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test report
ORIGINAL REPORT in attachment

TESTRAPPORT 61220/2 ENGLISH TRANSLATION

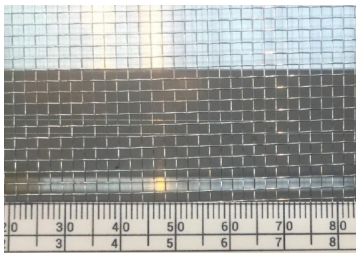
According to EN 13030: 2001: "Ventilation of buildings - Grilles - Performance testing of air grilles subjected to simulated rain"

L.075HF-457
(mesh 2.3x2.3, with water channel)

carried out by : BSRIA Ltd
Old Bracknell West, Bracknell
Berkshire RG12 7AH (Engeland)

commissioned by : nv RENSON Sunprotection-Projects sa
Maalbeekstraat 10
8790 Waregem (België)

Date of issue : 5 December 2018



Close-up of guard

TEST INFORMATION

Contract	**61220**
Date	20-8-18
Manufacturer	nv Renson Ventilation sa
Louvre Model	L.075HF-457 (mesh 2.3x2.3, with water channel)
Material	Aluminium
Painted	No
Blade Height	995 mm
Blade Width	1000 mm
Blade Depth	52 mm
Frame Depth	65 mm
No. of Blades	13
Blade Pitch	75 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

60554A3 (front)

59126A7 (back)

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.

INTRODUCTION

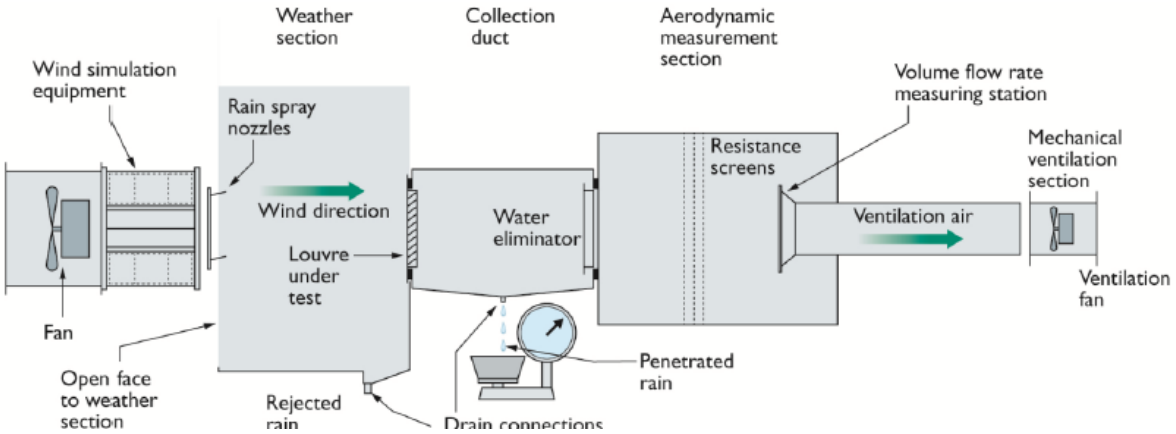
This report concerns tests conducted on a louvre to determine the Rainwater Penetration and the Pressure Drop versus Airflow Curves, with the associated Coefficients of Discharge and Entry, using the test methods contained within EN 13030:2001. It should be noted that BS EN 13030:2001 simply provides 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
481/L.050HF	60554A3

TEST METHOD

A schematic representation of the rig used during testing



The test comprises of two parts:

- **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.

- **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 give 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.

- **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

WEATHER LOUVRE TEST

Uitgevoerd in opdracht van	nv RENSON Sunprotection-Projects sa Industriezone 2 Vijverdam Maalbeekstraat 10 8790 Waregem België
Contract :	**Report 61220/2**
Datum :	**05-Dec-2018**
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Compiled by:	Approved by:
Naam : Andrew Freeth	Naam : Mark Roper
Titel : Senior Testingenieur	Titel : Hoofd Testingenieur

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RAINWATER PENETRATION

MANUFACTURER nv Renson Ventilation sa
MODEL L.075HF-457
(mesh 2.3x2.3, with water channel)

