

ZERO AIR CONTROL SYSTEMS - UK TESTING

TEST #	PASCALS (Pa)	WIND VELOCITY (MPH)	PRODUCTS TESTED			LEAKAGE RATE CMH/LMC (m ³ /h.m)	
			FRAME SEAL	THRESHOLD	DROPSEAL	Zero Negative Pressure	Zero Positive Pressure
1	25 Pa	14 mph	188S	Taped	None	0.00 CMH/LMC	0.48 CMH/LMC
2	25 Pa	14 mph	488S	Taped	None	0.00 CMH/LMC	0.00 CMH/LMC
3	25 Pa	14 mph	388S	Taped	None	0.57 CMH/LMC	1.13 CMH/LMC
1	25 Pa	14 mph	388S	Taped	None	0.57 CMH/LMC	1.13 CMH/LMC
2	25 Pa	14 mph	Taped	564A	None	1.36 CMH/LMC	1.81 CMH/LMC
3	25 Pa	14 mph	388S	564A	None	0.45 CMH/LMC	0.28 CMH/LMC
4	25 Pa	14 mph	Taped	None	321A	0.69 CMH/LMC	2.31 CMH/LMC
5	25 Pa	14 mph	388S	None	321A	0.18 CMH/LMC	0.52 CMH/LMC
6	25 Pa	14 mph	475AA	Taped	None	0.78 CMH/LMC	0.39 CMH/LMC
7	25 Pa	14 mph	770AA	Taped	None	1.07 CMH/LMC	0.91 CMH/LMC
1	76 Pa	25 mph	D-0608	564A	None	0.16 CMH/LMC	0.11 CMH/LMC
2	76 Pa	25 mph	188S	564A	None	0.27 CMH/LMC	0.21 CMH/LMC
3	76 Pa	25 mph	388S	564A	None	0.19 CMH/LMC	0.14 CMH/LMC
4	76 Pa	25 mph	475AA & 188S	564A	365AA	0.16 CMH/LMC	0.10 CMH/LMC
5	76 Pa	25 mph	870AA & 188S	564A	365AA	0.25 CMH/LMC	0.23 CMH/LMC
6	76 Pa	25 mph	770AA & 188S	564A	365AA	0.23 CMH/LMC	0.20 CMH/LMC
7	76 Pa	25 mph	770AA & 388S	564A	365AA	0.12 CMH/LMC	0.06 CMH/LMC
8	76 Pa	25 mph	475AA & 388S	564A	365AA	0.12 CMH/LMC	0.05 CMH/LMC
1	306 Pa	50 mph	D-0608	564A	None	0.87 CMH/LMC	0.34 CMH/LMC
2	306 Pa	50 mph	188S	564A	None	0.48 CMH/LMC	0.49 CMH/LMC
3	306 Pa	50 mph	388S	564A	None	0.34 CMH/LMC	0.37 CMH/LMC
4	306 Pa	50 mph	475AA & 188S	564A	365AA	0.30 CMH/LMC	0.34 CMH/LMC
5	306 Pa	50 mph	870AA & 188S	564A	365AA	0.51 CMH/LMC	0.50 CMH/LMC
6	306 Pa	50 mph	770AA & 188S	564A	365AA	0.47 CMH/LMC	0.46 CMH/LMC
7	306 Pa	50 mph	770AA & 388S	564A	365AA	0.26 CMH/LMC	0.29 CMH/LMC
8	306 Pa	50 mph	475AA & 388S	564A	365AA	0.25 CMH/LMC	0.28 CMH/LMC
1	688 Pa	75 mph	D-0608	564A	None	1.41 CMH/LMC	0.57 CMH/LMC
2	688 Pa	75 mph	188S	564A	None	1.31 CMH/LMC	0.81 CMH/LMC
3	688 Pa	75 mph	388S	564A	None	0.57 CMH/LMC	0.65 CMH/LMC
4	688 Pa	75 mph	475AA & 188S	564A	365AA	0.95 CMH/LMC	0.58 CMH/LMC
5	688 Pa	75 mph	870AA & 188S	564A	365AA	1.06 CMH/LMC	0.80 CMH/LMC
6	688 Pa	75 mph	770AA & 188S	564A	365AA	1.31 CMH/LMC	0.65 CMH/LMC
7	688 Pa	75 mph	770AA & 388S	564A	365AA	0.42 CMH/LMC	0.51 CMH/LMC
8	688 Pa	75 mph	475AA & 388S	564A	365AA	0.39 CMH/LMC	0.48 CMH/LMC
1	1223 Pa	100 mph	D-0608	564A	None	2.73 CMH/LMC	0.81 CMH/LMC
2	1223 Pa	100 mph	188S	564A	None	13.43 CMH/LMC	1.12 CMH/LMC
3	1223 Pa	100 mph	388S	564A	None	0.86 CMH/LMC	0.89 CMH/LMC
4	1223 Pa	100 mph	475AA & 188S	564A	365AA	2.15 CMH/LMC	0.78 CMH/LMC
5	1223 Pa	100 mph	870AA & 188S	564A	365AA	4.92 CMH/LMC	0.98 CMH/LMC
6	1223 Pa	100 mph	770AA & 188S	564A	365AA	3.08 CMH/LMC	0.79 CMH/LMC
7	1223 Pa	100 mph	770AA & 388S	564A	365AA	0.68 CMH/LMC	0.70 CMH/LMC
8	1223 Pa	100 mph	475AA & 388S	564A	365AA	0.59 CMH/LMC	0.64 CMH/LMC
1	1912 Pa	125 mph	D-0608	564A	None	59.87 CMH/LMC	0.99 CMH/LMC
2	1912 Pa	125 mph	188S	564A	None	55.09 CMH/LMC	1.37 CMH/LMC
3	1912 Pa	125 mph	388S	564A	None	1.38 CMH/LMC	1.09 CMH/LMC
4	1912 Pa	125 mph	475AA & 188S	564A	365AA	4.66 CMH/LMC	0.93 CMH/LMC
5	1912 Pa	125 mph	870AA & 188S	564A	365AA	11.01 CMH/LMC	1.11 CMH/LMC
6	1912 Pa	125 mph	770AA & 188S	564A	365AA	5.49 CMH/LMC	0.89 CMH/LMC
7	1912 Pa	125 mph	770AA & 388S	564A	365AA	1.02 CMH/LMC	0.79 CMH/LMC
8	1912 Pa	125 mph	475AA & 388S	564A	365AA	0.85 CMH/LMC	0.74 CMH/LMC

