



# Louvre Airflow Test

## 521

BSRIA Final Report 60242/2

Carried out for  
nv RENSON Sunprotection-Projects sa

By Andrew Freeth

13 July 2017





# Louvre Airflow Test 521

**Carried out for:**

**nv RENSON Sunprotection-Projects sa**  
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Contract: **BSRIA Final Report 60242/2**

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# 1 INTRODUCTION

This report concerns tests conducted on a louvre to determine the Pressure Drop versus Airflow Curve, with the associated Coefficient of Entry and Discharge 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 3 - 4 May 2017.

## Items received for test

Test Item	BSRIA ID
521	60242A2

## 1.1 TEST ITEM INFORMATION

<b>Contract</b>	60242
<b>Date</b>	3-5-17
<b>Manufacturer</b>	nv RENSON Sunprotection-Projects sa
<b>Louvre Model</b>	521
<b>Material</b>	Galvanised Steel
<b>Painted</b>	No
<b>Core Area Height</b>	992 mm
<b>Core Area Width</b>	993 mm
<b>Blade Pack Depth</b>	40 mm
<b>Frame Depth</b>	45 mm
<b>No. of Blades</b>	19
<b>Blade Pitch</b>	50 mm
<b>Blade Angle</b>	45° approx.
<b>No. of Banks</b>	1
<b>Guard Type</b>	Bird/Vermin
<b>Guard Spacing</b>	0 mm
<b>Side Channels</b>	No
<b>Water Drip Tray</b>	Yes
<b>Blade Orientation</b>	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.



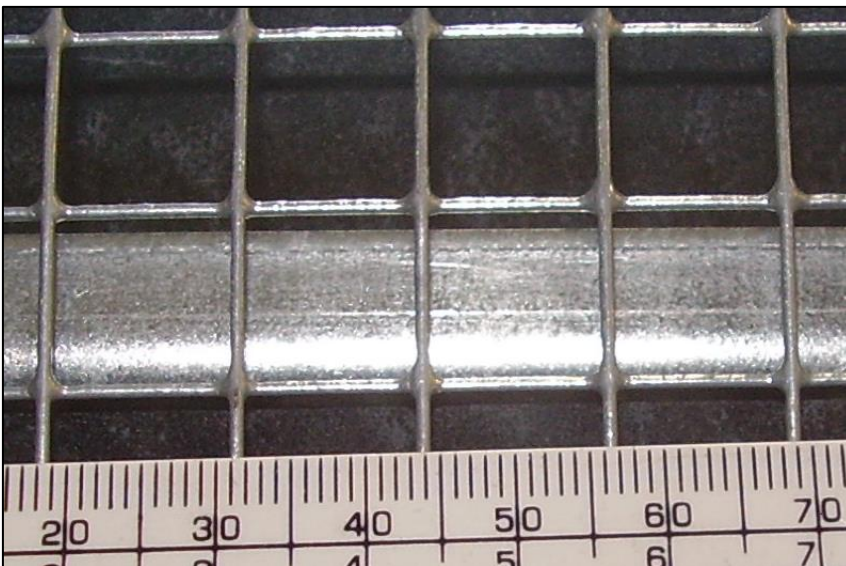
Figure 1 Test item 60242A2 (front)



Figure 2 Test item 60242A2 (rear)

