

# MANUFACTURING AND ANALYSIS OF CARBON ABSORBER DEVICE

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## ABSTRACT

Global warming and global climatic changes resulted from anthropogenic CO<sub>2</sub> emissions has become the main issue recently. Since, the beginning of industrial revolution, the concentration of CO<sub>2</sub> has increased more than 30% in the atmosphere, and resulted in various catastrophic occurrences. Our research is focused on decreasing the level of CO<sub>2</sub> from exhaust gases from heavy duty vehicles like trucks, bus etc by adsorption technology. The adsorption is carried out in an absorber like device containing a bed of carbon absorbing plates inside it through which the exhaust gases are passed. After adsorption we found a significant amount of CO<sub>2</sub> reduction from exhaust gases with excellent vehicle efficiency. The type of CO<sub>2</sub> adsorption is reversible that is physical adsorption is observed. The saturated bed of carbon absorb plates is again recharged or also replaced it again and again when plates gets corrosion, whether it is damage.

**Keyword:** - Global warming, CO<sub>2</sub>, exhaust gases, Exhaust system, Absorber device etc....

## I. INTRODUCTION

Air pollution is one of the major factor which affects on day to day life. Another sources of pollutions are from Industries, Power plants, The main pollutants which are emitted by Automobiles are CO (Carbon Monoxide), CO<sub>2</sub> (Carbon dioxide), NO<sub>x</sub> (Nitric oxide), HC (Hydrocarbons), etc So, it is important to prepare suitable or proper attempts for conserve the environment from such hazardous calamities. It is our responsibility to give gratitude towards mother earth from saving her from global warming, pollution, toxic emissions and many more pollutants. Carbon absorber device is a step towards it. It will be fitted to the Exhaust pipe of automobile, so that residues from exhaust like chemical or toxic gases, natural or artificial pollutants and dust particles will be get filtered when get passed from our device. And emission of harmful gases will be reduced.

## II. OBJECTIVES

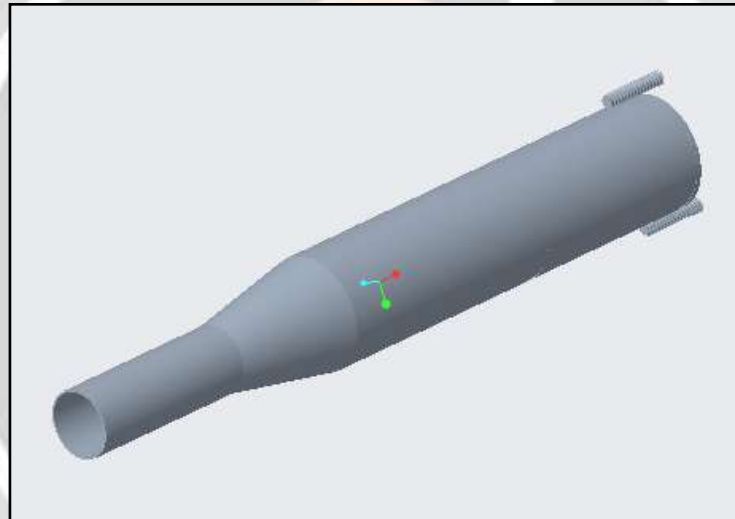
- Testing the device inserting in the exhaust system of diesel engine as well as in the vehicle.
- To control the emission level in the diesel engine and in vehicle.
- To get desirable result by using this device.
- To show how this device help us to change our daily life in the automobiles industries or any manufacturing industries.
- To understand the concept of carbon absorber device.
- To understand the problems that is occurred during manufacturing and analysis of this device.

### III. SCOPE: -

The carbon absorber device is a pollution free device which can reduce the emission level or harmful gases which are coming from exhaust system of engine and automobile. We have to design this device on the basis of industrial application in automobile. To manufacture this device we have to do certain manufacturing processes or operations to avoid mechanical problems such as friction, vibrations, noise, corrosion, erosion, etc. This device contains various components like carbon filters, carbon absorber sheets, steel casing, etc. We used carbon filters such as to insert in the device, the suitable materials like PAC (Polymer Active Carbon Filters) , Platinum, Palladium, Nox elements, etc to absorb the various harmful gases like CO, CO<sub>2</sub>, HC, Nox, ketone, aldehyde, etc which is coming from diesel engine and from other vehicles. To avoid this major problem we are also insert various active carbon block filters and also some manufacturing operation we need do for the assembly of the device so as to avoid various mechanical problems like friction, corrosion and capacity, many more.