CMH/LMC (m³ / h.m) = Cubic Metres per Hour / Linear Metre of frame Crack

The first block of three tests are detailed in Exova warringtonfire WF Assessment Report No 193454 Issue 3 dated 09.03.2018 covering the smoke leakage and fire resistance performance of doorsets incorporating 188S, 388S and 488S smoke seals, if tested in accordance with BS EN 1634-1 and BS EN 1634-3. Copy available upon request.

The second block of seven tests were a series of ambient temperature air leakage tests in accordance with BS EN 1634-3:2004, on a range of smoke seals fitted to a single-acting, single-leaf doorset undertaken at Bodycote warringtonfire Testing. Copy of WF Report No 185149 available upon request.

The final five blocks of eight tests were achieved in indicative air tests undertaken at Exova Willenhall, a UKAS accredited Testing Laboratory in 2016, copy of Test Report WIL 360275 Issue 4 available upon request. The eight sets of seals were tested on a single inward opening door at air pressures of 76 Pa, 306 Pa, 688 Pa, 1223 Pa and 1912 Pa in both negative and positive pressure.

To calculate the air leakage through a door first measure the frame crack. For example, a single door 2 metres high x 1 metre wide would have a frame crack of 6 metres. Then multiply the CMH/LMC figure (in the far right hand column of the table above) by 6. This gives you the total air leakage for that doorset for each system, under both negative and positive pressure.

Negative pressure tests are the more onerous, and leakage rates are generally higher under negative pressure. Zero uses the following definitions of positive pressure and negative pressure.

Positive pressure (air infiltration) - where high pressure pushes the door against the seals. For example, external outward opening doors with panic exit devices.

Negative pressure (air exfiltration) - where high pressure pushes the door away from the seals. For example, computer rooms, halon systems, hotel bedroom doors etc.