



# **AERCalc V 1.2**

## **User Guide**

**Lawrence Berkeley National Laboratory**

**December 13, 2017**

# AERCalc Workflow

- Import the attachment products from the WINDOW Window Library
  - When you first open AERCalc, there are no records in the main screen
- Save as a Project if desired
  - The default location is C:\Users\<username>\AppData\LBNL\aecalc but a project can be saved to any directory
- Edit the record as needed
  - Adjust the **AL** value if needed
  - Add an **AERC ID** value if needed
  - Edit the manufacturer value if needed
- Simulate the products (select the records and click the simulate button)
- Export the products (for the AERC CPD) and edit as needed
  - Edit the **Manufacturer** or **Material Manufacturer** if needed
  - For Venetian blinds and vertical louvers, copy the **U-factor**, **SHGC** and **Tvis** values from the appropriate child record to the parent record

# Main Screen: Overview

Menu options

Directory path of the current Project

Grid of attachment products (imported from WINDOW)

Date and time of last simulation

Total number of products in this Project

Num. Products : 12  
Last simulation : 03:06 PM, 12/02/2017

select all | deselect all

ID	Name	BSDF	Error Status	ID	Manufacturer	W7 Product ID	W7 Glazing System ID	CGDB ID	CGDB Version	W7 DB	W7 Version	Window Attachment	Baseline Window	U-factor (Btu/h-ft <sup>2</sup> -F)	SHGC	TVIS	AL (cfm/ft <sup>2</sup> )	EPc	EPh
1	Single cell Light color (Levolor) Indoor::CS::BW-B	✓		Lev-01	Generic	1003	1003	50	10.0	C:\Users\	7.6.3	CS	BW-B	0.00	0.00	0.00	2.00		
2	Stacked double cell Light color(Levolor) Indoor::CS::BW-B	✓			Generic	1004	1004	51	10.0	C:\Users\	7.6.3	CS	BW-B	0.26	0.21	0.05	2.00		
3	Cell-in-cell Light color (HD) Indoor::CS::BW-B	✓			Generic	1007	1007	52	10.0	C:\Users\	7.6.3	CS	BW-B	0.28	0.27	0.03	2.00		
4	Single cell Blackout low-e (HD) Indoor::CS::BW-B	✓			Generic	1010	1010	53	10.0	C:\Users\	7.6.3	CS	BW-B	0.28	0.25	0.00	2.00		

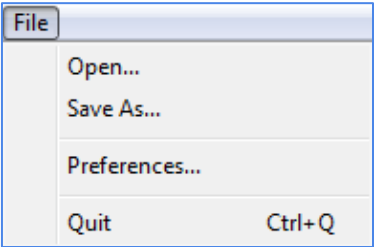
Import Products

Run Simulation

Button to import attachment products from a WINDOW database

Button to calculate the EPc and EPh values for the highlighted records

# Main Screen: File Menu



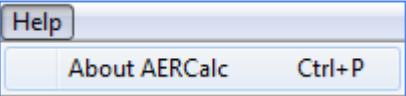
Open	Open a project, which will open a Browse window to select the folder containing the desired Project
Save As	Save the current products to a Project. This opens a Browse window to select the folder which will contain the saved Project
Preferences	<p>Opens the Preferences window, where the following can be specified</p> <ul style="list-style-type: none"><li>● <b>General Tab:</b><ul style="list-style-type: none"><li>○ <b>Log:</b> Creates a log with messages that can be used for debugging</li><li>○ <b>Precision:</b> allows control of the number of decimal places for the EPc and EPh values. The default is 0 decimal points.</li><li>○ <b>Product List:</b> An option to show (or not) the ID column in the main screen</li></ul></li></ul> <div data-bbox="564 833 1611 1159"></div> <ul style="list-style-type: none"><li>● <b>WINDOW7 tab:</b><ul style="list-style-type: none"><li>○ Allows specification of the WINDOW 7 database from which the attachment products will be Imported</li></ul></li></ul> <div data-bbox="564 1251 1568 1569"></div>
Quit	Closes the program

# Main Screen: Products Menu

Products		
Select All		Ctrl+A
Deselect All		Ctrl+Shift+A
Simulate		Ctrl+S
Import		Ctrl+I
Export as CSV		Ctrl+E
Delete		Ctrl+D

Select All	Selects all products in the grid
Deselect All	Unselects all the products in the grid
Simulate	Starts the calculation of the EPc and EPh values for all the selected products. Equivalent to clicking the Simulate button
Import	Opens the Import dialog box, which allows selection of attachment products to be imported into AERCalc from the WINDOW database specified in the File/Preferences menu, WINDOW tab
Export as CSV	Exports all the records in the grid to a CSV file
Delete	Deletes any selected records

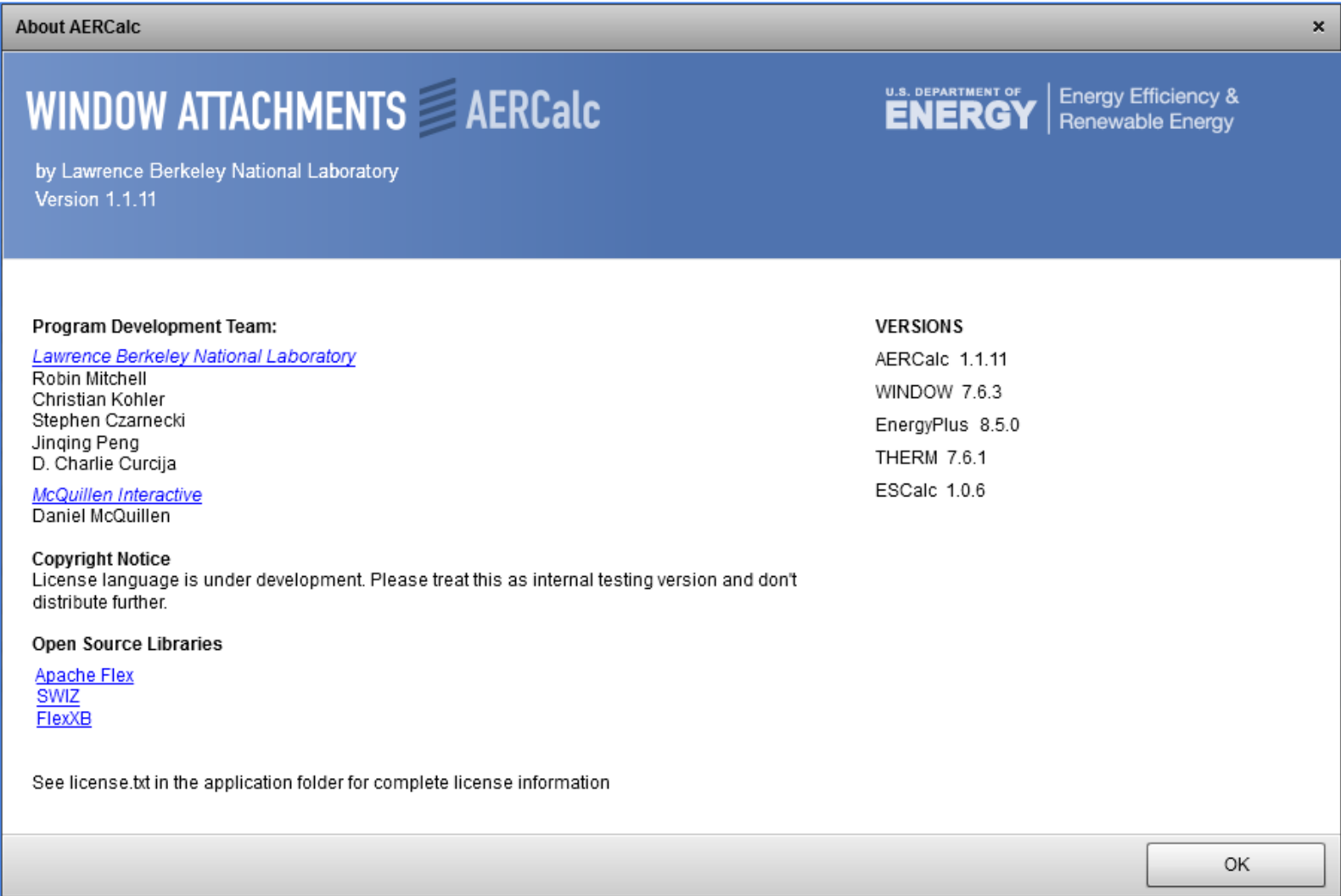
# Main Screen: Help Menu



## About AERCalc

Shows the About screen, which indicates the version numbers of AERCalc and associated components, as well as developers and license information.

