Window installation and other “Grimms” stories

Joerg Birkelbach

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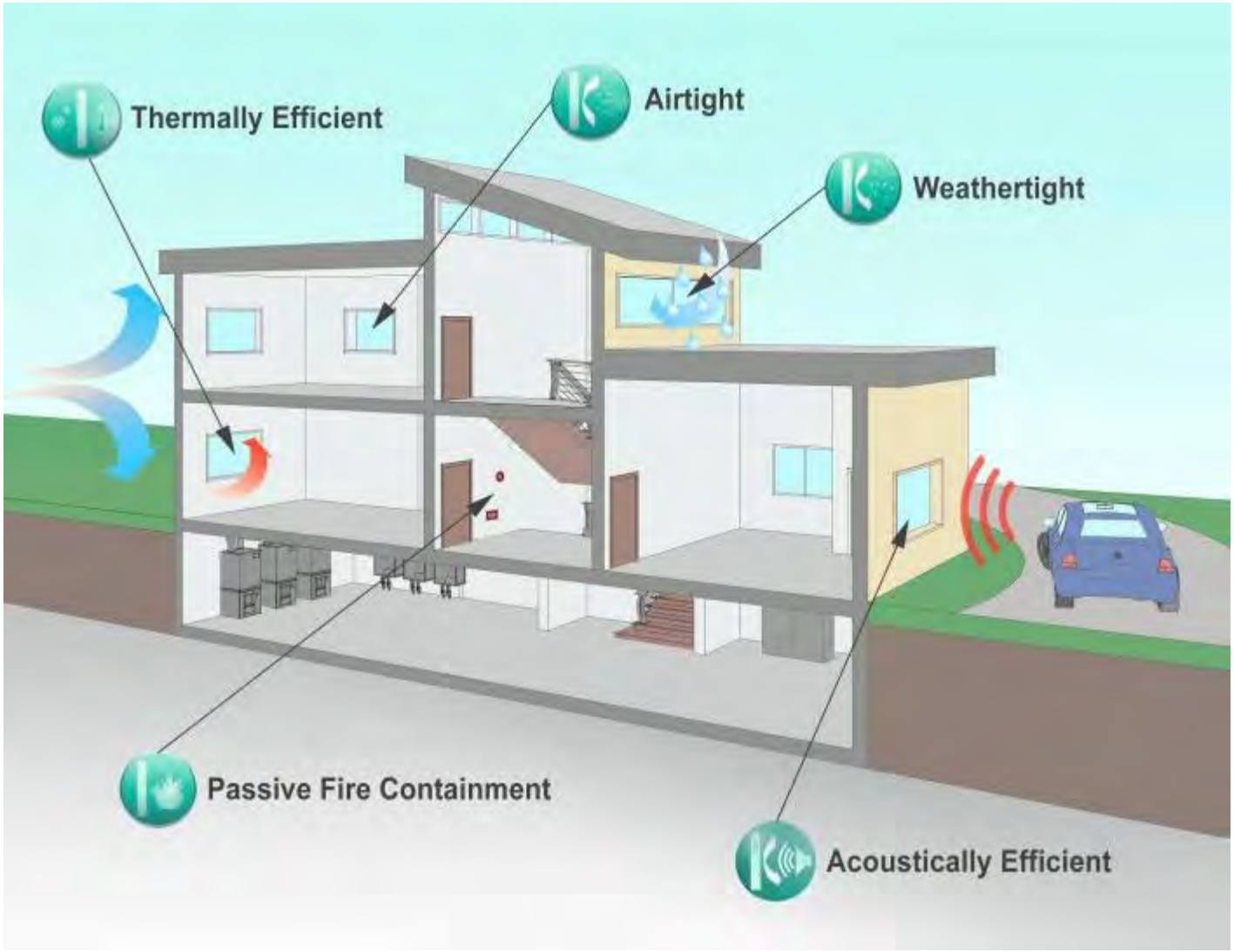
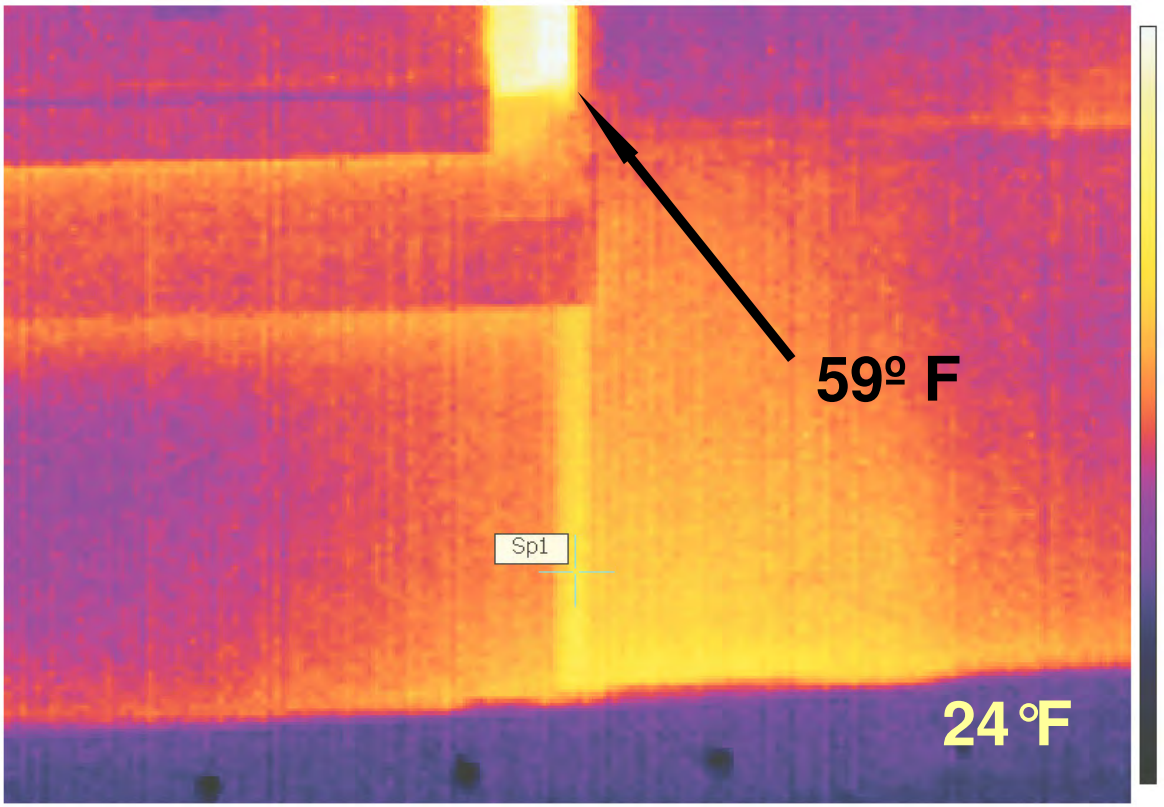
The building envelope!



lt isn’t always obvious



What worth a high end window without a high end install?

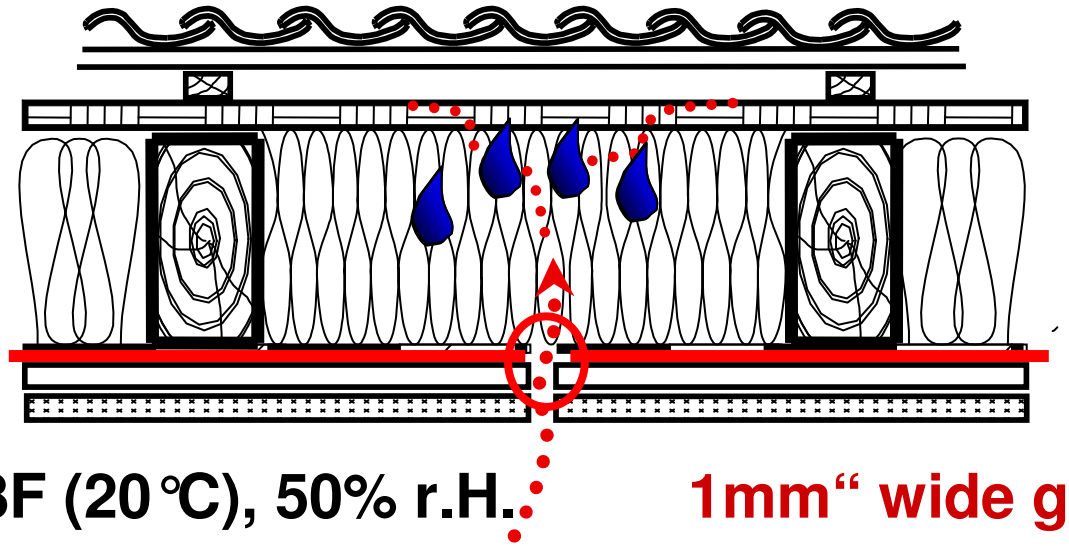
30ft long crack	Crack width 1,0 mm (1/32”)			Crack width 1,5 mm (3/64”)		
	Helsinki	Tampere	Oulu	Helsinki	Tampere	Oulu
Consumption [kWh / year]	287,4	334,2	352,9	980,0	1101,5	1163,2
Oil [litres/year], with 90 % efficiency	31,9	37,1	39,2	108,9	122,4	129,2

Sources: University of Tampere

Why is airtightness important?

Outside: 23F (-5℃), 80% r.H.

1 pint a day



Inside: 68F (20℃), 50% r.H.

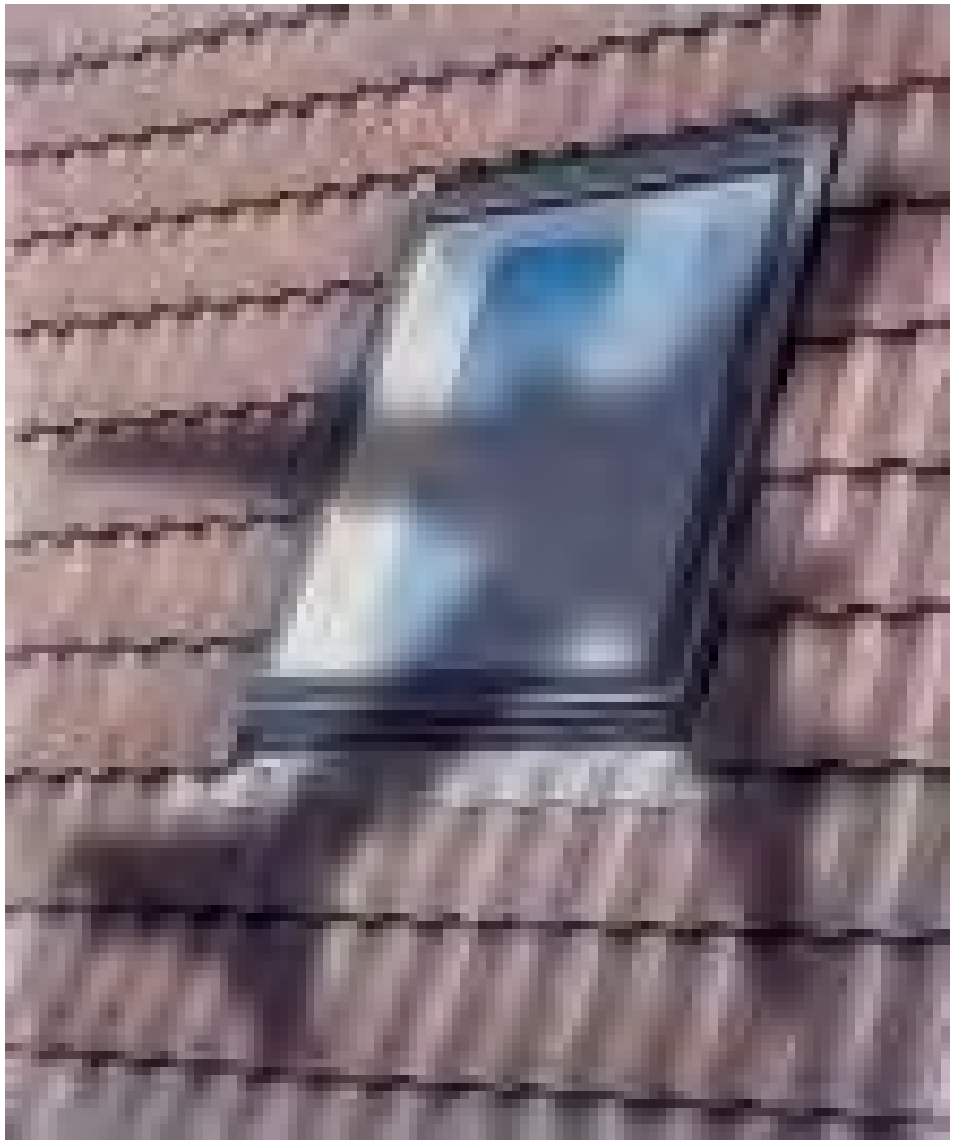
1mm“ wide gap

(1 long)

