Sales Offices:
Dundee:
(Accord and North East)
Arrol Road
Wester Gourdie Ind. Est.
Dundee DD2 4TH
Tel: +44 (0) 1382 611444
Fax: +44 (0) 1382 611403
E: acoustics.scotland@gallowaygroup.co.uk

Dewsbury:
(Head Office)
Galloway Acoustics
Low Mill Lane
Ravensthorpe
Dewsbury
W. Yorkshire WF13 3LN
Tel: +44 (0) 1924 498818
Fax: +44 (0) 1924 498814
E: acoustics@gallowaygroup.co.uk

Richmond:
(London and South)
Galloway Acoustics
Parkshot House
5 Kew Road
Richmond
Surrey TW9 2PR
Tel: +44 (0) 20 8334 8076
Fax: +44 (0) 20 8334 8876
E: acoustics.london@gallowaygroup.co.uk

www.gallowaygroup.co.uk

GALLOWAY ACOUSTICS
Noise Control for Industry and Commerce

SILENCERS
Installation and Other Products

Normally Galloway Acoustics silencers are provided on a supply only basis, to be installed by the ductwork contractor. However, where required, a professional and skilled installation service is offered by Galloway Acoustics. This is backed by a comprehensive Public and Employers’ Liability Insurance and working practices compliant with all relevant and current COSHH and Health at Work Safety Standards. Specific method statements are provided for each project undertaken by Galloway Acoustics. All contracts both supply only and those involving an element of installation are project managed by an experienced engineer who will coordinate the design for approval, manufacture, dispatch and on-site installation programme. Upon completion of silencer deliveries, O and M guidelines can be provided upon request.

Other Products

In addition to silencers, Galloway Acoustics full range of products and services comprises:

- **ACOUSTIC AND NON ACOUSTIC LOUVRES**
- **SPECIALISED ACOUSTIC DUCTING COMPONENTS**
- **METAL ACOUSTIC AND FIRE RATED DOORSETS**
- **ACOUSTIC ENCLOSURES AND SCREENS**
- **ACOUSTIC MATERIALS**
- **VIBRATION ISOLATORS**
- **INERTIA BASES**
- **FLOATING FLOORS**
- **INSTALLATION SERVICES**
- **ACOUSTIC CONSULTANCY**
- **CUSTOM DESIGNED PRODUCTS**

### Installation and Other Products

Silencers or attenuators, whichever term you prefer, are basically a system to allow the passage of airflow while at the same time providing an acoustic loss or reduction to the passage of sound or noise.

The products themselves tend to be manufactured from basic materials and well-recognised sheet metal construction processes and designs. The real science is in the products known and thus measured performance, coupled with accurate and professional acoustic design calculations and product selection.

Hence Galloway Acoustics decided to test its range of silencers not only to both BS 4718: 1971 and ISO 7235: 1996, but also to UKAS (United Kingdom Accreditation Service) standards. Some would say why go to the trouble of seeking UKAS accreditation on testing. Basically UKAS can only be achieved via an independent test laboratory, and gives an additional level of credibility to the data being obtained at the end of the test programme.

This is accomplished by rigorous checks carried out on the laboratory test facilities in which the margin of difference between a number of repeated test results, on the same product test sample, must be so small that complete confidence can be gained in the knowledge that the same test on a similar product can be compared on a ‘like for like’ basis, without fear of relevant inaccuracies in the test rig design, other than those normal for the test procedure in question.

In 1999 no acoustic test laboratory in the UK had a UKAS accredited silencer test rig to the above standards. Very few had a fully compliant BS4718 test rig with a reversible fan to allow measurement of both inlet and outlet regeneration flow noise, and even fewer could test to the new ISO 7235 Standard. Thus Galloway Acoustics, in conjunction with Salford University, embarked upon a programme of designing, manufacturing and installing a fully compliant test rig to BS4718 and ISO 7235 and at the same time gain UKAS accreditation.

The test programme commenced in March 2000, and after many months of hard work, was fully completed by August 2001, making Galloway Acoustics, to our knowledge, the only UK company to have tested silencers to both of the existing standards and on a UKAS accredited test rig, the first of its kind in the UK.

In conjunction with these tests a range of software calculation spreadsheets based on Excel Macro programmes were developed in-house and these are the basis for our design selections.

A comprehensive silencer selection programme has been designed and this is available shortly on CD-ROM for use by designers needing to select in-duct rectangular or cylindrical silencers.
Crosstalk Silencers

As previously mentioned Crosstalk Silencers can take the form of a standard rectangular duct mounted unit (with or without flanges), or a standard cylindrical unit, usually a CAXT1 or CAXT2, see sketches on page 14 and 15.

However within the range of Crosstalk units the following have been specifically designed for true room to room crosstalk application where little or no duct is required. One such scenario is air transfer between adjoining rooms.

The following sketches show the standard types available and as with all our other silencers separate data sheets that show the acoustic performance of the units are available.

End Flanges

<table>
<thead>
<tr>
<th>DW144</th>
<th>End Flanges</th>
<th>DW144 Class C</th>
<th>End Flanges</th>
</tr>
</thead>
<tbody>
<tr>
<td>W or H (mm)</td>
<td>W or H (mm)</td>
<td>W or H (mm)</td>
<td>W or H (mm)</td>
</tr>
<tr>
<td>Ductmate 25/20</td>
<td>Up to 800</td>
<td>Ductmate 25/20</td>
<td>Up to 600</td>
</tr>
<tr>
<td>Ductmate 35/3, 30/3</td>
<td>801 to 1250</td>
<td>Ductmate 35/3, 30/3</td>
<td>601 to 1000</td>
</tr>
<tr>
<td>Ductmate 35/4, 30/4</td>
<td>1251 to 1600</td>
<td>Ductmate 35/4, 30/4</td>
<td>1001 to 1250</td>
</tr>
<tr>
<td>Ductmate 45</td>
<td>1601 to 3000</td>
<td>Ductmate 45</td>
<td>1251 to 2500</td>
</tr>
</tbody>
</table>

Ductmate 25 and 35 are standard, however where specifically requested Ductmate 20 and 30mm can be substituted and again sized in accordance with DW144 and the chart above.

Due to the splitter casings being riveted to the main attenuator case creating an inherently stiff component, intermediate stiffeners are only used on attenuator lengths over 1800mm as required.

Where RSA flanges are specifically requested or the width or height of the silencer exceed DW144 classifications the flanges would be in accordance with Galloway Acoustics’ drawing 01-SK6 1 of 2.

Arranged within the casing would be attenuating splitter sections manufactured from a minimum of 0.8mm sheet steel, fixed to the casing with rivets at 250mm centres (one row for sideliners and two rows for splitters).
All GALLOWAY attenuators would have aerodynamically shaped bullnose fairings to the front and back of the splitters, 0.7mm expanded metal facing to the acoustic infill and polythene sheet blocked ends, which must be removed prior to installation of the unit.

