



Weather Louvre Test

VSR

Final Report 58839/2

Carried out for
TROX Auranor Norge AS

By Andrew Freeth

21 May 2015



Weather Louvre Test VSR

Carried out for:

TROX Auranor Norge AS
Grimsdal 10
2760 Brandbu
Norway

Contract: **Final Report 58839/2**

Date: **21 May 2015**

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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 TROX Auranor Norge AS and was carried out at BSRIA on 22nd – 27th April 2015.

Items received for test

Test Item	BSRIA ID
VSR	58839A2

1.1 TEST ITEM INFORMATION

Contract	58839
Date	22 April 2015
Manufacturer	TROX Auranor Norge AS
Louvre Model	VSR
Material	Aluminium
Painted	No
Blade Height	923 mm
Blade Width	924 mm
Blade Depth	190 mm
Frame Depth	210 mm
No. of Blades	19
Blade Pitch	50 mm (approx)
Blade Angle	See drawing in APPENDIX
No. of Banks	2 (using a single component – see drawing in APPENDIX)
Guard Type	Bird/Vermin
Guard Spacing	0 mm
Side Channels	No
Water Drip Tray	Yes (extending 305 mm)
Blade Orientation	Vertical

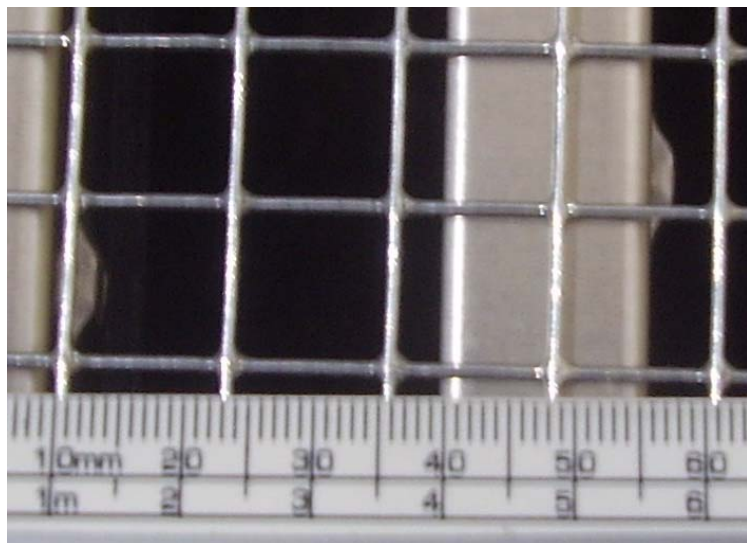
Figure 1 Test item 58839A2 (front)



Figure 2 Test item 58839A2 (rear)

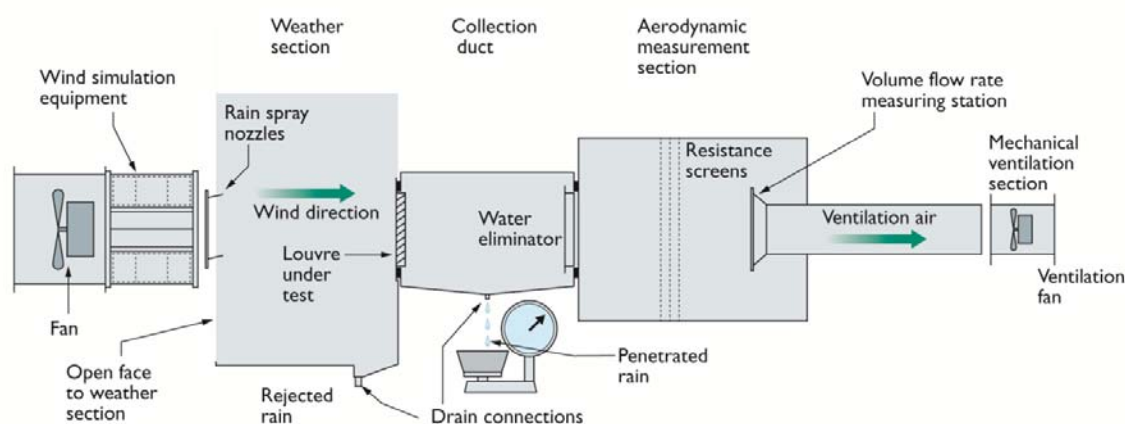


Figure 3 Close-up of guard



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	9-1-16
Rain measuring system	353	9-1-16
Airflow cones	364	9-1-16
Micromanometer	502	1-10-15
Micromanometer	682	7-1-16
Scales (water)	1364	9-2-16

