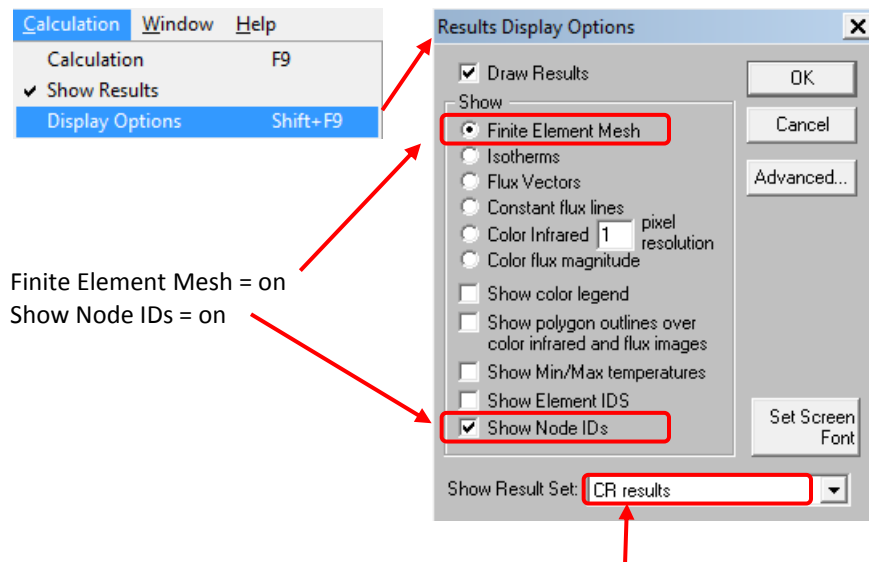# THERM Surface Temperature Data

It is possible to obtain surface temperature data from a THERM file. When a file is calculated, the program calculates a mesh with temperatures at each of the mesh nodes. You can see the mesh and the nodes, including the ID number of each mesh node, by setting the Calculation preferences as follows.

Finite Element Mesh = on
Show Node IDs = on

If you are modeling a glazing system with the "CR Model" turned on (set when importing the glazing system or in Options / Preferences / THERM File Options, set "Show Result Set" to "CR results".

If you are not modeling a glazing system using the "CR Model", then this option will not even appear, and the temperature values at each node will be those calculated for the U-factor.

