

U-Value

**How to Automatically Calculate U-Value (Overall Heat Transfer Coefficient)
in Revit**

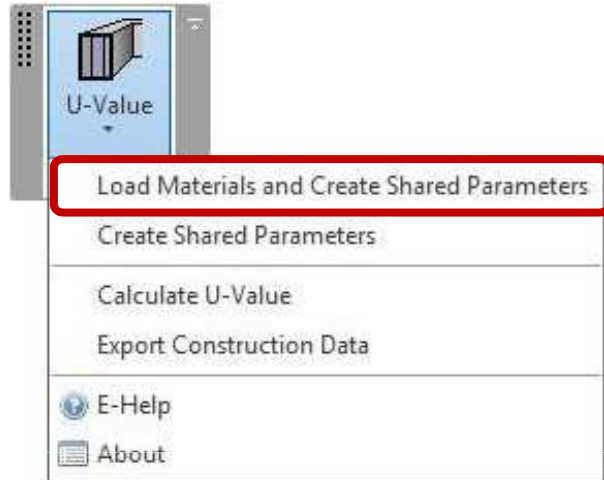
U - VALUE

Working with U-Value

- provides more than 400 building materials and products with physical parameters and many more...
- includes products of international producers like PAROC, ISOVER, ROCKWOOL, YTONG, WIENERBERGER, DURISOL etc;
- automatically calculates U-Value (Overall heat transfer coefficient) for walls, floors, roofs, ceilings and foundation slabs;
- exports construction data.

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Load Materials and Create shared parameters

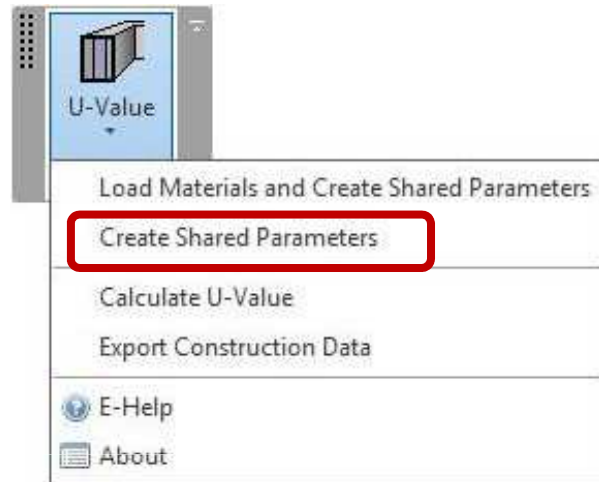


Load Materials and Create Shared Parameters function – loads materials with parameters and creates new parameters, needed for calculating u-value.

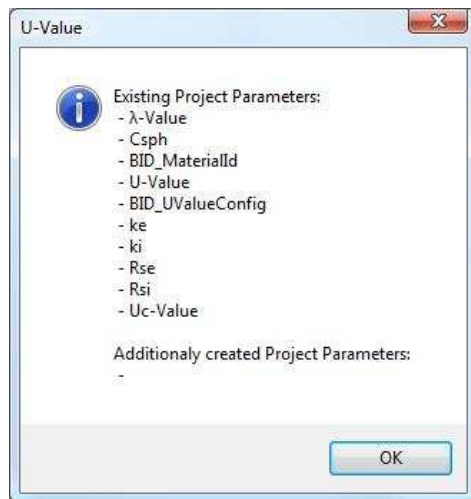
Materials are loaded (by default) from
C:\Program Files\tools4revit\U-Value 2012\U-Value\Data\Materials
It's possible to create your own materials with parameters (update .txt file).

