Weather Louvre Test

L.050IM1

Carried out for

nv Renson Ventilation sa

Report 61220/3

Compiled by Paul Ainscoe

5 December 2018

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Weather Louvre Test

L.050IM1

Carried out for: nv Renson Ventilation sa
Maalbeekstraat 6
8790 - Waregem
Belgium

Contract: Report 61220/3

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QUALITY ASSURANCE

Issue	Date	Compiled by:	Approved by:	Signature
Draft	*05-Dec-2018*	*Paul Ainscoe*	*Mark Roper*	
		Test Engineer	*Principal Test Engineer*	

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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 Coefficients of Discharge and Entry, using the test methods contained within 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 nv Renson Ventilation sa and was carried out at BSRIA North on 23 to 24 August 2018.

Items received for test

Test Item	BSRIA ID
L.050IM1	61220A3

1.1 TEST ITEM INFORMATION

Contract		61220
Date		20-8-18
Manufacturer		nv Renson Ventilation sa
Louvre Model		L.050IM1
Material		Aluminium
Painted		No
Core Area Height		975 mm
Core Area Width		995 mm
Blade Pack Depth		41 mm
Frame Depth		50 mm
No. of Blades		19
Blade Pitch		50 mm
Blade Angle		45° approx.
No. of Banks		1
Guard Type		None
Guard Spacing		N/A
Side Channels		No
Water Drip Tray		No
Blade Orientation		Horizontal

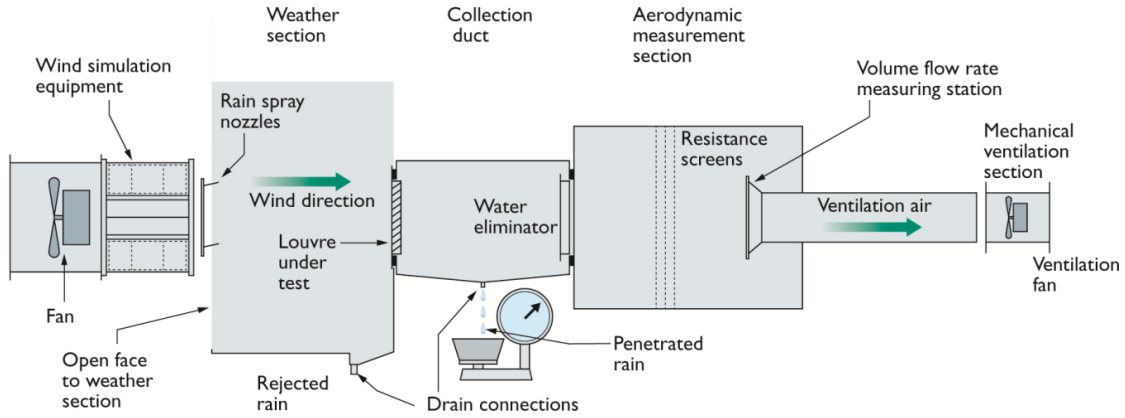
Note: Weather louvre core area - product of the minimum height H and minimum width W of the front opening in the weather louvre assembly with the louvre blades removed
Blade Pack Depth refers to the distance from front of first bank to rear of last bank.

Figure 1 Test item 61220A3 (front)

Figure 2 Test item 61220A3 (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. 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 EQUIPTMENT USED

Test equipment	BSRIA ID	Calibration Expiry Date
Water supply measurement	352	19-4-19
Rain measuring system	353	20-4-19
Airflow cones	364	17-1-19
Micromanometer	1600	21-12-18
Micromanometer	1601	21-12-18
Scales (water)	1599	26-6-19
Flow meter	1688	29-5-19

