

NSAI National Standards Authority of Ireland

Ventilation Validation Registration Scheme

Gary O'Sullivan

Irish Building Regulations

On the **1st November 2019** the Department of Housing, Local Government and Heritage (DHLGH) published updates to <u>two</u> Irish Building Regulations namely

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

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DHLGH published updated Technical Guidance
Document (TGD) Part L and Part F
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Subject to transitional arrangements the updated regulations came into full effect 1st November 2020





Some impacts of Part L Dwelling & Part F 2019

TGD Part L Dwelling 2019

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

TGD Part F 2019

- Air permeability index $< 5 \text{ m}^3/(\text{h.m}^2)$
- Dwelling with < 3 m³/(h.m²) must have some form on 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.

1.2.1.10 Ventilation systems should be designed by competent designers. Systems should be installed, balanced and commissioned by competent installers e.g. Quality and Qualifications Ireland accredited or Education Training Board or equivalent. Systems, when commissioned and balanced, should then be validated by a competent person to ensure that they achieve the design flow rates. The validation should be carried out by a person certified by an independent third party to carry out this work, e.g. Irish National Accreditation Board (INAB), National Standards Authority of Ireland (NSAI) certified or equivalent. Detailed information on the installation and commissioning of ventilation systems is provided in Installation and Commissioning of Ventilation Systems for Dwellings-Achieving Compliance with Part F.

TGD Part F 2019



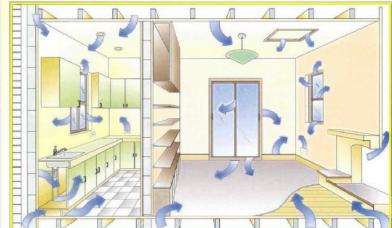
Ventilation Heat Loss

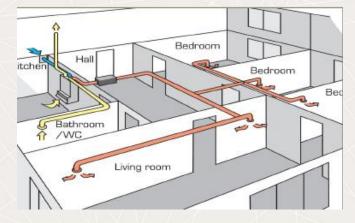
Domestic Energy Assessment Procedure (DEAP) considers both designed and un-designed Ventilation Heat Loss when calculating the BER for a Dwelling

Un-designed

Air tightness Testing Scheme 70 NSAI Registered testers







Designed

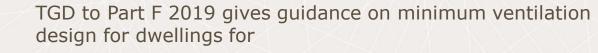
General principles

This new scheme Ventilation Validation Registration Scheme

Has been developed to drive compliance in this area



Typical designed ventilation approaches in Ireland



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)

Cross

Demand Control ventilation (DCV)

P





5th May 2022

Extract

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 Part F - Ventilation (2019) to the Irish Building Regulations.

D-IAB-009 Ventilation Validation Reg Scheme Master Doc Rev 7.docx

| | NSAL Agrément Document Title NSAL Agrément Certified Reference D-IAB-009 | | | | | | |
|-----|---|---|---|--|--|--|--|
| | Ventilation Validation Registration Scheme | Reference Page Issue date Revision | D-IAB-009 Page 1 of 37 30/09/2021 See footer | | | | |
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| | Master Docu | iment for | | | | | |
| | NSAI Agrément App | roval Sch | ieme for | | | | |
| and | Ventilation Validation F | Registrati | on Scheme | | | | |
| ts | to | | | | | | |
| | I.S. EN 14134:2019, Ventilation testing and installation check syster | s of resid | | | | | |
| x | | | | | | | |
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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





Ventilations 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.







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"



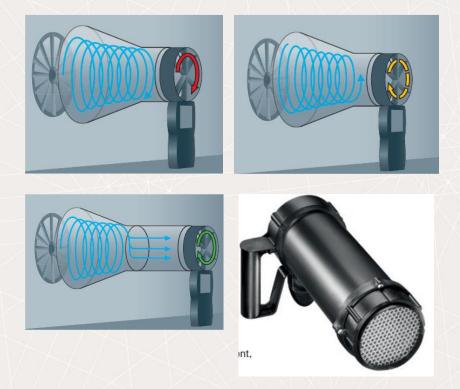
Ventilation Validation Registration Scheme Development

During the development of the scheme, we made it a requirement that all instrumentation must be calibrated 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 straightener were not being used





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.





