Industrial Acoustic Sound Enclosures

**FanAir Company** designs and builds Acoustic Sound Enclosures Engineered to each specific application to control noise radiating from Blowers, Fans, Pumps, Compressors, Generators and any type of noise producing type of machine.

**Fiberglass Acoustic Enclosures**
Furnished with split housing, cut-out for intake and discharge duct, ventilation fan, intake louver, base flange, optional zerk fitting, quick release latches and access doors when required.

**Steel Acoustic Sound Enclosures**
Heavy gage welded steel construction. Unit pictured with optional lifting eyes. We can furnish structural steel skids to support both the blower or compressor and rubber or spring isolators to further mitigate noise and vibration.

FanAir Company
Ph (714) 744-6444
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Construction options:

- **Fiberglass FRP Acoustic Sound Enclosures** Sample Specs 100% Chemical resistant for severe process plant installations such as Water Treatment Plants, Chemical Plants, Wet Process areas and Marine Duty service.

- **Galvanized Steel Acoustic Sound Enclosures** Moderate chemical resistance, suitable for outdoor use for general purpose noise control applications, most economical.

- **Stainless Steel Acoustic Sound Enclosures** Extra heavy duty double wall design for any noise application requiring 'military' strength and chemical and corrosion resistant properties.
Installation examples:

FanAir Co. 10 Ft x 10 Ft x 12 FT Fiberglass Acoustic Sound Enclosure Installed at Anacortes, Washington Waste Water Treatment Plant.

FanAir Co. 6 Ft x 6 Ft x 5 FT Fiberglass Acoustic Sound Enclosure designed and built for a Fiberglass Odor Control Blower for a Biofilter Located in Orange, County, Ca.
FanAir Co. Fiberglass Acoustic Sound Enclosures furnished with Split and Access Door for Odor Control “BioFilter” Blowers for Waste Water Treatment Plant.

FanAir Co. Fiberglass Acoustic Sound Enclosure with Pitched Roof and Double Access Doors
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Construction examples:

FanAir Co. 12 Ft x 12 Ft x 12 FT Fiberglass Acoustic Sound Enclosure Constructed for a 49" Dia FRP Centrifugal Blower for a H2S Fume Scrubber. (Blanking Panels Removed)

FanAir Co. Steel Acoustic Sound Enclosure being lifted over a Large Air Compressor for a Hydro pneumatic Facility in Pasadena, CA
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Accessories - Options:

• Polypropylene, Spark Resistant Explosion Proof Supply or Exhaust Ventilators for Enclosure Ventilating

• Control Panels w/ Thermostats for Cooling available in NEMA 4X, NEMA 3R, NEMA 12.

• Acoustic Louvers, Shutters and Back Draft Dampers

• Interior Lights, Sealed and/or Explosion Proof.

Also: Air Conditioners, Heaters, Lexan Windows, Access Doors, Special Colors.
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**Design, Testing, Engineering:**

FanAir Company Designs and builds each Acoustic Sound Enclosure specific to the type of equipment to be silenced with considerations made for the installation, inlet and discharge ducting or piping, required noise reduction, ventilation rate and structural reinforcement requirements.

With each enclosure FanAir Company builds we provide a set of certified “To Scale” AutoCAD drawings, Heat Transfer Calculations and Insertion Loss Calculations.
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Sample Specifications

