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BRE Test Report

Mighton Products LTD Trickle Ventilator tests according to EN13141-1 2019

Prepared for: Andrew Harrison
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1 Introduction

Mighton Products ltd. requested BRE test 5-off background ventilators to determine the aerodynamic characteristics according to:

> EN 13141-1:2019. *Ventilation for buildings – Performance testing of components/products for residential ventilation – Part 1: Externally and internally mounted air transfer devices.*

Mighton supplied test blocks with each of the vents installed on meeting the requirements of Clause 5.1.2.1 of EN13141-1:2019.

The vents submitted for testing were:

Product Name:

Model name	Slot size
D	1-off; 284.8 x 16.2 mm
E	1-off; 410 x 16.2 mm

The blocks and vents were delivered to BRE on 15th September and 27th September, the testing was undertaken on from 19th and 20th October 2023.

2 Tests summary

The vents submitted for testing were

Name	EqA @ 1Pa (mm^2)
D	1540
E	2337

3 Configuration of products tested

The Mighton vents test layout is shown in Figure 1.

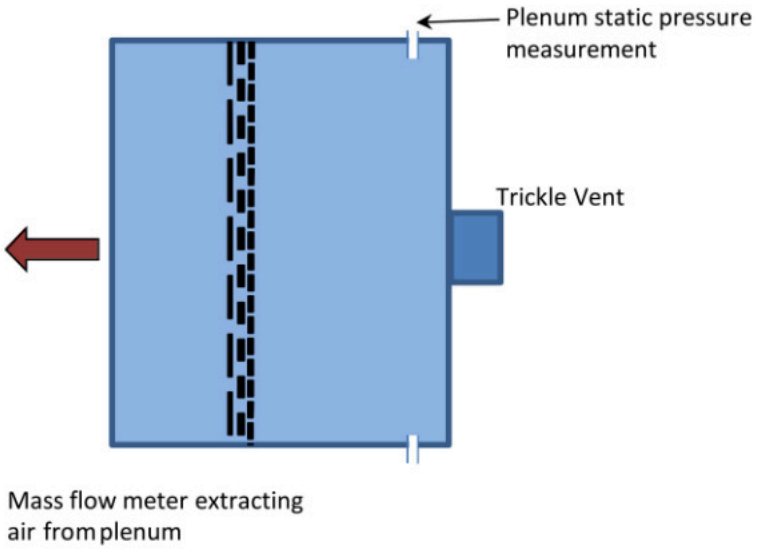

Figure 1 Test layout

Figure 2 Vent installed onto block and in board of plenum.

The five ventilator products submitted for testing are shown in Figure 3.

Figure 3 Five samples of trickle ventilator products tested

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4 Details of tests carried out

Test installation and conditions

The test apparatus used conformed to the requirements set out in BSEN 13141-1 2019 clause 5.1.2. An air permeability test was performed on the test apparatus with the vent sealed over before the start of the test to a ΔP of 100 Pa. The results are documented in Table 2.

The vents were mounted in a representative 60 mm thick block (supplied by Mighton Products Ltd.) to simulate an installation into a typical double-glazed window header.

Table 1 Test Instruments Used

Variable	Instrument used for measurement	Calibration	Uncertainty of measurement
Air relative humidity readings	Vaisala HMP110	In-situ 8-point calibration with Michell S8000 Mirror Michell (Traceable NIST)	< ±2% RH < 0.2°C
Airflow rate readings	Hastings LFE LS-6S Chell Display CMD100	In-situ cross calibration with nozzle box using Furness FCO560 Calibrator Furness Controls (UKAS)	1 to 60 l/s < ±0.2+3%
	Furness Controls FC096 Pressure difference - Furness Controls FCO560	Furness Controls (UKAS) Furness Controls (UKAS)	0.1 to 3 l/s < ±0.2+3%
	Furness Controls LFE FCO96 Display FCO332	In-situ cross calibration with nozzle box using Furness FCO560 Calibrator Furness Controls (UKAS)	6 to 60 l/s < ±0.2+3%
Atmospheric pressure	Druck DPI 260	Furness Controls (UKAS)	< ±0.09% (±90 Pa)
Static pressure readings	MKS Baratron	Furness Controls (UKAS)	< ±1% of reading

5 Test results

5.1 The air permeability of the test equipment

Table 2 Air permeability results for the Test Rig before the start of the testing.

