

### SELECTION OF SUPPLY GRILLES AND REGISTERS

- The performance data which follows permits quick, easy, and accurate selection of supply grilles and registers.
- Two groups of data are required for selection.
- Inherently required by the structural and room use considerations.
- The required performance characteristics of the supply outlets.
- Consider first the spaces which are to be conditioned and their effects upon outlet selections.

1. m<sup>3</sup>/s the air volume to be delivered to each space is determined by overall system design, and the m<sup>3</sup>/s per outlet is determined by the number of outlets which supply each space.
2. NC Level The permissible sound level in each space may be specified by the owner or the architect, or it may be determined as an engineering design goal. Figure 1 contains an abbreviated list of design goals for air conditioning sound control in common occupancies.
3. Throw Requirement The required throw is determined from the building plan. Often the throw requirement will be the distance from the outlet to the opposite wall. Sometimes it will be the distance from the outlet to the intersection of its air system with air being delivered from another supply outlet.

- Other items to be considered are the spread requirement, permissible drop, and acceptable pressure drop.

- The air stream should spread sufficiently so that the wall or space at the end of the throw is blanketed.
- The drop of the air stream should not be so great that it is within 1.5m of the floor at the end of the throw.
- Finally, the allowance in the design of the system for outlet pressure loss should not be exceeded.
- After the design requirements - air flow, NC level, throw spread, and drop requirements – are known, the outlet can be selected

### Selection of Grilles and Registers - 19mm Louvers

- The basic selection data are given in the tables to follow for grilles and registers having louvers on 19mm spacing.
- For each listed air volume, the static pressure drop and two values of throw are given for each grille area factor.
- The minimum throw is the distance the air will travel to a terminal velocity of 0.64m/s; the maximum throw is the distance of air travel to a terminal velocity of 0.41m/s.
- For each m<sup>3</sup>/s and the grille size, selection data are given at three spread angles -0°, 22½° and 45°.
- NC level is coded in 5 db. Increments for each m<sup>3</sup>/s, spread angle, and area factor in the table.

## SUPPLY AIR GRILLES

### Details

**TABLE 5 - RECOMMENDED NC LEVEL DESIGN GOALS**

NC RANGE	COMMUNICATION		TYPICAL APPLICATION
	TEL	VOICE	
20-25	Excellent	9.1-15.2m	Church Sanctuary Concert & Opera Halls Sound Reproduction Studios
25-30	Excellent	6.0-12.1m	Legitimate Theaters Board Rooms
30-35	Good	3.0-9.1m	Private Office Ball Rooms Movie Theaters
35-40	Fair	.8-3.6m	Public Library Building Lobbies General Office
40-45	Fair	1.2-2.7m	Halls & Corridors Cafeterias
45-50	Poor	0.9-1.8m	Supermarkets Department Stores Restaurant Kitchens
Over 50	Very Poor	0.3-0.6m	Manufactory Areas

- The area factor shown at the top of each column is the key to actual grille-size selection.
  - The Grille Sizes shown are not the only grilles which could be selected.
  - Complete size selection is given, in Tables 6, 7 & 8 to follow, which relates grille height and grille width to the area factor.
  - Selecting a register requires that the effects of dampers on grille performance be considered.
  - Throw, spread, and drop are not affected by the dampers of a register - if the damper is wide open - but the pressure requirement and the sound level generated by a register are different from those of a grille only.
  - The effects of the damper on these performance characteristics are shown in Table 6 to follow.
  - To obtain the NC level of a register add the "NC addition" factor to the NC level of the grille as determined from Tables 6 & 9 to follow.
  - To obtain the static pressure loss of the register, multiply the grille static pressure by the "Ps mu
- **Note these two factors vary with grille width.**

### DROP

- The drop of the cooled air stream is shown in Table 7. This is the vertical distance which the air will have dropped as it travels across the room and slows to a velocity of 0.6mJs.
- Note that, at a constant air flow the drop increases as the grille area factor increases.
- This occurs because the air velocity at the grille face decreases as the grille area increases.
- On the other hand, it must be realized that the further the air travels – that is, the longer the throw – the greater the drop becomes.
- For this reason, drop increases as air flow is increased as air flow is increased if the grille size and spread angle are kept constant.
- The spread angle settings affects all of the performance characteristics of a grille.
- The following general rules can be used to estimate the spread:
  1. For 0°spread angle, the total spread of the air stream is one-third of the throw.
  2. For 22½° spread angle, the total spread of the air stream is about 45 percent of the throw.
  3. For 45°spread angle, the total spread of the air stream is 1.5 times the throw.
- These values are the total spread of the air stream, but they do not consider grille width which should be added to the spread estimated above.
- If three grilles serve the space, determine the difference between the combined NY level for the first two grilles and the NC level of the third grille. Determine the NC addition as above, and add this to the combined NC level of the first two units. If the difference between NC levels of two grilles is 10 db. Or more, the sound generated by the quieter grille will not affect the space NC.