The version numbers for the program and associated components are included in the Export file



# Main Screen: Fields

Glazing System ID for the Window from WINDOW 7

Product ID (Window ID from WINDOW 7)

Attachment Manufacturer

Product Name (from WINDOW Window Library name)

Name of WINDOW db where the record originated

Air Leakage  
The program automatically defaults AL to 2.0 cfm/ft2, but this value can be edited

These properties are calculated in WINDOW 7

Name	BSDF	Error Status	ID	Manufacturer	W7 Product ID	W7 Glazing System ID	CGDB ID	CGDB Version	W7 DB	W7 Version	Window Attachment	Baseline Window	U-factor (Btu/h-ft2-F)	SHGC	TVIS	AL (cfm/ft2)	EPc	EPH
Triple cell blackout low-e (HD) (no side gap) Indoor::CS::BW-B	✓			Hunter	1105	1105	14006	10.0	C:\Users	7.6.3	CS	BW-B	0.19	0.21	0.00	2.00	43	20
Stacked double cell Light color(Levolor) Indoor::CS::BW-B	✓			Generic	1004	1004	51	10.0	C:\Users	7.6.3	CS	BW-B	0.26	0.21	0.05	2.00		
Stacked double cell Light color(Levolor) (no side gap) Indoor::CS::BW-B	✓			Generic	1104	1104	51	10.0	C:\Users	7.6.3	CS	BW-B	0.22	0.20	0.05	2.00		
Single cell Light color (Levolor) Indoor::CS::BW-B	✓		GN-1433	Generic	1003	1003	50	10.0	C:\Users	7.6.3	CS	BW-B	0.00	0.00	0.00	2.00		
Single cell Light color (Levolor) (no side gap) Indoor::CS::BW-B	✓			Generic	1103	1103	50	10.0	C:\Users	7.6.3	CS	BW-B	0.26	0.26	0.17	2.00		

This column indicates if the required BSDF file exists (created on import)

Used editable ID

CGDB ID (WINDOW Shading System ID)

CGDB Version number

Abbreviation for the Attachment type

Abbreviation for the Baseline Window

U-factor

Solar Heat Gain Coefficient

Visible Transmittance

Energy Performance results (blank means they have not been simulated yet)

# Main Screen: Field Descriptions

The table below lists all of the fields in the main screen.

Name	Name of the Attachment product, from the Window Library in WINDOW. It must have a prescribed format. A Window record without this name format can not be imported into AERCalc <name>::<shadeType><slat tilt>::<attachment position>::BW<basecase window ID>								
BSDF	When importing a product from WINDOW, a BSDF file is generated (and stored in a subfolder called BSDF below where the AERCalc database is located). This must exist in order to calculate the EPc/EPH values. The program will show an icon indicating the existence (or not) of this file. <ul style="list-style-type: none"><li>A green checkmark means that the file exists and the product can be simulated✔</li><li>A red X means that the file does not exist and the product must be re-imported into AERCalc from WINDOW✖</li></ul>								
Error Status	If the product was imported in a previous version of AERCalc, a warning icon appears, showing the older version numbers. In this case the product must be re-imported (and a new BSDF file generated) and re-simulated in AERCalc ⚠								
ID	A user-editable field that can be used for any type of identifying reference. It is blank by default.								
Manufacturer	The Manufacturer from WINDOW as follows: <ul style="list-style-type: none"><li>For CS, RS, VB, VL, PS, SS, it is the Manufacturer from the WINDOW Shading Layer Library</li><li>For AP and WP, it is the Manufacturer from the WINDOW Glass Library</li></ul>								
W7 Product ID	The ID from the WINDOW Window Library (that was imported into AERCalc) <div><div>ID #1003 NameSingle cell Light color (Levolor)</div></div>								
W7 Glazing System ID	The ID from the WINDOW Glazing System Library used for this product <div><div>ID #:1003Name:Single cell Light color (Levolor) Indoor::CS::l::BW-B</div></div>								
CGDB ID	The ID from the WINDOW Shading Layer Library <div><div>Shading Layer Library ID #:50 Name:Cellular Shade. Single cell, light color</div></div>								
CGDB Version	The CGDB Version number for the product, as shown in the WINDOW Shading Layer Library <table><tr><th>ID</th><th>Name</th><th>Source</th><th>Version</th></tr><tr><td>50</td><td>Cellular Shade. Single cell, light color</td><td>CGDB</td><td>10.00</td></tr></table>	ID	Name	Source	Version	50	Cellular Shade. Single cell, light color	CGDB	10.00
ID	Name	Source	Version						
50	Cellular Shade. Single cell, light color	CGDB	10.00						



# Main Screen: Field Descriptions

The table below lists all of the fields in the main screen.

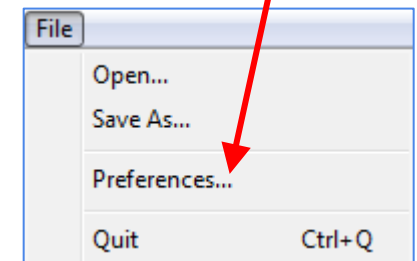
<b>W7 DB</b>	<p>The name (including complete directory path) of the WINDOW database the product was imported from.</p> <p><code>C:\Users\Public\LBNL\AERCalc 1-1-9 Sample DB\AERCalcSample.mdb</code></p>
<b>W7 Version</b>	<p>The WINDOW 7 program version used when importing the product from WINDOW into AERCalc. This can be found in WINDOW in the Help/About menu option</p> <p><code>7.6.3</code></p>
<b>Window Attachment</b>	<p>The abbreviation for the Attachment Product Type</p> <ul style="list-style-type: none"><li>• SS: Solar Screen</li><li>• CS: Cellular Shade</li><li>• PS: Pleated Shade</li><li>• RS: Roller Shade</li><li>• AF: Applied Film</li><li>• WP: Window Panel</li><li>• VB: Venetian Blind</li><li>• VL: Vertical Louver</li></ul>
<b>Baseline Window</b>	<p>The abbreviation for the AERC baseline window. The initial window is BW-B, but in the future there will be windows BW-A through BW-G</p>
<b>U-factor (Btu/h-ft<sup>2</sup>-°F)</b>	<p>U-factor of the product from the WINDOW Window Library. This is calculated by WINDOW. If this value is zero, recalculate it in WINDOW and reimport the product into AERCalc</p>
<b>SHGC</b>	<p>Solar Heat Gain Coefficient of the product from the WINDOW Window Library. This is calculated by WINDOW. If this value is zero, recalculate it in WINDOW and reimport the product into AERCalc</p>
<b>TVIS</b>	<p>Visible Transmittance of the product from the WINDOW Window Library. This is calculated by WINDOW. If this value is zero, recalculate it in WINDOW and reimport the product into AERCalc</p>
<b>AL (cfm/ft<sup>2</sup>)</b>	<p>Air Leakage of the product. The default value assigned on import is 2.0 cfm/ft<sup>2</sup>, but this field is user editable and can be changed as needed.</p>
<b>EPc</b>	<p>The Energy Performance value for cooling, calculated by highlighting records and clicking the Simulate button on the main AERCalc screen.</p>
<b>EPh</b>	<p>The Energy Performance value for heating, calculated by highlighting records and clicking the Simulate button on the main AERCalc screen.</p>

