TESTRAPPORT 53355/1 — ENGLISH TRANSLATION

According to EN 13030: 2001: "Ventilation of buildings - Grilles - Performance testing of air grilles subjected to simulated rain"

Louvre 491, mesh 6x6
and derived types :
Louvres494, mesh 6x6
Linius L.033.08, mesh 6x6

carried out by : BSRIA Ltd
Old Bracknell West, Bracknell
Berkshire RG12 7AH (Engeland)

commissioned by : nv RENSON Sunprotection-Projects sa
Maalbeekstraat 10
8790 Waregem (België)

Date of issue : 9 oktober 2018

INFORMATIE OVER DE TEST

Contract	**53355A**
Date	14/08/2009
Manufacturer	Renson
Louvre Model	491
Material	Aluminium
Painted	No
Blade Height	1000 mm
Blade Width	1000 mm
Blade Depth	22 mm
Frame Depth	35 mm
No.of Blades	29
Blade Pitch	33 mm
Blade Angle	30 Degrees
No.of Banks	1
Guard Type	Bird
Guard Spacing	8mm
Side Channels	No
Water Drip Tray	Yes (17mm Deep)
Blade Orientation	Horizontal

CLASSIFICATION OF WEATHER LOUVRES

Weather louvres shall be classified by their ability to reject simulated rain.

- **Penetration Classification**

Table 1 shows the different classifications based on the maximum simulated rain penetration per square metre of louvre. The classification is determined in accordance with section 8.2 of EN 13030:2001.

Water penetration rating at a given louvre face velocity is determined by the water penetration while the louvre is subjected to a 13 ms-1 simulated wind velocity and a simulated rain fall at the nominal rate.

Table 1 Penetration classification

classe	Effectiveness	Maximum allowed penetration of simulated rain l.h-1.m-2
A	1,00 - 0,99	0,75
B	0,989 - 0,95	3,75
C	0,949 - 0,80	15,0
D	< 0,80	> 15,0

These classifications apply to various core velocities.

- **Discharge and Entry Loss Coefficient**

The discharge and entry loss coefficient given in Table 2, shall be determined in accordance with section 8.3 of test standard EN13030:2001.

Classe	Discharge and Entry Loss Coefficient
1	> 0,4
2	0,3 - 0,399
3	0,2 - 0,299
4	< 0,199

Summary Report 53355/1 **Issue No: 1** **Date of issue: 10 October 2018**

This Summary Report confirms that BSRIA Ltd has tested a sample of the product described below in accordance with the test methods contained within EN 13030:2001 and have determined the item met the detailed classification shown on pages 3 to 5. For further details of the test item see Page 2 of this Summary Report.

Manufacturer/Agent	N.V. Renson Projects IZ 2 Vijverdam Maalbeekstraat 6 B-8790 Waregem
Product	491
Test location	BSRIA Old Bracknell West Bracknell Berkshire RG12 7AH
Date of test	14 August to 17 September 2009
Date of issue	9 October 2018
Test engineer	A Freeth
Quality approved	Mark Roper Principal Test Engineer

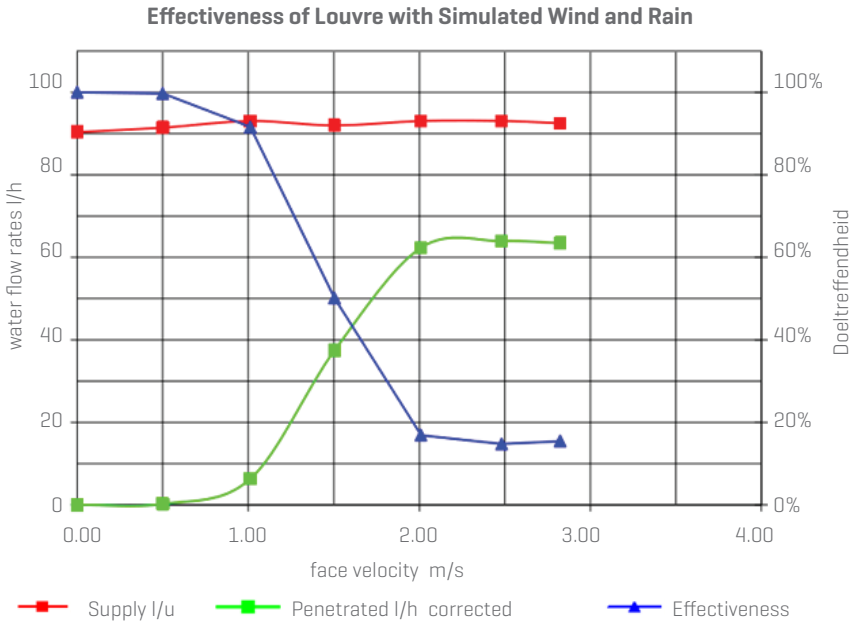
This summary report supersedes certificate 53355/1. This up-date was carried out under BSRIA contract reference 61223.