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- **TABLE 6 - NC AND STATIC PRESSURE FACTORS FOR REGISTERS (OPEN DAMPER)**

Grille Width	100	125	150-170	200-250	250-200	300-350	350-450	450-550	550-600	600-700	700-850	850-1000	1000-1200
NC Addition (1)	12	11	10	9	8	7	6	5	5	4	4	4	3
PS Multiplier (2)	2.5	2.4	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.5	1.4	1.3	1.2

- **NOTES:**
- (1) NC Addition plus grille NC equals register NC level.
- (2) Ps Multiplier time's grille static pressure equals register static pressure

- **TABLE 7 - DROP OF COOLED SUPPLY AIR**

Area Factor	0.15		0.25		0.5		1		2		3		4	
	0°	45°	0°	45°	0°	45°	0°	45°	0°	45°	0°	45°	0°	45°
M3/s														
0.035														
0.047	1.21	0.61	1.37	0.80	1.52	0.80								
0.07	1.37	0.61	1.52	0.80	1.68	0.80	1.83	0.91						
	1.52	0.50	1.68	0.80	1.83	0.91	1.98	0.91						
0.9														
0.14	1.68	0.8	1.83	0.91	1.98	1.07	2.29	1.07	2.44	1.22				
0.25			1.98	0.91	2.29	1.07	2.59	1.22	2.74	1.40	3.05	1.52		
					2.60	1.22	2.90	1.40	3.20	1.52	3.35	1.68	3.66	1.68
0.35														
0.5					2.90	1.40	3.20	1.52	3.5	1.68	3.81	1.83	3.96	1.98
0.7							3.66	1.68	3.96	1.98	4.27	1.98	4.42	2.13
							3.96	1.98	4.57	2.13	4.72	2.28	5.02	2.44
0.95														
1.2									4.88	2.44	5.18	2.59	5.48	2.59
1.5									5.18	2.59	5.48	2.74	5.79	2.89
									5.64	2.74	5.94	2.89	6.25	3.05

- For larger spaces and specific room absorption conditions, a calculation using sound power level data is required.
- Closing the damper of a register results in:
- The restriction of the air flow, thereby increasing the pressure drop and decreasing the air flow. The damper generating sound - increases the NC level.
- For example a damper closed sufficiently to double the pressure loss of a register (pressure ratio of 2) Causes and NC increase of about 7 db.  
(As a rule of thumb - and for general reference only - it can be assumed that closing an opposed blade damper to an effective opening ratio of 70 percent doubles the pressure loss of the damper outlet combination. Closing the damper to an effective Opening ratio of fifty percent increases the pressure loss to 4-times the grille-open damper loss.)

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### Combining Sound Sources

- The NC data for registers and grilles, given in tables to follow, contain an allowance for the sound adsorbing properties of the average room and its contents.
- This absorption is assumed to be 8 db.
- For relatively small spaces - about 73.5 sq. m. or less of floor area and ceiling height of 3.0m or less – the following simplified method for estimating NC level produced by combinations of supply and return registers and grilles can be used:
  1. Determine the difference in NC level between the grilles or registers having the highest NC and the second highest NC level.
  2. From table 9 to follow determine the number of decibels to be added to the NC level of the grille having highest NC level. This sum is the combined NC level generated by the two grilles or registers.

**TABLE 8 AREA FACTORS, FOR SELECTION OF SUPPLY GRILLES - 19mm, SD AND DD**

Grille Width	100	125	150	200	250	300	350	400	450
100	1.52								
125	2.03	2.54							
150	2.29	3.05	3.81						
200	3.30	4.32	5.33	7.37					
250	4.32	5.33	6.60	9.14	11.68				
300	5.08	6.60	8.13	11.18	14.22	17.27			
350	6.10	9.65	13.21	16.76	20.57	34.38			
400	6.86	11.18	15.24	19.30	23.62	27.94	31.75		
450	7.87	12.45	17.27	21.18	29.92	31.24	36.07	40.64	
500	8.64	11.43	13.97	19.30	24.38	29.72	34.80	40.64	45.72
550	9.65	12.45	15.49	21.08	27.43	1.29	1.50	1.75	1.95
600	10.41	13.72	16.76	23.11	29.46	35.41	41.91	48.26	54.61
650	11.43	14.73	18.29	25.15	32.00	39.37	45.72	53.34	59.69
700	12.70	16.00	19.81	27.18	34.54	41.91	49.53	57.15	64.77
750	13.97	17.27	21.08	29.21	37.08	44.45	53.34	60.96	68.58
800	16.61	21.59	21.59	25.40	35.05	44.45	54.61	63.50	73.66
1000	19.05	24.13	24.13	29.21	39.37	49.53	60.96	71.12	81.28
1100	20.30	26.67	26.67	31.75	43.18	53.34	66.04	78.74	90.17
1200	22.86	29.21	34.29	46.99	59.69	72.39	86.36	99.06	111.76
1300	25.40	30.48	38.10	52.07	64.77	77.47	91.44	105.41	119.38
1400	26.67	33.03	40.64	55.88	69.85	83.82	96.52	111.76	127.00
1500	27.94	35.56	43.18	59.99	74.93	90.17	101.60	119.38	137.16