# Import Products: Specify WINDOW 7 Database

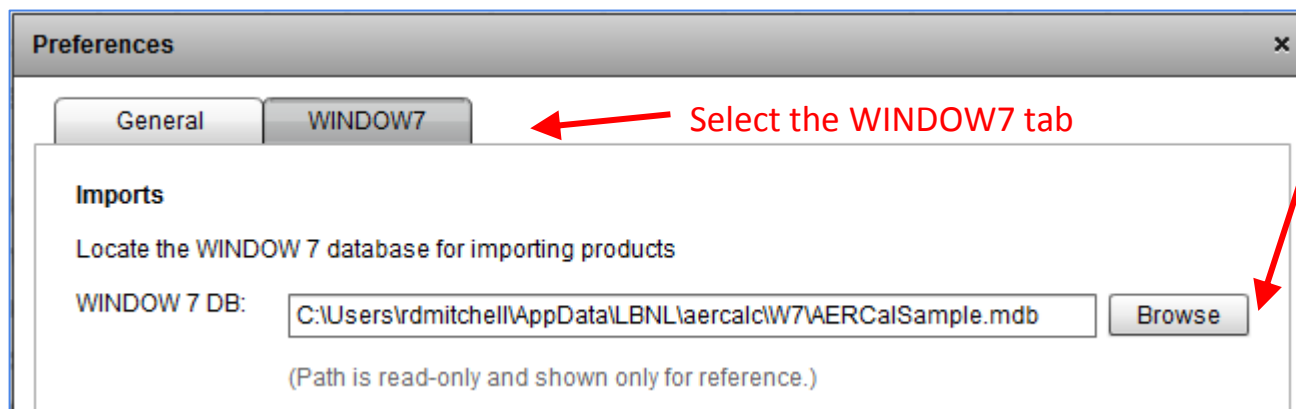
**File / Preferences:** Specify the WINDOW 7 database to import products from

- The default WINDOW database in **File/Preferences** is located in the W7 subdirectory of the default AERCalc working directory:  
C:\Users\<username>\AppData\LBNL\aecalc\W7
- To change to another database
  - Click on the **File/Preferences** menu option
  - Select the **WINDOW7** tab and use the **Browse** button to select another WINDOW 7 database
  - The database specified here will be the database that EP Calc opens when the **Import** button is clicked

Go to the File/  
Preferences menu option



Use the Browse button to select another WINDOW 7 database, such as the default database in the WINDOW 7 working directory, or any other WINDOW 7 database. (The default database is called AERCalcSample.mdb and is located in:  
C:\Users\<username>\AppData\LBNL\aecalc\W7



Make sure that all the needed XML, THMX, and other associated files (referenced by WINDOW) are in the correct folders for the selected database.

The easiest way to check this is to calculate (in WINDOW) the Windows that you want to import. If they calculate in WINDOW, AERCalc will be able to simulate them

# Import Products: Calculate Products in WINDOW

**In WINDOW:** Make sure to calculate the products in WINDOW before importing them

ID	Name	Type	Width	Height	Ufactor	SHGC	Tvis
			mm	mm	W/m2-K		
1003	Single cell Light color (Levolor) Indoor::CS::I::BW-B	Fixed (picture)	1200	1500	?	?	?
1004	Stacked double cell Light color(Levolor) Indoor::CS::I::BW-B	Fixed (picture)	1200	1500	1.494	0.214	0.046
1007	Cell-in-cell Light color (HD) Indoor::CS::I::BW-B	Fixed (picture)	1200	1500	1.564	0.270	0.029
1010	Single cell Blackout low-e (HD) Indoor::CS::I::BW-B	Fixed (picture)	1200	1500	1.584	0.249	0.000
1011	Single cell Light Color Sheer (HD) Indoor::CS::I::BW-B	Fixed (picture)	1200	1500	1.944	0.434	0.420

If the products have not been calculated in WINDOW, when the program imports them, there will be zeros for SHGC, TVis and U-factor.

Import from WINDOW7 :: C:\Users\rdmitchell\AppData\Local\LBNL\AERCalc\W7\AERCalcSample.mdb

WINDOW7 Products List

Available to Import		Unavailable for Import							
W7 ID	W7 Glz Sys ID	W7 Shd Sys ID	CGDB Ver.	Window Name	Manufacturer	Window Attachment	SHGC	TVis	U-factor...
1003	1003	50	10.0	Single cell Light color (Levolor) Indoor::CS::I::BW-B	Generic	Cellular Shade	0.00	0.00	0.00
1004	1004	51	10.0	Stacked double cell Light color(Levolor) Indoor::CS::	Generic	Cellular Shade	0.21	0.05	0.26
1007	1007	52	10.0	Cell-in-cell Light color (HD) Indoor::CS::I::BW-B	Generic	Cellular Shade	0.27	0.03	0.28
1010	1010	53	10.0	Single cell Blackout low-e (HD) Indoor::CS::I::BW-B	Generic	Cellular Shade	0.25	0.00	0.28

✓ = window import complete.  
✗ = window cannot be imported.

Import Done

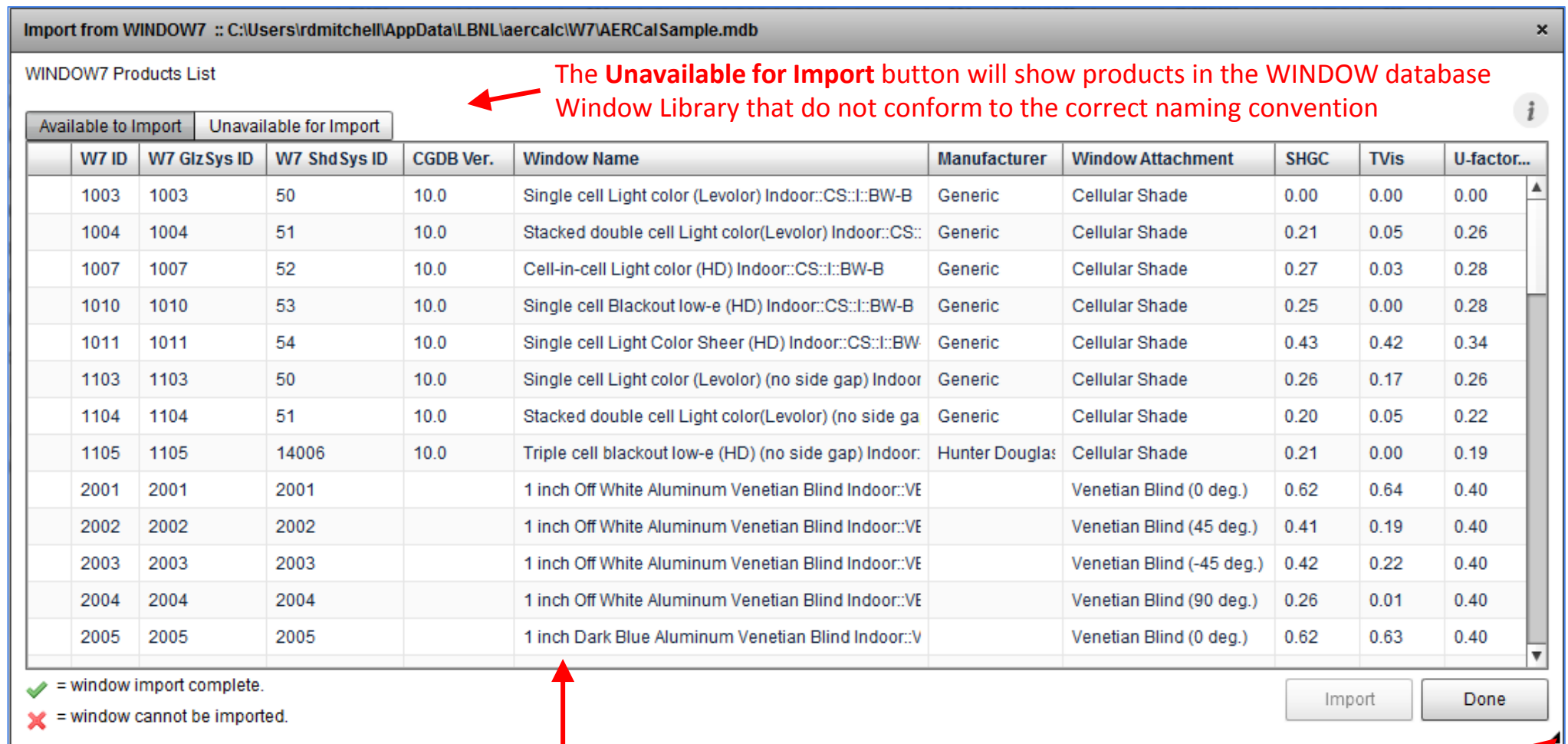
# Import Products: Import from WINDOW database

