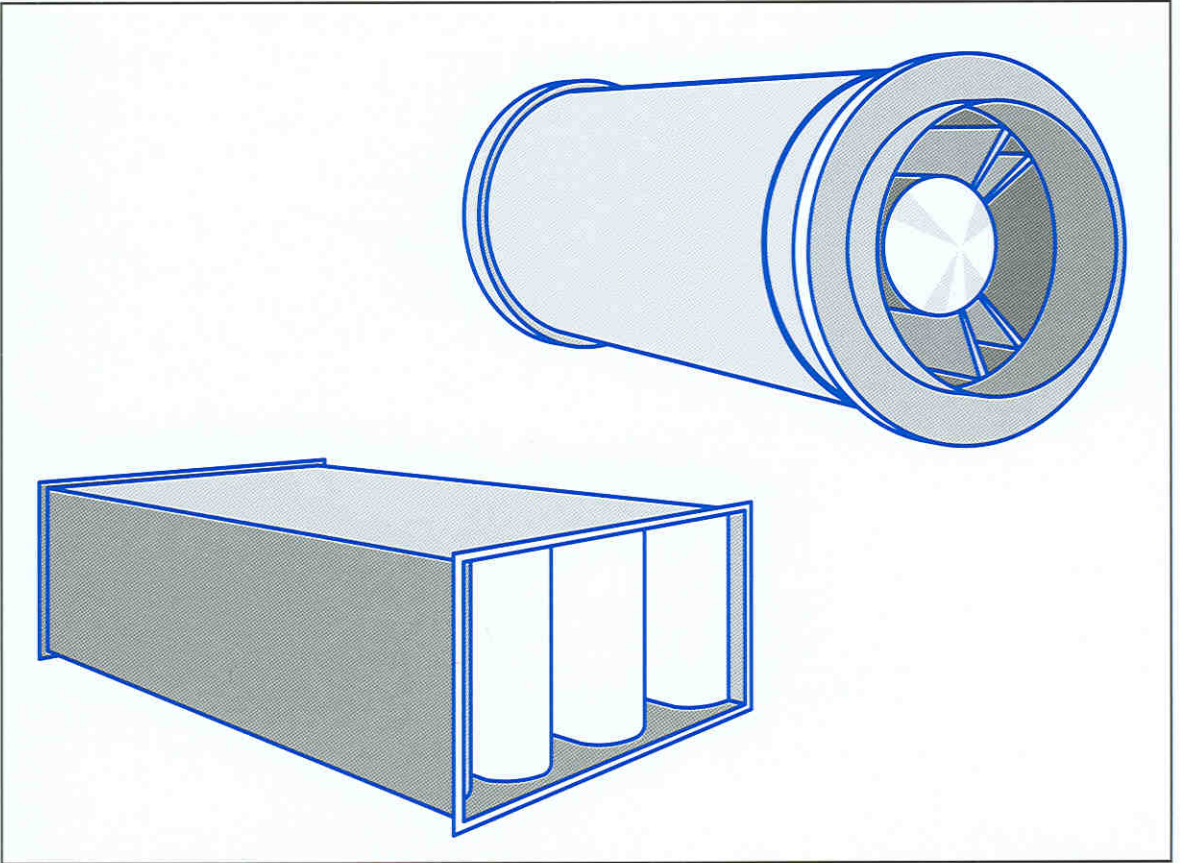


**GMAMCO**



**Rectangular, Circular & Crosstalk Attenuators**

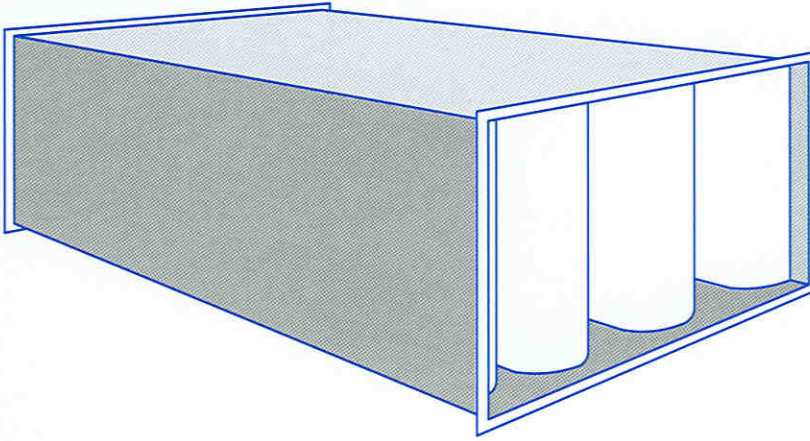
**NOISE CONTROL**



**GULF MECHANICAL  
ACOUSTIC MANUFACTURING COMPANY**

P.O. BOX: 50174 DUBAI, U.A.E. TEL: 04-3476961 FAX: 04-3476963  
Email : gmamco@emirates.net.ae

## RECTANGULAR ATTENUATORS



### STANDARD SPECIFICATION

#### OUTER CASING

MINIMUM 0.7MM PREGALVANISED SHEET STEEL WITH LONGITUDINAL MASTIC SEALED, LOCK FORMED JOINTS.

#### SPLITTER FACINGS

0.7MM PERFORATED PREGALVANISED SHEET STEEL. SPLITTER ENTRIES AND EXITS ARE EITHER AERODYNAMICALLY PROFILED (TYPE T) OR FLAT FACED (TYPE Q) AND FABRICATED FROM MINIMUM 0.7MM PREGALVANISED SHEET STEEL.

#### ACOUSTIC INFILL

INORGANIC, NON-HYGROSCOPIC, FLAME, MOISTURE AND VERMIN PROOF MINERAL FIBRE OF THE APPROPRIATE DENSITY TO ACHIEVE THE REQUIRED ACOUSTIC PERFORMANCE, PACKED UNDER COMPRESSION TO PREVENT THE FORMATION OF VOIDS DUE TO SETTLING.

#### END CONNECTIONS

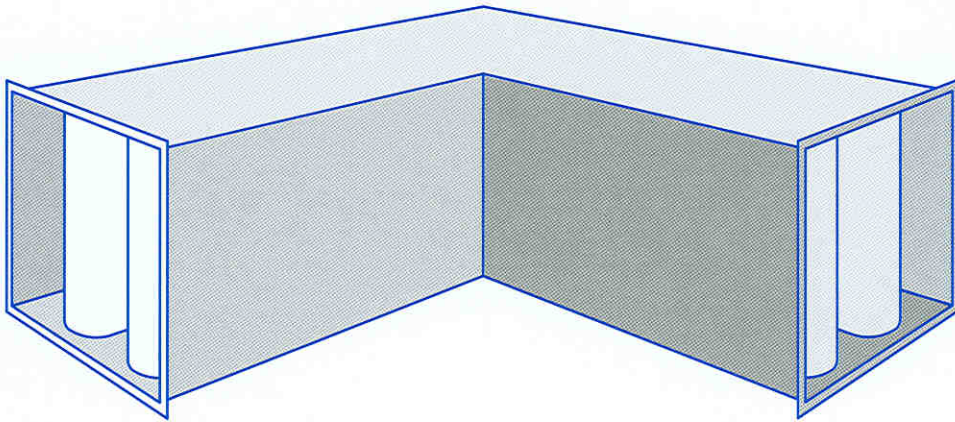
A VARIETY OF END CONNECTION ARRANGEMENTS ARE AVAILABLE INCLUDING ROLLED STEEL ANGLE FLANGES, SPIGOT CONNECTIONS OR ANY PROPRIETARY PREFABRICATED FLANGE SUCH AS DUCTMATE, MEZ.

