



# Weather Louvre Test

**L.033HF**

Final Report 60554/5

Carried out for  
nv RENSON Sunprotection-Projects sa

By Andrew Freeth

27 November 2018





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## Carried out for:

**nv RENSON Sunprotection-Projects sa**  
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Belgium

Contract: **Final Report 60554/5**

Date: **27 November 2018**

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## CONTENTS

1	INTRODUCTION.....	5
1.1	Test item information .....	5
2	TEST METHOD .....	7
2.1	Water penetration .....	7
2.2	Pressure drop .....	7
2.3	Test equipment used .....	7
3	RESULTS.....	8
3.1	Rainwater Penetration .....	8
3.2	Coefficient of Entry (with mesh).....	9
3.3	Coefficient of Discharge (with mesh).....	10

## APPENDICES

APPENDIX: A	MANUFACTURER'S DRAWING.....	11
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## FIGURES

Figure 1	Test item 60554A5 (front).....	6
Figure 2	Test item 60554A5 (rear).....	6
Figure 3	Close-up of guard .....	6

# 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 Sunprotection-Projects sa and was carried out at BSRIA North, Preston on 12 October 2017 and 9 February 2018.

## Items received for test

Test Item	BSRIA ID
L.033HF	60554A5

## 1.1 TEST ITEM INFORMATION

<b>Contract</b>	60554
<b>Date</b>	4-10-17
<b>Manufacturer</b>	nv RENSON Sunprotection-Projects sa
<b>Louvre Model</b>	L.033HF (insect mesh)
<b>Material</b>	Aluminium
<b>Painted</b>	No
<b>Core Area Height</b>	1000 mm
<b>Core Area Width</b>	990 mm
<b>Blade Pack Depth</b>	20.4 mm
<b>Frame Depth</b>	34 mm
<b>No. of Blades</b>	30
<b>Blade Pitch</b>	33 mm
<b>Blade Angle</b>	30° approx.
<b>No. of Banks</b>	1
<b>Guard Type</b>	Insect
<b>Guard Spacing</b>	10 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.

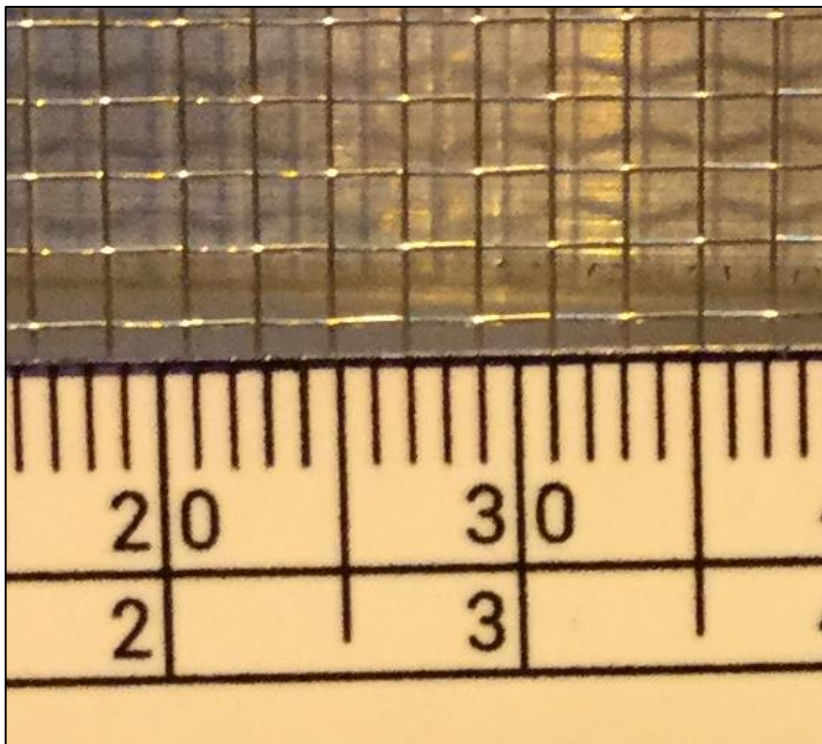
Figure 1 Test item 60554A5 (front)



Figure 2 Test item 60554A5 (rear)

