



ŞİŞECAM
FLAT GLASS



**BIM SMART OBJECTS
GUIDE**

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General Information

This document contains helpful information about the model structure and use of the BIM Smart Object which is downloaded with.

The following file types may be downloaded for each product group:

- The *.rfa file for the curtain panels family for Revit (2019 & 2021 versions),
- The *.rfa file for the generic model (windows) family for Revit (2019 & 2021 versions),
- The *.txt file for the family type catalog (2019 & 2021 versions),
- The *.ifc file with all family types of the family,
- This *.pdf file for guidance.

Version Information

Şişecam Flat Glass's BIM Smart Objects are created in Autodesk Revit 2019 and 2021.

For IFC exchange, IFC 4.0.2.1 is used.

For OmniClass, 2012 version of OmniClass Taxonomy file is used. As of 2021, Revit users need to change default OmniClass taxonomy file for Revit manually with an updated one. For more information please follow Autodesk's instructions [here](#).

Family Naming

Şişecam Flat Glass's BIM Smart Objects' names for families follow a standard naming as follows:

Originator + **Revit Category** + **Product Group** + **Product Subcategory** + **Revit Version.rfa**

For example:

SisecamFlatGlass_GNM_TIGU_EXTGL_Low-E_INTGL_Low-E_onClear_2019.rfa

For Revit categories, abbreviation “**GNM**” is used for Generic Model category (as Windows) and abbreviation “**CWP**” is used for Curtain Panels category.

For product groups, abbreviation “**DIGU**” is used for double insulating glass unit and abbreviation “**TIGU**” is used for triple insulating glass unit.

Type Naming

Şişecam Flat Glass's BIM Smart Objects' names for family types follow a standard naming as follows:

Product Information + **Glass Unit Combination**

For example:

Neutral80/64_Temperable_6+16+6+16+6

Family Categories

Şişecam Flat Glass's BIM Smart Objects are created in two different Autodesk Revit categories for more flexibility to use.

These are:

- Curtain Panels
- Generic Model (as Windows)

“*.rfa” file with “**CWP**” abbreviation is a BIM Smart Object (or family) in Curtain Panels category. This family can be loaded directly to project and is accessible via a curtain wall's type settings under “**Curtain Panel**” (Figure 1).

Smart objects for this category can be listed in “<Multi-Category>” or “**Curtain Panels**” schedule categories in Autodesk Revit.

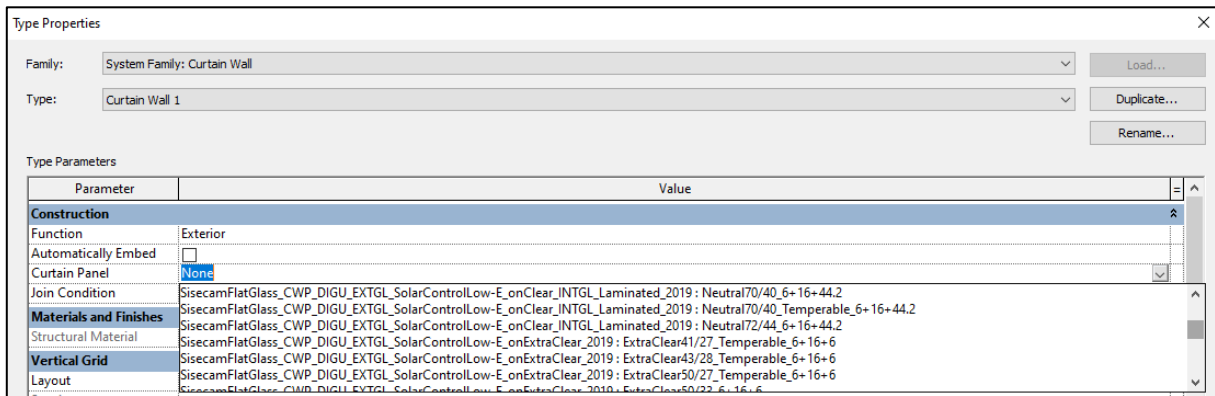


Figure 1 : Choosing Smart Object for a Curtain Wall

“*.rfa” file with “**GNM**” abbreviation is a BIM Smart Object (or family) in generic model category but marked as “**windows**”. This family can be loaded directly to project or to a family as nested and is accessible via family browser or insert window button (Figure 2). However, it does not create its opening on the host when loaded. Smart objects for this category can be listed in “<Multi-Category>” or “**Windows**” schedule categories in Autodesk Revit.

