



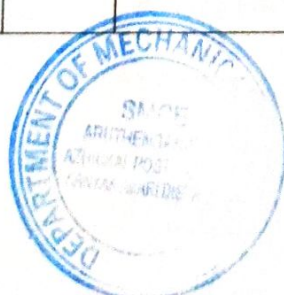
STELLA MARY'S COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Aruthenganvilai, Kallukatti Junction Azhikal Post, Kanyakumari District-629202, Tamil Nadu.

DEPARTMENT OF MECHANICAL ENGINEERING

Academic Year / Semester : 2023 – 2024 / 08
Regulation : 2021
Subject Code / Subject : ME3811 /Project

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		963520114022	Libin Samuvel S	
Mr. I. P. Rakhesh	II.	963520114010	A Aswin Beniho	Simulation Of Bio-Phase Change Material As Energy Storage Device For The Automotive System
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		963520114309	R Ashok	
		963520114312	J Beslin Roosow	
Dr. M. Sivaprakash	III.	963520114017	Jefrey Bells R S	Evaluating The Effectiveness Of A Novel Sensor Based Alarm System To Minimize Risk In Oil And Gas Industry
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		963520114321	Jobin Askar S	
		963520114326	Sham J	
Dr. R. Suresh Premil Kumar	IV.	963520114004	Ajin .D	Design Fabrication And Testing Of Wireless Controlled River Waste Cleaning Vehicle
		963520114012	Benitline Geno.E	
		963520114005	Ajithkumar.A	
Mr. E. Prakash	V.	963520114320	Jeshvin G Sekhar	Performance And Emission Characteristics Study Of Bio-Diesel (Mahua Seed) -Diesel Blends In Ci Engine
		963520114325	Shajan J	
		963520114324	Pearlson Prasanna Raja	



Dr. J. Jenix RIno	VI.	963520114002	Abishek Raxon J	Study Of Graphitic Carbon Nitride As Filler Material In Epoxy Matrix Composites For Light Weight Structural Application
		963520114006	Ajith Kumar N	
		963520114035	Siva Kishore K	
Mr. S. R. Rajkumar	VII.	963520114038	Thanga Boopathi S	Improved Bio Gas Production From Kitchen Waste.
		963520114008	Alto Sujan J	
		953520114013	Binoth G	
		963520114305	Ajin C	
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		963520114033	Shajan R A	
		963520114036	Surin S	
Mr. E. Bravin Daniel	IX.	963520114322	Kibin Kumar K	Tecno-Economic Analysis Through Innovative Design On Conventional Motor Bike To Powered Electric Vehicle
		963520114328	Vinoth S	
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Mr. P. Vijayan	X.	963520114016	Jemi J A Rebisha	Analysis The Effect Of Friction On The Matal Forming Process Using Different Lubricants
		963520114024	Manikandan S	
		963520114306	Ajin P	
Dr. C. Dhayananth Jegan	XI.	963520114020	Kannanr	Rigid Body Dynamic And Optimization Of Connecting Rod Using FEA Technique
		963520114303	Abish R	
		963520114307	Amuthan TR	
Dr. F. Michael Raj	XII.	963520114315	Cruz Sanju J M	Iot Based Combined Cycle Of Desalination And Rainwater Collector
		963520114316	Dharun D	
		963520114311	Berlin Joy P	
Dr. S. Ajith	XIII.	963520114318	Efrin Raj M	Fabrication And Testing Of Industrial Safety Helmets Using Banana And Coir Fiber Polymer Composites
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		963520114313	Bovas S	



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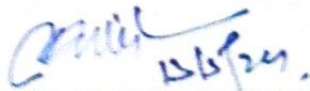
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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

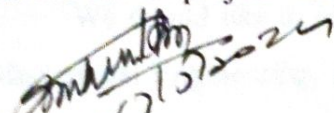
This work deals with an experimental and analytical determination of friction for aluminum Cylinders under different lubricating conditions. The aluminum ring having a standard ratio specified by the Male and Cockcroft (6:3:2) with a dimension of the Outer diameter, inner diameter & Height is 60:30:20 prepared to carry the ring compression test, to determine the friction between the interface of the work piece and die. Different lubrication conditions are applied such as zinc stearate, molybdenum disulphide, graphite powder and in dry condition. The friction is sensitive to contact between the specimens and die. When the lubricant applied, the aluminum ring dimensions are change.

The change in dimension, outer diameter, internal diameter, and reduction in height, using the standard calibration curve available for friction conditions by Male and Cockcroft is used to determine the coefficient of friction of material. Aluminum specimen is applied by the load. Deformations take place, the dimensions of specimen changes. When the lubricants are applied on aluminum ring under ring compression test. The load applied to the ring during ring compression test is insensitive to friction condition.