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Create shared parameters



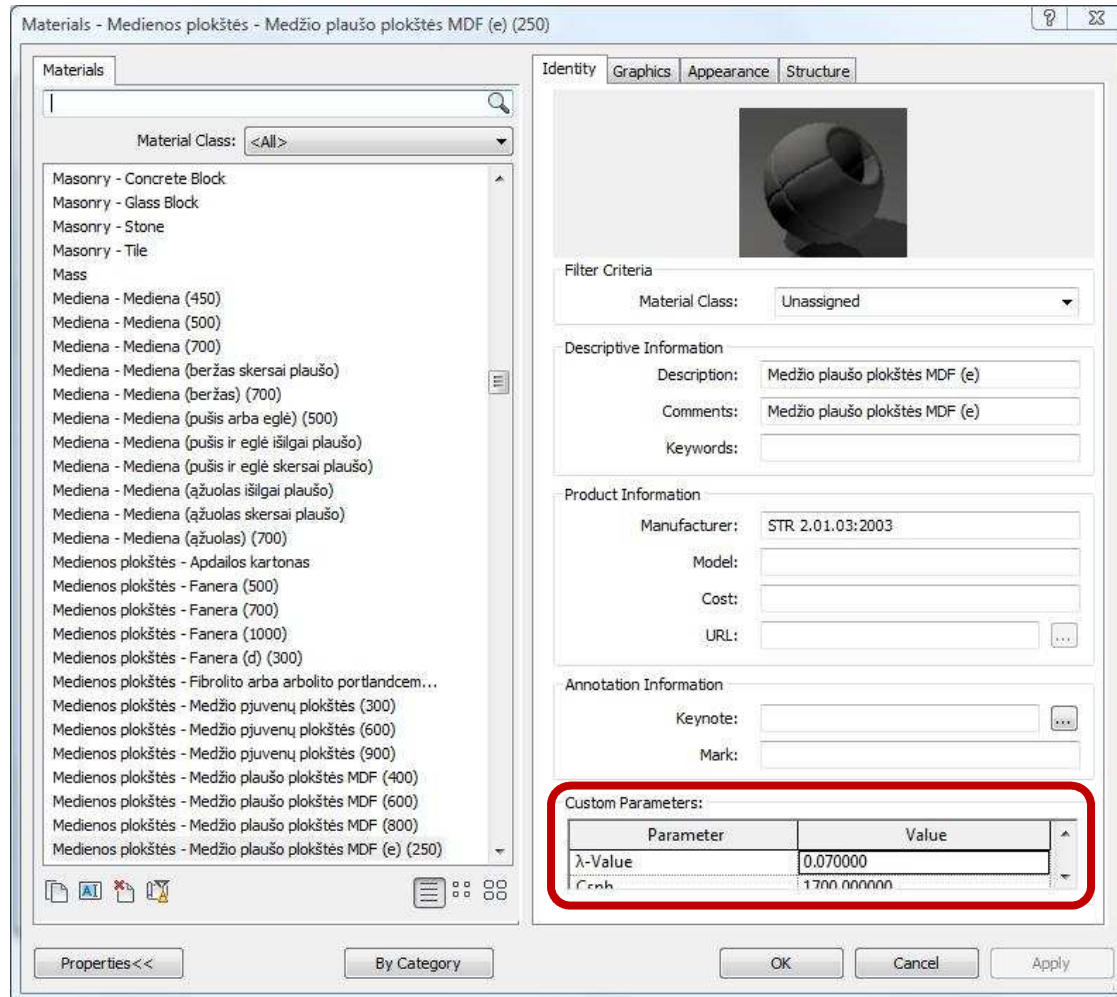
Create Shared Parameters function – creates new parameters, needed for calculating u-value.



λ-Value – thermal conductivity coefficient;
Csph – internal heat capacity per area;
BID_MaterialId – material Id number;
U-Value – overall heat transfer coefficient;
BID_UValueConfig – parameter needed for software;
ke – external heat capacity;
ki – internal heat capacity;
Rse – partitions of the external surface thermal resistance;
Rsi – envelope inner surface thermal resistance;
Uc-Value - overall heat transfer coefficient (not rated air space ventilation).

