Guidelines for designers and workers: the Etanch'air project

Webinar
“Building airtightness and initiatives to improve the quality of the works”

Clarisse Mees, Christophe Delmotte, Xavier Loncour and Yves Martin
BBRi
Airtightness: Quality of works
During the construction process…
And from the pre-project!
- Architects have to deal with a large bunch of items.
  - Airtight zone?
  - Which material?
  - Piping and ducts?
  - Construction details?

Airtightness: Quality of works
A path decomposed on 10 practical steps
Step 1: Define the ambition level

EP regulation

- Airtightness is taken into account in EP-calculation BUT there is no explicit requirement.

- Calculation is made with a default value of $v_{50} = 12 \text{ m}^3/(\text{h.m}^2)$

  → **Objective**: Motivate a pressurization test to get in better value for airtightness and valorised it in the calculation of the EP

  The targeted value of airtightness should be fixed as soon as the pre-project by the customer

Step 2: Define the airtight zone within the building

![Diagram showing Defined Airtight Zone](image)

Protected volume = Isolated zone = Airtight zone
Step 3: Choose equipment types and their position regarding the airtight zone

- Example for heating appliance

Openings can not be sealed during the pressurization test

Summary tables are available as tools for designer

<table>
<thead>
<tr>
<th>Equipment / rooms</th>
<th>Recommended position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garages</td>
<td>Foresee specific ventilation system or place them outside the protected volume</td>
</tr>
<tr>
<td>Technical shafts</td>
<td>Depending on the fire regulations. If not applied in the considered building: inside the protected volume. If applied in the considered building: inside the protected volume or provide a partitioning of the shafts</td>
</tr>
<tr>
<td>Elevator shafts</td>
<td>Inside the protected volume and provide a ventilation system with motorized valves. Or Outside the protected volume</td>
</tr>
</tbody>
</table>
Step 4: Place piping and ducts

- Passage of ducts could lead to huge air leakages

Solutions exist BUT need place!

→ Architects has to:
- minimize the openings through the airtight envelope
- provide a sufficient space

Solutions exist BUT need place!
Step 5: Choose the good material to achieve an airtight envelope

Example

We could consider a material as airtight if its air permeability is below $0.1 \text{ m}^3/(\text{h.m}^2)$ for a pressure difference of 50 Pascal.

Step 6: Correctly choose doors and windows

Class of air permeability
Step 6: Correctly choose doors and windows

Class of air permeability

Air permeability: Class 4

Etanch’air project

- Estimation of local air leakages

Which constructive node has to be treated in priority?
Step 7: Prioritize the constructive nodes

<table>
<thead>
<tr>
<th>Prioritization order</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>****</td>
<td>Priority 1</td>
</tr>
<tr>
<td>***</td>
<td>Priority 2</td>
</tr>
<tr>
<td>**</td>
<td>Priority 3</td>
</tr>
<tr>
<td>*</td>
<td>Priority 4</td>
</tr>
</tbody>
</table>

For cavity walls

<table>
<thead>
<tr>
<th>Constructive nodes</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground bearing floor</td>
<td>* ➔ **</td>
</tr>
<tr>
<td>Junction between separating wall and façade</td>
<td>*</td>
</tr>
<tr>
<td>Junction between intermediate floor and façade</td>
<td>**</td>
</tr>
<tr>
<td>Pitched roof: Purlins</td>
<td>*** ➔ ****</td>
</tr>
<tr>
<td>Pitched roof: Gable</td>
<td>****</td>
</tr>
<tr>
<td>Pitched roof: Eaves</td>
<td>*** ➔ ****</td>
</tr>
<tr>
<td>Service penetration through roof</td>
<td>***</td>
</tr>
<tr>
<td>Junction between window and façade</td>
<td>** ➔ ***</td>
</tr>
</tbody>
</table>

Step 8: Choose technical solutions for each constructive nodes… and implement it!