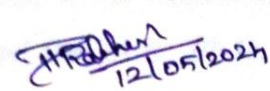
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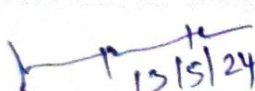

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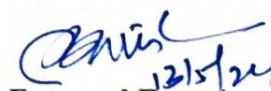
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ABSTRACT

The use of bio-based Phase Change Materials (bio-PCM) is an effective mean to enhance the Thermal Energy Storage (TES) capacity with low-cost and eco-friendly materials. The present study encompasses the results of simulation of novel composite PCM with bio-char developed in the laboratory to improve the thermal comfort in the outdoor environments. Simulation of automotive top is analysed with the Paraffin Wax, blend of paraffin wax and without any phase change materials. It results that paraffin wax blended with bio-char enables adhere the good properties of melting and it may be providing good cooling effect when compared to paraffin wax and with out any PCM materials.

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Certified that this Report title **“IMPROVED BIOGAS PRODUCTION FROM KITCHEN WASTE BY CO-DIGEST WITH FLORAL WASTE”** is the bonafide work of **ALTO SUJAN J (963520114008), BINOTH G (963520114013), THANGA BOOOPATHIS (963520114038), AJIN C (963520114305)** carried out the work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.


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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

There are two hostels for boys and girls at Stella Mary's College of Engineering, each having its own mess where a lot of cooking garbage is collected every day that can be used for better things. Anaerobic digestion is required to produce biogas. With the help of this project, an organic processing facility will be built to produce biogas, which will be more affordable, environmentally friendly, and produce high-quality renewable fuel while lowering carbon dioxide and methane emissions. Overall, it will be advantageous to build a biogas reactor on campus, in the backyard of the dorm mess. The boy's dorm at SMCE will provide kitchen (food) waste for the reactor, which functions as an anaerobic digester system to generate biogas. This generates biogas energy and functions as an anaerobic digestion system. Biogas, a priceless energy source, is produced by the anaerobic decomposition of kitchen waste. Biogas is created by the microbial process of anaerobic digestion, which predominantly produces methane (CH_4) and carbon dioxide (CO_2). In addition to being used as a fuel, biogas has many other uses. However, understanding of the composition and quantity of elements in the generated biogas is necessary for any potential uses. Sodium hydroxide (NaOH) must be added to continuously fed digested biogas in order to keep the alkalinity and pH at 7. We have improved the efficiency of biogas digester adding flower waste.

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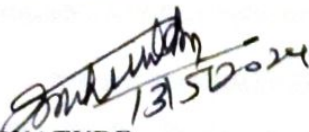
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BONAFIDE CERTIFICATE

Certified that this project report titled **"STUDY ON GRAPHITITE CARBON NITRIDE AS FILLER MATERIAL IN EPOXY MATRIX COMPOSITE FOR LIGHT WEIGHT STRUCTURAL APPLICATION"** is the bonafide work of **"J. ABISHEK REXON (963520114002), N. AJITH KUMAR (963520114006), K. SIVA KISHORE (963520114035)**, who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.


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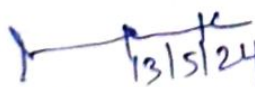

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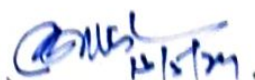
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INTERNAL EXAMINER


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ABSTRACT

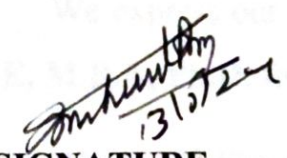
The strength and interfacial bonding in polymeric matrix composites (PMCs) are highly influenceable by fillers. The property enhancement of the PMCs using fillers depends upon many factors like filler material properties, size, and processing route of the composite. This study finds the influence of graphitic carbon nitride (g-C₃N₄) in the epoxy matrix composite. The basic mechanical properties like tensile, hardness, and impact strength were tested. The wear analysis was done using the SEM images of worn surfaces. The interfacial reactions were studied using FTIR. The high nitrogen content in the graphitic carbon nitride prevents interfacial degradation due to chemical stability.

Keywords: Polymer Matrix Composites, Fillers, Graphitic carbon nitride, Mechanical Properties, Wear, FTIR.

