

Instructions for Using the Web-Based Industry Products Data Acquisition Assistant Tool (IPDAT)

Tool Address: http://buildsim_cbpd.arc.cmu.edu:8888/ProductData/

EEB Hub BP2 Sub-task 4.4

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1 Introduction

The purpose of the project is to develop a web-based assistant tool to facilitate the transfer of real-world industrial system/component/ material products data to systematic XML-based databases. The databases can be further implemented to support the generation of professional ready-to-use simulation input file components in order to conduct whole building performance simulations, which are essential for the evaluation of the industry products and the support of the decision-making in the early building design phase.

As an implemented example, the EnergyPlus input structures for both the opaque (Fig. 1) and transparent (Fig. 2) envelope material and construction assembly definitions were extracted to support the development of the XML-based schema implemented in the tool, and more than 4100 glass products from the International Glazing Database (IGDB) and about 500 other enclosure products were added to the database to instantiate the schema. With the obtained XML-based schema, the tool has the ability to be easily extended to cooperate with various simulation programs with different input structure requirements.

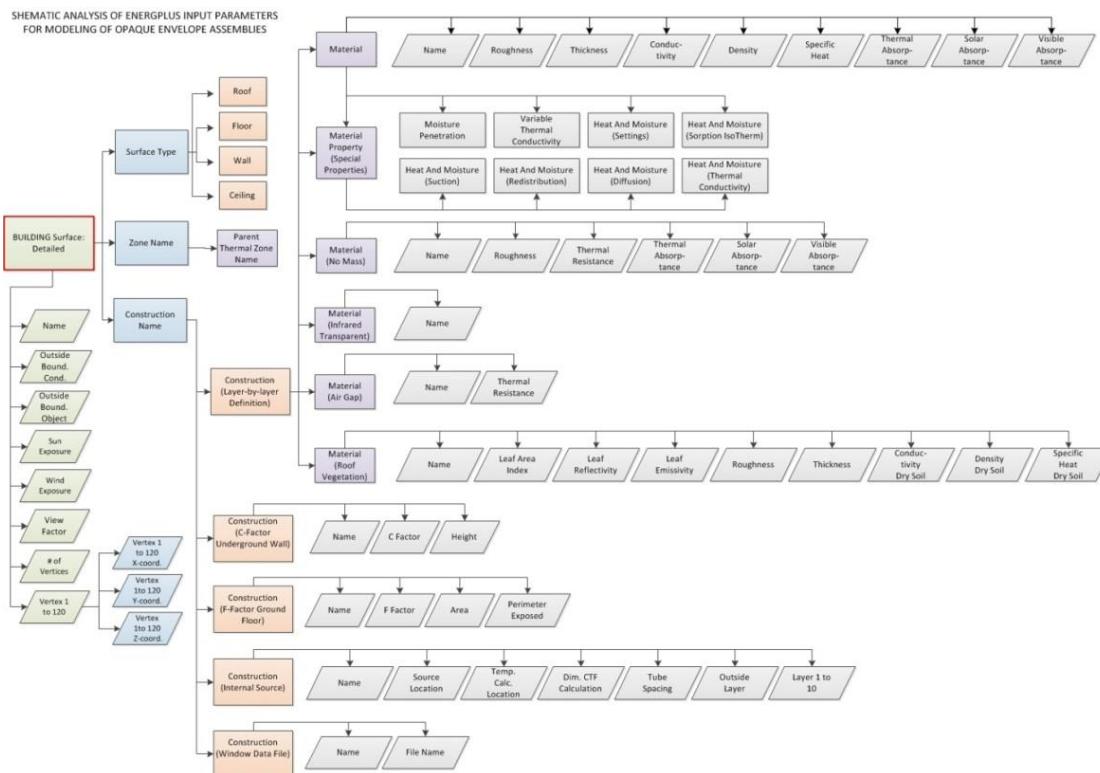


Fig. 1 Schematic Description of EnergyPlus Modelling Structure for Opaque Envelope Definitions

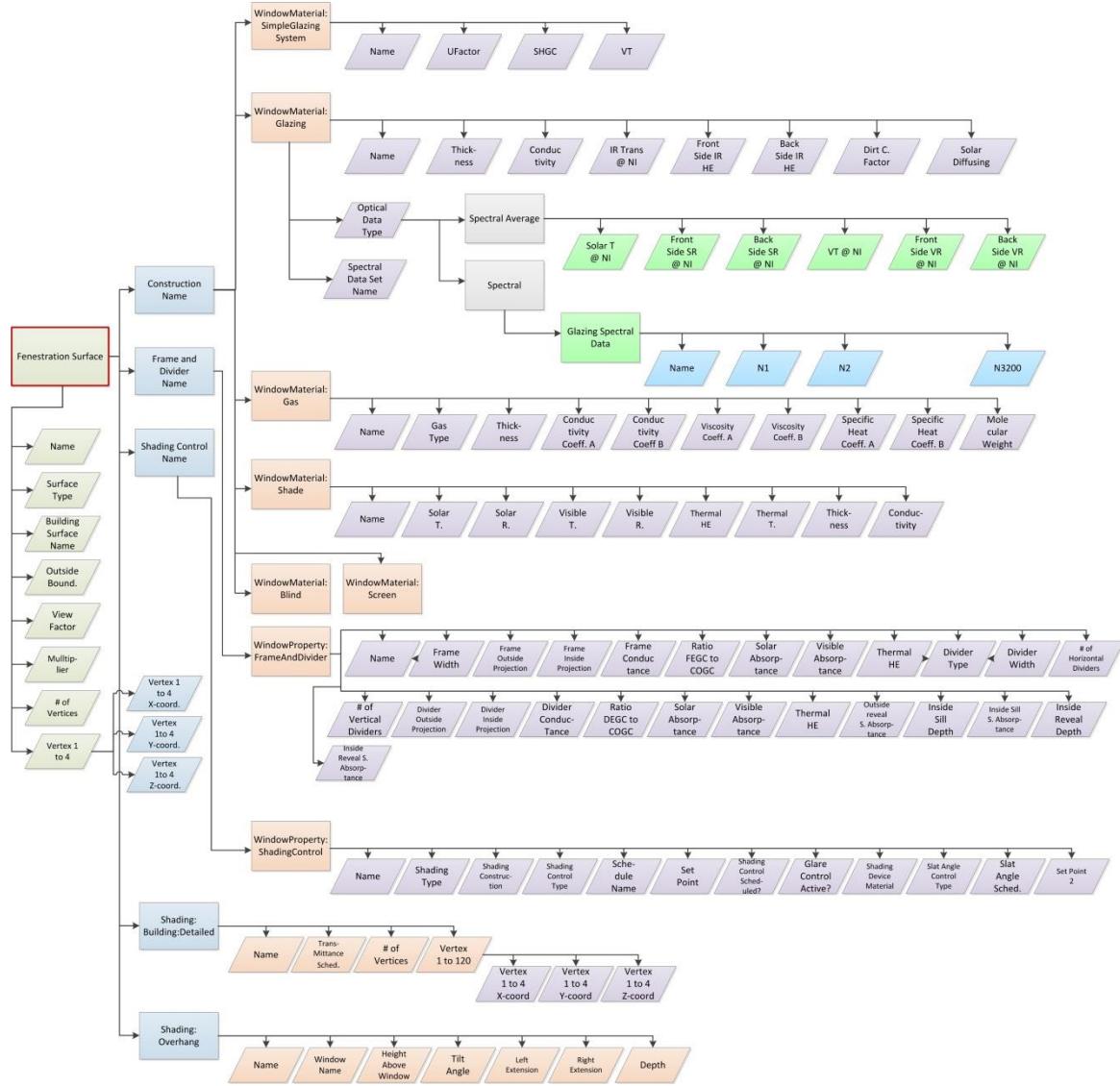


Fig. 2 Schematic Description of EnergyPlus Modelling Structure for Transparent Envelope Definitions

2 General Functions and Legends

Web-Based Industry Products/Design Solutions Data Acquisition Page [Home Page](#)

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition

- Mass Material
- No Mass Material
- Infrared Transparent Material
- Air Gap Material
- Roof Vegetation Material
- I do not know the material type

Opaque Envelope Component Definition Type

Window Definition Type

Mass Material [?]

