

Result Analysis in WUFI® Pro

1. What is „Result Analysis“ or „Postprocessing“?

So far WUFI® provides results almost only as raw physical data which means it predicts Temperature, Relative Humidity and Water Content within the construction depending on time. But the final questions about the service performance concerning for instance mould growth, corrosion, freeze thaw cycles, durability, etc. are not yet answered.

Thus additional models and software are required to evaluate the results of WUFI® to answer these questions. Each of these models/software is a so-called postprocessor. Fig. 1 shows how postprocessors interact with WUFI®.

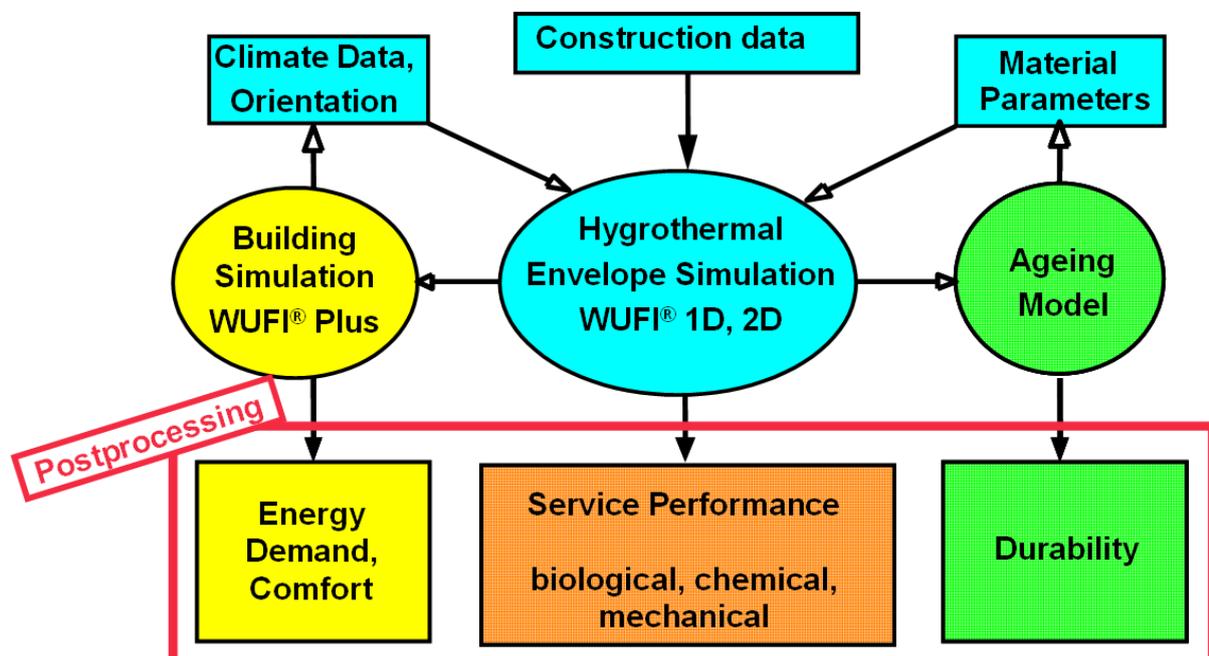


Fig. 1: Schematic overview of postprocessing.

Since version 5.1 WUFI® 1D comes with one postprocessor, analyzing the “Thermal Transmission” (formerly known as “Transient U-Value”).

Postprocessors

- are displayed in the “Result Analysis” menu of WUFI® or/and its film viewer Animation1D.
- can be invoked from WUFI® or/and Animation1D.
- can be provided with the course of e.g. Temperature, RH, Water Content at specific user defined positions as the basis of there analysis.
- can be developed by every WUFI® User.
- can be shared with other WUFI® Users.
- may work in the future with WUFI® 2D and WUFI® Plus as well.
- do not necessarily need WUFI®. As the data interface is open, measured data can be used as well.

2. How can I download and install postprocessors?

Additional postprocessors (e.g. WUFI® Bio) can be downloaded and installed from:
<https://wufi.de/en/service/downloads/> (English)
<https://wufi.de/de/service/downloads/> (German)

An example can be downloaded here:

<https://wufi.de/download/Example4PostProc.zip>

and connected to WUFI® Pro. This example shows how WUFI® communicates with a postprocessor and how the data interface is defined.