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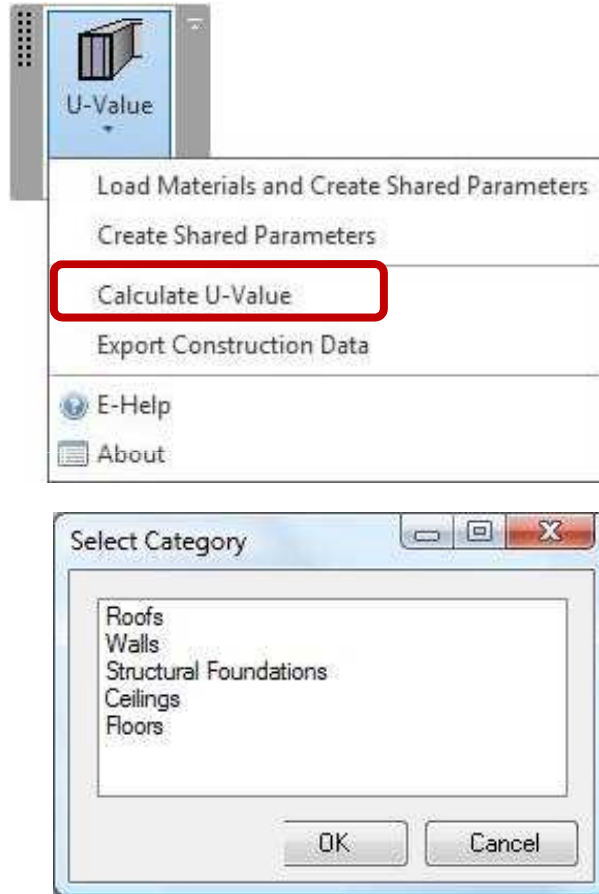
Create shared parameters



After upload new parameters, all materials have custom parameters (“Identity” tab) for calculating U-Value. It’s always has to be value of parameter “λ-Value”.

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Calculate U-Value



Calculate U-Value function – opens dialog window for calculating u-value.

Select the category of system family which will be calculated. The category can be selected in two ways:

- from the model. Select any system family on the current project;
- from the list. Select category from the list of all model categories which can be calculated.

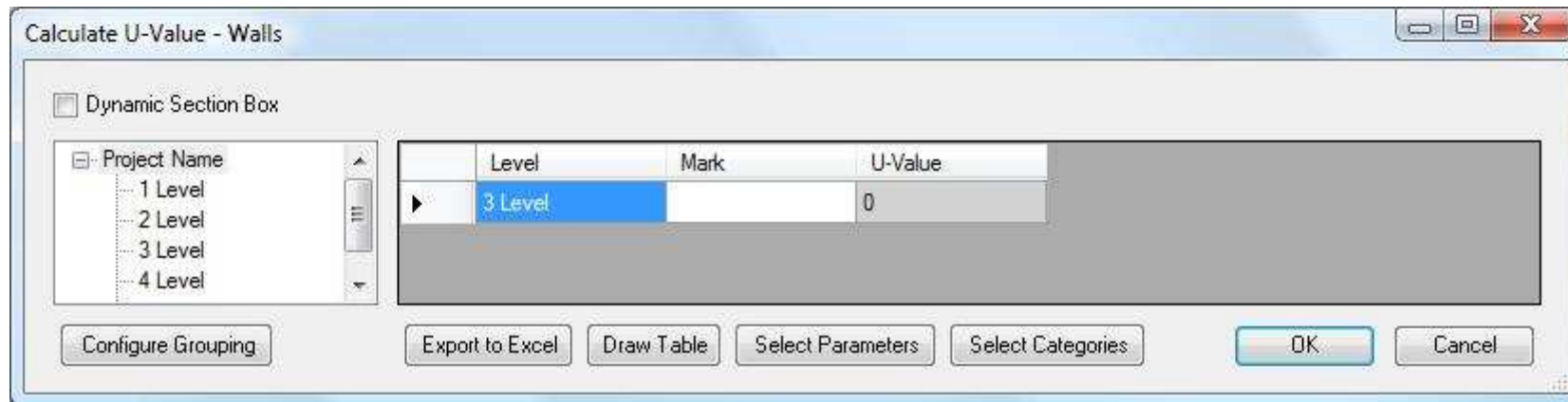
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Calculate U-Value

Elements of the selected category are conveniently grouped together in a tree where the user can filter it by any configurable criterions. The criterions can be selected with “Configure Grouping”.