Name:	Manufacturer:	Reference Url:
<input type="text"/>	<input type="text"/>	<input type="text"/>

Roughness: Very Rough

Thickness: **Unit:** m Value Range(Inclusive) Unknown

Conductivity: **Unit:** W/m-K Value Range(Inclusive) Unknown

Density: **Unit:** kg/m³ Value Range(Inclusive) Unknown

Specific Heat: **Unit:** J/kg-K Value Range(Inclusive) Unknown

Thermal Absorptance: Value Range(Inclusive) Unknown

Solar Absorptance: Value Range(Inclusive) Unknown

Visible Absorptance: Value Range(Inclusive) Unknown

Unit:

Fig. 3 General Functions and Legends of the GUI of IPDAT

[?]: click for detailed explanation according to EnergyPlus Technical Manual.

Units radio buttons: click to select unit of measurement

*: indicates required fields

Color coding: green = required fields, blue = optional fields, yellow = custom fields.

3 Opaque Envelope Component Definition

Step 1: Go to the Opaque Envelope Component Definition Type (Fig. 4).

It shows the main page of the data collection assistant tool. The tool can handle the data collection for three kinds of products: materials, opaque envelope components and windows.

Both the opaque envelope component and the window component may refer to certain materials, therefore, material definition may be necessary for defining opaque envelop component. Sections 2 and 3 will explain the opaque envelope component definition and material definition, respectively.

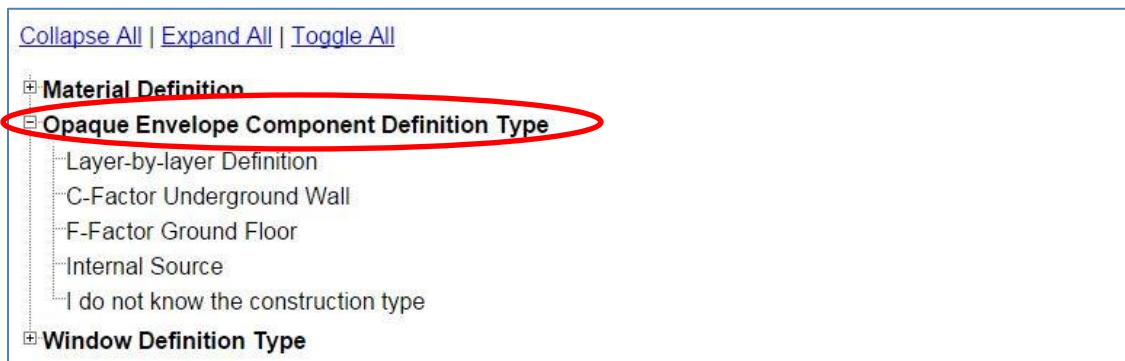


Fig. 4 Main List of the Industry Products Types: Opaque Envelope

Step 2: Select Opaque Envelope Component Definition Type (Fig. 5).

There are four definition methods for defining the opaque envelop component, namely, Layer-by-layer method, C-Factor Underground Wall method, F-Factor Ground Floor method, and Internal Source method.

These methods use different parameters to describe the component, and each method is sufficient to model an opaque envelop component to conduct the building energy simulation. If unsure, select "*I do not know the construction type*", which will be explained in section 2.7.

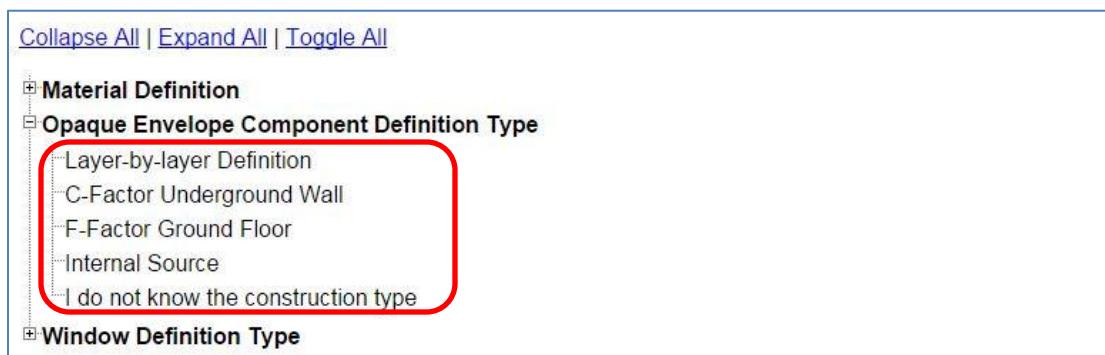


Fig. 5 List of the Definition Types for the Opaque Envelope Component

Step 3: Enter information, select material, or add custom data.

Refer to Sections 3.1-3.5 for detailed instructions.

Step 4: Click the submit button.

3.1 Layer-by-layer Definition

In this definition type, the opaque envelope component is treated as the combination of several layers of materials, so the user need to specify the type and layer configurations of the materials predefined in the tool. Therefore, before defining the opaque envelope component using Layer-by-layer definition method, the user needs to first define all the layer materials in the tool (See section 4 for details).

Select the *Layer-by-layer Definition* in the *Opaque Envelope Component Definition Type*, and panel (Fig. 6) will pop up.

Collapse All Expand All Toggle All	
Material Definition	
Opaque Envelope Component Definition Type	
<input checked="" type="checkbox"/> Layer-by-layer Definition	
<input type="checkbox"/> C-Factor Underground Wall	
<input type="checkbox"/> F-Factor Ground Floor	
<input type="checkbox"/> Internal Source	
<input type="checkbox"/> I do not know the construction type	
Window Definition Type	
Layer-by-layer Definition [?]	
<input checked="" type="radio"/> SI units <input type="radio"/> IP units	
*Name:	<input type="text"/>
Manufacturer:	<input type="text"/>
Reference Url:	<input type="text"/>
*Outside Layer:	<input type="button" value="Select Material"/>
Layer2:	<input type="button" value="Select Material"/>
Layer3:	<input type="button" value="Select Material"/>
Layer4:	<input type="button" value="Select Material"/>
Layer5:	<input type="button" value="Select Material"/>
Layer6:	<input type="button" value="Select Material"/>
Layer7:	<input type="button" value="Select Material"/>
Layer8:	<input type="button" value="Select Material"/>
Layer9:	<input type="button" value="Select Material"/>
Layer10:	<input type="button" value="Select Material"/>
<input type="button" value="Submit"/> <input type="button" value="Add Custom Property"/>	

Fig. 6 Data Entry Panel for the Layer-by-layer Definition

Layer-by-layer Definition [?]

(SI units IP units)

*Name:	<input type="text"/>
Manufacturer:	<input type="text"/>
Reference Url:	<input type="text"/>
*Outside Layer:	Select Material
Layer2:	Close <input type="text"/>
Material Definition Type: <input type="text" value="--Please Select--"/>	
Window Definition Type: <input type="text" value="--Please Select--"/>	
Layer3: Select Material <input type="text"/>	

Fig. 7 Select Material by Reference in the Layer-by-layer Definition

Click the *Select Material* link (Fig. 7), the material definition type panel will pop up.

*Outside Layer:	Select Material <input type="text"/>
Layer2:	Close <input type="text"/>
Material Definition Type:	<input type="text" value="Mass Material"/>
Window Definition Type:	<input type="text" value="--Please Select--"/>
Spray Foam SPF Closed Cell 2 --View Details Spray Foam SPF Closed Cell 3 --View Details Spray Foam XPS Extruded Polystyrene --View Details Spray Foam XPS Extruded Polystyrene 2 --View Details Rigid Mineral Wool --View Details Rigid Mineral Wool 2 --View Details Cellulose (Dense Pack) --View Details Cellulose (Dense Pack) 2 --View Details Cellulose (Dense Pack) 3 --View Details Other Pack --View Details	
Layer3: Select Material <input type="text"/>	

Fig. 8 Existing Material List in the Layer-by-layer Definition

Select the layer material definition type (Fig. 8), and the existing material list will show up.

Click the *material name* to specify the material for that layer.

*Outside Layer: [Select Material](#) Cellulose (Dense Pack)

Layer2: [Close](#) Window Film

[Gypsum Plasterboard 1---View Details](#)
[EPS Roof Insulation Type II---View Details](#)
[EPS Roof Insulation Type VIII---View Details](#)
[EPS Roof Insulation Type ---View Details](#)
[Cotton Batt---Close Details](#)

Name:	Cotton Batt
Manufacturer:	Bonded Logic
Reference Url:	n/a
Roughness:	Rough
Thickness:	2 ~ 8 in
Conductivity:	0.033 ~ 0.125 Btu-in/h-ft ² -F
Density:	1.000 ~ 1.375 lb/ft ³

Layer3: [Select Material](#)

Fig. 9 View Existing Material's Details in the Layer-by-layer Definition

To view the material details, click *View Details* link (Fig. 9), and all the associated data will show up.