Let's consider a

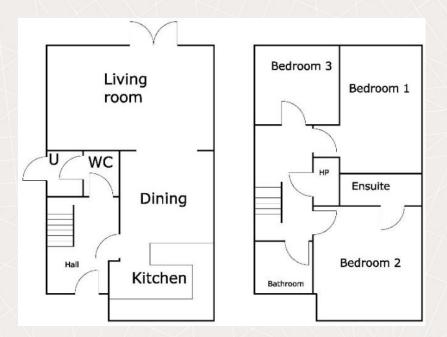
Centralized Continuous Mechanical Extract Ventilation (**CMEV**)

or

Centralized Mechanical Ventilation with Heat Recovery (**MVHR**)

Take a

- 122 m²
- 3 bedrooms
- 2.4m floor to ceiling height





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 m² internal floor area

NSAI - MEV MVHR Design Sheet Issue 7th.xlsx

Discuss general design principle

| Ventilation design sheet | | | | | | | |
|--|---------------|-------------|---------------------|----------------------------------|--|--|--|
| Dwelling address | | | Examp | | | | |
| Dwelling type | | | Semi-detach | ned house | | | |
| Total floor area | _ | | | 122.0 m ² | | | |
| Ventilation system | Ce | ntralised S | Supply & Extrac | t Mechanical Ventilation | | | |
| Date of test | | | | | | | |
| Installer/builder (if applicable) | | | | | | | |
| Validation certificate number | | | 1.91.0xx. | | | | |
| Air permeability < | | | : | 5 m³/(h.m | | | |
| Select rooms | | | Area | Height | | | |
| Kitchen | No. | 1 | | | | | |
| Utility room | No. | 1 | | | | | |
| Bathroom/Ensuite (1) | No. | 1 | | | | | |
| Sanitary accommodation (no bath or shower) (1) | No. | 1 | | | | | |
| Bathroom/Ensuite (2) | No. | 1 | | | | | |
| | No. | | | | | | |
| | No. | | | | | | |
| Living room (1) | No. | 1 | 24 m ² | 2.4 m | | | |
| Dining room | No. | 1 | 10 m ² | 2.4 m | | | |
| Playroom | No. | | m ² | m | | | |
| Study room | No. | | m ² | m | | | |
| Reception room | No. | | m ² | m | | | |
| Bedroom 1 | No. | 1 | 14 m ² | 2.4 m | | | |
| Bedroom 2 | No. | 1 | 16.4 m ² | 2.4 m | | | |
| Bedroom 3 | No. | 1 | 9.3 m ² | 2.4 m | | | |
| Bedroom 4 | No. | | m ² | m | | | |
| Bedroom 5 | No. | | m ² | m | | | |
| Bedroom 6 | No. | | m ² | m | | | |
| | No. | | m² | m | | | |
| | No. | | m² | m | | | |
| | No. | | m² | m | | | |
| Step 1 - | General ver | tilation r | ate | | | | |
| | | | | | | | |
| Calculated general ventilation rate based on | | Calculat | | ntilation rate based on internal | | | |
| occupancy of the dwelling | | | | a of the dwelling | | | |
| [TGD F - 1.2.3.2]: | | | [TGD | F - 1.2.3.2]: | | | |
| 5 l/s plus 4 l/s x Persons | | | Floor Area | a m² at 0.3 l/s/m² | | | |
| Persons = | 5 | | | | | | |
| 5 l/s + (4 l/s x Persons) = | 25.0 l/s | | 36 | 5.6 l/s | | | |
| (Assume 2 people in main bedroom and second bed person in third bedroom) | room and 1 | | | | | | |
| General ventilation rate of the dwelling | is the greate | r of the at | 00ve = | 36.6 l/s | | | |
| General continuous supply ventilation | n rate of the | dwelling i | s = | 36.6 l/s | | | |
| General continuous extract ventilatio | n rate of the | dwelling i | is = | 36.6 l/s | | | |



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 extract ventilation systems: minimum extract rates ¹ | | | | | |
|--|-------------------------------|--|--|--|--|
| Wet rooms | Minimum extract rate (I/s) | | | | |
| Kitchen | 13 ² | | | | |
| Utility room | 8 | | | | |
| Bathroom | 8 | | | | |
| Sanitary accommodation (no bath or shower) | 63 | | | | |
| Notes: | -l | | | | |

