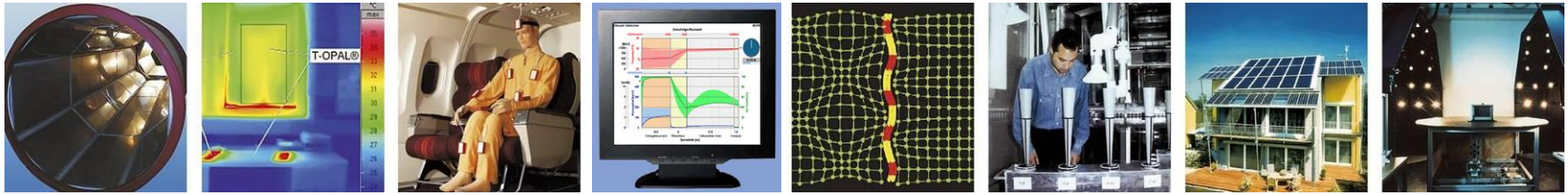

WUFI®

Guideline for Defining an Infiltration Source in WUFI® 2D

Date: October 2026

Fraunhofer IBP

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Problem

Problem:
The current version of WUFI® 2D cannot directly model an infiltration source using the IBP model. First determine the source strength in WUFI® Pro, then import it into WUFI® 2D as a file.

Solution in 5 steps:

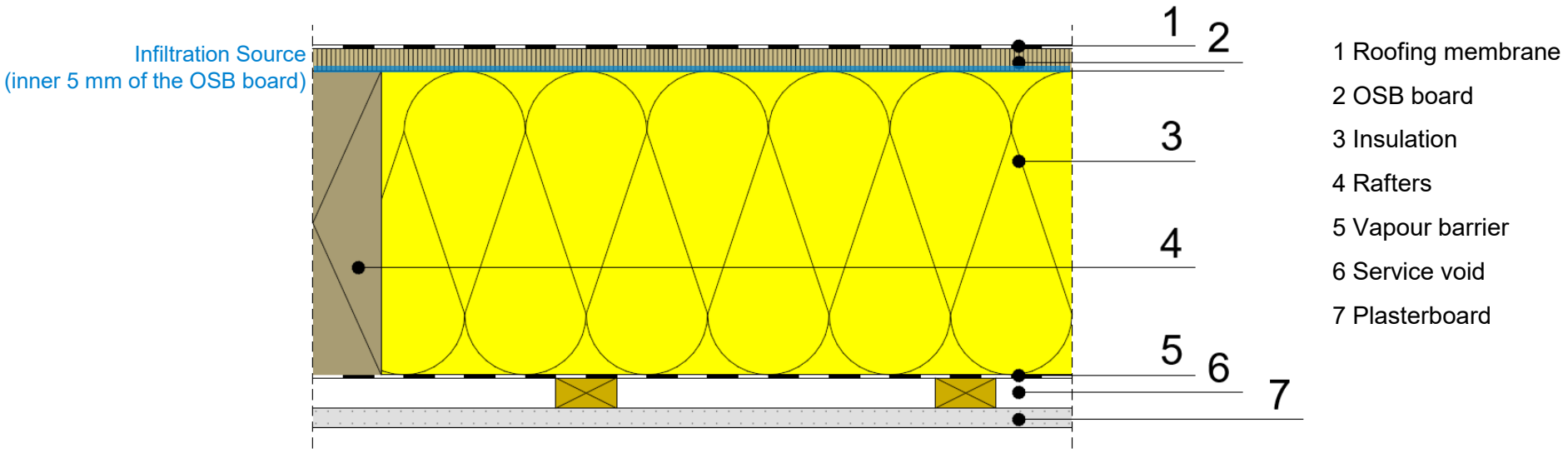
1. One-dimensional simulation of the relevant cross-section with WUFI® Pro (at the position where the infiltration source occurs)
2. Export the source strength as an ASCII file
3. Convert source strength from [kg/(m²·s)] to [kg/(m·s)] – multiply by the width of the source in the 2D model
4. Create a text file containing the converted source strength values
5. Insert the text file into WUFI® 2D as "Source from File"

→ This procedure is explained step by step in the following slides.

