TO IMPROVE THE PERFORMNCE OF CI ENGINE USING ADDITIVES (IKOSHIELD-DZ)

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Abstract: The experimental study report the results of emission and vibration characteristics of compression ignition (CI) engine with variable compression ratio using nano particle added to diesel fuels. The based on fuel used is blend on biodiesel and diesel. Day by day demand for petroleum products is increasing since its rate of consumption is increasing. The whole world may suffers from shortage of fuel. therefore it necessary to ind different way of reducing fuel consumption**.**

***Keywords*- Nanoparticles, Diesel Engine Exhaust Emission, Noise and vibration, Temperature Control**

I. INTRODUCTION

The diesel engine also known as compression ignition engine or CI engine. The engine is starts this increase air temperature inside the cylinder to such high degree that atomized diesel fuel injected into a combustion chamber ignites spontaneously .The diesel engine has the highest thermal efficiency of any practical internal or external combustion engine. Pollution emission results from internal combustion engines are major issues in all over the world . Another metho commonly used in recent times is to utilize from nano particle . In addition nanoparticle affect the time scale of c hemical reaction and leads to decrease in ignition delay time. It mixed additives in diesel engine it slightly increase density, kinematic viscosity of fuel. It also observed that the addition additive(IKOSHIELDDZ) enhanced to the calor ific value and cetane number of blends. In addition of additives nanoparticles added in diesel fuels kinematic viscosity, cold plugging point, density but slighty increase in flash point, cetane index. Generally diesel en gine are widely used in transporation, power generator and heavy machinery due to their high operating efficiency and high durability. Addition additives in diesel engine could be cost effective solutions for mitigating diesel engine emission, while improving engine fuel consumption.

An additive is a substances which is small amount to other in order to improve them or to make last longer. This are used to modify the properties of diesel engine. Additives have many benefits but must be proven fit for purpose in specific application.

While using additives in diesel engine IKOSHIELD-DZ additives spectrum show presence of Polyethylene-polypropylene polymer 10,10 oxbisphenoxarine as a antimirobail additives 2,3. Dimethyl butane and cyclopentane pent amethylene as solvent and defoamer by using of this additives improvement of quality of combustion and increase t hermal efficiency of engine.

I.1 PROBLEM STATEMENT

Diesel engine widely used in transportation, power generator and heavy machinery due to their high operating efficiency and high durability.However, diesel engines are known to release harmful emissions such as nitrogen oxides (NOx) , particula te matter(PM), carbon monoxide (CO), and unburned hydrocarbons (UHCs).The purpose of manufacturing and using IKOSHIELD-DZ additive fact that it is an alternative fuel to our fossil fuel which causes pollution on large scale and which is also going to get depleted soon. The main aim to manufacture this additive to use is in diesel engine and to obtain the value of different engine parameters such as vibration, temperature control, noise and efficiency of engine. Then to compare this parameter with the parameters obtain from same engine using diesel. Nanoparticle additives could be cost-effective solutions for mitigating diesel emissions, while improving engine fuel consumption.

I.2 ENGINE

FOUR STROKE, TWO CYLINDER, VERTICAL, WATER COOLED DIESEL ENGINE

I.3 SPECIFICATION OF DIESEL ENGINE

ENGINE- FOUR STROKE, TWO CYLINDER, VERTICAL, WATER COOLED DIESEL ENGINE .

RATED POWER- 7.36 KW

CYLINDER BORE- 114.3 mm

STROKE LENGTH -114.3 mm

COMPRESSION RATIO- 16:1

DYNAMOTER – DC GENERATOR

II.1 OBSERVATION TABLE:-

Table no. 1Without Additives (Diesel)

LOAD Nm	TEMPERATURE (℃)	R.P.M	TIME FOR CONSUMPTION (10ml)	BRAKE SPECIFIC FUEL CONSUMPTION (BSFC)	MASS OF FUEL CONSUMPTION	MECHANICAL EFFICIENCY (%)	VOLUMWTRIC EFFICIENCY (%)
0	41	1631	57.92	0	0.1450	0	54.15
9	62	1488	38.40	561.1090	0.2187	41.21	39.97

Table no.2 With Additives (IKOSHIELD-DZ)

LOAD Nm	TEMPERATURE (℃)	R.P.M	TIME FOR CONSUMPTION (10ml)	BRAKE SPECIFIC FUEL CONSUMPTION (BSFC)	MASS OF FUEL CONSUMPTION	MECHANICAL EFFICIENCY (%)	VOLUMWTRIC EFFICIENCY (%)
0	35	1650	76.33	0	0.11	0	72.00
9	61	1499	46.83	456.5122	0.1793	41.29	47.63

II.2 ADDITIVES SPECIFICATION

Polyethylene
polypropylene polymer 10,10 oxbisphenoxarine as a ant mirobail additives 2,3. Dimethyl butane and cyclopentane pentamethylene.

