

## Weather Louvre Test L.050W-V

Report 59126/6

Carried out for nv RENSON Sunprotection-Projects sa

By Andrew Freeth

27 April 2016







# Weather Louvre Test L.050W-V

#### Carried out for:

#### nv RENSON Sunprotection-Projects sa

IZ 2 Vijverdam Maalbeekstraat 10 B-8790 Waregem Belgium

Contract: Report 59126/6

Date: 27 April 2016

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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 Curve, with the associated Coefficient of Entry using the test methods contained within EN 13030 : 2001. The work was commissioned by nv RENSON Sunprotection-Projects sa and was carried out at BSRIA on 16 - 22 December 2015.

#### Items received for test

Test Item	BSRIA ID
L.050W-V	59126A6

#### 1.1 TEST ITEM INFORMATION

Contract59126Date16-12-15Manufacturernv RENSON Sunprotection-Projects saLouvre ModelL.050W-VMaterialAluminiumPaintedNoBlade Height998 mmBlade Height998 mmBlade Depth145 mmFrame Depth157 mmBlade Pitch50 mmBlade Pitch50 mmBlade Pitch50 mmBlade Angle10 numGuard Type10 mmSide ChannelsYesWater Drip TrayYesBlade OrientationVertical		
Manufacturernv RENSON Sunprotection-Projects saLouvre ModelL.050W-VMaterialAluminiumPaintedNoBlade Height998 mmBlade Height998 mmBlade Depth145 mmBlade Depth157 mmNo. of Blades19Blade Pitch50 mmBlade Angle60° approx. to the airflowNo. of Banks1Guard TypeInsectGuard Spacing10 mmSide ChannelsYesWater Drip TrayYes	Contract	59126
Louvre ModelL.050W-VMaterialAluminiumPaintedNoBlade Height998 mmBlade Height998 mmBlade Width954 mmBlade Depth145 mmFrame Depth157 mmBlade Pitch50 mmBlade Angle60° approx. to the airflowNo. of Blades1InsectInsectGuard TypeInsectSide ChannelsYesWater Drip TrayYes	Date	16-12-15
MaterialAluminiumPaintedNoBlade Height998 mmBlade Width954 mmBlade Depth145 mmFrame Depth157 mmNo. of Blades19Blade Pitch50 mmBlade Angle60° approx. to the airflowNo. of Banks1Guard TypeInsectGuard Spacing10 mmSide ChannelsYesWater Drip TrayYes	Manufacturer	nv RENSON Sunprotection-Projects sa
PaintedNoBlade Height998 mmBlade Width954 mmBlade Depth145 mmBlade Depth157 mmNo. of Blades19Blade Pitch50 mmBlade Angle60° approx. to the airflowNo. of Banks1Guard TypeInsectGuard Spacing10 mmSide ChannelsYesWater Drip TrayYes	Louvre Model	L.050W-V
Blade Height998 mmBlade Width954 mmBlade Depth145 mmFrame Depth157 mmNo. of Blades19Blade Pitch50 mmBlade Angle60° approx. to the airflowNo. of Banks1Guard TypeInsectGuard Spacing10 mmSide ChannelsYesWater Drip TrayYes	Material	Aluminium
Blade Width954 mmBlade Depth145 mmFrame Depth157 mmNo. of Blades19Blade Pitch50 mmBlade Angle60° approx. to the airflowNo. of Banks1Guard TypeInsectGuard Spacing10 mmSide ChannelsYesWater Drip TrayYes	Painted	No
Blade Depth145 mmFrame Depth157 mmNo. of Blades19Blade Pitch50 mmBlade Angle60° approx. to the airflowNo. of Banks1Guard TypeInsectGuard Spacing10 mmSide ChannelsYesWater Drip TrayYes	Blade Height	998 mm
Frame Depth157 mmNo. of Blades19Blade Pitch50 mmBlade Angle60° approx. to the airflowNo. of Banks1Guard TypeInsectGuard Spacing10 mmSide ChannelsYesWater Drip TrayYes	Blade Width	954 mm
No. of Blades19Blade Pitch50 mmBlade Angle60° approx. to the airflowNo. of Banks1Guard TypeInsectGuard Spacing10 mmSide ChannelsYesWater Drip TrayYes	Blade Depth	145 mm
Blade Pitch   50 mm     Blade Angle   60° approx. to the airflow     No. of Banks   1     Guard Type   Insect     Guard Spacing   10 mm     Side Channels   Yes     Water Drip Tray   Yes	Frame Depth	157 mm
Blade Angle   60° approx. to the airflow     No. of Banks   1     Guard Type   Insect     Guard Spacing   10 mm     Side Channels   Yes     Water Drip Tray   Yes	No. of Blades	19
No. of Banks1Guard TypeInsectGuard Spacing10 mmSide ChannelsYesWater Drip TrayYes	Blade Pitch	50 mm
Guard Type Insect   Guard Spacing 10 mm   Side Channels Yes   Water Drip Tray Yes	Blade Angle	60º approx. to the airflow
Guard Spacing 10 mm   Side Channels Yes   Water Drip Tray Yes	No. of Banks	1
Side Channels Yes   Water Drip Tray Yes	Guard Type	Insect
Water Drip Tray Yes	Guard Spacing	10 mm
	Side Channels	Yes
Blade Orientation Vertical	Water Drip Tray	Yes
	Blade Orientation	Vertical

Figure 1 Test item 59126A6 (front)

