The Terminal Velocity is listed for each chart since it has such a dramatic effect on the listed throws.

Method of Measurement:

I Supply:
Position the probe flush to the diffuser or register face bars and centered in the opening. Multiple readings should be taken in face areas not to exceed 6" x 6" but in no case less than six (6) readings to ensure a representative average. This average velocity in FPM is used in the equation: $CFM = A_k \times Vave$. (where Ak=Effective Area and Vave=Average Face Velocity). See Fig. 1.

II Return:
The position of the thermoanenometer probe must be held at a distance of 1" from the face of the grille for prime accuracy. This is critical and should not vary by ± 1/32". A position gauge can be attached to the probe for this purpose. Multiple readings as described above are required. See Fig. 2.

AIR MEASUREMENT – SUPPLY

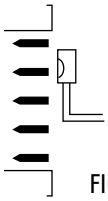


FIG.1

AIR MEASUREMENT – RETURN

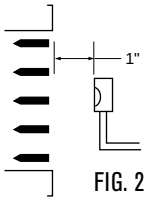


FIG. 2

Using the Engineering Data
For a given CFM and chosen register style and location(s), use the chart to select a size that delivers the required CFM at a velocity that is recommended for the particular application or throw requirement. Noise increases with increasing velocities. If CFM is constant, an increase in either register size or the number of registers of a given size will decrease the velocity, throw, and related noise.

No single type of supply register provides optimum air distribution for yearround air conditioning since the preferred outlet for one season will be a compromise for the other season. However, the success of an air diffusion system is dependent almost entirely on the location of the supply diffusers. The location of return grilles is far less critical. Return airflow affects room air motion only in the immediate vicinity of a return air grille.

As a general rule, maximum recommended face velocity for a supply outlet used in a residential application is 800 FPM. Maximum recommended return grille velocity is 400 FPM. Systems with higher velocities are likely to have noise problems.

Return air filter grille velocities greater than about 400 FPM will exceed the performance of the filter.

Note: For sizes not listed, use nearest Total Square Inches.

Engineering Data

210 Floor Register (Page 6)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
4x10	cfm	60	80	100	120	140	160	180	200
Ak .20	Throw	8	11	13	16	19	22	24	26
4x12 & 6x8	cfm	75	100	125	150	175	200	225	250
Ak .25	Throw	9	12	15	18	21	25	28	31
4x14	cfm	85	110	140	170	195	225	250	280
Ak .28	Throw	6	10	15	19	22	25	28	32
6x10 & 8x8	cfm	95	130	160	190	225	255	290	320
Ak .32	Throw	10	14	17	21	24	27	31	34
6x12	cfm	115	150	190	230	265	305	340	380
Ak .38	Throw	12	15	19	23	26	30	34	38
8x10	cfm	125	170	210	250	295	335	380	420
Ak .42	Throw	12	15	18	24	28	32	37	41
6x14	cfm	130	175	220	265	310	350	395	440
Ak .44	Throw	13	16	20	24	28	32	36	41
6x16	cfm	145	195	245	295	345	390	440	490
Ak .49	Throw	11	16	21	25	30	35	39	44
8x12 & 10x10	cfm	160	210	265	320	370	425	475	530
Ak .53	Throw	12	17	21	26	32	37	43	48
9x12 & 8x14	cfm	180	240	300	360	420	480	540	600
Ak .60	Throw	14	20	24	29	34	39	44	50
10x12	cfm	195	260	325	390	455	520	585	650
Ak .65	Throw	14	18	24	30	35	41	46	51
8x16 & 9x14	cfm	205	275	345	415	485	550	620	690
Ak .69	Throw	15	21	27	32	37	42	48	53
10x14 & 12x12	cfm	235	310	390	470	545	625	700	780
Ak .78	Throw	14	21	28	34	40	46	51	56
10x16	cfm	265	350	440	530	615	705	790	880
Ak .88	Throw	17	23	30	36	41	48	53	60
12x14	cfm	280	370	465	560	650	745	835	930
Ak .93	Throw	18	24	30	37	43	50	56	62
12x16 & 14x14	cfm	320	430	535	640	750	855	965	1070
Ak 1.07	Throw	20	26	32	39	46	53	59	64
12x18 & 14x16	cfm	365	490	610	730	855	975	1100	1220
Ak 1.22	Throw	21	28	34	42	49	56	62	68
14x18 & 16x16	cfm	425	570	710	850	995	1135	1280	1420
Ak 1.42	Throw	22	30	37	45	52	58	63	68
12x24 & 14x20	cfm	475	635	795	955	1115	1270	1430	1590
Ak 1.59	Throw	23	31	39	46	52	59	65	71

Terminal Velocity of 50 fpm

265 Return Air Grille (Page 6)

*Average Face Velocity		400	500	600	700	800	900	1000
4x12	cfm	120	150	175	205	235	265	295
Ak .295	Pt	.011	.017	.024	.033	.043	.054	.065
4x14	cfm	135	170	200	235	270	300	335
Ak .335	Pt	.011	.016	.023	.032	.042	.052	.064
6x10	cfm	150	185	220	260	295	335	370
Ak .37	Pt	.010	.016	.022	.031	.041	.051	.063
6x12	cfm	180	225	265	310	355	400	445
Ak .445	Pt	.010	.015	.021	.030	.039	.049	.060
8x10	cfm	195	245	295	345	390	440	490
Ak .49	Pt	.010	.015	.021	.029	.038	.047	.059
6x14	cfm	205	255	305	355	410	460	510
Ak .51	Pt	.010	.015	.020	.029	.038	.047	.058
8x12	cfm	235	295	350	410	470	525	585
Ak .585	Pt	.009	.014	.020	.028	.036	.046	.057
8x14	cfm	270	340	410	475	545	610	680
Ak .68	Pt	.009	.014	.019	.027	.035	.044	.055
10x12	cfm	290	360	430	505	575	650	720
Ak .72	Pt	.009	.014	.019	.027	.035	.043	.054
12x12 & 6x24	cfm	340	425	510	595	680	765	850
Ak .85	Pt	.009	.013	.019	.026	.033	.042	.053
6x30	cfm	410	515	620	720	825	925	1030
Ak 1.03	Pt	.008	.012	.018	.024	.032	.040	.049
8x24	cfm	445	555	665	775	890	1000	1110
Ak 1.11	Pt	.008	.012	.018	.024	.031	.039	.048
14x14	cfm	460	575	690	805	920	1035	1150
Ak 1.15	Pt	.008	.012	.018	.024	.031	.039	.048
8x30	cfm	540	675	810	945	1080	1215	1350
Ak 1.35	Pt	.008	.012	.017	.023	.030	.037	.046
14x20	cfm	630	790	950	1105	1265	1420	1580
Ak 1.58	Pt	.007	.011	.016	.022	.029	.036	.045
12x24	cfm	655	820	985	1150	1310	1475	1690
Ak 1.64	Pt	.007	.011	.016	.022	.029	.036	.044
10x30	cfm	670	840	1010	1175	1345	1510	1680
Ak 1.68	Pt	.007	.011	.016	.022	.029	.036	.044
18x18	cfm	720	900	1080	1260	1440	1620	1800
Ak 1.80	Pt	.007	.011	.015	.021	.028	.035	.043
14x24	cfm	750	935	1120	1310	1495	1685	1870
Ak 1.87	Pt	.007	.011	.015	.021	.028	.035	.043
12x30	cfm	800	1000	1200	1400	1600	1800	2000
Ak 2.00	Pt	.007	.011	.015	.021	.027	.034	.042
14x30	cfm	940	1175	1410	1645	1880	2115	2350
Ak 2.35	Pt	.007	.010	.015	.020	.026	.033	.040
24x24	cfm	1240	1550	1860	2170	2480	2790	3100
Ak 3.10	Pt	.006	.010	.014	.019	.024	.031	.038
30x30	cfm	1880	2350	2820	3290	3760	4230	4700
Ak 4.70	Pt	.006	.009	.012	.017	.022	.028	.034

* Velocity measured 1" from face.

411 Floor Diffuser (Page 6)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
2 1/4 x10	cfm	25	35	45	55	60	70	80	90
Ak .09	Spread	2	2.5	3	4	4.5	5	6	6.5
	Throw	3	4	5	6.5	7.5	9	10	11
2 1/4 x12	cfm	35	45	55	65	75	90	100	110
Ak .11	Spread	2	3	3.5	4	5	6	6.5	7
	Throw	3	4.5	6	7	8.5	9.5	11	12
2 1/4 x14	cfm	40	50	65	80	90	105	115	130
Ak .13	Spread	2.5	3	4	4.5	5.5	6.5	7	8
	Throw	3.5	5	7	8	9.5	10.5	12	13
4x10	cfm	50	70	85	100	120	135	155	170
Ak .17	Spread	3	3.5	4.5	5.5	6.5	7	8	9
	Throw	4	6	7.5	9	11	12	13.5	15.5
4x12	cfm	65	85	105	125	145	170	190	210
Ak .21	Spread	3	4	5	6	7	8	9	10
	Throw	5	7	8.5	10	12	13.5	15.5	17
4x14	cfm	75	100	125	150	175	200	225	250
Ak .25	Spread	5.5	7.5	9.5	11	13	15	17	18.5
	Throw	3.5	4.5	5.5	6.5	7.5	9	10	11
6x10	cfm	80	110	135	160	190	215	245	270
Ak .27	Spread	6	8	10	11.5	13.5	15.5	17.5	19.5
	Throw	3.5	4.5	6	7	8	9	10.5	11.5
6x12	cfm	100	130	165	200	230	265	295	330
Ak .33	Spread	6.5	8.5	11	13	15	17	19.5	21.5
	Throw	4	5	6.5	7.5	9	10	11.5	12.5
6x14	cfm	115	155	195	235	275	310	350	390
Ak .39	Spread	7.5	9.5	12	14	17	19	21.5	23.5
	Throw	4.5	5.5	7	8.5	10	11	12.5	14

Terminal velocity of 50 fpm.

420/421 Floor Diffuser (Page 7)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
2x10	cfm		35	45	50	60	70	75	85
Ak .085	Spread		3	5	5	6	7	8	9
	Throw		4	4.5	6	7	8	9	10
2x12	cfm	30	40	50	60	70	80	90	100
Ak .100	Spread	3	4	4.5	5.5	6.5	7	8	9
	Throw	3.5	4.5	5.5	7	8	9	10	11
2x14	cfm	35	45	60	70	80	90	105	115
Ak .115	Spread	3.5	4	5	7	7	8	9	10
	Throw	3.5	4.5	6	8	8	9.5	10.5	12
4x8	cfm	40	50	65	80	90	105	115	130
Ak .13	Spread	3	4	5	6.5	7.5	8.5	9.5	11
	Throw	4	4.5	6	7.5	8.5	10	11	13
4X10	cfm	50	70	85	100	120	135	155	170
Ak .170	Spread	4.5	5	6.5	7.5	9	10	11.5	13
	Throw	4	6	8	10	11	12.5	14	15.5
4x12	cfm	60	80	100	120	140	160	175	195
Ak .195	Spread	5	6.5	8	9.5	11.5	13	14.5	16
	Throw	4	5.5	7	8	9.5	11	12	13
4x14	cfm	70	90	115	140	160	185	205	230
Ak .230	Spread	5.5	7	8.5	10	12	13.5	15.5	17
	Throw	4.5	5.5	7	8.5	10	11.5	12.5	14
6x10	cfm	70	95	120	145	170	190	215	240
Ak .24	Spread	5.5	7	8	10	12	14	15	17
	Throw	4	5.5	7	8.5	10	11	12.5	14
6x12	cfm	85	115	140	170	200	230	255	285
Ak .285	Spread	6	7.5	9	11	13	15	17	19
	Throw	4.5	6	7.5	9	10	12	14	16
6x14	cfm	100	130	165	200	230	265	300	330
Ak .33	Spread	6.5	8	9	12	14	16.5	18	20
	Throw	4.5	6.5	8	9.5	11	13	15	17

Terminal velocity of 50 fpm.

531 Royalaire® Floor Register (Page 7)

Face Velocity		300		400		500		600		700		800		900		1000	
Pressure Loss		.006		.010		.016		.022		.031		.040		.050		.062	
		H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
2x10	cfm							30	30	40	40	45	50	50	55	55	60
Ak .085 Heating	Spread							3.5		4.5		5		5.5		5.5	
Ak .060 Cooling	Throw							4	6	5.5	7.5	6	8.5	8.5	9	7	10
2x12	cfm					35	35	40	45	45	50	55	60	60	65	65	75
Ak .067 Heating	Spread					3.5		4		4.5		5		5.5		6"	
Ak .074 Cooling	Throw					4	6	5	8.5	5.5	7.5	6	9	7	10	8	11
2x14	cfm			30	35	40	45	45	50	55	60	65	70	70	80	80	85
Ak .079 Heating	Spread			3		4		4.5		5		5.5		6"		6"	
Ak .087 Cooling	Throw			3.5	4.5	5	6	5.5	7	6.5	8.5	7.5	10	8	11.5	8.5	12.5
4x10	cfm	35	40	45	50	55	65	70	75	80	90	90	100	105	115	115	125
Ak .115 Heating	Spread	3		3.5		4.5		5.5		6"		6"		6"		6"	
Ak .125 Cooling	Throw	3	4.5	4	6	5.5	7.5	6.5	8.5	7.5	10.5	8.5	11.5	8.5	13.5	11.5	15
4x12	cfm	40	50	55	65	70	80	85	95	100	110	115	130	125	145	140	160
Ak .140 Heating	Spread	3		4		5		5.5		6"		6"		6"		6"	
Ak .160 Cooling	Throw	3.5	5	4.5	6.5	6	8.5	7.5	10	11	11.5	10	13	11	15	12	17
4x14	cfm	50	55	65	70	80	90	100	110	115	125	130	145	150	160	165	180
Ak .165 Heating	Spread	3.5		4.5		5		6"		6"		6"		6"		6"	
Ak .180 Cooling	Throw	4	5.5	5.5	7	6.5	9.5	8	11	10	12.5	11	14	12	15.5	13.5	17.5
6x10	cfm	60	60	75	80	95	105	115	125	135	145	150	165	170	185	190	205
Ak .190 Heating	Spread	3.5		4.5		5.5		6"		6"		6"		6"		6"	
Ak .205 Cooling	Throw	4.5	8	5.5	7.5	7	9.5	8.5	11	10	13	11	15	12.5	16.5	14	18.5
6x12	cfm	70	75	90	100	115	125	135	150	160	175	180	200	205	225	225	250
Ak .225 Heating	Spread	4		5		6"		6"		6"		6"		6"		6"	
Ak .250 Cooling	Throw	5	6.5	6	8.5	8	10.5	9	12	11	15	12.5	16.5	14	18.5	16	21
6x14	cfm	80	90	105	120	135	150	160	180	185	210	210	240	240	270	265	300
Ak .265 Heating	Spread	4.5		5		6"		6"		6"		6"		6"		6"	
Ak .300 Cooling	Throw	5	7	7	9.5	8.5	11.5	10	13.5	12	16	13.5	18	16	20.5	17.5	23.5

The spread shown for the heating mode is for a valve setting of 22° right deflection and 22° left deflection. *The maximum value given for spread for heating is that which occurs at the ceiling height (8 ft.). The cooling spread is a straight vertical column of air and is not shown. Throw and spread values are based on a terminal velocity of 50 fpm.

Engineering Data

406 18" Baseboard Diffuser (Page 8)

Face Velocity		300	400	500	600	700	800
Pressure Loss		.013	.022	.035	.048	.067	.088
Ak .26	cfm	80	105	130	155	180	210
	Spread	4.5	6.5	7.5	8.5	9.5	11
	Throw	5	7	8	9	10	11

Terminal velocity of 50 fpm.

406 15" Baseboard Diffuser (Page 8)

Face Velocity		300	400	500	600	700	800	900	1000
15"	cfm	48	63	79	95	111	127	143	159
Ak=0.159	PS	0.005	0.009	0.014	0.020	0.027	0.035	0.044	0.053
Throw	50	5.5	7.5	9	11	13	14.5	16.5	18.5
Spread	fpm	5.5	7.5	9.5	11.5	13.5	15	17	19
Throw	100	3	3.5	4.5	5.5	6.5	7.5	8.5	9
Spread	fpm	3	3.5	4.5	5.5	6.5	7.5	9	9.5
Throw	150	2	2.5	3	3.5	4.5	5	5.5	6
Spread	fpm	2	2.5	3	3.5	4.5	5	5.5	6

462 & 464 Baseboard Diffusers (Page 8, 9)

Airflow (cfm)		300	400	500	600	700	800
	CFM	55	75	95	110	130	150
2 Feet	Spread	6.5	7.5	8	8.5	9	11
27 sq. in.	Throw	7	8	9.5	10.5	12	13
Ak .187	Press. loss	.009	.017	.029	.038	.054	.072
	CFM	110	150	185	225	260	300
4 Feet	Spread	12	15	17.5	19	20	21
54 sq. in.	Throw	7.5	9	10	11.5	12.5	13.5
Ak .375	Press. loss	.031	.058	.090	.124	.178	.224

Terminal velocity of 50 fpm.

472 & 474 Baseboard Return (Page 8, 9)

Face Velocity		300	400	500	600	700
2 Feet	cfm	100	130	165	195	230
Ak .325	Ps	.010	.028	.046	.064	.090
4 Feet	cfm	195	260	325	390	455
Ak .65	Ps	.015	.026	.040	.060	.078

Velocity measured on the face.

654, 655 Baseboard/Sidewall Registers (Page 9, 10)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
8x4	cfm	33	44	55	66	77	88	100	110
Ak .11	Throw	6	8	10	12	14	16	18	20
10x4	cfm	40	54	67	80	95	110	120	135
Ak .135	Throw	6.5	8.5	10.5	12.5	15	17.5	19	21
12x4, 8x6	cfm	55	72	90	108	125	145	162	180
Ak .18	Throw	7.5	10	12.5	15	17.5	20.5	23	25
10x6	cfm	70	92	115	140	160	185	205	230
Ak .23	Throw	9	11.5	14.5	17.5	20	23	25.5	29
12x6	cfm	85	115	145	175	205	230	260	290
Ak .29	Throw	10	13	17	20	23.5	26.5	30	33
14x6	cfm	102	135	170	205	240	270	305	340
Ak .34	Throw	11	14.5	18	22	25.5	29	32.5	36

Terminal Velocity of 75 fpm

657/658 Baseboard Return Grille (Page 10)

*Average Face Velocity		300	400	500	600	700
10x6	cfm	115	150	180	225	265
Ak .38	Pt	.013	.023	.037	.052	.072
12x6	cfm	135	180	220	268	320
Ak .46	Pt	.013	.022	.035	.051	.070
10x8	cfm	150	205	265	305	365
Ak .51	Pt	.012	.022	.035	.050	.068
14x6	cfm	160	210	265	320	370
Ak .53	Pt	.012	.022	.035	.050	.068
12x8	cfm	180	245	305	365	430
Ak .61	Pt	.012	.022	.034	.049	.066
14x8	cfm	215	288	360	430	505
Ak .72	Pt	.012	.021	.033	.047	.065
20x6	cfm	225	300	375	450	525
Ak .75	Pt	.012	.021	.033	.047	.064
18x8	cfm	250	330	415	500	580
Ak .83	Pt	.012	.021	.033	.046	.063
14x18 & 24x6	cfm	275	365	480	550	640
Ak .92	Pt	.011	.020	.032	.045	.062
14x12	cfm	320	430	540	650	755
Ak 1.08	Pt	.011	.020	.031	.045	.060
30x6	cfm	335	445	560	670	780
Ak 1.12	Pt	.011	.020	.031	.044	.060
24x8	cfm	365	485	605	730	850
Ak 1.21	Pt	.011	.020	.031	.044	.059
30x10	cfm	375	500	630	750	880
Ak 1.25	Pt	.011	.019	.030	.043	.059
24x18 & 30x8	cfm	450	600	750	898	1040
Ak 1.50	Pt	.011	.019	.030	.042	.057
24x12	cfm	550	730	910	1100	1270
Ak 1.82	Pt	.010	.018	.029	.041	.056
30x18	cfm	575	760	960	1150	1330
Ak 1.91	Pt	.010	.018	.029	.041	.055
30x12	cfm	680	900	1130	1350	1570
Ak 2.25	Pt	.010	.018	.028	.040	.054

* Velocity measured 1" from face.

664 Baseboard Register (Page 11)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
8x6	cfm	55	70	90	110	125	145	160	180
Ak .18	Throw	5.5	7	9	10.5	12.5	14	16	18
10x6 & 12x5	cfm	75	100	125	145	170	195	220	245
Ak .245	Throw	6	8	10	12	14	16	18	20
14x6	cfm	110	145	180	215	252	290	325	360
Ak .36	Throw	7	9.5	12	14	16.5	19	21.5	24
12x8	cfm	130	170	215	255	300	340	385	425
Ak .425	Throw	7.5	10	12.5	15	18	20.5	23	25.5

Terminal Velocity of 75 fpm

Series 300 Stamped Curved-Blade Registers (Page 12-14)

Hart & Cooley 301

Face Velocity		300	400	500	600	700	800	900	1000
6 x 6	CFM	30	40	45	55	65	75	85	95
Ak 0.09	Ps	0.007	0.013	0.020	0.029	0.040	0.052	0.066	0.081
	Throw	6	8	10	11	13	15	17	19
8 x 4	CFM	30	45	55	65	75	85	95	105
Ak 0.11	Ps	0.007	0.013	0.021	0.030	0.041	0.053	0.067	0.083
	Throw	6	8	10	12	14	16	18	20
8 x 6	CFM	35	50	60	75	85	100	110	125
Ak 0.12	Ps	0.007	0.013	0.021	0.030	0.040	0.053	0.067	0.082
	Throw	7	9	11	13	15	17	19	22
8 x 8	CFM	50	65	80	95	110	130	145	160
Ak 0.16	Ps	0.008	0.014	0.022	0.031	0.042	0.055	0.070	0.086
	Throw	8	10	12	15	17	20	22	25
10 x 4	CFM	35	50	60	70	85	95	110	120
Ak 0.12	Ps	0.008	0.013	0.021	0.030	0.041	0.054	0.068	0.084
	Throw	6	9	11	13	15	17	19	21
10 x 6	CFM	40	55	70	80	95	110	120	135
Ak 0.14	Ps	0.008	0.014	0.021	0.031	0.042	0.054	0.069	0.085
	Throw	7	9	11	14	16	18	20	23
10 x 8	CFM	55	75	95	115	130	150	170	190
Ak 0.19	Ps	0.008	0.014	0.022	0.031	0.043	0.056	0.071	0.087
	Throw	8	11	13	16	19	21	24	27
10 x 10	CFM	70	95	120	145	170	190	215	240
Ak 0.24	Ps	0.008	0.014	0.021	0.030	0.042	0.054	0.069	0.085
	Throw	8	11	14	16	19	22	24	27
12 x 4	CFM	40	55	65	80	95	105	120	135
Ak 0.13	Ps	0.008	0.014	0.021	0.031	0.042	0.054	0.069	0.085
	Throw	9	12	15	18	21	24	27	30
12 x 6	CFM	55	75	95	110	130	150	165	185
Ak 0.18	Ps	0.008	0.015	0.023	0.033	0.045	0.059	0.074	0.091
	Throw	7	9	11	13	16	18	20	22
12 x 8	CFM	65	85	110	130	150	170	195	215
Ak 0.22	Ps	0.008	0.014	0.022	0.032	0.043	0.056	0.071	0.088
	Throw	8	11	13	16	19	21	24	26
12 x 12	CFM	90	120	150	180	210	235	265	295
Ak 0.30	Ps	0.008	0.014	0.022	0.032	0.044	0.057	0.073	0.090
	Throw	10	13	16	19	22	25	28	31
14 x 4	CFM	45	60	75	90	105	120	130	145
Ak 0.15	Ps	0.008	0.014	0.021	0.031	0.042	0.055	0.069	0.086
	Throw	10	14	17	20	24	27	30	34
14 x 6	CFM	65	85	110	130	150	175	195	215
Ak 0.22	Ps	0.008	0.014	0.022	0.031	0.042	0.055	0.070	0.087
	Throw	7	9	12	14	16	19	21	23
14 x 8	CFM	75	95	120	145	170	195	220	240
Ak 0.24	Ps	0.008	0.014	0.022	0.032	0.043	0.057	0.072	0.089
	Throw	9	12	14	17	20	23	26	29

Terminal Velocity of 75 fpm

Hart & Cooley 302

Face Velocity		300	400	500	600	700	800	900	1000
8 x 4	CFM	30	40	50	65	75	85	95	105
Ak 0.11	Ps	0.012	0.021	0.033	0.047	0.064	0.083	0.106	0.13
	Throw	3	4	6	7	8	9	10	11
8 x 6	CFM	40	50	65	75	90	100	115	125
Ak 0.13	Ps	0.012	0.02	0.032	0.046	0.063	0.082	0.104	0.128
	Throw	4	5	6	7	8	9	11	12
8 x 8	CFM	55	75	90	110	130	150	165	185
Ak 0.19	Ps	0.011	0.02	0.031	0.045	0.061	0.08	0.101	0.125
	Throw	5	6	7	9	10	11	13	14
10 x 6	CFM	50	65	85	100	115	130	150	165
Ak 0.17	Ps	0.011	0.02	0.031	0.045	0.062	0.08	0.102	0.126
	Throw	4	6	7	8	9	11	12	13
10 x 8	CFM	65	90	110	135	155	180	200	225
Ak 0.23	Ps	0.011	0.02	0.031	0.044	0.061	0.079	0.1	0.124
	Throw	5	7	8	10	11	13	14	15
12 x 6	CFM	60	80	100	125	145	165	185	205
Ak 0.21	Ps	0.011	0.02	0.031	0.045	0.061	0.079	0.101	0.124
	Throw	5	6	8	9	10	12	13	15
12 x 8	CFM	80	105	130	160	185	210	240	265
Ak 0.27	Ps	0.011	0.02	0.031	0.044	0.06	0.079	0.099	0.123
	Throw	5	7	9	10	12	14	15	17
14 x 6	CFM	70	95	115	140	165	190	210	235
Ak 0.24	Ps	0.011	0.02	0.031	0.044	0.06	0.079	0.1	0.123
	Throw	5	7	8	10	11	13	14	16
14 x 8	CFM	90	120	150	185	215	245	275	305
Ak 0.31	Ps	0.011	0.02	0.031	0.044	0.06	0.078	0.099	0.122
	Throw	6	8	9	11	13	14	16	18

Terminal Velocity of 75 fpm

Hart & Cooley 303

Face Velocity		300	400	500	600	700	800	900	1000
6 x 6	CFM	35	50	60	75	85	100	110	125
Ak 0.12	Ps	0.014	0.025	0.039	0.056	0.077	0.100	0.126	0.156
L	Throw	5	7	9	10	12	14	15	17
S	Throw	3	4	5	6	7	8	9	10
8 x 4	CFM	30	40	50	65	75	85	95	105
Ak 0.10	Ps	0.015	0.027	0.041	0.060	0.081	0.106	0.134	0.166
L	Throw	5	6	8	9	11	12	14	15
S	Throw	3	4	5	6	7	8	8	9
8 x 6	CFM	40	55	70	85	100	115	125	140
Ak 0.14	Ps	0.015	0.026	0.041	0.059	0.080	0.104	0.132	0.163
L	Throw	6	7	9	11	13	15	16	18
S	Throw	3	5	6	7	8	9	10	11
8 x 8	CFM	55	75	90	110	130	145	165	185
Ak 0.18	Ps	0.013	0.022	0.035	0.050	0.069	0.090	0.114	0.140
L	Throw	6	8	11	13	15	17	19	21
S	Throw	4	5	6	8	9	10	11	12
10 x 4	CFM	35	50	60	75	85	100	110	125
Ak 0.12	Ps	0.014	0.025	0.039	0.056	0.076	0.100	0.126	0.156
L	Throw	5	7	9	10	12	14	15	17
S	Throw	3	4	5	6	7	8	9	10
10 x 6	CFM	50	70	85	105	120	140	155	175
Ak 0.17	Ps	0.015	0.027	0.043	0.062	0.084	0.110	0.139	0.171
L	Throw	6	8	10	12	14	16	18	20
S	Throw	4	5	6	7	9	10	11	12
10 x 8	CFM	65	90	110	135	155	180	200	225
Ak 0.22	Ps	0.012	0.022	0.034	0.049	0.066	0.086	0.109	0.135
L	Throw	7	9	12	14	16	18	21	23
S	Throw	4	6	7	8	10	11	12	14
10 x 10	CFM	95	125	155	185	220	250	280	310
Ak 0.31	Ps	0.015	0.027	0.043	0.062	0.084	0.110	0.139	0.172
L	Throw	8	11	14	16	19	22	24	27
S	Throw	5	7	8	10	11	13	14	16
12 x 6	CFM	60	85	105	125	145	165	185	205
Ak 0.21	Ps	0.012	0.022	0.034	0.049	0.066	0.086	0.109	0.135
L	Throw	7	9	11	13	15	18	20	22
S	Throw	4	6	7	8	9	11	12	13
12 x 8	CFM	80	105	130	160	185	210	240	265
Ak 0.26	Ps	0.008	0.014	0.022	0.032	0.044	0.057	0.072	0.089
L	Throw	8	10	13	15	17	20	22	25
S	Throw	5	6	8	9	11	12	13	15
12 x 12	CFM	115	155	190	230	270	305	345	385
Ak 0.38	Ps	0.008	0.014	0.023	0.033	0.044	0.058	0.073	0.090
L	Throw	9	12	15	18	21	24	27	30
S	Throw	6	7	9	11	13	14	16	18
14 x 4	CFM	50	65	80	100	115	130	150	165
Ak 0.16	Ps	0.008	0.014	0.022	0.031	0.042	0.055	0.070	0.086
L	Throw	6	8	10	12	14	16	17	19
S	Throw	4	5	6	7	9	10	11	12
14 x 6	CFM	60	80	100	120	145	165	185	205
Ak 0.20	Ps	0.009	0.017	0.026	0.037	0.051	0.066	0.084	0.104
L	Throw	7	9	11	13	15	17	20	22
S	Throw	4	6	7	8	9	11	12	13
14 x 8	CFM	90	120	150	185	215	245	275	305
Ak 0.30	Ps	0.008	0.014	0.022	0.032	0.044	0.057	0.073	0.090
L	Throw	8	11	13	16	19	21	24	27
S	Throw	5	7	8	10	11	13	14	16
16 x 6	CFM	80	105	130	160	185	210	240	265
Ak 0.26	Ps	0.008	0.014	0.022	0.032	0.044	0.057	0.072	0.089
L	Throw	8	10	12	15	17	20	22	25
S	Throw	5	6	8	9	11	12	14	15

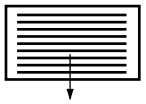
Terminal Velocity of 75 fpm

Hart & Cooley 304

Face Velocity		300	400	500	600	700	800	900	1000
6 x 6	CFM	50	65	80	95	110	125	145	160
Ak 0.16	Ps	0.040	0.072	0.112	0.161	0.219	0.287	0.363	0.448
L	Throw	3	4	5	6	7	8	9	10
S	Throw	4	5	6	7	8	9	11	12
8 x 8	CFM	65	85	110	130	155	175	195	220
Ak 0.22	Ps	0.024	0.043	0.067	0.096	0.130	0.170	0.216	0.266
L	Throw	4	5	6	7	8	10	11	12
S	Throw	4	6	7	8	10	11	12	14
10 x 10	CFM	85	115	140	170	200	225	255	285
Ak 0.28	Ps	0.016	0.029	0.045	0.064	0.087	0.114	0.144	0.178
L	Throw	4	6	7	8	10	11	12	14
S	Throw	5	6	8	10	11	13	14	16
12 x 12	CFM	120	160	200	235	275	315	355	395
Ak 0.40	Ps	0.012	0.022	0.032	0.047	0.064	0.084	0.107	0.133
L	Throw	5	7	8	10	11	13	14	16
S	Throw	6	8	9	11	13	15	17	18
14 x 14	CFM	145	190	240	285	335	380	430	475
Ak 0.48	Ps	0.009	0.016	0.025	0.037	0.049	0.065	0.081	0.102
L	Throw	6	7	9	11	12	14	16	18
S	Throw	6	8	10	12	14	16	18	20

Terminal Velocity of 75 fpm

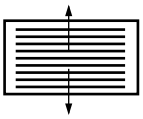
A611 1-Way Adjustable Curved-Blade Register (Page 15)



Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8x4 Ak .107	cfm	30	45	55	65	75	85	95	105	120	130
	Throw	3.5	5.5	6.5	7.5	9	10	11.5	12.5	14	15.5
10x4 Ak .132	cfm	40	55	65	80	90	105	120	130	145	160
	Throw	4	6	7	8.5	9.5	11	12.5	13.5	15.5	17
10x6 Ak .200	cfm	60	80	100	120	140	160	180	200	220	240
	Throw	5	6.5	8.5	10	11.5	13.5	15	16	18	20
12x6 Ak .235	cfm	70	95	120	140	165	190	210	235	260	280
	Throw	5.5	7	9	10.5	12.5	14.5	16	18	20	22
10x8 Ak .264	cfm	80	105	130	160	185	210	240	265	290	315
	Throw	5.5	7.5	9.5	11.5	13	15	17	19	21	23
12x8 Ak .320	cfm	95	130	160	190	225	255	290	320	350	385
	Throw	6	8.5	10.5	12.5	14.5	16.5	19	21	23	25
14x8 Ak .364	cfm	110	145	180	220	255	290	330	365	400	435
	Throw	6.5	8.5	11	13	15.5	17.5	20	22	24	26

Terminal Velocity of 75 fpm

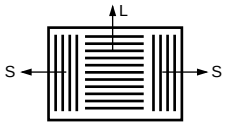
A612 2-Way Adjustable Curved-Blade Register (Page 15)



Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
10x6 Ak .200	cfm	60	80	100	120	140	160	180	200	220	240
	Throw	3.5	4.5	6	7	8.5	9.5	10.5	12	13	14
12x6 Ak .235	cfm	70	95	120	140	165	190	210	235	260	280
	Throw	4	5	6.5	7.5	9	10	11.5	12.5	14	15
12x8 Ak .320	cfm	95	130	160	190	225	255	290	320	350	385
	Throw	4.5	6	7.5	8.5	10.5	11.5	13.5	14.5	16	18
14x8 Ak .364	cfm	110	145	180	220	255	290	330	365	400	435
	Throw	4.5	6	7.5	9.5	11	12.5	14	15.5	17	19

Terminal Velocity of 75 fpm

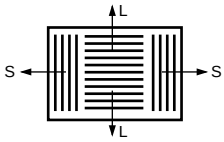
A613 3-Way Adjustable Curved-Blade Register (Page 15)



Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
10x6 Ak .200	Total cfm	60	80	100	120	140	160	180	200	220	240
	cfm L/S	22/19	29/26	36/32	43/38	50/45	58/51	65/58	72/64	79/70	86/77
	Throw L/S	3/2	4/4	5/4.5	6/5	7/6.5	8/7.5	9/8.5	10/9.5	11/10.5	12/11.5
8x8 Ak .215	Total cfm	65	85	110	130	150	170	195	215	235	260
	cfm L/S	30/18	39/23	50/30	60/35	68/41	78/46	89/53	98/58	108/64	119/70
	Throw L/S	3.5/3	4.5/3.5	6/4.5	7/5.5	8/6.5	9.5/7	10.5/8	11.5/9	13/10	14/11
12x6 Ak .235	Total cfm	70	95	120	140	165	190	210	235	260	280
	cfm L/S	21/25	28/33	36/42	42/49	49/58	57/67	63/74	70/82	77/91	83/98
	Throw L/S	3/3	4/4	5/5.5	6/6.5	7/7.5	8/8.5	9/9.5	9.5/10.5	10.5/11.5	11.5/12.5
10x10 Ak .330	Total cfm	100	130	165	200	230	265	295	330	365	395
	cfm L/S	36/32	47/42	59/63	72/64	83/74	95/85	106/94	119/106	131/117	142/126
	Throw L/S	4/3.5	5/4.5	6.5/6	7.5/7	9/8.5	10/9.5	11/10.5	12.5/12	14/13	15/14

Terminal Velocity of 75 fpm

A614 4-Way Adjustable Curved-Blade Register (Page 16)



Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8x8 Ak .215	Total cfm	65	85	110	130	150	170	195	215	235	260
	cfm L/S	15/18	20/23	25/30	30/35	35/41	39/46	45/53	49/58	54/64	60/70
	Throw L/S	2.5/3	3.5/3.5	4/4.5	5/5.5	6/6.5	6.5/7	7.5/8	8/9	9/10	10/11
10x10 Ak .33	Total cfm	100	130	165	200	230	265	295	330	365	395
	cfm L/S	18/32	24/42	30/53	36/64	42/74	48/85	53/94	60/106	66/117	71/126
	Throw L/S	2.5/3.5	3.5/4.5	4.5/6	5.5/7	6.5/8.5	7/9.5	8/10.5	9/12	10/13	10.5/14
12x12 Ak .452	Total cfm	135	180	225	270	315	360	405	450	495	540
	cfm L/S	20/47	27/63	34/79	40/95	47/111	54/126	61/142	67/158	74/174	81/190
	Throw L/S	2.5/4	3.5/5.5	4.5/7	5.5/8.5	6.5/10	7.5/11	8.5/12.5	9/14	10/15.5	11/17

Terminal Velocity of 75 fpm

A618 Adjustable Fin Register (Page 16) Deflection A

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8x4 Ak .156	cfm	45	60	80	95	110	125	140	155	170	185
	Throw	5	6.5	8.5	10	12	13	15	16	18	19
10x4 Ak .198	cfm	60	80	100	120	140	160	180	200	220	240
	Throw	6	7.5	9.5	12	13	15	17	19	20	22
12x4 Ak .240	cfm	70	95	120	145	170	190	215	240	265	290
	Throw	6	8	10	12	14	16	18	20	22	25
10x6 Ak .313	cfm	95	125	155	190	220	250	280	315	345	375
	Throw	7	9	12	14	16	19	21	23	26	28
12x6 Ak .379	cfm	115	150	190	225	265	305	340	380	415	455
	Throw	8	10	13	15	18	21	23	26	28	31
10x8 Ak .425	cfm	130	170	215	255	300	340	385	425	470	510
	Throw	8	11	14	16	19	21	24	27	30	32
14x6 Ak .446	cfm	135	180	225	270	310	355	400	445	490	545
	Throw	8	11	14	17	19	22	25	28	30	33
12x8 Ak .530	cfm	160	200	265	320	370	425	475	530	585	635
	Throw	9	11	15	18	21	24	27	30	33	36
14x8 Ak .620	cfm	185	250	310	370	435	495	560	620	680	745
	Throw	10	13	16	20	23	26	30	33	36	39

Terminal Velocity of 75 fpm

A618 Adjustable Fin Register (Page 16) Deflection C

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8x4 Ak .141	cfm	40	55	70	85	100	115	125	140	155	170
	Throw	3.5	5	6.5	7.5	9	10	11	13	14	15
10x4 Ak .178	cfm	55	70	90	105	125	140	160	180	195	215
	Throw	4	5.5	7	8.5	10	11	13	14	16	17
12x4 Ak .216	cfm	65	85	110	130	150	175	195	215	240	260
	Throw	4.5	6	8	9.5	11	13	14	16	18	19
10x6 Ak .282	cfm	85	115	140	170	195	225	255	280	310	340
	Throw	5.5	7.5	9	11	12	14	16	18	20	22
12x6 Ak .342	cfm	105	135	170	205	240	275	310	340	375	410
	Throw	6	8	10	12	14	16	18	20	22	24
10x8 Ak .390	cfm	115	155	195	235	275	310	350	390	430	470
	Throw	6	8	11	13	15	17	19	21	23	26
14x6 Ak .412	cfm	125	165	205	245	290	330	370	410	455	495
	Throw	7	9	11	13	16	18	20	22	24	27
12x8 Ak .470	cfm	140	190	235	280	330	375	425	470	515	565
	Throw	7	9	12	14	16	19	21	23	25	28
14x8 Ak .550	cfm	165	220	275	330	385	440	495	550	605	660
	Throw	8	10	13	15	18	20	23	25	28	30

Terminal Velocity of 75 fpm

A618 Adjustable Fin Register (Page 16) Deflection E

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8x4 Ak .127	cfm	40	50	65	75	90	100	115	125	140	150
	Throw	3	4	5	5.5	7	7.5	8.5	9.5	11	11.5
10x4 Ak .162	cfm	50	65	80	95	115	130	145	160	180	195
	Throw	3	4.5	5.5	6.5	7.5	8.5	9.5	11	12	13
12x4 Ak .197	cfm	60	80	100	120	140	160	175	195	215	235
	Throw	4	4.5	6	7.5	8.5	10	11	12	13	14
10x6 Ak .257	cfm	75	105	130	155	180	205	230	255	285	310
	Throw	4	5.5	7.5	8.5	9.5	11	12	14	15	17
12x6 Ak .311	cfm	95	125	155	185	220	250	280	310	340	375
	Throw	4.5	6	7.5	9	11	12	14	15	17	18
10x8 Ak .350	cfm	105	140	175	210	245	280	315	350	385	420
	Throw	5	6	8	10	11	13	14	16	18	19
14x6 Ak .365	cfm	110	145	185	220	255	290	330	365	400	440
	Throw	5.5	6.5	8.5	10	11	13	15	16	18	20
12x8 Ak .435	cfm	130	175	220	260	305	350	390	435	480	520
	Throw	5	7	9	11	13	15	16	18	20	22
14x8 Ak .510	cfm	155	205	255	305	355	410	460	510	560	610
	Throw	6	8	10	12	14	16	18	20	22	23

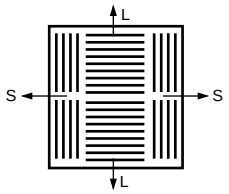
Terminal Velocity of 75 fpm

A618 Adjustable Fin Register (Page 16) Deflection G

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8x4 Ak .118	cfm	35	45	60	70	85	95	105	120	130	140
	Throw	2	2.5	3.5	4	5	5.5	6	6.5	7.5	8
10x4 Ak .149	cfm	45	60	75	90	105	120	135	150	165	180
	Throw	2	3	3.5	4.5	5	6	6.5	7.5	8	9
12x4 Ak .181	cfm	55	70	90	110	125	145	165	180	200	215
	Throw	2.5	3	4	5	5.5	6.5	7.5	8	9	10
10x6 Ak .236	cfm	70	95	120	140	165	190	210	235	260	285
	Throw	3	4	5	5.5	6.5	7.5	8.5	9.5	10	11
12x6 Ak .286	cfm	85	115	145	170	200	230	255	285	315	345
	Throw	3	4	5	6	7	8.5	9	10	11	12
10x8 Ak .320	cfm	95	130	160	190	225	255	290	320	350	385
	Throw	3	4.5	5.5	6.5	7.5	8.5	10	11	12	13
14x6 Ak .336	cfm	100	135	170	200	235	270	300	335	370	405
	Throw	3.5	4.5	5.5	6.5	8	9	10	11	12	13
12x8 Ak .395	cfm	120	160	200	235	275	315	355	395	435	475
	Throw	3.5	5	6	7	8	10	11	12	13	15
14x8 Ak .460	cfm	140	185	230	275	320	370	415	460	505	550
	Throw	4	5.5	6.5	8	9	10.5	11.5	13	14.5	15.5

Terminal Velocity of 75 fpm

See Alternative sizing graph on page XXX

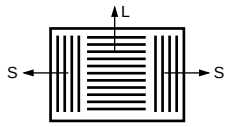


621 Sidewall/Ceiling Register 4-Way Deflection (Page 17)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
6x6 Ak .14	cfm	40	55	70	85	100	110	125	140
	Throw L/S	4.5/3.5	6.5/5	8/6.5	10/8	11.5/9.5	12.5/10.5	14.5/12	16/13.5
8x8 Ak .28	cfm	85	110	140	170	195	225	250	280
	Throw L/S	6.5/5.5	9/7.5	11/9.5	13.5/11.5	15.5/13	18/15	20/16.5	22.5/18.5
10x10 Ak .44	cfm	130	175	220	265	310	350	395	440
	Throw L/S	8/6.5	11/9	14/11.5	17/14	20/16.5	22/18	25/21	28/23
12x12 Ak .68	cfm	205	270	340	410	475	545	610	680
	Throw L/S	10.5/8.5	14/11	17.5/14	21/17	24.5/19.5	28/22.5	30/25	33/28
14x14 Ak .93	cfm	280	370	465	560	650	745	835	930
	Throw L/S	11/9.5	14.5/12.5	18.5/16	22/19	26.5/22	30/25.5	32.5/28	36/31
16x16 Ak 1.28	cfm	385	510	640	770	895	1025	1150	1280
	Throw L/S	13/11	17.5/14	22/18	26.5/21.5	30/25	35/28	39/32	43/36

Terminal Velocity of 75 fpm

631 Register (Page 17)



Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
10x6 Ak .18	cfm	85	110	140	170	195	225	250	280
	Throw L/S	4.0/8.0	5.5/10	7.0/13	8.5/16	9.5/19	11/21	13/24	15/26
12x6 Ak .34	cfm	100	135	170	205	240	275	305	340
	Throw L/S	4.0/8.0	5.0/10	6.0/13	7.5/16	9.0/20	10/22	11.5/24	13/28
10x8 Ak .38	cfm	115	150	190	230	265	305	340	380
	Throw L/S	3.5/9.5	5.0/13	6.0/16	7.0/18	8.0/21	9.0/24	10.5/29	11.5/32
14x6 Ak .40	cfm	120	160	200	240	280	320	360	400
	Throw L/S	4.0/10	5.0/12	6.5/16	8.0/19	9.0/22	10/24	11/27	12.5/30
12x8 Ak .47	cfm	140	190	235	280	330	375	425	470
	Throw L/S	4.5/10	6.0/13	7.5/15	9.0/18	10/21	11.5/25	13/28	14.5/31
14x8 Ak .55	cfm	165	220	275	330	385	440	495	550
	Throw L/S	4.0/10	5.5/13.5	7.5/18	8.5/22	10/25	11.5/29	13/33	15/36

Terminal Velocity of 50 fpm

Engineering Data

650 & A650 Return Air Grille (Page 17, 18)
659 Return Air Filter Grille (Page 18)

Face velocity *		300	400	500	600	700
6 x 4	CFM	33	44	55	66	77
Ak 0.111	Ps	0.010	0.018	0.029	0.041	0.056
6 x 6	CFM	50	67	83	100	117
Ak 0.167	Ps	0.010	0.018	0.029	0.041	0.056
8 x 4	CFM	44	59	74	89	104
Ak 0.148	Ps	0.010	0.018	0.029	0.041	0.056
8 x 6	CFM	67	89	112	134	156
Ak 0.223	Ps	0.010	0.018	0.029	0.041	0.056
8 x 8	CFM	90	120	150	179	209
Ak 0.299	Ps	0.010	0.018	0.029	0.041	0.056
10 x 4	CFM	56	74	93	111	130
Ak 0.186	Ps	0.010	0.018	0.029	0.041	0.056
10 x 6	CFM	84	112	140	168	196
Ak 0.28	Ps	0.010	0.018	0.029	0.041	0.056
10 x 8	CFM	112	150	187	225	262
Ak 0.375	Ps	0.010	0.018	0.029	0.041	0.056
10 x 10	CFM	141	188	235	282	329
Ak 0.47	Ps	0.010	0.018	0.029	0.041	0.056
12 x 6	CFM	101	135	168	202	236
Ak 0.337	Ps	0.010	0.018	0.029	0.041	0.056
12 x 8	CFM	135	180	226	271	316
Ak 0.451	Ps	0.010	0.018	0.029	0.041	0.056
12 x 10	CFM	170	226	283	339	396
Ak 0.566	Ps	0.010	0.018	0.029	0.041	0.056
12 x 12	CFM	204	272	340	408	476
Ak 0.681	Ps	0.010	0.018	0.029	0.041	0.056
12 x 18	CFM	308	411	513	616	719
Ak 1.027	Ps	0.010	0.018	0.029	0.041	0.056
14 x 6	CFM	118	158	197	236	276
Ak 0.394	Ps	0.010	0.018	0.029	0.041	0.056
14 x 8	CFM	158	211	264	316	369
Ak 0.527	Ps	0.010	0.018	0.029	0.041	0.056
14 x 10	CFM	198	265	331	397	463
Ak 0.661	Ps	0.010	0.018	0.029	0.041	0.056
14 x 12	CFM	239	318	398	477	557
Ak 0.796	Ps	0.010	0.018	0.029	0.041	0.056
14 x 14	CFM	279	372	465	558	651
Ak 0.93	Ps	0.010	0.018	0.029	0.041	0.056
14 x 18	CFM	360	480	600	720	840
Ak 1.2	Ps	0.010	0.018	0.029	0.041	0.056

Face velocity *		300	400	500	600	700
16 x 6	CFM	135	180	226	271	316
Ak 0.451	Ps	0.010	0.018	0.029	0.041	0.056
16 x 8	CFM	181	242	302	362	423
Ak 0.604	Ps	0.010	0.018	0.029	0.041	0.056
16 x 10	CFM	227	303	379	454	530
Ak 0.757	Ps	0.010	0.018	0.029	0.041	0.056
16 x 12	CFM	273	364	455	547	638
Ak 0.911	Ps	0.010	0.018	0.029	0.041	0.056
16 x 14	CFM	320	426	533	639	746
Ak 1.065	Ps	0.010	0.018	0.029	0.041	0.056
16 x 16	CFM	366	488	610	732	854
Ak 1.219	Ps	0.010	0.018	0.029	0.041	0.056
16 x 24	CFM	552	736	920	1104	1288
Ak 1.84	Ps	0.010	0.018	0.029	0.041	0.057
18 x 6	CFM	153	203	254	305	356
Ak 0.508	Ps	0.010	0.018	0.029	0.041	0.056
18 x 18	CFM	465	619	774	929	1084
Ak 1.548	Ps	0.010	0.018	0.029	0.041	0.057
20 x 6	CFM	170	226	283	339	396
Ak 0.566	Ps	0.010	0.018	0.029	0.041	0.056
20 x 10	CFM	285	380	475	570	665
Ak 0.949	Ps	0.010	0.018	0.029	0.041	0.056
20 x 12	CFM	343	457	571	685	800
Ak 1.142	Ps	0.010	0.018	0.029	0.041	0.056
20 x 14	CFM	401	534	668	801	935
Ak 1.335	Ps	0.010	0.018	0.029	0.041	0.056
20 x 20	CFM	575	767	959	1150	1342
Ak 1.917	Ps	0.010	0.018	0.029	0.041	0.057
20 x 24	CFM	692	923	1153	1384	1615
Ak 2.307	Ps	0.010	0.019	0.029	0.042	0.057
20 x 25	CFM	721	962	1202	1442	1683
Ak 2.404	Ps	0.010	0.019	0.029	0.042	0.057

Face velocity *		300	400	500	600	700
24 x 4	CFM	135	180	226	271	316
Ak 0.451	Ps	0.010	0.018	0.029	0.041	0.056
24 x 6	CFM	204	272	340	408	476
Ak 0.681	Ps	0.010	0.018	0.029	0.041	0.056
24 x 8	CFM	273	364	455	547	638
Ak 0.911	Ps	0.010	0.018	0.029	0.041	0.056
24 x 10	CFM	343	457	571	685	800
Ak 1.142	Ps	0.010	0.018	0.029	0.041	0.056
24 x 12	CFM	412	550	687	825	962
Ak 1.374	Ps	0.010	0.018	0.029	0.041	0.056
24 x 14	CFM	482	643	803	964	1125
Ak 1.607	Ps	0.010	0.018	0.029	0.041	0.057
24 x 22	CFM	762	1016	1270	1524	1778
Ak 2.541	Ps	0.010	0.019	0.029	0.042	0.057
24 x 24	CFM	832	1110	1387	1665	1942
Ak 2.775	Ps	0.010	0.019	0.029	0.042	0.057
30 x 4	CFM	170	226	283	339	396
Ak 0.566	Ps	0.010	0.018	0.029	0.041	0.056
30 x 6	CFM	256	341	427	512	597
Ak 0.853	Ps	0.010	0.018	0.029	0.041	0.056
30 x 8	CFM	343	457	571	685	800
Ak 1.142	Ps	0.010	0.018	0.029	0.041	0.056
30 x 10	CFM	430	573	716	859	1003
Ak 1.432	Ps	0.010	0.018	0.029	0.041	0.056
30 x 12	CFM	517	689	862	1034	1206
Ak 1.723	Ps	0.010	0.018	0.029	0.041	0.057
30 x 14	CFM	604	806	1007	1209	1410
Ak 2.015	Ps	0.010	0.018	0.029	0.042	0.057
30 x 18	CFM	780	1040	1300	1560	1819
Ak 2.599	Ps	0.010	0.019	0.029	0.042	0.057
30 x 20	CFM	868	1157	1446	1735	2025
Ak 2.892	Ps	0.010	0.019	0.029	0.042	0.057
30 x 24	CFM	1044	1392	1740	2088	2436
Ak 3.479	Ps	0.010	0.019	0.029	0.042	0.057
30 x 30	CFM	1309	1745	2181	2618	3054
Ak 4.363	Ps	0.010	0.019	0.029	0.042	0.057
36 x 6	CFM	308	411	513	616	719
Ak 1.027	Ps	0.010	0.018	0.029	0.041	0.056
36 x 8	CFM	412	550	687	825	962
Ak 1.374	Ps	0.010	0.018	0.029	0.041	0.056

*Tested without filters. Typical disposable 1-inch capacity is 2 cfm per square inch of gross filter area. Recommended velocity is 300-400 fpm. Velocities higher than 500 fpm will decrease filter performance. Increase flow resistance, and possibly blow off agglomerates of collected dirt. Velocity measured 1" from face.

