

Weather Louvre Test

**480 - 483 - L.060HF - No Insect
Mesh, No Water Gutter**

Carried out for
Renson Ventilation NV

Report 101232/4

Compiled by Paul Ainscoe

3 March 2020



This page is intentionally left blank

Weather Louvre Test

480 - 483 - L.060HF - No Insect Mesh, No Water Gutter

Carried out for: Renson Ventilation NV
Industriezone 2 Vijverdam Maalbeekstraat 10
Waregem
8790
Belgium

Contract: Report 101232/4


Issued by: BSRIA Limited
Old Bracknell Lane West
Bracknell
Berkshire
RG12 7AH
UK

Telephone: +44 (0)1344 465600

Fax: +44 (0)1344 465626

Email: bsria@bsria.co.uk
Website: www.bsria.co.uk

QUALITY ASSURANCE

Issue	Date	Compiled by:	Approved by:	Signature
FINAL	03-Mar-2020	Paul Ainscoe	Mark Roper	
		Technician	Principal Test Engineer	

DISCLAIMER

This Document must not be reproduced except in full without the written approval of an executive director of BSRIA. It is only intended to be used within the context described in the text.

This Document has been prepared by BSRIA Limited, with reasonable skill, care and diligence in accordance with BSRIA's Quality Assurance and within the scope of our Terms and Conditions of Business.

This Document is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the Document at its own risk.

CONTENTS

1	INTRODUCTION.....	5
1.1	Test Item Information	5
2	TEST METHOD	7
2.1	Water Penetration.....	7
2.2	Pressure Drop.....	7
2.3	Test equipment used.....	7
3	RESULTS	8
3.1	Rainwater Penetration	8
3.2	Coefficient of Entry.....	9
3.3	Coefficient of Discharge	10

FIGURES

Figure 1	Test item 101232A4 (front).....	6
Figure 2	Test item 101232A4 (rear)	6

APPENDICES

APPENDIX A:	Manufacturer's Drawing	11
-------------	------------------------------	----

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 31 January to 3 February 2020.

Items received for test

Test Item	BSRIA ID
480 – 483 – L.060HF – No Insect Mesh, No Water Gutter	101232A4

1.1 TEST ITEM INFORMATION

Contract	101232
Date	21/Jan/2020
Manufacturer	Renson Ventilation NV
Louvre Model	480 – 483 – L.060HF – No Insect Mesh, No Water Gutter
Material	Aluminium
Painted	No
Core Area Height	970 mm
Core Area Width	1000 mm
Blade Pack Depth	70 mm
Frame Depth	85 mm
No. of Blades	16
Blade Pitch	60 mm
Blade Angle	45° approx.
No. of Banks	1
Guard Type	None
Side Channels	No
Water Drip Tray	No
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 101232A4 (front)

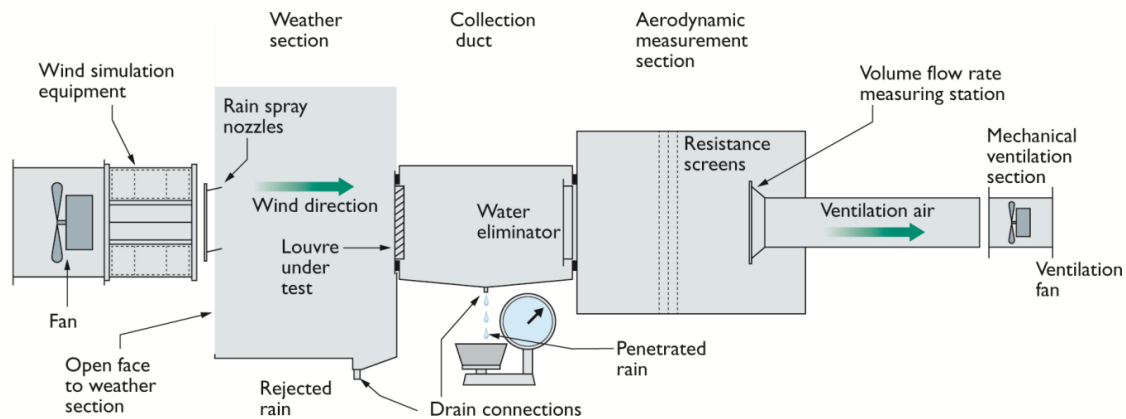


Figure 2 Test item 101232A4 (rear)