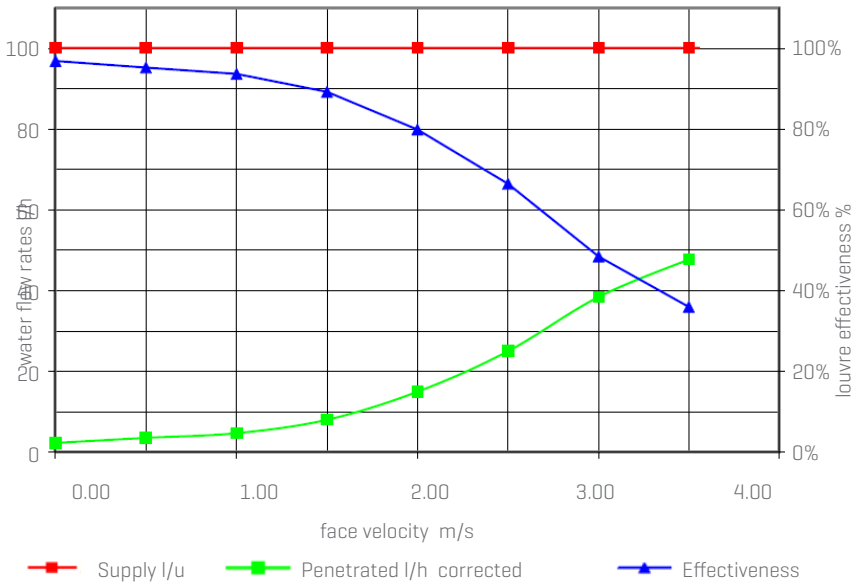
Date 21/08/2018
Contract 61220

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 m3/s	Velocity m/s	Supply l/u	Penetrated l/u		
0,00	0,00	100,2	2,3	96,9 %	B
0,50	0,50	100,2	3,5	95,2 %	B
1,00	1,00	100,2	4,7	93,7 %	C
1,49	1,50	100,2	8,0	89,2 %	C
1,99	2,00	100,2	15,0	79,9 %	D
2,49	2,50	100,2	25,0	66,5 %	D
2,99	3,00	100,2	38,5	48,5 %	D
3,48	3,50	100,2	47,8	36,0 %	D

Effectiveness of Louvre with Simulated Wind and Rain



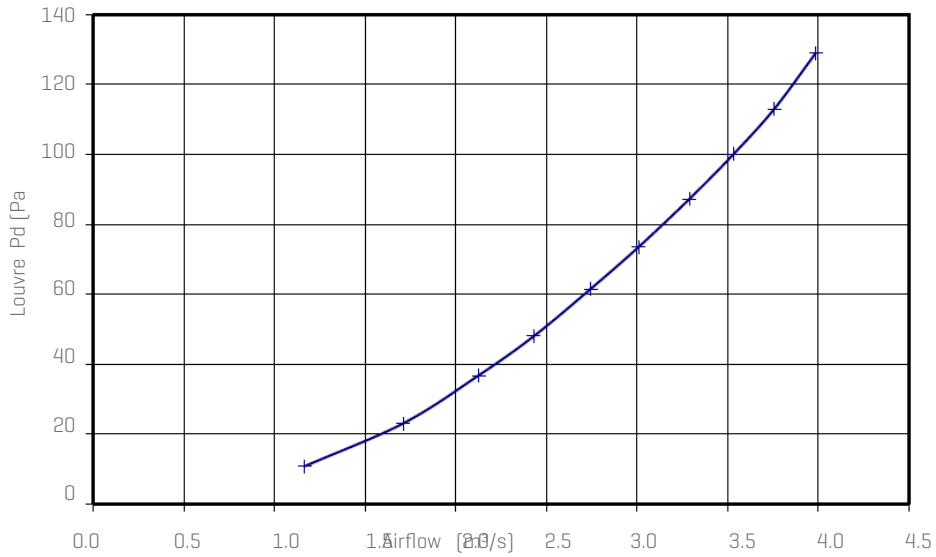
COEFFICIENT OF ENTRY

MANUFACTURER	nv Renson Ventilation sa	Date	20/08/2018
MODEL	L.075HF-457 (mesh 2.3x2.3, with water channel)	Contract	61220

air temperature	19 °C	louvre height	995 mm
barometer	1013 mbar	louvre width	1000 mm
air density	1.203 kg/m3	louvre area	0.995 m2

	louvre face velocity	air flow rate		
louvre pd Pascal	**m/s**	**Test m³/s**	**theoretical m³/s**	**Coëfficiënt Ce**
10,7	1,17	1,163	4,196	0,277
23,0	1,72	1,709	6,152	0,278
36,7	2,14	2,125	7,771	0,273
48,0	2,44	2,432	8,887	0,274
61,5	2,76	2,745	10,059	0,273
73,5	3,03	3,010	10,997	0,274
87,3	3,31	3,292	11,985	0,275
100,0	3,55	3,533	12,827	0,275
113,0	3,78	3,759	13,635	0,276
129,0	4,01	3,988	14,569	0,274
			Ce moyen	0,275
			Classe	3

