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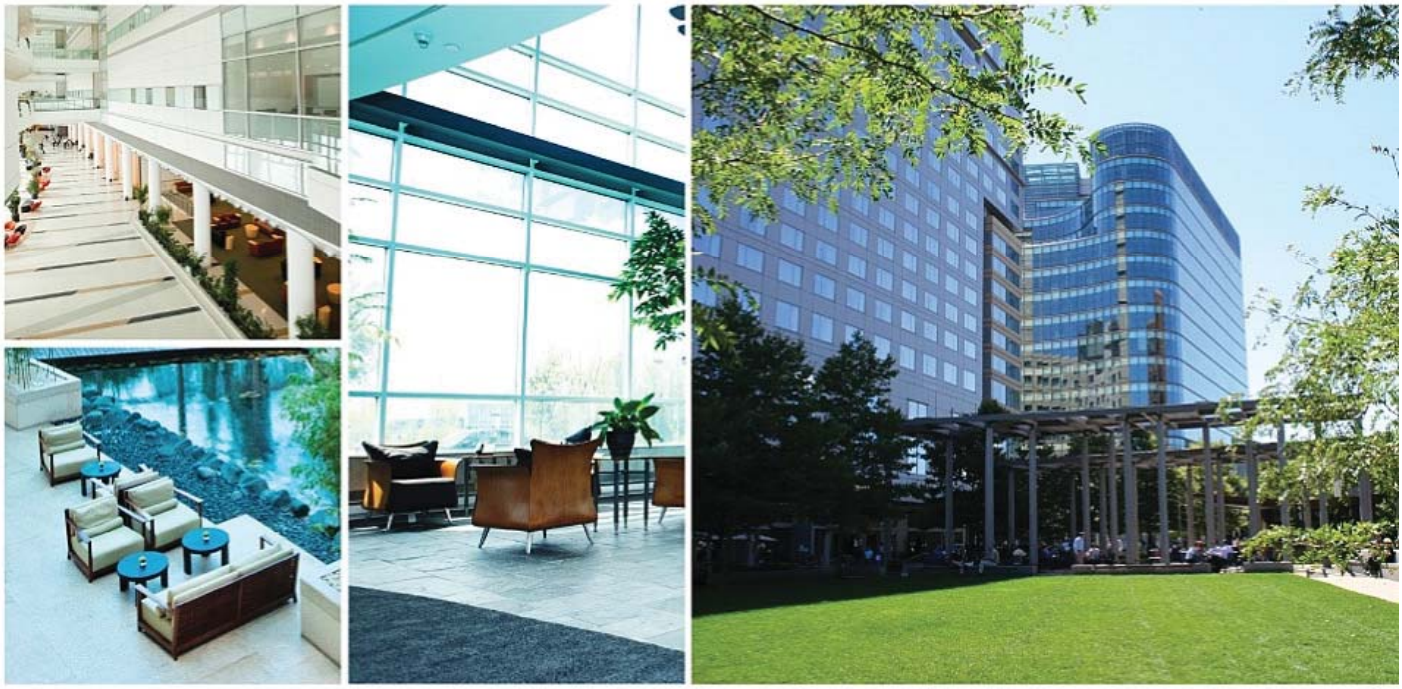
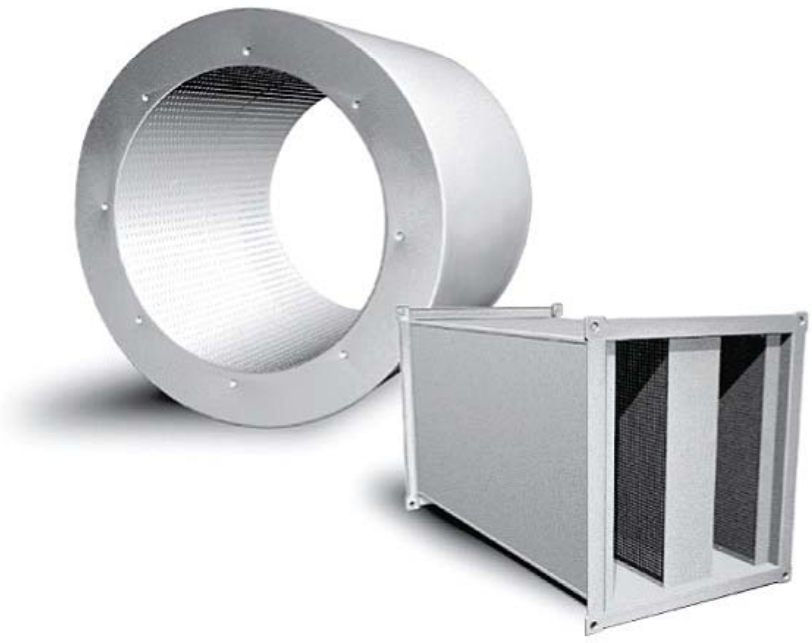