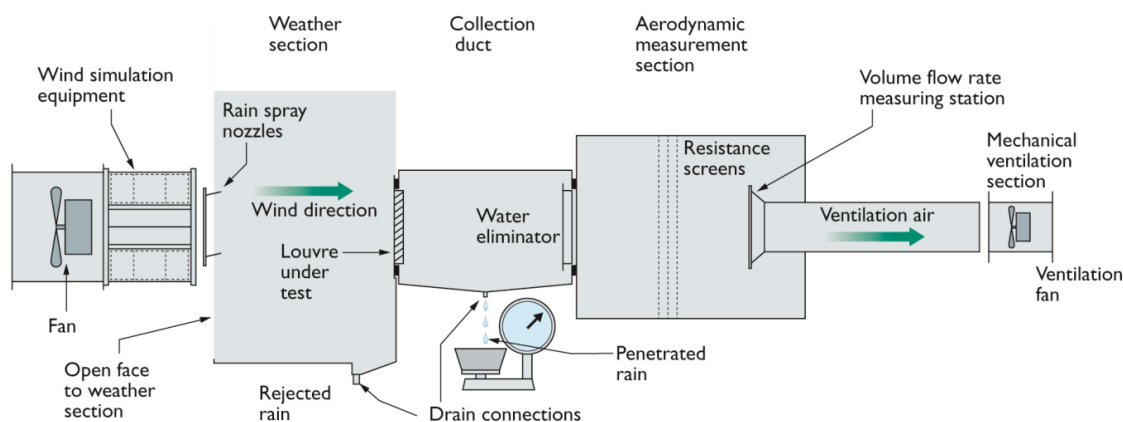


Figure 3 Close-up of guard



## 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 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.

### 2.3 TEST EQUIPMENT USED

Test equipment	BSRIA ID	Calibration Expiry Date
Water supply measurement	352	24-4-18
Rain measuring system	353	24-4-18
Airflow cones	364	7-1-19
Micromanometer	1600	24-6-18
Micromanometer	1601	24-6-18
Scales (water)	1599	20-6-18
Flow meter	1533	9-6-18