Resistance to Airflow (C_e)



A 'trendline' for the above graph would follow y = 6.8074x1.9559

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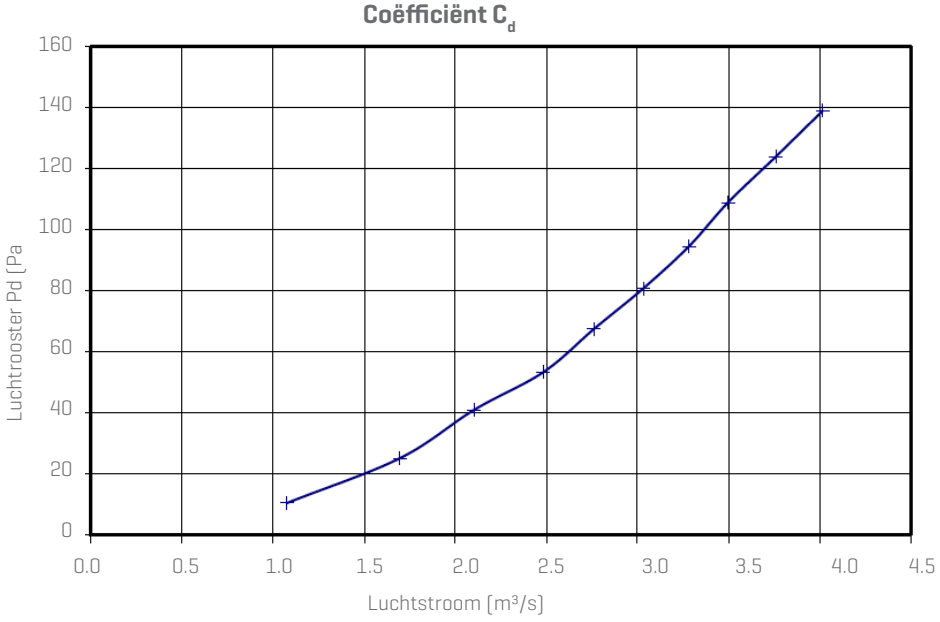
COEFFICIENT OF DISCHARGE

MANUFACTURER	nv Renson Ventilation sa	Date	20/08/2018
MODEL	L.075HF-457 (mesh 2.3x2.3, with water channel)	Contract	61220

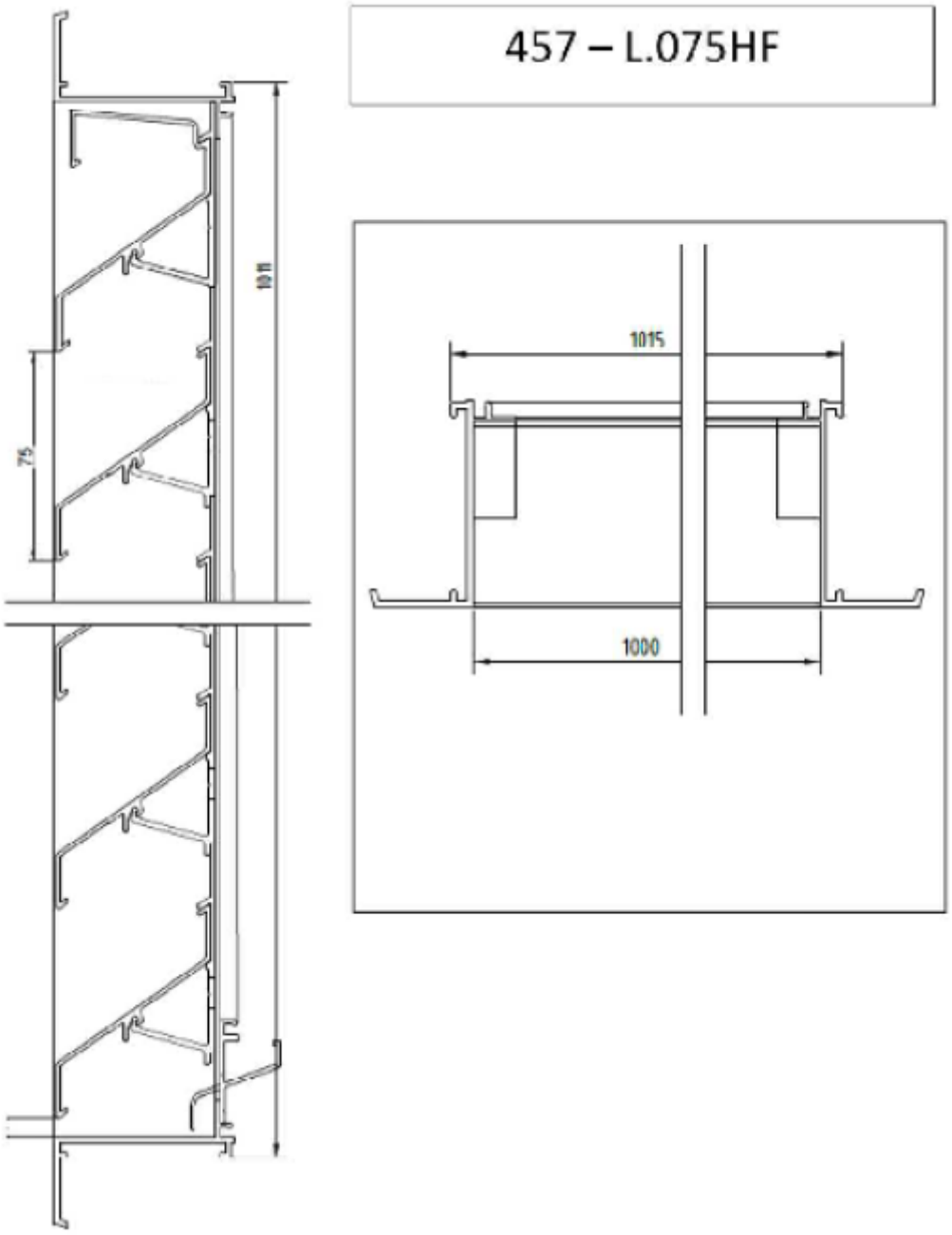
air temperature	19.2 °C	louvre height	995 mm
barometer	1014 mbar	louvre width	1000 mm
air density	1.203 kg/m3	louvre area	0.995 m2