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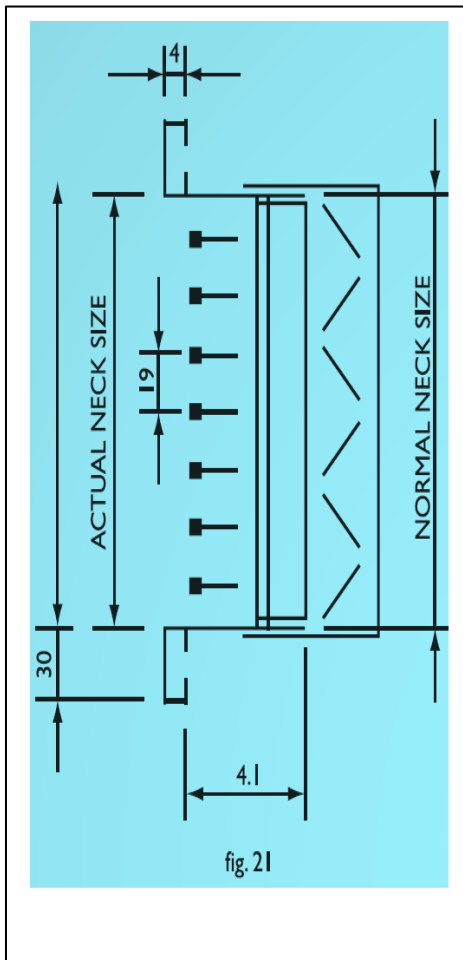
**TABLE 9 - NC ADDITION FOR COMBINING EFFECTS OF SOUND SOURCES**

DIFFERENCE BETWEEN TWO LEVELS TO BE COMBINED	0	1	2	4	6	9	10
NUMBER TO BE ADDED TO HIGHER LEVEL TO OBTAIN COMBINED LEVEL	3	2.5	2	1.5	1	0.5	0

### Selection of Grilles and Registers - 19mm Blade Spacing

- Grilles and registers having louvers (blades) on 19mm spacing are selected in a similar manner.
- The structural and room-use factors, the air volume, and the throw, spread drop and NC Requirements must be considered in the same way as with other grilles and registers.
- For each listed air volume, the static pressure and two values of throw are given.
- The minimum throw is the distance the air will travel to a terminal velocity of 0.64m/s; the maximum throw is the distance of air travel to a terminal velocity of 0.41m/s.
- Selection data are given at each of three spread angles - 0°, 22½°, and 45° - and for NC level in 5 db. Increments.
- The area factor shown at the top of each column permits flexibility in grille-size selection

## SUPPLY AIR GRILLES



### Details

**TYPE DD:** Double deflection supply air grilles manufactured of extruded type 50S anodizing grade aluminum with individually adjustable front vertical and rear horizontal louvres held in place by star lock washers and spring wire.

Optional Accessories

<b>OBD</b>	=	Opposed Blade Damper
<b>CF</b>	=	Concealed Fixing

Frame Options

**30mm Standard**  
**20mm**  
**50mm**

Finish Options

<b>NA</b>	=	Natural Anodized
<b>EPC</b>	=	Epoxy Powder Coating
<b>WS</b>	=	Wet Spray Colour

Note: (1) Dimensions given are for opening size into which grille will fit (i.e. Normal Duct Size)  
 (2) If code "OS" is entered under SPECIAL INSTRUCTIONS, then dimensions given are over flange.

