

Weather Louvre Test

**480 - 483 - L.060HF - Insect Mesh,
Water Gutter**

Carried out for
Renson Ventilation NV

Report 101232/2

Compiled by Paul Ainscoe

3 March 2020



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Weather Louvre Test

480 - 483 - L.060HF - Insect Mesh, Water Gutter

Carried out for: Renson Ventilation NV
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Contract: Report 101232/2

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QUALITY ASSURANCE

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1 INTRODUCTION

This report concerns tests conducted on a louvre to determine the Rainwater Penetration and the Pressure Drop versus Airflow Curves, with the associated Coefficient of Entry, using the test methods contained within BS EN 13030:2001. It should be noted that BS EN 13030:2001 simply provides a method for testing and rating louvre samples, there are no minimum permitted values or recommendations for louvre performance.

The work was commissioned by Renson Ventilation NV and was carried out at BSRIA North from 29 January to 3 February 2020.

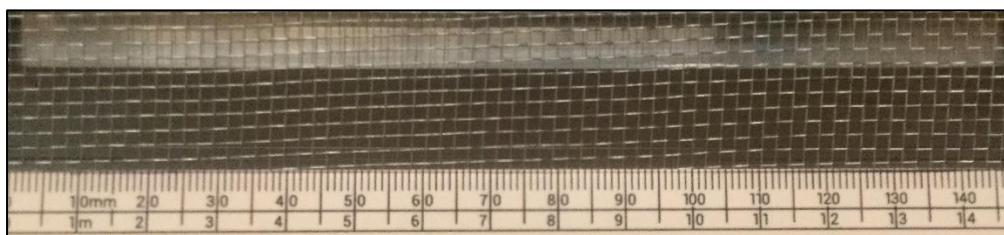
Items received for test

Test Item	BSRIA ID
480 – 483 – L.060HF – Insect Mesh, Water Gutter	101232A5

1.1 TEST ITEM INFORMATION

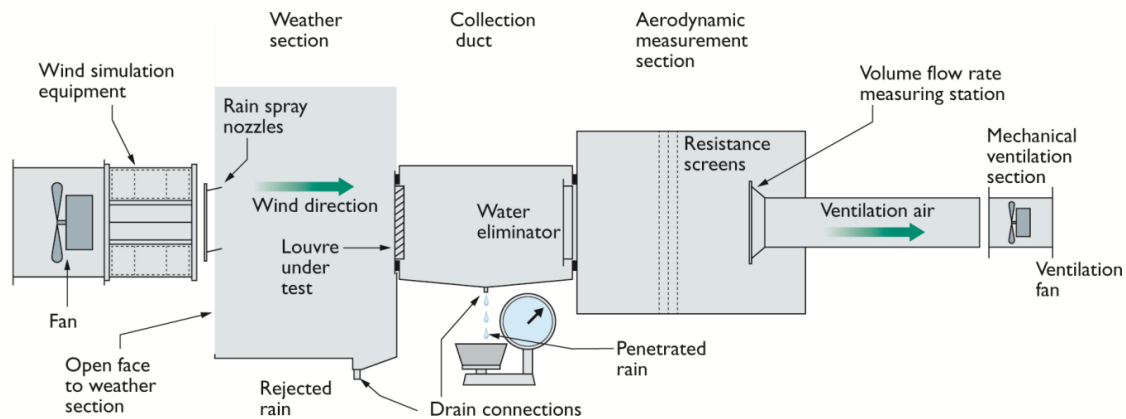
Contract	101232
Date	21/Jan/2020
Manufacturer	Renson Ventilation NV
Louvre Model	480 – 483 – L.060HF – Insect Mesh, Water Gutter
Material	Aluminium
Painted	No
Core Area Height	980 mm
Core Area Width	1000 mm
Blade Pack Depth	75 mm
Frame Depth	100 mm
No. of Blades	16
Blade Pitch	60 mm
Blade Angle	45° approx.
No. of Banks	1
Guard Type	Insect
Guard Spacing	10 mm
Side Channels	No
Water Drip Tray	Yes
Blade Orientation	Horizontal

Note: Weather louvre core area - product of the minimum height H and minimum width W of the front opening in the weather louvre assembly with the louvre blades removed
Blade Pack Depth refers to the distance from front of first bank to rear of last bank.