651 Baseboard Register (Page 18)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
8x4	cfm	33	44	55	66	77	88	100	110
Ak .11	Throw	6	8	10	12	14	16	18	20
10x4	cfm	40	54	67	80	95	110	120	135
Ak .135	Throw	6.5	8.5	10.5	12.5	15	17.5	19	21
12x4 & 8x6	cfm	55	72	90	108	125	145	162	180
Ak .18	Throw	7.5	10	12.5	15	17.5	20.5	23	25
10x6	cfm	70	92	115	140	160	185	205	230
Ak .23	Throw	9	11.5	14.5	17.5	20	23	25.5	29
12x6	cfm	85	115	145	175	205	230	260	290
Ak .29	Throw	10	13	17	20	23.5	26.5	30	33
14x6	cfm	102	135	170	205	240	270	305	340
Ak .34	Throw	11	14.5	18	22	25.5	29	32.5	36

Terminal Velocity of 75 fpm

672/674 Return Air Grille (Page 20, 11)
673 Return Air Filter Grille (Page 20)

Face velocity *		300	400	500	600	700
6 x 4	CFM	34	45	56	68	79
Ak 0.11	Ps.	0.020	0.035	0.054	0.079	0.108
6 x 6	CFM	50	67	84	101	117
Ak 0.17	Ps.	0.019	0.035	0.054	0.079	0.107
8 x 4	CFM	45	60	75	90	105
Ak 0.15	Ps.	0.019	0.035	0.054	0.079	0.108
8 x 6	CFM	67	89	111	134	156
Ak 0.22	Ps.	0.019	0.035	0.054	0.079	0.107
8 x 8	CFM	89	118	148	178	207
Ak 0.30	Ps.	0.019	0.035	0.054	0.078	0.107
10 x 4	CFM	56	74	93	112	130
Ak 0.19	Ps.	0.019	0.035	0.054	0.079	0.107
10 x 6	CFM	83	111	139	167	194
Ak 0.28	Ps.	0.019	0.035	0.054	0.078	0.107
10 x 8	CFM	111	147	184	221	258
Ak 0.37	Ps.	0.019	0.034	0.054	0.078	0.106
10 x 10	CFM	138	184	230	276	322
Ak 0.46	Ps.	0.019	0.034	0.054	0.078	0.106
12 x 6	CFM	100	133	166	199	233
Ak 0.33	Ps.	0.019	0.034	0.054	0.078	0.106
12 x 8	CFM	132	177	221	265	309
Ak 0.44	Ps.	0.019	0.034	0.054	0.078	0.106
12 x 10	CFM	165	220	275	330	385
Ak 0.55	Ps.	0.019	0.034	0.053	0.077	0.105
12 x 12	CFM	197	263	329	395	461
Ak 0.66	Ps.	0.019	0.034	0.053	0.077	0.104
12 x 18	CFM	294	392	491	589	687
Ak 0.98	Ps.	0.019	0.034	0.053	0.075	0.102
14 x 6	CFM	116	155	193	232	271
Ak 0.39	Ps.	0.019	0.034	0.054	0.078	0.106
14 x 8	CFM	154	205	257	308	360
Ak 0.51	Ps.	0.019	0.034	0.053	0.077	0.105
14 x 10	CFM	192	256	320	384	448
Ak 0.64	Ps.	0.019	0.034	0.053	0.077	0.104
14 x 12	CFM	230	306	383	460	536
Ak 0.77	Ps.	0.019	0.034	0.053	0.076	0.103
14 x 14	CFM	267	357	446	535	624
Ak 0.89	Ps.	0.019	0.034	0.053	0.075	0.103
14 x 18	CFM	343	457	571	685	800
Ak 1.14	Ps.	0.019	0.033	0.052	0.074	0.101

Face velocity*		300	400	500	600	700
16 x 6	CFM	132	177	221	265	309
Ak 0.44	Ps.	0.019	0.034	0.054	0.078	0.106
16 x 8	CFM	176	234	293	352	410
Ak 0.59	Ps.	0.019	0.034	0.053	0.077	0.105
16 x 10	CFM	219	292	365	438	511
Ak 0.73	Ps.	0.019	0.034	0.053	0.076	0.104
16 x 12	CFM	262	349	437	524	612
Ak 0.87	Ps.	0.019	0.034	0.053	0.076	0.103
16 x 14	CFM	305	407	509	610	712
Ak 1.02	Ps.	0.019	0.034	0.052	0.075	0.102
16 x 16	CFM	348	464	580	696	812
Ak 1.16	Ps.	0.019	0.033	0.052	0.074	0.101
16 x 24	CFM	519	692	865	1038	1211
Ak 1.73	Ps.	0.018	0.033	0.051	0.071	0.097
16 x 25	CFM	540	720	900	1081	1261
Ak 1.80	Ps.	0.018	0.033	0.051	0.071	0.097
18 x 6	CFM	149	198	248	297	347
Ak 0.50	Ps.	0.019	0.034	0.054	0.077	0.105
18 x 18	CFM	439	585	732	878	1024
Ak 1.46	Ps.	0.019	0.033	0.052	0.073	0.099
18 x 24	CFM	583	777	971	1166	1360
Ak 1.94	Ps.	0.018	0.032	0.051	0.070	0.096
20 x 6	CFM	165	220	275	330	385
Ak 0.55	Ps.	0.019	0.034	0.053	0.077	0.105
20 x 10	CFM	273	364	455	546	637
Ak 0.91	Ps.	0.019	0.034	0.053	0.075	0.103
20 x 12	CFM	327	435	544	653	762
Ak 1.09	Ps.	0.019	0.033	0.052	0.074	0.101
20 x 14	CFM	380	507	634	760	887
Ak 1.27	Ps.	0.019	0.033	0.052	0.074	0.100
20 x 20	CFM	540	720	900	1081	1261
Ak 1.80	Ps.	0.018	0.033	0.051	0.071	0.097
20 x 24	CFM	647	862	1078	1293	1509
Ak 2.16	Ps.	0.018	0.032	0.050	0.069	0.094
20 x 25	CFM	673	898	1122	1346	1571
Ak 2.24	Ps.	0.018	0.032	0.050	0.069	0.094
24 x 4	CFM	132	177	221	265	309
Ak 0.44	Ps.	0.019	0.034	0.054	0.078	0.106
24 x 6	CFM	197	263	329	395	461
Ak 0.66	Ps.	0.019	0.034	0.053	0.077	0.104
24 x 8	CFM	262	349	437	524	612
Ak 0.87	Ps.	0.019	0.034	0.053	0.076	0.103
24 x 10	CFM	327	435	544	653	762
Ak 1.09	Ps.	0.019	0.033	0.052	0.074	0.101
24 x 12	CFM	391	521	651	782	912
Ak 1.30	Ps.	0.019	0.033	0.052	0.073	0.100
24 x 14	CFM	455	607	758	910	1062
Ak 1.52	Ps.	0.019	0.033	0.051	0.072	0.098
24 x 22	CFM	710	947	1184	1421	1657
Ak 2.37	Ps.	0.018	0.032	0.050	0.068	0.093
24 x 24	CFM	774	1032	1290	1548	1806
Ak 2.58	Ps.	0.018	0.032	0.049	0.067	0.091
30 x 4	CFM	165	220	275	330	385
Ak 0.55	Ps.	0.019	0.034	0.053	0.077	0.105
30 x 6	CFM	246	328	410	492	574
Ak 0.82	Ps.	0.019	0.034	0.053	0.076	0.103
30 x 8	CFM	327	435	544	653	762
Ak 1.09	Ps.	0.019	0.033	0.052	0.074	0.101
30 x 10	CFM	407	543	678	814	949
Ak 1.36	Ps.	0.019	0.033	0.052	0.073	0.100
30 x 12	CFM	487	649	812	974	1136
Ak 1.62	Ps.	0.018	0.033	0.051	0.072	0.098
30 x 14	CFM	567	756	945	1134	1323
Ak 1.89	Ps.	0.018	0.032	0.051	0.071	0.096
30 x 18	CFM	726	968	1210	1452	1694
Ak 2.42	Ps.	0.018	0.032	0.050	0.068	0.092
30 x 20	CFM	806	1074	1343	1611	1880
Ak 2.69	Ps.	0.018	0.031	0.049	0.067	0.091
30 x 24	CFM	964	1286	1607	1928	2250
Ak 3.21	Ps.	0.017	0.031	0.048	0.064	0.087
30 x 24	CFM	964	1286	1607	1928	2250
Ak 3.21	Ps.	0.017	0.031	0.048	0.064	0.087
30 x 30	CFM	1201	1602	2002	2403	2803
Ak 4.00	Ps.	0.017	0.030	0.046	0.060	0.082
36 x 6	CFM	294	392	491	589	687
Ak 0.98	Ps.	0.019	0.034	0.053	0.075	0.102
36 x 8	CFM	391	521	651	782	912
Ak 1.30	Ps.	0.019	0.033	0.052	0.073	0.100

*Tested without filters. Typical disposable 1-inch capacity is 2 cfm per square inch of gross filter area. Recommended velocity is 300-400 fpm. Velocities higher than 500 fpm will decrease filter performance. Increase flow resistance, and possibly blow off agglomerates of collected dirt. Velocity measured 1" from face.

661 & A661 2-Way Supply Register (Page 19)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		**.006**	**.010**	**.016**	**.022**	**.031**	**.040**	**.050**	**.062**
6x4	cfm	25	30	40	50	55	65	70	80
Ak .080	Throw	4	4.5	6	7	8.5	10	11	12.5
8x4	cfm	35	45	55	65	75	90	100	110
Ak .110	Throw	4.5	5.5	7	8.5	10	11.5	13	14.5
10x4 & 8x5	cfm	45	60	75	85	100	115	130	145
Ak .145	Throw	5	6.5	8	9.5	11.5	13	14.5	16
12x4 & 8x6	cfm	55	70	90	110	125	145	160	180
Ak .180	Throw	5.5	7	9	10.5	12.5	14	16	18
14x4	cfm	65	85	110	130	150	170	195	215
Ak .215	Throw	6	7.5	9.5	11.5	13.5	15.5	17	19
10x6 & 12x5	cfm	75	100	125	145	170	195	220	245
Ak .245	Throw	6	8	10	12	14	16	18	20
12x6 & 14x5	cfm	90	120	150	175	205	235	265	295
Ak .295	Throw	6.5	8.5	11	13	15.5	17.5	19.5	22
10x8	cfm	105	140	175	205	240	275	310	345
Ak .345	Throw	7	9	11.5	13.5	16.5	18.5	21	23.5
14x6	cfm	110	145	180	215	250	290	325	360
Ak .360	Throw	7	9.5	12	14	16.5	19	21.5	24
16x6 & 12x8	cfm	130	170	215	255	300	340	385	425
Ak .425	Throw	7.5	10	12.5	15	18	20.5	23	25.5
14x8	cfm	155	205	260	310	360	410	465	515
Ak .515	Throw	8	10.5	14	16	19.5	22	25	28
20x6	cfm	165	220	275	330	385	440	495	550
Ak .550	Throw	8.5	11	14.5	17	20	23	25.5	29
16x8	cfm	180	240	300	360	420	480	540	600
Ak .600	Throw	8.5	11	14.5	17	20	23	25.5	29
24x6 & 18x8	cfm	205	270	340	410	475	545	610	680
Ak .680	Throw	9.5	12	15.5	18.5	22	25	28	31.5
20x8	cfm	230	305	380	455	530	610	685	760
Ak .760	Throw	10	13	16.5	19	23	26	28.5	33
30x6	cfm	265	350	440	530	615	705	790	880
Ak .880	Throw	10.5	14	17.5	20.5	24.5	28	31.5	35
24x8	cfm	295	390	490	590	685	785	880	980
Ak .980	Throw	11	14	18	21.5	25.5	29	33	37
30x8	cfm	375	500	625	750	875	1000	1125	1250
Ak 1.25	Throw	12	16	20	24	28.5	32	37	41

Terminal velocity of 75 fpm

Engineering Data

681 1-Way Sidewall/Ceiling Register (Page 20)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
8x6	cfm	40	55	70	90	100	110	125	140
Ak .140	Throw	5	6	8	9	11	12	14	15
10x6	cfm	55	80	95	110	130	150	165	185
Ak .185	Throw	5	7	10	11	13	14	16	18
12x6	cfm	70	90	115	135	160	180	205	225
Ak .225	Throw	6	8	12	12	14	16	18	20
14x6	cfm	85	115	145	175	205	230	260	290
Ak .290	Throw	7	9	16	14	17	19	21	24
16x6	cfm	100	130	165	200	230	265	295	330
Ak .330	Throw	8	10	18	15	18	20	23	25
18x6	cfm	115	155	195	235	275	310	350	390
Ak .390	Throw	8	11	21	17	20	22	25	28
20x6	cfm	130	175	220	265	310	360	395	440
Ak .440	Throw	5	12	24	18	21	24	27	30

Terminal Velocity of 75 fpm

682 2-Way Sidewall/Ceiling Register (Page 21)

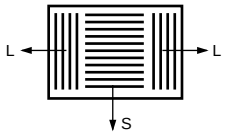
Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
8x4	cfm	25	35	45	55	65	70	80	90
Ak .090	Throw	2	3.5	4.5	5.5	6.5	7	8	9
6x6	cfm	30	40	50	65	75	85	95	105
Ak .105	Throw	3	3.5	4.5	6	7	8	9	10
10x4	cfm	35	45	60	70	80	90	105	115
Ak .115	Throw	3	4	5	6	7	8	9	10
12x4	cfm	40	55	70	85	100	110	125	140
Ak .140	Throw	3.5	4.5	5.5	6.5	8	9	10	11.5
10x6	cfm	55	75	95	110	130	150	165	185
Ak .185	Throw	4	5	6.5	8	9	10.5	12	13
8x8	cfm	60	80	100	120	140	160	180	200
Ak .200	Throw	4	5.5	7	8	9.5	11	12.5	13.5
12x6	cfm	70	90	115	135	160	180	205	225
Ak .225	Throw	4.5	6	7.5	8.5	10.5	12	13	14.5
14x6	cfm	85	115	145	175	205	230	260	290
Ak .290	Throw	5	6.5	8.5	10	11.5	13.5	15	17
10x10	cfm	95	125	155	185	215	250	280	310
Ak .310	Throw	5	7	8.5	10	12	14	15.5	17
12x8	cfm	95	130	160	190	225	255	290	320
Ak .320	Throw	5.5	7	9	10.5	12.5	14	16	18
14x8	cfm	115	155	195	235	275	310	350	390
Ak .390	Throw	6	8	10	12	14	16	18	20
12x12	cfm	140	190	235	280	330	375	425	470
Ak .470	Throw	6.5	8.5	10.5	125	15	17	19	21

Terminal Velocity of 75 fpm

683 3-Way Sidewall/Ceiling Register (Page 21)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
8x4	Total cfm	25	35	45	55	65	70	80	90
	cfm L/S	13/6	17/9	24/11	29/13	34/16	37/17	42/19	48/22
Ak .090	Throw L/S	3/2.5	4/3	5/3.5	6/4	7/5	7.5/5.5	8.5/6	10/6.5
6x6	Total cfm	30	40	50	65	75	85	95	105
	cfm L/S	10/10	13/14	16/17	21/22	24/26	27/29	30/32	34/36
Ak .105	Throw L/S	3/3	3.5/3.5	4/4	5.5/5.5	6/6	7/7	8/8	9/9
10x4	Total cfm	35	45	60	70	80	90	105	115
	cfm L/S	21/7	29/8	328/11	45/13	51/14	58/16	67/19	74/21
Ak .115	Throw L/S	4/2	5/2.5	6/3.5	7.5/4	8.5/4.5	9.5/5	11/6	12/6.5
12x4	Total cfm	40	55	70	85	100	110	125	140
	cfm L/S	21/10	29/13	36/17	44/20	52/24	57/26	65/30	73/34
Ak .140	Throw L/S	3.5/2.5	5/3	6/4	7.5/5	8.5/5.5	9.5/6	10.5/7	12/8
10x6	Total cfm	55	75	95	110	130	150	165	185
	cfm L/S	35/10	48/14	61/17	70/20	83/23	96/27	106/30	118/33
Ak .185	Throw L/S	4.5/2.5	6.5/3.5	8/4	9/5	11/5.5	12.5/6.5	14/7.5	15.5
8x8	Total cfm	60	80	100	120	140	160	180	200
	cfm L/S	31/14	42/19	52/24	62/29	73/34	83/38	94/43	104/48
Ak .200	Throw L/S	4.5/3	6/4	7.5/5	8.5/6	10.5/7	11.5/8	13/9	14.5/10
12x6	Total cfm	70	90	115	135	160	180	205	225
	cfm L/S	36/17	47/22	60/28	70/32	83/38	94/43	107/49	117/54
Ak .225	Throw L/S	4.5/3.5	6/4	8/5.5	9/6	11/7.5	12.5/8	14/6.5	15.5/10.5
14x6	Total cfm	85	115	145	175	205	230	260	290
	cfm L/S	51/17	69/23	87/29	105/35	123/41	138/46	156/52	174/58
Ak .290	Throw L/S	5.5/3.5	7.5/4.5	10/5.5	12/6.5	14/8	15.5/9	18/10	20/11
10x10	Total cfm	95	125	155	185	215	250	280	310
	cfm L/S	61/17	80/23	99/28	118/33	138/39	160/45	179/50	198/56
Ak .310	Throw L/S	6/3.5	8/4.5	10/5.5	12/6.5	14/7.5	16.5/9	18/9.5	20/10.5
12x8	Total cfm	95	130	160	190	225	255	290	320
	cfm L/S	49/23	68/31	83/38	99/46	117/54	133/61	151/70	166/77
Ak .320	Throw L/S	5.5/4	7.5/5	9.5/6	11/7.5	13/9	15/10	17/11.5	19/12.5
14x8	Total cfm	115	155	195	235	275	310	350	390
	cfm L/S	69/23	93/31	117/39	141/47	165/55	186/62	210/70	234/78
Ak .390	Throw L/S	6.5/4	9/5	11/6	13.5/7.5	16/9	18/10	20/11.5	22/12.5
12x12	Total cfm	140	190	235	280	330	375	425	470
	cfm L/S	73/34	99/46	122/56	146/67	172/79	195/90	221/102	244/113
Ak .470	Throw L/S	7/4.5	9/6	11.5/7.5	13.5/9	16/10.5	18/12	20/14	23/15.5
14x14	Total cfm	195	260	325	390	455	520	585	650
	cfm L/S	117/39	156/52	195/65	234/78	273/91	312/104	351/117	390/130
Ak .650	Throw L/S	8.5/5	11.5/6.5	14/8	17/9.5	20/11.5	23/13	26/14.5	28/16
16x16	Total cfm	280	370	465	560	650	745	835	930
	cfm L/S	164/67	192/89	242/112	291/134	338/156	387/179	434/200	484/223
Ak .930	Throw L/S	10/6.5	13/9	16.5/11	20/13	23/15.5	26/17	29/20	33/22

Terminal Velocity of 75 fpm



684 4-Way Sidewall/Ceiling Register (Page 21)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
6x6	Total cfm	30	40	50	65	75	85	95	105
	cfm L/S	4/11	6/14	8/17	10/22	12/26	14/29	15/32	17/36
Ak .105	Throw L/S	2/3	2/3.5	3/4	3.5/5.5	4.5/6.5	5/7	5.5/8	6/9
8x8	Total cfm	60	80	100	120	140	160	180	200
	cfm L/S	16/14	21/19	26/24	31/29	37/34	42/38	47/43	52/48
Ak .200	Throw L/S	3/3	4/4	5/5	6/6	7.5/7	8.5/8	9.5/9	10.5/10
10x10	Total cfm	95	125	155	185	215	250	280	310
	cfm L/S	31/17	40/23	50/28	59/33	69/39	80/45	90/50	99/56
Ak .310	Throw L/S	4.5/3.5	6/4.5	7/5.5	8.5/6.5	10/7.5	11/9	13/9.5	14.5/10.5
12x12	Total cfm	140	190	235	280	330	375	425	470
	cfm L/S	37/34	50/46	61/56	73/67	86/79	98/90	111/102	122/113
Ak .470	Throw L/S	5/4.5	6.5/6	8/7.5	9.5/9	11.5/10.5	13/12	14.5/14	16/15.5
14x14	Total cfm	195	260	325	390	455	520	585	650
	cfm L/S	59/39	78/52	98/65	117/78	137/91	156/104	176/117	195/130
Ak .650	Throw L/S	6/5	8/6.5	10/8	12/9.5	14/11.5	16/13	18/14.5	20/16
16x16	Total cfm	280	370	465	560	650	745	835	930
	cfm L/S	73/67	96/89	121/112	146/134	169/156	194/179	217/200	242/223
Ak .930	Throw L/S	7/6.5	9/9	11.5/11	14/13	16/15.5	19/17	21/20	23/22

Terminal Velocity of 75 fpm

RZ421 Register (Page 22)

Face Velocity		300	400	500	600	700	800	900	1000
2 x 12 Ak 0.084	CFM	25	34	42	50	59	67	76	84
	Ps	0.01	0.02	0.03	0.05	0.06	0.08	0.10	0.12
	Throw	2	2.5	3.5	4	4.5	5.5	6	6.5
	Spread	1.5	2	2.5	3	3	3.5	4	4.5
4 x 10 Ak 0.141	CFM	42	56	71	85	99	113	127	141
	Ps	0.02	0.02	0.03	0.04	0.06	0.07	0.09	0.11
	Throw	2	2.5	3	3.5	4.5	5	5.5	6
	Spread	0.5	1.5	2.5	3	4	5	5.5	6.5
4 x 12 Ak 0.157	CFM	47	63	79	94	110	126	141	157
	Ps	0.02	0.03	0.04	0.05	0.07	0.09	0.11	0.13
	Throw	1.5	2	2.5	3	3.5	4	4.5	5
	Spread	0.5	1.5	2.5	4	5	6	7	8

Terminal Velocity of 50 FPM

RZ682 Register (Page 22)

Face Velocity		300	400	500	600	700	800	900	1000
8 x 4 Ak 0.095	CFM	28	38	47	57	66	76	85	95
	Ps	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.07
	Throw	1.5	2	2.5	3	3.5	4	4.5	5
10 x 4 Ak 0.117	CFM	35	47	59	70	82	94	105	117
	Ps	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06
	Throw	1.5	2	2.5	3	3.5	4	4.5	5
10 x 6 Ak 0.193	CFM	58	77	97	116	135	154	174	193
	Ps	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06
	Throw	1.5	2	2.5	3	3.5	4.5	5	5.5
12 x 6 Ak 0.238	CFM	71	95	119	143	167	190	214	238
	Ps	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.06
	Throw	5.5	7	9	10.5	12.5	14	16	17.5
14 x 6 Ak 0.291	CFM	87	116	145	174	204	233	262	291
	Ps	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06
	Throw	NA	NA	NA	NA	NA	NA	NA	NA
14 x 8 Ak 0.395	CFM	119	158	198	237	277	316	356	395
	Ps	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.06
	Throw	NA	NA	NA	NA	NA	NA	NA	NA

Terminal Velocity of 75 FPM

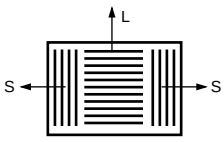
NA = Not Available

RZ683 Register (Page 22)

Face Velocity		300	400	500	600	700	800	900	1000
8 x 4 Ak 0.297	CFM	32	43	54	65	75	86	97	108
	Ps	0.01	0.01	0.02	0.03	0.04	0.05	0.07	0.08
	Throw Short	NA	NA	NA	NA	NA	NA	NA	NA
	Throw Long	NA	NA	NA	NA	NA	NA	NA	NA
10 x 6 Ak 0.193	CFM	58	77	97	116	135	154	174	193
	Ps	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06
	Throw Short	2	3	3.5	4	5	5.5	6.5	7
	Throw Long	1	1.5	2	2.5	2.5	3	3.5	4
10 x 8 Ak 0.246	CFM	74	98	123	148	172	197	221	246
	Ps	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.05
	Throw Short	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
	Throw Long	2.5	3.5	4.5	5	6	7	7.5	8.5
12 x 6 Ak 0.238	CFM	71	95	119	143	167	190	214	238
	Ps	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.07
	Throw Short	2.5	3.5	4.5	5	6	7	7.5	8.5
	Throw Long	2.5	3.5	4.5	5	6	7	7.5	8.5
14 x 6 Ak 0.297	CFM	89	119	148	178	208	237	267	297
	Ps	0.01	0.01	0.02	0.03	0.03	0.04	0.06	0.07
	Throw Short	NA	NA	NA	NA	NA	NA	NA	NA
	Throw Long	NA	NA	NA	NA	NA	NA	NA	NA
14 x 8 Ak 0.399	CFM	120	160	199	239	279	319	359	399
	Ps	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.06
	Throw Short	NA	NA	NA	NA	NA	NA	NA	NA
	Throw Long	NA	NA	NA	NA	NA	NA	NA	NA

Terminal Velocity of 75 FPM

NA = Not Available



Engineering Data

RZ684 Sidewall/Ceiling Diffuser (Page 23)

Face Velocity		300	400	500	600	700	800	900	1000
6 x 6 Ak 0.124	CFM	37	49	62	74	87	99	111	124
	Ps	0.01	0.01	0.02	0.03	0.03	0.05	0.06	0.07
	Throw	NA	NA	NA	NA	NA	NA	NA	NA
8 x 8 Ak 0.231	CFM	69	92	115	139	162	185	208	231
	Ps	0.00	0.01	0.01	0.02	0.02	0.03	0.04	0.04
	Throw	NA	NA	NA	NA	NA	NA	NA	NA
10 x 10 Ak 0.347	CFM	104	139	173	208	243	277	312	347
	Ps	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.07
	Throw	NA	NA	NA	NA	NA	NA	NA	NA
12 x 12 Ak 0.510	CFM	153	204	255	306	357	408	459	510
	Ps	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.07
	Throw	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Available

RZ500 Square Ceiling Diffuser (Page 24)

RZ505 (1-way)

Neck Velocity		300	400	500	600	700
Neck size 6"	CFM	60	80	100	120	135
Ak 0.284	Ps	0.002	0.004	0.006	0.008	0.011
Vt 75	Throw	2.5	3.5	4	5	6
Vt 100	Throw	2.5	3	4	4.5	5.5
Vt 150	Throw	1.5	2	2.5	3	3.5
Neck size 7"	CFM	82	109	136	164	191
Ak 0.267	Ps	0.009	0.016	0.025	0.037	0.050
Vt 75	Throw	4	5	6	7.5	8.5
Vt 100	Throw	3.5	4.5	5.5	7	8
Vt 150	Throw	2.5	3	4	4.5	5.5
Neck size 8"	CFM	105	140	175	209	244
Ak 0.251	Ps	0.016	0.029	0.045	0.065	0.088
Vt 75	Throw	5	6.5	8	9.5	11
Vt 100	Throw	4.5	6	7.5	9	10.5
Vt 150	Throw	3	4	5	6	7

RZ503 (3-way)

Neck Velocity		300	400	500	600	700
Neck size 6"	CFM	60	80	100	120	135
Ak 0.247	Ps	0.002	0.004	0.006	0.008	0.011
Vt 75 S/L	Throw	2 2.5	3 3.5	3.5 4.5	4.5 5.5	5 6
Vt 100 S/L	Throw	2 2.5	3 3.5	3.5 4	4 5	5 6
Vt 150 S/L	Throw	1.5 1.5	2 2	2.5 3	3 3.5	3 4
Neck size 7"	CFM	80	110	135	165	190
Ak 0.243	Ps	0.009	0.016	0.026	0.037	0.050
Vt 75 S/L	Throw	2.5 4	3.5 5.5	4.5 7	5.5 8.5	6 9.5
Vt 100 S/L	Throw	2.5 3.5	3.5 5.3	4 6.3	5 7.5	5.5 9
Vt 150 S/L	Throw	1.8 2.5	2.5 3.5	3 4.5	3.5 5.5	4 6
Neck size 8"	CFM	105	140	175	210	245
Ak 0.239	Ps	0.016	0.029	0.046	0.066	0.090
Vt 75 S/L	Throw	3 5.5	4 7.5	5 9	6 11	7 13
Vt 100 S/L	Throw	3 5	3.5 7	4.5 8.5	5.5 11	6.5 12
Vt 150 S/L	Throw	2 3.5	2.5 4.5	3 6	3.5 7	4.5 8

RZ504 (4-way)

Neck Velocity		300	400	500	600	700
Neck size 6"	CFM	60	80	100	120	135
Ak 0.210	Ps	0.001	0.002	0.003	0.005	0.006
Vt 75	Throw	3	3.5	4.5	5.5	6.5
Vt 100	Throw			4.5	5	6
Vt 150	Throw	1.5	2.5	3	3.5	4
Neck size 7"	CFM	80	110	135	165	190
Ak 0.209	Ps	0.003	0.005	0.008	0.011	0.015
Vt 75	Throw			6	7.5	8.5
Vt 100	Throw	3.5	4.5	5.5	7	8
Vt 150	Throw	2.5	3	4	4.5	5.5
Neck size 8"	CFM	105	140	175	210	245
Ak 0.209	Ps	0.005	0.008	0.013	0.018	0.025
Vt 75	Throw	4.5	6	7.5	9	10.5
Vt 100	Throw	4	5.5	7	8.5	10
Vt 150	Throw	3	3.5	4.5	5.5	6.5

RZ16 Round Ceiling Diffuser (Page 24)

Face Velocity		300	400	500	600	700	800	900	1000
Neck Size 6" Ak 0.224	CFM	67	89	112	134	157	179	201	224
	Ps	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
	Throw	1.5	2	2.5	3	3.5	4	4.5	5
Neck Size 7" Ak 0.229	CFM	69	92	115	137	160	183	206	229
	Ps	0.05	0.09	0.13	0.19	0.26	0.34	0.43	0.53
	Throw	1.75	2.25	2.75	3.25	3.75	4.25	5	5.5
Neck Size 8" Ak 0.235	CFM	70	94	117	141	164	188	211	235
	Ps	0.10	0.17	0.26	0.38	0.52	0.67	0.85	1.05
	Throw	2	2.5	3	3.5	4	4.5	5.5	6

Terminal Velocity of 50 FPM

RZSRT Register (Page 23)

		Neck Velocity fpm									
		400	500	600	700	800	900	1000	1200	1400	1600
6"	cfm	79	98	118	137	157	177	196	236	275	314
	Static Pressure	0.003	0.005	0.006	0.008	0.011	0.013	0.016	0.023	0.031	0.041
	Total Pressure	0.016	0.024	0.034	0.046	0.060	0.076	0.094	0.134	0.183	0.238
	NC	-	-	-	-	-	-	15	22	26	31
8"	cfm	140	175	209	244	279	314	349	419	489	559
	Static Pressure	0.009	0.014	0.021	0.028	0.037	0.046	0.057	0.082	0.111	0.145
	Total Pressure	0.019	0.030	0.043	0.058	0.076	0.096	0.118	0.170	0.231	0.301
	NC	-	-	-	-	18	22	23	31	35	39
10"	cfm	218	273	327	382	436	491	545	654	764	873
	Static Pressure	0.009	0.014	0.021	0.028	0.037	0.047	0.058	0.083	0.113	0.148
	Total Pressure	0.019	0.029	0.042	0.058	0.075	0.095	0.117	0.169	0.230	0.300
	NC	-	-	-	-	18	22	26	31	36	40
12"	cfm	314	393	471	550	628	707	785	942	1100	1257
	Static Pressure	0.015	0.022	0.032	0.044	0.059	0.076	0.095	0.142	0.198	0.264
	Total Pressure	0.025	0.038	0.054	0.074	0.098	0.126	0.157	0.231	0.319	0.422
	NC	-	-	-	18	20	26	29	36	41	45
14"	cfm	428	535	641	748	855	962	1069	1283	1497	1710
	Static Pressure	0.015	0.023	0.033	0.044	0.057	0.072	0.089	0.128	0.175	0.228
	Total Pressure	0.025	0.037	0.053	0.072	0.094	0.119	0.146	0.211	0.287	0.375
	NC	-	-	-	15	21	25	29	35	40	44

RZSRT Throw

Term Velocity	75									
Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
cfm	79	98	118	137	157	177	196	236	275	314
6"	3.1	3.9	4.6	5.4	6.2	7.0	7.7	9.3	10.8	12.4
cfm	140	175	209	244	279	314	349	419	489	559
8"	5.3	6.7	8.0	9.3	10.7	12.0	13.3	16.0	18.7	21.3
cfm	218	273	327	382	436	491	545	654	764	873
10"	6.3	7.9	9.4	11.0	12.6	14.1	15.7	18.8	22.0	25.1
cfm	314	393	471	550	628	707	785	942	1100	1257
12"	7.1	8.8	10.6	12.4	14.2	15.9	17.7	21.2	24.8	28.3
cfm	428	535	641	748	855	962	1069	1283	1497	1710
14"	9.1	11.3	13.6	15.9	18.1	20.4	22.7	27.2	31.8	36.3

RZSRT Throw

Term Velocity	150									
Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
cfm	79	98	118	137	157	177	196	236	275	314
6"	1.3	1.7	2.0	2.4	2.7	3.0	3.4	4.0	4.7	5.4
cfm	140	175	209	244	279	314	349	419	489	559
8"	2.2	2.7	3.3	3.8	4.4	4.9	5.5	6.6	7.7	8.8
cfm	218	273	327	382	436	491	545	654	764	873
10"	2.5	3.1	3.7	4.4	5.0	5.6	6.2	7.5	8.7	10.0
cfm	314	393	471	550	628	707	785	942	1100	1257
12"	3.8	4.8	5.8	6.7	7.7	8.6	9.6	11.5	13.4	15.3
cfm	428	535	641	748	855	962	1069	1283	1497	1710
14"	4.2	5.2	6.3	7.3	8.3	9.4	10.4	12.5	14.6	16.7

RZMCDST Register (Page 23)

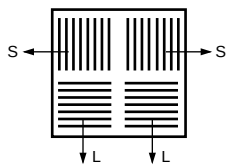
RZMCDST		Neck Velocity fpm									
		400	500	600	700	800	900	1000	1200	1400	1600
6"	cfm	79	98	118	137	157	177	196	236	275	314
	Static Pressure	0.003	0.005	0.007	0.010	0.013	0.017	0.021	0.030	0.041	0.054
	Total Pressure	0.018	0.023	0.026	0.035	0.043	0.067	0.086	0.120	0.166	0.209
	NC	-	-	-	30	-	16	20	24	30	34
8"	cfm	140	175	209	244	279	314	349	419	489	559
	Static Pressure	0.004	0.006	0.008	0.011	0.014	0.017	0.020	0.028	0.036	0.045
	Total Pressure	0.013	0.021	0.030	0.041	0.053	0.066	0.081	0.115	0.155	0.201
	NC	-	-	-	-	17	22	24	34	37	41
10"	cfm	218	273	327	382	436	491	545	654	764	873
	Static Pressure	0.004	0.007	0.010	0.013	0.017	0.022	0.027	0.039	0.053	0.069
	Total Pressure	0.014	0.021	0.031	0.042	0.055	0.070	0.086	0.124	0.170	0.222
	NC	-	-	-	17	22	26	34	42	44	48
12"	cfm	314	393	471	550	628	707	785	942	1100	1257
	Static Pressure	0.006	0.009	0.012	0.017	0.022	0.028	0.034	0.048	0.065	0.084
	Total Pressure	0.015	0.024	0.035	0.047	0.061	0.077	0.095	0.137	0.186	0.242
	NC	-	-	-	20	24	27	35	40	45	49
14"	cfm	428	535	641	748	855	962	1069	1283	1497	1710
	Static Pressure	0.008	0.013	0.018	0.024	0.031	0.040	0.048	0.069	0.093	0.120
	Total Pressure	0.017	0.030	0.041	0.056	0.071	0.090	0.114	0.144	0.200	0.278
	NC	-	-	15	23	27	34	39	44	48	51
16"	cfm	559	698	838	977	1117	1257	1396	1676	1955	2234
	Static Pressure	0.012	0.019	0.028	0.037	0.048	0.061	0.075	0.107	0.145	0.189
	Total Pressure	0.022	0.034	0.049	0.066	0.086	0.108	0.134	0.192	0.260	0.339
	NC	-	-	24	27	31	38	40	45	49	51

- Indicates less than NC15

RZMCDST Throw
75 fpm Terminal Velocity

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	79	98	118	137	157	177	196	236	275	314
6"	1-direction	3.5	4.4	5.3	6.2	7.1	7.9	8.8	10.6	12.4	14.1
	2-direction	4.5	5.6	6.8	7.9	9.0	10.2	11.3	13.6	15.8	18.1
	3-direction Short	0.9	1.1	1.3	1.5	1.7	2.0	2.2	2.6	3.0	3.5
	3-direction Long	1.2	1.5	1.8	2.1	2.5	2.8	3.1	3.7	4.3	4.9
	4-direction	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.8	2.1	2.5

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	140	175	209	244	279	314	349	419	489	559
8"	1-direction	3.1	3.9	4.6	5.4	6.2	7.0	7.7	9.3	10.8	12.4
	2-direction	4.4	5.5	6.6	7.7	8.8	9.9	11.0	13.2	15.4	17.6
	3-direction Short	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.1	8.1
	3-direction Long	3.5	4.4	5.3	6.2	7.0	7.9	8.8	10.6	12.3	14.1
	4-direction	1.5	1.9	2.3	2.7	3.1	3.4	3.8	4.6	5.4	6.1



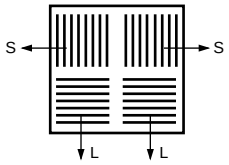
	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	218	273	327	382	436	491	545	654	764	873
10"	1-direction	6.1	7.6	9.2	10.7	12.2	13.7	15.3	18.3	21.4	24.4
	2-direction	7.1	8.9	10.7	12.5	14.3	16.1	17.8	21.4	25.0	28.5
	3-direction Short	2.1	2.6	3.1	3.7	4.2	4.7	5.2	6.3	7.3	8.4
	3-direction Long	6.4	8.0	9.6	11.2	12.8	14.4	16.0	19.2	22.4	25.6
	4-direction	2.9	3.6	4.3	5.0	5.7	6.4	7.1	8.6	10.0	11.4

Engineering Data

RZMCDST Throw
75 fpm Terminal Velocity

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	314	393	471	550	628	707	785	942	1100	1257
12"	1-direction	9.8	12.2	14.7	17.1	19.6	22.0	24.5	29.3	34.2	39.1
	2-direction	9.1	11.4	13.6	15.9	18.2	20.5	22.7	27.3	31.8	36.4
	3-direction Short	3.6	4.5	5.4	6.3	7.2	8.1	9.0	10.8	12.6	14.4
	3-direction Long	8.0	10.0	12.0	14.0	16.0	18.0	20.1	24.1	28.1	32.1
	4-direction	2.1	2.6	3.1	3.7	4.2	4.7	5.2	6.3	7.3	8.4

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	428	535	641	748	855	962	1069	1283	1497	1710
14"	1-direction	12.1	15.1	18.2	21.2	24.2	27.3	30.3	36.3	42.4	48.5
	2-direction	8.4	10.5	12.6	14.7	16.8	18.9	21.0	25.2	29.4	33.6
	3-direction Short	3.9	4.9	5.9	6.8	7.8	8.8	9.8	11.7	13.7	15.7
	3-direction Long	7.0	8.8	10.5	12.3	14.0	15.8	17.5	21.0	24.5	28.0
	4-direction	2.8	3.5	4.2	4.9	5.6	6.3	7.0	8.4	9.8	11.2



	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	559	698	838	977	1117	1257	1396	1676	1955	2234
16"	1-direction	24.3	30.4	36.5	42.5	48.6	54.7	60.8	72.9	85.1	97.2
	2-direction	14.1	17.6	21.1	24.6	28.1	31.7	35.2	42.2	49.3	56.3
	3-direction Short	11.2	14.0	16.8	19.7	22.5	25.3	28.1	33.7	39.3	44.9
	3-direction Long	16.3	20.4	24.5	28.6	32.7	36.7	40.8	49.0	57.1	65.3
	4-direction	3.2	4.0	4.9	5.7	6.5	7.3	8.1	9.7	11.3	12.9

RZMCDST Throw
150 fpm Terminal Velocity

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	79	98	118	137	157	177	196	236	275	314
6"	1-direction	1.5	1.9	2.3	2.6	3.0	3.4	3.8	4.2	4.5	4.9
	2-direction	1.7	2.1	2.5	3.0	3.4	3.8	4.2	4.7	5.1	5.5
	3-direction Short	0.6	0.7	0.9	1.0	1.2	1.3	1.5	1.6	1.8	1.9
	3-direction Long	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.9	0.9
	4-direction	0.6	0.7	0.8	1.0	1.1	1.2	1.4	1.5	1.7	1.8

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	140	175	209	244	279	314	349	419	489	559
8"	1-direction	1.6	2.1	2.5	2.9	3.3	3.7	4.1	4.5	4.9	5.4
	2-direction	1.7	2.1	2.5	2.9	3.3	3.8	4.2	4.6	5.0	5.4
	3-direction Short	1.3	1.6	1.9	2.3	2.6	2.9	3.2	3.5	3.9	4.2
	3-direction Long	1.5	1.9	2.2	2.6	3.0	3.3	3.7	4.1	4.5	4.8
	4-direction	1.1	1.4	1.6	1.9	2.2	2.5	2.7	3.0	3.3	3.6

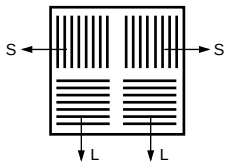
	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	218	273	327	382	436	491	545	654	764	873
10"	1-direction	3.0	3.7	4.5	5.2	6.0	6.7	7.5	8.2	9.0	9.7
	2-direction	2.8	3.5	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0
	3-direction Short	1.5	1.9	2.2	2.6	3.0	3.4	3.7	4.1	4.5	4.8
	3-direction Long	2.5	3.1	3.7	4.3	5.0	5.6	6.2	6.8	7.4	8.1
	4-direction	2.3	2.9	3.4	4.0	4.6	5.2	5.7	6.3	6.9	7.5

RZMCDST Throw
150 fpm Terminal Velocity

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	314	393	471	550	628	707	785	942	1100	1257
12"	1-direction	3.4	4.3	5.2	6.0	6.9	7.8	8.6	9.5	10.3	11.2
	2-direction	2.1	2.6	3.1	3.6	4.1	4.7	5.2	5.7	6.2	6.7
	3-direction Short	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.7	7.3	7.9
	3-direction Long	2.1	2.6	3.1	3.6	4.1	4.7	5.2	5.7	6.2	6.7
	4-direction	1.7	2.1	2.5	2.9	3.3	3.8	4.2	4.6	5.0	5.4

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	428	535	641	748	855	962	1069	1283	1497	1710
14"	1-direction	5.3	6.6	7.9	9.3	10.6	11.9	13.2	14.5	15.9	17.2
	2-direction	3.0	3.8	4.6	5.3	6.1	6.8	7.6	8.3	9.1	9.9
	3-direction Short	2.3	2.9	3.5	4.1	4.6	5.2	5.8	6.4	6.9	7.5
	3-direction Long	2.6	3.2	3.9	4.5	5.1	5.8	6.4	7.1	7.7	8.4
	4-direction	2.2	2.7	3.2	3.8	4.3	4.9	5.4	5.9	6.5	7.0

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	cfm	559	698	838	977	1117	1257	1396	1676	1955	2234
16"	1-direction	14.9	18.6	22.3	26.0	29.7	33.5	37.2	40.9	44.6	48.3
	2-direction	7.0	8.7	10.4	12.2	13.9	15.6	17.4	19.1	20.9	22.6
	3-direction Short	5.2	6.5	7.8	9.1	10.4	11.7	13.0	14.3	15.6	16.9
	3-direction Long	6.7	8.4	10.0	11.7	13.4	15.1	16.7	18.4	20.1	21.8
	4-direction	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.6



16 Round Ceiling Diffuser (Page 25)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
6" Ak .135	cfm		55	65	80	95	105	120	135
	Throw		2.5	3	3.5	4	4.5	5	5.5
8" Ak .225	cfm	70	90	115	135	160	180	200	225
	Throw	2	3	3.5	4.5	5	5.5	6.5	7
10" Ak .345	cfm	105	140	175	210	240	275	310	345
	Throw	2.5	3.5	4.5	5	6	7	8	8.5
12" Ak .500	cfm	150	200	250	300	350	400	450	500
	Throw	3	4	5	6	7.5	8.5	9	10.5
14" Ak .625	cfm	190	250	315	375	440	500	565	625
	Throw	3.5	4.5	5.5	6.5	8	9	10	11
18" Ak 1.04	cfm	310	415	520	625	730	830	935	1040
	Throw	4.5	6	7	8.5	10	11.5	13	14.5

Terminal Velocity of 50 fpm

24 Square Ceiling Diffuser (Page 27)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
6 Ak .165	cfm	50	65	85	100	115	130	150	165
	Throw	3.5	4.5	5.5	6.5	8	9	10	11
8 Ak .280	cfm	85	110	140	170	195	225	250	280
	Throw	4.5	5.5	7	8.5	10	11	12	14
10 Ak .420	cfm	125	170	210	250	295	335	380	420
	Throw	5	6.5	8	9.5	11.5	13	15	16
12 Ak .595	cfm	180	240	300	355	415	475	535	595
	Throw	6	8	10	11.5	13.5	15.5	17.5	19
14 Ak .820	cfm	245	330	410	490	575	655	740	820
	Throw	7	9	11.5	13.5	16	18	20	22.5
16 Ak 1.03	cfm	310	410	515	620	720	825	925	1030
	Throw	7.5	10	12.5	15	18	20	22	25
18 Ak 1.33	cfm	400	530	665	800	930	1065	1200	1330
	Throw	8.5	11	14	17	20	23	26	28
20 Ak 1.60	cfm	480	640	800	960	1120	1280	1440	1600
	Throw	9.5	12	16	18	22	25	28	31
22 Ak 1.90	cfm	570	760	950	1140	1330	1520	1710	1900
	Throw	10.5	13.5	17	19	24	27	30	33
24 Ak 2.30	cfm	690	920	1150	1380	1610	1840	2070	2300
	Throw	11	14.5	18.5	22	26	30	33	36

Terminal Velocity of 50 fpm

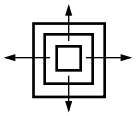
Engineering Data

A500 Series (Page 27, 28)

A501MS/A501OB
1-Way Diffuser

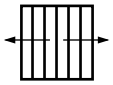
Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6x6 Ak .13	cfm	55	65	75	90	120	140	195
	Throw	5	6	7	8	10	12	15
8x8 Ak .20	cfm	75	90	105	120	150	180	240
	Throw	6	7	8	10	12	15	18
10x10 Ak .29	cfm	115	135	155	175	235	290	395
	Throw	7	8	10	12	15	19	24
12x12 Ak .42	cfm	170	210	255	300	380	470	610
	Throw	8	10	12	15	19	24	29
14x14 Ak .59	cfm	250	305	360	410	505	610	800
	Throw	11	13	15	18	24	30	35

A504MS/A504OB
4-Way Diffuser



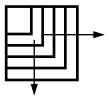
Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6x6 Ak .13	cfm	55	65	75	90	120	140	195
	Throw	2	3	4	5	6	7	9
8x8 Ak .20	cfm	75	90	105	120	150	180	240
	Throw	3	4	5	6	8	10	13
10x10 Ak .29	cfm	115	135	155	175	235	290	395
	Throw	4	5	6	7	9	12	14
12x12 Ak .42	cfm	170	210	255	295	380	470	610
	Throw	5	6	7	8	10	12	15
14x14 Ak .59	cfm	250	305	360	410	505	610	800
	Throw	6	7	8	9	11	14	18

A502MS/A502OB
2-Way Diffuser



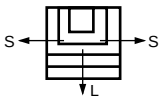
Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6x6 Ak .13	cfm	55	65	75	90	120	140	195
	Throw	3	4	5	6	7	9	12
8x8 Ak .20	cfm	75	90	105	120	150	180	240
	Throw	4	5	6	7	9	12	16
10x10 Ak .29	cfm	115	135	155	175	235	290	395
	Throw	5	6	7	8	10	14	20
12x12 Ak .42	cfm	170	210	255	300	380	470	610
	Throw	6	7	8	10	13	17	23
14x14 Ak .59	cfm	250	305	360	410	505	610	800
	Throw	7	9	11	13	16	19	27

A505MS/A505OB
2-Way Corner Diffuser

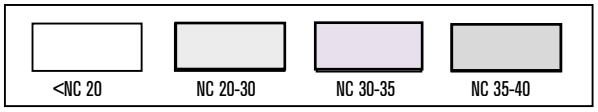


Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6x6 Ak .13	cfm	55	65	75	90	120	140	195
	Throw	3	4	5	6	7	9	12
8x8 Ak .20	cfm	75	90	105	120	150	180	240
	Throw	4	5	6	7	9	12	16
10x10 Ak .29	cfm	115	135	155	175	235	290	395
	Throw	5	6	7	8	10	14	20
12x12 Ak .42	cfm	170	210	255	300	380	470	610
	Throw	6	7	8	10	13	17	23
14x14 Ak .59	cfm	250	305	360	410	505	610	800
	Throw	7	9	11	13	16	19	27

A503MS/A503OB
3-Way Diffuser



Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6x6 Ak .13	cfm	55	65	75	90	120	140	195
	Throw L/S	3.5/2.5	4/3	5/3.5	5.5/4	7/5	9/6	12/9
8x8 Ak .20	cfm	75	90	105	120	150	180	240
	Throw L/S	4/2	5/2.5	6/3.5	7/4	8/4.5	10/5.5	12/7
10x10 Ak .29	cfm	115	135	155	175	235	290	395
	Throw L/S	5/3	7/4	8/4.5	10/5.5	12/7	14/8.5	18/10.5
12x12 Ak .42	cfm	170	210	255	300	380	470	610
	Throw L/S	7/4	8.5/4.5	10/5.5	12/6.5	15/8.5	18/10	23/14
14x14 Ak .59	cfm	250	305	360	410	505	610	800
	Throw L/S	8/5.5	10/6	11.5/7	13/7.5	15.5/9	20/11	27/16



Terminal velocity of 75 fpm.
NC Noise criteria rating. NC is based on 10db room absorption (ref. 10^{-12} watts).
Tested in accordance with ASHRAE 36-72, ADC 1062: GRD84 and ISO 3741.