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## PERFORMANCE DATA DD - SD

Normal Size			200x100			250x100			300x100 200x150			400x100 250x150			500x100 300x150			350x150 250x200			
Core Area			0.015			0.02			0.024			0.032			0.038			0.044			
Deflection			'0- 45-	22½		'0- 45-	22½	45-	'0- 45-	22½	45-	'0- 45-	22½	45-	'0- 45-	22½	45-	'0- 45-	22½	45-	
m³/s	Aj	(m³)	'0.011	0.01	0.008	0.014	0.014	0.011	0.018	0.017	0.013	0.023	0.022	0.017	0.028	0.027	0.021	0.032	0.031	0.024	
0.024	Tp	(Pa)	1.72	2.12	8.48	1.11	1.38	5.74													
	Throw	(m)	2.1-4.0	1.5-3.01	2-2.1	1.7-3.6	1.4-2.7	0.9-2.2													
	Vel	(m/s)	1.97	2.18	4.36	1.58	1.76	3.59													
	NS	dB	*	*	*	*	*	*													
0.036	Tp	(Pa)	3.87	4.77	19.09	2.5	3.11	12.92	1.74	2.18	9.33	1.14	3.11	12.92							
	Throw	(m)	3-4.8	2.4-3.61	1.5-2.7	2.7-4.9	2.1-3.7	1.5-2.7	2.49-4.9	1.8-3.7	1.3-2.6	2.1-4.3	1.6-3.2	1.3-2.3							
	Vel	(m/s)	2.95	3.27	6.65	2.37	2.64	5.39	1.98	2.21	4.58	1.6	1.8	3.9							
	NS	dB	*	*	*	*	*	*	*	*	*	*	*	*							
0.047	Tp	(Pa)	6.6	8.13	32.53	4.25	5.3	22.03	2.97	3.72	15.9	1.94	2.74	11.56	1.32	1.69	7.65				
	Throw	(m)	4-5.6	3-4.2	2.1-3	3.6-5.3	2.7-4.3	2.1-3.1	3.6-5	2.5-4.3	1.8-3	2.7-5.5	2.05-4.3	1.6-3.1	2.4-5.2	1.8-4.1	1.3-2.7				
	Vel	(m/s)	3.85	4.27	8.55	3.09	3.45	7.03	2.58	2.89	5.97	2.08	2.36	5.09	1.72	1.95	4.14				
	NS	dB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
0.060	Tp	(Pa)	10.76	13.25		6.93	8.63	35.9	4.84	6.06	25.9	3.16	4.03	18.85	2.15	2.76	12.46	1.74	2.13	8.58	
	Throw	(m)	4.3-6.5	3.4-4.9		4.3-6.4	3.5-5	2.5-3.7	4.6-1	3-4.6	2.2-3.5	3.4-6.5	2.4-4.9	1.8-3.7	2.4-5.2	1.8-4.1	1.3-2.7	3.1-6.2	2.4-4.6	1.8-3.4	
	Vel	(m/s)	4.91	5.45		3.94	4.4	8.98	3.29	3.69	7.63	2.66	3.01	6.5	2.2	2.49	5.29	1.97	2.19	4.39	
	NS	dB	17	18		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
0.070	Tp	(Pa)	14.64	18.04		9.44	11.75		6.58	8.25	35.26	4.3	5.48	25.65	2.93	3.76	16.96	2.36	2.9	11.68	
	Throw	(m)	4.9-6.5	3.7-5.5		4.9-7	3.7-5.5		4.8-7	3.7-7	2.7	4.2-6.7	3.4-5.2	2.3-3.7	4-6.7	3-5.2	2-3.8	3.7-6.8	2.7-5.2	2.1-3.7	
	Vel	(m/s)	5.73	6.36		4.6	5.14		3.84	4.3	8.9	3.11	3.51	7.59	2.56	2.9	6.17	2.3	2.55	5.12	
	NS	dB	23	24		18.4	19		*	*	*	*	*	*	*	*	*	*	*	*	*
0.083	Tp	(Pa)	20.58	25.36		13.27	16.52		9.25	11.6		6.04	7.71	36.06	4.12	5.28	23.85	3.32	4.07	16.41	
	Throw	(m)	5.2-7.6	4-5.8		5.2-7.3	4-5.3		5-7.2	4-5.4	2.7	4-7.2	3.6-5.5	2.4-4	4.2-7.2	3.4-5.4	2.4-4	4-7.3	3.1-5.4	2.1-4	
	Vel	(m/s)	6.8	7.55		5.46	6.09		4.56	5.1		3.68	4.16	9	3.04	3.44	7.32	2.73	3.02	6.07	
