

# Weather Louvre Test

## Linus L.120 Blades

Carried out for  
Renson Ventilation NV

Report 101477/3

Compiled by Paul Ainscoe

6 April 2020



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# Weather Louvre Test

## Linus L.120 Blades

Carried out for: Renson Ventilation NV  
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Contract: Report 101477/3

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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 and Coefficient of Discharge, 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 16 to 17 March 2020.

## Items received for test

Test Item	BSRIA ID
Linus L.120 Blades	101477A10

## 1.1 TEST ITEM INFORMATION

Contract	101477
Date	04/Mar/2020
Manufacturer	Renson Ventilation NV
Louvre Model	Linus L.120 Blades
Material	Aluminium
Painted	No
Core Area Height	1020 mm
Core Area Width	1005 mm
Blade Pack Depth	90 mm
Frame Depth	60 mm
No. of Blades	9
Blade Pitch	120 mm
Blade Angle	30° approx.
No. of Banks	1
Guard Type	None
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 101477A10 (front)**

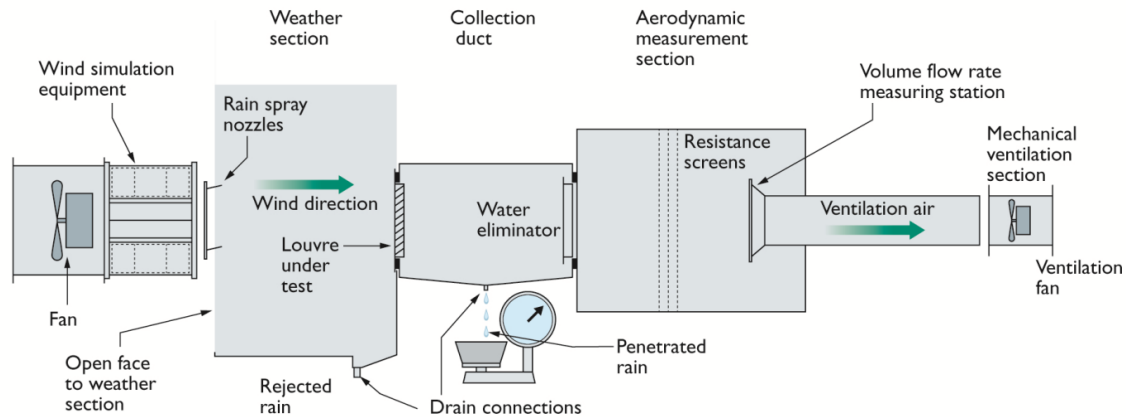


