



Insight

CSIRO DIVISION OF BUILDING, CONSTRUCTION AND ENGINEERING

Report No. DTA 313

**Determination of Resistance to Leakage
during Rain to AS 2428.1 of Hurricane
Turbine Ventilators.**

**IN CONFIDENCE TO
Edmonds Products Aust Ltd.**

December 1994



**DETERMINATION OF
RESISTANCE TO LEAKAGE DURING RAIN TO AS2428.1
OF HURRICANE TURBINE VENTILATORS.**

CSIRO Report No DTA313 and Job No. NDDZTR2332

1. INTRODUCTION

The following information outlines details about the client and project.

Sponsor: Edmonds Products Aust Pty Ltd
PO Box 511
BROOKVALE NSW 2100

Test Date: 6 and 9 December 1994

Background: CSIRO was engaged by Edmonds Products to carry out dynamic wind load and water penetration testing on the several "Hurricane Turbine Ventilators" to AS2428.1 Methods or testing smoke/heat release ventilators - Determination of resistance to leakage during rain.

CSIRO provided all equipment and personnel to perform the tests.

2. TEST SAMPLE

The specimen referred to as "Hurricane Turbine Ventilator" comprises an assembly of various aluminium components all riveted or mechanically fastened to form a turbine head mounted to freely rotate on a double row precision ground water pump bearing concealed beneath the domed cap and protected from weather and exhaust gases. The turbine head is mounted on a braced shaft above a segmented tube of a nominal diameter which is riveted to a rectangular flashing.

Three samples of different sizes were tested being:

- 1) H400 Hurricane Turbine Ventilator
- 2) H600 Hurricane Turbine Ventilator
- 3) H800 Hurricane Turbine Ventilator

Details of the samples are found in Appendix A of this report.

3. TEST CONDITIONS

The samples were installed on a model roof in the test area and subjected to a simulated wind velocity which can be varied up to 55 m/s. Water is introduced into the wind stream at a rate of 2.5 Litres per second. The sample was subjected to the maximum wind velocity of 55 m/s (198 k.p.h.).

The test apparatus consists of a dynamic wind machine having a propeller of 4160mm diameter. The source of the air stream is produced at a point situated 11 ± 1 m upstream from the leading edge of the specimen.

Water is introduced into the wind stream by a spray nozzles system situated 8 m from the wind source.

The ventilator was installed on the model roof which was set at 0° pitch.

All three ventilators were tested to conditions as described in AS2428.1 as follows:

- (a) The wind machine was started and the air stream speed was adjusted to 16 m/s which was maintained for five (5) minutes.
- (b) Water was introduced into the air stream at a rate of 2.5 L/s.
- (c) The wind speed was increased to 55 m/s and maintained for two (2) minutes.

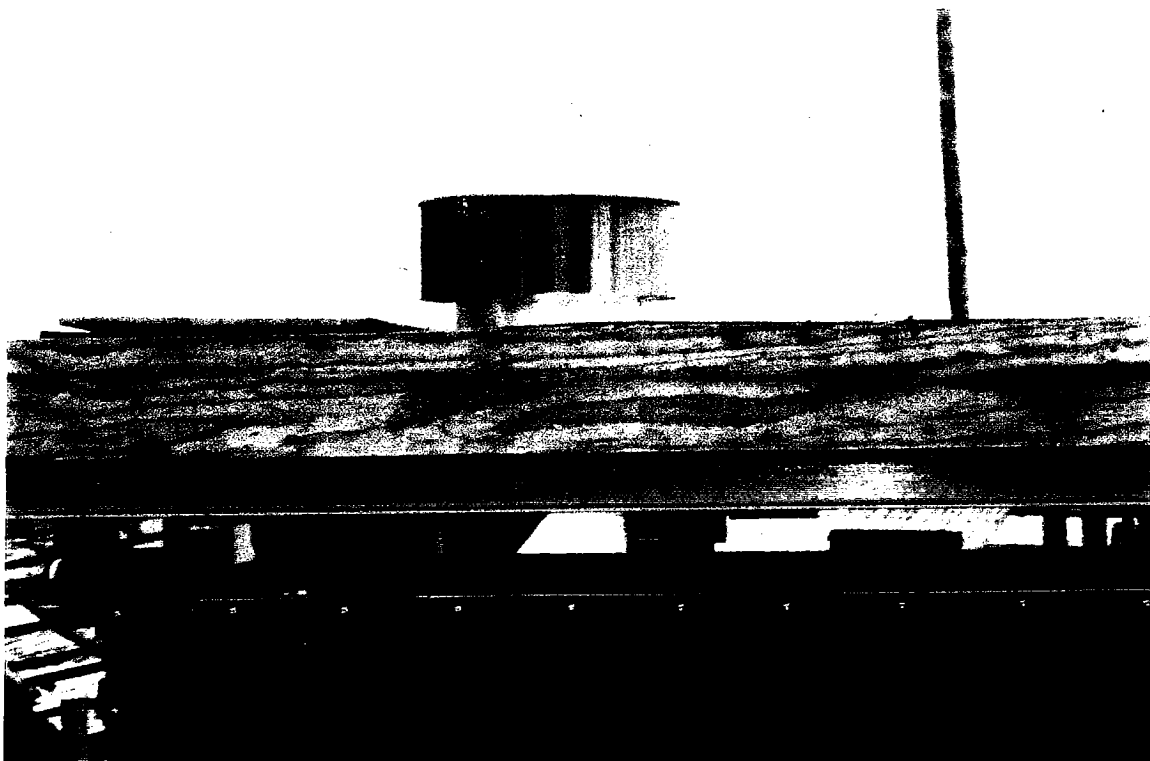


Figure 1: The Hurricane Turbine Ventilator mounted for testing.

3. RESULTS

1. The Hurricane Turbine Ventilators each successfully withstood the dynamic wind speeds ranging from 16 mps (57.6 kph) to the maximum speed generated by the test apparatus of 55 mps (198 kph).
2. During the test there was no abnormal vibration or mechanical damage to the units and each ventilator operated normally at the conclusion of the programme.
3. There was no water entry at any time during the test ranging from 16 mps (57.6 kph) to 55 mps (198kph) dynamic wind speeds and simulated rain of 2.5 litres per second in the wind stream.

4. CONCLUSIONS

The vents described as:

- 1) H400 Hurricane Turbine Ventilator
- 2) H600 Hurricane Turbine Ventilator
- 3) H800 Hurricane Turbine Ventilator

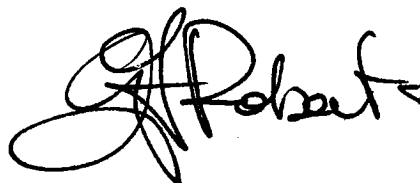
were presented for testing on the 6 December 1994.

Each ventilator successfully resisted water entry in a wind speed of 55 m/s therefore complying with test requirements to AS2428.1 - methods of testing smoke/heat release ventilators - determination of resistance to leakage during rain.

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