Acoustic Enclosure

Application Notes

ISTIQ ACOUSTIC ENCLOSURE are available in modular forms and they come in various designs such as frame less, welded and bolted concepts. The panels are pre-fabricated which make the installation at site fast and easy.

The enclosure are provided with hinged doors, windows, ventilation systems and any other features which may be specified. The panels can be installed and disassembled as required to accommodate future changes in plant layout.

Applications

ISTIQ ACOUSTIC ENCLOSURE are one of the most effective means for containment of excessive noise and for isolation of workers from the noise. Even where silencers are used, these can treat only the air-borne noise. The treatment of mechanical noise from the blower, motor etc. is beyond the scope of the silencer. Thus, in order to achieve low noise levels that are often specified, noise enclosures are required. **ISTIQ ACOUSTIC ENCLOSURE** are individually designed to give the required noise attenuation and ease of accessibility. A well designed enclosure can help reduce the noise created to acceptable limits.

Typical application are on Press Machines, Compressors, Pumps, Generator Sets, Control Rooms and Sound Measuring Rooms.

Selection Guidelines

Enclosure for stamping machine

When designing an enclosure as acoustic treatment system, there are a number of factors that should be considered to maximize the design in terms of performance and cost. A few of the items that should be taken into consideration include:

- Acoustic Environment into which machine need to be enclosed
- Noise level to be achieved i.e. - at 1 or 3 metre away
- Heat rejection of the equipment to be enclosed
- Maintenance accessibility requirement
- Numbers and size for observation windows Ventilation requirement and arrangement within the room
- Lighting and power points
- Overall Dimension of the enclosure
- Consideration on the aesthetic look

Construction

ISTIQ ACOUSTIC ENCLOSURE are made of from metal sheet and perforated sheet. In between, acoustic infill (rockwool or fibre glass) is used to absorb noise. The thickness of these panels are available in 50mm, 100mm and 150mm. Different acoustic infill and different thickness of metal sheet are used depending on the application to ensure excellent performance and cost effectiveness without sacrificing quality.

Specific percentage of perforation of galvanized sheets, which hold the infill, is specially selected to give the optimum overall noise absorption coefficient.

SOUND TRANSMISSION LOSS (STL) is the effectiveness of a barrier in preventing sound transmit from one side to the other and it is measured in decibel (dB). In order to determine STL, one needs to measures the sound level on the side of the barrier closer to the sound source (the source room), the level on the opposite side (the receiving room), and the reverberation of absorption of the receiving room. The result is given by:

$$STL = L_a - L_b + 10 \log (S/A)$$

Where L_a is the sound level of the source room and L_b is the sound level of the receiving room. 10 log (S/A) is the correction for absorption.

SOUND ABSORPTION is the effectiveness of a surface of material in preventing the reflection of sound. It does this by converting sound energy to heat. The more sound is absorbing, the less echoing will exist. The absorption of a material is measured in Sabine and is found by the equation:

$$A = 0.921 \, V \, d/c$$

where V = the room volume

D = the measured rate of decay in a decibel per second.

C = the speed of sound

It is important to note the difference the Sound Transmission Loss (STL) and Sound Absorption. STL is related to hard and dense material which may actually increase the echoes in the room by reflecting the sound back while absorptions allow sound to pass through and absorb most of the sound.

NRC (Noise Reduction Coefficient) is the average of absorption coefficient at four key frequencies. It is a rating of the absorptive characteristic of a surface.

*Enclosure for stamping machine*

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Material Specifications

a)	Outer casing	1.2 mm thk. Mild Steel Plate
b)	Inner casing	0.7 mm thk. Perforated G.I
c)	Percentage of perforation	30% to 40%
d)	Panel thickness	50 mm to 150 mm thk.
e)	Frame and support	2.3 - 3.2 mm M.S Hollow Section
f)	Intermediate	2 x 9 mm thk Gypsum Board and 60 kg/m3 density Rockwool
g)	Rockwool Thermal Conductivity	0.034 W/mK at 20 deg C
h)	Observation Panel	2 x 5 mm thk transparent plexiglass
i)	Glass panel rubber	14 'L Normal type
j)	Lock set	Takigen design w/o key
k)	Door hinges	4" stainless steel
l)	Acoustic Seal	Rubber c/w magnetic seal
m)	Finishing	2 coat colour of choice

