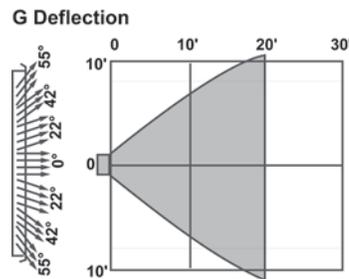
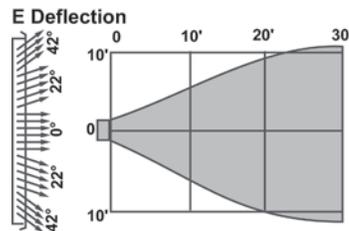
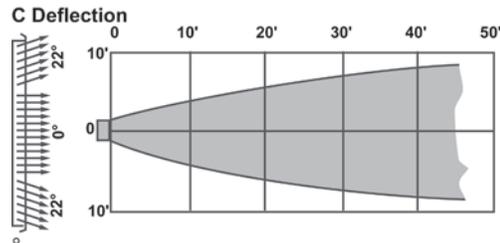
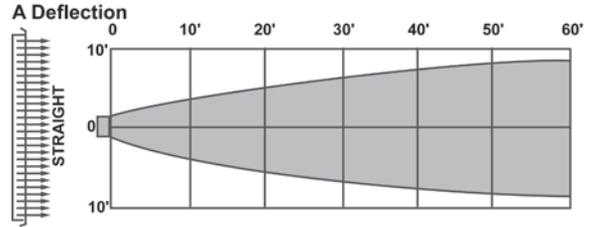


Recommended NC Criteria

	Communication Environment	Typical Occupancy
< 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, theaters, libraries, executive offices, directors rooms.
NC 35	Quiet office; satisfactory for conference at a 15-foot table; normal voice 10 to 30 feet; telephone use satisfactory.	Private offices, schools, hotel guestrooms, courtrooms, churches, hospital rooms.
NC 40	Satisfactory for conferences at a 6-to 8-foot table; normal voice 6 to 12 feet; telephone use satisfactory.	General office, labs, dining rooms.
NC 45	Satisfactory for conferences at a 4- to 5-foot table; normal voice 3 to 6 feet; raised voice 6 to 12 feet; telephone use occasionally difficult.	Retail stores, cafeterias, lobby areas, large drafting and engineering offices, reception areas.
> NC 50	Unsatisfactory for conference of more than two or three persons; normal voice 1 to 2 feet; raised voice 3 to 6 feet; telephone use slightly difficult.	Computer rooms, stenographic pools, print machine rooms, process areas.

Air Pattern Obtained with Various Deflection Settings



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, face velocities can be controlled within safe sound limits.

The following recommended face velocities are within the safe sound limits for most applications, when NC data are not available.

Application	Recommended Velometer Velocities
Broadcasting Studios	500 FPM
Residences	500 to 750 FPM
Apartments	500 to 750 FPM
Churches	500 to 750 FPM
Hotel Guestrooms	500 to 750 FPM
Legitimate Theaters	500 to 1000 FPM
Private Offices, acoustically treated	500 to 1000 FPM
Private Offices, not treated	1000 to 1250 FPM
Motion Picture Theaters	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



ALC / ALCML / ALCOBD 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 ALC tables gives 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 with no obstruction to the air stream.
3. Turn to the proper SIZE TABLE for the air pattern desired.
4. Determine the appropriate size based on the CFM, Throw, Pressure Loss, and Face Velocity requirements.