	louvre face velocity	air flow rate		
louvre pd Pascal	**m/s**	**Test m³/s**	**theoretical m³/s**	**Coëfficiënt Ce**
10,5	1,08	1,076	4,157	0,259
25,2	1,71	1,697	6,441	0,263
41,0	2,11	2,103	8,215	0,256
53,4	2,50	2,484	9,376	0,265
67,6	2,78	2,763	10,549	0,262
80,8	3,05	3,032	11,533	0,263
94,6	3,30	3,283	12,479	0,263
109,0	3,52	3,498	13,395	0,261
124,0	3,78	3,760	14,287	0,263
139,0	4,04	4,017	15,126	0,266
			Cd moyen	0,262
			Classe	3



A 'trendline' for the above graph would follow y = 7.0049x1.9711

APPENDIX: A MANUFACTURER'S DRAWING



Weather Louvre Test

L.075HF-457 (mesh 2.3x2.3, with water channel)

Carried out for

nv Renson Ventilation sa

Report 61220/2

Compiled by Paul Ainscoe

5 December 2018

Weather Louvre Test

L.075HF-457 (mesh 2.3x2.3, with water channel)

Carried out for: nv Renson Ventilation sa
Maalbeekstraat 10
8790 - Waregem
Belgium

Contract: Report 61220/2

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Website: www.bsria.co.uk

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 20 to 21 August 2018.

Items received for test

Test Item	BSRIA ID
L.075HF-457 (mesh 2.3x2.3, with water channel)	61220A2

1.1 TEST ITEM INFORMATION

Contract		61220
Date		20-8-18
Manufacturer		nv Renson Ventilation sa
Louvre Model		L.075HF-457 (mesh 2.3x2.3, with water channel)
Material		Aluminium
Painted		No
Core Area Height		995 mm
Core Area Width		1000 mm
Blade Pack Depth		52 mm
Frame Depth		65 mm
No. of Blades		13
Blade Pitch		75 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.

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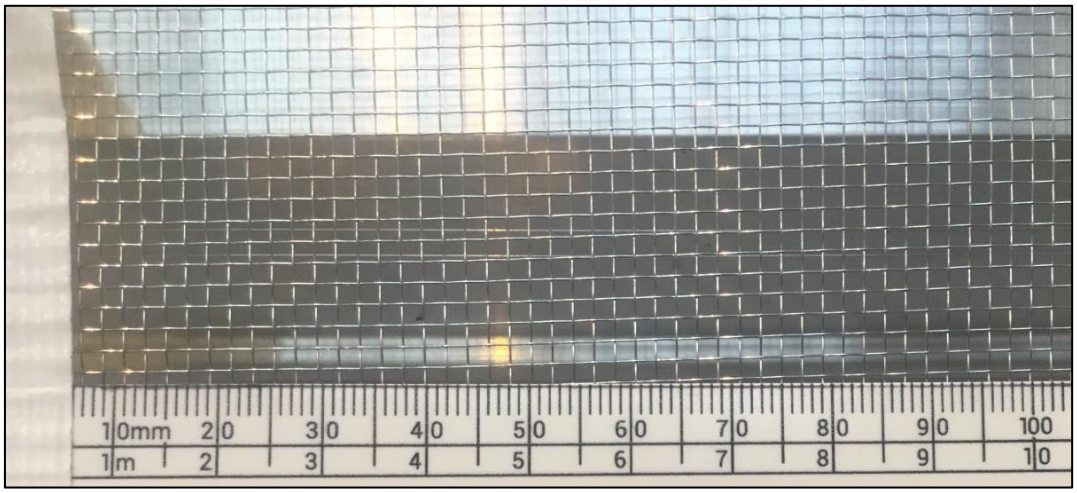
Blade Pack Depth refers to the distance from front of first bank to rear of last bank.