RAINWATER PENETRATION

MANUFACTURER	Renson	Date	14/08/2009
MODEL	491	Contract	53355A

Simulated rainfall	75 mm/hr	louvre height	1000 mm
Wind speed	13.0 m/s	louvre width	1000 mm
		louvre area	1.000 m2

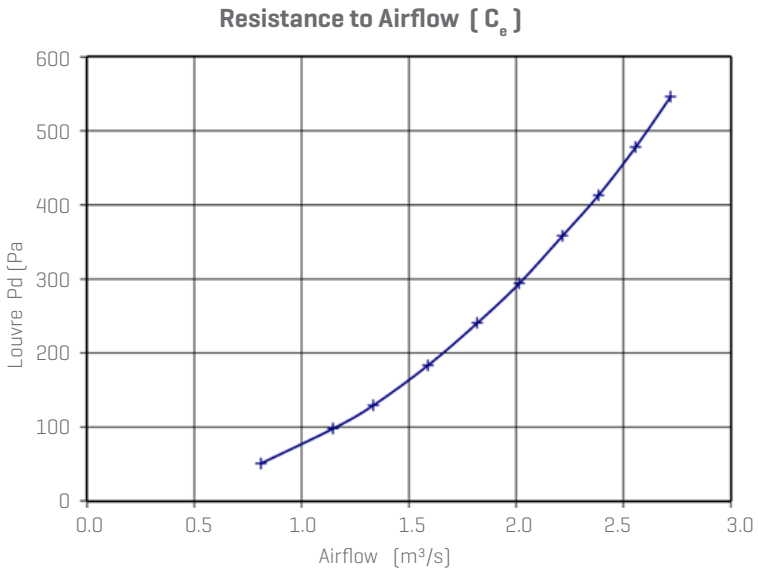
VENTILATION RATE		WATER FLOW RATES		Effectiveness	Class
Volume m3/s	Velocity m/s	Supply l/u	Penetrated l/u		
0,00	0,00	90,3	0,0	100,0 %	A
0,50	0,50	91,4	0,2	99,7 %	A
1,01	1,01	93,0	6,3	91,6%	C
1,50	1,50	92,0	37,4	50,1%	D
2,01	2,01	93,0	62,3	16,9%	D
2,48	2,48	93,0	63,9	14,7%	D
2,82	2,82	92,5	63,4	15,4%	D



COEFFICIENT OF ENTRY

MANUFACTURER	Renson	Date	26/08/2009
MODEL	491	Contract	53355A
air temperature	19.6 °C	louvre height	1000 mm
barometer	1002 mbar	louvre width	1000 mm
air density	1.188 kg/m3	louvre area	1.000 m2

	louvre face velocity	air flow rate		
louvre pd Pascal	**m/s**	**Test m³/s**	**theoretical m³/s**	**Coëfficiënt Ce**
50,8	0,81	0,811	9,249	0,088
97,8	1,15	1,147	12,834	0,089
129,2	1,33	1,334	14,751	0,090
183,3	1,59	1,589	17,570	0,090
240,5	1,82	1,819	20,125	0,090
294,1	2,02	2,015	22,255	0,091
358,2	2,22	2,216	24,561	0,090
413,0	2,38	2,384	26,373	0,090
477,9	2,56	2,577	28,369	0,090
546,0	2,72	2,719	30,323	0,090
			mean C_e	0,090
			Class	4