1 The above are minimum boost extract rates and may need to be increased to achieve the general ventilation rate.

2. Excludes cooker hood extract.

3. As an alternative, an opening window provided for purge ventilation may be relied on for extract.

| Table 2: MVHR Systems: Minimum extract rates | | | | | | |
|---|-------------------------------------|--|--|--|--|--|
| Wet rooms | Minimum extract rate (I/s) | | | | | |
| Kitchen | 13 | | | | | |
| Utility room | 8 | | | | | |
| Bathroom | 8 | | | | | |
| Sanitary | 6 ¹ | | | | | |
| accommodation (no | | | | | | |
| bath or shower) | | | | | | |
| Notes: | | | | | | |
| 4 A 14 | and the second second second second | | | | | |

1. As an alternative, an opening window provided for purge ventilation may be relied on for extract.

Step 2 - Overall minimum boost extract ventilation rate Overall minimum boost extract ventilation rate requirement [TGD F - Table 2]: Kitchen 1 13 13 х Utility room 1 х 8 8 Bathroom/Ensuite (1) 1 x 8 8 Sanitary accommodation (no bath or shower) (1) 1 6 6 Bathroom/Ensuite (2) 8 1 х 8 0 0 0 х 0 x 0 0 43.0 l/s Step 3 - Ventilation system capacity 25% capacity requirement over general ventilation rate of the dwelling [TGD F - 1.2.3.4]: Greater of overall minimum boost extract rate and (General ventilation rate * 1.25) = 45.8 l/s The total capacity of the ventilation system required is = 45.8 l/s

This is the total capacity of the ventilation system that is required.

Waterford and Wexford Education and Training Board (WWETB)



- From above the General continuous supply ventilation rate of the dwelling is = 36.6l/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.

| Room with MVHR supply terminal(s) | Room area (m ²) | Room volume (m ³) | Room general supply airflow rate (l/s) | | |
|--|--------------------------------|-------------------------------------|---|-------------|----------|
| | | | Supply | % Vol | Total |
| iving room (1) | 24 | 57.6 | 36.60 | 32.6% | 11.9 l/s |
| Dining room | 10 | 24.0 | 36.60 | 13.6% | 5.0 l/s |
| layroom | | | | | |
| Study room | | | | | |
| leception room | | | | | |
| edroom 1 | 14 | 33.6 | 36.60 | 19.0% | 7.0 l/s |
| edroom 2 | 16.4 | 39.4 | 36.60 | 22.3% | 8.1 l/s |
| edroom 3 | 9.3 | 22.3 | 36.60 | 12.6% | 4.6 l/s |
| edroom 4 | | | | | |
| edroom 5 | | | | | |
| Bedroom 6 | | | | | |
| | | | | | |
| otal | 73.70 | 176.9 | Σ Balance | e check = | 36.6 l/: |
| Room with MEV/MVHR extract terminal(s) | Ger | ieral Room | extract air | flow rate (| l/s) |
| | Extract | % Ext | Per Room | No | Total |

| Room with MEV/MVHR extract terminal(s) | General Room extract annow rate (i) | | | | ,,,,, | |
|--|-------------------------------------|-------|----------|-------|----------|--|
| | Extract | % Ext | Per Room | No. | Total | |
| Kitchen | 36.6 | 30% | 11.1 l/s | x 1.0 | 11.1 l/s | |
| Utility room | 36.6 | 19% | 6.8 l/s | x 1.0 | 6.8 l/s | |
| Bathroom/Ensuite (1) | 36.6 | 19% | 6.8 l/s | x 1.0 | 6.8 l/s | |
| Sanitary accommodation (no bath or shower) (1) | 36.6 | 14% | 5.1 l/s | x 1.0 | 5.1 l/s | |
| Bathroom/Ensuite (2) | 36.6 | 19% | 6.8 l/s | x 1.0 | 6.8 l/s | |
| | | | | | | |