Click the Import Products button on the main screen to open the import window



Click the **Import Products** button on the main screen to see the list of products from a WINDOW database

The products modeled in WINDOW will be displayed (AERCalc reads the WINDOW database)

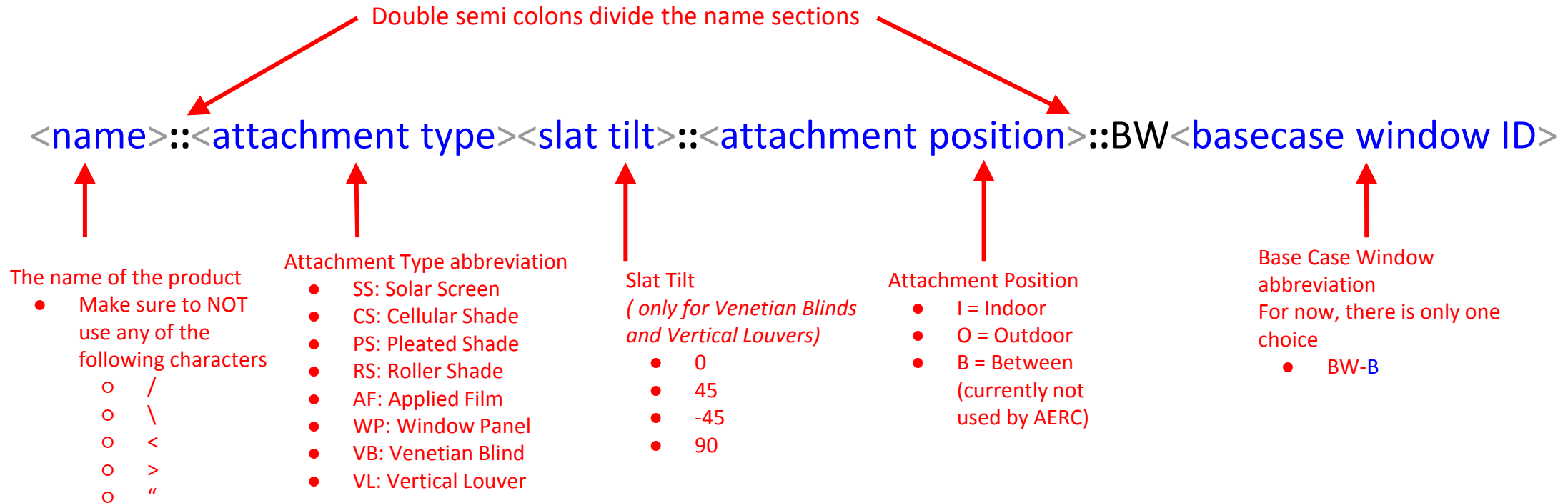


The program uses a strict naming convention to interpret what products are represented, so it is important to get the naming convention right.  
(See the next page)

Change the screen size with this resize handle

# Import Products: Naming Convention

Here is the naming convention to use in WINDOW when creating products



If the products are not correctly named, they will appear in the **Unavailable for Import** tab

## Examples:

- Sample Solar Screen Outside::SS::O::BW-B

For Venetian blinds, all four slat angles must be defined

- White Venetian Blind Outside::VB0::O::BW-B
- White Venetian Blind Outside::VB45::O::BW-B
- White Venetian Blind Outside::VB-45::O::BW-B
- White Venetian Blind Outside::VB90::O::BW-B

For Venetian Blinds, make sure that all the names are IDENTICAL except for the slat tilt -- the program will not be able to import them if they are not identical

WINDOW7 Products List			
Available to Import		Unavailable for Import	
	W7 ID	W7 GlzSys ID	Window Name
✗	1	1	Single Glazed Aluminum

# Import Products: Select Products to Import

Highlight the products to import and click the Import button

Highlight the products you want to import

- Holding the **Shift** key down will allow selecting multiple **consecutive** records
- Holding the **Ctrl** key down will allow selecting multiple **non-consecutive** records

Import from WINDOW7 :: C:\Users\rdmitchell\AppData\Local\LBNL\AERCalc\W7\AERCalcSample.mdb

WINDOW7 Products List

Available to Import   Unavailable for Import

	W7 ID	W7 GlzSys ID	W7 ShdSys ID	CGDB Ver.	Window Name	Manufacturer	Window Attachment
	1003	1003	50	10.0	Single cell Light color (Levolor) Indoor::CS:::BW-B	Generic	Cellular Shade
	1004	1004	51	10.0	Stacked double cell Light color(Levolor) Indoor::CS:::BW-B	Generic	Cellular Shade
	1007	1007	52	10.0	Cell-in-cell Light color (HD) Indoor::CS:::BW-B	Generic	Cellular Shade
	1010	1010	53	10.0	Single cell Blackout low-e (HD) Indoor::CS:::BW-B	Generic	Cellular Shade
	1011	1011	54	10.0	Single cell Light Color Sheer (HD) Indoor::CS:::BW-B	Generic	Cellular Shade
	1103	1103	50	10.0	Single cell Light color (Levolor) (no side gap) Indoor::CS:::BW-B	Generic	Cellular Shade
	1104	1104	51	10.0	Stacked double cell Light color(Levolor) (no side gap) Indoor::CS:::BW-B	Generic	Cellular Shade
	1105	1105	14006	10.0	Triple cell blackout low-e (HD) (no side gap) Indoor::CS:::BW-B	Hunter Douglas	Cellular Shade
	2001	2001	2001		1 inch Off White Aluminum Venetian Blind Indoor::VB0:::BW-B		Venetian Blind (0 deg.)
	2002	2002	2002		1 inch Off White Aluminum Venetian Blind Indoor::VB45:::BW-B		Venetian Blind (45 deg.)
	2003	2003	2003		1 inch Off White Aluminum Venetian Blind Indoor::VB-45:::BW-B		Venetian Blind (-45 deg.)
	2004	2004	2004		1 inch Off White Aluminum Venetian Blind Indoor::VB90:::BW-B		Venetian Blind (90 deg.)
	2005	2005	2005		1 inch Dark Blue Aluminum Venetian Blind Indoor::VB0:::BW-B		Venetian Blind (0 deg.)
	2006	2006	2006		1 inch Dark Blue Aluminum Venetian Blind Indoor::VB45:::BW-B		Venetian Blind (45 deg.)

✓ = window import complete.  
✗ = window cannot be imported.

Click the **Import** button to import the highlighted records

Click the **Done** button to close the window

When importing **Venetian Blinds**, import records for all 4 slat angles at the same time

Click the **Done** button to close the window



# Import Products: Select Products to Import

## Importing products takes a while

When the **Import** button is clicked, the program will put up a progress bar for the import

It will take several minutes to import each product. Behind the scenes, an EnergyPlus BSDF IDF file (for the Window) is being created by WINDOW, which takes a bit of time to generate. The BSDF files can be found in the following directory

C:\Users\<username>\AppData\Local\LBNL\epcalculator\bsdf

When the import is completed, the imported products will have green checkmarks next to them.