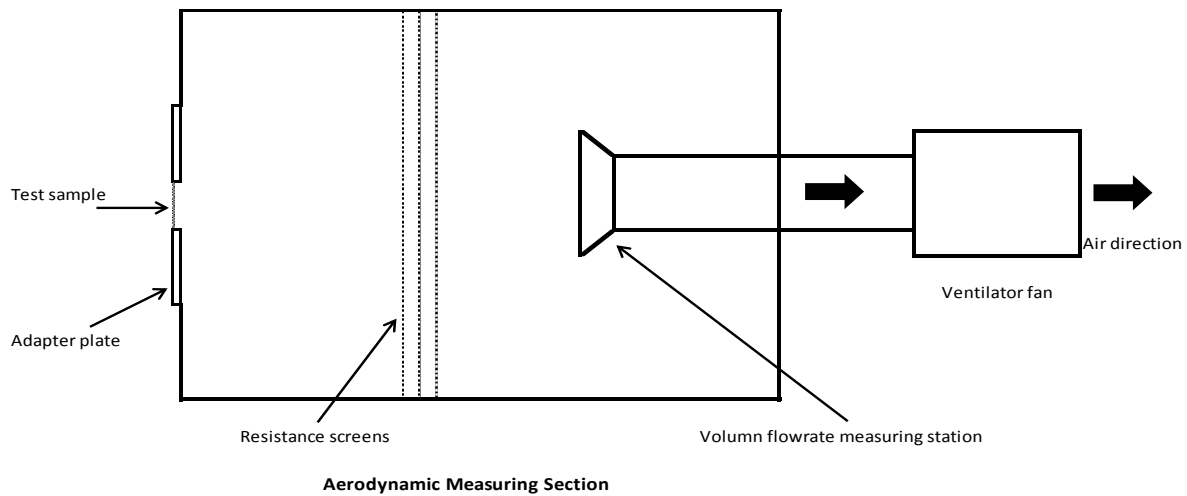


Figure 3 Close-up of guard



## 2 TEST METHOD

A schematic representation of the rig used during testing



### 2.1 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.

### 2.2 TEST EQUIPMENT USED

Test equipment	BSRIA ID	Calibration Expiry Date
Airflow cones	364	7-1-18
Micromanometer	5	16-2-18
Micromanometer	682	2-2-18

### 3 RESULTS

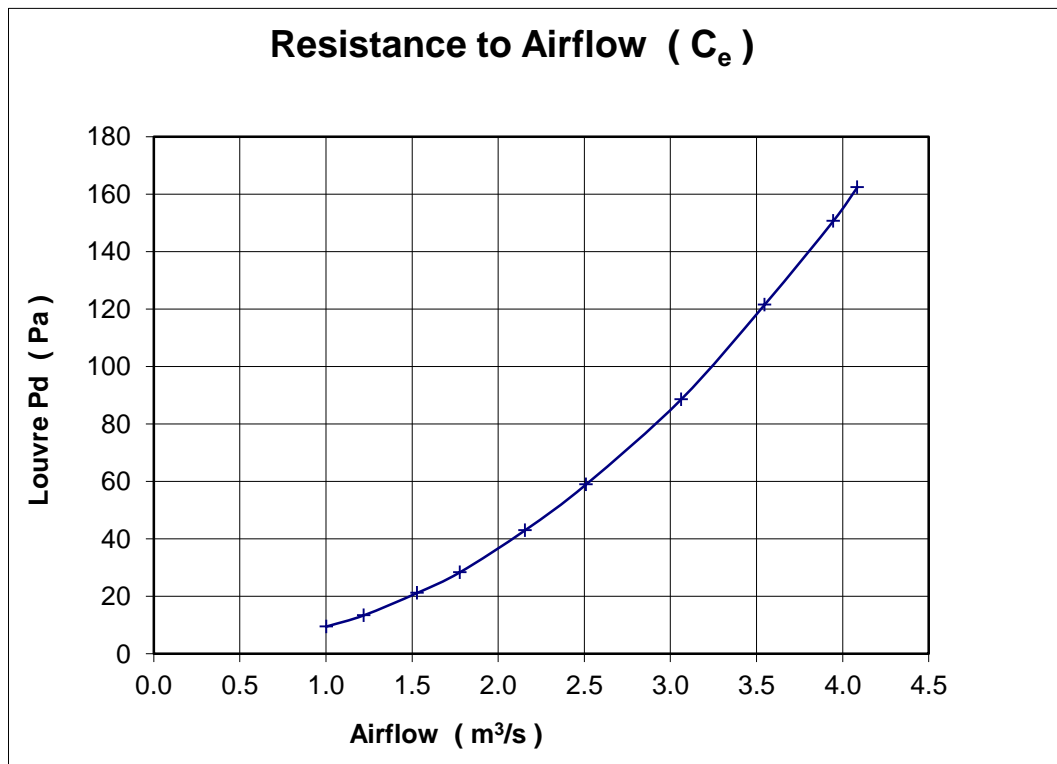
#### 3.1 COEFFICIENT OF ENTRY

MANUFACTURER nv RENSON Sunprotection-Projects sa  
 MODEL 521

Date 03/05/2017  
 Contract 60242

air temperature 16.1 °C      louvre height 992 mm  
 barometer 1014 mbar      louvre width 993 mm  
 air density 1.216 kg/m<sup>3</sup>      louvre area 0.985 m<sup>2</sup>

louvre pd Pascals	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	
9.5	1.02	1.002	3.893	0.257
13.4	1.24	1.219	4.624	0.264
21.2	1.55	1.530	5.816	0.263
28.4	1.81	1.778	6.731	0.264
43.0	2.19	2.156	8.282	0.260
59.0	2.55	2.511	9.702	0.259
88.6	3.11	3.063	11.889	0.258
121.5	3.60	3.547	13.922	0.255
150.7	4.01	3.947	15.505	0.255
162.4	4.15	4.086	16.096	0.254
mean C <sub>e</sub>				0.259
Class				3



