TESTS ON ROOF VENTILATORS

FOR

Alsynite Roofing Products
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By

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Executive Summary

At the request of Alsynite, UTS conducted ventilator testing to ascertain the effectiveness of two different roof ventilators, a Turbovent and an Alsynite Prototype. The testing was conducted on the Ventilator Test Rig at the City Campus of UTS on the 28th of November 2006. The test rig was constructed to simulate AS 4740, Appendix E.

Results Summary

Test Specimen	Measured Wind Flow Speed (V_t)	Flow Rate (V_v)
	Average	
	(m/s)	**(L/min)**
Alsynite Prototype	1.6	1230.73
	2.65	2442.16
	3.35	3561.69
	5	n/a *
Turbovent	3.7	1921.48

n/a * : NOTE: The test apparatus does not have the capacity to balance the plenum pressure at this wind flow speed.

Testing Procedure

At the request of Alsynite, UTS conducted ventilator testing to ascertain the effectiveness of two different roof ventilators, a Turbovent and an Alsynite Prototype. The testing was conducted on the Ventilator Test Rig at the City Campus of UTS on the 28th of November 2006. The test rig was constructed to simulate AS 4740, Appendix E.

The test apparatus is split into two air flow circuits; one to simulate wind flow over a flat roof space, the other to provide "make up air" to the test plenum.

1) The wind flow (V_t) is generated using an industrial axial flow fan and a flow straightener. The axial flow fan has a capacity of 11kW and a diameter of approximately 900mm. Air flow is measured topically using a Kestrel 4000 Anemometer. The fan is operated using a continuously variable Variable Frequency Drive (VFD). The VFD is an ABB SAMI type 3 phase 32A unit.

2) The "make up air" flow (V_v) is provided by an industrial axial flow fan. The diameter of this fan is approximately 470mm. The fan is operated using a continuously variable VFD. This VFD is a FREQROL Z200, 3 phase 20A unit.

"Make Up Air" flow through specimen (V_v) is measured using a nozzle specified in AS 4740, where the internal diameter (d) of the nozzle is 58.40mm and the internal diameter (D) of the conduit is 101.88mm. The differential pressure across the nozzle is measured using an Airflow Developments Micromanometer; "Mk 4 & 5 Airflow Testing Set". The inclined top tube was used for flow measurement. The inclined top tube was set at the top inclined setting, indicating a correction factor of 0.2.

The differential pressure across each ventilator is also measured using an Airflow Developments Micromanometer; "Mk 4 & 5 Airflow Testing Set". The inclined bottom tube was used for this measurement. The inclined bottom tube was set at the bottom inclined setting, indicating a correction factor of 0.01.

For each wind flow (V_t) the "make up air" flow (V_v) is adjusted so the pressure inside the plenum matches the ambient pressure in the laboratory. Once the pressures have been matched the differential pressure across the nozzle is recorded, which allows the "make up air flow" (V_v) to be calculated.

Test Data

Appendix A - Measured Data

Test Specimen	Desired Wind Flow Speed		Measured Wind Flow Speed (V_t)		Wind Flow VFD Frequency Setting	Measured Differential Pressure for Air Flow through specimen	Corrected Differential Pressure for Air Flow through specimen	"Make up Flow" VFD Frequency setting
	(kmh)	(m/s)	Left (m/s)	Right (m/s)	(Hz)	(kPa)	(kPa)	(Hz)
Alsynite Prototype	6	1.67	1.5	1.7	10.22	0.16	0.032	19.27
	9	2.50	2.5	2.8	17.99	0.63	0.126	39.57
	12	3.33	3.2	3.5	29.04	1.34	0.268	60.1
	18	5.00	4.6	5.4	39.18	n/a *	n/a *	n/a *
Turbovent	12	3.33	3.9	3.5	29.04	0.39	0.078	30.92

n/a * : NOTE: The test apparatus does not have the capacity to balance the plenum pressure at this wind flow speed.

Appendix B - Calculated Results

Test Specimen	Desired Wind Flow Speed		Measured Wind Flow Speed (V_t)			Corrected Differential Pressure for Air Flow through specimen	Flow Rate (V_v)	
	(kmh)	(m/s)	Left (m/s)	Right (m/s)	Average (m/s)	(kPa)	(m^3/s)	(L/min)
Alsynite Prototype	6	1.67	1.5	1.7	1.6	0.032	0.205122	1230.732
	9	2.50	2.5	2.8	2.65	0.126	0.407026	2442.158
	12	3.33	3.2	3.5	3.35	0.268	0.593615	3561.688
	18	5.00	4.6	5.4	5	n/a *	n/a *	n/a *
Turbovent	12	3.33	3.9	3.5	3.7	0.078	0.320247	1921.479

n/a * : NOTE: The test apparatus does not have the capacity to balance the plenum pressure at this wind flow speed.