



NCS Acoustics

DESIGN · MANUFACTURE · INSTALL



NCS Rectangular Attenuators

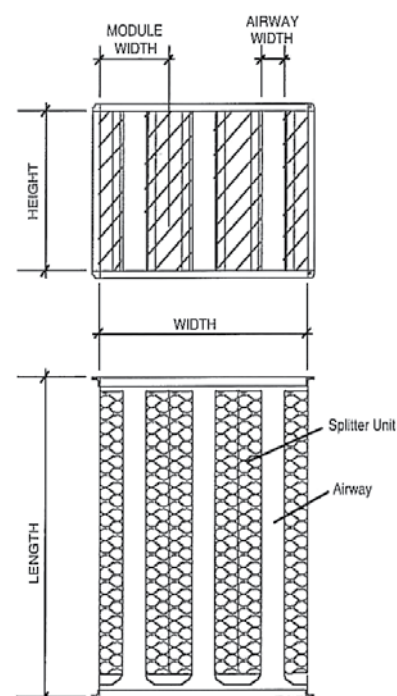
High performance



Attenuators are designed to absorb sound energy as air passes through their length, resulting in reduced sound levels at exit.

NCS Rectangular Attenuators provide optimised acoustic performance for applications where high levels of noise reduction are required or space constraints govern.

- Wide range of standard sizes (600mm to 3600mm long) or manufactured to individual requirements.
- Galvanized steel, stainless steel or PVC construction.
- Powder-coated or epoxy paint finishes, available in a range of colours.
- Melinex lining available, see NSM Rectangular Attenuators brochure.



ACOUSTIC PERFORMANCE

Rectangular splitter type attenuators consist of a duct casing, housing parallel splitters with airways in between. Air passes through the airways and sound energy is absorbed by the porous material contained within the splitters.

Various configurations of airway size and length are available. Higher acoustic performance is achieved by lengthening the attenuator and by decreasing the airway size. By offering a variety of combinations the length, airway width and size can be optimised for the particular application.

ATTENUATOR SELECTION PROGRAM

NCS Acoustics has developed an Attenuator Selection Program. Simply enter your acoustic and aerodynamic performance requirements and it selects suitable configurations from the NCS, NSM, NCT and NTM ranges, lengths from 600mm to 3600mm. Contact us for program, Excel software required.

MANUAL SELECTION

The first step in selecting a suitable attenuator configuration is to choose a model that meets the required insertion loss from the opposite table. This will determine the length and module width of the attenuator.

The next step is to determine the width and height of the attenuator. The width must be in even increments of the module width. For example a model NCS-300-18 is available in widths of 300mm, 600mm, 900mm, 1200mm etc. The height can be selected to suit the application.

Thirdly calculate the pressure loss. The air flow through the attenuator is required for the calculation. If the pressure loss and/or regenerated noise are too high then the width and/or height of the attenuator needs to be increased.

Lastly calculate the weight of the attenuator.

When ordering specify the model, width, height and connection flange type if required.

REGENERATED NOISE

Turbulence from airflow through the attenuator airways generates noise. This regenerated noise increases as the airflow velocity through the attenuator increases. Laboratory testing has resulted in a procedure for calculating the level of regenerated noise. Use the Attenuator Selection Program to determine or contact us.

MELINEX

Melinex lined rectangular attenuators are available. See the NCM Rectangular Attenuators brochure or use the Attenuator Selection Program.

INSERTION LOSS (dB)

