

TABLE 12. DETERMINATION OF FREE AREA AND TOTAL PRESSURE LOSS OF REGISTER FOR 22 DEG DEFLECTION OF AIR ^{a,b,c,d,e}

Register Free Area in Square Inches (Upper value in each group)
Pressure Loss in Inches of Water (Lower value in each group)

CFM	RESIDENTIAL USE		CFM	RESIDENTIAL USE		CFM	DISTANCE FROM REGISTER TO OPPOSITE WALL							
	REG. SIZE OR EQUIV-ALERT	PRES-SURE LOSS		REG. SIZE OR EQUIV-ALERT	PRES-SURE LOSS									
							31-34	35-39	40-49	50-59	60-69	70-79	80-89	
							A'		B'					
Up to 59	10 x 4 10 x 6	.01 .01	100-119	12 x 6 14 x 4	.02 .02	700-739	243 0.02	186 0.03	127 0.06	85 0.11				
60-69	10 x 6 12 x 4	.01 .02	120-129	12 x 6 14 x 6	.02 .02	740-779	271 0.02	208 0.03	141 0.05	94 0.10				
70-99	10 x 6 12 x 6	.02 .02	130-169	14 x 6	.02	780-819		230 0.02	157 0.05	105 0.09				
			170-189	14 x 8	.02	820-859		254 0.02	173 0.04	115 0.08				
CFM	DISTANCE FROM REGISTER TO OPPOSITE WALL													
	Up to 18	19-21	22-24	25-27	28-30	31-34	35-39	40-49	50-59					
190-209	68 0.02	49 0.03	38 0.05	29 0.08	24 0.11	19 0.16								
210-229	82 0.02	60 0.03	45 0.04	35 0.06	28 0.10	23 0.13								
230-249		71 0.02	54 0.04	42 0.06	34 0.08	28 0.11	22 0.17							
250-269		84 0.02	63 0.03	49 0.05	40 0.07	32 0.10	25 0.16							
270-299		100 0.02	76 0.03	60 0.04	48 0.06	38 0.09	30 0.13							
300-339			96 0.02	73 0.04	60 0.05	48 0.07	37 0.11							
340-379			122 0.02	95 0.03	78 0.04	61 0.06	47 0.09	33 0.18						
380-419				117 0.02	94 0.03	75 0.05	58 0.08	39 0.15						
420-459				142 0.02	113 0.03	91 0.04	70 0.06	47 0.13						
460-499				168 0.02	135 0.03	108 0.04	83 0.06	56 0.11						
500-539				159 0.02	126 0.03	97 0.05	66 0.10							
540-579				185 0.02	147 0.03	113 0.04	77 0.08							
580-619				212 0.02	169 0.03	130 0.04	88 0.08	51 0.18						
620-659				192 0.02	147 0.03	100 0.04	59 0.07	15 0.15						
660-699				217 0.02	166 0.03	113 0.04	75 0.06	13 0.13						

A B

A' B'

^a If register selected based on distance from register to opposite wall is unsatisfactory on account of size or pressure loss, it is permissible to shift one or more spaces left or right in the tables to obtain a more suitable register. If requirements fall in blank space, select two registers in place of one and divide CFM capacity between the two registers.

^b Total pressure (static plus velocity) loss is based on FLAT FACE ADJUSTABLE BAR TYPE and does NOT include stackhead.

^c Values on the right of line A and A' should not be used in applications such as churches, auditoriums, and concert halls.

^d Values on right of line B and B' should not be used in applications such as residential work, motion picture theaters, court rooms and schools.

^e For floor and baseboard registers where a velocity of approximately 300 FPM is used, the free area = $\frac{CFM \times 144}{300}$

or approximately, $\frac{CFM}{2}$. Assume a pressure loss of 0.01.

TABLE 13. DETERMINATION OF FREE AREA AND TOTAL PRESSURE LOSS OF REGISTER FOR NO DEFLECTION OF AIR ^{a,b,c,d,e}

Register Free Air in Square Inches (Upper value in each group)
Pressure Loss in Inches of Water Column (Lower value in each group)

