

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



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

Carried out for: nv Renson Ventilation sa
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Contract: Report 61220/2

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| 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.

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

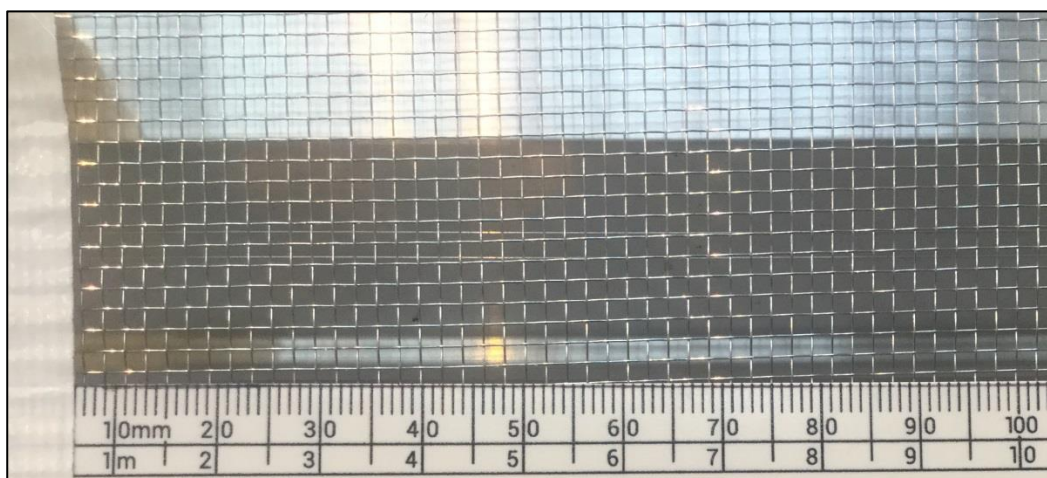
Figure 1 Test item 61220A2 (front)



Figure 2 Test item 61220A2 (rear)

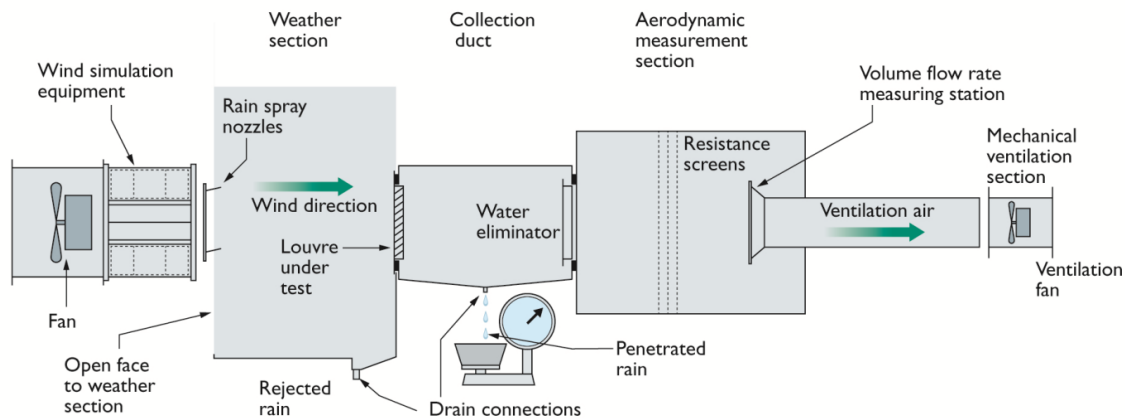


Figure 3 Close-up of guard



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 tapings 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