#### HOSTIL ENVIRONMENTS

IN MOISTURE OR GREASE LADEN ENVIRONMENTS THE INFILL CAN BE ENVELOPED IN ICI MELINEX OR GLASSCLOTH TO FACILITATE CLEANING. THIS IS ALSO USED TO PREVENT ANY POSSIBILITY OF PROGRESSIVE PARTICLE MIGRATION AND SO CAN BE USED IN HOSPITALS, CLEAN ROOMS AND FOOD PRODUCTION AREAS. FOR CORROSIVE ENVIRONMENTS SUCH AS LABORATORIES FUME CUPBOARDS OR CHEMICAL PROCESS SYSTEMS CONSTRUCTION THROUGHOUT WILL BE WITH STAINLESS STEEL.



## BEND ATTENUATORS



### STANDARD SPECIFICATION

#### APPLICATIONS

VERTICAL AND HORIZONTAL BEND ATTENUATORS CAN BE USED WHERE SPACE IS LIMITED. THESE ARE IDENTIFIED BY ADDING BV OR BH TO THE ATTENUATOR CODE AS DESCRIBED ON PAGE 6.

#### CONSTRUCTION

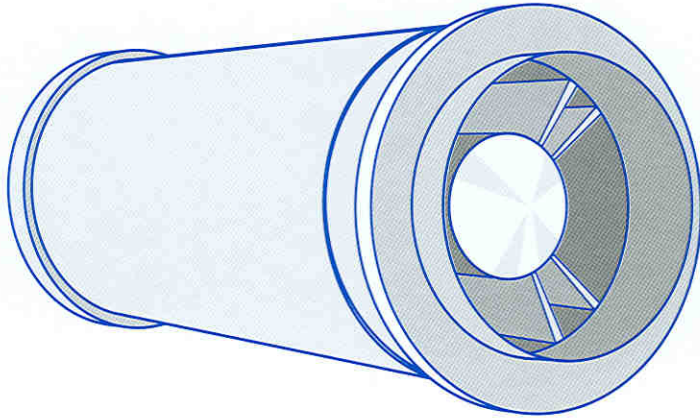
CONSTRUCTION IS GENERALLY AS FOR STANDARD RECTANGULAR ATTENUATORS. EACH BEND ATTENUATOR IS DESIGNED TO ENSURE THAT THE ADDITIONAL PRESSURE DROP CREATED BY THE BEND IS MINIMISED. BEND ATTENUATORS ARE AVAILABLE WITH THE SAME CONSTRUCTION OPTIONS AND INFILL VARIATIONS AS FOR STANDARD RECTANGULAR ATTENUATORS.

#### ACOUSTIC PERFORMANCE

USING THE CENTRE LENGTH OF A VERTICAL OR HORIZONTAL BEND ATTENUATOR THE INSERTION LOSS CAN BE FOUND.

TESTS HAVE SHOWN THAT A BEND ATTENUATOR MAY HAVE AN INSERTION LOSS HIGHER THAN THAT OF THE STRAIGHT ATTENUATOR BUT THIS EFFECT IS UNPREDICTABLE AND DIFFICULT TO QUANTIFY AND CAN BE THEREFORE BE IGNORED.

## CIRCULAR ATTENUATORS



### STANDARD SPECIFICATION

#### OUTER CASING

MINIMUM 0.7MM PREGALVANISED SHEET STEEL WITH LONGITUDINAL MASTIC SEALED, LOCK FORMED JOINTS, END CAPS OF SAME CONSTRUCTION.

#### INNER FACE

0.7 MM PERFORATED PREGALVANISED SHEET STEEL

#### ENHANCED PERFORMANCE

A CENTRAL POD IS FITTED, CONSTRUCTED FROM 0.7MM PERFORATED PREGALVANISED SHEET STEEL WITH CONICAL, DOMED OR FLAT ENDS AS APPROPRIATE CONSTRUCTED FROM PREGALVANISED SHEET STEEL.

#### ACOUSTIC INFILL

AS FOR STANDARD RECTANGULAR ATTENUATORS.

#### END CONNECTIONS

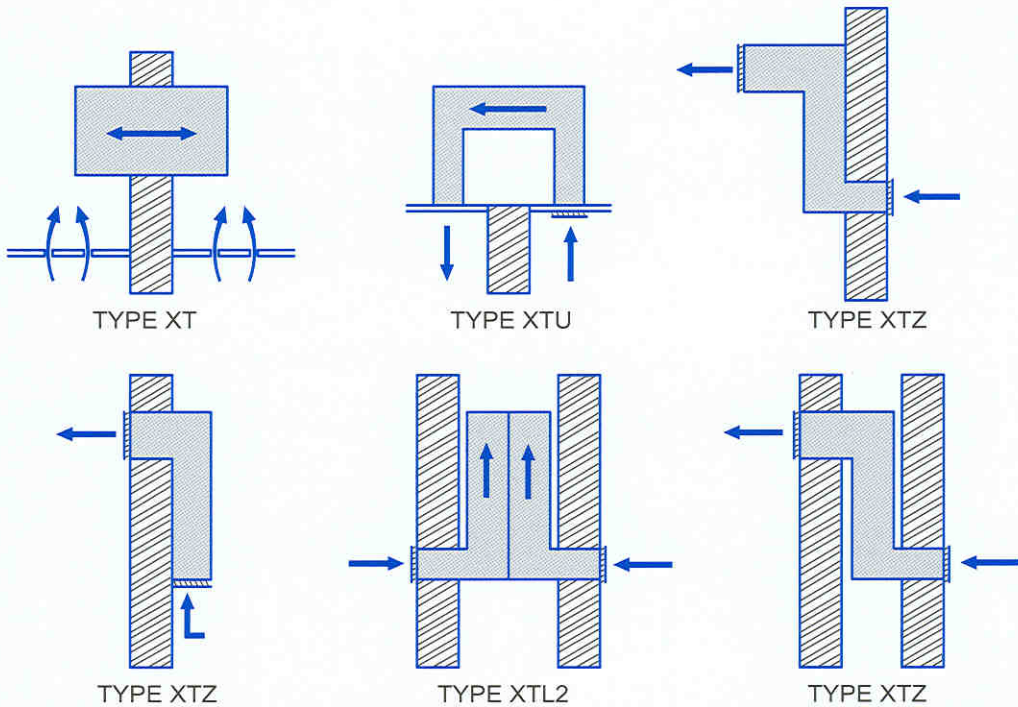
TAPPED END RING INSERTS ARE STANDARD, ALTERNATIVE CONNECTIONS WOULD BE SPIGOT OR ROLLED ANGLE FLANGES.