Library of technical details
Step 9: Check the coordination and communication between all the builders

Step 10: Provide an intermediate pressurization test
Thank you for your attention
Laboratory investigation on the durability of taped joints in exterior air barrier applications

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Introduction

Complex details of interior air barriers
Introduction

- Traditional wood-frame construction: interior air barrier
  - Disadvantages:
    - Many joints make it labour intensive to seal
    - Risk of later penetration of the air barrier
    - Labour intensive
Introduction

Exterior air barriers: potential to reduce labour costs

<table>
<thead>
<tr>
<th>Wind barrier</th>
<th>n_{50} (1/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bituminous wood fiber board</td>
<td>0.8</td>
</tr>
<tr>
<td>Foil</td>
<td>2</td>
</tr>
<tr>
<td>Gypsum board + foil</td>
<td>0.28</td>
</tr>
<tr>
<td>Bituminous wood fiber board</td>
<td>0.56</td>
</tr>
<tr>
<td>Gypsum board + foil</td>
<td>0.29</td>
</tr>
<tr>
<td>Bituminous wood fiber board</td>
<td>0.52</td>
</tr>
<tr>
<td>Gypsum board + foil</td>
<td>0.61</td>
</tr>
</tbody>
</table>
Introduction

But… exterior air barriers are exposed to more severe conditions!

Method

Artificial aging

Air permeability testing
**Test-setup**

### TEST SAMPLES

<table>
<thead>
<tr>
<th>TEST SERIES</th>
<th>TAPE</th>
<th>Spacer</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tape A</td>
<td>Aluminium</td>
</tr>
<tr>
<td>B</td>
<td>Tape B</td>
<td>Aluminium</td>
</tr>
<tr>
<td>C</td>
<td>Tape A</td>
<td>Wood</td>
</tr>
<tr>
<td>D</td>
<td>Tape B</td>
<td>Wood</td>
</tr>
</tbody>
</table>

### AIR PERMEABILITY TEST

27 x 27 cm²

70 x 70 cm²

\[
K_{\text{joint}} = \frac{(K_{\text{spec}} - K_{\text{mat}}) \cdot A_{\text{spec}}}{l_{\text{joint}}}
\]
ARTIFICIAL AGING

<table>
<thead>
<tr>
<th>Test</th>
<th>Type</th>
<th>Total time</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Temperature</td>
<td>2 weeks</td>
<td>6 x (24h 70°C and 24h 15°C @30% RH)</td>
</tr>
<tr>
<td>2</td>
<td>Temperature, rain, frost</td>
<td>12 days</td>
<td>40 x (3h 70°C - 1h rain - 2h repose) - 2 x (8h 50°C - 16h -20°C)</td>
</tr>
<tr>
<td>3</td>
<td>UV-exposure, vapour</td>
<td>4 weeks</td>
<td>56 x (8h UV (40°C) and 4h vapour exposure (60°C))</td>
</tr>
</tbody>
</table>

RESULTS

BEFORE ARTIFICIAL AGING

- TAPE A: $3.1 \times 10^6$ m³/m/h/Pa
- TAPE B: $3.9 \times 10^7$ m³/m/h/Pa

EXTREMELY LOW VALUES
BEFORE ARTIFICIAL AGING

- TAPE A: $3.1 \times 10^6$ m³/m/h/Pa
- TAPE B: $3.9 \times 10^7$ m³/m/h/Pa

EXTREMELY LOW VALUES
Methodology to test the durability of taping products was proposed
- Temperature cycles
- Frost-thaw cycles
- UV cycles
• Methodology to test the durability of taping products was proposed
  • Temperature cycles
  • Frost-thaw cycles
  • UV cycles

• Two tapes have been tested: $\text{impact} < 4\cdot6\cdot10^{-5}$ m³/m/h/Pa

$n_{50}=0.003 \text{ l/h} \ll 0.6 \text{ l/h} \text{ (Passive house)}$
Limitations of current study
- Two taping products with high quality
- Application of the tape in laboratory conditions

Further research
- More products available in the market
- Application of the tapes in worse conditions (freezing, dusty,....)
System approach and on-site quality control

Isov’Air Test: Airtightness evaluation

Airtightness systems

- Adhésif Vario KB1
  (Jointoiment des lés)

- Adhésif Vario Multitape
  (Jonction formable)

- Adhésif Isostrech
  (Tour de conduit)

- Mastic Vario Double Fit
  (Jonction membrane/support)

- Joint ruban Vario Protape
  (Jonction membrane/support)

- Adhésif Vario Double Face
  (Collage membrane/fournure)
Service : Field of application

- Evaluation of air tightness for private housing:
  - At reception of new building to evaluate the performance
  - In the course of the project to correct the possible defects (before installation of the facing)
  - At the end of the project, in order to ensure the official measurement carried out by an approved operator

- Evaluation in multifamily apartment on independent batches

Control of air tightness on jobsite in a quality approach

Isov' Air Tests: the 1st workstation of self-evaluation of air tightness on sub-project

Facilitate the coordination between the different installers

Help to anticipate the potential issues before final measurements.
Principles?