| Room with MVHR supply terminal(s) | Room area (m ²) | Room volume | Room Minimum Boost supply airflow rate (l/s) | | |
|-----------------------------------|--------------------------------|-------------------|---|-----------|---------|
| | | (m ³) | Supply | % Vol | Total |
| Living room (1) | 24 | 57.6 | 43.00 | 32.6% | 14.0 l/ |
| Dining room | 10 | 24.0 | 43.00 | 13.6% | 5.8 l/s |
| Playroom | | | | | |
| Study room | | | | | |
| Reception room | | | | | |
| Bedroom 1 | 14 | 33.6 | 43.00 | 19.0% | 8.2 l/s |
| Bedroom 2 | 16.4 | 39.4 | 43.00 | 22.3% | 9.6 l/s |
| Bedroom 3 | 9.3 | 22.3 | 43.00 | 12.6% | 5.4 l/s |
| Bedroom 4 | | | | | |
| Bedroom 5 | | | | | |
| Bedroom 6 | | | | | |
| | | | | | |
| Total | 73.7 | 176.9 | Σ Balanc | e check = | 43.0 l/ |

| Room with MEV/MVHR extract terminal(s) | Room Minimum Boost extract airflow rate (I/s) | | | | | |
|--|---|-------|----------|-------|----------|--|
| | Extract | % Ext | Per Room | No. | Total | |
| Kitchen | 43.00 | 30% | 13.0 l/s | x 1.0 | 13.0 l/s | |
| Utility room | 43.00 | 19% | 8.0 l/s | x 1.0 | 8.0 l/s | |
| Bathroom/Ensuite (1) | 43.00 | 19% | 8.0 l/s | x 1.0 | 8.0 l/s | |
| Sanitary accommodation (no bath or shower) (1) | 43.00 | 14% | 6.0 l/s | x 1.0 | 6.0 l/s | |
| Bathroom/Ensuite (2) | 43.00 | 19% | 8.0 l/s | x 1.0 | 8.0 l/s | |
| | | | | | | |