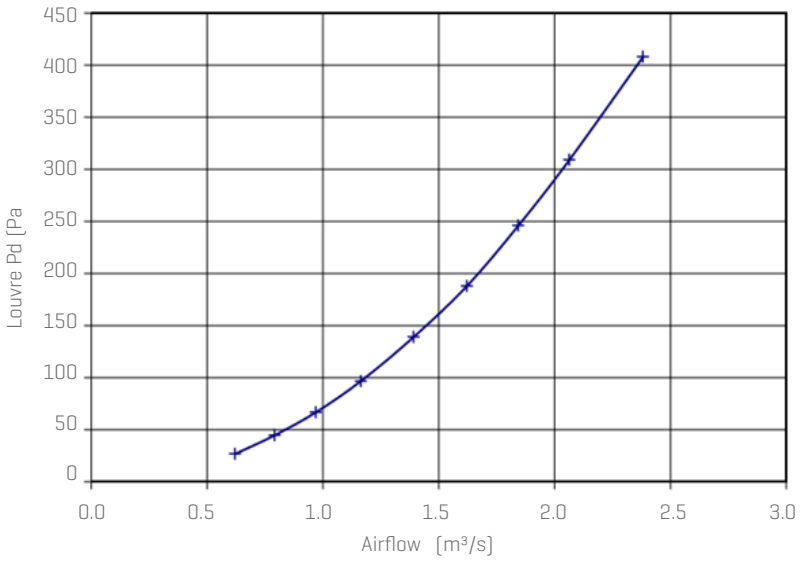
COEFFICIENT OF DISCHARGE

MANUFACTURER	Renson	Date	17/09/2009
MODEL	491	Contract	53355A

air temperature	18.9 °C	louvre height	1000 mm
barometer	1014 mbar	louvre width	1000 mm
air density	1.205 kg/m3	louvre area	1.000 m2

	louvre face velocity	air flow rate		
Louvre pd Pascal	**m/s**	**Test m³/s**	**theoretical m³/s**	**coefficient Ce**
26,8	0,62	0,621	6,670	0,093
44,7	0,79	0,792	8,614	0,092
66,8	0,97	0,970	10,531	0,092
96,7	1,16	1,164	12,670	0,092
139,0	1,39	1,391	15,191	0,092
188,0	1,62	1,622	17,667	0,092
246,0	1,84	1,844	20,209	0,091
309,0	2,06	2,064	22,649	0,091
408,0	2,38	2,382	26,026	0,092
546,0	2,72	2,719	30,323	0,090
			mean Ce	0,092
			Class	4

Resistance to Airflow (Cd)



Summary Report

www.bsria.co.uk

Summary Report 53355/1 **Issue No: 1** **Date of issue: 10 October 2018**

This Summary Report confirms that BSRIA Ltd has tested a sample of the product described below in accordance with the test methods contained within EN 13030:2001 and have determined the item met the detailed classification shown on pages 3 to 5. For further details of the test item see Page 2 of this Summary Report.

Manufacturer/Agent	N.V. Renson Projects IZ 2 Vijverdam Maalbeekstraat 6 B-8790 Waregem
Product	491
Test location	BSRIA Old Bracknell West Bracknell Berkshire RG12 7AH
Date of test	14 August to 17 September 2009
Date of issue	9 October 2018
Test engineer	A Freeth
Quality approved	Mark Roper Principal Test Engineer

This summary report supersedes certificate 53355/1. This up-date was carried out under BSRIA contract reference 61223.