The element list with its parameters:

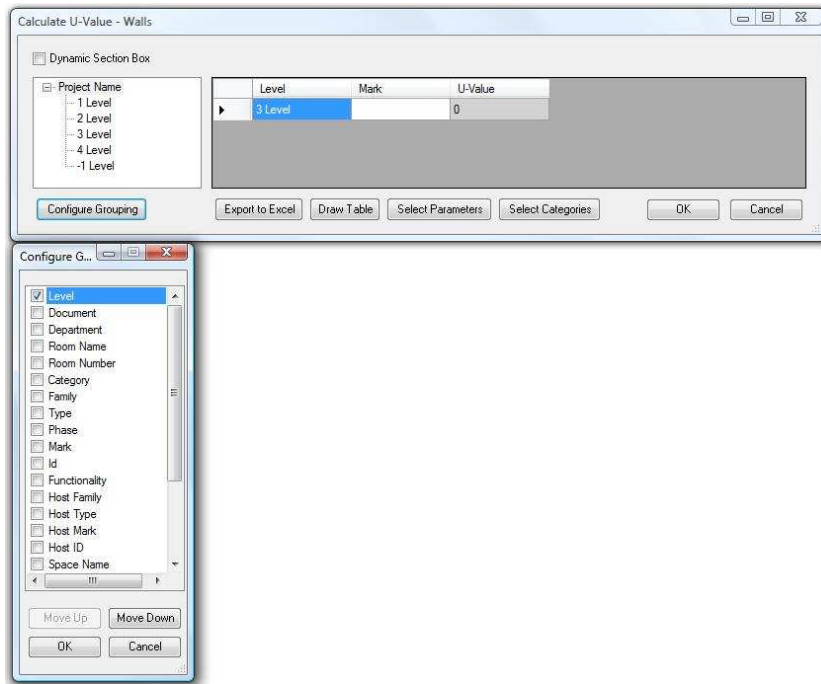
- Configurable criterions are displayed like yellow columns (“3 level”).
- Parameters (“Mark”) are displayed like white columns and can be selected with “Select Parameters”.



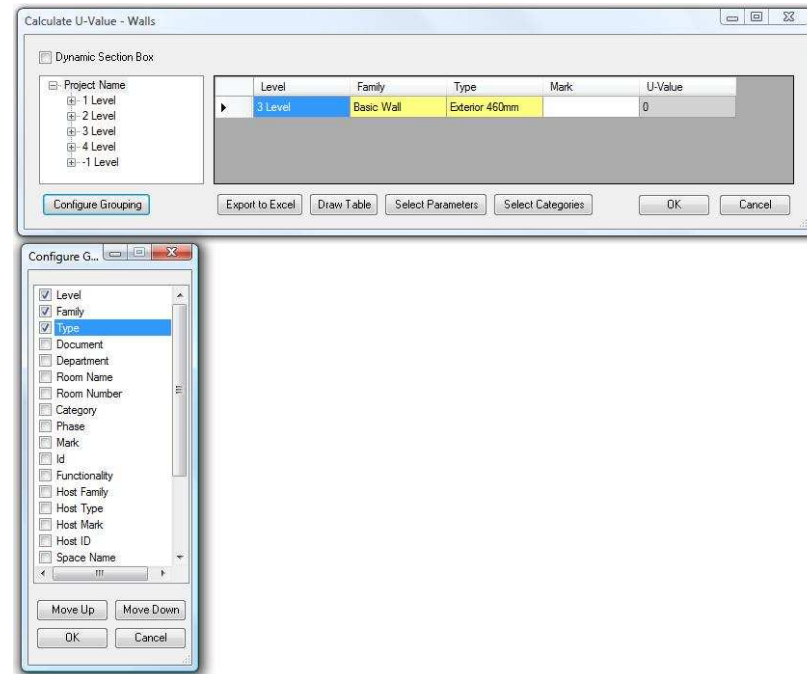
Dialog window can be export to excel (“Export to Excel”) and to drafting view (Draw Table).
Select Categories – selects category for further work.

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Calculate U-Value – Configure Grouping



If in “Configure Grouping” are selected “Level”, the elements can be expanded and filtered under this criterion.