This type of construction has been tested in accordance with HVCA specification DW144 and at a pressure of 1000N/M², a leakage of class “B” was obtained.

The acoustic media used is ATTENUFILL, which is manufactured by the Galloway Group. This is a mineral fibre slab with a minimum installed compression rating of 5.0%. The material is inert, non combustible, non-hygroscopic, vermin proof, rat proof, will not support bacterial growth and sound absorbent to BS 3638 1963 absorption coefficient with a minimum density of 45kg/m³ and faced with a glass fibre issue.

Where M has been added to the code the acoustic infill woven glass fibre mesh facing will be replaced with a Hemitically Sealed Melinex membrane bag retained behind expanded metal facing. Where advised the silencer hygiene will match the TM specification relevant to the site.

Differential Pressures up to 2000pa as above but manufactured to obtain Class “C” leakage DW144 positive pressure (please advise if this is a requirement).

Splitter Bend Type VB/HB - These shall be constructed as above.

Horizontal Splitters - Attenuators with code suffix (H) will be constructed with horizontal splitters.

Matching Flanges - Available for all Galloway Silencers are available as standard at extra cost.

Galloway Acoustics Cylindrical Silencer Constructional Specification

Dependent upon quantity and specification, cylindrical attenuators will be constructed from pre-galvanised sheet steel either as an overlapped longitudinal seam or spiral wound with all casings and leakage being to a minimum of DW144.

End Flanges would be internal and manufactured from lock-formed rolled steel. In all cases the flanges have nut inserts to our standard drilling dimensions. These can be altered as required to ensure compatibility with other components on site.

The acoustic media used is ATTENUFILL specification as described under rectangular silencers.

All podded Galloway Cylindrical silencers have flat entry and exit with 0.7mm expanded metal facing to the acoustic infill and polythene blocked ends, which must be removed prior to installation of the unit. The acoustic media is further protected by the use of expanded pre-galvanised sheet steel as standard.

Melinex membrane – specification as described under rectangular silencers.

When units are manufactured in sectional lengths these are connected together using SPIRALMATE manufactured by Ductmate (Europe) Limited.

GALLOWAY cylindrical attenuators are suitable as standard for internal duct pressures up to 1000N/M² DW144 class A/B. As a non standard they can be manufactured suitable for internal duct pressures up to 2000N/M² DW144 Class C at an extra charge (please advise when required).

CA/CPA – SPC The addition of SPG on the code denotes the use of spigot connections in preference to the internal flanges and nut inserts.

CA/CPA – SPC – S For quick installation and release application the code S after SPG denotes the use of SPIRALMATE connections for which compatible mating flanges will be supplied.

CART 1 & 2 SILENCERS – The units are manufactured as above with spigot connections on both ends to fit into most standard ISO duct systems. Their main purpose is to provide high levels of cross talk privacy between adjacent rooms served by a common ductwork system, whilst producing a negligible additional pressure loss on that system.

Matching Flanges – As with rectangular, available at additional cost.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>UNPODDED</th>
<th>PODDED</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>OD</td>
<td>LENGTH</td>
<td>PCD</td>
<td>No. OF HOLES</td>
<td>THREAD</td>
<td>GAUGE DW 144 Class B</td>
<td>GAUGE DW 144 Class C</td>
</tr>
<tr>
<td>250</td>
<td>480</td>
<td>250</td>
<td>500</td>
<td>320</td>
<td>4</td>
<td>M8</td>
<td>0.8</td>
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<tr>
<td>300</td>
<td>500</td>
<td>300</td>
<td>600</td>
<td>340</td>
<td>8</td>
<td>M8</td>
<td>0.8</td>
</tr>
<tr>
<td>315</td>
<td>515</td>
<td>315</td>
<td>630</td>
<td>355</td>
<td>8</td>
<td>M8</td>
<td>0.8</td>
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<td>355</td>
<td>555</td>
<td>355</td>
<td>710</td>
<td>395</td>
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<td>M8</td>
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<tr>
<td>400</td>
<td>600</td>
<td>400</td>
<td>800</td>
<td>450</td>
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<td>450</td>
<td>900</td>
<td>500</td>
<td>8</td>
<td>M10</td>
<td>0.8</td>
</tr>
<tr>
<td>500</td>
<td>700</td>
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<td>1000</td>
<td>560</td>
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<td>1100</td>
<td>900</td>
<td>1800</td>
<td>970</td>
<td>16</td>
<td>M12</td>
<td>0.8</td>
</tr>
<tr>
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<td>1300</td>
<td>1000</td>
<td>2000</td>
<td>1070</td>
<td>16</td>
<td>M12</td>
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<td>1400</td>
<td>1100</td>
<td>2200</td>
<td>1190</td>
<td>20</td>
<td>M12</td>
<td>1.0</td>
</tr>
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<td>1250</td>
<td>1550</td>
<td>1250</td>
<td>2500</td>
<td>1320</td>
<td>20</td>
<td>M12</td>
<td>1.0</td>
</tr>
<tr>
<td>1400</td>
<td>1700</td>
<td>1400</td>
<td>2800</td>
<td>1470</td>
<td>20</td>
<td>M12</td>
<td>1.0</td>
</tr>
<tr>
<td>1600</td>
<td>1900</td>
<td>1600</td>
<td>3200</td>
<td>1680</td>
<td>24</td>
<td>M12</td>
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<td>2100</td>
<td>1800</td>
<td>3800</td>
<td>1880</td>
<td>24</td>
<td>M12</td>
<td>1.2</td>
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<tr>
<td>2000</td>
<td>2300</td>
<td>2000</td>
<td>4000</td>
<td>2080</td>
<td>24</td>
<td>M12</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Galloway Acoustics Cylindrical Silencer Constructional Specification

Dependent upon quantity and specification, cylindrical attenuators will be constructed from pre-galvanised sheet steel either as an overlapped longitudinal seam or spiral wound with all casings and leakage being to a minimum of DW144.
Optional Features

Facings: Whilst not specifically covered under DW144, Galloway Acoustics strongly recommends that all duct mounted silencers and acoustic splitters provided on modern day ventilation projects should have their acoustic media protected not only by a glass fibre scrim but also expanded or perforated metal protection. Galloway Acoustics provide this feature as standard. The photograph below shows what can happen if it is not.

Other facings available are Melinex hermetically sealed bags and full glass cloth wrap.

Full glass cloth wrap is used for ‘clean applications’ that require the mid and high frequency performance that Melinex ‘bagged’ units lose.

Fire Rated/HTC

The Galloway Group, of which Galloway Acoustics are a part, are licensees for the fire protection of ductwork using Fenland Fire Spray (FF) treatment methods.

This being the case the Galloway Acoustics range of silencers can be manufactured from the above certified alternative constructional methods to meet any specific requirement relating to BS476 Part 4 (Fire) and BS5588 Part A (Smoke).

For systems requiring the use of only a high-temperature casing for non-certified applications, our HTC option is available. Please note this is not a certified fire rated construction.