100% Σ Balance check = 43.0 l/s

100% Σ Balance check =



Sample Ventilation Validation Certificate

| Ventilation v | alidatio | n certi | ficate | | | NSA | NI - |
|---|--|---|---|--|--|---|--|
| Dwelling address | | | | arview Hou | | | |
| Owelling type | | | Sei | mi-detache | | | |
| otal floor area | | | | 159.65 | m² | | |
| /entilation system | | | | MVHR | | | |
| Date of test nstaller/builder (if applicable) | | | | 26.09.20 | 19 | | |
| | 1.0 | 2 0.00 22 0 | O1 (NCALE | ile Mumber/ | (aar/aaauanti | al 2 diait fie | |
| Validation certificate number | 1.9 | | | lie Number/ | rear/sequenti | al 3-digit fig | (ure) |
| Complexity in | | Presented design supply air flows rates | | Measured supply air flow rate at trickle | | Measured supply ai flow rate at boost | |
| Supply air | | Trickle | Boost | Trickle | Tolerance check | Boost | Toleranc check |
| iving room (1) | | 11.92 | 14.00 | 12.00 | 0.7% | 14.20 | 1.4% |
| Dining room | | 4.97 | 5.83 | 5.00 | Within 1 l/s | 6.00 | Within 1 l/ |
| Playroom | | | | | 1.1.1 | | 1 |
| itudy room | | | | | | | |
| teception room | | | | | | | |
| Bedroom 1 | | 6.95 | 8.17 | 7.00 | Within 1 l/s | 8.00 | Within 1 / |
| Bedroom 1 | | 8.14 | 9.57 | 8.00 | Within 1 l/s | 9.40 | Within 1 l/ |
| Bedroom 3 | | 4.62 | 5.43 | 5.00 | Within 1 l/s | 5.30 | Within 1 l/ |
| sedroom 3 Sedroom 4 | | 4.02 | 5.43 | 5.00 | within 11/s | 5.30 | within 1 l |
| | | | | | | | - |
| edroom 5 | | | | | | | - |
| edroom 6 | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | 36.60 | 43.00 | 37.00 | 1.09% | 42.90 | -0.23% |
| | | Presente | d daalaa | | | | |
| Extract air | | extract a | air flows | | extract air at trickle | | l extract a e at boost |
| | | Trickle | Boost | Trickle | Tolerance check | Boost | Toleranc check |
| Gtchen | | 11.07 | 13.00 | 11.40 | 3.0% | 12.50 | -3.8% |
| Itility room | | 6.81 | 8.00 | 6.40 | Within 1 l/s | 7.80 | Within 1 l |
| athroom/Ensuite (1) | | 6.81 | 8.00 | 6.40 | Within 1 l/s | 7.90 | Within 1 l |
| | | | | | | | |
| anitary accommodation (no bath o | or shower) | 5.11 | 6.00 | 5.00 | Within 1 l/s | 5.80 | |
| anitary accommodation (no bath o | or shower) | 5.11 6.81 | 6.00 8.00 | 5.00 6.60 | Within 1 l/s Within 1 l/s | 5.80 7.60 | |
| anitary accommodation (no bath o | or shower) | | | | | | |
| anitary accommodation (no bath o | or shower) | 6.81 | 8.00 | 6.60 | Within 1 l/s | 7.60 | Within 1 l |
| anitary accommodation (no bath o | or shower) | | | | | | Within 1 l |
| anitary accommodation (no bath o | or shower) | 6.81 36.60 | 8.00 43.00 | 6.60 | Within 1 l/s | 7.60 | Within 1 l |
| anitary accommodation (no bath o athroom/Ensuite (2) | | 6.81 36.60 | 8.00 | 6.60 | Within 1 l/s | 7.60 | Within 1 |
| anitary accommodation (no bath o athroom/Ensuite (2) Ilowable supply trickle error/uncert | tainty* | 6.81 36.60 | 8.00 43.00 | 6.60 | Within 1 l/s | 7.60 | Within 1 |
| anitary accommodation (no bath o athroom/Ensuite (2) Ilowable supply trickle error/uncert | tainty* | 6.81 36.60 | 8.00 43.00 | 6.60 | Within 1 l/s | 7.60 | -3.26% |
| anitary accommodation (no bath o lathroom/Ensuite (2) llowable supply trickle error/uncert llowable supply boost error/uncert. | tainty* ainty* | 6.81 36.60 RES | 8.00 43.00 | 6.60 35.80 | Within 1 I/s | 7.60 41.60 | -3.26% |
| ianitary accommodation (no bath o lathroonyEnsuite (2) Illowable supply trickle error/uncert Illowable supply boost error/uncert Illowable supply boost error/uncert | tainty* ainty* flow rate was | 6.81 36.60 RES | 8.00 43.00 SULTS erance of th | 6.60 35.80 e presented | Within 1 I/s | 7.60 41.60 air flow rate | -3.26% |
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| Sanitary accommodation (no bath o Bathnonn/Ensuite (2) Nilowable supply trickle error/uncert Nilowable supply boost error/uncert he total measured supply trickle air he total measured supply trickle . | tainty* ainty* flow rate was flow rate was t >15% | 6.81 36.60 RES | 8.00 43.00 SULTS erance of th | 6.60 35.80 e presented | Within 1 I/s | 7.60 41.60 air flow rate | Within 1 -3.26% 5.20 /s 5.42 /s PASS PASS PASS PASS |
| anitary accommodation (no bath o athroom/Ensuite (2) ullowable supply trickle error/uncert he total measured supply trickle are he total measured supply brickle are total measured supply brickle are frickle supply > trickle extract but z | tainty* ainty* flow rate was flow rate was t ≯15% ⊧15% | 6.81 36.60 RES | 8.00 43.00 SULTS erance of th | 6.60 35.80 e presented | Within 1 I/s | 7.60 41.60 air flow rate | Within 1 I -3.26% 5.20 I/s 5.42 I/s PASS PASS PASS PASS PASS |
| anitary accommodation (no bath o athroom/Ensuite (2) ullowable supply trickle error/uncert he total measured supply trickle are he total measured supply trickle are total measured supply trickle extract but obset supply > trickle extract but z | tainty* ainty* flow rate was flow rate was t ≯15% ⊧15% extract rates | 6.81 36.60 RES s within tok within tole | 8.00 43.00 SULTS erance of the | 6.60 35.80 e presented e presented o | Within 1 i/s -2.2% design trickle design boost a | 7.60 41.60 air flow rate | Within 1 -3.26% 5.20 /s 5.42 /s PASS PASS PASS PASS |
| anitary accommodation (no bath o athroom/Ensuite (2) Ilowable supply trickle error/uncert Ilowable supply boost error/uncert Ilowable supply boost error/uncert he total measured supply trickle air he total measured supply boost air rickle supply > brickle extract but foost supply > boost extract but foost supply > boost extract but > | tainty* ainty* flow rate was flow rate was t ≯15% ⊧15% extract rates | 6.81 36.60 RES s within tok within tole | 8.00 43.00 SULTS erance of the | 6.60 35.80 e presented e presented o | Within 1 i/s -2.2% design trickle design boost a | 7.60 41.60 air flow rate | Within 1 -3.26% 5.20 1/2 5.42 1/2 PASS PASS PASS PASS PASS PASS PASS |
| anitary accommodation (no bath o athroomyEnsuite (2) Illowable supply trickle error/uncert Illowable supply boost error/uncert he total measured supply trickle air he total measured supply trickle air he total measured supply boost air heck on individual minimum boost Opinion on compliance that the | tainty* ainty* flow rate was flow rate was t ≯15% ⊧15% extract rates | 6.81 36.60 RES s within tok within tole | 8.00 43.00 SULTS erance of the | 6.60 35.80 e presented e presented o | Within 1 i/s -2.2% design trickle design boost a | 7.60 41.60 air flow rate | Within 1 I -3.26% 5.20 I/s 5.42 I/s PASS PASS PASS PASS PASS PASS PASS |
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Sample Ventilation Validation Certificate