Figure 1. Set the Calculation Display options to show the Node IDs of the mesh.
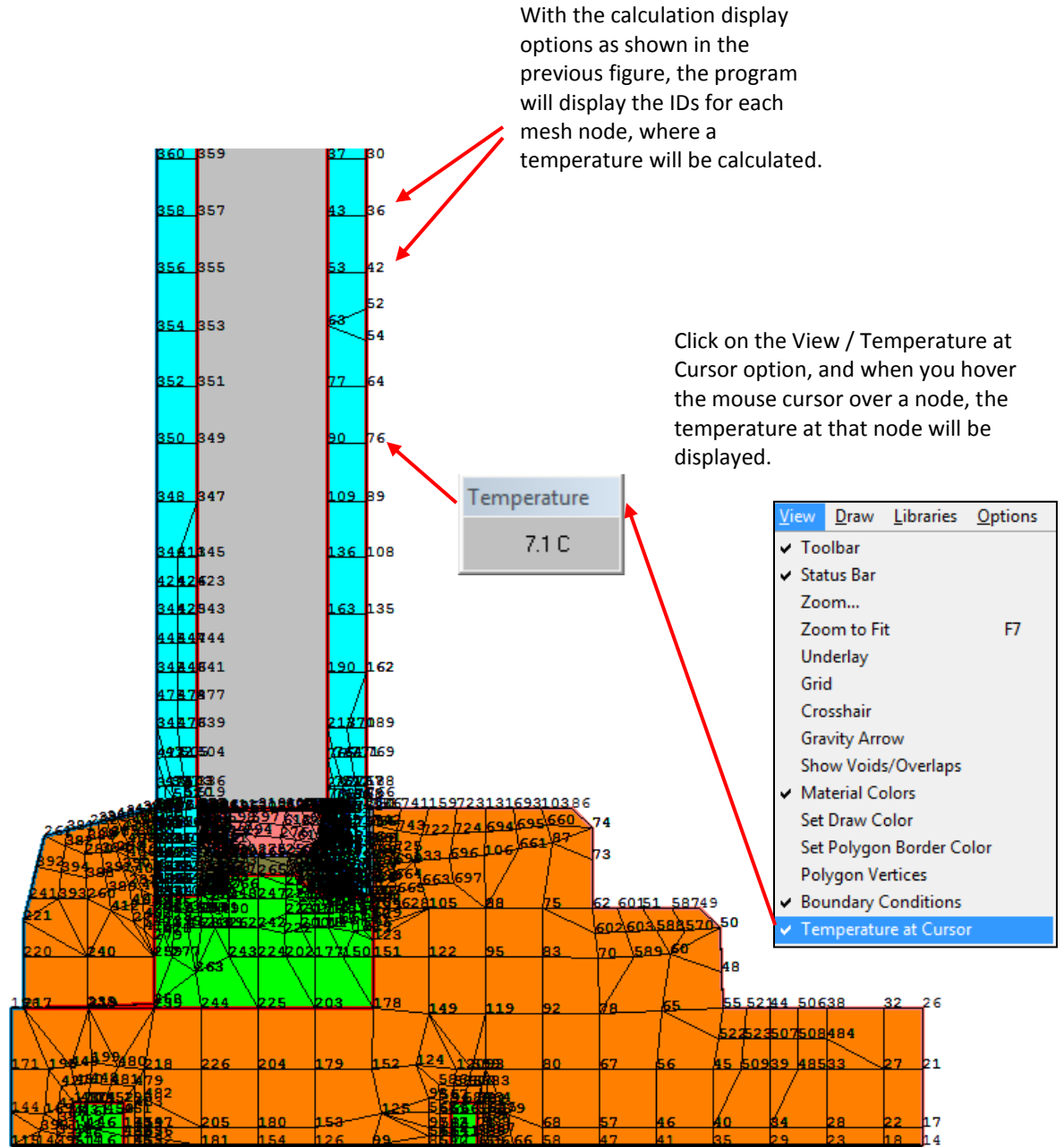
With the calculation display options as shown in the previous figure, the program will display the IDs for each mesh node, where a temperature will be calculated.

Click on the View / Temperature at Cursor option, and when you hover the mouse cursor over a node, the temperature at that node will be displayed.

Figure 2. The settings from the previous figure will result in a display of the mesh nodes and their ID mumbers

It is possible to generate an output file which contains all the surface temperatures that have U-factor tags assigned to them.

- Save the THERM file

- Open WINDOW

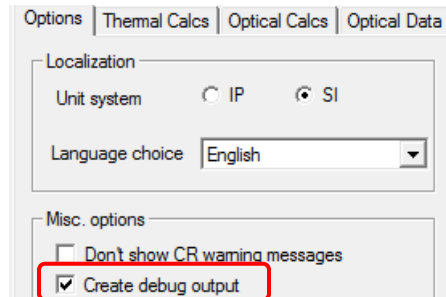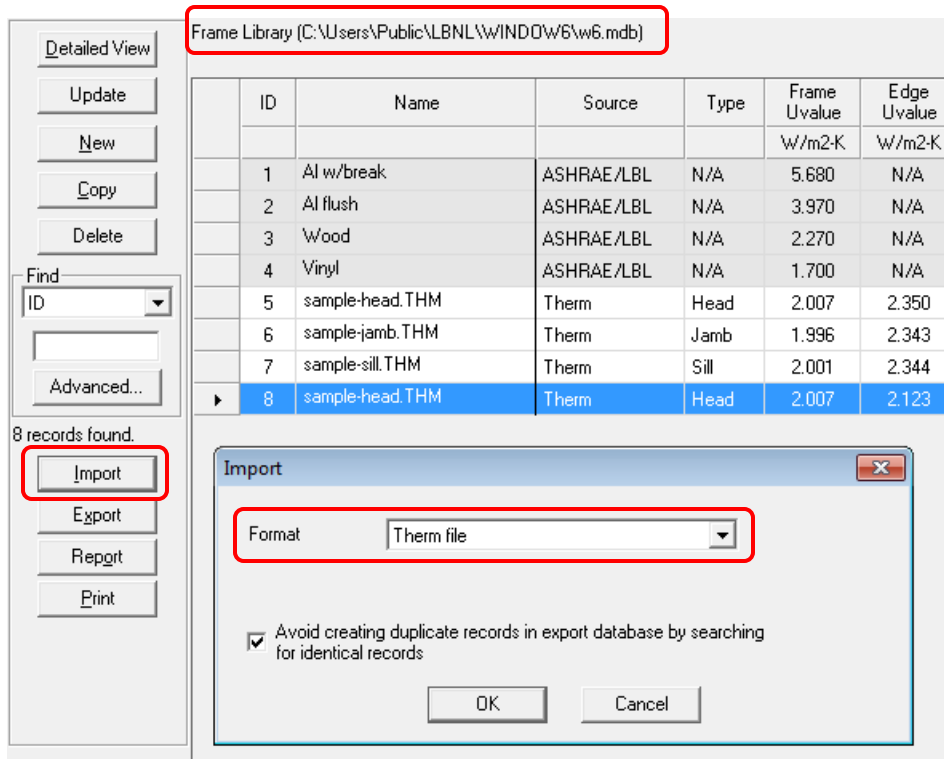- Under File / Preferences, Options tab, check the "Create debug output" option

