



Sand Louvre Test

Report 56827/1 Edition 2
This report supersedes Report Number 56827/1
dated 29 January 2013

Carried out for
N.V. Renson Ventilation

By Andrew Freeth

11 February 2013



Sand Louvre Test

Carried out for:

N.V. Renson Ventilation

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Contract: **Report 56827/1 Edition 2**

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PREFACE

This report supersedes Report Number 56827/1 dated 29 January 2013.

The following amendments have been made:

The louvre's model name has been amended by the client from 468V (+ sill) to 468SA.

The client and manufacturer name and address has been amended.

1 INTRODUCTION

This report concerns tests conducted on a sand louvre to determine the Sand Penetration and the Pressure Drop versus Airflow Curve, with the associated Coefficient of Entry using the test methods contained within EN 13181 : 2001. The work was commissioned by N.V. Renson Ventilation and was carried out at BSRIA on 5 December 2012 to 28 January 2013, under PO 1220155.

Items received for test

Test Item	BSRIA ID
468SA	56827A6

1.1 TEST ITEM INFORMATION

Contract	56827
Date	5-12-12
Manufacturer	N.V. Renson Ventilation
Louvre Model	468SA
Material	Aluminium
Painted	No
Blade Height	985mm
Blade Width	1020mm
Blade Depth	55mm
Frame Depth	60mm
No. of Blades	12
Blade Pitch	85mm
Blade Angle	90° to the airflow
No. of Banks	2
Guard Type	Insect
Guard Spacing	10mm
Side Channels	None
Blade Orientation	Vertical

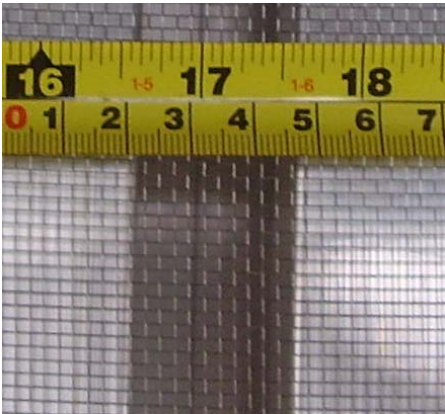
Figure 1 Test item 56827A6 (front)



Figure 2 Test item 56827A6 (rear)

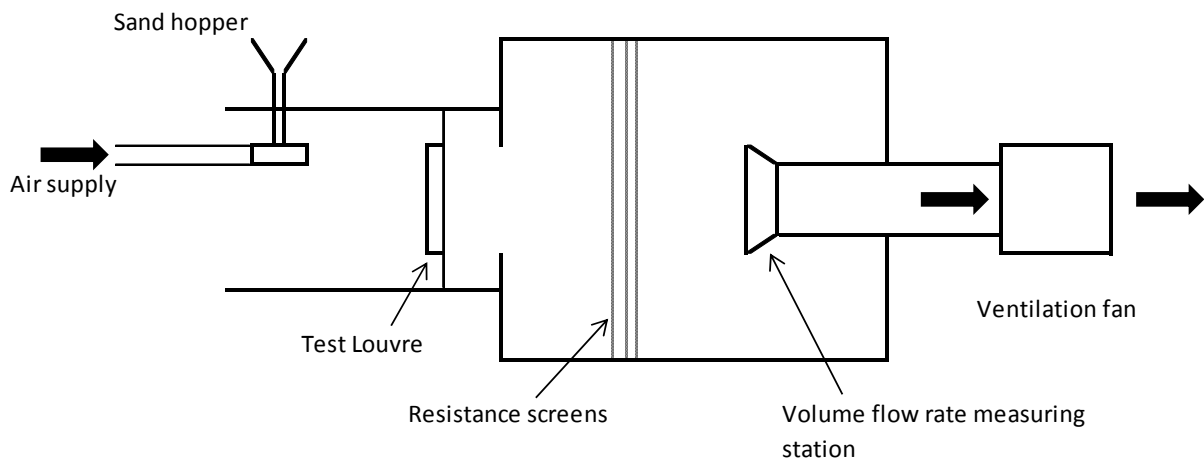


Figure 3 Close-up of mesh



2 TEST METHOD

A schematic representation of the rig used during testing



The test comprises of two parts:

2.1 SAND PENETRATION

The sand louvre is subjected to wind driven sand at an airflow speed of 20 - 25 m/s measured in the injection tube with various sand masses and delivery rates as shown in Table 1 below. In addition to the simulated wind and sand, air is drawn through the louvre at a range of velocities (0, 0.5, 1.3, 2.0, 2.8, and 3.5 m/s, or the maximum achievable). Table 2 shows the graded sand requirements for 1 Kg of standard test sand.