- Air tightness of a building is measured by sealing all the air entries and air leakages envisaged and by putting the house in depressurization or surpressurisation.

- Measurement is carried out by an operator recognized by a commission and respecting a standardized testing method (European standard EN NF 13829).

- The lawful index French Q4Pa-surf quantifies the escapes of air of the building and is expressed in m³ of air per hour and m² of cold wall (walls, roof) under 4 Pascal of difference in pressure external interior/.

isoAIR Test

- Performance evaluation of air tightness compared to a target value

- Enables to locate the defects of sealing

- Speed of implementation

- Easiness of reading

- Reliability of the evaluation
  - development resulting from the experience of Ubat Controls
  - calibration by independent organism (CETIAT)
Reminder of the requirements of label BBC Effinergie (current) and RT2012 (to be come)

- Requirement for air tightness to 4 Pa (Q4Pa-surfing)
  For:
  - Single family housing: 0.6 m³/h/m²
  - Multifamily apartment: 1 m³/h/m²

IsoV’AIR Tests

Characteristics

- Surface Maximum cold wall: 700 m²
- Feeding: 220 V (sector or generating set)
- Handiness: handle + casters any ground
- Ventilator monovitess with very stable flow
- Dimension: 60 cms X 43 cms X 63 cms / Weight: 23.9 kg
- Reading of the differential of pressure by digital display on autonomous manometer (pile)
  Cover and tallies provided

Feedback: Useful in pre-control
  - Possible rent in the retails
  - Present users: big builders in particular (single family housing and multifamily housing)
Market drivers for the development and use of new building airtightness products
Tightvent

Filip Van Mieghem
Senior Product Manager
12th of January, 2016

Contents

✓ General: (product) standards, test methods
✓ Sealants
✓ PU-foams
✓ Combination of products
✓ Innovation
Soudal : key figures

- Founded in 1966 by current owner
- HQ in Belgium
- 100% privately owned
- 2,200 people – €565 million in 2014
- 44 affiliates – export to 130 countries
- Annual R&D budget > EUR 5 mio

R&D is part of Soudal’s DNA

- R&D is our core business
  - > 250 R&D projects p.a.
  - 50% product modifications
  - 50% new products
  - Patents
  - Vertical upstream integration
- Products meet many internat. standards
Typical jointing products:
Sealing and bonding

Outside  Middle  Inside

Function/issues:
- Weather sealing / water tightness
- Cosmetical
- Thermal insulation (thermal bridges)
- Fire proofing
- Acoustics
- Burglar resistance
- Airtightness
- Vapourtightness

And mostly a combination thereof…

Important unimportance!
Construction joints and airtightness

Care for detail and awareness are needed to improve airtightness – quality of the works.

Airtightness of constr. materials: standards?

- Foams, sealants, adhesives:
  - Airtightness not covered in (inter)national product standards (if any)
- Precompressed (expanding) tapes:
  - DIN18542: airtight = BG-R (↔BG1 = water tight icw 600 Pa windpressure)
  - NF 85-570 and NF 85-571 (Classe 1)
- Membranes, tapes, vapour barriers, …
  - Membranes and flashing tapes: wide variety: laminated PE, butyl, etc
  - Vapour control barrier: flexible sheets, EPDM cladding (EN 13984)
  - Selfadhesive tapes: wide variety (carrier, adhesive)

⇒ Vapour tight = airtight (the opposite is not necessarily true)

- $S_d = \mu \times m$
- Estimate: $S_d > 1m$ is sufficient
Airtightness of constr. materials: test methods

- **EN 12114**: Air permeability of building components and building elements (laboratory test method)
  - a-value: ≤0.1 m³/h.m at 1 daPa