Optional Features

Rectangular Construction Notes and Flange Connection Details

1. Drill hole in each corner of flange on standard benchmark ‘B’
2. Mark off holes at 300mm centres from each corner hole towards centre line of flange.
3. If dimension ‘A’ exceeds 301mm drill an additional hole on centre line of flange.
4. Dimension ‘A’ must not be less than angle size ‘W’. If this occurs omit the two holes adjacent to the flange centre line and replace with one hole on the flange centre line.
**Optional Features**

**Bends** – All Galloway rectangular silencers can be manufactured as either vertical (VB), horizontal (HB) or T-section (TB) bends.

**Multi Section (MSL, MSW, MSH) and Flat Pack (FP)**

Options are available where lack of lifting mechanisms and poor access on site require large silencers to be broken down into smaller component parts. Multi section silencers are split on the length, width, height or a multiple of all three to provide handable sectional sizes.

Flat pack silencers are generally broken down into individual casing and splitter sections. Both options are for site assembly by others. Please advise when issuing your enquiry/pricing request whether these options are required.

**Ductwork Terminations**

All Galloway silencers can be manufactured with a range of optional complementary ductwork components as an integral part of the silencer, e.g.:
- **Inlet and Outlet plenums** for silencers being situated close to an obstruction such as a louvre, filter, damper etc.
- **Square to Rounds**, straight-through and stepped spigots where space is limited.
- Transformation sections and in the case of cylindrical silencers, SpiraMate quick fix and release connection flanges to facilitate easy installation and removal to and from the ductwork system.

**Painting**

The complete range of standard silencers can be painted to a high standard using Polyester Powder Paint to both the internal and external metal surfaces for both chlorination protection and aesthetic appearance requirements.

Special features such as lifting lugs for craneage, special flange connections, fully welded units for high pressure applications, dual skin silencers to reduce noise breakout into critical areas and drop in roof silencers for roof curb mounted fans etc. can all be provided by Galloway Acoustics.

For further assistance on all the options available please contact Galloway Acoustics Technical Sales Department who will be happy to assist you with your enquiry.
### Standard Codings

**Rectangular Silencers**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Silencer Configuration Type – followed by reference number</td>
</tr>
<tr>
<td><strong>ASL</strong></td>
<td>Adjust Sideliners</td>
</tr>
<tr>
<td><strong>EOA</strong></td>
<td>Even Out Airways</td>
</tr>
<tr>
<td><strong>H</strong></td>
<td>Horizontal Splitters</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Class C Construction</td>
</tr>
<tr>
<td><strong>HTC</strong></td>
<td>High Temperature Casing</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>Melinex, hermetically sealed bag with silencer hygiene to match TM specification relevant to the project</td>
</tr>
<tr>
<td><strong>GLW</strong></td>
<td>Glass Cloth Wrap to all faces of acoustic media</td>
</tr>
<tr>
<td><strong>VB</strong></td>
<td>Vertical Bend</td>
</tr>
<tr>
<td><strong>HB</strong></td>
<td>Horizontal Bend</td>
</tr>
<tr>
<td><strong>TB</strong></td>
<td>&quot;T&quot; Section Bend</td>
</tr>
<tr>
<td><strong>MSL</strong></td>
<td>Multi Section Construction in length</td>
</tr>
<tr>
<td><strong>MSW</strong></td>
<td>Multi Section Construction in width</td>
</tr>
<tr>
<td><strong>M5SW</strong></td>
<td>Multi Section Construction in height</td>
</tr>
<tr>
<td><strong>SF</strong></td>
<td>Self Flange</td>
</tr>
<tr>
<td><strong>FP</strong></td>
<td>Flat Pack</td>
</tr>
<tr>
<td><strong>DF</strong></td>
<td>Standard Ductmate</td>
</tr>
<tr>
<td><strong>IF</strong></td>
<td>Internal Ductmate Flange</td>
</tr>
<tr>
<td><strong>GF</strong></td>
<td>RSA Flanges to suit specification, hot dipped galvanised after manufacture</td>
</tr>
<tr>
<td><strong>IGF</strong></td>
<td>Internal RSA flange to suit specification, hot dipped galvanised after manufacture</td>
</tr>
<tr>
<td><strong>SPG</strong></td>
<td>Spigot Connections (straight through, i.e. silencer duct size)</td>
</tr>
<tr>
<td><strong>SPGS</strong></td>
<td>Stepped Spigot Connections</td>
</tr>
<tr>
<td><strong>SPGC</strong></td>
<td>Capped and with cylindrical spigot, i.e. SPCG 150 150 dia spigot and</td>
</tr>
<tr>
<td><strong>PL</strong></td>
<td>Hot Plenum, i.e. PLO300 = 300mm long</td>
</tr>
<tr>
<td><strong>PLO</strong></td>
<td>Outlet Plenum, i.e. PLO300 = 300mm long</td>
</tr>
<tr>
<td><strong>PP</strong></td>
<td>Polyester Powder Coated to BS/RAL colour</td>
</tr>
<tr>
<td><strong>SPF</strong></td>
<td>Other paint finishes to be specified</td>
</tr>
<tr>
<td><strong>PC</strong></td>
<td>Polypropylene Construction</td>
</tr>
<tr>
<td><strong>UPVC/GRP</strong></td>
<td>UPVC/GRP construction</td>
</tr>
<tr>
<td><strong>ST/ST</strong></td>
<td>Stainless Steel Construction</td>
</tr>
<tr>
<td><strong>FF</strong></td>
<td>Fenland Fire Spray</td>
</tr>
<tr>
<td><strong>DS</strong></td>
<td>Double Skin Construction</td>
</tr>
<tr>
<td><strong>DIS</strong></td>
<td>Drop in Silencer – refer to drawing for details</td>
</tr>
<tr>
<td><strong>NS</strong></td>
<td>Non standard construction – refer to drawing for details</td>
</tr>
</tbody>
</table>