**Figure 2 Test item 101477A10 (rear)**



## 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

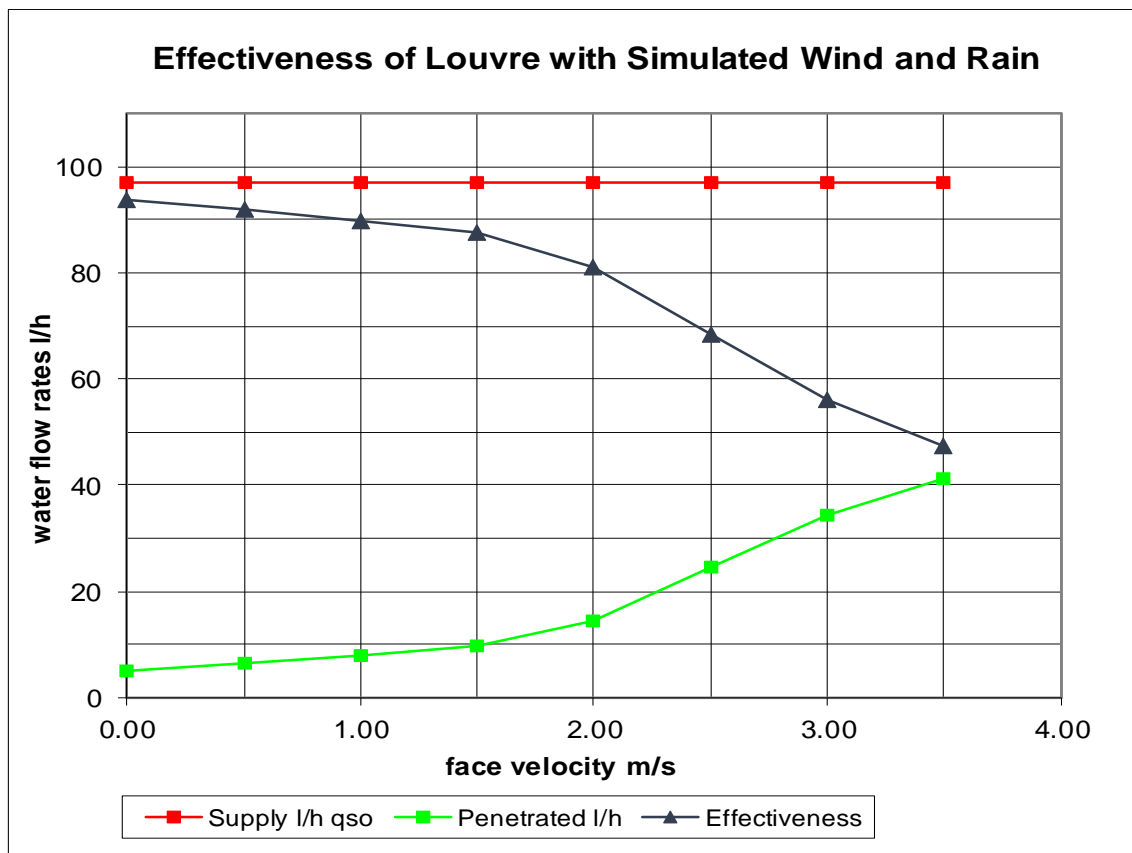
#### 3.1 RAINWATER PENETRATION

Manufacturer Renson Ventilation NV  
Model Linius L.120 Blades

Date 17/03/2020  
Contract 101477

Simulated Rainfall	75 (+10% / -0%)	mm/hr	Core Area Height	1020	mm
Wind Speed	13	m/s	Core Area Width	1005	mm
			Core Area Area	1.025	m <sup>2</sup>

Ventilation Rate		Water Flow Rates		Effectiveness %	Class
Volume m <sup>3</sup> /s	Velocity m/s	Supply l/h	Penetrated l/h		
0.00	0.00	97.2	4.9	93.6	C
0.51	0.50	97.2	6.3	91.8	C
1.03	1.00	97.2	7.8	89.9	C
1.54	1.50	97.2	9.6	87.7	C
2.05	2.00	97.2	14.6	81.2	C
2.56	2.50	97.2	24.5	68.4	D
3.07	3.00	97.2	34.3	55.9	D
3.59	3.50	97.2	41.1	47.2	D





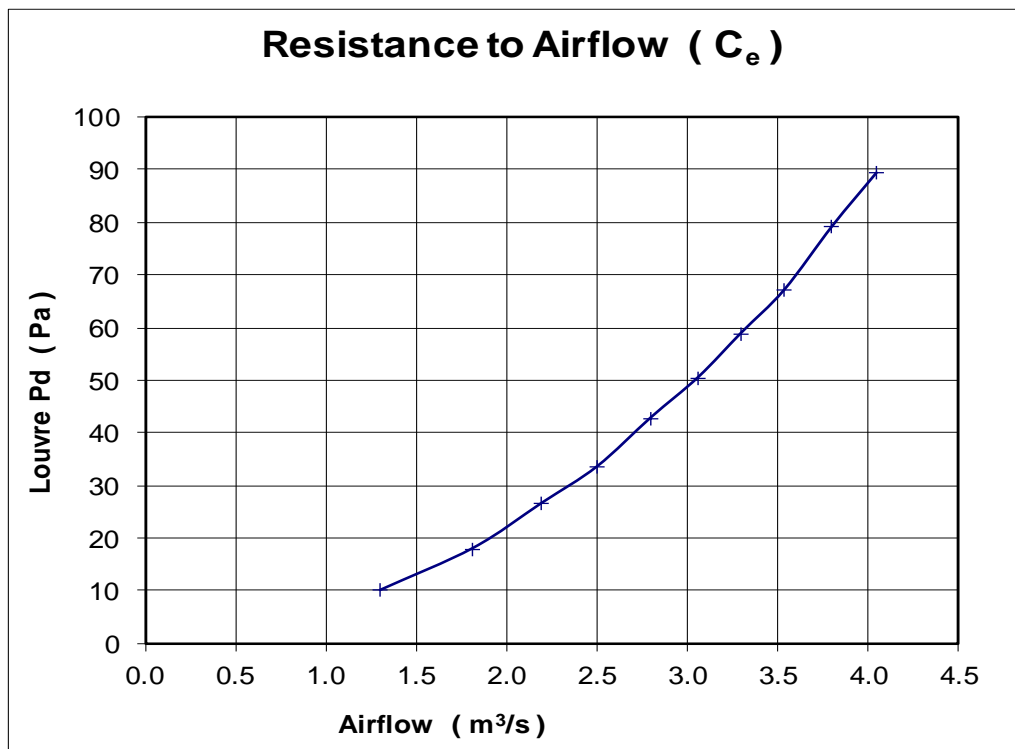
### 3.2 COEFFICIENT OF ENTRY

Manufacturer Renson Ventilation NV  
Model Linius L.120 Blades

Date 16/03/2020  
Contract 101477

Air Temperature	15.9 °C	Core Area Height	1020 mm
Barometer	1014.7 mbar	Core Area Width	1005 mm
Air Density	1.218 kg/m <sup>3</sup>	Core Area Area	1.025 m <sup>2</sup>