SD & SDD Ceiling Diffuser (Page 28)

Face Velocity		400	500	600	700	800	900	1000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062
6x6 Ak .155	cfm	60	80	95	110	125	140	155
	Throw	2.5	3.5	4	4.5	5.5	6	6.5
8x8 Ak .270	cfm	110	135	160	190	215	245	270
	Throw	3.5	4	5	6	6.5	7.5	8.5
10x10 Ak .425	cfm	170	215	255	300	340	385	425
	Throw	4	5.5	6	7.5	8.5	9.5	10
12x12 Ak .600	cfm	240	300	360	420	480	540	600
	Throw	5	6	7.5	8.5	9.5	11	12
14x14 Ak .625	cfm	320	400	480	560	640	720	800
	Throw	5.5	7	8	9.5	11	12	14
16x16 Ak 1.06	cfm	425	530	635	740	850	955	1060
	Throw	6.5	8	9.5	11	13	14	16
18x18 Ak 1.36	cfm	545	680	815	950	1090	1225	1360
	Throw	7	9	11	13	14	16	18
20x20 Ak 1.65	cfm	660	825	990	1155	1320	1485	1650
	Throw	8	10	12	14	16	18	20

Terminal Velocity of 50 fpm

Terminal velocity of 75 fpm.
NC Noise criteria rating. NC is based on 10db room absorption (ref. 10^{-12} watts).
Tested in accordance with ASHRAE 36-72, ADC 1062: GRD84 and ISO 3741.

ECFM Aluminum Diffuser (Page 30)

Face Velocity		400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
14x14	cfm	368	460	552	644	736	828	920	1104	1288	1472	1656	1840
Ak .92 sq. ft.	Pt	.013	.020	.028	.038	.050	.063	.078	.112	.152	.199	.251	.310
16x16	cfm	484	605	726	847	968	1089	1210	1452	1694	1936	2178	2420
Ak 1.21 sq. ft.	Pt	.013	.020	.028	.038	.050	.063	.078	.112	.153	.199	.252	.311
18x18	cfm	564	705	846	987	1128	1269	1410	1692	1974	2256	2538	2820
Ak 1.41 sq. ft.	Pt	.012	.019	.027	.036	.047	.060	.074	.106	.144	.188	.238	.294
20x20	cfm	756	945	1134	1323	1512	1701	1890	2268	2646	3024	3402	3780
Ak 1.89 sq. ft.	Pt	.013	.020	.028	.038	.050	.063	.078	.113	.153	.200	.252	.311

Notes:
1. Diffusers tested with damper fully open.
2. Pt = Total Pressure and is the sum of the static and velocity pressure.
3. Ak is the effective area of the diffuser face. Vk is the mean air velocity measured at the diffuser face.

ECBX Steel Box Diffuser (Page 30)

Face Velocity		400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
14x14	cfm	383	479	574	670	766	861	957	1148	1340	1531	1723	1914
Ak .96 sq. ft.	Pt	.043	.064	.090	.119	.152	.188	.228	.318	.421	.536	.665	.806
18x18	cfm	464	580	696	812	928	1044	1160	1392	1624	1856	2088	2320
Ak 1.16 sq. ft.	Pt	.028	.042	.057	.075	.094	.115	.138	.190	.248	.313	.383	.460
20x20	cfm	537	670	804	938	1072	1206	1340	1608	1876	2144	2412	2680
Ak 1.34 sq. ft.	Pt	.028	.042	.059	.077	.098	.121	.146	.203	.267	.339	.419	.505
22x22	cfm	668	836	1003	1170	1337	1504	1671	2005	2339	2674	3008	3342
Ak 1.67 sq. ft.	Pt	.017	.027	.040	.056	.075	.097	.121	.179	.250	.333	.428	.537
24x24	cfm	730	912	1094	1277	1459	1642	1824	2189	2554	2918	3283	3648
Ak 1.82 sq. ft.	Pt	.032	.048	.066	.086	.109	.134	.161	.222	.291	.367	.452	.544
30x30	cfm	1118	1398	1678	1957	2237	2516	2796	3355	3914	4474	5033	5592
Ak 2.79 sq. ft.	Pt	.026	.040	.057	.076	.098	.122	.149	.211	.283	.365	.457	.558
36x36	cfm	1404	1756	2107	2458	2809	3160	3511	4213	4915	5618	6320	7022
Ak 3.51 sq. ft.	Pt	.030	.043	.060	.078	.098	.120	.144	.197	.257	.324	.397	.477

Notes:
1. Tests conducted in accordance with ASHRAE 70-1991.
2. Total Pressure is the sum of static pressure and velocity pressure.
3. Ak is the effective area of the diffuser face.
4. Tests conducted with all valves in fully-open position.

ECHVD Evaporative Cooler Diffuser (Page 31)

Face Velocity		400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
6x6	cfm	47	59	71	83	95	107	119	142	166	190	213	237
Ak .119	Pt	.012	.019	.027	.036	.047	.059	.074	.105	.142	.186	.235	.289
8x8	cfm	118	148	177	207	237	266	296	355	414	473	532	592
Ak .296	Pt	.013	.020	.028	.039	.050	.063	.078	.112	.152	.197	.251	.308
10x10	cfm	189	237	284	331	378	426	473	568	662	757	851	946
Ak .473	Pt	.013	.021	.030	.041	.053	.067	.083	.119	.162	.209	.266	.328
12x12	cfm	281	351	421	491	562	632	702	842	983	1123	1264	1404
Ak .702	Pt	.012	.020	.026	.036	.046	.058	.072	.104	.142	.186	.235	.290
14x14	cfm	419	524	629	733	838	943	1048	1257	1467	1676	1886	2095
Ak 1.048	Pt	.012	.019	.026	.035	.046	.058	.072	.104	.141	.185	.233	.289
16x16	cfm	557	697	836	975	1115	1254	1393	1672	1950	2229	2508	2786
Ak 1.393	Pt	.012	.019	.026	.035	.046	.058	.072	.103	.141	.184	.232	.288
18x18	cfm	696	869	1043	1217	1391	1565	1739	2087	2434	2782	3130	3478
Ak 1.739	Pt	.012	.018	.026	.035	.046	.058	.072	.103	.140	.182	.231	.286

ECSD & ECSDD Step-Down Evaporative Cooler Diffuser (Page 30)

Face Velocity		400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
14x14	cfm	255	320	385	450	510	575	640	770	895	1025	1150	1280
Ak .74 sq. ft.	Ps	.012	.018	.023	.035	.044	.051	.067	.094	.130	.171	.210	.250
16x16	cfm	370	465	560	650	745	835	930	1115	1300	1490	1675	1860
Ak .93 sq. ft.	Ps	.016	.020	.031	.041	.055	.069	.084	.120	.160	.198	.240	.265
18x18	cfm	480	600	720	840	960	1080	1200	1440	1680	1920	2160	2400
Ak 1.2 sq. ft.	Ps	.016	.022	.031	.044	.057	.072	.088	.122	.164	.205	.250	.29
20x20	cfm	600	750	900	1050	1200	1350	1500	1800	2100	2400	2700	3000
Ak 1.50 sq. ft.	Ps	.017	.024	.035	.051	.058	.075	.091	.125	.170	.218	.260	.30

Notes:
1. Total Pressure is the sum of the static and velocity pressure.
2. Ak is the effective area of the diffuser face. Vk is the mean air velocity measured at the diffuser face.
3. ECSDD tested with damper fully open.

Face Velocity		400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
14x14	cfm	303	379	454	530	606	681	757	908	1060	1211	1363	1514
Ak .76 sq. ft.	Pt	.015	.023	.034	.046	.061	.077	.096	.139	.191	.250	.318	.394
16x16	cfm	384	480	576	672	768	864	960	1152	1344	1536	1728	1920
Ak .96 sq. ft.	Pt	.019	.029	.041	.055	.071	.089	.109	.156	.210	.271	.341	.418
18x18	cfm	495	619	743	867	990	1114	1238	1486	1733	1981	2228	2476
Ak 1.24 sq. ft.	Pt	.018	.027	.039	.053	.068	.086	.105	.150	.202	.261	.329	.403
20x20	cfm	642	803	963	1124	1284	1445	1605	1926	2247	2568	2889	3210
Ak 1.60 sq. ft.	Pt	.015	.025	.036	.050	.066	.084	.105	.154	.213	.282	.361	.450

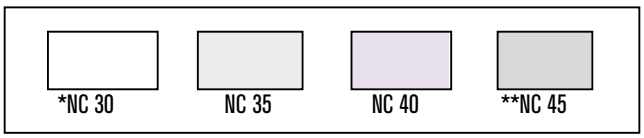
Notes:
1. Tests conducted in accordance with ASHRAE 70-1991.
2. Pt = Total Pressure and is the sum of the static and velocity pressure.
3. Ak is the effective area of the diffuser face. Vk is the mean air velocity measured at the diffuser face.
4. ECSDD tested with damper fully open.

821, 831, 92 Series and 98VOH (Page 36-38, 41)

Deflection A

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4	cfm	65	80	100	110	130	145	160	175	190	210	225	255	290	320
Ak .160	Throw	6.5	8	10	11	13	15	16	18	19	21	23	26	29	32
10x4	cfm	80	100	120	140	160	180	200	220	240	265	285	325	365	405
Ak .202	Throw	7	9	11	13	14	16	18	20	22	24	26	29	33	36
12x4	cfm	100	120	145	170	195	220	245	270	295	315	340	390	440	490
Ak .244	Throw	8	10	12	14	16	18	20	22	24	26	28	32	36	40
14x4	cfm	115	145	170	200	230	255	285	315	345	370	400	460	515	570
Ak .286	Throw	8.5	11	13	15	17	19	22	24	26	28	30	35	39	43
12x5	cfm	125	155	190	220	250	280	310	345	375	405	435	500	560	625
Ak .312	Throw	9	11	14	16	18	20	22	25	27	29	31	36	41	45
10x6	cfm	125	155	190	220	250	285	315	345	375	410	440	500	565	630
Ak .314	Throw	9	11	14	16	18	21	23	25	27	30	32	36	41	45
14x5	cfm	145	185	220	255	295	330	365	405	440	475	510	585	660	730
Ak .366	Throw	10	12	15	17	20	22	24	27	29	32	34	39	44	49
12x6	cfm	150	190	225	265	305	340	380	415	455	495	530	605	680	760
Ak .379	Throw	10	12	15	17	20	22	25	27	30	33	35	40	45	50
16x5	cfm	170	210	250	295	335	380	420	460	505	545	585	670	755	840
Ak .419	Throw	11	13	16	18	21	24	26	29	32	34	37	42	47	53
14x6	cfm	180	220	265	310	355	400	445	490	535	575	620	710	800	890
Ak .444	Throw	11	13	16	19	22	24	27	30	32	35	38	43	49	54
16x6	cfm	205	255	305	355	410	460	510	560	610	665	715	815	920	1020
Ak .510	Throw	12	15	17	20	23	26	29	32	35	38	41	47	53	58
20x5	cfm	210	265	315	370	420	475	525	580	630	685	735	840	945	1050
Ak .526	Throw	12	15	18	21	23	27	29	32	35	38	41	47	53	59
24x5	cfm	255	315	380	445	505	570	635	695	760	825	890	1015	1140	1270
Ak .634	Throw	13	16	19	23	26	29	32	35	39	42	45	52	58	65
20x6	cfm	255	320	385	445	510	575	640	705	770	830	895	1015	1140	1270
Ak .640	Throw	13	16	19	23	26	29	32	36	39	42	45	52	58	65
24x6	cfm	310	385	465	540	615	695	770	850	925	1000	1080	1235	1390	1540
Ak .771	Throw	14	18	21	25	28	32	35	39	43	46	50	57	64	71
20x8	cfm	345	435	520	610	695	780	870	955	1040	1130	1215	1390	1560	1735
Ak .868	Throw	15	19	23	26	30	34	38	41	45	49	53	60	68	75
30x6	cfm	385	485	580	675	775	870	965	1065	1160	1255	1355	1545	1740	1935
Ak .967	Throw	16	20	24	28	32	36	40	44	48	51	56	63	71	79
24x8	cfm	420	525	625	730	835	940	1045	1150	1255	1360	1465	1670	1880	2090
Ak 1.045	Throw	17	21	25	29	33	37	41	46	50	54	58	66	74	83
30x8	cfm	525	655	785	915	1050	1180	1310	1440	1570	1705	1835	2095	2360	2620
Ak 1.310	Throw	19	23	28	32	37	42	46	51	56	60	65	74	84	93
24x10	cfm	530	660	790	925	1055	1185	1320	1450	1585	1715	1845	2110	2375	2640
Ak 1.319	Throw	19	23	28	33	37	42	46	51	56	60	65	74	84	93
36x8	cfm	630	790	945	1105	1260	1420	1575	1735	1890	2050	2205	2520	2835	3150
Ak 1.576	Throw	20	25	30	36	41	46	51	56	61	66	71	81	91	101
24x12	cfm	635	795	995	1115	1275	1435	1595	1750	1910	2070	2230	2550	2865	3185
Ak 1.593	Throw	20	25	31	36	41	47	51	56	61	66	71	82	92	102
30x10	cfm	660	825	990	1160	1325	1490	1655	1820	1985	2150	2315	2645	2975	3310
Ak 1.654	Throw	21	26	31	37	42	47	52	57	63	68	73	83	94	104
36x10	cfm	795	995	1195	1390	1590	1790	1990	2190	2385	2585	2785	3180	3580	3980
Ak 1.989	Throw	23	29	34	40	46	51	57	63	68	74	80	91	103	114
30x12	cfm	800	1000	1200	1400	1600	1800	2000	2200	2395	2595	2795	3195	3595	3995
Ak 1.997	Throw	23	29	34	40	45	51	57	63	68	74	80	91	103	114
36x12	cfm	960	1200	1440	1680	1920	2160	2400	2640	2880	3120	3365	3845	4325	4805
Ak 2.402	Throw	25	31	38	44	50	56	63	69	75	81	88	100	113	125

Terminal Velocity of 75 fpm



* less than or equal to

** greater than or equal to

Deflection C

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4	cfm	55	70	85	100	110	125	140	155	170	180	195	225	250	280
Ak .140	Throw	5	6	7.5	8.5	9.5	11	12	14	15	16	17	20	22	24
10x4	cfm	70	90	105	125	140	160	180	195	215	230	250	285	320	355
Ak .178	Throw	5	7	8	9.5	11	12	14	15	17	18	19	22	25	28
12x4	cfm	85	110	130	150	170	195	215	235	260	280	300	345	385	430
Ak .215	Throw	6	8	9	11	12	14	15	17	18	20	21	24	27	30
14x4	cfm	100	125	150	175	200	225	250	275	300	330	355	405	455	505
Ak .252	Throw	6.5	8	10	11	13	15	16	18	20	22	23	26	30	33
12x5	cfm	110	135	165	190	220	245	275	300	330	355	385	440	495	550
Ak .274	Throw	7	8.5	10	12	14	15	17	19	21	22	24	28	31	34
10x6	cfm	110	140	165	195	220	245	275	305	330	360	385	440	495	550
Ak .276	Throw	7	8.5	10	12	14	15	17	19	21	22	24	27	31	34
14x5	cfm	130	160	195	225	255	290	320	355	385	415	450	515	580	645
Ak .321	Throw	7.5	9	11	13	15	17	18	21	22	24	26	30	34	37
12x6	cfm	135	165	200	235	265	300	335	365	400	435	465	535	600	665
Ak .333	Throw	7.5	9.5	11	13	15	17	19	21	23	25	26	30	34	38
16x5	cfm	150	185	220	260	295	330	370	405	445	480	515	590	665	740
Ak .369	Throw	8	10	12	14	16	18	20	22	24	26	28	32	36	40
14x6	cfm	155	195	235	275	315	350	390	430	470	510	545	625	705	780
Ak .391	Throw	8	10	12	14	17	18	20	23	25	27	29	33	37	41
16x6	cfm	180	225	270	315	360	405	450	495	540	580	625	715	805	895
Ak .448	Throw	9	11	13	15	18	20	22	24	26	28	31	35	39	44
20x5	cfm	185	230	280	325	370	415	465	510	555	600	650	740	835	925
Ak .463	Throw	9	11	13	16	18	20	22	25	27	29	31	36	40	44
24x5	cfm	225	280	335	390	445	500	555	615	670	725	780	890	1005	1115
Ak .557	Throw	10	12	15	17	19	22	24	27	29	32	34	40	44	49
20x6	cfm	225	280	340	395	450	505	565	620	675	730	790	900	1015	1125
Ak .563	Throw	10	12	15	17	20	22	25	27	29	32	34	39	44	49
24x6	cfm	270	340	405	475	540	610	680	745	815	880	950	1085	1220	1355
Ak .678	Throw	11	14	16	19	21	24	27	30	32	35	38	43	49	54
20x8	cfm	305	380	460	535	610	685	765	840	915	990	1070	1220	1375	1525
Ak .763	Throw	11	14	17	20	23	26	29	32	34	37	40	46	52	57
30x6	cfm	340	425	510	595	680	765	850	935	1020	1105	1190	1360	1530	1700
Ak .850	Throw	12	15	18	21	24	27	30	33	36	39	42	48	54	60
24x8	cfm	370	460	550	645	735	825	920	1010	1105	1195	1285	1470	1655	1840
Ak .919	Throw	13	16	19	22	25	28	31	35	38	41	44	50	57	63
30x8	cfm	460	575	690	805	920	1035	1150	1265	1380	1500	1615	1845	2075	2305
Ak 1.152	Throw	14	15	21	25	28	32	35	39	42	46	49	56	63	70
24x10	cfm	465	580	695	810	930	1045	1160	1275	1390	1510	1625	1855	2090	2320
Ak 1.160	Throw	14	18	21	25	28	32	35	39	42	46	49	56	64	71
36x8	cfm	555	695	830	970	1110	1245	1385	1525	1665	1800	1940	2220	2495	2770
Ak 1.386	Throw	15	19	19	27	31	35	39	42	46	50	54	62	69	77
24x12	cfm	560	700	840	980	1120	1260	1400	1540	1680	1820	1960	2240	2520	2800
Ak 1.401	Throw	16	19	23	27	31	35	39	43	47	50	54	62	70	78
30x10	cfm	580	725	870	1020	1165	1310	1455	1600	1745	1890	2035	2325	2615	2910
Ak 1.454	Throw	16	20	24	28	32	36	39	43	47	51	55	63	71	79
36x10	cfm	700	875	1050	1225	1400	1575	1750	1925	2100	2275	2450	2800	3150	3500
Ak 1.749	Throw	17	22	26	30	35	39	43	48	52	56	61	69	78	87
30x12	cfm	700	880	1055	1230	1405	1580	1755	1930	2110	2285	2460	2810	3160	3510
Ak 1.756	Throw	17	22	26	30	35	39	43	48	52	56	61	69	78	87
36x12	cfm	845	1055	1265	1480	1690	1990	2110	2325	2535	2745	2955	3380	3800	4225
Ak 2.112	Throw	19	24	28	33	38	43	47	52	57	62	66	76	86	95

Terminal Velocity of 75 fpm

See Alternate Sizing Graph on Page 160.

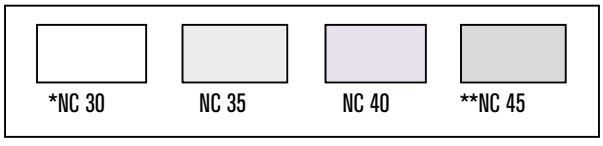
See Deflections and Description of NC Criteria on Page 158.

821, 831, 92 Series and 98VOH (Page 36-38, 41)

Deflection E

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4	cfm	50	60	75	85	100	110	125	135	150	160	175	200	225	250
Ak .124	Throw	3.5	4.5	5.5	6	7.5	8	9	10	11	12	13	15	16	18
10x4	cfm	65	80	95	110	125	140	155	175	190	205	220	250	285	315
Ak .157	Throw	4	5	6	7	8	9	10	11	12	13	14	16	19	20
12x4	cfm	75	95	115	135	150	170	190	210	230	245	265	305	340	380
Ak .190	Throw	4.5	5.5	7	8	9	10	11	12	14	15	16	18	20	22
14x4	cfm	90	110	135	155	180	200	220	245	265	290	310	355	400	445
Ak .222	Throw	5	6	7.5	8.5	10	11	12	13	14	16	17	19	22	24
12x5	cfm	95	120	145	170	195	220	240	265	290	315	340	385	435	485
Ak .242	Throw	5	6.5	7.5	9	10	12	13	14	15	17	18	20	23	25
10x6	cfm	100	120	145	170	195	220	245	270	295	315	340	390	440	490
Ak .244	Throw	5	6.5	7.5	9	10	11	13	14	15	16	18	20	23	26
14x5	cfm	115	140	170	200	225	255	285	310	340	370	400	455	510	570
Ak .284	Throw	5.5	7	8	9.5	11	12	14	15	16	18	19	22	25	28
12x6	cfm	120	145	175	205	235	265	295	325	355	380	410	470	530	590
Ak .294	Throw	5.5	7	8.5	9.5	11	13	14	15	17	18	19	22	25	28
16x5	cfm	130	165	195	230	260	295	325	360	390	425	455	520	585	650
Ak .325	Throw	6	7.5	9	10	12	13	15	16	18	19	21	24	26	29
14x6	cfm	140	175	205	240	275	310	345	380	415	450	485	550	620	690
Ak .345	Throw	6	7.5	9	11	12	14	15	17	18	20	21	24	27	30
16x6	cfm	160	200	240	275	315	355	395	435	475	515	555	635	715	790
Ak .396	Throw	6.5	8	10	11	13	15	16	18	19	21	23	26	29	32
20x5	cfm	165	205	245	285	325	365	410	450	490	530	570	655	735	815
Ak .408	Throw	6.5	8.5	10	11	13	15	17	18	20	21	23	26	30	33
24x5	cfm	195	245	295	345	395	445	490	540	590	640	690	785	885	985
Ak .492	Throw	7	9	11	13	14	16	18	20	22	23	25	29	32	36
20x6	cfm	200	250	300	350	400	445	495	545	595	645	695	795	895	995
Ak .497	Throw	7.5	9	11	13	15	16	18	20	22	24	25	29	33	36
24x6	cfm	240	300	360	420	480	540	600	660	720	775	835	955	1075	1195
Ak .598	Throw	8	10	12	14	16	18	20	22	24	26	28	32	36	40
20x8	cfm	270	335	405	470	540	605	675	740	810	875	940	1075	1210	1345
Ak .673	Throw	8.5	11	13	15	17	19	21	23	25	27	30	34	38	42
30x6	cfm	300	375	450	525	600	675	750	825	900	975	1050	1200	1350	1500
Ak .750	Throw	9	11	13	16	18	20	22	25	27	29	31	36	40	45
24x8	cfm	325	405	485	570	650	730	810	890	975	1055	1135	1300	1460	1620
Ak .811	Throw	9.5	12	14	16	19	21	23	25	28	30	32	37	42	46
30x8	cfm	405	510	610	710	815	915	1015	1120	1220	1320	1425	1625	1830	2035
Ak 1.017	Throw	11	13	16	18	21	23	26	29	31	34	36	42	47	52
24x10	cfm	410	510	615	715	820	920	1025	1125	1230	1330	1430	1635	1840	2045
Ak 1.023	Throw	10	13	16	18	21	23	26	29	31	34	36	42	47	52
36x8	cfm	490	610	735	855	980	1100	1220	1345	1465	1590	1710	1955	2200	2445
Ak 1.222	Throw	11	14	17	20	23	26	28	31	34	37	40	46	51	57
24x12	cfm	495	620	740	865	990	1110	1235	1360	1485	1605	1730	1975	2225	2470
Ak 1.236	Throw	11	14	17	20	23	26	29	32	34	37	40	46	52	57
30x10	cfm	515	640	770	900	1025	1155	1285	1410	1540	1670	1795	2055	2310	2565
Ak 1.283	Throw	12	15	17	20	23	26	29	32	35	38	42	46	52	58
36x10	cfm	615	770	925	1080	1235	1390	1545	1700	1850	2005	2160	2470	2775	3085
Ak 1.543	Throw	13	16	19	22	26	29	32	35	38	42	45	51	57	64
30x12	cfm	620	775	930	1085	1240	1395	1550	1705	1860	2015	2170	2480	2790	3100
Ak 1.550	Throw	13	16	19	22	26	29	32	35	39		45	51	58	64
36x12	cfm	745	930	1120	1305	1490	1680	1865	2050	2235	2425	2610	2980	3355	3730
Ak 1.864	Throw	14	18	21	25	28	32	35	39	42	46	49	56	63	70

Terminal Velocity of 75 fpm



* less than or equal to

** greater than or equal to

Deflection G

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4	cfm	50	60	70	85	95	105	120	130	145	155	165	190	215	240
Ak .119	Throw	2.5	3	4	4.5	5	5.5	6.5	7	8	8.5	9	10	12	13
10x4	cfm	55	70	85	100	115	130	145	155	170	185	200	230	255	285
Ak .143	Throw	2.5	3.5	4	5	5.5	6.5	7	7.5	8	9	9.5	11	12	14
12x4	cfm	70	85	105	120	140	155	175	190	210	225	240	275	310	345
Ak .173	Throw	3	3.5	4.5	5.5	6	7	7.5	8.5	9	10	11	12	14	15
14x4	cfm	80	100	120	140	160	180	200	220	240	265	285	325	365	405
Ak .202	Throw	3	4	5	5.5	6.5	7.5	8	9	9.5	11	12	13	15	16
12x5	cfm	90	110	130	155	175	200	220	240	265	285	310	350	395	440
Ak .220	Throw	3.5	4.5	5	6	7	8	8.5	9.5	10	11	12	14	15	17
10x6	cfm	90	110	135	155	180	200	220	245	265	290	310	355	400	445
Ak .222	Throw	3.5	4.5	5	6	7	7.5	8.5	9.5	10	11	12	14	15	17
14x5	cfm	105	130	155	180	205	230	260	285	310	335	360	415	465	515
Ak .258	Throw	4	4.5	5.5	6.5	7.5	8.5	9.5	10	11	12	13	15	17	18
12x6	cfm	105	135	160	190	215	240	270	295	320	350	375	430	480	535
Ak .268	Throw	4	5	5.5	6.5	7.5	8.5	9.5	10	11	12	13	15	17	19
16x5	cfm	120	150	180	205	235	265	295	325	355	385	415	475	535	590
Ak .296	Throw	4	5	6	7	8	9	10	11	12	13	14	16	18	20
14x6	cfm	125	155	190	220	250	285	315	345	375	410	440	500	565	630
Ak .314	Throw	4	5	6	7	8	9.5	10	11	12	13	14	16	18	20
16x6	cfm	145	180	215	250	290	325	360	395	430	470	505	575	650	720
Ak .360	Throw	4.5	5.5	6.5	7.5	9	10	11	12	13	14	15	17	20	22
20x5	cfm	150	185	225	260	300	335	370	410	445	485	520	595	670	745
Ak .372	Throw	4.5	5.5	6.5	7.5	9	10	11	12	13	14	15	18	20	22
24x5	cfm	180	225	270	315	360	405	450	495	540	580	625	715	805	895
Ak .448	Throw	5	7.5	7.5	8.5	10	11	12	13	15	16	17	19	22	24
20x6	cfm	180	225	270	315	360	410	455	500	545	590	635	725	815	905
Ak .453	Throw	5	6	7.5	8.5	10	11	12	14	15	16	17	20	22	25
24x6	cfm	220	275	325	380	435	490	545	600	655	710	765	870	980	1090
Ak .545	Throw	5.5	7	8	9.5	11	12	13	15	16	18	19	21	24	27
20x8	cfm	245	305	370	430	490	555	615	675	735	800	860	980	1105	1230
Ak .614	Throw	5.5	7	8.5	10	11	13	14	16	17	19	20	23	26	29
30x6	cfm	275	340	410	480	545	615	685	750	820	890	955	1095	1230	1365
Ak .683	Throw	6	7.5	9	11	12	14	15	17	18	20	21	24	27	30
24x8	cfm	295	370	445	515	590	665	740	815	885	960	1035	1180	1330	1480
Ak .739	Throw	6.5	8	9.5	11	13	14	16	17	19	20	22	25	28	31
30x8	cfm	370	465	555	650	740	835	925	1020	1110	1205	1295	1480	1665	1850
Ak .926	Throw	7	9	10	12	14	16	17	19	21	23	24	28	31	35
24x10	cfm	375	465	560	650	745	840	930	1025	1120	1210	1305	1490	1675	1865
Ak .932	Throw	7	9	11	12	14	16	18	19	21	23	25	28	32	35
36x8	cfm	445	555	670	780	890	1005	1115	1225	1335	1450	1560	1780	2005	2230
Ak 1.114	Throw	7.5	9.5	12	13	15	17	19	21	23	25	27	31	35	39
24x12	cfm	450	565	675	790	900	1015	1125	1240	1350	1465	1575	1800	2025	2250
Ak 1.126	Throw	7.5	9.5	12	14	15	17	19	21	23	25	27	31	35	39
30x10	cfm	470	585	700	820	935	1050	1170	1285	1405	1520	1635	1870	2105	2340
Ak 1.169	Throw	8	10	12	14	16	18	20	22	24	26	27	31	35	39
36x10	cfm	560	705	845	985	1125	1265	1405	1545	1685	1830	1970	2250	2530	2810
Ak 1.406	Throw	8.5	11	13	15	17	19	22	24	26	28	30	35	39	43
30x12	cfm	565	705	845	990	1130	1270	1410	1555	1695	1835	1975	2260	2540	2825
Ak 1.412	Throw	8.5	11	13	15	17	19	22	24	26	28	30	35	39	43
36x12	cfm	680	850	1020	1190	1360	1530	1700	1870	2040	2210	2375	2715	3055	3395
Ak 1.698	Throw	9.5	12	14	17	19	21	24	26	29	31	33	38	43	48

See Alternate Sizing Graph on Page 160.
See Deflections and Description of NC Criteria on Page 158.

94 Series Return Air Grilles & Registers (Page 39)

Average Face Velocity		300	400	500	600	700	800	900	1000
6 x 6	CFM	39	52	65	78	91	104	116	129
Ak 0.13	Ps	0.005	0.009	0.014	0.020	0.028	0.035	0.045	0.055
8 x 8	CFM	82	110	137	165	192	220	247	275
Ak 0.27	Ps	0.005	0.009	0.014	0.020	0.028	0.035	0.045	0.055
10 x 10	CFM	138	184	231	277	323	369	415	461
Ak 0.46	Ps	0.005	0.009	0.014	0.020	0.027	0.037	0.046	0.058
12 x 6	CFM	95	127	158	190	221	253	285	316
Ak 0.32	Ps	0.005	0.009	0.014	0.020	0.028	0.035	0.045	0.056
14 x 6	CFM	114	151	189	227	265	303	341	378
Ak 0.38	Ps	0.005	0.009	0.014	0.020	0.028	0.036	0.046	0.057
14 x 8	CFM	157	209	262	314	366	418	471	523
Ak 0.52	Ps	0.005	0.009	0.014	0.020	0.027	0.037	0.047	0.059
12 x 12	CFM	206	275	344	413	481	550	619	688
Ak 0.69	Ps	0.005	0.009	0.014	0.020	0.027	0.039	0.048	0.061
24 x 8	CFM	280	373	467	560	654	747	840	934
Ak 0.93	Ps	0.005	0.009	0.015	0.020	0.028	0.040	0.049	0.061
18 x 12	CFM	317	422	528	634	739	845	950	1056
Ak 1.06	Ps	0.005	0.009	0.015	0.021	0.028	0.040	0.049	0.062
30 x 8	CFM	353	471	589	707	825	942	1060	1178
Ak 1.18	Ps	0.005	0.009	0.015	0.021	0.029	0.041	0.050	0.062
24 x 12	CFM	426	568	710	852	995	1137	1279	1421
Ak 1.42	Ps	0.005	0.009	0.015	0.022	0.030	0.041	0.051	0.063
18 x 18	CFM	481	641	801	961	1121	1282	1442	1602
Ak 1.60	Ps	0.005	0.009	0.016	0.022	0.031	0.042	0.052	0.064
30 x 12	CFM	535	713	891	1069	1248	1426	1604	1782
Ak 1.78	Ps	0.005	0.009	0.016	0.023	0.031	0.043	0.053	0.066
20 x 20	CFM	595	793	991	1189	1387	1585	1784	1982
Ak 1.98	Ps	0.005	0.010	0.016	0.024	0.032	0.044	0.054	0.067
36 x 12	CFM	642	856	1070	1284	1498	1712	1927	2141
Ak 2.14	Ps	0.006	0.010	0.017	0.024	0.033	0.045	0.056	0.068
24 x 20	CFM	713	951	1189	1427	1664	1902	2140	2378
Ak 2.38	Ps	0.006	0.010	0.017	0.025	0.035	0.046	0.058	0.070
30 x 18	CFM	802	1069	1336	1603	1870	2137	2405	2672
Ak 2.67	Ps	0.006	0.010	0.018	0.027	0.036	0.048	0.060	0.074
24 x 24	CFM	854	1139	1424	1708	1993	2278	2562	2847
Ak 2.85	Ps	0.006	0.011	0.019	0.027	0.037	0.050	0.062	0.076
36 x 18	CFM	959	1278	1598	1917	2237	2556	2876	3196
Ak 3.20	Ps	0.006	0.011	0.020	0.029	0.040	0.052	0.066	0.080
30 x 24	CFM	1062	1416	1770	2124	2478	2832	3187	3541
Ak 3.54	Ps	0.007	0.011	0.021	0.031	0.042	0.056	0.070	0.085
36 x 24	CFM	1266	1688	2110	2532	2955	3377	3799	4221
Ak 4.22	Ps	0.008	0.013	0.024	0.035	0.047	0.063	0.081	0.097
30 x 30	CFM	1317	1756	2194	2633	3072	3511	3950	4389
Ak 4.39	Ps	0.008	0.013	0.024	0.036	0.049	0.065	0.083	0.101
36 x 30	CFM	1565	2087	2608	3130	3651	4173	4695	5216
Ak 5.22	Ps	0.010	0.015	0.029	0.041	0.056	0.076	0.099	0.120
48 x 24	CFM	1662	2217	2771	3325	3879	4433	4987	5542
Ak 5.54	Ps	0.011	0.016	0.030	0.043	0.060	0.080	0.106	0.129
36 x 36	CFM	1855	2473	3091	3709	4328	4946	5564	6182
Ak 6.18	Ps	0.012	0.017	0.034	0.048	0.067	0.087	0.122	0.148
48 x 36	CFM	2407	3210	4012	4815	5617	6420	7222	8025
Ak 8.02	Ps	0.012	0.024	0.034	0.048	0.067	0.087	0.122	0.148
48 x 48	CFM	3089	4119	5148	6178	7208	8237	9267	10297
Ak 10.3	Ps	0.012	0.024	0.034	0.048	0.067	0.087	0.122	0.148

94A Series Return Air Grilles & Registers (Page 40)

Average Face Velocity		300	400	500	600	700	800	900	1000
6 x 6	CFM	45	60	75	90	105	120	135	150
Ak 0.15	Ps	0.010	0.019	0.029	0.046	0.060	0.075	0.100	0.130
8 x 8	CFM	84	112	140	169	197	225	253	281
Ak 0.28	Ps	0.010	0.019	0.029	0.046	0.060	0.075	0.100	0.130
10 x 10	CFM	135	180	225	270	315	360	405	450
Ak 0.45	Ps	0.011	0.019	0.030	0.042	0.057	0.072	0.094	0.119
12 x 6	CFM	96	127	159	191	223	255	287	318
Ak 0.32	Ps	0.011	0.019	0.029	0.045	0.059	0.074	0.099	0.128
14 x 6	CFM	112	150	187	225	262	300	337	375
Ak 0.37	Ps	0.011	0.019	0.029	0.044	0.058	0.074	0.097	0.124
14 x 8	CFM	152	203	254	304	355	406	456	507
Ak 0.51	Ps	0.011	0.019	0.030	0.041	0.056	0.072	0.093	0.116
12 x 12	CFM	198	264	330	395	461	527	593	659
Ak 0.66	Ps	0.011	0.019	0.030	0.039	0.054	0.070	0.089	0.109
24 x 8	CFM	267	355	444	533	622	711	800	888
Ak 0.89	Ps	0.011	0.020	0.031	0.040	0.055	0.074	0.091	0.111
18 x 12	CFM	301	401	502	602	703	803	903	1004
Ak 1.00	Ps	0.011	0.020	0.031	0.041	0.056	0.076	0.092	0.112
30 x 8	CFM	336	448	560	672	784	895	1007	1119
Ak 1.12	Ps	0.011	0.020	0.031	0.041	0.056	0.078	0.093	0.114
24 x 12	CFM	406	541	676	811	946	1082	1217	1352
Ak 1.35	Ps	0.011	0.020	0.031	0.043	0.058	0.081	0.095	0.116
18 x 18	CFM	458	611	764	917	1069	1222	1375	1528
Ak 1.53	Ps	0.011	0.020	0.032	0.043	0.058	0.083	0.096	0.117
30 x 12	CFM	511	682	852	1023	1193	1364	1534	1704
Ak 1.70	Ps	0.011	0.020	0.032	0.044	0.059	0.084	0.097	0.118
20 x 20	CFM	571	761	951	1141	1331	1522	1712	1902
Ak 1.90	Ps	0.011	0.020	0.032	0.044	0.059	0.086	0.098	0.119
36 x 12	CFM	618	824	1030	1236	1442	1649	1855	2061
Ak 2.06	Ps	0.011	0.020	0.032	0.045	0.060	0.087	0.099	0.120
24 x 20	CFM	690	920	1150	1380	1610	1840	2070	2300
Ak 2.30	Ps	0.011	0.020	0.032	0.045	0.060	0.089	0.100	0.120
30 x 18	CFM	781	1041	1301	1561	1822	2082	2342	2602
Ak 2.60	Ps	0.011	0.020	0.032	0.045	0.060	0.090	0.100	0.121
24 x 24	CFM	835	1114	1392	1671	1949	2228	2506	2785
Ak 2.78	Ps	0.011	0.020	0.031	0.046	0.060	0.090	0.100	0.121
36 x 18	CFM	946	1261	1576	1892	2207	2522	2838	3153
Ak 3.15	Ps	0.011	0.019	0.031	0.045	0.059	0.090	0.099	0.120
30 x 24	CFM	1057	1410	1762	2115	2467	2820	3172	3525
Ak 3.52	Ps	0.011	0.019	0.030	0.045	0.058	0.089	0.098	0.119
36 x 24	CFM	1284	1712	2140	2568	2996	3424	3852	4280
Ak 4.28	Ps	0.011	0.018	0.028	0.043	0.055	0.085	0.092	0.114
30 x 30	CFM	1341	1789	2236	2683	3130	3577	4024	4471
Ak 4.47	Ps	0.011	0.017	0.028	0.042	0.054	0.083	0.091	0.112
36 x 30	CFM	1633	2177	2721	3265	3810	4354	4898	5442
Ak 5.44	Ps	0.010	0.015	0.024	0.037	0.047	0.070	0.079	0.100
48 x 24	CFM	1751	2335	2919	3503	4086	4670	5254	5838
Ak 5.84	Ps	0.009	0.014	0.022	0.035	0.043	0.064	0.073	0.095
36 x 36	CFM	1992	2656	3320	3984	4648	5312	5976	6640
Ak 6.64	Ps	0.008	0.012	0.017	0.029	0.034	0.048	0.059	0.081
48 x 36	CFM	2742	3656	4570	5484	6398	7312	8226	9140
Ak 9.14	Ps	0.008	0.012	0.017	0.029	0.034	0.048	0.059	0.081
48 x 48	CFM	3808	5077	6346	7615	8884	10154	11423	12692
Ak 12.7	Ps	0.008	0.012	0.017	0.029	0.034	0.048	0.059	0.081

96AFB Steel Fixed-Bar Filter Grille (Page 40)

		Static Pressure (in W.C.)	-0.024	-0.042	-0.065	-0.094	-0.128
		Total Pressure (in W.C.)	-0.018	-0.032	-0.050	-0.072	-0.098
SIZE	Ak (Sq. Ft.)	Face Velocity (fpm)	300	400	500	600	700
12x12	0.65	cfm	195	260	325	390	455
14x14	0.92	cfm	275	367	459	551	643
14x20	1.26	cfm	377	502	628	754	879
16x20	1.41	cfm	423	564	705	845	986
24x14	1.46	cfm	437	582	728	873	1019
20x20	1.75	cfm	524	698	873	1048	1222
30x14	1.83	cfm	549	732	915	1098	1281
20x25	2.23	cfm	668	890	1113	1335	1558
24x24	2.73	cfm	819	1092	1365	1637	1910
20x30	2.79	cfm	837	1116	1395	1674	1953
20x20T	1.87	cfm	560	746	933	1119	1306

H and V Series (Page 42-46)

Deflection A

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4 Ak .156	cfm	60	80	95	110	125	140	155	170	185	205	220	250	280	310
	Throw	6.5	8.5	10	12	13	15	16	18	19	22	23	26	29	33
10x4 Ak .198	cfm	80	100	120	140	160	180	200	220	240	260	275	315	355	395
	Throw	7.5	9.5	12	13	16	17	19	20	22	24	26	29	33	37
12x4 Ak .240	cfm	95	120	145	170	190	215	240	265	290	310	335	385	430	480
	Throw	8	10	12	14	16	18	20	22	25	26	28	33	36	41
14x4 Ak .282	cfm	115	140	170	195	225	255	280	310	340	365	395	450	510	565
	Throw	9	11	13	15	18	20	22	24	27	29	31	35	40	44
12x5 Ak .310	cfm	125	155	185	215	250	280	310	340	370	405	435	495	560	620
	Throw	9	12	14	16	19	21	23	25	28	30	32	37	42	46
10x6 Ak .313	cfm	125	155	190	220	250	280	315	345	375	405	440	500	565	625
	Throw	9	12	14	16	19	21	23	26	28	30	33	37	42	46
14x5 Ak .364	cfm	145	180	220	255	290	330	365	400	435	475	510	580	655	730
	Throw	10	12	15	18	20	23	25	28	30	33	35	40	45	50
12x6 Ak .379	cfm	150	190	225	265	305	340	380	415	455	495	530	605	680	760
	Throw	10	13	15	18	21	23	26	28	31	33	36	41	46	51
16x5 Ak .418	cfm	165	210	250	295	335	375	420	460	500	545	585	670	750	835
	Throw	11	13	16	19	22	24	27	30	32	35	38	43	48	54
14x6 Ak .446	cfm	180	225	270	310	355	400	445	490	535	580	625	715	805	890
	Throw	11	14	17	19	22	25	28	30	33	36	39	44	50	55
16x6 Ak .512	cfm	205	255	305	360	410	460	510	565	615	665	715	820	920	1025
	Throw	11	14	17	20	22	25	28	31	34	36	39	45	50	56
20x5 Ak .526	cfm	210	265	315	370	420	475	525	580	630	685	735	840	945	1050
	Throw	12	15	18	21	24	27	30	33	36	39	42	48	54	60
24x5 Ak .634	cfm	255	315	380	445	505	570	635	695	760	825	890	1015	1140	1270
	Throw	13	16	20	23	26	30	33	36	40	43	46	53	59	66
20x6 Ak .645	cfm	260	325	385	450	515	580	645	710	775	840	905	1030	1160	1290
	Throw	13	17	20	23	27	30	33	37	40	43	47	53	60	67
24x6 Ak .777	cfm	310	390	465	545	620	700	775	855	930	1010	1090	1245	1400	1555
	Throw	15	18	22	26	29	33	37	40	44	48	51	59	66	73
20x8 Ak .882	cfm	355	440	530	615	705	795	880	970	1060	1145	1235	1410	1590	1765
	Throw	16	19	23	27	31	35	39	43	47	51	55	62	70	78
30x6 Ak .976	cfm	390	490	585	685	780	880	975	1075	1170	1270	1365	1560	1755	1950
	Throw	16	21	25	29	33	37	41	45	49	53	57	66	74	82
24x8 Ak 1.06	cfm	425	530	635	740	850	955	1060	1165	1270	1380	1485	1695	1910	2120
	Throw	17	21	23	30	34	38	43	47	51	56	60	68	77	85
30x8 Ak 1.34	cfm	535	670	805	940	1070	1205	1340	1475	1610	1740	1875	2145	2410	2680
	Throw	19	24	29	34	38	43	48	53	58	62	67	77	87	96
24x10 Ak 1.35	cfm	540	675	810	945	1080	1215	1350	1485	1620	1755	1890	2160	2430	2700
	Throw	19	24	29	34	39	43	48	53	58	63	68	77	87	97
36x8 Ak 1.61	cfm	645	805	965	1125	1290	1450	1610	1770	1930	2095	2255	2575	2900	3220
	Throw	21	26	32	37	42	47	52	58	63	68	73	84	94	105
24x12 Ak 1.64	cfm	655	820	985	1150	1310	1475	1640	1805	1970	2130	2295	2625	2950	3280
	Throw	21	27	32	37	43	48	53	59	64	69	75	85	96	107
30x10 Ak 1.69	cfm	675	845	1015	1185	1350	1520	1690	1860	2030	2195	2365	2705	3040	3380
	Throw	21	27	32	38	43	48	54	59	65	70	75	86	97	108
36x10 Ak 2.04	cfm	815	1020	1225	1430	1630	1835	2040	2245	2450	2650	2855	3265	3670	4080
	Throw	24	30	36	42	47	53	59	65	71	77	83	95	107	119
30x12 Ak 2.05	cfm	820	1025	1230	1435	1640	1845	2050	2255	2460	2665	2870	3280	3690	4100
	Throw	24	30	36	42	48	54	59	65	71	77	83	95	107	119
36x12 Ak 2.47	cfm	990	1235	1480	1730	1975	2225	2470	2715	2965	3210	3460	3950	4451	4940
	Throw	26	33	39	46	52	59	65	72	78	85	91	104	17	130

Terminal Velocity of 75 fpm

Deflection C

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4 Ak .141	cfm	55	70	85	100	115	125	140	155	170	185	195	225	255	280
	Throw	5.0	6.5	7.5	9.0	10	11	13	14	15	17	18	20	23	25
10x4 Ak .178	cfm	70	90	105	125	140	160	180	195	215	230	250	285	320	355
	Throw	5.5	7.0	8.5	10	11	13	14	16	17	18	20	23	26	29
12x4 Ak .216	cfm	85	110	130	150	175	195	215	240	260	280	300	345	390	430
	Throw	6.0	8.0	9.5	11	13	14	16	18	19	20	22	25	28	31
14x4 Ak .254	cfm	100	125	150	180	205	230	255	280	305	330	355	405	455	510
	Throw	7.0	8.5	10	12	14	16	17	19	21	22	24	27	31	34
12x5 Ak .279	cfm	110	140	165	195	225	250	280	305	335	365	390	445	500	560
	Throw	7.0	9.0	11	13	14	16	18	20	22	23	25	29	32	36
10x6 Ak .282	cfm	115	140	170	195	225	255	280	310	340	365	395	450	510	565
	Throw	7.5	9.0	11	12	14	16	18	20	22	23	25	29	33	36
14x5 Ak .328	cfm	130	165	195	230	260	295	330	360	395	425	460	525	590	655
	Throw	7.5	10	12	14	15	17	20	21	23	25	27	31	35	39
12x6 Ak .342	cfm	135	170	205	240	275	310	340	375	410	445	480	545	615	685
	Throw	8.0	10	12	14	16	18	20	22	24	26	28	32	36	40
16x5 Ak .377	cfm	150	190	225	265	300	340	375	415	450	490	525	605	680	755
	Throw	8.5	11	12	15	17	19	21	23	25	27	29	34	38	41
14x6 Ak .412	cfm	165	205	245	290	330	370	410	455	495	535	575	660	740	825
	Throw	9.0	11	13	16	18	20	22	24	27	28	31	35	40	44
16x6 Ak .462	cfm	185	230	275	325	370	415	460	510	555	600	645	740	830	925
	Throw	9.0	11	13	15	18	20	22	24	26	28	31	35	39	44
20x5 Ak .474	cfm	190	235	285	330	380	425	475	520	570	615	665	760	855	950
	Throw	9.5	12	14	16	19	21	23	26	28	30	33	38	42	47
24x5 Ak .572	cfm	230	285	345	400	460	515	570	630	685	745	800	915	1030	1145
	Throw	10	13	15	18	21	23	26	28	33	33	36	41	46	51
20x6 Ak .581	cfm	230	290	350	405	465	525	580	640	695	755	815	930	1045	1160
	Throw	10	13	16	18	21	23	26	29	31	34	36	41	47	52
24x6 Ak .701	cfm	280	350	420	490	560	630	700	770	840	910	980	1120	1260	1400
	Throw	11	14	17	20	23	26	28	31	34	37	40	45	51	57
20x8 Ak .795	cfm	320	400	475	555	635	715	795	875	955	1035	1115	1270	1430	1590
	Throw	12	15	18	21	24	27	30	33	36	39	42	48	54	61
30x6 Ak .880	cfm	350	440	530	615	705	790	880	970	1055	1145	1230	1410	1585	1760
	Throw	13	16	19	22	26	29	32	35	38	41	46	51	57	64
24x8 Ak .959	cfm	385	480	575	670	765	865	960	1055	1150	1245	1345	1535	1725	1920
	Throw	13	17	20	23	27	30	33	37	40	43	47	53	60	67
30x8 Ak 1.20	cfm	480	600	720	840	960	1080	1200	1320	1440	1560	1680	1920	2160	2400
	Throw	15	19	22	26	30	33	37	41	45	48	52	60	67	74
24x10 Ak 1.22	cfm	490	610	730	855	975	1100	1220	1340	1465	1585	1710	1950	2200	2440
	Throw	15	19	22	26	30	34	38	41	45	49	53	60	68	75
36x8 Ak 1.45	cfm	580	725	870	1015	1160	1305	1450	1595	1740	1885	2030	2320	2610	2900
	Throw	16	20	25	29	33	37	41	45	49	53	57	65	74	82
24x12 Ak 1.47	cfm	590	735	880	1030	1175	1325	1470	1615	1765	1910	2060	2350	2645	2940
	Throw	17	21	25	29	33	37	41	45	49	53	58	66	74	82
30x10 Ak 1.53	cfm	610	765	920	1070	1225	1375	1530	1685	1835	1990	2140	2450	2755	3060
	Throw	17	21	25	29	34	38	42	46	50	55	59	67	76	84
36x10 Ak 1.84	cfm	735	920	1105	1290	1470	1655	1840	2025	2210	2390	2575	2945	3310	3680
	Throw	18	23	28	32	37	42	46	51	55	60	65	74	83	92
30x12 Ak 1.85	cfm	740	925	1110	1295	1400	1665	1850	2035	2220	2405	2590	2960	3330	3700
	Throw	19	23	28	32	37	42	46	51	56	60	65	74	83	93
36x12 Ak 2.23	cfm	890	1115	1340	1560	1785	2000	2230	2455	2675	2900	3120	3570	4015	4460
	Throw	20	25	31	36	41	46	51	56	61	66	71	81	92	102

Terminal Velocity of 75 fpm

*NC 30 NC 35 NC 40 **NC 45

* less than or equal to ** greater than or equal to

See Alternate Sizing Graph on Page 160.
See Deflections and Description of NC Criteria on Page 158.