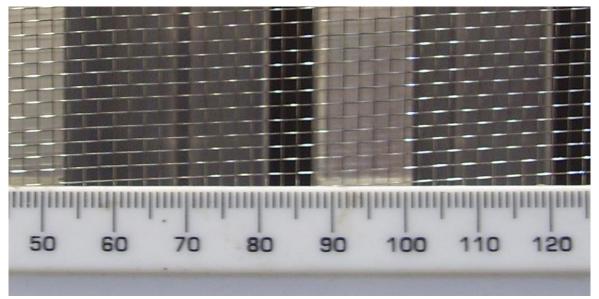


Figure 2 Test item 59126A6 (rear)



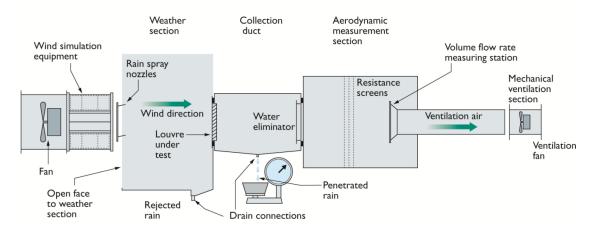
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## 2 TEST METHOD

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.

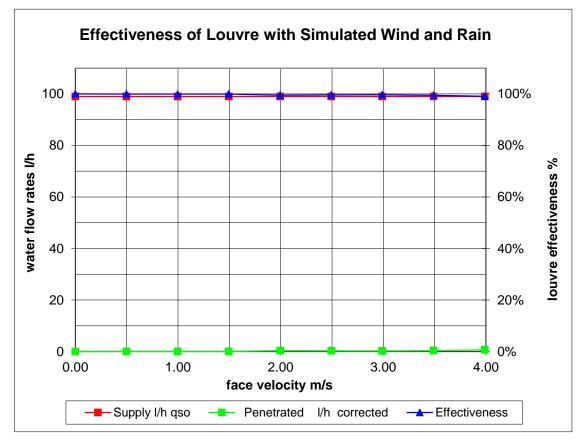
Test equipment	BSRIA ID	Calibration Expiry Date
Water supply measurement	352	9-1-16
Rain measuring system	353	9-1-16
Airflow cones	364	9-1-16
Micromanometer	5	17-2-16
Micromanometer	682	7-1-16
Scales (water)	332	9-2-16

#### 2.3 TEST EQUIPMENT USED

#### 3.1 RAINWATER PENETRATION

MANUFACTURER nv RENSON Sunprotection-Projects sa Date 17/12/2015 MODEL L.050W-V Contract 59126

 ated rainfall Vind speed	75 13.0	mm/hr m/s		louvre height louvre width louvre area	998 954 0.952	mm	
VENTILAT	ION RATE		WATER FLO	OW RATES			
Volume	Velocity		Supply	Penetrated		Effectiveness	Class
m³/s	m/s		l/h	l/h			
0.00	0.00		99.0	0.0		100.0%	А
0.47	0.50		99.0	0.0		99.9%	А
0.95	1.00		99.0	0.0		99.9%	А
1.42	1.50		99.0	0.0		99.9%	А
1.90	2.00		99.0	0.3		99.5%	А
2.37	2.49		99.0	0.3		99.6%	А
2.85	2.99		99.0	0.2		99.7%	А
3.32	3.49		99.0	0.4		99.5%	А
3.80	3.99		99.0	0.7		99.1%	А

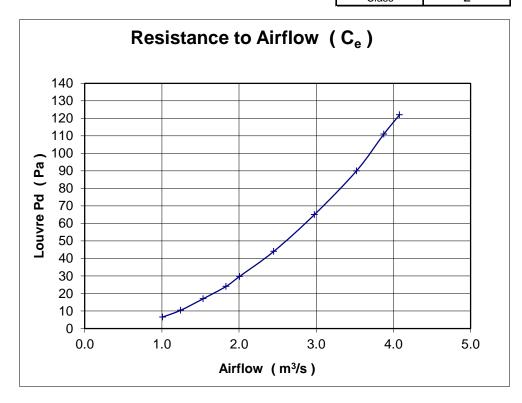


**Note:** The louvre developed a water leak from a corner which became significant at 3.5m/s. The louvre was removed & the corner re-sealed. The 3.5m/s test was repeated & used in this report. In addition to the standard velocities, 4m/s was also requested and followed the 3.5m/s test.

#### 3.2 COEFFICIENT OF ENTRY

MANUFACTURER MODEL	nv RENSON Sunpi L050W-V	rotection-Projects sa	Date 16/12/2015 Contract 59126
air temperature	17.8 °C	louvre height	998 mm
barometer	1010 mbar	louvre width	954 mm
air density	1.205 kg/m <sup>3</sup>	louvre area	0.952 m <sup>2</sup>

Г	louvre face velocity	air flow r	ate	
louvre pd		test	theoretical	coefficient
Pascals	m/s	m³/s	m³/s	C <sub>e</sub>
6.5	1.06	1.009	3.127	0.323
10.4	1.31	1.244	3.956	0.314
17.0	1.61	1.536	5.057	0.304
24.0	1.92	1.832	6.009	0.305
29.7	2.11	2.006	6.685	0.300
44.0	2.57	2.450	8.136	0.301
65.0	3.13	2.976	9.889	0.301
90.0	3.70	3.522	11.637	0.303
111.0	4.07	3.877	12.923	0.300
122.0	4.28	4.080	13.548	0.301
			mean C <sub>e</sub>	0.305
			Class	2



## APPENDIX: A MANUFACTURER'S DRAWING