#### HOSTILE ENVIRONMENTS

AS FOR STANDARD RECTANGULAR ATTENUATORS. CIRCULAR ATTENUATORS WITHOUT A CENTRE POD ARE DESIGNATED ST AND THOSE WITH A POD PT. THE ATTENUATORS ARE NORMALLY SUPPLIED IN LENGTHS WHICH ARE MULTIPLES OF THE DIAMETER e.g. ST 30/2 HAS NO CENTRE POD, IS 300mm IN DIAMETER AND 600mm LONG.



## AIR TRANSFER & CROSSTALK ATTENUATORS



### STANDARD SPECIFICATION

#### OUTER CASING

MANUFACTURED FROM 0.7mm PREGALVANISED SHEET STEEL, CONSTRUCTION IS GENERALLY SIMILAR TO THAT USED FOR STANDARD RECTANGULAR ATTENUATORS

#### SPLITTER AND INFILL DETAILS.

AS FOR STANDARD RECTANGULAR ATTENUATORS.

#### END CONNECTIONS

UNLESS OTHERWISE SPECIFIED UNIT ARE SUPPLIED WITH PLAIN SPIGOTS .CONNECTION TO DUCTWORK IS OFTEN NOT REQUIRED, HOWEVER, ANY FLANGE ARRANGEMENT CAN BE ACCOMMODATED ON REQUEST.

DUE TO SPACE RESTRICTIONS OR OTHER FACTORS IT IS SOMETIMES INCONVENIENT TO HAVE A STRAIGHT CROSSTALK ATTENUATOR .IN THIS CASE GMAMCO CAN SUPPLY THEM IN A VIRIETY OF ALTERNATIVE CONFIGURATIONS INCLUDING L-SHAPED,Z-SHAPED AND U-SHAPED. SEE TABLE ABOVE.

ALSO AVAILABLE, ON REQUEST, ARE DECORATIVE GRILLES TO BE FITTED WHERE THE UNITS ARE IN VISUALLY EXPOSED LOCATOINS.

## ATTENUATOR RANGE

### RECTANGULAR MODEL IDENTIFICATION

TYPE	RECTANGULAR ATTENUATOR PERFORMANCE CHARACTERISTICS
GE0	PREMIUM PERFORMANCE, HIGH PRESSURE DROP ATTENUATOR FOR USE AS PRIMARY ATTENUATOR ONLY.
GE1	HIGH PERFORMANCE, LOWER PRESSURE DROP ATTENUATOR FOR USE WHEN GOOD LOW-FREQUENCY PERFORMANCE REQUIRED.
GE2	GOOD PERFORMANCE THROUGH ALL FREQUENCIES WITH ONLY MODERATE PRESSURE DROP.
GE3	GOOD GENERAL PURPOSE ATTENUATOR WITH LOW PRESSURE DROP. USEFUL AS SECONDARY ATTENUATOR.
GE4	GOOD MID-FREQUENCY PERFORMANCE AND LOW PRESSURE DROP.

ATTENUATOR RANGE	LENGTH AND SPLITTER TYPE	CONSTRUCTION VARIATIONS	ATTENUATOR CONNECTIONS
GE1	18Q	MBV	Z
ACOUSTIC AND AERODYNAMIC RANGE	1800mm LONG FLAT END SPLITTERS	MELINEX WRAPPED INFILL VERTICAL BEND ATTENUATOR	MEZ FLANGES

### CIRCULAR MODEL IDENTIFICATION & DESIGNATION

TYPE	CIRCULAR ATTENUATOR PERFORMANCE CHARACTERISTICS
ST	STRAIGHT THROUGH TYPE. LOW PRESSURE DROP WITH GOOD MID FREQUENCY PERFORMANCE.
PT	POD TYPE. HIGH PERFORMANCE WITH MODERATE PRESSURE DROP.

ATTENUATOR RANGE	LENGTH	CONSTRUCTION VARIATIONS	ATTENUATOR CONNECTIONS
ST	2	MP	S
ACOUSTIC AND AERODYNAMIC RANGE	TWICE LENGTH OF INSIDE DIAMETER	MELINEX WRAPPED INFILL PLASTIC CONSTRUCTION	SPIGOT

DESIGNATION REF	A	D	Z	S
CONSTRUCTION DESCRIPTION	DRILLED RS ANGLE	DUCTMATE	MEZ	SPIGOT

● NOTE: DUCTMATE, MEZ ARE NOT AVAILABLE FOR CIRCULAR ATTENUATORS.



## ATTENUATOR RANGE CONSTRUCTION GUIDE

DESIGNATION REF	CONSTRUCTION DESCRIPTION
T	STANDARD SPLITTERS WITH AERODYNAMICALLY SHAPED LEADING AND TRAILING EDGES.
Q	STANDARD SPLITTERS WITH FLAT LEADING AND TRAILING EDGES. ENHANCE PERFORMANCE WITH SMALL INCREASE IN PRESSURE DROP.
W	SPLITTER ONLY ATTENUATOR. SUPPLIED COMPLETE WITH ALL FIXINGS AND CHANNELS FOR INSTALLING IN AIR HANDLING UNITS OR BUILDERS WORK DUCTS.
M	MELINEX WRAPPED SPLITTER INFILL FOR USE IN SATURATED CONDITIONS OR TO PREVENT THE POSSIBILITY OF PARTICLE MIGRATION.
BV,BH	VERTICAL OR HORIZONTAL BEND ATTENUATORS. IT IS IMPORTANT TO CHECK PRESSURE DROP CORRECTIONS,

### ATTENUATOR LOCATION GUIDE

#### DO

- ALLOW AT LEAST ONE FAN DIAMETER DISTANCE BETWEEN THE END OF THE ATTENUATOR AND THE FAN.
- WHEN DUCTING SIZE CHANGES IMMEDIATELY BEFORE AN ATTENUATOR, ALLOW A MAXIMUM OF 15° FROM THE HORIZONTAL TRANSFORMATION ANGLE TO MINIMISE THE PRESSURE DROP.
- INSTALL ATTENUATORS EITHER SPANNING OR ABUTTING PLANT ROOM WALL, TO PREVENT NOISE BREAK-OUT/BREAK-IN.
- INSTALL ATTENUATOR AFTER VCDs TO PROTECT ROOM FROM REGENERATED NOISE ESPECIALLY ON LOW ROOM CRITERIA INSTALLATIONS.
- ACOUSTICALLY LAG DUCTING AFTER ATTENUATOR UP TO PLANTROOM WALL TO PREVENT NOISE BREAK-OUT/BREAK-IN.
- NOTE: CONSTRUCTION VARIATION 'X' MAY REQUIRE THE CASING TO BE ACOUSTICALLY LAGGED TO PREVENT NOISE BREAK-OUT.

#### DO NOT

- INSTALL ATTENUATORS DIRECTLY IN FRONT OR BEHIND FILTERS OR FINNED HEATER BATTERIES.
- FIT ATTENUATORS IMMEDIATELY AFTER A BEND -WE WOULD RECOMMEND THAT A BEND ATTENUATORS IS USED WHEN THIS SITUATION IS ENCOUNTERED.
- FIT VARIABLE CONTROL DAMPERS DIRECTLY IN FRONT OF AN ATTENUATOR, ALLOW A PLENUM BETWEEN.

