

# Certificate

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**Certificate No: 53559/1**

**Issue No: 1**

**Date of issue: 13 October 2009**

This is to certify that

**BSRIA Limited**

Has tested a sample of the product described below in accordance with the test methods contained within EN 13030 : 2001 and has determined the item met the detailed classification shown on pages 3 and 4 of this certificate. For further details of the test item see Page 2 of this certificate

**Manufacturer/Agent** ALU + Ltd  
Unit 1 Maguire Industrial Estate  
219 Torrington Avenue  
Coventry  
Warwickshire  
CV4 9HN

**Product** LLS (70mm)

**Test location** BSRIA  
Old Bracknell West  
Bracknell  
Berkshire  
RG12 7AH

**Date of test** 8 September 2009

**Expiry date** 13 October 2012

**Test engineer** Andrew Coulson

**Quality approved** Phil Stonard  
Laboratory Manager  
Testing & Certification

This certificate must not be reproduced except in full without the written approval of an executive director of BSRIA. It is only intended to be used within the context described in the text.

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### TEST ITEM INFORMATION

|                          |            |
|--------------------------|------------|
| <b>Contract</b>          | 53559A     |
| <b>Date</b>              | 08/09/2009 |
| <b>Manufacturer</b>      | ALU + Ltd  |
| <b>Louvre Model</b>      | LLS (70mm) |
| <b>Material</b>          | Aluminium  |
| <b>Painted</b>           | No         |
| <b>Blade Height</b>      | 1111 mm    |
| <b>Blade Width</b>       | 1001 mm    |
| <b>Blade Depth</b>       | 85 mm      |
| <b>Frame Depth</b>       | 90 mm      |
| <b>No.of Blades</b>      | 13         |
| <b>Blade Pitch</b>       | 73 mm      |
| <b>Blade Angle</b>       | 45 Degrees |
| <b>No.of Banks</b>       | 1          |
| <b>Guard Type</b>        | Vermin     |
| <b>Guard Spacing</b>     | 5 mm       |
| <b>Side Channels</b>     | No         |
| <b>Water Drip Tray</b>   | Yes        |
| <b>Blade Orientation</b> | Horizontal |



WATER PENETRATION

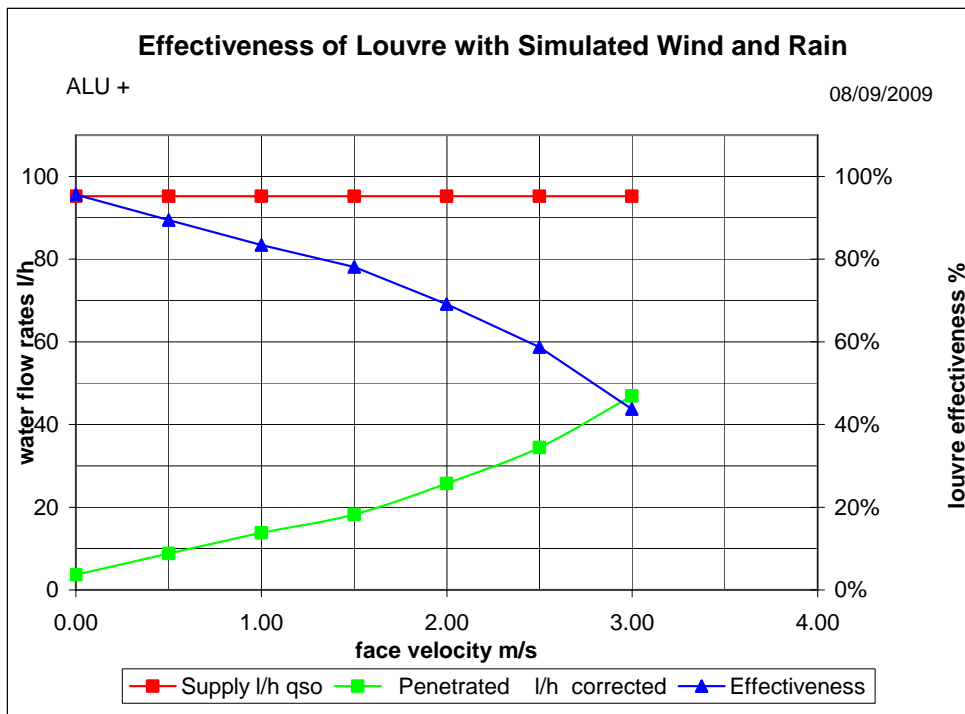
Certification test

MANUFACTURER ALU +  
MODEL LLS (70mm)

Date 08/09/2009  
Contract 53559A

Simulated rainfall 75 mm/hr  
Wind speed 13.0 m/s  
louvre height 1111 mm  
louvre width 1001 mm  
louvre area 1.112 m<sup>2</sup>

| VENTILATION RATE            |                 | WATER FLOW RATES |                   | Effectiveness | Class |
|-----------------------------|-----------------|------------------|-------------------|---------------|-------|
| Volume<br>m <sup>3</sup> /s | Velocity<br>m/s | Supply<br>l/h    | Penetrated<br>l/h |               |       |
| 0.00                        | 0.00            | 95.2             | 3.7               | 95.6%         | B     |
| 0.56                        | 0.50            | 95.2             | 8.8               | 89.5%         | C     |
| 1.11                        | 1.00            | 95.2             | 13.8              | 83.4%         | C     |
| 1.67                        | 1.50            | 95.2             | 18.3              | 78.1%         | D     |
| 2.22                        | 2.00            | 95.2             | 25.7              | 69.1%         | D     |
| 2.78                        | 2.50            | 95.2             | 34.4              | 58.7%         | D     |
| 3.33                        | 3.00            | 95.2             | 46.9              | 43.7%         | D     |