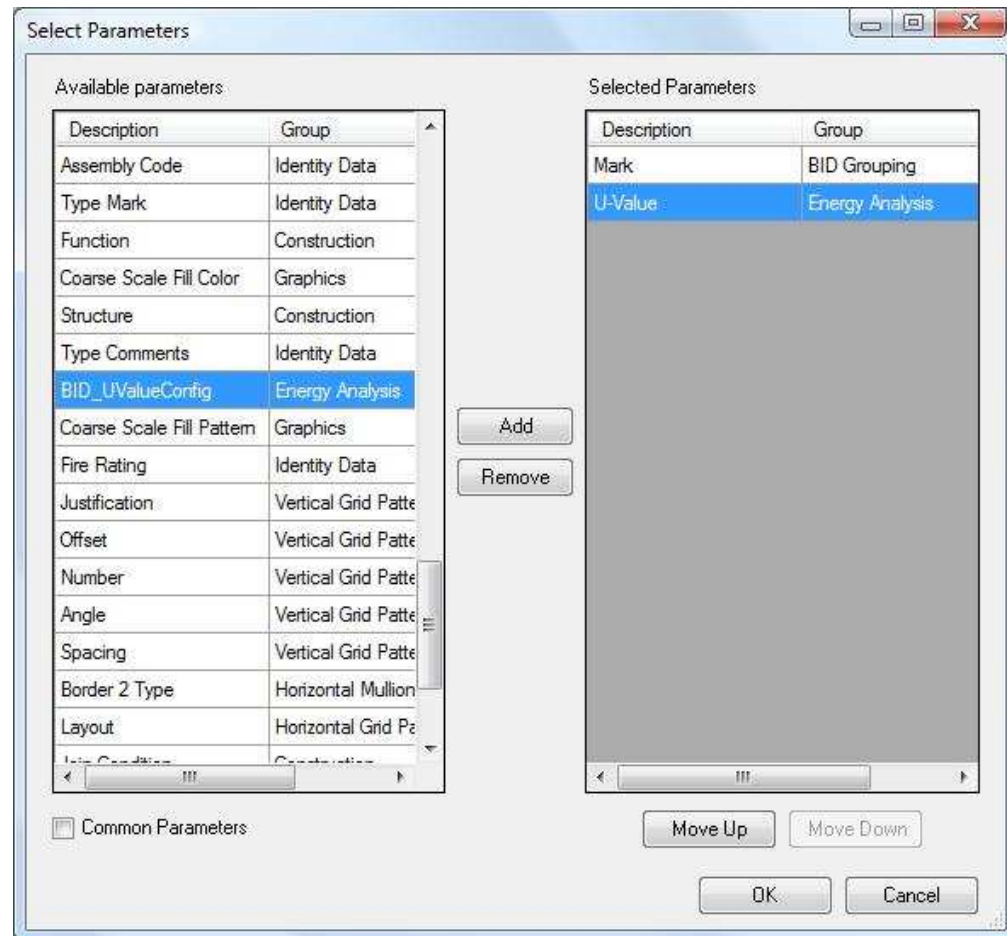


If in “Configure Grouping” are selected “Family”, “Type”, the elements can be expanded and filtered also under this criterion .

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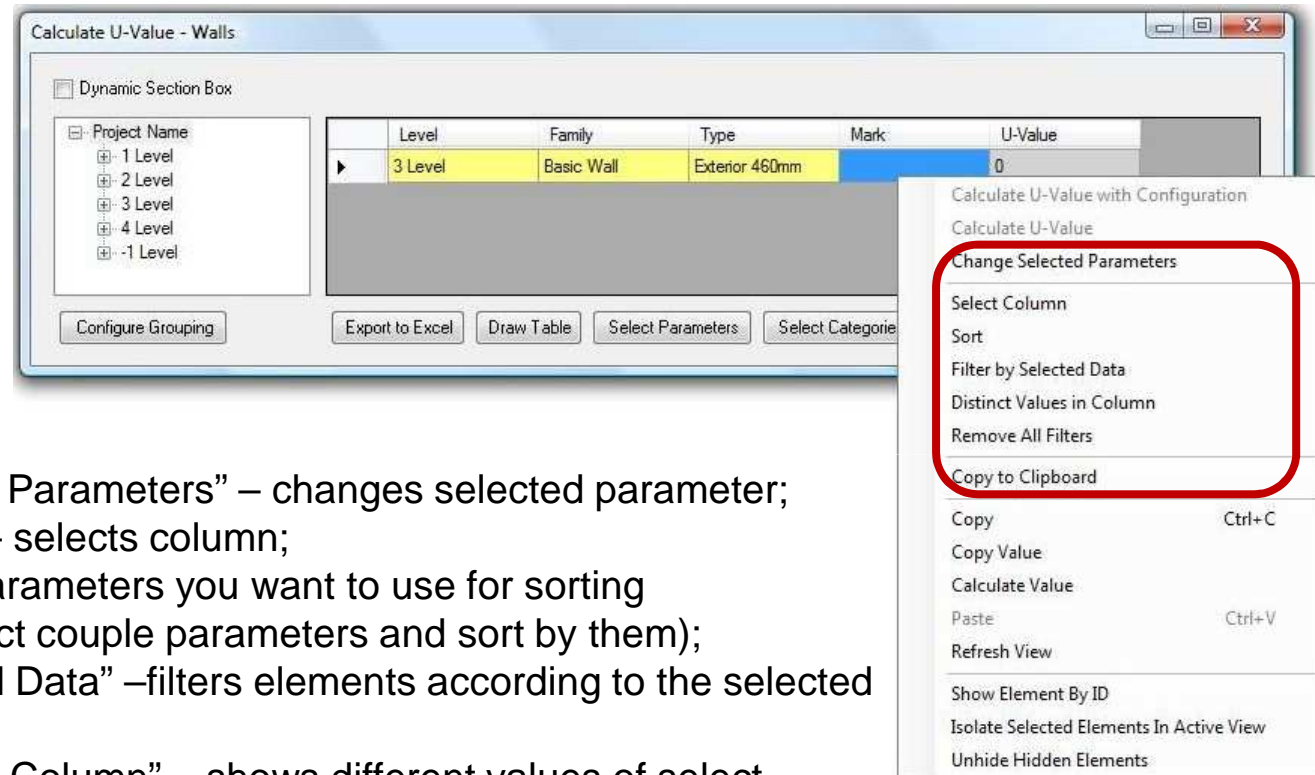
Calculate U-Value – Select Parameters