H and V Series (Page 42-46)

Deflection E

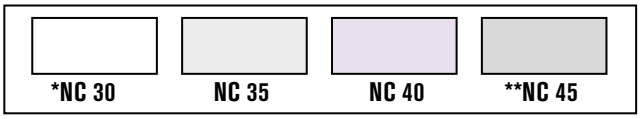
Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4	cfm	45	60	70	85	95	105	120	130	140	155	165	190	210	235
Ak .127	Throw	2.5	3.5	4.0	5.0	5.5	6.0	6.5	7.5	8.0	8.5	9.5	11	12	13
10x4	cfm	60	75	90	105	120	135	150	165	180	195	210	240	270	300
Ak .162	Throw	3.0	3.5	4.5	5.0	6.0	6.5	7.5	8.0	9.0	9.5	10	12	13	15
12x4	cfm	80	100	120	140	160	175	195	215	235	255	275	315	355	395
Ak .197	Throw	4.5	6.0	7.5	8.5	10	11	12	13	14	16	17	19	22	24
14x4	cfm	90	115	140	160	185	210	230	255	275	300	325	370	415	460
Ak .231	Throw	5.0	6.5	8.0	9.0	11	12	13	14	16	17	18	21	23	26
12x5	cfm	100	125	150	180	205	230	255	280	305	330	355	405	455	510
Ak .254	Throw	5.5	6.5	8.0	9.5	12	12	14	15	16	18	19	22	25	27
10x6	cfm	105	130	155	180	205	230	255	285	310	335	360	410	465	515
Ak .257	Throw	5.5	7.5	8.5	9.5	11	12	14	15	17	18	19	22	25	28
14x5	cfm	120	150	180	210	240	270	300	330	360	385	415	475	535	595
Ak .291	Throw	6.0	7.5	9.0	10	12	13	15	16	18	19	21	24	27	30
12x6	cfm	125	155	185	220	250	280	310	340	375	405	435	500	560	620
Ak .311	Throw	6.0	7.5	9.0	11	12	14	15	17	18	20	21	24	28	30
16x5	cfm	135	170	205	240	275	310	345	375	410	445	480	550	615	685
Ak .343	Throw	6.5	8.0	9.5	11	13	14	16	17	19	21	22	26	29	32
14x6	cfm	145	185	220	255	290	330	365	400	440	475	510	585	655	730
Ak .365	Throw	6.5	8.5	10	11	13	15	16	18	20	21	23	26	29	33
16x6	cfm	170	215	260	300	345	390	430	475	545	560	605	690	775	860
Ak .431	Throw	7.0	9.0	11	12	14	16	18	20	21	23	25	28	32	36
20x5	cfm	190	235	280	330	375	425	470	515	565	610	660	750	845	940
Ak .470	Throw	7.5	9.5	11	13	15	17	19	20	22	24	26	30	33	37
24x5	cfm	210	260	310	365	415	470	520	570	625	675	730	830	935	1040
Ak .520	Throw	8.0	10	12	14	16	18	20	21	24	25	27	31	35	39
20x6	cfm	210	265	315	370	420	475	530	580	635	685	740	845	950	1055
Ak .528	Throw	8.0	10	12	14	16	18	20	22	24	26	28	32	35	39
24x6	cfm	255	320	380	445	510	575	635	700	765	830	890	1020	1145	1275
Ak .637	Throw	8.5	11	13	15	17	20	22	24	26	28	30	35	39	43
20x8	cfm	290	360	435	505	580	650	725	795	870	940	1010	1155	1300	1445
Ak .723	Throw	9.0	12	14	16	19	21	23	25	28	30	32	37	42	46
30x6	cfm	320	400	480	560	640	720	800	880	960	1040	1120	1280	1440	1600
Ak .800	Throw	10	12	15	17	19	22	24	27	29	32	34	39	44	49
24x8	cfm	350	435	525	610	700	785	870	960	1045	1135	1220	1400	1570	1745
Ak .872	Throw	10	13	15	18	20	23	25	28	30	33	36	41	48	51
30x8	cfm	435	545	655	765	870	980	1090	1200	1310	1415	1525	1745	1960	2180
Ak 1.09	Throw	11	14	17	20	23	25	28	31	34	37	40	45	51	57
24x10	cfm	445	555	665	775	890	1000	1110	1220	1330	1445	1555	1775	2000	2220
Ak 1.11	Throw	11	14	17	20	23	26	29	31	34	37	40	46	52	57
36x8	cfm	530	660	790	925	1055	1190	1320	1450	1585	1715	1850	2110	2375	2640
Ak 1.32	Throw	14	17	21	24	27	31	34	38	41	45	48	55	62	69
24x12	cfm	535	670	805	940	1070	1205	1340	1475	1610	1740	1875	2145	2410	2680
Ak 1.34	Throw	13	16	19	22	25	28	31	35	38	41	44	50	57	63
30x10	cfm	555	695	835	975	1110	1250	1390	1530	1670	1805	1945	2225	2500	2780
Ak 1.39	Throw	13	16	19	22	26	29	32	38	38	42	45	51	58	64
36x10	cfm	670	835	1000	1170	1335	1505	1670	1835	2005	2170	2340	2670	3005	3340
Ak 1.67	Throw	14	18	21	25	28	32	35	39	42	46	49	56	63	70
30x12	cfm	670	840	1010	1175	1345	1510	1680	1850	2015	2185	2350	2690	3025	3360
Ak 1.68	Throw	14	16	21	25	28	32	35	39	42	46	49	56	63	70
36x12	cfm	810	1015	1220	1420	1625	1825	2030	2235	2435	2640	2840	3250	3655	4060
Ak 2.03	Throw	15	19	23	27	31	35	39	43	46	50	54	62	70	78

Terminal Velocity of 75 fpm

Deflection G

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4	cfm	45	60	70	85	95	105	120	130	140	155	165	190	210	235
Ak .118	Throw	2.5	3.5	4.0	5.0	5.5	6.0	6.5	7.5	8.0	8.5	9.5	11	12	13
10x4	cfm	60	75	90	105	120	135	150	165	180	195	210	240	270	300
Ak .149	Throw	3.0	3.5	4.5	5.0	6.0	6.5	7.5	8.0	9.0	9.5	10	12	13	15
12x4	cfm	70	90	110	125	145	165	180	200	215	235	255	290	325	360
Ak .181	Throw	3.0	4.0	5.0	5.5	6.5	7.5	8.0	9.0	10	11	12	13	15	16
14x4	cfm	85	105	125	150	170	190	210	235	255	275	300	340	380	425
Ak .212	Throw	3.5	4.5	5.0	6.5	7.0	8.0	9.0	10	11	12	13	14	16	18
12x5	cfm	95	115	140	165	185	210	235	255	280	305	325	375	420	465
Ak .233	Throw	4.0	4.5	5.5	6.5	7.5	8.5	9.5	10	11	12	13	15	17	19
10x6	cfm	95	120	140	165	190	210	235	260	285	305	330	380	425	470
Ak .236	Throw	4.0	5.0	5.5	6.5	7.5	8.5	9.5	10	11	12	13	15	17	19
14x5	cfm	110	135	165	190	220	245	275	300	330	355	385	440	495	550
Ak .274	Throw	4.0	5.0	6.0	7.0	8.0	9.0	10	11	12	13	14	16	18	20
12x6	cfm	115	145	170	200	230	255	285	315	345	370	400	460	515	570
Ak .286	Throw	4.0	5.0	6.0	7.0	8.5	9.0	10	11	12	13	14	17	19	21
16x5	cfm	125	160	190	220	250	285	315	345	380	410	440	505	565	630
Ak .315	Throw	4.5	5.5	6.5	7.5	8.5	10	11	12	13	14	15	17	19	22
14x6	cfm	135	170	200	235	270	300	335	370	405	435	470	540	605	670
Ak .336	Throw	4.5	5.5	6.5	8.0	9.0	10	11	12	13	13	16	18	20	22
16x6	cfm	155	195	230	270	310	345	385	425	465	500	540	620	695	770
Ak .386	Throw	4.5	5.5	6.5	8.0	9.0	10	11	12	14	15	16	18	20	23
20x5	cfm	160	200	240	280	320	355	395	435	475	515	555	635	715	795
Ak .397	Throw	5.0	6.0	7.5	8.5	10	11	12	13	15	16	17	19	22	24
24x5	cfm	190	240	285	335	380	430	480	525	575	620	670	765	860	955
Ak .478	Throw	5.5	6.5	8.0	9.5	11	12	13	15	16	17	19	21	24	27
20x6	cfm	195	245	290	340	390	435	485	535	585	630	680	780	875	970
Ak .486	Throw	5.5	7.0	8.0	9.5	11	12	13	15	16	17	19	22	24	27
24x6	cfm	235	295	350	410	470	525	585	645	705	760	820	940	1055	1170
Ak .586	Throw	6.0	7.5	9.0	10	12	13	15	16	18	19	21	24	27	29
20x8	cfm	265	335	400	465	530	600	665	730	800	865	930	1065	1195	1330
Ak .665	Throw	6.5	8.0	9.5	11	13	14	16	17	19	21	22	25	28	32
30x6	cfm	295	370	440	515	590	660	735	810	885	955	1030	1180	1325	1470
Ak .736	Throw	6.5	8.5	10	12	13	15	17	18	20	21	23	27	30	33
24x8	cfm	320	400	480	560	640	720	800	880	960	1045	1125	1285	1445	1605
Ak .802	Throw	7.0	8.5	10	12	14	15	17	19	21	22	24	28	31	35
30x8	cfm	405	505	605	705	810	910	1010	1110	1210	1315	1415	1615	1820	2020
Ak 1.01	Throw	8.0	9.5	12	14	16	17	19	21	23	25	27	31	35	39
24x10	cfm	410	510	610	715	815	920	1020	1120	1225	1325	1430	1630	1835	2040
Ak 1.02	Throw	8.0	9.5	12	14	16	18	19	21	23	25	27	31	35	40
36x8	cfm	485	605	725	845	970	1090	1210	1330	1450	1575	1695	1935	2180	2420
Ak 1.21	Throw	8.5	11	13	15	17	19	21	23	25	28	30	34	38	42
24x12	cfm	490	615	740	860	985	1105	1230	1355	1475	1600	1720	1970	2215	2460
Ak 1.23	Throw	8.5	11	13	15	17	19	21	24	26	28	30	34	39	43
30x10	cfm	510	640	770	900	1025	1150	1280	1410	1535	1665	1790	2050	2305	2560
Ak 1.28	Throw	8.5	11	13	15	18	20	22	24	26	28	31	35	39	44
36x10	cfm	615	770	925	1080	1230	1385	1540	1695	1850	2000	2155	2465	2770	3080
Ak 1.54	Throw	9.5	12	14	17	19	22	24	26	29	31	34	38	43	48
30x12	cfm	620	775	930	1085	1240	1395	1550	1705	1860	2015	2170	2480	2790	3100
Ak 1.55	Throw	9.5	12	14	17	19	22	24	26	29	31	34	38	43	48
36x12	cfm	745	930	1115	1300	1490	1675	1860	2045	2230	2420	2605	2975	3350	3720
Ak 1.86	Throw	11	13	16	18	21	24	26	29	31	34	37	42	47	52

Terminal Velocity of 75 fpm



* less than or equal to

** greater than or equal to

See Alternate Sizing Graph on Page 160.

See Deflections and Description of NC Criteria on Page 158.

C Series Curved-Blade Diffusers Selection Procedure

1. Determine the diffuser air pattern best suited to the duct layout and room area to be served.

2. Select the air pattern type and CFM per outlet. The tables give the recommended limits of air volume per outlet for various ceiling heights. Choose the correct table for the style diffuser selected. Outlets are assumed to be mounted flush on the ceiling and no obstruction to the air stream.

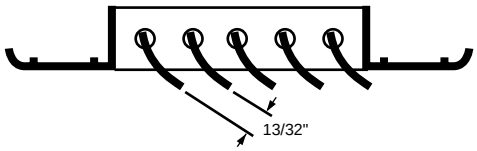
3. Turn to the proper SIZE SELECTION TABLE for the air pattern desired.

4. Determine the appropriate size based on the CFM, Throw, Pressure Loss, and Face Velocity requirements.

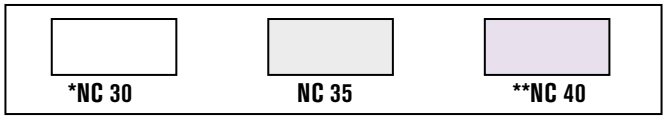
Curved-Blade – C Series

Ceiling Height In Feet	Maximum Cooling Temperature Differential (°F)	Maximum CFM per outlet			
		1 way	2 way	3 way	4 way
7	15°	75	150	225	300
8	18°	100	200	300	400
9	20°	200	400	600	800
10	22°	300	600	900	1200
11	25°	400	800	1200	1600
12	25°	500	1000	1500	2000
14	25°	700	1400	2100	2800
16	25°	900	1800	2700	3600

The Face Bars on the Curved-Blade Diffuser should be pre-set to the dimension shown below.



One Way Pattern

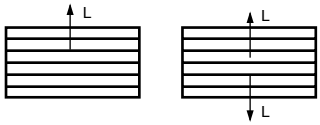


* less than or equal to ** greater than or equal to

See Description of NC Criteria on Page 158.

C Series Curved-Blade Diffusers (Page 47-51)

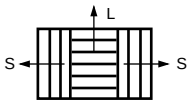
One-Way, Two-Way



Face Velocity		400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090
6x6 Ak .09	cfm	35	45	55	65	70	80	90	100	110
	Throw 1/2	3.5/2.5	5/3.5	6/4	7/5	7.5/5.5	8.5/6	9.5/7	11/7.5	11.5/8.5
8x6 Ak .10	cfm	40	50	60	70	80	90	100	110	120
	Throw 1/2	3.5/2.5	4.5/3	5.5/4	6.5/4.5	7/5	8/6	9/6.5	10/7	11/7.5
10x6 Ak .15	cfm	60	75	90	105	120	135	150	165	180
	Throw 1/2	5/3.5	6/4.5	7/5	8.5/6	9.5/7	11/7.5	12/8.5	13/9.5	14/10
8x8 Ak .16	cfm	65	80	95	110	130	145	160	175	190
	Throw 1/2	5/3.5	6/4.5	7.5/5	8.5/6	10/7	11/8	12/9	14/9.5	15/10
12x6 Ak .18	cfm	70	90	110	125	145	160	180	200	215
	Throw 1/2	5/3.5	6.5/4.5	8/5.5	9/6.5	11/7.5	12/8.5	13/9.5	15/10	16/11
14x6 Ak .21	cfm	85	105	125	145	170	190	210	230	250
	Throw 1/2	5.5/4	7/5	8.5/6	10/7	11/8	13/9	14/10	16/11	17/12
10x10 Ak .24	cfm	95	120	145	170	190	215	240	265	290
	Throw 1/2	6/4	7.5/5	9/6.5	10/7.5	12/8	13/9.5	15/10	16/11	18/13
12x10 Ak .29	cfm	115	145	175	205	230	260	290	320	350
	Throw 1/2	6.5/4.5	8/5.5	9.5/7	11/8	13/9	14/10	16/11	18/13	19/14
16x8 Ak .31	cfm	125	155	185	215	250	280	310	340	370
	Throw 1/2	6.5/5	8.5/6	10/7	12/8	13/9.5	15/11	17/12	18/13	20/14
12x12 Ak .35	cfm	140	175	210	245	280	315	350	385	420
	Throw 1/2	7/5	9/6	11/7.5	12/8.5	14/10	16/11	18/12	19/14	21/15
16x12 Ak .46	cfm	185	230	275	320	370	415	460	505	550
	Throw 1/2	8/5.5	10/7	12/8.5	14/10	16/11	18/13	20/14	22/16	24/17
14x14 Ak .48	cfm	190	240	290	335	385	430	480	530	575
	Throw 1/2	8/5.5	10/7.5	12/9	14/10	17/12	18/13	21/15	23/16	25/17
16x16 Ak .63	cfm	250	315	380	440	505	565	630	695	755
	Throw 1/2	9.5/6.5	12/8.5	14/10	16/12	19/13	21/15	23/17	26/18	28/20
20x14 Ak .68	cfm	270	340	410	475	545	610	680	750	815
	Throw 1/2	9.5/7	12/8.5	15/10	17/12	19/14	22/15	24/17	27/19	29/21
24x12 Ak .70	cfm	280	350	420	490	560	630	700	770	840
	Throw 1/2	10/7	12/8.5	15/10	17/12	20/14	22/16	25/17	27/19	30/21
30x10 Ak .73	cfm	290	365	440	510	585	655	730	805	875
	Throw 1/2	10/7	13/9	15/11	18/12	20/14	23/16	25/18	28/20	30/21
36x10 Ak .88	cfm	350	440	530	615	705	790	880	970	1055
	Throw 1/2	11/8	14/10	17/12	19/14	22/16	25/18	28/20	31/22	33/24
36x12 Ak 1.05	cfm	420	525	630	735	840	945	1050	1155	1260
	Throw 1/2	12/8.5	15/11	18/13	21/15	24/17	27/19	30/21	33/23	36/25
30x16 Ak 1.15	cfm	460	575	690	805	920	1035	1150	1265	1380
	Throw 1/2	12/9	16/11	19/13	22/15	25/18	28/20	31/22	34/24	37/26
36x16 Ak 1.40	cfm	560	700	840	980	1120	1260	1400	1540	1680
	Throw 1/2	14/9.5	17/12	21/15	24/17	27/19	31/22	34/24	38/27	41/29

Terminal Velocity of 75 fpm

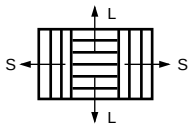
C Series Three-Way



Face Velocity		400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090
6x6 Ak .09	Total cfm	35	45	55	65	70	80	90	100	110
	cfm L/S	9/13	11/17	15/20	17/24	18/26	22/29	24/33	26/37	30/40
	Throw L/S	2/2	2.5/3	3/3.5	3.5/4	4/4.5	4.5/5	5/6	5.5/6.5	6/7
8x6 Ak .10	Total cfm	40	50	60	70	80	90	100	110	120
	cfm L/S	18/11	24/13	28/16	32/19	36/22	42/24	46/27	50/30	56/32
	Throw L/S	2.5/2	3/2.5	3.5/3	4.5/3.5	5/4	5.5/4.5	6/5	7/5	7.5/5.5
10x6 Ak .15	Total cfm	60	75	90	105	120	135	150	165	180
	cfm L/S	22/19	27/24	32/29	39/33	44/38	49/43	54/48	61/52	66/57
	Throw L/S	3/2.5	3.5/3	4.5/4	5/4.5	6/5	6.5/5.5	7/6.5	8/7	9/7.5
8x8 Ak .16	Total cfm	65	80	95	110	130	145	160	175	190
	cfm L/S	31/17	36/22	43/26	50/30	60/35	67/39	74/43	81/47	88/51
	Throw L/S	3.5/2.5	4/3.5	5/4	5.5/4.5	7/5	7.5/6	8.5/6.5	9/7	10/7.5
12x6 Ak .18	Total cfm	70	90	110	125	145	160	180	200	215
	cfm L/S	20/25	26/32	32/39	37/44	43/51	48/56	54/63	60/70	65/75
	Throw L/S	2.5/3	3.5/4	4.5/5	5/5.5	5.5/6.5	6.5/7	7/8	8/8.5	8.5/9.5
14x6 Ak .21	Total cfm	85	105	125	145	170	190	210	230	250
	cfm L/S	21/32	27/39	31/47	37/54	44/63	48/71	54/78	58/86	64/93
	Throw L/S	2.5/3.5	3.5/4.5	4/5	5/6	6/7	6.5/8	7/8.5	8/9.5	17/12
10x10 Ak .24	Total cfm	95	120	145	170	190	215	240	265	290
	cfm L/S	35/30	44/38	53/46	62/54	70/60	79/68	88/76	97/84	106/92
	Throw L/S	3.5/3	4.5/4	5.5/5	6/6	7/6.5	8/7.5	9/8	10/9	11/10
12x10 Ak .29	Total cfm	115	145	175	205	230	260	290	320	350
	cfm L/S	35/40	44/51	53/61	62/72	70/80	78/91	88/101	96/112	106/122
	Throw L/S	3.5/4	4.5/5	5.5/5.5	6.5/7	7/7.5	8/8.5	9/9.5	9.5/11	11/11
16x8 Ak .31	Total cfm	125	155	185	215	250	280	310	340	370
	cfm L/S	43/41	55/50	65/60	75/70	88/81	98/91	108/101	120/110	130/120
	Throw L/S	4/4	5/4.5	6/5.5	7/6.5	8/7.5	9/8.5	10/9.5	11/10	12/11
12x12 Ak .35	Total cfm	140	175	210	245	280	315	350	385	420
	cfm L/S	42/49	53/61	62/74	73/86	84/98	95/110	105/123	115/135	126/147
	Throw L/S	4/4	5/5	6/6.5	6.5/7.5	7.5/8.5	8.5/9.5	9.5/10	11/11	13/13
16x12 Ak .46	Total cfm	185	230	275	320	370	415	460	505	550
	cfm L/S	65/60	80/75	97/89	113/104	130/120	146/134	162/149	178/164	194/178
	Throw L/S	4.5/4.5	6/5.5	7/7	8.5/8	9.5/9	11/10	12/11	13/12	14/14
14x14 Ak .48	Total cfm	190	240	290	335	385	430	480	530	575
	cfm L/S	48/71	62/89	74/108	86/125	99/143	110/160	123/179	136/197	147/214
	Throw L/S	4/5	5/6.5	6.5/7.5	7.5/9	8.5/10	9.5/11	10/13	12/14	13/15
16x16 Ak .63	Total cfm	250	315	380	440	505	565	630	695	755
	cfm L/S	88/81	111/102	134/123	155/143	178/164	199/183	222/204	245/225	266/245
	Throw L/S	5.5/5.5	7/7	8.5/8	9.5/9.5	11/11	13/12	14/13	15/15	17/16
20x14 Ak .68	Total cfm	270	340	410	475	545	610	680	750	815
	cfm L/S	76/97	95/122	115/148	133/171	153/196	171/220	190/245	210/270	228/293
	Throw L/S	5/6	6.5/7	7.5/9	9/10	10/12	12/13	13/15	14/16	15/17
24x12 Ak .70	Total cfm	280	350	420	490	560	630	700	770	840
	cfm L/S	90/95	112/119	134/143	156/167	178/191	200/215	222/239	244/263	268/286
	Throw L/S	5.5/5.5	7/7	8.5/8.5	9.5/10	11/12	12/13	14/14	15/16	17/17
30x10 Ak .73	Total cfm	290	365	440	510	585	655	730	805	875
	cfm L/S	92/99	117/124	140/150	164/173	187/199	210/223	234/248	258/274	280/298
	Throw L/S	5.5/6	7/7.5	8.5/9	10/10	11/12	13/13	14/15	16/16	17/18
36x10 Ak .88	Total cfm	350	440	530	615	705	790	880	970	1055
	cfm L/S	113/118	143/149	172/179	199/208	228/238	256/267	285/297	314/328	342/357
	Throw L/S	6.5/6.5	8/8	9.5/9.5	11/11	13/13	14/14	16/16	17/18	19/19
36x12 Ak 1.05	Total cfm	420	525	630	735	840	945	1050	1155	1260
	cfm L/S	135/142	169/178	203/214	237/249	270/285	304/320	338/356	372/392	406/427
	Throw L/S	7/7	8.5/9	10/11	12/12	14/14	15/16	17/18	19/19	20/21
30x16 Ak 1.15	Total cfm	460	575	690	805	920	1035	1150	1265	1380
	cfm L/S	148/156	183/196	220/235	258/274	294/313	331/352	368/391	405/430	442/469
	Throw L/S	7/7	9/9	10/11	12/13	14/15	16/16	18/18	19/20	21/22
36x16 Ak 1.40	Total cfm	560	700	840	980	1120	1260	1400	1540	1680
	cfm L/S	180/190	226/237	270/285	316/332	360/380	406/427	450/475	496/522	540/570
	Throw L/S	8/8	10/10	12/12	14/14	16/16	18/18	19/20	21/22	23/24

Terminal Velocity of 75 fpm

C Series Four-Way



Face Velocity		400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090
6x6 Ak .09	Total cfm	35	45	55	65	70	80	90	100	110
	cfm L/S	5/13	6/17	7/20	9/24	9/26	11/29	12/33	13/37	15/40
	Throw L/S	1.5/2	1.5/3	2/3.5	2.5/4	2.5/4.5	3/5	3.5/6	4/6.5	4.5/7
8x6 Ak .10	Total cfm	40	50	60	70	80	90	100	110	120
	cfm L/S	9/11	12/13	14/16	16/19	18/22	21/24	23/27	25/30	28/32
	Throw L/S	1.5/1.5	2.5/2	2.5/2.5	3/2.5	3.5/3	4/3.5	4.5/4	4.5/4.5	5.5/4.5
10x6 Ak .15	Total cfm	60	75	90	105	120	135	150	165	180
	cfm L/S	11/19	14/24	16/29	19/33	22/38	25/43	27/48	30/52	33/57
	Throw L/S	2/2.5	2.5/3.5	3/4	3.5/4.5	4/5.5	4.5/6	5/7	5.5/7.5	6/8
8x8 Ak .16	Total cfm	65	80	95	110	130	145	160	175	190
	cfm L/S	15/17	18/22	22/26	25/30	30/35	33/39	37/43	40/47	44/51
	Throw L/S	2.5/2	3/2.5	3.5/3	4/3.5	5/4.5	3.5/5	6/5.5	6.5/6	7/6.5
12x6 Ak .18	Total cfm	70	90	110	125	145	160	180	200	215
	cfm L/S	10/25	13/32	16/39	19/44	22/51	24/56	27/63	30/70	32/75
	Throw L/S	2/3	2.5/4	3/5	3.5/5.5	4/6.5	4.5/7	5/8	5.5/8.5	6/9.5
14x6 Ak .21	Total cfm	85	105	125	145	170	190	210	230	250
	cfm L/S	11/32	13/39	16/47	18/54	22/63	24/71	27/78	29/86	32/93
	Throw L/S	2/3.5	2.5/4.5	3/5	3.5/6	4/7	4.5/8	5/8.5	5.5/9.5	6/10
10x10 Ak .24	Total cfm	95	120	145	170	190	215	240	265	290
	cfm L/S	17/30	22/38	26/46	31/54	35/60	39/68	44/76	48/84	53/92
	Throw L/S	2.5/3	3/4	3.5/5	4.5/6	5/6.5	5.5/7.5	6.5/8	7/9	7.5/10
12x10 Ak .29	Total cfm	115	145	175	205	230	260	290	320	350
	cfm L/S	17/40	22/51	26/61	31/72	35/80	39/91	44/101	48/112	53/122
	Throw L/S	2.5/4	3/5	3.5/5.5	4.5/7	5/7.5	5.5/8.5	6.5/9.5	7/11	7.5/11
16x8 Ak .31	Total cfm	125	155	185	215	250	280	310	340	370
	cfm L/S	22/41	27/50	33/60	38/70	44/81	49/91	55/100	60/110	65/120
	Throw L/S	3/4	3.5/4.5	4/5.5	5/6.5	5.5/7.5	6.5/8.5	7/9.5	7.5/10	8.5/11
12x12 Ak .35	Total cfm	140	175	210	245	280	315	350	385	420
	cfm L/S	21/49	26/61	31/74	37/86	42/98	47/110	52/123	58/135	63/147
	Throw L/S	2.5/4	3.5/5	4/6.5	5/7.5	5.5/8.5	6/9.5	7/10	7.5/11	8/13
16x12 Ak .46	Total cfm	185	230	275	320	370	415	460	505	550
	cfm L/S	33/60	40/75	48/89	56/104	65/120	73/135	81/149	89/164	97/178
	Throw L/S	3.5/4.5	4/5.5	5/7	6/8	7/9	7.5/10	8.5/11	9/12	10/14
14x14 Ak .48	Total cfm	190	240	290	335	385	430	480	530	575
	cfm L/S	24/71	31/89	37/108	43/125	49/143	55/160	61/179	68/197	74/214
	Throw L/S	3/5	3.5/6.5	4.5/7.5	5/9	6/10	6.5/11	7.5/13	8/14	9/15
16x16 Ak .63	Total cfm	250	315	380	440	505	565	630	695	755
	cfm L/S	44/81	55/102	67/123	77/143	89/164	99/183	111/204	122/225	133/245
	Throw L/S	4/5.5	5/6.5	6/8	7/9.5	8/11	9/12	10/13	11/15	12/16
20x14 Ak .68	Total cfm	270	340	410	475	545	610	680	750	815
	cfm L/S	38/97	48/122	57/148	67/171	76/196	85/220	95/245	105/270	114/293
	Throw L/S	3.5/6	4.5/7	5.5/9	6.5/10	7/12	8/13	9/15	10/16	11/17
24x12 Ak .70	Total cfm	280	350	420	490	560	630	700	770	840
	cfm L/S	45/95	56/119	67/143	78/167	89/191	100/215	111/239	122/263	134/286
	Throw L/S	4/5.5	5/7	6/8.5	7/10	8/12	9/13	10/14	11/16	12/17
30x10 Ak .73	Total cfm	290	365	440	510	585	655	730	805	875
	cfm L/S	46/99	58/124	70/150	82/173	94/199	105/223	117/248	129/274	140/298
	Throw L/S	4/6	5/7.5	6/9	7/10	8/12	9/13	10/15	11/16	12/18
36x10 Ak .88	Total cfm	350	440	530	615	705	790	880	970	1055
	cfm L/S	57/118	71/149	86/179	100/208	114/238	128/267	143/297	157/328	171/357
	Throw L/S	4.5/6.5	5.5/8	6.5/9.5	8/11	9/13	10/14	11/16	12/18	13/19
36x12 Ak 1.05	Total cfm	420	525	630	735	840	945	1050	1155	1260
	cfm L/S	67/142	85/178	101/214	118/249	135/285	152/320	169/356	186/392	203/427
	Throw L/S	5/7	6/9	7/11	8.5/12	9.5/14	11/16	12/18	13/19	14/21
30x16 Ak 1.15	Total cfm	460	575	690	805	920	1035	1150	1265	1380
	cfm L/S	74/156	92/196	110/235	129/274	147/313	166/352	184/391	202/430	221/469
	Throw L/S	5/7	6/9	7.5/11	8.5/13	10/15	11/16	12/18	14/20	15/22
36x16 Ak 1.40	Total cfm	560	700	840	980	1120	1260	1400	1540	1680
	cfm L/S	90/190	113/237	135/285	158/332	180/380	203/427	225/475	248/522	270/570
	Throw L/S	5.5/8	7/10	8.5/12	9.5/14	11/16	12/18	14/20	15/22	17/24

Terminal Velocity of 75 fpm

*NC 30 NC 35 **NC 40

* less than or equal to ** greater than or equal to

See Description of NC Criteria on Page 158.

RH45 Registers and Grilles (Page 54, 55)

Average Face Velocity		400	500	600	700	800	900	1000
6 x 6	CFM	40	60	70	80	90	100	110
Ak 0.11	Ps	0.037	0.058	0.083	0.113	0.148	0.189	0.232
8 x 8	CFM	100	120	140	170	190	220	240
Ak 0.24	Ps	0.032	0.050	0.072	0.098	0.128	0.163	0.200
12 x 6	CFM	110	140	170	190	220	250	280
Ak 0.28	Ps	0.031	0.048	0.069	0.094	0.122	0.155	0.191
14 x 6	CFM	130	170	200	230	270	300	330
Ak 0.33	Ps	0.029	0.045	0.065	0.088	0.114	0.145	0.179
14 x 8	CFM	190	230	280	330	370	420	460
Ak 0.46	Ps	0.025	0.039	0.055	0.075	0.097	0.123	0.152
12 x 12	CFM	250	310	370	430	490	550	610
Ak 0.61	Ps	0.021	0.032	0.046	0.062	0.079	0.100	0.125
24 x 8	CFM	340	420	500	590	670	760	840
Ak 0.84	Ps	0.020	0.032	0.046	0.061	0.079	0.100	0.124
18 x 12	CFM	380	480	570	670	760	860	950
Ak 0.95	Ps	0.020	0.032	0.046	0.061	0.080	0.101	0.124
30 x 8	CFM	430	530	640	750	850	960	1100
Ak 1.07	Ps	0.020	0.032	0.046	0.061	0.080	0.101	0.124
24 x 12	CFM	520	650	780	900	1000	1200	1300
Ak 1.29	Ps	0.020	0.032	0.046	0.062	0.081	0.102	0.124
18 x 18	CFM	580	730	880	1000	1200	1300	1500
Ak 1.46	Ps	0.020	0.032	0.046	0.062	0.081	0.102	0.124
30 x 12	CFM	650	820	980	1100	1300	1500	1600
Ak 1.63	Ps	0.021	0.032	0.046	0.062	0.082	0.103	0.124
20 x 20	CFM	730	910	1100	1300	1500	1600	1800
Ak 1.82	Ps	0.021	0.032	0.046	0.063	0.083	0.104	0.124
36 x 12	CFM	790	990	1200	1400	1600	1800	2000
Ak 1.98	Ps	0.021	0.032	0.046	0.063	0.084	0.105	0.125
24 x 20	CFM	880	1100	1300	1500	1800	2000	2200
Ak 2.21	Ps	0.021	0.032	0.047	0.064	0.085	0.107	0.126
30 x 18	CFM	1000	1200	1500	1700	2000	2200	2500
Ak 2.50	Ps	0.021	0.033	0.048	0.065	0.087	0.109	0.128
24 x 24	CFM	1100	1300	1600	1900	2100	2400	2700
Ak 2.67	Ps	0.022	0.033	0.048	0.066	0.088	0.110	0.130
36 x 18	CFM	1200	1500	1800	2100	2400	2700	3000
Ak 3.02	Ps	0.023	0.035	0.051	0.069	0.092	0.116	0.137
30 x 24	CFM	1300	1700	2000	2400	2700	3000	3400
Ak 3.37	Ps	0.024	0.037	0.053	0.073	0.096	0.121	0.144
36 x 24	CFM	1600	2000	2400	2900	3300	3700	4100
Ak 4.08	Ps	0.027	0.040	0.058	0.080	0.105	0.132	0.158
30 x 30	CFM	1700	2100	2600	3000	3400	3800	4300
Ak 4.26	Ps	0.027	0.041	0.060	0.081	0.107	0.135	0.162
36 x 30	CFM	2100	2600	3100	3600	4100	4600	5200
Ak 5.15	Ps	0.030	0.045	0.066	0.090	0.117	0.149	0.179
48 x 24	CFM	2200	2800	3300	3900	4400	5000	5500
Ak 5.51	Ps	0.031	0.047	0.069	0.093	0.122	0.154	0.186
36 x 36	CFM	2500	3100	3700	4400	5000	5600	6200
Ak 6.24	Ps	0.034	0.051	0.074	0.100	0.130	0.165	0.200
48 x 36	CFM	3400	4200	5100	5900	6800	7600	8500
Ak 8.48	Ps	0.025	0.038	0.055	0.075	0.098	0.124	0.153
48 x 48	CFM	4600	5800	6900	8100	9200	10000	12000
Ak 11.6	Ps	0.022	0.034	0.048	0.066	0.086	0.109	0.134

RCB Series Return Air Registers and Grilles (Page 52)

Average Face Velocity		200	300	400	500	600	700	800	900	1000
6 x 6	CFM	25	37	50	62	75	87	100	112	124
Ak 0.12	Ps	0.005	0.014	0.024	0.037	0.053	0.084	0.113	0.150	0.180
8 x 8	CFM	49	74	99	124	148	173	198	223	247
Ak 0.25	Ps	0.006	0.014	0.024	0.037	0.054	0.085	0.114	0.150	0.181
12 x 6	CFM	56	85	113	141	169	198	226	254	282
Ak 0.28	Ps	0.006	0.014	0.024	0.038	0.054	0.085	0.114	0.150	0.181
14 x 6	CFM	67	101	134	168	201	235	268	302	335
Ak 0.34	Ps	0.006	0.014	0.024	0.038	0.054	0.085	0.114	0.150	0.182
14 x 8	CFM	92	138	184	230	276	322	368	414	460
Ak 0.46	Ps	0.006	0.015	0.025	0.039	0.056	0.086	0.115	0.150	0.183
12 x 12	CFM	121	181	241	301	362	422	482	542	603
Ak 0.60	Ps	0.006	0.015	0.025	0.039	0.057	0.087	0.115	0.150	0.184
24 x 8	CFM	164	246	328	409	491	573	655	737	819
Ak 0.82	Ps	0.006	0.015	0.026	0.040	0.059	0.089	0.116	0.151	0.186
18 x 12	CFM	186	278	371	464	557	649	742	835	928
Ak 0.93	Ps	0.006	0.016	0.026	0.041	0.059	0.089	0.117	0.151	0.187
30 x 8	CFM	207	311	415	519	622	726	830	934	1037
Ak 1.04	Ps	0.006	0.016	0.026	0.042	0.060	0.090	0.117	0.152	0.188
24 x 12	CFM	252	377	503	629	755	881	1007	1132	1258
Ak 1.26	Ps	0.006	0.016	0.027	0.043	0.062	0.092	0.119	0.152	0.191
18 x 18	CFM	285	428	570	713	855	998	1140	1283	1426
Ak 1.43	Ps	0.006	0.017	0.027	0.043	0.063	0.093	0.119	0.153	0.192
30 x 12	CFM	319	478	638	797	956	1116	1275	1435	1594
Ak 1.59	Ps	0.006	0.017	0.028	0.044	0.064	0.094	0.120	0.154	0.194
20 x 20	CFM	357	535	713	891	1070	1248	1426	1605	1783
Ak 1.78	Ps	0.007	0.018	0.028	0.045	0.065	0.095	0.121	0.155	0.196
36 x 12	CFM	387	581	774	968	1161	1355	1548	1742	1935
Ak 1.94	Ps	0.007	0.018	0.028	0.046	0.066	0.096	0.122	0.156	0.197
24 x 20	CFM	433	650	866	1083	1299	1516	1732	1949	2165
Ak 2.17	Ps	0.007	0.018	0.029	0.046	0.067	0.098	0.124	0.157	0.200
30 x 18	CFM	491	737	983	1228	1474	1720	1965	2211	2456
Ak 2.46	Ps	0.007	0.019	0.029	0.047	0.069	0.099	0.126	0.159	0.203
24 x 24	CFM	527	790	1053	1316	1580	1843	2106	2370	2633
Ak 2.63	Ps	0.007	0.019	0.030	0.048	0.069	0.101	0.127	0.160	0.205
36 x 18	CFM	598	897	1196	1495	1794	2093	2392	2691	2990
Ak 2.99	Ps	0.007	0.020	0.030	0.049	0.071	0.103	0.129	0.163	0.208
30 x 24	CFM	670	1006	1341	1676	2011	2346	2681	3017	3352
Ak 3.35	Ps	0.007	0.021	0.031	0.050	0.072	0.105	0.132	0.166	0.212
36 x 24	CFM	818	1227	1637	2046	2455	2864	3273	3682	4092
Ak 4.09	Ps	0.008	0.023	0.032	0.052	0.074	0.110	0.137	0.172	0.220
30 x 30	CFM	856	1284	1712	2140	2568	2996	3424	3852	4280
Ak 4.28	Ps	0.008	0.023	0.032	0.052	0.074	0.111	0.139	0.174	0.222
36 x 30	CFM	1048	1572	2096	2620	3144	3668	4192	4717	5241
Ak 5.24	Ps	0.008	0.026	0.033	0.054	0.075	0.117	0.147	0.185	0.233
48 x 24	CFM	1127	1690	2254	2817	3380	3944	4507	5071	5634
Ak 5.63	Ps	0.009	0.027	0.033	0.054	0.075	0.120	0.150	0.190	0.237
36 x 36	CFM	1287	1931	2575	3218	3862	4506	5150	5793	6437
Ak 6.44	Ps	0.009	0.029	0.034	0.055	0.074	0.125	0.158	0.200	0.247
48 x 36	CFM	1794	2691	3589	4486	5383	6280	7177	8074	8971
Ak 8.97	Ps	0.009	0.029	0.034	0.055	0.068	0.125	0.158	0.200	0.247
48 x 48	CFM	2529	3793	5058	6322	7587	8851	10116	11380	12645
Ak 12.6	Ps	0.009	0.029	0.034	0.055	0.068	0.125	0.158	0.200	0.247

RH90 Registers and Grilles (Page 53, 54, 56)

Average Face Velocity		400	500	600	700	800	900	1000
6 x 6	CFM	50	63	76	88	101	113	126
Ak 0.13	Ps	0.012	0.019	0.029	0.038	0.048	0.055	0.065
8 x 8	CFM	103	129	155	181	207	233	259
Ak 0.26	Ps	0.011	0.018	0.028	0.037	0.046	0.053	0.063
12 x 6	CFM	119	148	178	208	237	267	297
Ak 0.30	Ps	0.011	0.018	0.027	0.036	0.046	0.053	0.063
14 x 6	CFM	141	177	212	248	283	318	354
Ak 0.35	Ps	0.011	0.018	0.027	0.036	0.045	0.052	0.062
14 x 8	CFM	195	244	292	341	390	438	487
Ak 0.49	Ps	0.011	0.018	0.026	0.035	0.044	0.051	0.061
12 x 12	CFM	256	320	384	448	512	576	640
Ak 0.64	Ps	0.011	0.017	0.025	0.033	0.042	0.049	0.059
24 x 8	CFM	348	435	523	610	697	784	871
Ak 0.87	Ps	0.010	0.017	0.024	0.032	0.040	0.047	0.057
18 x 12	CFM	395	493	592	691	789	888	987
Ak 0.99	Ps	0.010	0.016	0.023	0.031	0.039	0.046	0.056
30 x 8	CFM	441	552	662	772	882	993	1103
Ak 1.10	Ps	0.010	0.016	0.023	0.030	0.038	0.045	0.055
24 x 12	CFM	535	668	802	936	1069	1203	1337
Ak 1.34	Ps	0.010	0.016	0.021	0.028	0.036	0.043	0.053
18 x 18	CFM	605	756	907	1059	1210	1361	1512
Ak 1.51	Ps	0.010	0.016	0.021	0.027	0.035	0.042	0.052
30 x 12	CFM	676	845	1014	1182	1351	1520	1689
Ak 1.69	Ps	0.010	0.016	0.020	0.026	0.034	0.041	0.051

Average Face Velocity		400	500	600	700	800	900	1000
20 x 20	CFM	755	943	1132	1321	1509	1698	1887
Ak 1.89	Ps	0.010	0.016	0.019	0.026	0.033	0.040	0.050
36 x 12	CFM	818	1023	1227	1432	1636	1841	2045
Ak 2.05	Ps	0.010	0.015	0.019	0.025	0.032	0.039	0.049
24 x 20	CFM	914	1142	1370	1599	1827	2055	2284
Ak 2.28	Ps	0.010	0.015	0.018	0.024	0.031	0.038	0.048
30 x 18	CFM	1034	1292	1551	1809	2068	2326	2584
Ak 2.58	Ps	0.010	0.015	0.017	0.023	0.030	0.037	0.047
24 x 24	CFM	1106	1383	1659	1936	2213	2489	2766
Ak 2.77	Ps	0.009	0.015	0.017	0.023	0.030	0.037	0.047
36 x 18	CFM	1252	1565	1878	2191	2505	2818	3131
Ak 3.13	Ps	0.009	0.015	0.016	0.022	0.029	0.036	0.046
30 x 24	CFM	1399	1749	2099	2449	2799	3149	3499
Ak 3.50	Ps	0.009	0.015	0.016	0.022	0.029	0.036	0.046
36 x 24	CFM	1697	2122	2546	2971	3395	3819	4244
Ak 4.24	Ps	0.009	0.014	0.016	0.023	0.031	0.038	0.048
30 x 30	CFM	1773	2216	2659	3102	3546	3989	4432
Ak 4.43	Ps	0.009	0.014	0.016	0.023	0.031	0.038	0.048
36 x 30	CFM	2154	2692	3231	3769	4307	4846	5384
Ak 5.38	Ps	0.009	0.014	0.018	0.026	0.036	0.043	0.053
48 x 24	CFM	2308	2885	3462	4039	4616	5193	5771
Ak 5.77	Ps	0.009	0.014	0.020	0.028	0.039	0.046	0.056
36 x 36	CFM	2621	3276	3931	4587	5242	5897	6552
Ak 6.55	Ps	0.009	0.014	0.023	0.033	0.045	0.052	0.062
48 x 36	CFM	3588	4485	5382	6279	7176	8073	8971
Ak 8.97	Ps	0.009	0.014	0.023	0.033	0.045	0.052	0.062
48 x 48	CFM	4946	6183	7419	8656	9893	11129	12366
Ak 12.4	Ps	0.008	0.013	0.023	0.033	0.045	0.052	0.062

RE5 Series Return Air Registers and Grilles (Page 53)

Average Face Velocity		400	500	600	700	800	900	1000
6 x 6	CFM	30	37	44	52	59	67	74
Ak 0.07	Ps	0.010	0.013	0.018	0.023	0.030	0.038	0.049
8 x 8	CFM	87	108	130	152	174	195	217
Ak 0.22	Ps	0.010	0.013	0.018	0.023	0.031	0.039	0.049
10 x 10	CFM	160	200	240	280	320	360	400
Ak 0.40	Ps	0.010	0.014	0.018	0.024	0.031	0.040	0.050
12 x 6	CFM	103	129	155	180	206	232	258
Ak 0.26	Ps	0.010	0.014	0.018	0.024	0.031	0.039	0.049
14 x 6	CFM	127	159	191	223	255	287	319
Ak 0.32	Ps	0.010	0.014	0.018	0.024	0.031	0.040	0.050
14 x 8	CFM	184	230	276	322	368	414	460
Ak 0.46	Ps	0.011	0.014	0.018	0.024	0.032	0.040	0.050
12 x 12	CFM	249	311	373	435	497	559	622
Ak 0.62	Ps	0.011	0.014	0.018	0.025	0.032	0.041	0.051
24 x 8	CFM	345	431	517	603	689	775	862
Ak 0.86	Ps	0.011	0.014	0.019	0.025	0.032	0.041	0.052
18 x 12	CFM	392	490	589	687	785	883	981
Ak 0.98	Ps	0.012	0.014	0.019	0.025	0.033	0.041	0.052
30 x 8	CFM	440	550	660	770	880	990	1100
Ak 1.10	Ps	0.012	0.015	0.019	0.025	0.033	0.042	0.052
24 x 12	CFM	534	668	801	935	1068	1202	1336
Ak 1.34	Ps	0.012	0.015	0.019	0.026	0.033	0.042	0.053
18 x 18	CFM	604	756	907	1058	1209	1360	1511
Ak 1.51	Ps	0.013	0.015	0.019	0.026	0.033	0.042	0.054
30 x 12	CFM	674	843	1011	1180	1348	1517	1685
Ak 1.69	Ps	0.013	0.015	0.019	0.026	0.034	0.042	0.054
20 x 20	CFM	751	939	1127	1315	1502	1690	1878
Ak 1.88	Ps	0.013	0.015	0.019	0.026	0.034	0.043	0.055
36 x 12	CFM	812	1015	1218	1422	1625	1828	2031
Ak 2.03	Ps	0.014	0.015	0.019	0.026	0.034	0.043	0.055
24 x 20	CFM	903	1129	1355	1581	1807	2033	2258
Ak 2.26	Ps	0.014	0.016	0.019	0.026	0.034	0.043	0.055
30 x 18	CFM	1016	1270	1524	1778	2032	2286	2540
Ak 2.54	Ps	0.014	0.016	0.020	0.027	0.034	0.043	0.056
24 x 24	CFM	1083	1354	1625	1895	2166	2437	2708
Ak 2.71	Ps	0.014	0.016	0.020	0.027	0.034	0.043	0.056
36 x 18	CFM	1216	1519	1823	2127	2431	2735	3039
Ak 3.04	Ps	0.014	0.016	0.020	0.027	0.035	0.043	0.056
30 x 24	CFM	1346	1683	2019	2356	2692	3029	3366
Ak 3.37	Ps	0.015	0.016	0.020	0.027	0.035	0.044	0.057
36 x 24	CFM	1602	2003	2403	2804	3204	3605	4005
Ak 4.01	Ps	0.014	0.016	0.020	0.027	0.035	0.044	0.057
30 x 30	CFM	1665	2081	2497	2913	3330	3746	4162
Ak 4.16	Ps	0.014	0.016	0.020	0.027	0.035	0.044	0.057
36 x 30	CFM	1972	2465	2958	3451	3944	4437	4929
Ak 4.93	Ps	0.014	0.016	0.021	0.028	0.035	0.044	0.056
48 x 24	CFM	2091	2614	3137	3660	4183	4705	5228
Ak 5.23	Ps	0.013	0.016	0.021	0.028	0.036	0.045	0.055
36 x 36	CFM	2325	2906	3487	4068	4650	5231	5812
Ak 5.81	Ps	0.012	0.016	0.021	0.028	0.036	0.045	0.053
48 x 36	CFM	2981	3726	4471	5216	5961	6706	7452
Ak 7.45	Ps	0.012	0.013	0.021	0.028	0.036	0.045	0.044
48 x 48	CFM	3751	4689	5626	6564	7502	8439	9377
Ak 9.38	Ps	0.012	0.013	0.021	0.029	0.037	0.046	0.044

TG Transfer Grilles (Page 57)

* Average Face Velocity		200	300	400	500	600	700	800
8x8	cfm	90	130	180	220	265	310	350
Ak .44	PL	.08	.17	.30	.47	.68	.93	1.20
14x6	cfm	110	165	220	275	330	385	440
Ak .55	PL	.07	.16	.30	.46	.65	.90	1.20
12x8	cfm	130	190	255	320	385	450	510
Ak .64	PL	07	.16	.29	.45	.64	.88	1.10
14x8	cfm	150	220	295	370	445	520	590
Ak .74	PL	.07	.16	.28	.44	.63	.87	1.10
20x6	cfm	155	235	310	390	470	545	625
Ak .78	PL	.07	.16	.28	.44	.62	.86	1.10
12x12	cfm	185	280	370	465	560	650	745
Ak .93	PL	.07	.15	.27	.43	.61	.84	1.10
30x6	cfm	225	335	450	560	670	785	895
Ak 1.12	PL	.07	.15	.26	.42	.60	.82	1.10
16x12	cfm	240	360	475	595	715	835	950
Ak 1.19	PL	.07	.15	.26	.41	.59	.81	1.10
18x12	cfm	265	400	530	665	800	930	1065
Ak 1.33	PL	.07	.15	.26	.41	.58	.88	1.00
20x12	cfm	290	440	585	730	875	1020	1170
Ak 1.46	PL	.06	.15	.26	.40	.58	.79	1.00
16x16	cfm	310	460	615	770	925	1080	1230
Ak 1.54	PL	.06	.14	.25	.40	.57	.78	1.00
24x12	cfm	350	525	700	875	1050	1225	1400
Ak 1.75	PL	.06	.14	.25	.39	.56	.77	1.00
18x18	cfm	390	585	780	975	1170	1365	1560
Ak 1.95	PL	.06	.14	.25	.39	.55	.76	.99
30x12	cfm	435	650	870	1085	1300	1520	1740
Ak 2.17	PL	.06	.14	.25	.38	.54	.75	.98
20x20	cfm	485	730	970	1210	1450	1690	1940
Ak 2.42	PL	.06	.14	.24	.38	.54	.74	.97
24x18	cfm	510	765	1020	1275	1530	1785	2040
Ak 2.55	PL	.06	.14	.24	.37	.53	.73	.96
30x18	cfm	650	970	1290	1620	1940	2260	2580
Ak 3.23	PL	.06	.13	.23	.36	.51	.71	.93
24x24	cfm	680	1020	1360	1700	2040	2380	2720
Ak 3.40	PL	.06	.13	.23	.36	.51	.70	.92
30x24	cfm	840	1250	1670	2090	2510	2930	3340
Ak 4.18	PL	.06	.13	.22	.35	.50	.68	.89
30x30	cfm	1030	1550	2060	2580	3090	3610	4120
Ak 5.15	PL	.05	.12	.22	.34	.48	.66	.86

* Velocity measured 1" from face.