Avoid Construction Damage

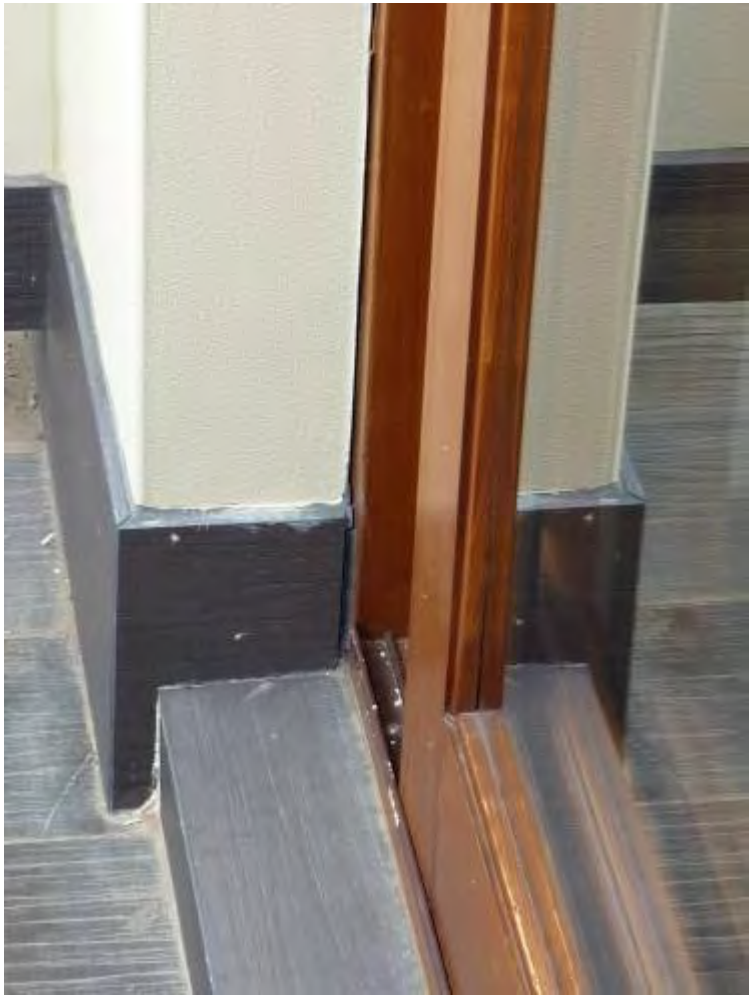
If you build tight ventilate right

Noise Reduction



Current situation

Traditional Seal



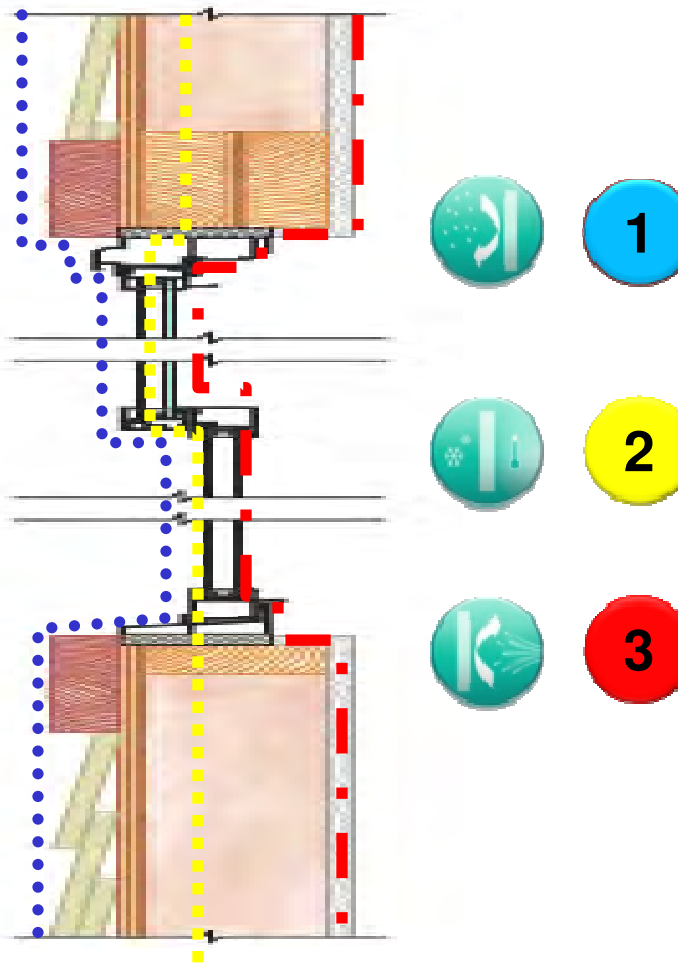
Current situation

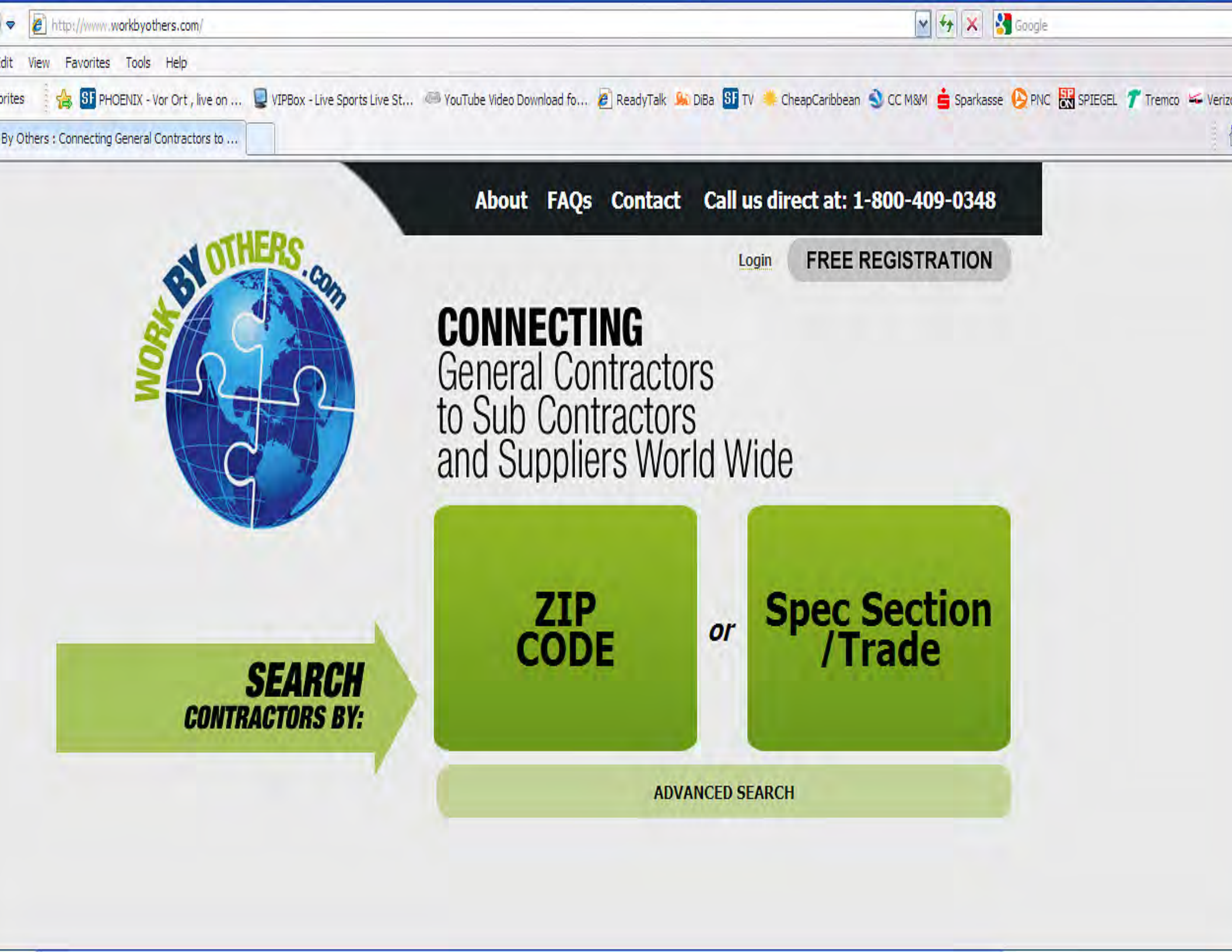
Traditional Seal

Traditional Seal

Traditional Seal

3 level seal!

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VIPBox - Live Sports Live St...
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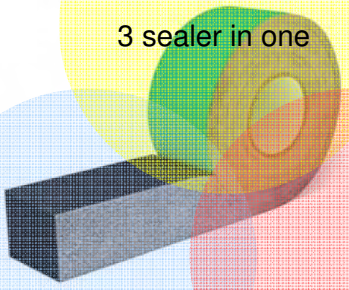
or
Spec Section
/Trade
ADVANCED SEARCH

3 level seal toolbox?

Multifunctional tape

3 sealer in one



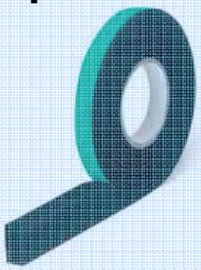
LEF

Low Expansion PU Foam for Sound & Thermal Insulation

Moisture variable flashing tapes

Intelligent Seal for Airtight Internal & Weather tight External Joints

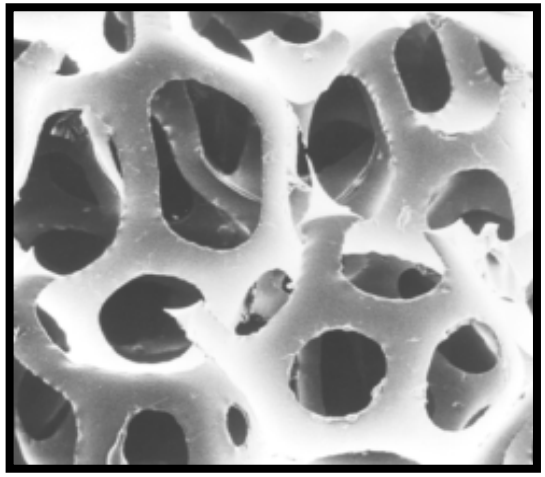
Impregnated pre compressed tape

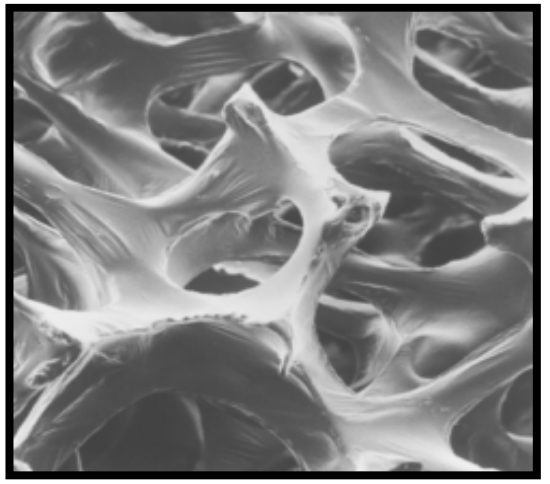


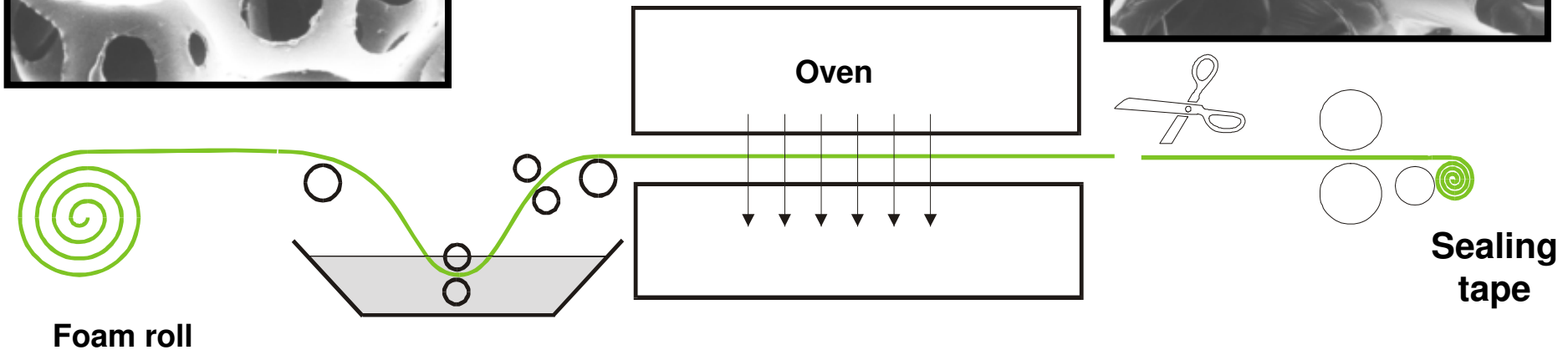
High performance engineered transition assembly

Take a closer look how impregnated tapes are developed

Let’s have a look how an impregnated pre compressed tape is developed







Impregnation

Drying

Cutting

Compression rollers

What does the impregnation do?