Test Number	Differential Pressure (Pa)	Flow rate (l/s)
1	100.2	< 0.45

5.2 Aerodynamic characteristics

Table 3 – **Product D**

Flow rate/pressure characteristics for both flow directions and corresponding calculates EqA.

Pressure difference Δp (Pa)	qv ($l.s^{-1}$) Inside to outside	CEN calculated equivalent area mm^2	Pressure difference Δp (Pa)	qv ($l.s^{-1}$) outside to inside	CEN calculated equivalent area mm^2
1	1.3	1617	1	1.2	1540
2	1.8	1630	2	1.7	1538
4	2.6	1643	4	2.4	1536
8	3.7	1656	8	3.4	1534
10	4.1	1661	10	3.8	1534
20	5.9	1675	20	5.4	1532

- The calculated mean equivalent area at 1 Pa is 1578.3 mm^2.
- **The calculated minimum equivalent area at 1 Pa is 1539.9 mm^2.**

Table 4 – **Product D airtightness when closed**

Test Number	Differential Pressure (Pa)	Flow rate (l/s)
1	40.4	0.23

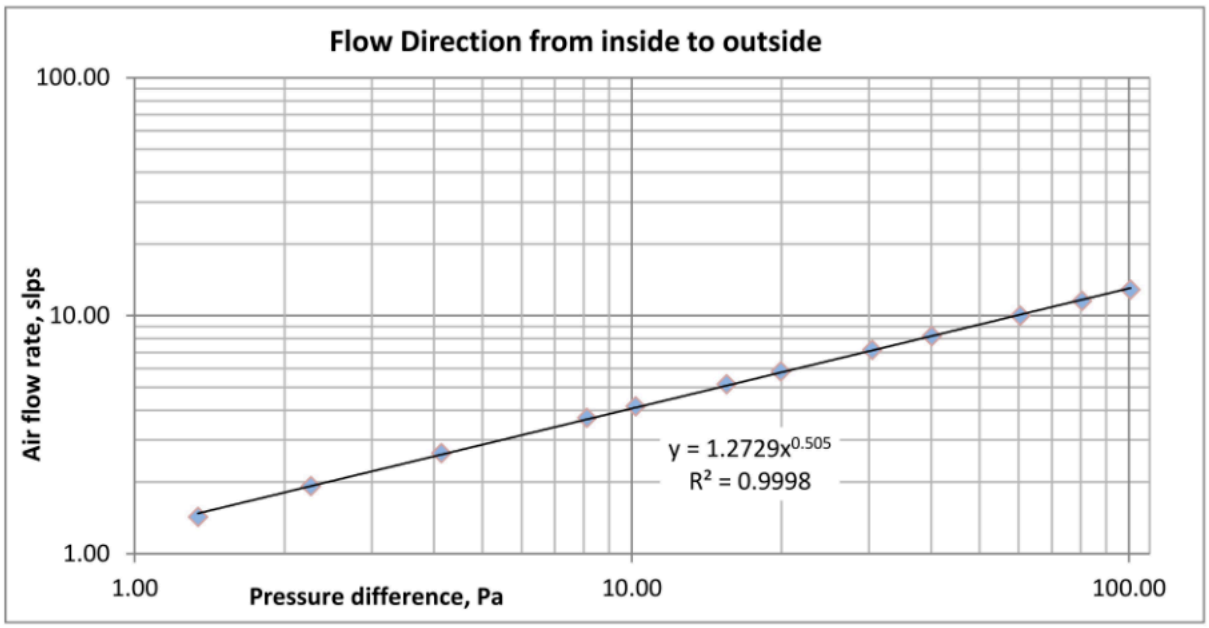

Figure 4 Measured air flow and pressure data for air flow from inside to outside

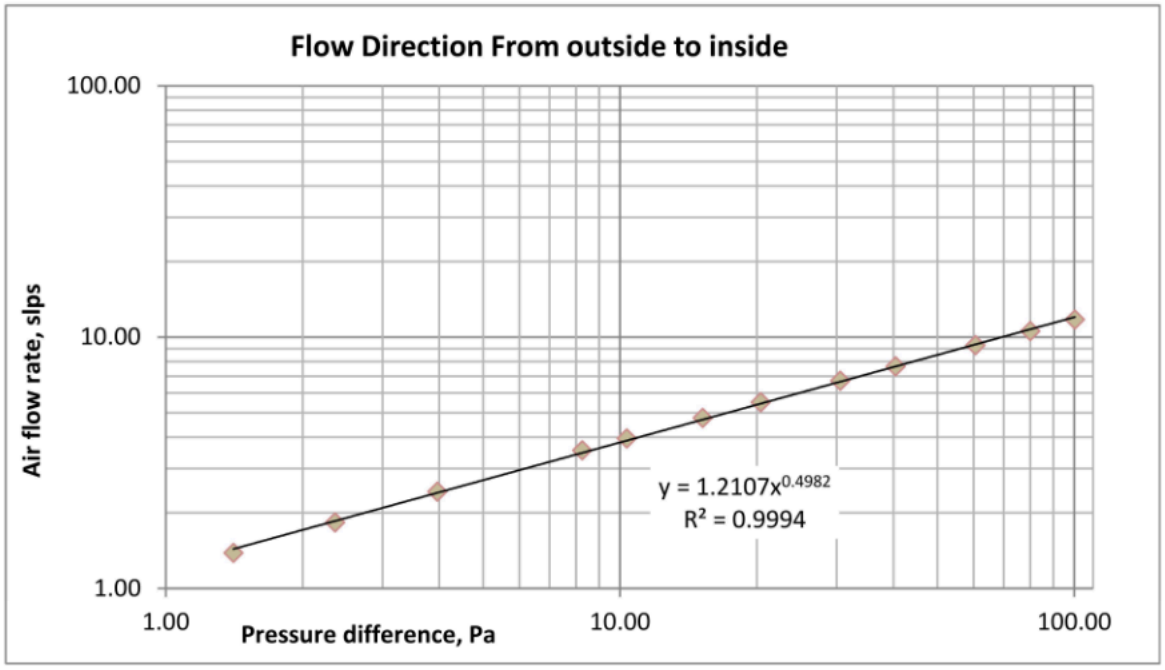

Figure 5 Measured air flow and pressure data for air flow from outside to inside

Table 5 – **Product E**

Flow rate/pressure characteristics for both flow directions and corresponding calculates EqA.

Pressure difference Δp (Pa)	qv ($l.s^{-1}$) Inside to outside	CEN calculated equivalent area mm^2	Pressure difference Δp (Pa)	qv ($l.s^{-1}$) outside to inside	CEN calculated equivalent area mm^2
1	2.0	2492	1	1.8	2337
2	2.8	2504	2	2.6	2331
4	4.0	2515	4	3.7	2325
8	5.6	2527	8	5.2	2318
10	6.3	2530	10	5.8	2316
20	8.9	2543	20	8.1	2310

- The calculated mean equivalent area at 1 Pa is 2414.6 mm^2.
- **The calculated minimum equivalent area at 1 Pa is 2337.1 mm^2.**

