeling

- Create a planar surface
- Create a spun surface
- Create a series of lofted surfaces (using two parallel plane surfaces, with multiple curves, or closed)
- Create a Coons 2.5D Patch (using linear and circular only)
- Create a variety of swept surfaces (drum curve plane alignment is 2D, one curve-drums, and one curve-swept, and sharp corner)
- Extract a surface from a solid
- Trim, untrim and extend a surface
- Stitch/untitch surfaces
SolidSurfer® Option

The SolidSurfer option provides higher-level surface and solid modeling capabilities. Advanced functionality is required to machine the model, which is included. Using SolidSurfer, you can address the most demanding surface and solid modeling and machining requirements for complex mold, tool and die work.

Surface Modelling

- Create Swept patch surfaces
- Create a swept surface using a variety of methods; no-drive curve plane alignment, the normal drive curve passes, generating curve function (with optional marker), multiple drive curves, blended drive curves

Solid Modelling

- Create body by lofting across multiple curves
- Create body through a closed loop
- Create a body using a variety of methods; no drive curve plane alignment, continuous curve function (with optional marker), multiple drive curves, blended drive curves
- Create parting line from solid
- Apply positive/negative draft to solid

Machining

- Lace Cut Roughing, including single direction, back and forth, user specified angle with constant Z steps, offset Z, variable offset Z, constant number of passes over the entire model and optional automatic peripheral cleanup
- Lace Cut Finishing, including single direction, back and forth and user specified angle
- Clean-up only large radius areas left by previous lace cut at a different angle
- Contour Finishing with constant Z steps or constant radius height steps (water line machining)
- Clean-up only concave fillets left by a previous large radius tool (corner clean-up, root milling)

Post Processing

- Pocket URI for GibbsCAM, a complete suite of CAM post processor development tools delivered with over 225 example post processor templates
- The FlexiCAM version of one of GibbsCAM's popular post processors, ensuring what-you-see-is-what-you-machine G-code output
- API C/L output for use with legacy post processing systems

Customer Support

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Gibbs Website: www.GibbsCAM.com – if enrolled in the GibbsCAM Maintenance Program, you can download the latest version of GibbsCAM software between major upgrades, including interim versions. The site also contains the latest GibbsCAM product information, technical support file, customer success stories, technical articles, training videos and much more.

Why Include Modelling Functionality?

GibbsCAM provides the user with a complete suite of the tools necessary to get their job done. GibbsCAM's extensive solid modeling capabilities support creating solids for fixtures, precision-casting, importing user-defined solid shapes and creating models for finishing. Because this functionality was specifically designed for manufacturing professionals, it is easy to use and appropriate for their specific needs.

Solid model-based CAD applications are becoming more and more widely used, resulting in part in that various solid model formats become more widely available. Customers are requesting models, solid and surface models offer a more complete representation. Not only that, but they enable more intuitive modeling and advanced machining capabilities.

In order to fully take advantage of the benefits of solid technologies, a cost-effective suite of solid-based options are available for GibbsCAM. Incrementally structured to address the basic building or Turning modules, these options allow the user to start with basic solid-based functionality and gradually expand to more advanced capabilities while protecting their investment. Combined with GibbsCAM's intuitive graphical user interface, integrated part numbering and associativity between part geometry, process parameters and tooling, these solid-based options provide powerful yet easy-to-use programming capabilities for today's solid and surface models. Using GibbsCAM's integrated advanced machining capabilities, ultra-efficient part programs with gage-free toolpaths are created. At the same time, programming efficiency is significantly enhanced with GibbsCAM's highly automated multi-task, multi-surface roughing and finishing, and "natural only" machining methods. The GibbsCAM solid-based options include:

- **Solid Import Option** Provides initial solid capability allowing solid and surface models to be read and manipulated. Geometry is extracted from the solids/surface for precise machining.

- **2.5D Solids Option** Provides a full range of functionality necessary to create and modify surface/solids, machine 2.5D solids/surfaces and generate optimized CNC programs. Specialized tools are provided for the import, repair and automatic smoothing of surface data. Using the 2.5D Solids option, CNC programs are created faster, safer and more efficiently than from geometric shapes only. Solid Import option is required.

- **SolidSurfer Option** Provides additional capability to handle complex surface machining, plugging roughing, multi-surface capabilities and advanced 3D capabilities. Tools maximize the use of solid, curved, cone, and aerocone, medical and automotive components. (2.5D Solids option is required.)

The solid-based options are completely compatible with GibbsCAM Production Milling, Turning, Machining, Sheetmetal and MFD configurations as well as their post processors. GibbsCAM is certified under the Autodesk Inventor Certified Application Program, is a SolidWorks Partner Program (F3D for Solid Edge Product), and is a SolidWorks Certified CAM Product. GibbsCAM is compatible with Windows® 7 and certified for Windows Vista®.
machining advanced by a reason.

Cut steps, swept off generate output more – X X solids-based fillets ridge including single.

Surface Modeling

Create Faces patch surfaces.

Create a swept surface using a variety of methods: no drive curve plane alignment, the normal drive curve plane, generating curve function (with optional marker), multiple drive curves, blend drive curves.

Solid Modeling

Create body by lofting across multiple curves.

Create body through a closed loop.

Create a body using a variety of methods: no drive curve plane alignment, blend drive curves (with optional marker), multiple drive curves, blended drive curves.

Create part line from solid.

Post Processing

Cut off selected areas.

Finish top surfaces and clean-up ridges and slats by previous constant Z roughing.

Automatic intersection matching following close-up roughing cleanup from previous tools (pencil milling).

Multi-Surface Flow Machining.

2 Cuts Flow Machining.


gibbsCAM Solids-Based Options

Solid Import Options: Provides initial solids capability allowing solid and surface models to be read and manipulated. Geometry is extracted from the solids/surface for general machining.

2.5D Solids Option: Provides a full range of functionality necessary to create and modify solids/surfaces; machines 2.5D solids/surfaces and generates optimized CNC programs. Specialized tools are provided for the import, repair and automatic calibration of surface data. Using the 2.5D Solids options, CNC programs are created faster, safer and more efficiently than from geometrical shapes only. Solidimport option is required.

SolidSurface Options: Provides additional capability to handle complex surface modeling, plunge roughing, multi-surface capabilities and advanced 3D capability. Tools maximize the use of MLG12/2.5M/1010, solids, sheet and aerospace, medical and automotive components. (2.5D solids option is required.)

The solids-based options are completely compatible with GibbsCAM Production Milling, GibbsCAM Turn & Turrets and MRM configurations as well as their post processors. gibbsCAM is certified under the Autodesk Inventor Certified Application Program, is a SolidWorks Partner Program (FPT for solid Edge Pro), and is a SolidWorks Certified CAM Product.

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