1. Kinematic viscosity at 40 C=2.0 to 4.5
2. Density at 15 kg/m= 820-845
3. Total sulphur, mg/kg,mclx=50
4. Water content mg/kg.max= 200
5. Cold filter plugging point (CFPP)

Winter= 6 C

Summer= 18 C

6. Oxidation stability gm/m/max= 25
7. Cetane index, Min.= 46
8. Calorific Value= 39933

II.3 CALCULATION FORMULA

1. B.P = 2ΠNT/60*1000
2. mf = V*ρ/TIME
3. B.S.F.C.=(mf/B.P)*3600
4. I.P=B.P+F.P
5. ηmech = (B.P/I.P)*100
6. ηITH =(I.P/mf*C.V)*100
7. ηBTH =(B.P/mf*C.V)*100
8. THEOROTICAL AIR VOLUME=(A*L*(N/2))/60
9. THEOROTICAL AIR CONSUMPTION=T.A.V*ρAIR/TIME
10. ACTUAL AIR CONSUMPTION =A*Cd*$\sqrt{2gH}$
11. ηvol =(THEOROTICAL AIR CONSUMPTION/ ACTUAL AIR CONSUMPTION) *100

III. RESULT

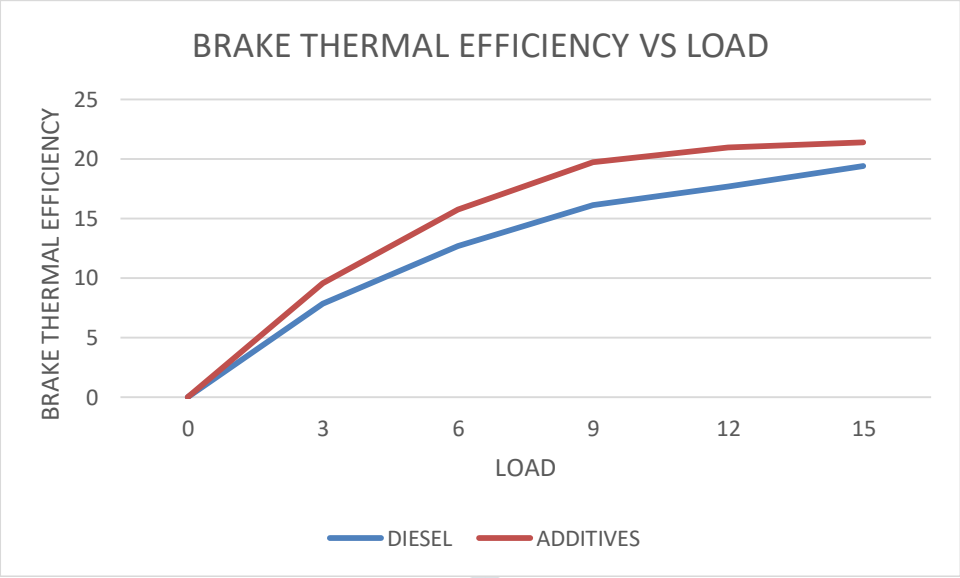


Fig no. 1

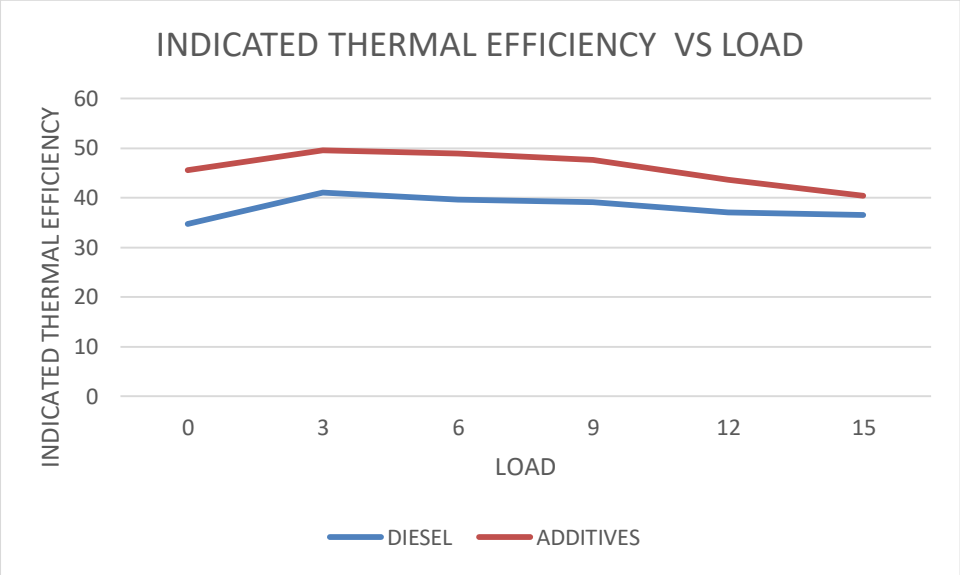
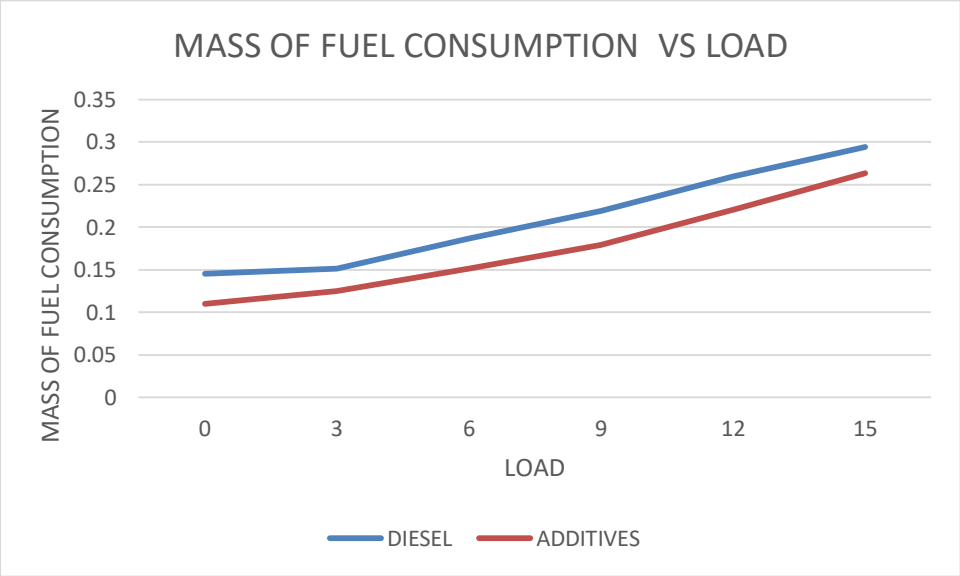


Fig no. 2



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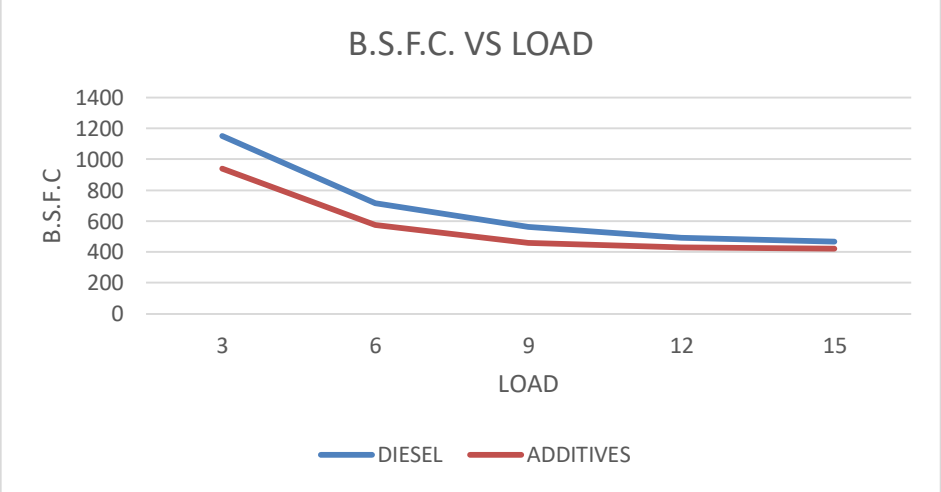