### Cylindrical Silencers Codings

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CA</strong></td>
<td>Cylindrical silencer without concentric pod</td>
</tr>
<tr>
<td><strong>CPA</strong></td>
<td>Cylindrical silencer with concentric pod</td>
</tr>
<tr>
<td><strong>SPG</strong></td>
<td>Cylindrical CA/CPA unit with spigot connections in lieu of nut inserts</td>
</tr>
<tr>
<td><strong>S</strong></td>
<td>Spiralmate connections</td>
</tr>
<tr>
<td><strong>FLO</strong></td>
<td>Circular silencer with external angle flange. Drillings to be advised</td>
</tr>
<tr>
<td><strong>CAXT1</strong></td>
<td>Spigotted cylindrical crosstalk silencer 50mm lining</td>
</tr>
<tr>
<td><strong>CAXT2</strong></td>
<td>Spigotted cylindrical silencer 100mm lining</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>DW144 Class &quot;C&quot; Construction</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>Melinex hermetically sealed bag with silencer hygiene to match TM specification relevant to project</td>
</tr>
<tr>
<td><strong>GLW</strong></td>
<td>Glass Cloth Wrap to all faces of acoustic media</td>
</tr>
<tr>
<td><strong>PL</strong></td>
<td>Hot Plenum, i.e. PLO300 = 300mm long</td>
</tr>
<tr>
<td><strong>PLO</strong></td>
<td>Outlet Plenum, i.e. PLO300 = 300mm long</td>
</tr>
<tr>
<td><strong>PP</strong></td>
<td>Polyester Powder Coated to BS/RAL colour</td>
</tr>
<tr>
<td><strong>SPF</strong></td>
<td>Other paint finishes to be specified</td>
</tr>
<tr>
<td><strong>PC</strong></td>
<td>Polypropylene Construction</td>
</tr>
<tr>
<td><strong>UPVC/GRP</strong></td>
<td>UPVC/GRP construction</td>
</tr>
<tr>
<td><strong>ST/ST</strong></td>
<td>Stainless Steel Construction</td>
</tr>
<tr>
<td><strong>FF</strong></td>
<td>Fenland Fire Spray</td>
</tr>
<tr>
<td><strong>DS</strong></td>
<td>Double Skin Construction</td>
</tr>
<tr>
<td><strong>NS</strong></td>
<td>Non standard. Refer to drawings and schedule and includes all multi-section variables</td>
</tr>
</tbody>
</table>
**Acoustic Design**

Having read the introduction to this catalogue you will know that our standard silencers have been tested on the UKAS accredited test rig shown below.

With regard to the results obtained the items that were measured to both standards were:

1. Static Insertion Loss (Not dynamic. Please note that BS 4718:1971 does not define or require the testing of dynamic insertion loss. ISO 7235:1996 defines dynamic insertion loss but does not class testing of this as compulsory. Both standards require static insertion loss to be measured for the standard to be met.) With regards to IOS 7235 this standard requires the static insertion loss data to be presented in the form of 1/3 octaves. This being the case Galloway Acoustics have accurate information on silencer performance figures at these frequencies, essential for the treatment of applications including tonal noise problems.

2. Inlet and outlet flow generated noise.

3. Silencer pressure loss due to airflow.

Regenerated airnoise and pressure losses are kept to a minimum by the use of aerodynamic bullnoses to both the inlet and outlet of the rectangular silencers. This also negates the requirement of airflow directional arrows and eliminates the risk of the silencer being installed in the ‘wrong direction’.

To carryout an accurate acoustic assessment of a ductwork run for the selection of a silencer, the following information will be required:

1. **Ductwork Losses** – This is assessed from ductwork layout drawings provided by the design team. However site co-ordination can often result in some ductwork runs being altered. Ductwork losses should always be checked with the mechanical contractor prior to final schedule selection of the silencers.

2. **Grille Size and Location** – Required to assess end reflection. ‘The End Reflection’ – the energy loss and subsequent attenuation of sound change in cross section from one area to another and directivity’ without the need for detailed drawings, air volumes, and approximate pressure and fan type.

3. **Number of Noise Sources in a Room** – For instance one extract and one supply grille would be two noise sources. This would add 10(Log2) to the overall sound pressure, i.e. 3dB. Hence if one calculated NR30 independently for each noise source, without taking into account the two noise sources within the calculation, the overall result could be NR30 + 3dB, an excess. The greater the number of noise sources the worse the potential problem.

4. **Sound Power to Room** – Sound is measured in decibels, a logarithmic scale, and this changes in proportion to the amount of air entering a room from the total being handled by the fan.

5. **Room Size (Volume)** – In reality it is really the room volume that one requires. However most rooms tend to be a standard length x Width x Height, hence ’Room Size’.

6. **Reverberation Time (RT)** – The reverberation time can dramatically change overall sound pressure measured in a room from the same sound source. The lower the reverberation time the lower the contribution to the overall sound level, and vice versa with a higher RT. However as it is affected by the amount of total absorption in a room (the greater number of soft furnishings, i.e. chairs, curtains, carpets etc., the greater the absorption and the lower the reverberation time and hence overall sound level in the room, from a given noise source), it is often difficult to assess at design stage. Opposite is a basic guide for different applications where the RT is unknown.

7. **Sound Power to Outlet** – This is effectively the outlet for the sound power, which in the case of an induct silencer is often an air inlet or outlet grill, diffuser, sub duct or other termination, such as an atmospheric louvre. The principle with respect to energy loss/attenuation is the same as 4) above.

8. **Distance to Listener** – The distance from the sound source (for instance the grille) to the receiver, the human ear. Generally for a ceiling mounted grille with a standard room height of 2.8m – this is usually calculated as 1.0m (average human height is 1.8m). In the case of an atmospheric calculation this will change from site to site and will be dependent upon the proximity of other noise sensitive areas on the site, i.e. office or bedroom windows and/or the site legal boundary, i.e. industrial location or close to residential properties.

The above is a basic guide only with regards to the minimum of information required to carryout an induct silencer selection. Galloway Acoustics staff are on hand to carryout any selections required and advise on what other data may be needed for more complicated applications including potential ductborne noise breakout into noise sensitive areas.

If the scheme being considered is provisional and the above data is not available, Galloway Acoustics have developed a quick budget selection programme that will, without the need for detailed drawings, select a silencer based upon the application, air volume, approximate fan type and static pressure, and the specification required (NR/NC). Please Note this system is a guide only and not a substitute for accurate calculations.
### Project: CATALOGUE EXAMPLE

<table>
<thead>
<tr>
<th>EN</th>
<th>???</th>
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</thead>
</table>

#### Fan Details: ???

<table>
<thead>
<tr>
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<th>???</th>
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</table>

#### Room / Area Served: ???

<table>
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</table>

### Duct A1M TO A55M for each type, i.e.: - 110 data sheets. In addition the cylindrical silencer range has 8 different data sheets covering both standard internally flanged and spigotted silencer types.

### Silencer Selection

The following sections explain what information is required to carryout an acoustic calculation and hence then select a silencer. The starting point has always got to be ‘what are the design requirements’. For instance what is the application and what are the acceptable noise levels for such an environment. NR (Noise Rating) and NC (Noise Criteria) levels are sound curves that can be used, as a guide to estimate how loud a certain noise will appear to the human ear. These curves are a guideline and not an exact science. Different people may well have varying degrees of tolerance from one type of noise to another. Always it is sensible to engage in discussion with the client (end user) to establish what their requirements are likely to be.

Overleaf are graphical and tabulated NR and NC graphs/figures. Generally the NR scale is used throughout Europe while the NC is used in the USA and throughout areas of the rest of the world.

Page 11 shows guides for the selection of NR/NC levels for different applications and should be treated as the maximum overall level as a direct result of all the different noise levels. In the case of a mechanical design this means ‘with all plant running’.

With regards to an external or atmospheric specification the NR or NC guide poses little use. The main source of reference and what are the acceptable noise levels for such an environment.