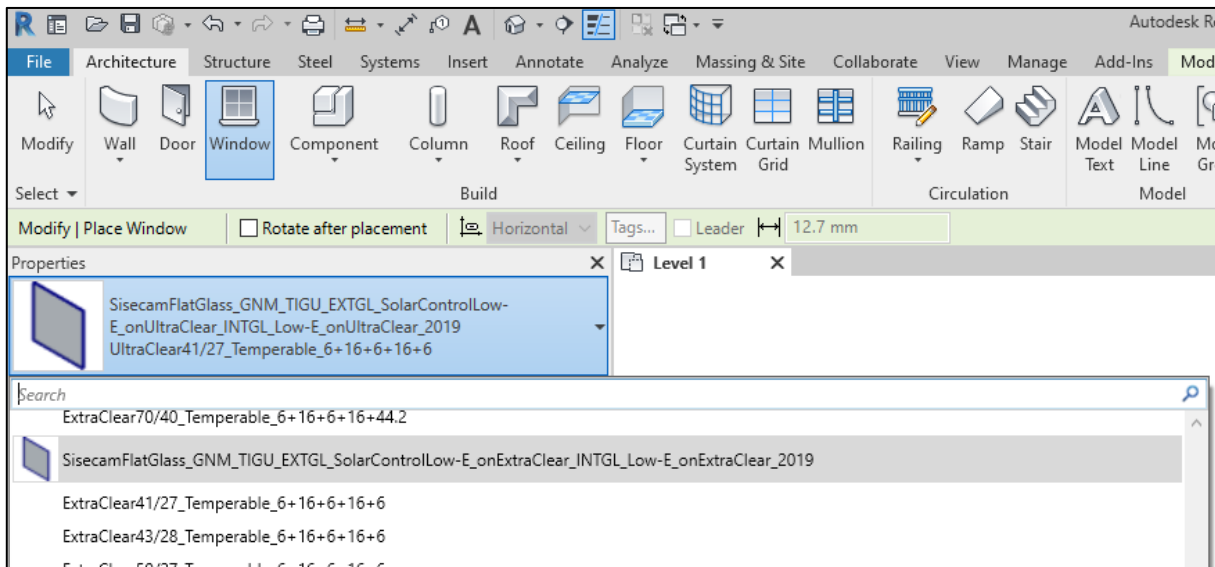


Figure 2 : Choosing Smart Object in Generic Model Category (as Windows)

How to Load?

Şişecam Flat Glass's BIM Smart Objects have 2 types of loading methods.

1. You can simply load a BIM Smart Object with all its predefined types by simply dragging and dropping it to a Revit project.
2. Alternatively, you can load by using type catalog file. Type catalog allows user to filter and load only desired types.

To use type catalog, first make sure family file (*.rfa) and its type catalog (*.txt) are in the same folder. Then load BIM Smart Object by going insert tab and clicking load family button. This will pop-up a filtering window that user can use to filter types by their parameters and load selected types only (**Figure 3**).

Note: Due to corrections and formatting changes in Revit 2021's database identifiers, type catalogs which have certain identifiers and are generated in earlier versions of Revit need to be updated for compatibility. Users who have 2019 or 2020 version of Revit should use families and type catalogs with "2019" suffix while Revit 2021 or newer version users should use families and type catalogs with "2021" suffix.