After each sand delivery, the fans are kept running for a further 5 minutes.

The rejected sand in the louvre and in the area in front of it, is collected, weighed and recorded. A range of measurements are taken to give the characteristic curve for the test louvre.

Table 1 Core air velocities, weights of sand and sand discharge durations

Airspeed (m/s)	Sand mass (Kg)	Discharge duration (s)
0	1	Not timed*
0.5	1	200
1.3	1	75
2.0	2	100
2.8	2	70
3.5	2	60

* Note: Although 0m/s is not required as a test velocity, it has been included for information purposes. For 0m/s the ventilation fan is turned off

Table 2 Standard sand requirements

Grade size µm	Mass %	Mass required for 1kg sample (kg)
> 699	0.5	0.005
423 to 699	3.0	0.03
353 to 422	12.0	0.12
251 to 352	30.0	0.3
211 to 250	20.0	0.2
152 to 210	27.0	0.27
104 to 151	6.0	0.06
76 to 103	1.0	0.01
< 76	0.5	0.005

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 give 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
Airflow cones	364
Micromanometer	502
Scales	149
Sand injection nozzles	1235 - 1239

3 RESULTS

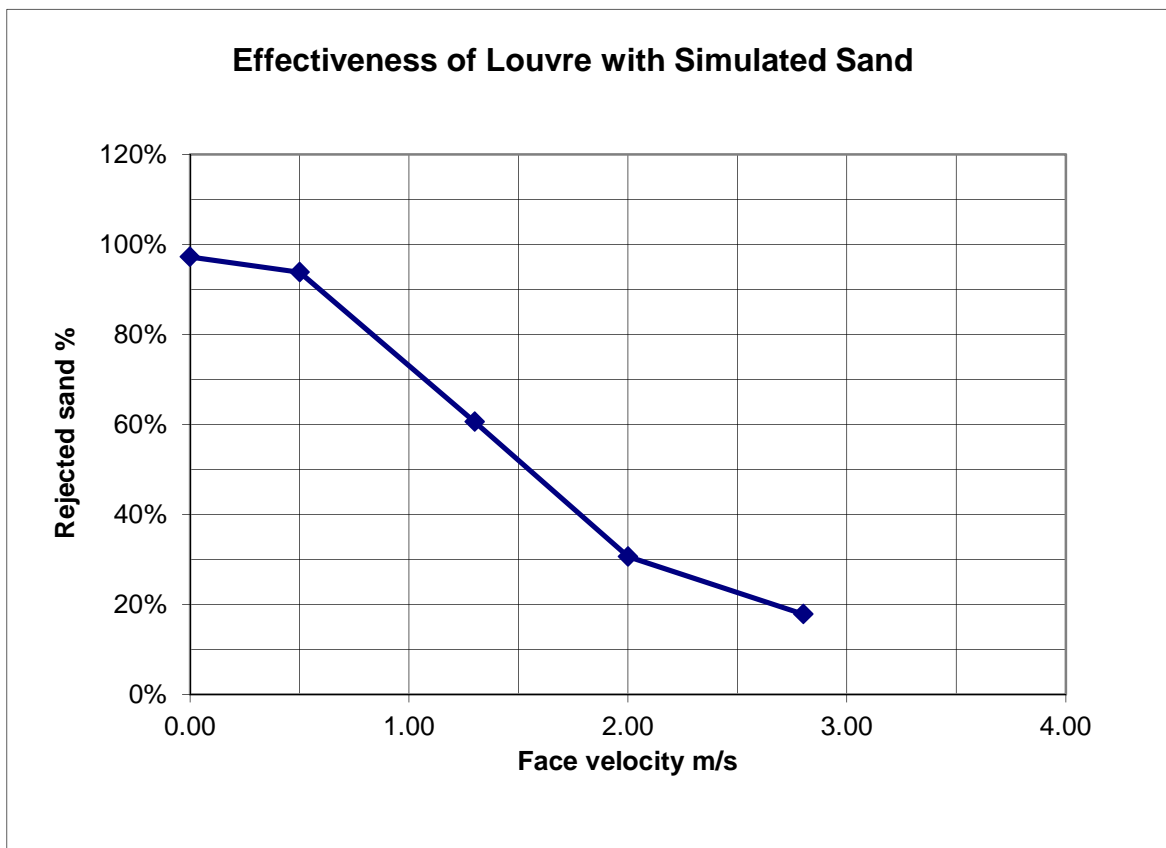
3.1 SAND PENETRATION

MANUFACTURER N.V. Renson Ventilation
 MODEL 468SA

Date 05/12/2012
 Contract 56827

louvre height 985 mm
 louvre width 1020 mm
 louvre area 1.005 m²

VENTILATION RATE		SAND MASS		Effectiveness
Volume m ³ /s	Velocity m/s	Injected kg	Rejected kg	
0.00	0.00	1.00	0.97	97%
0.50	0.50	1.00	0.94	94%
1.31	1.30	1.00	0.61	61%
2.01	2.00	2.00	0.61	31%
2.81	2.80	2.00	0.36	18%



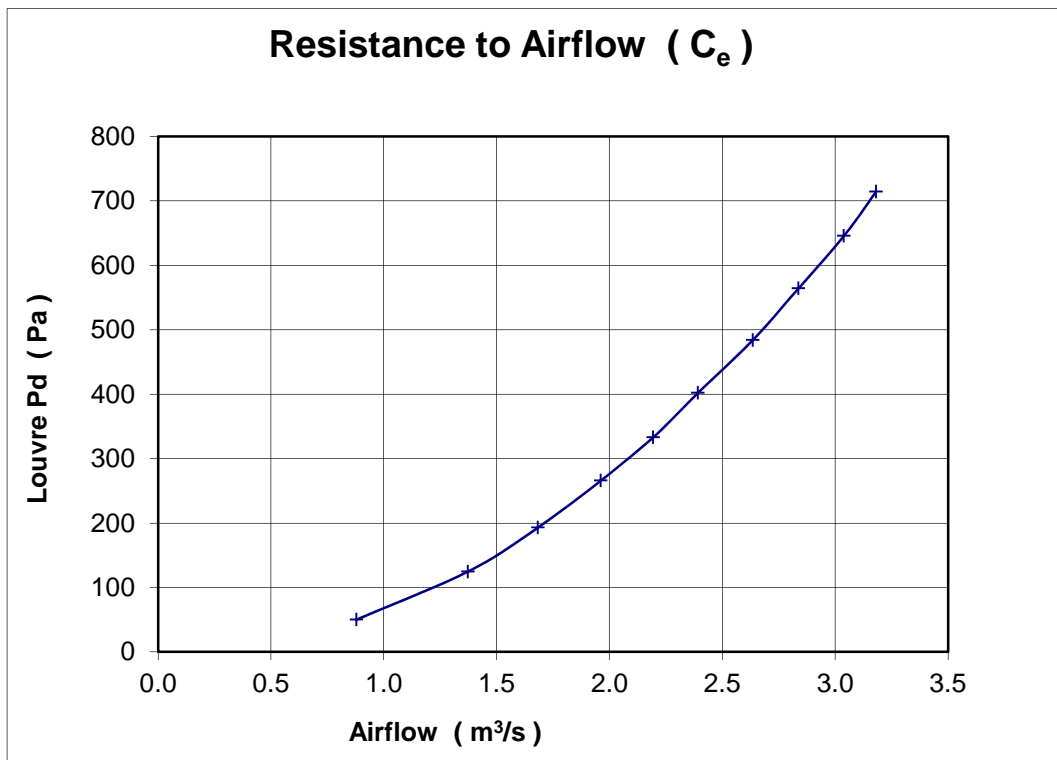
3.2 COEFFICIENT OF ENTRY

MANUFACTURER N.V. Renson Ventilation
 MODEL 468SA

Date 16/10/2012
 Contract 56827

air temperature 14.3 °C louvre height 985 mm
 barometer 989.6 mbar louvre width 1020 mm
 air density 1.195 kg/m³ louvre area 1.005 m²

louvre pd Pascals	louvre face velocity	air flow rate		coefficient C _e
	m/s	test m ³ /s	theoretical m ³ /s	
50.2	0.88	0.879	9.211	0.095
124.7	1.37	1.373	14.517	0.095
193.2	1.68	1.684	18.070	0.093
266.1	1.95	1.962	21.207	0.093
333.2	2.18	2.194	23.730	0.092
402.1	2.38	2.392	26.069	0.092
484.2	2.62	2.636	28.606	0.092
mean C _e				0.093
Class				4



APPENDIX: A MANUFACTURER'S DRAWING