Rectangular & Circular Duct Silencer



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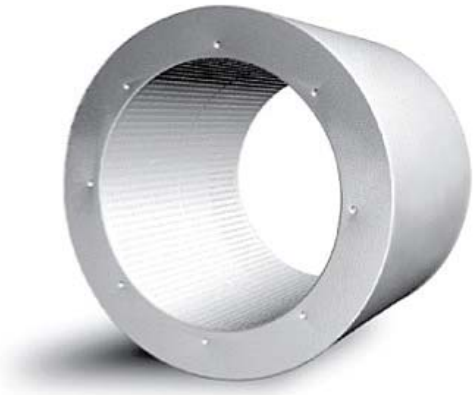

Circular Silencers

Circular Silencers Types

GTG Circular Silencers are available in a range of sizes from 315mm diameter through to 1600mm diameter and are normally supplied with flanges both ends to match axial flow fan flanges or ductwork.

The range comprises CS (without pod) and CSP (with pod) and each type is available in two lengths, one diameter long or two diameters long.

Construction

Construction consists of a galvanised sheetmetal case. Infill material is glass or mineral fibre faced with perforated galvanised steel to protect the infill from erosion.

Silencer Dimensions

Nominal Diameter	Case O/D	Shell Thickness	Length 1D	Length 2D	Pod Diameter
315	465	75	315 (12kg)	630 (24kg)	N/A
400	550	75	400 (14kg)	800 (29kg)	250
500	700	100	500 (23kg)	1000 (42kg)	310
560	760	100	560 (27kg)	1120 (50kg)	345
630	830	100	630 (39kg)	1260 (74kg)	390
710	910	100	710 (44kg)	1420 (82kg)	440
800	1000	100	800 (56kg)	1600 (105kg)	495
900	1100	100	900 (99kg)	1800 (138kg)	560
1000	1200	100	1000 (143kg)	2000 (196kg)	620
1250	1450	100	1250 (210kg)	2500 (295kg)	775
1400	1600	100	1400 (320kg)	2800 (640kg)	870
1530	1730	100	1530 (375kg)	3060 (726kg)	950
1600	1800	100	1600 (400kg)	3200 (800kg)	990

Circular Silencers Without POD

Octave		1	2	3	4	5	6	7	8
Freq (Hz)		63	125	250	500	1k	2k	4k	8k
Model									
315CS	1D	2	3	5	9	7	6	8	6
400CS	1D	2	3	5	9	7	6	8	6
500CS	1D	2	3	5	9	7	6	8	6
560CS	1D	2	3	5	9	8	7	7	5
630CS	1D	2	3	5	9	8	7	7	5
710CS	1D	2	3	7	9	6	5	4	5
800CS	1D	2	3	7	9	6	5	4	5
900CS	1D	2	3	7	10	8	6	6	4
1000CS	1D	2	3	7	10	8	6	6	4
1250CS	1D	3	5	5	10	8	6	5	3
1400CS	1D	3	5	5	10	8	6	5	3
1530CS	1D	3	5	9	9	7	6	3	2
1600CS	1D	3	5	9	9	7	6	3	2
315CS	2D	4	5	8	15	14	12	11	9
400CS	2D	4	5	8	15	14	12	11	9
500CS	2D	4	5	8	15	14	12	11	9
560CS	2D	4	6	8	15	15	12	11	8
630CS	2D	4	6	8	15	15	12	11	8
710CS	2D	5	6	11	16	13	10	8	8
800CS	2D	5	6	11	16	13	10	8	8
900CS	2D	5	6	10	17	16	11	9	7
1000CS	2D	5	6	10	17	16	11	9	7
1250CS	2D	6	9	14	19	15	10	9	6
1400CS	2D	6	9	14	19	15	10	9	6
1530CS	2D	6	10	16	19	12	10	6	5
1600CS	2D	6	10	16	19	12	10	6	5