### IV. ANALYTICAL DRAWING OF CARBON DEVICE: -

As shown in below diagram which are inserting in the vehicle exhaust system and test rig engine exhaust system and analyze the working according through testing process.



**Fig – 1 Analytical drawing of device**

### V. CONSTRUCTIONAL DETAILS: -

- a) M.S. Pipe feature or Casing
- b) Exhaust Inlet Port
- c) Exhaust Outlet Port
- d) Filtration Mechanism
- e) Metal foam
- f) Organic Metal Catalyst

These systems are inserted or fitted in the casing through welding process or joining process. Exhaust of engine is enters from inlet port and delivery from outlet port, in between them there are various components are install or mounted like metal foam, catalyst and many more. We taken casing material as mild steel because this type of steel having very high heat absorption rate where we have to insert in the exhaust system of vehicle or engine It having organic metal cores which collect the CO<sub>2</sub> gases and other harmful gases which come from vehicle exhaust system. Filter mechanism is also provide between flow of exhaust, its consists of catalyst like poly-aldehyde or Silver Nox catalyst and platinum silver catalyst plates it all include the emission absorption rate which capture more carbon

particle's or emission which is harmful for the living life.

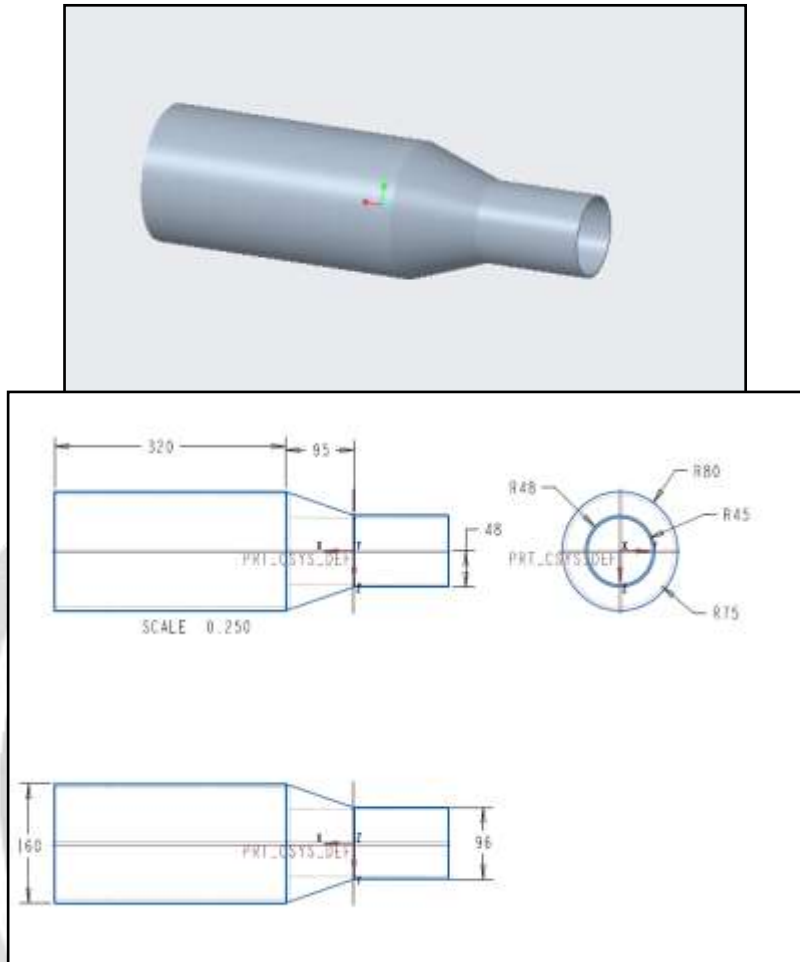


Fig – 2 Casing Design Details

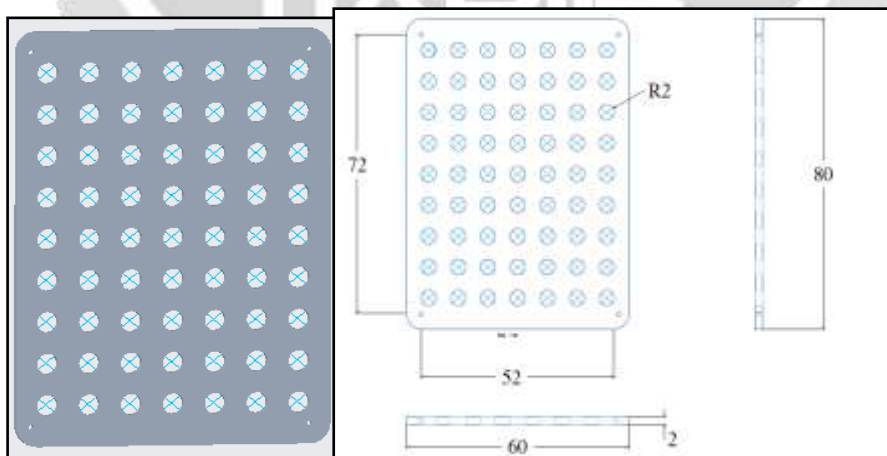
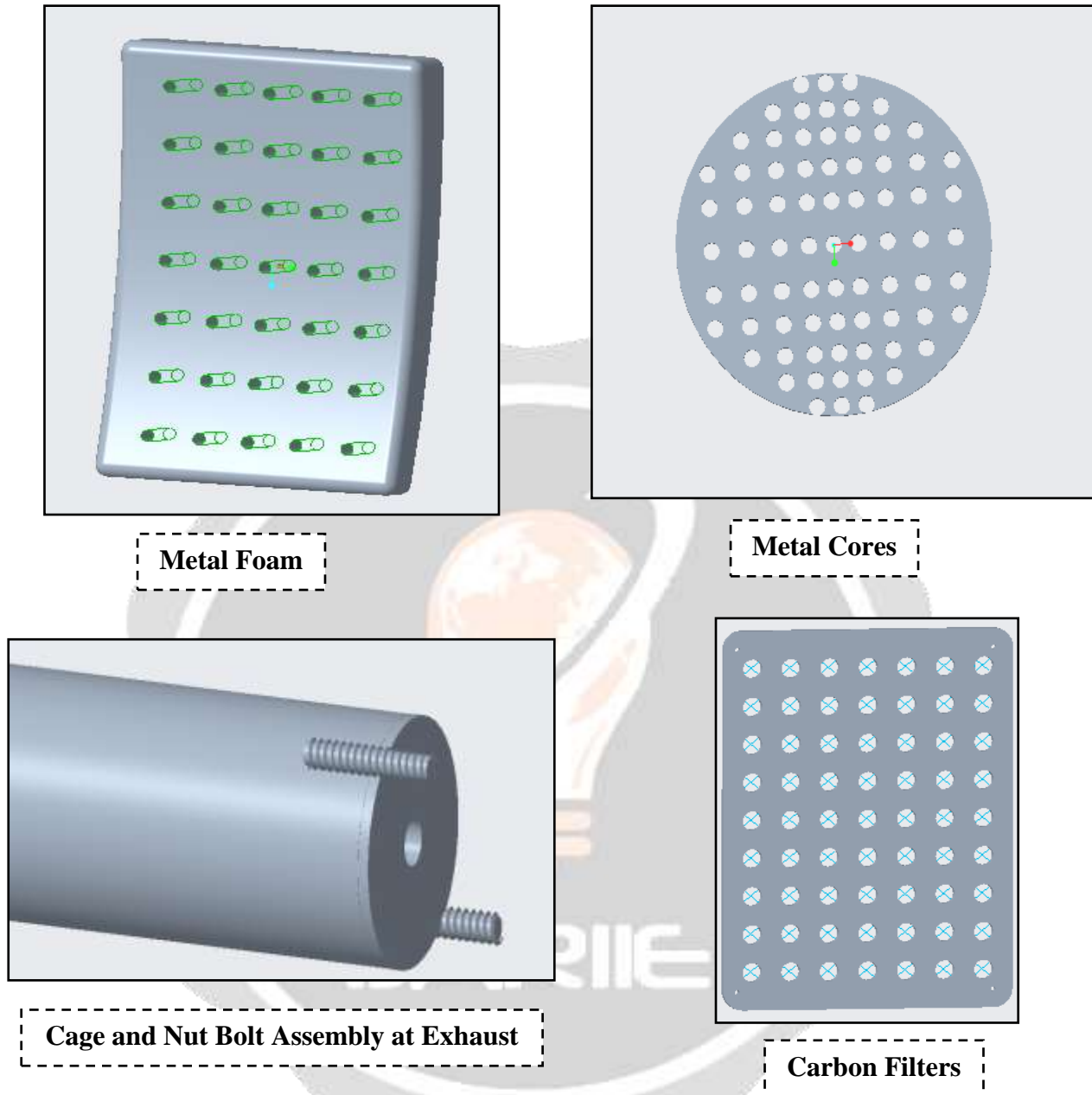