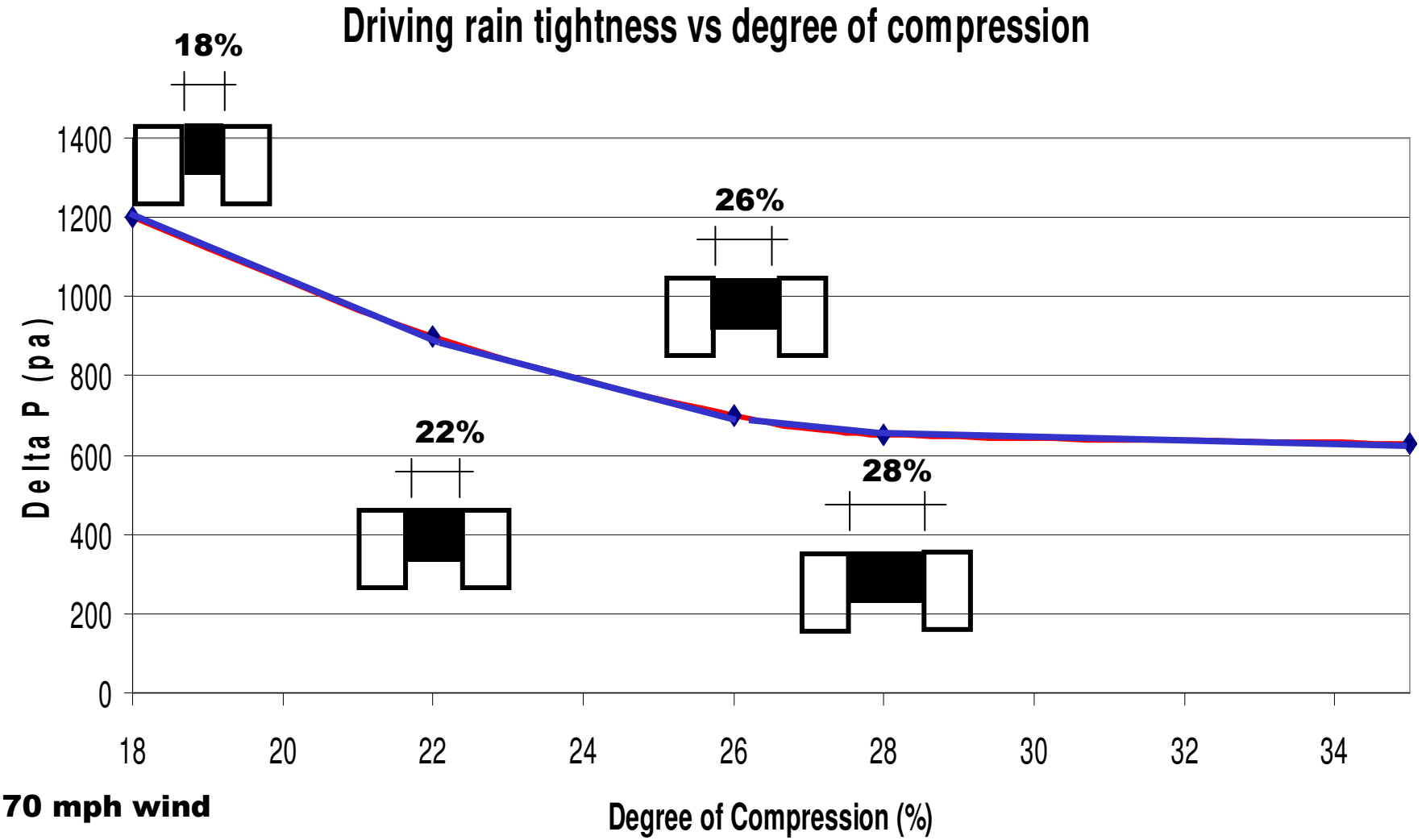
It makes the foam hydrophobic

It makes the foam UV resistant

It controls the expansion time

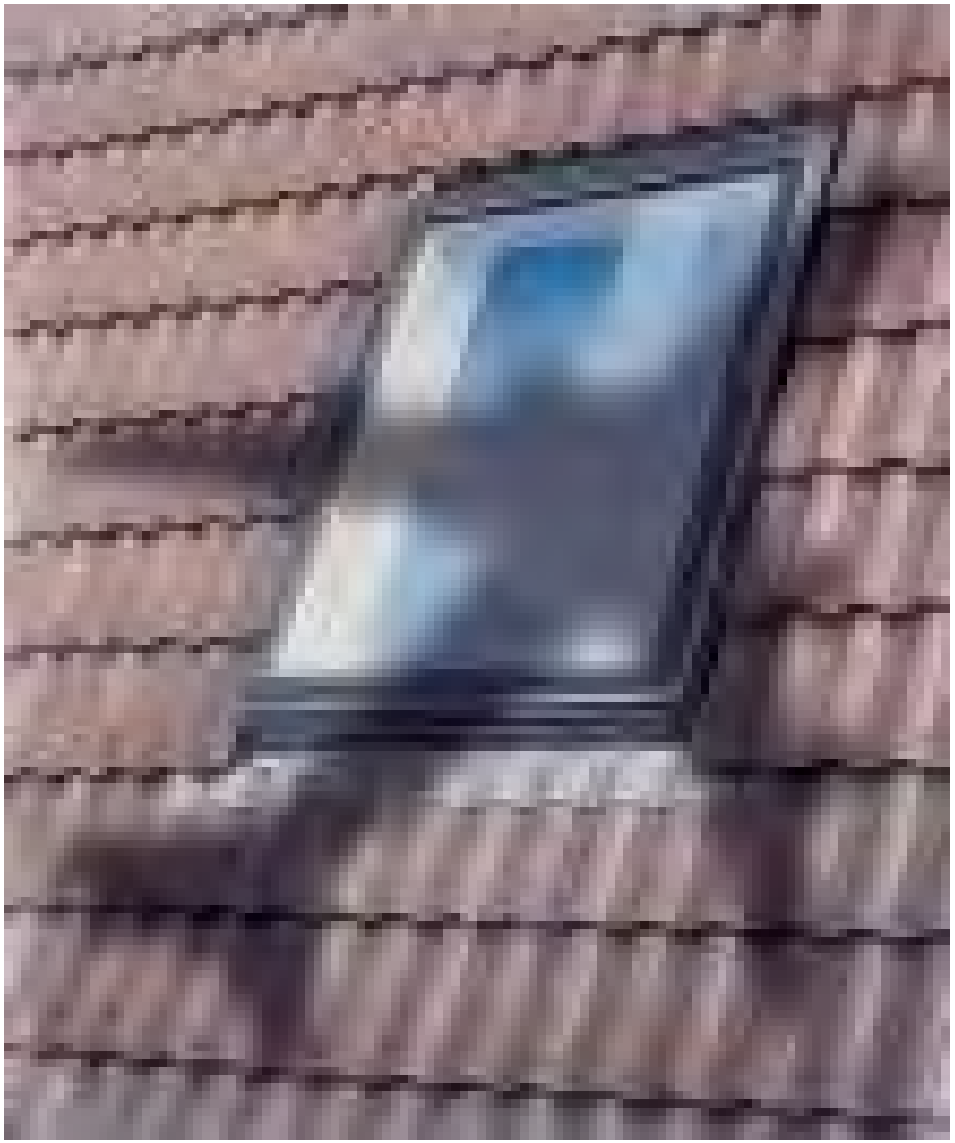
What is the correct tapes size?

How about the weather resistant's?



pa =70 mph wind

Noise Reduction

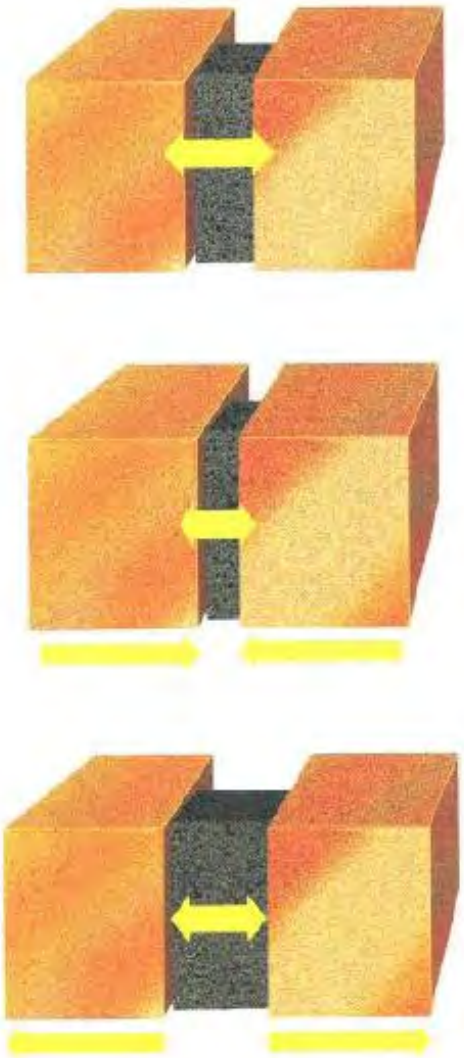


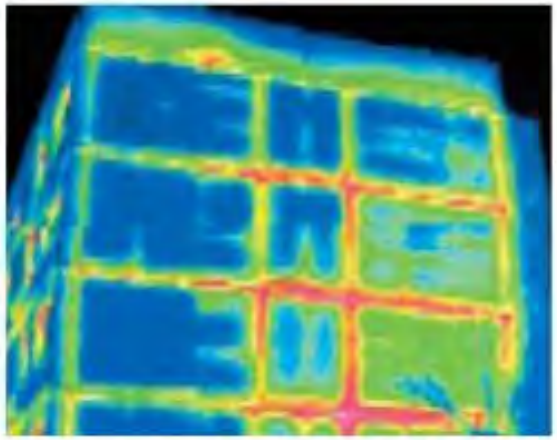
STC up to 54!

Comparison of cheap with valuable solutions

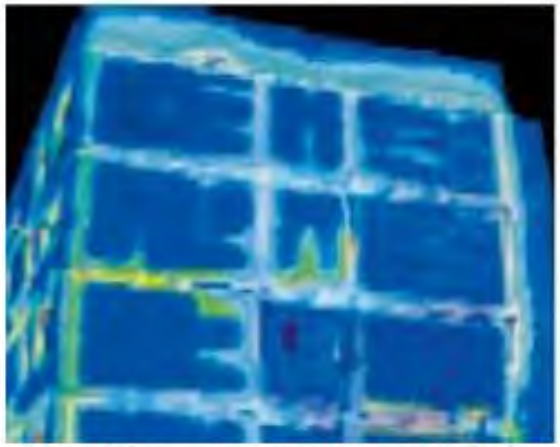
Other main benefits of impregnated tapes

- High movement capability
- Thermal insulation
- Sound insulation
- No installation temperature limitation
- Driving rain and UV resistance*
- Fast, clean and easy installation
- Aesthetic solutions





Thermography shows clearly the heat loss due to faulty facade sealing



Illmod 600 guarantees a tight seal against wind and driving rain up to 600Pa, as well as providing the openness needed for vapour diffusion from the facade joints

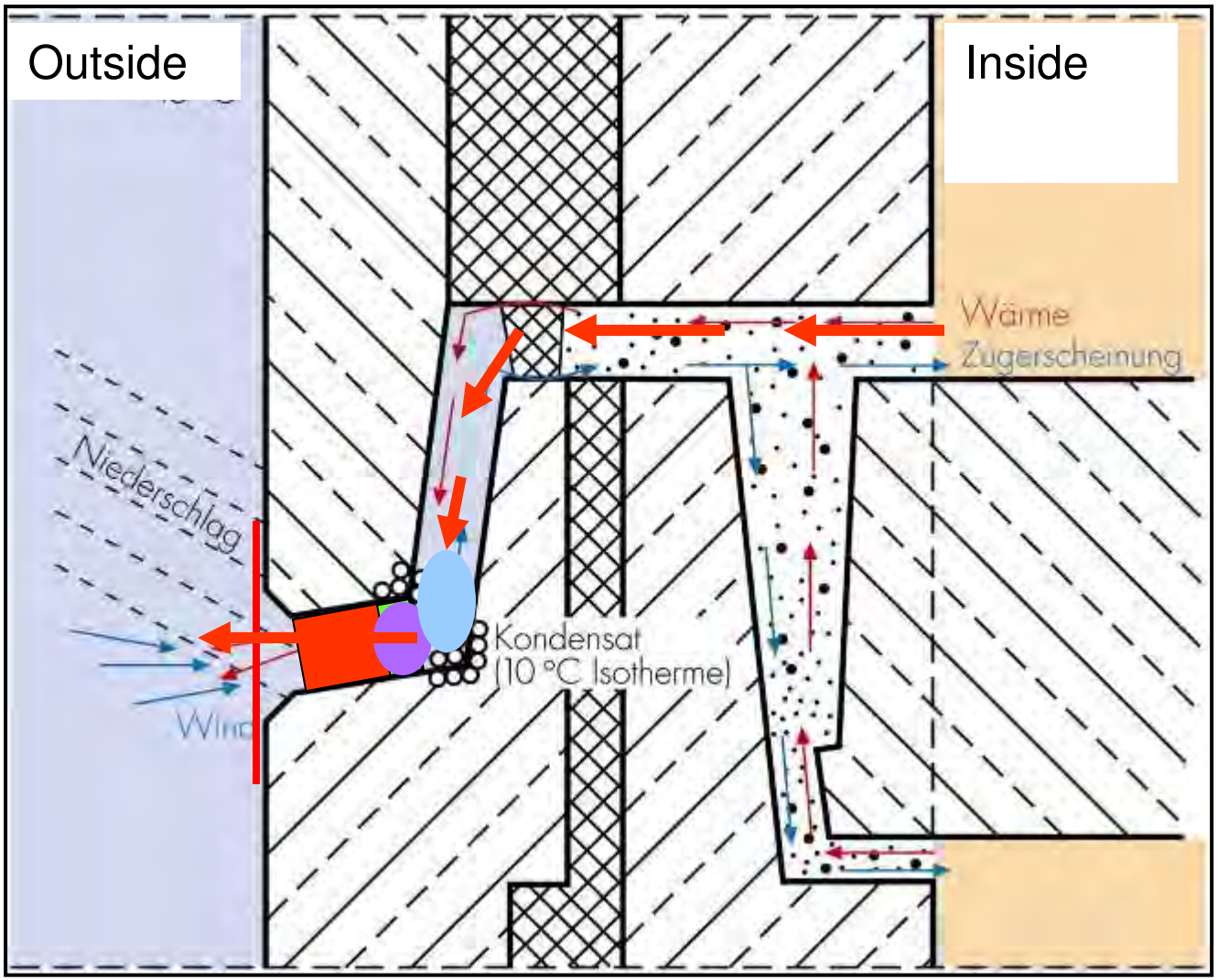
Is this technology new...?