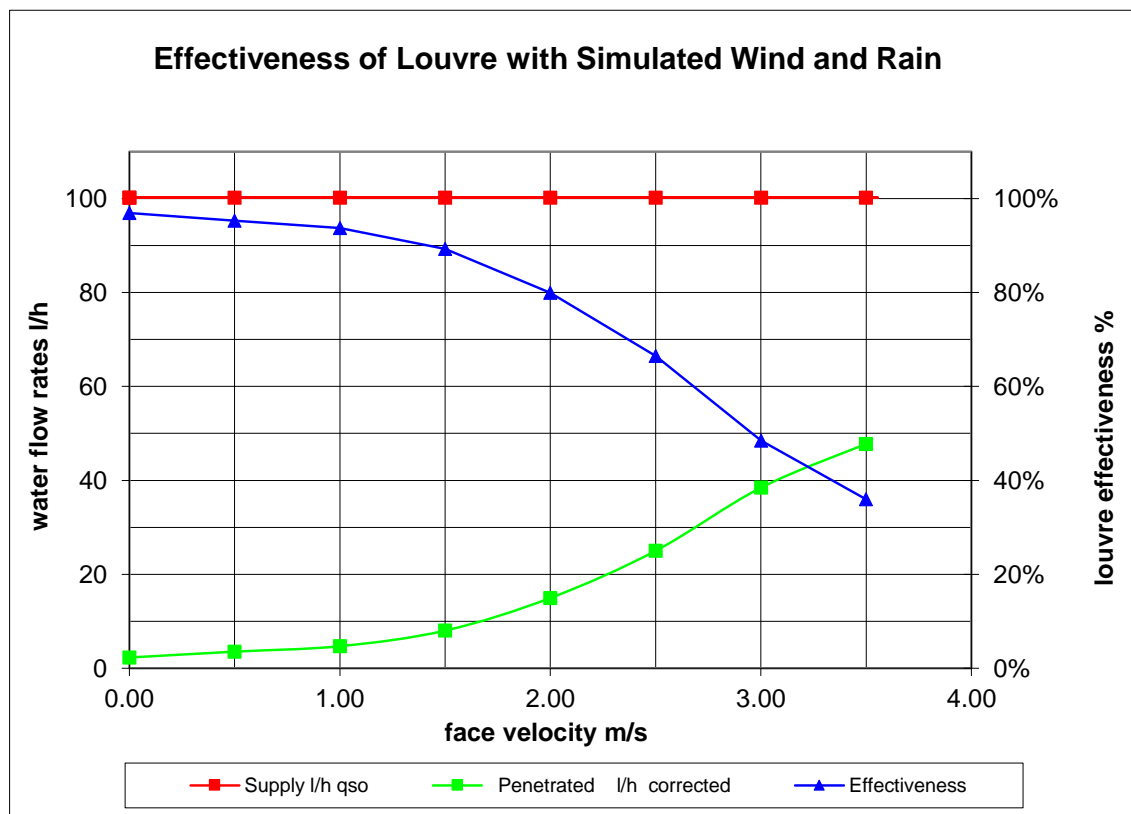
MANUFACTURER nv Renson Ventilation sa
 MODEL L.075HF-457
 (mesh 2.3x2.3, with water channel)

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 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 |