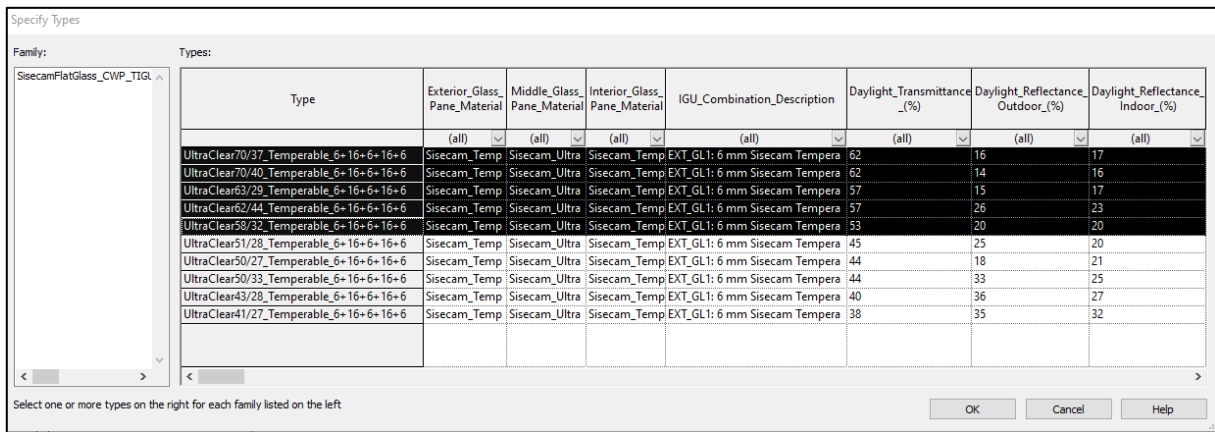


Figure 3 : Type Catalog Loading Window

Parameters

Şişecam Flat Glass's BIM Smart Objects have properties to provide information about the object. Parameters belong to selected instance can be found in properties window or in type properties window. These parameters are sorted alphabetically in their groups.

Both the Curtain Panels' and Generic Model families' parameters have tooltips that provide an additional information about the parameter. These tooltips can be accessed by hovering the mouse pointer over the parameter name in the properties window (**Figure 4**).

In cases where the parameter name itself was deemed to be a sufficient explanation; a tooltip was not included.

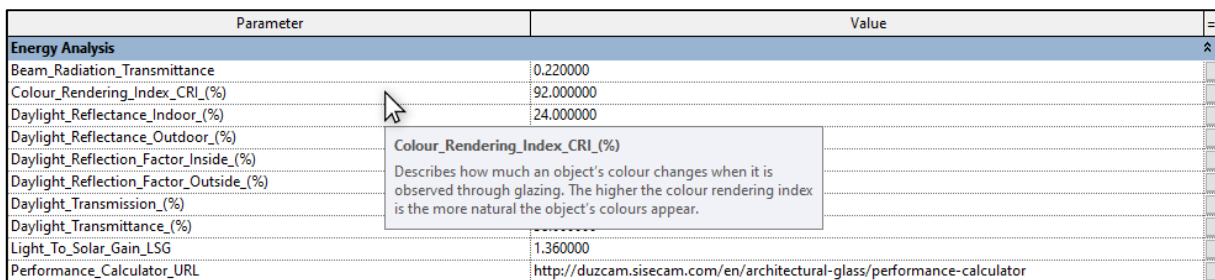


Figure 4 : Tooltip Assistance

In some parameters, the unit of the value is given in the name of the parameter (**Figure 5**).

Thermal_Conductivity_U-Value_Argon_16mm_(W/m²K)	1.100000
Thermal_Conductivity_U-Value_Summer_(Btu/hft²F)	0.190000
Thermal_Conductivity_U-Value_Summer_(W/m²K)	1.100000
Thermal_Conductivity_U-Value_Winter_(Btu/hft²F)	0.250000
Thermal_Conductivity_U-Value_Winter_(W/m²K)	1.400000
Thermal_Resistance_(R)_Hvac_Thermal_Resistance_(m²K/W)	0.910000

Figure 5 : Sample Parameters with Units in Their Names

Users should pay attention that these values will not be converted automatically by software when units are changed in Revit settings or when using these values in formulas or calculated values.