TEST INFORMATION

Contract	53355A	
Date	14/08/2009	
Manufacturer	Renson	
Louvre Model	491	
Material	Aluminium	
Painted	No	
Blade Height	1000	mm
Blade Width	1000	mm
Blade Depth	22	mm
Frame Depth	35	mm
No.of Blades	29	
Blade Pitch	33	mm
Blade Angle	30	Degrees
No.of Banks	1	
Guard Type	Bird	
Guard Spacing	8mm	
Side Channels	No	
Water Drip Tray	Yes (17mm Deep)	
Blade Orientation	Horizontal	

Front view of louvre

RAINWATER PENETRATION

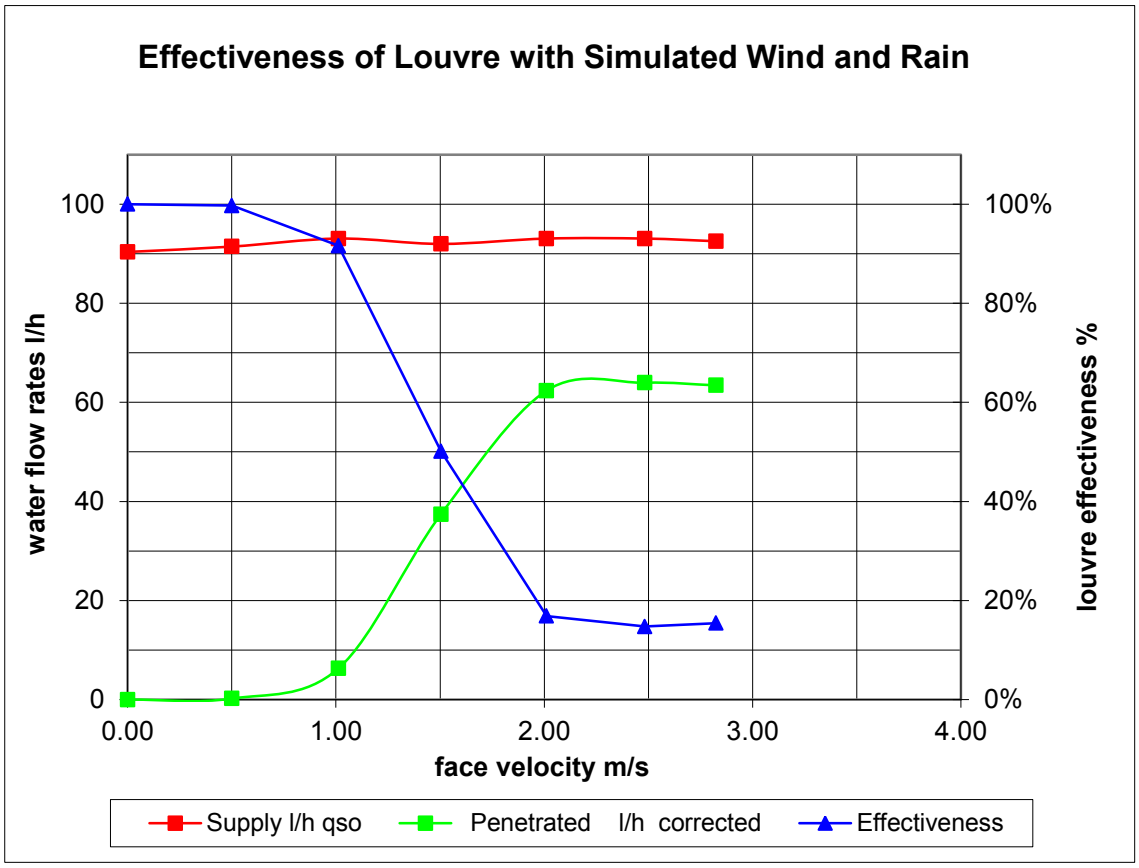
MANUFACTURER Renson
MODEL 491

Date 14/08/2009
Contract 53355A

Simulated rainfall 75 mm/hr
Wind speed 13.0 m/s

louvre height 1000 mm
louvre width 1000 mm
louvre area 1.000 m^2

VENTILATION RATE		WATER FLOW RATES		Effectiveness	Class
Volume m^3/s	Velocity m/s	Supply l/h	Penetrated l/h		
0.00	0.00	90.3	0.0	100.0%	A
0.50	0.50	91.4	0.2	99.7%	A
1.01	1.01	93.0	6.3	91.6%	C
1.50	1.50	92.0	37.4	50.1%	D
2.01	2.01	93.0	62.3	16.9%	D
2.48	2.48	93.0	63.9	14.7%	D
2.82	2.82	92.5	63.4	15.4%	D