Just proceed as follows:

- 1) Extract the downloaded zip file to the “PostProc” subfolder of WUFI®; typically C:\Program Files (x86)\WUFI\PostProc”
- 2) The registration file ID_100.ini tells WUFI® about the additional postprocessor. You may have to update the value of “ExeName” and “Icon” in this file to point to the postprocessor “Example4PostProc.exe” (see Fig. 3).
- 3) Start Animation1D, open any film and you should see the new postprocessor as marked in Fig. 2.
- 4) Press this postprocessor button and use the cursor to select one position (click there) or an area (draw a zoom box) for analysis.

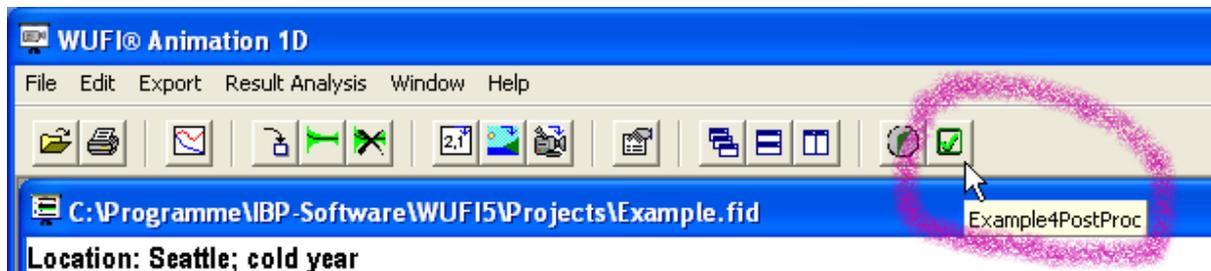


Fig. 2: Appearance of Animation1D after installation of an additional postprocessor.

The registration file must be located in the “PostProc” subfolder of WUFI® and must have a name between ID_100.ini and ID_199.ini. Fig. 3 visualizes and Table 1 describes the content of this file.

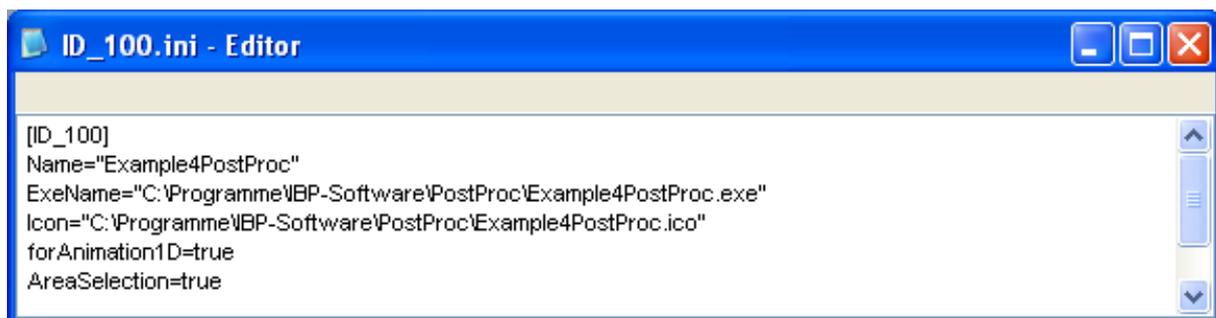


Fig. 3: Visualization of the registration file for postprocessors.

Table 1: Description of the registration file for postprocessors.

Element Name	Description
[ID_100]	Section Name, must be equal to the name of the registration file. IDs from 100 to 199 are valid.
Name	Name of the postprocessor to be displayed in the “Result Analysis” menu of WUFI® or/and Animation1D.
ExeName	Path and file name of the postprocessor.
Icon	Path and file name of the Icon to be displayed in the “Result Analysis” menu of WUFI® or/and Animation1D
forAnimation1D	Tells Animation1D to use this postprocessor
forWUFI1D	Tells WUFI 1D to use this postprocessor (not yet in WUFI Pro)
forWUFI2D	Tells WUFI 2D to use this postprocessor (not yet in WUFI2D)
forWUFIPlus	Tells WUFI Plus to use this postprocessor (not yet in WUFI Plus)
AreaSelection	Tells Animation1D whether the postprocessor accepts average values over more than one grid element. If the value is set to “true”, Animation1D allows to select multiple grid elements within one layer by using a zoom box and sends the average values to the postprocessor.

3. How is the data interface defined?

After proceeding as explained in section 2 the postprocessor “Example4PostProc” should pop up as shown in Fig. 4. This example postprocessor shows the parameters and files which are passed to it.