Figure 1 Test item 101232A5 (front)**Figure 2 Test item 101232A5 (rear)****Figure 3 Test item 101232A5 (close-up of guard)**

2 TEST METHOD

A schematic representation of the rig used during testing



The test comprises of two parts:

2.1 WATER PENETRATION

The weather louvre is subjected to fan driven wind at a speed of 13 m/s and water sprayed as rainfall at a rate of 75 l/h (+10% / -0%). In addition to the simulated wind and rain, air is drawn through the louvre at various set velocities (0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0 and 3.5 m/s).

Each test is preceded by a suitable 'pre-test' soak which is typically around 30 minutes. Each test is run until the results become stable, and in any case, for a minimum of 30 minutes.

The penetrated water is collected in the collection duct and is measured and recorded against time elapsed. A range of measurements are taken to give the characteristic curve for the test louvre.

2.2 PRESSURE DROP

For this test, the Aerodynamic Measuring Section (AMS) is separated from the main rig. The louvre is then mounted in the upstream opening of the AMS.

Pressure tappings in the plenum walls of the AMS allow measurement of the static pressure within the plenum during testing. The airflow volume is calculated from the differential pressure at the measuring cones. The plenum has a set of settling screens within to produce even flow through the cones and therefore gives an accurate reading of the total volume.

By adjusting the fan speed, the total airflow through the system varies and therefore changes the pressure on the louvre under test. A range of measurements are taken to give the characteristic curve for the test louvre.

2.3 TEST EQUIPMENT USED

Test equipment	BSRIA ID	Calibration Expiry Date
Rain measuring system	353	19-12-20
Airflow cones	364	24-01-21
Fan	484	19-12-20
Flow meter	1688	17-06-20
Scales (water)	1599	15-05-20
Micromanometer	1600	19-12-20
Micromanometer	1601	19-12-20
Temperature and Pressure Gauge	1605	31-07-20
Water supply measurement	1749	20-12-20

