REPORT ON

Testing of

Wind Ventilator

Requisitioned by

M/s Sudha Ventilating System Pvt. Ltd

JOB NO : /DRD/AE/BR-1/05-06

BY

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May, 2005

REPORT- PART A

1. No. of the Report	DRD/AE/BR-1/05-06
2. Name of the party	**Sudha Ventilating System Pvt. Ltd**
3. Address of the Party	Sudha ventilating Systems P. Ltd B – 85, M.I.D.C, Ahemadnagar - 414111

REPORT- PART B

1. Name of the instrument tested	Sudha Wind Ventilator Model
2. Sr. Nos of instruments	Sr. #001
3. Date of the Experiments	: 25th, 26th, 27th, 28th May, 2005
4. Names of the Equipment	: Horizontal Wind Closed jet Open Circuit Tunnel, Standard Pitot Static Tube, Micro Manometer TSI 1650 hot-Wire anemometer
5. Description of the Equipment Used for Testing	: Appendix A
6. Experimental Procedure	: Appendix B
7. Reduction of the Data	: Appendix C
8. Specific Comments	: Accuracy of Results 5 %

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APPENDIX A

Description of the Equipment Used for testing

Horizontal Wind Tunnel

Horizontal open jet open circuit wind tunnel, used to test the ventilator has test section of size 1 m X 1m. It is powered by one fan. The test section of this tunnel is covered with plywood/Plexiglas on all the four sides. The maximum wind speed that can be achieved in 1m X 1m test section is 8 m/sec.

Arrangement for collecting Air Discharge

The wind ventilator was connected to a 300 mm Dia Duct. This duct has a straight portion followed by a 90 degree bend and one more straight section and a bell mouthed entry. The straight portion accommodates screens in its flanges as shown in Fig. 2.

Standard Pitot Static Tube

This is a standard Pitot tube. It is mainly used for the wind speed measurement. It is calibrated at period intervals.

Micro Manometer

Micro manometer used for the experiment has a least count 0.01-mm of water. This instrument is used for measuring pressure difference typical less than 0.1 mm of water.

Vane Anemometer

This instrument is used for measuring low velocities either in the tunnel or in the duct connected to wind ventilator. This instrument is calibrated periodically.

Tachometer

This is a commercial quality non contact type tachometer with 3 ½ digit display. It is used for measuring the rpm of wind ventilator.

APPENDIX B

Experimental Procedure Followed

The testing procedure is similar IS 3963-1987 used for testing exhaust fans. However, the present ventilator uses wind energy rather than electrical for ventilation. Hence, the experimental set up and testing procedure has been modified.

The wind ventilator being tested is located at the center of the test section of the wind tunnel. It is kept with its axis perpendicular to the axis of the tunnel as shown in fig. 1.

A hot wire anemometer is located at the test section away from the wind ventilator but at the center of the tunnel (not shown in Fig). It is aligned along the axis of the tunnel. This meter reads wind speed.

The duct connected to the wind ventilator as shown in fig. 2 between the bell mouthed entry and the flanges are used for locating the screens. Hot wire anemometer is traversed at the duct entry in diametric direction for taking velocity readings. These reading when averaged give the volume flow rate generated by the ventilator.

The screens located in the duct the resistance against which the ventilator is supposed to produce the volume flow rate. This resistance is measured as a differential pressure across the screen averaged over four circumferential locations.

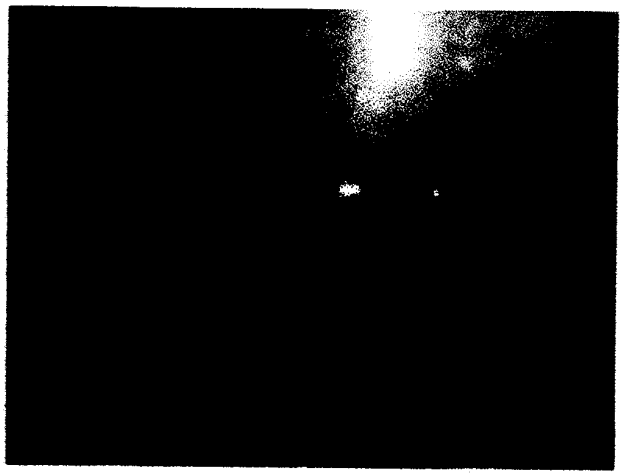

Fig. 1 Ventilator

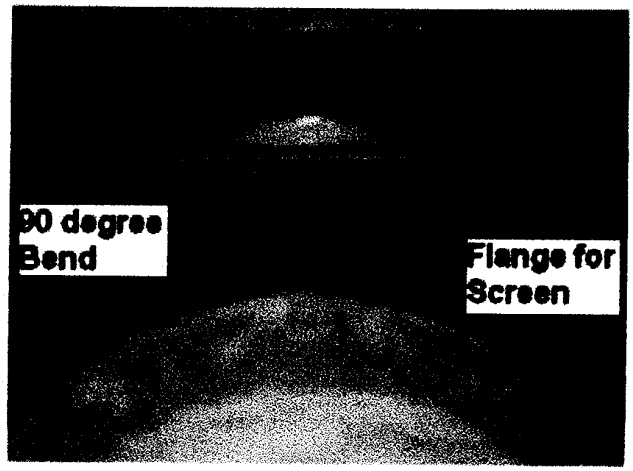

Fig.2 Duct Bend

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APPENDIX C

Reduction of Data

The experiments were conducted with no screen, 1 screen and 2 screens located in the duct connected to the ventilator. For each of these configurations wind ventilator was subjected to a number of wind speeds. For each configuration and for every wind, air in the duct was measured at a number of locations along four radial directions. Pressure drop across the screen(s) and rpm of the ventilator was also measured for each configuration and for each wind speed.

