

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 EQUIVALENT	PRESSURE LOSS		REG. SIZE OR EQUIVALENT	PRESSURE 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				
DISTANCE FROM REGISTER TO OPPOSITE WALL														
CFM	Up to 18	19-21	22-24	25-27	28-30	31-34	35-39	40-49	50-59	860-899				
190-209	68 0.02	49 0.03	38 0.05	29 0.08	24 0.11	19 0.16				900-930	304 0.02	207 0.04	138 0.07	
210-229	82 0.02	60 0.03	45 0.04	35 0.06	28 0.10	23 0.13				940-979	332 0.02	226 0.03	151 0.07	108 0.12
230-249		71 0.02	54 0.04	42 0.06	34 0.08	28 0.11	22 0.17			980-1019	360 0.02	245 0.03	163 0.06	118 0.11
250-269		84 0.02	63 0.03	49 0.05	40 0.07	32 0.10	25 0.16			1020-1059	390 0.02	265 0.03	177 0.06	127 0.11
270-299		100 0.02	76 0.03	60 0.04	48 0.06	38 0.09	30 0.13			1060-1099		285 0.03	190 0.06	137 0.10
300-339			96 0.02	73 0.04	60 0.05	48 0.07	37 0.11			1100-1139		307 0.03	204 0.05	147 0.09
340-379			122 0.02	95 0.03	78 0.04	61 0.06	47 0.09	33 0.18		1140-1179		330 0.02	220 0.05	158 0.09
380-419				117 0.02	94 0.03	75 0.05	58 0.08	39 0.15		1180-1219		353 0.02	235 0.04	169 0.08
420-459				142 0.02	113 0.03	91 0.04	70 0.06	47 0.13		1220-1259		376 0.02	251 0.04	180 0.08
460-499				168 0.02	135 0.03	108 0.04	83 0.06	56 0.11		1260-1299		401 0.02	267 0.04	192 0.07
500-539					159 0.02	126 0.03	97 0.05	66 0.10		1300-1339		426 0.02	284 0.04	204 0.07
540-579					185 0.02	147 0.03	113 0.04	77 0.08		1340-1379		452 0.02	301 0.04	217 0.06
580-619					212 0.02	169 0.03	130 0.04	88 0.08	51 0.18	1380-1419		479 0.02	319 0.04	230 0.06
620-659						192 0.02	147 0.03	100 0.05	59 0.15	1420-1459		508 0.02	338 0.03	244 0.06
660-699						217 0.02	166 0.03	113 0.06	75 0.13	1460-1500		536 0.02	356 0.03	256 0.06
													182 0.10	129 0.19

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 ^d -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	38 0.05	29 0.08	22 0.12			700-739	235 0.02	160 0.03	107 0.08	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 0.03	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 0.03	81 0.14			
340-379			120 0.02	97 0.02	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	453 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	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	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	1180-1219		446 0.02	297 0.03	214 0.04	151 0.08	107 0.15		
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 = $\frac{\text{CFM} \times 144}{300}$ or approximately, $\frac{\text{CFM}}{2}$. Assume a pressure loss of .01.																	
For any volume of air flow, the free area of a register is equal to the area of the register divided by the velocity of the air flow in feet per minute.																	

A' B'

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^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.

For any volume under 190 CFM use Table 12.