Instance Properties

For CWP families, the height and width of panels are determined by Autodesk Revit to fit the mullions used on the curtain wall grids.

For GNM (as Windows) families, panel sizes can be manipulated by the user through the “**Panel_Height**” and “**Panel_Width**” parameters for each instance of the family. These are instance parameters listed under “**Dimensions**” (**Figure 6**). For CWP families, panel width and panel height are set by curtain wall layout settings; but “**Panel_Width**” and “**Panel_Height**” parameters can still be used to report panel sizes by using these parameters.

In addition to these parameters, users can find other instance parameters for panel area, panel perimeter length, panel daylight opening height and panel daylight opening (**DLO**) width under “**Dimensions**” as well. Daylight opening refers to the area of glass visible in a glazing system.

Weight information for panel and its components can be found under group named “**Structural**” (**Figure 6**).

Structural		⤴
EXT_Sealant_Weight	0.887 kg	
Glass_Weight	45.000 kg	
INT_Sealant_Weight	0.047 kg	
Interlayer_Weight	0.000 kg	
Spacer1_Weight	0.438 kg	
Spacer2_Weight	0.438 kg	
Spacer_And_Sealant_Weight	1.810 kg	
Total_IGU_Weight	46.831 kg	
Dimensions		⤴
DLO_Height	1000.0	
DLO_Width	1000.0	
Panel_Area	1.000 m²	
Panel_Height	1000.0	
Panel_Width	1000.0	
Perimeter_Length	4000.0	

Figure 6 : Panel Sizes

The maximum glass panel size is 3210x6000 mm, and when a panel in the model exceeds these dimensions, a warning sign will appear on the panel as shown below (**Figure 7**).

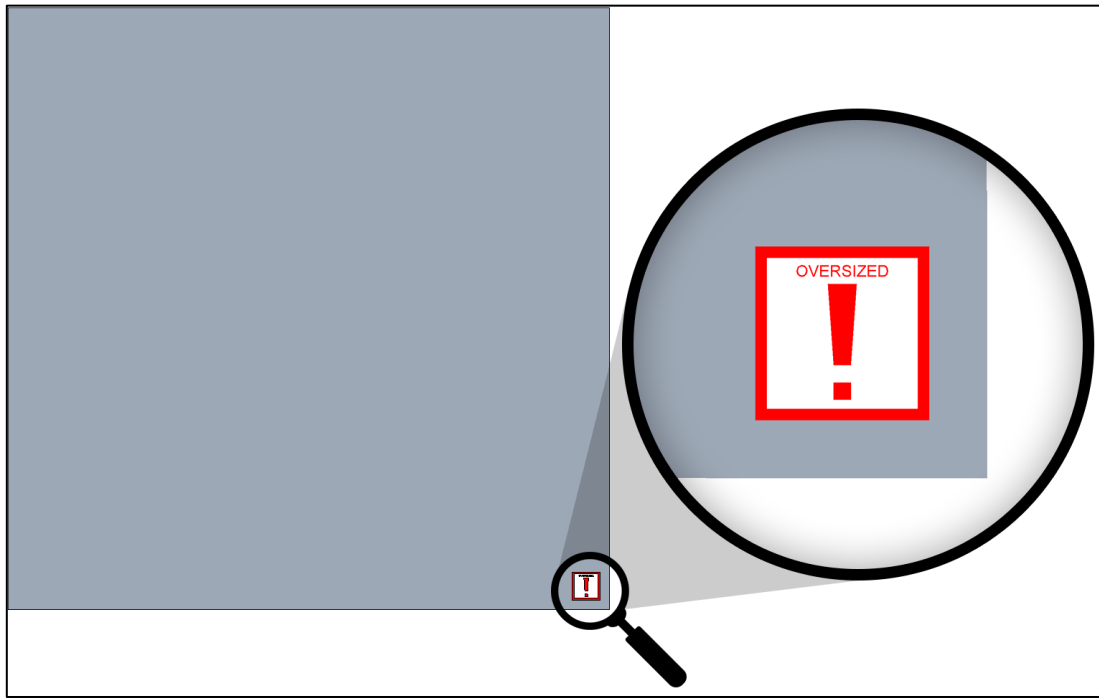


Figure 7 : Size Warning Sign

Please contact us for more information: archglass@sisecam.com.