Circular Silencers With POD

Octave		1	2	3	4	5	6	7	8
Freq (Hz)		63	125	250	500	1k	2k	4k	8k
Model									
400CSP	1D	4	5	8	13	14	17	19	15
500CSP	1D	4	5	8	13	14	17	19	15
560CSP	1D	4	5	8	13	17	21	17	12
630CSP	1D	4	5	8	13	17	21	17	12
710CSP	1D	4	5	11	13	16	21	14	12
800CSP	1D	4	5	11	13	16	21	14	12
900CSP	1D	5	6	10	15	20	20	14	10
1000CSP	1D	5	6	10	15	20	20	14	10
1250CSP	1D	5	7	11	15	23	18	13	8
1400CSP	1D	5	7	11	15	23	18	13	8
1530CSP	1D	6	9	12	16	22	16	10	8
1600CSP	1D	6	9	12	16	22	16	10	8
400CSP	2D	6	8	15	24	30	37	32	22
500CSP	2D	6	8	15	24	30	37	32	22
560CSP	2D	6	8	18	26	34	37	31	18
630CSP	2D	6	8	18	26	34	37	31	18
710CSP	2D	7	9	22	27	33	34	25	17
800CSP	2D	7	9	22	27	33	34	25	17
900CSP	2D	8	10	22	30	38	34	21	14
1000CSP	2D	8	10	22	30	38	34	21	14
1250CSP	2D	8	14	24	31	38	33	20	12
1400CSP	2D	8	14	24	31	38	33	20	12
1530CSP	2D	10	15	25	33	36	26	16	12
1600CSP	2D	10	15	25	33	36	26	16	12

Pressure Loss Calculation

Determine pressure loss for the selected model of silencer as follows:

1. Determine the loss coefficient (K) for the selected model of silencer from the following table.

Loss Coefficient K

SIZE	K
CSP-1D	0.3
CSP-2D	0.4

2. Determine the face velocity of the silencer by dividing the airflow (m^3/s) by the silencer face area (m^2)

3. Determine the pressure loss of the silencer by multiplying the loss coefficient K by the square of the face velocity (m/s)

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Type H - Insertion Loss

Octave		1	2	3	4	5	6	7	8
Freq (Hz)		63	125	250	500	1k	2k	4k	8k
Model	Module Width								
H5/900	450	8	13	18	23	27	20	17	15
H5/1200	450	9	15	22	28	33	26	21	16
H5/1500	450	9	17	28	32	36	30	23	20
H5/1800	450	12	19	31	39	45	36	29	21
H5/2400	450	14	25	42	49	55	46	37	25
H5/3000	450	17	30	53	61	63	58	43	30
H6/900	500	7	11	15	26	29	16	16	15
H6/1200	500	8	13	19	31	34	21	18	15
H6/1500	500	8	15	24	35	37	24	18	17
H6/1800	500	10	17	28	40	42	28	22	17
H6/2400	500	12	22	37	50	51	37	27	19
H6/3000	500	13	26	47	56	58	47	29	21
H7/900	550	3	9	14	21	22	13	15	10
H7/1200	550	4	11	17	25	26	17	14	10
H7/1500	550	5	12	22	31	30	20	15	13
H7/1800	550	8	15	24	36	36	22	18	14
H7/2400	550	10	20	33	46	46	29	20	16
H7/3000	550	14	24	42	52	55	37	21	19
H8/900	600	3	7	13	17	15	11	12	11
H8/1200	600	4	11	16	23	20	14	13	11
H8/1500	600	4	12	20	27	25	16	13	13
H8/1800	600	6	12	22	30	32	18	16	13
H8/2400	600	8	17	29	41	43	25	18	13
H8/3000	600	12	20	37	45	49	30	17	15