“Select Parameters” is a place where the user can select parameters that will be used at “U-Value” form columns. At the left side there are all available parameters from selected category. At the right side are shown selected parameters. Adding new or removing parameters is available with commands “Add” and “Remove”.



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Calculate U-Value – Right-click functions



- “Change selected Parameters” – changes selected parameter;
- “Select Column” – selects column;
- “Sort” – selects parameters you want to use for sorting (it’s possible select couple parameters and sort by them);
- “Filter by Selected Data” –filters elements according to the selected values;
- “Distinct Values in Column” – shows different values of select columns at a separate convenient window where you can apply the filter by selecting values;
- “Remove All Filters” – removes all filters;
- “Copy to Clipboard” – copies to clipboard the selected values;

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Calculate U-Value – Right-click functions

The screenshot shows the 'Calculate U-Value - Walls' application window. On the left, there is a 'Dynamic Section Box' with a tree view under 'Project Name' containing levels: -1 Level, 2 Level, 3 Level, 4 Level, and -1 Level. The main area is a table with the following data:

Level	Family	Type	Mark	U-Value
3 Level	Basic Wall	Exterior 460mm		0

Below the table are buttons for 'Configure Grouping', 'Export to Excel', 'Draw Table', 'Select Parameters', and 'Select Categories'. A right-click context menu is open over the table, listing the following options:

- Calculate U-Value with Configuration
- Calculate U-Value
- Change Selected Parameters
- Select Column
- Sort
- Filter by Selected Data
- Distinct Values in Column
- Remove All Filters
- Copy to Clipboard
- Copy (Ctrl+C)
- Copy Value
- Calculate Value
- Paste (Ctrl+V)
- Refresh View
- Show Element By ID
- Isolate Selected Elements In Active View
- Unhide Hidden Elements

The 'Copy' and 'Calculate Value' options are highlighted with a red circle.

- “Copy” – copies selected parameters;
- “Calculate Value” – calculates selected value by formulas;
- “Refresh View” – refreshes view after changes.
- “Show Element By ID” – shows selected element by ID number;
- “Isolate Selected elements In Active View” – isolates elements;
- “Unhide Hidden Elements” – unhides hidden elements.

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Calculate U-Value – Right-click functions

The 'Calculate U-Value - Walls' dialog box features a tree view on the left for project levels, a table of results, and several action buttons. The table below shows the data for the selected '3 Level'.