3.2 C-Factor Underground Wall Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
 Opaque Envelope Component Definition Type
 - Layer-by-layer Definition
 C-Factor Underground Wall
 - F-Factor Ground Floor
 - Internal Source
 - I do not know the construction type
 Window Definition Type

C-Factor Underground Wall [?]
 SI units IP units

*Name:	<input type="text"/>		
Manufacturer:	<input type="text"/>		
Reference Url:	<input type="text"/>		
*C Factor:	[?] Unit: W/m ² -K	<input type="text"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Height:	[?] Unit: m	<input type="text"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown

[Submit](#) [Add Custom Property](#)

Fig. 10 Data Entry Panel for the C-Factor Underground Wall Definition

Select the *C-Factor Underground Wall* in the *Opaque Envelope Component Definition Type* (Fig. 10), and data entry panel will pop up.

3.3 F-Factor Ground Floor Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
 Opaque Envelope Component Definition Type
 - Layer-by-layer Definition
 F-Factor Ground Floor
 - Internal Source
 - I do not know the construction type
 Window Definition Type

F-Factor Ground Floor [?]
 SI units IP units

*Name:	<input type="text"/>		
Manufacturer:	<input type="text"/>		
Reference Url:	<input type="text"/>		
*F Factor:	Unit: W/m-K	<input type="text"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Area:	Unit: m ²	<input type="text"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Perimeter Exposed:	Unit: m	<input type="text"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown

[Submit](#) [Add Custom Property](#)

Fig. 11 Data Entry Panel for the F-Factor Ground Floor Definition

Once select the *F-Factor Ground Floor Definition* in the *Opaque Envelope Component Definition Type* (Fig. 11) and data entry panel will pop up.

3.4 Internal Source Definition

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<input type="radio"/> Material Definition	Internal Source [?]		
<input type="radio"/> Opaque Envelope Component Definition Type	<input checked="" type="radio"/> SI units	<input type="radio"/> IP units	
Layer-by-layer Definition	Name:		
C-Factor Underground Wall	Manufacturer:		
F-Factor Ground Floor	Reference Url:		
Internal Source	*Source Present After Layer Number:	[?]	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
I do not know the construction type	*Temperature Calculation Requested After Layer Number:	[?]	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
<input type="radio"/> Window Definition Type	*Dimensions For The Ctf Calculation:	[?]	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	*Tube Spacing:	[?] Unit: m	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	*Outside Layer:	Select Material	
	Layer2:	Select Material	
	Layer3:	Select Material	
	Layer4:	Select Material	
	Layer5:	Select Material	
	Layer6:	Select Material	
	Layer7:	Select Material	
	Layer8:	Select Material	
	Layer9:	Select Material	
	Layer10:	Select Material	
	Submit Add Custom Property		

Fig. 12 Data Entry Panel for the Internal Source Definition

Select the *Internal Source Definition* in the *Opaque Envelope Component Definition Type* (Fig. 12) and data entry panel will pop up.

3.5 Unclassified Opaque Envelope Component Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

<input type="radio"/> Material Definition	I do not know the construction type		
<input type="radio"/> Opaque Envelope Component Definition Type	<input checked="" type="radio"/> SI units	<input type="radio"/> IP units	
Layer-by-layer Definition	Name:		
C-Factor Underground Wall	Manufacturer:		
F-Factor Ground Floor	Reference Url:		
I do not know the construction type	Outside Layer:	Select Material	
<input type="radio"/> Window Definition Type	Layer2:	Select Material	
	Layer3:	Select Material	
	Layer4:	Select Material	
	Layer5:	Select Material	
	Layer6:	Select Material	
	Layer7:	Select Material	
	Layer8:	Select Material	
	Layer9:	Select Material	
	Layer10:	Select Material	
	C Factor:	[?] Unit: W/m-K	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Height:	[?] Unit: m	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	F Factor:	Unit: W/m-K	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Area:	Unit: m ²	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Perimeter Exposed:	Unit: m	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Source Present After Layer Number:	[?]	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Temperature Calculation Requested After Layer Number:	[?]	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Dimensions For The Ctf Calculation:	[?]	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Tube Spacing:	[?] Unit: m	<input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Submit Add Custom Property		

Fig. 13 Data Entry Panel for the Unclassified Opaque Envelope Component Definition

To provide as much information as possible to describe the component, without considering the definition types, select *I do not know the construction type* in the *Opaque Envelope Component Definition Type* (Fig. 13) and data entry panel will pop up.

4 Material Definition

Step 1: Go to the Material Definition Type (Fig. 14).

Collapse All | Expand All | Toggle All

Material Definition

- Mass Material
- No Mass Material
- Infrared Transparent Material
- Air Gap Material
- Roof Vegetation Material
- I do not know the material type

Opaque Envelope Component Definition Type

Window Definition Type

Fig. 14 Main List of the Industry Products Types: Material Products

Step 2: Select Material Definition Type (Fig. 14).

There are five definition methods for defining the material, namely, mass material method, no mass material method, infrared transparent material method, air gap material method and roof vegetation material method (Fig. 15). If unsure, select “*I do not know the material type*” which will be explained in section 4.6.

Collapse All | Expand All | Toggle All

Material Definition

- Mass Material
- No Mass Material
- Infrared Transparent Material
- Air Gap Material
- Roof Vegetation Material
- I do not know the material type

Opaque Envelope Component Definition Type

Window Definition Type

Fig. 15 List of the Definition Types for the Material Products

Step 3: Enter information or add custom data.

Refer to Sections 4.1-4.6 for detailed instructions.

Step 4: Click the submit button.

4.1 Mass Material Definition

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Material Definition	Mass Material [?]
<input checked="" type="radio"/> Mass Material	<input checked="" type="radio"/> SI units <input type="radio"/> IP units
No Mass Material	*Name: <input type="text"/>
Infrared Transparent Material	Manufacturer: <input type="text"/>
Air Gap Material	Reference Url: <input type="text"/>
Roof Vegetation Material	*Roughness: <input type="text"/> Very Rough <input type="button" value="▼"/>
I do not know the material type	*Thickness: Unit: <input type="text"/> m <input type="button" value="▼"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
<input type="checkbox"/> Opaque Envelope Component Definition Type	*Conductivity: Unit: <input type="text"/> W/m-K <input type="button" value="▼"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
<input type="checkbox"/> Window Definition Type	*Density: Unit: <input type="text"/> kg/m ³ <input type="button" value="▼"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	*Specific Heat: Unit: <input type="text"/> J/kg-K <input type="button" value="▼"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Thermal Absorptance: <input type="text"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Solar Absorptance: <input type="text"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Visible Absorptance: <input type="text"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	<input type="button" value="Submit"/> <input type="button" value="Add Custom Property"/>

Fig. 16 Data Entry Panel for the Mass Material Definition

Select the *Mass Material* in the *Material Definition Type* (Fig. 16) and data entry panel will pop up.

4.2 No Mass Material Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition	No Mass Material [?]
<input checked="" type="radio"/> Mass Material	<input checked="" type="radio"/> SI units <input type="radio"/> IP units
<input checked="" type="radio"/> No Mass Material	*Name: <input type="text"/>
Infrared Transparent Material	Manufacturer: <input type="text"/>
Air Gap Material	Reference Url: <input type="text"/>
Roof Vegetation Material	*Roughness: <input type="text"/> Very Rough <input type="button" value="▼"/>
I do not know the material type	*Thermal Resistance: Unit: <input type="text"/> m ² -K/W <input type="button" value="▼"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
<input type="checkbox"/> Opaque Envelope Component Definition Type	Thermal Absorptance: <input type="text"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
<input type="checkbox"/> Window Definition Type	Solar Absorptance: <input type="text"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	Visible Absorptance: <input type="text"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
	<input type="button" value="Submit"/> <input type="button" value="Add Custom Property"/>

Fig. 17 Data Entry Panel for the No Mass Material Definition

Select the *No Mass Material* in the *Material Definition Type* (Fig. 17) and data entry panel will pop up.