Approach

The following slides explain the steps in detail using a flat roof assembly as an example.

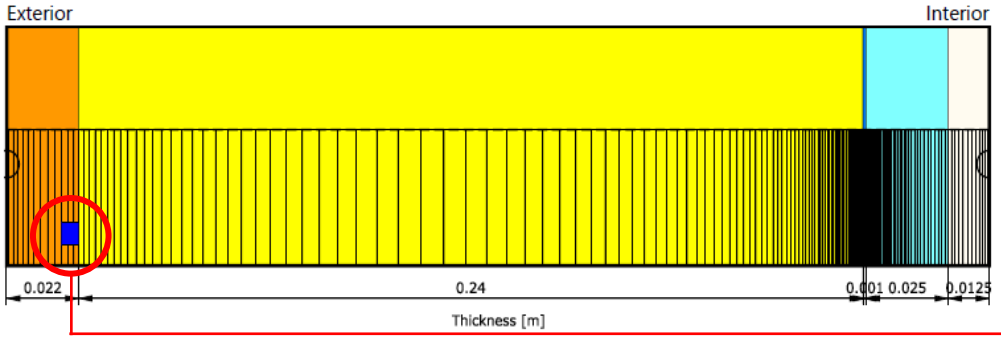
Note:
The flat roof construction shown here is only an example. Verification does not require a two-dimensional analysis of this assembly. A one-dimensional calculation through the cavity is sufficient.

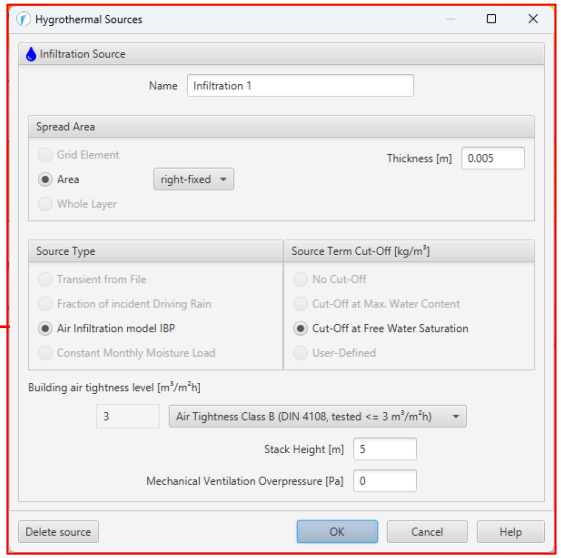


Step 1 – 1D Simulation with WUFI® Pro

Assembly in WUFI® Pro (here: cross-section through the cavity)

One-dimensional section through the assembly in the area where the infiltration source occurs (here: cross-section through the cavity)





Define the infiltration source

- Spread Area (here: inner 5 mm of the OSB)
- Air Tightness Class (here: Class B)
- Stack Height (here: 5 m)

Important:

The source location, climate data, and simulation period must match those in the planned 2D simulation.

Step 2 – Export the Source as an ASCII File

Export the source as an ASCII file

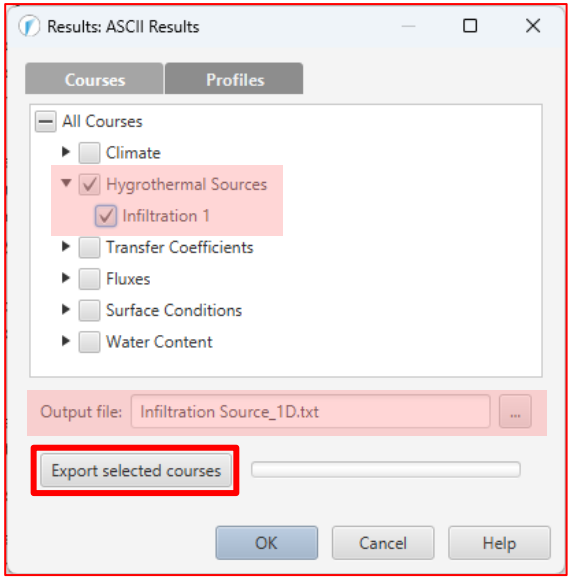
After the simulation, export the source strength using the ASCII export function:

Outputs → ASCII-Export

Courses: Hygrothermal Sources
→ Check the box for "Infiltration 1"

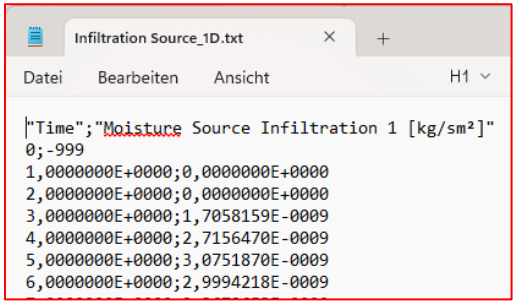
Select an output file

→ Export selected courses



Result:

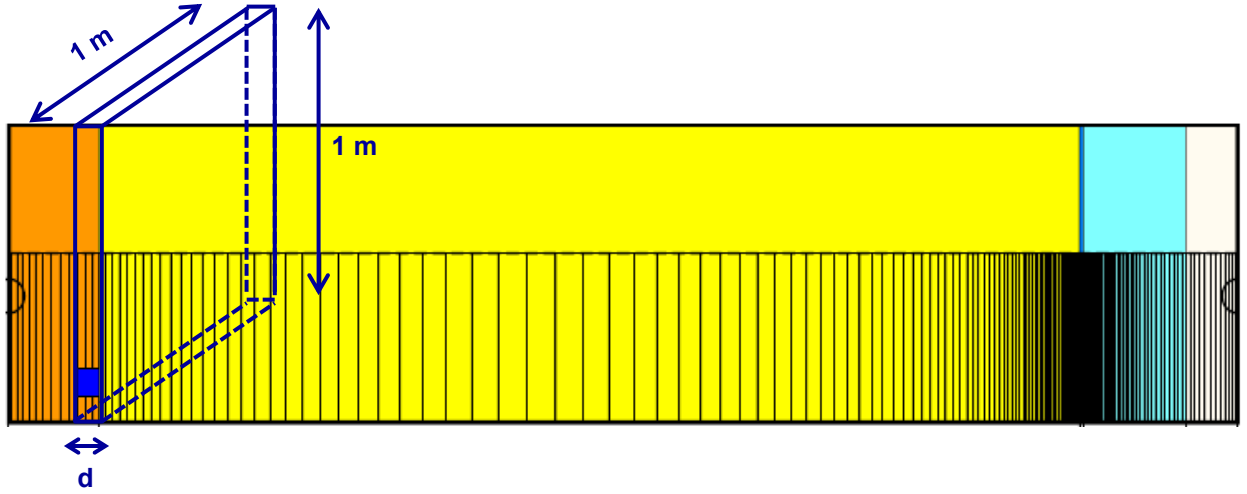
File with hourly values
of the source strength in [kg/(m²·s)]



Step 3 – Convert the Source for WUFI® 2D

Background: Why does the source have to be converted?

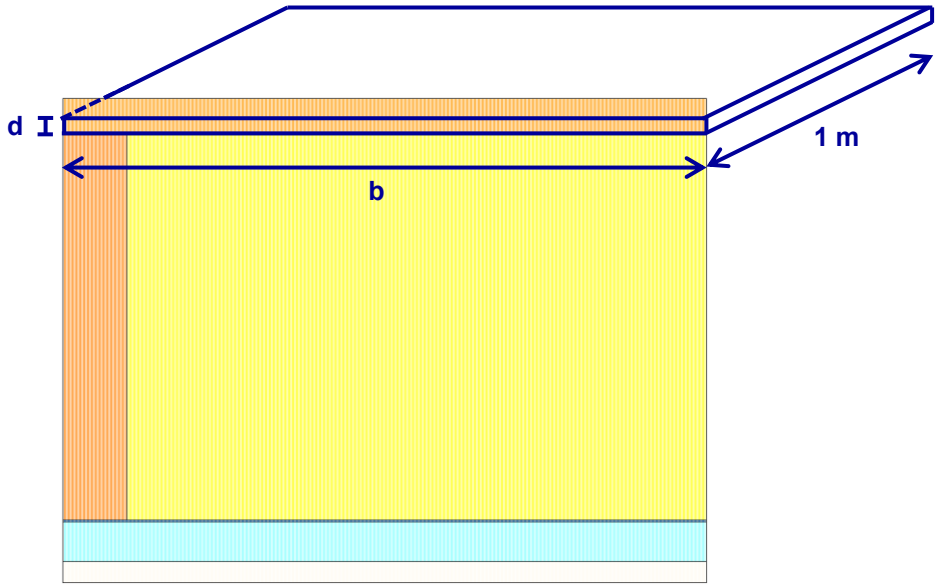
WUFI® Pro (1D): Source strength is expressed per unit area [kg/(m²·s)]