Figure 3. In WINDOW, under File/Preferences/Options tab, check "Create debug output".

Import the THERM file into the WINDOW Frame Library

Figure 4. Import the THERM file into the WINDOW Frame Library.

Profile.csv file

The act of importing that THERM file into the WINDOW Frame Library (with the debug output option checked) will cause a file called "profile.csv" to be created.

It should be located in the "working directory" where the WINDOW database is located, in the "Debug" subdirectory.

The data in the "profile.csv" file will depend on how the glazing system was calculated.

- If the "Use CR Model for Glazing Systems" **IS** checked (at the time of the glazing system import or in Options/Preferences/THERM File Options), the data in "profile.csv" will be temperatures calculated using the CR model.

  o If the CR Glazing System model is used, make sure to set the "Show Results Set" to CR Results in the Calculation / Results Display Options if you want to view the same temperatures in the THERM file results display as are written to the profile.csv file.

- If the "Use CR Model for Glazing Systems" **IS NOT** checked (at the time of the glazing system import or in Options/Preferences/THERM File Options), the data in "profile.csv" will be temperatures calculated for the U-factor results.

- In this case, the "Show Results Set" will not be shown in the Calculation / Results Display Optioncs dialog box, and the temperatures dispalyed for the THERM file nodes will be based on the U-factor calculation.
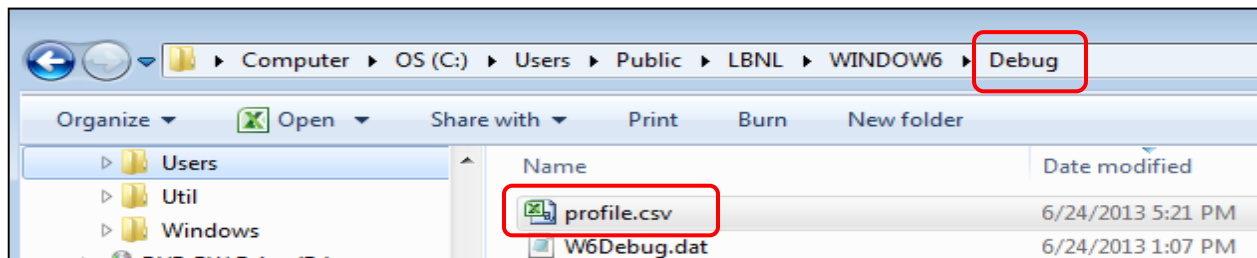

Figure 5. The profile.csv file will be located in the "Debug" directory of the working directory (where the database is located).

If you open the CSV file in a spreadsheet program, you will see the results as follows:

	U-factor Tag label	X-coordinate (from the origin)	Y-coordinate (from the origin)	Temperature (°C)	
Mesh Node ID					**Indicator of transition between U-factor tags**
Frame					
14	332.6831	-339.956	18.84044	1	
17	332.6831	-337.546	18.8447	0	
21	332.6831	-330.313	18.9153	0	
26	332.6831	-322.481	19.01886	0	
32	327.6991	-322.481	18.52362	0	
38	320.4662	-322.481	17.81796	0	
506	316.8499	-322.481	17.44619	0	
44	313.2334	-322.481	17.00754	0	
521	310.2582	-322.481	16.53162	0	
55	307.2831	-322.481	15.7482	0	
48	307.1206	-317.828	15.97888	0	
50	306.9283	-312.32	16.53135	0	
49	304.2997	-309.781	16.29549	0	
587	300.7056	-309.781	15.61275	0	
51	297.1116	-309.781	14.8675	0	
601	293.863	-309.781	14.05695	0	
62	290.6144	-309.781	12.77013	0	
73	290.6144	-303.481	13.53569	0	
74	290.6144	-299.621	14.20048	0	
86	288.0744	-297.081	13.8739	0	
103	284.1211	-297.081	12.69088	0	
693	280.5952	-297.081	11.5416	0	
131	277.0693	-297.081	10.2321	0	
723	273.4529	-297.081	8.638808	0	
159	269.8365	-297.081	6.645314	0	
741	266.3349	-297.081	4.158622	0	
186	262.8333	-297.081	0.097513	0	
753	262.3564	-297.081	-0.42643	0	
210	261.8795	-297.081	-0.99732	0	
Edge					
210	261.8795	-297.081	-0.99732	1	
766	261.8795	-295.615	-0.77818	0	
188	261.8795	-294.149	-0.42544	0	
769	261.8795	-290.532	0.55049	0	
189	261.8795	-286.916	1.490467	0	
162	261.8795	-279.683	3.132076	0	

Figure 6. The profile.csv file contains the Node IDs, X/Y coordinates for each node, and node temperatures.

It is possible to verify the temperatures in the CSV by looking at the THERM file display of nodes, using the View Temperature at Cursor feature.
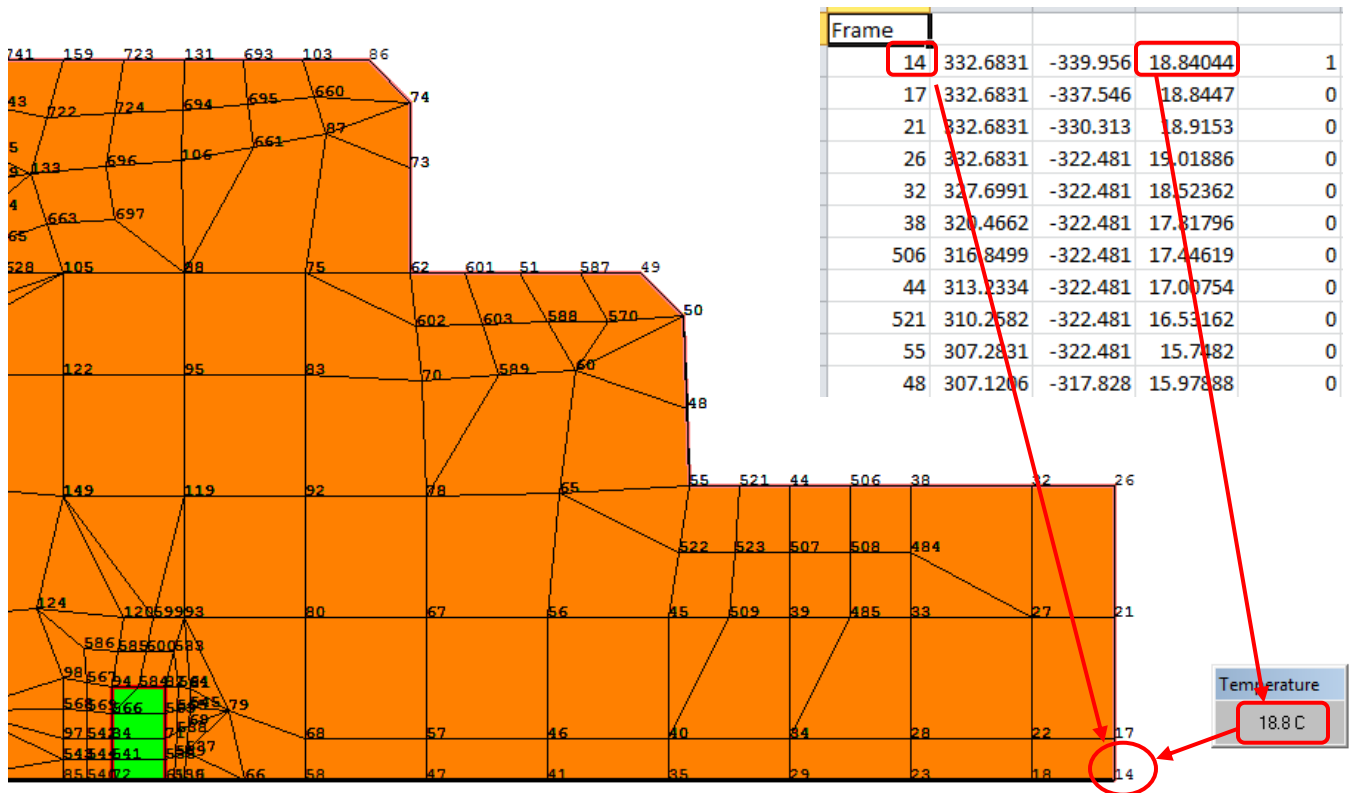