Figure 1 Test item 61220A2 (front)

Figure 2 Test item 61220A2 (rear)

Figure 3 Close-up of guard



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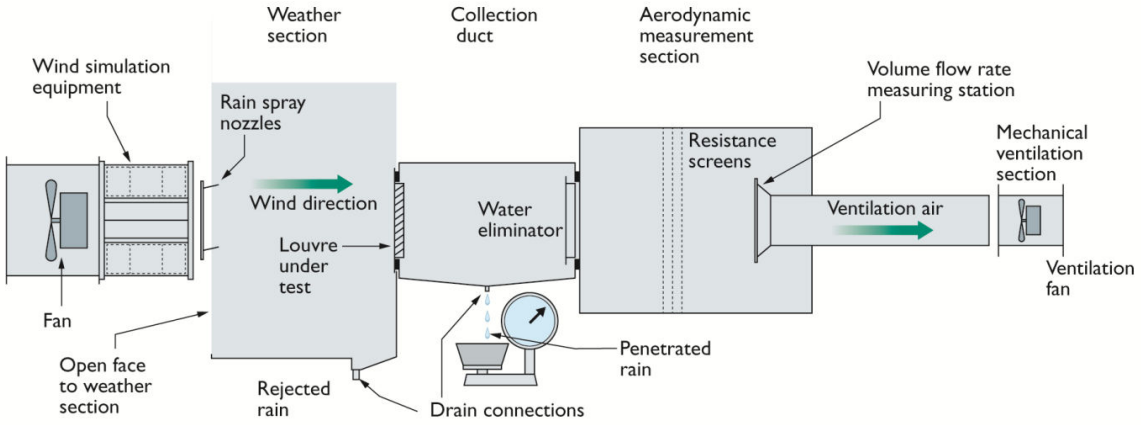
2 TEST METHOD

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

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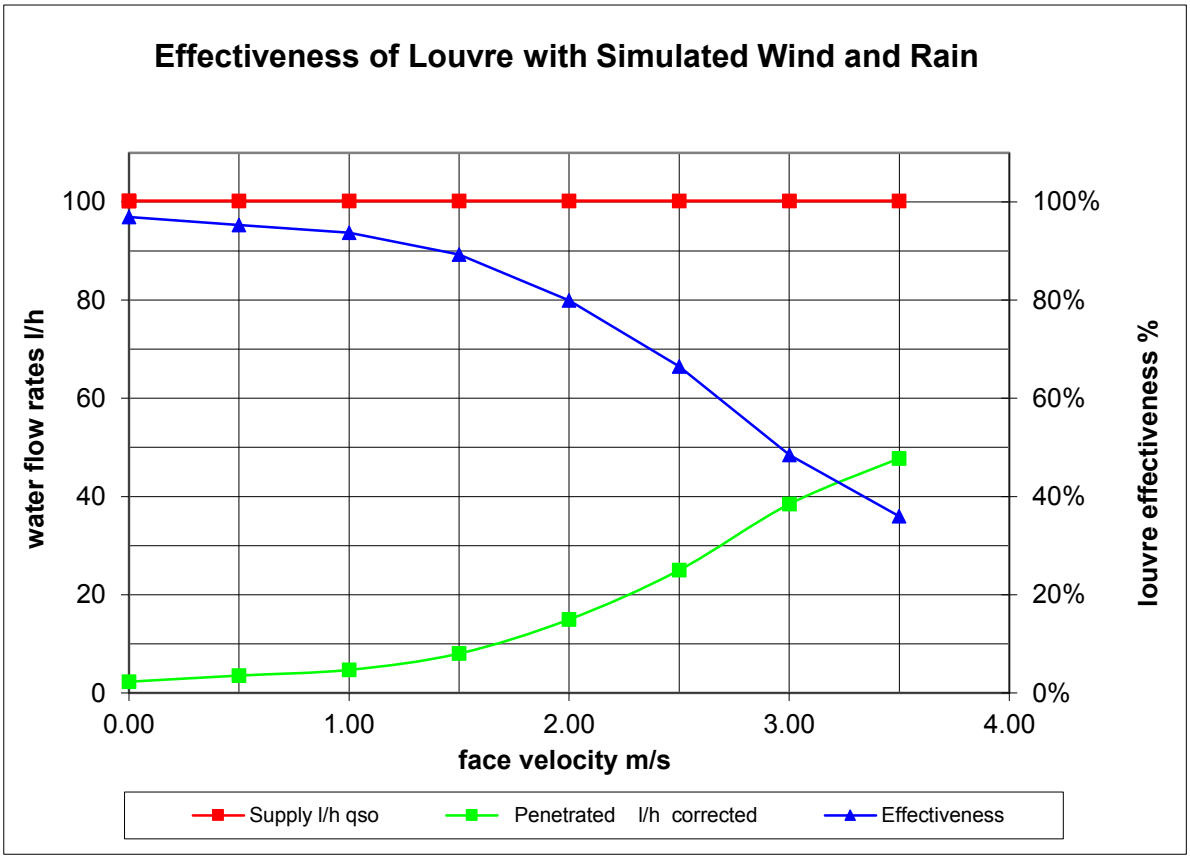
3 RESULTS