20 Round Diffuser (Page 59)

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800
6"	cfm	80	95	110	130	145	160	190	225	255	290
Ak .16	Ps	<.01	<.01	<.01	.014	.016	.020	.027	.038	.049	.062
	Throw	2	2.5	3	3.5	4.5	5	6	7	8	9
8"	cfm	140	170	195	225	250	280	335	390	450	505
Ak .28	Ps	<.01	<.01	<.01	.013	.016	.020	.028	.038	.050	.063
	Throw	3.5	4	4.5	5	5.5	6.5	7.5	9	10.5	12
10"	cfm	220	265	310	350	395	440	530	615	705	790
Ak .44	Ps	<.01	<.01	.010	.013	.016	.020	.029	.041	.051	.065
	Throw	4	4.5	5	6	7	8	9	11	13	14
12"	cfm	330	395	460	530	595	660	790	925	1025	1190
Ak .66	Ps	<.01	<.01	.010	.013	.017	.021	.029	.040	.050	.063
	Throw	5	6	7	8	9	10	12	14	16	18
14"	cfm	455	545	640	730	820	910	1090	1275	1455	1640
Ak .91	Ps	<.01	<.01	.011	.014	.017	.021	.030	.040	.053	.067
	Throw	6	7	8	9	10.5	12	14	16	18	21
16"	cfm	600	720	840	960	1080	1200	1440	1680	1920	2160
Ak 1.20	Ps	<.01	<.01	.010	.013	.016	.020	.028	.039	.050	.063
	Throw	7	8	9	10.5	12	13.5	16	19	22	24
18"	cfm	750	900	1050	1200	1350	1500	1800	2100	2400	2700
Ak 1.50	Ps	<.01	<.01	.010	.013	.017	.021	.030	.040	.052	.062
	Throw	8	9	10	12	13.5	15	18	21	24	27
		NC < 35						NC > 35			

NOTE: The use of a balancing hood is recommended to balance the system.
Ak = Effective Area in square feet
Ps = Static Pressure Loss in inches of water
NC = Noise Criteria, based on a 10dB room attenuation (Re: 10^{-12} watts) ASHRAE 36-72.
Terminal Velocity of 100 fpm
Product tested with core in "out" position.
When diffusers are used on an exposed duct, multiply throw by 0.7

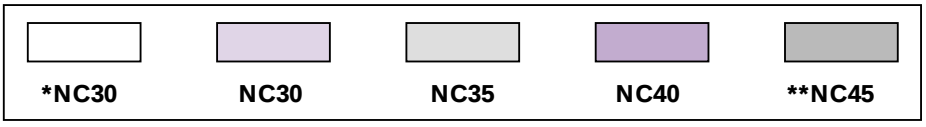
Square & Rectangular Ceiling Diffusers — Steel/Aluminum (Page 60, 62-63, 96)

SR/AR 4-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
6 x 6	cfm	50	60	70	80	90	100	120	140	160	180	200
Ak .10	Throw X/Y	2-3/2-3	2-3/2-3	2-4/2-4	2-4/2-4	3-5/3-5	3-5/3-5	4-6/4-6	4-8/4-8	5-8/5-8	5-9/5-9	6-11/6-11
9 x 9	cfm	110	135	155	180	205	225	270	315	360	410	450
Ak .22	Throw X/Y	2-4/2-4	2-4/2-4	3-5/3-5	3-5/3-5	4-6/4-6	5-8/5-8	5-9/5-9	6-11/6-11	6-12/6-12	7-13/7-13	8-14/8-14
12 x 12	cfm	200	240	280	320	360	400	480	560	640	725	800
Ak .40	Throw X/Y	3-5/3-5	4-6/4-6	4-8/4-8	5-8/5-8	5-9/5-9	6-11/6-11	6-12/6-12	7-13/7-13	8-15/8-15	9-17/9-17	10-19/10-19
15 x 15	cfm	310	375	440	500	565	625	750	875	1000	1125	1250
Ak .62	Throw X/Y	4-6/4-6	4-8/4-8	5-9/5-9	6-11/6-11	6-11/6-11	6-12/6-12	8-15/8-15	10-18/10-18	10-19/10-19	12-21/12-21	13-23/13-23
18 x 18	cfm	450	540	630	720	810	900	1080	1260	1440	1620	1800
Ak .90	Throw X/Y	4-8/4-8	5-9/5-9	5-11/5-11	6-12/6-12	7-13/7-13	8-15/8-15	10-17/10-17	11-20/11-20	13-23/13-23	15-27/15-27	16-30/16-30
21 x 21	cfm	615	740	860	985	1110	1230	1475	1725	1970	2220	2460
Ak 1.23	Throw X/Y	5-9/5-9	6-11/6-11	7-13/7-13	8-14/8-14	9-15/9-15	9-17/9-17	11-21/11-21	13-25/13-25	15-29/15-29	17-31/17-31	19-35/19-35
24 x 24	cfm	800	960	1120	1275	1440	1600	1925	2240	2570	2890	3200
Ak 1.6	Throw X/Y	5-11/5-11	7-13/7-13	7-14/7-14	8-15/8-15	9-17/9-17	10-19/10-19	12-23/12-23	14-29/14-29	16-31/16-31	18-35/18-35	20-39/20-39
27 x 27	cfm	1010	1215	1420	1615	1820	2020	2430	2840	3240	3650	4040
Ak 2.02	Throw X/Y	6-12/6-12	7-13/7-13	8-15/8-15	10-18/10-18	10-19/10-19	12-22/12-22	14-27/14-27	16-32/16-32	18-35/18-35	20-38/20-38	23-42/23-42
33 x 33	cfm	1370	1650	1925	2200	2470	2750	3300	3850	4400	4950	5500
Ak 2.75	Throw X/Y	7-13/7-13	9-16/9-16	10-18/10-18	12-21/12/21	14-24/14-24	16-27/16-27	18-33/18-33	19-37/19-37	23-41/23-41	27-46/27-46	31-50/31-50

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
9 x 6	cfm	75	90	105	120	135	150	180	210	240	270	300
Ak .15	Throw X/Y	1-3/2-4	1-3/3-5	2-4/3-5	2-4/4-6	3-5/4-6	3-5/4-8	4-6/5-9	4-6/5-9	4-8/7-13	5-9/8-15	6-11/8-15
12 x 6	cfm	100	120	140	160	180	200	240	280	320	360	400
Ak .20	Throw X/Y	1-3/3-5	1-3/4-6	2-4/4-8	2-4/4-8	2-4/5-9	3-5/6-11	4-6/7-13	4-8/8-15	4-8/8-15	5-9/10-18	6-11/11-21
12 x 9	cfm	150	180	210	240	270	300	360	420	480	540	600
Ak .30	Throw X/Y	2-4/3-5	2-4/3-5	3-5/4-6	4-6/4-8	4-7/5-10	4-8/6-11	5-9/6-12	6-11/7-13	7-13/9-17	7-13/10-18	8-14/11-19
15 x 9	cfm	185	225	265	300	340	375	450	525	600	675	750
Ak .37	Throw X/Y	2-4/4-6	2-4/4-6	3-5/5-9	4-6/6-11	4-6/6-12	4-8/8-14	5-9/8-15	5-9/9-17	6-12/11-21	7-13/13-25	7-13/13-25
18 x 9	cfm	225	270	315	360	405	450	540	630	720	810	900
Ak .45	Throw X/Y	2-4/4-6	2-4/5-9	3-5/6-11	4-6/6-12	4-6/8-14	4-8/8-15	5-9/10-19	5-10/11-23	6-12/13-25	8-14/15-29	10-17/17-32
21 x 9	cfm	265	320	370	425	475	530	635	740	850	955	1060
Ak .53	Throw X/Y	2-4/5-9	2-4/6-11	3-5/8-14	4-6/8-15	4-8/10-18	4-8/10-19	5-9/11-21	6-17/13-25	8-13/16-31	9-15/19-35	10-17/21-38
15 x 12	cfm	250	300	350	400	450	500	600	700	800	900	1000
Ak .50	Throw X/Y	3-5/4-6	3-5/4-8	4-6/5-9	4-8/6-11	5-9/6-12	6-11/7-13	6-12/8-15	7-13/10-18	8-15/11-21	10-18/13-23	12-21/14-27
18 x 12	cfm	295	355	415	475	535	595	715	835	950	1070	1190
Ak .59	Throw X/Y	2-4/4-8	3-5/5-9	4-6/6-11	4-8/7-13	5-9/8-14	6-11/8-15	6-12/10-18	8-14/11-21	9-16/13-23	10-18/15-27	12-21/17-31
21 x 12	cfm	345	415	485	555	625	690	830	970	1100	1240	1375
Ak .69	Throw X/Y	3-5/5-9	3-5/6-11	4-6/7-13	4-8/8-14	4-8/8-15	5-9/10-18	6-11/11-21	7-13/14-26	8-15/16-29	9-17/17-31	10-19/19-35
24 x 12	cfm	400	480	560	640	720	800	960	1140	1280	1440	1600
Ak .80	Throw X/Y	2-4/6-11	4-6/7-13	4-6/8-14	4-8/9-16	4-8/10-18	5-9/11-21	6-12/14-26	8-14/15-29	9-17/17-31	10-19/19-35	10-19/21-39
18 x 15	cfm	375	450	525	600	675	750	900	1050	1200	1350	1500
Ak .75	Throw X/Y	4-6/4-8	4-8/5-9	5-9/6-11	6-11/6-12	6-12/8-14	7-13/8-15	8-15/10-18	9-17/10-19	10-19/13-23	12-22/15-26	14-25/17-29
24 x 15	cfm	500	600	700	800	900	1000	1200	1400	1600	1800	2000
Ak 1.0	Throw X/Y	4-6/6-11	4-8/6-12	5-9/8-14	6-11/9-17	6-12/10-18	7-13/11-21	8-15/13-25	10-18/15-29	11-21/17-32	13-23/20-36	15-27/22-39
24 x 18	cfm	600	720	840	960	1080	1200	1440	1680	1920	2160	2400
Ak 1.2	Throw X/Y	4-8/6-11	5-9/6-12	6-11/7-14	6-12/8-15	7-14/10-19	8-15/11-21	10-18/13-23	11-21/15-27	13-25/18-34	15-30/21-37	16-32/23-41
33 x 21	cfm	960	1150	1340	1530	1725	1920	2300	2690	3070	3450	3840
Ak 1.92	Throw X/Y	4-8/8-15	6-11/10-18	7-13/12-22	8-14/13-25	8-15/15-29	10-18/17-31	12-21/21-35	14-26/24-39	16-29/26-43	17-31/29-47	21-39/35-56
30 x 24	cfm	1000	1200	1400	1600	1800	2000	2400	2800	3200	3600	4000
Ak 2.0	Throw X/Y	6-11/7-13	6-12/8-15	8-14/10-18	8-15/11-21	10-18/13-23	10-19/14-26	12-23/16-29	15-28/19-35	16-31/21-39	19-35/24-43	22-40/29-51

Note 1: The minimum Throw Dimension is based on a terminal velocity of 200 fpm. The maximum Throw Dimension is based on a terminal velocity of 100 fpm.



* less than or equal to

** greater than or equal to

See Description of NC Criteria on Page 158.

4-WAY SQUARE

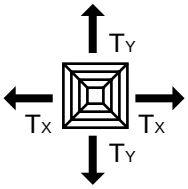


TABLE 1

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	400
8	600
9	1200
10	1800
12	3200
14	4800
16	6000

Refer to Table 3 and Note 1.

4-WAY RECTANGULAR

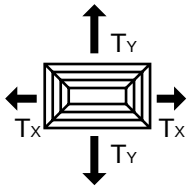


TABLE 1

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	400
8	600
9	1200
10	1800
12	3200
14	4800
16	6000

TABLE 3

Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential
7	15°
8	20°
9	25°
10	25°
12	30°
14	30°
16	30°

Refer to Note 1.

Square & Rectangular Ceiling Diffusers — Steel/Aluminum (Page 60, 62-63, 96)
SR/AR Three-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
6 x 6	cfm	50	60	70	80	90	100	120	140	160	180	200
Ak .10	Throw X/Y	2-4/1-2	2-4/1-2	3-5/2-3	3-5/2-3	4-7/2-4	4-7/2-4	5-9/3-6	6-10/3-6	6-11/4-7	6-11/4-7	7-13/4-8
9 x 9	cfm	110	135	155	180	205	225	270	315	360	410	450
Ak .22	Throw X/Y	2-4/2-3	3-6/2-3	4-7/2-4	4-8/2-4	5-9/3-6	5-9/3-6	6-12/4-7	7-13/5-9	9-15/6-10	10-18/6-11	11-20/7-12
12 x 12	cfm	200	240	280	320	360	400	480	560	640	725	800
Ak .40	Throw X/Y	4-7/2-5	5-9/3-6	6-10/4-7	6-10/4-7	6-11/4-8	7-13/5-9	9-16/6-10	12-21/7-12	13-22/8-13	14-24/8-14	16-27/9-15
15 x 15	cfm	310	375	440	500	565	625	750	875	1000	1125	1250
Ak .62	Throw X/Y	4-8/2-4	6-11/4-7	7-13/4-7	8-14/4-8	8-15/5-9	9-16/6-10	11-19/7-12	13-23/9-15	15-26/10-18	17-29/11-20	19-33/12-21
18 x 18	cfm	450	540	630	720	810	900	1080	1260	1440	1620	1800
Ak .90	Throw X/Y	4-9/3-5	6-11/4-7	7-13/5-9	9-15/6-10	10-18/6-11	11-20/7-12	13-24/9-15	15-26/10-18	18-32/11-20	20-35/12-22	23-40/14-25
21 x 21	cfm	615	740	860	985	1110	1230	1475	1725	1970	2220	2460
Ak 1.23	Throw X/Y	5-11/3-6	7-13/4-8	11-19/6-11	11-20/7-12	12-21/8-13	13-23/8-14	16-29/10-17	19-34/11-20	21-39/14-23	24-42/16-25	27-45/18-29
24 x 24	cfm	800	960	1120	1275	1440	1600	1925	2240	2570	2890	3200
Ak 1.6	Throw X/Y	7-14/5-9	9-16/6-11	11-19/7-13	13-21/8-14	14-24/9-15	16-27/9-16	17-31/11-19	21-35/14-24	25-39/16-27	28-43/18-31	32-47/20-33
27 x 27	cfm	1010	1215	1420	1615	1820	2020	2430	2840	3240	3650	4040
Ak 2.02	Throw X/Y	7-13/4-9	9-16/6-11	11-20/7-13	13-23/9-15	14-25/9-16	15-27/10-18	18-31/12-21	22-37/14-25	25-41/18-30	28-46/19-33	31-50/21-36

3-WAY STYLE 3

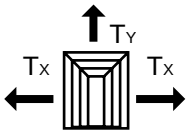


TABLE 2

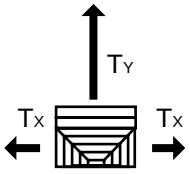
Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	300
8	450
9	900
10	1350
12	2400
14	3600
16	4500

Refer to Table 3 and Note 2.

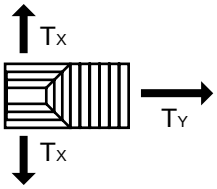
Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
9 x 6	cfm	75	90	105	120	135	150	180	210	240	270	300
Ak .15	Throw X/Y	2-3/4-7	2-3/4-7	2-3/4-7	2-4/4-8	3-5/5-8	3-6/5-9	4-7/6-11	4-8/7-12	6-10/9-15	6-11/10-17	6-11/11-19
9 x 9	cfm	115	135	155	180	200	225	270	315	360	405	450
Ak .22	Throw X/Y	1-3/4-7	2-3/5-9	2-3/6-11	2-4/7-12	3-6/8-14	3-6/9-16	4-7/10-18	4-8/12-21	5-9/14-24	6-10/16-28	6-11/18-32
12 x 9	cfm	150	180	210	240	270	300	360	420	480	540	600
Ak .30	Throw X/Y	2-3/4-8	2-4/5-9	3-6/6-10	4-7/7/12	4-8/8-14	4-8/8-14	5-9/9-16	6-10/11-20	7-12/14-24	8-13/15-26	9-15/16-28
12 x 12	cfm	200	240	280	320	360	400	480	560	640	720	800
Ak .40	Throw X/Y	2-3/5-11	2-4/7-13	3-6/9-15	3-6/10-17	4-7/11-19	4-8/12-21	6-10/15-26	6-11/18-32	7-12/20-34	7-13/21-36	8-14/24-42
15 x 15	cfm	310	375	440	500	565	625	750	875	1000	1125	1250
Ak .62	Throw X/Y	2-4/7-13	3-6/10-18	4-7/11-20	4-8/12-21	5-9/14-25	5-9/14-25	6-11/19-34	7-13/22-38	8-14/25-43	9-16/27-44	10-18/30-45
18 x 15	cfm	375	450	525	600	675	750	900	1050	1200	1350	1500
Ak .75	Throw X/Y	3-6/7-13	4-7/9-15	4-8/9-16	5-9/11-20	6-10/13-23	6-11/15-26	7-13/17-30	9-16/19-35	10-18/22-39	11-20/27-40	13-25/30-46
21 x 18	cfm	525	630	735	840	945	1050	1260	1475	1680	1890	2100
Ak 1.05	Throw X/Y	4-7/8-14	4-8/10-18	5-9/11-20	6-10/18-23	6-11/14-25	7-12/16-28	9-15/19-34	10-18/22-39	11-20/27-40	13-23/29-46	15-26/33-51
21 x 21	cfm	615	740	860	985	1110	1230	1475	1725	1970	2210	2460
Ak 1.23	Throw X/Y	3-6/9-17	4-8/12-21	5-9/16-27	6-10/17-30	7-11/19-32	7-12/21-36	9-15/26-40	11-19/30-45	13-22/34-51	15-25/39-56	17-28/43-60
27 x 21	cfm	780	940	1080	1250	1400	1560	1870	2180	2500	2800	3120
Ak 1.56	Throw X/Y	5-9/10-18	5-9/11-20	6-10/13-22	7-12/15-26	8-14/18-32	9-16/21-36	11-19/23-40	13-21/25-43	15-24/29-47	17-29/34-53	19-33/38-59
30 x 24	cfm	1000	1200	1400	1600	1800	2000	2400	2800	3200	3600	4000
Ak 2.0	Throw X/Y	5-9/11-20	6-11/13-23	7-13/16-27	8-14/17-31	9-16/20-35	10-18/22-40	12-21/25-44	14-25/31-48	16-29/34-53	18-32/38-57	20-35/43-61
33 x 27	cfm	1230	1475	1725	1970	2220	2460	2950	3450	3925	4425	4920
Ak 2.46	Throw X/Y	6-10/13-23	7-13/17-28	8-14/19-33	9-16/21-35	11-18/23-39	12-20/25-44	14-25/29-47	16-29/33-51	18-33/37-56	22-37/42-59	25-41/47-64

Note 2: The minimum Throw Dimension is based on a terminal velocity of 170 fpm. The maximum Throw Dimension is based on a terminal velocity of 85 fpm.

3-WAY STYLE 31S



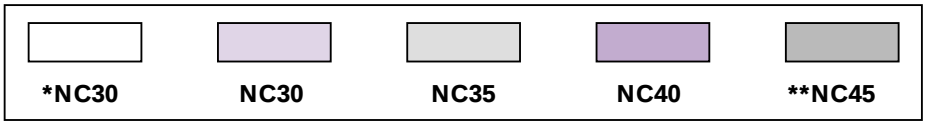
3-WAY STYLE 31L*



*Style 31L not available in square configuration

TABLE 2

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	300
8	450
9	900
10	1350
12	2400
14	3600
16	4500



* less than or equal to

** greater than or equal to

See Description of NC Criteria on Page 158.

TABLE 3

Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential
7	15°
8	20°
9	25°
10	25°
12	30°
14	30°
16	30°

Refer to Table 3 and Note 2.

Square & Rectangular Ceiling Diffusers — Steel/Aluminum (Page 60, 62-63, 96)
SR/AR Two-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
6 x 6	cfm	45	55	60	70	80	90	105	125	140	160	180
Ak .09	Throw X/Y	1-3/1-3	2-5/2-5	2-5/2-5	3-7/3-7	3-7/3-7	5-8/5-8	5-8/5-8	6-11/6-11	7-12/7-12	8-13/8-13	9-14/9-14
9 x 9	cfm	95	115	135	155	175	195	235	275	315	350	390
Ak .19	Throw X/Y	4-6/4-6	4-6/4-6	5-7/5-7	5-8/5-8	6-10/6-10	6-11/6-11	8-13/8-13	9-14/9-14	10-16/10-16	13-20/13-20	14-22/14-22
12 x 12	cfm	175	210	245	280	315	350	420	480	560	635	700
Ak .35	Throw X/Y	5-7/5-7	5-8/5-8	6-11/6-11	8-13/8-13	8-13/8-13	9-14/9-14	10-16/10-16	13-19/13-19	14-22/14-22	16-26/16-26	19-29/19-29
15 x 15	cfm	275	330	385	440	495	550	660	775	885	995	1100
Ak .55	Throw X/Y	5-9/5-9	7-12/7-12	8-13/8-13	9-14/9-14	10-16/10-16	11-18/11-18	13-21/13-21	15-25/15-25	19-29/19-29	21-33/21-33	23-36/23-36
18 x 18	cfm	390	470	545	625	700	780	935	1090	1250	1410	1560
Ak .78	Throw X/Y	7-12/7-12	9-14/9-14	10-15/10-15	10-16/10-16	12-19/12-19	14-22/14-22	16-25/16-25	18-29/18-29	21-33/21-33	25-38/25-38	28-42/28-42
21 x 21	cfm	540	650	760	865	975	1080	1300	1515	1730	1945	2160
Ak 1.08	Throw X/Y	8-13/8-13	10-15/10-15	12-18/12-18	13-21/13-21	15-23/15-23	17-28/17-28	20-32/20-32	22-35/22-35	25-39/25-39	29-43/29-43	32-47/32-47
24 x 24	cfm	705	845	990	1130	1270	1410	1690	1950	2250	2540	2820
Ak 1.41	Throw X/Y	9-16/9-16	11-18/11-18	13-21/13-21	15-24/15-24	17-27/17-27	19-29/19-29	22-34/22-34	25-38/25-38	29-42/29-42	33-47/33-47	37-51/37-51
27 x 27	cfm	880	1055	1230	1410	1585	1760	2110	2470	2820	3170	3520
Ak 1.76	Throw X/Y	10-17/10-17	12-19/12-19	14-22/14-22	16-26/16-26	19-29/19-29	21-33/21-33	24-37/24-37	28-41/28-41	32-46/32-46	35-50/35-50	39-55/39-55

2-WAY CORNER
STYLE 2C

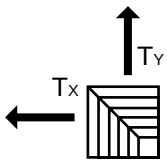


TABLE 4

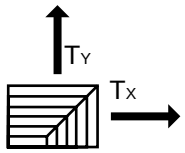
Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	200
8	300
9	600
10	900
12	1600
14	2400
16	3000

Refer to Table 3 and Note 3.

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
9 x 6	cfm	65	80	95	105	120	130	160	185	210	240	260
Ak .13	Throw X/Y	2-4/3-5	3-5/4-7	4-6/5-8	4-6/5-8	5-7/6-11	5-7/6-11	6-9/8-13	6-10/9-14	7-12/11-16	8-13/13-21	10-16/16-25
12 x 6	cfm	90	105	120	140	160	175	210	245	280	315	350
Ak .17	Throw X/Y	2-4/3-6	3-5/5-8	3-5/6-11	4-6/7-12	5-7/8-13	5-7/9-14	5-8/10-15	6-11/13-20	7-12/15-24	8-13/17-26	10-15/19-29
15 x 6	cfm	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw X/Y	2-4/5-8	3-5/6-10	3-5/7-12	4-6/8-13	5-7/10-15	5-8/11-17	6-9/13-20	6-10/15-24	8-12/17-27	10-14/20-30	11-17/22-34
12 x 9	cfm	130	155	180	210	235	260	310	365	415	470	520
Ak .26	Throw X/Y	4-6/5-7	4-6/5-8	5-7/6-10	5-8/6-11	6-10/8-12	6-11/9-14	8-13/10-16	11-17/14-21	12-19/16-24	13-20/17-26	14-23/19-30
15 x 9	cfm	165	195	230	260	295	325	390	460	525	590	650
Ak .32	Throw X/Y	4-6/6-10	5-7/6-11	6-8/8-12	6-9/10-14	6-11/10-16	7-12/12-19	9-14/14-22	10-15/16-25	12-17/19-29	13-20/21-33	14-22/23-35
18 x 9	cfm	195	235	275	310	350	390	470	545	625	700	780
Ak .39	Throw X/Y	4-6/6-11	5-7/8-13	5-7/9-14	5-8/10-15	6-10/11-18	7-12/13-21	8-13/16-25	9-15/19-29	11-17/22-33	12-20/23-35	14-24/26-39
21 x 9	cfm	230	275	320	365	410	455	545	635	730	820	910
Ak .45	Throw X/Y	4-6/8-13	5-7/10-15	6-8/11-17	6-9/12-19	6-10/13-21	6-11/15-24	8-13/18-29	10-15/22-34	12-18/24-38	13-21/26-42	15-25/30-47
15 x 12	cfm	220	260	305	350	390	435	525	610	700	785	870
Ak .43	Throw X/Y	5-7/5-8	5-8/6-11	6-10/8-13	7-12/9-14	8-13/10-16	9-14/12-19	11-18/14-22	13-20/16-25	15-24/19-29	16-26/21-32	18-29/24-37
18 x 12	cfm	260	315	370	420	475	525	630	735	840	945	1050
Ak .52	Throw X/Y	4-7/6-11	5-8/8-13	6-10/9-14	7-12/11-17	9-14/13-21	10-15/14-22	12-18/17-26	14-20/21-30	16-24/23-34	18-27/27-38	21-31/29-42
21 x 15	cfm	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .76	Throw X/Y	6-10/8-13	6-11/9-14	8-13/11-18	9-14/13-20	10-16/15-24	12-19/16-26	13-21/19-29	15-26/22-33	18-29/25-38	21-33/29-44	25-38/32-49
24 x 15	cfm	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .87	Throw X/Y	4-9/8-14	6-11/10-16	8-13/13-20	9-14/15-24	10-16/16-26	12-19/19-29	14-22/22-34	16-25/25-38	19-29/29-44	21-32/33-48	25-37/37-52
21 x 18	cfm	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .98	Throw X/Y	6-11/8-13	8-13/10-15	10-15/11-18	11-17/12-20	12-19/14-22	13-21/16-25	16-26/19-29	19-30/22-34	22-34/26-39	25-38/29-43	27-42/32-48
27 x 21	cfm	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.38	Throw X/Y	8-13/10-17	10-15/13-20	12-19/15-24	14-21/17-27	15-23/19-30	16-26/21-33	20-30/25-37	24-36/29-42	28-41/33-46	30-46/37-51	34-51/42-56

Note 3: The minimum Throw Dimension is based on a terminal velocity of 135 fpm. The maximum Throw Dimension is based on a terminal velocity of 65 fpm.

2-WAY CORNER
STYLE 2CR



2-WAY CORNER
STYLE 2CL

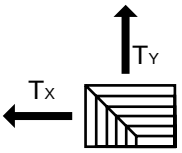
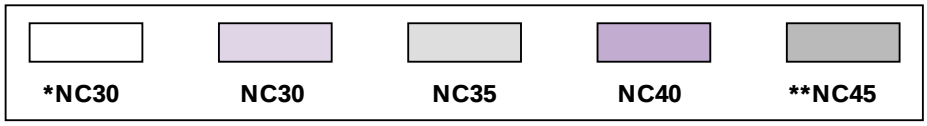


TABLE 4

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	200
8	300
9	600
10	900
12	1600
14	2400
16	3000



* less than or equal to

** greater than or equal to

TABLE 3

Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential
7	15°
8	20°
9	25°
10	25°
12	30°
14	30°
16	30°

Refer Note 3.

See Description of NC Criteria on Page 158.

Engineering Data

SR/AR Two-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
9 x 6	cfm	65	80	95	105	120	130	160	185	210	240	260
Ak .13	Throw X/Y	– /3-5	– /3-5	– /5-7	– /6-8	– /7-10	– /7-10	– /8-12	– /10-14	– /11-17	– /14-20	– /16-23
12 x 6	cfm	90	105	120	140	160	175	210	245	280	315	350
Ak .17	Throw X/Y	– /3-5	– /5-7	– /6-8	– /6-9	– /7-10	– /8-12	– /10-14	– /12-18	– /15-21	– /16-23	– /17-25
15 x 6	cfm	110	130	155	175	200	220	265	310	350	395	440
Ak .22	Throw X/Y	– /4-6	– /6-8	– /6-9	– /7-10	– /9-13	– /10-14	– /10-15	– /13-19	– /15-21	– /18-26	– /21-30
12 x 9	cfm	130	155	180	210	235	260	310	365	415	470	520
Ak .26	Throw X/Y	– /5-7	– /6-8	– /6-9	– /8-12	– /10-14	– /10-14	– /11-17	– /14-21	– /16-24	– /19-27	– /20-31
15 x 9	cfm	165	195	230	260	295	325	390	460	525	590	650
Ak .32	Throw X/Y	– /6-8	– /7-10	– /8-12	– /9-13	– /10-15	– /12-18	– /14-20	– /16-24	– /18-26	– /21-31	– /24-35
18 x 9	cfm	195	235	275	310	350	390	470	545	625	700	780
Ak .39	Throw X/Y	– /6-9	– /8-12	– /9-13	– /10-14	– /11-17	– /13-19	– /15-21	– /17-25	– /19-29	– /22-33	– /25-39
21 x 9	cfm	230	275	320	365	410	455	545	635	730	820	910
Ak .45	Throw X/Y	– /7-10	– /8-12	– /9-13	– /11-16	– /12-18	– /14-20	– /16-24	– /19-27	– /22-32	– /25-36	– /29-41
15 x 12	cfm	220	260	305	350	390	435	525	610	700	785	870
Ak .43	Throw X/Y	– /6-9	– /8-12	– /10-14	– /10-15	– /12-18	– /14-20	– /15-24	– /18-27	– /22-32	– /24-36	– /28-41
18 x 12	cfm	260	315	370	420	475	525	630	735	840	945	1050
Ak .52	Throw X/Y	– /7-11	– /9-13	– /11-15	– /12-18	– /13-19	– /15-21	– /18-26	– /20-29	– /23-34	– /27-39	– /31-42
21 x 15	cfm	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .76	Throw X/Y	– /9-13	– /10-15	– /12-18	– /14-20	– /15-23	– /17-25	– /20-30	– /23-34	– /27-40	– /31-44	– /34-48
24 x 15	cfm	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .87	Throw X/Y	– /8-14	– /11-16	– /13-19	– /15-21	– /17-25	– /19-29	– /22-33	– /25-38	– /29-42	– /33-48	– /38-54
21 x 18	cfm	460	550	640	735	825	915	110	1280	1465	1645	1830
Ak .91	Throw X/Y	– /10-15	– /11-17	– /13-19	– /16-22	– /19-25	– /20-28	– /23-33	– /26-38	– /29-42	– /34-46	– /38-51
27 x 21	cfm	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.3	Throw X/Y	– /11-17	– /14-20	– /17-24	– /19-27	– /21-31	– /23-35	– /27-40	– /34-46	– /38-51	– /42-56	– /47-61

2-WAY STYLE 2L

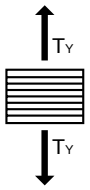


TABLE 4

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	200
8	300
9	600
10	900
12	1600
14	2400
16	3000

Refer to Table 3 and Note 3.

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
9 x 6	cfm	65	80	95	105	120	130	160	185	210	240	265
Ak .13	Throw X/Y	3-6/–	4-7/–	5-8/–	6-9/–	8-12/–	9-13/–	10-14/–	11-17/–	13-19/–	15-23/–	17-26/–
12 x 6	cfm	90	105	120	140	160	175	210	245	280	315	350
Ak .17	Throw X/Y	4-7/–	6-8/–	7-10/–	8-12/–	9-13/–	10-14/–	11-17/–	14-20/–	15-23/–	17-25/–	19-29/–
15 x 6	cfm	110	130	155	175	200	220	265	310	350	395	440
Ak .22	Throw X/Y	5-7/–	6-9/–	7-10/–	9-13/–	10-15/–	11-17/–	13-19/–	15-23/–	18-26/–	21-30/–	23-34/–
12 x 9	cfm	130	155	180	210	235	260	310	365	415	470	520
Ak .26	Throw X/Y	6-8/–	6-9/–	7-10/–	9-13/–	9-13/–	10-15/–	13-19/–	15-21/–	17-25/–	19-29/–	21-31/–
15 x 9	cfm	165	195	230	260	295	325	390	460	525	590	650
Ak .32	Throw X/Y	7-10/–	8-12/–	9-13/–	10-14/–	12-18/–	14-20/–	16-24/–	18-26/–	19-29/–	23-33/–	27-39/–
18 x 9	cfm	195	235	275	310	350	390	470	545	625	700	780
Ak .39	Throw X/Y	7-10/–	9-13/–	11-17/–	12-18/–	13-19/–	15-23/–	18-27/–	20-30/–	22-32/–	25-38/–	29-43/–
21 x 9	cfm	230	275	320	365	410	455	545	635	730	820	910
Ak .45	Throw X/Y	9-13/–	9-14/–	10-15/–	12-18/–	15-21/–	16-24/–	19-29/–	22-33/–	26-38/–	29-42/–	32-47/–
15 x 12	cfm	220	260	305	350	390	435	525	610	700	785	870
Ak .43	Throw X/Y	7-10/–	8-12/–	10-14/–	11-17/–	13-19/–	15-21/–	16-24/–	19-27/–	22-33/–	25-38/–	29-42/–
18 x 12	cfm	260	315	370	420	475	525	630	735	840	945	1050
Ak .52	Throw X/Y	8-11/–	10-14/–	10-15/–	12-18/–	14-20/–	15-23/–	18-27/–	23-33/–	25-37/–	29-42/–	32-47/–
21 x 15	cfm	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .76	Throw X/Y	10-15/–	11-17/–	14-20/–	15-23/–	18-26/–	20-29/–	22-33/–	26-38/–	29-42/–	35-46/–	39-51/–
24 x 15	cfm	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .87	Throw X/Y	9-14/–	11-17/–	15-21/–	17-25/–	19-29/–	22-32/–	25-37/–	28-41/–	33-45/–	38-51/–	43-56/–
21 x 18	cfm	460	550	640	735	825	915	110	1280	1465	1645	1830
Ak .91	Throw X/Y	11-17/–	12-18/–	14-20/–	16-24/–	19-27/–	20-29/–	23-34/–	27-40/–	32-45/–	37-49/–	40-55/–
27 x 21	cfm	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.3	Throw X/Y	12-18/–	15-21/–	18-25/–	21-29/–	23-33/–	25-37/–	29-43/–	33-48/–	38-53/–	43-59/–	49-63/–

Note 3: The minimum Throw Dimension is based on a terminal velocity of 135 fpm. The maximum Throw Dimension is based on a terminal velocity of 65 fpm.

2-WAY STYLE 2S

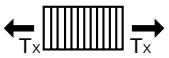


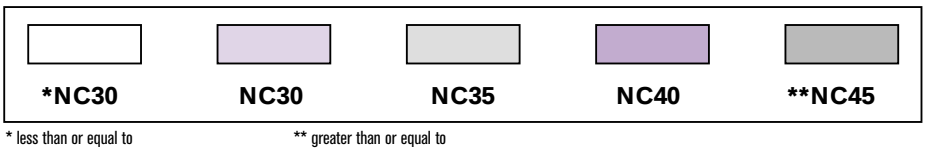
TABLE 4

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	200
8	300
9	600
10	900
12	1600
14	2400
16	3000

TABLE 3

Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential
7	15°
8	20°
9	25°
10	25°
12	30°
14	30°
16	30°

Refer Note 3.



* less than or equal to

** greater than or equal to

See Description of NC Criteria on Page 158.

SR/AR Two-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
6 x 6	cfm	45	55	60	70	80	90	105	125	140	160	180
Ak .09	Throw X/Y	– /3-5	– /3-5	– /4-7	– /4-7	– /5-8	– /5-8	– /6-9	– /9-13	– /10-15	– /11-17	– /12-18
9 x 9	cfm	95	115	135	155	175	195	235	275	315	350	390
Ak .19	Throw X/Y	– /5-7	– /6-8	– /6-8	– /6-9	– /8-12	– /9-13	– /11-17	– /12-18	– /14-20	– /16-24	– /18-26
12 x 12	cfm	175	210	245	280	315	350	420	480	560	635	700
Ak .35	Throw X/Y	– /4-7	– /6-9	– /9-13	– /10-15	– /11-17	– /12-18	– /14-20	– /17-23	– /18-27	– /21-31	– /23-35
15 x 15	cfm	275	330	385	440	495	550	660	775	885	995	1100
Ak .55	Throw X/Y	– /8-12	– /10-14	– /10-15	– /12-18	– /14-20	– /15-23	– /18-27	– /22-32	– /24-36	– /26-39	– /29-43
18 x 18	cfm	390	470	545	625	700	780	935	1090	1250	1410	1560
Ak .78	Throw X/Y	– /9-15	– /11-17	– /12-18	– /14-20	– /15-23	– /18-26	– /20-30	– /24-36	– /27-42	– /31-45	– /36-51
21 x 21	cfm	540	650	760	865	975	1080	1300	1515	1730	1945	2160
Ak 1.08	Throw X/Y	– /11-17	– /14-20	– /15-23	– /18-26	– /19-29	– /23-35	– /26-40	– /29-44	– /34-49	– /38-54	– /43-59
24 x 24	cfm	705	845	990	1130	1270	1410	1690	1950	2250	2540	2820
Ak 1.41	Throw X/Y	– /12-19	– /14-22	– /17-25	– /20-30	– /21-33	– /23-35	– /27-40	– /34-46	– /39-51	– /42-56	– /46-60
27 x 27	cfm	880	1055	1230	1410	1585	1760	2110	2470	2820	3170	3520
Ak 1.76	Throw X/Y	– /12-20	– /15-23	– /18-26	– /21-31	– /24-36	– /26-40	– /30-45	– /35-50	– /39-56	– /43-61	– /48-66

2-WAY STYLE 2

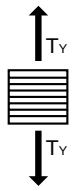


TABLE 4

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	200
8	300
9	600
10	900
12	1600
14	2400
16	3000

Refer to Table 3 and Note 3.

SR/AR One-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
6 x 6	cfm	45	55	60	70	80	90	105	125	140	160	180
Ak .09	Throw X/Y	3-5/ –	4-7/ –	5-8/ –	6-9/ –	8-10/ –	9-12/ –	10-14/ –	12-18/ –	14-20/ –	15-22/ –	16-24/ –
9 x 9	cfm	95	115	135	155	175	195	235	275	315	350	390
Ak .19	Throw X/Y	6-9/ –	7-10/ –	9-13/ –	10-14/ –	11-17/ –	13-19/ –	15-21/ –	18-26/ –	19-29/ –	22-33/ –	25-38/ –
12 x 12	cfm	175	210	245	280	315	350	420	480	560	635	700
Ak .35	Throw X/Y	8-12/ –	10-14/ –	12-18/ –	13-19/ –	15-21/ –	18-26/ –	21-31/ –	24-36/ –	27-40/ –	30-43/ –	33-45/ –
15 x 15	cfm	275	330	385	440	495	550	660	775	885	995	1100
Ak .55	Throw X/Y	10-16/ –	13-19/ –	14-22/ –	18-26/ –	19-29/ –	21-31/ –	25-37/ –	30-43/ –	35-46/ –	38-50/ –	42-56/ –
18 x 18	cfm	390	470	545	625	700	780	935	1090	1250	1410	1560
Ak .78	Throw X/Y	13-21/ –	15-23/ –	18-26/ –	19-29/ –	22-33/ –	25-38/ –	29-42/ –	35-46/ –	42-49/ –	44-52/ –	49-56/ –
21 x 21	cfm	540	650	760	865	975	1080	1300	1515	1730	1945	2160
Ak 1.08	Throw X/Y	14-23/ –	17-25/ –	21-30/ –	24-36/ –	27-40/ –	30-43/ –	34-48/ –	39-54/ –	44-60/ –	48-64/ –	53-68/ –
24 x 24	cfm	705	845	990	1130	1270	1410	1690	1950	2250	2540	2820
Ak 1.41	Throw X/Y	20-29/ –	23-33/ –	24-36/ –	27-40/ –	30-44/ –	35-48/ –	39-54/ –	43-60/ –	48-65/ –	52-69/ –	56-74/ –
27 x 27	cfm	880	1055	1230	1410	1585	1760	2110	2470	2820	3170	3520
Ak 1.76	Throw X/Y	19-27/ –	22-31/ –	25-38/ –	28-42/ –	33-47/ –	36-53/ –	43-58/ –	49-63/ –	54-68/ –	60-73/ –	65-77/ –

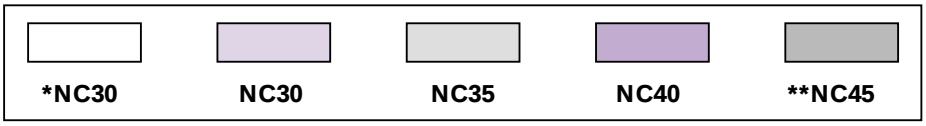
NC re 8db room attenuation

1-WAY STYLE

TABLE 4

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	100
8	150
9	300
10	450
12	800
14	1200
16	1500

Note 3: The minimum Throw Dimension is based on a terminal velocity of 135 fpm. The maximum Throw Dimension is based on a terminal velocity of 65 fpm.



* less than or equal to

** greater than or equal to

TABLE 3

Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential
7	15°
8	20°
9	25°
10	25°
12	30°
14	30°
16	30°

Refer Note 3.

See Description of NC Criteria on Page 158.

SR/AR One-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
9 x 6	cfm	65	80	95	105	120	130	160	185	210	240	265
Ak .13	Throw X/Y	5-8/–	6-9/–	7-11/–	8-12/–	9-13/–	10-15/–	12-18/–	15-21/–	16-24/–	19-29/–	21-32/–
12 x 6	cfm	90	105	120	140	160	175	210	245	280	315	350
Ak .17	Throw X/Y	5-8/–	6-9/–	9-13/–	9-14/–	10-15/–	12-18/–	14-20/–	17-25/–	18-27/–	20-30/–	23-35/–
15 x 6	cfm	110	130	155	175	200	220	265	310	350	395	440
Ak .22	Throw X/Y	5-8/–	7-10/–	9-13/–	10-15/–	12-18/–	14-20/–	16-24/–	18-27/–	21-31/-	24-36/–	28-41/–
12 x 9	cfm	130	155	180	210	235	260	310	365	415	470	520
Ak .26	Throw X/Y	7-10/–	8-12/–	10-14/–	11-17/–	12-18/–	14-20/–	17-25/–	19-29/–	22-23/–	25-37/–	28-41/–
15 x 9	cfm	165	195	230	260	295	325	390	460	525	590	650
Ak .32	Throw X/Y	9-13/–	10-14/–	11-17/–	12-18/–	15-23/–	17-25/–	20-30/–	22-33/–	25-37/–	29-42/–	32-45/–
18 x 9	cfm	195	235	275	310	350	390	470	545	625	700	780
Ak .39	Throw X/Y	9-13/–	10-15/–	12-18/–	14-20/–	16-24/–	18-26/–	20-30/–	25-37/–	27-40/–	31-44/–	36-48/–
15 x 12	cfm	220	260	305	350	390	435	525	610	700	785	870
Ak .43	Throw X/Y	10-14/–	11-17/–	13-19/–	15-23/–	18-26/–	19-29/–	22-32/–	26-39/–	30-43/–	35-48/–	39-54/–
18 x 12	cfm	260	315	370	420	475	525	630	735	840	945	1050
Ak .52	Throw X/Y	10-15/–	12-18/–	14-20/–	17-25/–	19-27/–	21-30/–	25-36/–	28-41/–	32-45/–	36-49/–	42-54/–
21 x 15	cfm	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .76	Throw X/Y	13-19/–	15-21/–	18-26/–	19-29/–	22-34/–	25-38/–	29-42/–	34-46/–	38-51/–	43-56/–	48-61/–
24 x 15	cfm	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .87	Throw X/Y	14-22/–	16-24/–	18-27/–	21-31/–	24-36/–	27-40/–	30-43/–	35-47/–	41-52/–	46-57/–	53-61/–
21 x 18	cfm	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .91	Throw X/Y	14-20/–	16-24/–	19-29/–	22-32/–	24-36/–	26-39/–	30-43/–	35-47/–	41-51/–	45-56/–	49-62/–
27 x 21	cfm	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.38	Throw X/Y	17-27/–	19-29/–	23-35/–	26-40/–	30-45/–	34-49/–	38-54/–	43-60/–	48-67/–	54-72/–	59-80/–

1-WAY STYLE 1L

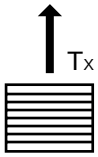


TABLE 5

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	100
8	150
9	300
10	450
12	800
14	1200
16	1500

Refer to Table 3 and Note 3.

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
9 x 6	cfm	65	80	95	105	120	130	160	185	210	240	265
Ak .13	Throw X/Y	4-7/–	5-9/–	7-11/–	9-13/–	11-17/–	13-19/–	15-21/–	16-24/–	18-27/–	21-32/–	23-35/–
12 x 6	cfm	90	105	120	140	160	175	210	245	280	315	350
Ak .17	Throw X/Y	6-10/–	8-12/–	10-15/–	12-17/–	14-19/–	15-21/–	17-25/–	21-31/–	23-35/–	25-37/–	29-44/–
15 x 6	cfm	110	130	155	175	200	220	265	310	350	395	440
Ak .22	Throw X/Y	9-12/–	10-14/–	12-18/–	14-20/–	16-24/-	18-26/–	21-31/–	23-35/–	27-40/–	31-45/–	35-51/–
12 x 9	cfm	130	155	180	210	235	260	310	365	415	470	520
Ak .26	Throw X/Y	8-12/–	10-14/–	10-15/–	12-18/–	14-20/–	16-24/–	18-27/–	23-33/–	24-37/–	28-42/–	30-44/-
15 x 9	cfm	165	195	230	260	295	325	390	460	525	590	650
Ak .32	Throw X/Y	10-15/–	12-18/–	13-19/–	15-21/–	18-26/–	22-32/–	23-35/–	26-39/–	30-43/–	35-46/–	38-47/–
18 x 9	cfm	195	235	275	310	350	390	470	545	625	700	780
Ak .39	Throw X/Y	11-17/–	13-19/–	15-23/–	17-25/–	20-30/–	22-33/–	25-38/-	31-44/–	34-45/–	38-47/–	42-51/–
15 x 12	cfm	220	260	305	350	390	435	525	610	700	785	870
Ak .43	Throw X/Y	11-16/–	12-18/–	15-21/–	17-25/–	19-29/–	22-32/–	25-38/–	28-44/–	33-45/–	36-49/–	42-54/–
18 x 12	cfm	260	315	370	420	475	525	630	735	840	945	1050
Ak .52	Throw X/Y	12-18/–	14-20/–	16-24/–	19-27/–	21-31/–	22-33/–	27-40/–	32-45/–	37-47/–	42-50/–	45-56/-
21 x 15	cfm	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .76	Throw X/Y	14-20/–	16-24/–	19-29/–	22-32/–	24-37/–	28-41/–	33-45/–	39-48/–	43-52/–	48-58/–	54-63/–
24 x 15	cfm	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .87	Throw X/Y	16-23/–	18-26/–	22-32/–	25-37/–	28-41/–	32-45/–	37-47/–	44-54/–	49-59/–	54-66/–	59-71/–
21 x 18	cfm	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .91	Throw X/Y	16-24/–	18-26/–	21-31/–	24-33/–	26-38/–	28-41/–	33-47/–	39-53/–	44-58/–	48-63/–	54-69/–
27 x 21	cfm	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.38	Throw X/Y	19-29/–	21-32/-	25-38/–	31-44/–	37-49/–	40-51/–	42-55/–	46-61/–	51-66/–	56-71/–	61-77/–

Note 3: The minimum Throw Dimension is based on a terminal velocity of 135 fpm. The maximum Throw Dimension is based on a terminal velocity of 65 fpm.