Import from WINDOW7 :: C:\Users\rdmitchell\AppData\Local\LBNL\laercalc\W7\AERC\Sample.mdb

WINDOW7 Products List

Available to Import	Unavailable for Import	W7 ID	W7 GlzSys ID	W7 ShdSys ID	CGDB Ver.	Window Name	Manufacturer	Window Attachment
		4007	4007	7026		Dark Colored Low Openness Solar Shade Outdoor::SS::O::BW-B	Alkenz	Solar Screen
		4008	4008	7007		Light Colored High Openness Solar Shade Outdoor::SS::O::BW-B	Alkenz - Sunsh:	Solar Screen
		4009	4009	7005		Dark Colored High Openness Solar Shade Outdoor::SS::O::BW-B	Alkenz - Sunsh:	Solar Screen
✓		5001	5001			Clear Glass Window Panel Indoor::WP::I::BW-B		Window Panel
		5002	5002			Low-e Glass Window Panel Indoor::WP::I::BW-B		Window Panel
		5003	5003			Clear Glass Window Panel Outdoor::WP::O::BW-B		Window Panel
		5004	5004			Low-e Glass Window Panel Outdoor::WP::O::BW-B		Window Panel

✓ = window import complete.  
✗ = window cannot be imported.

Import Done

Click the **Done** button to close this screen and see the imported records in the Main screen

# Import Products: Imported Products in Main Screen

The imported products are now shown in the Main Screen

The "X" in the BSDF field means that for some reason the BSDF file needed for the simulation does not exist. The record must be reimported

ID 1 ▲	Name	BSDF	Error Status	ID	Manufacturer	W7 Product ID	W7 Glazing System ID	CGDB ID	CGDB Version	W7 DB	W7 Version	Window Attachment	Baseline Window	U-factor (Btu/h-ft2-F)	SHGC	TVIS	AL (cfm/ft2)	EPc	EPh
1	Single cell Light color (Levolor) Indoor::CS:::BW-B	✓		Lev-01	Generic	1003	1003	50	10.0	C\U	7.6.3	CS	BW-B	0.00	0.00	0.00	2.00		
2	Stacked double cell Light color(Levolor) Indoor::CS:::BW-B	✓			Generic	1004	1004	51	10.0	C\U	7.6.3	CS	BW-B	0.26	0.21	0.05	2.00		
3	Cell-in-cell Light color (HD) Indoor::CS:::BW-B	✓			Generic	1007	1007	52	10.0	C\U	7.6.3	CS	BW-B	0.28	0.27	0.03	2.00		
4	Single cell Blackout low-e (HD) Indoor::CS:::BW-B	✓			Generic	1010	1010	53	10.0	C\U	7.6.3	CS	BW-B	0.28	0.25	0.00	2.00		
5	Single cell Light Color Sheer (HD) Indoor::CS:::BW-B	✓			Generic	1011	1011	54	10.0	C\U	7.6.3	CS	BW-B	0.34	0.43	0.42	2.00		
6	Single cell Light color (Levolor) (no side gap) Indoor::CS:::BW-B	✓			Generic	1103	1103	50	10.0	C\U	7.6.3	CS	BW-B	0.26	0.26	0.17	2.00		
7	Stacked double cell Light color(Levolor) (no side gap) Indoor::CS:::BW-B	✓			Generic	1104	1104	51	10.0	C\U	7.6.3	CS	BW-B	0.22	0.20	0.05	2.00		
8	Triple cell blackout low-e (HD) (no side gap) Indoor::CS:::BW-B	✗			Hunter Douglas	1105	1105	14006	10.0	C\U	7.6.3	CS	BW-B	0.19	0.21	0.00	2.00	43	20
29	Light Colored Low Openness Roller Shade Indoor::RS:::BW-B	✓			Alkenz - Sunshadow	3001	3001	7015		C\U	7.6.3	RS	BW-B	0.35	0.19	0.10	2.00		
30	Dark Colored Low Openness Roller Shade Indoor::RS:::BW-B	✓			Alkenz	3002	3002	7026		C\U	7.6.3	RS	BW-B	0.35	0.49	0.00	2.00		
31	1 inch Dark Blue Aluminum Venetian Blind Indoor																	15	5
32	1 inch Dark Blue Aluminum Venetian Blind Indoor::VB0:::BW-B	✓				2005	2005	2005		C\U	7.6.3	VB0	BW-B	0.40	0.62	0.63	2.00		
33	1 inch Dark Blue Aluminum Venetian Blind Indoor::VB45:::BW-B	✓				2006	2006	2006		C\U	7.6.3	VB45	BW-B	0.40	0.52	0.08	2.00		
34	1 inch Dark Blue Aluminum Venetian Blind Indoor::VB-45:::BW-B	✓				2007	2007	2007		C\U	7.6.3	VB-45	BW-B	0.40	0.52	0.08	2.00		
35	1 inch Dark Blue Aluminum Venetian Blind Indoor::VB90:::BW-B	✓				2008	2008	2008		C\U	7.6.3	VB90	BW-B	0.40	0.48	0.00	2.00		
36	Light Colored Low Openness Roller Shade Outdoor::RS:::BW-B	✓			Alkenz - Sunshadow	3006	3006	7015		C\U	7.6.3	RS	BW-B	0.33	0.11	0.09	2.00		
37	Clear Glass Window Panel Indoor::WP:::BW-B	✓				5001	5001			C\U	7.6.3	WP	BW-B	0.30	0.57	0.62	2.00		

Parent Venetian Blind Product

Click the arrow icon to expand the records to show the associated "child" records or collapse the records to just show the "parent" record

Child Venetian Blind Product records, one for each slat angle



# Simulating Products

Select the products to be simulated and click the Run Simulation button

**WINDOW ATTACHMENTS** AERCalc  
by Lawrence Berkeley National Laboratory

Num. Products : 13  
Last simulation : 03:06 PM, 12/02/2017

ID	Name	BSDF	Error Status	ID	Manufacturer	W7 Product ID	W7 Glazing System ID	CGDB ID	CGDB Version	W7 DB	W7 Version	Window Attachment	Baseline Window	U-factor (Btu/h-ft <sup>2</sup> -F)	SHGC	TVIS	AL (cfm/ft <sup>2</sup> )	EPh	EPh
1	Single cell Light color (Levolor) Indoor::CS::BW-B	✓		Lev-01	Generic	1003	1003	50	10.0	C:\U:	7.6.3	CS	BW-B	0.00	0.00	0.00	2.00		
2	Stacked double cell Light color(Levolor) Indoor::CS::BW-B	✓			Generic	1004	1004	51	10.0	C:\U:	7.6.3	CS	BW-B	0.26	0.21	0.05	2.00		
3	Cell-in-cell Light color (HD) Indoor::CS::BW-B	✓			Generic	1007	1007	52	10.0	C:\U:	7.6.3	CS	BW-B	0.28	0.27	0.03	2.00		
4	Single cell Blackout low-e (HD) Indoor::CS::BW-B	✓			Generic	1010	1010	53	10.0	C:\U:	7.6.3	CS	BW-B	0.28	0.25	0.00	2.00		
5	Single cell Light Color Sheer (HD) Indoor::CS::BW-B	✓			Generic	1011	1011	54	10.0	C:\U:	7.6.3	CS	BW-B	0.34	0.43	0.42	2.00		
6	Single cell Light color (Levolor) (no side gap) Indoor::CS::BW-B	✓			Generic	1103	1103	50	10.0	C:\U:	7.6.3	CS	BW-B	0.26	0.26	0.17	2.00		
7	Stacked double cell Light color(Levolor) (no side gap) Indoor::CS::BW-B	✓			Generic	1104	1104	51	10.0	C:\U:	7.6.3	CS	BW-B	0.22	0.20	0.05	2.00		
8	Triple cell blackout low-e (HD) (no side gap) Indoor::CS::BW-B	✗			Hunter Douglas	1105	1105	14006	10.0	C:\U:	7.6.3	CS	BW-B	0.19	0.21	0.00	2.00	43	20
29	Light Colored Low Openness Roller Shade Indoor::RS::O::BW-B	✓			Alkenz - Sunshadow	3001	3001	7015		C:\U:	7.6.3	RS	BW-B	0.35	0.19	0.10	2.00		
30	Dark Colored Low Openness Roller Shade Indoor::RS::BW-B	✓			Alkenz	3002	3002	7026		C:\U:	7.6.3	RS	BW-B	0.35	0.49	0.00	2.00		
31	1 inch Dark Blue Aluminum Venetian Blind Indoor																	15	5
36	Light Colored Low Openness Roller Shade Indoor::RS::O::BW-B	✓			Alkenz - Sunshadow	3006	3006	7015		C:\U:	7.6.3	RS	BW-B	0.33	0.11	0.09	2.00		
37	Clear Glass Window Panel Indoor::WP::BW-B	✓				5001	5001			C:\U:	7.6.3	WP	BW-B	0.30	0.57	0.62	2.00		