Fiberglass Sound Enclosure Sample Specifications

GENERAL 1.0

Contractor shall furnish and install 1 each, Fiberglass Reinforced Plastic Sound Enclosure for each blower as listed on equipment schedule, as remarked to require sound attenuation package. Sound enclosures shall be as manufactured only by companies with a minimum of 5 years manufacturing experience of noise control equipment for fans, blowers, pumps and or compressors. Sound enclosure manufacturer shall guarantee a minimum of -15 dB"A" at 3 Feet insertion loss from noise producing equipment to be enclosed. Sound enclosure manufacturer shall obtain from the blower equipment manufacturer listed on schedule, the sound level ratings based on AMCA test standard 300, the housing radiated noise level and the inlet and discharge noise level ratings. Sound enclosure manufacturer shall coordinate with the equipment manufacturer listed on schedule requirements for cooling, temperature rise and special provisions for Inlet ducting, discharge ducting, appurtenances such as dampers, Flexible duct connections, inlet or discharge silencers, intake filters, vibration isolators, motors, drives and guards, electrical connections, electrical safety disconnect switches. The sound enclosure manufacturer shall also make special provisions to allow access to serviceable items such as bearings, lubrication, seals, dampers, belts, motors and access doors. Sound enclosure manufacturer will provide and place a 10" x 14" warning sign, on each access door, indicating equipment is to be shut down and locked out prior to entry.

PRODUCT 2.0

The sound enclosure shall be a rigid complete enclosure using Fiberglass Reinforced Plastic and shall be lined with acoustical materials as listed below. Sound adsorbing materials shall be a minimum of 1/2" thick, .5 Lb/Sq.Ft. loaded vinyl barrier acoustic insulating foam, with a vinyl facing. Acoustic Insulation shall have a NRC rating of .48 and an STC rating of 31. Acoustic lining shall be capable of being steam cleaned and shall be chemical resistant. Exterior fiberglass structure shall have a Class I E 84 flame spread rating of 25 or less. The sound enclosure shall be vertically split in such a manner to allow one half of the enclosure of the enclosure to be removed without disturbing the intake or discharge duct connections. The 2 sections of the enclosure shall be joined by use of quick release latches. The sound enclosure shall be provided with factory pre-cut penetrations to facilitate intake and discharge ductwork or pipe. The pre-cut penetrations shall be 2 Inches overall larger than the duct or pipe diameter. Additional filler strips shall be provided with insulation to close within 1/4" of the ductwork. The sound enclosures shall be provided with 1 Each, spun aluminum AMCA Type B, roof mounted exhaust fan furnished with roof curb. The exhaust fan shall be selected to provide no less than 30 air changes per hour or 1 air change every 2 minutes. The exhaust fan shall have a 1-60-115V, ( TENV or Explosion Proof Motor ) and be factory pre-wired to an external junction box. All electrical connections shall be UL rated for Class I, Division I, Group D. Sound enclosure shall be fitted with an acoustical intake louver, located at low point of side wall of enclosure, furthest point away from exhaust fan. Louver shall be provided with insect screen and be sized for a minimum transmission noise loss and pressure drop. Sound enclosure shall be provided with one or more of the following: 24" x 24" bolted or hinged inspection door, inspection window, constructed in Lexan or similar material, locking hinged access door minimum of 24" H x 30" Wide. Sound enclosure manufacturer shall provide certified drawings, sound test data showing transmission loss, Installation, operation and maintenance instructions and a 2 year warranty. Sound enclosure manufacturer shall demonstrate a minimum of 10 previous instances of sound enclosure installations with industry references. Sound Enclosures shall be as manufactured by FanAir Company, Orange, California.
SOUND DEFINITIONS