Fig – 3 Carbon Filter Design Details



**Fig -4 Other Analytical Designs of remaining parts**

## VI. WORKING AND MANUFACTURING: -

Following process is required for manufacturing the exhaust device: -

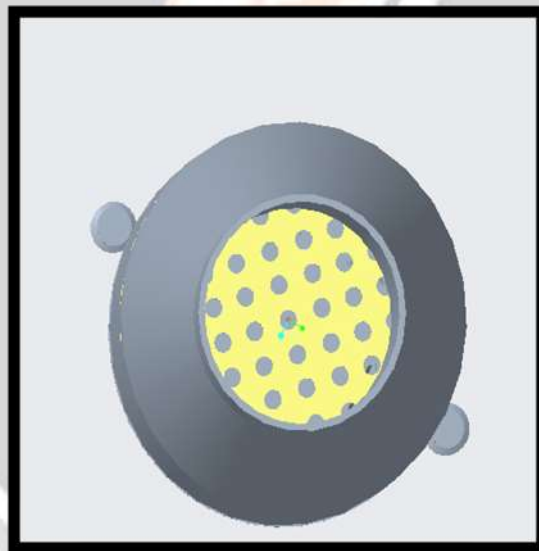
- Welding or Joining Process
- Bending Process
- Heat treatment process
- Finishing process
- Painting
- Testing process

As shown in below diagram which are inserting in the vehicle exhaust system and test rig engine exhaust system and analyze the working according through testing process. We need exhaust gas analyzer for our testing process or any

PUC control device which analyze the feature and gives its rated output in terms of readings.



**Fig -5 D. C. Arc Welding Process**



**Fig -6 Internal Structure of device**

After the production and assembly of the device we are testing in diesel engine as well as in vehicle by using exhaust gas analyzer or also called as PUC tester, check results which are obtain before and after inserting the device and compare the results, note it which given by analyzer. Our device will help to reduce carbon content in the atmosphere and as well as we are going on the concept that from the collected carbon, from device that can convert into the ink by using proper processes. This ink will help to apply in Sketch pens & Markers for Drawing or Drafting Purpose.



**Fig -7 Manufacturing of the device**



**Fig -8 Final Carbon absorber device**

## VII. CONCLUSION: -

The carbon absorber device is to manufacture to reduce the harmful gases or emission gases like carbon monoxide, carbon dioxide, hydrocarbons in the diesel engine and in exhaust system of heavy commercial vehicle like transportation buses, trucks, and many more and also design in such way that it can absorb the exhaust which is coming from the exhaust system of diesel, it also suitable for medium commercial vehicle like car and make it desirably to used in industries in the automobiles.

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