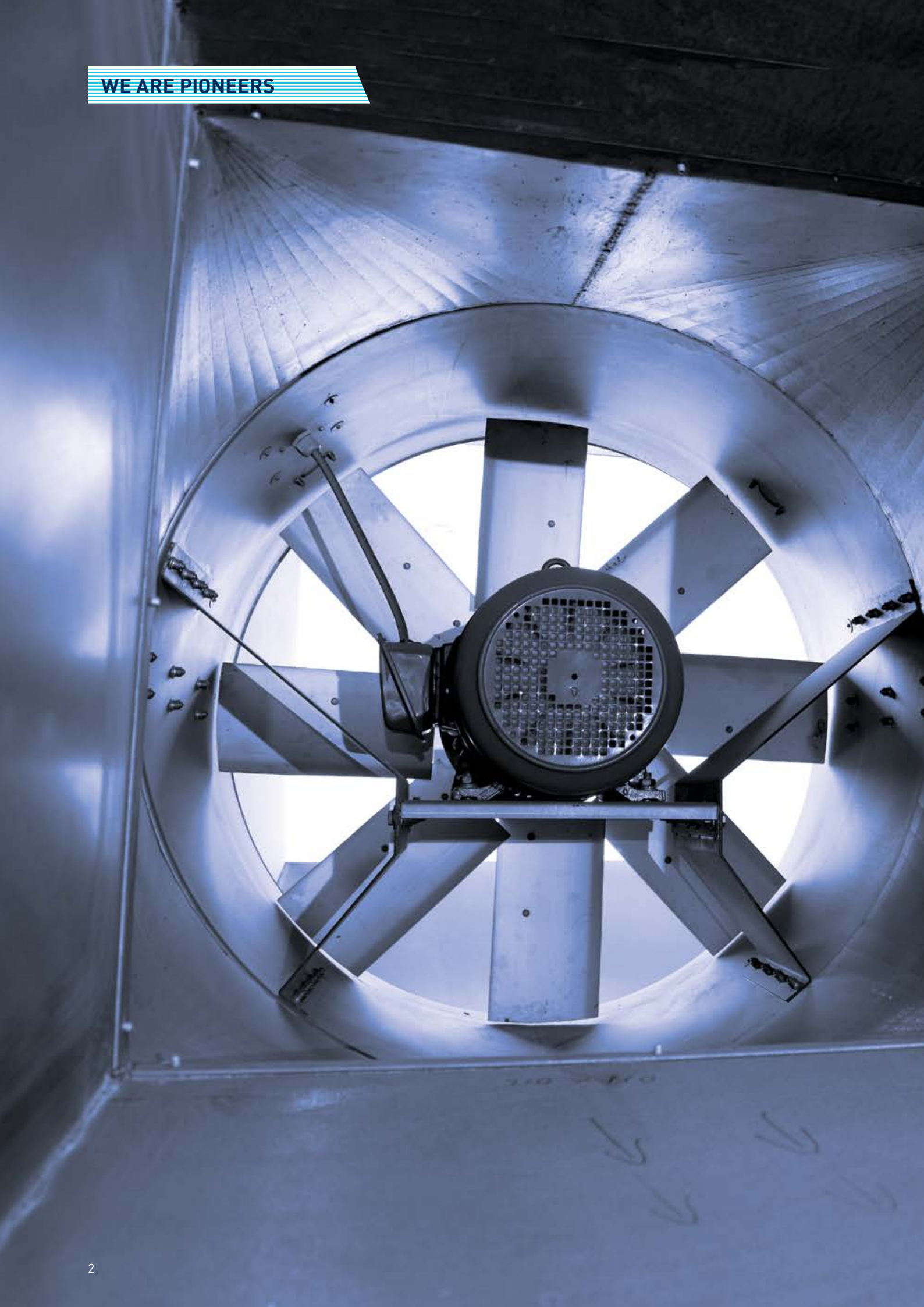





**Towards a quieter
environment**

WE ARE PIONEERS






Established in 1996, VTR is a leading provider of turnkey industrial noise and vibration control solutions in Malaysia and the surrounding region.

A component of the KSM Group, we manufacture the Phoenix range of products for noise and vibration control applications.

We have also built the first testing laboratory for air distribution system silencers in Malaysia to ensure strict control. In 2000, we became the first local noise control plant to achieve ISO certification, a global standard for quality management systems.