Table 6 – **Product E airtightness when closed**

Test Number	Differential Pressure (Pa)	Flow rate (l/s)
1	39.9	1.19

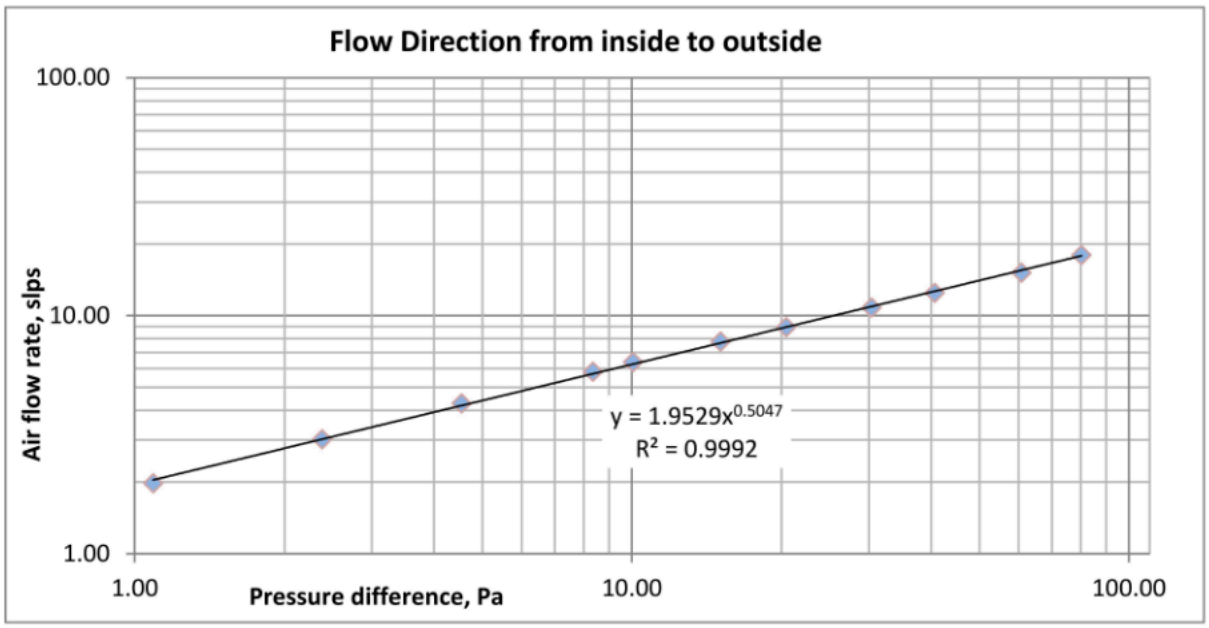

Figure 6 Measured air flow and pressure data for air flow from inside to outside

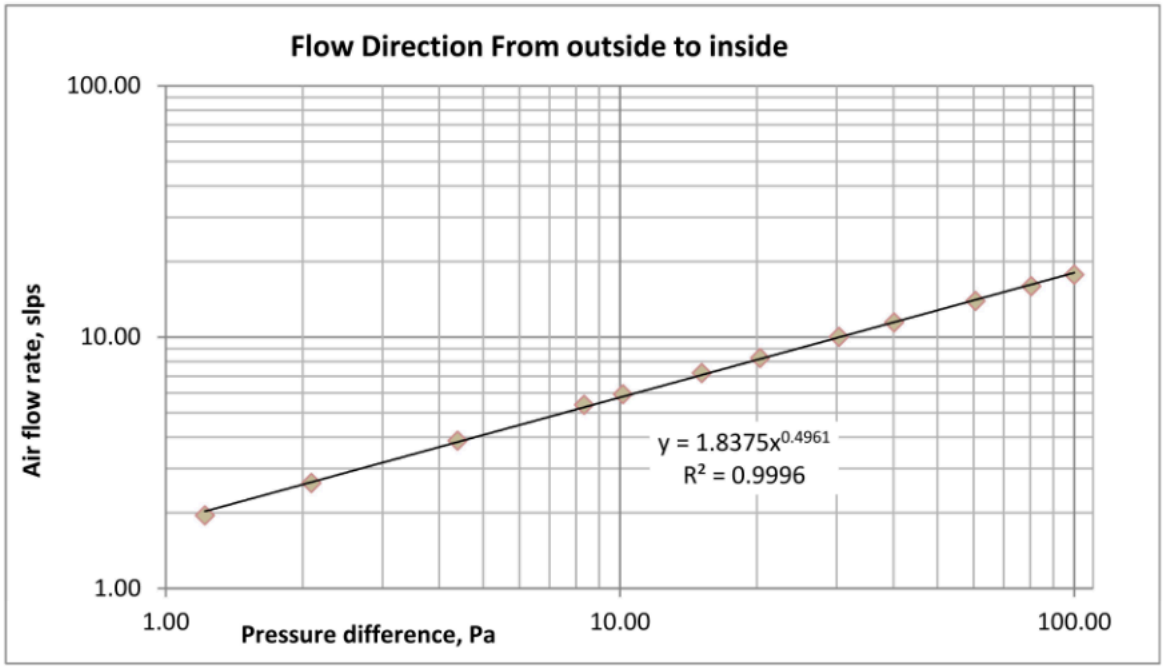

Figure 7 Measured air flow and pressure data for air flow from outside to inside