### Acoustic Design

However, what is not apparent from the above is the breadth and depth of the data available from these tests. To explain, Galloway Acoustics currently has 55 different silencer configurations, A1 to A55, in its range, with a melon equivalent, A1M TO A55M for each type, i.e.: - 110 data sheets. In addition the cylindrical silencer range has 8 different data sheets covering both standard internally flanged and spigotted silencer types.

In both cases, rectangular or cylindrical, these configurations can be adopted for the use of induct crosstalk. However, to our knowledge we are unique in this feature, we also have 5 types of crosstalk silencers that have been designed specifically for nonducted applications. That is the actual Sound Reduction Index (to BS EN ISO 14013 1995) of the units has been measured and not the static insertion loss (which is based on a ducted scenario in the case of BS4718 1971 and ISO 7235 1996). This allows accurate assessment of the performance of a crosstalk silencer when installed as an air transfer unit, for instance in a wall above and between two false/suspended/ceiling voids or as an air transfer through a wall or door i.e. a ‘true crosstalk’ application.

The above information is exactly the reason you will not find any performance figures shown in this catalogue. There are far too many to publish. These are thus produced as data sheets available through issue by Galloway Acoustics staff, project dependent. Alternatively a CD or our members area website showing the full range of standard silencers to date along with all other products and a selection programme is available for use by designers. Should you not wish to indulge in the rigours of carrying out acoustic selections (after all if done properly it is a time consuming task), Galloway Acoustics staff are on hand to provide you with this service.

Any products ordered as a result of this assistance are covered by our Professional Indemnity Insurance in addition to our standard Product Liability.
Having established the specification and an selection of the plant (which could be an Air Handling Unit, extract fan, chiller or any other specific type of equipment), the inherent sound qualities of the equipment will be required. In the case of a silencer selection for a fan for instance, this will be the Induct Sound Power Level (SWL). The equipment manufacturer would normally provide this information.

If the design is preliminary and the accurate SWL unknown, an estimate of the fan SWL can be achieved by utilising a formula known as the Berenek Fan SWL Estimated Data. By cross-referencing the air volume against the fan pressure the reference SWL can be found. Correction for different fan types and frequencies are given.

The Sound Power level of the equipment is the starting point of any acoustic calculation, while the specified noise is the end giving the required acoustic performance. This is demonstrated by way of the sample silencer calculation sheet on the opposite page.

Further discussion with reference to this calculation sheet and information required is shown on page 14.
### RECOMMENDED NR AND NC CRITERIA FOR VARIOUS APPLICATIONS

<table>
<thead>
<tr>
<th>NR/NC Index</th>
<th>Offices</th>
<th>Public Buildings</th>
<th>Private Dwellings</th>
<th>Studio and Auditoria</th>
<th>Ecclesiastical and Academic Buildings</th>
<th>Industrial Buildings</th>
<th>Hospitals</th>
<th>Restaurants/Shop/Stores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Businessroom/Large Conference Room</td>
<td>Court Room</td>
<td>Bedroom</td>
<td>Restaurant/Department Store (upper floor)</td>
<td>Classroom/lecture Theatre</td>
<td>Warehouse/Garage</td>
<td>Operating Theatre/Single Bed Ward</td>
<td>Staff Room/Recreation Room</td>
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<td>20</td>
<td>25</td>
<td>25</td>
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<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fan Type</th>
<th>Volume Flow (m³/s)</th>
<th>Reference Sound Power Level (dB re. 10⁻¹² W)</th>
<th>Bereneck Fan SWL Estimated Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axial Flow</td>
<td>-5</td>
<td>-5</td>
<td>-7</td>
</tr>
<tr>
<td>Centrifugal</td>
<td>-5</td>
<td>-5</td>
<td>-7</td>
</tr>
<tr>
<td>Forward Curved</td>
<td>-5</td>
<td>-5</td>
<td>-7</td>
</tr>
<tr>
<td>Backward Curved</td>
<td>-5</td>
<td>-5</td>
<td>-7</td>
</tr>
</tbody>
</table>

Having established the specification and an selection of the plant (which could be an Air Handling Unit, extract fan, chiller or any other specific type of equipment that may involve the silenced passage of airflow) for the purpose it is proposed, the inherent sound qualities of the equipment will be required. In the case of a silencer selection for a fan for instance, this will be the Induct Sound Power Level (SWL). The equipment manufacturer would normally provide this information.

If the design is preliminary and the accurate SWL unknown, an estimate of the fan SWL can be achieved by utilizing a formula known as the Bereneck Fan SWL Estimated Data. For ease of use, a simplified version of this is shown opposite. By cross-referencing the air volume against the fan pressure the reference SWL can be found. Correction for different fan types and frequencies are given.

The Sound Power level of the equipment is the starting point of any acoustic calculation, while the specified noise is the end goal giving the required acoustic performance or in the case of the silencer the static insertion loss. The middle section is the information required that changes from one application to another. This is demonstrated by way of the sample silencer calculation sheet on the opposite page.

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Acoustic Design

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Page 11 shows guides for the selection of NR/NC levels for different applications and should be treated as the maximum overall level as a direct result of all the different noise levels. In the case of a mechanical design this means 'with all plant running'.

With regards to an external or atmospheric specification the NR or NC guide poses little use. The main source of reference for this would BS4142 1997 'Rating Industrial Noise Affecting Mixed Residential Sites and Industrial Areas'. This standard gives clear recommendations/guidelines on the potential effect of increasing the existing background noise level by varying degrees for a development on an existing or new site. However the final decision will rest with the Planning Department and Environmental Health Officer who may decree that 'no increase in background level is acceptable' especially for critical sites adjoining residential areas.

Invariably an acoustic survey will be required to establish the existing background noise level.

This should be carried out during the worst case scenario i.e. at the time of day that is deemed to be the 'quietest' when the plant is in question will be operating. For example equipment operating 24 hours, or with potential to do so, this would be during the night.

Galloway Acoustics can provide comprehensive testing and subsequent recommendations for all background applications.
Acoustic Design

Having read the introduction to this catalogue you will know that our standard silencers have been tested on the UKAS accredited test rig shown below.

With regard to the results obtained the items that were measured to both standards were: -
1. Static Insertion Loss (Not dynamic. Please note that BS 4718 1971 does not define or require the testing of dynamic insertion loss. ISO 7235 1996 defines dynamic insertion loss but does not class testing of this as compulsory. Both standards require static insertion loss to be measured for the standard to be met.) With regards to ISO 7235 this standard requires the static insertion loss data to be presented in the form of 1/3 octaves. This being the case Galloway Acoustics have accurate information on silencer performance figures at these frequencies, essential for the treatment of applications including tonal noise problems.
2. Inlet and outlet flow generated noise.
3. Silencer pressure loss due to airflow.

Regenerated airnoise and pressure losses are kept to a minimum by the use of aerodynamic bullnoses to both the inlet and outlet of the rectangular silencers. This also negates the requirement of airflow directional arrows and eliminates the need for detailed drawings, air volumes, and approximate pressure and fan type.