Construction damages a due to condensation

Construction damages a due to condensation

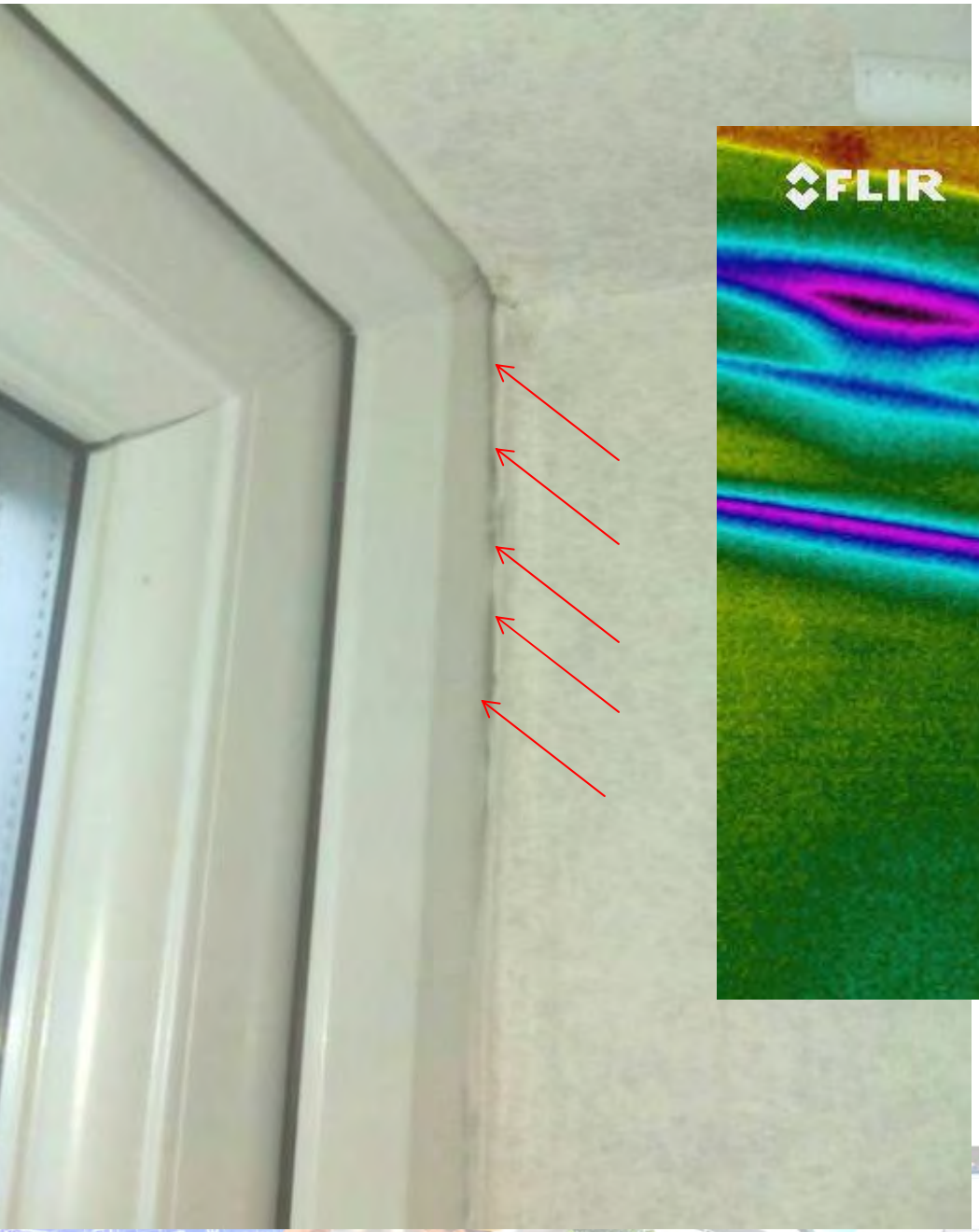
Construction damages a due to closing the system on wrong side

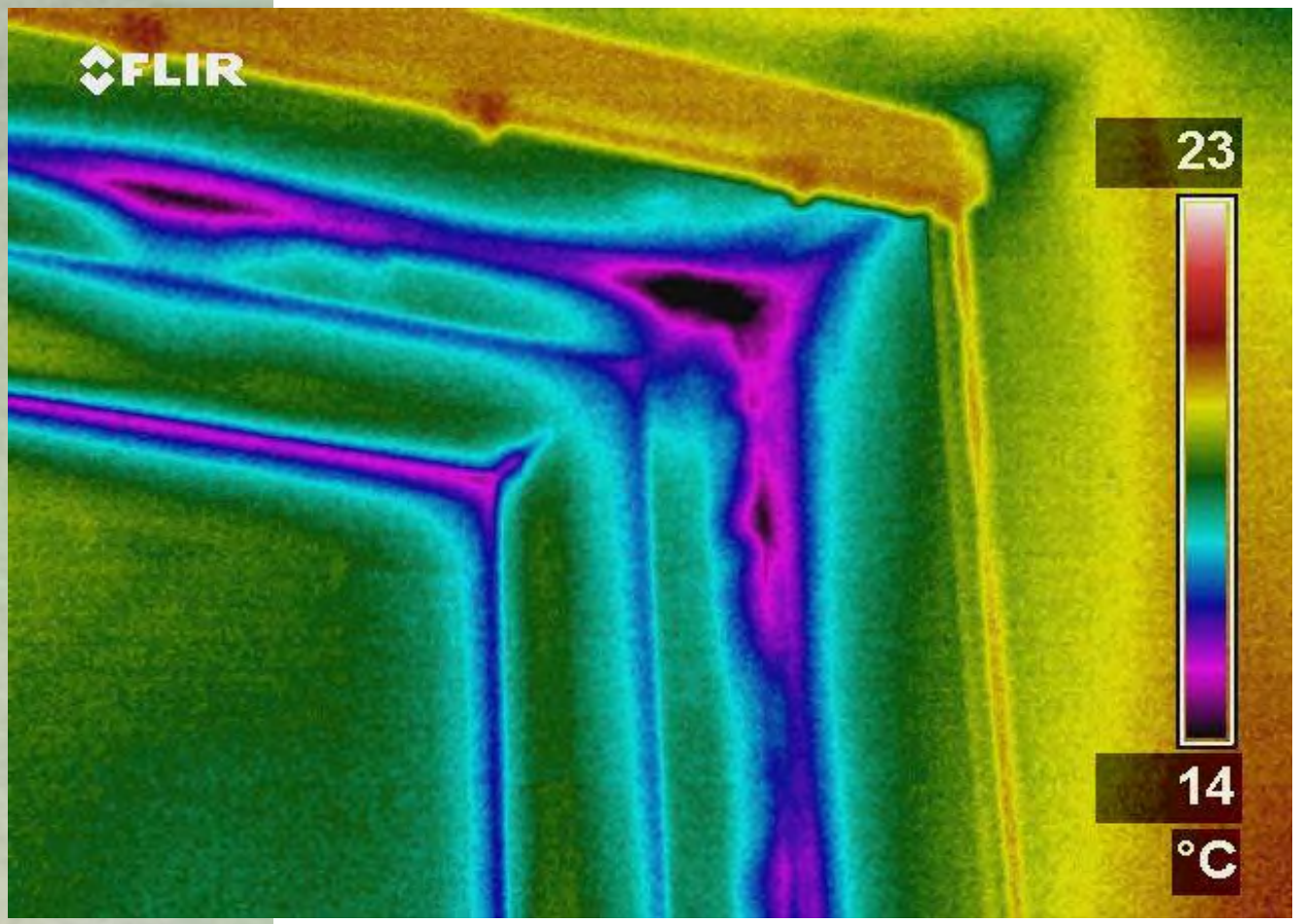
Construction damages a due condensation



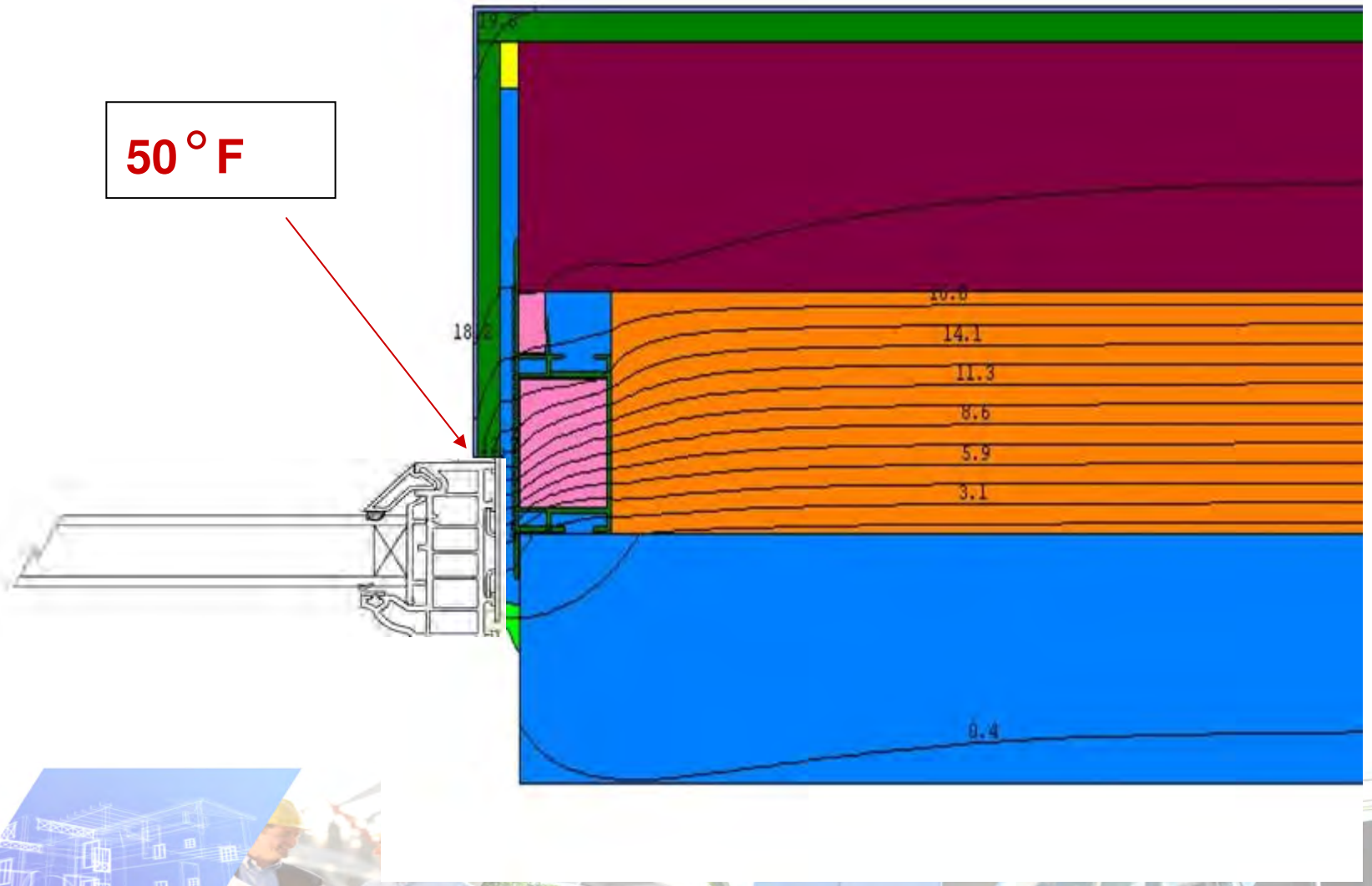
Field of applications for impre. tapes

Obvious need for a proper seal



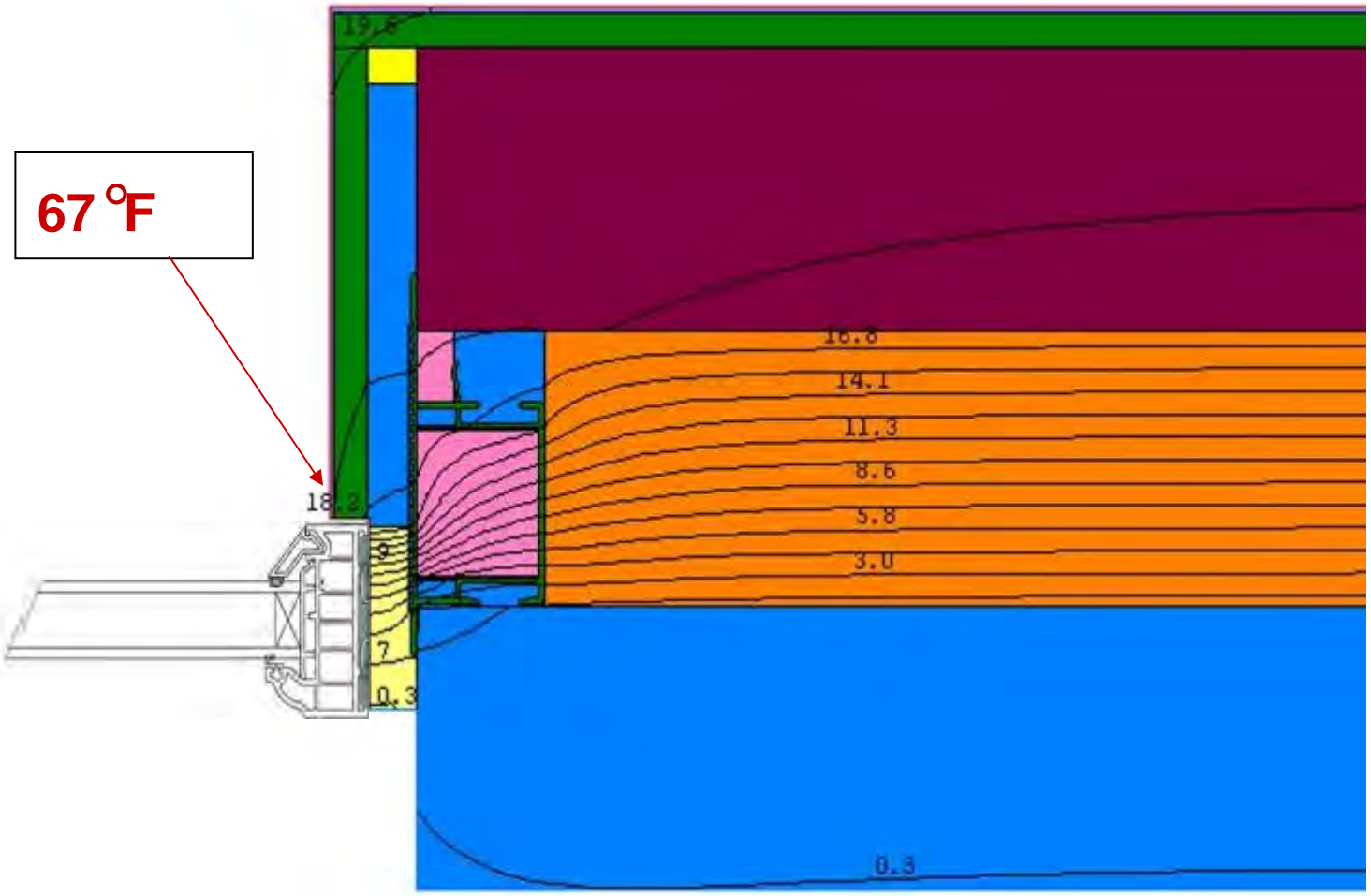


PVC Window : 3/16” gap; Silicone external seal; no insulation

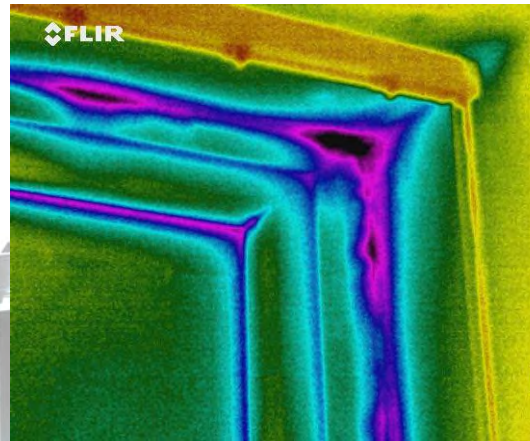


PVC Window: 5/8” gap ; Multi functional tape

Inside



Outside



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Hochschule Bochum
Bochum University
of Applied Sciences

012

-situ Measurements in Fenestration
Joints sealed with Tremco illbruck
illmod Trio in Habo, Sweden

uation of vapour diffusion, condensation risk and moisture storage in a wooden-frame house

Lars Krutzen, B. Sc.