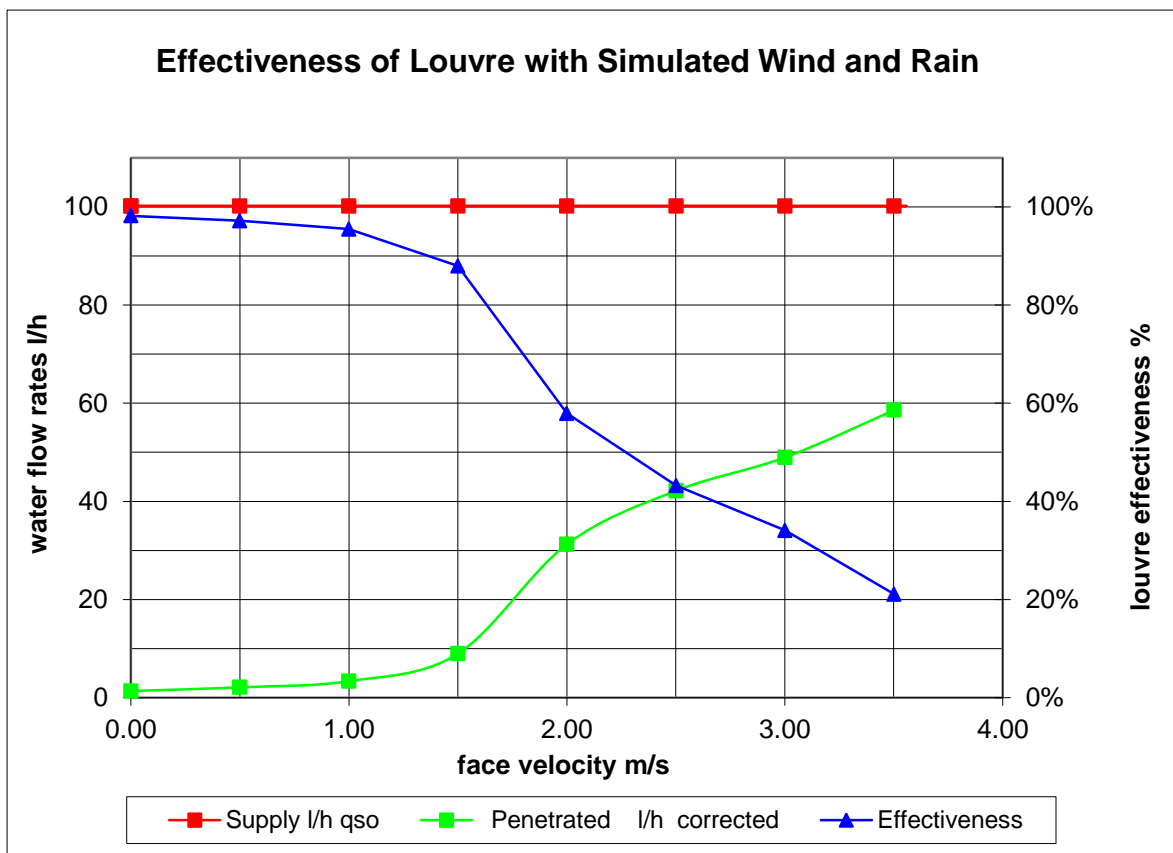
### 3 RESULTS

#### 3.1 RAINWATER PENETRATION

MANUFACTURER nv RENSON Sunprotection-Projects sa Date 09/02/2018  
 MODEL L.033HF (insect mesh) Contract 60554

Simulated rainfall 75 mm/hr louvre height 1000 mm  
 Wind speed 13.0 m/s louvre width 990 mm  
 louvre area 0.990 m<sup>2</sup>

VENTILATION RATE		WATER FLOW RATES		Effectiveness	Class
Volume m <sup>3</sup> /s	Velocity m/s	Supply l/h	Penetrated l/h		
0.00	0.00	100.2	1.4	98.2%	B
0.49	0.50	100.2	2.1	97.2%	B
0.99	1.00	100.2	3.4	95.5%	B
1.49	1.50	100.2	9.0	87.9%	C
1.98	2.00	100.2	31.2	57.9%	D
2.48	2.50	100.2	42.2	43.2%	D
2.97	3.00	100.2	49.0	34.1%	D
3.47	3.50	100.2	58.6	21.1%	D



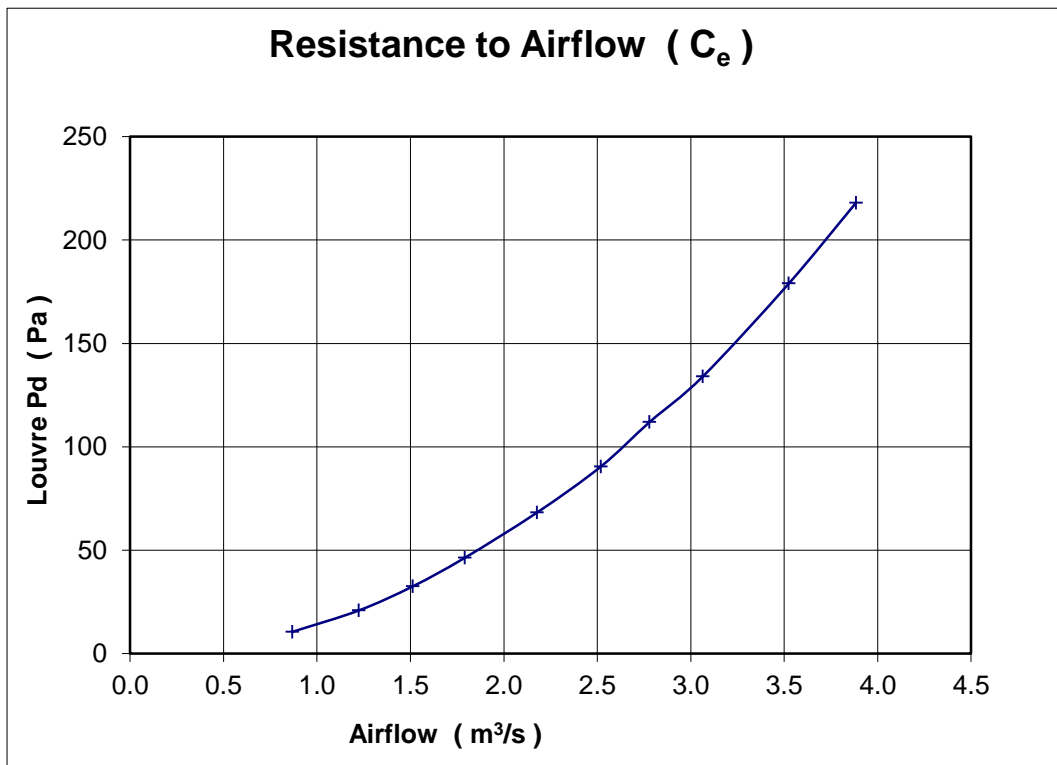


### 3.2 COEFFICIENT OF ENTRY (WITH MESH)

MANUFACTURER nv RENSON Sunprotection-Projects sa Date 12/10/2017  
 MODEL L.033HF (insect mesh) Contract 60554

air temperature 15.1 °C louvre height 1000 mm  
 barometer 1012 mbar louvre width 990 mm  
 air density 1.218 kg/m<sup>3</sup> louvre area 0.990 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	
10.6	0.88		0.869	4.131	0.210
20.9	1.24		1.224	5.800	0.211
32.6	1.53		1.513	7.244	0.209
46.4	1.81		1.792	8.642	0.207
68.3	2.20		2.179	10.485	0.208
90.5	2.54		2.519	12.070	0.209
112.0	2.81		2.780	13.427	0.207
134.0	3.10		3.065	14.687	0.209
179.0	3.56		3.526	16.975	0.208
218.0	3.92		3.885	18.733	0.207
mean C <sub>e</sub>					0.208
Class					3