	NS	dB	28	29		19	21		*	*	*	*	*	*	*	*	*	*	*	*	*
0.095	Tp	(Pa)				17.38	21.64		12.12	15.2		7.91	10.1		5.4	6.92	31.24	4.35	5.33	21.5	
	Throw	(m)				5.4-7.9	4.3-6.1		5.4-7.9	4.3-6.1		4.4-8	4.3-6.1		5.2-7.9	4.6	2.6-4.2	4.9-8	3.7-6	2.7-4.2	
	Vel	(m/s)				6.25	6.97		5.22	5.84		4.21	4.76		3.48	3.94	8.37	3.13	3.46	6.95	
	NS	dB				24	25		18	19		*	*		*	*	*	*	*	*	
0.106	Tp	(Pa)				21.64	26.94		15.09	18.93		9.85	12.58		6.72	8.61	38.89	5.42	6.64	26.77	
	Throw	(m)				6.1-8.5	4.5-6.7		5.8-8.5	4.5-6.7		5.8-8.5	4.5-6.7		5.7-8.4	4.5-6.7	3-4.6	5.5-8.8	4.3-6.8	3-4.5	
	Vel	(m/s)				6.97	7.78		5.82	6.52		4.7	5.31		3.88	4.4	9.34	3.49	3.86	7.75	
	NS	dB				29	30		23	24		16	17		*	*	*	*	*	*	
0.118	Tp	(Pa)				26.81	33.38		18.71	23.45		12.21	15.59		8.33	10.67		6.71	8.23	33.18	
	Throw	(m)				6.4-8.8	4.9-6.6		6-8.9	4.5-6.7		6-8.9	4.6-6.6		6.9	4.7-6.8		6.9	4.7-6.7	3.4-4.9	
	Vel	(m/s)				7.76	8.66		6.48	7.36		5.23	5.91		4.32	4.89		3.88	4.3	8.63	
	NS	dB				35	36		25	26		18	19		*	*		*	*	*	
0.131	Tp	(Pa)							23.05	28.91		15.05	19.21		10.26	13.15		8.27	10.14	40.89	
	Throw	(m)							6.7-9.5	5.1-7.3		6.4-9	5.7		6.4-9.5	5-7.3		6-7.9	5.2-7	3.7-5.1	
	Vel	(m/s)							7.19	8.06		5.81	6.57		4.8	5.43		4.31	4.77	9.58	
	NS	dB							29	30		21	22		17	23		*	*	*	
0.141	Tp	(Pa)							26.71	33.49		17.43	22.25		11.89	15.24		9.58	11.75		
	Throw	(m)							7-9.8	5.5-7.5		6.7-9.9	5.1-7.6		6.7-9.9	5-7.5		6.7-10	5-7.5		
	Vel	(m/s)							7.74	8.67		6.25	7.07		5.17	5.85		4.64	5.14		
	NS	dB							34	35		24	25		19	19		17	20		
0.165	Tp	(Pa)										23.87	30.47		16.28	20.86		13.12	16.09		
	Throw	(m)										7.7-10.3	5.6-8.2		7.3-10.4	5.5-8		7.3-10.4	5.5-8		
	Vel	(m/s)										7.32	8.27		6.05	6.84		5.43	6.01		
	NS	dB										29	30		24	25		20	21		
0.187	Tp	(Pa)										39.4	39.14		26.88	26.8		21.67	20.67		
	Throw	(m)										8-11.3	6-8.5		8-11.3	6-8.5		8-11.3	6-8.6		
	Vel	(m/s)										9.4	9.37		7.77	7.76		6.97	6.81		
	NS	dB										35	36		28	29		24	25		
0.212	Tp	(Pa)													33.31	34.44		26.85	26.57		
	Throw	(m)													8.5-12	6-7.9		8.5-12	6-7.9		
	Vel	(m/s)													8.65	8.79		7.76	7.72		
	NS	dB													33	34		28	29		
0.236	Tp	(Pa)													40.74	42.68		32.84	32.92		
	Throw	(m)													8.9-12.7	6.7-9.8		8.9-12.9	6.7-9.9		
	Vel	(m/s)													9.56	9.79		8.59	8.6		
	NS	dB													38	39		32	33		
0.261	Tp	(Pa)																38.88	40.27		
	Throw	(m)																9-13.5	7-10.5		
	Vel	(m/s)																9.34	9.51		
	NS	dB																37	38		