**Highlight the products to simulate**

Import Products Run Simulation

For Venetian Blinds, you can hide the child records and just highlight the parent record

Click the **Run Simulation** button

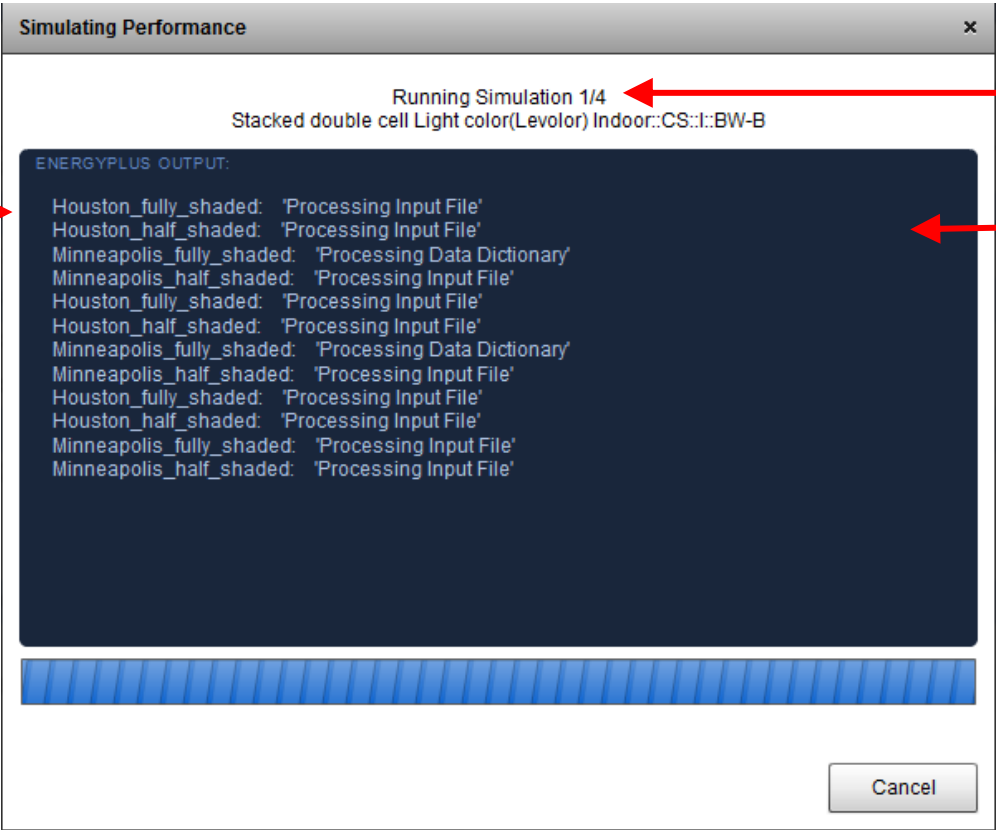
# Simulating Products

During the simulations, the program displays the progress  
The simulations for each product will take quite a while, many minutes each

When all the simulations are complete, the Main Screen will again have focus and there will be results in the EPc and EPh columns

This dialog box shows the progress of the EnergyPlus simulations

The program uses multiple computer cores (total cores - 1) to speed up the simulation process.



- In this example, 4 EnergyPlus simulations will be run
- Fully deployed Minneapolis
  - Half deployed Minneapolis
  - Fully deployed Houston
  - Half deployed Houston

When the simulations are complete, the **EPc** and **EPh** values will be displayed in the Main Screen

EPc	EPh
83	-59
24	12
16	16
60	-31
69	-69
42	11
66	-32

# Simulating Products: Venetian Blind Simulation Results

The main screen after the Venetian Blinds have finished calculating

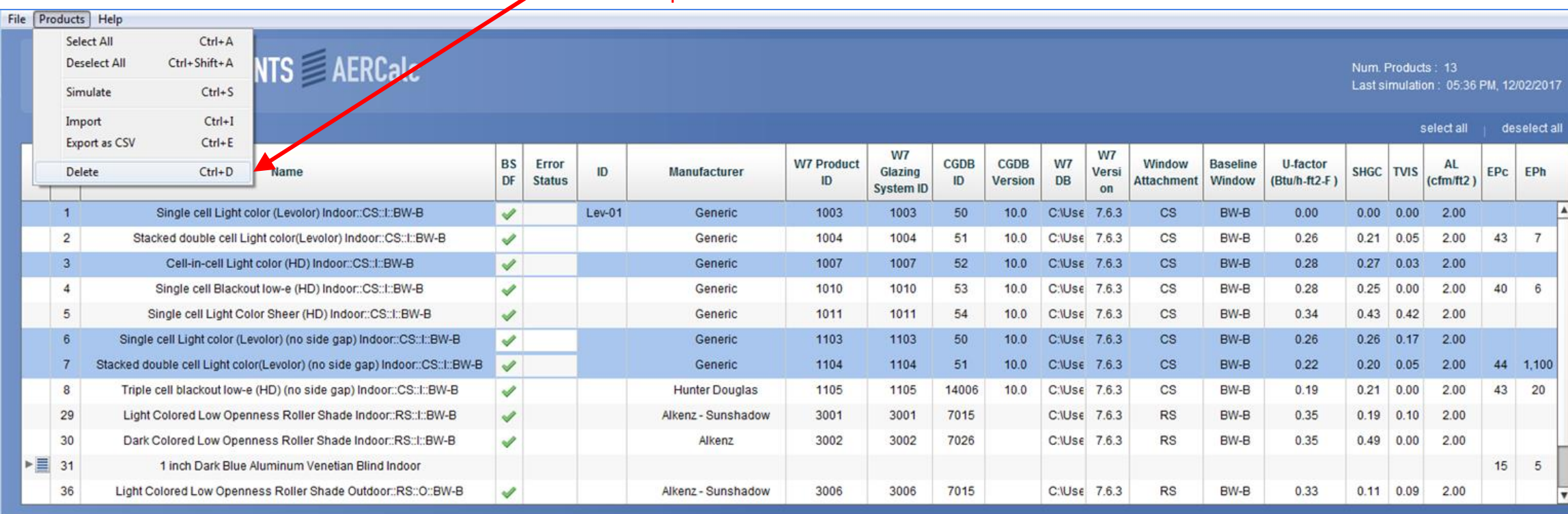
		Name	BS DF	Error Status	ID	Manufacturer	W7 Product ID	W7 Glazing System ID	CGDB ID	CGDB Version	W7 DB	W7 Versi on	Window Attachment	Baseline Window	U-factor (Btu/h-ft <sup>2</sup> -F)	SHGC	TVIS	AL (cfm/ft <sup>2</sup> )	EPc	EPh
	30	Dark Colored Low Openness Roller Shade Indoor::RS:::BW-B	✓			Alkenz	3002	3002	7026		C:\Use	7.6.3	RS	BW-B	0.35	0.49	0.00	2.00		
▼	31	1 inch Dark Blue Aluminum Venetian Blind Indoor																	15	5
	32	1 inch Dark Blue Aluminum Venetian Blind Indoor::VB0:::BW-B	✓				2005	2005	2005		C:\Use	7.6.3	VB0	BW-B	0.40	0.62	0.63	2.00		
	33	1 inch Dark Blue Aluminum Venetian Blind Indoor::VB45:::BW-B	✓				2006	2006	2006		C:\Use	7.6.3	VB45	BW-B	0.40	0.52	0.08	2.00		
	34	1 inch Dark Blue Aluminum Venetian Blind Indoor::VB-45:::BW-B	✓				2007	2007	2007		C:\Use	7.6.3	VB-45	BW-B	0.40	0.52	0.08	2.00		
	35	1 inch Dark Blue Aluminum Venetian Blind Indoor::VB90:::BW-B	✓				2008	2008	2008		C:\Use	7.6.3	VB90	BW-B	0.40	0.48	0.00	2.00		
	36	Light Colored Low Openness Roller Shade Outdoor::RS::O::BW-B	✓			Alkenz - Sunshadow	3006	3006	7015		C:\Use	7.6.3	RS	BW-B	0.33	0.11	0.09	2.00		
	37	Clear Glass Window Panel Indoor::WP:::BW-B	✓				5001	5001			C:\Use	7.6.3	WP	BW-B	0.30	0.57	0.62	2.00		