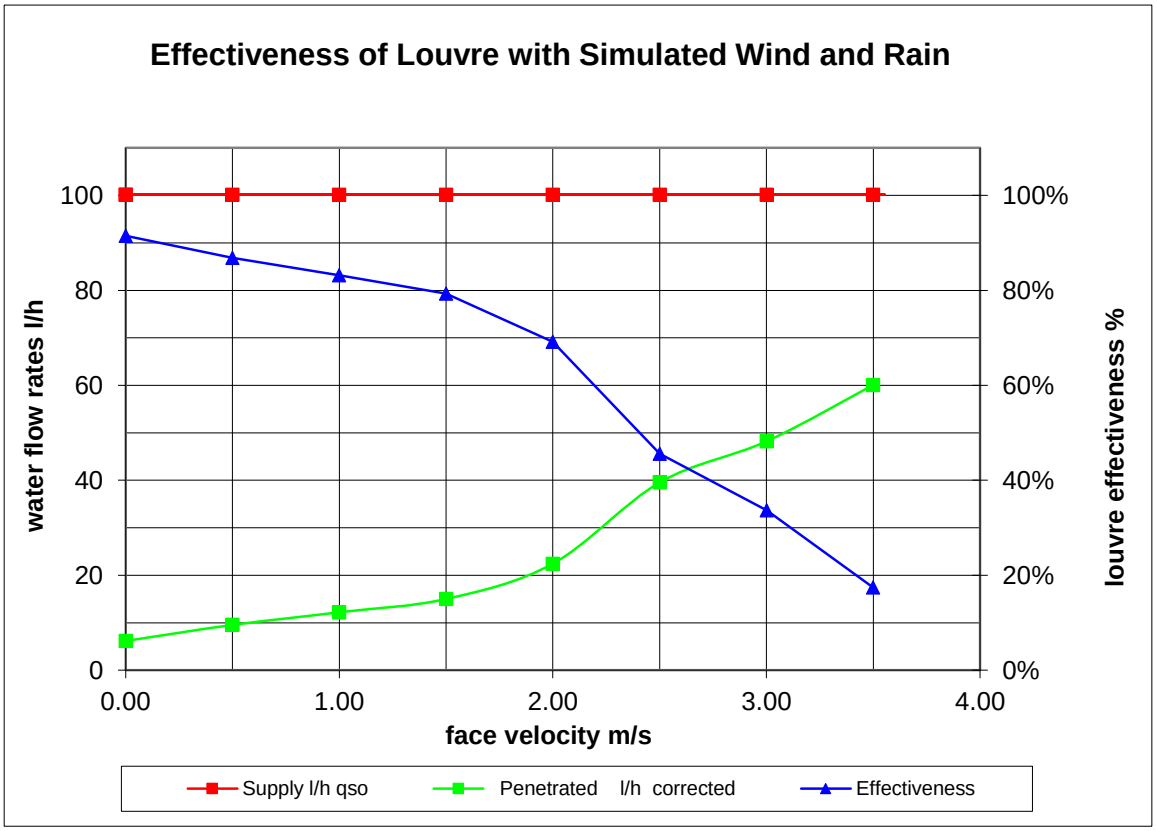
3 RESULTS

3.1 RAINWATER PENETRATION

MANUFACTURER nv Renson Ventilation sa Date 23/08/2018
MODEL L.050IM1 Contract 61220

			louvre height	975	mm
Simulated rainfall	75	mm/hr	louvre width	995	mm
Wind speed	13.0	m/s	louvre 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	100.2	6.2	91.5%	C
0.48	0.50	100.2	9.6	86.9%	C
0.97	1.00	100.2	12.2	83.2%	C
1.46	1.50	100.2	15.0	79.3%	D
1.94	2.00	100.2	22.4	69.1%	D
2.43	2.50	100.2	39.6	45.6%	D
2.91	3.00	100.2	48.2	33.7%	D
3.39	3.50	100.2	60.0	17.5%	D

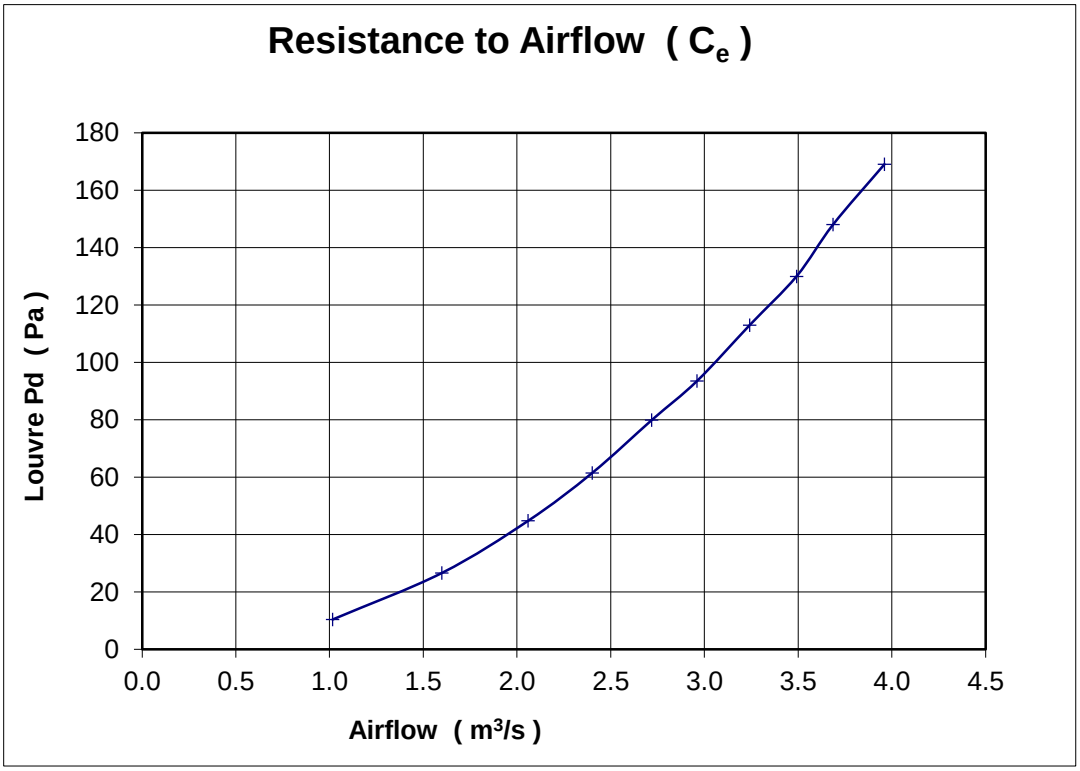


3.2 COEFFICIENT OF ENTRY

MANUFACTURER nv Renson Ventilation sa Date 24/08/2018
MODEL L.050IM1 Contract 61220