Prof. Dr. Gerrit Höfker

-situ measurements in nestration joints (Simulation d Validation)

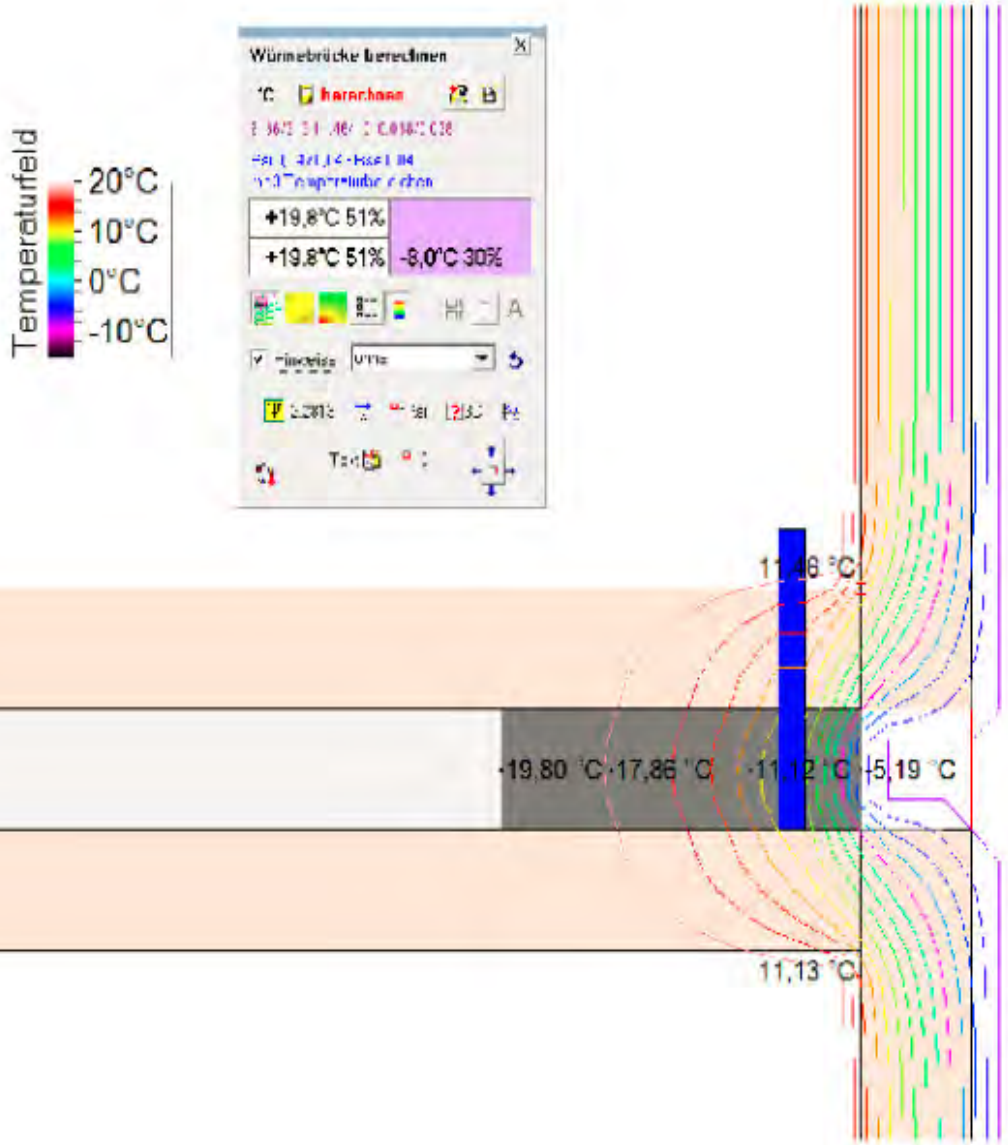
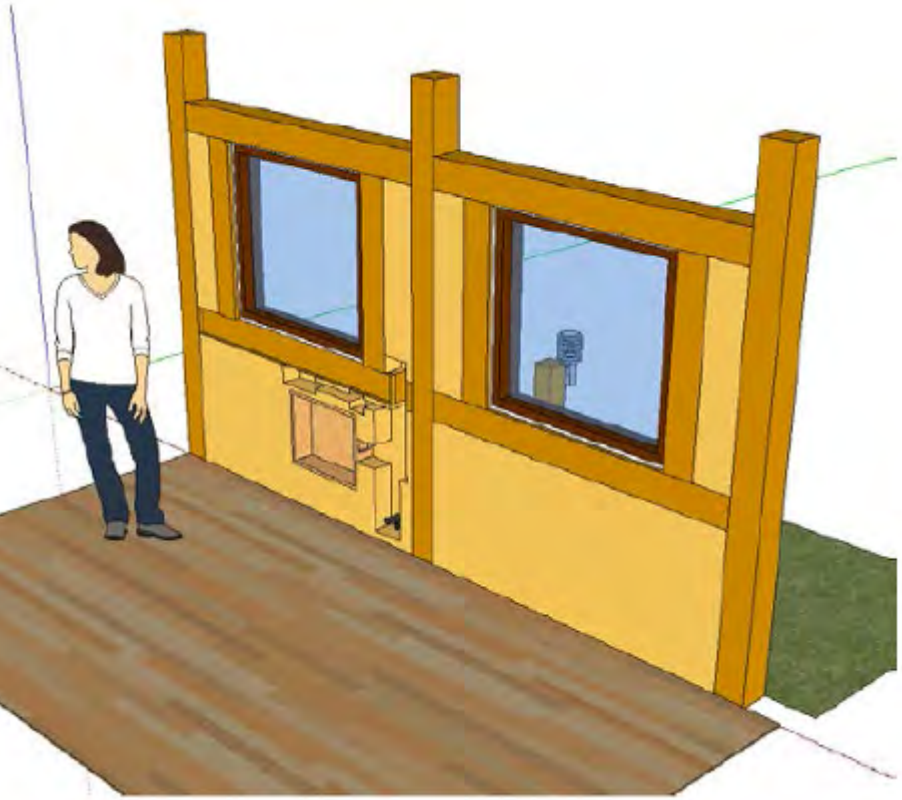
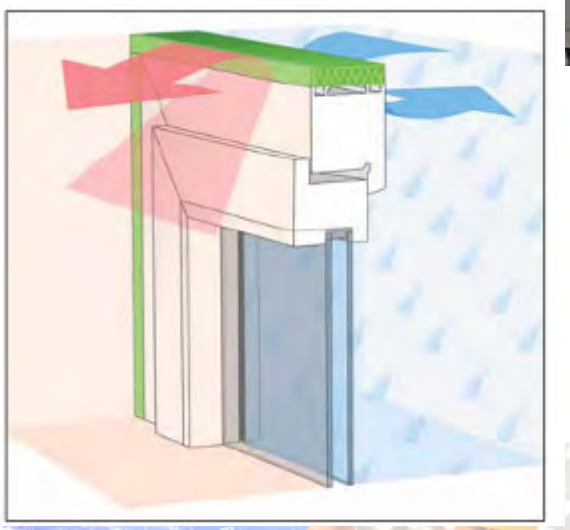


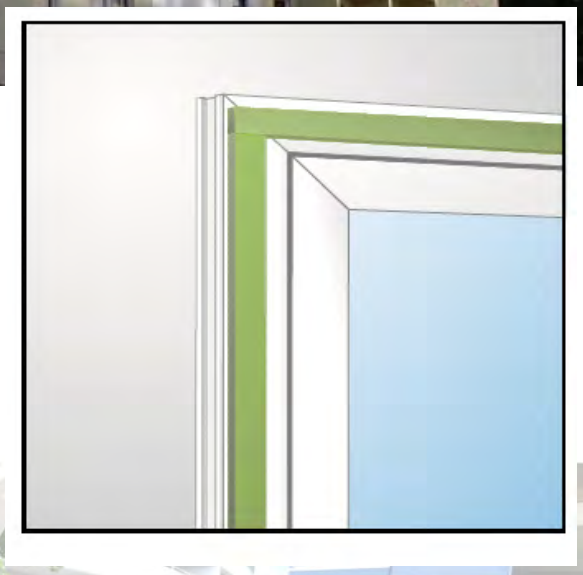
Figure 6: "Modules" that could each hold two ducts to which the illmod Trio was applied. The left picture the front aspect that faced the refrigerator with expanded illmod 600 used as a sealant. The right picture posterior aspect that faced the climatic chamber. The illmod Trio was applied and the four sensors install recording. Left picture taken on 2nd Jun 2010, right picture taken on 14th Jul 2010.

-situ measurements in
nestration joints



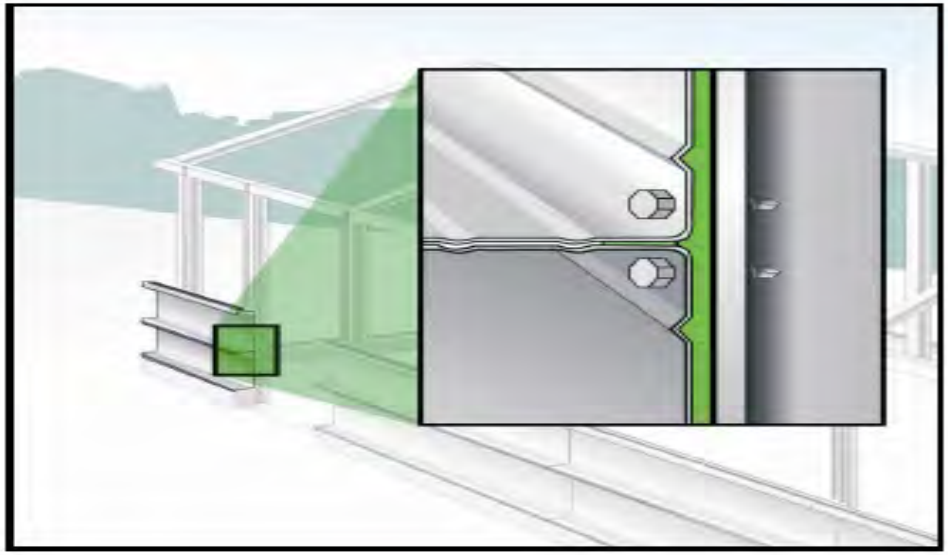
Field of applications for impre. tapes

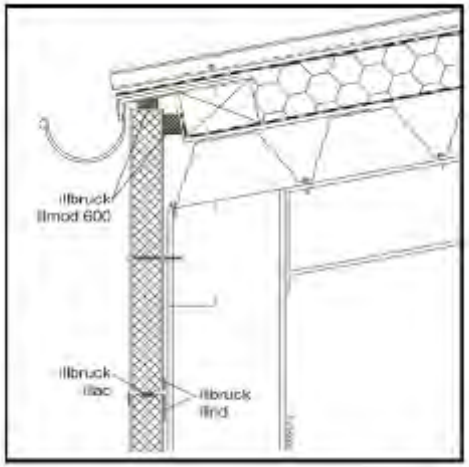


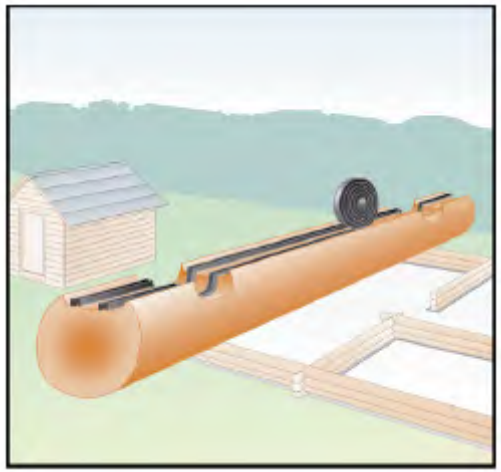


Berlin Potsdamer Platz” T3 Solution references”