Air Discharge in the ventilator was calculated by averaging out airspeed measured in the four radial directions.

The wind speed has been corrected to take into account the solid blockage due to the ventilator. The pressure losses due to the duct and bend are added to the pressure drop created by screens.

The results of the experiments and the reduction of the data are given in the form of Table No. 1 and figs : to 6.

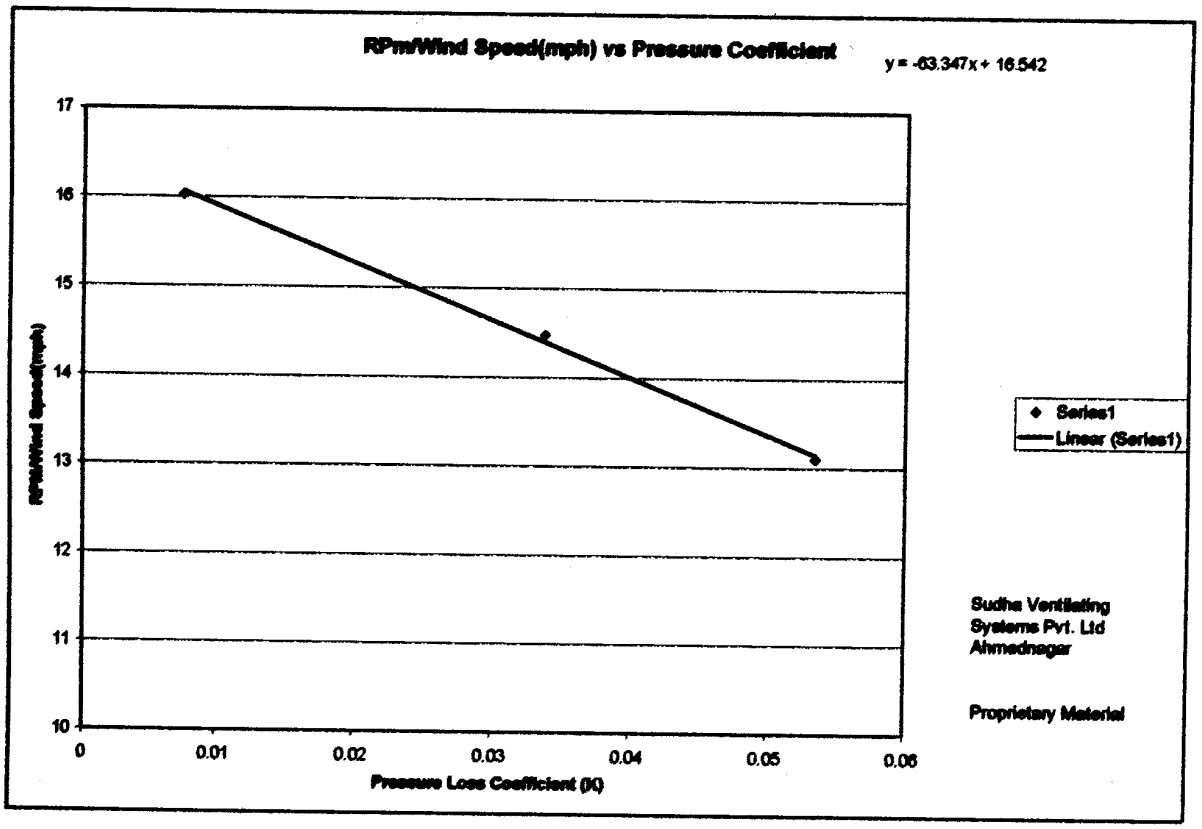

Fig 6. RPM/ Wind Speed vs Pressure Loss Coefficient

8th June, 2005

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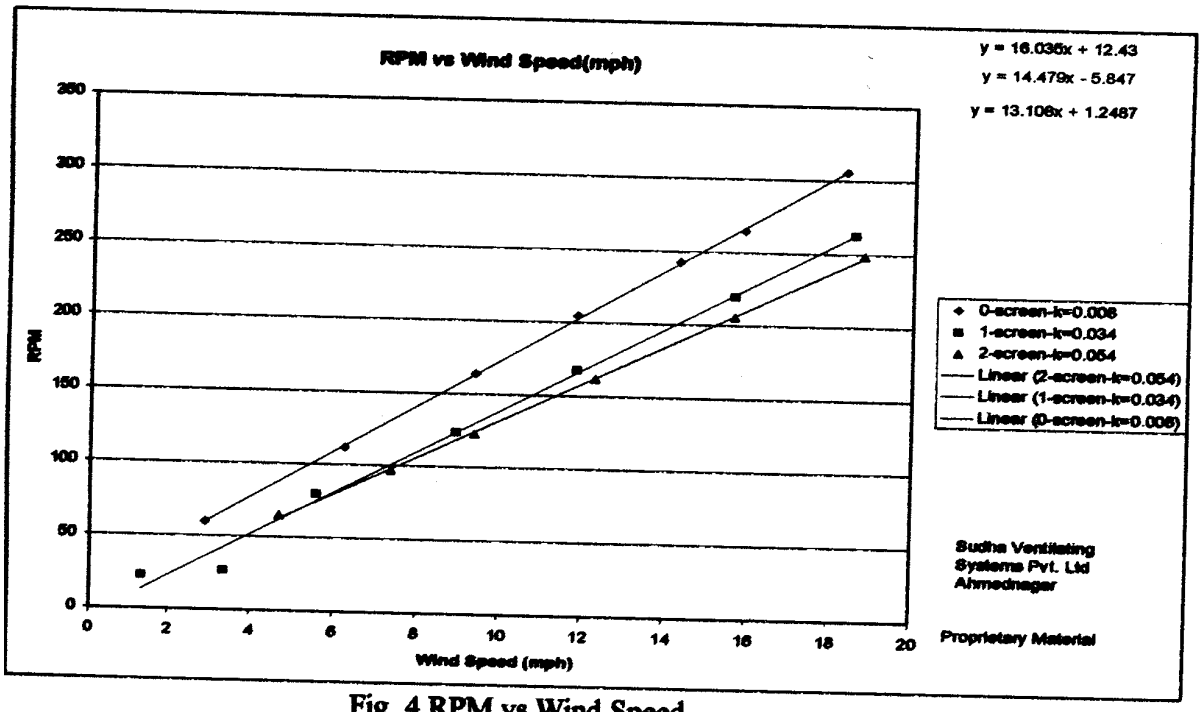

Fig. 4 RPM vs Wind Speed

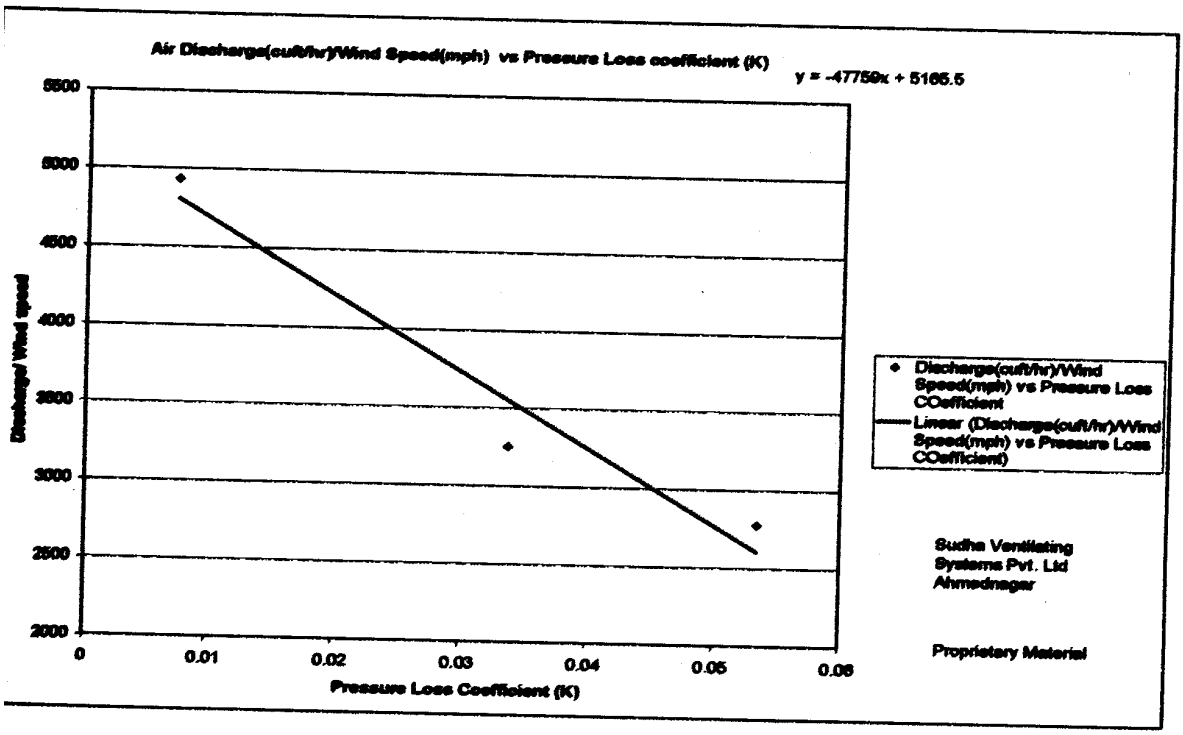

Fig. 5 discharge vs Pressure Loss Coefficient

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