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 31/01/2020

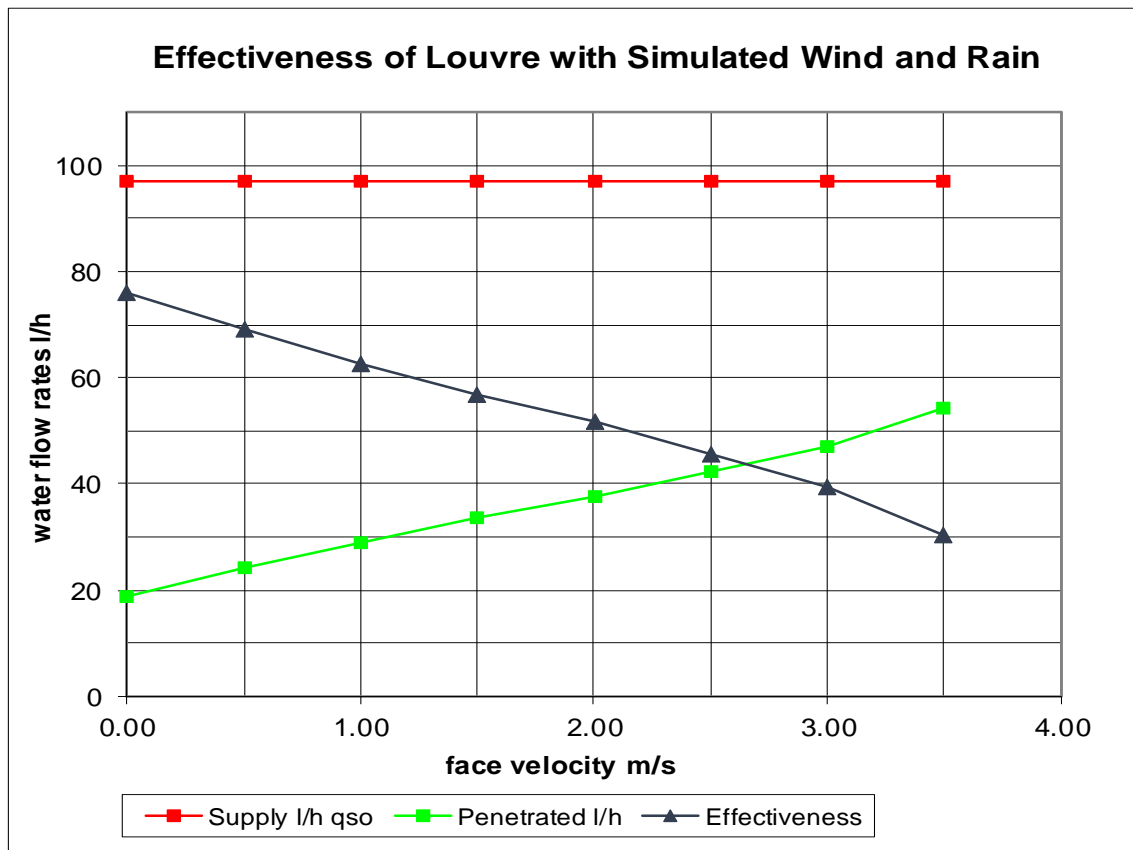
Model 480 - 483 - L.060HF - No Insect Mesh, No Water