- **EN 1026**: Windows and doors - Air permeability – Lab test method
  - Classification: EN 12207 (4 classes)

- **MO-01**: ift directive (Institut für Fenstertechnik)
  - Test on construction element: window-wall – combination of products
  - Airtightness (EN 12114) + watertightness (EN 1027)
  - Before and after ageing

- **Sd- value**: determination of water vapour transmission properties
  - EN ISO 12572: Hygrothermal performance of building materials and products
  - EN 1931: Flexible sheets for waterproofing (membranes)

### EN 12114

- Air permeability of building components/elements
- Laboratory test method
- Procedure:
  - 3 pulsations and then gradual steps; both positive and negative pressure
  - 50 Pa to 500 Pa (or even 1000 Pa) in logarithmic steps
EN 1026

- Test method for air permeability of windows and doors
  - Up to 600 Pa in steps of 50 Pa
  - Sometimes referred to for sealing products
    - from m² to m³: divided by 4
- Classification (EN12207)
  - Class 4: 0.6 m³/hm² at 10 Pa
    = 1.89 m³/hm² at 50 Pa
    = 0.47 m³/hm at 50 Pa
  - Class 5: 0.18 m³/hm² at 10 Pa
    = 0.76 m³/hm² at 50 Pa
  - Class 6: 0.05 m³/hm² at 10 Pa
    = ± 0.38 m³/hm² at 50 Pa

Combination of products
Ift directive MO-01/1

- Window to wall connection
- Voluntary
- Airtightness (EN 12114) + watertightness (EN 1027) before and after ageing
- Ageing
  - Temperature (+60°C / -15°C, 10 cycles)
  - Functionality of window (open / tilt, 10,000 cycles) (EN 1191)
  - 3 pulsations both positive and negative pressure (1,000 Pa, 200 cycles) (EN 12211)
Measuring equipment

Typical window test rig
Lindab LT600 in lab mode

Emission: VOC

- Indoor air quality is getting more of a concern with growing airtightness levels
- Sustainability: Leed, Breeam, ...(VOC content)
- France: mandatory emissions class labelling
  - All construction products used indoors
  - Highest class is A+
  - Measured after 28 days
- Germany: Emicode - voluntary
  - GEV: origin: adhesives for floor coverings
  - EC1(R), EC1 Plus are the highest classes
    - Measured after 10 or 3 /28 days
  - Harder to achieve
Sealants

- Silicone : AC / Alcoxy/ Oxime
- Acrylics
- Polyurethane
- Polyisobutylene
- Bitumen
- Fire rated sealants
- Fast curing
- Primers & tools

Sealants and airtightness

- Can generally contribute a lot to airtightness on 2 conditions:
  - **Cohesion**: no shear within the cured product
  - **Adhesion**: you also need an adhesion to the substrate(s)/supports
- **Movement capacity**: max % of total joint movement a sealant can permanently take without shearing (stretched)
- Some products are part of combined system test (MO-01/1)
- **Sd values**
  - Eg Acrylics: $\mu$ 10186, Sd 31m (2.5 to 3mm)
- Some sealants meet EC1 or EC1 Plus
CE marking : EN 15651

- New harmonised norm EN 15651 (CE marking)
  - Mandatory since 1/7/2014
  - EN15651-1: façade (interior and/or exterior): F
  - EN15651-2: glazing: G

- F-INT
  - Min. requirements, elongation at break (CE system 4)
- F-EXT-INT: 2 possibilities:
  - Min requirements: no class (CE, system 4)

General rules of thumb

- Make sure supports are clean, free of dust and grease
- Which substrates?
  - Most sealants work better on specific substrates (adhesion spectrum)
  - Hybrid sealants work on a lot of surfaces, even wet
  - Typically problematic for all sealants: PE, PP, PTFE
- Prepare substrates if recommended (primer)
- Preferably use backing rod
- Check joint dimension and movement
- Watch application temperature and RH
- Respect curing time of product
Sealants: types

- Hybrid sealants: permanently elastic
  - Excellent adhesion on almost any substrate
  - Diverse, low modulus and high modulus
  - High movement capacity (20-25LM or HM – EN-ISO 11600)
  - No cracks under UV-radiation
  - Paintable
  - Adhesion on damp surfaces