Ventilation validation certificate



| Dwelling address Dwelling type Total floor area | | Se | | | | | | | | | |
|---|---|--|---|--|---|--|--|--|--|--|--|
| | | 50 | mai data aka | House Type B Semi-detached house | | | | | | | |
| Total floor area | | | | | | | | | | | |
| | 159.65 m ² | | | | | | | | | | |
| Ventilation system | | | MVHR | | | | | | | | |
| Date of test | 26.09.2019 | | | | | | | | | | |
| Installer/builder (if applicable) | | | | | | | | | | | |
| Validation certificate number | | | | Year/sequenti | al 3-digit fig | jure) | | | | | |
| | | | Measure | l supply air | Measure | d supply air | | | | | |
| Sumply air | | | | | | e at boost | | | | | |
| Supply air | Trickle | Boost | Trickle | Tolerance check | Boost | Tolerance check | | | | | |
| Living room (1) | 11.92 | 14.00 | 12.00 | 0.7% | 14.20 | 1.4% | | | | | |
| Dining room | 4.97 | 5.83 | 5.00 | Within 1 l/s | 6.00 | Within 1 l/s | | | | | |
| Playroom | | | | | | | | | | | |
| Study room | | | | | | | | | | | |
| Reception room | | | | | | | | | | | |
| Bedroom 1 | 6.95 | 8.17 | 7.00 | Within 1 l/s | 8.00 | Within 1 l/s | | | | | |
| Bedroom 2 | 8.14 | 9.57 | 8.00 | Within 1 l/s | 9.40 | Within 1 l/s | | | | | |
| Bedroom 3 | 4.62 | 5.43 | 5.00 | Within 1 l/s | 5.30 | Within 1 l/s | | | | | |
| Bedroom 4 | | | | | | | | | | | |
| Bedroom 5 | | | | | | | | | | | |
| Bedroom 6 | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | 36.60 | 43.00 | 37.00 | 1.09% | 42.90 | -0.23% | | | | | |
| | Installer/builder (if applicable) Validation certificate number Supply air Living room (1) Dining room Playroom Study room Reception room Bedroom 1 Bedroom 2 Bedroom 3 Bedroom 4 Bedroom 5 | Installer/builder (if applicable) Validation certificate number Supply air Supply air Living room (1) Dining room Study room Reception room Bedroom 1 Bedroom 2 Bedroom 4 Bedroom 5 Supply air 1.92 0xx 22,0 Present Supply air Trickle 4.97 8.14 8.14 8.14 1.92 1.92 1.92 Present Supply air A.97 8.14 9.14 | Installer/builder (if applicable) Validation certificate number 1.92 0xx 22.001 (MSAI Present ec design supply air flows raites Trickle Boost Living room (1) 11.92 14.00 Dining room 4.97 1 11.92 1 14.00 Dining room 4.97 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Installer/builder (if applicable) Validation certificate number I.92 0xx 22.001 (NISAI File Number/ Present ed design supply air flows rates Trickle Boost Trickle Boost Trickle Living room (1) 11.92 14.00 12.00 Dining room 4.97 5.83 5.00 Playroom 4.97 5.83 5.00 Playroom 6 6.95 8.17 7.00 Bedroom 1 6.95 8.14 9.57 8.00 Bedroom 3 6.95 9 Bedroom 4 9 Bedroom 5 Bedroom 6 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Installer/builder (if applicable) Validation certificate number I.92 0xx 22.001_(NISAL File Number/Year/sequenti Present ec design supply air flows retes Trickle Boost Trickle Tolerance check Living room (1) 11.92 14.00 12.00 0.7% Dining room 4.97 5.83 5.00 Within 1 /s Playroom 4.97 5.83 5.00 Within 1 /s Playroom 6.95 8.17 7.00 Within 1 /s Bedroom 1 6.95 8.14 9.57 8.00 Within 1 /s Bedroom 3 6.95 6.1 Comparison | Installer/builder (if applicable) Validation certificate number I.92 Oxx 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design supply air flows rates Trickle Boost Trickle Boost Trickle II.92 Oxx 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design supply air flows rates Trickle Boost Trickle II.92 Ox 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design supply air flows rates Trickle II.92 Ox 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design supply air flows rates Trickle II.92 Ox 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design supply air flows rates Trickle II.92 Ox 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design supply air flows rates Trickle II.92 Ox 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design supply air flows rates Trickle II.92 Ox 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design supply air flows rates Trickle II.92 Ox 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design Supply air flows rates Trickle II.92 Ox 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design Supply air flows rates Trickle II.92 Ox 22 OUL (NSAL File Number/Year/sequential 3-digit fic Present ed design Supply air flows rates II.92 Ox 20 OX II.92 | | | | | |



