



**SUSTAINABLE ENGINEERING LTD**

Best-practice building science / building envelope consulting to produce comfortable, healthy, & durable buildings.


# Introduction to WUFI

Wärme und Feuchte instationär - Transient Heat and Moisture

Expert Tour 2015 - Wellington 19th May 2015




**Why didn't we have these problems before?**

**Because our buildings are prototypes!**

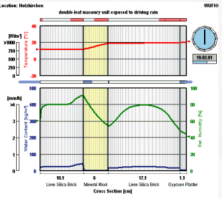
- Insulation:** Reduced drying potential of the enclosure
- Materials:** Reduced their permeability, increased their water and mould sensitivity, & reduced their ability to store/move moisture
- Airflow:** Ventilation, Infiltration & 3D airflow networks in hollow cavities

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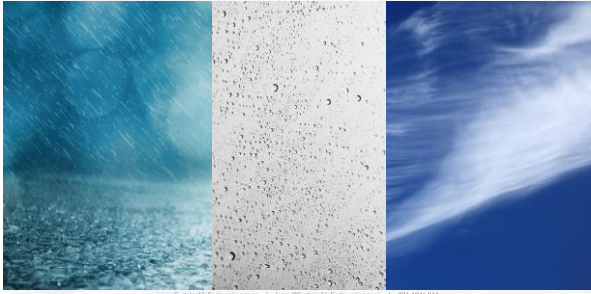
**Why I ❤️ WUFI and you should too**

- WUFI simply calculates the vapour diffusion and liquid transport in materials (1D/2D)
- Assess if an assembly is likely to fail
- Visualize the moisture flow
- Prototype on the computer instead of on my clients buildings



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 **THREE WAY BUILDINGS FAIL** 5



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 **THREE WAY BUILDINGS FAIL: Water** 6




**WUFI doesn't predict weather tightness but can assess rain absorbed into the cladding / leakage impacts**

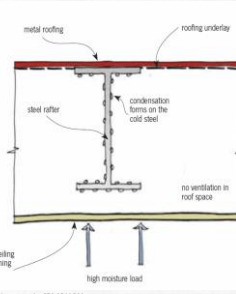
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Illustration: BRANZ

 **THREE WAY BUILDINGS FAIL: Condensation** 7




**WUFI doesn't predict airflow but can assess moisture transfer if you provide the airflow**

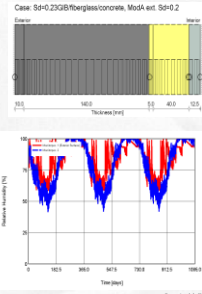



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Illustrations: BRANZ

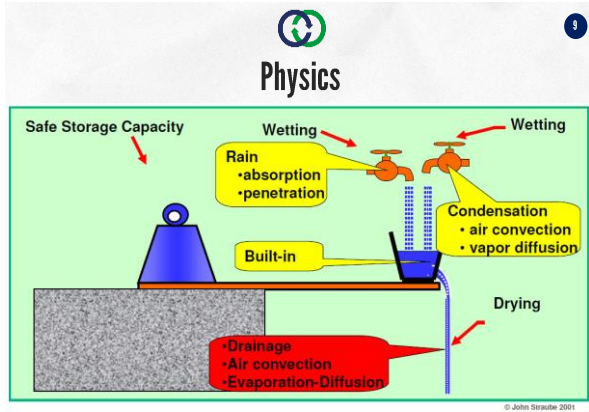
 **THREE WAY BUILDINGS FAIL: Moisture** 8

**WUFI can assess interstitial condensation**

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Moistly insulation photo: BuildingScience.com



**WUFI in ... Four Simple Steps**

1. Build your assembly
2. Apply boundary conditions
3. Run the simulation
4. Review results

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**Build your assembly**

Materials data can be difficult

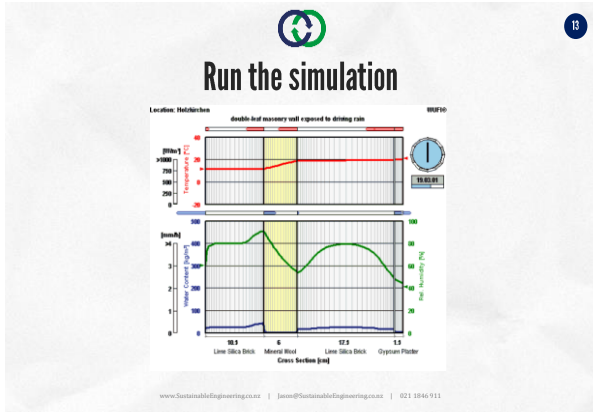
- Add moisture sources
- Add ventilation
- Orient surface and surfaces
- Built-in moisture levels

**GIGO**

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**Apply boundary conditions**

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## Sustainable Engineering Ltd.

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Slides available at:  
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