Field of applications for impre. tapes





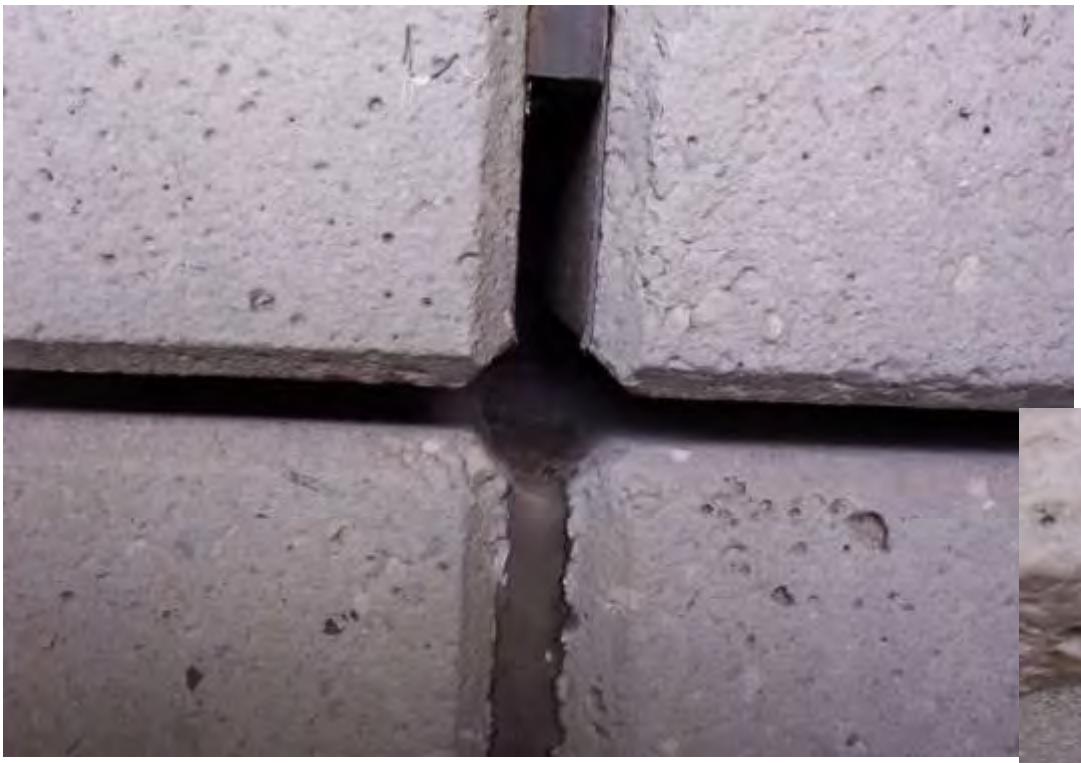


SIP Panel Installation/ Fabrication

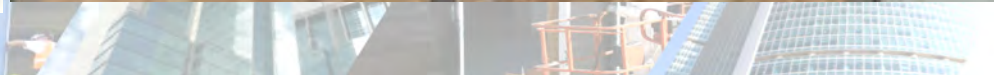
In plant application

Field of applications for impre. tapes

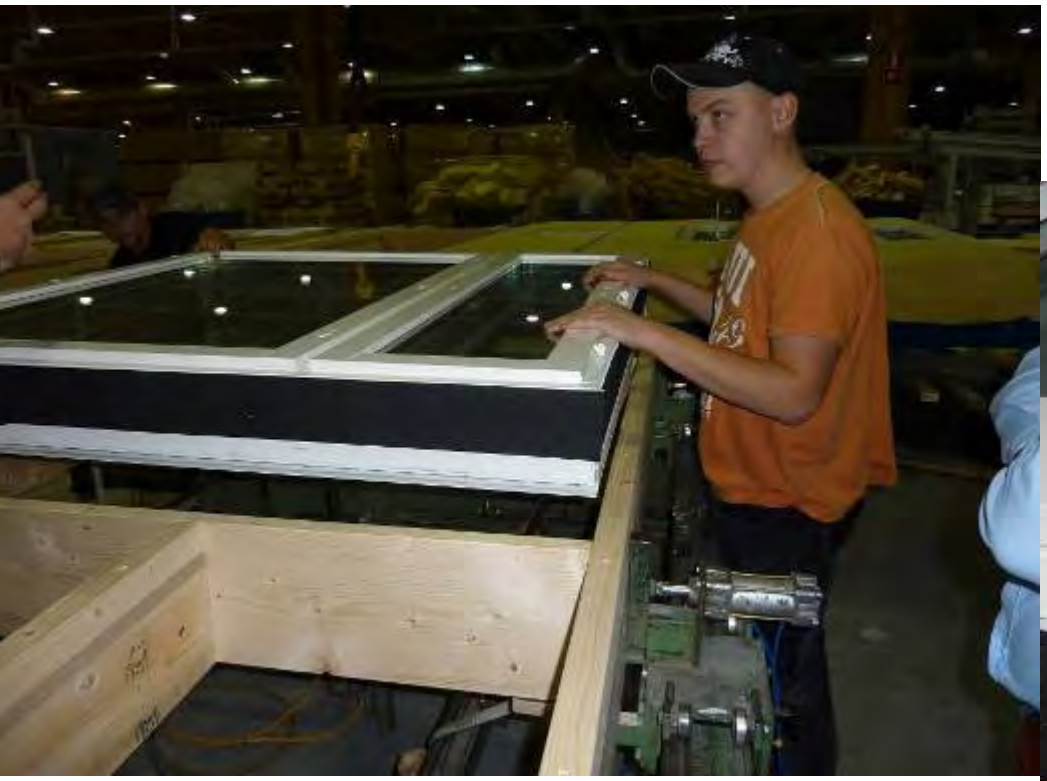
Field of applications for impre. tapes

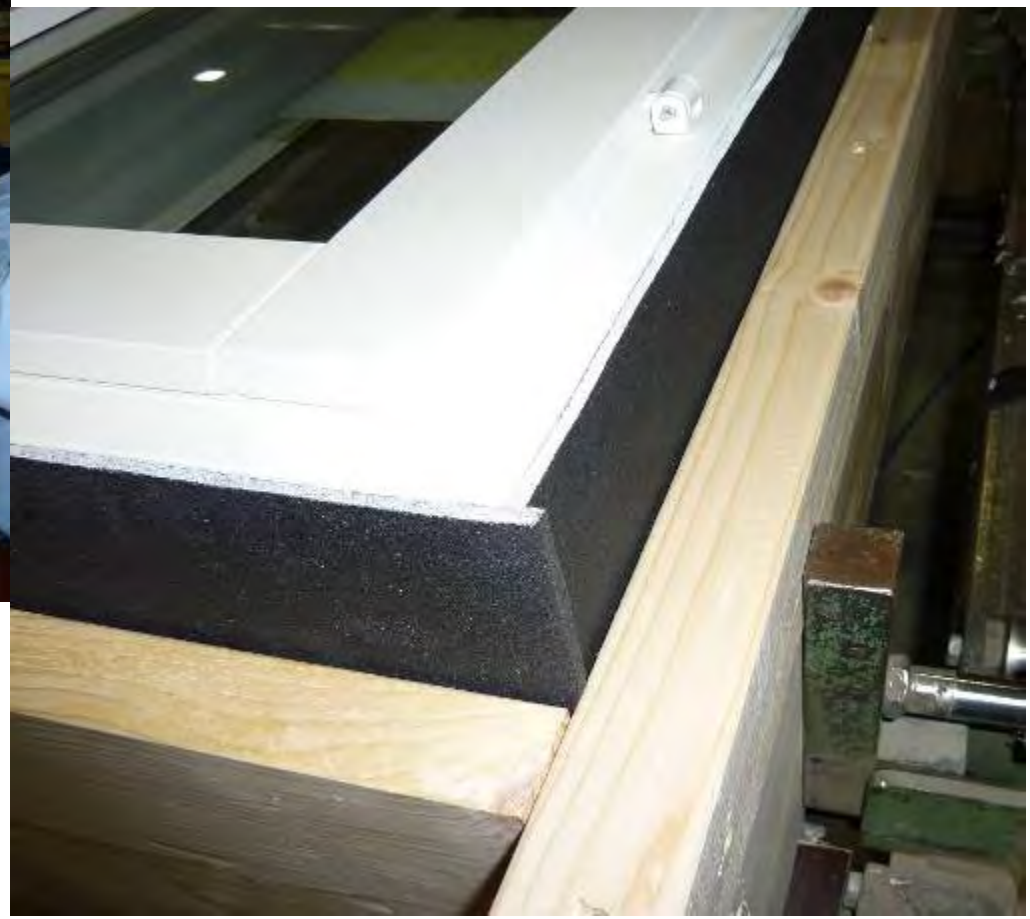


Field of applications for impre. tapes



Field of applications for impre. tapes



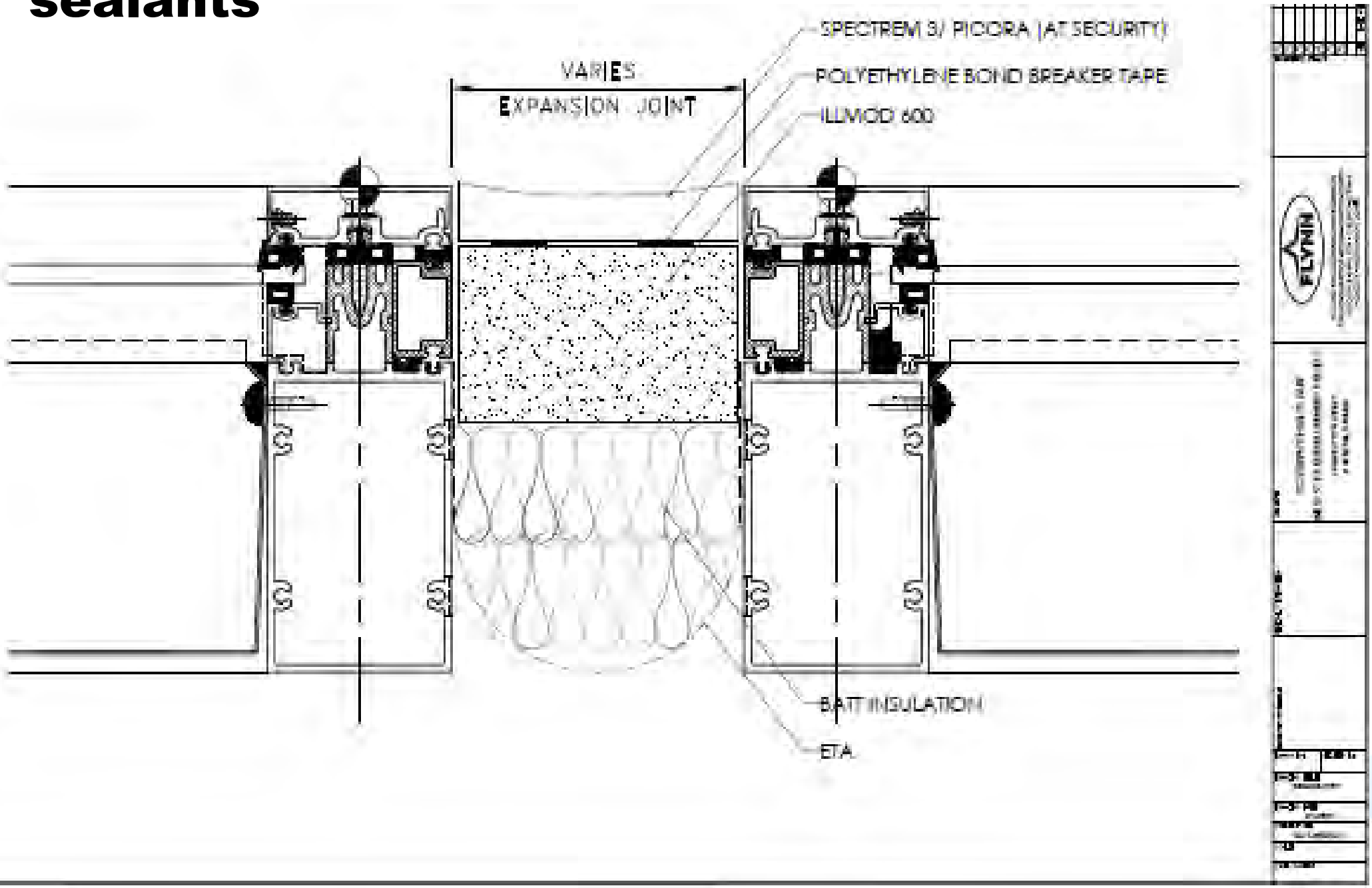



trio

Perfect use for impregnated tapes?

The hump point.....

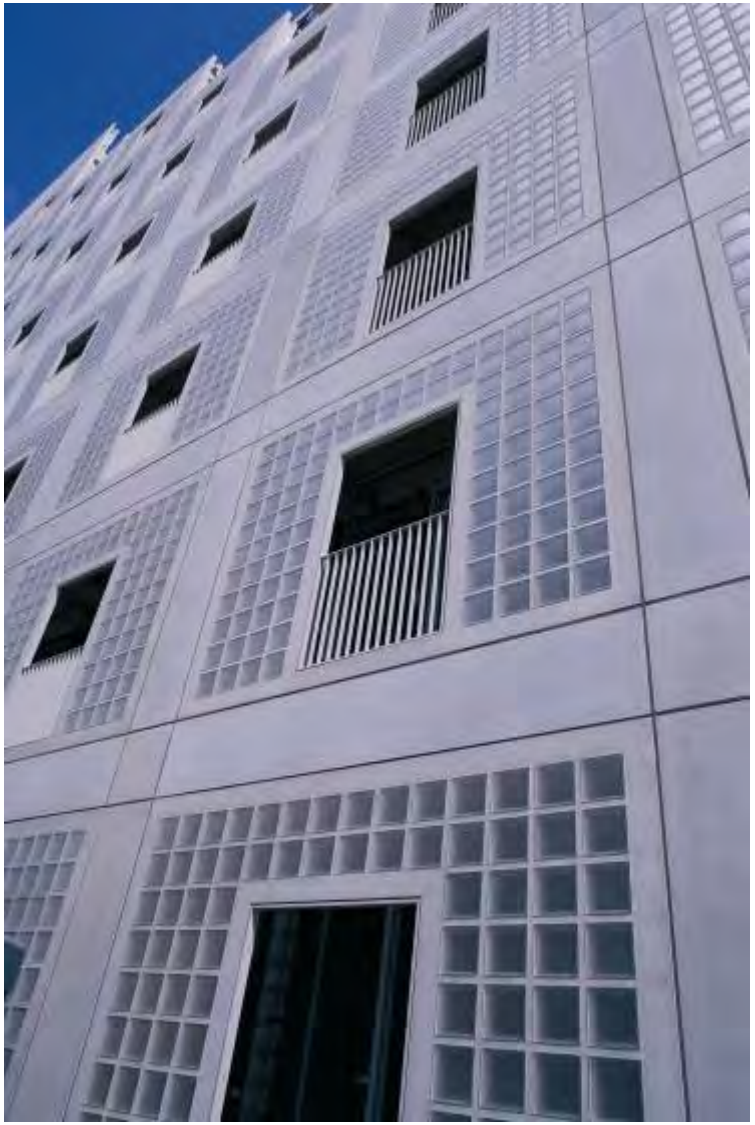
Vertical Expansion/Seismic Joints with impregnated tapes in conjunction with wet sealants



Seismic joints with illmod 600/Spectrem 1

Seismic joints with illmod 600/Spectrem 1

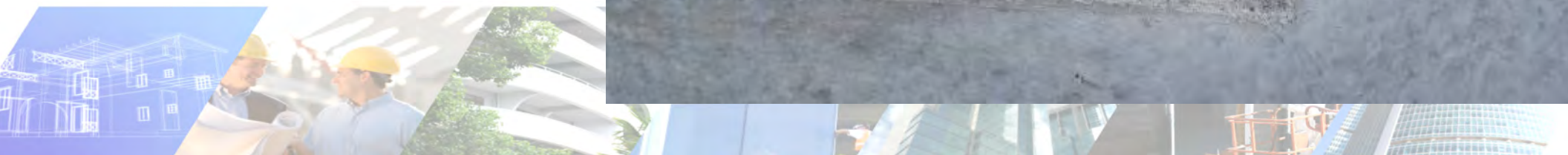
Impregnated pre compressed tape without sealant



Impregnated pre compressed tape without sealant

Tilt up wall Calgary, Alberta

Tilt up wall Calgary, Alberta



Impregnated pre compressed tape between metal panels

Photos

Front side of test article

Close-up of panel joint

Test Report
For

Tremco

Tested in Accordance with

ASTM E283
ASTM E331

Products Tested:

ExoAir 110, ExoAir Trio, Spectrem 1

Report No.: T0713-009-010
Test Start Time: 7/11/2013 11:46 AM
Test Completion Time: 7/11/2013 12:57 PM

Test Technician: Tim Mattox
Test Engineer: Tim Mattox

T3 is a solution approach to seal out weather around window and doors while sealing in comfort and energy savings. ExoAir Trio is a product used as an internal airtight seal and/or external weathertight but breathable seal in the ***T3*** solutions.