## ATTENUATOR INSERTION LOSS-dB TYPE 'T'

ATTENUATOR MODEL	OCTAVE BAND MID FREQUENCY -Hz							
	63	125	250	500	1K	2K	4K	8K
GE0-06T	7	11	15	29	34	33	27	18
GE0-09T	9	14	19	37	42	37	32	22
GE0-12T	10	18	26	46	50	41	39	26
GE0-15T	11	21	31	47	50	45	44	30
GE0-18T	13	23	36	48	50	49	50	35
GE0-21T	14	26	41	49	50	50	50	40
GE0-24T	15	28	46	50	50	50	50	44
GE1-06T	6	10	12	20	20	20	17	15
GE1-09T	9	14	16	30	34	32	31	17
GE1-12T	10	17	23	41	44	39	38	22
GE1-15T	10	20	28	45	46	47	41	27
GE1-18T	11	21	32	49	49	50	46	31
GE1-21T	11	25	37	50	50	50	50	35
GE1-24T	12	27	41	50	50	50	50	39
GE2-06T	3	7	11	15	15	17	14	12
GE2-09T	5	10	14	24	26	24	16	13
GE2-12T	5	12	20	36	39	31	21	15
GE2-15T	6	14	23	39	44	38	26	18
GE2-18T	8	15	26	43	49	46	31	20
GE2-21T	10	17	30	47	50	50	36	23
GE2-24T	10	20	33	50	50	50	41	25
GE3-06T	2	5	10	11	12	16	12	10
GE3-09T	3	7	13	21	21	19	13	10
GE3-12T	4	9	18	33	34	22	14	10
GE3-15T	5	11	21	37	39	29	19	15
GE3-18T	7	13	23	41	44	35	23	15
GE3-21T	9	14	26	45	49	42	27	18
GE3-24T	10	15	31	50	50	50	32	21
GE4-06T	1	4	8	9	10	10	7	5
GE4-09T	2	6	10	15	16	13	8	6
GE4-12T	3	7	15	27	29	16	11	8
GE4-15T	4	9	18	31	34	23	14	10
GE4-18T	5	11	20	35	39	29	18	12
GE4-21T	6	12	23	59	44	36	22	14
GE4-24T	7	13	28	46	50	45	27	16

INSERTION LOSS CORRECTIONS FOR SPECIAL SPLITTER FACINGS MULTIPLY STANDARD ATTENUATOR LOSSES BY CORRECTIONS SHOWN BELOW.

MELINEX	1	0.8	0.8	1.0	1.0	0.7	0.6	0.8
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## ATTENUATOR PRESSURE DROP TYPE 'T'

THE TABULATED PRESSURE DROPS INCLUDED IN THIS PUBLICATION ARE THOSE OBTAINED BY INDEPENDENT TESTING IN ACCORDANCE WITH BS4718:1971 .

THIS METHOD OF TESTING REQUIRES A STRAIGHT SECTION OF DUCTING BOTH BEFORE AND AFTER THE ATTENUATOR UNDER TEST THUS ENSURING AERODYNAMICALLY OPTIMUM CONDITIONS. IN PRACTICE, HOWEVER, IT IS NOT ALWAYS POSSIBLE TO INSTALL ATTENUATORS IN COMPARABLE CONDITIONS AND ATTENUATORS SITUATED CLOSE TO BENDS. AXIAL FANS, ABRUPT TRANSFORMATIONS ETC. MAY BE SUBJECT TO TURBULENT AIRFLOW. UNDER THESE CONDITIONS INCREASED PRESSURE DROP VALUES ARE LIKELY.

FACE VEL m/s	MODEL REF					FACE VEL m/s	MODEL REF			FACE VEL m/s	MODEL REF
	GE0	GE1	GE2	GE3	GE4		GE2	GE3	GE4		GE4
1.0	5	4	3	2	1	5.5	99	58	31	10.0	102
1.2	7	6	5	3	2	5.6	103	60	32	10.2	106
1.4	10	8	6	4	2	5.7	106	62	33	10.4	110
1.6	13	10	8	5	3	5.8	110	65	34	10.6	114
1.8	16	13	11	6	3	5.9	114	67	36	10.8	119
2.0	19	16	13	8	5	6.0	118	69	37	11.0	123
2.2	23	20	16	9	5	6.1	122	72	38		
2.4	28	24	19	11	6	6.2		74	39		
2.6	33	28	22	13	7	6.3		76	40		
2.8	38	32	26	15	8	6.4		79	42		
3.0	44	37	29	17	9	6.5		81	43		
3.1	47	39	32	19	10	6.6		84	44		
3.2	50	42	34	20	10	6.7		86	46		
3.3	53	44	36	21	11	6.8		89	47		
3.4	56	47	38	22	12	6.9		92	49		
3.5	60	50	40	24	13	7.0		94	50		
3.6	63	53	43	25	13	7.1		97	52		
3.7	67	56	45	26	14	7.2		100	53		
3.8	70	59	47	28	15	7.3		102	54		
3.9	74	62	50	29	16	7.4		105	56		
4.0	78	65	53	30	16	7.5		108	57		
4.1	82	59	55	32	17	7.6		111	59		
4.2	86	72	58	34	18	7.7		113	60		
4.3	90	75	61	35	19	7.8		117	62		
4.4	94	79	64	37	20	7.9		120	64		
4.5	99	83	67	39	21	8.0			65		
4.6	103	86	70	40	22	8.2			69		
4.7	107	90	73	42	23	8.4			72		
4.8	112	94	76	44	24	8.6			76		
4.9	117	98	79	46	25	8.8			79		
5.0	122	102	82	48	26	9.0			83		
5.1		106	86	50	27	9.2			86		
5.2		110	89	52	28	9.4			90		
5.3		115	92	54	29	9.6			94		
5.4		120	96	56	30	9.8			98		

FOR BEND ATTENUATORS MULTIPLY PRESSURE DROP FIGURE ABOVE BY CORRECTION SHOWN, I.E.  
 STRAIGHT ATTENUATOR GE1 FACE VEL 1.0 m/s MANUFACTURED AS BEND =  $4 \times 1.83 = 7.32$

<b>BEND ATTENUATOR PRESSURE DROP CORRECTIONS</b>	<b>GE0</b>	<b>GE1</b>	<b>GE2</b>	<b>GE3</b>	<b>GE4</b>
	2.08	1.83	1.58	1.69	1.83

● **NOTE:** ALL ABOVE VALUES ARE IN N/m<sup>2</sup> OR Pa.