1-WAY STYLE 1S

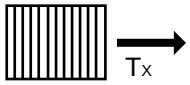


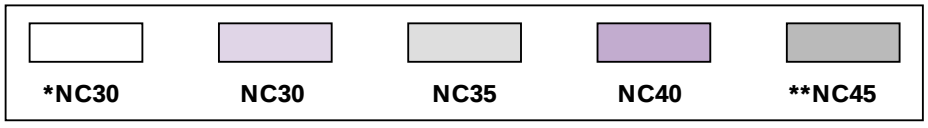
TABLE 5

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	100
8	150
9	300
10	450
12	800
14	1200
16	1500

TABLE 3

Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential
7	15°
8	20°
9	25°
10	25°
12	30°
14	30°
16	30°

Refer Note 3.



* less than or equal to

** greater than or equal to

See Description of NC Criteria on Page 158.

Square Supply Return Diffuser — Aluminum (Page 65)
ASR Four-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
		Supply Performance Data										
12 x 12	cfm	90	105	120	140	155	175	210	250	280	315	350
Ak .18	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	2-4/2-4	2-4/2-4	3-5/3-5	3-5/3-5	4-6/4-6	5-8/5-8	5-9/5-9	6-4/6-4	6-12/6-12	7-13/7-13	8-14/8-14
	NC	< 30	< 30	< 30	< 30	< 30	< 30	< 35	< 40	< 45	< 45	< 45
		Return Performance Data										
9 x 9	cfm	65	80	90	105	115	130	160	190	210	235	260
Grid Core	-Ps	< .01	< .01	< .01	< .01	< .01	< .01	.01	.02	.02	.03	.04
Ak .34	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	40	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
		Supply Performance Data										
15 x 15	cfm	200	240	280	320	360	400	480	560	640	720	800
Ak .40	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	3-5/3-5	4-6/4-6	4-8/4-8	5-8/5-8	5-9/5-9	6-11/6-11	6-12/6-12	7-13/7-13	8-15/8-15	9-17/9-17	10-19/10-19
	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	40	>45	>45	>45
		Return Performance Data										
9 x 9	cfm	150	180	210	240	270	300	360	420	480	540	600
Grid Core	-Ps	.01	.02	.02	.03	.04	.05	.07	.09	.12	.16	.19
Ak .34	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	40	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
		Supply Performance Data										
18 x 18	cfm	250	300	350	400	450	500	600	700	800	900	1000
Ak .50	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	3-5/3-5	4-6/4-6	4-8/4-8	5-8/5-8	5-9/5-9	6-11/6-12	6-12/6-12	7-13/7-13	8-15/8-15	9-17/9-17	10-19/10-19
	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	40	>45	>45	>45
		Return Performance Data										
12 x 12	cfm	190	225	265	300	340	375	450	525	600	675	750
Grid Core	-Ps	<.01	<.01	.01	.01	.02	.02	.03	.04	.06	.07	.09
Ak .64	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	40	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
		Supply Performance Data										
21 x 21	cfm	300	360	420	480	540	600	720	845	960	1075	1200
Ak .60	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	3-5/3-5	3-7/3-7	4-7/4-7	4-8/4-8	5-9/5-9	5-11/5-11	6-12/6-12	7-14/7-14	8-16/8-16	9-18/9-18	11-21/11-21
	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	40	>45	>45	>45
		Return Performance Data										
15 x 15	cfm	225	270	315	360	405	450	50	635	720	810	900
Grid Core	-Ps	<.01	<.01	<.01	<.01	.01	.01	.02	.03	.03	.04	.05
Ak 1.0	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	40	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
		Supply Performance Data										
24 x 24	cfm	350	420	490	560	630	700	840	980	1120	1260	1400
Ak .70	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	3-5/3-5	3-7/3-7	4-7/4-7	4-9/4-9	5-11/5-11	5-11/5-11	6-12/6-12	7-15/7-15	9-17/9-17	11-21/11-21	13-25/13-25
	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	40	>45	>45	>45
		Return Performance Data										
18 x 18	cfm	260	315	365	420	470	525	630	735	840	945	1050
Grid Core	-Ps	<.01	<.01	<.01	<.01	<.01	<.01	.01	.01	.19	.02	.03
Ak 1.6	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	40	>45	>45	>45

NOTE: Return cfm listed is 75% of supply.
NC re 8db room Attenuation

The minimum Throw Dimension is based on a terminal velocity of 200 fpm. The maximum Throw Dimension is based on a terminal velocity of 100 fpm.

4-WAY SQUARE

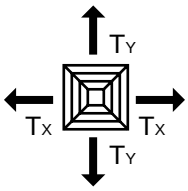


TABLE 1

Ceiling Height in Feet	Max. Rec. CFM Per Diff.
7	400
8	600
9	1200
10	1800
12	3200
14	4800
16	6000

TABLE 3

Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential
7	15°
8	20°
9	25°
10	25°
12	30°
14	30°
16	30°

Note 1: The minimum T Dimension in feet is based on a V_T of 200 FPM with a V_R of 65 FPM.

The maximum T Dimension of feet is based on a V_T of 100 FPM with a V_R of 35 FPM.

ASR Four-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		**.02**	**.02**	**.03**	**.04**	**.05**	**.06**	**.09**	**.12**	**.16**	**.20**	**.25**
		Supply Performance Data										
27 x 27	cfm	560	675	785	900	1020	1120	1345	1570	1790	2020	2240
Ak 1.1	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	3-5/3-5	3-5/3-5	4-8/4-8	5-11/5-11	6-14/6-14	7-15/7-15	8-17/8-17	9-18/9-18	11-21/11-21	13-25/13-25	15-29/15-29
	NC	< 30	< 30	< 30	< 30	< 30	< 30	< 35	< 40	< 45	< 45	< 45
		Return Performance Data										
18 x 18	cfm	345	505	590	675	765	840	1020	1180	1340	1520	1680
Grid Core	-Ps	< .01	< .01	< .01	.01	.02	.02	.03	.04	.05	.06	.07
Ak 1.6	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	40	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		**.02**	**.02**	**.03**	**.04**	**.05**	**.06**	**.09**	**.12**	**.16**	**.20**	**.25**
		Supply Performance Data										
30 x 30	cfm	635	765	890	1015	1140	1270	1520	1775	2030	2290	2540
Ak 1.3	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	3-7/3-7	4-8/4-8	4-10/4-10	5-12/5-12	6-14/6/14	7-16/7-16	9-17/9-17	10-19/10-19	12-23/12-23	14-27/14-27	16-31/16-31
	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	45	>45	>45	>45
		Return Performance Data										
21 x 21	cfm	475	575	665	760	855	955	1140	1330	1520	1720	1900
Grid Core	-Ps	< .01	< .01	< .01	< .01	.01	.01	.02	.03	.03	.04	.05
Ak 2.1	NC	< 30	< 30	< 30	< 30	< 30	<35	40	45	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		**.02**	**.02**	**.03**	**.04**	**.05**	**.06**	**.09**	**.12**	**.16**	**.20**	**.25**
		Supply Performance Data										
33 x 33	cfm	900	1080	1260	1440	1620	1800	2160	2520	2880	3250	3600
Ak 1.8	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.128	.16	.20
	Throw X/Y	4-8/4-8	50-10/5-10	6-12/6-12	6-13/6-13	7-15/7-15	8-17/8-17	11-23/11-23	14-29/14-29	16-31/16-31	18-35/18-35	20-39/20-39
	NC	< 30	< 30	< 30	< 30	< 30	< 30	35	45	>45	>45	>45
		Return Performance Data										
21 x 21	cfm	675	810	945	1080	1210	1350	1620	1885	2160	2440	2700
Grid Core	-Ps	< .01	< .01	.01	.02	.02	.03	.04	.05	.07	.09	.10
Ak 2.1	NC	< 30	< 30	< 30	< 30	< 30	< 35	40	45	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		**.02**	**.02**	**.03**	**.04**	**.05**	**.06**	**.09**	**.12**	**.16**	**.20**	**.25**
		Supply Performance Data										
36 x 36	cfm	1000	1200	1400	1600	1800	2000	2400	2800	3200	3600	4000
Ak 2.0	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16.	.20
	Throw X/Y	3-8/3-8	4-11/4-11	5-12/5-12	6-14/6-14	7-16/7-16	9-19/9-19	12-23/12-23	14-27/14-27	16-31/16-31	18-35/18-35	22-39/22-39
	NC	< 30	< 30	< 30	< 30	< 30	< 30	40	45	>45	>45	>45
		Return Performance Data										
24 x 24	cfm	750	900	1050	1200	1350	1500	1800	2100	2400	2700	3000
Grid Core	-Ps	< .01	< .01	< .01	.01	.01	.02	.03	.03	.05	.06	.07
Ak 2.8	NC	< 30	< 30	< 30	< 30	< 30	< 35	40	45	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		**.02**	**.02**	**.03**	**.04**	**.05**	**.06**	**.09**	**.12**	**.16**	**.20**	**.25**
		Supply Performance Data										
42 x 42	cfm	1450	1740	2030	2320	2610	2900	3480	4060	4640	5225	5800
Ak 2.9	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	4-11/4-11	5-13/5-13	7-16/7-16	10-21/10-21	12-25/12-25	15-29/15-29	17-33/17-33	19-36/19-36	22-41/22-41	25-48/25-48	29-54/29-54
	NC	< 30	< 30	< 30	< 30	< 30	< 40	45	45	>45	>45	>45
		Return Performance Data										
27 x 27	cfm	1085	1300	1520	1735	1950	2170	2600	3040	3470	3900	4340
Grid Core	-Ps	< .01	< .01	.01	.01	.02	.02	.03	.04	.06	.07	.09
Ak 3.6	NC	< 30	< 30	< 30	< 30	< 35	< 40	45	40	>45	>45	>45

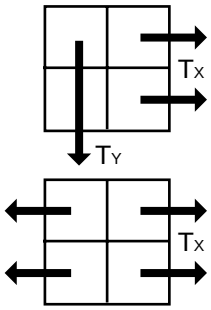
NOTE: Return cfm listed is 75% of supply.
NC re 8db room Attenuation

The minimum Throw Dimension is based on a terminal velocity of 200 fpm. The maximum Throw Dimension is based on a terminal velocity of 100 fpm.

Modular Ceiling Diffuser — Aluminum (Page 66, 67, 97)

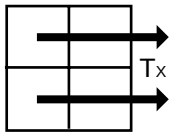
MCD Two-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
6 x 6	cfm	45	55	65	70	80	90	110	125	145	160	180
Ak .09	Throw X/Y	2-5	3-5	3-6	3-6	5-8	5-9	5-11	6-12	6-14	8-15	9-17
	NC	< 20	< 20	< 20	< 20	< 20	< 20	21	24	28	31	34
8 x 8	cfm	80	95	110	130	145	160	190	225	255	290	320
Ak .15	Throw X/Y	3-6	3-6	5-8	5-9	5-11	6-11	6-14	8-15	9-17	11-18	11-20
	NC	< 20	< 20	< 20	< 20	< 20	< 20	22	26	29	32	35
10 x 10	cfm	130	155	180	200	235	260	310	365	415	470	520
Ak .25	Throw X/Y	3-8	5-9	5-11	6-11	6-12	8-12	9-15	11-17	12-20	14-21	15-23
	NC	< 20	< 20	< 20	< 20	< 20	< 20	23	27	30	33	36
12 x 12	cfm	190	230	265	305	340	380	455	530	610	685	760
Ak .37	Throw X/Y	5-9	5-11	6-12	8-14	8-15	9-17	11-18	12-21	14-23	15-24	17-26
	NC	< 20	< 20	< 20	< 20	< 20	20	24	28	31	35	37
14 x 14	cfm	260	310	365	415	470	520	625	730	830	935	1040
Ak .52	Throw X/Y	5-11	6-12	8-14	8-17	9-18	11-20	12-21	14-23	17-24	18-27	20-29
	NC	< 20	< 20	< 20	< 20	< 20	20	25	29	32	35	38
16 x 16	cfm	350	420	490	560	630	700	840	980	1120	1260	1400
Ak .70	Throw X/Y	6-12	8-14	8-17	9-18	11-21	12-23	14-26	17-29	18-30	21-32	24-33
	NC	< 20	< 20	< 20	< 20	< 20	21	26	30	33	36	39
18 x 18	cfm	450	540	630	720	810	900	1080	1260	1440	1620	1800
Ak .90	Throw X/Y	6-14	8-17	9-18	11-21	12-23	14-24	17-27	18-30	21-33	24-35	27-36
	NC	< 20	< 20	< 20	< 20	20	22	27	31	34	37	40
20 x 20	cfm	555	665	775	890	1000	1110	1330	1555	1775	2000	2220
Ak 1.10	Throw X/Y	8-15	9-18	11-21	12-24	14-26	15-29	18-32	21-35	24-38	27-39	30-41
	NC	< 20	< 20	< 20	< 20	21	24	28	32	36	39	42
22 x 22	cfm	665	800	930	1065	1195	1330	1595	1860	2130	2395	2660
Ak 1.33	Throw X/Y	8-17	9-20	12-23	14-26	15-27	17-30	20-35	23-38	27-41	29-44	33-45
	NC	< 20	< 20	< 20	22	25	28	32	36	40	43	46



MCD One-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
6 x 6	cfm	45	55	65	70	80	90	110	125	145	160	180
Ak .09	Throw X/Y	2-6	4-6	4-8	4-8	6-10	6-12	6-14	8-16	8-18	10-20	12-22
	NC	< 20	< 20	< 20	< 20	< 20	< 20	21	24	28	31	34
8 x 8	cfm	80	95	110	130	145	160	190	225	255	290	320
Ak .15	Throw X/Y	4-8	4-8	6-10	6-12	6-14	8-14	8-18	10-20	12-22	14-24	14-26
	NC	< 20	< 20	< 20	< 20	< 20	< 20	22	26	29	32	35
10 x 10	cfm	130	155	180	21	235	260	310	365	415	470	520
Ak .25	Throw X/Y	4-10	6-12	6-14	8-14	8-16	10-16	12-20	14-22	16-26	18-28	20-30
	NC	< 20	< 20	< 20	< 20	< 20	< 20	23	27	30	33	36
12 x 12	cfm	190	230	265	305	340	380	455	530	610	685	760
Ak .37	Throw X/Y	6-12	6-14	8-16	10-18	10-20	12-20	12-22	14-24	16-28	18-30	20-30
	NC	< 20	< 20	< 20	< 20	< 20	20	24	28	31	35	37
14 x 14	cfm	260	310	365	415	470	520	625	730	830	935	1040
Ak .52	Throw X/Y	6-14	8-16	10-18	10-22	12-24	14-26	16-28	18-30	22-32	24-36	26-38
	NC	< 20	< 20	< 20	< 20	< 20	20	25	29	32	35	38
16 x 16	cfm	350	420	490	560	630	700	840	980	1120	1260	1400
Ak .70	Throw X/Y	8-16	10-18	10-22	12-24	14-28	16-30	18-34	22-38	24-40	28-42	32-44
	NC	< 20	< 20	< 20	< 20	< 20	21	26	30	33	36	39
18 x 18	cfm	450	540	630	720	810	900	1080	1260	1440	1620	1800
Ak .90	Throw X/Y	8-18	10-22	12-24	14-28	16-30	18-36	22-36	24-40	28-44	32-46	35-48
	NC	< 20	< 20	< 20	< 20	20	22	27	31	34	37	40
20 x 20	cfm	555	665	775	890	1000	1110	1330	1555	1775	2000	2220
Ak 1.10	Throw X/Y	10-20	12-24	14-28	16-32	18-34	20-38	24-42	28-46	32-50	36-52	40-54
	NC	< 20	< 20	< 20	< 20	21	24	28	32	36	39	42
22 x 22	cfm	665	800	930	1065	1195	1330	1595	1860	2130	2395	2660
Ak 1.33	Throw X/Y	10-22	12-26	16-30	18-34	20-36	22-40	26-46	30-50	36-54	38-58	44-60
	NC	< 20	< 20	< 20	20	23	26	30	34	38	41	44

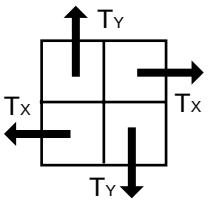


NOTES: The minimum Throw Dimension is based on a terminal velocity of 250 fpm. The maximum Throw Dimension is based on a terminal velocity of 125 fpm.
NC re 10db room Attenuation (LW10-12W)

Modular Ceiling Diffuser - Aluminum (Page 66, 67, 97)

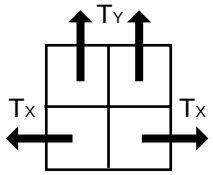
MCD Four-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
6 x 6	cfm	45	55	65	70	80	90	110	125	145	160	180
Ak .09	Throw X/Y	1-3	2-3	2-4	2-4	3-5	3-6	3-7	4-8	4-9	5-10	6-11
	NC	< 20	< 20	< 20	< 20	< 20	< 20	21	24	28	31	34
8 x 8	cfm	80	95	110	130	145	160	190	225	255	290	320
Ak .15	Throw X/Y	2-4	2-4	3-5	3-6	3-7	4-7	4-9	5-10	6-11	7-12	7-13
	NC	< 20	< 20	< 20	< 20	< 20	< 20	22	26	29	32	35
10 x 10	cfm	130	155	180	21	235	260	310	365	415	470	520
Ak .25	Throw X/Y	2-5	3-6	3-7	4-7	4-8	5-8	6-10	7-11	8-13	9-14	10-15
	NC	< 20	< 20	< 20	< 20	< 20	< 20	23	27	30	33	36
12 x 12	cfm	190	230	265	305	340	380	455	530	610	685	760
Ak .37	Throw X/Y	3-6	3-7	4-8	5-9	5-10	6-11	7-12	8-14	8-15	10-16	11-17
	NC	< 20	< 20	< 20	< 20	< 20	20	24	28	31	35	37
14 x 14	cfm	260	310	365	415	470	520	625	730	830	935	1040
Ak .52	Throw X/Y	3-7	4-8	5-9	5-11	6-12	7-13	8-14	9-15	11-16	12-18	13-19
	NC	< 20	< 20	< 20	< 20	< 20	20	25	29	32	35	38
16 x 16	cfm	350	420	490	560	630	700	840	980	1120	1260	1400
Ak .70	Throw X/Y	4-8	5-9	5-11	6-12	7-14	8-15	9-17	11-19	12-20	14-21	16-22
	NC	< 20	< 20	< 20	< 20	< 20	21	26	30	33	36	39
18 x 18	cfm	450	540	630	720	810	900	1080	1260	1440	1620	1800
Ak .90	Throw X/Y	4-9	5-11	6-12	7-14	8-15	9-16	11-18	12-20	14-22	16-23	18-24
	NC	< 20	< 20	< 20	< 20	20	22	27	31	34	37	40
20 x 20	cfm	555	665	775	890	1000	1110	1330	1555	1775	2000	2220
Ak 1.10	Throw X/Y	5-10	6-12	7-14	8-16	9-17	10-19	12-21	14-23	16-25	18-26	20-27
	NC	< 20	< 20	< 20	< 20	21	24	28	32	36	39	42
22 x 22	cfm	665	800	930	1065	1195	1330	1595	1860	2130	2395	2660
Ak 1.33	Throw X/Y	5-11	6-13	8-15	9-17	10-18	11-20	13-23	15-25	18-27	19-29	22-30
	NC	< 20	< 20	< 20	20	23	26	30	34	38	41	44



MCD Three-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25
6 x 6	cfm	45	55	65	70	80	90	110	125	145	160	180
Ak .09	Throw X/Y	1-3/2-5	2-3/3-5	2-4/3-6	2-4/3-6	3-5/5-8	3-6/5-9	3-7/5-11	4-8/6-12	4-9/6-14	5-10/8-15	6-11/9-17
	NC	< 20	< 20	< 20	< 20	< 20	< 20	21	24	28	31	34
8 x 8	cfm	80	95	110	130	145	160	190	225	255	290	320
Ak .15	Throw X/Y	2-4/3-6	2-4/3-6	3-5/5-8	3-6/5-9	3-7/5-11	4-7/6-11	4-9/6-14	5-10/8-15	6-11/9-17	7-12/11-18	7-13/11-20
	NC	< 20	< 20	< 20	< 20	< 20	< 20	22	26	29	32	35
10 x 10	cfm	130	155	180	21	235	260	310	365	415	470	520
Ak .25	Throw X/Y	2-5/3-8	3-6/5-9	3-7/5-11	4-7/6-11	4-8/6-12	5-8/8-12	6-10/9-15	7-11/11-17	8-13/12-20	9-14/14-21	10-15/15-23
	NC	< 20	< 20	< 20	< 20	< 20	< 20	23	27	30	33	36
12 x 12	cfm	190	230	265	305	340	380	455	530	610	685	760
Ak .37	Throw X/Y	3-6/5-9	3-7/5-11	4-8/6-12	5-9/8-14	5-10/8-15	6-11/9-17	7-12/11-18	8-14/12-21	9-15/14-23	10-16/15-24	11-17/17-26
	NC	< 20	< 20	< 20	< 20	< 20	20	24	28	31	35	37
14 x 14	cfm	260	310	365	415	470	520	625	730	830	935	1040
Ak .52	Throw X/Y	3-7/5-11	4-8/6-12	5-9/8-14	5-11/8-17	6-12/9-18	7-13/11-20	8-14/12-21	9-15/14-23	11-16/17-24	12-18/18-27	13-19/20-29
	NC	< 20	< 20	< 20	< 20	< 20	20	25	29	32	35	38
16 x 16	cfm	350	420	490	560	630	700	840	980	1120	1260	1400
Ak .70	Throw X/Y	4-8/6-12	5-9/8-14	5-11/8-17	6-12/9-18	7-14/11-21	8-15/12-23	9-17/14-26	11-19/17-29	12-20/18-30	14-21/21-32	16-22/24-33
	NC	< 20	< 20	< 20	< 20	< 20	21	26	30	33	36	39
18 x 18	cfm	450	540	630	720	810	900	1080	1260	1440	1620	1800
Ak .90	Throw X/Y	4-9/6-14	5-11/8-17	6-12/9-18	7-14/11-21	8-15/12-23	9-16/14-24	11-18/17-27	12-20/18-30	14-22/21-33	16-23/24-35	18-24/27-36
	NC	< 20	< 20	< 20	< 20	20	22	27	31	34	37	40
20 x 20	cfm	555	665	775	890	1000	1110	1330	1555	1775	2000	2220
Ak 1.10	Throw X/Y	5-10/8-15	6-12/9-18	7-14/11-21	8-16/12-24	9-17/14-26	10-19/15-29	12-21/18-32	14-23/21-35	16-25/24-38	18-26/27-39	20-27/30-41
	NC	< 20	< 20	< 20	< 20	21	24	28	32	36	39	42
22 x 22	cfm	665	800	930	1065	1195	1330	1595	1860	2130	2395	2660
Ak 1.33	Throw X/Y	5-11/8-17	6-13/9-20	8-15/12-23	9-17/14-26	10-18/15-27	11-20/17-30	13-23/20-35	15-25/23-38	18-27/27-41	19-29/29-44	22-30/33-45
	NC	< 20	< 20	< 20	20	23	26	30	34	38	41	44



NOTES: The minimum Throw Dimension is based on a terminal velocity of 250 fpm. The maximum Throw Dimension is based on a terminal velocity of 125 fpm.
NC re 10db room Attenuation ($LW10^{-12}W$)

ECBXT (Page 98)

Listed Size	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
22 x 22	Airflow Rate (cfm)	537	537	672	806	940	1074	1209	1343	1612	1880	2149	2417
Ak=1.343 Sq. Ft.	Total Pressure (in WC)	0.028	0.042	0.059	0.077	0.098	0.121	0.146	0.203	0.267	0.339	0.419	0.505

NOTES:

1. Tests conducted in accordance with ASHRAE 70-1991.
2. Total Pressure is the sum of static pressure and velocity pressure.
3. Ak is the effective area of the diffuser face.
4. Tests conducted with all valves in fully opened position.

SS Spiral Diffuser (Page 69)

Model SS Spiral Diffuser (1/2" wide slot) nonducted

1 Slot	Airflow Rate	7	10	13	17	20	23	27	30	33	37
	Static Pressure	.002	.003	.006	.009	.016	.018	.024	.030	.037	.045
	Horizontal Throw	7-4-2	11-6-4	15-7-5	19-9-6	22-11-7	26-13-9	30-15-10	33-17-11	37-19-12	41-20-14
	Noise Criteria	<15	<15	<15	<15	<15	<15	19	21	23	25

2 Slot	Airflow Rate	10	17	23	30	37	43	50	57	63	70
	Static Pressure	.001	.002	.004	.007	.011	.015	.020	.026	.032	.039
	Horizontal Throw	6-3-2	9-5-3	13-6-4	17-8-6	20-10-7	24-12-8	28-14-9	31-16-10	35-18-12	39-19-13
	Noise Criteria	<15	<15	<15	<15	<15	<15	19	23	27	31

3 Slot	Airflow Rate	13	23	33	43	53	63	73	83	93	103
	Static Pressure	.001	.002	.004	.006	.009	.012	.017	.021	.027	.033
	Horizontal Throw	5-3-2	10-5-3	14-7-5	18-9-6	22-11-7	26-13-9	30-15-10	34-17-11	38-19-13	42-21-14
	Noise Criteria	<15	<15	<15	<15	<15	18	21	25	30	33

4 Slot	Airflow Rate	17	30	43	57	70	83	97	110	123	137
	Static Pressure	.001	.002	.003	.005	.008	.012	.016	.020	.025	.031
	Horizontal Throw	6-3-2	10-5-3	15-8-5	20-10-7	24-12-8	29-14-10	31-17-11	38-19-13	43-21-14	47-24-16
	Noise Criteria	<15	<15	<15	<15	18	20	22	27	32	34

Model SS Spiral Diffuser (3/4" wide slot) nonducted

1 Slot	Airflow Rate	10	15	20	25	30	35	40	45	50	55
	Static Pressure	.002	.004	.007	.011	.015	.020	.027	.034	.042	.050
	Horizontal Throw	6-3-2	9-5-3	12-6-4	15-8-5	18-9-6	22-11-7	25-12-8	28-14-9	31-15-10	34-17-11
	Noise Criteria	<15	<15	<15	<15	19	21	25	30	34	39

2 Slot	Airflow Rate	15	25	35	45	55	65	75	85	95	105
	Static Pressure	.001	.003	.005	.008	.012	.017	.022	.029	.036	.044
	Horizontal Throw	5-2-2	8-4-3	11-5-4	14-7-5	17-8-6	20-10-7	23-12-8	26-13-9	29-15-10	32-16-11
	Noise Criteria	<15	<15	<15	<15	19	26	32	35	38	41

3 Slot	Airflow Rate	20	35	50	65	80	95	110	125	140	155
	Static Pressure	.001	.002	.004	.007	.010	.014	.019	.024	.030	.037
	Horizontal Throw	5-2-2	8-4-3	11-6-4	15-7-5	18-9-6	22-11-7	25-12-8	28-14-9	32-16-11	35-18-12
	Noise Criteria	<15	<15	<15	18	23	28	33	37	40	43

4 Slot	Airflow Rate	25	45	65	85	105	125	145	165	185	205
	Static Pressure	.001	.002	.004	.006	.009	.013	.017	.023	.028	.035
	Horizontal Throw	5-2-2	9-4-3	13-6-4	16-8-5	20-10-7	24-12-8	28-14-9	32-16-11	38-19-12	40-20-13
	Noise Criteria	<15	<15	17	22	25	29	33	37	40	43

Engineering Data

SS Spiral Diffuser (Page 69)

Model SS Spiral Diffuser (1" wide slot) nonducted

1 Slot	Airflow Rate	13	20	27	33	40	47	53	60	67	73
	Static Pressure	.002	.005	.009	.014	.020	.027	.036	.045	.056	.067
	Horizontal Throw	5-2-2	7-4-2	10-5-3	12-6-4	15-7-5	17-9-6	20-10-7	22-11-7	25-12-8	27-14-9
	Noise Criteria	<15	<15	<15	20	25	31	37	41	43	45

2 Slot	Airflow Rate	20	33	47	60	79	87	100	113	127	140
	Static Pressure	.001	.003	.007	.011	.016	.023	.030	.038	.048	.059
	Horizontal Throw	4-2-1	6-3-2	9-4-3	11-6-4	14-7-5	16-8-5	19-9-6	21-10-7	23-12-8	26-13-9
	Noise Criteria	<15	<15	<15	23	32	35	40	44	48	51

3 Slot	Airflow Rate	27	47	67	87	107	127	147	167	187	207
	Static Pressure	.001	.003	.005	.009	.013	.019	.025	.032	.040	.049
	Horizontal Throw	4-2-1	6-3-2	9-5-3	12-6-4	15-7-5	17-9-6	20-10-7	23-11-8	25-13-8	28-14-9
	Noise Criteria	<15	<15	<15	23	32	35	40	44	48	51

4 Slot	Airflow Rate	33	60	87	113	140	167	193	220	247	273
	Static Pressure	.001	.002	.005	.008	.012	.017	.023	.030	.038	.046
	Horizontal Throw	4-2-1	7-3-2	10-5-3	13-7-4	16-8-5	19-10-8	22-11-7	25-13-8	29-14-10	32-16-11
	Noise Criteria	<15	16	22	27	31	37	42	46	50	54

NOTES

1. Tests conducted in accordance with ANSI/ASHRAE 70-1991 at isothermal conditions.
2. Engineering Units: Airflow rate = cfm/linear foot
   Static Pressure = in. w.c.
   Throw = ft at 50, 100, and 150 fpm terminal velocity
3. Noise Criteria is based on 10 dB room absorption (Re: 10^{12} watts) evaluated at 125 through 4000 Hz octave bands.
4. Throw data are based on a horizontal discharge in one direction only. For 2-way discharge pattern, the throw is determined from the published engineering data based on the number of slots and cfm/lin ft discharging in each direction.
5. Throw data are for 4-foot active diffuser lengths. For other active lengths, throw may be determined by applying the following multiplication factors.

Diffuser Length (feet)	Multiplication Factor
1	0.50
2	0.85
3	0.95
4	1.00

6. Sound data are for 4-foot active diffuser lengths. For other lengths, add or deduct the following values to or from the reported NC level.

Diffuser Length (feet)	NC Correction
1	-2
2	-2
3	-1
4	0

Spiral Grille SV/SVH - CFM for sizes not listed

	Average Face Velocities									
SIZE/Ak	300	400	500	600	700	800	900	1000	1100	1200
10X3/.141	42	56	71	85	99	113	127	141	155	169
12X3/.169	51	68	85	101	118	135	152	169	186	203
10X4/.188	56	75	94	113	132	150	169	188	207	226
14X4/.263	79	105	132	158	184	210	237	263	289	316
10X6/.282	85	113	141	169	197	226	254	282	310	338
14X6/.393	118	157	197	236	275	314	354	393	432	472
16X6/.46	138	184	230	276	322	368	414	460	506	552
18X12/1.00	300	400	500	600	700	800	900	1000	1100	1200
30X8/1.11	333	444	555	666	777	888	999	1110	1221	1332
30X10/1.35	405	540	675	810	945	1080	1215	1350	1485	1620
36X12/2.00	600	800	1000	1200	1400	1600	1800	2000	2200	2400

SV and SVH Spiral Diffuser (Page 68)

Average Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
12 x 4	CFM	70	90	115	140	160	185	205	230	255	275
	Total Pressure	.008	.015	.023	.033	.045	.059	.075	.093	.112	.134
Ak .23	Horizontal Throw	5-3	7-4	9-4	10-5	12-6	14-7	16-8	17-9	19-9	21-10
	Noise Criteria	-	-	-	-	-	-	-	<20	20	25
12 x 6	CFM	100	130	165	200	230	265	295	330	365	395
	Total Pressure	.008	.015	.023	.033	.045	.059	.075	.093	.112	.133
Ak .33	Horizontal Throw	6-3	8-4	10-5	12-6	14-7	16-8	18-9	20-10	21-11	23-12
	Noise Criteria	-	-	-	-	-	-	-	<20	20	25
14 x 8	CFM	155	210	260	310	365	415	470	520	570	625
18 x 6	Total Pressure	.008	.014	.023	.032	.044	.058	.073	.090	.109	.130
	Horizontal Throw	7-4	10-5	12-6	14-7	17-8	19-10	22-11	24-12	27-13	29-14
Ak .52	Noise Criteria	-	-	-	-	-	-	<20	20	25	30
16 x 8	CFM	175	235	295	355	415	470	530	590	650	710
20 x 6	Total Pressure	.008	.014	.022	.032	.044	.057	.072	.089	.108	.128
	Horizontal Throw	8-4	10-5	13-6	15-8	18-9	20-10	23-11	26-13	28-14	31-15
Ak .59	Noise Criteria	-	-	-	-	-	<20	20	25	25	30
24 x 6	CFM	200	270	335	400	470	535	605	670	735	805
18 x 8	Total Pressure	.008	.014	.022	.032	.044	.057	.072	.089	.108	.128
	Horizontal Throw	8-4	11-5	14-7	17-8	19-10	22-11	25-12	28-14	30-15	33-16
Ak .67	Noise Criteria	-	-	-	-	<20	20	25	30	30	35
20 x 8	CFM	220	295	370	445	520	590	665	740	815	890
16 x 10	Total Pressure	.008	.014	.022	.032	.043	.057	.072	.089	.107	.128
	Horizontal Throw	9-4	11-6	14-7	17-8	20-10	23-11	26-13	28-14	31-15	34-17
Ak .74	Noise Criteria	-	-	-	<20	20	20	25	25	30	35
18 x 10	CFM	245	330	410	490	575	655	740	820	900	985
	Total Pressure	.008	.014	.022	.031	.042	.055	.070	.087	.105	.124
Ak .82	Horizontal Throw	9-4	12-6	15-7	18-9	21-10	24-12	27-13	30-15	32-16	35-17
	Noise Criteria	-	-	-	<20	20	25	30	30	35	40
20 x 10	CFM	280	370	465	560	650	745	835	930	1025	1115
24 x 8	Total Pressure	.008	.014	.022	.031	.042	.055	.070	.086	.100	.123
	Horizontal Throw	10-5	13-6	16-8	19-9	22-11	25-12	29-14	32-16	35-17	38-19
Ak .93	Noise Criteria	-	-	<20	20	25	30	35	40	40	45
24 x 10	CFM	335	445	555	665	775	890	1000	1110	1220	1330
20 x 12	Total Pressure	.008	.014	.022	.032	.043	.055	.071	.086	.104	.123
	Horizontal Throw	10-5	14-7	17-8	21-10	24-12	28-14	31-15	34-17	38-19	41-20
Ak 1.11	Noise Criteria	-	<20	20	25	30	30	35	40	45	45
24 x 12	CFM	405	540	675	810	945	1080	1215	1350	1485	1620
	Total Pressure	.008	.014	.022	.031	.043	.054	.071	.086	.104	.122
Ak 1.35	Horizontal Throw	11-6	15-7	19-9	23-11	27-13	30-15	34-17	38-19	42-21	46-22
	Noise Criteria	-	<20	20	25	30	35	35	40	45	>45
30 x 12	CFM	500	670	835	1000	1170	1335	1505	1670	1835	2005
	Total Pressure	.008	.014	.022	.031	.043	.054	.071	.086	.104	.122
Ak 1.67	Horizontal Throw	13-6	17-8	21-10	25-12	29-14	33-16	38-19	42-21	46-23	50-25
	Noise Criteria	-	20	25	30	35	40	40	45	>45	>45

NOTES

1. Total Pressure in inches water column.
2. Throw data are in feet at terminal velocities of 75 and 150 fpm, respectively.
3. Noise Criteria based on a 10 dB room attenuation (Re: 10^{-12} watts).

L Series (Page 70-72)

NOTES:

a. Table 1 based on 4-foot grille length. For longer lengths, correct throw and NC per table 2.

b. When using continuous grille lengths with alternate active and inactive sections, a reduction in throw can be obtained by omitting the factors contained in Table 2.

c. Bar style 30 and 01
Increase Table 1 NC + 5 NC

d. Supply air temperature effect on horizontal throw is shown in Table 3. vertical down-throw at varying supply temperatures is shown in Table 4.

e. When spreading the air path with a horizontal deflection of 22º per side in grille lengths up to 4 feet:
Multiply Table 1 Throw x .75
Increase Table 1 NC + 5 NC
Multiply Table 1 P_S x 1.20
Multiply Table 5 A_k x .90

f. Terminal velocities (V_t) at the minimum and maximum throw (T) values are rated at 125 fpm and 75 fpm respectively with corresponding room velocities (V_r) of 50 fpm and 35 fpm.

TABLE 1 — SUPPLY AIR

CFM per Foot	Listed Width in Inches	Min. P_S in H_2O		Face Velocity (V_k) FPM		Throw (T) in Feet		Minimum Ceiling Height in Feet		
		Bar Style		Bar Style		Sidewall	Sill			
		00 and 15	30 and 01	00 and 15	30 and 01	Min.-Max.	Min.-Max.	@ -18F Δ T	@ -25F Δ T	NC
20	1-1/2	.01	.01	500	575	6-9	1-2	8	9	< 20
30	1-1/2	.03	.04	750	865	7-10	2-3	9	10	25
	2	.01	.01	475	545	6-9	1-2			20
40	1-1/2	.05	.07	1000	1150	9-13	3-5	9	11	30
	2	.02	.03	635	730	8-11	2-4			25
	2-1/2	.01	.01	460	530	7-10	2-3			20
50	1-1/2	.09	.12	1250	1440	11-16	4-9	9-1/2	11	30
	2	.03	.04	790	910	10-14	3-7			25
	2-1/2	.02	.03	575	660	9-13	2-6			20
	3	< .01	.01	440	505	8-12	2-5			< 20
60	2	.05	.07	950	1090	12-18	5-11	9-1/2	12	30
	2-1/2	.02	.03	690	795	11-16	4-9			25
	3	.01	.01	530	610	10-14	3-7			20
	4	< .01	.01	370	425	8-12	2-5			< 20
70	2	.06	.08	1110	1275	14-20	7-13	10	12	30
	2-1/2	.03	.04	810	935	13-19	6-12			30
	3	.02	.03	660	760	11-16	4-9			25
	4	< .01	.01	435	500	10-14	3-7			< 20
80	2	.08	.10	1275	1450	16-23	9-16	10-1/2	12-1/2	30
	2-1/2	.04	.05	920	1060	15-21	8-14			30
	3	.03	.04	700	805	13-18	6-11			25
	4	.01	.01	495	570	11-16	4-9			20
90	2-1/2	.05	.07	1030	1185	17-24	10-17	11	13	30
	3	.04	.05	785	905	15-21	8-14			30
	4	.01	.02	550	635	13-18	6-11			25
	5	< .01	.01	450	520	11-16	4-9			20
100	2-1/2	.06	.08	1150	1325	19-27	12-20	11	13	30
	3	.04	.05	875	1010	16-23	9-16			30
	4	.02	.03	620	715	14-20	7-13			25
	5	.01	.01	500	575	12-18	5-11			20
120	3	.06	.08	1050	1210	19-28	11-20	11-1/2	13	30
	4	.03	.04	745	855	17-24	9-16			30
	5	.02	.03	600	680	15-22	7-14			25
	6	< .01	.01	480	550	13-19	5-11			20
140	3	.08	.11	1220	1410	22-32	14-24	11-1/2	14	35
	4	.04	.05	870	1000	19-28	11-20			30
	5	.02	.03	700	810	17-25	9-17			25
	6	.01	.01	560	645	15-22	7-14			20
160	4	.05	.07	990	1140	22-32	13-23	12	15	35
	5	.03	.04	800	925	19-29	10-20			30
	6	.02	.03	640	735	18-26	9-17			25
	8	.01	.01	460	530	15-22	6-13			20
180	4	.07	.09	1110	1275	25-36	16-27	12	15	35
	5	.04	.05	900	1035	22-33	13-24			30
	6	.03	.04	725	835	20-30	11-21			25
	8	.02	.03	520	600	17-25	8-16			20
200	4	.08	.11	1240	1425	28-41	-	12	15	40
	5	.05	.07	1000	1150	24-36	-			35
	6	.04	.05	800	925	23-33	-			30
	8	.02	.03	575	665	20-28	-			25
250	5	.08	.11	1250	1440	30-46	-	13	15	40
	6	.05	.07	1000	1150	27-39	-			35
	8	.03	.04	720	830	25-35	-			30
	10	.01	.01	550	635	21-32	-			25
300	6	.07	.09	1200	1375	33-48	-	13	15	40
	8	.04	.05	865	1000	29-42	-			35
	10	.02	.03	665	765	25-39	-			30
	12	.01	.01	545	630	23-33	-			25
350	8	.05	.08	1020	1175	34-48	-	13	15	40
	10	.03	.04	780	900	29-45	-			35
	12	.02	.03	640	735	26-38	-			30
400	8	.08	.11	1170	1350	40-55	-	14	16	45
	10	.04	.05	890	1025	33-50	-			40
	12	.03	.04	730	845	30-44	-			35

SYMBOLS:
V_t Terminal Velocity in FPM
V_r Room Velocity in FPM
V_k Face Velocity in FPM
A_k Outlet area in Sq. Ft.
A_n Neck area in Sq. Ft.
P_s Static Pressure in. H_2O
NC 18db Room Attenuation
T Throw in Feet, see note f.
ΔT Temperature Differential

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TABLE 2 — CONTINUOUS GRILLE LENGTH FACTORS

Modify Table 1 by listed values for grille lengths above 4 feet.

Grille Length	THROW (T) Sidewall Min.-Max.	THROW (T) Sill Min.-Max.	NC
4'-6'	No Change		+ 0
7'-20'	T x 1.10		+ 5
21'-100'	T x 1.15		+ 10

TABLE 3 — SUPPLY AIR TEMPERATURE FACTORS

Multipl Throw in Table 1 (or factor in Table 2 if used) by listed value.

	@-20FΔT	@ 0F Δ T	@+25FΔT
Sidewall Sill	T x 1.0	T x 1.1	T x 1.2

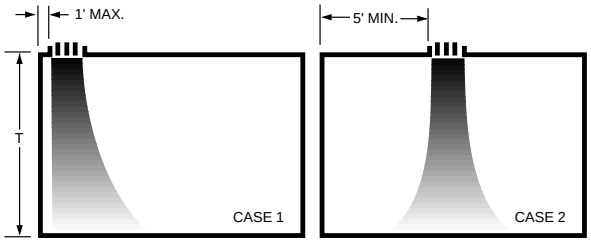
TABLE 4 — VERTICAL DOWN-THROW AND SUPPLY AIR TEMPERATURE FACTORS

Multiply Throw-Sidewall in Table 1 (or factor in Table 2 if used) by listed value.

	@-20FΔT Cooling	@ 0F Δ T Ventilating	@+25FΔT Heating
Case 1	T x 1.0	T x .90	T x .60
Case 2	T x .70	T x .60	T x .40

TABLE 5 — SUPPLY GRILLE AREAS Per Foot of Length

Listed Width in Inches																	
	1-1/2	2	2-1/2	3	4	5	6	8	10	12	14	16	18	20	24	30	36
An	.13	.17	.21	.25	.33	.42	.50	.67	.84	1.0	1.2	1.3	1.5	1.7	2.0	2.5	3.0
00 and 15 Bar Styles																	
Ak	.04	.06	.09	.11	.16	.20	.25	.35	.45	.55	.68	.79	.90	1.0	1.3	1.6	2.1
30 and 01 Bar Styles																	
Ak	.03	.05	.08	.09	.14	.17	.21	.30	.38	.47	.58	.67	.77	.85	1.1	1.4	1.8

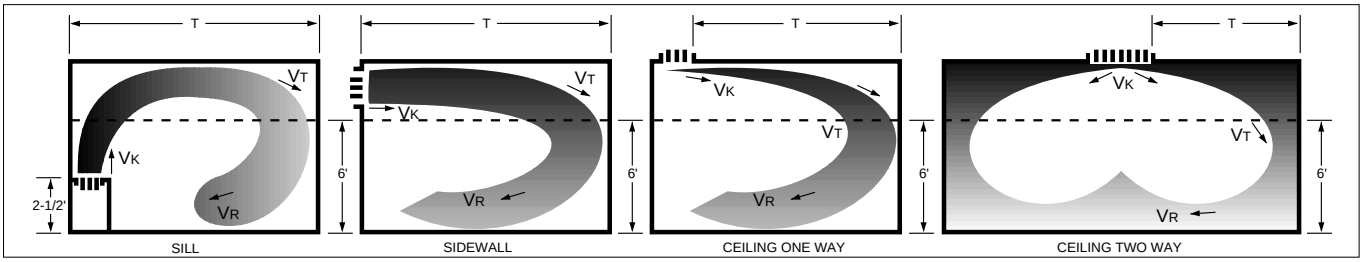


RETURN AIR CFM PER FOOT OF LENGTH

Listed Width in Inches	Ak Area	Bar Style	NC20-25 Non-Ducted -.02"P_S CFM	NC20-25 Non-Ducted -.03"P_S CFM	NC 30 Ducted -.08"P_S CFM	NC 30 Ducted -.10"P_S CFM	NC 35-40 Ducted -.15"P_S CFM	NC 35-40 Ducted -.20"P_S CFM
1-1/2	.13	00 15	20	25	40	45	55	65
	.12	01 30	15	20	35	40	45	55
2	.18	00 15	30	40	65	70	90	100
	.17	01 30	25	35	55	60	75	85
2-1/2	.23	00 15	45	50	85	95	115	135
	.22	01 30	35	45	70	80	100	115
3	.27	00 15	55	65	105	120	145	165
	.25	01 30	45	55	90	100	120	140
4	.34	00 15	75	90	150	165	205	235
	.33	01 30	60	75	125	140	170	195
5	.41	00 15	95	120	190	215	260	305
	.39	01 30	80	100	160	180	220	255
6	.46	00 15	120	145	240	265	325	375
	.44	01 30	100	120	200	220	270	315
8	.57	00 15	160	200	325	360	445	515
	.54	01 30	135	165	270	305	370	430
10	.68	00 15	210	255	415	465	570	655
	.64	01 30	175	215	350	390	475	550
12	.76	00 15	255	310	510	565	695	800
	.72	01 30	210	260	425	475	580	670
16	.93	00 15	350	430	700	785	960	1100
	.86	01 30	285	350	570	635	780	900
20	1.1	00 15	445	545	885	990	1220	1410
	1.0	01 30	365	445	730	815	1000	1160
24	1.25	00 15	540	660	1080	1210	1475	1710
	1.15	01 30	440	540	880	985	1200	1390

NC re 18db Room Attenuation

S Series (Page 73-77)



Type 50 1/2" Slot TABLE 1—SUPPLY AIR

CFM Per Foot in Direction of T	No. of Slots	Min. P_S in. H_2O	Outlet Velocity (V_k) FPM	Throw (T) in Feet			Minimum Ceiling Height in Feet		NC
				Ceiling	Sidewall	Sill	@ - 18F	@ - 25F	
				Min.-Max.	Min.-Max.	Min.-Max.	ΔT	ΔT	
10	1	.02	500	5-7	3-5	1-2	7-1/2	9	< 20
	2	< .01	335	4-6	2-4	1-2			< 20
20	1	.08	1000	10-13	8-11	1-3	8	9	20
	2	.02	670	8-11	6-9	2-3			< 20
	3	.01	400	6-9	4-7	1-2			< 20
30	1	.08	1500	11-16	10-14	4-6	9	10	25
	2	.05	1000	10-14	8-12	3-4			20
	3	.02	600	8-11	6-9	2-3			< 20
	4	.01	430	7-9	5-7	1-2			< 20
40	2	.08	1330	13-17	11-15	4-6	9	11	25
	3	.04	800	10-14	8-12	3-5			20
	4	.02	570	9-12	7-10	2-3			20
	5	.01	445	8-11	6-9	2-3			< 20
50	3	.06	1000	11-15	9-13	4-6	9-1/2	11	25
	4	.03	710	10-14	8-12	3-4			20
	5	.02	560	9-13	7-11	2-4			20
	6	.01	500	8-12	7-10	1-3			< 20
60	3	.08	1200	13-17	11-15	5-8	9-1/2	12	25
	4	.05	855	12-16	10-14	4-7			25
	5	.03	670	11-15	9-13	3-6			20
	6	.02	600	10-14	8-12	3-5			< 20
	7	.01	500	9-13	7-11	2-4			< 20
70	3	.12	1400	15-20	13-18	6-11	10	12	25
	4	.06	1000	13-18	11-16	5-9			25
	5	.04	780	12-16	10-14	4-7			20
	6	.03	700	11-15	9-13	3-6			20
	7	.02	580	10-15	8-13	2-5			20
80	4	.08	1140	14-20	12-18	6-11	10-1/2	12-1/2	25
	5	.05	890	13-19	11-17	5-10			25
	6	.04	800	13-18	11-16	5-9			25
	7	.03	670	13-17	11-15	4-8			20
	8	.02	570	12-16	10-14	3-7			20
90	4	.10	1280	17-24	15-21	8-14	11	13	30
	5	.07	1000	16-22	14-20	7-13			25
	6	.05	900	16-21	14-19	7-12			25
	7	.04	750	15-20	13-18	6-11			25
	8	.03	640	14-18	12-16	5-9			20
	9	.02	600	13-17	11-15	4-8			20
100	5	.09	1120	18-25	16-22	9-15	11	13	25
	6	.06	1000	17-24	15-21	8-14			25
	7	.05	830	16-23	14-20	7-13			25
	8	.03	710	14-20	12-18	6-11			20
	9	.03	670	13-19	11-17	5-10			20
	10	.02	590	12-18	10-16	5-10			< 20
120	6	.09	1200	19-27	17-24	10-16	11-1/2	13	30
	7	.07	1000	18-25	16-23	8-15			25
	8	.05	860	17-25	15-22	7-14			25
	9	.04	800	16-24	14-21	6-13			20
	10	.03	705	15-22	13-19	5-11			20
140	7	.10	1170	20-30	18-27	10-19	11-1/2	14	25
	8	.06	1000	19-28	17-25	9-17			25
	9	.05	930	18-27	16-24	8-16			20
	10	.04	825	17-25	15-22	7-14			20
160	8	.08	1140	21-32	19-29	10-20	12	15	25
	9	.07	1070	20-30	18-27	9-18			25
	10	.05	940	19-28	17-25	8-17			20
180	8	.10	1280	24-35	21-31	12-22	12	15	30
	9	.08	1200	23-34	20-30	11-21			25
	10	.07	1060	22-32	19-29	10-20			25
200	9	.10	1335	25-39	22-35	-	12	15	30
	10	.08	1175	24-37	21-33				25

Outlet velocity (Vk) FPM										
500	600	700	800	900	1000	1200	1400	1600	1800	2000
Total Pressure (Pt) inches H_2O										
.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25