3 RESULTS

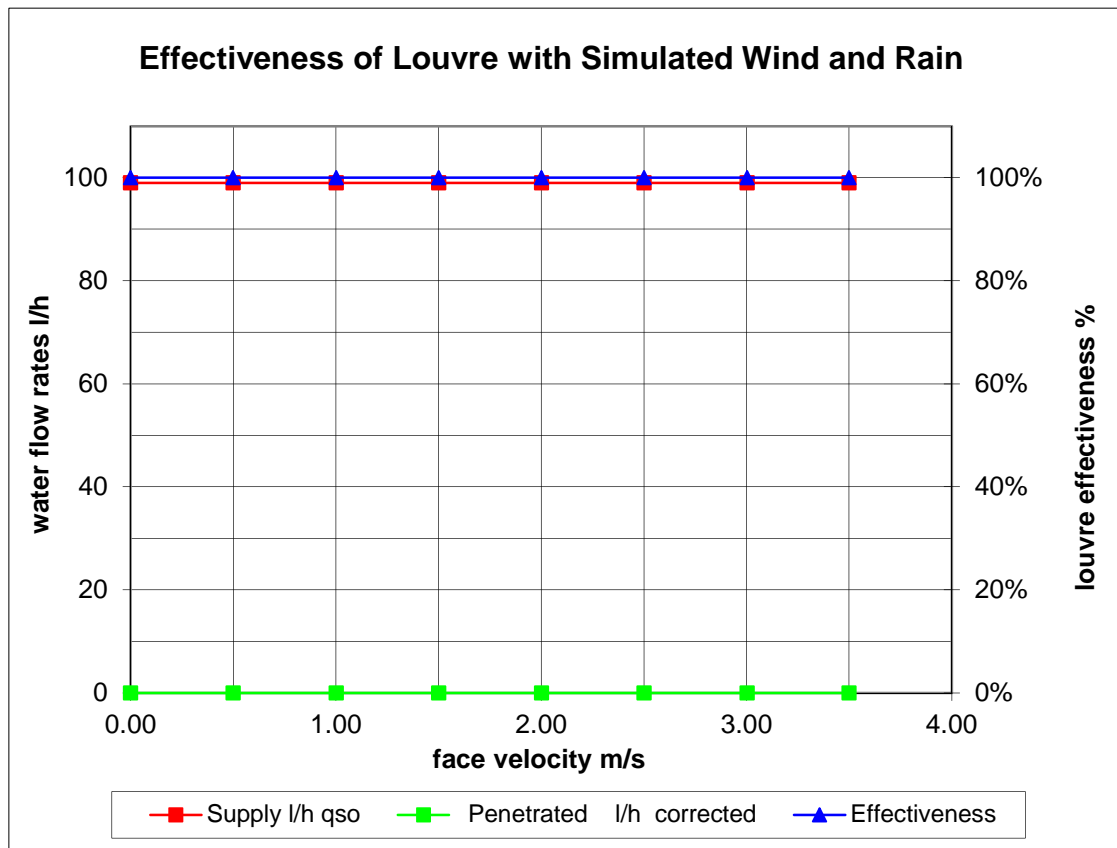
3.1 RAINWATER PENETRATION

MANUFACTURER TROX Auranor Norge AS
 MODEL VSR

Date 23/04/2015
 Contract 58839

Simulated rainfall 75 mm/hr
 Wind speed 13.0 m/s
 louvre height 922 mm
 louvre width 924 mm
 louvre area 0.852 m²