Model	Module (mm)	Length (mm)	Frequency (Hz)							
			63	125	250	500	1k	2k	4k	8k
NCS-250-6	250	600	6	11	22	36	41	43	40	24
NCS-250-12		1200	10	19	35	50	50	50	47	32
NCS-250-18		1800	14	27	48	50	50	50	50	39
NCS-250-24		2400	18	35	50	50	50	50	50	46
NCS-275-6	275	600	5	9	18	27	37	32	33	18
NCS-275-12		1200	8	15	29	44	47	47	43	26
NCS-275-18		1800	11	21	39	50	50	50	50	31
NCS-275-24		2400	14	27	48	50	50	50	50	36
NCS-300-6	300	600	5	8	14	21	28	25	21	15
NCS-300-12		1200	7	12	25	39	44	44	38	23
NCS-300-18		1800	10	17	32	50	50	50	46	27
NCS-300-24		2400	12	22	40	50	50	50	48	31
NCS-325-6	325	600	4	7	14	19	30	26	19	14
NCS-325-12		1200	7	11	23	36	43	39	31	19
NCS-325-18		1800	9	15	31	48	49	49	37	23
NCS-325-24		2400	11	19	38	50	50	50	42	26
NCS-350-6	350	600	4	5	11	16	28	24	15	12
NCS-350-12		1200	6	9	20	32	42	36	25	17
NCS-350-18		1800	8	13	28	47	50	48	31	21
NCS-350-24		2400	9	17	36	50	50	50	37	24
NCS-375-6	375	600	4	5	10	15	23	19	14	10
NCS-375-12		1200	5	9	19	29	35	30	21	15
NCS-375-18		1800	7	13	26	40	43	39	27	18
NCS-375-24		2400	8	16	32	50	50	48	32	20
NCS-400-6	400	600	3	4	9	13	17	14	12	8
NCS-400-12		1200	4	8	17	25	30	26	18	13
NCS-400-18		1800	5	11	23	36	40	34	22	15
NCS-400-24		2400	6	14	28	47	49	42	26	17

OTHER SIZES AVAILABLE – CONTACT US

The static insertion loss performance figures have been measured in accordance with AS1277-1983 Acoustics – Measurement Procedures for Duct Silencers. A testing facility has been purpose built to allow the verification of the acoustic performance of these attenuators.

ATTENUATOR SELECTION PROGRAM

NCS, NSM, NCT, NTM ranges

Lengths from 600mm to 3600mm

Contact us for program, Excel software required.

PRESSURE LOSS

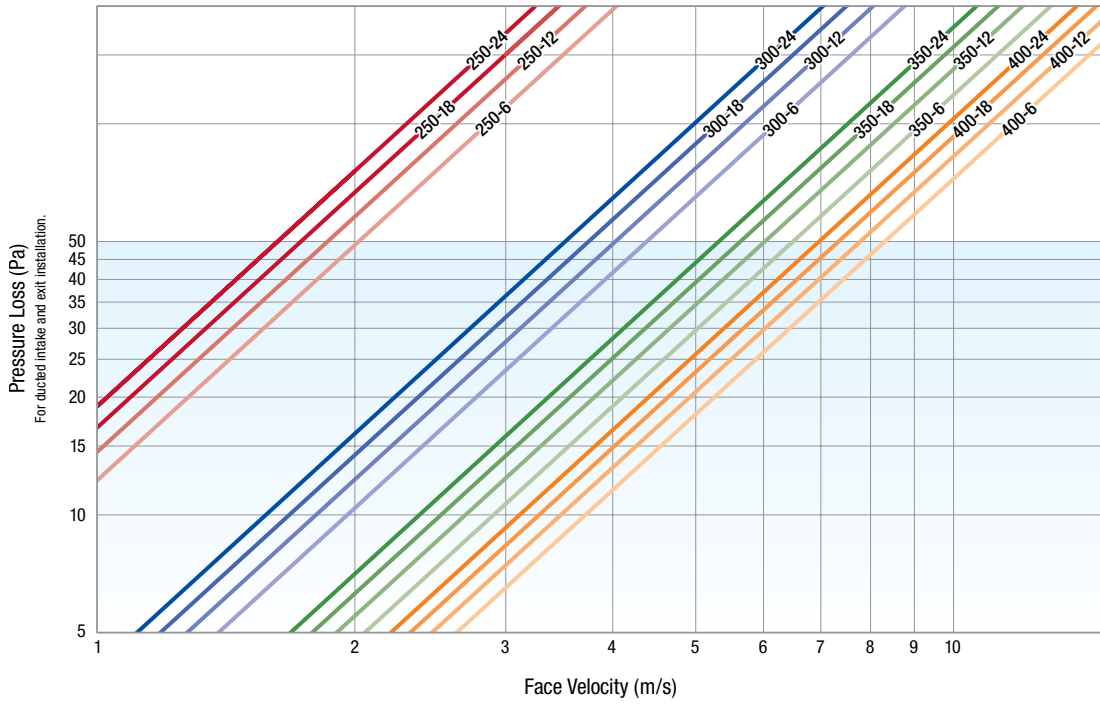
To calculate the pressure loss firstly calculate the face or duct velocity. Locate on the graphs below the attenuator model line and read off the pressure loss. For clarity the intermediate lengths are not shown. For intermediate lengths interpolate between adjacent lengths.