Step 3 – Convert the Source for WUFI® 2D

Background: Why does the source have to be converted?

WUFI® 2D: Source strength is expressed per unit length [kg/(m·s)]



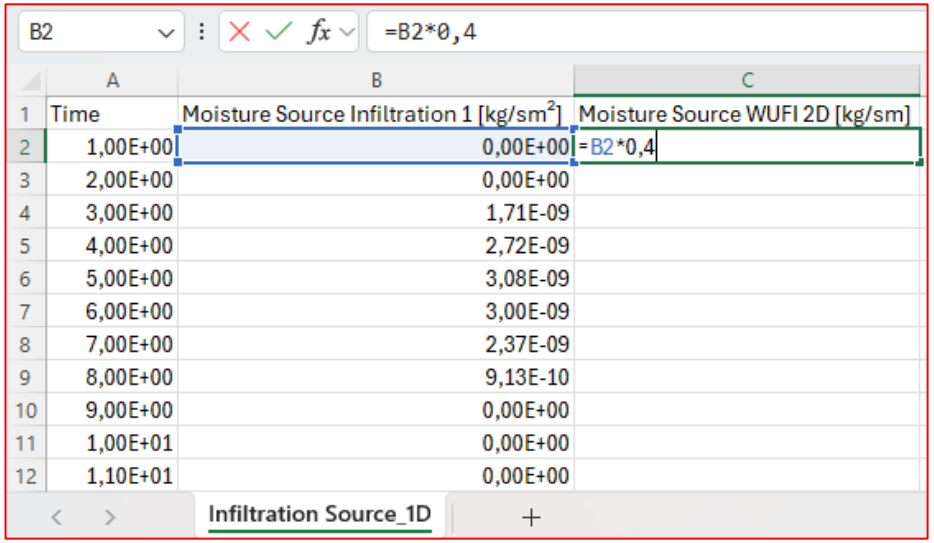
→ Conversion: *SourceStrength2D = SourceStrength1D * b*

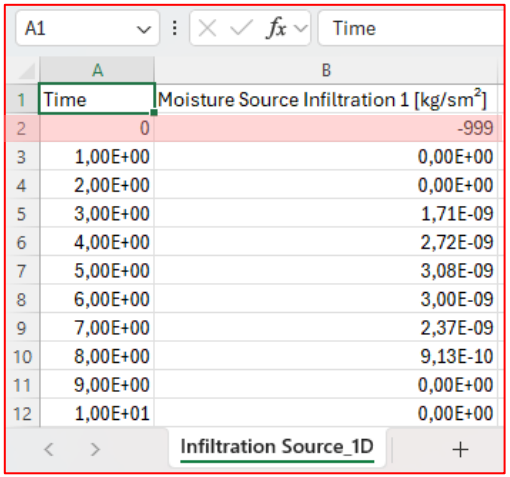
where b is the width of the source in the 2D model in [m]

Step 3 – Convert the Source for WUFI® 2D

Conversion using Excel, for example

- Open the exported file "Infiltration Source_1D.txt" in Excel
- Delete the row containing the entries "0" and "-999"
- New column: = *SourceStrength1D * b*
  (read the width *b* of the source from the 2D model; here: b = 0.4 m)