Type Properties

Parameters that are related to all instances of the type or the type itself can be found in type settings of the object by pressing “**Edit Type**” button when object is selected.

The glass bite dimensions of the panels can be set by the user through 4 type parameters for each side of the panel separately. These parameters are called “**Glass Bite Bottom**”, “**Glass Bite Top**”, “**Glass Bite Left**” and “**Glass Bite Right**” and are listed under “**Dimensions**” group in type parameters. Users should pay attention that these parameters will not change the “**Panel Width**” and “**Panel Height**” parameters and thus will not alter the physical dimensions of the panels in the model. Instead, they will affect the “**DLO Height**” and “**DLO Width**” parameters, these denote the daylight openings of the panels (**Figure 8**).

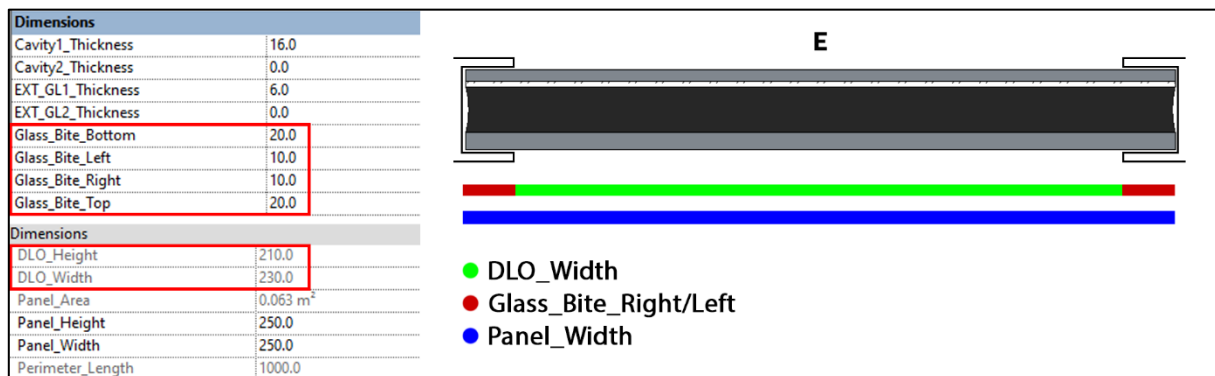


Figure 8 : Glass Bite Settings and Daylight Opening

For example, an instance of a panel type with 20 mm glass bite from the top and bottom and 10 mm of glass bite from the left and right with 250 mm panel width and 250 mm panel height will have a daylight opening height of 210mm [250mm-(20mm+20mm)] and a daylight opening width of 230mm [250mm-(10mm+10mm)].

BIM Smart Object Customization

Customization for Şişecam Flat Glass's BIM Smart Objects is limited since objects have sensitive data which are predefined and/or formulated in family types. Users are only allowed to change certain shared parameters as listed below and Şişecam Flat Glass cannot be held responsible for any unauthorised changes and their results.

Parameter Name	Description
Glass_Bite_Bottom	To determine bottom border of daylight opening. Default value is 0.
Glass_Bite_Left	To determine left border of daylight opening. Default value is 0.
Glass_Bite_Right	To determine right border of daylight opening. Default value is 0.
Glass_Bite_Top	To determine top border of daylight opening. Default value is 0.
Panel_Offset_From_Centerline	To set glass unit's offset from the object placement default centerline if glass units do not need to be aligned with the layout grids. Default value is 0.
Panel_Height*	To determine height of the glass unit.
Panel_Width*	To determine width of the glass unit.
Show_Exterior_Sign	To show or hide exterior sign in plan and section views.

*For CWP, these parameters can be used to extract a value from a geometric condition and use it to report the data to a formula or as a schedulable parameter. Curtain wall layout settings determine glass unit's size for CWP category BIM Smart Objects.