This pressure loss is for ducted inlet and ducted exit installation. Additional pressure loss will occur if the intake or exit from the attenuator are plenum type conditions. The pressure loss figures are for uniform air flow at the intake of the attenuator. Poor inlet and exit conditions will result in an increase in the pressure loss through the attenuator. Poor conditions include a bend or fan located close to the attenuator.

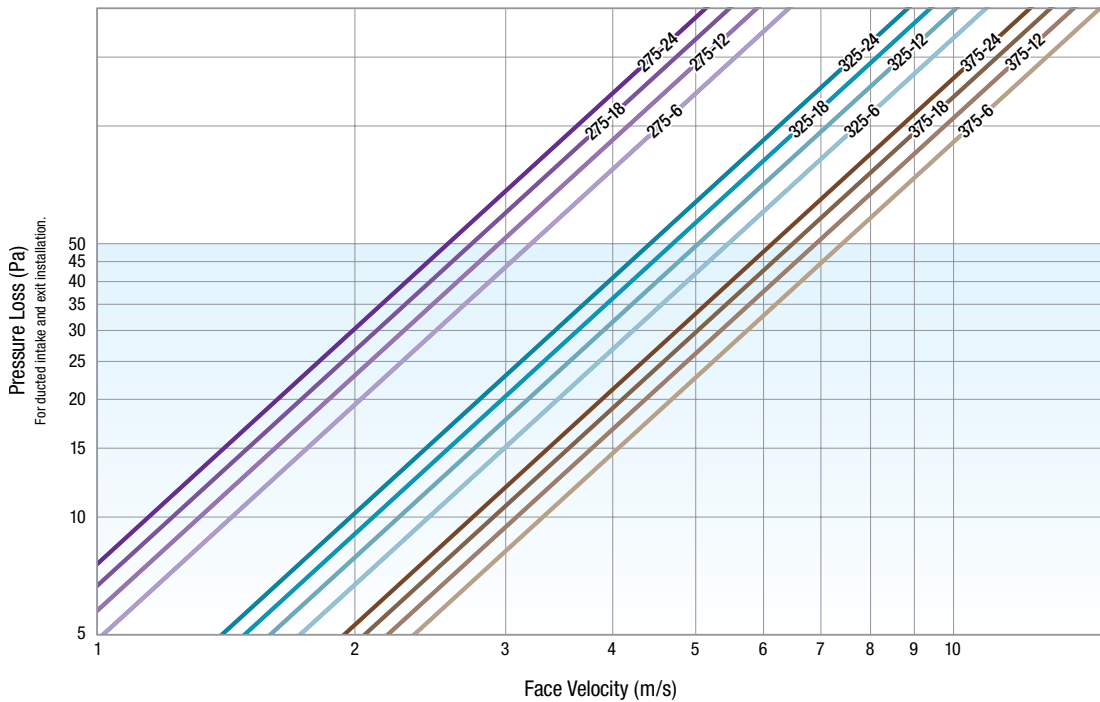
Example:

Model	NCS-300-18, 1200W x 600H x 1800L
Airflow	= 2000l/s (2.0m ³ /s)
Attenuator area	= 1.2m x 0.6m = 0.72m ²
Face velocity	= 2.0 m ³ /s ÷ 0.72m ² = 2.78m/s
Pressure loss	= 38Pa

NCS MODULES 250/300/350/400



NCS MODULES 275/325/375



MASS

How to calculate total attenuator mass (casing and splitter/s).