The first local manufacturer of top quality blowdown silencers in Malaysia, VTR's strength as a turnkey specialist lies in providing customised technical solutions.



We supply protection and control devices to the marine, oil and gas, gas production, power generation and industrial markets locally and regionally. Some of the clients we have worked with include Howden, Petronas, and many other established names.

As a pioneer in Malaysia's industrial noise and vibration control industry, we are constantly rethinking efficient and innovative ways to work towards a quieter environment.

VTR has achieved many firsts over the years, but we are careful to not rest on our laurels. Instead, we are always looking forward towards doing things better.

In line with this pursuit, we are in the midst of a two-year plan to establish an internal policy for the Health, Safety and Environment (HSE) system in our facilities.

This is a commitment to improve the health and safety of our workers and their environment by cutting down injury time and improving productivity. Initiated in 2014, we plan to have our HSE policy fully implemented and audited by 2017.

VTR was the first local noise control plant to receive ISO 9001 certification.



Among VTR's testing facilities include the first and only custom-made laboratory for testing air distribution system silencers.

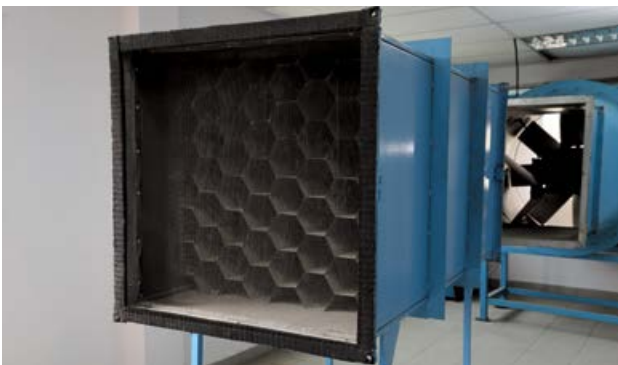
Built in accordance to ISO 7235 (BS4718:1971), "Acoustics – Laboratory measurement procedures for ducted silencers and air-terminal units", the testing facility measures at 11m. Located within our manufacturing plant, it has been operational since 1995.

Having a bespoke testing laboratory ensures the quality of our in-house Phoenix noise control products. It also allows product demonstration for clients who wish to review the performance of our silencers. The testing laboratory operates in three ways:

- \ Measuring the insertion loss of the silencers when a noise source passes through.
- \ Measuring the airflow when air (driven by a variable speed fan 1m in diameter) is flowing through the silencers.
- \ Measuring the pressure drop across the silencers.

The acoustic instrumentations available for the testing lab are:

- \ 01dB Symphonie Dual Channel Real-time Analyser
- \ 01dB Solo Type 1 Sound Level Meter
- \ 01dB PRE12N Preamplifier and MCP211/212 Microphone capsule
- \ 01dB CAL01 Sound Level Calibrator
- \ 12" Behringer high-powered amplifier/speaker
- \ Anemometer
- \ Manometer



Volume flow measurement (Laboratory based on ISO 7235)



Testing (Testing Duct based on ISO 7235)



Auxiliary fan for volume measurement purpose
(Test laboratory for ISO 7235)



Silencer (attenuator) test assembly

MANUFACTURING CAPABILITIES

Being the manufacturing arm of KSM Group, VTR has a host of capabilities, which include the following assets and services:

- | | | |
|--|------------------------------|------------------------------------|
| \ Site installation | \ Document management system | \ Acoustic modelling and design |
| \ Offshore installation | \ ISO certification | \ Computation Fluid Dynamics (CFD) |
| \ Materials: Carbon steel
/ Stainless steel SS304, SS316L
/ Galvanised steel | \ ND test reports | \ Finite Element Analysis (FEA) |
| \ Qualified welders with welding procedure reports | \ Finishing options | \ Structure and Thermal Analysis |
| \ Skilled labour | \ Coating options | \ Wind Load and Seismic Analysis |
| \ Export packaging | \ Project Management | \ Custom packaging |
| | \ Noise Survey | |