SYMBOLS:
V_t Terminal Velocity in FPM
V_r Room Velocity in FPM
V_k Face Velocity in FPM
A_k Outlet area in Sq. Ft.
A_n Neck area in Sq. Ft.
P_s Static Pressure in. H20
NC 18db Room Attenuation
T Throw in Feet, see note f.
ΔT Temperature Differential

S Series (Page 73-77)

Type 75 3/4" Slot
TABLE 1—SUPPLY AIR

CFM Per Foot in Direction of T	No. of Slots	Min. P_S in. H_2O	Outlet Velocity (V_K) FPM	Throw (T) in Feet			Minimum Ceiling Height in Feet		NC
				Ceiling	Sidewall	Sill	@ - 18F	@ - 25F	
				Min.-Max.	Min.-Max.	Min.-Max.	ΔT	ΔT	
10	1	.01	335	4-6	2-4	1-2	7-1/2	9	< 20
20	1	.04	670	8-11	6-9	2-3	8	9	20
	2	< .01	400	6-9	4-7	1-2			< 20
30	1	.09	1000	10-14	8-12	3-4	9	10	25
	2	.02	600	8-11	6-9	2-3			20
	3	< .01	430	7-9	5-7	1-2			< 20
40	1	.16	1340	13-17	11-15	4-6	9	11	30
	2	.04	800	10-14	8-12	3-4			25
	3	.02	575	9-12	7-10	2-3			20
	4	.01	445	8-11	6-9	2-3			< 20
50	2	.06	1000	11-15	9-13	4-6	9-1/2	11	25
	3	.03	715	10-14	8-12	3-4			20
	4	.02	555	9-13	7-11	2-4			< 20
	5	< .01	415	7-12	6-10	2-3			< 20
60	2	.09	1200	13-17	11-15	5-8	9-1/2	12	30
	3	.04	860	12-16	10-14	4-7			25
	4	.02	665	11-15	9-13	3-6			20
	5	.01	500	9-13	7-11	3-4			< 20
70	2	.13	1400	15-20	13-18	6-11	10	12	30
	3	.06	1000	13-18	11-16	5-9			25
	4	.03	775	12-16	10-14	4-7			20
	5	.02	585	10-15	8-13	3-5			< 20
	6	.01	500	9-14	7-12	2-5			< 20
80	3	.07	1140	14-20	12-18	6-11	10-1/2	12-1/2	30
	4	.04	885	13-19	11-17	5-10			25
	5	.03	665	13-17	11-15	4-8			20
	6	.02	575	12-16	10-14	3-7			< 20
	7	< .01	500	11-15	9-13	3-6			< 20
90	3	.09	1290	17-24	15-21	8-14	11	13	30
	4	.05	1000	16-22	14-20	7-13			25
	5	.03	750	15-20	13-18	6-11			20
	6	.02	645	14-18	12-16	5-9			20
	7	.01	560	13-17	11-15	4-8			< 20
100	3	.13	1430	19-26	17-23	10-16	11	13	35
	4	.06	1110	18-25	16-22	9-15			30
	5	.04	830	16-23	14-20	7-13			25
	6	.03	715	14-20	12-18	6-11			20
	7	.02	630	13-19	11-17	5-10			< 20
120	4	.09	1330	19-27	17-24	10-16	11-1/2	13	30
	5	.06	1000	18-26	16-23	8-15			25
	6	.04	860	17-25	15-22	7-14			20
	7	.03	750	16-23	14-20	6-12			20
	8	.02	630	15-20	13-18	5-10			< 20
140	5	.08	1170	20-30	18-27	10-19	11-1/2	14	30
	6	.06	1000	19-28	17-25	9-17			25
	7	.04	875	18-26	16-23	8-15			25
	8	.03	740	16-24	14-21	6-13			20
	9	.02	665	15-21	13-19	5-11			< 20
160	6	.07	1150	21-32	19-29	10-20	12	15	25
	7	.05	1000	20-30	18-27	9-18			25
	8	.04	840	18-27	16-24	8-16			20
	9	.03	760	17-26	15-23	6-14			< 20
	10	.02	695	16-25	14-22	5-13			< 20
180	6	.09	1290	24-35	21-31	12-22	12	15	30
	7	.07	1130	23-34	20-30	11-21			30
	8	.05	950	20-31	18-28	9-19			25
	9	.04	860	19-30	17-27	8-18			20
	10	.03	780	18-29	16-26	7-17			< 20
200	6	.11	1440	26-40	23-36	-	12	15	30
	7	.08	1250	25-38	22-34				30
	8	.06	1110	24-36	21-32				25
	9	.05	955	22-33	20-30				25
	10	.04	870	21-31	19-28				20
250	8	.10	1315	26-46	23-41	-	13	15	35
	9	.07	1190	25-42	22-38				30
	10	.06	1085	24-39	21-35				25

S Series (Page 73-77)

Type 10 1" Slot
TABLE 1—SUPPLY AIR

CFM Per Foot in Direction of T	No. of Slots	Min. P_S in. H_2O	Outlet Velocity (V_K) FPM	Throw (T) in Feet			Minimum Ceiling Height in Feet		NC
				Ceiling	Sidewall	Sill	@ - 18F	@ - 25F	
				Min.-Max.	Min.-Max.	Min.-Max.	ΔT	ΔT	
20	1	.02	500	6-8	4-7	1-2	8	9	20
30	1	.03	750	9-13	7-10	2-3	9	10	20
	2	02	500	7-9	5-7	1-2			20
40	1	.06	1000	10-14	9-14	4-6	9	11	25
	2	.03	670	8-10	6-9	2-3			20
50	1	.09	1250	12-15	10-14	3-5	9-1/2	11	31
	2	.04	835	10-14	8-12	3-4			20
	3	.02	555	9-11	7-10	2-3			20
60	2	.06	1000	18-15	9-13	4-6	9-1/2	12	30
	3	.03	665	10-13	7-11	2-4			20
	4	.02	500	8-11	6-9	2-3			20
70	2	.09	1165	13-17	11-15	5-8	10	12	30
	3	.04	780	11-16	9-14	4-6			25
	4	.02	585	10-14	7-11	3-4			20
80	2	.11	1335	15-19	14-17	6-10	10-1/2	12-1/2	35
	3	.05	890	12-17	10-14	4-7			25
	4	.03	665	10-14	8-12	3-5			20
	5	.02	533	9-13	7-11	2-4			20
90	3	.06	1000	14-19	11-17	5-10	11	13	30
	4	.04	750	13-18	11-15	4-8			20
	5	.02	600	12-16	10-14	3-7			20
	6	.02	500	11-15	9-13	3-6			20
100	3	.08	1110	16-21	14-20	7-12	11	13	30
	4	.04	835	15-20	13-28	6-11			25
	5	.03	665	14-18	12-16	5-9			20
	6	.02	555	13-17	11-15	4-8			20
120	3	.11	1335	18-25	16-22	8-13	11-1/2	13	35
	4	.06	1000	17-24	15-20	7-13			30
	5	.04	800	16-23	14-21	6-12			25
	6	.03	665	15-21	13-19	5-11			20
	7	.02	570	14-20	12-17	4-10			20
140	4	.09	1165	18-25	16-21	8-15	11-1/2	14	30
	5	.05	935	18-26	16-22	8-14			30
	6	.04	780	17-25	15-22	7-14			25
	7	.03	665	16-23	14-20	6-12			20
	8	.02	585	15-20	13-20	5-10			20
160	4	.11	1335	19-27	17-24	10-16	12	15	35
	5	.07	1065	18-26	16-23	8-15			30
	6	.05	890	17-25	15-22	7-14			25
	7	.04	760	16-23	14-20	6-12			25
	8	.03	665	15-20	13-18	5-10			20
	9	.02	590	14-19	12-17	4-9			20
180	5	.09	1200	20-30	18-27	10-19	12	15	35
	6	.06	1000	19-28	17-25	9-17			30
	7	.05	850	18-26	16-23	8-15			25
	8	.04	750	16-24	14-21	6-13			20
	9	.03	665	15-21	13-19	5-11			20
	10	.02	600	14-19	12-18	4-10			20
200	5	.11	1335	23-33	20-30	12-21	12	15	35
	6	.08	1110	21-32	19-29	10-20			30
	7	.06	950	20-31	18-27	9-18			30
	8	.04	835	18-27	16-24	8-16			25
	9	.03	740	17-26	15-23	6-14			20
	10	.03	665	16-25	14-22	5-10			20
250	6	.12	1390	24-35	21-31	-	13	15	35
	7	.09	1190	23-34	20-30				35
	8	.07	1040	21-32	19-28				30
	9	.05	925	20-31	18-27				25
	10	.04	833	19-30	17-26				25
300	7	.13	1430	25-40	23-35	-	13	16	35
	8	.10	1250	24-36	22-32				35
	9	.08	1110	23-34	20-30				30
	10	.06	1000	22-32	19-28				30
350	8	.13	1460	27-47	24-43	-	14	16	40
	9	.11	1300	26-45	23-41				35
	10	.09	1165	25-42	22-39				30

S Series (Page 73-77)

NOTES:

a. Table 1 based on 4-foot diffuser length. For longer lengths, correct throw and NC per Table 2.

b. For 2-way ceiling throw, proportion cfm and number of slots in each direction of T and select from 1-way data, Table 1.

c. When using continuous diffuser lengths with alternate active and inactive sections, a reduction in throw can be obtained by omitting the factors contained in Table 2.

d. P_S constant for horizontal 1-way, 2-way and vertical pattern adjustment.

e. Supply air temperature effect on horizontal throw is shown in Table 3. Vertical throw at varying supply air temperatures is shown in Table 4.

f. Terminal velocities (V_t) at the minimum and maximum throw (T) positions are rated at 150 fpm and 100 fpm respectively with corresponding room velocities (V_r) of 50 fpm and 35 fpm.

TABLE 2—CONTINUOUS DIFFUSER LENGTH FACTORS

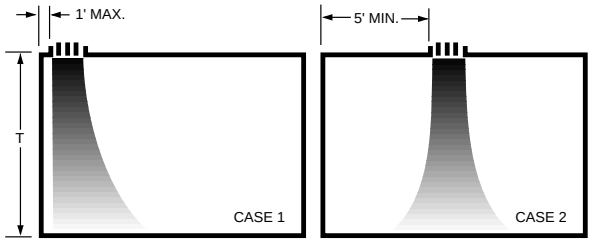
Modify Table 1 by factors for diffuser lengths above 4 feet.				
	THROW (T)			
Diffuser Length	Ceiling Min.-Max.	Sidewall Min.-Max.	Sill Min.-Max.	NC
4'-6'	No Change			+ 0
7'-20'	T x 1.10			+ 5
21'-100'	T x 1.15			+ 10

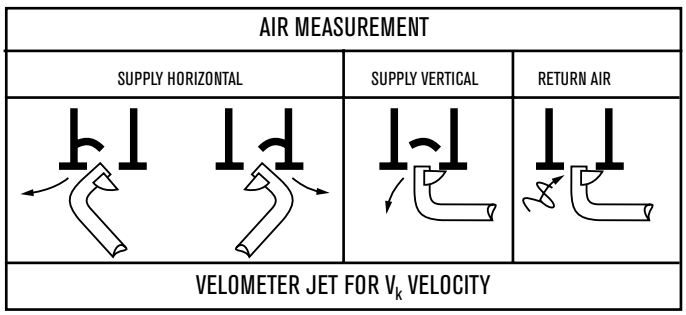
TABLE 3—SUPPLY AIR TEMPERATURE FACTORS

Multiply Throw in Table 1 (or factor in Table 2 if used) by listed value.			
	@ -20F Δ T	@ 0F Δ T	@ +25F Δ T
Ceiling Sidewall Sill	T x 1.0	T x 1.1	T x 1.2

TABLE 4—VERTICAL DOWN-THROW AND SUPPLY TEMPERATURE FACTORS

Multiply Throw-Sidewall in Table 1 (or factor in Table 2 if used) by listed value.			
	@ -20F Δ T Cooling	@ 0F Δ T Ventilating	@ +25F Δ T Heating
Case 1	T x 1.0	T x .90	T x .60
Case 2	T x .70	T x .60	T x .40





TYPE 50 SUPPLY DIFFUSER AREAS Per Foot of Length

	No. of Slots									
	1	2	3	4	5	6	7	8	9	10
Ak Area	.02	.03	.05	.07	.09	.10	.12	.14	.15	.17
An Area	.08	.17	.25	.33	.42	.50	.58	.67	.75	.84

TYPE 75 SUPPLY DIFFUSER AREAS Per Foot of Length

	No. of Slots									
	1	2	3	4	5	6	7	8	9	10
Ak Area	.03	.05	.07	.09	.12	.14	.16	.19	.21	.23
An Area	.12	.24	.36	.48	.60	.72	.84	.96	1.1	1.2

TYPE 10 SUPPLY DIFFUSER AREAS Per Foot of Length

	No. of Slots									
	1	2	3	4	5	6	7	8	9	10
Ak Area	.04	.06	.09	.12	.15	.18	.21	.24	.27	.30
An Area	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67

Ak constant for horizontal 1-way, 2-way and vertical pattern.
CFM = Ak x length in feet x Vk

TYPE 50 RETURN AIR CFM Per Foot of Length*

No. of Slots	Ak Area	NC 20-25 Application Non-Ducted -.02"Ps CFM	NC 20-25 Application Non-Ducted -.03"Ps CFM	NC 30 Application Ducted -.08"Ps CFM	NC 30 Application Ducted -.10"Ps CFM	NC 35-40 Application Ducted -.15"Ps CFM	NC 35-40 Application Ducted -.20"Ps CFM
1	.03	15	20	30	35	40	45
2	.06	35	45	70	80	95	110
3	.08	55	70	110	125	150	175
4	.11	70	85	140	155	190	220
5	.14	90	110	180	200	245	285
6	.16	110	135	220	245	300	345
7	.20	130	160	260	290	355	410
8	.22	140	170	280	310	385	440
9	.25	165	200	330	370	450	520
10	.28	185	225	370	415	505	585

TYPE 75 RETURN AIR CFM Per Foot of Length*

No. of Slots	Ak Area	NC 20-25 Application Non-Ducted -.02"Ps CFM	NC 20-25 Application Non-Ducted -.03"Ps CFM	NC 30 Application Ducted -.08"Ps CFM	NC 30 Application Ducted -.10"Ps CFM	NC 35-40 Application Ducted -.15"Ps CFM	NC 35-40 Application Ducted -.20"Ps CFM
1	.04	25	35	50	65	75	90
2	.08	50	60	100	110	135	160
3	.12	80	100	160	180	220	250
4	.16	100	120	200	225	275	320
5	.20	130	160	260	295	360	420
6	.24	160	195	320	360	440	510
7	.28	175	215	350	390	475	550
8	.32	200	245	400	445	545	630
9	.36	235	290	470	525	640	740
10	.40	260	320	520	580	710	820

TYPE 10 RETURN AIR CFM Per Foot of Length*

No. of Slots	Ak Area	NC 20-25 Application Non-Ducted -.02"Ps CFM	NC 20-25 Application Non-Ducted -.03"Ps CFM	NC 30 Application Ducted -.08"Ps CFM	NC 30 Application Ducted -.10"Ps CFM	NC 35-40 Application Ducted -.15"Ps CFM	NC 35-40 Application Ducted -.20"Ps CFM
1	.06	35	43	70	80	95	110
2	.11	70	85	140	155	190	220
3	.17	105	130	210	235	285	330
4	.23	140	170	280	310	380	440
5	.28	175	215	350	390	475	550
6	.33	210	255	420	465	570	660
7	.39	245	300	490	545	665	770
8	.44	280	340	560	620	760	880
9	.50	315	385	630	700	855	990
10	.55	350	425	700	775	950	1100

* Capacity based on diffuser without pattern controller. When pattern controller is used, cfm capacities are reduced by 65% at listed Ps, NC, and Ak.

Engineering Data

Drum Louver (Page 78)

6 INCH
Standard Finish: Satin Aluminum

Size	Area	Neck	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
(in x in)	Factors	Area	Velocity Pressure	.007	.010	.015	.025	.030	.040	.052
		(Ft2)	Total Pressure	.039	.065	.100	.147	.194	.254	.330
9x6	.16	.375	CFM	128	160	192	224	256	288	336
			THROW	6-7-13	8-11-14	10-14-23	12-17-26	4-19-29	16-21-32	17-23-35
12x6	.21	.500	CFM	168	210	252	294	336	378	441
			THROW	8-10-18	10-15-24	12-17-27	14-18-30	15-20-33	17-22-37	18-23-41
18x6	.32	.750	CFM	256	320	384	448	512	576	672
			THROW	10-14-23	13-18-30	15-20-34	18-23-38	20- 26-43	23-30-48	25-32–52
24x6	.41	1.000	CFM	328	410	492	574	656	738	861
			THROW	12-17-28	16-21-35	19-25-40	22-29 -45	24-33-51	27-36-56	30-38-61
30x6	.52	1.250	CFM	416	520	624	728	832	936	1092
			THROW	15-20-33	18-24-39	22-28-44	25-32-50	27-37-56	30-40-61	33-43-66
36x6	.62	1.500	CFM	496	620	744	868	992	1116	1302
			THROW	17-23-37	20-26-43	24-30-47	28-35-54	31-40-60	34-44-65	37-46-72
48x6	.83	2.000	CFM	664	830	996	1162	1328	1494	1743
			THROW	20-26-41	23-29-47	26-35-55	32-41-62	36-45-66	40-49-72	44-53-78
60x6	1.05	2.500	CFM	840	1000	1260	1470	1680	1890	2205
			THROW	22-29-45	25-32-52	29-39-61	36-46-70	41-50-79	46-54-86	49-59-96
			NC LEVEL	<30				<35	<40	

Drum Louver (Page 78)

10 INC
Standard Finish: Satin Aluminum

Size	Area	Neck	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
(in x in)	Factors	Area	Velocity Pressure	.007	.010	.015	.025	.030	.040	.052
		(Ft2)	Total Pressure	.039	.065	.100	.147	.194	.254	.330
20x10	.60	1.390	CFM	480	600	720	840	960	1080	1260
			THROW	19-23-33	23-27-40	26-31-46	29-35-53	32-39-58	35-42-64	38-46-69
25x10	.75	1.740	CFM	600	750	900	1050	1200	1350	1575
			THROW	21-24-38	25-29-46	28-34-53	32-38-60	35-42-66	38-46-73	41-50-79
30x10	.90	2.080	CFM	720	900	1080	1260	1440	1620	1890
			THROW	22-25-41	27-31-51	31-36-58	35-41-66	39-46-74	42-50-81	46-54-88
35x10	1.05	2.440	CFM	840	1050	1260	1470	1680	1890	2205
			THROW	22-27-43	27-33-53	32-39-62	37-45-71	41-50-81	45-54-89	49-59-98
40x10	1.20	2.780	CFM	960	1200	1440	1680	1920	2160	2520
			THROW	23-28-47	28-34-58	34-41-69	39-48-79	44-59-88	48-59-96	53-65-105
50x10	1.50	3.470	CFM	1200	1500	1800	2100	2400	2700	3150
			THROW	25-31-52	31-39-63	37-46-74	44-53-82	48-59-91	54-65-100	60-72-110
60x10	1.85	4.170	CFM	1480	1850	2220	2590	2960	3330	3885
			THROW	25-33-59	33-42-73	40-50-84	47-58-95	54-55-108	61-74-118	68-81-128
70x10	2.15	4.860	CFM	1720	2150	2580	3010	3440	3870	4515
			THROW	28-36-62	35-46-78	43-54-93	50-63-108	58-71-123	65-79-135	72-87-147
			NC LEVEL	<30			<35	<40		

*Outlet velocity and Ak based on 15° deflection

Throw data is based on Terminal Velocities of 150 fpm, 100 fpm, and 50 fpm respectively.

THROW-NC-TOTAL PRESSURE are based on 15° blade deflection. For 0° or 30° deflection the following correction factors should be applied to the table values.

NC SOUND DATA COLOR CODE

NC Level less than 30
NC Level less than 35
NC Level less than 40
Data based on 8db room attenuation

	Throw	Total Pressure	NC
0°	1.2	.795	-4
30°	0.8	1.43	+5

NC LESS THAN 30 NC LESS THAN 35 NC LESS THAN 40

See Description of NC Criteria on Page 158.

Drum Louver (Page 78)

12 INCH
Standard Finish: Satin Aluminum

Size	Area	Neck	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
(in x in)	Factors	Area	Velocity Pressure	.007	.010	.015	.025	.030	.040	.052
		(Ft2)	Total Pressure	.039	.065	.100	.147	.194	.254	.330
20x12	.70	1.670	CFM	560	700	840	980	1120	1260	1470
			THROW	10-20-35	18-25-43	23-31-51	26-35-58	29-39-64	33-44-71	36-49-78
30x12	1.05	2.500	CFM	840	1050	1260	1470	1680	1890	2205
			THROW	17-25-42	24-32-53	28-38-63	33-43-72	38-49-81	43-55-90	48-60-99
40x12	1.40	3.330	CFM	1120	1400	1680	1960	2240	2520	2940
			THROW	20-28-49	27-36-62	32-43-74	38-50-86	44-57-97	49-64-107	55-61-120
50x12	1.75	4.160	CFM	1400	1750	2100	2450	2800	3150	3675
			THROW	22-29-56	29-39-71	37-48-85	44-56-99	51-64-117	58-73-127	64-81-138
60x12	2.15	5.000	CFM	1720	2150	2580	3010	3440	3870	4515
			THROW	25-33-61	33-44-78	42-53-94	49-63-110	58-74-125	66-83-140	75-92-155
70x12	2.50	5.830	CFM	2000	2500	3000	3500	4000	4500	5250
			THROW	28-37-68	37-49-87	47-61-107	57-73-125	67-86-142	76-97-160	86-110-180
			NC LEVEL	<30				<35	<40	

Drum Louver (Page 78)

15 INCH
Standard Finish: Satin Aluminum

Size	Area	Neck	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
(in x in)	Factors	Area	Velocity Pressure	.007	.010	.015	.025	.030	.040	.052
		(Ft2)	Total Pressure	.039	.065	.100	.147	.194	.254	.330
15x15	.75	1.560	CFM	600	750	900	1050	1200	1350	1575
			THROW	3-10-28	9-18-36	14-24-36	21-27-50	24-30-56	25-32-58	29-38-69
20x15	1.00	2.080	CFM	800	1000	1200	1400	1600	1800	2100
			THROW	9-17-35	17-24-43	22-28-52	25-32-60	29-37-68	31-40-72	35-44-80
25x15	1.25	2.600	CFM	1000	1250	1500	1750	2000	2250	2625
			THROW	13-21-38	21-26-48	25-32-58	29-38-68	34-43-77	38-48-86	42-54-95
30x15	1.55	3.120	CFM	1240	1550	1860	2170	2480	2790	3255
			THROW	14-23-42	22-28-54	27-35-65	32-41-76	37-47-86	41-54-97	46-59-107
40x15	2.05	4.170	CFM	1640	2050	2460	2870	3280	3690	4305
			THROW	19-25-48	27-35-66	34-43-79	39-50-93	45-58-105	51-65-118	57-72-130
50x15	2.55	5.210	CFM	2040	2550	3060	3570	4080	4590	5355
			THROW	24-30-61	31-40-78	38-48-96	45-58-114	52-66-130	58-75-145	65-83-163
60x15	3.0	6.250	CFM	2400	3000	3600	4200	4800	5400	6300
			THROW	27-34-68	35-46-88	43-58-106	52-68-125	60-79-143	68-89-160	76-100-176
70x15	3.5	7.300	CFM	2800	3500	4200	4900	5600	6300	7350
			THROW	29-38-72	40-51-95	50-64-118	60-76-140	71-89-160	81-101-184	90-112-195
			NC LEVEL	<30				<35	<40	

*Outlet velocity and Ak based on 15° deflection

Throw data is based on Terminal Velocities of 150 fpm, 100 fpm and 50 fpm respectively.

THROW-NC-TOTAL PRESSURE are based on 15° blade deflection. For 0° or 30° deflection the following correction factors should be applied to the table values.

NC LESS THAN 30 NC LESS THAN 35 NC LESS THAN 40

Data based on 8db room attenuation

	Throw	Total Pressure	NC
0°	1.2	.795	-4
30°	0.8	1.43	+5

See Description of NC Criteria on Page 158.

Engineering Data

Stationary Louvers

1530ZC, 1530ZF (Page 80)

FREE AREA IN SQUARE FEET

HEIGHT \ WIDTH	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
12	0.37	0.58	0.80	0.98	1.19	1.41	1.62	1.80	2.02	2.23	2.45	2.63	2.84	3.06	3.27
18	0.60	0.96	1.31	1.60	1.96	2.31	2.66	2.95	3.31	3.66	4.01	4.31	4.66	5.01	5.37
24	0.84	1.33	1.82	2.23	2.72	3.21	3.70	4.11	4.60	5.09	5.58	5.99	6.48	6.97	7.46
30	1.07	1.70	2.33	2.85	3.48	4.11	4.73	5.26	5.89	6.51	7.14	7.66	8.29	8.92	9.55
36	1.31	2.07	2.84	3.48	4.24	5.01	5.77	6.41	7.18	7.94	8.71	9.34	10.11	10.87	11.64
42	1.54	2.45	3.35	4.10	5.00	5.91	6.81	7.56	8.46	9.37	10.27	11.02	11.92	12.83	13.73
48	1.78	2.82	3.86	4.72	5.77	6.81	7.85	8.71	9.75	10.79	11.83	12.70	13.74	14.78	15.82
54	2.01	3.19	4.37	5.35	6.53	7.70	8.88	9.86	11.04	12.22	13.40	14.38	15.56	16.74	17.91
60	2.25	3.56	4.88	5.97	7.29	8.60	9.92	11.02	12.33	13.65	14.96	16.06	17.37	18.69	20.00
66	2.48	3.93	5.39	6.60	8.05	9.50	10.96	12.17	13.62	15.07	16.53	17.74	19.19	20.64	22.10
72	2.72	4.31	5.90	7.22	8.81	10.40	11.99	13.32	14.91	16.50	18.09	19.42	21.01	22.60	24.19
78	2.95	4.68	6.41	7.85	9.58	11.30	13.03	14.47	16.20	17.93	19.65	21.09	22.82	24.55	26.28
84	3.19	5.05	6.92	8.47	10.34	12.20	14.07	15.62	17.49	19.35	21.22	22.77	24.64	26.50	28.37
90	3.42	5.42	7.43	9.10	11.10	13.10	15.10	16.77	18.78	20.78	22.78	24.45	26.45	28.46	30.46

245ZC, 245ZF (Page 81)

FREE AREA IN SQUARE FEET

HEIGHT \ WIDTH	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
12	0.26	0.41	0.56	0.71	0.86	1.01	1.16	1.31	1.46	1.61	1.76	1.91	2.06	2.21	2.36
18	0.45	0.71	0.96	1.22	1.48	1.73	1.99	2.25	2.50	2.76	3.02	3.27	3.53	3.79	4.05
24	0.76	1.20	1.63	2.07	2.50	2.94	3.37	3.81	4.24	4.68	5.11	5.55	5.98	6.42	6.86
30	0.95	1.49	2.03	2.57	3.12	3.66	4.20	4.74	5.29	5.83	6.37	6.91	7.45	8.00	8.54
36	1.14	1.78	2.43	3.08	3.73	4.38	5.03	5.68	6.33	6.98	7.62	8.27	8.92	9.57	10.22
42	1.32	2.08	2.83	3.59	4.35	5.10	5.86	6.61	7.37	8.12	8.88	9.64	10.39	11.15	11.90
48	1.51	2.37	3.23	4.10	4.96	5.82	6.69	7.55	8.41	9.27	10.14	11.00	11.86	12.72	13.59
54	1.70	2.67	3.64	4.60	5.57	6.54	7.51	8.48	9.45	10.42	11.39	12.36	13.33	14.30	15.27
60	1.88	2.96	4.04	5.11	6.19	7.26	8.34	9.42	10.49	11.57	12.65	13.72	14.80	15.87	16.95
66	2.20	3.45	4.71	5.96	7.21	8.47	9.72	10.98	12.23	13.49	14.74	16.00	17.25	18.51	19.76
72	2.38	3.74	5.11	6.47	7.83	9.19	10.55	11.91	13.27	14.64	16.00	17.36	18.72	20.08	21.44
78	2.57	4.04	5.51	6.97	8.44	9.91	11.38	12.85	14.32	15.78	17.25	18.72	20.19	21.66	23.13
84	2.76	4.33	5.91	7.48	9.06	10.63	12.21	13.78	15.36	16.93	18.51	20.08	21.66	23.23	24.81
90	2.94	4.63	6.31	7.99	9.67	11.35	13.04	14.72	16.40	18.08	19.76	21.45	23.13	24.81	26.49

1545ZC, 1545ZF (Page 80)

FREE AREA IN SQUARE FEET

HEIGHT \ WIDTH	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
12	0.30	0.47	0.64	0.79	0.96	1.14	1.31	1.45	1.63	1.80	1.97	2.12	2.29	2.47	2.64
18	0.50	0.79	1.08	1.32	1.61	1.90	2.20	2.44	2.73	3.02	3.31	3.55	3.85	4.14	4.43
24	0.70	1.11	1.52	1.86	2.26	2.67	3.08	3.42	3.83	4.24	4.65	4.99	5.40	5.81	6.21
30	0.90	1.42	1.95	2.39	2.92	3.44	3.97	4.41	4.93	5.46	5.98	6.42	6.95	7.48	8.00
36	1.10	1.74	2.39	2.92	3.57	4.21	4.85	5.39	6.03	6.68	7.32	7.86	8.50	9.14	9.79
42	1.30	2.06	2.82	3.46	4.22	4.98	5.74	6.37	7.14	7.90	8.66	9.29	10.05	10.81	11.58
48	1.50	2.38	3.26	3.99	4.87	5.75	6.63	7.36	8.24	9.12	9.99	10.73	11.61	12.48	13.36
54	1.70	2.70	3.69	4.52	5.52	6.52	7.51	8.34	9.34	10.33	11.33	12.16	13.16	14.15	15.15
60	1.90	3.02	4.13	5.06	6.17	7.28	8.40	9.33	10.44	11.55	12.67	13.60	14.71	15.82	16.94
66	2.10	3.33	4.57	5.59	6.82	8.05	9.28	10.31	11.54	12.77	14.00	15.03	16.26	17.49	18.72
72	2.30	3.65	5.00	6.13	7.47	8.82	10.17	11.29	12.64	13.99	15.34	16.46	17.81	19.16	20.51
78	2.50	3.97	5.44	6.66	8.12	9.59	11.06	12.28	13.74	15.21	16.68	17.90	19.37	20.83	22.30
84	2.71	4.29	5.87	7.19	8.78	10.36	11.94	13.26	14.85	16.43	18.01	19.33	20.92	22.50	24.08
90	2.91	4.61	6.31	7.73	9.43	11.13	12.83	14.25	15.95	17.65	19.35	20.77	22.47	24.17	25.87

445ZC, 445ZF (Page 81)

FREE AREA IN SQUARE FEET

HEIGHT \ WIDTH	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
12	0.33	0.53	0.73	0.93	1.13	1.34	1.54	1.74	1.94	2.07	2.28	2.48	2.68	2.88	3.08
18	0.55	0.89	1.22	1.56	1.90	2.23	2.57	2.91	3.25	3.47	3.81	4.25	4.48	4.82	5.16
24	0.82	1.32	1.82	2.32	2.82	3.32	3.82	4.32	4.83	5.16	5.66	6.16	6.66	7.16	7.67
30	1.04	1.67	2.31	2.95	3.58	4.22	4.86	5.49	6.13	6.56	7.19	7.83	8.47	9.10	9.74
36	1.30	2.10	2.90	3.71	4.51	5.31	6.11	6.91	7.71	8.24	9.05	9.85	10.65	11.45	12.25
42	1.52	2.46	3.40	4.33	5.27	6.21	7.14	8.08	9.02	9.64	10.58	11.51	12.45	13.39	14.32
48	1.79	2.89	3.99	5.09	6.19	7.29	8.39	9.49	10.60	11.33	12.43	13.53	14.63	15.73	16.83
54	2.01	3.25	4.48	5.72	6.96	8.19	9.43	10.66	11.90	12.73	13.96	15.20	16.45	17.67	18.91
60	2.28	3.68	5.08	6.48	7.88	9.28	10.68	12.08	13.48	14.41	15.81	17.22	18.62	20.02	21.42
66	2.50	4.03	5.57	7.10	8.64	10.18	11.71	13.25	14.79	15.81	17.35	18.88	20.42	21.95	23.49
72	2.76	4.46	6.16	7.86	9.56	11.26	12.97	14.67	16.37	17.50	16.20	20.99	22.60	24.30	26.00
78	2.98	4.82	6.66	8.49	10.33	12.16	14.00	15.84	17.67	18.90	20.73	22.57	24.40	26.24	28.07
84	3.25	5.25	7.25	9.25	11.25	13.25	15.25	17.25	19.25	20.58	22.58	24.48	26.58	28.58	30.58
90	3.47	5.61	7.74	9.88	12.01	14.15	16.28	18.42	20.56	21.98	24.12	26.25	28.39	30.52	32.66

Adjustable Louvers

4 ABC (Page 81)

FREE AREA IN SQUARE FEET

HEIGHT \ WIDTH	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
12	0.24	0.38	0.53	0.67	0.82	0.96	1.11	1.25	1.40	1.54	1.68	1.83	1.97	2.12	2.26
18	0.42	0.68	0.93	1.19	1.45	1.17	1.96	2.22	2.48	2.73	2.99	3.25	3.51	3.76	4.02
24	0.55	0.88	1.22	1.55	1.88	2.22	2.55	2.89	3.22	3.56	3.89	4.23	4.56	4.89	5.23
30	0.76	1.23	1.69	2.16	2.62	3.09	3.55	4.02	4.48	4.95	5.41	5.88	6.34	6.81	7.27
36	0.93	1.49	2.06	2.62	3.19	3.76	4.32	4.89	5.45	6.02	6.58	7.15	7.72	8.28	8.85
42	1.11	1.79	2.47	3.15	3.83	4.51	5.19	5.87	6.55	7.23	7.91	8.59	9.27	9.95	10.63
48	1.30	2.09	2.88	3.67	4.46	5.26	6.05	6.84	7.63	8.42	9.22	10.01	10.80	11.59	12.38
54	1.42	2.29	3.16	4.03	4.90	5.77	6.64	7.51	8.38	9.25	10.11	10.98	11.85	12.73	13.59
60	1.64	2.64	3.64	4.64	5.64	6.64	7.64	8.64	9.64	10.64	11.64	12.64	13.64	14.64	15.64
66	1.80	2.90	4.00	5.10	6.20	7.30	8.40	9.51	10.61	11.71	12.81	13.91	15.01	16.11	17.21
72	1.99	3.20	4.42	5.63	6.84	8.06	9.27	10.49	11.70	12.92	14.15	15.34	16.56	17.77	18.99
78	2.17	3.50	4.82	6.15	7.48	8.80	10.13	11.46	12.78	14.11	15.44	16.76	18.09	19.42	20.74
84	2.30	3.70	5.11	6.51	7.91	9.32	10.72	12.13	13.53	14.93	16.34	17.74	19.14	20.55	21.95
90	2.51	4.05	5.58	7.12	8.65	10.19	11.72	13.25	14.79	16.32	17.86	19.39	20.93	22.46	24.00
96	2.68	4.31	5.95	7.58	9.22	10.85	12.49	14.12	15.76	17.39	19.03	20.67	22.30	23.94	25.57

659T/659TI/PFT/PFTI Series Performance (Page 83, 86)

AVE. FACE VEL. FPM		300	400	500	600	700	800
659-T	cfm	730	975	1220	1465	1710	1950
Ak 2.44	-Ps	.017	.030	.047	.067	.090	.120
PFT	cfm	820	1095	1370	1645	1920	2190
Ak 2.74	-Ps	.028	.050	.078	.113	.152	.200
659-TI							
w/12" colllar	cfm	670	890	1115	1340	1560	1785
Ak 2.23	-Ps	.084	.147	.230	.330	.450	.590
w/14" collar	cfm	680	905	1130	1355	1580	1810
Ak 2.26	-Ps	.060	.105	.165	.240	.330	.420
w/ 16" collar	cfm	695	930	1160	1390	1625	1855
Ak 2.32	-Ps	.039	.068	.106	.155	.210	.275
PFTI							
w/12" collar	cfm	770	1025	1280	1535	1790	2050
Ak 2.32	-Ps	.098	.170	.265	.380	.520	.680
w/14" collar	cfm	775	1035	1295	1555	1815	2070
Ak 2.59	-Ps	.076	.125	.200	.283	.390	.510
w/16" collar	cfm	790	1050	1315	1580	1840	2105
Ak 2.63	-Ps	.055	.094	.145	.210	.285	.350

Note: Filter grille performance limited by filter capacity rating. 2 cfm per square inch of gross filter area is typical.

96AFBT/96AFBTI (Page 84, 85)

		Static Pressure (in W.C.)	-0.024	-0.042	-0.065	-0.094	-0.128
		Total Pressure (in W.C.)	-0.018	-0.032	-0.050	-0.072	-0.098
SIZE	Ak (Sq. Ft.)	Face Velocity (fpm)	300	400	500	600	700
20x20	1.75	cfm	524	698	873	1048	1222

T-Bar Return Air Grilles & Filter Grilles (Page 85-88)

		Average Face Velocity FPM							
Type & Size		300	400	500	600	700	800	900	1000
RE5T/RE5TI									
22 X 22	cfm	725	970	1210	1450	1695	1935	2180	2420
Ak 2.42	-Ps	.004	.006	.010	.014	.020	.025	.031	.040
46 x 22	cfm	1520	2024	2530	3035	3540	4050	4550	5060
Ak 5.06	-Ps	.003	.006	.010	.012	.018	.024	.029	.036
RH45T									
22 x 22	cfm	785	1045	1305	1565	1825	2090	2350	2610
Ak 2.61	-Ps	.015	.030	.043	.062	.084	.120	.140	.170
46 x 22	cfm	1635	2180	2725	3270	3815	4360	4905	5450
Ak 5.46	-Ps	.015	.030	.040	.059	.081	.116	.136	.165
REF5T*									
20 X 20	cfm	600	800	1000	1200	1400	1600	1800	2000
Ak 2.00	-Ps	.003	.006	.010	.014	.019	.024	.030	.037
44 x 20	cfm	1320	1760	2200	2640	3080	3520	3960	4400
Ak 4.40	-Ps	.003	.006	.009	.013	.018	.024	.030	.036
RHF45T*									
20 X 20	cfm	650	870	1085	1300	1520	1735	1955	2170
Ak 2.17	-Ps	.015	.025	.040	.060	.080	.105	.135	.152
44 x 20	cfm	1430	1910	2385	2860	3340	3815	4295	4770
Ak 4.77	-Ps	.015	.024	.039	.058	.078	.103	.132	.148

* Tested without filters. Typical disposable 1 inch filter capacity is 2 CFM per square inch of gross filter area. Recommended velocity is 300-400 FPM. Velocities higher than 500 FPM will decrease filter performance, increase flow resistance, and possibly blow off agglomerates of collected dirt. Velocity measured 1" from face.

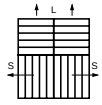
441 & 445 (Page 89)

	Neck Velocity	250	350	450	550	650	750	850	1000	1200
6" Dia.	cfm	50	70	90	110	130	145	165	195	235
	Ps	.004	.009	.014	.021	.029	.036	.046	.065	.094
	NC	x	x	x	x	x	x	x	x	x
Ak .43	444 Throw	3	3.5	4.5	6	7.5	8	9	11	12
Ak .43	*443Trrow	3/4	3.5/5	4.5/6.5	6/8	7.5/10	8/11	9/13	11/15	12/17
Ak .43	44 Throw	4	5	6.5	8	10	11	13	15	17
8" Dia.	cfm	85	120	155	190	225	260	295	350	420
	Ps	.006	.012	.019	.029	.040	.054	.070	.098	.140
	NC	x	x	x	x	21	26	31	34	37
Ak .53	444 Throw	4	5	6.5	8	9.5	11	13	15	17
Ak .53	*443 Trrow	4/5.5	5/7	6.5/9	8/11	95./14	11/16	13/19	15/21	17/23
Ak .53	442 Throw	5.5	7	9	11	14	16	19	21	23
10" Dia.	cfm	135	190	245	300	355	410	465	545	655
	Ps	.009	.017	.028	.043	.069	.078	.102	.140	.205
	NC	x	x	x	22	29	35	38	42	46
Ak .62	444 Throw	4	6	8	10	12	13	15	18	19
Ak .62	*443 Trrow	4/6	6/8	8/11	10/14	12/17	13/19	15/21	18/25	19/26
Ak .62	442 Throw	6	8	11	14	17	19	21	25	26
12" Dia.	cfm	190	245	355	450	530	590	670	785	940
	Ps	.012	.024	.040	.059	.082	.110	.142	.195	.275
	NC	x	x	22	28	35	39	44	47	52
Ak .70	444 Throw	5	7.5	10	11.5	14	16	18	19	20
Ak .70	*443 Trrow	5/8.5	7.5/11	10/14	11.5/17	14/19	16/23	18/25	19/26	20/27
Ak .70	442 Throw	8.5	11	14	17	19	23	25	26	27
14" Dia.	cfm	285	375	480	590	695	800	910	1070	1285
	Ps	.015	.031	.050	.075	.105	.137	.177	.245	.350
	NC	x	21	27	31	36	40	45	48	53
Ak .75	444 Throw	6	9	11	14	17	19	20	22	24
Ak .75	*443 Trrow	6/8.5	9/13	11/16	14/20	17/24	19/26	20/27	22/28	24/29
Ak .75	442 Throw	8.5	13	16	20	24	26	27	28	29

NOTE: The use of a balancing hood is recommended to balance the system. NC is based on 10db room attenuation (Re: 10 - ^{12} watts) ASHRAE 36-72.Terminal velocity of 75 fpm.

442, 443 & 444 SurfAire® (Page 89)

	Neck Velocity	250	350	450	550	650	750	850	1000	1200
6" Dia.	cfm	50	70	90	110	130	145	165	195	235
	Ps	.004	.009	.014	.021	.029	.036	.046	.065	.094
	NC	x	x	x	x	x	23	27	31	35
Ak .43	444 Throw	3	3.5	4.5	6	7.5	8	9	11	12
Ak .43	*443 Trrow	3/4	3.5/5	4.5/6.5	6/8	7.5/10	8/11	9/13	11/15	12/17
Ak .43	442 Throw	4	5	6.5	8	10	11	13	15	17
8" Dia.	cfm	85	120	155	190	225	260	295	350	420
	Ps	.006	.012	.019	.029	.040	.054	.070	.098	.140
	NC	x	x	x	x	21	26	31	34	37
Ak .53	444 Throw	4	5	6.5	8	9.5	11	13	15	17
Ak .53	*443 Trrow	4/5.5	5/7	6.5/9	8/11	9.5./14	11/16	13/19	15/21	17/23
Ak .53	442 Throw	5.5	7	9	11	14	16	19	21	23
10" Dia.	cfm	135	190	245	300	355	410	465	545	655
	Ps	.009	.017	.028	.043	.069	.078	.102	.140	.205
	NC	x	x	x	22	29	35	38	42	46
Ak .62	444 Throw	4	6	8	10	12	13	15	18	19
Ak .62	*443 Trrow	4/6	6/8	8/11	10/14	12/17	13/19	15/21	18/25	19/26
Ak .62	442 Throw	6	8	11	14	17	19	21	25	26
12" Dia.	cfm	190	245	355	450	530	590	670	785	940
	Ps	.012	.024	.040	.059	.082	.110	.142	.195	.275
	NC	x	x	22	28	35	39	44	47	52
Ak .70	444 Throw	5	7.5	10	11.5	14	16	18	19	20
Ak .70	*443 Trrow	5/8.5	7.5/11	10/14	11.5/17	14/19	16/23	18/25	19/26	20/27
Ak .70	442 Throw	8.5	11	14	17	19	23	25	26	27
14" Dia.	cfm	285	375	480	590	695	800	910	1070	1285
	Ps	.015	.031	.050	.075	.105	.137	.177	.245	.350
	NC	x	21	27	31	36	40	45	48	53
Ak .75	444 Throw	6	9	11	14	17	19	20	22	24
Ak .75	*443 Trrow	6/8.5	9/13	11/16	14/20	17/24	19/26	20/27	22/28	24/29
Ak .75	442 Throw	8.5	13	16	20	24	26	27	28	29



*443 throw S/L

REN4 (Page 89)

	Neck Velocity	180	220	300	350	400	450	500	580	650	700
6" Dia.	cfm	35	45	60	70	80	90	100	115	130	135
Ak .43	Ps	.002	.003	.004	.006	.008	.010	.012	.015	.020	.022
	NC	x	x	x	x	x	x	20	22	26	30
	Throw	3	3.5	4.5	5.5	6.5	7.5	8	9	11	11
8" Dia.	cfm	65	75	105	120	140	155	175	200	225	245
Ak .53	Ps	.002	.003	.006	.008	.010	.013	.016	.021	.027	.032
	NC	x	x	x	x	x	22	25	30	35	38
	Throw	4	5	6	7	8.5	9.5	11	12	13	15
10" Dia.	cfm	100	120	165	190	220	245	275	315	355	380
Ak .62	Ps	.003	.005	.009	.011	.015	.019	.024	.031	.040	.045
	NC	x	x	x	x	20	23	27	33	35	39
	Throw	4	5.5	7	8	9.5	11	12	13	15	16
12" Dia.	cfm	140	175	235	275	315	355	39/5	455	510	550
Ak .70	Ps	.005	.007	.013	.018	.023	.029	.036	.048	.061	.071
	NC	x	x	x	x	21	24	27	33	36	40
	Throw	4.5	5.5	7	8	10	11	12	14	15	17
14" Dia.	cfm	190	235	320	375	430	480	535	620	695	750
Ak .75	Ps	.007	.011	.020	.027	.036	.044	.055	.074	.094	.107
	NC	x	x	x	x	20	24	28	32	35	40
	Throw	4.5	5.5	7	8.5	10	11	12	14	16	17

Note: The use of a balancing hood is recommended to balance the system. NC is based on 10 db room attenuation (Re: 10 - ^{12} watts) ASHRAE 36-72. X=less than 20. Terminal velocity of 75 fpm.

Engineering Data

RENPS, PDS (Page 90, 94)

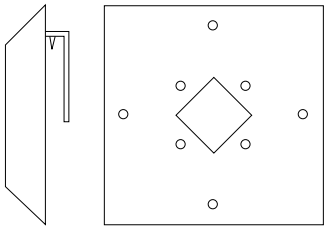
	Neck Velocity	300	400	500	600	700	800	900	1000	1100
6" Dia.	cfm	60	80	100	120	140	160	180	200	220
An .20	Ps	.008	.011	.017	.024	.032	.042	.054	.066	.080
	NC	x	x	x	x	24	27	32	36	38
	Throw	1	2	3	3	4	4	5	5	6
8" Dia.	cfm	110	140	175	210	245	280	310	350	385
An .35	Ps	.008	.011	.017	.024	.034	.043	.054	.068	.083
	NC	x	x	x	20	24	27	30	34	38
	Throw	2	3	4	4	5	6	7	8	8.5
10" Dia.	cfm	165	220	270	325	385	430	490	550	600
An .54	Ps	.008	.012	.017	.024	.032	.043	.056	.068	.082
	NC	x	x	20	24	29	33	36	39	42
	Throw	2	3	4	5	5	6	7	8	9
12" Dia.	cfm	230	310	390	470	550	610	700	780	870
An .78	Ps	.009	.016	.026	.037	.050	.065	.080	.100	.125
	NC	x	x	20	23	26	31	34	37	40
	Throw	3	4	5	6	7	8	9	10	11
14" Dia.	cfm	315	430	535	640	750	855	960	1090	1200
An 1.07	Ps	.009	.016	.026	.037	.050	.065	.083	.125	.150
	NC	x	20	25	30	35	39	43	45	48
	Throw	3	5	6	7	8	9	10	11	12

Note: The use of a balancing hood is recommended to balance the system.

NC is based on 10 db room attenuation (Re: 10^{-12} watts) ASHRAE 36-72. X=less than 20.

Terminal velocity of 75 fpm.

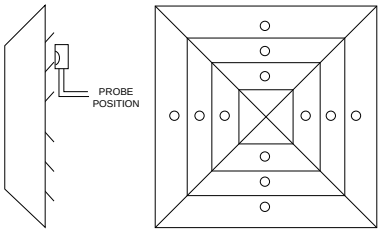
Probe Position: The probe is held 1 inch in from the outer edge of the diffuser, flush with the face.

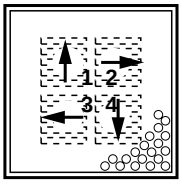


HVS, FPD, FPD3 (Page 91)

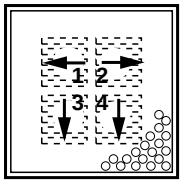
	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
6"	cfm	80	100	120	135	155	175	195	235	275	315
An .20	Ps	.008	.012	.017	.021	.028	.035	.043	.063	.086	.112
Ak .78	NC	x	x	x	x	x	x	20	25	30	35
	Throw	2	3	3	3.5	4	4.5	5	6	7	8
8"	cfm	140	175	210	245	280	315	350	420	490	560
An .35	Ps	.010	.015	.022	.029	.038	.049	.060	.086	.117	.150
Ak .92	NC	x	x	x	x	20	25	30	35	35	40
	Throw	3.5	4.5	5.5	6.5	7	8	9	10.5	12.5	14.5
10"	cfm	220	270	325	380	435	490	545	655	765	870
An .54	Ps	.014	.021	.030	.041	.054	.068	.084	.122	.167	.212
Ak 1.20	NC	x	x	x	20	25	30	35	35	40	45
	Throw	5.5	7	8.5	10	11	12.5	14	17	19.5	22
12"	cfm	315	390	470	550	630	705	785	940	1100	1255
An .78	Ps	.015	.023	.033	.045	.060	.072	.094	.132	.180	.230
Ak 1.65	NC	x	x	20	25	30	35	35	40	45	45
	Throw	6	7.5	9	10.5	12	13.5	15	18	21	24
14"	cfm	430	535	640	750	855	960	1070	1285	1500	1710
An 1.07	Ps	.023	.036	.051	.071	.093	.115	.140	.205	.277	.350
Ak 2.06	NC	x	x	20	25	30	35	40	40	45	45
	Throw	6.5	8	9.5	11.5	13	14.5	16	19	22.5	25

Terminal velocity of 75 fpm.
An = neck area in sq. feet.

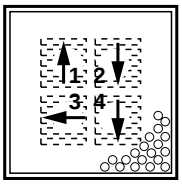




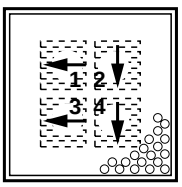
Four-Way (Short Throw)
- For throw in all four directions, use short throw data.



Three-Way (Short Throw)
- For throw in all three directions, use short throw data.



Three-Way (Long & Short)
- For throw in the #2 & #4 direction use long throw data.
- For throw in the #1 & #3 directions, use short throw data.