4.3 Infrared Transparent Material Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition	Infrared Transparent Material [?]
<input checked="" type="radio"/> Mass Material	<input checked="" type="radio"/> SI units <input type="radio"/> IP units
No Mass Material	*Name: <input type="text"/>
<input checked="" type="radio"/> Infrared Transparent Material	Manufacturer: <input type="text"/>
Air Gap Material	Reference Url: <input type="text"/>
Roof Vegetation Material	<input type="button" value="Submit"/> <input type="button" value="Add Custom Property"/>
I do not know the material type	
<input type="checkbox"/> Opaque Envelope Component Definition Type	
<input type="checkbox"/> Window Definition Type	

Fig. 18 Data Entry Panel for the Infrared Transparent Material Definition

Select the *Infrared Transparent Material* in the *Material Definition Type* (Fig. 18) and data entry panel will pop up.

4.4 Air Gap Material Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

<input type="checkbox"/> Material Definition <ul style="list-style-type: none"> - Mass Material - No Mass Material - Infrared Transparent Material Air Gap Material - Roof Vegetation Material - I do not know the material type 	Air Gap Material [?] <input checked="" type="radio"/> SI units <input type="radio"/> IP units *Name: <input type="text"/> Manufacturer: <input type="text"/> Reference Url: <input type="text"/> Thermal Resistance: Unit: <input type="text"/> m ² -K/W ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown <input type="button" value="Submit"/> <input type="button" value="Add Custom Property"> </input>
--	--

Fig. 19 Data Entry Panel for the Air Gap Material Definition

Select the *Air Gap Material* in the *Material Definition Type* (Fig. 19) and data entry panel will pop up.

4.5 Roof Vegetation Material Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

<input type="checkbox"/> Material Definition <ul style="list-style-type: none"> - Mass Material - No Mass Material - Infrared Transparent Material Air Gap Material Roof Vegetation Material - I do not know the material type 	Roof Vegetation Material [?] <input checked="" type="radio"/> SI units <input type="radio"/> IP units *Name: <input type="text"/> Manufacturer: <input type="text"/> Reference Url: <input type="text"/> Height Of Plants: ? Unit: <input type="text"/> m ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown *Leaf Area Index: ? Unit: dimensionless ? <input type="radio"/> Value <input type="radio"> Range(Inclusive) <input type="radio"/> Unknown *Leaf Reflectivity: ? Unit: dimensionless ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown *Leaf Emissivity: ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown Minimum Stomatal Resistance: ? Unit: s/m ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown Soil Layer Name: <input type="text"/> *Roughness: ? <input type="text"/> Medium Rough ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown *Thickness: ? Unit: m ? <input type="radio"/> Value <input type="radio"> Range(Inclusive) <input type="radio"/> Unknown *Conductivity Of Dry Soil: ? Unit: W/m-K ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown *Density Of Dry Soil: ? Unit: kg/m³ ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown *Specific Heat Of Dry Soil: ? Unit: J/kg-K ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown Thermal Absorptance: ? ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown Solar Absorptance: ? ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown Visible Absorptance: ? ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown Saturation Volumetric Moisture Content Of The Soil Layer: ? ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown Residual Volumetric Moisture Content Of The Soil Layer: ? ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown Initial Volumetric Moisture Content Of The Soil Layer: ? ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown Moisture Diffusion Calculation Method: ? ? Advanced ? <input type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown <input type="button" value="Submit"/> <input type="button" value="Add Custom Property"/> </input></input>
---	--

Fig. 20 Data Entry Panel for the Roof Vegetation Material Definition

Select the *Roof Vegetation Material* in the *Material Definition Type* (Fig. 20) and data entry panel will pop up.

4.6 Unclassified Material Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

<ul style="list-style-type: none"> <input type="checkbox"/> Material Definition <ul style="list-style-type: none"> - Mass Material - No Mass Material - Infrared Transparent Material - Air Gap Material - Roof/Vegetation Material I do not know the material type <input type="checkbox"/> Opaque Envelope Component Definition Type <input type="checkbox"/> Window Definition Type 	<p>I do not know the material type</p> <p><input checked="" type="radio"/> SI units <input type="radio"/> IP units</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Name:</td> <td colspan="2"></td> </tr> <tr> <td>Manufacturer:</td> <td colspan="2"></td> </tr> <tr> <td>Reference Url:</td> <td colspan="2"></td> </tr> <tr> <td>Roughness:</td> <td colspan="2">Very Rough</td> </tr> <tr> <td>Thickness:</td> <td>Unit: <input type="button" value="m"/></td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Conductivity:</td> <td>Unit: <input type="button" value="W/m-K"/></td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Density:</td> <td>Unit: <input type="button" value="kg/m<sup>3</sup>"/></td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Specific Heat:</td> <td>Unit: <input type="button" value="J/kg-K"/></td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Thermal Resistance:</td> <td>Unit: <input type="button" value="m<sup>2</sup>-K/W"/></td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Thermal Absorptance:</td> <td colspan="2"></td> </tr> <tr> <td>Solar Absorptance:</td> <td colspan="2"></td> </tr> <tr> <td>Visible Absorptance:</td> <td colspan="2"></td> </tr> <tr> <td>Infrared Transparent:</td> <td>Unit: <input type="button" value="False"/></td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Height Of Plants:</td> <td colspan="2"></td> </tr> <tr> <td>Leaf Area Index:</td> <td>[?] Unit: dimensionless</td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Leaf Reflectivity:</td> <td>[?] Unit: dimensionless</td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Leaf Emissivity:</td> <td colspan="2"></td> </tr> <tr> <td>Minimum Stomatal Resistance:</td> <td>[?] Unit: <input type="button" value="s/m"/></td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Soil Layer Name:</td> <td colspan="2"></td> </tr> <tr> <td>Conductivity Of Dry Soil:</td> <td>[?] Unit: <input type="button" value="W/m-K"/></td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Density Of Dry Soil:</td> <td>[?] Unit: <input type="button" value="kg/m<sup>3</sup>"/></td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Specific Heat Of Dry Soil:</td> <td>Unit: <input type="button" value="J/kg-K"/></td> <td><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> </tr> <tr> <td>Saturation Volumetric Moisture Content Of The Soil Layer:</td> <td colspan="2"></td> </tr> <tr> <td>Residual Volumetric Moisture Content Of The Soil Layer:</td> <td colspan="2"></td> </tr> <tr> <td>Initial Volumetric Moisture Content Of The Soil Layer:</td> <td colspan="2"></td> </tr> <tr> <td>Moisture Diffusion Calculation Method:</td> <td>[?]</td> <td>Advanced <input type="button" value="▼"/></td> </tr> </table> <p><input type="button" value="Submit"/> <input type="button" value="Add Custom Property"/></p>	Name:			Manufacturer:			Reference Url:			Roughness:	Very Rough		Thickness:	Unit: <input type="button" value="m"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Conductivity:	Unit: <input type="button" value="W/m-K"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Density:	Unit: <input type="button" value="kg/m<sup>3</sup>"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Specific Heat:	Unit: <input type="button" value="J/kg-K"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Thermal Resistance:	Unit: <input type="button" value="m<sup>2</sup>-K/W"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Thermal Absorptance:			Solar Absorptance:			Visible Absorptance:			Infrared Transparent:	Unit: <input type="button" value="False"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Height Of Plants:			Leaf Area Index:	[?] Unit: dimensionless	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Leaf Reflectivity:	[?] Unit: dimensionless	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Leaf Emissivity:			Minimum Stomatal Resistance:	[?] Unit: <input type="button" value="s/m"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Soil Layer Name:			Conductivity Of Dry Soil:	[?] Unit: <input type="button" value="W/m-K"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Density Of Dry Soil:	[?] Unit: <input type="button" value="kg/m<sup>3</sup>"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Specific Heat Of Dry Soil:	Unit: <input type="button" value="J/kg-K"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown	Saturation Volumetric Moisture Content Of The Soil Layer:			Residual Volumetric Moisture Content Of The Soil Layer:			Initial Volumetric Moisture Content Of The Soil Layer:			Moisture Diffusion Calculation Method:	[?]	Advanced <input type="button" value="▼"/>
Name:																																																																															
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Thermal Resistance:	Unit: <input type="button" value="m<sup>2</sup>-K/W"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown																																																																													
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Solar Absorptance:																																																																															
Visible Absorptance:																																																																															
Infrared Transparent:	Unit: <input type="button" value="False"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown																																																																													
Height Of Plants:																																																																															
Leaf Area Index:	[?] Unit: dimensionless	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown																																																																													
Leaf Reflectivity:	[?] Unit: dimensionless	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown																																																																													
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Density Of Dry Soil:	[?] Unit: <input type="button" value="kg/m<sup>3</sup>"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown																																																																													
Specific Heat Of Dry Soil:	Unit: <input type="button" value="J/kg-K"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown																																																																													
Saturation Volumetric Moisture Content Of The Soil Layer:																																																																															
Residual Volumetric Moisture Content Of The Soil Layer:																																																																															
Initial Volumetric Moisture Content Of The Soil Layer:																																																																															
Moisture Diffusion Calculation Method:	[?]	Advanced <input type="button" value="▼"/>																																																																													

Fig. 21 Data Entry Panel for the Unclassified Material Definition

To provide as much information as possible to describe the material, without considering the definition types, select *I do not know the material type* in the *Material Definition Type* (Fig. 21) and data entry panel will pop up.