The results for **EPc** and **EPh** are shown only for the master **Venetian Blind** record

# Delete Products

Delete products by highlighting them, then using the Products/Delete menu

- Highlight the records to delete
- Click the **Products / Delete** menu option



Num. Products : 13  
Last simulation : 05:36 PM, 12/02/2017

	Name	BS DF	Error Status	ID	Manufacturer	W7 Product ID	W7 Glazing System ID	CGDB ID	CGDB Version	W7 DB	W7 Version	Window Attachment	Baseline Window	U-factor (Btu/h-ft2-F)	SHGC	TVIS	AL (cfm/ft2)	EPc	EPh
1	Single cell Light color (Levolor) Indoor::CS::BW-B	✓		Lev-01	Generic	1003	1003	50	10.0	C:\Use	7.6.3	CS	BW-B	0.00	0.00	0.00	2.00		
2	Stacked double cell Light color(Levolor) Indoor::CS::BW-B	✓			Generic	1004	1004	51	10.0	C:\Use	7.6.3	CS	BW-B	0.26	0.21	0.05	2.00	43	7
3	Cell-in-cell Light color (HD) Indoor::CS::BW-B	✓			Generic	1007	1007	52	10.0	C:\Use	7.6.3	CS	BW-B	0.28	0.27	0.03	2.00		
4	Single cell Blackout low-e (HD) Indoor::CS::BW-B	✓			Generic	1010	1010	53	10.0	C:\Use	7.6.3	CS	BW-B	0.28	0.25	0.00	2.00	40	6
5	Single cell Light Color Sheer (HD) Indoor::CS::BW-B	✓			Generic	1011	1011	54	10.0	C:\Use	7.6.3	CS	BW-B	0.34	0.43	0.42	2.00		
6	Single cell Light color (Levolor) (no side gap) Indoor::CS::BW-B	✓			Generic	1103	1103	50	10.0	C:\Use	7.6.3	CS	BW-B	0.26	0.26	0.17	2.00		
7	Stacked double cell Light color(Levolor) (no side gap) Indoor::CS::BW-B	✓			Generic	1104	1104	51	10.0	C:\Use	7.6.3	CS	BW-B	0.22	0.20	0.05	2.00	44	1,100
8	Triple cell blackout low-e (HD) (no side gap) Indoor::CS::BW-B	✓			Hunter Douglas	1105	1105	14006	10.0	C:\Use	7.6.3	CS	BW-B	0.19	0.21	0.00	2.00	43	20
29	Light Colored Low Openness Roller Shade Indoor::RS::BW-B	✓			Alkenz - Sunshadow	3001	3001	7015		C:\Use	7.6.3	RS	BW-B	0.35	0.19	0.10	2.00		
30	Dark Colored Low Openness Roller Shade Indoor::RS::BW-B	✓			Alkenz	3002	3002	7026		C:\Use	7.6.3	RS	BW-B	0.35	0.49	0.00	2.00		
31	1 inch Dark Blue Aluminum Venetian Blind Indoor																	15	5
36	Light Colored Low Openness Roller Shade Outdoor::RS::O::BW-B	✓			Alkenz - Sunshadow	3006	3006	7015		C:\Use	7.6.3	RS	BW-B	0.33	0.11	0.09	2.00		

**Confirm Delete**

Delete the 4 selected rows?

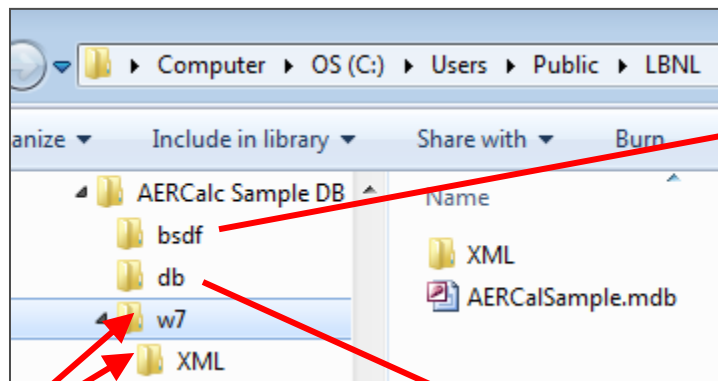
The program will ask you to confirm the deletion

# Projects

AERCalc is organized around a concept of Projects

A Project is defined as a folder which contains the minimum set of files needed by AERCalc. These folders are

- **bsdf**: a folder containing the Energy Plus BSDF IDF files (generated by WINDOW when records are imported into AERCalc) needed for the simulations that are used to calculate EPc and EPh. There should be one BSDF IDF file for every product in the AERCalc main screen
- **db**: a folder that contains the AERCalc sqlite database



You may also want to copy the associated WINDOW database file. If you do that, make a subdirectory called **w7**, and copy the **WINDOW database** and all the files in the **XML** subdirectory needed to each of the WINDOW records (such as XML, THMX, GenBSDF files)

A screenshot of a Windows Explorer window showing the contents of the 'bsdf' folder. The path is 'Users > Public > LBNL > AERCalc Sample DB > bsdf'. The table below lists the files in this folder.

Name	Date modified	Type
1 inch Off White Aluminum Venetian Blind Interior_VB0_BW-B_bsdf.idf	11/22/2017 2:25 PM	IDF File
1 inch Off White Aluminum Venetian Blind Interior_VB45_BW-B_bsdf.idf	11/22/2017 2:28 PM	IDF File
1 inch Off White Aluminum Venetian Blind Interior_VB-45_BW-B_bsdf.idf	11/22/2017 2:30 PM	IDF File
1 inch Off White Aluminum Venetian Blind Interior_VB90_BW-B_bsdf.idf	11/22/2017 2:33 PM	IDF File
Cell-in-cell Light color (HD) Interior_CS_BW-B_bsdf.idf	11/22/2017 2:09 PM	IDF File
Single cell Blackout low-e (HD) Interior_CS_BW-B_bsdf.idf	11/22/2017 2:12 PM	IDF File
Single cell Light color (Levolor) (no side gap) Interior_CS_BW-B_bsdf.idf	11/22/2017 2:17 PM	IDF File
Single cell Light color (Levolor) Interior_CS_BW-B_bsdf.idf	11/22/2017 12:07 ...	IDF File
Single cell Light Color Sheer (HD) Interior_CS_BW-B_bsdf.idf	11/22/2017 2:14 PM	IDF File
Stacked double cell Light color (Levolor) (no side gap) Interior_CS_BW-B_bsdf.idf	11/22/2017 2:20 PM	IDF File
Stacked double cell Light color(Levolor) Interior_CS_BW-B_bsdf.idf	11/22/2017 2:06 PM	IDF File
Triple cell Blackout low-e (HD) (no side gap) Interior_CS_BW-B_bsdf.idf	11/22/2017 2:23 PM	IDF File

A screenshot of a Windows Explorer window showing the contents of the 'db' folder. The path is 'Users > Public > LBNL > AERCalc Sample DB > db'. The table below lists the files in this folder.

