



Air flow pressure applied to a door as listed per testing standards:

.10 inches of water	24.90Pa	15 Miles/Hr
.30 inches of water	76.00Pa	25 Miles/Hr
.60 inches of water	150Pa	35 Miles/Hr
1.23 inches of water	306Pa	50 Miles/Hr
2.76 inches of water	688Pa	75 Miles/Hr
4.92 inches of water	1223Pa	100 Miles/Hr

Smoke and draft control

Fire door assemblies shall also meet the NFPA 105 requirements for a smoke and draft control door assembly tested under UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot [0.01524 m³/(sq m²)] of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature and elevated temperature tests. Installation of smoke doors shall be under NFPA 105.

Pressure Rate	Standard	Leakage Rate
.10 inches of water	NFPA 105, UL 1784 IBC 715.4.3.1 STD	3.0 CFM= 16.95 CMH/LM

Pressure Rate	Products Tested				Leakage Rate
	SYSTEM #	PERIMETER	THRESHOLD	DOOR BOTTOMS	
.30 inches of water	6K		No gasketing		11.36 CFM= 64.18 CMH/LM
.30 inches of water	6Z-1	5574	3565	7563	.02 CFM= .11 CMH/LM
.30 inches of water	6D	5823	3461	7451	.07 CFM= .39 CMH/LM
.30 inches of water	6A	5823	3565	7163	.03 CFM= .17 CMH/LM
.30 inches of water	6B	5077	3565	7163	.04 CFM= .22 CMH/LM
.30 inches of water	6Z-2	5073	3565	7563	.07 CFM= .39 CMH/LM
.30 inches of water	6Z-5	5574	3556	7563	.05 CFM= .28 CMH/LM
.30 inches of water	6E	5823	3461	7163	.17 CFM= .96 CMH/LM
.30 inches of water	6F	5813	3465	7153	.25 CFM= 1.41 CMH/LM
.30 inches of water	6SM-11	54418	3778	7553	.27 CFM= 1.52 CMH/LM
.30 inches of water	6G	5213	3565	7153	.35 CFM= 1.97 CMH/LM
.60 inches of water	6SM-12	5574	3565	7563	.04 CFM= .22 CMH/LM
.60 inches of water	6SM-14	5823	3565	7163	.06 CFM= .33 CMH/LM
.60 inches of water	6SM-15	5574	3556	7563	.07 CFM= .39 CMH/LM
.60 inches of water	6SM-16	5077	3565	7163	.07 CFM= .39 CMH/LM
.60 inches of water	6SM-17	5073	3565	7563	.08 CFM= .45 CMH/LM
.60 inches of water	6SM-18	5823	3461	7163	.25 CFM= 1.41 CMH/LM
1.23 inches of water	6SM-19	5823	3565	7163	.09 CFM= .51 CMH/LM
1.23 inches of water	6SM-20	5077	3565	7163	.11 CFM= .62 CMH/LM
1.23 inches of water	6Z-2	5073	3565	7563	.16 CFM= .90 CMH/LM
1.23 inches of water	6SM-21	5823	3461	7163	.38 CFM= 2.15 CMH/LM
1.23 inches of water	6SM-22	54418	50778	7553	.64 CFM= 3.62 CMH/LM
2.76 inches of water	6SM-23	54418	50778	7553	1.39 CFM= 7.85 CMH/LM
4.92 inches of water	6SM-24	5574	3465	5911	.50 CFM= 2.82 CMH/LM

Conclusions and Observations

- To comply with NFPA 105 and/or any of the standards that refer to air/smoke infiltration rates, door seals must be specified and installed. In general, a door will not pass the smoke test without gasketing.
- The higher the air pressure differential, the better the quality of the gasketing is needed.
- Adjustable gasketing facilitates installation and allows adjustment when needed for consistent performance over time.
- Hospitals are designed with the idea of keeping patients in their rooms in case of fire. In a room that measures 10 X 10 X 9 feet with a 3 X 7-foot door, the room will be 100% filled with smoke from smoke-filled corridors in 15 minutes if the door only complies with the UL 1784/ NFPA 105 maximum leakage standard 3.0 CFM. If the leakage rate is reduced to .02 CFM using smoke control systems, it will take 37 hours for smoke to fill that same room.
- Although fast, efficient evacuation is the goal in school fires, prudent design should provide adequate smoke protection exceeding 15 minutes for students who might remain trapped in fully engaged fire zones.