CFM	DISTANCE FROM REGISTER TO OPPOSITE WALL										CFM	DISTANCE FROM REGISTER TO OPPOSITE WALL									
	19-21 22-24 25-27 28-30 31-34 35-39 40-49 50-59 60-69											35-39 40-49 50-59 60-69 70-79 80-89									
	A					B						A'					B'				
190-209	62 0.02	47 0.03	37 0.04	30 0.06	24 0.09	18 0.15					660-699	210 0.02	143 0.03	95 0.07	69 0.12	49 0.22					
210-229	76 0.02	58 0.03	45 0.04	36 0.05	29 0.08	22 0.12					700-739	236 0.02	160 0.03	107 0.06	77 0.11	54 0.21					
230-249		69 0.02	53 0.03	43 0.04	34 0.07	26 0.11					740-779	262 0.02	179 0.03	119 0.06	86 0.10	61 0.18					
250-269		81 0.02	63 0.03	50 0.04	40 0.06	31 0.09	21 0.18				780-819	291 0.02	198 0.03	132 0.05	95 0.09	67 0.17					
270-299		93 0.02	73 0.03	59 0.04	47 0.05	36 0.08	24 0.16				820-859	320 0.02	218 0.03	145 0.05	105 0.08	74 0.15					
300-339			95 0.02	77 0.03	61 0.04	46 0.06	32 0.12				860-899	352 0.02	240 0.02	160 0.04	115 0.08	81 0.14					
340-379			120 0.02	97 0.03	77 0.03	59 0.05	40 0.10				900-939	385 0.01	262 0.02	175 0.04	126 0.07	89 0.13					
380-419				119 0.02	95 0.03	73 0.04	50 0.08				940-979	419 0.01	285 0.02	190 0.04	137 0.07	97 0.12					
420-459				149 0.02	114 0.03	88 0.04	60 0.07				980-1019	455 0.01	309 0.02	206 0.04	148 0.06	105 0.11					
460-499				171 0.02	136 0.02	105 0.03	71 0.06				1020-1059	493 0.01	335 0.02	223 0.03	161 0.06	113 0.11					
500-539					160 0.02	123 0.03	84 0.05				1060-1099	530 0.01	361 0.02	241 0.03	173 0.06	123 0.10					
540-579					186 0.02	143 0.02	97 0.05	65 0.09	47 0.17		1100-1139	571 0.01	388 0.02	258 0.03	186 0.05	132 0.09	93 0.17				
580-619					213 0.02	164 0.02	111 0.04	74 0.08	54 0.15		1140-1179		416 0.02	277 0.03	199 0.05	141 0.08	100 0.16				
620-659						180 0.02	127 0.04	85 0.07	61 0.14		1180-1219		446 0.02	297 0.03	214 0.04	151 0.08	107 0.15				
A B											1220-1259		476 0.02	317 0.03	228 0.04	161 0.07	116 0.14				
* If register selected based on distance from register to opposite wall is unsatisfactory on account of size or pressure loss, it is permissible to shift one or more spaces left or right in the tables to obtain a more suitable register. If requirements fall in blank space, select two registers in place of one and divide CFM capacity between the two registers.											1260-1299		507 0.01	338 0.02	243 0.04	172 0.07	122 0.13				
											1300-1339		539 0.01	359 0.02	258 0.04	183 0.07	130 0.12				
b Total pressure (static plus velocity) loss is based on FLAT FACE ADJUSTABLE BAR TYPE and does NOT include stackhead.											1340-1379			382 0.02	274 0.04	195 0.07	138 0.12				
c Values on the right of line A and A' should not be used in applications such as churches, auditoriums, and concert halls.											1380-1419			403 0.02	290 0.03	206 0.06	146 0.12				
d Values on right of line B and B' should not be used in applications such as residential work, motion picture theaters, court rooms and schools.											1420-1459				308 0.03	218 0.06	155 0.10				
* For floor and baseboard registers where a velocity of approximately 300 FPM is used, the free area = $\frac{\text{CFM} \times 144}{300}$ or approximately, $\frac{\text{CFM}}{2}$. Assume a pressure loss of .01.											1460-1500				324 0.03	230 0.06	163 0.10				
† For any velocity other than 300 FPM, the free area = $\frac{\text{CFM} \times 144}{\text{Velocity}}$																					

A' B'

^a If register selected based on distance from register to opposite wall is unsatisfactory on account of size or pressure loss, it is permissible to shift one or more spaces left or right in the tables to obtain a more suitable register. If requirements fall in blank space, select two registers in place of one and divide CFM capacity between the two registers.

^b Total pressure (static plus velocity) loss is based on FLAT FACE ADJUSTABLE BAR TYPE and does NOT include stackhead.

^c Values on the right of line A and A' should not be used in applications such as churches, auditoriums, and concert halls.

^d Values on right of line B and B' should not be used in applications such as residential work, motion picture theaters, court rooms and schools.

^e For floor and baseboard registers where a velocity of approximately 300 FPM is used, the free area = $\frac{CFM \times 144}{300}$ or approximately, $\frac{CFM}{2}$. Assume a pressure loss of .01.

^f For any volume under 190 CFM use Table 12.