## ATTENUATOR INSERTION LOSS-dB TYPE 'Q'

ATTENUATOR MODEL	OCTAVE BAND MID FREQUENCY-Hz							
	63	125	250	500	1K	2K	4K	8K
GE0-06Q	8	12	18	36	42	36	31	21
GE0-09Q	10	16	25	44	50	40	38	26
GE0-12Q	11	20	30	47	50	45	43	30
GE0-15Q	12	23	35	48	50	50	50	34
GE0-18Q	13	24	41	49	50	50	50	40
GE0-21Q	15	28	45	50	50	50	50	45
GE0-24Q	17	31	50	50	50	50	50	48
GE1-06Q	7	11	16	28	32	31	30	17
GE1-09Q	9	15	22	40	44	38	37	22
GE1-12Q	10	19	28	43	46	48	40	27
GE1-15Q	11	22	33	48	49	49	46	31
GE1-18Q	12	24	38	49	50	50	50	36
GE1-21Q	14	28	42	50	50	50	50	40
GE1-24Q	15	33	45	50	50	50	50	43
GE2-06Q	4	9	14	23	24	24	16	13
GE2-09Q	6	12	19	33	36	31	21	15
GE2-12Q	6	14	21	36	41	35	26	18
GE2-15Q	7	18	25	40	47	44	31	20
GE2-18Q	9	2	29	45	48	50	36	23
GE2-21Q	11	2	31	48	50	50	41	25
GE2-24Q	11	22	33	50	50	50	41	28
GE3-06Q	3	7	12	18	18	19	13	10
GE3-09Q	4	9	15	28	29	22	14	10
GE3-12Q	6	12	18	31	33	29	19	15
GE3-15Q	8	13	21	37	39	29	19	15
GE3-18Q	8	15	23	41	44	35	23	15
GE3-21Q	10	16	26	45	49	42	27	18
GE3-24Q	10	17	31	50	50	50	37	21
GE4-06Q	2	5	10	13	13	10	7	5
GE4-09Q	3	7	12	20	22	17	11	8
GE4-12Q	4	8	16	28	29	23	14	10
GE4-15Q	5	10	18	32	36	29	18	12
GE4-18Q	6	12	20	36	39	36	22	14
GE4-21Q	7	13	24	39	44	45	27	16
GE4-24Q	8	15	29	46	50	50	32	18

INSERTION LOSS CORRECTIONS FOR SPECIAL FACINGS MULTIPLY STANDARD ATTENUATOR LOSSES  
BY CORRECTIONS SHOWN BELOW.

MELINEX	1	0.85	0.9	1.0	1.0	0.7	0.6	0.8
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## ATTENUATOR PRESSURE DROP TYPE 'Q' SPLITTERS

THE TABULATED PRESSURE DROPS INCLUDED IN THIS PUBLICATION ARE THOSE OBTAINED BY INDEPENDENT TESTING IN ACCORDANCE WITH BS4718:1971 .

THIS METHOD OF TESTING REQUIRES A STRAIGHT SECTION OF DUCTING BOTH BEFORE AND AFTER THE ATTENUATOR UNDER TEST THUS ENSURING AERODYNAMICALLY OPTIMUM CONDITIONS.

IN PRACTICE, HOWEVER, IT IS NOT ALWAYS POSSIBLE TO INSTALL ATTENUATORS IN COMPARABLE CONDITIONS AND ATTENUATORS SITUATED CLOSE TO BENDS. AXIAL FANS, ABRUPT TRANSFORMATIONS ETC. MAY BE SUBJECT TO TURBULENT AIRFLOW. UNDER THESE CONDITIONS INCREASED PRESSURE DROP VALUES ARE LIKELY.

FACE VEL m/s	MODEL REF					FACE VEL m/s	MODEL REF		
	AE0	AE1	AE2	AE3	AE4		AE2	AE3	AE4
1.0	7	5	4	3	2	5.5	130	81	54
1.2	11	7	6	4	3	5.6	135	85	56
1.4	15	10	8	5	4	5.7	140	88	58
1.6	19	13	11	7	5	5.8	145	91	60
1.8	24	17	14	9	6	5.9	150	94	62
2.0	29	21	17	11	7	6.0		97	64
2.2	35	25	21	13	9	6.1		100	66
2.4	42	30	25	16	10	6.2		104	69
2.6	50	35	29	18	12	6.3		107	71
2.8	58	40	34	21	14	6.4		111	73
3.0	66	45	39	24	16	6.5		114	75
3.1	71	50	42	26	17	6.6		118	78
3.2	76	53	44	28	18	6.7		121	80
3.3	81	57	47	29	19	6.8		125	82
3.4	86	60	50	31	20	6.9		129	85
3.5	91	64	53	33	22	7.0		133	87
3.6	96	67	56	35	23	7.1		136	90
3.7	101	71	59	37	24	7.2		140	92
3.8	106	75	63	39	26	7.3		144	95
3.9	112	79	66	41	27	7.4		148	98
4.0	118	83	69	43	29	7.5		152	100
4.1	124	87	73	46	30	7.6			103
4.2	130	91	76	48	31	7.7			105
4.3	136	96	80	50	33	7.8			108
4.4	143	100	84	52	35	7.9			111
4.5	149	105	88	55	36	8.0			114
4.6		111	92	57	38	8.2			120
4.7		115	96	60	39	8.4			126
4.8		119	100	62	41	8.6			132
4.9		125	104	65	43	8.8			138
5.5		130	108	68	45	9.0			144
5.1		135	112	70	46	9.2			150
5.2		140	117	73	48	9.4			
5.3		146	121	76	50	9.6			
5.4		151	126	79	52	9.8			

FOR BEND ATTENUATORS MULTIPLY PRESSURE DROP FIGURE ABOVE BY CORRECTION SHOWN, I.E.  
 STRAGHT ATTENUATOR GE1 FACE VEL 1.0 m/s MANUFACTURED AS BEND =5 x 1.65 =8.25

<b>BEND ATTENUATOR PRESSURE DROP CORRECTIONS</b>	<b>GE0</b>	<b>GE1</b>	<b>GE2</b>	<b>GE3</b>	<b>GE4</b>
	1.71	1.65	1.44	1.49	1.53

● **NOTE:** ALL ABOVE VALUES ARE IN N/m<sup>2</sup> OR Pa.



## REGENERATED NOISE LEVELS - TYPE 'T'. SPLITTERS

MODEL	FACE VEL m/s	OCTAVE BAND MID FREQUENCY-Hz							
		63	125	250	500	1K	2K	4K	8K
GM0-T	+2	42	33	26	22	21	<20	<20	<20
	+3	46	40	35	33	22	25	<20	<20
	+4	48	44	42	41	40	36	30	20
	+5	53	48	46	46	46	44	37	28
	-5	57	50	47	50	53	51	46	33
	-4	55	49	46	46	53	46	42	30
	-3	52	47	38	38	47	35	32	26
	-2	49	43	28	27	36	22	<20	<20
GM1-T	+2	40	30	29	27	21	<20	<20	<20
	+3	42	37	35	34	32	27	20	<20
	+4	47	42	40	39	39	35	28	<20
	+5	55	46	44	43	43	40	35	23
	-5	54	48	46	47	51	48	45	29
	-4	48	47	44	44	52	46	40	25
	-3	47	45	39	39	46	38	33	<20
	-2	44	41	32	33	37	27	22	<20
GM2-T	+3	44	42	32	26	22	<20	<20	<20
	+4	46	45	35	30	28	22	<20	<20
	+5	48	46	37	32	32	25	<20	<20
	+6	51	48	38	35	36	28	20	<20
	-6	56	54	44	42	46	38	32	26
	-5	54	52	43	38	44	37	30	23
	-4	53	50	43	38	44	44	27	<20
	-3	50	46	40	27	38	30	24	<20
GM3-T	+3	40	37	32	29	28	21	<20	<20
	+4	44	41	37	33	33	27	20	<20
	+6	50	46	43	41	40	39	33	25
	+8	54	50	48	47	47	47	40	34
	-8	60	57	51	54	57	56	44	36
	-6	56	53	49	45	56	55	38	27
	-4	49	48	47	41	54	47	32	<20
	-3	45	44	37	36	46	35	25	<20
GM4-T	+4	47	41	37	33	30	22	<20	<20
	+6	50	46	42	40	39	36	30	20
	+8	52	50	45	45	46	45	40	30
	+10	56	53	47	50	50	53	46	38
	-10	58	56	52	55	60	59	55	43
	-8	56	54	50	52	55	53	42	32
	-6	55	52	48	45	54	49	32	20
	-4	5	48	48	44	53	44	25	<20
FACE AREA CORRECTIONS		m <sup>2</sup>	0.03	0.062	0.125	0.25	0.5	1.0	2.0
		dB	-6	-3	+0	+3	+6	+9	+12