1. Determine casing mass

Look up the casing length and height and then width on table A. Interpolate for intermediate sizes as required.

2. Determine individual splitter mass

Look up the height and length from table B.

3. Determine number of splitters required

Number of splitters = attenuator width divided by module width (see Insertion Loss table on page 2).

4. Calculate total attenuator mass

Multiply the splitter mass by the number of splitters and add the casing mass. The numbers of splitters number is the width divided by the module width.

Example:

Model NCS-300-18: 1800L x 600H x 1200W

Casing mass = 67kg (from table A)

Splitter mass = 31kg (from table B)

No. Splitters = 1200 (width) ÷ 300 (module width from Insertion Loss table) = 4

Total mass = 31 (splitter mass) X 4 (no. of splitters) + 67 (casing mass) = 191kg

(A) ATTENUATOR CASING ONLY MASS (kg)									
Length (mm)	Height (mm)	Width (mm)							
		300	600	900	1200	1500	1800	2100	2400
600	2400	40	44	48	53	57	61	66	70
	1800	31	35	40	44	48	53	57	61
	1200	23	27	31	35	40	44	48	53
	600	14	18	23	27	31	35	40	44
1200	2400	70	78	85	93	101	172	184	196
	1800	55	62	70	78	85	93	101	172
	1200	39	47	55	62	70	78	85	93
	600	24	32	39	47	55	62	70	78
1800	2400	100	111	122	188	203	219	235	250
	1800	78	89	100	111	122	188	203	219
	1200	56	67	78	89	100	111	122	188
	600	34	45	56	67	78	89	100	111
2400	2400	131	145	209	228	247	266	285	304
	1800	102	116	131	145	209	228	247	266
	1200	73	87	102	116	131	145	209	228
	600	44	59	73	87	102	116	131	145

(B) INDIVIDUAL SPLITTER MASS (kg)				
Height (mm)	Length (mm)			
	600	1200	1800	2400
2400	45	74	107	136
2100	40	65	95	121
1800	34	57	83	106
1500	29	49	71	90
1200	23	38	55	70
900	18	30	43	55
600	13	21	31	40
300	7	13	19	25

CONSTRUCTION

Standard

Casings are manufactured from pre-galvanised sheet steel. End flanges supplied are typically proprietary systems although other flange systems are available on request. On larger units structural angle reinforcements are included.

The splitter modules are constructed from pre-galvanised sheet steel frames. The inlet has an aerodynamically shaped folded nose. The porous infill material is protected behind a layer of galvanised perforated sheet steel.

Acoustic Infill

Acoustic infill within splitters carry a Group Number of 1-s which complies with New Zealand Building Code clause C3.4(a). Tests were carried out in accordance with NZBC Verification Method C/VM2 Appendix A : Establishing group numbers for lining materials. High temperature infill is also available.

Stainless Steel or Heavy Duty Industrial

Stainless Steel attenuators can be light HVAC style (1.2mm) or Heavy Duty Industrial Construction (over 3mm).

PVC

Attenuators can be manufactured from PVC for specialised requirements. Mechanical strength must be considered.

Powder-Coated or Painted Finishes

For environmental or architectural requirements, powder coating or paint finishes such as epoxy are available in a range of colours. Can be applied internally and/or externally.

Splitters Only

In some situations, the acoustic splitter elements only can be supplied separately for applications such as builders work voids or air risers. Contact us for details.

ADDITIONAL INFORMATION

Visit our website or contact us for information on installation, testing, monitoring, maintenance services and technical guides.

Other models are available, visit our website for the full range. Or contact us to discuss which model is best suited to your requirements. If none of our standard models are suitable, we can design and manufacture a solution for you.



Got a question? Call us to discuss with an experienced engineer:

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Or visit our website for more information:

www.ncsacoustics.co.nz

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