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Chiltern Acoustics Ltd have over 30 years of experience in the reduction of industrial noise. We specialise in the design, fabrication and installation of noise control equipment for engineering, construction, process and petro-chemical industries.

Chiltern Acoustics has broad based experience in designing and developing noise attenuation schemes to meet the requirements of both current and proposed legislation. This extensive experience is available to industry either as part of an overall noise control project, or as a separate consultancy service.

We have an extensive range of adaptable products which allow the economic advantages of standard products to be combined with the effectiveness of custom made designs to provide the best solution to any noise problem at the lowest cost.

Chiltern Acoustics range of products includes:

Sound Insulated Enclosures and Doors
High Pressure Vent and Line Silencers
Reciprocating Compressor Inlet Filter silencers
Pulsation Dampeners
Roots Blower Intake and Discharge Silencers
Ventilation System Attenuators
Acoustic Louvres

We have successfully completed noise control contracts for many well known industrial organisations including:

Biwater Treatment Ltd
Dresser Roots Ltd
Howden Donkin Blowers Ltd
Mowlem Water
VA Tech Wabag Ltd
Thames Water Technologies
Miller Civil Engineering
Birse Construction
British Nuclear Fuels Ltd
IMI Bailey Birkett
Qatar Petroleum
Shell Exploration & Production
Foster Wheeler
BP Chemicals
Esso Research
M.W.Kellogg
Air Products Ltd

Acoustic Enclosures

Specification:

Enclosures are all steel constructions available in a range of panel thicknesses dependant on the attenuation required.

The standard panel thicknesses available are 50mm, 75mm,100mm. In addition to variations in panel thickness, the acoustic pack density will also be varied to enhance the performance.

All panels have a plain steel outer surface and a perforated steel inner surface retaining a high sound absorption mineral fibre acoustic pack..

Finish:

Enclosures can be manufactured from pre galvanised steel sheet and left in their natural state, plastic powder coated externally or finished to a clients own painting requirements.

Construction:

Depending on the size and degree of accessibility required, enclosures can be manufactured with a simple framework allowing some or all panels to be hinged or removed if required (typically used for blower and compressor applications) or for larger enclosures a series of panels joined by H section joiners can be used to construct larger rooms not needing the degree of side access required by a close fitting enclosure.

Ventilation:

Silenced ventilation will be supplied on all enclosures designed to remove heat generated by enclosed machinery or to provide a pleasant working environment for personnel working inside the enclosure.

Ventilation will generally be provided by forced draft fans and will be based on an internal temperature rise of no more than 10^0C above the ambient temperature unless otherwise requested.

Roots Blower Silencers

Design:

Silencers designed for use on roots and other positive displacement blowers and compressors use reactive silencing technology to reduce the noise produced by the machine to a minimum. The advantage of this approach is that reactive designs do not use any form of sound absorption material giving the silencers a much longer life and removing any possibility of contamination of product or machinery downstream of the compressor.

This allows effective silencers to be installed in food applications, pharmaceuticals, air handling systems, chemical plants and even water treatment where clogging of downstream diffusers is a problem with conventional silencers.

Specification:

All silencers are manufactured from a minimum thickness of 5mm carbon steel internally and externally. Silencers can also be manufactured from stainless steels, aluminium or nickel based alloys such as Hasteloy for very corrosive applications.

Flanges can be British Standard, ANSI, DIN or to any customer preference.

For high pressure applications the external shells can be designed to conform to British Standards or ASME pressure vessel codes.

Inlet Filtration:

For atmospheric intake silencers the standard inlet filter will be to EU4 standard.

Sizing Information Required:

Nature of machine, i.e., roots blower, reciprocating compressor, vane pump, etc.
Flowrate
Operating temperature
Operating pressure
Machine speed
Number of lobes, vanes, cylinders per stage, etc. (to establish number of pulses per revolution)
Nature of gas (air, steam, other - molecular weight & Cp/Cv value)

Roots Blower Silencers (contd.)