## REGENERATED NOISE LEVELS - TYPE 'Q' SPLITTERS

MODEL	FACE VEL m/s	OCTAVE BAND MID FREQUENCY-Hz							
		63	125	250	500	1K	2K	4K	8K
GM0-Q	+2	47	38	33	26	20	<20	<20	<20
	+3	48	43	37	31	27	21	<20	<20
	+4	54	49	40	37	34	30	24	21
	+5	61	55	45	43	41	38	32	25
	-5	64	58	47	47	47	45	41	30
	-4	60	54	45	42	47	40	37	30
	-3	56	50	40	36	42	32	30	27
	-2	53	47	35	31	32	21	<20	<20
GM1-Q	+2	46	38	32	34	<20	<20	<20	<20
	+3	47	42	36	30	26	20	<20	<20
	+4	52	47	40	35	33	27	22	<20
	+5	59	52	43	40	38	36	28	22
	-5	62	54	45	44	48	44	38	27
	-4	55	52	44	40	44	38	34	22
	-3	52	49	40	35	40	31	28	<20
	-2	49	47	35	30	28	22	<20	<20
GM2-Q	+3	45	42	36	30	26	<20	<20	<20
	+4	48	45	39	33	29	24	<20	<20
	+5	54	51	43	39	36	34	27	<20
	+6	60	56	48	45	43	45	35	23
	-6	62	60	54	51	50	55	45	33
	-5	59	56	50	45	42	46	35	28
	-4	54	52	44	41	37	40	22	<20
	-3	51	48	40	38	28	34	<20	<20
GM3-Q	+3	44	42	35	28	24	<20	<20	<20
	+4	47	45	38	32	28	22	<20	<20
	+6	56	52	45	40	38	38	30	<20
	+8	64	60	52	50	48	52	40	24
	-8	69	66	62	58	57	60	45	28
	-6	61	58	52	45	50	52	35	<20
	-4	53	50	44	40	42	42	28	<20
	-3	49	47	40	35	38	31	23	<20
GM4-Q	+4	48	44	36	30	28	20	<20	<20
	+6	56	51	44	39	37	34	27	<20
	+8	61	58	51	48	46	49	37	22
	+10	67	65	58	56	55	54	48	26
	-10	69	67	63	61	65	60	56	32
	-8	67	62	56	55	55	57	40	25
	-6	60	56	50	44	54	54	30	<20
	-4	53	51	48	41	51	42	24	<20
FACE AREA CORRECTIONS		m <sup>2</sup>	0.03	0.062	0.125	0.25	0.5	1.0	2.0
		dB	-6	-3	+0	+3	+6	+9	+12

## ATTENUATOR INSERTION LOSS -dB CIRCULAR TYPE 'ST/PT'

ATTENUATOR MODEL	OCTAVE BAND MID FREQUENCY-Hz							
	63	125	250	500	1K	2K	4K	8K
ST30/1	1	2	4	8	11	10	9	7
6T30/2	2	2	5	13	18	12	11	10
PT30/1	2	7	8	14	22	25	22	19
PT30/2	3	13	14	23	30	30	30	25
ST40/1	2	3	5	10	13	11	9	8
ST40/2	3	4	7	14	18	15	11	12
PT40/1	2	7	9	15	23	25	21	12
PT40/2	3	10	15	24	30	30	29	22
ST50/1	2	3	6	13	14	10	10	6
ST50/2	3	7	8	19	25	24	20	15
PT50/1	3	7	9	17	21	24	21	17
PT50/2	4	10	16	28	30	30	29	21
ST60/1	3	5	7	15	13	8	9	5
ST60/2	4	6	13	22	22	14	13	12
PT60/1	3	6	10	19	27	23	20	15
PT60/2	5	9	18	28	30	30	27	20
ST80/1	3	6	10	16	16	10	9	8
ST80/2	4	9	17	22	24	17	13	10
PT80/1	4	5	11	20	27	23	20	14
PT80/2	5	9	18	29	30	30	27	20
ST100/1	4	6	11	17	15	11	9	9
ST100/2	5	10	16	23	23	16	13	11
PT100/1	3	6	13	22	25	21	17	14
PT100/2	5	10	19	29	30	27	22	18
ST125/1	4	7	12	17	16	11	9	7
ST125/2	6	11	21	25	24	19	13	10
PT125/1	4	8	15	25	23	19	16	12
PT125/2	6	11	21	30	30	27	22	16

INSERTION LOSS CORRECTIONS FOR SPECIAL SPLITTER FACINGS MULTIPLY STANDARD ATTENUATOR  
LOSSES BY CORRECTIONS SHOWN BELOW.

<b>MELINEX</b>	1.00	0.80	0.8	1.00	1.00	0.70	0.60	0.80
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## ATTENUATOR PRESSURE DROP CIRCULAR TYPE 'ST/PT'

### TYPE 'ST'

THE TYPE 'ST' CIRCULAR ATTENUATOR DOES NOT PRESENT ANY OBSTRUCTION TO THE AIRSTREAM AND HAS NEGLIGIBLE PRESSURE DROP.