2 Grille Size and Location - Required to assess end reflection. "The End Reflection", the energy loss and subsequent attenuation of sound change in cross section from one area to another and directivity without the need for detailed drawings, air volumes, and approximate pressure and fan type.

3 Number of Noise Sources in a Room - For instance one extract and one supply grille would be two noise sources. This would add 10(log2) to the overall sound pressure, i.e. 3dB. Hence if one calculated NR30 independently for each noise source, without taking into account the two noise sources within the calculation, the overall result could be NR30 + 3dB, an excess. The greater the number of noise sources the worse the potential problem.

4 Sound Power to Room - Sound is measured in decibels, a logarithmic scale, and this changes in proportion to the amount of air entering a room from the total being handled by the fan.

5 Room Size (Volume) - In reality it is really the room volume that one requires. However most rooms tend to be a standard length x Width x Height, hence 'Room Size'.

6 Reverberation Time (RT) - The reverberation time can dramatically change overall sound pressure measured in a room from the same sound source. The lower the reverberation time the lower the contribution to the overall sound level, and vice versa with a higher RT. However as it is affected by the amount of total absorption in a room (the greater number of soft furnishings, i.e. chairs, curtains, carpets etc., the greater the absorption and the lower the reverberation time and hence overall sound level in the room, from a given noise source), it is often difficult to assess at design stage. Opposite is a basic guide for different applications where the RT is unknown.

7 Sound Power to Outlet - This is effectively the outlet for the sound power, which in the case of an induct silencer is often an air inlet or outlet grill, diffuser, sub duct or other termination, such as an atmospheric louvre. The principle with respect to energy loss/attenuation is the same as 4) above.

8 Distance to Listener - The distance from the sound source (for instance the grille) to the receiver, the human ear. Generally for a ceiling mounted grille with a standard room height of 2.8m – this is usually calculated as 1.0m (average human height is 1.8m). In the case of an atmospheric calculation this will change from site to site and will be dependent upon the proximity of other noise sensitive areas on the site, i.e. office or bedroom windows and/or the site legal boundary, i.e. industrial location or close to residential properties.

The above is a basic guide only with regards to the minimum of information required to carryout an induct silencer selection. Galloway Acoustics staff are on hand to carryout any selections required and advise on what other data may be needed for more complicated applications including potential ductborne noise breakout into noise sensitive areas.

If the scheme being considered is provisional and the above data is not available, Galloway Acoustics have developed a quick budget selection programme that will, without the need for detailed drawings, select a silencer based upon the application, air volume, approximate fan type and static pressure, and the specification required (NR/NC).

Please Note this system is a guide only and not a substitute for accurate calculations.

---

**TYPICAL REVERBERATION TIMES**

<table>
<thead>
<tr>
<th>Application</th>
<th>Reverberation Time (seconds) At 500 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Department Stores/Restaurants</td>
<td>0.4 - 0.5</td>
</tr>
<tr>
<td>b. Homes, Hotel Rooms, Offices</td>
<td>0.8 - 1.2</td>
</tr>
<tr>
<td>c. Libraries and Class Rooms</td>
<td>1.4 - 1.6</td>
</tr>
<tr>
<td>d. Multi Purpose Halls, Schools</td>
<td>1.6 - 2.2</td>
</tr>
<tr>
<td>e. Large Churches, Gymnasium Facilites</td>
<td>2.5 - 4.5</td>
</tr>
</tbody>
</table>

The figures given in the table above apply only at mid frequency typically 500 Hz and the following adjustments should be made for values at other frequencies. This correction is not applicable to large music rooms and studios.

<table>
<thead>
<tr>
<th>Hz</th>
<th>63</th>
<th>125</th>
<th>250</th>
<th>500</th>
<th>1000</th>
<th>2000</th>
<th>4000</th>
</tr>
</thead>
<tbody>
<tr>
<td>dB</td>
<td>1.5</td>
<td>1.3</td>
<td>1.1</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
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</tr>
</tbody>
</table>

 Value at required frequency = Tabulated value x factor below
### RECTANGULAR SILENCERS

- **A**: Silencer Configuration Type – followed by reference number
- **ASL**: Adjust Sideliners
- **EOA**: Even Out Airways
- **H**: Horizontal Splitters
- **C**: Class C Construction
- **HTC**: High Temperature Casing
- **M**: Melinex, hermetically sealed bag with silencer hygiene to match TM specification relevant to the project
- **GVW**: Glass Cloth Wrap to all faces of acoustic media
- **VB**: Vertical Bend
- **HB**: Horizontal Bend
- **TB**: "T" Section Bend
- **MSL**: Multi Section Construction in Length
- **MSW**: Multi Section Construction in Width
- **M5SW**: Multi Section Construction in Height
- **SF**: Self Flange
- **FP**: Flat Pack
- **DF**: Standard Ductmate
- **IF**: Internal Ductmate Flange
- **GF**: RSA Flanges to suit specification, hot dipped galvanised after manufacture
- **IGF**: Internal RSA Flange to suit specification, hot dipped galvanised after manufacture
- **SPG**: Spigot Connections (straight through, i.e. silencer duct size)
- **SPGS**: Spigot Connections
- **SPGC**: Capped and with Cylindrical Spiget, i.e. 50mm dia spigot and 150mm dia casing and
- **PU**: Inlet Plenum, i.e. PLO = 300mm long
- **PLO**: Outlet Plenum, i.e. PLO = 300mm long
- **PP**: Polyester Powder Coated to BS/RAL colour
- **SPF**: Other Paint finishes to be specified
- **PC**: Polypropylene Construction
- **UPVC/GRP**: UPVC/GRP construction
- **ST/ST**: Stainless Steel Construction
- **FF**: Fenland Fire Spray
- **DS**: Double Skin Construction
- **DIS**: Drop in Silencer – refer to drawing for details
- **NS**: Non standard construction – refer to drawing for details

### CYLINDRICAL SILENCER CODINGS

- **CA**: Cylindrical silencer without concentric pod
- **CPA**: Cylindrical silencer with concentric pod
- **SPG**: Cylindrical CA/CPA unit with spigot connections in lieu of nut inserts
- **S**: Spiralmate connections
- **FLG**: Circular silencer with external angle flange. Drillings to be advised
- **CAXT1**: Spigotted cylindrical cross talk silencer 50mm lining
- **CAXT2**: Spigotted cylindrical silencer 100mm lining
- **C**: DW144 Class "C" Construction
- **M**: Melinex hermetically sealed bag with silencer hygiene to match TM specification relevant to the project
- **GVW**: Glass Cloth Wrap to all faces of acoustic media
- **PLI**: Inlet Plenum, i.e. PLI = 300mm long
- **PLO**: Outlet Plenum, i.e. PLO = 300mm long
- **PP**: Polyester Powder Painted to required BS/RAL colour
- **SPF**: Other Paint finishes to be specified
- **PC**: Polypropylene Construction
- **UPVC/GRP**: UPVC/GRP construction
- **ST/ST**: Stainless Steel Construction
- **FF**: Fenland Fire Spray
- **DS**: Double Skin Construction
- **NS**: Non standard. Refer to drawings and schedule and includes all multi-section variables
**Bends** – All Galloway rectangular silencers can be manufactured as either vertical (VB), horizontal (HB) or T-section (TB) bends.