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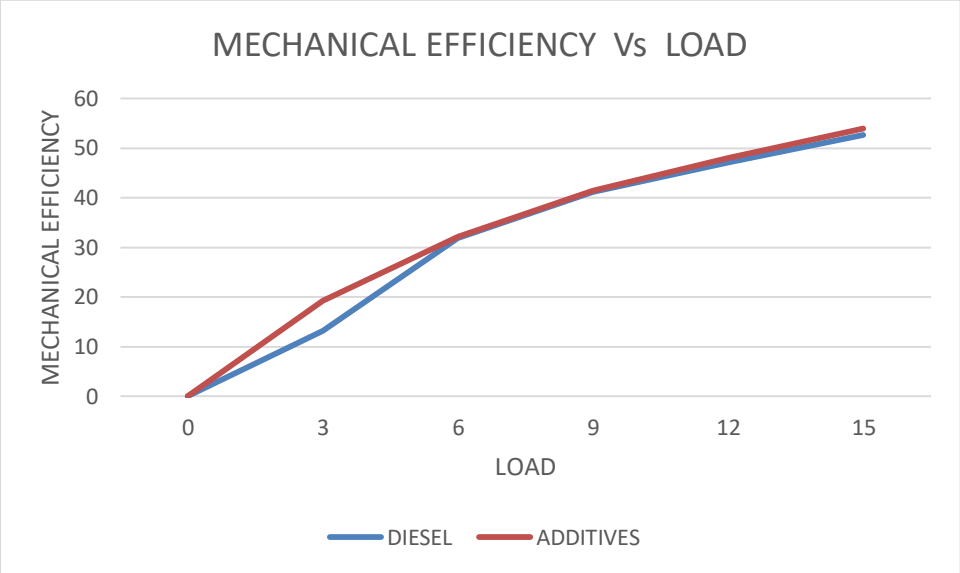

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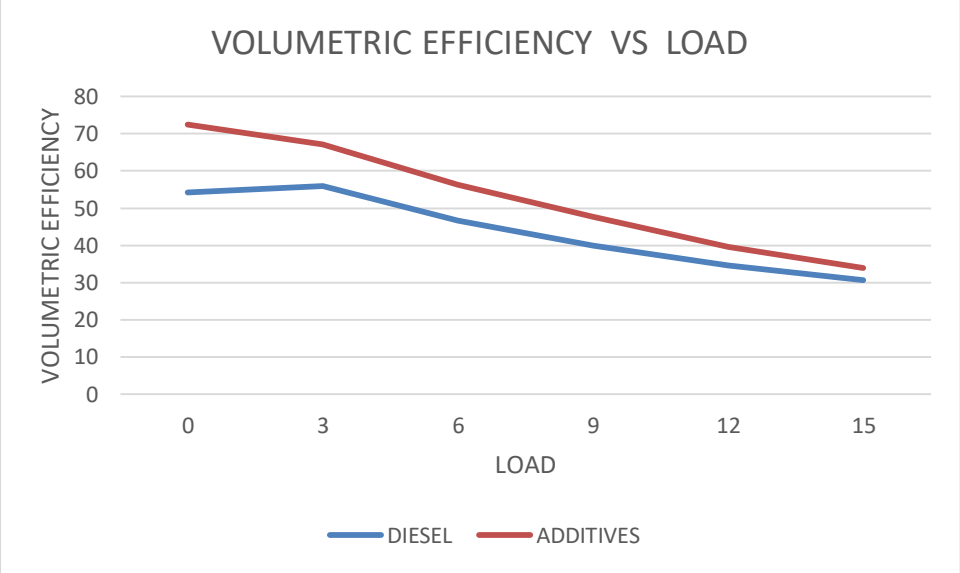

Fig no. 6

IV. CONCLUSION

In this study of Performance of diesel engine using (IKOSHILDDZ) additives is successfully accmolished under d ifferent parameter like increase efficiency, reduce vibration, reduce effect of harmful gases,control noise.It also im proves the calorific value and cetane number of test fuel.

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