Contract 101232

Gutter

Simulated Rainfall	75 (+10% / -0%)	mm/hr	Core Area Height	970	mm
Wind Speed	13	m/s	Core Area Width	1000	mm
			Core Area Area	0.970	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	18.7	75.9	D
0.48	0.50	97.2	24.0	68.9	D
0.97	1.00	97.2	28.9	62.8	D
1.46	1.50	97.2	33.5	56.9	D
1.94	2.00	97.2	37.5	51.7	D
2.43	2.50	97.2	42.3	45.5	D
2.91	3.00	97.2	47.1	39.4	D
3.39	3.50	97.2	54.3	30.4	D



3.2 COEFFICIENT OF ENTRY

Manufacturer Renson Ventilation NV

Date 03/02/2020

Model 480 - 483 - L.060HF - No Insect Mesh, No

Contract 101232

Water Gutter

Air Temperature 14.2 °C

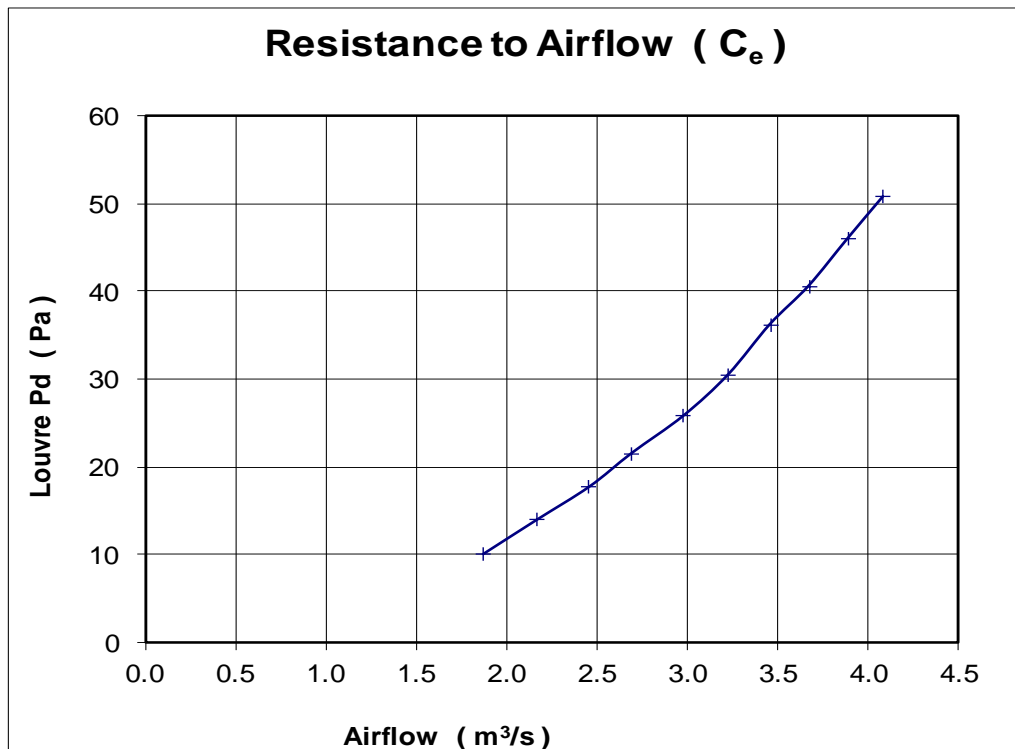
Core Area Height 970 mm

Barometer 1005.8 mbar

Core Area Width 1000 mm

Air Density 1.215 kg/m³Core Area Area 0.970 m²

Louvre p.d. Pa	Louvre Face Velocity	Air Flow Rate		Coefficient C _e
	m/s	Test m ³ /s	Theoretical m ³ /s	
10.0	1.92	1.865	8.872	0.461
13.9	2.23	2.163	8.442	0.461
17.7	2.53	2.457	7.931	0.463
21.5	2.77	2.690	7.489	0.462
25.8	3.07	2.980	6.874	0.470
30.5	3.33	3.228	6.323	0.471
36.2	3.57	3.459	5.772	0.466
40.6	3.79	3.675	5.237	0.469
46.0	4.01	3.891	4.641	0.466
50.8	4.22	4.089	3.936	0.474
Mean C _e				0.466
Class				1