Type M - Insertion Loss

Octave		1	2	3	4	5	6	7	8
Freq (Hz)		63	125	250	500	1k	2k	4k	8k
Model	Module Width								
M5/900	350	6	11	19	32	36	26	25	18
M5/1200	350	7	13	23	38	42	34	29	20
M5/1500	350	7	16	29	43	45	40	30	24
M5/1800	350	10	17	32	50	52	47	36	25
M5/2400	350	12	23	43	59	58	60	42	28
M5/3000	350	13	28	50	62	63	62	46	32
M6/900	400	5	8	15	26	28	20	16	13
M6/1200	400	6	11	20	31	35	25	19	14
M6/1500	400	6	14	26	35	39	28	20	17
M6/1800	400	8	17	31	41	46	32	24	19
M6/2400	400	10	22	41	51	58	41	32	22
M6/3000	400	12	25	47	58	61	52	34	26
M7/900	450	5	7	14	23	26	15	13	11
M7/1200	450	6	10	17	26	31	19	12	12
M7/1500	450	6	11	22	32	34	22	16	14
M7/1800	450	7	14	24	36	40	25	20	14
M7/2400	450	8	18	33	45	49	33	25	17
M7/3000	450	10	22	40	51	55	41	27	19
M8/900	500	3	7	12	18	21	11	10	8
M8/1200	500	3	9	14	23	25	13	11	8
M8/1500	500	3	10	18	27	28	16	12	10
M8/1800	500	6	10	21	29	32	19	16	10
M8/2400	500	7	15	27	40	41	25	20	13
M8/3000	500	10	19	33	45	48	31	20	15

Pressure Loss Calculation

Determine pressure loss for the selected model of silencer as follows:

1. Determine the loss coefficient for the selected model of silencer from the table.

2. Determine the face velocity of the silencer by dividing the airflow (m^3/s) by the silencer face area (m^2)

3. Determine the pressure drop of the silencer by multiplying the loss coefficient K by the square of the face velocity (m/s)

   Pressure Loss (Pa) = KV^2
   where:
   K = loss coefficient
   V = face velocity (m/s)
   This equation is based on air density at standard conditions (1.21 kg/m^3)

Please note these calculations are based on in-duct configuration.

Type	Model	Module Width	900	1200	1500	1800	2400	3000
S	S3	275	4.61	4.65	4.68	4.80	4.94	5.18
S	S4	300	2.63	2.65	2.70	2.73	2.86	2.94
S	S5	325	1.74	1.75	1.80	1.79	1.83	1.91
S	S6	350	1.24	1.25	1.25	1.28	1.32	1.33
S	S7	375	0.93	0.95	0.95	0.97	0.98	1.02
S	S8	400	0.73	0.73	0.75	0.76	0.78	0.80
M	M5	350	4.29	4.31	4.32	4.42	4.50	4.68
M	M6	400	1.98	2.00	2.03	2.03	2.11	2.15
M	M7	450	1.18	1.18	1.20	1.20	1.22	1.26
M	M8	500	0.80	0.79	0.79	0.81	0.82	0.83
H	H5	450	2.99	2.98	3.04	3.03	3.06	3.17
H	H6	500	1.75	1.76	1.75	1.77	1.82	1.82
H	H7	550	1.16	1.18	1.18	1.20	1.20	1.23
H	H8	600	0.85	0.84	0.86	0.86	0.88	0.89

Procedure for silencer selection

Information required:
- Silencer insertion loss
- Maximum allowable pressure loss
- Airflow
- Dimensional constraints

From the insertion loss table select the silencer that offers the closest match to the required insertion loss.

Note that a small free area and long length provides the greatest attenuation, but also the greatest pressure loss.

Select the module width closest to the preferred size.

Note: to achieve the required attenuation it is essential the module widths are adhered to.

There are no restraints on the height of the silencer.

