

## 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 E90<sup>1</sup> and E413<sup>2</sup>.

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 E283<sup>3</sup> and E779<sup>4</sup>.

### 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 1030 cm<sup>2</sup> grille (given a grille with 44% Free Area)

		Installation Details			Sound	Ventilation		
		Seals		Undercut (mm)	STC	EQLA (cm <sup>2</sup> )	Nominal Opening Area (cm <sup>2</sup> )	% Free Area
		Top/Sides	Bottom					
<b>Grilles</b>	152 x 254mm (V section)	Y	Y	-	17	155	385	40%
	254 x 254mm (Y section)	Y	Y	-	-	170	645	26%
	152 x 254mm x2 (V section)	Y	Y	-	-	310	775	40%
	305 x 305mm (V section)	Y	Y	-	14	415	930	44%
<b>35mm VanAir</b>	Foam (Sound option)	Y	Y	-	24	250	515	
	No foam	Y	Y	-	18	260	-	
	No foam	Y	N	13	-	360	-	
	No foam (Standard)	N	N	13	-	460	905	
<b>45mm VanAir</b>	Foam (Sound option)	Y	Y	-	25	245	515	
	Foam	N	N	5	19	330	-	
	No foam	Y	Y	-	19	275	-	
	No foam (Standard)	N	N	13	-	445	905	
<b>Solid Core</b>		Y	Y	-	29	-		
		Y	N	5	23	30		
		N	N	5	19	95		
		Y	N	13	18	130		
		N	N	13	15	200		
		Y	N	25	16	245		
		N	N	25	14	330		
		Y	N	38	14	370		
<b>Hollow Core</b>		Y	Y	-	23	-		
		N	N	13	13	200		

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

<sup>2</sup> ASTM International, "ASTM E413 Classification for Rating Sound Insulation," (2016)

<sup>3</sup> 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)

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