3.1 RAINWATER PENETRATION

MANUFACTURER nv Renson Ventilation sa — Date 21/08/2018
MODEL L.075HF-457 — Contract 61220
(mesh 2.3x2.3, with water channel)

			louvre height	995	mm
Simulated rainfall	75	mm/hr	louvre width	1000	mm
Wind speed	13.0	m/s	louvre area	0.995	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	2.3	96.9%	B
0.50	0.50	100.2	3.5	95.2%	B
1.00	1.00	100.2	4.7	93.7%	C
1.49	1.50	100.2	8.0	89.2%	C
1.99	2.00	100.2	15.0	79.9%	D
2.49	2.50	100.2	25.0	66.5%	D
2.99	3.00	100.2	38.5	48.5%	D
3.48	3.50	100.2	47.8	36.0%	D

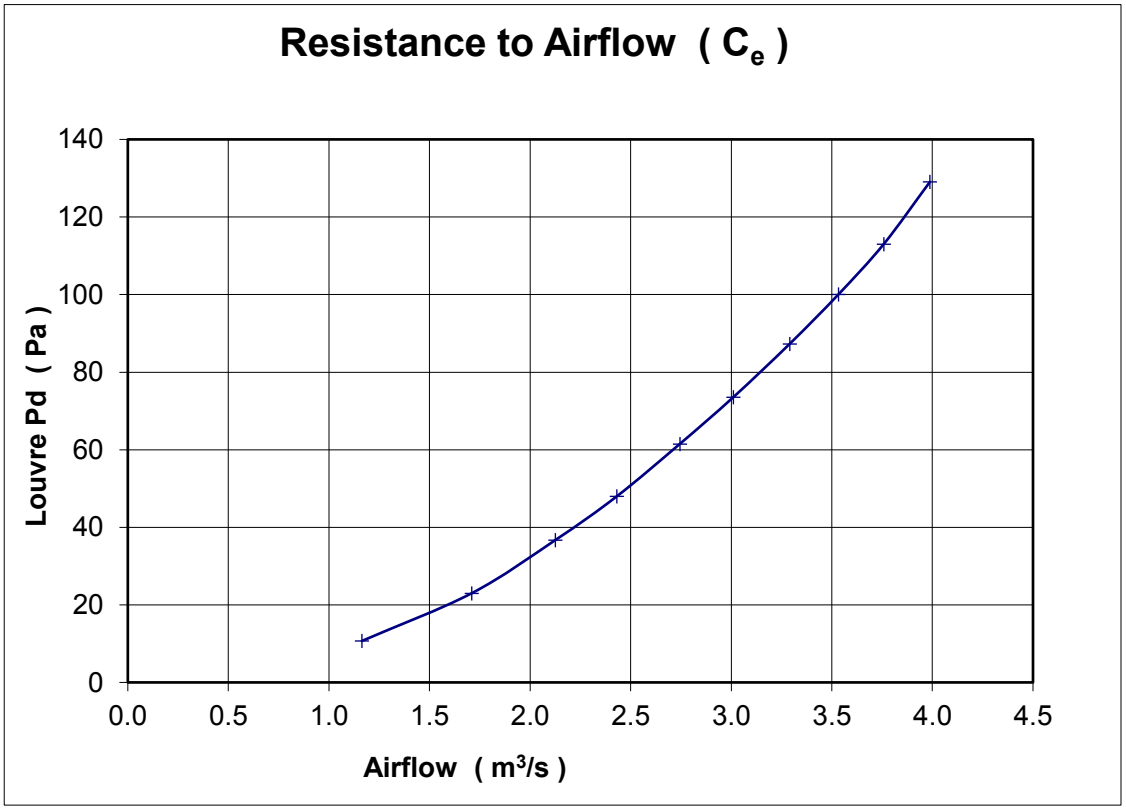


3.2 COEFFICIENT OF ENTRY

MANUFACTURER nv Renson Ventilation sa — Date 20/08/2018