ENGINEERING SOFTWARE

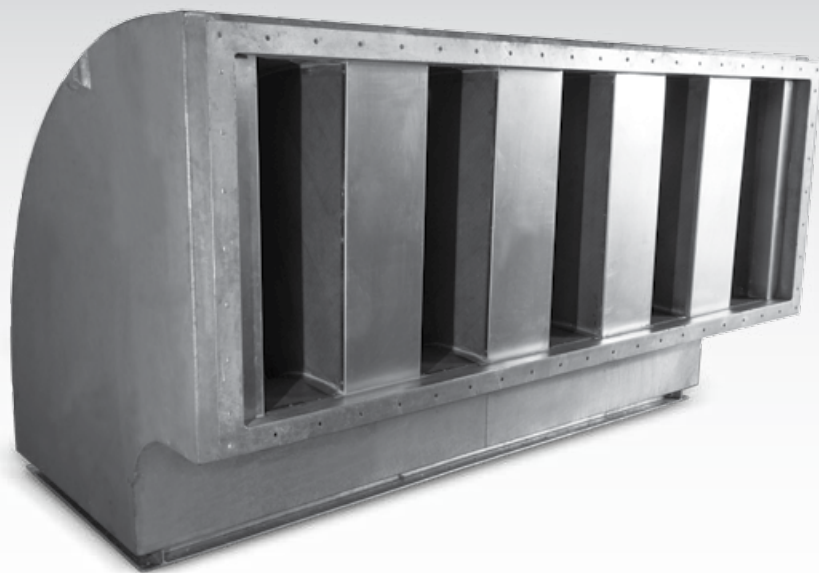
We have developed our proprietary software in noise control and vibration control based on Microsoft .NET Framework Software Development Kit (SDK). Improving efficiency in servicing our clientele, the software is a result of detailed engineering calculations and numerous noise simulation tests performed in our testing laboratory and work site.

Furthermore, we also employ CadnaA, Odeon and SolidWorks to complement more complex simulations including noise, fluid, wind load and statics analysis, thus providing our clientele a total solution.

PRODUCT RANGE & FACILITIES

The following is a list of Phoenix noise control equipment (in-house designed and manufactured) and acoustic test rooms.

- \ Phoenix Splitter Silencers
- \ Phoenix Circular Silencers
- \ Phoenix Exhaust Silencers
- \ Phoenix Vent & Blowdown Silencers
- \ Phoenix Acoustic Enclosure (Panels & Doors)
- \ Phoenix Acoustic Genset Canopy
- \ Acoustic Test Rooms (Anechoic & Semi-Anechoic Chambers; Reverberation Chambers)



Phoenix BY KSM Splitter Silencers

Used mainly in fans, gas turbines (in power plants), compressors, and steam generators, the Phoenix range of splitter silencers are selected after an extensive computer analysis of application criteria.

The Phoenix Splitter Silencers have been tested at the **National University of Singapore** in accordance with the ASTM Standard E477-84 (Standard Method of Testing Duct Linear Materials and Prefabricated Silencers for Acoustical and Airflow Performance)

SIRIM, Malaysia
in accordance to BS4719:1971-clause 2.3
(Test Report No: 92M075)



Phoenix BY KSM Exhaust Silencers

Used mostly in power systems, Phoenix Exhaust Silencers have a highly efficient silencing performance. All Phoenix Exhaust Silencers are constructed from heavy-gauge hot rolled cold quenched sheet steel with welded construction, which lengthens the life span of the silencers, and is finished with a layer of high quality, heat-resistant aluminium paint.

Phoenix Exhaust Silencers are available in Four different models.

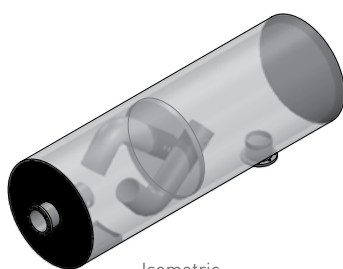
Multi-Chamber Reactive Type

Model: EXP-S (side entry) & EXP-E (end entry)

Also known as the primary silencer, these silencers provide good attenuation at mid and low frequencies. They are available with side entry (EXP-S) and end entry (EXP-E). Overall attenuation is approximately 30 dB.



Side



Isometric

Straight Through (Absorptive type)

Model: EXS-E

These secondary silencers are connected in series with the primary silencers, providing good attenuation over a broad range of frequencies due to the presence of high temperature sound absorbing material lining the internal side of the silencer. Only available with end entry. Overall attenuation is approximately 20 dB.