STC Rating & Sound Absorption

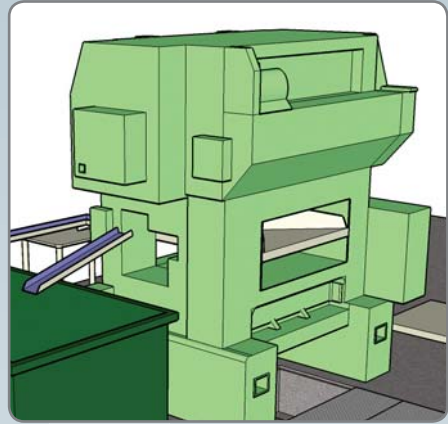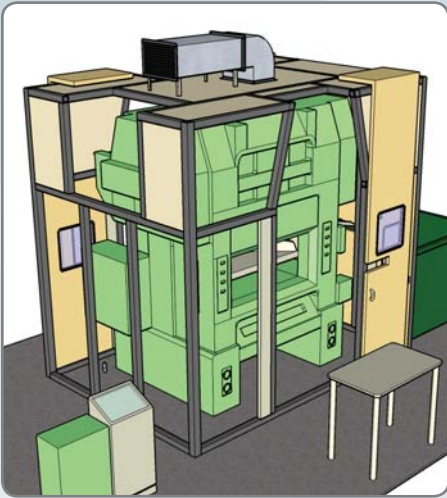| Model	STC	NRC
IP 50	30	0.75
IP 100	38	0.86
IP 150	45	0.92

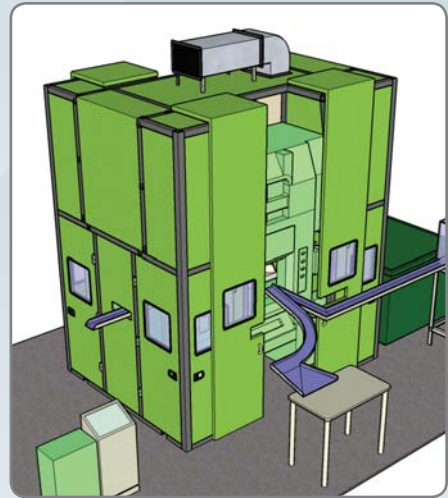## Acoustic Performance Data
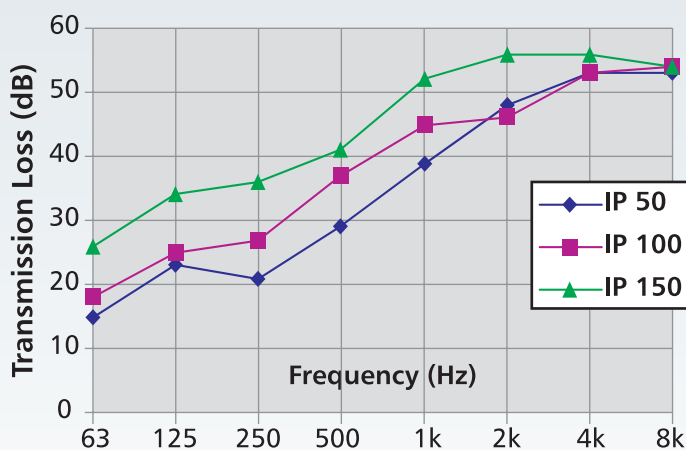
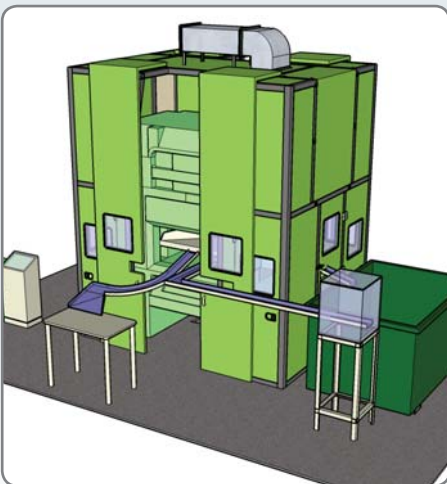# From Design to Reality

Feeder Machine Before Treatment

Modelling Feeder Machine using 3D software

Frame & Panel Assembly to suit maintenace requirement

Adjustment were made based on the feed back received from the user

After all the issues were taken into consideration, the proposal is finalized

Actual Installation of Acoustic Enclosure at Site