**Multi Section (MSL, MSW, MSH) and Flat Pack (FP)** Options are available where lack of lifting mechanisms and poor access on site require large silencers to be broken down into smaller component parts. Multi section silencers are split on the length, width, height or a multiple of all three to provide handable sectional sizes.

Flat pack silencers are generally broken down into individual casing and splitter sections. Both options are for site assembly by others. Please advise when issuing your enquiry/pricing request whether these options are required.

**Ductwork Terminations**

All Galloway silencers can be manufactured with a range of optional complementary ductwork components as an integral part of the silencer, e.g.,

- Inlet and Outlet plenums for silencers being situated close to an obstruction such as a louvre, filter, damper etc.

- Square to Round, straight through and stepped spigots where space is limited.

- Transformation sections and in the case of cylindrical silencers, Spiralmate quick fix and release connection flanges to facilitate easy installation and removal to and from the ductwork system.

**Painting**

The complete range of standard silencers can be painted to a high standard using Polyester Powder Paint to both the internal and external metal surfaces for both chlorination protection and aesthetic appearance requirements.

Special features such as lifting lugs for craneage, special flange connections, fully welded units for high pressure applications, dual skin silencers to reduce noise breakout into critical areas and drop in roof silencers for roof curb mounted fans etc. can all be provided by Galloway Acoustics.

For further assistance on all the options available please contact Galloway Acoustics Technical Sales Department who will be happy to assist you with your enquiry.
Optional Features

Facings: Whilst not specifically covered under DW144, Galloway Acoustics strongly recommends that all duct mounted silencers and acoustic splitters provided on modern day ventilation projects should have their acoustic media protected not only by a glass fibre scrim but also expanded or perforated metal protection. Galloway Acoustics provide this feature as standard. The photograph below shows what can happen if it is not.

Other facings available are Melinex hermetically sealed bags and full glass cloth wrap.

Full glass cloth wrap is used for ‘clean applications’ that require the mid and high frequency performance that Melinex ‘bagged’ units lose.

Fire Rated/HTC

The Galloway Group, of which Galloway Acoustics are a part, are licensees for the fire protection of ductwork using Fenland Fire Spray (FF) treatment methods.

This being the case the Galloway Acoustics range of silencers can be manufactured from the above certified alternative constructional methods to meet any specific requirement relating to BS476 Part 4 (Fire) and BS5588 Part A (Smoke).

For systems requiring the use of only a high temperature casing for non certified applications, our HTC option is available. Please note this is not a certified fire rated construction.

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The Galloway Group, of which Galloway Acoustics are a part, are licensees for the fire protection of ductwork using Fenland Fire Spray (FF) treatment methods.

This being the case the Galloway Acoustics range of silencers can be manufactured from the above certified alternative constructional methods to meet any specific requirement relating to BS476 Part 4 (Fire) and BS5588 Part A (Smoke).

For systems requiring the use of only a high temperature casing for non certified applications, our HTC option is available. Please note this is not a certified fire rated construction.

Optional Features

Facings: Whilst not specifically covered under DW144, Galloway Acoustics strongly recommends that all duct mounted silencers and acoustic splitters provided on modern day ventilation projects should have their acoustic media protected not only by a glass fibre scrim but also expanded or perforated metal protection. Galloway Acoustics provide this feature as standard. The photograph below shows what can happen if it is not.

Other facings available are Melinex hermetically sealed bags and full glass cloth wrap.

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For systems requiring the use of only a high temperature casing for non certified applications, our HTC option is available. Please note this is not a certified fire rated construction.
All GALLOWAY attenuators would have aerodynamically shaped bullnose fairings to the front and back of the splitters, 0.7mm expanded metal facing to the acoustic infill and polythene sheet blocked ends, which must be removed prior to installation of the unit.

This type of construction has been tested in accordance with HVCA specification DW144 and at a pressure of 1000N/M_, a leakage of class “B” was obtained.

The acoustic media used is ATTENUFILL, which is manufactured by the Galloway Group. This is a mineral fibre slab with a minimum installed compression rating of 5.0%. The material is inert, non combustible, non hygroscopic, vermin proof, rot proof, will not support bacterial growth and sound absorbent to BS 3638 1963 absorption coefficient with a minimum density of 45kg/m³ and faced with a glass fibre issue.

Where M has been added to the code the acoustic infill woven glass fibre mesh facing will be replaced with a Hermetically Sealed Melinex membrane bag retained behind expanded metal facing. Where advised the silencer hygiene will match the TM specification relevant to the site.

Differential Pressures up to 2000pa as above but manufactured to obtain Class “C” leakage DW144 positive pressure (please advise if this is a requirement).

GALLOWAY cylindrical attenuators are suitable as standard for internal duct pressures up to 1000N/M_, DW144 class A/B. As a non standard they can be manufactured suitable for internal duct pressures up to 2000N/M_, DW144 Class C at an extra charge (please advise when required).

CA/CPA – SPG The addition of SPG on the code denotes the use of spiral connections in preference to the internal flanges and nut inserts.

CA/CPA – SPC – For quick installation and release application the code S after SPG denotes the use of SPIRALMATE connections for which compatible mating flanges will be supplied.

CART 1 & 2 SILencers – The units are manufactured as with spiral connections each end to fit into most standard ISO duct systems. Their main purpose is to provide high levels of cross talk privacy between adjacent rooms served by a common ductwork system, whilst producing a negligible additional pressure loss on that system.

Matching Flanges – As with rectangular, available at additional cost.

**Galloway Acoustics Cylindrical Silencer Constructional Specification**

Dependent upon quantity and specification, cylindrical attenuators will be constructed from pre-galvanised sheet steel either as an overlapped longitudinal seam or spiral wound with all casings and leakage being to a minimum of DW144.

End flanges would be internal and manufactured from lock-formed rolled steel. In all cases the flanges have nut inserts to our standard drilling dimensions. These can be altered as required to ensure compatibility with other components on site.

The acoustic media used is ATTENUFILL specification as described under rectangular silencers.

All podded Galloway Cylindrical silencers have flat entry and exit with 0.7mm expanded metal facing to the acoustic infill and polythene blocked ends, which must be removed prior to installation of the unit. The acoustic media is further protected by the use of expanded pre-galvanised sheet steel as standard.

Melinex membrane – specification as described under rectangular silencers.

When units are manufactured in sectional lengths these are connected together using SPIRALMATE manufactured by Ductmate (Europe) Limited.