5 Transparent Envelope Component Definition

Step 1: Go to the Window Definition Type (Fig. 22).

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

- ⊕ Material Definition
- ⊕ Opaque Envelope Component Definition Type
- ⊖ Window Definition Type
 - Glazing System: Simple Glazing System
 - Glazing System: Layer by layer Definition
 - Glazing
 - Gas
 - Gas Mixture
 - Frame and Dividers
 - Blind
 - Shade
 - Screen
 - I do not know the window type

Fig. 22 Main List of the Industry Products Types: Transparent Envelope

Step 2: Select Material Definition Type (Fig. 23).

There are nine definition methods for defining the material, namely, Glazing System: Simple Glazing System, Glazing System: Layer by layer Definition, Glazing, Gas, Gas Mixture, Frame and Dividers, Blind, Shade, and Screen.

If unsure, select “*I do not know the window type*” which will be explained in section 5.10.

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

- ⊕ Material Definition
- ⊕ Opaque Envelope Component Definition Type
- ⊖ Window Definition Type
 - Glazing System: Simple Glazing System
 - Glazing System: Layer by layer Definition
 - Glazing
 - Gas
 - Gas Mixture
 - Frame and Dividers
 - Blind
 - Shade
 - Screen
 - I do not know the window type

Fig. 23 List of the Definition Types for the Transparent Envelope Component

Step 3: Enter information or add custom data.

Refer to Sections 5.1-5.10 for detailed instructions.

Step 4: Click the submit button.

5.1 Glazing System: Simple Glazing System Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
 Opaque Envelope Component Definition Type
 Window Definition Type
 Glazing System: Simple Glazing System (red circle)
 Glazing System: Layer by layer Definition
 Glazing
 Gas
 Gas Mixture
 Frame and Dividers
 Blind
 Shade
 Screen
I do not know the window type

Glazing System: Simple Glazing System [?]
SI units IP units
*Name:
Manufacturer:
Reference Url:
*U Factor: [?] Unit: W/m²-K Value Range(Inclusive) Unknown
*Solar Heat Gain Coefficient: [?] Value Range(Inclusive) Unknown
Visible Transmittance: [?] Value Range(Inclusive) Unknown
Submit Add Custom Property

Fig. 24 Data Entry Panel for the Simple Glazing System Definition

Select the *Glazing System: Simple Glazing System* in the *Window Definition Type* and data entry panel will pop up (Fig. 24).

5.2 Glazing System: Layer by layer Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
 Opaque Envelope Component Definition Type
 Window Definition Type
 Glazing System: Simple Glazing System
 Glazing System: Layer by layer Definition (red circle)
 Glazing
 Gas
 Gas Mixture
 Frame and Dividers
 Blind
 Shade
 Screen
I do not know the window type

Glazing System: Layer by layer Definition
SI units IP units
*Name:
Manufacturer:
Reference Url:
*Outside Layer: Select Material
*Gas Layer: Select Material
*Inside Layer: Select Material
Submit Add Custom Property

Fig. 25 Data Entry Panel for the Layer by layer Glazing System Definition

Select the *Glazing System: Layer by layer Definition* in the *Window Definition Type* and data entry panel will pop up (Fig. 25).

The Out Side Layer field and Inside Layer field only accept *Glazing* material (Fig. 26):

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
 Opaque Envelope Component Definition Type
 Window Definition Type

- Glazing System: Simple Glazing System
- Glazing System: Layer by layer Definition
- Glazing
- Gas
- Gas Mixture
- Frame and Dividers
- Blind
- Shade
- Screen
- I do not know the window type

Glazing System: Layer by layer Definition

SI units IP units

*Name:

Manufacturer:

Reference Url:

*Outside Layer:

Material Definition Type:

Window Definition Type:

Customized--View Details
(6OptiW/060SafelexOptiW)--View Details
SageGlass(R) fully tinted 1.6%T state on 6mm--View Details
Optitherm™ SN--View Details
4mm Solarban® 70XL CLR_090Butacite_4mm Solargray®--View Details
Solarban® 70XL Solargray®--View Details
6mm Solexa/0.090 DuPont PVB/6mm SB60 Clear--View Details
Float glass 4mm--View Details
PPG Test--View Details
*Gas Layer:

*Inside Layer:

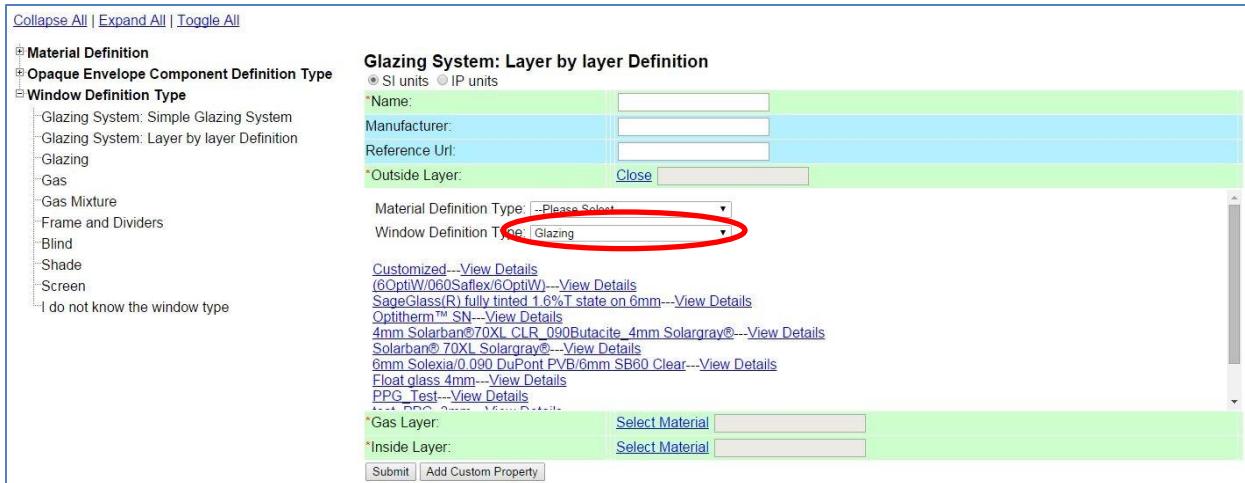


Fig. 26 Out Side/Inside Layer Requirement in the Layer by Layer Glazing System Definition

The Gas Layer field only accepts *Gas, and Gas Mixture* material (Fig. 27):

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
 Opaque Envelope Component Definition Type
 Window Definition Type

- Glazing System: Simple Glazing System
- Glazing System: Layer by layer Definition
- Glazing
- Gas
- Gas Mixture
- Frame and Dividers
- Blind
- Shade
- Screen
- I do not know the window type

Glazing System: Layer by layer Definition

SI units IP units

*Name:

Manufacturer:

Reference Url:

*Outside Layer:

*Gas Layer:

Material Definition Type:
Window Definition Type:

No Existing Materials under Gas type

*Inside Layer:

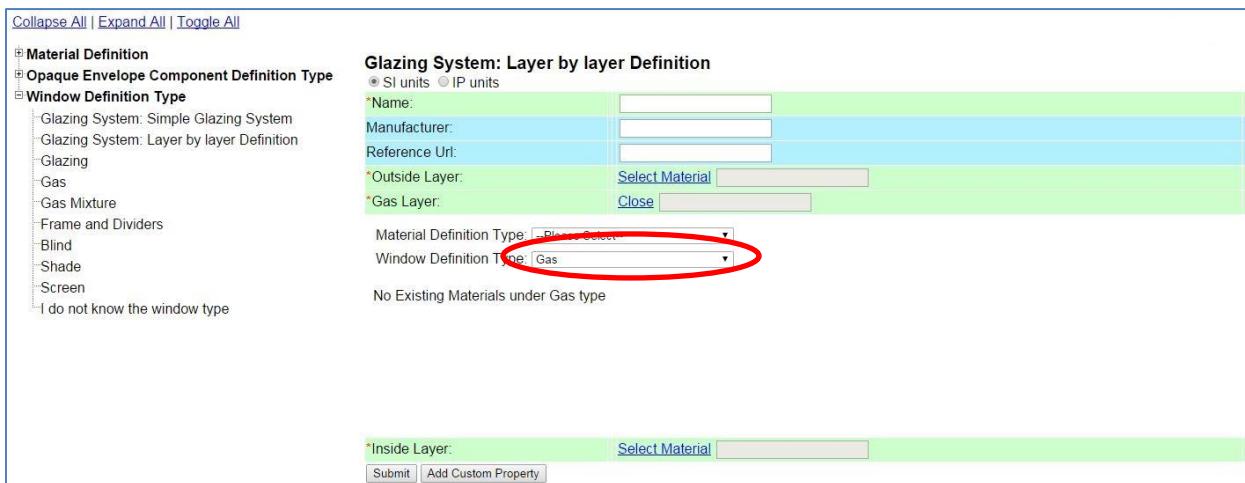


Fig. 27 Gas Layer Requirement in the Layer by Layer Glazing System Definition

5.3 Glazing Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition

Opaque Envelope Component Definition Type

Window Definition Type

- Glazing System: Simple Glazing System
- Glazing System: Layer by layer Definition
- Glazing**
- Gas
- Gas Mixture
- Frame and Dividers
- Blind
- Shade
- Screen

I do not know the window type

Select existing glazing material from IGDB Create new glazing material

Fig. 28 Data Entry Panel for the Glazing Definition Type

Select the *Glazing* in the *Window Definition Type*, two radio buttons will come out (Fig. 28). Then you can choose one of the two definition types: to select existing glazing material from IGDB (International Glazing Database), or to create a new glazing material.

Select Existing Glazing Material from IGDB

Check the first radio button, select the manufacturer first. The tool will find the potential matching manufacturer name based on your input (Fig. 29):

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Select existing glazing material from IGDB Create new glazing material

Glazing Materials from International Glazing Database

Manufacturer: **PPG Industries**

Glass name:

*Click Submit to save the material to the user database.

Material Definition

Opaque Envelope Component Definition Type

Window Definition Type

- Glazing System: Simple Glazing System
- Glazing System: Layer by layer Definition
- Glazing
- Gas
- Gas Mixture
- Frame and Dividers
- Blind
- Shade
- Screen
- I do not know the window type

Fig. 29 Select Existing Glazing Material Manufacturer in the Glazing Definition

Then choose a specific glazing material (Fig. 30):

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Select existing glazing material from IGDB Create new glazing material

Glazing Materials from International Glazing Database

Manufacturer:

Glass name:

**3mmSB70XLCLR_090DPPVB_3mmCL
090BUTACITE-CRLAM_3.PPG
3mmSB70XLCLR_090DPSGP_3mmCL
090DPSGP-CRLAM_3.PPG
3mmSGY_090DPPVB_3mmSB70XLCL
090BUTACITE-SB70XL_3.PPG
3mmSGY_090DPSGP_3mmSB70XLCL
090DPSGP-SB70XL_3.PPG
4mm Solarban®70XL
CLR_090Butacite_3mm**

Material Definition

Opaque Envelope Component Definition Type

Window Definition Type

- Glazing System: Simple Glazing System
- Glazing System: Layer by layer Definition
- Glazing
- Gas
- Gas Mixture
- Frame and Dividers
- Blind
- Shade
- Screen
- I do not know the window type

Fig. 30 Select Existing Glazing Material in the Glazing Definition

Then the chosen material's detailed information will show up (Fig. 31):

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition Opaque Envelope Component Definition Type

Window Definition Type

- Glazing System: Simple Glazing System
- Glazing System: Layer by layer Definition
- Glazing
- Gas
- Gas Mixture
- Frame and Dividers
- Blind
- Shade
- Screen

I do not know the window type

Glazing [?]

SI units IP units

*Name:	3mmSB70XLCLR_090DPPV
Manufacturer:	PPG Industries
Reference Url:	
*Optical Data Type:	Spectral Average
Window Gas Spectral Data Set Name:	[?]
*Thickness:	Unit: m
Solar Transmittance At Normal Incidence:	[?]
Front Side Solar Reflectance At Normal Incidence:	[?]
Back Side Solar Reflectance At Normal Incidence:	[?]
Visible Transmittance At Normal Incidence:	[?]
Front Side Visible Reflectance At Normal Incidence:	[?]
Back Side Visible Reflectance At Normal Incidence:	[?]
Infrared Transmittance At Normal Incidence:	[?]
Front Side Infrared Hemispherical Emissivity:	[?]
Back Side Infrared Hemispherical Emissivity:	[?]
Conductivity:	Unit: W/m-K
Dirt Correction Factor For Solar And Visible Transmittance:	[?]
Solar Diffusing:	No

[View Spectral Details](#)

[Submit](#) | [Add Custom Property](#)

Fig. 31 Existing Glazing Material Detailed Information in the Glazing Definition

You can view detailed spectral data set via the *View Spectral Details* link (Fig. 32):

Glazing [?]

SI units IP units

*Name:	3mmSB70XLCLR_090DPPV
Manufacturer:	PPG Industries
Reference Url:	
*Optical Data Type:	Spectral Average
Window Gas Spectral Data Set Name:	[?]
*Thickness:	Unit: m
Solar Transmittance At Normal Incidence:	[?]
Front Side Solar Reflectance At Normal Incidence:	[?]
Back Side Solar Reflectance At Normal Incidence:	[?]
Visible Transmittance At Normal Incidence:	[?]
Front Side Visible Reflectance At Normal Incidence:	[?]
Back Side Visible Reflectance At Normal Incidence:	[?]
Infrared Transmittance At Normal Incidence:	[?]
Front Side Infrared Hemispherical Emissivity:	[?]
Back Side Infrared Hemispherical Emissivity:	[?]
Conductivity:	Unit: W/m-K
Dirt Correction Factor For Solar And Visible Transmittance:	[?]
Solar Diffusing:	No

[View Spectral Details](#)

[Submit](#)

Fig. 32 Detailed Spectral Data Link in the Glazing Definition

The spectral details page will show up (Fig. 33):

Spectral Details ID: 31384				
Wave Length Index	Wave Length (micron)	Transmittance	Front Reflectance	Back Reflectance
1	0.3	0.0	0.0511	0.0511
2	0.305	0.0	0.0506	0.0506
3	0.31	0.0	0.0505	0.0505
4	0.315	0.0	0.0506	0.0502
5	0.32	0.0	0.0521	0.05
6	0.325	0.0	0.0595	0.0498
7	0.33	0.0	0.0753	0.0495
8	0.335	0.0	0.0987	0.0495
9	0.34	0.0	0.1263	0.0495
10	0.345	0.0	0.1537	0.0495

Fig. 33 Detailed Spectral Data in the Glazing Definition

After change(s) to any field except Name field, the Name field will be cleared, then give a new name to the material to distinguish with the existing one (Fig. 34):

Glazing Materials from International Glazing Database

Manufacturer: PPG Industries

Glass name: 3mmSP70XLCLP_200DRRVRB_3mmCLR_SB70XL

*Please provide a new name for this customized material.

Glazing [?]

SI units IP units

Name:	
Manufacturer:	PPG Industries
Reference Url:	

Fig. 34 Provide New Names to Customized Existing Glazing Materials

Create New Glazing Material

Check the second radio button, and data entry panel will pop up (Fig. 35).

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
 Opaque Envelope Component Definition Type
 Window Definition Type

- Glazing System: Simple Glazing System
- Glazing System: Layer by layer Definition
- Glazing
- Gas
- Gas Mixture
- Frame and Dividers
- Blind
- Shade
- Screen
- I do not know the window type

Select existing glazing material from IGDB
 Create new glazing material

Glazing [?]

* Name:

Manufacturer:

Reference Url:

* Optical Data Type:

Window Gas Spectral Data Set Name: [?]

* Thickness: Unit:

Solar Transmittance At Normal Incidence: [?]

Front Side Solar Reflectance At Normal Incidence: [?]

Back Side Solar Reflectance At Normal Incidence: [?]

Visible Transmittance At Normal Incidence: [?]

Front Side Visible Reflectance At Normal Incidence: [?]

Back Side Visible Reflectance At Normal Incidence: [?]

