

Weather Louvre Test

L.075HF-457 (mesh 6x6, no water channel)

Carried out for
nv Renson Ventilation sa

Report 61220/1

Compiled by Paul Ainscoe

5 December 2018



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L.075HF-457 (mesh 6x6, no water channel)

Carried out for: nv Renson Ventilation sa
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Contract: Report 61220/1 (Draft)

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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 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 20 to 21 August 2018.

Items received for test

Test Item	BSRIA ID
L.075HF-457 (mesh 6x6, no water channel)	61220A1

1.1 TEST ITEM INFORMATION

Contract	61220
Date	20-8-18
Manufacturer	nv Renson Ventilation sa
Louvre Model	L.075HF-457 (mesh 6x6, no water channel)
Material	Aluminium
Painted	No
Core Area Height	995 mm
Core Area Width	1000 mm
Blade Pack Depth	55 mm
Frame Depth	65 mm
No. of Blades	13
Blade Pitch	75 mm
Blade Angle	45° approx.
No. of Banks	1
Guard Type	Bird
Guard Spacing	10 mm
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.

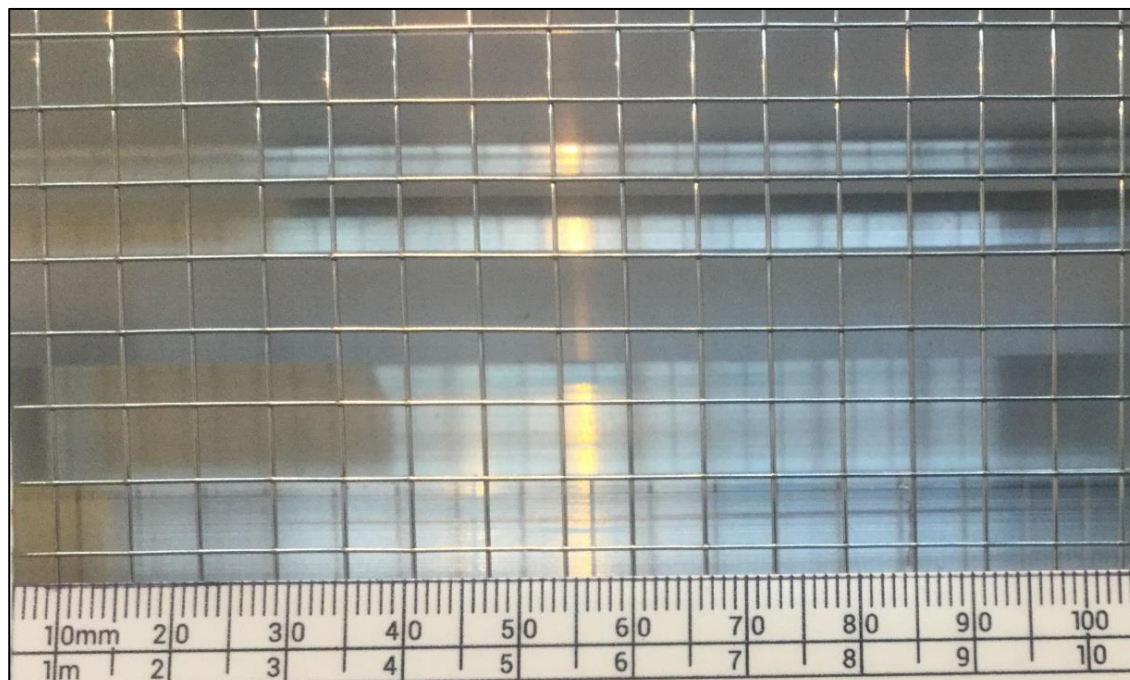
Figure 1 Test item 61220A1 (front)



Figure 2 Test item 61220A1 (rear)