NS = Sound rating from sound power data assuming RA =8dB  
CA = Core are m²  
Aj = Effective area of throw in m/s  
Tp = Static Power + the duct velocity pressure in Pa  
= Total Pressure in Pa  
Throw = Distance Tp of max air stream velocity at  
0.5m/s to 0.25m/s



# ADVANTAGE AIR®

## SUPPLY AIR GRILLES

### PERFORMANCE DATA DD - SD

Normal Size			300 x 400 800 x 150			300 x 250 375 x 200 500 x 150			300 x 300 360 x 250 450 x 200 600 x 150			350 x 300 420 x 250 825 x 200 700 x 150			400 x 300 480 x 250 600 x 200			450 x 350 525 x 300 750 x 200 750 x 200		
	Core Area		0.01			0.08			0.09			0.11			0.12			0.16		
	Deflection		'0-	22½	45-	'0-	22½	45-	'0-	22½	45-	'0-	22½	45-	'0-	22½	45-	'0-	22½	45-
m³/s	Aj	(m³)	0.07	0.064	0.03	0.045	0.04	0.019	0.054	0.048	0.022	0.062	0.056	0.026	0.071	0.064	0.03	0.093	0.083	0.038
0.070	Tp	(Pa)	0.43	0.54	2.5															
	Throw	(m)	3.4-6.4	2.4-4.8	1.8-3.8															
	Vel	(m/s)	9.98	1.1	3.27															
	NS	dB	*	*	*															
0.083	Tp	(Pa)	0.6	0.75	3.51	1.53	1.9	8.58												
	Throw	(m)	3.7-7.3	3-5.6	2.1-4	3.5-6.8	2.5-5.2	1.8-3.8												
	Vel	(m/s)	1.16	1.3	2.81	1.85	2.07	4.39												
	NS	dB	*	*	*	*	*	*												
0.095	Tp	(Pa)	0.79	0.99	4.6	2	2.49	11.25	1.4	1.74	7.97									
	Throw	(m)	4.3-8	3.5-6.2	2.5-4.3	4-7.6	3-5.8	2.1-4.3	3.7-7.3	2.7-5.5	2.1-4									
	Vel	(m/s)	1.33	1.49	3.21	2.12	2.36	5.02	1.77	1.98	4.23									
	NS	dB	*	*	*	*	*	*	*	*	*									
0.106	Tp	(Pa)	0.98	1.23	5.73	2.5	3.1	14	1.74	2.17	9.92	1.28	1.6	7.4						
	Throw	(m)	5-8.2	3.4-6.7	2.4-4.6	4.4-8.5	3.4-6.7	2.4-4.5	4-7.9	3-6	2-4.3	3.8-7.4	2.8-5.5	2.1-4						
	Vel	(m/s)	1.48	1.66	3.59	2.37	2.64	5.61	1.97	2.2	4.72	1.69	1.89	4.07						
	NS	dB	*	*	*	*	*	*	*	*	*	*	*	*						
0.118	Tp	(Pa)	1.21	1.52	7.1	3.09	3.84	17.35	2.15	2.68	12.3	1.58	1.98	9.17						
	Throw	(m)	5.6-9	4.4-6.5	3-5	5-9	3.8-6.9	2.7-5	4.7-9	3.7-6.8	2.7-5	4.4-8.2	3.4-6.4	2.4-4.6						
	Vel	(m/s)	1.65	1.85	3.99	2.63	2.94	6.24	2.2	2.45	5.25	1.89	2.11	4.54						
	NS	dB	*	*	*	*	*	*	*	*	*	*	*	*						
0.131	Tp	(Pa)	1.5	1.87	8.75	3.81	4.73	21.38	2.65	3.31	15.15	1.95	2.44	11.3	1.51	1.86	8.52			
	Throw	(m)	5.8-9	4.6-7	3-5.2	5.2-9	4-7	2.8-5.2	5-9.7	3.7-7.3	2.7-5.2	4-6.9	3.7-7	2.4-5.2	4.3-8.3	3.4-6.5	2.4-4.6			
	Vel	(m/s)	1.83	2.05	4.43	2.95	3.36	6.93	2.44	2.71	5.83	2.09	2.34	5.04	1.84	2.94	4.37			
	NS	dB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
0.165	Tp	(Pa)	2.37	2.97	13.88	6.05	7.51	33.93	4.21	5.25	24.04	3.1	3.87	17.92	2.4	2.95	13.52	1.4	1.74	8.21
	Throw	(m)	7.3-10	5.5-8.2	4-5.9	6.7-10	4.5-7.8	3.7-5.8	6.1-10.4	4.6-7.9	3.4-5.8	5.9-10.4	4.6-7.8	3-5.9	5.2-10.4	4-8	2.8-5.9	4.6-9.6	3.7-7.3	2.4-5.2
	Vel	(m/s)	2.31	2.58	5.58	3.68	4.11	8.73	3.07	3.43	7.35	2.64	2.95	6.34	2.32	2.57	5.51	1.77	1.97	4.29
	NS	dB	17	18	23	17	17	22	*	*	*	*	*	*	*	*	*	*	*	*
0.187	Tp	(Pa)	3.05	3.82	17.82	7.77	9.65	43.58	5.41	6.74	30.88	3.98	4.97	23.02	3.08	3.79	17.37	1.8	2.23	10.54