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Certified that this project report titled “ANALYSIS BATTERY IN TWO
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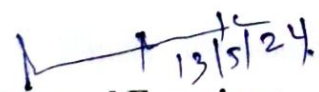
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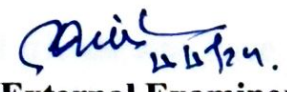
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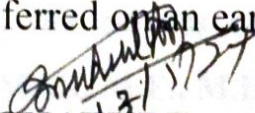
ABSTRACT

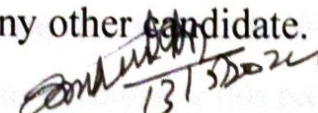
The electrification of two-wheelers is rapidly gaining momentum as a sustainable solution to urban mobility challenges. Central to the performance and viability of electric two-wheelers (e-bikes, scooters, motorcycles) is the battery system. This project aims to comprehensively analyze the battery systems employed in electric two-wheelers, focusing on their design, performance, and impact on vehicle dynamics. The study begins with a detailed examination of the various types of batteries used in electric two-wheelers, including lithium-ion, lead-acid, and emerging technologies such as solid-state batteries. Each battery type is evaluated based on parameters such as energy density, power output, lifespan, and cost-effectiveness. Furthermore, the project investigates the integration of battery systems into the vehicle architecture, considering factors such as weight distribution, space utilization, and thermal management. The influence of battery placement on vehicle handling and stability is also explored through simulation and real-world testing. Moreover, the project delves into the charging infrastructure for electric two-wheelers, analyzing the efficiency and accessibility of different charging solutions, including conventional plug-in charging and fast-charging networks. Additionally, the environmental impact of battery production, usage, and disposal is assessed, with a focus on minimizing the carbon footprint and promoting sustainable practices throughout the battery lifecycle. The findings of this project provide valuable insights into optimizing battery systems for electric two-wheelers, contributing to the advancement of environmentally friendly and efficient urban transportation solutions. **Keywords:** Electric Two-Wheelers, Battery Systems, Lithium-Ion Batteries, Vehicle Dynamics, Charging Infrastructure, Sustainability.

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Certified that this Report title **“IOT BASED COMBINED CYCLE OF DESALINATION AND RAINWATER COLLECTOR”** is the bonafide work of **CRUZ SANJU J.M. (963520114315), DHARUN D. (9638520114316), BERLIN JOY P. (963520114311)** carried out the work under my supervision. Certified further that to the best of my knowledge the work reported here in does not from any other part of thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.


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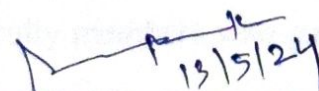
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INTERNAL EXAMINER


EXTERNAL EXAMINER

ABSTRACT

Nowadays the ground level water is reducing due to less rainfall and more lands become dry with no water. Many people suffer without water. This paper presents the electronic control unit based desalination process using solar energy. This process is 3-4 steps of pumping water from groundwater tank to the solar still or hood. The still is made up of stainless steel and the top side is covered with glass. The sunlight heated the water and become evaporated and that vapor condenses in the glass and the water droplet is collected in the pipe. The desalinated water enters into the fine filter and in the hose hold usages. The top side of the still or hood collecting rainwater to the sedimentation filter and the fine filter assembly. Both the rainwater and desalinated water for usages excess water is allowed to the underground storage tank. This system is more suitable for the coastal hamlets and household uses.

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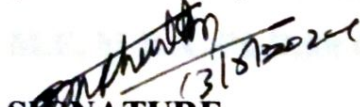
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BONAFIDE CERTIFICATE

Certified that this project report titled **“OPTIMIZATION OF TRANSESTERIFICATION PARAMETERS FOR ENHANCED BIODISEL YIELD FROM MAHUA OIL”** is the bonafide work of **“NITHIN.N (963520114027), SHAJAN.R.A (963520114033), SURIN.S (963518114036)”** who carried out the project work under my supervision.


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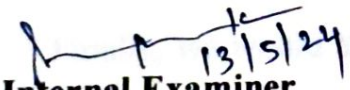
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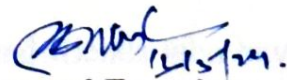

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ABSTRACT

In the past few decades, major researchers focus on fuel consumption and emission reduction. Due to volatile fossil fuel price and depletion there is a growing demand for the alternative fuels. Alternative fuel like biodiesel is green energy, which is derived from vegetable oils. Utilization of green energy in more efficient manner is a need of research. This research work is about the production of biodiesel from mahua oil. Other oils can also be used for the production, but mahua was chosen because it is not edible therefore, it will not pose a problem to humans in terms of food competition. Before the transesterification process was carried out, some basic tests such as free fatty acid content, iodine value, and moisture content were carried out. This was done so as to ascertain quality yield of the biodiesel after the reaction. The production of the biodiesel was done with standard materials and under standard conditions which made the production a hitch-free one. The mahua oil was heated to 60°C, and a solution of sodium methoxide (at 60°C) was added to the oil and stirred for 45 minutes using a magnetic stirrer. The mixture was then left to settle for 24 hours. The result shows that the product meets the set standard for biodiesel. The focus is to study its performance and emission characteristics of biodiesel under various engine loading conditions.