### TYPE 'PT'

PRESSURE DROP	MODEL AIRFLOW m <sup>3</sup> /s						
	PA	PT30	PT40	PT50	PT60	PT80	PT100
5	0.33	0.53	0.85	1.32	2.12	3.38	5.46
10	0.47	0.75	1.20	1.87	3.01	4.81	7.77
15	0.57	0.91	1.46	2.29	3.65	5.84	9.43
20	0.66	1.05	1.69	2.64	4.23	6.76	11.03
25	0.74	1.20	1.89	2.95	4.74	7.58	12.24
30	0.81	1.30	2.07	3.23	5.19	8.29	13.40
35	0.87	1.40	2.23	3.49	5.58	8.90	14.39
40	0.93	1.50	2.38	3.73	5.96	9.52	15.38
45	1.00	1.60	2.56	3.96	6.41	10.24	16.54
50	1.04	1.66	2.66	4.17	6.67	10.85	17.20
55	1.09	1.74	2.79	4.38	6.99	11.16	18.03
60	1.14	1.82	2.92	4.57	7.31	11.68	18.86
65	1.19	1.90	3.05	4.76	7.63	12.19	19.68
70	1.23	1.96	3.15	4.94	7.88	12.60	20.34
75	1.28	2.05	3.28	5.11	8.21	13.11	21.17
80	1.32	2.11	3.38	5.28	8.46	13.51	21.83
85	1.36	2.18	3.48	5.44	8.72	13.93	22.49
90	1.40	2.24	3.58	5.60	8.97	14.34	23.16
95	1.44	2.30	3.69	5.75	9.23	14.75	23.82
100	1.48	2.37	3.79	5.90	9.48	15.15	24.48

## REGENERATED NOISE LEVELS CIRCULAR TYPE 'PT'

FACE VELOCITY m/s	OCTAVE BAND MID FREQUENCY-Hz							
	63	125	250	500	1K	2K	4K	8K
+5	42	36	33	30	25	<20	<20	<20
+7.5	49	45	41	39	35	31	27	<20
+10	56	53	49	48	45	42	36	26
+15	64	61	57	58	56	52	45	36
+20	72	69	64	67	67	62	54	45
SIZE	Dia (mm)	300	400	500	600	800	1000	1250
CORRECTIONS	dB	-6	-4	-2	0	2	4	6



## ATTENUATOR INSERTION LOSS CROSSTALK TYPE 'XT'

ATTENUATOR MODEL	OCTAVE BAND CENTRE FREQUENCY-Hz						COMPATIBLE PARTITION SRI
	125	250	500	1K	2K	4K	
XT0-06	13	24	33	40	38	33	32
XT0-09	17	33	41	49	46	39	38
XT0-12	20	42	48	50	50	43	45
XT1-06	10	20	29	35	33	27	25
XT1-09	13	26	34	41	38	32	32
XT1-12	16	35	42	50	46	39	40
XT2-06	6	13	21	27	25	18	20
XT2-09	9	18	26	32	29	21	25
XT2-12	12	23	31	37	33	24	30
XT3-06	5	11	18	34	20	15	15
XT3-09	8	15	23	27	24	18	20
XT3-12	11	19	28	32	29	20	25
XT4-06	5	7	11	13	11	9	10
XT4-09	6	11	16	19	15	11	14
XT4-12	7	15	22	25	19	13	18

● **NOTE:** THE COMPATIBLE PARTITION SRI IS FOR NON-DUCTED SYSTEMS.

GMAMCO TRANSFER AND CROSSTALK ATTNEUATORS CAN BE INSTALLED IN DUCTWORK OR BUILT INTO PARTY WALLS TO ALLOW AIR TO PASS IN EITHER DIRECTION WHILST CONSIDERABLY REDUCING THE TRANSFER OF NOISE BETWEEN THE ADJOINING SPACES . THEY ARE PARTICULARLY USEFUL BETWEEN INTERVIEW ROOMS. PRIVATE OFFICES ,MAIL AND FEMALE TOILETS AND HOSPITAL EXAMINATION ROOMS ESPECIALLY WHERE THERE IS A COMMON DUCTWORK SYSTEM AND VOICE TRANSFER VIA THE ITERCONNECTING DUCTWORK IS UNDESIRABLE.

SELECTION OF CROSSTALK ATTENUATORS SHOULD TAKE INTO COSIDERATION THE DEGREE OF PRIVACY REQUIRED AND THE SEPARATION PROVIDED BY THE PARTY WALL.

CROSSTALK ATTENUATORS ARE SIZED INDIVIDUALLY TO SUIT SITE CONDITIONS. TO OBTAIN THE PRESSURE DROP FOR TYPE 'XT' ATTENUATORS PLEASE USE THE CHART ON PAGE 9 FOR RECTANGULAR ATTENUATORS WITH TYPE T SPLITTERS. FOR XT0 USE GE0, AND FOR XTI USE GE1 ETC. FOR TYPES XTL,XTU AND XTZ PLEASE USE THE FOLLOWING CORRECTIONS.

MODEL	0	1	2	3	4
XTL	x1.16	x1.18	x1.23	x1.38	x1.75
XTZ/XTU	x1.32	x1.36	x1.46	x1.76	x2.50



## DEFINITIONS

### OCTAVE BAND

A RANGE OF FREQUENCIES WHOSE UPPER LIMIT IS TWICE THE FREQUENCY OF THE LOWER LIMIT NORMALLY IDENTIFIED BY IT'S "CENTER" FREQUENCY WHICH IS 1.414 TIMES THE LOWER LIMIT. FOR EASE OF USE THE AUDIBLE SOUND SPECTRUM IS DIVIDED INTO A SERIES OF PREFERRED OCTAVE BANDS INTERNATIONALLY ACKNOWLEDGED AS STANDARD.

### INSERTION LOSS

GENERALLY THE NOISE LEVEL DIFFERENCE IN DB BEFORE AND AFTER THE ADDITION OF AN ATTENUATOR. THE INSERTION LOSS WILL USUALLY BE DIFFERENT IN EACH OCTAVE BAND SO IT IS NECESSARY TO SPECIFY THE LOSS IN ALL RELEVANT BANDS.

### FACE VELOCITY

THE MEAN AIR VELOCITY OVER THE ENTIRE FACE AREA (WIDTH X HEIGHT) OF AN ATTENUATOR. AIR VOLUME (M<sup>3</sup>/S) DIVIDED BY THE FACE AREA (M<sup>2</sup>). IN THIS PUBLICATION ALL FACE VELOCITIES ARE IN METERS PER SECOND (M/S).

### PRESSURE DROP

AIR PASSING THROUGH AN ATTENUATOR EXPERIENCES A REDUCTION IN ITS BAROMETRIC PRESSURE. THIS EFFECT MUST BE QUANTIFIED TO ENSURE THAT IT IS COMPATIBLE WITH THE DESIGN AND SELECTION OF OTHER COMPONENTS IN THE SYSTEM. NORMALLY SHOWN AS UNITS PASCALS (Pa) NEWTONS PER METRE SQUARED (N/M<sup>2</sup>).

### REGENERATION

THE LEVEL OF NOISE DUE TO TURBULENCE CREATED BY THE PASSAGE OF AIR THROUGH THE ATTENUATOR. GENERALLY THE HIGHER THE PRESSURE DROP, THE HIGHER THE REGENERATED NOISE LEVELS. AGAIN, THESE WILL USUALLY BE DIFFERENT FOR EACH OCTAVE BAND SO IT IS NECESSARY TO SPECIFY THE LEVEL IN ALL RELEVANT BANDS. THE LEVELS WILL ALSO BE DIFFERENT FOR NOISE AND AIRFLOW IN THE SAME DIRECTION ( POSITIVE VALUES OF FACE VELOCITY ) AND FOR NOISE AND AIRFLOW IN OPPOSITE DIRECTIONS ( NEGATIVE VALUES OF FACE VELOCITY ).

### 63 Hz OCTAVE BAND

FIGURES FOR 63 Hz OCTAVE BAND ARE NOT REQUIRED AS PART OF BS4718:1971 . THE STANDARD DOES , HOWEVER , PERMIT FIGURES TO BE OBTAINED AND REPORTED BUT STRESSES THAT THESE WILL HAVE A LOWER DEGREE OF ACCURACY .