- **AMPLITUDE** of a sound wave is the maximum amount by which the air pressure differs from atmospheric pressure. Characterized by louder or softer sounds.
- **AREA CORRECTION, FACTORS** are applied against self noise to take into account the fact that a silencer’s self-noise varies with silencer size.
- **ATTENUATION** is absorption of sound pressure. Attenuation reduces the amplitude only of a sound wave, while leaving the frequency unchanged. Basically, attenuation makes a noise quieter.
- **DECIBEL**, db, is a mathematical unit used to express the level of sound power or sound pressure. The decibel is used because it is able to condense an extremely large range of numbers into a convenient sized scale.
- **DYNAMIC INSERTION LOSS, DIL.**, is the amount of attenuation achieved by a silencer. This rating is taken with air flowing through the silencer since this type of test most closely approximates the actual conditions under which they operate. Ratings taken in this way are the most meaningful and accurate possible.
- **END REFLECTION** is the actual loss of some sound pressure when a sound which is traveling down a duct abruptly enters a large room or plenum.
- **EQUIVALENT FLOW RESISTANCE, EFR**, is the difference in fan static pressure with and without the fan silencer. EFR takes into account not only static pressure drop, but also the effect of the dynamic interaction between fan and silencer.
- **FREQUENCY** of a sound wave is the number of pressure peaks passing by a point per second. Frequency is labeled in cycles per second, CPS, or by its new title of Hz (pronounced Hertz).
- **IMPACT NOISE** is a sound of very short duration where pressure amplitudes and frequencies are rapidly changing. Impact noise might be created by a carpenter driving nails, gunshot or punch press,.
- **LOGARITHM** is a mathematical term used as the basis of the decibel system. A logarithm is the exponent of 10 which gives a known number. For instance the log of 100 is 2 since \( \log_{10} 100 = 2 \) \( 10^2 = 100 \).
- **NOISE CRITERIA** NC. is a way for an engineer to specify the maximum permissible sound power level in each of the eight octave bands. NC curves give, in a graphical form, maximum permissible intensity per octave band.
- **OCTAVE BANDS** are ranges of frequencies. Where the higher frequency is twice the lower frequency. For instance, the third octave band includes all the frequencies between 150 CPS and 300 CPS.
- **PURE TONE** is a sound that is characterized by a very uniform wave pattern. Such a sound as created by a tuning fork.
- **ROOM EFFECT** is a number that is used to convert sound power levels to sound pressure levels depending upon the condition and size of a room.
- **RANDOM NOISE** is a sound that is characterized by constantly changing frequencies either singly or together.
- **SELF NOISE** is the sound produced in a fan silencer itself by the air flowing through it. Since this noise is very low, it normally is not considered in silencer calculating. Self noise is only important when extremely low fan sound power levels are encountered.
- **SONE RATINGS** are a measurement of sound loudness. This one number measuring system is not concerned so much with actual sound intensities, but more on how people's ears hear sound. Sones are primarily associated with Propeller Fans, Roof Ventilators, and other non-ducted devices. They have the convenient characteristic of being proportional to the human ear. For example: A noise of 10 sones sounds twice as loud as a noise of 5 sones.
- **SOUND** is something that is heard. It is characterized by rapidly alternating pressures in an elastic media - namely air.
- **SOUND LEVEL METER** is an instrument used to measure the sound pressure level present at any point. Often this instrument is portable and is taken to a job site.
- **SOUND PRESSURE LEVEL** is the acoustical pressure present at a point. \( L_p \), is closely associated with what a person would hear. Sound pressure is usually expressed in decibels with a reference of 2 X 10-4, u Bars.
- **SOUND PRESSURE LEVEL, Lw,** is the acoustical power radiated from a fan or other sound source. Lw is used for fan ratings because it is independent of surroundings. Sound power is usually expressed in decibels with a reference of 10-12 watts.
- **THIRD OCTAVE BAND RATINGS** take into account only the fan sound power generating the Third octave band. The thinking is, most fans have fairly flat frequency characteristics which can be approximated by viewing only the 3rd octave band, unfortunately, this is not always true.
- **VP/SP** is velocity pressure divided by static pressure. This division gives single number which, identifies a fan's system curve in the same way C.FM and SP identify a system curve.
- **VP/SP CORRECTION FACTORS** are applied against the fan sound power ratings to correct the fact that the sound generated by a fan depends on the fan's point of operation.
- **WEIGHTING NETWORKS** is a term used to describe the one number rating created by modifying the frequency of a sound level meter.
- **A Network** is the most modified, by reducing the sensitivity to low and high frequencies.
- **B Network** is less modified than “A” but at the same frequencies.
- **C Network** is the term for a non-modified system, giving a “Flat” response.