

BIM and Building Product Manufacturers

This whitepaper examines the growing trend of product manufacturers creating BIM-based libraries for their own product lines, enabling designers to easily incorporate those products in their building information models.

For decades, building product manufacturers have been providing CAD-based libraries for their product lines. In turn, designers have been using this content within CAD applications, primarily for the geometric data that describe the product. There has been limited use of the associated non-graphic product data associated with the building product components.

BIM and computable building information models are changing that, as designers add more detail (both graphic and non-graphic) to their building information models earlier in the process to support a variety of tasks—from design visualization to energy analysis to costing. In response, there is a growing trend amongst product manufacturers to create BIM-based libraries for their own product lines, in an effort to increase the specification of their products by enabling designers to easily incorporate their products in building information models.

Revit Building Components

Building information modeling solutions based on the Revit® platform include an extensive library of components. These parametric families range from basic architectural components such as walls, casework, and doors to elaborate assemblies such as kitchen cabinetry and escalators. Revit-based application components include geometry (the component's size and shape) and design intent (how it relates to other building components), as well as non-graphic attributes that describe the component (material or fire rating for instance).

Because Revit-based application components are parametric by nature, the library does not have to include a representation of every single size or type of component—the library elements are preprogrammed to size accordingly. For example, six-panel colonial doors could be considered one family, although the doors that comprise that family come in different sizes and materials. When a Revit application user selects a particular size and type of door—a wooden, 30" by 84", six-panel colonial door for example—the software creates a unique instance of the component, automatically adjusting the different parameter values and non-graphic properties when the element is inserted into the Revit model.

The component libraries created by Autodesk for the Revit Architecture application are generic. They do not describe specific manufacturer's components and therefore have no specific product information like model number.

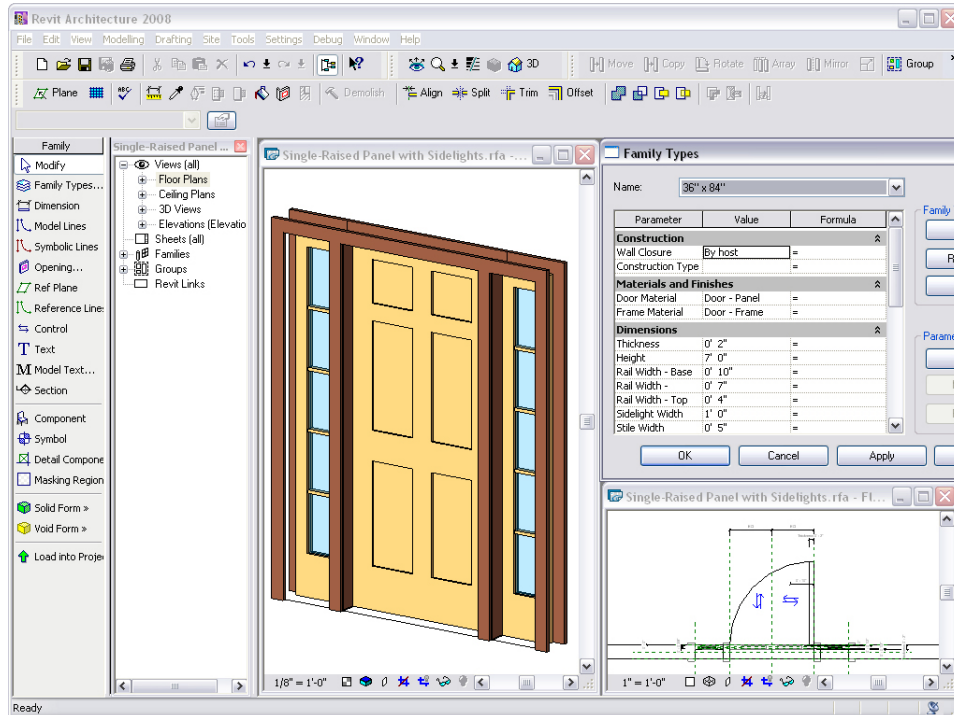


Figure 1:

Revit® Architecture software includes an extensive library of generic parametric components.

