



CORD EXHAUST ENGINEERING PTE LTD

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UEN / GST Reg. No:
199606140H

STEAM VENT SILENCERS CATALOGUE

What is a CEE Steam Vent Silencer?

A Steam Vent Silencer is a device specially designed by CEE to reduce unwanted noise caused by steam flow or gas from an engine, through a pipeline and discharged directly into the atmosphere.

When there are other devices such as an elbow, a valve or an orifice along the line of pipes that changes the direction and flow rate of the flow, this unwanted noise is amplified.

As in most steam vent systems currently in use in the various industries, the primary generation of noise occurs at the open stack exit. To solve this problem, a CEE Steam Vent Silencer can be installed at the stack outlet to attenuate this noise before it is even released into the atmosphere.

With extensive R&D done by CEE's team of engineers, CEE Steam Vent Silencers incorporate two fundamental noise reduction principles currently in use. The first is the use of reactive components to achieve noise reduction in concentrated frequency bands. The second involves the use of dissipative components which achieve a more balance noise reduction over a broader range of frequencies. When these two principles are combined, the result is a highly efficient and durable Steam Vent Silencer design.

Operations of a CEE Steam Vent Silencer.

One of the internal features of a CEE Steam Vent Silencer is the diffuser. It is basically a component with an array of small holes evenly spread out. As steam or gas enters the silencer, the first place it arrives is this diffuser. As the top of the diffuser is capped, the velocity of the steam is reduced. It is then released into the next chamber through the numerous small holes. During this transitional process, the system vent noise is reduced, particularly in the low frequency range of the noise spectrum due to the lower velocity.

In the next two areas, known as the Silencer Expansion Chamber (Upper and Lower), low frequency noise is further reduced. This is achieved through the now-enlarged space that accommodates the steam, resulting in a much-reduced velocity as it flows through the annular passages of the acoustic core.

At the same time, noise reduction is also achieved by the sound absorbing properties of the acoustic pack and the resonant properties of the perforated material lining the sides of these two chambers.

The following page illustrates the working of CEE Steam Vent Silencer.



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STAGE 3: UPPER EXPANSION CHAMBER

The even enlarger volume in this chamber further reduces the velocity of the steam, thus achieving greater attenuation of noise level.

The acoustic pack and perforated material along the side of the chamber also aid in this attenuation before the steam is released into the atmosphere.

the acoustic material can function most efficiently.

It also serves to distribute and regulate the expansion pattern of the steam flow further up the Steam Vent Silencer.

The diffuser also makes pressure drop, which occurs as a result of the high velocity incoming steam, more predictable.

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STAGE 2: LOWER EXPANSION CHAMBER

The now-enlarged chamber allows the same flow of steam that was in the diffuser to slow down considerably.

Along the wall of this chamber are the acoustic pack and the perforated material, both of which are instrumental in the noise attenuation process.

This chamber also serves as a transitional cavity between the diffuser and the Upper Expansion Chamber so that noise from the diffuser and the resultant expansion turbulence are controlled.

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STAGE 1: DIFFUSER

The first and foremost function of the Diffuser is to shift any untreated noise into the Expansion Chambers where



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Construction of CEE Steam Vent Silencer

Acoustic Perforated Material

The acoustic perforated material is constructed of heavy gauge perforated sheets which are able to retain the acoustic pack against the high velocity of the steam flowing along the silencer chambers. In addition, the perforation causes the noise energy to dissipate, along the acoustic path created by the evenly spread and calculated holes, within the noise absorbing material.

Acoustic Pack

Long strand glass fiber has operating temperatures of up to 1000 Degrees Fahrenheit. While attenuating the noise, it also allows steam to flow easily without much resistance. This premium material has very superior acoustic absorptivity, chemical resistance and temperature tolerance with fiber loss. The glass fiber is accurately weighed and uniformly spooled behind the perforated material to ensure efficient performance of the silencer and to eliminate void or varying fill density.

Silencer External Body

The external bodies of all CEE silencers are made of continuously welded rolled plates. The minimum thickness of the plates used in CEE standard silencers is 3mm. There is a choice of mild steel and stainless steel, depending on the specifications of the end-user. In order to maintain silencer rigidity and durability, the shell thickness will be increased as the silencer diameter increases.

External Support

CEE Steam Vent Silencers come equipped with mounting brackets on the exterior of both the Lower and Upper Chambers. This allows for both vertical and horizontal mounting.

Diffuser

As the diffuser has to withstand the most incoming flow impact, strength is crucial in preventing disintegration under the cyclic load received. The diffuser unit in all CEE Steam Vent Silencers are made from Stainless Steel, coupled with full penetration and continuous weld, to ensure the lifespan and performance of the silencer.