	Throw	(m)	8-11.3	6-8.6	4.3-6	8-11.3	6-8.6	4.3-6	7-11	5.6-8.5	4-6.1	6.7-11.3	5.2-8.5	3.7-6.1	6.1-11.3	4.6-8.5	3.4-6.1	5.1-10.3	4-8	2.7-5.8
	Vel	(m/s)	2.62	2.93	6.32	4.18	4.65	9.89	3.48	3.89	8.33	2.99	3.34	7.19	2.63	2.92	6.24	2.01	2.24	4.86
	NS	dB	20	21	26	16	17	22	*	*	*	*	*	*	*	*	*	*	*	*
0.212	Tp	(Pa)	3.92	4.91		9.98	12.4		6.95	8.66	39.69	5.11	6.39	29.59	3.95	4.87	22.33	2.31	2.86	13.55
	Throw	(m)	8.1-12	6.5-9.1		8.5-11.9	6.7-9		8-12	6-9	4.3-6.4	7.6-12	5.8-9.1	4.3-6.4	6.7-12	5.2-9	3.7-6.4	6-12	4.6-9	3.4-6.4
	Vel	(m/s)	2.97	3.32		4.73	5.28		3.95	4.41	9.44	3.39	3.79	8.15	2.98	3.31	7.08	2.28	2.54	5.51
	NS	dB	23	24		19	20		*	*	*	*	*	*	*	*	*	*	*	*
0.236	Tp	(Pa)	4.86	6.08		12.37	15.37		8.61	10.73		6.34	7.92	36.67	4.9	6.04	27.67	2.87	3.53	16.79
	Throw	(m)	8.8-12.5	6.6-10		8.8-12.6	6.7-10		8.5-12.6	6.7-9.7		8.3-12.6	6.1-10	4.6-7.1	7.3-12.6	5.6-10	4-7	6.7-12.6	5.3-10	3.7-7
	Vel	(m/s)	3.3	3.7		5.27	5.87		4.4	4.91		3.77	4.22	9.07	3.32	3.68	7.88	2.54	2.82	6.14
	NS	dB	27	28		22	23		17	18		*	*	*	*	*	*	*	*	*
0.261	Tp	(Pa)	5.94	7.44		15.13	18.79		10.53	13.13		7.75	9.69		5.99	7.38	33.84	3.5	4.34	20.53
	Throw	(m)	9-13	7-10		9-13	7-10.1		9.1-13.1	7-10.1		9.1-13.1	7-10.1		8.3-13.2	5-10.2	4.7-7.4	7.4-13	5.6-10.2	4.1-7
	Vel	(m/s)	3.65	4.09		5.83	6.5		4.96	5.43		4.17	4.66		3.6	4.07	8.72	2.8	3.12	6.79
	NS	dB	30	31		24	25		20	21		16	17		*	*	*	*	*	*
0.284	Tp	(Pa)	7.03	8.81		17.91	22.25		12.47	15.53		9.18	11.47		7.1	8.74	40.07	4.15	5.14	24.31
	Throw	(m)	9.9-13.8	7.7-10.8		9.6-13.8	7.3-10.7		9.9-13.8	8.7-10.7		9.9-14	7.6-10.7		8.9-13.7	6.8-10.8	5-7.7	8-13.8	6-10.6	4.4-7.7
	Vel	(m/s)	3.97	4.45		6.34	7.07		5.29	5.91		4.54	5.07		3.99	4.43	9.48	3.05	3.4	7.39
	NS	dB	32	33		27	28		22	23		19	20		*	*	*	*	*	*
0.331	Tp	(Pa)	9.55	11.97		24.33	30.23		16.94	21.12		12.46	15.58		9.64	11.88		5.64	6.98	33.02
	Throw	(m)	10-14.9	8-11.6		10.4-15	8-11.7		10.4-15	8-11.7		10.4-15	8-11.7		10.7-15	8.3-11.6		9-15	7-11.7	5.3-8.3
	Vel	(m/s)	4.63	5.18		7.39	8.24		6.17	6.88		5.29	5.91		4.65	5.16		3.56	3.96	8.61
	NS	dB	38	39		32	33		26	27		23	24		18	19		*	*	*
0.380	Tp	(Pa)				32.07	39.84		22.32	27.83		16.43	20.53		12.7	15.65		7.43	9.2	43.52
	Throw	(m)				11.3-16	8.6-12		11.4-16.8	8.6-12.3		11-16	8.6-12.3		11.4-16	8.6-12.4		10.7-16	8.3-12.3	5.8-8.9
	Vel	(m/s)				8.48	9.46		7.08	7.9		6.07	6.79		5.34	5.93				
	NS	dB				37	38		31	32		27	28		22	23				
0.424	Tp	(Pa)							27.79	34.65		20.45	25.56		15.82	19.49		9.25	11.46	
	Throw	(m)							12-16	9-12.8		12-16	9.1-12.8		11.7-17	8.9-12.8		11.7-17	9-12.9	
	Vel	(m/s)							7.9	8.82		6.78	7.57		5.96	6.61		4.56	5.07	
	NS	dB							35	36		31	31		25	26		20	21	
0.473	Tp	(Pa)							34.58	43.12		25.45	31.81		19.68	24.25		11.51	14.26	
	Throw	(m)							12.6-18	9.8-14		12.6-17.8	9.9-13.8		12.5-17	9.9-13.8		12.6-17.8	9.9-13.8	
	Vel	(m/s)							8.81	9.84		7.56	8.45		6.65	7.38		5.08	5.66	
	NS	dB							39	40		35	36		28	39		23	24	