GALLOWAY cylindrical attenuators are suitable as standard for internal duct pressures up to 1000N/M_, DW144 class A/B. As a non standard they can be manufactured suitable for internal duct pressures up to 2000N/M_, DW144 Class C at an extra charge (please advise when required).
Crosstalk Silencers

As previously mentioned, Crosstalk Silencers take the form of a standard rectangular duct mounted unit (with or without flanges), or a standard cylindrical unit, usually a CAXT1 or CAXT2, see sketches on pages 14 and 15.

However, within the range of Crosstalk units the following have been specifically designed for true-to-room Crosstalk application where little or no duct is required.

One such scenario is air transfer between adjoining rooms.

The following sketches show the standard types available and as with all our other silencers separate data sheets that show the acoustic performance of the units are available.

Galloway Acoustics standard rectangular and cylindrical plastic silencers are generally manufactured from pre-galvanised sheet steel in accordance with DW144 (or the latest HVCA ductwork standard at that time) and as per the construction specification shown below.

Other material options include:
- Stainless Steel to 304/316 (or any other Galloway approved grade). Generally stainless steel silencers are manufactured to the same casing thicknesses as their pre-galvanised sheet counterparts, unless otherwise advised.
- Plastic – Polypropylene and UPVC/GRP generally in accordance with DW155 and as Galloway Acoustics data sheets, PGB 2.5 Sheet 1 and 2, available upon request.

Galloway Acoustics standard rectangular and cylindrical plastic silencers are generally manufactured from pre-galvanised sheet steel in accordance with DW144 (or the latest HVCA ductwork standard at that time) and as per the construction specification shown below.

Other material options include:
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- Plastic – Polypropylene and UPVC/GRP generally in accordance with DW155 and as Galloway Acoustics data sheets, PGB 2.5 Sheet 1 and 2, available upon request.

**Plastic Silencer**

**Galloway Acoustics Rectangular Silencer Constructional Specification**

These would be constructed with pre-galvanised sheet steel casings with mastic filled Grooved Seam longitudinal joints, and would generally be manufactured with casing thicknesses in accordance with DW144.

The material to be used is “Prime galvanised mild steel to BS EN 10142 1991 DX51D+Z Z275 quality, lock forming and working up quality, normal spangle finish [N], Coating type C”.

Flanges would be knock on type Ductmate and would generally be fabricated from pre-galvanised sheet as follows:

<table>
<thead>
<tr>
<th>DW144</th>
<th>End Flanges</th>
<th>DW144 Class C</th>
<th>End Flanges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ductmate 25/20</td>
<td>Up to 800</td>
<td>Ductmate 25/20</td>
<td>Up to 600</td>
</tr>
<tr>
<td>Ductmate 35/3, 30/3</td>
<td>801 to 1250</td>
<td>Ductmate 35/3, 30/3</td>
<td>601 to 1000</td>
</tr>
<tr>
<td>Ductmate 45</td>
<td>1251 to 1600</td>
<td>Ductmate 45, 30/4</td>
<td>1001 to 1250</td>
</tr>
<tr>
<td>Ductmate 45</td>
<td>1601 to 3000</td>
<td>Ductmate 45</td>
<td>1251 to 2500</td>
</tr>
</tbody>
</table>

Ductmate 25 and 35 are standard, however where specifically requested Ductmate 20 and 30mm can be substituted and again sized in accordance with DW144 and the chart above.

Due to the splitter casings being riveted to the main attenuator case creating an inherently stiff component, intermediate stiffeners are only used on attenuator lengths over 1800mm as required.

Where RSA flanges are specifically requested or the width or height of the silencer exceed DW144 classifications the flanges would be in accordance with Galloway Acoustics’ drawing 01-SK6 1 of 2.

Arranged within the casing would be attenuating splitter sections manufactured from a minimum of 0.8mm sheet steel, fixed to the casing with rivets at 250mm centres (one row for sideiners and two rows for splitters).
Normally Galloway Acoustics silencers are provided on a supply only basis, to be installed by the ductwork contractor. However, where required, a professional and skilled installation service is offered by Galloway Acoustics. This is backed by a comprehensive Public and Employers’ Liability Insurance and working practices compliant with all relevant and current COSHH and Health at Work Safety Standards. Specific method statements are provided for each project undertaken by Galloway Acoustics. All contracts both supply only and those involving an element of installation are project managed by an experienced engineer who will coordinate the design for approval, manufacture, dispatch (and on site) installation programme. Upon completion of silencer deliveries, O and M guidelines can be provided upon request.

Other Products
In addition to silencers, Galloway Acoustics full range of products and services comprises:

• ACOUSTIC AND NON ACOUSTIC LOUVRES
• SPECIALISED ACOUSTIC DUCTING COMPONENTS
• METAL ACOUSTIC AND FIRE RATED DOORSETS
• ACOUSTIC ENCLOSURES AND SCREENS
• ACOUSTIC MATERIALS
• VIBRATION ISOLATORS
• INERTIA BASES
• FLOATING FLOORS
• INSTALLATION SERVICES
• ACOUSTIC CONSULTANCY
• CUSTOM DESIGNED PRODUCTS

Silencers or attenuators, whichever term you prefer, are basically a system to allow the passage of airflow while at the same time providing an acoustic loss or reduction to the passage of sound or noise.

The products themselves tend to be manufactured from basic materials and well-recognised sheet metal construction processes and designs. The real science is in the products known and thus measured performance, coupled with accurate and professional acoustic design calculations and product selection.

Hence Galloway Acoustics decided to test its range of silencers not only to both BS 4718: 1971 and ISO 7235: 1996, but also to UKAS (United Kingdom Accreditation Service) standards. Some would say why go to the trouble of seeking UKAS accreditation on testing. Basically UKAS can only be achieved via an independent test laboratory and gives an additional level of credibility to the data being obtained at the end of the test programme.

This is accomplished by rigorous checks carried out on the laboratory test facilities in which the margin of difference between a number of repeated test results, on the same product test sample, must be so small that complete confidence can be gained in the knowledge that the same tests on a similar product can be compared on a ‘like for like’ basis, without fear of relevant inaccuracies in the test rig design, other than those normal for the test procedure in question.

In 1999 no acoustic test laboratory in the UK had a UKAS accredited silencer test rig to the above standards. Very few had a fully compliant BS4718 test rig with a reversible fan to allow measurement of both inlet and outlet regenerated flow noise, and even fewer could test to the new ISO 7235 Standard. Thus Galloway Acoustics in conjunction with Salford University, embarked upon a programme of designing, manufacturing and installing a fully compliant test rig to BS4718 and ISO 7235, and gain UKAS accreditation.

The test programme commenced in March 2000, and after many months of hard work, was fully completed by August 2001, making Galloway Acoustics, to our knowledge, the only UK company to have tested silencers to both of the existing standards and on a UKAS accredited test rig, the first of its kind in the UK.

In conjunction with these tests a range of software calculation spreadsheets based on Excel Macro programmes were developed in-house and these are the basis for our design selections.

A comprehensive silencer selection programme has been designed and this is available shortly on CD-ROM for use by designers needing to select in-duct rectangular or cylindrical silencers.