Adding Specificity

One of the advantages of BIM is the ability to include detailed information regarding the building even at a very early stage of the design. As such, there is a growing trend towards incorporating more detailed data in the building information model—including manufacturer-specific building product data—and adding that detailed data earlier in the process.

There are a variety of drivers for the push towards more detailed models. For example:

- To better convey design ideas, even in early conceptual models.
- To enable more accurate energy analysis and for evaluating how specific products perform in a specific design context.
- To enable earlier costing information and specification applications.
- To create highly detailed 3D visualizations throughout the building process.

Getting Building Component Content

As mentioned earlier, Revit Architecture software includes a large library of generic components. In addition, there are several different approaches used to add custom components, as well as manufacturer-specific components and related product attributes.

User Generated: Revit Architecture users can create their own content, using the parametric family templates that come with the software. Or users can draw on content generated by their colleagues or from user community websites. There is a lot of free content shared on the Internet, but sometimes you get what you pay for and there is no guarantee that the component definition is accurate.

Commercial Sites: Users can also download content from commercial sites like BIMWorld that develop both generic as well as manufacturer-specific BIM content. In general, downloads from these sites are free for users because the content is paid for by building product manufacturers who contract with the site to develop BIM libraries of their products.

Manufacturer Sites: Content developed and distributed directly by the manufacturer is the most reliable way of getting manufacturer-specific product data. In fact, many manufacturers already provide CAD representations of their products that designers can use in CAD applications. There is now a similar trend towards publishing BIM representations of those products. One building component manufacturer taking the lead on this is USG.

“Specify Quickly, Specify Correctly”

USG Corporation (www.usg.com) is a Fortune 500 manufacturer and distributor of high-performance building systems including wall, ceiling, flooring and roofing products. Headquartered in Chicago, the company serves the residential and non-residential construction markets, repair and remodel construction markets, and industrial processes. As the inventor of wallboard and mineral wool ceiling tile with flagship brands like SHEETROCK® gypsum panels and DUROCK® cement board, USG is at the forefront of North America's building materials industry.

In response to the popularity of BIM, USG recently developed a web portal—the USG Design Studio (www.usgdesignstudio.com)—an online resource for architects, designers, specifiers and contractors to browse and select USG products and find information they need to support their role in the building process. For users of Revit-based applications, the site delivers USG product content directly to the Revit platform, with design templates for Revit-specific system files that can be used for creating, defining and manipulating interior designs. USG's Design Studio includes advanced search capabilities that aid in the identification of materials that match the designer's specific performance criteria.

