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Study of Pollutant Absorbing Fluids Using Aqua Silencer

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ABSTRACT: This research paper is a study of various fluid's pollution absorption capacity and changes in their properties after the absorption of fluids. The study is conducted using an aqua silencer. An aqua silencer is an instrument used to reduce the pollution from IC engines using a perforated tube surrounded by fluids.

KEYWORDS: pollution absorption capacity, Aqua silencer, perforated tubes.

I. INTRODUCTION

In this rapidly developing period, we are using fluids in many areas. One of the areas of use is to reduce the contents of air pollutants. These pollutants can lead to many issues like global warming, illness, climate change, and extinction of the biosphere. The main pollutants causing air pollution are carbon monoxide, carbon dioxide, oxides of nitrates and sulphur, methane, etc. By using the Aqua Silencer as our testing instrument we are trying to determine the different pollutant absorption properties of fluids.

II. REQUIREMENTS

- Fluids undergoing testing:
  - Water
  - Lime Water
  - Engine Oil
  - Vegetable Oil
- Parts required for aqua silencer:
  - GI tube
  - Valves
  - 4 stroke engine
  - Perforated tube
  - Metal frame

III. METHODOLOGY

We are testing the fluids using an aqua silencer. Exhaust gas is passed through a perforated tube enclosed in a container filled with solvent (fluid). Solvent (fluids) absorbs the harmful pollutants from the exhaust gas. This helps to reduce the concentration of exhaust pollutants like CO_2 , NO_2, SO_2, etc. The perforated tube helps to diffuse the exhaust gas into the fluid and also it reduces the exhaust sound. We are analyzing the properties of different fluids by switching fluids between cycles. We are also testing the pH level, thermal properties, and viscosity of the fluids. By doing this analysis we are determining the best pollutant absorbing fluids among our test fluids.

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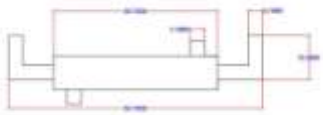
IV. MODELLING



2D Drawing

3D Drawing

V. RESULT

Pollutant concentrations in the exhaust gas after the test are:

TEST RESULT FOR PETROL/CNG/LPG VEHICLE

	MEASURED VALUE	UNIT
CO	3.481	%
CO-CORRECTED	3.481	%
HC	3746.0	PPM
CO2	1.7	%
O2	14.9	%

Reference value (No fluids)

TEST RESULT FOR PETROL/CNG/LPG VEHICLE

	MEASURED VALUE	UNIT
CO	2.105	%
CO-CORRECTED	2.105	%
HC	2243.0	PPM
CO2	0.69	%
O2	17.04	%

Lime water

TEST RESULT FOR PETROL/CNG/LPG VEHICLE

	MEASURED VALUE	UNIT
CO	1.708	%
CO-CORRECTED	1.708	%
HC	1289.0	PPM
CO2	0.64	%
O2	17.66	%

Engine oil

TEST RESULT FOR PETROL/CNG/LPG VEHICLE

	MEASURED VALUE	UNIT
CO	2.066	%
CO-CORRECTED	2.066	%
HC	1295.0	PPM
CO2	0.79	%
O2	17.15	%

Vegetable oil (palm oil)

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TEST RESULT FOR PETROL/CNG/LPG VEHICLE

	MEASURED VALUE	UNIT
CO	1.513	%
CO-CORRECTED	1.513	%
HC	2217.0	PPM
CO2	0.54	%
O2	18.04	%

Water

By comparing the results of all fluids, it is found that for absorption of Carbon Monoxide water is the best fluid to absorb. The percentage of carbon monoxide after test using water was 1.513% Water is also best for absorbing Carbon dioxide as compared to other fluids, after the test the level of carbon dioxide using water as fluid is 0.54%

In the case of Hydro-carbons engine oil is the best for absorbing. It is found that when engine oil is used as the fluid the test result showed HC content as 1289 PPM.

In the case of Oxygen, water has the lowest absorption capacity. After the test, it is found that the percentage of water in the exhaust was 18.4%.

In conclusion, we can see that water is best for absorbing most of the pollutants from the exhaust gas.

VI. CONCLUSION

This study can improve pollution absorption of different instruments which use fluids. By the end of our study, we have analysed and found out the different pollutant absorbing properties of various fluids and found out the best absorbent among them.

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