air temperature	17.4	°C	louvre height	975	mm
barometer	1005	mbar	louvre width	995	mm
air density	1.201	kg/m^3	louvre area	0.970	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_e
10.4	1.05	1.016	4.038	0.252
26.6	1.65	1.598	6.458	0.247
44.8	2.12	2.059	8.381	0.246
61.5	2.48	2.402	9.819	0.245
79.9	2.80	2.719	11.192	0.243
93.5	3.05	2.960	12.107	0.245
113.0	3.34	3.242	13.310	0.244
130.0	3.60	3.492	14.276	0.245
148.0	3.80	3.687	15.232	0.242
169.0	4.08	3.961	16.277	0.243
			mean C_e	0.245
			Class	3



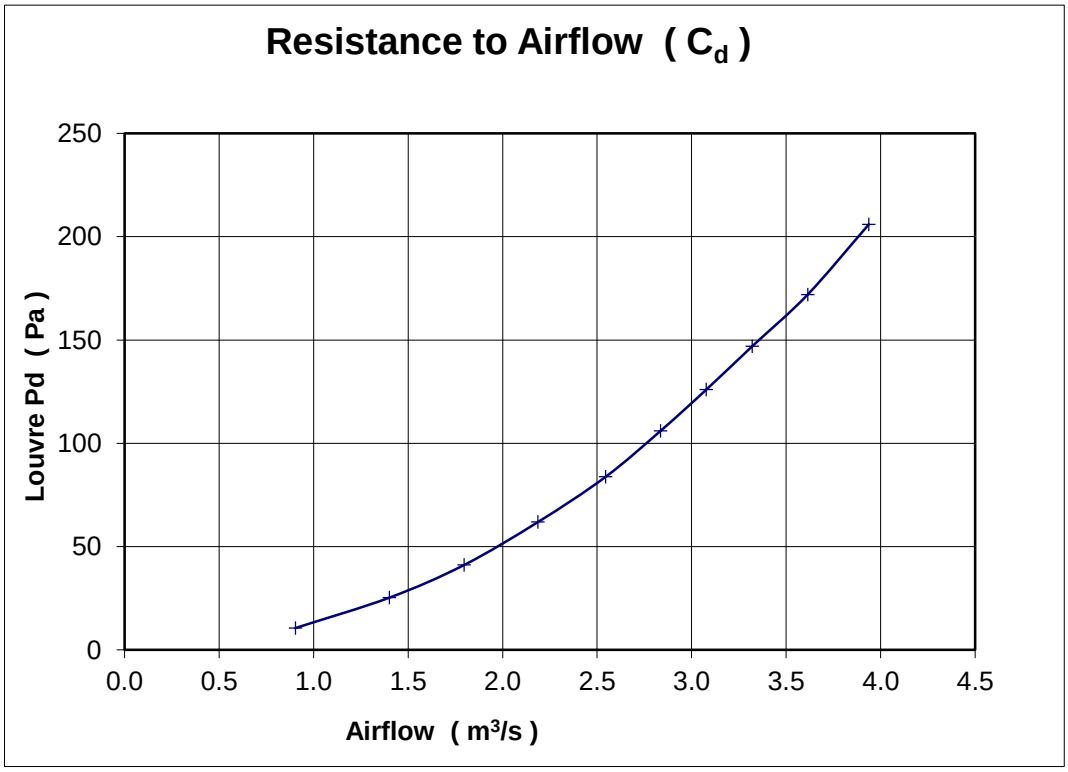
A 'trendline' for the above graph would follow $y = 10.155x^{2.0488}$

3.3 COEFFICIENT OF DISCHARGE

MANUFACTURER nv Renson Ventilation sa Date 24/08/2018
MODEL L.050IM1 Contract 61220

air temperature	17.6	°C	louvre height	975	mm
barometer	1005	mbar	louvre width	995	mm
air density	1.200	kg/m^3	louvre area	0.970	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_d
10.7	0.93	0.904	4.097	0.221
25.4	1.44	1.401	6.313	0.222
41.2	1.85	1.796	8.040	0.223
62.0	2.25	2.188	9.863	0.222
83.8	2.62	2.544	11.466	0.222
106.0	2.92	2.835	12.896	0.220
126.0	3.17	3.077	14.060	0.219
147.0	3.42	3.321	15.187	0.219
172.0	3.73	3.614	16.427	0.220
206.0	4.06	3.938	17.978	0.219
			mean C_d	0.221
			Class	3



A 'trendline' for the above graph would follow $y = 12.898x^{2.0178}$

APPENDIX A: MANUFACTURERS DRAWING