NSAI
National Standards Authority of Ireland

Ventilation Validation
Registration Scheme

Gary O’Sullivan

November 2021

Irish Building Regulations

On the 1st November 2019 the Department of Housing, Planning and Local Government (DHPLG) published updates to two Irish Building Regulations namely

Part L - Conservation of Fuel and Energy - Dwellings
Part F – Ventilation

In addition to the updated regulations, the DHPLG published updated Technical Guidance Document (TGD) Part L and Part F

Subject to transitional arrangements the updated regulations came into full effect 1st November 2020

November 2021
Building Regulations updates


November 2021

NZEB in Building Codes

Building code requirements for new Dwellings (primary energy)

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Some impacts of Part L Dwelling & Part F 2019

TGD L Dwelling 2019
- BER A2 or Better
- Renewable Energy Ratio = 0.20
- MPEPC (0.3) and MPCPC (0.35) (equivalent to 70% Reduction on 2005)
- Upper Air permeability now 5 m³/(h.m²)
- Elemental backstop U-values improved
- All dwelling require an airtight test

TGD F 2019
- Air permeability index < 5 m³/(h.m²)
- Dwelling with < 3 m³/(h.m²) must have some form of mechanical extract ventilation i.e. natural ventilation will not be acceptable
- All ventilation systems to be validated by an independent competent person certified by NSAI or equivalent.

Ventilation Heat Loss
Domestic Energy Assessment Procedure (DEAP) considers both designed and un-designed Ventilation Heat Loss when calculating the BER for a Dwelling

Un-designed
Air tightness Testing Scheme
70 NSAI Registered testers

Designed
This new scheme
Ventilation Validation Registration Scheme
Has been developed to drive compliance in this area

November 2021
NSAI has established a registration scheme that certifies an individual as a **competent independent third party** to validate that a ventilation system has been installed, balanced and commissioned to meet the minimum requirements of Technical Guidance Document F - Ventilation (2019) to the Irish Building Regulations.

Reference documents

NSAI Ventilation Validation Registration Scheme Master Document give guidance on the scheme requirements and design examples.

I.S. EN 14134:2019, **Ventilation for buildings - Performance testing and installation checks of residential ventilation systems**

Department of Housing, Planning and Local Government (DHPLG) have published a guidance document on "Installation and Commissioning of Ventilation Systems for Dwellings - Achieving Compliance with Part F 2019".

BSRIA - **Domestic Ventilation Systems**, a guide to measuring airflow rates.
Ventilation systems must be designed and commissioned to provide adequate and effective means of ventilation to satisfy the minimum requirements of TGD to Part F of the Irish Building Regulations. This shall be achieved by:

(a) limiting the moisture content of the air within the building so that it does not contribute to condensation and mould growth, and

(b) limiting the concentration of harmful pollutants in the air within the building.

The primary purpose of a residential ventilation system is to supply air to and extract air from the rooms in a dwelling.

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**Ventilation Validation Registration Scheme**

The NSAI Certified Ventilation validator will be expected to validate that a ventilation system has been installed, balanced and commissioned to meet the minimum requirements of TGD to Part F of the Building regulations.

- On arrival to a site, the Ventilation validator shall be presented with a ventilation design and installers commissioning certificate.

- The Ventilation validator will assess that the presented design will satisfy the minimum requirements of TGD to Part F.

- They shall then proceed to take measurements to establish that the commissioned system complies with the satisfactory presented design.

- The Ventilation validator will issue a "Ventilation validation Certificate"
Ventilation Validation Registration Scheme Development

During the development of the scheme, we made it a requirement that all instrumentation must be calibrated annually by an accredited laboratory such as INAB, UKAS or similar approved.

Despite having calibrated equipment, flow measurement reading on a control house varied greatly.

It was clear that operatives did not know how to correctly configure their equipment to record accurate reading.

Furthermore, flow straighteners were not being used.

Waterford and Wexford Education and Training Board NZEB

In recognition of the challenges facing the construction sector, Waterford and Wexford Education and Training Board (WWETB) has developed a number of training courses which are designed to upskill construction workers with knowledge of how to achieve the NZEB standard.

The WWETB National NZEB Training Centre is the first facility in Europe to offer a suite of trade-specific NZEB courses.

Training modules cover all trades including a course on Ventilation delivered in a purposed building facility in Enniscorthy.
**Waterford and Wexford Education and Training Board**

**NZEB**

**Fundamental principles of ventilation systems**

This 3 day course aims to provide participants with the principles and practices required to effectively **design** ventilation flow rates, **install** ventilation systems and **commission** ventilation systems, in accordance with Technical Guidance Document Part F 2019.