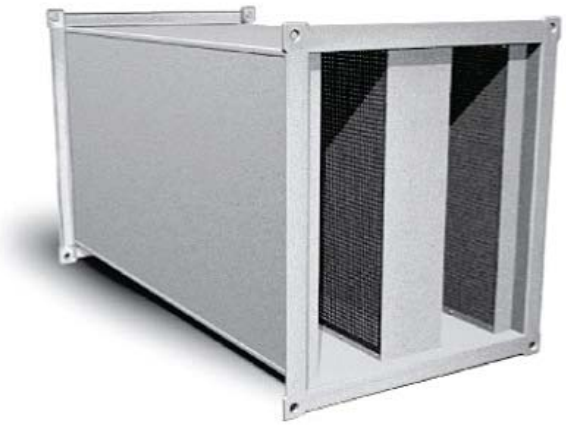
Refer to the pressure loss charts and determine the air flow resistance for the selected silencer model at the selected width, height and length.

If the pressure loss is low compared to the design constraints then increase the face velocity ie. Reduce the width and/or silencer height.

Regenerated Noise

Regenerated noise or airflow generated noise may have an adverse affect on the performance of a silencer.
Contact GTG engineering staff for assistance with your specific application.

Rectangular Silencers



Rectangular Silencer Types

GTG Rectangular silencers are available in standard lengths of 900, 1200, 1500, 2400 and 3000mm.

There are three different silencer types. These are Type S, Type M and Type H. All have different splitter and airway widths and consequently different percentage open areas.

Construction

GTG Rectangular silencers are rigidly constructed and consist of a galvanised sheet metal casing containing a series of centre and side splitters. The casing is provided with Pittsburgh corner seams.

Splitter infill material is glass or mineral fibre faced with perforated galvanised steel to protect the infill from erosion. Acoustic infill is suitably faced to prevent erosion of the fibre at passage velocities up to 50m/s.

Acoustic Performance

The main factors that determine silencer performance are the silencer length, splitter thickness and open area. Typically the longer the silencer the better the insertion loss or acoustic performance. The values tabled are static insertion loss as defined in BS EN ISO 7235.

Type S - Insertion Loss

Octave		1	2	3	4	5	6	7	8
Freq (Hz)		63	125	250	500	1k	2k	4k	8k
Model	Module Width								
S3/900	275	5	10	19	34	42	31	29	21
S3/1200	275	5	13	23	41	48	36	33	23
S3/1500	275	5	16	29	45	52	41	32	25
S3/1800	275	7	17	32	53	56	49	37	26
S3/2400	275	10	25	43	61	62	60	41	29
S3/3000	275	10	29	49	62	63	62	42	31
S4/900	300	4	9	18	32	41	28	25	18
S4/1200	300	5	11	21	37	47	33	27	19
S4/1500	300	5	14	27	42	50	39	27	22
S4/1800	300	6	15	31	49	54	44	32	23
S4/2400	300	7	22	40	58	62	56	36	25
S4/3000	300	9	25	45	62	63	59	39	28
S5/900	325	4	8	17	30	36	24	20	15
S5/1200	325	5	10	20	34	41	29	22	16
S5/1500	325	5	13	26	39	45	32	22	19
S5/1800	325	6	15	30	45	51	37	27	20
S5/2400	325	8	20	41	59	60	47	31	22
S5/3000	325	8	23	44	61	62	56	33	25
S6/900	350	3	6	15	27	31	20	15	12
S6/1200	350	4	8	18	30	35	24	15	13
S6/1500	350	4	10	25	36	39	27	17	16
S6/1800	350	5	14	29	41	46	30	21	17
S6/2400	350	6	19	41	50	58	37	24	19
S6/3000	350	9	21	45	57	62	46	26	21
S7/900	375	3	6	14	24	28	17	13	10
S7/1200	375	4	7	17	27	32	21	15	12
S7/1500	375	4	10	22	32	37	24	15	14
S7/1800	375	5	13	28	35	42	26	20	15
S7/2400	375	6	17	36	47	52	33	25	17
S7/3000	375	8	20	39	50	57	41	26	19
S8/900	400	3	6	13	20	24	14	10	7
S8/1200	400	4	8	15	24	29	17	13	10
S8/1500	400	4	10	20	28	32	20	14	12
S8/1800	400	5	10	23	32	38	22	19	12
S8/2400	400	5	14	30	42	47	29	25	15
S8/3000	400	7	18	33	45	50	35	26	17