Chiltern Acoustics Ltd reactive silencers fitted to a Dresser 1431 DVJ exhauster

Gas Vent & Pressure Reduction Silencers (contd.)

A selection of gas vent silencers showing the smaller range silencers. The unit at the bottom photographed before final assembly shows multiple inlets where a single silencer is being used to reduce noise from different valves. The absorption section for this unit is a 7 seven tube section.

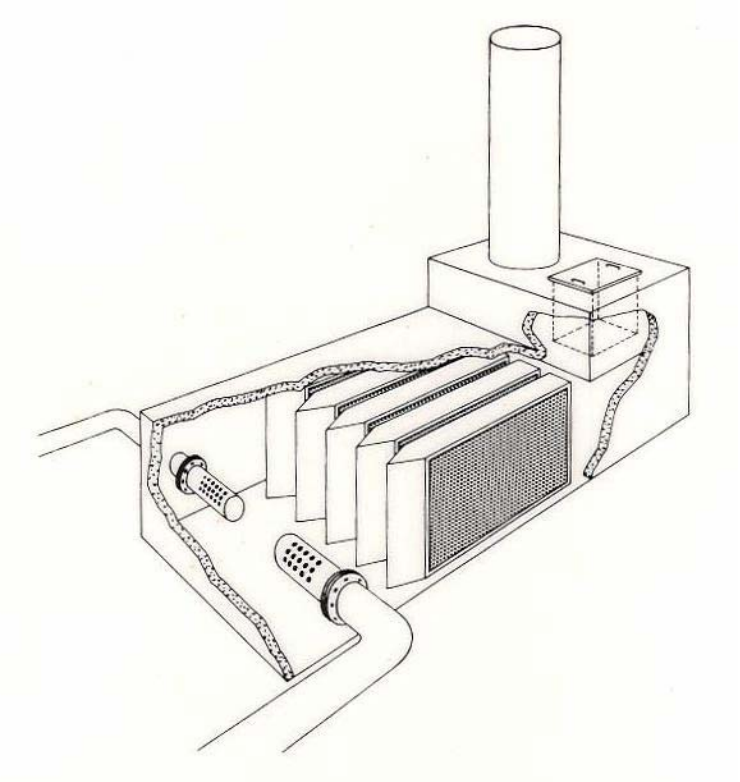
A larger vent silencer design to stand vertically on the ground with a side inlet- 19 tube absorption section.

High Volume/ High Performance Vent Silencers

Design

Conventional vent silencers are limited in overall sound attenuation to approximately 50dB as they are subject to noise break out from the lower shell areas and also due to flanking sound transmission (sound running along the length of the shell bypassing the flow tubes). There are also practical limitations on size where very large flows are generated.

To over come this, Chiltern Acoustics can offer a different approach to the silencer standard silencer design. The same methods of silencing are used, i.e., diffusion, expansion and then sound absorption but these elements are contained in a concrete shell buried beneath the ground.