Infrared Transmittance At Normal Incidence:

Front Side Infrared Hemispherical Emissivity:

Back Side Infrared Hemispherical Emissivity:

Conductivity: Unit:

Dirt Correction Factor For Solar And Visible Transmittance:

Solar Diffusing:

Fig. 35 Data Entry Panel for Creating New Glazing Material

5.4 Gas Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
 Opaque Envelope Component Definition Type
 Window Definition Type

- Glazing System: Simple Glazing System
- Glazing System: Layer by layer Definition
- Glazing
- Gas**
- Gas Mixture
- Frame and Dividers
- Blind
- Shade
- Screen
- I do not know the window type

Gas [?]

* Name:

Manufacturer:

Reference Url:

* Gas Type:

* Thickness: Unit:

Conductivity Coefficient A: [?] Unit:

Conductivity Coefficient B: [?] Unit:

Conductivity Coefficient C: [?] Unit:

Viscosity Coefficient A: [?] Unit:

Viscosity Coefficient B: [?] Unit:

Viscosity Coefficient C: [?] Unit:

Specific Heat Coefficient A: [?] Unit:

Specific Heat Coefficient B: [?] Unit:

Specific Heat Coefficient C: [?] Unit:

Molecular Weight: [?] Unit:

Specific Heat Ratio: [?]

Fig. 36 Entry Panel for the Gas Definition

Select the *Gas* in the *Window Definition Type* and data entry panel will pop up (Fig. 36).

5.5 Gas Mixture Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

<ul style="list-style-type: none"> <input type="checkbox"/> Material Definition <input type="checkbox"/> Opaque Envelope Component Definition Type <input checked="" type="checkbox"/> Window Definition Type <ul style="list-style-type: none"> - Glazing System: Simple Glazing System - Glazing System: Layer by layer Definition - Glazing - Gas - Gas Mixture (Red Circle) - Frame and Dividers - Blind - Shade - Screen - I do not know the window type 	<p>Gas Mixture [?]</p> <p><input checked="" type="radio"/> SI units <input type="radio"/> IP units</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">*Name:</td> <td style="width: 15%;"><input type="text"/></td> <td style="width: 15%; text-align: center;">Unit: <input type="button" value="m"/></td> <td style="width: 15%; text-align: center;"><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> <td style="width: 15%; text-align: 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Fig. 37 Entry Panel for the Gas Mixture Definition

Select the *Gas Mixture* in the *Window Definition Type* and data entry panel will pop up (Fig. 37).

5.6 Frame and Dividers Definition

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<ul style="list-style-type: none"> <input type="checkbox"/> Material Definition <input type="checkbox"/> Opaque Envelope Component Definition Type <input checked="" type="checkbox"/> Window Definition Type <ul style="list-style-type: none"> - Glazing System: Simple Glazing System - Glazing System: Layer by layer Definition - Glazing - Gas - Gas Mixture - Frame and Dividers (Red Circle) - Blind - Shade - Screen - I do not know the window type 	<p>Frame and Dividers [?]</p> <p><input checked="" type="radio"/> SI units <input type="radio"/> IP units</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">*Name:</td> <td style="width: 15%;"><input type="text"/></td> <td style="width: 15%; text-align: center;"><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown</td> <td style="width: 15%; text-align: center;"><input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input 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Reference Url:	<input type="text"/>																																																																																																												
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Fig. 38 Data Entry Panel for the Frame and Dividers Definition

Select the *Frame and Dividers* in the *Window Definition Type* and data entry panel will pop up (Fig. 38).

5.7 Blind Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition		
Opaque Envelope Component Definition Type		
Window Definition Type		
Glazing System: Simple Glazing System	<input checked="" type="radio"/> SI units <input type="radio"/> IP units	
Glazing System: Layer by layer Definition		
Glazing		
Gas		
Gas Mixture		
Frame and Dividers		
Blind		
Shade		
Screen		
I do not know the window type		
Blind [?]		
Name:		
Manufacturer:		
Reference Url:		
Slat Orientation:	Horizontal ▾	
*Slat Width:	Unit: <input type="text" value="m"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Slat Separation:	Unit: <input type="text" value="m"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Slat Thickness:	Unit: <input type="text" value="m"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Slat Angle:	Unit: <input type="text" value="deg"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Slat Conductivity:	Unit: <input type="text" value="W/m-K"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Slat Beam Solar Transmittance:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Front Side Slat Beam Solar Reflectance:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Back Side Slat Beam Solar Reflectance:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Slat Diffuse Solar Transmittance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Front Side Slat Diffuse Solar Reflectance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Back Side Slat Diffuse Solar Reflectance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Slat Beam Visible Transmittance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Front Side Slat Beam Visible Reflectance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Back Side Slat Beam Visible Reflectance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Slat Diffuse Visible Transmittance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Front Side Slat Diffuse Visible Reflectance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Back Side Slat Diffuse Visible Reflectance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Slat Infrared Hemispherical Transmittance:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Front Side Slat Infrared Hemispherical Emissivity:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Back Side Slat Infrared Hemispherical Emissivity:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Blind To Glass Distance:	Unit: <input type="text" value="m"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Blind Top Opening Multiplier:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Blind Bottom Opening Multiplier:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Blind Left Side Opening Multiplier:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Blind Right Side Opening Multiplier:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Minimum Slat Angle:	Unit: <input type="text" value="deg"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Maximum Slat Angle:	Unit: <input type="text" value="deg"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown

Fig. 39 Entry Panel for the Blind Data Definition

Select the *Blind* in the *Window Definition Type* and data entry panel will pop up (Fig. 39).

5.8 Shade Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition		
Opaque Envelope Component Definition Type		
Window Definition Type		
Glazing System: Simple Glazing System	<input checked="" type="radio"/> SI units <input type="radio"/> IP units	
Glazing System: Layer by layer Definition		
Glazing		
Gas		
Gas Mixture		
Frame and Dividers		
Blind		
Shade		
Screen		
I do not know the window type		
Shade [?]		
Name:		
Manufacturer:		
Reference Url:		
*Solar Transmittance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Solar Reflectance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Visible Transmittance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Visible Reflectance:	Unit: <input type="text" value="?"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Thermal Hemispherical Emissivity:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Thermal Transmittance:	Unit: dimensionless <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Thickness:	Unit: <input type="text" value="m"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
*Conductivity:	Unit: <input type="text" value="W/m-K"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Shad To Glass Distance:	Unit: <input type="text" value="m"/> <input type="button" value="?"/>	<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Top Opening Multiplier:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Bottom Opening Multiplier:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Left Side Opening Multiplier:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Right Side Opening Multiplier:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown
Airflow Permeability:		<input checked="" type="radio"/> Value <input type="radio"/> Range(Inclusive) <input type="radio"/> Unknown

Fig. 40 Entry Panel for the Shade Data Definition

Select the *Shade* in the *Window Definition Type* and data entry panel will pop up (Fig. 40).

5.9 Screen Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
 Opaque Envelope Component Definition Type

Window Definition Type

- Glazing System: Simple Glazing System
- Glazing System: Layer by layer Definition
- Glazing
- Gas
- Gas Mixture
- Frame and Dividers
- Blind
- Shade
- Screen**
- I do not know the window type

Screen [?]	
<input checked="" type="radio"/> SI units	<input type="radio"/> IP units
Name:	
Manufacturer:	
Reference Url:	
R Effected Beam Transmittance Accounting Method:	[?]
Diffuse Solar Reflectance:	[?] Unit: dimensionless
Diffuse Visible Reflectance:	[?] Unit: dimensionless
Thermal Hemispherical Emissivity:	[?] Unit: dimensionless
Conductivity:	[?] Unit: W/m·K
Screen Material Spacing:	[?] Unit: m
Screen Material Diameter:	[?] Unit: m
Screen To Glass Distance:	[?] Unit: m
Top Opening Multiplier:	[?] Unit: dimensionless
Bottom Opening Multiplier:	[?] Unit: dimensionless
Left Side Opening Multiplier:	[?] Unit: dimensionless
Right Side Opening Multiplier:	[?] Unit: dimensionless
Angle Of Resolution For Screen Transmittance Output Map:	[?] Unit: deg
<input type="button" value="Submit"/> <input type="button" value="Add Custom Property"/>	

Fig. 41 Entry Panel for the Screen Data Definition

Select the *Screen* in the *Window Definition Type* and data entry panel will pop up (Fig. 41).