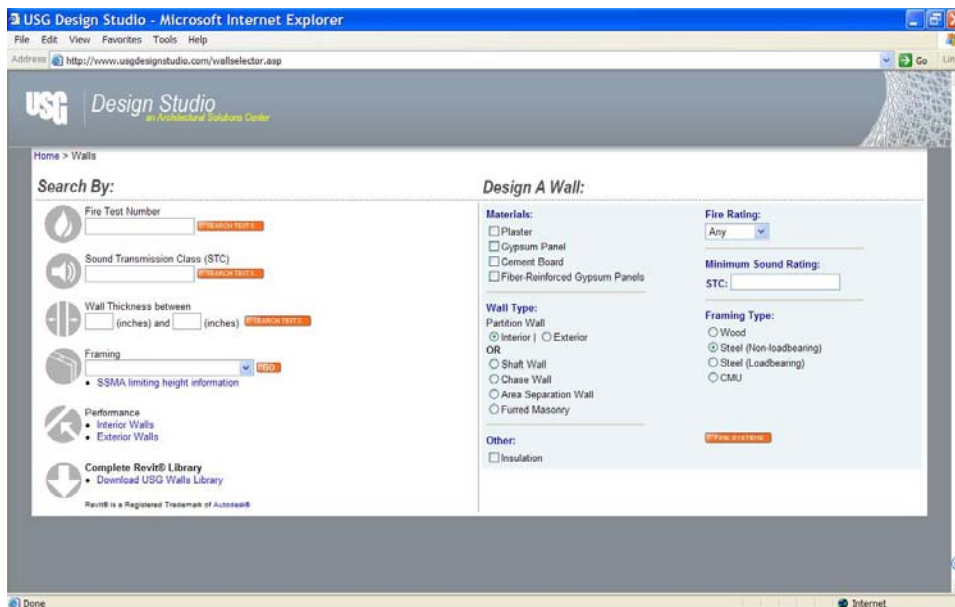


Figure 2:

USG's Design Studio enables Revit-based application users to browse and select USG products and download those components directly into their Revit platform building information model.

For example, a designer can start by searching for a specific fire-rated wall such as U419 and then use other search criteria—such as fire rating = 2 hours, minimum STC of 50, and systems that do not require insulation—to filter down to a group of products that fit the designer's requirements. After a system is selected, the user clicks the Revit Architecture

download link to download a Revit Architecture template file that contains the USG wall family types. After download, the user can simply copy/paste a single USG wall assembly from the template into their project. Alternately, all of the wall assemblies can be copied into a project using the 'Transfer Project Standards' tool.

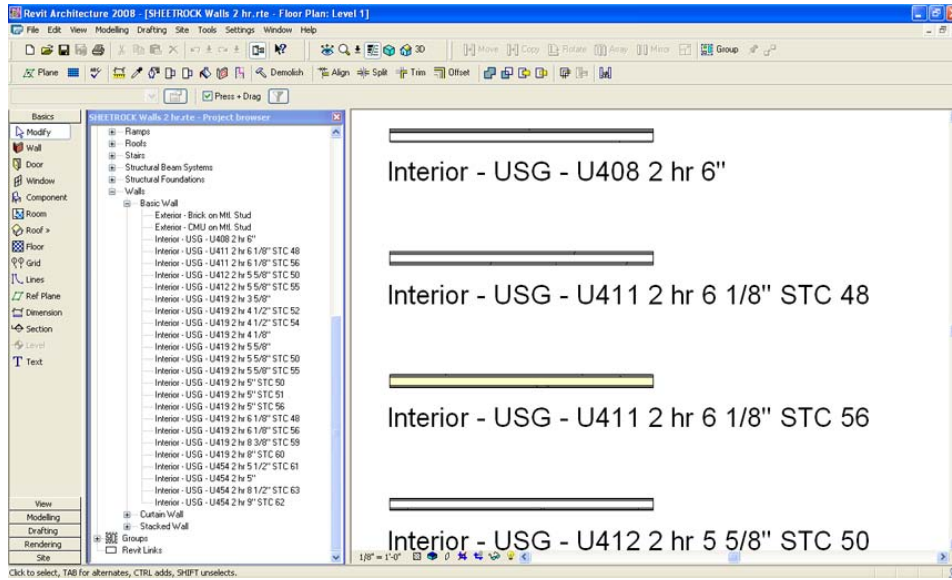


Figure 3:

Revit Architecture users can download USG wall system directly from the USG Design Studio.

In the newly downloaded wall family, several new parameters are added to the wall family type properties, specific to the assembly type selected. For example, for walls tested for sound performance—parameters are created for the STC (Sound Transmission Class) and sound test number. For assemblies that were tested at Underwriters Laboratory (UL)—there is a link to their online certifications directory for the complete fire rating information on the assembly.