- Silicone sealants: permanently elastic
  - Excellent adhesion on glass, metals.
  - Ideal for airtight glass sealing
  - High movement capacity (20LM – 25LM)
  - Very resistant to UV, excellent weatherability
  - Usually not paintable

- PU
  - Excellent adhesion on mineral substrates (stone, cement)
  - High movement capacity (20-25%)
  - Mostly LM
  - Might crack under UV

- Acrylics
  - Mainly interior use/finishing
  - Paintable, “elastic and airtight extension of plaster”
  - Prevents cracks between window frame and plaster
  - New development: meets with ISO 11600 12.5E
  - Physical drying: shrinkage
Sealant profiles

Outside sealing
Inside sealing

- Airtightness in the proper sense
- Acrylic sealants
  - Mostly used (interior façade sealing) (F-INT)
  - Paintable
  - Limited movement capacity (mostly plastic, max 12.5%)
- Hybrid sealants
  - Inside and outside use (F-INT-EXT)
  - Large movement capacity (up to 25%)
  - Paintable (waterbased paints)
- Remark: paint is not flexible!!!

PU Foams

- Handheld / Gun / Click & Fix / Genius Gun
- Construction foam
- Insulation foam
- Sound proofing foam
- All season foam
- 2K-foam
- Zero % Isocyanate foam(SMX)
- Low monomeric
- PU mining foam
- Multi position foam
- Fire rated foam
- Arctic foam -25°C
- Sahara foam +40°C
Flexifoam = elastic foam

- No product norm – but test methods issued by Feica
- Voluntary testing on airtightness at ift Rosenheim (EN 12114)
  - $A$-value $\leq 0.1 \text{ m}^3/\text{hm} (\text{daPa}^{2/3})$ – joint 2 (width) x 6 cm (depth)

### Prüfungs nach DIN EN 12114

<table>
<thead>
<tr>
<th>Druck</th>
<th>1000</th>
<th>1000</th>
<th>100</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>600</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V$ in m³/h</td>
<td>12.24</td>
<td>18.13</td>
<td>27.48</td>
<td>28.14</td>
<td>53.72</td>
<td>60.90</td>
<td>110.90</td>
<td>155.82</td>
<td>209.00</td>
</tr>
<tr>
<td>$V$ in cm³/s</td>
<td>0.0035</td>
<td>0.0051</td>
<td>0.0079</td>
<td>0.0081</td>
<td>0.0207</td>
<td>0.0259</td>
<td>0.0509</td>
<td>0.0710</td>
<td>0.0808</td>
</tr>
</tbody>
</table>

### Druck

<table>
<thead>
<tr>
<th>Volumenstrom 1</th>
<th>Nullmessung (Fugen abgedichtet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_a$ in Pa</td>
<td>70</td>
</tr>
<tr>
<td>$V$ in m³/h</td>
<td>12.24</td>
</tr>
<tr>
<td>$V$ in cm³/s</td>
<td>0.0035</td>
</tr>
</tbody>
</table>

### Volumenstrom 2

<table>
<thead>
<tr>
<th>Fugen nicht abgedichtet</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_a$ in Pa</td>
</tr>
<tr>
<td>$V$ in m³/h</td>
</tr>
<tr>
<td>$V$ in cm³/s</td>
</tr>
</tbody>
</table>

### Luftdurchlässigkeit Fuge

<table>
<thead>
<tr>
<th>Volumenstrom 3</th>
<th>Luftdurchlässigkeit Fuge</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_a$ in Pa</td>
<td>70</td>
</tr>
<tr>
<td>$V$ in m³/h</td>
<td>12.24</td>
</tr>
<tr>
<td>$V$ in cm³/s</td>
<td>0.0035</td>
</tr>
</tbody>
</table>

* $V$, kompakter Luftdurchgängigkeit unter Referenzbedingungen (20°C / 50% rel. Luftfeuchtigkeit)
## Airtightness testing at Ghent university