Outer seal
Proves a weather protection level while allowing for vapor diffusion.

Middle layer
Provides a thermal layer by filling the gap between the window frame and the wall.

Inner seal
Provides an airtight separation for the inside environment, serving as a vapor retarder to ensure occupant comfort.

ExoAir LEF
Low Expansion PU Foam for Sound & Thermal Insulation

Note: The above are general recommendations based on application. For jobsite specific specifications, please consult Tremco Technical Service.

PU Gun Foam

PU Gun Foam

Chemical background of PU-foam

Catalysts
Stabilizer
Plasticizer
Polyether / Polyesther

Polyol-Blend

+

Isocyanate

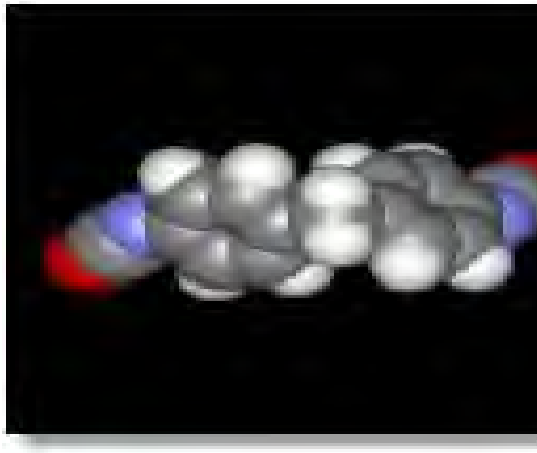
Isocyanate

+

Water / propellants

Blowing agent

=



PU-foam

That isn’t smart!!!

Spray foam is not UV stable!

3 weeks after application

PU Foam is reliable insulation when correctly applied

T3 is a solution approach to seal out weather around window and doors while sealing in comfort and energy savings. ExoAir Trio is a product used as an internal airtight seal and/or external weathertight but breathable seal in the ***T3*** solutions.

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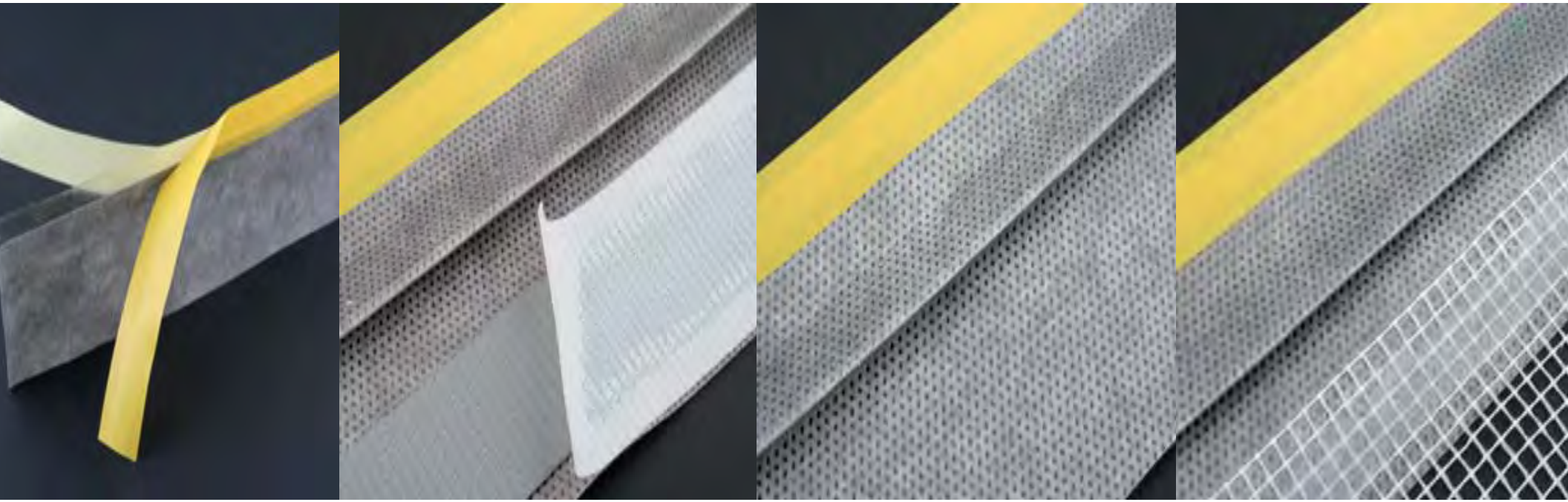
Why do We Claim Duo Membrane is Intelligent?

Moisture variable flashing tapes

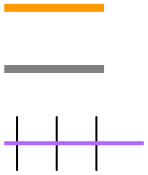


Duo 2 x Acrylic and Butyl

Duo 2 x Acrylic and Mesh

Duo 2 x Butyl

Duo 2 x Acrylic without Butyl



- **Acrylic self adhesive**
- **Butyl adhesive**
- **Mesh**

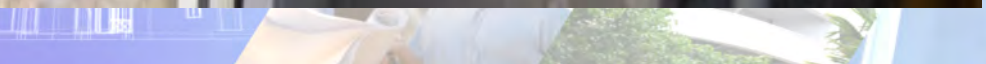
Moisture variable flashing tapes

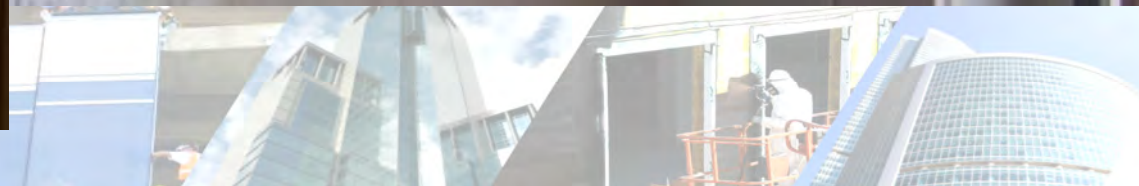
Moisture variable flashing tapes

Moisture variable flashing tapes

How to seal this?

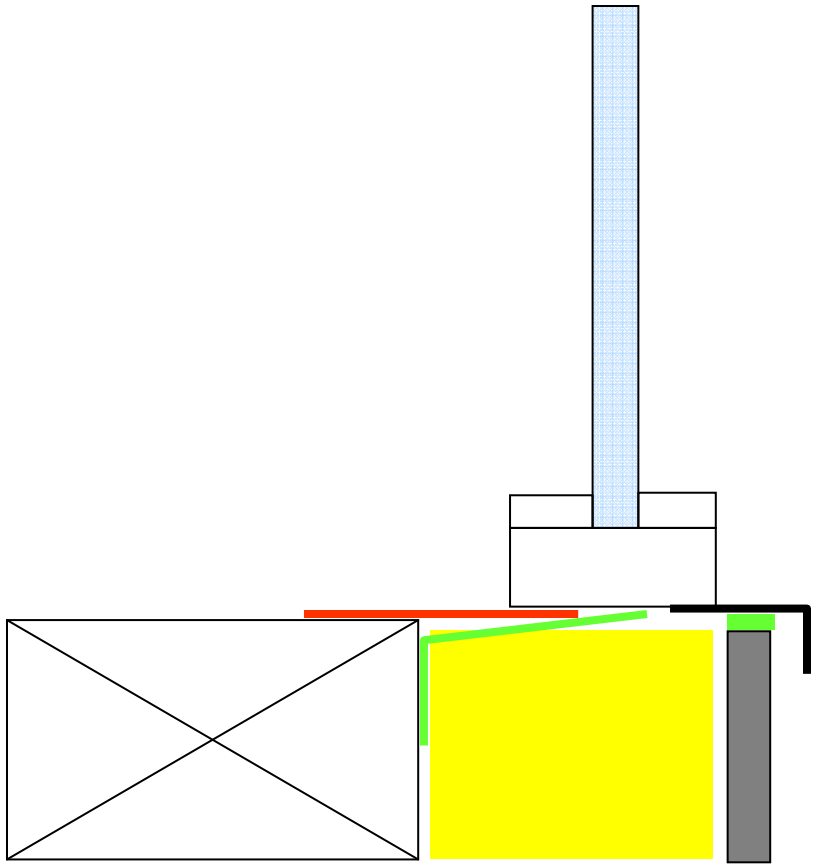
How to seal this?



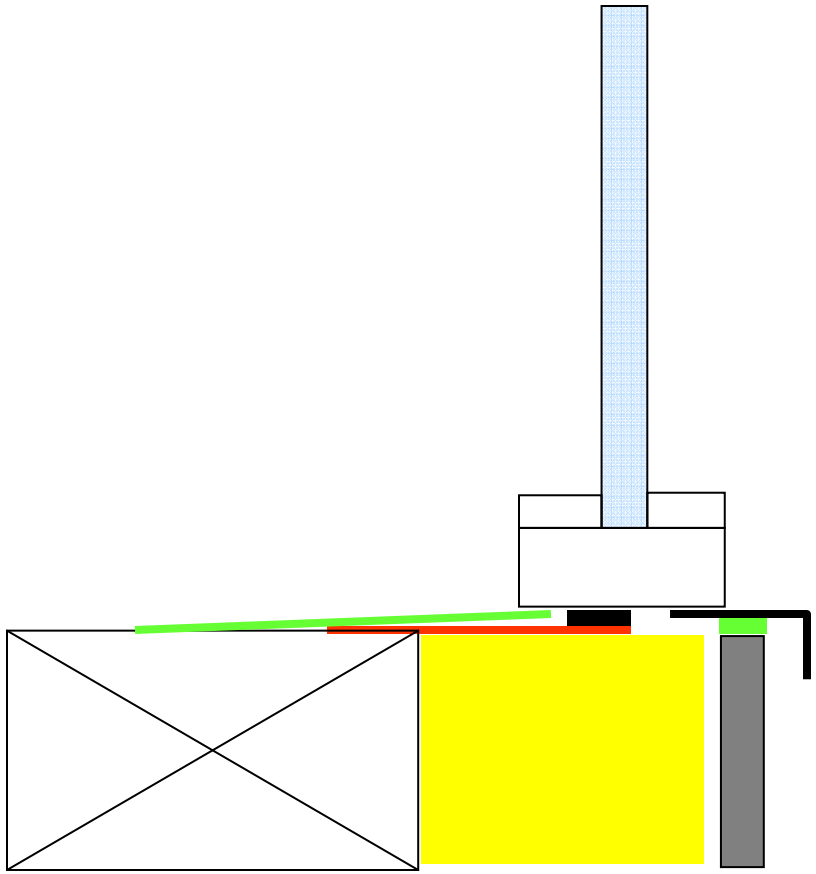


School project in Newcastle

How to handle this...?