3 RESULTS

3.1 RAINWATER PENETRATION

Manufacturer Renson Ventilation NV

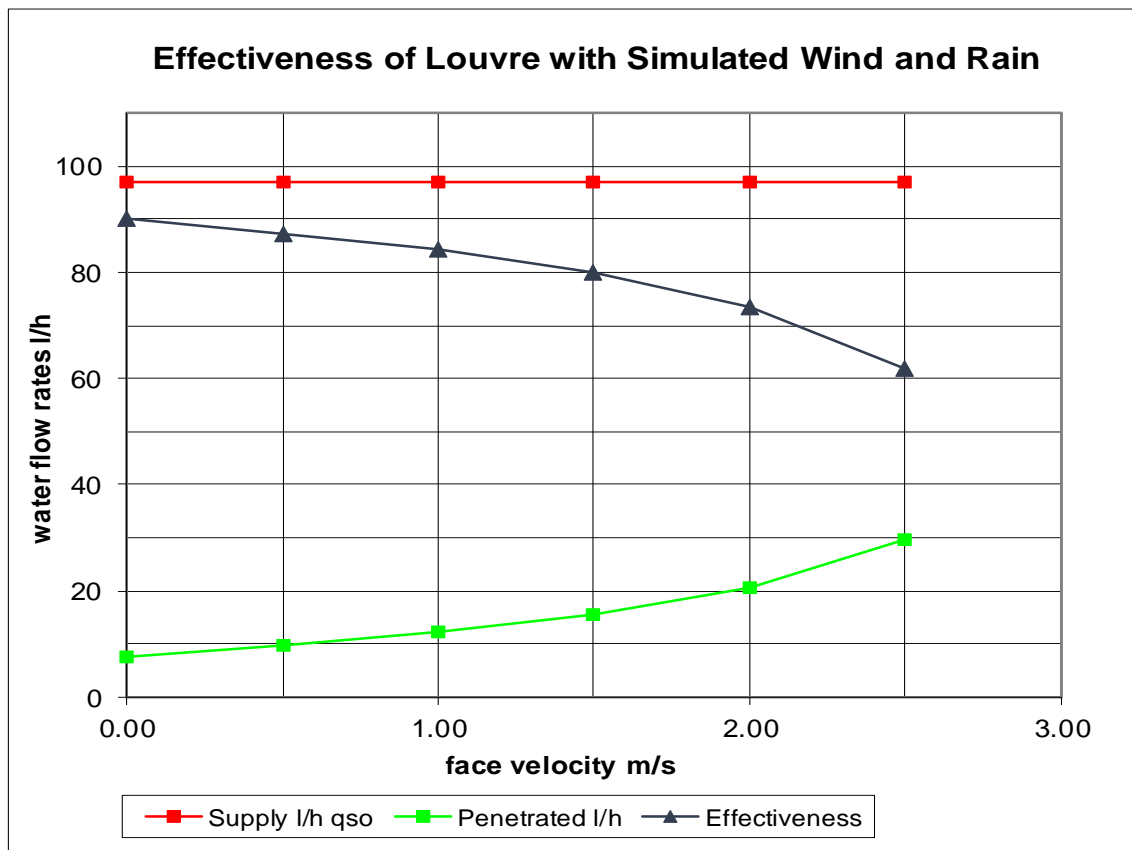
Date 29/01/2020

Model 480 - 483 - L.060HF - Insect Mesh, Water Gutter

Contract 101232

Simulated Rainfall	75 (+10% / -0%)	mm/hr	Core Area Height	980	mm
Wind Speed	13	m/s	Core Area Width	1000	mm
			Core Area Area	0.980	m ²

Ventilation Rate		Water Flow Rates		Effectiveness %	Class
Volume m ³ /s	Velocity m/s	Supply l/h	Penetrated l/h		
0.00	0.00	97.2	7.7	90.1	C
0.49	0.50	97.2	9.9	87.3	C
0.98	1.00	97.2	12.3	84.2	C
1.47	1.50	97.2	15.4	80.1	C
1.96	2.00	97.2	20.7	73.4	D
2.45	2.50	97.2	29.5	62.0	D



Giel Bruyneel and Lieven Depraetere who came to witness the tests verbally requested that the rain penetration test stopped once the 2.5m/s was complete.