Supercritical Type

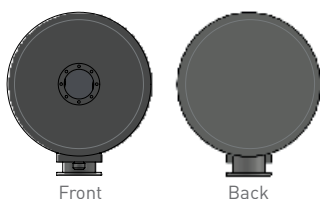
Model: EXC-S (side entry) & EXC-E (end entry)

A compact combination of a primary multi-chamber reactive and a secondary straight-through absorptive type silencer. Normally used where space is a constraint and where the noise criteria is not too stringent. The overall performance of the silencer is approximately 35 dB.

Spark Arrestor

An exhaust silencer should be equipped with a spark arrestor especially at an environment where noise and fire hazard is critical, such as at marine and offshore installations.

The spark arrestor works by containing sparks or flammable debris from exiting the exhaust silencer, thus preventing them from igniting an explosion. Spark arrestors can be easily accessed for maintenance through the carbon trap valve found at the bottom of the exhaust silencer.



Front

Back



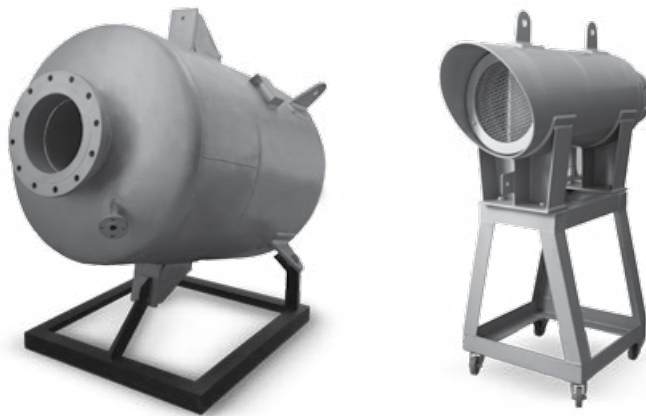
Phoenix BY KSM Circular Silencers

Used mainly in ventilation in marine conditions and in fans, our Phoenix Circular Silencers are available in a wide range of diameters and lengths and are normally supplied with flange ends with threaded holes for direct attachment to most axial flow fans and blowers currently in the market. It can also be directly connected to the air-conditioning and ventilation ductwork.

Individually designed silencers are also available to meet specialised requirements. These are designed for both 'on fan' and 'on duct' applications. Phoenix Circular Silencers are available in two different models:

- GS - without centre Pod
- GSP - with centre Pod

Each model comes in two different lengths of 1D (1 x diameter) and 2D (2 x diameter).



Phoenix BY KSM Vent & Blowdown Silencers

The Phoenix Vent & Blowdown Silencers are designed to operate safely in high-pressure, high-temperature conditions such as those found in oil and gas processing plants, power plants, chemical plants and industrial processing plants.

Designed to minimise hazardous and offensive noise generated from the expansion process of highly-compressed steam, vapour or gases; the silencers are installed at the safety and control valves, where these compressed steam, vapour or gases are released into connecting pipes or the atmosphere.

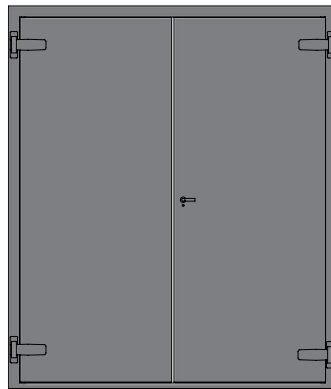
The recommended installation point of a Phoenix Blowdown Silencer is either on the rooftop or at an open area outdoors. It has the flexibility to be installed vertically or horizontally, depending on site conditions and requirements. Additional coating system is applied to protect against corrosion and to prolong the product lifespan.



Phoenix BY KSM Acoustic Enclosure

Phoenix Acoustic Enclosures offers a simple solution to noise problems in industrial environments. These enclosures are made up of standard acoustic panels in a range of thickness and specially designed flush-panelled steel doors that provide high sound insulation performance.

The enclosures can be designed and fabricated to customised specifications according to a specific client's needs, such as natural ventilation, forced ventilation, weather exposure or complicated site conditions.



Phoenix BY KSM Acoustic Door

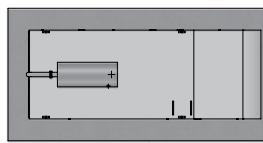
Phoenix Acoustic Doors are specially designed, flush panelled steel doors that provide high performance sound insulation.