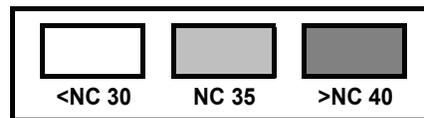
One-Way, Two Way

Face Velocity		400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090
6 x 6	CFM	0.35	45	55	65	70	80	90	100	110
Ak .09	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
8 x 6	CFM	40	50	60	70	80	90	100	110	120
Ak .10	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
10 x 6	CFM	60	75	90	105	120	135	150	165	180
Ak .15	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
8 x 8	CFM	65	80	95	110	130	145	160	175	190
Ak .16	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
12 x 6	CFM	70	90	110	125	145	160	180	200	215
Ak .18	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
14 x 6	CFM	85	105	125	145	170	190	210	230	250
Ak .21	Throw 1/2	5.5/4	7/5	8.5/6	10/7	11/8	13/9	14/10	16/11	17/12
10 x 10	CFM	95	120	145	170	190	215	240	265	290
Ak .24	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
12 x 10	CFM	115	145	175	205	230	260	290	320	350
Ak .29	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
16 x 8	CFM	125	155	185	215	250	280	310	340	370
Ak .31	Throw 1/2	6.5/5	8.5/6	10/7	12/8	13/9.5	15/11	17/12	18/13	20/14
12 x 12	CFM	140	175	210	245	280	315	350	385	420
Ak .35	Throw 1/2	7/5	9/6	11/7.5	12/8.5	14/10	16/11	18/12	19/14	21/15
16 x 12	CFM	185	230	275	320	370	415	460	505	550
Ak .46	Throw 1/2	8/5.5	10/7	12/8.5	14/10	16/11	18/13	20/14	22/16	24/17
14 x 14	CFM	190	240	290	335	385	430	480	530	575
Ak .48	Throw 1/2	8/5.5	10/7.5	12/9	14/10	17/12	18/13	21/15	23/16	25/17
16 x 16	CFM	250	315	380	440	505	565	630	695	755
Ak .63	Throw 1/2	9.5/6.5	12/8.5	14/10	16/12	19/13	21/15	23/17	26/18	28/20
20 x 14	CFM	270	340	410	475	545	610	680	750	815
Ak .68	Throw 1/2	9.5/7	12/8.5	15/10	17/12	19/14	22/15	24/17	27/19	29/21
24 x 12	CFM	280	350	420	490	560	630	700	770	840
Ak .70	Throw 1/2	10/7	12/8.5	15/10	17/12	20/14	22/16	25/17	27/19	30/21
30 x 10	CFM	290	365	440	510	585	655	730	805	875
Ak .73	Throw 1/2	10/7	13/9	15/11	18/12	20/14	23/16	25/18	28/20	30/21
36 x 10	CFM	350	440	530	615	705	790	880	970	1055
Ak .88	Throw 1/2	11/8	14/10	17/12	19/14	22/16	25/18	28/20	31/22	33/24
36 x 12	CFM	420	525	630	735	840	945	1050	1155	1260
Ak 1.05	Throw 1/2	12/8.5	15/11	18/13	21/15	24/17	27/19	30/21	33/23	36/25
30 x 16	CFM	460	575	690	805	920	1035	1150	1265	1380
Ak 1.15	Throw 1/2	12/9	16/11	19/13	22/15	25/18	28/20	31/22	34/24	37/26
36 x 16	CFM	560	700	840	980	1120	1260	1400	1540	1680
Ak 1.40	Throw 1/2	14/9.5	17/12	21/15	24/17	27/19	31/22	34/24	38/27	41/29

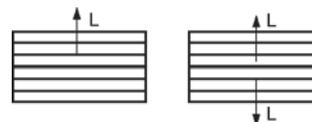
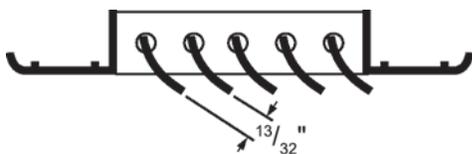
Terminal Velocity of 75 FPM

Curved-Blade - ALC 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 preset to the dimension shown below.

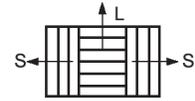




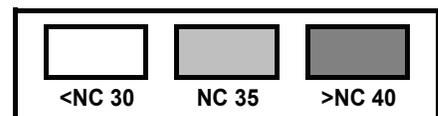
ALC / ALCML / ALCOBD Curved-Blade Diffusers

Three-Way

Face Velocity		400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090
6 x 6 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
8 x 6 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
10 x 6 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
8 x 8 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
12 x 6 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
14 x 6 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
10 x 10 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
12 x 10 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
16 x 8 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
12 x 12 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
16 x 12 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
14 x 4 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
16 x 16 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
20 x 14 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
24 x 12 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
30 x 10 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
36 x 10 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
36 x 12 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
30 x 16 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	295/313	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
36 x 16 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

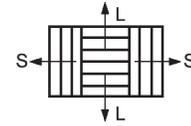




ALC / ALCML / ALCOBD Curved-Blade Diffusers

Four-Way

Face Velocity		400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090
6 x 6 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
8 x 6 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
10 x 6 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
8 x 8 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	5.5/5	6.5/5	6.5/6	7/6.5
12 x 6 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
14 x 6 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
10 x 10 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
12 x 10 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
16 x 8 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
12 x 12 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
16 x 12 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
14 x 4 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
16 x 16 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
20 x 14 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
24 x 12 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
30 x 10 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
36 x 10 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
36 x 12 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
30 x 16 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
36 x 16 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