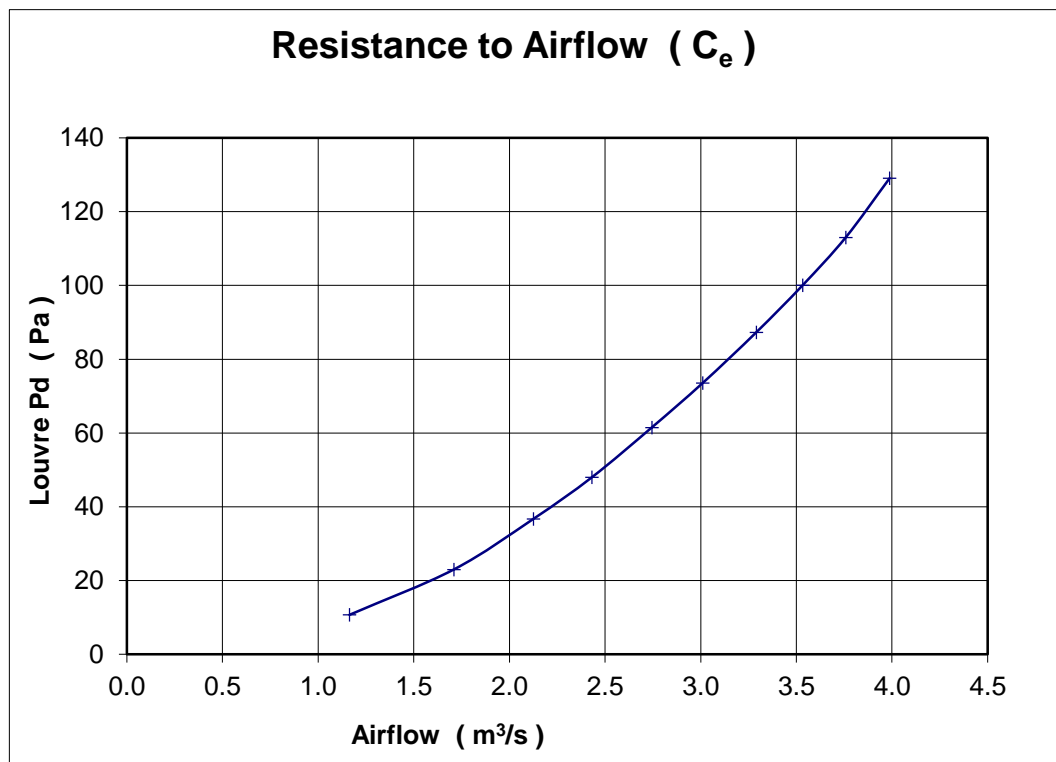
3.2 COEFFICIENT OF ENTRY

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

Date 20/08/2018
 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 pd Pascals | louvre face velocity | air flow rate | | coefficient C _e |
|----------------------|----------------------|---------------------------|----------------------------------|-------------------------------|
| | m/s | test m ³ /s | theoretical m ³ /s | |
| 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 $y = 7.916x^{2.0171}$

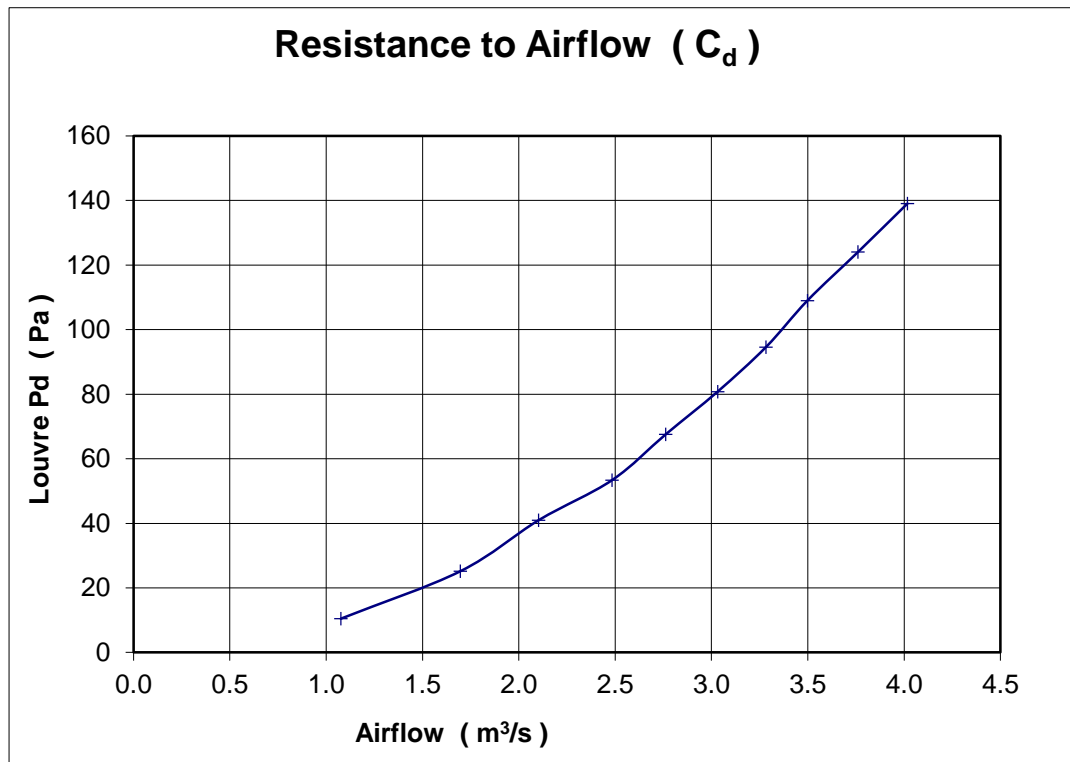
3.3 COEFFICIENT OF DISCHARGE

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

Date 20/08/2018
 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 pd Pascals | louvre face velocity | air flow rate | | coefficient C _d |
|----------------------|----------------------|---------------------------|----------------------------------|-------------------------------|
| | m/s | test m ³ /s | theoretical m ³ /s | |
| 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