5.10 Unclassified Window Definition

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
 Opaque Envelope Component Definition Type

Window Definition Type

- Glazing System: Simple Glazing System
- Glazing System: Layer by layer Definition
- Glazing
- Gas
- Gas Mixture
- Frame and Dividers
- Blind
- Shade
- Screen**
- I do not know the window type

I do not know the window type	
<input checked="" type="radio"/> SI units	<input type="radio"/> IP units
Name:	
Manufacturer:	
Reference Url:	
U Factor:	[?] Unit: W/m ² ·K
Solar Heat Gain Coefficient:	[?]
Visible Transmittance:	
Optical Data Type:	Spectral Average
Window Gas Spectral Data Set Name:	[?]
Thickness:	Unit: m
Solar Transmittance At Normal Incidence:	[?]
<input type="button" value="Submit"/> <input type="button" value="Add Custom Property"/>	

Fig. 42 Data Entry Panel for the Unclassified Window Definition

To provide as much information as possible to describe the window, without considering the definition types, select *I do not know the window type* in the *Window Definition Type* and data entry panel will pop up (Fig. 42).

6 Search Function

Web-Based Industry Products/Design Solutions Data Acquisition Page [Home Page](#)

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Material Definition
Opaque Envelope Component Definition Type
Window Definition Type

Search product by name Search in Current Category Search in All Categories
Search product by manufacturer Search in Current Category Search in All Categories



Fig. 43 Search Area

6.1 Search by Product Name

Search product by name



Fig. 44 Search by Product Name Area

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition
Mass Material
No Mass Material
Infrared Transparent Material
Air Gap Material
Root Vegetation Material
I do not know the material type

Opaque Envelope Component Definition Type
Window Definition Type

Definition Category Definition Type Reliability Name

Definition Category	Definition Type	Reliability	Name
Material	Mass Material	Specifications	test
Material	Mass Material	Derived	test_1
Material	Mass Material	Derived	test_2
Material	Mass Material	Specifications	A_test_mass_material
Material	Mass Material	Specifications	Tree_Test_whp
Material	Mass Material	Derived	Tree_Test_whp_Update
Material	Mass Material	Derived	Tree_Test_whp_Update

test Search in Current Category Search in All Categories
Search product by manufacturer Search in Current Category Search in All Categories

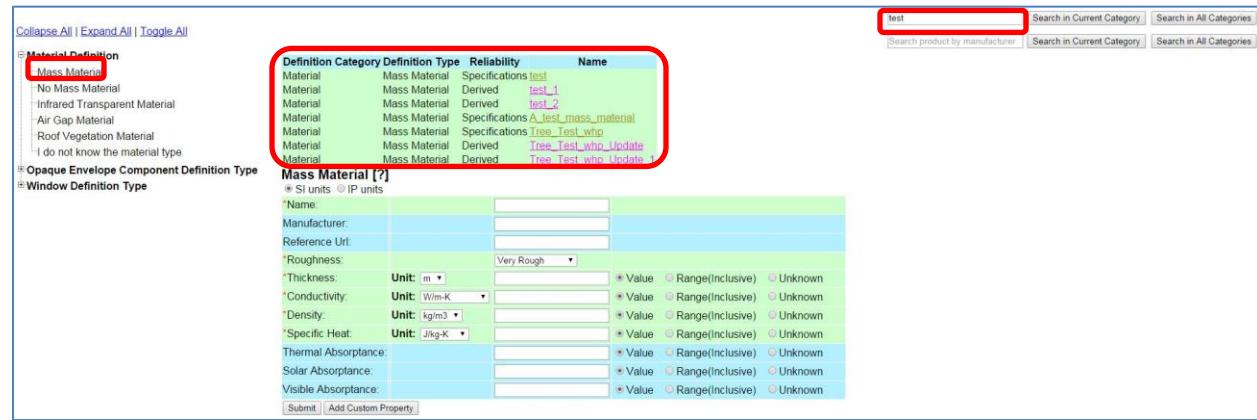


Fig. 45 Search in Current Category

Mass Material is selected as current category, all the materials under Mass Material category are searched, and the material whose name contains 'test' is returned (Fig. 45).

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Definition	Category	Definition Type	Reliability	Name
Material	Mass Material	Mass Material	Specifications	test
Material	Mass Material	Derived	test_1	
Material	Mass Material	Derived	test_2	
Material	Mass Material	Specifications	A	test_moss_material
Material	Mass Material	Specifications	Tree	Test_whp
Material	Mass Material	Derived	Tree_Test_whp_Update	
Material	Mass Material	Derived	Tree_Test_whp_Update_1	
Transparent Material Glazing		Derived		PPG_Test
Transparent Material Glazing		Derived		test_PPG_3mm
Transparent Material Glazing		Specifications	A	test_glaze_material
Transparent Material Glazing		Derived	(000)	test_glaze_material

Mass Material [1]

* SI units * IP units

* Name:

Manufacturer:

Reference Url:

* Roughness: Very Rough

* Thickness: Unit: m * Value Range(Inclusive) Unknown

* Conductivity: Unit: W/m-K * Value Range(Inclusive) Unknown

* Density: Unit: kg/m³ * Value Range(Inclusive) Unknown

* Specific Heat: Unit: J/kg-K * Value Range(Inclusive) Unknown

Thermal Absorptance: * Value Range(Inclusive) Unknown

Solar Absorptance: * Value Range(Inclusive) Unknown

Visible Absorptance: * Value Range(Inclusive) Unknown

[Submit](#) | [Add Custom Property](#)

Fig. 46 Search in All Categories

All the materials are searched, and the material whose name contains ‘test’ is returned (Fig. 46).

6.2 Search by Manufacturer

[Search product by manufacturer](#) [Search in Current Category](#) [Search in All Categories](#)

Fig. 47 Search by Manufacturer Area

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Definition	Category	Definition Type	Reliability	Name
Material	Mass Material	Mass Material	Specifications	Spray Foam SPF Closed Cell 3
Material	Mass Material	Mass Material	Specifications	Eerglass Batt 2
Material	Mass Material	Mass Material	Specifications	Interior Insulation 2

Mass Material [1]

* SI units * IP units

* Name:

Manufacturer:

Reference Url:

* Roughness: Very Rough

* Thickness: Unit: m * Value Range(Inclusive) Unknown

* Conductivity: Unit: W/m-K * Value Range(Inclusive) Unknown

* Density: Unit: kg/m³ * Value Range(Inclusive) Unknown

* Specific Heat: Unit: J/kg-K * Value Range(Inclusive) Unknown

Thermal Absorptance: * Value Range(Inclusive) Unknown

Solar Absorptance: * Value Range(Inclusive) Unknown

Visible Absorptance: * Value Range(Inclusive) Unknown

[Submit](#) | [Add Custom Property](#)

Fig. 48 Search in Current Category

Mass Material is selected as current category, all the materials under Mass Material category are searched, and the material whose manufacturer name contains ‘ma’ is returned (Fig. 48).

[Collapse All](#) | [Expand All](#) | [Toggle All](#)

Material Definition

- Mass Material
- No Mass Material
- Infrared Transparent Material
- Air Gap Material
- Root Vegetation Material
- I do not know the material type

Opaque Envelope Component Definition Type

Window Definition Type

Definition Category	Definition Type	Reliability	Name
Material	Mass Material	Specifications	Spray Foam SPF-Closed Cell.3
Material	Mass Material	Specifications	Fiberglass Batt.2
Material	Mass Material	Specifications	Interior Insulation.2
Transparent Material	I do not know the window type	Specifications	Casement Windows
Transparent Material	I do not know the window type	Specifications	Hopper Window.2
Transparent Material	I do not know the window type	Specifications	Double Hung Windows.3
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Air.2
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Air.1
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Argon.1
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Air.3
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Argon.2
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Air.4
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Air.5
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Air.6
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Air.7
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Argon.3
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Argon.4
Transparent Material Glazing System	Simple Glazing System	Specifications	Awning Windows_Marvin_Clad Ultimate Awning_LoE_Argon.5

Mass Material [1]

* SI units IP units

* Name:

Manufacturer:

Reference Url:

* Roughness: Very Rough

* Thickness: Unit: m Value Range(inclusive) Unknown

* Conductivity: Unit: W/m-K Value Range(inclusive) Unknown

* Density: Unit: kg/m³ Value Range(inclusive) Unknown

* Specific Heat: Unit: J/kg-K Value Range(inclusive) Unknown

Thermal Absorptance: * Value Range(inclusive) Unknown

Solar Absorptance: * Value Range(inclusive) Unknown

Visible Absorptance: * Value Range(inclusive) Unknown

Fig. 49 Search in All Categories

All the materials are searched, and the material whose manufacturer name contains 'ma' is returned (Fig. 49).