Sample Ventilation Validation Certificate

| Extract air | extract | extract air flows | | Measured extract air flow rate at trickle | | Measured extract air flow rate at boost | |
|---|--|---|---|--|---|--|--|
| | Trickle | Boost | Trickle | Tolerance check | Boost | Tolerance check | |
| Kitchen | 11.07 | 13.00 | 11.40 | 3.0% | 12.50 | -3.8% | |
| Utility room | 6.81 | 8.00 | 6.40 | Within 1 l/s | 7.80 | Within 1 l/s | |
| Bathroom/Ensuite (1) | 6.81 | 8.00 | 6.40 | Within 1 l/s | 7.90 | Within 1 l/s | |
| Sanitary accommodation (no bath or shower) | 5.11 | 6.00 | 5.00 | Within 1 l/s | 5.80 | Within 1 l/s | |
| Bathroom/Ensuite (2) | 6.81 | 8.00 | 6.60 | Within 1 l/s | 7.60 | Within 1 l/s | |
| | | | | | | | |
| | 26.60 | | 25.00 | 2.20/ | 41.00 | | |
| | 36.60 | 43.00 | 35.80 | -2.2% | 41.60 | -3.26% | |
| Allowable supply trickle error/uncertainty* Allowable supply boost error/uncertainty* The total measured supply trickle air flow rate wa | | SULTS | e presented | design trickle | air floy rate | 5.20 l/s 5.42 l/s PASS | |
| | as within tole s within tole es | erance of th rance of the | presented o | lesign boost a | ir flow rate | 5.42 I/s PASS PASS PASS PASS PASS | |
| Allowable supply boost error/uncertainty* The total measured supply trickle air flow rate wa The total measured supply boost air flow rate was Trickle supply > trickle extract but ≯15% Boost supply > boost extract but ≯15% Check on individual minimum boost extract rate Opinion on compliance that the measure Overall comments:- | as within tole s within tole es | erance of th rance of the | presented o | lesign boost a | ir flow rate | 5.42 I/s PASS PASS PASS PASS PASS | |
| Allowable supply boost error/uncertainty* The total measured supply trickle air flow rate was The total measured supply boost air flow rate was Trickle supply > trickle extract but ≯15% Boost supply > boost extract but ≯15% Check on individual minimum boost extract rate Opinion on compliance that the measure Overall comments:- Examples of comments | as within tol s within tole es system ac | erance of th rance of the hieved the | presented of | lesign boost a I design air f l | ir flow rate | 5.42 I/s PASS PASS PASS PASS PASS PASS | |
| Allowable supply boost error/uncertainty* The total measured supply trickle air flow rate was The total measured supply boost air flow rate was Trickle supply > trickle extract but ≯15% Boost supply > boost extract but ≯15% Check on individual minimum boost extract rate Opinion on compliance that the measure Overall comments:- Examples of comments 10mm undercut were present at the time of va | as within tole s within tole es system ac | erance of th rance of the hieved the rection but | presented of presented of the presented | lesign boost a I design air fl no floor finishe | ir flow rate ow rates es downstai | 5.42 I/s PASS PASS PASS PASS PASS PASS | |
| Allowable supply boost error/uncertainty* The total measured supply trickle air flow rate was The total measured supply boost air flow rate was Trickle supply > trickle extract but ≯15% Boost supply > boost extract but ≯15% Check on individual minimum boost extract rate Opinion on compliance that the measure Overall comments:- Examples of comments | as within tole s within tole es system ac | erance of th rance of the hieved the rection but | presented of presented of the presented | lesign boost a I design air fl no floor finishe | ir flow rate ow rates es downstai | 5.421/s PASS PASS PASS PASS PASS PASS | |