VENTILATION RATE		WATER FLOW RATES		Effectiveness	Class
Volume m ³ /s	Velocity m/s	Supply l/h	Penetrated l/h		
0.00	0.00	99.0	0.0	100.0%	A
0.43	0.50	99.0	0.0	100.0%	A
0.85	1.00	99.0	0.0	100.0%	A
1.28	1.50	99.0	0.0	100.0%	A
1.71	2.00	99.0	0.0	100.0%	A
2.13	2.50	99.0	0.0	100.0%	A
2.56	3.00	99.0	0.0	100.0%	A
2.98	3.50	99.0	0.0	100.0%	A



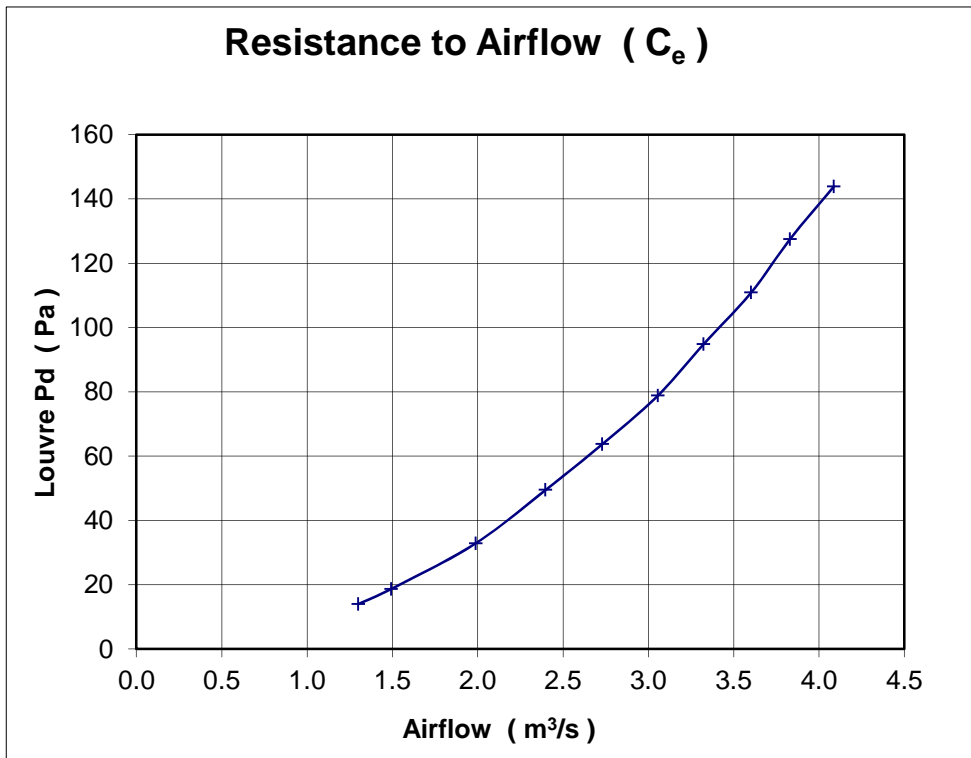
3.2 COEFFICIENT OF ENTRY

MANUFACTURER TROX Auranor Norge AS
 MODEL VSR

Date 23/04/2015
 Contract 58839

air temperature 16.4 °C louvre height 922 mm
 barometer 1004 mbar louvre width 924 mm
 air density 1.203 kg/m³ louvre area 0.852 m²

louvre pd Pascals	louvre face velocity	air flow rate		coefficient C _e
	m/s	test m ³ /s	theoretical m ³ /s	
14.0	1.53	1.300	4.110	0.316
18.7	1.75	1.493	4.751	0.314
32.9	2.33	1.989	6.301	0.316
49.5	2.81	2.398	7.729	0.310
63.7	3.20	2.729	8.768	0.311
78.8	3.59	3.055	9.752	0.313
94.8	3.90	3.323	10.696	0.311
110.9	4.23	3.603	11.569	0.311
127.5	4.50	3.830	12.405	0.309
143.9	4.80	4.088	13.178	0.310
mean C _e				0.312
Class				2



APPENDIX: A MANUFACTURER'S DRAWING