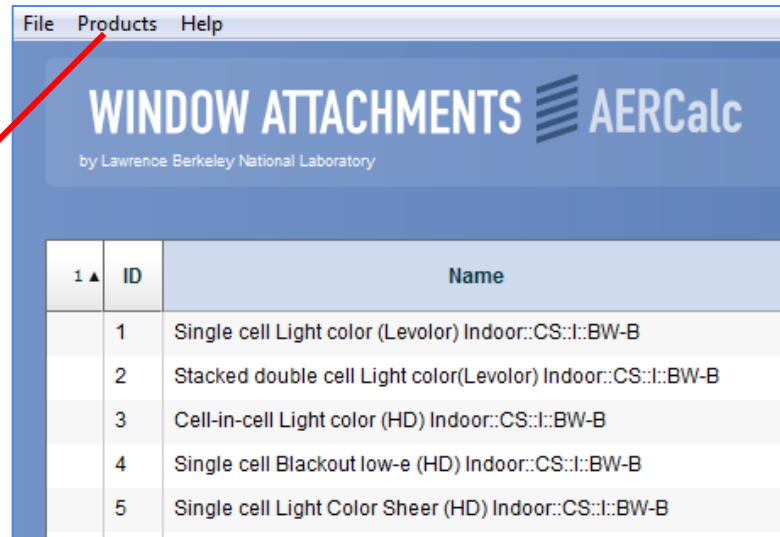
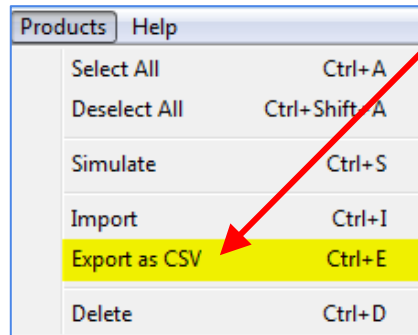
Name	Date modified	Type
AERCalc Sample DB V 1-1-7.sqlite	11/22/2017 2:33 PM	SQLITE File



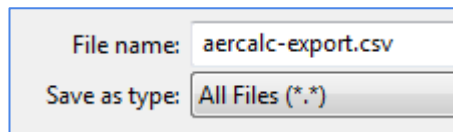
# Export

## Export a CSV file of all the Products in the Main Screen

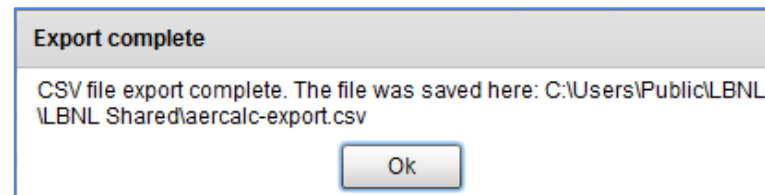
Click the **Product / Export** menu option



The program allows you to save the file to any folder and with any name (keep the CSV extension)



The program confirms the filename and location



Open the file to view the exported results

AERCalc Record ID	Parent ID	Parent/Child	CGDB Version	Simulated Product Name	W7 ID	W7 Glz Sys ID	CGDB ID	Shading System Type	AERC Baseline Window Type	U-factor	SHGC	VT
1			10	Single cell Light color (Levolor) Indoor::CS::BW-B	1003	1003	50	CS	BW-B	0	0	0
2			10	Stacked double cell Light color(Levolor) Indoor::CS::BW-B	1004	1004	51	CS	BW-B	0.263114328	0.214341	0.046162
3			10	Cell-in-cell Light color (HD) Indoor::CS::BW-B	1007	1007	52	CS	BW-B	0.275512296	0.270322	0.028713
4			10	Single cell Blackout low-e (HD) Indoor::CS::BW-B	1010	1010	53	CS	BW-B	0.278959121	0.248699	0.000004
5			10	Single cell Light Color Sheer (HD) Indoor::CS::BW-B	1011	1011	54	CS	BW-B	0.342377564	0.433584	0.420052
6			10	Single cell Light color (Levolor) (no side gap) Indoor::CS::BW-B	1103	1103	50	CS	BW-B	0.258484572	0.256318	0.17483
7			10	Stacked double cell Light color(Levolor) (no side gap) Indoor::CS::BW-B	1104	1104	51	CS	BW-B	0.221463256	0.195161	0.046162
8			10	Triple cell blackout low-e (HD) (no side gap) Indoor::CS::BW-B	1105	1105	14006	CS	BW-B	0.187243498	0.207161	0.000056

# Export: Venetian Blinds and Vertical Louvers

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For Venetian Blinds and Vertical Louvers, the Parent record in the export file will not have values for

U-factor

SHCG

Tvis

These values are associated with the Child records for each of the four slat angle cases.

For the file to be uploaded to the CPD, the values for those field from the appropriate Child record must be copied into the Parent record.

# Export: Fields

The table below lists all of the fields in the AERCalc export file.

AERCalc Record ID	Auto-incrementing ID given to each record that is imported from WINDOW into AERCalc. It can be turned on and off in File/Preferences
Parent ID	For Venetian blinds and vertical slats that have Parent and child records, this is the ID of the parent record
Parent/Child	For Venetian blinds and vertical slate that have Parent and child records, this indicates which is the Parent (P) and the child (C)
CGDB Version	The CGDB version number for the shading layer
Simulated Product Name	Name of Window (product) as defined in the Window Library, that the record was imported from (from the WINDOW database)
W7 ID	Window ID from the Window Library (from the WINDOW database)
W7 Glz Sys ID	Glazing System ID used in the Window (from the WINDOW database)
CGDB ID	The Shading System ID used in the Glazing System in the Window (from the WINDOW database)
Shading System Type	Abbreviation for Shading system
AERC Baseline Window Type	Abbreviation for the AERC Baseline Window Type
U-factor (Btu/h-ft <sup>2</sup> -°F)	U-factor of the AERC Baseline Window with the shading system (from the WINDOW database)
SHGC	Solar Heat Gain Coefficient of the AERC Baseline Window with the shading system (from the WINDOW database)
VT	Visible Transmittance of the AERC Baseline Window with the shading system (from the WINDOW database)
TvT	
AL (cfm/ft <sup>2</sup> )	Air Leakage of the AERC Baseline Window with the shading system
EPc Ratio	Energy Performance ratio for cooling
EPH Ratio	Energy Performance ratio for heating
EPc	EPc Ratio multiplied by 100
EPH	EPH Ratio multiplied by 100



# Export: Fields

The table below lists all of the fields in the main screen.

WINDOW Origin DB Filepath	WINDOW database name including full path
THERM Files	THERM files used to define the frames for the product being modeled
Manufacturer	Manufacturer of the product, from the Manufacturer field in the Shading Layer Library (WINDOW database)
Material Manufacturer	Material Manufacturer of the product, from the Shade Material Library reference in the Shading Layer Library (WINDOW database)
AERCalc Version	Version of AERCalc used to calculate the EPh and EPc results
WINDOW Version	Version of WINDOW used to import the products from the WINDOW database
EnergyPlus Version	Version of EnergyPlus used to simulate the models used to calculate the EPh and EPc values
ESCalc Version	Version of the internal AERCalc calculation module called “ESCalc”, which calculates EPh and EPc from the EnergyPlus results
BSDF	The status of the EnergyPlus BSDF IDF file generated by WINDOW when a record is imported
Status	Indication of a record having been calculated with a previous version of AERCalc, EnergyPlus, WINDOW or ESCalc
AERC ID	An ID input by the user
Emissivity Front	Emissivity of the front side (Outside) of the product
Emissivity Back	Emissivity of the back side (Inside) of the product
Tsol	Solar transmittance of the product
Attachment Position	Position of the attachment in the glazing system, either Indoor or Outdoor.