The door leaves and frames are constructed out of rigid, heavy gauge steel sheets and filled with heavy acoustic fillings. Fitted with heavy duty hinges, the doors swing easily despite their weight. Stainless steel sill is provided for installation at floor-level to protect against corrosion and wear. The sill design enables easy on-site installation and also allows for easy grouting of concrete to form a more solid foundation.

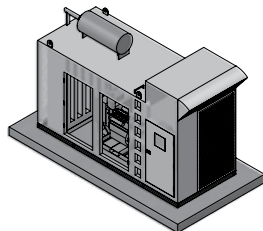
Phoenix Acoustic Doors are extensively used to separate between quiet and noisy areas, such as:

- Generator rooms, air-conditioning plant rooms, compressor and boiler houses, pumping stations, and electrical substations;
- Broadcasting booths, control rooms, conference rooms, and recording studios;
- Anechoic and semi-anechoic rooms, and reverberation rooms.

Each door comes with a layer of high quality zinc chromate primer paint. Our engineers will provide full service – from initial survey, planning, acoustic calculation, and metal fabrication – up to final installation.



Top

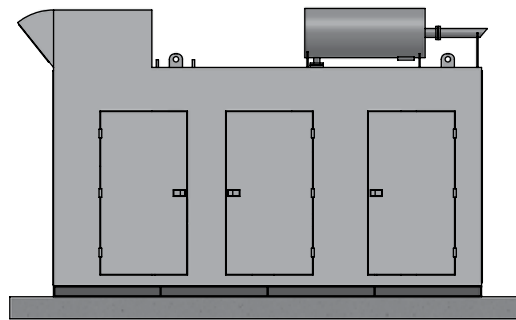


Isometric

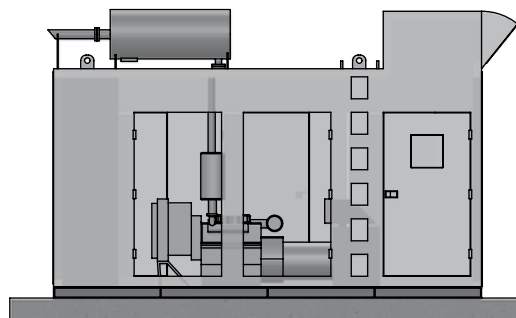


Front

Back



Right



Left

Phoenix BY KSM Acoustic Canopy

Designed to control and reduce noise emitted by generator sets, the Phoenix Acoustic canopy specifically targets the power generation industry. A canopy consists of a Phoenix Acoustic Enclosure, skid base, intake and discharge silencers, and Exhaust Silencer equipped with Spark Arrestor.

The canopy skid base can be designed to include a fuel tank and lifting system for the ease of mobilisation.

We also have the capability to fulfil canopy design based on BS EN 12079 for ingress protection criteria and lifting.

Phoenix BY KSM Acoustic Test Rooms

An acoustic room is an enclosure intended for a specific purpose in relation to the measurement of sound, or for the isolation of the interior from external sound sources.

There are three kinds of rooms used for measurement purposes as follows:

Anechoic Room

For true free field measurement.

Semi-Anechoic Room

For free field over a reflective ground surface for equipment testing.

Reverberation Room

Good general standard for indoor measurement with hard (reflective) walls, floor, and ceiling.

SMART Tunnel



SITUATION

The SMART Tunnel is an efficient storm drainage and congestion management system. However, its structure also magnified noise, causing a disturbance to residential and commercial areas nearby.

SOLUTION

Noise control splitter is designed based on a strict requirements. We then conducted exhaustive laboratory noise tests witnessed by the client, including performance tests in submerged environment. After meeting all criteria, we began to design and construct all the needed equipment.

OUTCOME

With aerodynamics efficiency and noise reduction, the splitters have effectively dampened the noise in the tunnel. This durable solution also serves to keep costs low and is able to withstand critical environment in high humid conditions.



Talin Power Plant (Taiwan)

SITUATION

Power plants typically use equipment such as fans, pumps, and compressors, among others, that generate high levels of noise. With this in mind, we were commissioned to build four noise silencers for the Talin Power Plant in Taiwan.

SOLUTION

Before we began building them, the silencers were tested for efficacy at our testing lab. Once we have verified the performance of the silencers, we began the process of manufacturing, in strict accordance to QC requirements.

OUTCOME

Noise was successfully reduced to the desired level.



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