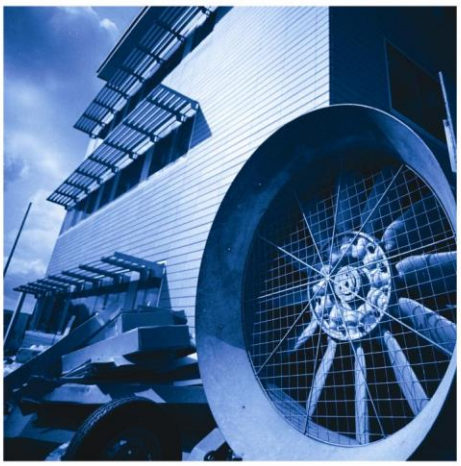
Louvre Airflow Test 467

BSRIA Final Report 60242/4

Carried out for
nv RENSON Sunprotection-Projects sa

By Andrew Freeth

13 July 2017



Louvre Airflow Test 467

Carried out for:

nv RENSON Sunprotection-Projects sa
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Belgium

Contract: **BSRIA Final Report 60242/4**

Date: **13 July 2017**

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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
467	60242A4

1.1 TEST ITEM INFORMATION

Contract		60242
Date		3-5-17
Manufacturer		nv RENSON Sunprotection-Projects sa
Louvre Model		467
Material		Plastic
Painted		No
Core Area Height		760 mm
Core Area Width		963 mm
Blade Pack Depth		100 mm
Frame Depth		100 mm
No. of Blades		43
Blade Pitch		20 mm
Blade Angle		0º (to the airflow)
No. of Banks		1
Guard Type		None
Guard Spacing		N/A
Side Channels		No
Water Drip Tray		No
Blade Orientation		Horizontal

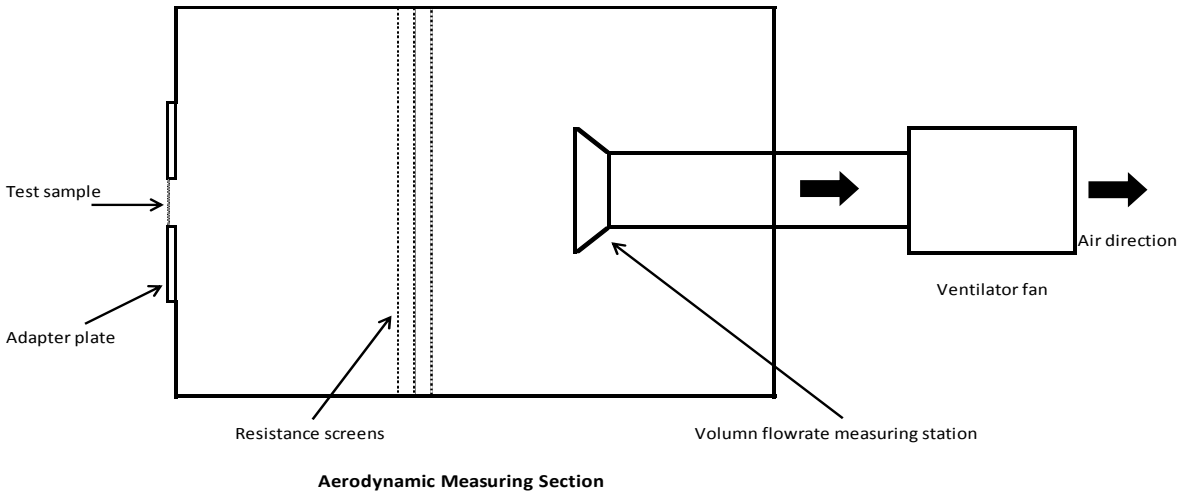
Note: Weather louvre core area - product of the minimum height H and minimum width W of the front opening in the weather louvre assembly with the louvre blades removed
Blade Pack Depth refers to the distance from front of first bank to rear of last bank.

Figure 1 Test item 60242A4 (front)

Figure 2 Test item 60242A4 (rear)