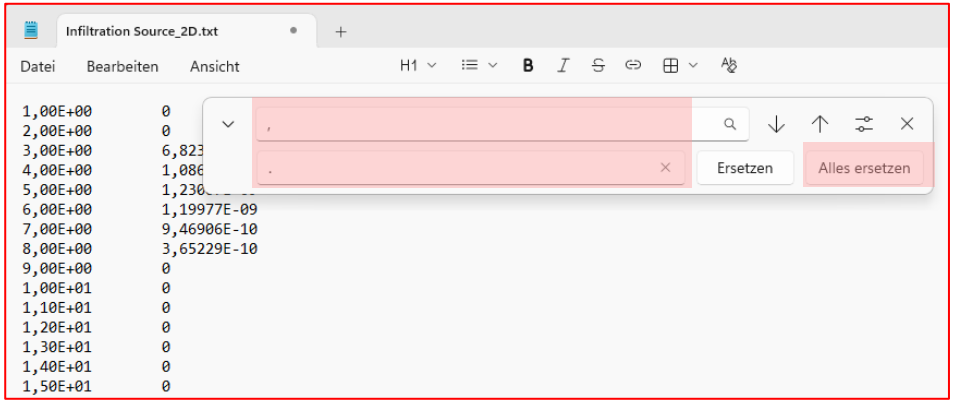


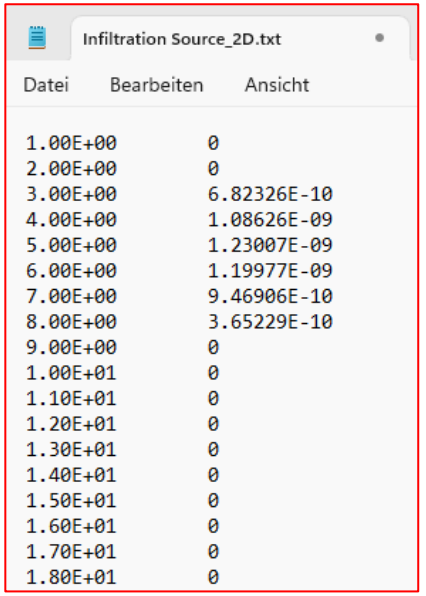


Step 4 – Create a Text File for WUFI® 2D

Creating a text file to import the source strength into WUFI® 2D

- Select and copy the columns "Time" and "Moisture source WUFI 2D" excluding the headers
- Paste the data into a new file in a text editor
- If necessary, replace decimal commas with decimal points
  (Edit → Replace → Replace all)