RESULT & CONCLUSION

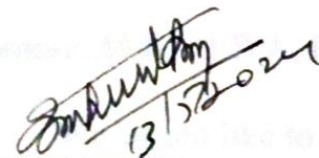
6.1 Result

6.2 Conclusion

REFERENCES

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Certified that this project report titled “ **RIGID BODY DYNAMICS AND SHAPE OPTIMIZATION CONNECTING ROD USING FEA TECHNIQUES**” is the bonafide work of “**AMUTHAN T R (963520114307), R ABISH (963520114303), R KANNAN (963520114020)**” who carried out the project work under my supervision.


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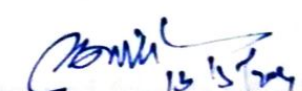
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ABSTRACT

The main function of the Connecting Rod in IC engine is to receive the force from piston and to transmit the energy to the crankshaft. The main aim of this Project is to Model & Assemble the Piston, Connecting Rod & Crankshaft for a 4-stroke air-cooled 200cc for Higher Efficiency Engine. Using Rigid Body dynamics, we can simulate the entire assembly and find out the axial load acting on connecting rod during simulation. Modeling, Assembly of Piston, Connecting rod and Crankshaft is done in PTC CREO software & Rigid body Analysis and stress analysis of connecting rod is done by ANSYS

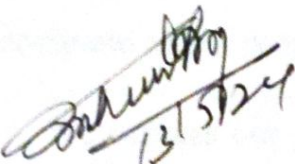
Finally we would optimize the shape of a connecting rod using shape optimization techniques in ANSYS. The aim of the optimization has been to minimize the respective Von Mises stresses which occur at connected rod in both cases, i. e. compressive loads coming from the gas pressure at maximum engine output and the bending loads resulting from the inertia force at the maximum engine power. The weight of the connecting rod should be maintained to prevent increasing of the inertia force

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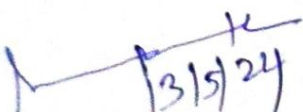
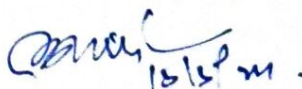
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Submitted for project Viva- voice examination held on...13/05/2024...

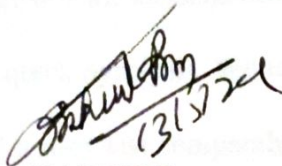

INTERNAL EXAMINER
EXTERNAL EXAMINER

ABSTRACT

Researchers and architects from all over the world have become interested in phase change materials (PCMs) due to their enormous advantages in boosting the proportion of renewable energy, achieving significant energy consumption reductions, delivering the required thermal comfort in buildings, and lowering environmental pollution. Buildings are the energy-hungry industries in general, particularly when it comes to heating and cooling, thus PCM technology is being used in a variety of ways there. The current article examines new research on the usage of PCMs for hybrid and heating applications as thermal energy storage systems (TES) in buildings. Along with their corresponding applications, incorporation techniques, and fundamental thermo physical properties, a synopsis of the PCMs in use is also provided. It was demonstrated that the uses of heating are promising; still, additional experimental analysis of commercial buildings is urgently needed, as is research on combined applications and combined PCMs.

BONAFIDE CERTIFICATE

Certified that this project report titled **“OVERVIEW OF BIOMASS PYROLYSIS FOR BIO OIL”** is the bonafide work of **“S.NITHISH (963520114028), M.SAHAYA SUTHISH JOY(963520114030)”** who carried out the project work under my supervision.


SIGNATURE


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Mr. S. AJITHKUMAR M.E.,

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SUPERVISOR

Professor & Head

Assistant Professor

Department of Mechanical Engineering

Department of Mechanical Engineering

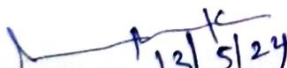
Stella Mary's College of Engineering

Stella Mary's College of Engineering

Aruthenganvilai, Tamil Nadu, India

Aruthenganvilai, Tamil Nadu, India

Submitted for the Project Viva-Voce held on.....13.05.2024.....


