

Aerstad carried out air tightness testing on two identical dwellings, in the same housing development, in the Mid-Ulster area. The first house was built using traditional construction techniques and the second had the Aerstad system installed.

The first site (without the Aerstad system) had an overall air tightness test result of $4.25 \text{ m}^3 / (\text{hr} \cdot \text{m}^2) @ 50 \text{ Pa}$ (ref. appendix A). The second site (with the Aerstad system) achieved an overall air tightness test result of $1.47 \text{ m}^3 / (\text{hr} \cdot \text{m}^2) @ 50 \text{ Pa}$ (ref. appendix B). Hence, a massive 65% reduction in total air leakage.

When using the Passive House calculation methodology this equates to almost a 50% reduction of the annual heating load.



Figure 1: Aerstad System installed on site



Figure 2: Air Tightness Testing on site to comply with Building Regulations

Appendix A

Air Tightness Test Results

(Aerstad System Not Installed)

BUILDING LEAKAGE TEST

Date of Test: 23.03.2016 Test File: AERSTAD NOT INSTALLED AA18138 Customer: AERSTAD Phone: Fax:	Technician: GERRY MALLON 0135 Building Address: C/O AERSTAD 21 MOUNTVIEW DRIVE MONEYMORE CO. DERRY, NORTHERN IRELAND
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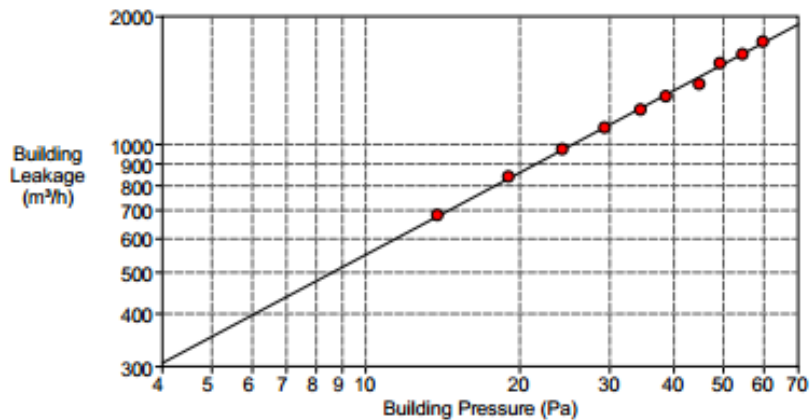
Test Results at 50 Pascals:
 V50: Airflow (m³/h) 1545 (+/- 0.6 %)
 n50: Air Changes per Hour (1/h)
 w50:
 q50: m³/(h*m² Surface Area) 4.25

Leakage Areas: 614.8 cm² (+/- 2.1 %) Canadian EqLA @ 10 Pa or 1.69 cm²/m² Surface Area
 329.7 cm² (+/- 3.5 %) LBL ELA @ 4 Pa or 0.91 cm²/m² Surface Area

Building Leakage Curve: Air Flow Coefficient (C_{env}) = 124.6 (+/- 5.5 %)
 Air Leakage Coefficient (CL) = 126.0 (+/- 5.5 %)
 Exponent (n) = 0.641 (+/- 0.015)
 Correlation Coefficient = 0.99793

Test Standard:	EN 13829 Test Mode:	Depressurization
Type of Test Method:	B Regulation complied with:	TB F1
Equipment:	Model 3 (230V) Minneapolis Blower Door	

Inside Temperature:	18 °C	Volume:	
Outside Temperature:	10 °C	Surface Area:	363 m ²
Barometric Pressure:	100920 Pa	Floor Area:	
Wind Class:	1 Light Air	Uncertainty of	
Building Wind Exposure:	Highly Exposed Building	Building Dimensions:	%
Type of Heating:	N/A	Year of Construction:	2015/16
Type of Air Conditioning:	N/A		
Type of Ventilation:	NATURAL		



BUILDING LEAKAGE TEST Page 2

 Date of Test: 23.03.2016 Test File: AERSTAD NOT INSTALLED AA18138

Comments

THIS IS A TWO STOREY DETACHED TYPE DWELLING
 A DESIGN AIR PERMEABILITY OF 10.0 HAS BEEN GIVEN TO THIS DWELLING
 ALL EXTERNAL DOORS HAVE BEEN CLOSED
 ALL WINDOWS HAVE BEEN CLOSED
 ALL TRICKLE VENTS HAVE BEEN CLOSED
 ALL MECHANICAL FANS HAVE BEEN SEALED
 THE STOVE DOORS HAS BEEN CLOSED
 THE STOVE DRAFT HAS BEEN SEALED
 THE WC PIPES HAVE BEEN SELAED
 THE TRAP DOOR HAS BEEN CLOSED

THE AERSTAD FLOOR CLOSER WAS NOT FITTED IN THIS DWELLING

Data Points: Depressurization - Data Entered Manually

Nominal Building Pressure (Pa)	Fan Pressure (Pa)	Nominal Flow (m³/h)	Temperature Adjusted Flow (m³/h)	% Error	Fan Configuration
-1.1	n/a				
-14.3	47.9	695	683	0.9	Ring B
-19.5	73.1	856	841	1.2	Ring B
-24.7	98.9	994	976	0.6	Ring B
-29.8	125.1	1116	1096	-0.0	Ring B
-34.9	152.4	1230	1208	-0.6	Ring B
-39.1	176.6	1323	1300	-0.7	Ring B
-45.3	202.2	1414	1389	-3.5	Ring B
-49.7	26.1	1583	1555	1.7	Ring A
-55.0	28.8	1661	1632	-0.0	Ring A
-60.2	33.1	1778	1747	1.0	Ring A
0.1	n/a				
Test 0 Baseline (Pa): p01- = -1.1 p01+ = 0.0 p02- = -0.3 p02+ = 0.3					