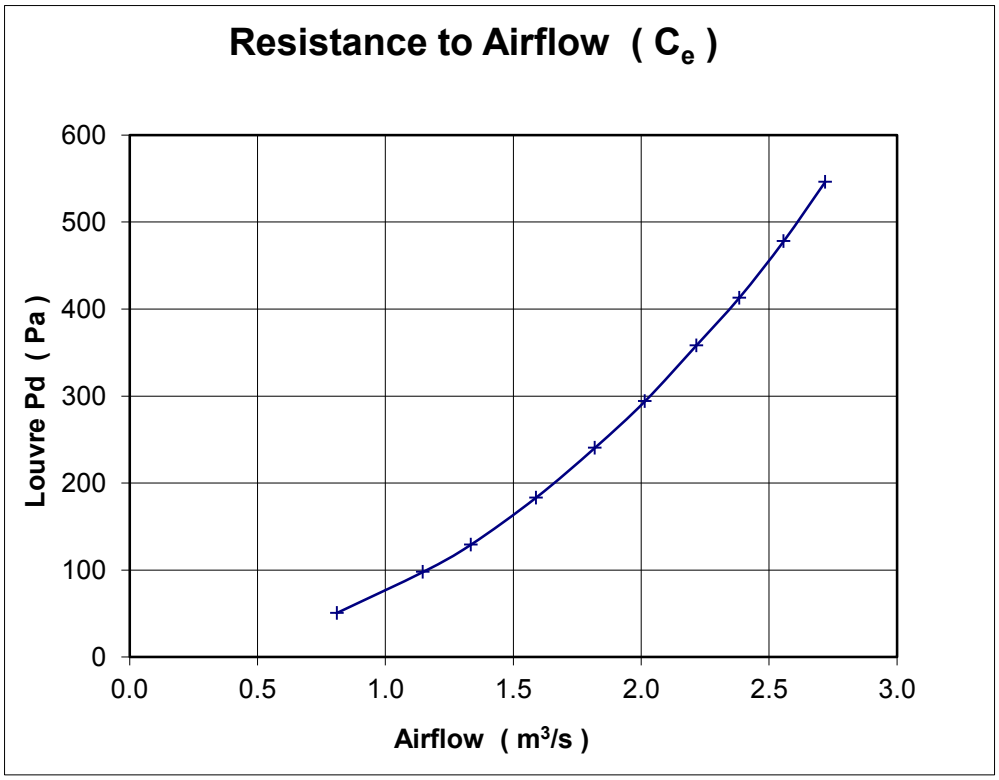
COEFFICIENT OF ENTRY

MANUFACTURER Renson
MODEL 491

Date 26/08/2009
Contract 53355A

air temperature	19.6	°C	louvre height	1000	mm
barometer	1002	mbar	louvre width	1000	mm
air density	1.188	kg/m^3	louvre area	1.000	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_e
50.8	0.81	0.811	9.249	0.088
97.8	1.15	1.147	12.834	0.089
129.2	1.33	1.334	14.751	0.090
183.3	1.59	1.589	17.570	0.090
240.5	1.82	1.819	20.125	0.090
294.1	2.02	2.015	22.255	0.091
358.2	2.22	2.216	24.561	0.090
413.0	2.38	2.384	26.373	0.090
477.9	2.56	2.557	28.369	0.090
546.0	2.72	2.719	30.323	0.090
			mean C_e	0.090
			Class	4