## RECTANGULAR ATTENUATOR - WEIGHTS

ALL WEIGHTS ARE GIVEN IN KG AND ARE BASED ON ATTENUATOR TYPE / GEI / TA.  
 ATTENUATORS GREATER THAN 1800MM X 1800MM X 1500MM OR WEIGHING IN EXCESS OF 450KG WILL NORMALLY BE CONSTRUCTED IN MODULAR FORM FOR EASE OF HANDLING.

ATTENUATOR CROSS SECTION (mm)	LENGTH (mm)							ATTENUATOR CROSS SECTION (mm)	LENGTH (mm)						
	600	900	1200	1500	1800	2100	2400		600	900	1200	1500	1800	2100	2400
150 X 100	5	7	9	10	12	14	16	1000 X 250	26	37	48	59	71	82	94
150 X 150	6	8	11	13	15	17	20	1000 X 300	29	40	52	65	78	90	104
200 X 100	6	8	10	12	14	16	18	1000 X 400	33	47	61	76	92	106	140
200 X 150	7	9	12	14	17	20	22	1000 X 500	38	54	70	87	106	123	199
200 X 200	8	11	14	17	20	20	20	1000 X 600	42	91	79	98	120	139	218
250 X 100	7	9	11	13	16	18	21	1000 X 800	52	74	97	121	148	171	218
250 X 150	8	10	13	16	19	22	25	1000 X 900	56	81	106	132	162	188	237
250 X 200	9	12	15	19	22	25	29	1000 X 1000	61	88	115	143	176	204	154
250 X 250	10	14	17	21	25	29	33	1200 X 300	53	69	85	102	120	136	179
300 X 100	7	10	12	15	18	20	23	1200 X 400	60	78	97	117	139	157	204
300 X 150	8	12	15	18	21	24	27	1200 X 500	67	88	109	132	157	179	229
300 X 200	10	13	17	20	24	28	31	1200 X 600	73	97	121	147	176	200	278
300 X 250	11	15	19	23	27	31	36	1200 X 800	87	116	146	177	213	243	303
300 X 300	12	17	21	26	31	35	40	1200 X 900	93	126	158	192	231	264	328
400 X 200	11	15	19	23	28	32	37	1200 X 1000	100	135	170	207	250	285	377
400 X 250	12	17	22	27	32	37	42	1200 X 1200	114	154	195	237	287	328	187
400 X 300	14	19	24	30	36	41	47	1500 X 300	64	83	102	123	146	165	217
400 X 400	16	23	29	35	43	49	56	1500 X 400	72	94	117	141	168	190	246
500 X 300	18	25	32	39	47	54	56	1500 X 500	79	105	131	159	190	216	276
500 X 400	21	29	38	47	56	65	75	1500 X 600	87	116	146	177	212	241	335
500 X 500	24	34	44	54	66	76	87	1500 X 800	103	139	175	212	256	292	366
600 X 300	20	27	35	43	52	60	49	1500 X 900	119	160	188	228	278	317	394
600 X 400	23	32	42	57	62	71	82	1500 X 1000	119	161	204	248	300	343	453
600 X 500	27	37	48	59	72	83	95	1500 X 1200	134	184	233	284	344	393	545
600 X 600	30	42	55	67	82	94	109	1500 X 1500	157	217	277	338	412	472	241
800 X 300	25	35	46	56	68	78	90	1600 X 400	78	104	129	157	186	212	304
800 X 400	29	42	54	67	81	93	107	1600 X 600	94	127	159	194	232	265	366
800 X 500	34	48	63	78	95	109	126	1600 X 800	110	150	190	231	279	319	397
800 X 600	38	55	71	88	107	124	143	1600 X 900	119	162	206	250	302	345	428
800 X 800	47	67	88	109	133	153	178	1600 X 1000	125	174	221	269	325	372	372
900 X 300	27	38	49	60	73	84	96	1600 X 1200	143	197	251	306	371	426	491
900 X 400	32	45	58	72	87	101	116	1800 X 600	106	143	179	218	262	299	342
900 X 500	36	51	67	83	101	116	134	1800 X 800	124	169	215	261	314	359	413
900 X 600	41	58	75	94	114	132	152	1800 X 900	133	182	232	282	340	389	448
900 X 800	50	71	93	115	141	163	189	1800 X 1200	168	221	283	345	418	480	553
900 X 900	54	78	102	126	155	178	207	1800 X 1500	187	260	334	409	500	573	662



## CIRCULAR ATTENUATORS- WEIGHTS & DIMENSIONS

ATTENUATOR MODEL	INTERNAL DIAMETER	EXTERNAL DIAMETER	LENGTH (mm)	STANDARD DRILLINGS			WEIGHT (kg)
				NO	THREAD	PCD mm	
ST30/1	300	500	300	8	M8	340	7
6T30/2			600				14
PT30/1			300				11
PT30/2			600				16
ST40/1	400	600	400	8	M10	450	11
ST40/2			800				21
PT40/1			400				16
PT40/2			800				29
ST50/1	500	700	500	8	M12	550	21
ST50/2			1000				37
PT50/1			500				28
PT50/2			1000				44
ST60/1	600	800	600	12	M12	650	28
ST60/2			1200				50
PT60/1			600				36
PT60/2			1200				55
ST80/1	800	1000	800	12	M12	860	45
ST80/2			1600				79
PT80/1			800				58
PT80/2			1600				96
ST100/1	1000	1200	1000	16	M16	1070	110
ST100/2			2000				158
PT100/1			1000				140
PT100/2			2000				210
ST125/1	1250	1450	1250	20	M16	1320	180
ST125/2			2500				260
PT125/1			1250				210
PT125/2			2500				260

## TEST CELL MEASUREMENT

NOISE OR AIR AS REQUIRED IS FED INTO THE SYSTEM AND THE EFFECTS ON INSERTION LOSS OR REGENERATION ARE MONITORED IN THE REVERBERATION ROOM USING A SERIES OF MICROPHONES LINKED TO A COMPUTERISED CONTROL UNIT.

FOR PRESSURE DROP MEASUREMENTS PRESSURE SENSING EQUIPMENT IS INSERTED INTO THE DUCTS BEFORE AND AFTER THE UNIT IS TESTED AND THE READINGS COMPARED.

ALL ACOUSTIC AND AERODYNAMIC DATA CONTAINED WITHIN THIS BOOK HAS BEEN DERIVED FROM INDEPENDENT TESTS IN ACCORDANCE WITH BS4718:1971 "METHODS OF TEST FOR SILENCERS FOR AIR DISTRIBUTION SYSTEMS".

## WARRANTY

A WARRANTY AGAINST DEFECTIVE MATERIALS OR WORKMANSHIP IS FURNISHED WITH ALL GMAMCO PRODUCTS, EXPIRING 12 MONTHS FROM THE DATE OF DESPATCH FROM OUR WORKS. WE RESERVE THE RIGHT TO IMPROVE OUR DESIGN AND SPECIFICATION AT ANY TIME, WITHOUT PRIOR NOTICE.



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