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.

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.
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 the attenuator.

Example:
Model: NCS-300-18, 1200W x 600H x 1800L
Airflow = 2000l/s (2.0m³/s)
Attenuator area = 1.2m x 0.6m = 0.72m²
Face velocity = 2.0 m³/s ÷ 0.72m² = 2.78m/s
Pressure loss = 38Pa
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

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:
+64 9 269 0001
Or visit our website for more information:
www.ncsacoustics.co.nz

Data correct at time of publication, please ensure you have the latest version by checking our website. NCS Acoustics Limited accepts no liability for use of data within this brochure. Materials may be updated at any time without notice.