Graphic Representation

Şişecam Flat Glass's BIM Smart Objects are made of multiple parts. These parts for triple insulating glass units with laminated glass are shown below (**Figure 9**):

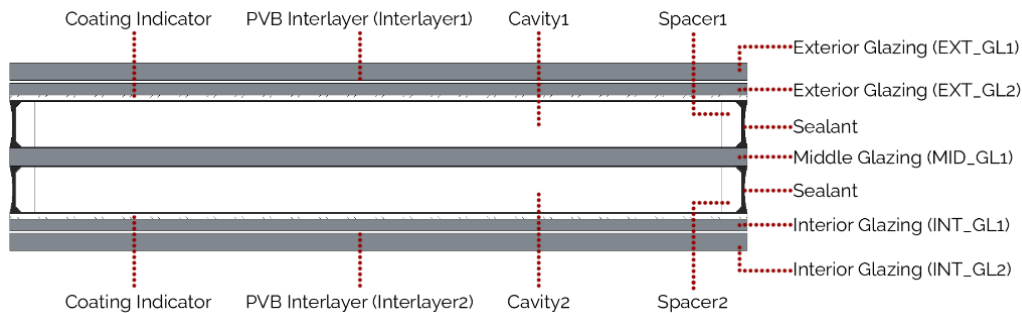


Figure 9 : Graphic Representation of BIM Smart Object

Exterior glass and parameters associated with these glass panes are named as “EXT_GL1” and “EXT_GL2” (from exterior to inside) while interior glass pane and parameters associated with these glass panes are named as “INT_GL1” and “INT_GL2” (from exterior to interior).

A middle glass pane named as “MID_GL1” is also added for triple insulating glass units.

Material for exterior, interior and middle glazing are given for information in “Exterior_Glass_Pane_Material”, “Interior_Glass_Pane_Material” and “Middle_Glass_Pane_Material” parameters as type parameters under parameter group “Materials and Finishes”. But for more accurate graphic representation, “IGU_Reflectance_Outside_RGB” values are assigned to all glazing in 3D model to indicate overall RGB value for the insulating glass unit combination.

On a coated glass, a 2d hatch is chosen to indicate the coating. This hatch does not reflect actual coating thickness and it is for indication purposes only.

Spacers and parameters associated with these spacers are named as “Spacer1” and “Spacer2” (exterior to interior) depending on the unit type (DIGU or TIGU).

Sealants and parameters associated with these sealants are named as “INT_Sealant” and “EXT_Sealant” but graphic representation for sealant is simplified for better understanding.

If the unit is laminated, which means two panes of glass with a PVB interlayer in-between, interlayers and parameters associated with these interlayers are named as “Interlayer1” and “Interlayer2” (exterior to interior). PVB Interlayers are not represented in the model since Autodesk Revit a minimum line size limit (0.8mm) and some PVB interlayers are smaller than 0.8mm.

Cavities and parameters associated with these cavities are named as “Cavity1” and “Cavity2” (exterior to interior) depending on the unit type (DIGU or TIGU). Material information for cavities is text-based since cavities are filled with gasses, which are not modelled.

The exterior side of the insulating glass units are denoted by an “E” symbol in plan and section views. The visibility of this symbol can be toggled on or off by using a type parameter called “Show_Exterior_Sign” is listed under “Model Properties” (Figure 10).

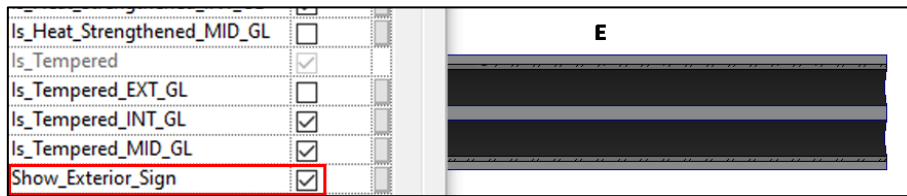


Figure 10 : Exterior Side Indicator

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For more information about Şişecam Flat Glass’s BIM Smart Objects:

duzcam.sisecam.com/en/architectural-glass/bim-smart-objects



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