

Door Ventilation and Sound Transmission Comparison Data Sheet

Methodology

Airflow and sound transmission data was collected on samples with and without top, side and bottom seals, in varying undercut heights.

Sound Transmission Class (STC) is a single number rating determined from the laboratory measurement of a partition's sound transmission loss - the decibel drop across the partition. Samples were tested to ASTM E90¹ and E413².

For a given ventilation opening, the pressure drop varies with the airflow rate. This relationship is characterized by the Equivalent Leakage Area (EQLA), which is the area of an unobstructed, sharp-edged hole required to produce the same airflow as the ventilation opening in question. Test methodology for ventilation performance was adapted from ASTM E283³ and E779⁴.

Highlighted Results

- Unsealed doors have greatly reduced sound performance
- VanAir Doors provide more airflow and better sound privacy than a solid core door with an undercut
- Door grilles are highly restrictive to airflow, measuring only 26-44% in Free Area
- Even small door grilles do not afford adequate sound privacy
- VanAir Doors can provide airflow equivalent to that of a 160 in² grille (given a grille with 44% Free Area)

		Installation Details			Sound	Ventilation		
		Seals		Undercut (in)	STC	EQLA (in ²)	Nominal Opening Area (in ²)	% Free Area
		Top/Sides	Bottom					
Door Grilles	6" x 10" (V section)	Y	Y	-	17	24	60	40%
	10" x 10" (Y section)	Y	Y	-	-	26	100	26%
	6" x 10" x2 (V section)	Y	Y	-	-	48	120	40%
	12" x 12" (V section)	Y	Y	-	14	64	144	44%
1-3/8" VanAir	Foam (Sound option)	Y	Y	-	24	39	80	
	No foam	Y	Y	-	18	40	-	
	No foam	Y	N	1/2	-	56	-	
	No foam (Standard)	N	N	1/2	-	71	140	
1-3/4" VanAir	Foam (Sound option)	Y	Y	-	25	38	80	
	Foam	N	N	3/16	19	51	-	
	No foam	Y	Y	-	19	43	-	
	No foam (Standard)	N	N	1/2	-	69	140	
Solid Core		Y	Y	-	29	-		
		Y	N	3/16	23	5		
		N	N	3/16	19	15		
		Y	N	1/2	18	20		
		N	N	1/2	15	31		
		Y	N	1	16	38		
		N	N	1	14	51		
		Y	N	1-1/2	14	57		
Hollow Core		Y	Y	-	23	-		
		N	N	1/2	13	31		

¹ ASTM International, "ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements," (2016)

² ASTM International, "ASTM E413 Classification for Rating Sound Insulation," (2016)

³ ASTM International, "ASTM E283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen," (2019)

⁴ ASTM International, "ASTM E779 Standard Test Method for Determining Air Leakage Rate by Fan Pressurization," (2019)