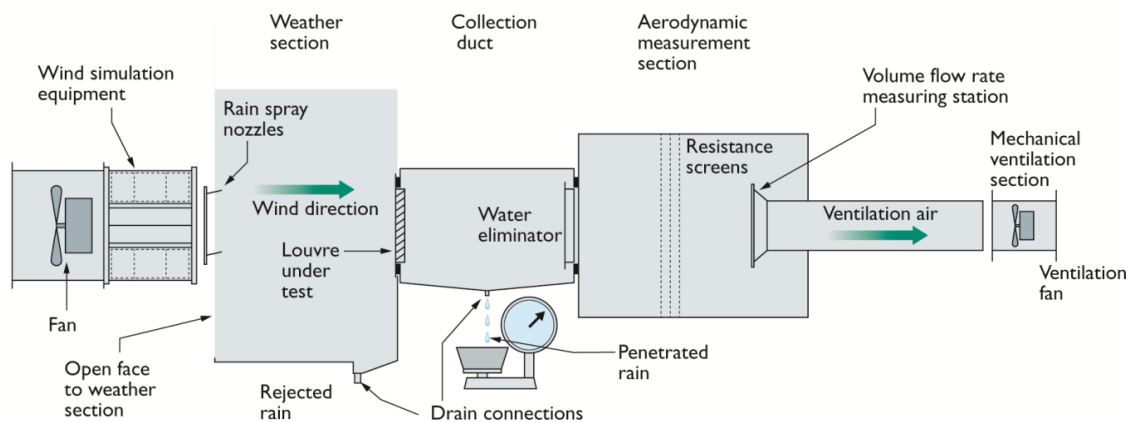


Figure 3 Close-up of guard



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. 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
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

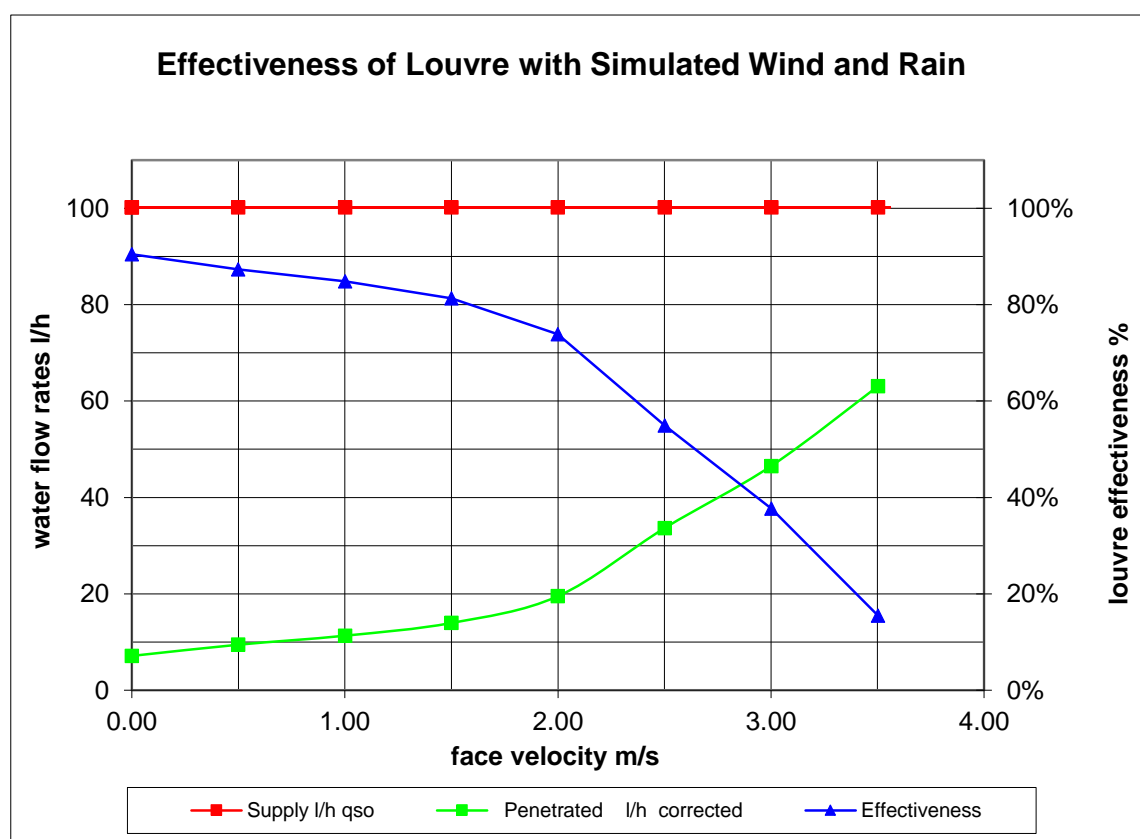
MANUFACTURER nv Renson Ventilation sa
 MODEL L.075HF-457
 (mesh 6x6, no water channel)