Comments on design:-

The design flowrates provided to the NSAI Validator differed from the NSAI design sheet, the competent person responsible for the design should provide sufficient evidence and calculations to demonstrate adequate ventilation has been provided to satisfy the requirements of TGD to Part F of the Building Regulations.

| SIGNED | Name, Company | | |
|--------------------------------------|----------------------------|------------------|---|
| | Report print date & time | 28/04/2022 10:29 | |
| * Measured error/uncertainty = 1 l/s | s < 10 l/s or 10% > 10 l/s | | _ |



Demand Control ventilation (DCV)

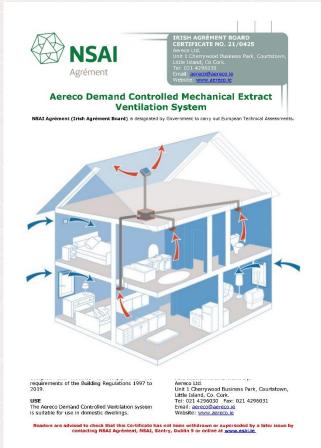
Demand control ventilation systems require a Ventilation Validation Certificate.

DCV systems utilises humidity-controlled extract units which provide high levels of ventilation in time of high humidity.

In times of low occupancy (low humidity) DCV can provide lower levels of ventilation but must still achieve the minimum general ventilation rate as required by TGD Part F.

If DCV systems wish to operate sub the minimum general ventilation rate as required by TGD Part F, then a NSAI Agrément certificate (or similar) will be required to support that Indoor Air Quality (IAQ) is not compromised.

Currently Aereco Ltd. have a Agrément Certificate for their Demand Control Mechanical Extract Ventilation (DCMEV) system.





Compliance requirements Part L & Part F

So what need to be checked?

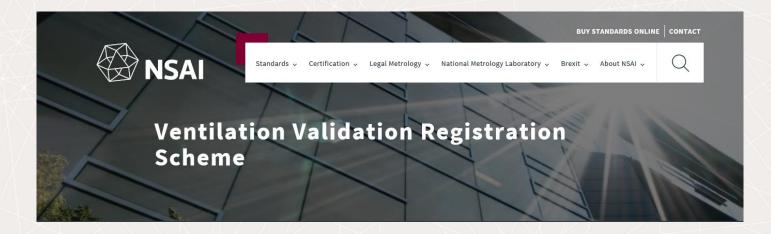
- Look for the airtightness test, Air permeability index < 5 m³/(h.m²)
- If the Air permeability index < 3 m³/(h.m²), natural ventilation will not be acceptable and some form of mechanical ventilation is required



3. Check the ventilation validation certificate is a Pass

| RESULTS | |
|---|----------|
| Allowable supply trickle error/uncertainty* | 5.20 l/s |
| Allowable supply boost error/uncertainty* | 5.42 l/s |
| The total measured supply trickle air flow rate was within tolerance of the presented design trickle air flow fate | PASS |
| The total measured supply boost air flow rate was within tolerance of the presented design boost air flow tate | PASS |
| Trickle supply > trickle extract but ≯15% | PASS |
| Boost supply > boost extract but ≯15% | PASS |
| Check on individual minimum boost extract rates | PASS |
| Opinion on compliance that the measure system achieved the presented design air flow rates | PASS |





Website

Thank You