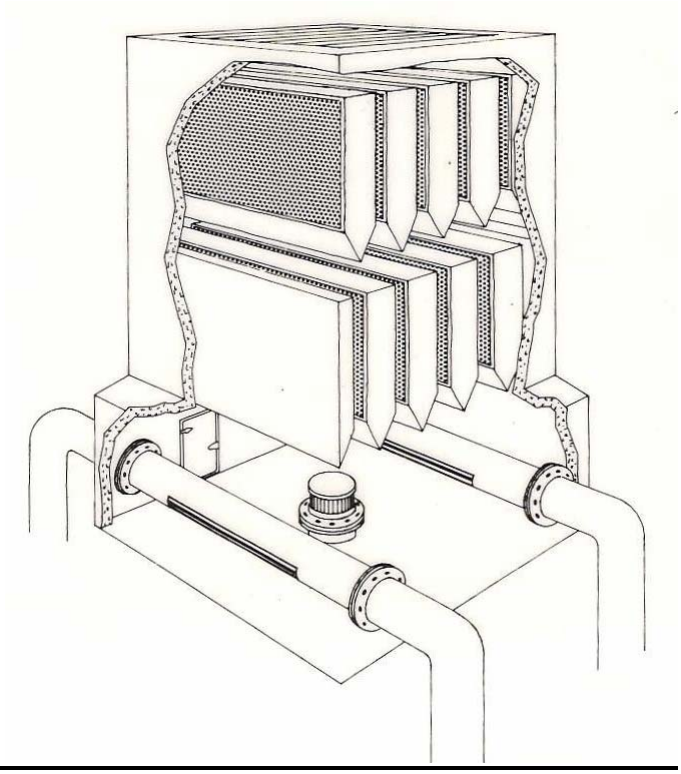
This approach removes completely the problems of noise break out and also reduces flanking losses considerably. Also, as the supply lines are also below ground there is no noise radiation form these.

This design is suited sites where there are a number of pressure releases in a local area, e.g., cryogenic air separation plants. It is possible to pipe the discharges from a number of vent valves underground to a single central underground vent silencer to be vented to atmosphere.

High Volume/ High Performance Vent Silencers(contd.)

Design (contd.)

This design can also be used in a vertical form as shown generally in the sketch below.



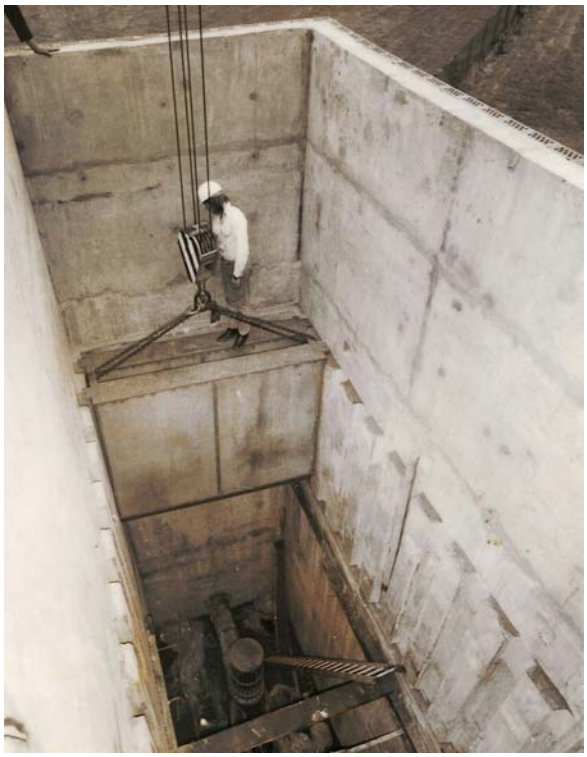
Supply

Chiltern Acoustics supply is limited to the internal parts only, i.e. inlet diffusers and flow splitters.

In addition, drawings will be supplied detailing the minimum concrete thicknesses to achieve the acoustic characteristics and also the minimum depth below ground. Required.

Design for structural integrity is not included in the package.

High Volume/ High Performance Vent Silencers(contd.)



The above photograph shows a silencer under construction designed to vent 620,000 Nm3/hr of natural gas to atmosphere from 76 bar.

This silencer was designed as an emergency vent outlet and also to depressurise the pipe system during maintenance periods.

The inlet diffusers were designed to absorb the impact from any high velocity hydrate crystals that may have formed in the pipe lines which originated from offshore gas production platforms in the North Sea.

The diffusers also expanded the gas and evenly distributed it across the expansion chamber before eventual discharge through a multi bank of sound absorbent splitters to atmosphere.

In this case, the top 5 metres of silencer was above ground with just the lower expansion chamber and diffusers below ground.