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ENTRY LOSS COEFFICIENT

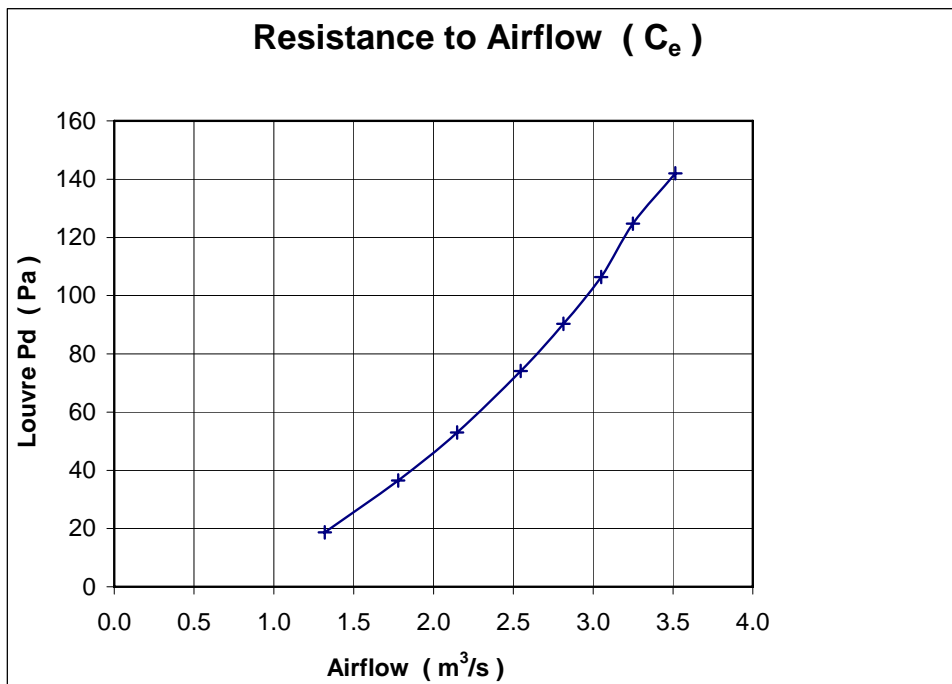
Certification test

MANUFACTURER ALU +  
MODEL LLS (70mm)

Date 08/09/2009  
Contract 53559A

|                 |                         |               |                      |
|-----------------|-------------------------|---------------|----------------------|
| air temperature | 20.1 °C                 | louvre height | 1111 mm              |
| barometer       | 1030 mbar               | louvre width  | 1001 mm              |
| air density     | 1.219 kg/m <sup>3</sup> | louvre area   | 1.112 m <sup>2</sup> |

| louvre pd<br>Pascals | louvre face velocity | air flow rate             |                                  | coefficient<br>C <sub>e</sub> |
|----------------------|----------------------|---------------------------|----------------------------------|-------------------------------|
|                      | m/s                  | test<br>m <sup>3</sup> /s | theoretical<br>m <sup>3</sup> /s |                               |
| 18.7                 | 1.19                 | 1.319                     | 6.161                            | 0.214                         |
| 36.5                 | 1.60                 | 1.779                     | 8.607                            | 0.207                         |
| 53.0                 | 1.93                 | 2.148                     | 10.372                           | 0.207                         |
| 74.1                 | 2.29                 | 2.547                     | 12.264                           | 0.208                         |
| 90.3                 | 2.53                 | 2.813                     | 13.538                           | 0.208                         |
| 106.4                | 2.74                 | 3.050                     | 14.695                           | 0.208                         |
| 124.7                | 2.92                 | 3.250                     | 15.909                           | 0.204                         |
| 142.0                | 3.16                 | 3.515                     | 16.977                           | 0.207                         |
| #N/A                 | #N/A                 | #N/A                      | #N/A                             | #N/A                          |
| #N/A                 | #N/A                 | #N/A                      | #N/A                             | #N/A                          |
| mean C <sub>e</sub>  |                      |                           |                                  | 0.208                         |
| Class                |                      |                           |                                  | 3                             |



## 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 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  $13 \text{ ms}^{-1}$  simulated wind velocity and a simulated rain fall at the nominal rate.

**Table 1 Penetration classification**

| Class | Effectiveness | Maximum allowed penetration of simulated rain $\text{l.h}^{-1}.\text{m}^{-2}$ |
|-------|---------------|---|
| A     | 1 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 Loss Coefficient

The discharge loss coefficient given in Table 2, shall be determined in accordance with section 7.2 of test standard EN13030:2001.

**Table 2 Discharge loss coefficient classification**

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

(Note: The above also applies to entry loss coefficient)