# ADVANTAGE AIR®

## SUPPLY AIR GRILLES

### TYPE DD

- The two sets of individually adjustable louvers - vertical and horizontal - with or without a damper attached, allow these grilles to provide maximum flexibility of adjustments for spread and throw requirements.
- The multi directional flexibility allows for multi-directional air supply.
- They are recommended for high sidewall, bulkhead or duct mounting and can be used for heating, cooling, or ventilating applications

### GENERAL SPECIFICATIONS

- All models feature two sets of individually adjustable blades - vertical and horizontal - spaced at 19mm apart, and fitted into a 32.5 or 20mm frame.
- The optional opposed blade damper is constructed using extruded aluminum blades and frame.
- The individual blades are secured by corrosion resistant star lock washers with added adjusting tension supplied by corrosion resistant spring wire.
- All models can be furnished with powder coated white finish preceded by five stage preparation process of cleaning, phosphatizing and drying.
- Grilles can be supplied in natural anodized and white powder coated finishes.
- Other colours are available on request.



# ADVANTAGE AIR®

## SUPPLY AIR GRILLES



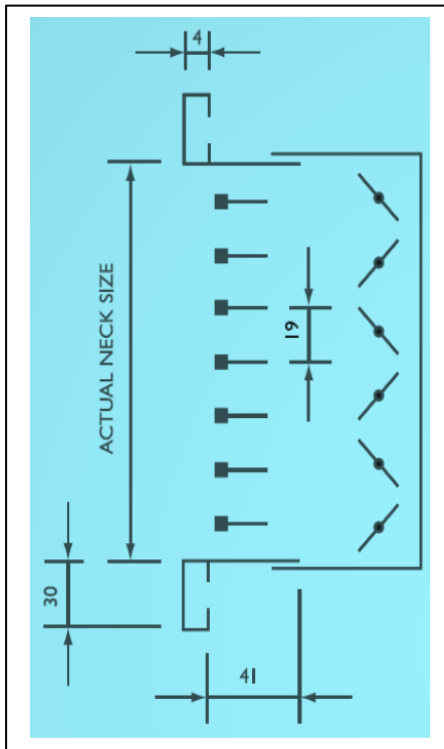
- These models have one set of individually adjustable blades on a horizontal plane to provide maximum throw requirements or on a vertical plane (on special request) to provide maximum spread adjustment.
- They are recommended for heating, cooling, and ventilating applications, generally mounted in a high sidewall, bulkhead or duct when either spread or throw only is important.
- The grilles are provided with or without an opposed blade damper.
- The adjustable blades are spaced at 19mm, but fixed blades with 13, 21 and 26mm spacing can be offered at special request.

### GENERAL SPECIFICATIONS

- All models feature one set of individually adjustable blades of extruded aluminum set in a 32.5 or 20mm extruded aluminum frame.
- An optional extra opposed blade damper is constructed of extruded aluminum blades can be supplied on request.
- All models can have a powder coated white surface finish preceded by five stage preparation process of cleaning, phosphatizing and drying.
- Other colours are available on request.
- Grilles can also be supplied in natural anodized finish.

# ADVANTAGE AIR®

## SUPPLY AIR GRILLES



### TYPE SD:

Single Deflection Supply Air Grille extruded type 50S anodizing grade aluminum with individually adjustable horizontal louvers held in place by star lock washers and wire

#### Optional

Accessories **OBD** = Opposed Blade Damper  
**CF** = Concealed Fixing

Frame Options **30mm Standard**  
**20mm**  
**50mm**

Finish Options **NA** = Natural Anodized  
**EPC** = Epoxy Powder Coating

Note: (1) Dimensions given are for opening size into which grille will fit (i.e. Normal Duct Size)  
(2) If code "OS" is entered under SPECIAL INSTRUCTIONS, then dimensions given are over flange.