MODEL L.075HF-457 — Contract 61220
(mesh 2.3x2.3, with water channel)

air temperature	19	°C	louvre height	995	mm
barometer	1013	mbar	louvre width	1000	mm
air density	1.203	kg/m^3	louvre area	0.995	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_e
10.7	1.17	1.163	4.196	0.277
23.0	1.72	1.709	6.152	0.278
36.7	2.14	2.125	7.771	0.273
48.0	2.44	2.432	8.887	0.274
61.5	2.76	2.745	10.059	0.273
73.5	3.03	3.010	10.997	0.274
87.3	3.31	3.292	11.985	0.275
100.0	3.55	3.533	12.827	0.275
113.0	3.78	3.759	13.635	0.276
129.0	4.01	3.988	14.569	0.274
			mean C_e	0.275
			Class	3



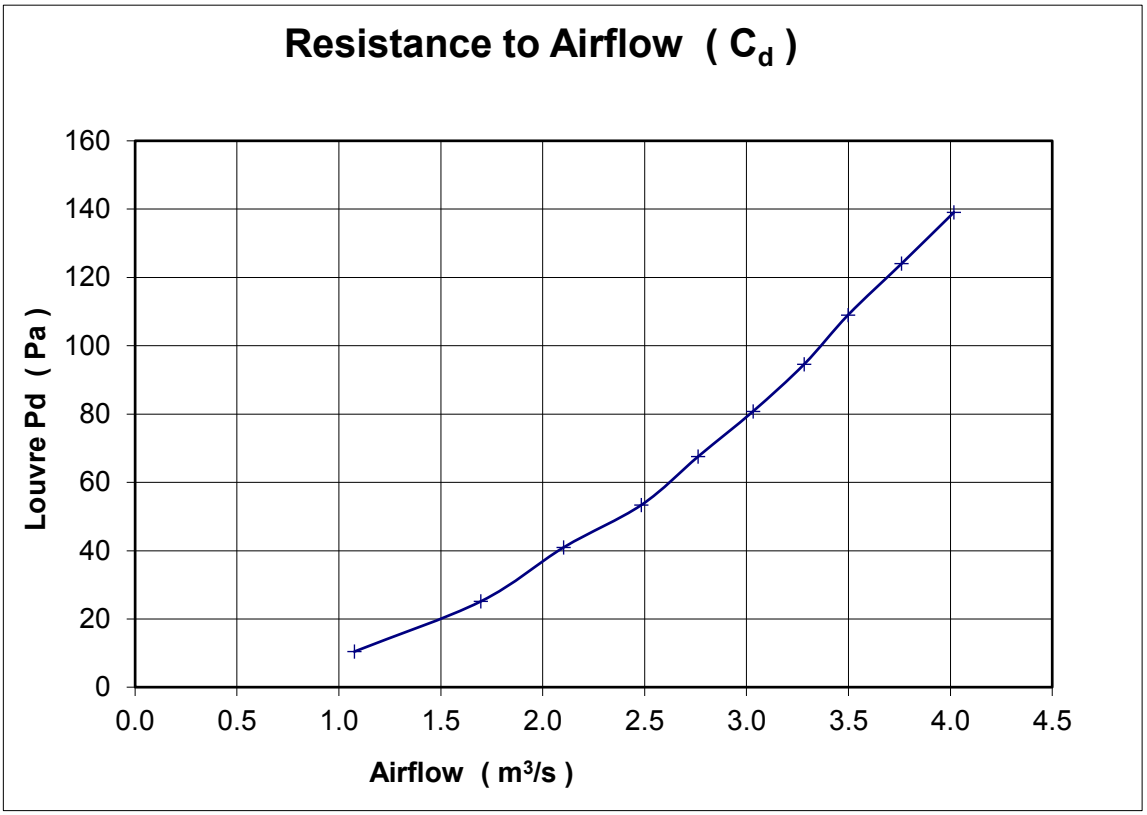
A 'trendline' for the above graph would follow y = 7.916x2.0171