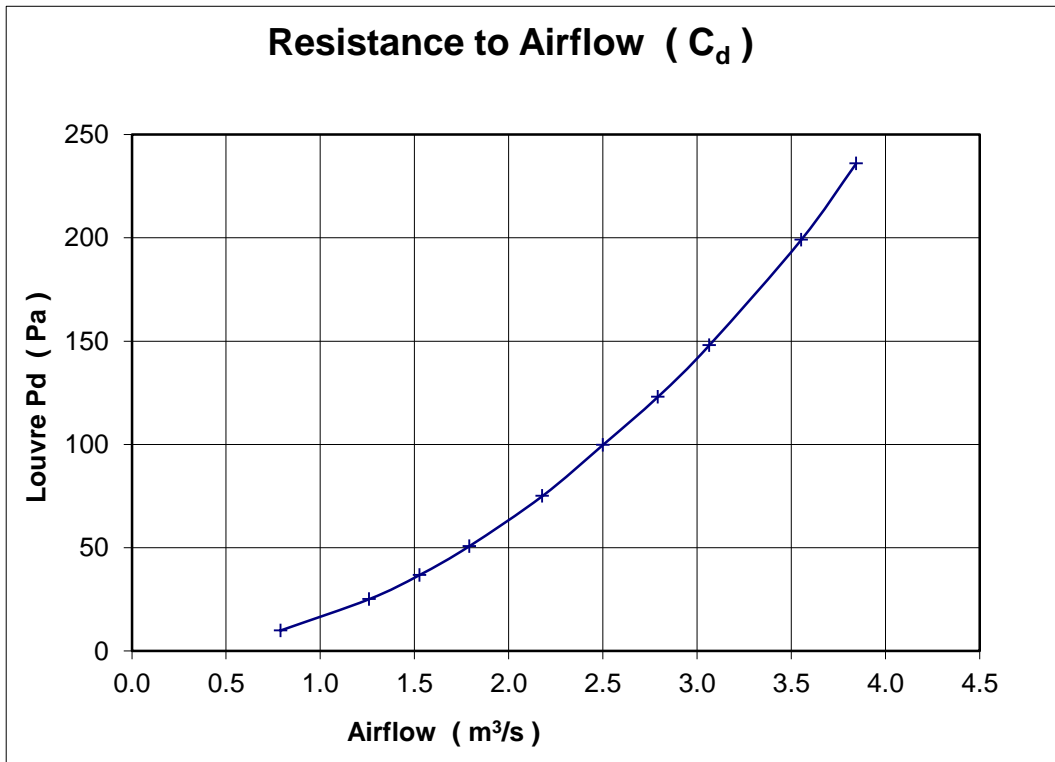
A 'trendline' for the above graph would follow  $y = 14.08x^{2.0199}$

**3.3 COEFFICIENT OF DISCHARGE (WITH MESH)**

MANUFACTURER nv RENSON Sunprotection-Projects sa Date 05/10/2017  
 MODEL L.033HF (insect mesh) Contract 60554

