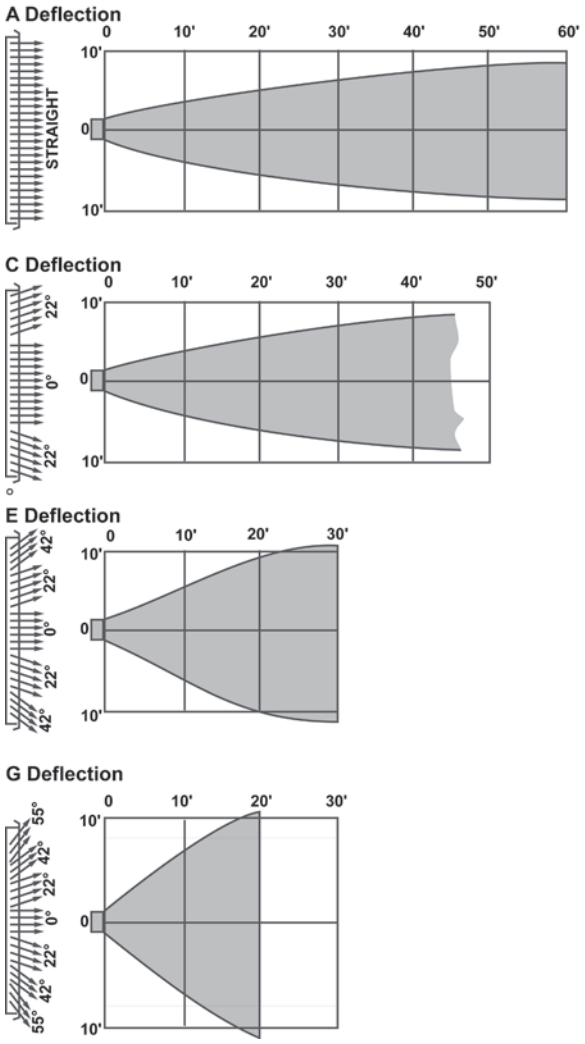
Recommended NC Criteria

	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

Recommended Noise Criteria and Face Velocity Ranges are on page 19.

ALHR90
Return Air Registers and Grilles

Avg. Face Velocity*		400	500	600	700	800	900	1000
6 x 6	CFM	60	70	90	100	120	130	150
Ak .145	Ps	.037	.058	.083	.113	.148	.189	.232
8 x 8	CFM	103	129	155	181	207	233	259
Ak .259	Ps	.011	.017	.024	.034	.043	.054	.067
12 x 6	CFM	119	148	178	208	237	267	297
Ak .297	Ps	.011	.017	.024	.034	.043	.054	.067
14 x 6	CFM	141	177	212	248	283	318	354
Ak .354	Ps	.011	.017	.024	.033	.042	.053	.066
14 x 8	CFM	195	244	292	341	390	438	487
Ak .487	Ps	.010	.016	.023	.032	.041	.052	.064
12 x 12	CFM	256	320	384	448	512	576	640
Ak .640	Ps	.010	.016	.022	.030	.040	.050	.062
24 x 8	CFM	348	435	523	610	697	784	871
Ak .871	Ps	.009	.015	.021	.028	.038	.045	.055
18 x 12	CFM	395	493	592	691	789	888	987
Ak .987	Ps	.009	.014	.021	.027	.037	.044	.054
30 x 8	CFM	441	552	662	772	882	993	1103
Ak 1.10	Ps	.009	.014	.020	.026	.036	.043	.053
24 x 12	CFM	535	668	802	936	1069	1203	1337
Ak 1.34	Ps	.009	.014	.019	.025	.035	.042	.052
18 x 18	CFM	605	756	907	1059	1210	1361	1512
Ak 1.51	Ps	.008	.013	.018	.023	.033	.040	.050
30 x 12	CFM	676	845	1014	1182	1351	1520	1689
Ak 1.69	Ps	.008	.013	.018	.023	.032	.039	.049
20 x 20	CFM	755	943	1132	1321	1509	1698	1887
Ak 1.89	Ps	.008	.012	.017	.022	.031	.038	.048
36 x 12	CFM	818	1023	1227	1432	1636	1841	2045
Ak 2.05	Ps	.007	.012	.017	.021	.030	.037	.047
24 x 20	CFM	914	1142	1370	1599	1827	2055	2284
Ak 2.28	Ps	.007	.012	.016	.021	.028	.035	.045
30 x 18	CFM	1034	1292	1551	1809	2068	2326	2584
Ak 2.58	Ps	.007	.011	.015	.020	.026	.033	.043
24 x 24	CFM	1106	1383	1659	1936	2213	2489	2766
Ak 2.77	Ps	.007	.011	.016	.021	.025	.035	.042
36 x 18	CFM	1252	1565	1878	2191	2505	2818	3131
Ak 3.13	Ps	.007	.011	.017	.022	.027	.037	.045
30 x 24	CFM	1399	1749	2099	2449	2799	3149	3499
Ak 3.50	Ps	.008	.012	.018	.023	.029	.039	.048
36 x 24	CFM	1697	2122	2546	2971	3395	3819	4244
Ak 4.24	Ps	.008	.014	.020	.026	.033	.044	.054
30 x 30	CFM	1773	2216	2659	3102	3546	3989	4432
Ak 4.43	Ps	.009	.014	.020	.027	.034	.045	.056
36 x 30	CFM	2154	2692	3231	3769	4307	4846	5384
Ak 5 38	Ps	.010	.016	.023	.031	.040	.051	.063
48x 24	CFM	2308	2885	3462	4039	4616	5193	5771
Ak 5.77	Ps	.010	.017	.024	.032	.042	.053	.066
36 x 36	CFM	2621	3276	3931	4587	5242	5897	6552
Ak 6.55	Ps	.011	.018	.026	.035	.046	.058	.072
48 x 36	CFM	3588	4485	5382	6279	7176	8073	8971
Ak 8.97	Ps	.010	.016	.023	.031	.040	.051	.063
48 x 48	CFM	4946	6183	7419	8656	9893	11129	12366
Ak 12.40	Ps	.010	.016	.023	.031	.041	.052	.064

