

A Review on Aquasilencer-A Controller to Reduce the Noise Pollution

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ABSTRACT: In this modern era we are facing various problems. But as the technology is going on increasing day by day various industries, chemical factories have been raised up. Due to this our India is facing a major problem which is "Air Pollution". There are many types of Pollution but apart from this air pollution has been going on increasing day by day. The causes of air pollution is due to various harmful gases released from the height of chimneys, also due to vehicles etc. So to cut down the pollution we make the use of aqua silencer. The paper briefs the information of aquasilencer how it helps to reduce the pollution created by various industries, factories etc.

Keywords: Application; Aqua silencer Construction; Demerit; Merit; Noise and Working.

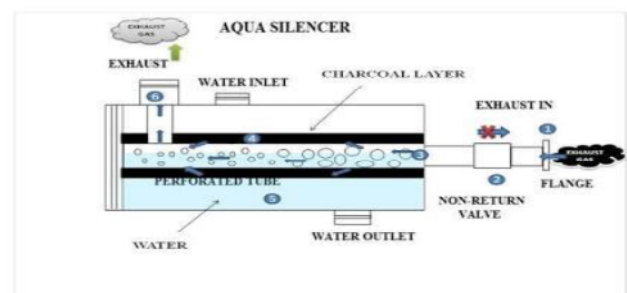
INTRODUCTION: Every individual would like to live in free and clean environment. The automobile industry plays a major role in creating air and noise pollution. The various exhaust gases such as CO, NO_x, SO₂, hydrocarbon etc get mixed in the air and causes air pollution. So aquasilencer helps to reduce the emission of exhaust gases and noise created by various engine's[1]. The aquasilencer also produces less noise in the water because in this process water acts as a medium which lowers high amplitude of noise to lower frequency. From the word "aquasilencer" it clearly depicts that in this process water is been used.

Aquasilencer is an attempt made to deal with the control of overall emissions and undesirable sound before it is emitted in atmosphere. The sound produced in the aquasilencer is less audible because in this water acts a medium. The harmful exhaust gases get escaped out from the perforated tube. So aquasilencer is very helpful to lower down the air pollution. The Aquasilencer intakes the various gases such as hydrocarbon, CO, SO₂, NO₂, sulphides etc and it gives the purified gases at outlet side.

Construction: Basically the construction of aquasilencer involves the perforated tube which has been inserted at the end of the exhaust pipe. The tube consists of dissimilar diameters. The reason behind is that it converts higher mass bubbles into lower mass bubbles. At the outlet side of the tube a layer of activated charcoal is been coated with metallic coating. The purpose of this coating is that the charcoal has high absorption capacity as it is highly porous in nature and has the tendency of free Valence electrons which help

back flow also consist of milk of limewater which comes in contact with exhaust gases. At the top of perforated tube a non-returnable value is provided which helps to avoid the backflow of the fluid and gases[2].

DIAGRAM



Working: As the exhaust gases enter in the aqua silencer, the perforated tube converts higher mass bubbles to lower mass bubbles. After that these bubbles come in contact with the lime water. These bubbles chemically react with the lime water and then they pass through charcoal layer which helps to purify the gases. It is highly porous and it possess extra free valence electrons so it has high absorption capacity. [3]. Sound produced in aqua silencer is less audible as compared to noise produced in the atmosphere. This is because water is less audible. This is mainly because of small sockets in water molecules, which lower its amplitude, thus lower the sound level hence aqua silencer helps to reduce noise and pollution [4].

Methods to Control Water Pollution: These are two methods to control the water pollution which are as follows:

- Lime Water Wash Method

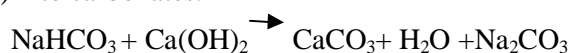
- Absorption Process

Lime Water Wash Method: The water is treated with calculated quantities of lime. After that heavy precipitates settle down as sludge at the bottom of the tank and they are removed from the outlet side any kind of acid to water, SO₂, CaSO₄. Precipitates bicarbonate as calcium carbonate



Precipitates bicarbonates as calcium carbonate
 $\text{Ca}(\text{HCO}_3)_2 + 2\text{Ca}(\text{OH})_2 \rightarrow 2\text{CaCO}_3 + 2\text{H}_2\text{O} \quad [5].$

Converts bicarbonate ions like (NaHCO₃, KHCO₃ etc) into carbonates.



Absorption Process: Activated charcoal is available in powdered form. As it is high porous in nature and valence it electrons has high absorption capacity. It is widely used for removal of taste and odorous from public water supplies. It has excellent properties of attracting gases, finely divided impurities, phenol type impurities. The activated charcoal is added to water before or after the coagulation and sedimentation [6].

Advantages of Absorption Process: Process is quite simple and requires no skills. Chlorine demand gets reduced. Coagulation process goes on increasing. Activated carbon is not harmful. Can be easily regenerated. Excellent property of attracting gases.

Thermal Properties of Water [7]:

Maximum Density-1000kg/m³

Specific weight-9.80KN/m³

Freezing Point-0°C

Boiling point-100°C

Latent heat of melting-334KJ/kg

Latent heat of evaporation-2.270*1

Specific heat-4.187KJ/kg °C

Thermal expansion-4°C to 100°C

Merits:

- It is cheaper
- Excellent property of attracting gases
- Easy to use
- Reduces chlorine demand
- No skills required
- No need of catalytic convertor. [8]
- Easily regenerated
- Emission and noise is controlled at a greater level
- Vibrationless running of engine

Demerits:

- Once in a year there is need of requirement of filling lime water
- More space is required
- The weight of silencer goes on increasing.

Applications: It has various industries applications which are as follows [7]. In automobiles for control of exhaust gas emission. In electrical power generation stations In industrial process, domestic fuel consumption and refuge burning.

CONCLUSION: The aqua silencer has been proved a very significant approach in today's modern era. It is very smokeless and pollution free emission and also it is cheaper in cost. By using perforated tube back pressure remains constant and the sound level gets reduced. It is more effective in lowering the emission of harmful gases. In this paper we have studied its construction, working and how it controls the level of noise and pollution which is being released from engines and automobiles. Due to use of water as medium the sound intensity gets decreased to great extent.

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