Appendix B

Air Tightness Test Results

(Aerstad System Installed)

BUILDING LEAKAGE TEST

Date of Test: 02.08.2016	Technician: GERRY MALLON 0135
Test File: AERSTAD INSTALLED AA18213	
Customer: AERSTAD	Building Address: C/O AERSTAD 18 MOUNTVIEW DRIVE MONEYMORE CO. DERRY, NORTHERN IRELAND BT45 7GX
Phone:	
Fax:	

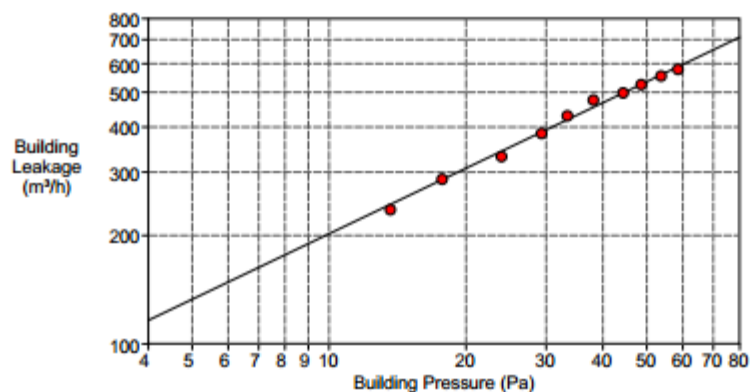
Test Results at 50 Pascals:
 V50: Airflow (m³/h) 535 (+/- 0.9 %)
 n50: Air Changes per Hour (1/h)
 w50:
 q50: m³/(h*m² Surface Area) 1.47

Leakage Areas: 225.8 cm² (+/- 3.0 %) Canadian EqLA @ 10 Pa or 0.62 cm²/m² Surface Area
 125.2 cm² (+/- 4.9 %) LBL ELA @ 4 Pa or 0.35 cm²/m² Surface Area

Building Leakage Curve: Air Flow Coefficient (Cenv) = 50.2 (+/- 7.7 %)
 Air Leakage Coefficient (CL) = 50.4 (+/- 7.7 %)
 Exponent (n) = 0.604 (+/- 0.021)
 Correlation Coefficient = 0.99529

Test Standard: EN 13829 Test Mode: Depressurization
 Type of Test Method: Regulation complied with: TB F1
 Equipment: Model 3 (230V) Minneapolis Blower Door, S/N 13858

Inside Temperature:	17 °C	Volume:	
Outside Temperature:	16 °C	Surface Area:	363 m ²
Barometric Pressure:	100830 Pa	Floor Area:	
Wind Class:	2 Light Breeze	Uncertainty of	
Building Wind Exposure:	Highly Exposed Building	Building Dimensions:	%
Type of Heating:	OIL CENTRAL	Year of Construction:	2015/16
Type of Air Conditioning:	N/A		
Type of Ventilation:	NATURAL		



BUILDING LEAKAGE TEST Page 2

 Date of Test: 02.08.2016 Test File: AERSTAD INSTALLED AA18213

Comments

THIS IS A TWO STOREY DETACHED TYPE DWELLING
 A DESIGN AIR PERMEABILITY OF 10.0 HAS BEEN GIVEN TO THIS DWELLING
 ALL EXTERNAL DOORS HAVE BEEN CLOSED
 ALL WINDOWS HAVE BEEN CLOSED
 ALL TRICKLE VENTS HAVE BEEN CLOSED
 ALL MECHANICAL FANS HAVE BEEN SEALED
 THE CHIMNEY FLUE HAS BEEN SEALED
 THE AIR COMBUSTION VENT HAS BEEN SEALED
 THE TRAP DOORS HAVE BEEN CLOSED

THE AERSTAD FLOOR CLOSER HAS BEEN FITTED IN THIS DWELLING

Data Points: Depressurization - Data Entered Manually

Nominal Building Pressure (Pa)	Fan Pressure (Pa)	Nominal Flow (m ³ /h)	Temperature Adjusted Flow (m ³ /h)	% Error	Fan Configuration
-1.2	n/a				
-15.2	39.9	237	236	-3.3	Ring C
-19.3	58.3	287	287	0.2	Ring C
-25.5	77.4	332	332	-3.3	Ring C
-30.9	103.2	385	384	-0.9	Ring C
-35.0	128.4	431	430	2.5	Ring C
-39.7	156.2	477	475	4.7	Ring C
-45.9	26.0	499	498	0.1	Ring B
-50.2	28.9	526	525	-0.2	Ring B
-55.3	32.3	556	555	-0.7	Ring B
-60.1	35.2	580	579	-1.6	Ring B
-1.9	n/a				

Test 0 Baseline (Pa): p01- = -1.2 p01+ = 0.0 p02- = -1.9 p02+ = 0.0