

Case Study

Airtightness performance
of a Renovation/
Extension



- ✓ **Site Location:**
Ovens, Co. Cork, Ireland
- ✓ **Equipment Supplier:**
Passive House Systems
- ✓ **Air testing performed by:**
Building Environment Resources Ltd.
- ✓ **Original house details:**
Built C.1962. 1 Bedroom,
single-storied cottage
with a floor area of 79m².
- ✓ **After works:**
Two story, 3 bedroom.
Floor area, 171 m².
- ✓ **BER Rating pre-works:**
G
- ✓ **BER Rating post-works:**
A2
- ✓ **Air permeability "Pre-works":**
Not tested.
- ✓ **Air permeability "Prelim test":**
Q50 = 0.63m³.m².hr.
- ✓ **Air permeability "Final":**
Q50 = 0.69m³.m².hr.



Products Used:

- **PHS Apollo 2 VCL Membrane** | Ceiling and wall airtight & vapour control membrane
- **PHS Argo Plus Sealing Tape** | Sealing the membrane joints and downlight hoods
- **Fortax Adhesive Sealant** | Bonding membrane and Winflex-I to challenging masonry surfaces
- **PHS Downlighter Hoods** | Ceiling low energy recessed lights
- **PHS Modbau Window Tape** | Membrane to window
- **Winflex-I Window Tape** | Existing masonry reveal to window
- **PHS Spray Primer** | Effective masonry preparation
- **PHS Double Sided Tape** | Bonding the membrane to substrate

Application Area:



PHS Apollo 2 VCL Membrane
PHS Argo Plus Sealing Tape



PHS Modbau Window Tape



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Blower Door Test



PHS Apollo 2 VCL Membrane
PHS Argo Plus Sealing Tape



PHS Apollo 2 VCL Membrane
PHS Argo Plus Sealing Tape

Tony Brown was the main contractor on this site, he commissioned EER Clean Energies LTD to install the airtightness requirements to meet EnerPHit demands. EER Clean Energies are well familiar with achieving very high levels of airtightness, regularly working with Passivhaus new-build requirements and Passivhaus retrofit requirements (EnerPHit) and high standards of Part L levels of airtightness with common air permeability test results well below $3\text{m}^2.\text{m}^3.\text{hour}$. Achieving EnerPHIT standards of airtightness is about carefully planning your installation, choosing the correct materials and having all the profession and trades working towards creating the effective Airtightness envelope. The plumbing, ventilation and electrician people are key to ensuring the end results. The builder must champion the airtightness project, ensuring all involved know the expectation and are invested in the results.

Key to any airtightness success story is the avoidance of staples to keep membranes in place. If staples are used then they should be taped over to maintain the membrane integrity. This project used double-sided tape and adhesive sealant for more challenging membrane -substrate interfaces.

The desired air permeability parameters required a cross-battening after the membrane application, thus allowing electrical services to remain inside the airtight envelope. Crawl spaces openings were sealed with PHS ECO Access Doors, these are insulated, airtight doors which come in various sizes, and are lockable.

Preliminary air testing was performed to ± 80 Pascals, using a Minneapolis blower door kit. The battening supported the membrane during the -80 Pascals testing, otherwise the membrane could have pulled away from its substrate. Upon final testing, air leakage was observed and measured at a few window details, plus including a sliding door to the outside by the kitchen.



PHS Apollo 2 VCL Membrane
PHS Argo Plus Sealing Tape
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Velux roof light airtightness detail



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