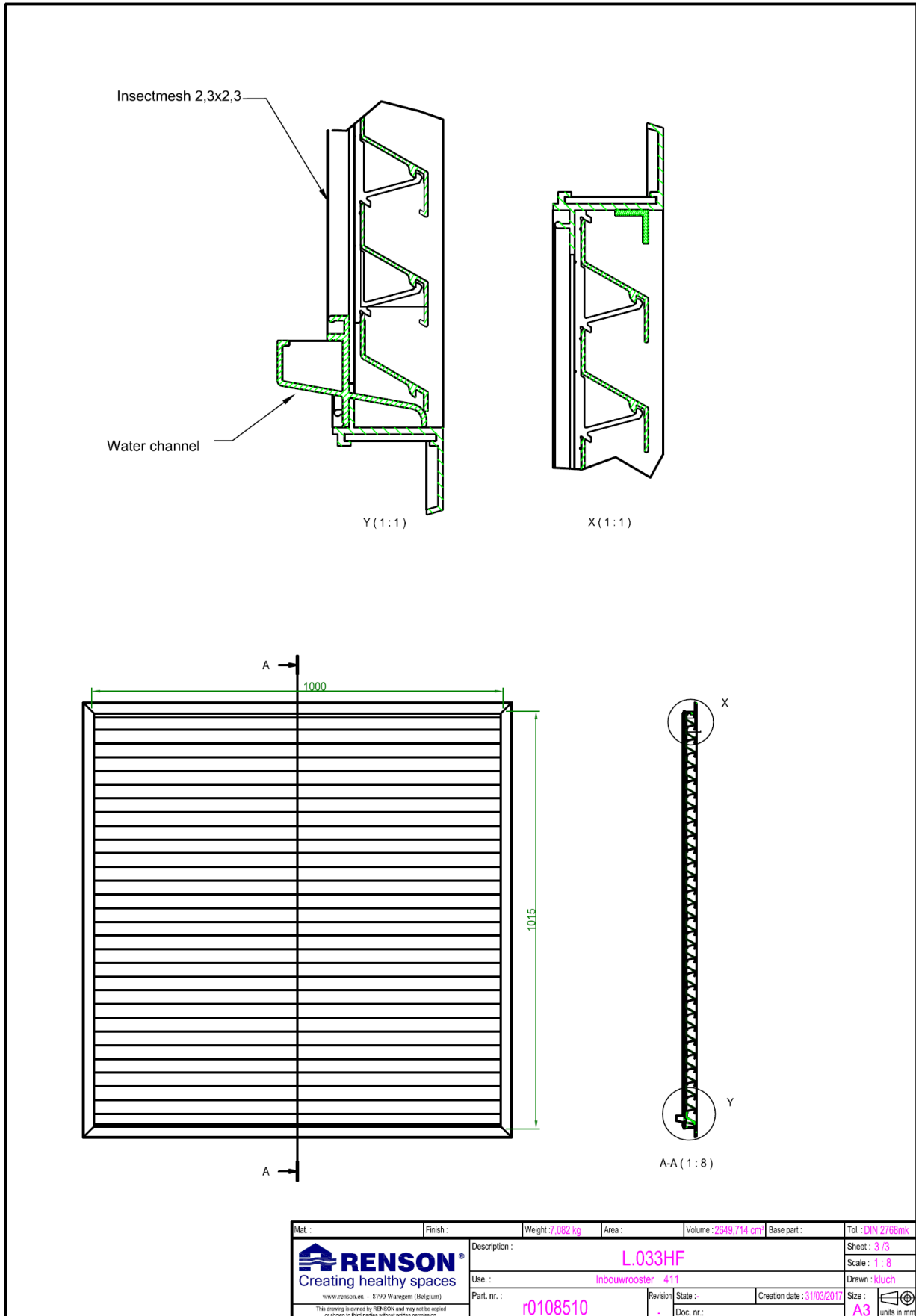
air temperature 15.4 °C louvre height 1000 mm  
 barometer 1012 mbar louvre width 990 mm  
 air density 1.217 kg/m<sup>3</sup> louvre area 0.990 m<sup>2</sup>


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	
10.0	0.80	0.791	4.013	0.197
25.1	1.27	1.259	6.359	0.198
36.8	1.54	1.527	7.699	0.198
50.8	1.81	1.792	9.046	0.198
75.0	2.20	2.179	10.991	0.198
99.8	2.53	2.501	12.679	0.197
123.0	2.82	2.792	14.076	0.198
148.0	3.10	3.066	15.440	0.199
199.0	3.59	3.553	17.904	0.198
236.0	3.88	3.845	19.497	0.197
mean C <sub>d</sub>				0.198
Class				4



A 'trendline' for the above graph would follow  $y = 15.883x^{1.9964}$

**APPENDIX: A MANUFACTURER'S DRAWING**



Mat.	Finish:	Weight: 7.082 kg	Area:	Volume: 2649.714 cm <sup>3</sup>	Base part:	Tot.: DIN 2768mk
		Description: L.033HF		Sheet: 3 / 3		Scale: 1 : 8
www.renson.eu - 8790 Waregem (Belgium)		Use.: Inbouwrooster - 411		Drawn: ktuch		Size: A3
Part. nr.: r0108510		Revision: -		State: -		Creation date: 31/03/2017
This drawing is owned by RENSON and may not be copied or shown to third parties without written permission.		Doc. nr.:		Size: A3		units in mm