3.2 COEFFICIENT OF ENTRY

Manufacturer Renson Ventilation NV

Date 03/02/2020

Model 480 - 483 - L.060HF - Insect Mesh, Water

Contract 101232

Gutter

Air Temperature 15 °C

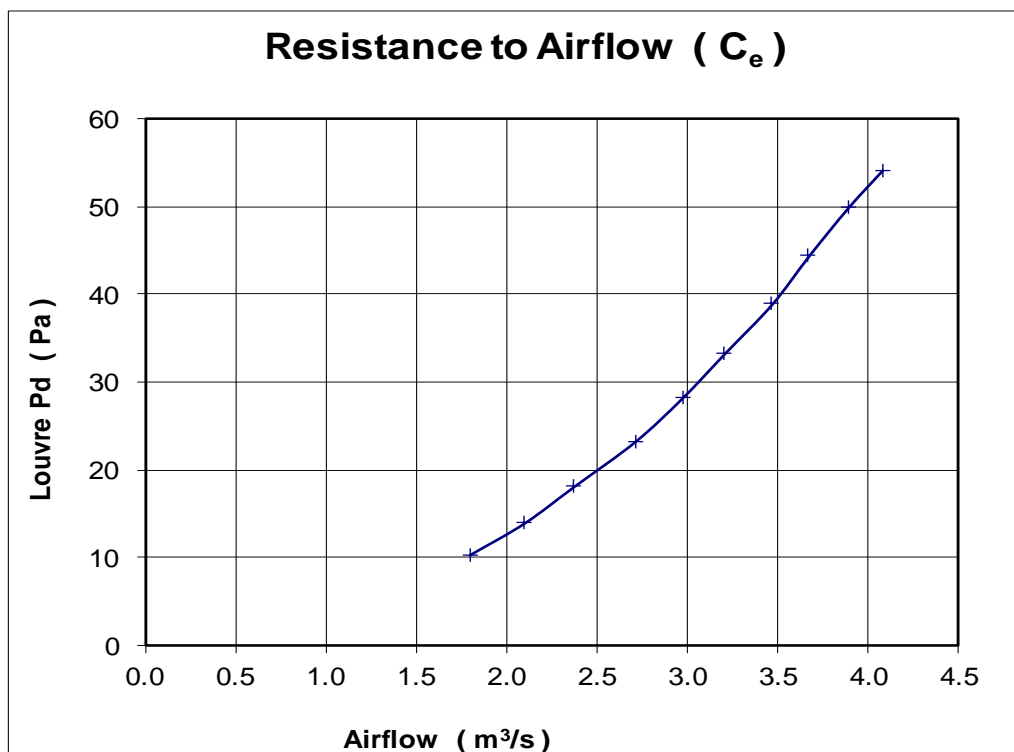
Core Area Height 980 mm

Barometer 1006 mbar

Core Area Width 1000 mm

Air Density 1.211 kg/m³Core Area Area 0.980 m²

Louvre p.d. Pa	Louvre Face Velocity	Air Flow Rate		Coefficient C _e
	m/s	Test m ³ /s	Theoretical m ³ /s	
10.3	1.84	1.799	9.270	0.440
13.9	2.14	2.099	8.895	0.437
18.1	2.42	2.375	8.391	0.438
23.2	2.77	2.711	7.854	0.442
28.2	3.03	2.973	7.266	0.441
33.3	3.27	3.208	6.687	0.445
38.9	3.54	3.468	6.065	0.447
44.4	3.75	3.671	5.357	0.443
49.9	3.97	3.888	4.695	0.447
54.2	4.16	4.079	4.041	0.445
Mean C _e				0.442
Class				1



A 'trendline' for the above graph would follow $y = 3.0628x^{2.0470}$

3.3 COEFFICIENT OF DISCHARGE

Manufacturer Renson Ventilation NV

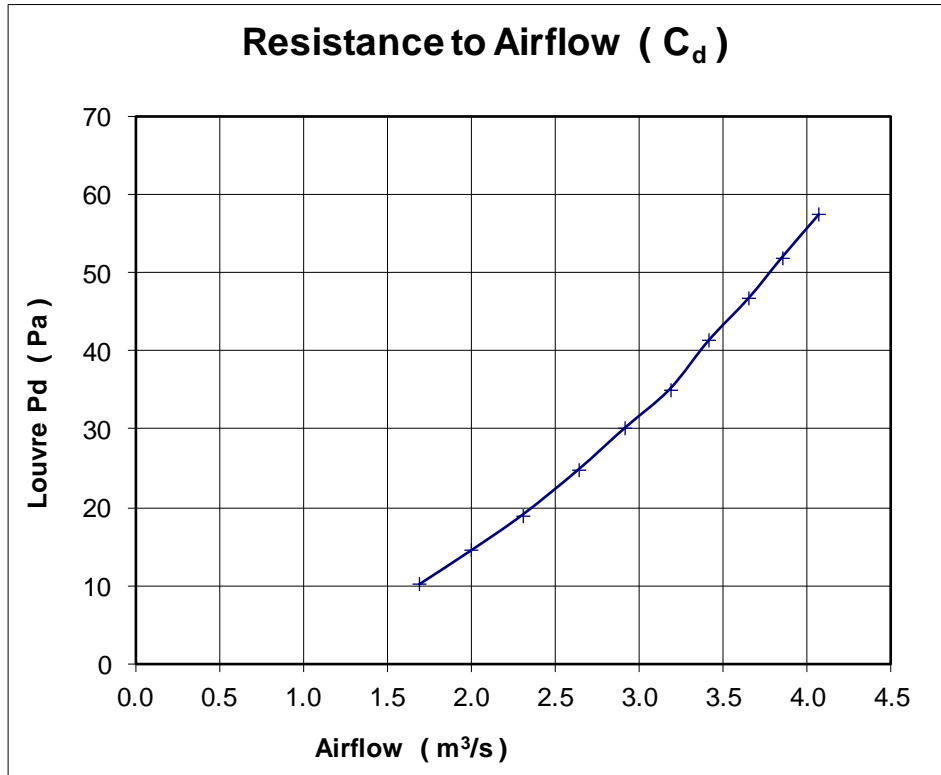
Date 03/02/2020

Model 480 - 483 - L.060HF - Insect Mesh, Water
Gutter

Contract 101232

Air Temperature	15.8	°C	Core Area Height	980	mm
Barometer	1005.9	mbar	Core Area Width	1000	mm
Air Density	1.208	kg/m ³	Core Area Area	0.980	m ²

Louvre p.d. Pa	Louvre Face Velocity	Air Flow Rate		Coefficient C _d
	m/s	Test m ³ /s	Theoretical m ³ /s	
10.1	1.73	1.696	9.562	0.426
14.4	2.04	2.001	9.085	0.424
19.0	2.36	2.310	8.627	0.424
24.8	2.70	2.644	8.104	0.422
30.1	2.98	2.918	7.471	0.427
35.1	3.25	3.188	6.918	0.422
41.3	3.49	3.418	6.280	0.421
46.8	3.73	3.659	5.497	0.420
51.9	3.93	3.853	4.785	0.418
57.5	4.16	4.077	4.008	0.423
Mean C _d				0.423
Class				1



A 'trendline' for the above graph would follow $y = 3.6187x^{1.9735}$

APPENDIX A: MANUFACTURER’S DRAWING