### Façade element

<table>
<thead>
<tr>
<th>Beschrijving opstelling</th>
<th>Flow at 50 Pa [m³/h/m]</th>
<th>underpressure</th>
<th>abs. dev.</th>
<th>overpressure</th>
<th>abs. dev.</th>
<th>average</th>
<th>abs. dev</th>
<th>Class</th>
<th>abs. dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>casing, empty</td>
<td></td>
<td>30,90</td>
<td>0,97</td>
<td>35,23</td>
<td>1,31</td>
<td>33,07</td>
<td>C</td>
<td>1,04</td>
<td></td>
</tr>
<tr>
<td>casing, mineral wool</td>
<td></td>
<td>2,61</td>
<td>0,13</td>
<td>3,33</td>
<td>0,15</td>
<td>2,96</td>
<td>C</td>
<td>0,14</td>
<td></td>
</tr>
<tr>
<td>casing, Flexifoam</td>
<td></td>
<td>0,95</td>
<td>0,09</td>
<td>1,59</td>
<td>0,12</td>
<td>1,27</td>
<td>B</td>
<td>0,16</td>
<td></td>
</tr>
<tr>
<td>casing, Flexifoam, Acryrub</td>
<td></td>
<td>0,01</td>
<td>0,06</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>A</td>
<td>0,07</td>
<td></td>
</tr>
<tr>
<td>plaster, profile, Acryrub</td>
<td></td>
<td>0,08</td>
<td>0,03</td>
<td>0,06</td>
<td>0,03</td>
<td>0,07</td>
<td>A</td>
<td>0,03</td>
<td></td>
</tr>
<tr>
<td>Plaster, SWS-foil, inside</td>
<td></td>
<td>0,08</td>
<td>0,03</td>
<td>0,27</td>
<td>0,03</td>
<td>0,18</td>
<td>A</td>
<td>0,03</td>
<td></td>
</tr>
<tr>
<td>Plaster, SWS-foil, side</td>
<td></td>
<td>0,08</td>
<td>0,03</td>
<td>0,24</td>
<td>0,03</td>
<td>0,16</td>
<td>A</td>
<td>0,03</td>
<td></td>
</tr>
<tr>
<td>Passive</td>
<td></td>
<td>0,03</td>
<td>0,03</td>
<td>0,00</td>
<td>0,04</td>
<td>0,02</td>
<td>A</td>
<td>0,04</td>
<td></td>
</tr>
</tbody>
</table>

<0,4 m³/h/m (A) 0,4-2,5 m³/h/m (B) >2,5 m³/h/m (C)

### PU-foams: airtight?

**PU-foam can be/stay airtight!**

- If used in the correct joint dimensions
- If used between 2 airtight building elements
- If correctly applied
- If flexible

... Thus combining insulation and airtightness

⇒ Thermal insulation: $\lambda = 0,035$ W/m.K
PU-foam: moisture curing!

Crucial for cell structure (insulation), adhesion and airtightness !!!

Without

With

Combination of products: SWS

➢ Voluntary MO-01 test report for elastic foam and 2 sealants (hybrid and acrylic)
Innovation: liquid membrane

- Airtight "Liquid membrane": application with brush
- Formula contains fibers to fill small cracks
- Window to wall: can replace membranes – ease of application

Liquid membrane

- Airtight liquid membrane applied with airless gun
- Floor to wall, wall to ceiling, etc
- Easy and fast!!
Soudatight LQ: test

- Test on construction site: 2 identical windows - façade not yet grouted - cavity wall - check reveal
  - Window with only foam filling (1);
  - Window with foam and Soudatight LQ (2)

Soudatight: on site test (part 1)

- Test according to EN 1026 and EN 12207
  - Living room: underpressure of 50 Pa with Blower Door
  - Result: 1.02 m³/hm: leaks at height of DPC foil
Soudatight LQ: test (part 2)

- Visual smoke test: Riosteam + DG700

Quality of the works?

- Manufacturer/supplier: ISO 9001 – ISO 14001
  - Support, service
- A-brands (cheaper seldom is better in the long run)
  - R&D
- Use the right product for your application
- Follow manufacturers instructions
  - Method, amount, temperature and humidity (during and after application), preparation,…
- CE marking
- Quality labels (voluntary)
- Technical approvals in case of more innovative products
- Easy of application and/or time saving:
  - Best market drivers, and better results
Expert in sealants, foams and adhesives