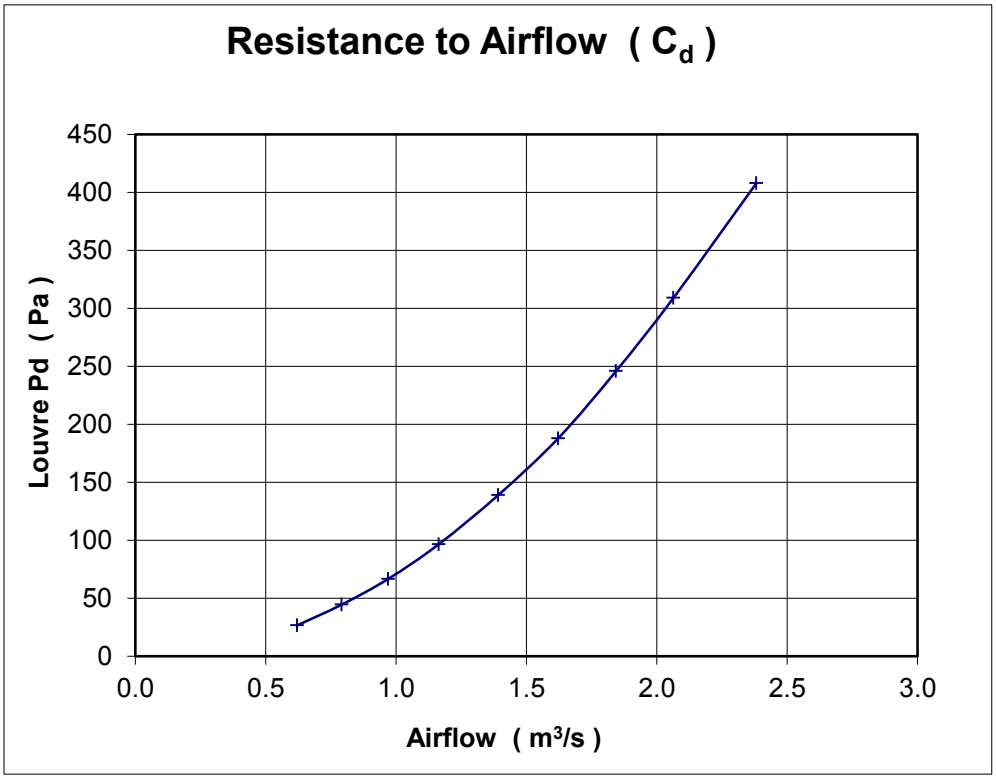
COEFFICIENT OF DISCHARGE

MANUFACTURER Renson
MODEL 491

Date 17/09/2009
Contract 53355A

air temperature	18.9	°C	louvre height	1000	mm
barometer	1014	mbar	louvre width	1000	mm
air density	1.205	kg/m^3	louvre area	1.000	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_e
26.8	0.62	0.621	6.670	0.093
44.7	0.79	0.792	8.614	0.092
66.8	0.97	0.970	10.531	0.092
96.7	1.16	1.164	12.670	0.092
139.0	1.39	1.391	15.191	0.092
188.0	1.62	1.622	17.667	0.092
246.0	1.84	1.844	20.209	0.091
309.0	2.06	2.064	22.649	0.091
408.0	2.38	2.382	26.026	0.092
			mean C_e	0.092
			Class	4



CLASSIFICATION OF WEATHER LOUVRES

Weather louvres shall be classified by their ability to reject simulated rain.

Penetration Classification

Table 1 shows the different classifications based on the maximum simulated rain penetration per square metre of louvre. The classification is determined in accordance with section 8.2 of EN 13030:2001.

Water penetration rating at a given louvre face velocity is determined by the water penetration while the louvre is subjected to a 13 ms^{-1} simulated wind velocity and a simulated rain fall at the nominal rate.

Table 1 Penetration classification

Class	Effectiveness	Maximum allowed penetration of simulated rain $l.h^{-1}.m^{-2}$
A	1,00 TO 0,99	0,75
B	0,989 TO 0,95	3,75
C	0,949 TO 0,80	15,0
D	Below 0,8	Greater than 15,0

These classifications apply to various core velocities.

Discharge and Entry Loss Coefficient

The discharge and entry loss coefficient given in Table 2, shall be determined in accordance with section 8.3 of test standard EN13030:2001.

Table 2 Discharge and Entry loss coefficient classification

Class	Discharge and Entry Loss Coefficient
1	0,4 and above
2	0,3 to 0,399
3	0,2 to 0,299
4	0,199 and below