- Save the file in .txt format

Step 4 – Create a Text File for WUFI® 2D

Checklist for the correct text file format

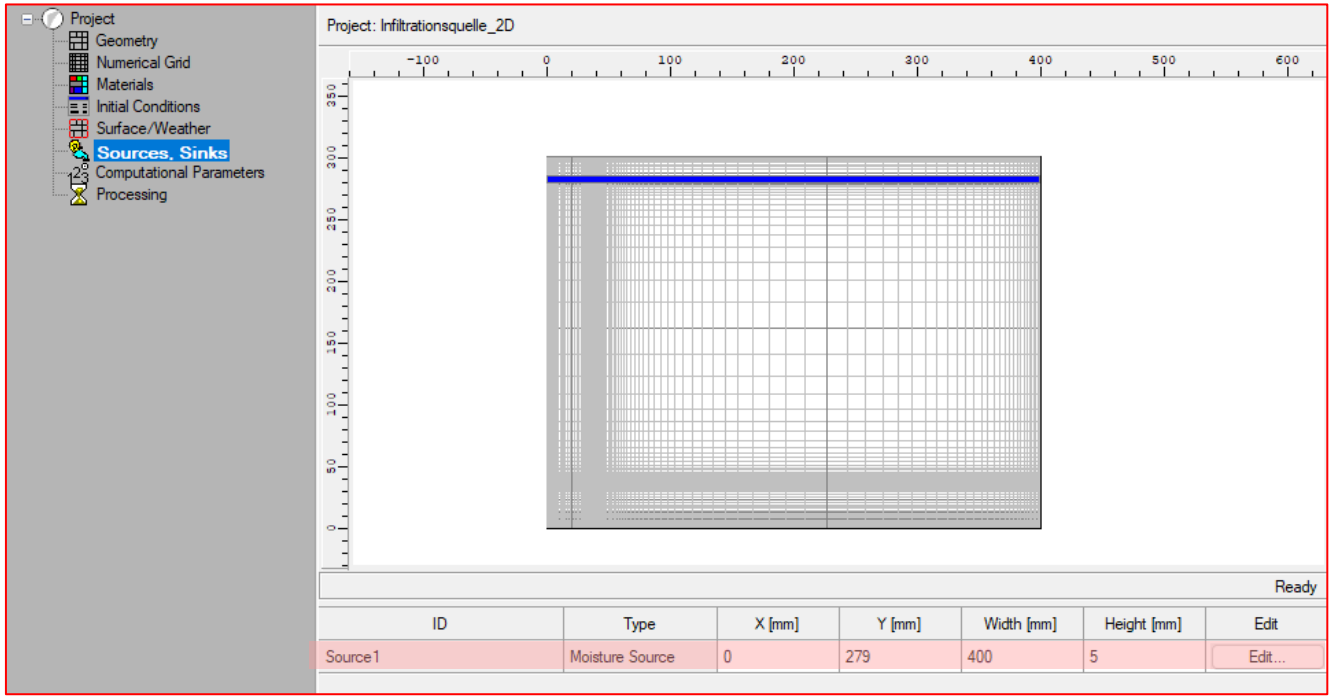
- ☑ no header
- ☑ exactly two columns (hour, source strength)
- ☑ decimal separator = decimal point
- ☑ columns separated by a tab or a space
- ☑ no blank lines at the end of the file

Step 5 – Insert the Source into WUFI® 2D

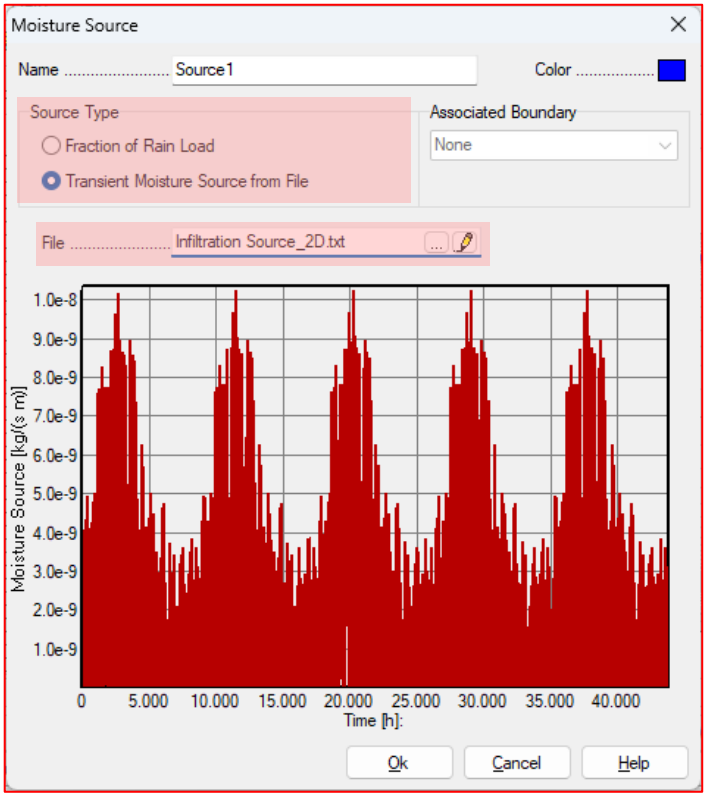
Insert the Source into WUFI® 2D

- Insert a moisture source and define its area in the 2D geometry
  here: inner 5 mm of the OSB board

Note:
For simplicity, the source is distributed across the full width, including the rafters.



Step 5 – Insert the Source into WUFI® 2D

Insert the Source into WUFI® 2D

- Click ‘Edit’ to define the source strength
- Source Type: Select "Transient Moisture Source from File"
- Select the text file you created
- Start the simulation
  (The start date and simulation period must match those used in the WUFI® Pro simulation.)