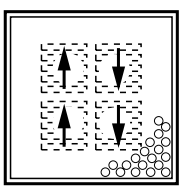


Two-Way Corner (Long & Short)
- For throw in the #2 & #4 direction use long throw data.
- For throw in the #1 & #3 directions, use short throw data.

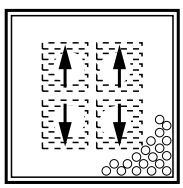
SBP (Page 93)

	Neck Velocity	300	400	500	600	700	800	900	1000	1200	1400
	Velocity Pressure	0.006	0.010	0.016	0.022	0.031	0.040	0.051	0.062	0.090	0.122
6" Dia.	Cfm	60	80	100	120	140	160	180	200	240	280
	Total Pressure	0.005	0.008	0.013	0.025	0.025	0.032	0.041	0.050	0.027	0.098
	Short Horizontal Throw	2-1-1	2-1-1	3-1-1	3-2-1	4-2-1	4-2-1	5-2-2	5-3-2	6-3-2	7-4-2
	Long Horizontal Throw	3-1-1	4-2-1	5-2-2	6-3-2	7-3-2	8-4-3	9-4-3	10-5-3	12-6-4	14-7-5
	Noise Criteria	<20	<20	<20	<20	<20	22	24	26	31	37
8" Dia.	Cfm	105	140	175	210	245	280	315	350	420	490
	Total Pressure	0.009	0.015	0.024	0.034	0.046	0.061	0.077	0.095	0.136	0.185
	Short Horizontal Throw	3-1-1	4-2-1	5-2-2	6-4-3	7-3-2	8-4-3	9-4-3	10-5-3	12-6-4	14-7-5
	Long Horizontal Throw	5-3-2	7-4-2	9-5-3	11-5-4	13-6-4	15-7-5	16-8-5	18-9-6	22-11-7	25-13-8
	Noise Criteria	<20	<20	<20	<20	20	25	30	34	39	44
10" Dia.	Cfm	165	220	275	330	385	440	495	550	660	770
	Total Pressure	0.013	0.023	0.036	0.052	0.071	0.092	0.117	0.144	0.208	0.283
	Short Horizontal Throw	5-2-2	6-3-2	8-4-3	10-5-3	11-6-4	13-6-4	14-7-5	16-8-5	19-10-6	23-11-8
	Long Horizontal Throw	9-5-3	12-6-4	15-8-5	18-9-6	21-11-7	24-12-8	27-14-9	30-15-10	36-18-12	42-21-14
	Noise Criteria	<20	<20	<20	22	25	28	33	36	41	47
12" Dia.	Cfm	240	320	400	480	560	640	720	800	960	1120
	Total Pressure	0.017	0.030	0.047	0.068	0.093	0.121	0.153	0.189	0.273	0.371
	Short Horizontal Throw	7-4-2	10-5-3	12-6-4	15-7-5	17-9-6	20-10-7	22-11-7	25-12-8	30-15-10	35-17-12
	Long Horizontal Throw	14-7-5	19-9-6	23-12-8	28-14-9	33-16-11	37-19-12	42-21-14	47-23-16	56-28-19	65-33-22
	Noise Criteria	<20	<20	21	25	29	32	35	38	44	50
14" Dia.	Cfm	330	440	550	660	770	880	990	1100	1320	1540
	Total Pressure	0.020	0.036	0.057	0.081	0.111	0.145	0.183	0.226	0.326	0.443
	Short Horizontal Throw	11-6-4	15-7-5	18-9-6	22-11-7	26-13-9	29-15-10	33-17-11	37-18-12	44-22-15	52-26-17
	Long Horizontal Throw	21-10-7	28-14-9	34-17-11	41-21-14	48-24-16	55-28-18	62-31-21	69-34-23	83-41-28	97-48-32
	Noise Criteria	<20	<20	25	31	36	40	43	45	48	53

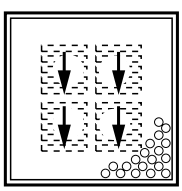
Notes:
1. Tests conducted in accordance with ANSI/ASHRAE 70-1991 at isothermal conditions.
2. Tests conducted with a straight rigid inlet condition. Other inlet conditions may alter performance.
3. Unit of measure: Neck Velocity = fpm; Velocity Pressure = in. w.c. Air Flow Rate = cfm; Total Pressure = in. w.c. Throw = ft at 50, 100, and 150 fpm terminal velocity
4. Noise Criteria (NC) is based upon 10 dB room absorption (Re: 10^{-12} watts) evaluated at 125 thru 4000 Hz octave bands.
5. Flow hoods are recommended for system balancing.



Two-Way (Long Throw)
- For throw in both directions use long throw data.



Two-Way (Short Throw)
- For throw in both directions use short throw data.



One-Way (Long Throw)
- For throw use long throw data.

RFPS (Page 94)

	Neck Velocity	300	400	500	600	700	800	900	1000	1200
6" Dia.	cfm	60	80	100	120	140	160	180	200	235
Ak .20	Ps	.005	.009	.015	.021	.027	.037	.047	.058	.080
	NC	x	x	x	x	21	26	32	34	39
	Throw	1.5	2	2.5	3	3.5	4	4.5	5.5	6.5
8" Dia.	cfm	105	140	175	210	245	280	315	350	420
Ak .35	Ps	.007	.012	.019	.027	.037	.049	.060	.074	.110
	NC	x	x	x	x	22	28	33	36	41
	Throw	2.5	3.5	4.5	5.5	6.5	7	8	9	10.5
10" Dia.	cfm	165	220	270	325	380	435	490	545	655
Ak .54	Ps	.008	.015	.023	.033	.046	.060	.076	.093	.135
	NC	x	x	x	22	27	32	36	39	43
	Throw	3.5	4.5	5.5	6.5	7.5	8.5	9.5	11	13
12" Dia.	cfm	235	315	390	470	550	630	705	785	945
Ak .78	Ps	.010	.018	.027	.039	.053	.070	.088	.110	.160
	NC	x	x	x	20	27	35	38	41	45
	Throw	3.5	5	6	7.5	8.5	10	11	12.5	15
14" Dia.	cfm	320	430	535	640	750	855	960	1070	1285
Ak 1.07	Ps	.011	.020	.031	.045	.060	.080	.105	.125	.180
	NC	x	x	x	25	31	34	39	43	49
	Throw	4	5.5	7	8.5	10	11	12.5	14	16.5

NC is based on 10db room absorption (Re: 10 - ^{12} watts).
X indicates NC less than 20. Throw in feet measured at a terminal velocity of 100 FPM. The change in throw due to pattern selection is not significant. Measurements were made an Alnor Thermo-Anemometer model 8565.

PDSD (Page 95)

	Neck Velocity	300	400	500	600	700	800	900	1000	1200
6" Dia.	cfm	60	80	100	120	135	155	175	195	235
An .20	Ps	.007	.013	.020	.029	.037	.048	.062	.076	.110
	NC	x	x	x	20	21	24	28	33	37
	1 Way Throw	4	6	7	8	10	11	13	14	16
	2-3 Way Throw	3.5	4.5	6	7	8	9.5	10.5	11.5	13
	4 Way Throw	2.5	3.5	4.5	5	6	7	7.5	8	9
8" Dia.	cfm	105	140	175	210	245	280	315	350	420
An .35	Ps	.011	.019	.030	.043	.059	.077	.097	.120	.173
	NC	x	x	x	20	22	27	31	35	40
	1 Way Throw	6	8	10	11.5	13	14.5	16	18	21
	2-3 Way Throw	5	7	8.5	10.5	12	13.5	14.5	16	19
	4 Way Throw	4	5	6.5	7.5	9	10	11.5	12.5	14
10" Dia.	cfm	165	220	275	325	380	435	490	545	655
An .54	Ps	.015	.026	.040	.056	.076	.100	.125	.115	.225
	NC	x	x	x	21	27	33	37	40	45
	1 Way Throw	8.5	11	14	16.5	19	22	25	27	30
	2-3 Way Throw	7.5	10	12.5	14.5	17	19.5	22	24	27
	4 Way Throw	5	7	8.5	10.5	12	14	15.5	17	20
12" Dia.	cfm	235	315	395	470	550	630	705	785	940
An .78	Ps	.016	.029	.045	.068	.086	.113	.140	.170	.250
	NC	x	x	x	20	25	32	35	38	44
	1 Way Throw	10	13	16.5	19.5	22	25	27	30	34
	2-3 Way Throw	8.5	11.5	14.5	17.5	20	22	25	27	30
	4 Way Throw	6	8	10	12	14	16.5	18	20	23
14" Dia.	cfm	320	430	535	640	750	855	960	1070	1285
An 1.07	Ps	.021	.037	.057	.082	.112	.145	.180	.225	.320
	NC	x	x	20	26	31	36	40	44	49
	1 Way Throw	11	15	19	22.5	26	29	32	35	39
	2-3 Way Throw	10	13.5	17	20	23	26	28	31	35
	4 Way Throw	7	10	12	14.4	17	19	21	23	27

Note: The use of a balancing hood is recommended to balance the system.
NC is based on 10 db room attenuation (Re: 10 - ^{12} watts) ASHRAE 36-72. X=less than 20.
Terminal velocity of 75 fpm.

PD, PDR, RFPR, RENP (Page 90, 94, 95)

	Neck Velocity, FPM	200	300	400	500	600	700	800
6" Dia.	cfm	40	60	80	100	120	135	155
	-Ps	.003	.007	.012	.019	.027	.034	.044
8" Dia.	cfm	70	105	140	175	210	245	380
	-Ps	.004	.010	.017	.026	.037	.051	.068
10" Dia.	cfm	110	165	220	275	325	380	435
	-Ps	.005	.011	.020	.030	.043	.058	.076
12" Dia.	cfm	155	235	315	395	470	550	630
	-Ps	.005	.012	.021	.033	.046	.063	.083
14" Dia.	cfm	215	320	430	535	640	750	855
	-Ps	.006	.013	.023	.035	.050	.069	.090
16" Dia.	cfm	280	420	560	700	840	975	1115
	-Ps	.008	.018	.031	.048	.070	.094	.120
18" Dia.	cfm	355	530	705	885	1060	1235	1415
	-Ps	.008	.018	.031	.049	.070	.092	.125
24 x 24	cfm	735	1100	1470	1835	2200	2570	2935
	-Ps	.008	.018	.032	.050	.070	.095	.130

Engineering Data

CBPS (Page 92)

ONE-WAY SUPPLY

Neck Size		Neck Velocity – V_N							
		300	400	500	600	700	800	1000	1200
6"	CFM	60	80	100	120	140	160	200	240
	Ps	.06	.08	.10	.15	.20	.26	.40	.58
	Throw	2.5-4-5	3.5-5-6	4-6-7	4.5-7-8.5	5.5-8-9.5	6.5-9.5-11.5	8-12-14.5	9.5-14-17
	NC	<20	<20	<20	22	26	30	40	>45
8"	CFM	105	140	175	210	245	280	350	420
	Ps	.08	.11	.16	.24	.32	.42	.65	.93
	Throw	4-6-7	5.5-8-9.5	6.5-10-12	8-12-14.5	7.5-14-17	10.5-16-19	13.5-20-24	16-24-29
	NC	<20	<20	23	26	31	39	>45	>45
10"	CFM	165	220	275	325	380	435	545	650
	Ps	.08	.11	.17	.25	.32	.43	.66	.94
	Throw	4.5-7-8.5	6.5-9.5-11.5	8-12-14.5	9.5-14.5-17.5	11-16.5-20	12.5-19-23	16-24-29	19-28.5-34
	NC	<20	<20	21	26	34	40	>45	>45
12"	CFM	235	315	395	470	550	630	790	940
	Ps	.08	.11	.17	.25	.34	.44	.69	.98
	Throw	5.5-8.5-10	7.5-11-13.5	9.5-14-17	11-16.5-20	13-19.5-26.5	14.5-22-26.5	18.5-27.5-33	22-33-39.5
	NC	<20	20	25	33	40	45	>45	>45
14"	CFM	325	430	535	640	750	860	1075	1275
	Ps	.11	.14	.21	.30	.42	.55	.86	1.20
	Throw	4.5-7-8.5	6.5-9.5-11.5	8-12-14.5	9.5-14.5-17.5	11.5-17-20.5	13-17.5-23.5	16.5-24.5-29.5	19.5-29-35
	NC	<20	20	25	30	38	44	>45	>45
16"	CFM	420	560	700	840	980	1120	1400	1680
	Ps	.020	.040	.060	.080	.110	.140	.220	.260
	Throw	5-8-10	7-10-12	10-13-16	12-15-18	13-18-21	14-19-24	18-26-30	20-31-36
	NC	<20	<20	26	34	39	43	>45	>45

TWO-WAY SUPPLY

Neck Size		Neck Velocity – V_N							
		300	400	500	600	700	800	1000	1200
6"	CFM	60	80	100	120	140	160	200	240
	Ps	.05	.07	.09	.13	.17	.22	.34	.50
	Throw	2-3-3.5	2.5-4.5	3.5-5.6	4-5.5-6.5	4.5-6.5-8	5-7.5-9	6.5-9.5-11.5	7.5-11.5-13.5
	NC	<20	<20	<20	20	24	28	37	44
8"	CFM	105	140	175	210	245	280	350	420
	Ps	-	.054	.084	.120	.165	.215	.330	.480
	Throw	3-4.5-5.5	3.5-5.5-6.5	4.5-7-8.5	5.5-8.5-10	6.5-9.5-11.5	7.5-11-13	9.5-14-17	11-16.5-20
	NC	<20	<20	<20	23	29	36	43	>45
10"	CFM	165	220	275	325	380	435	545	650
	Ps	.06	.08	.13	.18	.25	31	.51	.73
	Throw	4.5-6.5-7.5	5.5-8.5-10	7-10.5-12.5	8.5-12.5-15	9.5-14.5-17.5	11-16.5-20	14-21-25	16.5-25-30
	NC	<20	<20	<20	25	29	37	45	>45
12"	CFM	235	315	395	470	550	630	790	940
	Ps	.05	.07	.11	.15	.21	.27	.43	.60
	Throw	4.5-6.5-7.5	5.5-8.5-10	7-10.5-12.5	8.5-12.5-15	10-15-18	11.5-17-20.5	14.5-21.5-26	17-25.5-30.5
	NC	<20	<20	23	30	37	43	>45	>45
14"	CFM	325	430	535	640	750	860	1075	1275
	Ps	.05	.07	.10	.15	.20	.26	.41	.57
	Throw	3.5-5.5-6.5	4.5-7-8.5	6-9-11	7-10.5-12.5	8.5-12.5-15	9.5-14-17	11.5-17.5-21	14-21-25
	NC	<20	<20	22	28	35	40	>45	>45
16"	CFM	420	560	700	840	980	1120	1400	1680
	Ps	.020	.040	.060	.080	.110	.140	.220	.260
	Throw	4-6-8	5-8-9	7-10-12	9-11-13	10-14-16	11-16-19	13-19-24	16-22-27
	NC	<20	<20	26	34	39	43	>45	>45

THREE-WAY SUPPLY

Neck Size		Neck Velocity – V_N							
		300	400	500	600	700	800	1000	1200
6"	CFM	60	80	100	120	140	160	200	240
	Ps	.02	.03	.04	.06	.08	.10	.16	.23
	Throw	2.5-3.5-4.5	3-4.5-5.5	3.5-5.5-6.5	4.5-6.5-8	5-7.5-9	5.5-8.5-10.5	7.5-11-13.5	8.5-13-15.5
	NC	<20	<20	<20	<20	23	25	34	40
8"	CFM	105	140	175	210	245	280	350	420
	Ps	.02	.03	.04	.06	.08	.10	.16	.22
	Throw	3-4-5	4-5.5-6.5	4.5-7-8.5	5.5-8-9.5	6.5-9.5-11.5	7.5-11-13.5	9-13.5-16	11-16.5-20
	NC	<20	<20	<20	21	26	33	39	44
10"	CFM	165	220	275	325	380	435	545	650
	Ps	.03	.04	.06	.09	.12	.15	.24	.34
	Throw	4.5-6.5-8	5.5-8.5-10.5	7-10.5-12.5	8.5-12.5-15	9.5-14.5-17.5	11.5-17-20.5	14-21-25	17-25-30
	NC	<20	<20	<20	21	26	34	41	>45
12"	CFM	235	315	395	470	550	630	790	940
	Ps	.02	.03	.05	.07	.10	.13	.20	.29
	Throw	4.5-6.5-8	5.5-8.5-10	7-10.5-12.5	8.5-12.5-15	10-14.5-17.5	11-16.5-20	13.5-20.5-24.5	16.5-24.5-29.5
	NC	<20	<20	21	27	34	39	44	>45
14"	CFM	325	430	535	640	750	860	1075	1275
	Ps	.02	.03	.05	.07	.10	.13	.20	.28
	Throw	4-5-7	5.5-8-9.5	6-9-11	8-12-14.5	9.5-14-17	10.5-16-19.5	13.5-20-24	15.5-23.5-28
	NC	<20	<20	20	25	32	37	44	>45
16"	CFM	420	560	700	840	980	1120	1400	1680
	Ps	.020	.040	.060	.080	.110	.140	.220	.260
	Throw	5-6-8	6-9-10	7-9-12	9-13-15	10-13-16	11-15-18	12-18-21	15-21-26
	NC	<20	<20	26	34	39	43	>45	>45

NOTES:

1. **Ps** is static Pressure Loss in inches of H_2O
2. **NC** is based on 10db room attenuation (Re: 10^{-12} watts)
3. Throw is iso-thermal air at 150, 100, 75 FPM terminal velocities.
4. The use of a balancing hood is recommended to balance the system.

FOUR-WAY SUPPLY

Neck Size		Neck Velocity – V_N 300	400	500	600	700	800	1000	1200
6"	CFM	60	80	100	120	140	160	200	240
	Ps	<.01	.01	.02	.03	.04	.05	.08	.12
	Throw	1.5-2.5	1.5-2.5-3	2-3-4	2.5-3.5-4.5	3-4.5-5.5	3.5-5-6	4-6-7	5-7.5-9
	NC	<20	<20	<20	<20	21	24	32	38
8"	CFM	105	140	175	210	245	280	350	420
	Ps	<.01	.01	.02	.03	.04	.06	.09	.12
	Throw	1.5-2.5-3	2-3-4	2.5-4-5	3.5-5-6	4-5.5-7	4.5-6.5-8	5.5-8-10	6.5-9.5-11.5
	NC	<20	<20	<20	<20	25	31	37	42
10"	CFM	165	220	275	325	380	435	545	650
	Ps	.01	.02	.03	.04	.06	.07	.11	.16
	Throw	3-4-5	3.5-5.5-6.5	4.5-6.5-8	5.5-8-10	6-9-11	7-10.5-12.5	9-13-15.5	10.5-15.5-18.5
	NC	<20	<20	<20	21	27	32	39	44
12"	CFM	235	315	395	470	550	630	790	940
	Ps	.01	.02	.03	.04	.06	.08	.12	.17
	Throw	2.5-3.5-4	3-4.5-5.5	3.5-5.5-6.5	4.5-7-8.5	5.5-8-9.5	6-7-11	7.5-11.5-14	9-13.5-16
	NC	<20	<20	20	26	32	37	42	>45
14"	CFM	325	430	535	640	750	860	1075	1275
	Ps	.01	.02	.03	.05	.06	.08	.13	.18
	Throw	2-3-3.5	2.5-4-5	3.5-5-6	4-6-7	4.5-7-8.5	5.5-8-10	6.5-10-12	7.5-11.5-14
	NC	<20	<20	<20	24	30	35	42	>45
16"	CFM	420	560	700	840	980	1120	1400	1680
	Ps	.020	.040	.060	.080	.110	.140	.220	.260
	Throw	3-4-5	4-6-7	5-8-11	6-9-12	8-11-14	9-13-16	10-15-19	12-17-22
	NC	<20	<20	26	34	39	43	>45	>45

CBPR Return (Page 92)

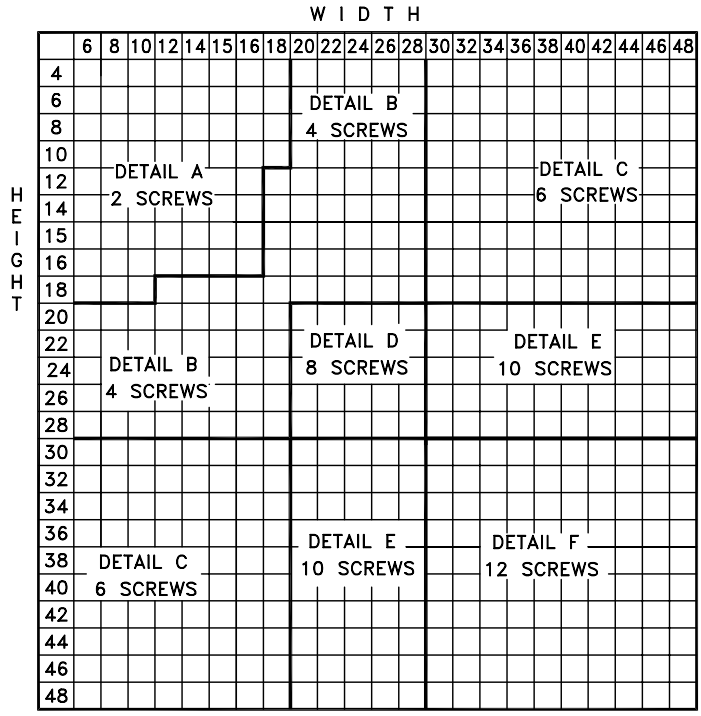
Neck Velocity – V_N -Ps		200 .01	300 .02	400 .03	500 .05	600 .07	700 .10	800 .12
6" Dia.	CFM	40	60	80	100	120	140	160
8" Dia.	CFM	70	105	140	175	210	245	280
10" Dia.	CFM	110	165	220	275	330	385	440
12" Dia.	CFM	160	240	320	395	475	550	630
14" Dia.	CFM	215	320	430	535	640	750	855
16" Dia.	CFM	281	420	563	698	836	975	1114
18" Dia.	CFM	356	531	712	881	1056	1231	1406

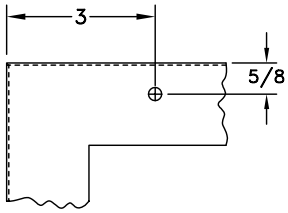
SCBPS Diffuser (Page 92)

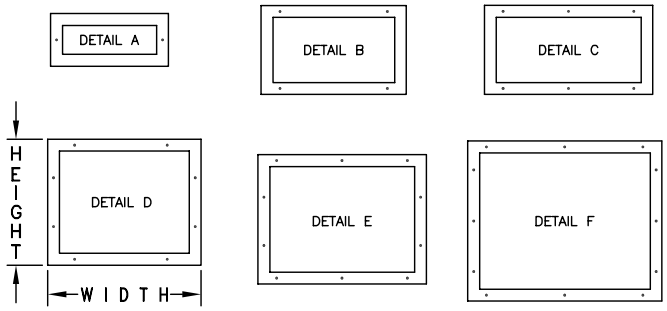
Neck Velocity		300	400	500	600	700	800	1000	1200
6 "	CFM	60	80	100	120	135	155	195	235
An 0.20	Ps	0.012	0.022	0.034	0.049	0.066	0.086	0.135	0.194
Ak 0.33	NC	-	-	-	21	27	30	36	41
Vt 75	Throw	1	1.5	1.5	2	2.5	3	3.5	4
Vt 150	Throw	0.5	1	1	1.5	1.5	1.5	2	2.5
8 "	CFM	105	140	175	210	245	280	350	420
An 0.35	Ps	0.012	0.022	0.034	0.049	0.066	0.086	0.135	0.195
Ak 0.45	NC	-	-	10	25	30	34	39	45
Vt 75	Throw	2.25	3	3.5	4.5	5.25	6	7.5	9
Vt 150	Throw	1.25	2	2.5	3	3.5	3.5	4.5	5.5
10 "	CFM	165	220	275	325	380	435	545	655
An 0.55	Ps	0.012	0.022	0.034	0.049	0.066	0.087	0.135	0.195
Ak 0.57	NC	-	-	20	28	33	37	42	48
Vt 75	Throw	3.5	4.5	5.5	7	8	9	11.5	13.5
Vt 150	Throw	2	3	3.5	4.5	5	5.5	7	8.5
12 "	CFM	235	315	395	470	550	630	785	945
An 0.79	Ps	0.014	0.025	0.039	0.056	0.076	0.099	0.155	0.223
Ak 0.70	NC	-	-	21	28	34	38	44	50
Vt 75	Throw	5	6	7.5	9.5	11	12.5	15.5	18.5
Vt 150	Throw	3	4	5	6	7	7.5	9.5	11.5
14 "	CFM	320	430	535	640	750	855	1070	1285
An 1.07	Ps	0.016	0.028	0.044	0.063	0.086	0.112	0.175	0.252
Ak 0.84	NC	-	-	21	28	35	39	46	52
Vt 75	Throw	6	7.5	9.5	11.5	13.5	15.5	19	23
Vt 150	Throw	3.5	5	6	7	8.5	9.5	12	14.5

- Less Than 20 NC

Screw Hole Location Chart
92 Series, 94 Series, 98 Series (Pages 37-40)
821, 831 (Page 36)



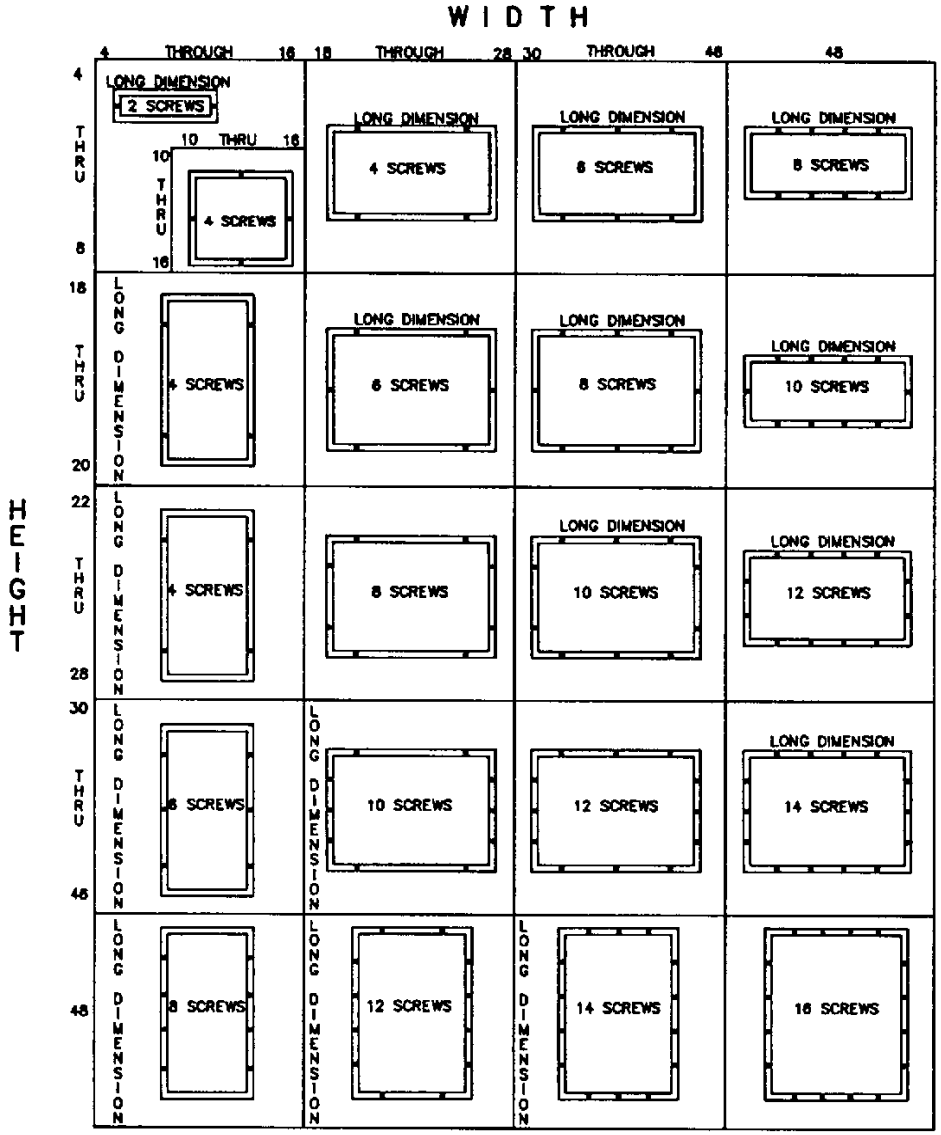


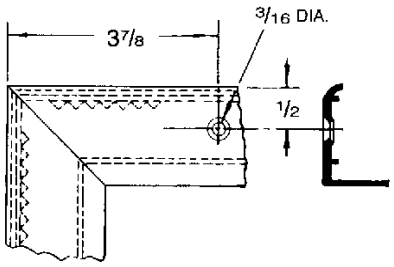


Mullions

Sizes 4x4 through 18x18 — No Mullion
Sizes 20x20 through 38x38 and one dimension greater than 18 — One reinforcing mullion
Sizes 40x40 through 48x48 and one dimension greater than 38 — Two reinforcing mullions

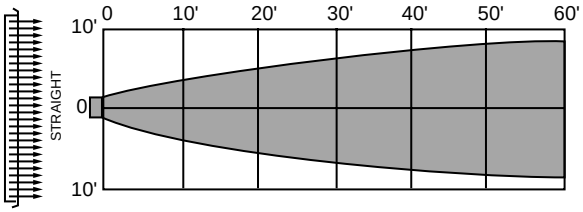
Screw Hole Chart for Extruded Aluminum Line
V Series, H Series, C Series, RH Series



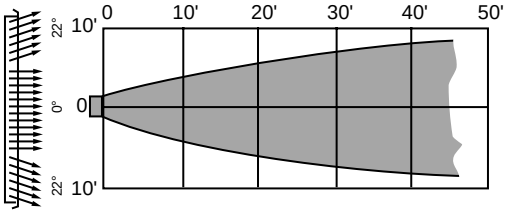


A618MS, 821, 831, 92 Series, 98VOH, H and V Series Registers and Grilles, Air Pattern Obtained with Various Deflection Settings

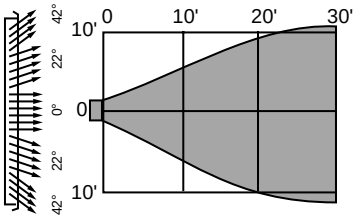
A DEFLECTION



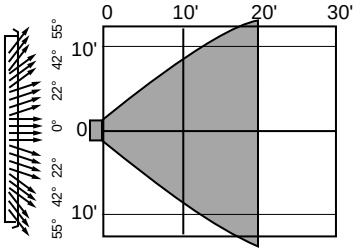
C DEFLECTION



E DEFLECTION



G DEFLECTION



Recommended NC Criteria

	Communication Environment	Typical Occupancy
Below NC 25	Extremely quiet environment; suppressed speech is quite audible; suitable for acute pickup of all sounds	Broadcasting studios, concert halls, music rooms.
NC 30	Very quiet office; suitable for large conferences; telephone use satisfactory.	Residences, theatres, libraries, executive offices, directors rooms.
NC 35	Quiet office; satisfactory for conference at a 15 ft. table; normal voice 10-30 ft.; telephone use satisfactory.	Private offices, schools, hotel rooms, courtrooms, churches, hospital rooms.
NC 40	Satisfactory for conferences at a 6-8 ft. table; normal voice 6-12 ft.; telephone use satisfactory.	General office, labs, dining rooms.
NC 45	Satisfactory for conferences at a 4-5 ft. table; normal voice 3-6 ft.; raised voice 6-12 ft.; telephone use occasionally difficult.	Retail stores, cafeterias, lobby areas, large drafting & engineering offices, reception areas.
Above NC 50	Unsatisfactory for conference of more than two or three persons, normal voice 1-2 ft.; raised voice 3-6 ft.; telephone use slightly difficult.	Computer rooms, stenographic pools, print machine rooms, process areas.

Velocity Limitations for Various Applications

The sound caused by an air outlet in operation is directly proportional to the velocity of the air passing through it. By selecting outlets of proper sizes, air velocities can be controlled within safe sound limits.

The following recommended outlet velocities are within the safe sound limits for most applications.

Application	Recommended Velometer Velocities
Broadcasting Studios	500 FPM
Residences	500 to 750 FPM
Apartments	500 to 750 FPM
Churches	500 to 750 FPM
Hotel Bedrooms	500 to 750 FPM
Legitimate Theatres	500 to 1000 FPM
Private offices, acoustically treated	500 to 1000 FPM
Motion Picture Theatres	1000 to 1250 FPM
Private Offices, not treated	1000 to 1250 FPM
General Offices	1250 to 1500 FPM
Stores, upper floors	1500 FPM
Stores, main floors	1500 FPM
Industrial Buildings	1500 to 2000 FPM

821, 831, 92 Series, 98VOH, H and V Series Drop Chart, Use with size selection charts

Instructions for use of Drop Chart

The drop of the air stream is determined by using the throw and velocity of the register selected. On the drop chart, lay a straight edge connecting these values. The total drop of the air stream will be the sum of the drop due to temperature (D_t) and the drop due to spread (D_s).

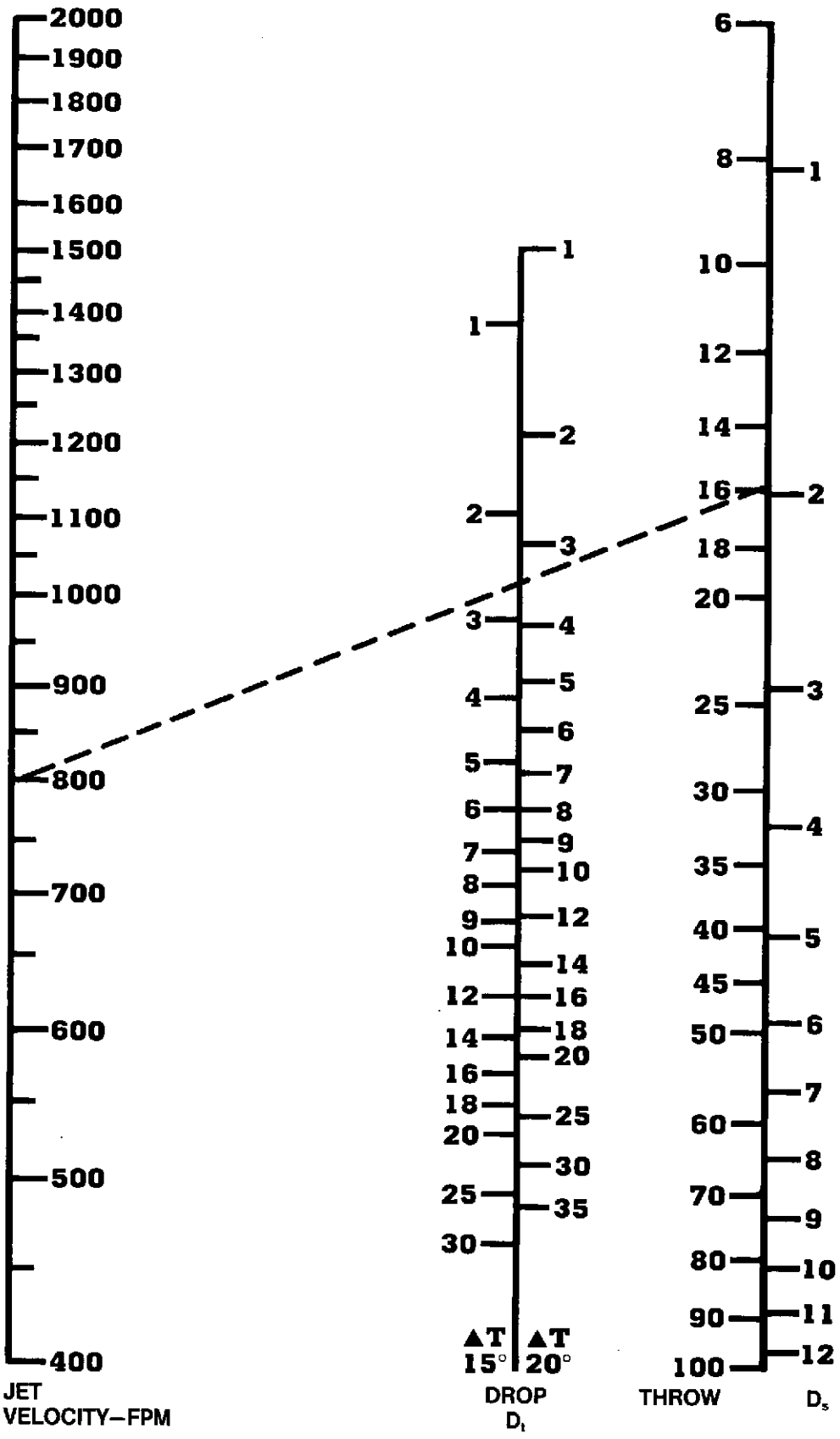
Example: The drop for a 92 Series register "C" deflection 16x5 size has an 800 fpm velocity and a 16 foot throw. Connect these two points on the chart and read the drops as follows:

$D_t = 2.7'$ $D_s = 2'$

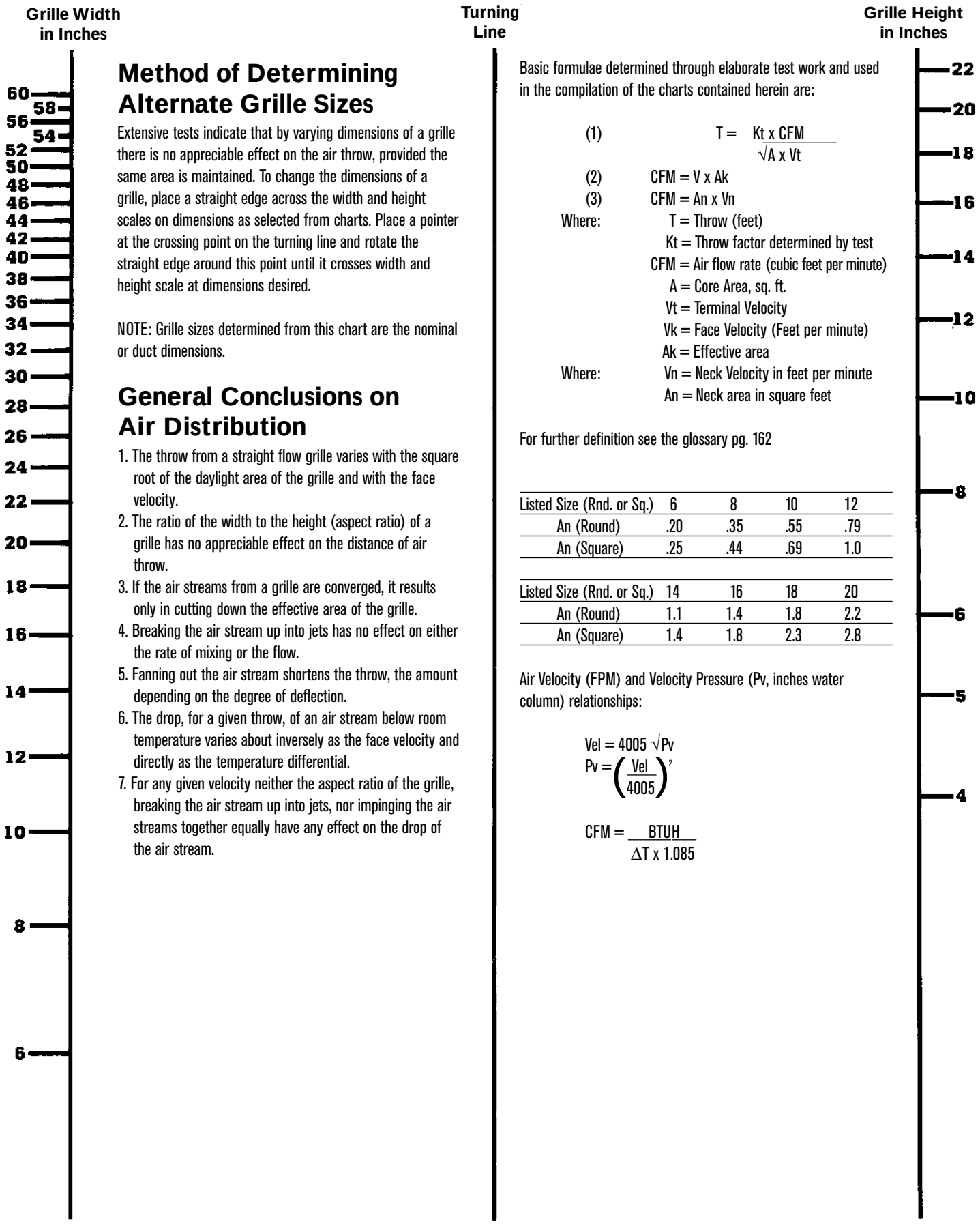
D total = 2.7 + 2 = 4.7'

D_t = Drop along line of throw due to temperature difference.

D_s = Drop resulting from vertical spread.



92 Series, H and V Series Alternate Sizing Graph



Method of Determining Alternate Grille Sizes

Extensive tests indicate that by varying dimensions of a grille there is no appreciable effect on the air throw, provided the same area is maintained. To change the dimensions of a grille, place a straight edge across the width and height scales on dimensions as selected from charts. Place a pointer at the crossing point on the turning line and rotate the straight edge around this point until it crosses width and height scale at dimensions desired.

NOTE: Grille sizes determined from this chart are the nominal or duct dimensions.

General Conclusions on Air Distribution

1. The throw from a straight flow grille varies with the square root of the daylight area of the grille and with the face velocity.
2. The ratio of the width to the height (aspect ratio) of a grille has no appreciable effect on the distance of air throw.
3. If the air streams from a grille are converged, it results only in cutting down the effective area of the grille.
4. Breaking the air stream up into jets has no effect on either the rate of mixing or the flow.
5. Fanning out the air stream shortens the throw, the amount depending on the degree of deflection.
6. The drop, for a given throw, of an air stream below room temperature varies about inversely as the face velocity and directly as the temperature differential.
7. For any given velocity neither the aspect ratio of the grille, breaking the air stream up into jets, nor impinging the air streams together equally have any effect on the drop of the air stream.

Basic formulae determined through elaborate test work and used in the compilation of the charts contained herein are:

(1) $$T = \frac{Kt \times CFM}{\sqrt{A} \times Vt}$$

(2) $CFM = V \times Ak$

(3) $CFM = An \times Vn$

Where:
T = Throw (feet)
Kt = Throw factor determined by test
CFM = Air flow rate (cubic feet per minute)
A = Core Area, sq. ft.
Vt = Terminal Velocity
Vk = Face Velocity (Feet per minute)
Ak = Effective area

Where:
Vn = Neck Velocity in feet per minute
An = Neck area in square feet

For further definition see the glossary pg. 162

Listed Size (Rnd. or Sq.)	6	8	10	12
An (Round)	.20	.35	.55	.79
An (Square)	.25	.44	.69	1.0

Listed Size (Rnd. or Sq.)	14	16	18	20
An (Round)	1.1	1.4	1.8	2.2
An (Square)	1.4	1.8	2.3	2.8

Air Velocity (FPM) and Velocity Pressure (Pv, inches water column) relationships:

$$Vel = 4005\sqrt{Pv}$$

$$Pv = \left(\frac{Vel}{4005}\right)^2$$

$$CFM = \frac{BTUH}{\Delta T \times 1.085}$$

Surfaire® T-Bar Diffusers

Furnish and install Hart & Cooley SurfAire® insulated ceiling diffusers as shown on the plans. The diffuser shall be a 2'x2' T-Bar lay-in. Face shall be stucco embossed aluminum with off-white baked enamel finish for ceiling esthetics, corrosion protection and ease of cleaning. Face will have formed deflector apertures which distribute air in thin layers along the ceiling surface and which provide for optimum dispersion in one, two, three, four-way and two-way corner patterns.

Back panel shall be formed galvanized steel covered with glass fiber insulation and an aluminum foil vapor barrier. Insulation is held securely in place by face margin edge fold over. Insulation will be prescored to accept specified collar sizes.

5400 Series collars will be supplied providing efficient, tight attachment with bayonet fasteners to mating prepunched holes in back panel. Collars will provide flex duct locking tabs and damper mounting slots. Collar damper slots provide for damper attachment of removal at any time.

3800 Series fully adjustable butterfly dampers shall be supplied (if specified). Damper adjustment handle is inserted before or after damper is mounted and is removable at any time.

Perforated Insulated T-Bar Diffusers and Return Grilles

Contractor shall furnish and install Hart & Cooley PDS perforated diffuser or PDSD perforated diffuser with deflectors as indicated on the plans. Perforated diffusers shall be 2'x2' T-Bar lay-in. Exposed face will have a minimum 51% free area and be coated with off-white baked enamel finish. Deflectors (if specified) shall be fully adjustable externally providing one, two, three, four-way and two-way corner air diffusion capability.

Back panel shall be black pre-coated formed steel covered with glass fiber insulation and an aluminum foil vapor barrier. Insulation is held securely in place by face margin edge fold over. Insulation is prescored to accept specified collar sizes.

5400 Series collars will be supplied providing efficient, tight attachment with bayonet fasteners to mating pre-punched holes in back panel. Collars will provide flex duct locking tabs and damper mounting slots. Collar damper slots provide for damper attachment or removal at any time.

3800 Series fully adjustable butterfly dampers shall be supplied (if specified). Damper adjustment handle is inserted before or after damper is mounted and is removable at any time.

Matching Hart & Cooley PDR perforated return air grilles shall be furnished according to the plans.

Removable Face Perforated T-Bar Diffusers and Return Grilles

Contractor shall furnish and install Hart & Cooley RFPS series perforated diffusers as indicated on the plans. Exposed face will be of a removable hinged style with a minimum 51% free area and be coated with white baked enamel finish. Deflectors are to be the patented directable deflector to ensure proper adjustable air deflection. Back panel shall be black pre-coated formed steel to minimize sight into diffuser.

5400 Series collars will be supplied providing efficient, tight attachment with bayonet fasteners to mating pre-punched holes in back panel. Collars will provide flex duct locking tabs and amper mounting slots. Collar damper slots provide for damper attachment or removal at any time.

3800 Series fully adjustable butterfly dampers shall be supplied (if specified). Damper adjustment handle is inserted before or after damper is mounted and is removable at any time.

Matching Hart & Cooley RFPR perforated return air grilles shall be furnished according to the plans.

High Volume Supply T-Bar Diffuser

Contractor shall furnish and install Hart & Cooley HVS high volume supply 2'x2' T-Bar lay-in diffuser as shown on the plans. This diffuser will consist of a formed back panel and three stepdown formed elements, all made of heavy gauge steel. Finish shall be an off-white baked enamel. Interior air diffusion elements are easily removable at any time without tools for access to damper control rod. The air diffusion pattern shall be a full 360°.

The back panel shall be fully insulated with fiberglass having an aluminum foil vapor barrier. Insulation is held rigidly in place with adhesive and will be prescored to accept specified collar sizes.

5400 Series collars will be supplied providing efficient, tight attachment with bayonet fasteners to mating pre-punched holes in back panel. Collars will provide flex duct locking tabs and amper mounting slots. Collar damper slots provide for damper attachment or removal at any time.

3800 Series fully adjustable butterfly dampers shall be supplied (if specified). Damper adjustment handle is inserted before or after damper is mounted and is removable at any time.

Fixed Pattern T-Bar Diffuser

Contractor shall furnish and install Hart & Cooley FPD fixed pattern diffuser 2'x2' T-Bar lay-in as shown on the plans. This diffuser will consist of a formed back panel and two stepdown formed elements, all made of heavy gauge steel. Finish shall be an off-white baked enamel. Interior air diffusion elements are easily removable at any time without tools for access to damper or neck. The air diffusion pattern shall be a full 360°.

3800 Series fully adjustable butterfly dampers shall be supplied (if specified) and can be adjustable through the face.

Glossary of Terms

Ceiling or Wall Effect
The tendency of an air stream moving along a wall or ceiling surface to remain in contact with that surface.

Core Area
The total plane area of that portion of a grille, face, or register bounded by a line tangent to the outer opening through which air can pass. The core area is less than the register size. Example, a 14-in. x 8-in. register may have a core that is 1 in. less than the listed size; so, the core area is 13in. x 7in. – 91 sq. in.

Diffuser
An outlet discharging supply air in a spreading pattern.

Diffusion
Distribution of air within a space by an outlet discharging supply air in a spreading pattern.

Drop
The vertical distance between the base of the outlet and the bottom of the air stream at the end of the horizontal throw.

Effective Area, Ak (Sq. Ft.)
The calculated area of an outlet based on the average measured velocity between the fins.

Envelope
The outer boundary of an air stream moving at a specific velocity (for example, a 50 fpm envelope).

Free Area
The total minimum area of the openings in the air outlet or inlet through which air can pass.

Grille
A louvered covering for an opening through which air passes.

Induction
The process of drawing room air into the projected air stream due to the velocity of the projected air stream (sometimes called aspiration).

Jet Velocity, Fpm (Face Velocity)
The average measured velocity of air passing between the fins.

Natural Convection Currents
Air currents created by a buoyancy effect caused by the difference in temperature between the room air and the air in contact with a warm or cold surface.

Outlet
Any opening through which air is delivered to condition a space.

Outlet Velocity, Fpm
The average velocity of the supply air, measured as it passes through the plane of the opening in the supply outlet.

Pressure Loss, WG
Indicates how much total pressure is required to move air through a register.

Primary Air
The mixture of supply air from the outlet and room air within the 1 50 fpm envelope.

Radius of Diffusion, Ft.
The horizontal distance (throw) from a ceiling diffuser to the point of terminal velocity.

Register
A grille which is equipped with a damper or control valve, and which directs air in a nonspreading jet.

Return
Any opening through which air is removed from a conditioned space.

Spread, Ft.
The maximum width of the total air stream at the point of terminal velocity.

Static Pressure, PS
The outward force of air within a duct measured in inches of water.

Stratification Boundary
The boundary between room air currents moving faster than 1 5 fpm and the stratification zone.

Stratified Zone
A region in which room air velocity is less than 1 5 fpm.

Temperature Difterential
The temperature difference between the primary and the room air.

Temperature Variation (ΔT)
The temperature difference between points within the same space.

Terminal Velocity, Fpm
When the velocity of total air drops to 50 or 75 fpm, depending on the particular application, it reaches terminal velocity. Terminal velocity is not sharply defined for all applications.

Throw (Blow), Ft.
The horizontal distance an air stream travels after leaving a horizontal sidewall outlet before maximum velocity is reduced to terminal velocity. For a perimeter outlet, throw is the vertical distance the air stream travels before maximum velocity is reduced to terminal velocity.

Total Air
The mixture of projected air and room air set in motion by the supply air.

Total Pressure, Pt
The sum of the velocity and static pressures measured in inches of water.

Vane Ratio
The ratio showing depth of vane to minimum width between two adjacent vanes.

Velocity Pressure, Pv
The forward-moving force of air within a duct measured in inches of water.

NC Noise Criteria
A single number noise rating system that indicates what Broad Band, continuous sounds are reasonably acceptable.