Graph equation is  $y = 9.0401x^{2.0431}$



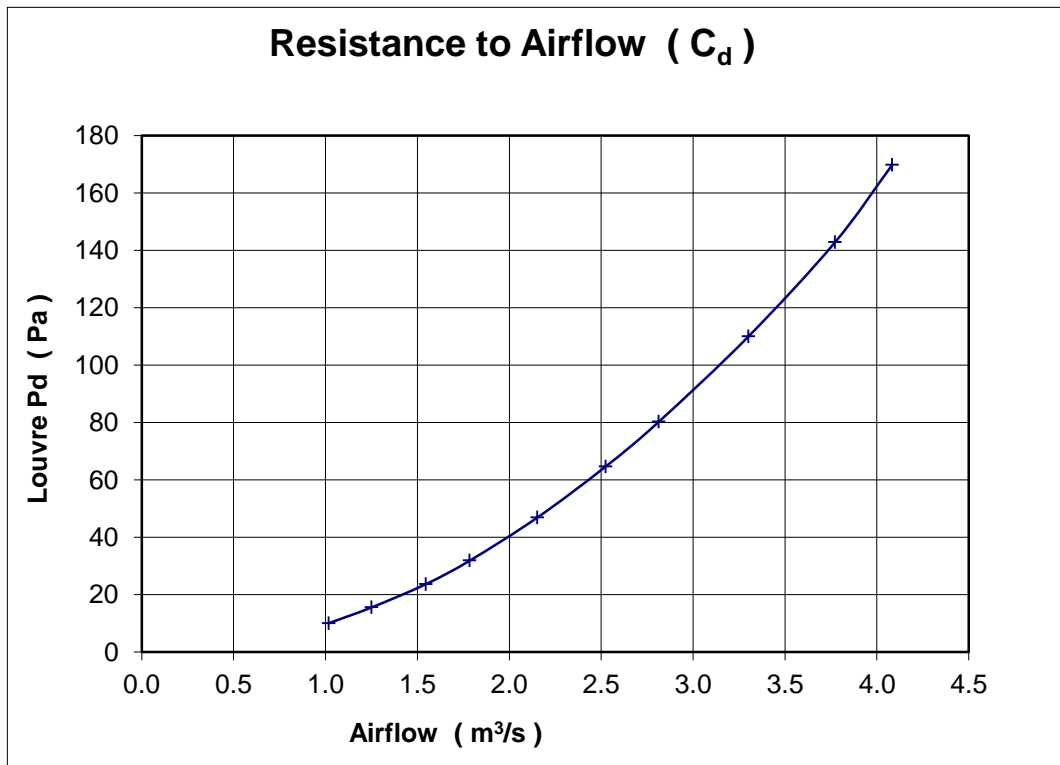
### 3.2 COEFFICIENT OF DISCHARGE

MANUFACTURER nv RENSON Sunprotection-Projects sa  
 MODEL 521

Date 04/05/2017  
 Contract 60242

air temperature 16.1 °C      louvre height 992 mm  
 barometer 1014 mbar      louvre width 993 mm  
 air density 1.216 kg/m<sup>3</sup>      louvre area 0.985 m<sup>2</sup>

louvre pd Pascals	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	
10.1	1.03	1.018	4.015	0.254
15.6	1.27	1.251	4.990	0.251
23.7	1.57	1.546	6.150	0.251
31.9	1.81	1.785	7.135	0.250
46.9	2.19	2.153	8.652	0.249
64.7	2.56	2.525	10.162	0.248
80.3	2.86	2.814	11.321	0.249
110.0	3.35	3.301	13.250	0.249
142.8	3.83	3.772	15.097	0.250
169.8	4.15	4.083	16.463	0.248
mean C <sub>d</sub>				0.250
Class				3



Graph equation is  $y = 9.8494x^{2.0235}$

**APPENDIX: A MANUFACTURER'S DRAWING**