3.3 COEFFICIENT OF DISCHARGE

MANUFACTURER nv Renson Ventilation sa — Date 20/08/2018
MODEL L.075HF-457 — Contract 61220
(mesh 2.3x2.3, with water channel)

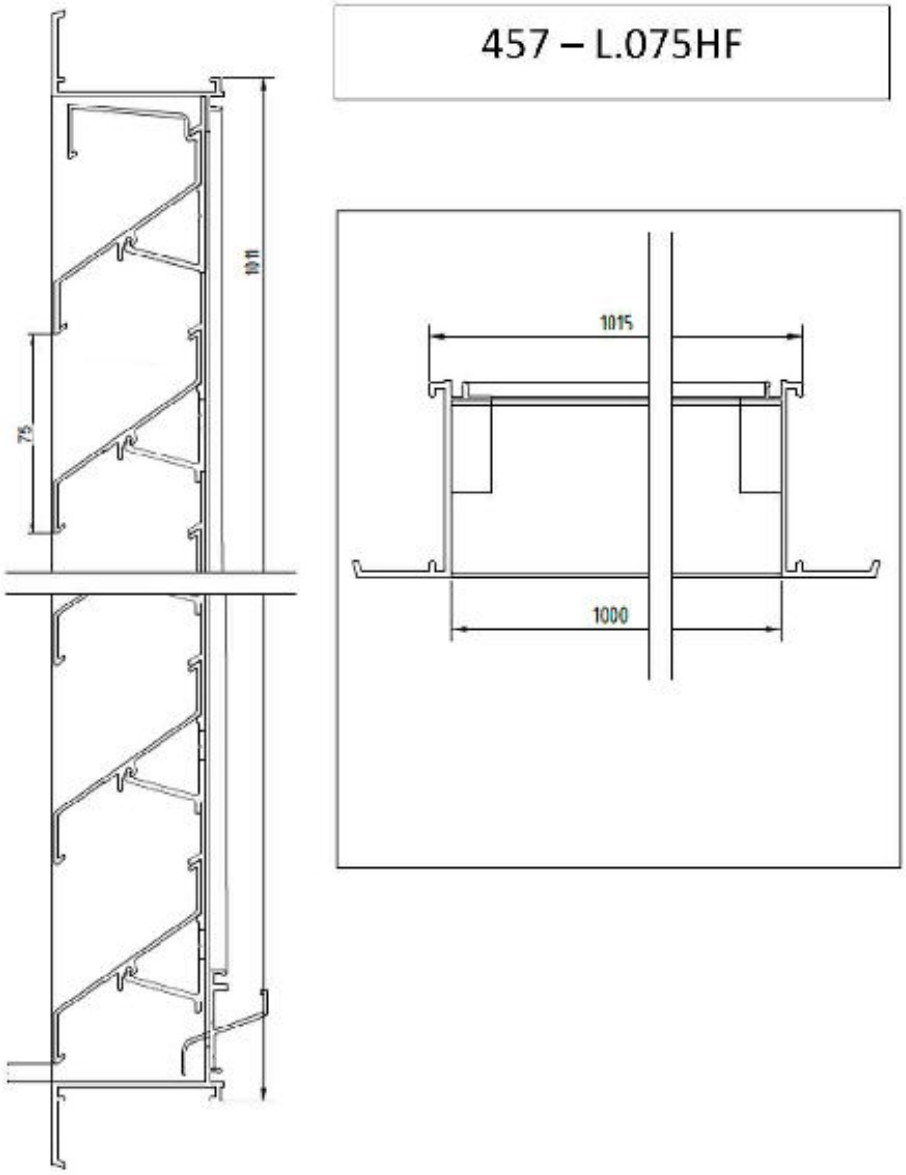
air temperature	19.2	°C	louvre height	995	mm
barometer	1014	mbar	louvre width	1000	mm
air density	1.203	kg/m^3	louvre area	0.995	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_d
10.5	1.08	1.076	4.157	0.259
25.2	1.71	1.697	6.441	0.263
41.0	2.11	2.103	8.215	0.256
53.4	2.50	2.484	9.376	0.265
67.6	2.78	2.763	10.549	0.262
80.8	3.05	3.032	11.533	0.263
94.6	3.30	3.283	12.479	0.263
109.0	3.52	3.498	13.395	0.261
124.0	3.78	3.760	14.287	0.263
139.0	4.04	4.017	15.126	0.266
			mean C_d	0.262
			Class	3



A 'trendline' for the above graph would follow $y = 9.076x^{1.9729}$

APPENDIX A: MANUFACTURERS DRAWING



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