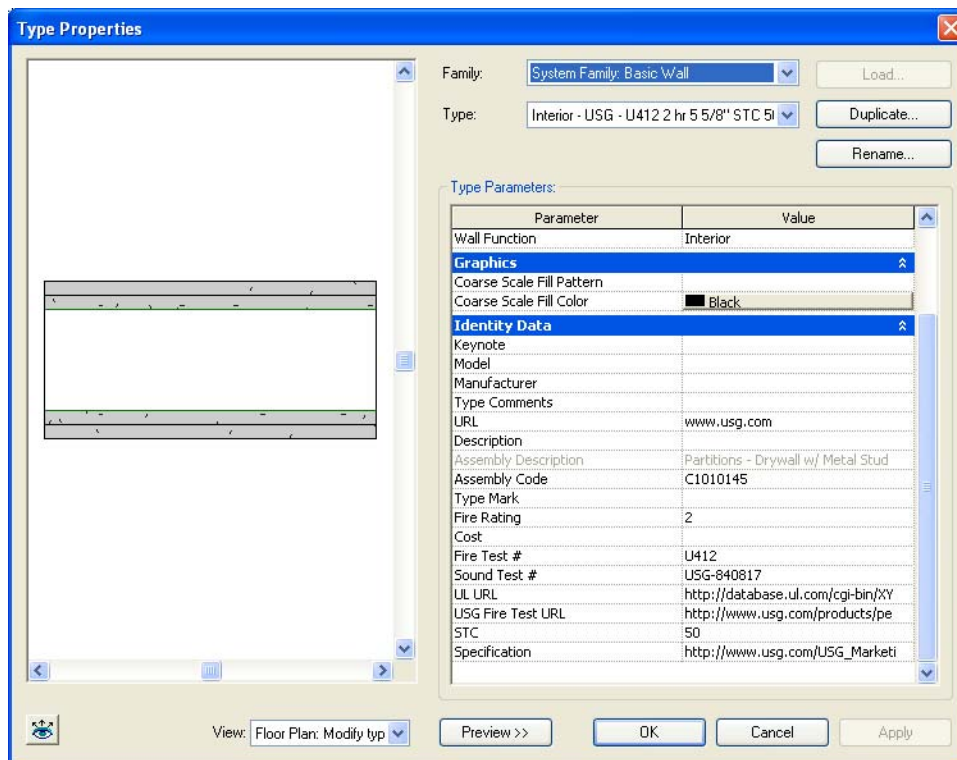


Figure 4:

Content downloaded from the USG Design Studio contains manufacturer-specific data such as the assembly sound test number or STC.

In addition to BIM libraries, the site also includes DWG-based components, links to assembly animations that demonstrate design and installation attributes, links to USG product and data pages, and specification templates that can be downloaded and incorporated into project specifications.

Why has USG invested the time to create and maintain this site? As Steve Martinez, a Technical Support Manager at USG puts it, “We are changing the way we call on architects. By connecting them with Design Studio, we can help them to specify the system they want and, in a few mouse clicks, incorporate that exact product data directly into their building information model. Before Design Studio, a process this complex wasn’t possible on a real-time basis.

Summary

As the use of BIM continues to grow, it is anticipated that more building product manufacturers will follow USG’s lead—providing tools and libraries that enable designers to easily integrate the manufacturers’ products in their building information models.

This is a win/win situation for the building industry. Architects and designers are presented with more building choices and richer product data to use throughout the building design process. And building component manufacturers can convey product information directly to their customers more efficiently and effectively.

About Revit

The Revit platform is Autodesk’s purpose-built solution for building information modeling. Applications such as Revit Architecture, Revit® Structure, and Revit® MEP built on the Revit platform are complete, discipline-specific building design and documentation systems supporting all phases of design and construction documentation. From conceptual studies through the most detailed construction drawings and schedules, applications built on Revit help provide immediate competitive advantage, better coordination, and quality, and can contribute to higher profitability for architects and the rest of the building team.

At the heart of the Revit platform is the Revit parametric change engine, which automatically coordinates changes made anywhere — in model views or drawing sheets, schedules, sections, plans... you name it.

For more information about building information modeling please visit us at <http://www.autodesk.com/bim>. For more information about Revit and the discipline-specific applications built on Revit please visit us at <http://www.autodesk.com/revit>.



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