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

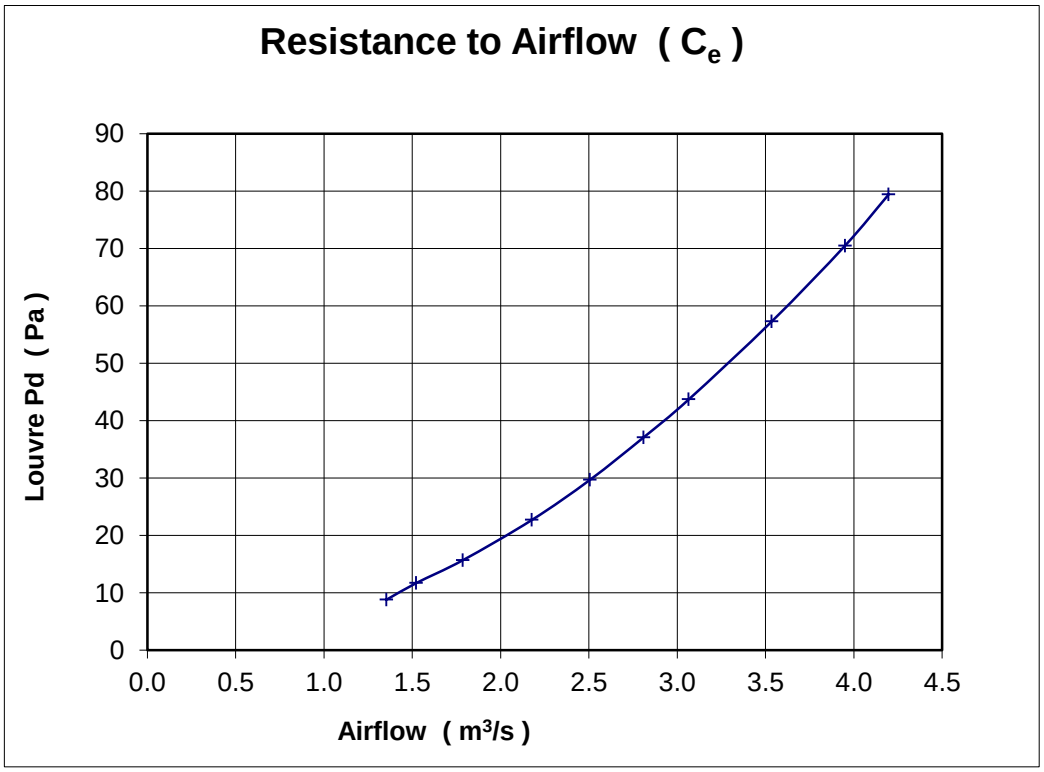
3 RESULTS

3.1 COEFFICIENT OF ENTRY

MANUFACTURER nv RENSON Sunprotection-Projects sa Date 03/05/2017
MODEL 467 Contract 60242

air temperature	16.3	°C	louvre height	760	mm
barometer	1014	mbar	louvre width	963	mm
air density	1.215	kg/m^3	louvre area	0.732	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_e
8.8	1.85	1.353	2.785	0.486
11.7	2.08	1.521	3.211	0.474
15.7	2.44	1.787	3.720	0.480
22.7	2.97	2.177	4.473	0.487
29.7	3.42	2.506	5.117	0.490
37.1	3.84	2.810	5.719	0.491
43.7	4.19	3.065	6.207	0.494
57.3	4.83	3.536	7.107	0.497
70.5	5.40	3.951	7.883	0.501
79.4	5.73	4.197	8.366	0.502
			mean C_e	0.490
			Class	1



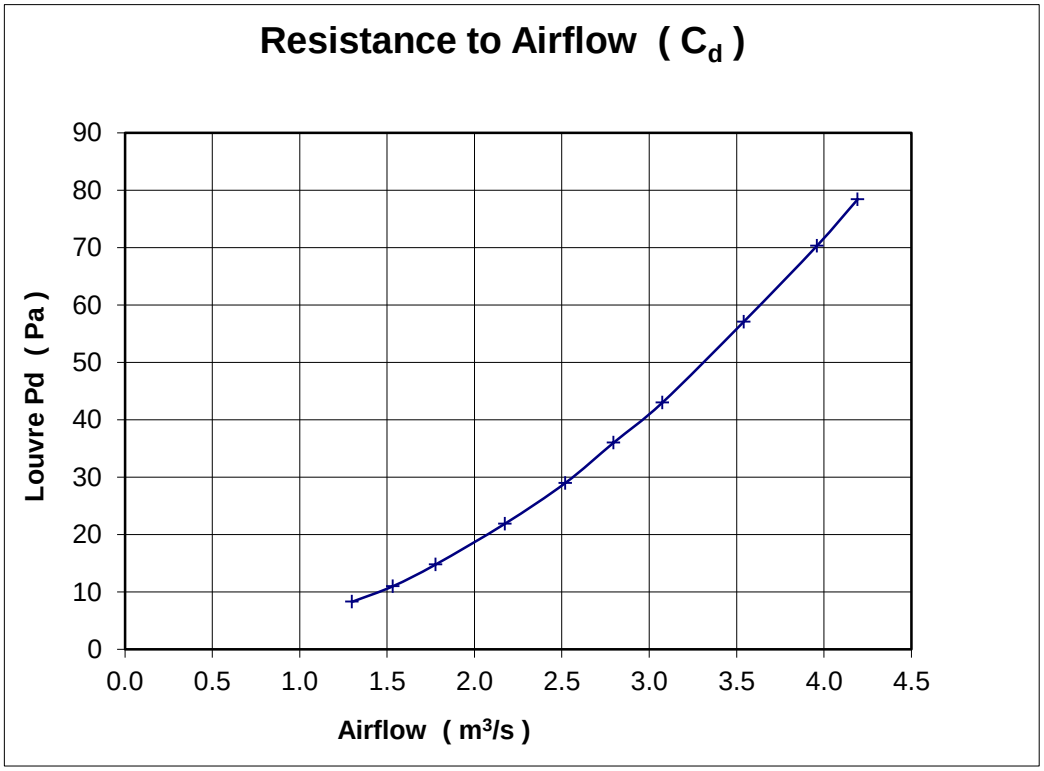
Graph equation is $y = 5.1037x^{1.9159}$

3.2 COEFFICIENT OF DISCHARGE

MANUFACTURER nv RENSON Sunprotection-Projects sa Date 03/05/2017
MODEL 467 Contract 60242

air temperature	16.3	°C	louvre height	760	mm
barometer	1014	mbar	louvre width	963	mm
air density	1.215	kg/m^3	louvre area	0.732	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_d
8.3	1.78	1.300	2.705	0.480
11.0	2.09	1.532	3.114	0.492
14.8	2.43	1.778	3.612	0.492
21.9	2.97	2.174	4.394	0.495
29.0	3.44	2.520	5.056	0.498
36.0	3.82	2.795	5.633	0.496
43.0	4.20	3.075	6.157	0.500
57.1	4.84	3.541	7.095	0.499
70.3	5.41	3.960	7.872	0.503
78.4	5.73	4.193	8.313	0.504
			mean C_d	0.496
			Class	1



Graph equation is $y = 4.8896x^{1.9363}$

APPENDIX: A MANUFACTURER'S DRAWING