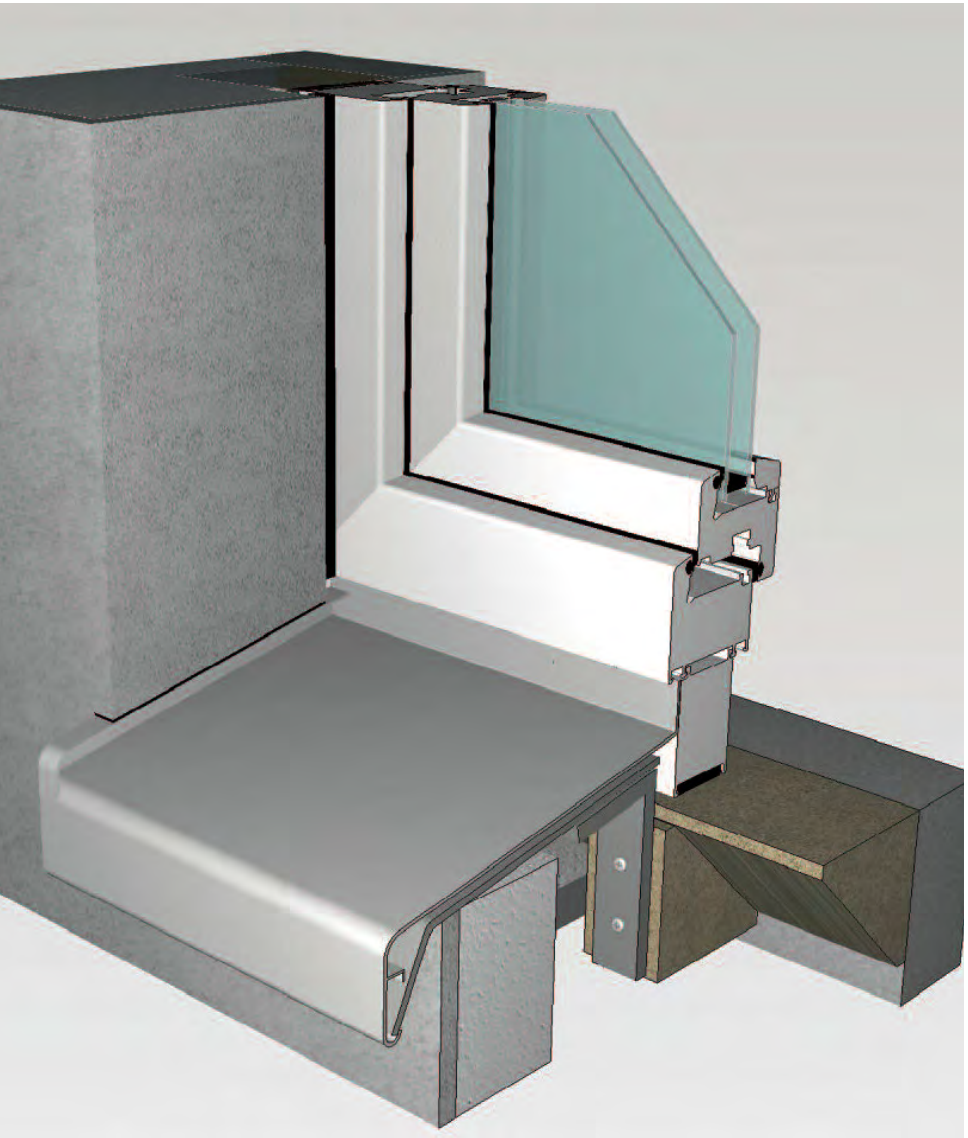
Already installed

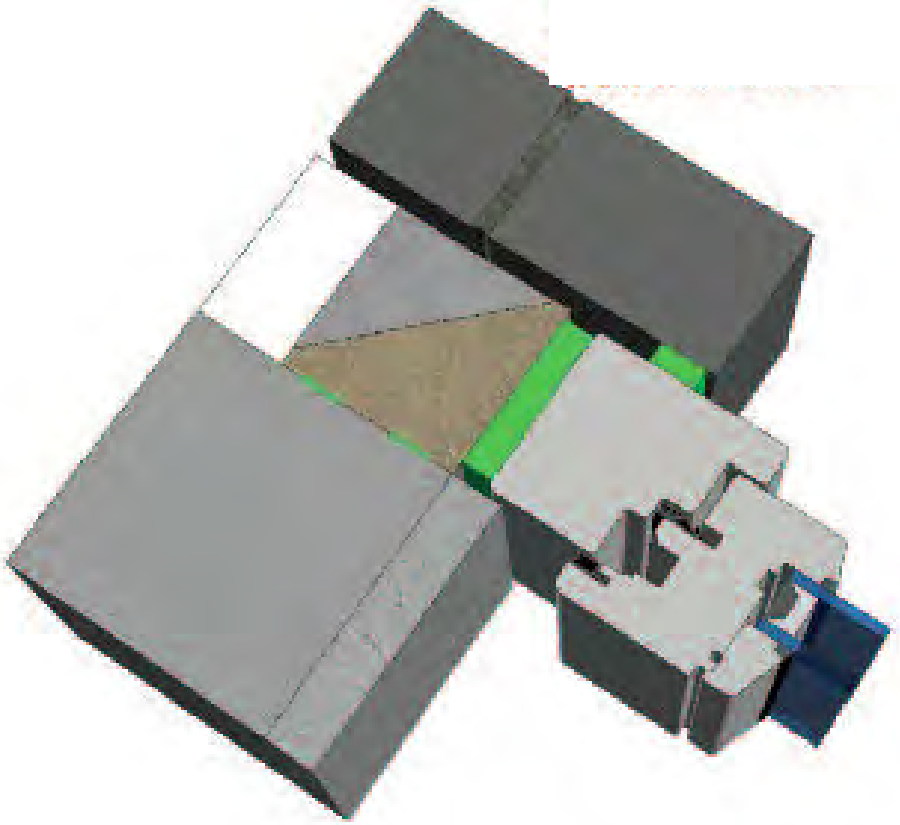


Not installed

School project in Newcastle, UK

Projecting Window installation – System Application





Application installation profile

- Apply 2 beads of addhesive to the profile

Projecting Window installation –System Application

- Bottom profile with adhesive

- Press hard, Profile will stick

Projecting Window installation –System Application

- 3 drill holes 8 mm with a HSS drill

- 7,5 mm window distance screws

illbruck Projecting Window installation –System Application

- Side profiles fixed with 2 beads of adhesive

- Press hard, use one screw for additional fixing for each profile

Projecting Window installation –System Application

- Insulation wedge as option for better thermal performance

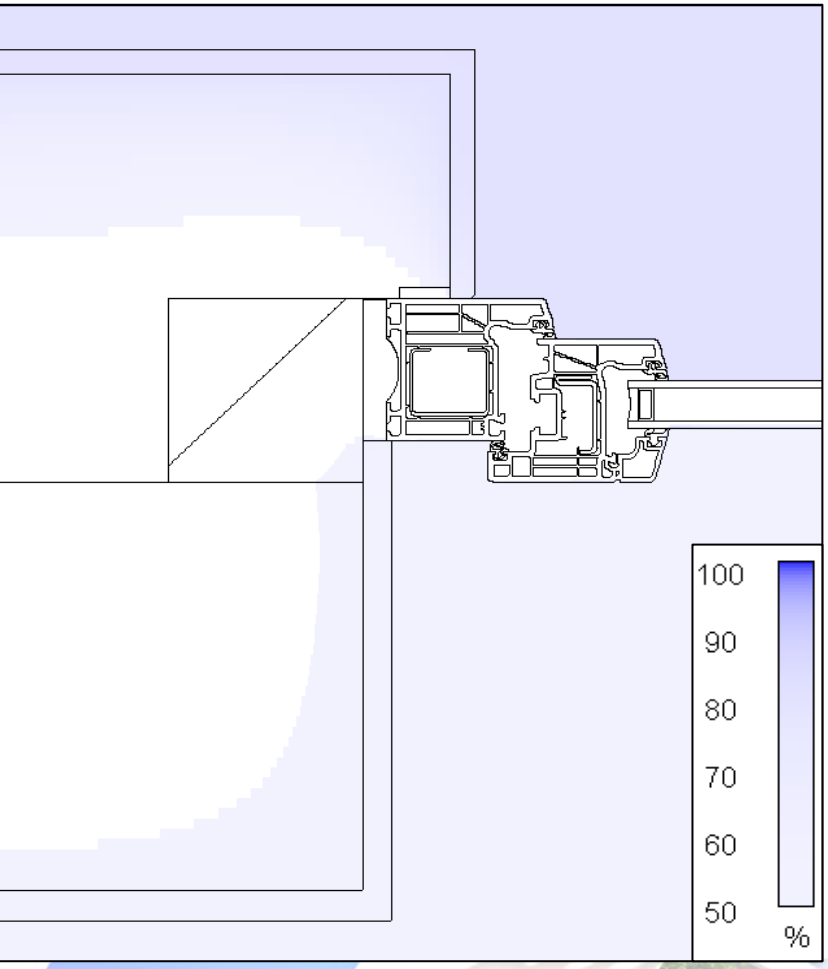
- Rectangular connection to EIFS

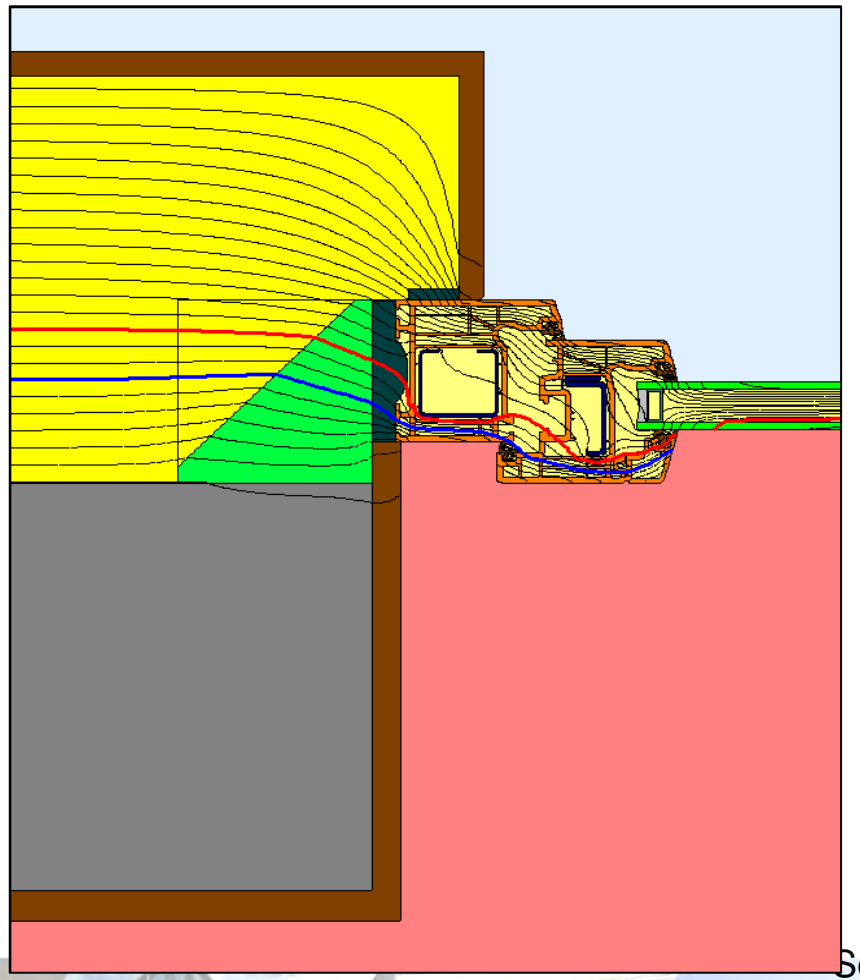
Projecting Window installation –System Application

- Easy installation and sealing with multifunctional tape

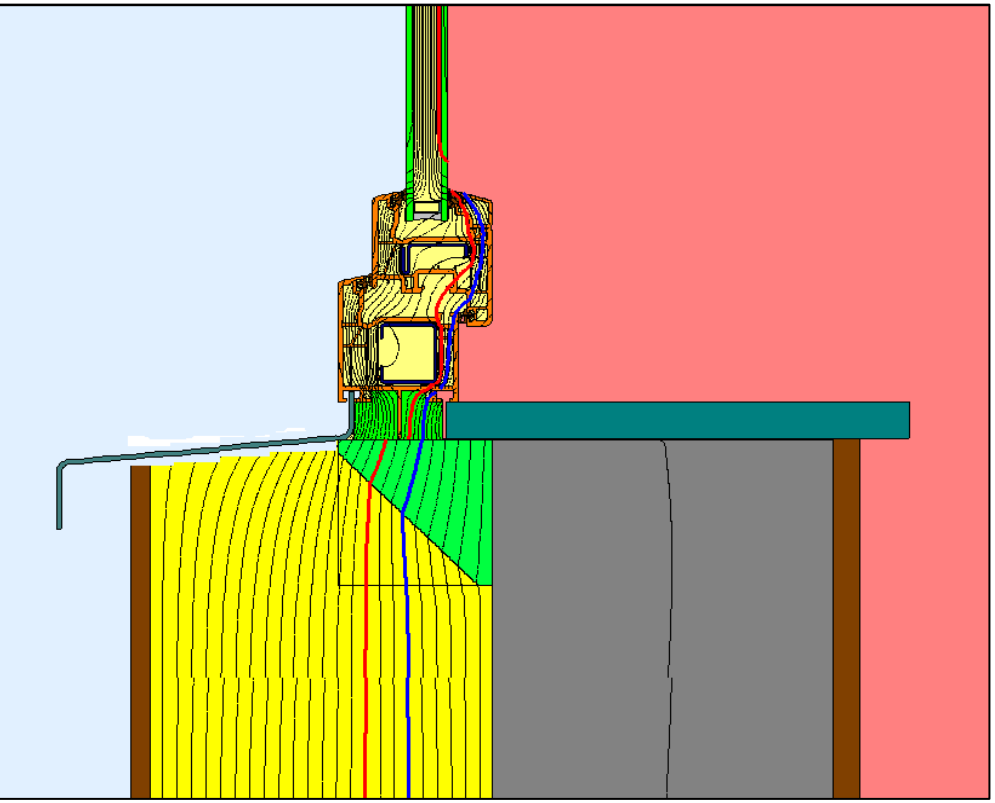
- Window fixing with 7,5 mm Window distance screws, pre-drill with 6,5 mm HSS drill, screw-in depth 40 mm

Projecting Window installation –System
Thermal performance calculation

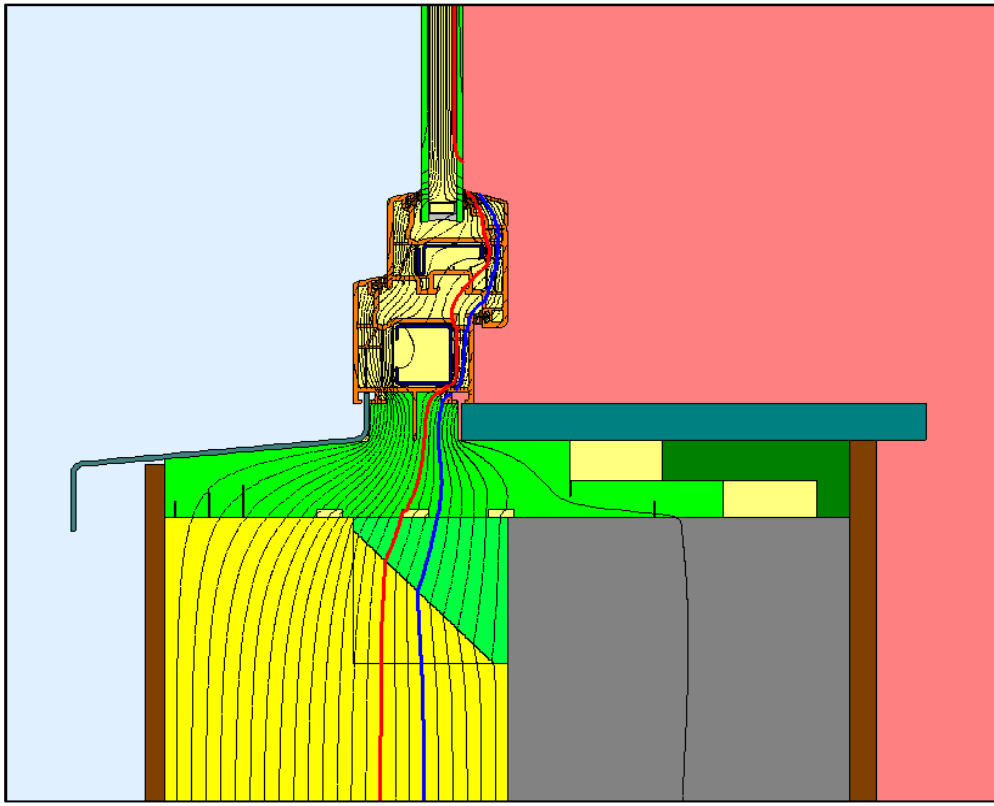




Projecting Window installation –System
Thermal performance calculation



- Window sill component small



- window sill component large