Figure 7. The profile.csv file contains the Node IDs, X/Y coordinates for each node, and node temperatures.

The Nodes in the CSV file are in the order of the nodes in the THERM file, working from the lower right of the frame up to the glazing system and then up the glazing system. The glazing system is tagged as "Edge" so the values under the Edge section will apply to that part of the glazing system that has that U-factor tag.
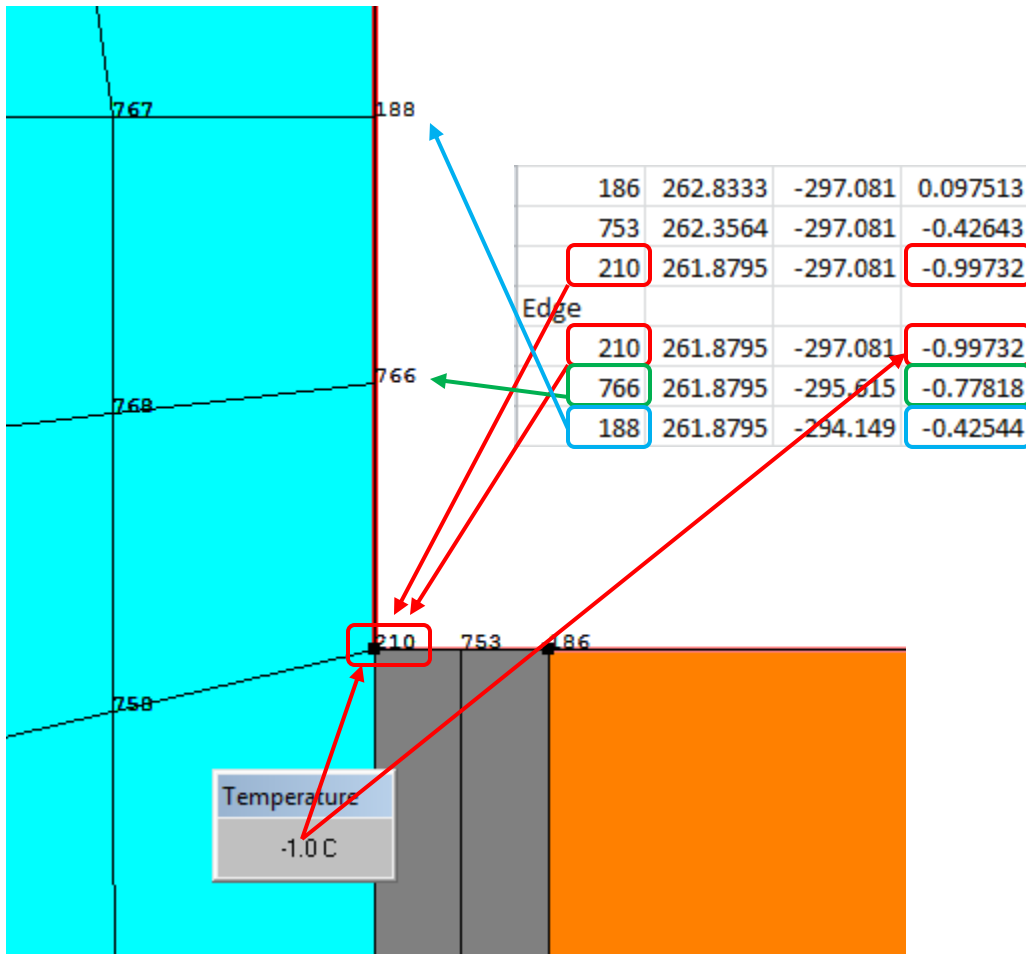

Figure 8. The last temperature for the frame and the first temperature for the Edge, are the same point in this example, and will have the same temperature.