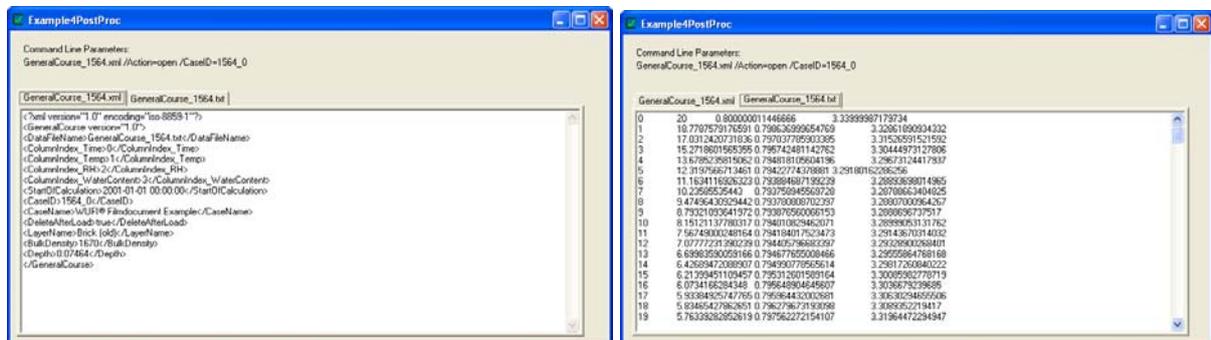


Fig. 4: Visualization of the two data files GeneralCourse.xml and GeneralCourse.txt

Each call of any postprocessor will be executed with command line parameters as shown in the upper area of the screen shots in Fig. 4. The first parameter is the location of the XML file to be read, 2nd and 3rd parameters are the specific action for the postprocessor (so far only “/open”) and a unique ID for possible later commands, but these are of minor interest so far.

The file GeneralCourse.xml contains some global information and has a reference to the data file GeneralCourse.txt where the hygrothermal results are located. The XML elements are defined in Table 2.

Table 2: Description of the XML elements of the file GeneralCourse.xml

Element Name	Description
GeneralCourse	Root element
DataFileName	Name of file containing the hygrothermal results for Temperature, RH and Water Content. This file is located in the same folder as the file GeneralCourse.xml.
ColumnIndex_Time	Column in file %DataFileName% where the time [hours since calculation start] is located.
ColumnIndex_Temp	Column in file %DataFileName% where the Temperature [°C] is located.
ColumnIndex_RH	Column in file %DataFileName% where the Relative Humidity [0..1] is located.
ColumnIndex_WaterContent	Column in file %DataFileName% where the Water Content [kg/m ³] is located.
StartOfCalculation	According to ISO standard 8601.
CaseID	Unique identification of the results to be referred to by possible later commands.
CaseName	Name of the calculation case in WUFI®
DeleteAfterLoad	Tells the postprocessor whether the files GeneralCourse.xml and %DataFileName% should be deleted after loading. This element is typically “true” if the data files are generated automatically.
LayerName	Name of the layer or material to be analyzed.
BulkDensity	Bulk Density of the material to be analyzed. Necessary if the results for Water Content in [mass percent] are needed.
Depth	Distance from the left side of the building component.
Depth2	Optional; If this element exists the results are average values within [%Depth% ... %Depth2%] of the material. Whether a postprocessor accepts average values can be specified in the element “AreaSelection” of the registration file (here: ID_100.ini)

The data file GeneralCourse.txt contains the raw physical data to be analyzed by the postprocessor. It is a text file with columns as specified in the file GeneralCourse.xml. Columns are separated by tabulators (ASCII code 09) and the decimal separator for floating point numbers is decimal point.

4. How can I create my own postprocessor?

Every postprocessor must be any windows executable file able to read the input data referred to by the command line parameters as described above.

5. How can I share my postprocessor with other WUFI Users?

If you like to share your postprocessor with other WUFI users, we can post it on the postprocessor section of our homepage. Please send an email to

<mailto:support@wufi.com?subject=WUFI-Postprocessing>

including following content:

- 1) Name of postprocessor
- 2) Name and email address of the author
- 3) Attachment with postprocessor (zip file or complete installation) including registration file
- 4) Release date
- 5) Language(s) of the graphical user interface

For further information please contact us by using the same email link above.

Kind Regards,
Your WUFI®-Team