Date 21/08/2018
 Contract 61220

Simulated rainfall 75 mm/hr
 Wind speed 13.0 m/s

louvre height 995 mm
 louvre width 1000 mm
 louvre area 0.995 m²

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	7.1	90.4%	C
0.50	0.50	100.2	9.5	87.3%	C
1.00	1.00	100.2	11.3	84.8%	C
1.49	1.50	100.2	14.0	81.3%	C
1.99	2.00	100.2	19.5	73.9%	D
2.49	2.50	100.2	33.7	54.9%	D
2.99	3.00	100.2	46.5	37.7%	D
3.48	3.50	100.2	63.1	15.5%	D



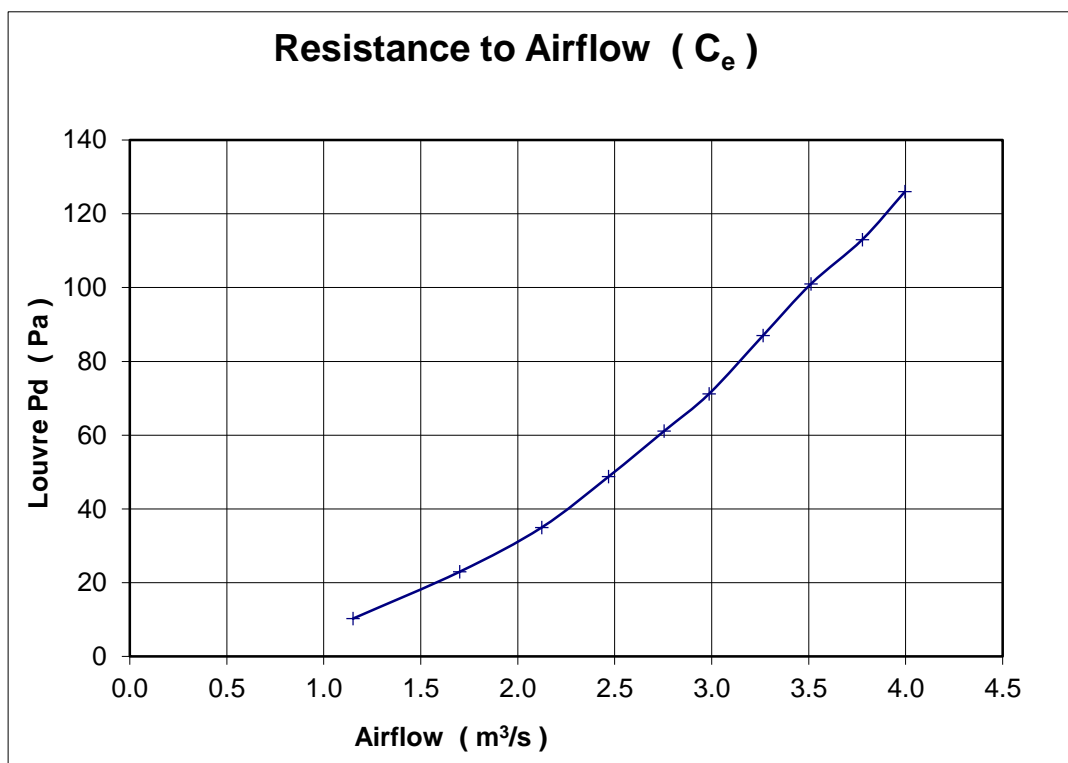
3.2 COEFFICIENT OF ENTRY

MANUFACTURER nv Renson Ventilation sa
 MODEL L.075HF-457
 (mesh 6x6, no water channel)

Date 20/08/2018
 Contract 61220

air temperature	18.5 °C	louvre height	995 mm
barometer	1013 mbar	louvre width	1000 mm
air density	1.205 kg/m ³	louvre area	0.995 m ²

louvre pd Pascals	louvre face velocity	air flow rate		coefficient C _e
	m/s	test m ³ /s	theoretical m ³ /s	
10.3	1.16	1.150	4.113	0.280
23.0	1.71	1.701	6.147	0.277
35.0	2.13	2.124	7.583	0.280
48.8	2.48	2.469	8.954	0.276
61.1	2.77	2.754	10.019	0.275
71.2	3.00	2.987	10.815	0.276
87.0	3.28	3.265	11.955	0.273
101.0	3.53	3.512	12.881	0.273
113.0	3.80	3.777	13.625	0.277
126.0	4.02	3.997	14.387	0.278
mean C _e				0.276
Class				3