Louvre p.d. Pa	Louvre Face Velocity	Air Flow Rate		Coefficient C <sub>e</sub>
	m/s	Test m <sup>3</sup> /s	Theoretical m <sup>3</sup> /s	
10.0	1.26	1.296	4.154	0.312
18.0	1.77	1.811	5.573	0.325
26.5	2.14	2.189	6.762	0.324
33.5	2.44	2.498	7.603	0.329
42.8	2.73	2.795	8.593	0.325
50.5	2.98	3.059	9.335	0.328
58.9	3.21	3.296	10.081	0.327
67.1	3.45	3.535	10.760	0.329
79.2	3.71	3.800	11.690	0.325
89.3	3.95	4.044	12.413	0.326
Mean C <sub>e</sub>				0.325
Class				2



A 'trendline' for the above graph would follow  $y = 5.8434x^{1.9375}$

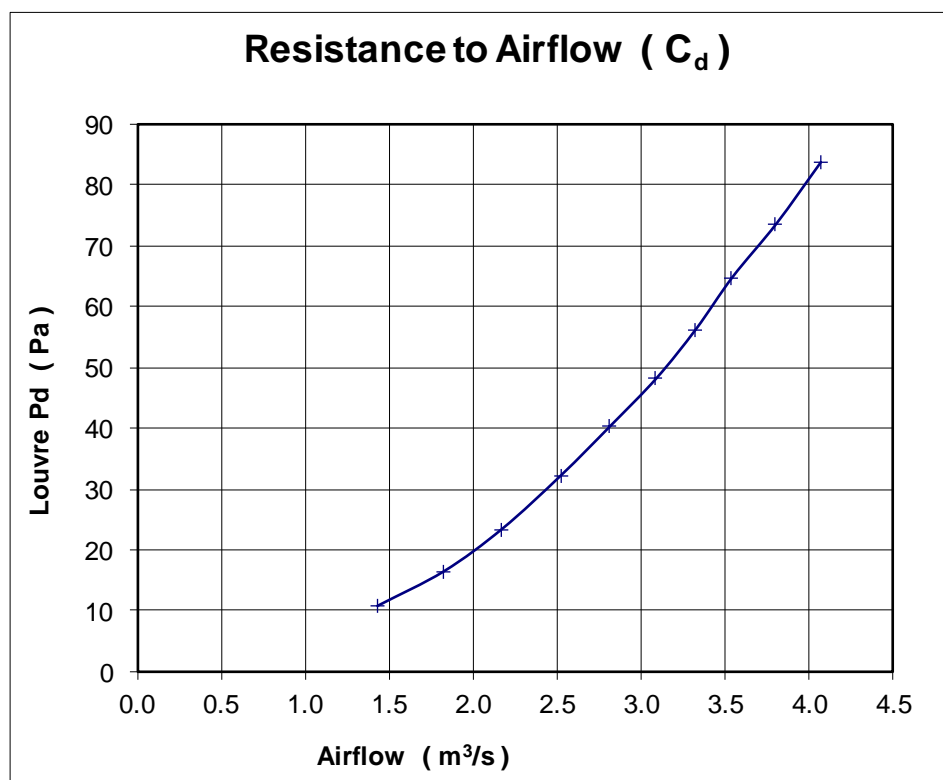
### 3.3 COEFFICIENT OF DISCHARGE

Manufacturer Renson Ventilation NV  
Model Linius L.120 Blades

Date 16/03/2020  
Contract 101477

Air Temperature	16.7 °C	Core Area Height	1020 mm
Barometer	1014.6 mbar	Core Area Width	1005 mm
Air Density	1.215 kg/m <sup>3</sup>	Core Area Area	1.025 m <sup>2</sup>

Louvre p.d. Pa	Louvre Face Velocity	Air Flow Rate		Coefficient C <sub>d</sub>
	m/s	Test m <sup>3</sup> /s	Theoretical m <sup>3</sup> /s	
10.7	1.39	1.427	4.303	0.332
16.4	1.78	1.823	5.327	0.342
23.4	2.12	2.170	6.363	0.341
32.2	2.46	2.520	7.464	0.338
40.4	2.75	2.816	8.361	0.337
48.2	3.01	3.089	9.133	0.338
56.3	3.24	3.324	9.870	0.337
64.8	3.45	3.540	10.589	0.334
73.6	3.71	3.801	11.285	0.337
83.7	3.97	4.065	12.035	0.338
Mean C <sub>d</sub>				0.337
Class				2



A 'trendline' for the above graph would follow  $y = 5.0844x^{1.9991}$

## APPENDIX A: MANUFACTURER'S DRAWING