This course provides an excellent understanding of the fundamental principles of ventilation systems.

It is recommended that Ventilation validators attend this course.

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**Ventilation Validation Registration Scheme Development and WWETB**

As mentioned previously operatives did not know how to correctly configure their equipment to record accurate reading.

To this end a "Proficiency testing unit" was built by Lindab and is located at WWETB.

The unit consists of two lines (line A and B) with a supply and extract grill on each line.

Each line contains a UltraLink flow monitor and a fan with 5 speed settings (4-20L/s).

Ventilation Validators must successfully complete and pass a proficiency test which establishes that they can measure flow rates accurately.
Typical designed ventilation approaches in Ireland

TGD to Part F 2019 gives guidance on minimum ventilation design for dwellings for Natural Ventilation with intermittent fans mechanical extract.

Only suitable for dwelling air permeability index is greater than $3 \text{ m}^3/(\text{h.m}^2)$ and less than $5 \text{ m}^3/(\text{h.m}^2)$ Difficult to design for.

Passive Stack

Mechanical ventilation

Centralized Continuous Mechanical Extract Ventilation (CMEV)

Centralized Mechanical Ventilation with Heat Recovery (MVHR)

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TGD to Part F 2019 - Ventilation

Let’s consider a

Centralized Continuous Mechanical Extract Ventilation (CMEV)

or

Centralized Mechanical Ventilation with Heat Recovery (MVHR)

Take a

- $122 \text{ m}^2$
- 3 bedrooms
- 2.4m floor to ceiling height

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Centralized Continuous Mechanical Extract Ventilation ([CMEV])

or

Centralized Mechanical Ventilation with Heat Recovery ([MVHR])

TGD requires us to calculate the general supply ventilation rate.

- Occupancy
- 0.3 l/s per m\(^2\) internal floor area

NSAI - MEV MVHR Design Sheet Issue 7th.xlsx

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Next we must establish the minimum boost extract ventilation rate.

In this example the General ventilation Rate < Overall Minimum boost extract rate

TGD F give minimum boost extract rate

Table 1: Centralised continuous mechanical ventilation systems

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In this example the General ventilation Rate < Overall Minimum boost extract rate

TGD F give minimum boost extract rate

Table 1: Centralised continuous mechanical ventilation systems

Table 2: [MVHR] Systems: Minimum extract rates

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### TGD to Part F 2019 - Ventilation

- From above the General continuous supply ventilation rate of the dwelling is \(36.6\) l/s

- Supplies are into habitable room (except kitchen) with extracts from wet rooms.

- Upper table takes the total supply ventilation rate and redistributes that supply to the habitable rooms in the ratio of the volume of those rooms.

- The second table takes the base line extract rates from Table 1 or 2 and proportionately decreases (or increases) the base line extract rates to achieve a balanced ventilation system.

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**Sample Ventilation Validation Certificate**

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## Sample Ventilation Validation Certificate

### Ventilation validation certificate

**Dwelling type:**
- Semi-detached house

**Ventilation system:**
- MVHR

**Date of test:**
- 26/09/2019

### Supply air

<table>
<thead>
<tr>
<th>Area</th>
<th>Measured supply air flow rate at trickle</th>
<th>Measured supply air flow rate at boost</th>
<th>Tolerance check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trickle</td>
<td>11.97 l/s</td>
<td>14.50 l/s</td>
<td>11.97 l/s</td>
</tr>
<tr>
<td>Boost</td>
<td>9.93 l/s</td>
<td>12.50 l/s</td>
<td>9.93 l/s</td>
</tr>
</tbody>
</table>

### Extract air

<table>
<thead>
<tr>
<th>Area</th>
<th>Measured extract air flow rate at trickle</th>
<th>Measured extract air flow rate at boost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trickle</td>
<td>6.03 l/s</td>
<td>7.60 l/s</td>
</tr>
<tr>
<td>Boost</td>
<td>5.20 l/s</td>
<td>6.81 l/s</td>
</tr>
</tbody>
</table>

### Tolerance

- Supply air: ± 10% of design
- Extract air: ± 15% of design

### Comments on design:

- Trickle supply was not greater than trickle extract by 0.4 l/s which is a relatively small variance.

### Overall comments:

- The measured supply air flow rates at trickle and boost were within ±10% of the presented design air flow rates.

### Signature

**Mr AIVC Validator, 11/03/2021**

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Ventilation Validation Registration Scheme

Website

Thank You