A 'trendline' for the above graph would follow $y = 7.7879x^{2.0239}$

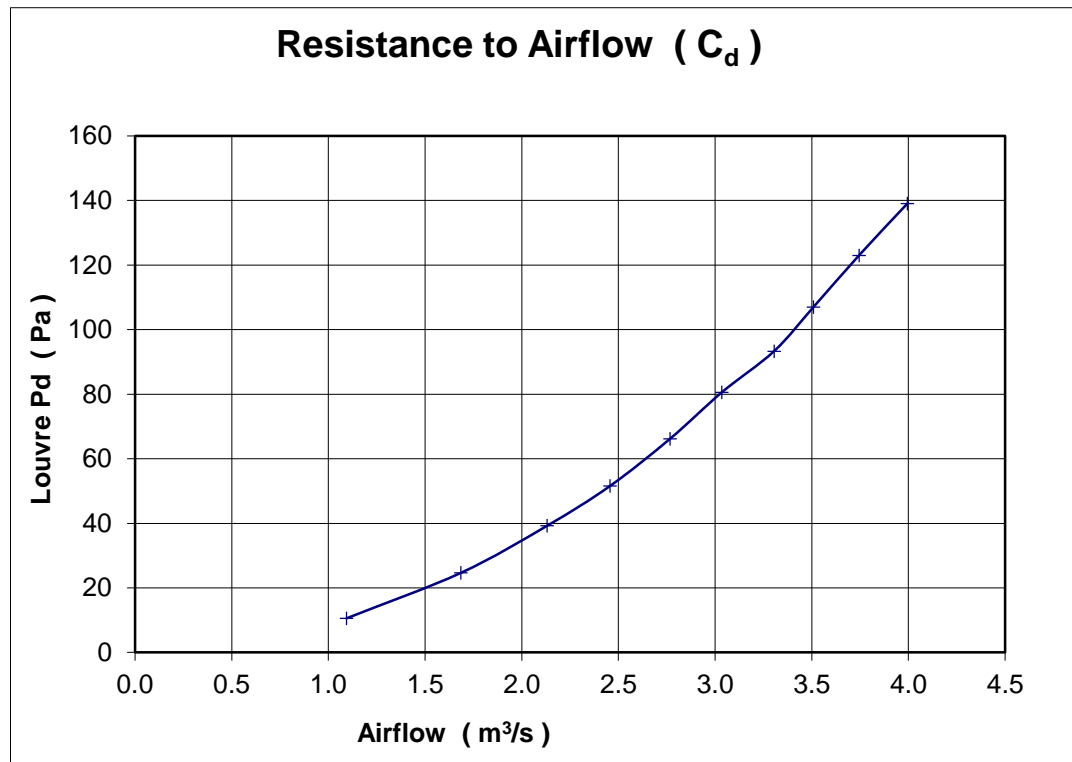
3.3 COEFFICIENT OF DISCHARGE

MANUFACTURER nv Renson Ventilation sa
 MODEL L.075HF-457
 (mesh 6x6, no water channel)

Date 20/08/2018
 Contract 61220

air temperature 18.8 °C louvre height 995 mm
 barometer 1013 mbar louvre width 1000 mm
 air density 1.204 kg/m³ louvre area 0.995 m²

louvre pd Pascals	louvre face velocity	air flow rate		coefficient C _d
	m/s	test m ³ /s	theoretical m ³ /s	
10.6	1.10	1.093	4.175	0.262
24.7	1.69	1.685	6.373	0.264
39.3	2.14	2.132	8.038	0.265
51.6	2.47	2.457	9.211	0.267
66.2	2.78	2.767	10.433	0.265
80.6	3.05	3.035	11.512	0.264
93.3	3.32	3.305	12.385	0.267
107.0	3.53	3.509	13.264	0.265
123.0	3.76	3.745	14.221	0.263
139.0	4.01	3.994	15.117	0.264
mean C _d				0.265
Class				3



A 'trendline' for the above graph would follow $y = 8.7708x^{1.9899}$

APPENDIX A: MANUFACTURERS DRAWING