Level	Family	Type	Mark	U-Value
3 Level	Basic Wall	Exterior 460mm		0

The context menu for the 'U-Value' column includes the following options:

- Calculate U-Value with Configuration
- Calculate U-Value
- Change Selected Parameters
- Select Column
- Sort
- Filter by Selected Data
- Distinct Values in Column
- Remove All Filters
- Copy to Clipboard
- Copy (Ctrl+C)
- Copy Value
- Calculate Value
- Paste (Ctrl+V)
- Refresh View
- Show Element By ID
- Isolate Selected Elements In Active View
- Unhide Hidden Elements

The 'Configure U-Value Calculation' dialog box allows for detailed parameter settings:

- Interior Side:** Internal surface heat flow direction (Horizontal, Up, Down).
- Thermal insulation layer:** Layer Material (Šilumos izoliacija - Pūstasis polistireninis putplastis (50)), Layer Thickness (200).
- Profile Exists:** Profile Material (Steel), Profile Type (Z), Profile Spacing (600), Profile Depth (1).
- Air Layer:** Layer Material (No layer), Layer Thickness, Is Ventilated, Heat Flow Direction (Horizontal, Up, Down).

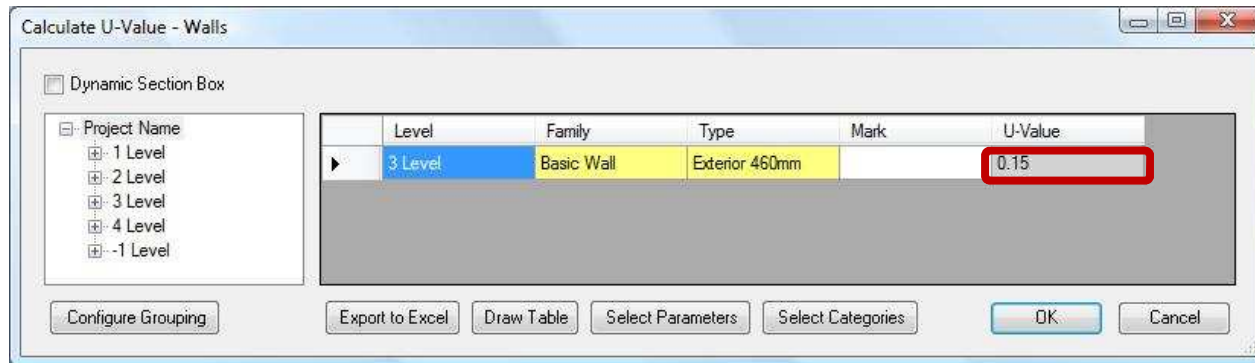
“U-Value” parameter right-click function “Calculate U-Value with Configuration” – it’s possibility to configure parameters for calculating system family with frame (profile material, type, spacing, depth etc.).

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Calculate U-Value – Right-click functions

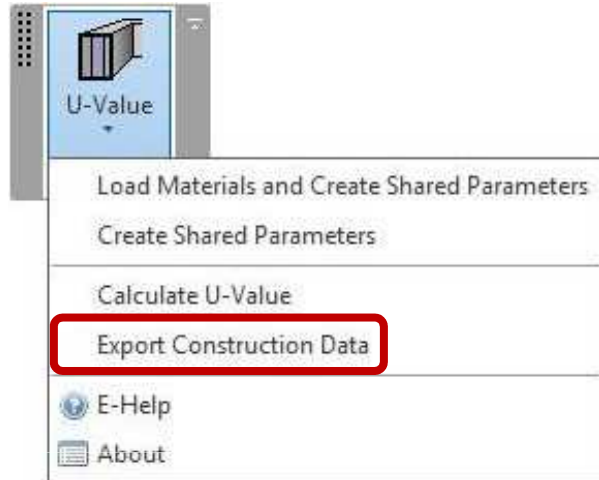


“U-Value” parameter right-click function “Calculate U-Value” – calculates selected element (or elements) U-Value.



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Export Construction Data



Export Construction Data function – exports construction data. For more information please contact us at info@tools4revit.com

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Result

- Extension provides building materials and products with physical parameters, which you can use, modify and update;
- includes products of international producers like PAROC, ISOVER, ROCKWOOL, YTONG, WIENERBERGER, DURISOL etc;
- automatically calculates U-Value (Overall heat transfer coefficient) for walls, floors, roofs, ceilings and foundation slabs;
- exports construction data.

Increase your productivity !