A 'trendline' for the above graph would follow $y = 2.7902x^{2.0571}$

3.3 COEFFICIENT OF DISCHARGE

Manufacturer Renson Ventilation NV

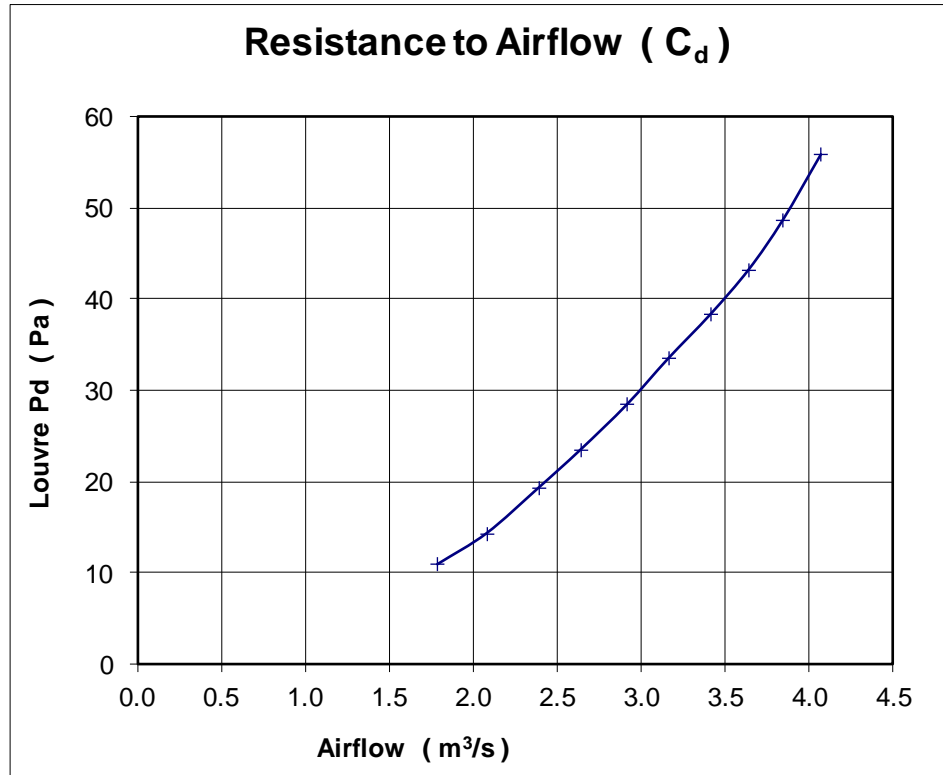
Date 03/02/2020

Model 480 - 483 - L.060HF - No Insect Mesh, No
Water Gutter

Contract 101232

Air Temperature	15.2	°C	Core Area Height	970	mm
Barometer	1006	mbar	Core Area Width	1000	mm
Air Density	1.211	kg/m ³	Core Area Area	0.970	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	
10.9	1.85	1.791	9.313	0.438
14.3	2.15	2.084	8.692	0.443
19.2	2.46	2.389	8.195	0.445
23.4	2.72	2.641	7.716	0.443
28.4	3.01	2.920	7.206	0.439
33.4	3.26	3.164	6.644	0.440
38.3	3.52	3.419	6.031	0.438
43.2	3.76	3.647	5.463	0.437
48.6	3.97	3.849	4.715	0.442
55.8	4.20	4.076	4.116	0.435
Mean C _d				0.440
Class				1



A 'trendline' for the above graph would follow $y = 3.421x^{1.9730}$

APPENDIX A: MANUFACTURER'S DRAWING