ALH45FF and ALHR45
Return Air Registers and Grilles

Avg. Face Velocity*		400	500	600	700	800	900	1000
6 x 6	CFM	50	63	76	88	101	113	126
Ak .126	Ps	.011	.018	.025	.036	.044	.056	.069
8 x 8	CFM	100	120	140	170	190	220	240
Ak .241	Ps	.032	.050	.072	.098	.128	.163	.200
12 x 6	CFM	110	140	170	190	220	250	280
Ak .278	Ps	.031	.048	.069	.094	.122	.155	.191
14 x 6	CFM	130	170	200	230	270	300	330
Ak .334	Ps	.029	.045	.065	.088	.114	.145	.179
14 x 8	CFM	190	230	280	330	370	420	460
Ak .464	Ps	.025	.039	.055	.075	.097	.123	.152
12 x 12	CFM	250	310	370	430	490	550	610
Ak .614	Ps	.021	.032	.046	.062	.079	.100	.125
24 x 8	CFM	340	420	500	590	670	760	840
Ak .839	Ps	.020	.032	.046	.061	.079	.100	.124
18 x 12	CFM	380	480	570	670	760	860	950
Ak .952	Ps	.020	.032	.046	.061	.080	.101	.124
30 x 8	CFM	430	530	640	750	850	960	1100
Ak 1.07	Ps	.020	.032	.046	.061	.080	.101	.124
24 x 12	CFM	520	650	780	900	1000	1200	1300
Ak 1.29	Ps	.020	.032	.046	.062	.081	.102	.124
18x 18	CFM	580	730	880	1000	1200	1300	1500
Ak 1.46	Ps	.020	.032	.046	.062	.081	.102	.124
30 x 12	CFM	650	820	980	1100	1300	1500	1600
Ak 1.63	Ps	.021	.032	.046	.062	.082	.103	.124
20 x 20	CFM	730	910	1100	1300	1500	1600	1800
Ak 1.82	Ps	.021	.032	.046	.063	.083	.104	.124
36x 12	CFM	790	990	1200	1400	1600	1800	2000
Ak 1.98	Ps	.021	.032	.046	.063	.084	.105	.125
24 x 20	CFM	880	1100	1300	1500	1800	2000	2200
Ak 2.21	Ps	.021	.032	.047	.064	.085	.107	.126
30 x 18	CFM	1000	1200	1500	1700	2000	2200	2500
Ak 2.50	Ps	.021	.033	.048	.065	.087	.109	.128
24x 24	CFM	1100	1300	1600	1900	2100	2400	2700
Ak 2.67	Ps	.022	.033	.048	.066	.088	.110	.130
36 x 18	CFM	1200	1500	1800	2100	2400	2700	3000
Ak3.02	Ps	.023	.035	.051	.069	.092	.116	.137
30 x 24	CFM	1300	1700	2000	2400	2700	3000	3400
Ak 3.37	Ps	.024	.037	.053	.073	.096	.121	.144
36 x 24	CFM	1600	2000	2400	2900	3300	3700	4100
Ak 4.08	Ps	.027	.040	.058	.080	.105	.132	.158
30 x 30	CFM	1700	2100	2600	3000	3400	3800	4300
Ak 4.26	Ps	.027	.041	.060	.081	.107	.135	.162
36 x 30	CFM	2100	2600	3100	3600	4100	4600	5200
Ak 5.15	Ps	.030	.045	.066	.090	.117	.149	.179
48 x 24	CFM	2200	2800	3300	3900	4400	5000	5500
Ak 5.51	Ps	.031	.047	.069	.093	.122	.154	.186
36 x 36	CFM	2500	3100	3700	4400	5000	5600	6200
Ak 6.24	Ps	.034	.051	.074	.100	.130	.165	.200
48 x 36	CFM	3400	4200	5100	5900	6800	7600	8500
Ak 8.48	Ps	.025	.038	.055	.075	.098	.124	.153
48 x 48	CFM	4600	5800	6900	8100	9200	10000	12000
Ak 11.60	Ps	.022	.034	.048	.066	.086	.109	.134

*Velocity measured 1 inch from face. Multiple readings are taken in face areas not exceeding 6” x 6”, but in no case less than 6 readings, to ensure a representative CFM = Ak x Average Measured Velocity.

Recommended Noise Criteria and Face Velocity Ranges are on page 19.