CSIRO Report No. DTA447
CSIRO Job No NLCETA2615

DYNAMIC WEATHER RESISTANCE TESTS ON A ROTARY VENTILATOR TO AS2050 (APPENDIX C)

IN CONFIDENCE TO
Edmonds Rotor Ventilator Co

December, 1996

CSIRO BUILDING, CONSTRUCTION AND ENGINEERING

CSIRO
AUSTRALIA

DYNAMIC WEATHER RESISTANCE TESTS TO AS2050 (APPENDIX C) ON A ROTARY VENTILATOR MANUFACTURED BY EDMONDS ROTOR VENTILATOR CO.

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1. INTRODUCTION

The following information outlines details about the client and project.

Sponsor: Edmonds Rotor Ventilator Co.
P O Box 511
BROOKVALE NSW 2100

Test Date: 21 November 1996.

Background: CSIRO was engaged by Edmonds Rotor Ventilator Co to carry out water penetration testing on a prototype variation of the H900 Hurricane turbine Ventilator to AS2050.1989 (Appendix C) Dynamic Weather Resistance Test.

CSIRO provided all equipment and personnel to perform the tests

2. TEST SAMPLE

The specimen referred to as the H900 Hurricane Turbine Ventilator comprises an assembly of various materials to form a cylindrical head mounted to freely rotate. The cylindrical head is mounted above duct of 900 mm nominal diameter which is joined to a rectangular flashing unit.

The unit tested was modified to prevent droplets of rain being induced into the throat of the ventilator during heavy rain and strong winds. The modification is an extension of the bottom skirt.

The skirt extension on the prototype that was tested was 50 mm fibre duct tape adhered to the existing skirt. For production the skirt will be extended using aluminium spun in one piece with the existing skirt. The production skirt should perform the same or better than that tested on the prototype.

Details of the sample are found in the drawing in Appendix A of this report.

3. TEST CONDITIONS

The sample was installed on a model roof in a test chamber and subjected to a simulated wind velocity which can be varied up to 22 m/s(79.2 km/h). Water is introduced into the wind stream at a rate of 0.5 L/s. The sample was subjected to a wind velocity of 22m/s.

The test apparatus consists of a 1200mm diameter, 8 blade fan driven by an 18.65kW electric motor. The wind stream from this fan is discharged into the test chamber by means of a 1230 mm square duct, 3000 mm long and fitted with flow straightening vanes at the discharge end.

Water is introduced into the wind stream by two sets of spray nozzles. The first consists of a set of 12 nozzles installed in vertical pipes which are mounted immediately downstream from, and in line with, the straightening vanes. This set discharges water horizontally into the wind stream. The second is a set of 8 nozzles installed in a horizontal sparge pipe mounted 900 mm above the centre of the wind stream and 1500 mm downstream from the discharge orifice. It discharges water downwards at an angle of 60° to the horizontal and in the direction of the wind stream.

The model roof is placed in the wind stream with its ridge 3600 mm downstream from the discharge orifice and the ventilator is in the center of the flow.

Procedure

(a) With vent on the windward side of the roof panel, and the tilting axis at right angles to the airstream,

(b) The wind machine was started and the airstream speed was adjusted to 22 m/s.

(c) Water was introduced to the airstream at the rate of 0.5 L/s.

(d) The wind speed of 22 m/s was maintained for five (5) minutes.

(e) Any water penetration was noted and recorded.

(f) This process was repeated with the tilting axis parallel to the windstream.

Figure 1: The H900 Hurricane Turbine Ventilator subjected to water penetration testing.

Figure 1: Close up view of the bottom skirt extension.

4. RESULTS

With the tilting axis normal to the windstream, no water drops, a negligible amount of drift (fine mist) and a significant updraft were observed in the throat of the specimen. Water condensed on the inner surfaces of the vent and drained out to the flashing.

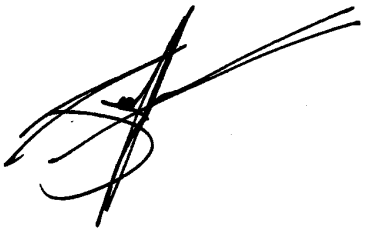
With the tilting axis parallel to the windstream, similar performance was observed.

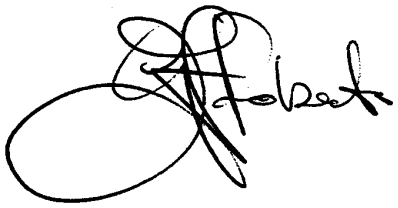
The unit remained stable in the conditions applied, 22 m/s (79.2 Km/h) wind speed. There was not evidence of water entry under the test conditions.

5. CONCLUSION

The unit described as the H900 Hurricane Turbine Ventilator with skirt extension modifications as described met the test requirements for AS2050.1989. (Appendix C) Dynamic Weather Resistance Test at a wind velocity of 22 m/s.

Report Prepared by:





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