Internal Examiner


External Examiner

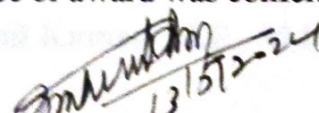
ABSTRACT

Biomass is utilized in fast pyrolysis to create a product that can be used as a feedstock for the synthesis of chemicals as well as an energy source. Since the mid-1970s oil crisis, significant attempts have been made to transform biomass from wood into liquid fuels and chemicals. The primary byproduct of rapid wood pyrolysis, bio-oils, are the subject of this review, which also discusses the latest advancements in the field. It is possible to consider almost any type of biomass for quick pyrolysis. Wood has been the material used for the majority of work since it is consistent and test-to-test comparable. Still, over a hundred different types of bio-mass have been explored, ranging from energy crops like sorghum and miscanthus to agricultural wastes like straw, olive pits, and nut shells. Studies have also been conducted on various solid wastes, such as sewage sludge and leather wastes, as well as forestry wastes like bark and thinnings. The primary focus of this review, albeit not the only one, has been wood. The physical and chemical properties of the resultant bio-oils are discussed, along with a study of the literature on biomass/wood pyrolysis, both rapid and slow. There is additional discussion of how the residence duration, heating rate, and content and structure of the wood affect the total reaction rate and volatile production during pyrolysis. When attempting to objectively study the research, it is difficult to identify generalizations due to the variety of heating rates, temperatures, residence periods, and feedstock variations documented in the literature, even though extremely fast and very slow pyrolysis of biomass create noticeably distinct products.

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this Report title **"DESIGN FABRICATION AND TESTING OF WIRELESS CONTROLLED RIVER WASTE CLEANING VEHICLE"** is the bonafide work of **AJIN D (963520114004), AJITH KUMAR A (963520114005), BENITLINE GENO (963520114012)** carried out the work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.


13/5/24
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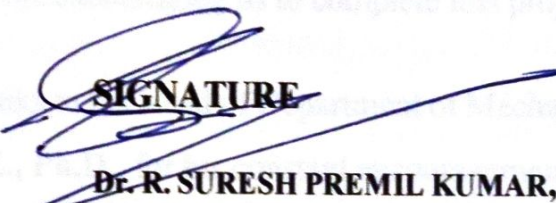
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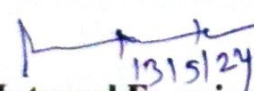
Principal & Professor

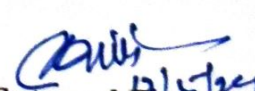
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13/5/24
Internal Examiner


13/5/24
External Examiner

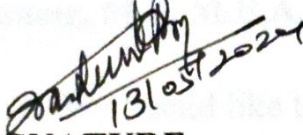
ABSTRACT

River bodies have been polluted indiscriminately by being subjected to waste generated by industries as well as human being and apart from the soluble waste there is a lot of insoluble waste which creates a layer on the river body which not only affects the quality of water but also prevents the sunrays to move down the bed of the river seriously affecting the aquatic life within the river. This huge amount of sewage loaded with pollutants, toxic material and debris has also led to shortage of potable water to be used by humans and poses health hazard to the flora and fauna as well as humans. The government of India has taken efforts toward cleaning of river bodies by investing huge capital on projects like “Namami Gange”, “Narmada Bachoo” and various other major and medium projects in various cities like Ahmadabad, Varanasi etc. Considering the above factor we have designed and fabricated a machine which is able to flush out the floating waste from the river bodies. The machine is automated with the help of an RF module. This RF module controls the dc motors fabricated on the machine and helps the machine to move ahead and make various movements on the river to collect the floating garbage. The machine is supplemented by a garbage bin which accumulates the garbage collected. The machine is able to collect floating garbage and thus can be supplemented to be used to clean various small water bodies which otherwise may not be cleaned due to want of funds.

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report titled **“EVALUATING THE EFFECTIVENESS OF A NOVAL SENSOR BASED ALARM SYSTEM TO MINIMIZE RISK IN OIL AND GAS INDUSTRY”** is the bonafide work of **“SAHAYA ABISON JERIN J (963520114029), JEFREY BELLS R S (963520114017), JOBIN ASKAR S (963518114321), SHAM J (963520114326)”** who carried out the project work under my supervision.


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Dr. M. SIVA PRAKASH, ME., Ph.D.,

SUPERVISOR

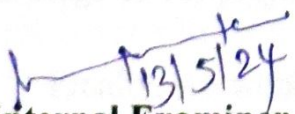
Assistant Professor

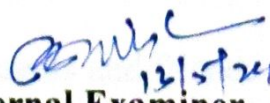
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Internal Examiner


External Examiner

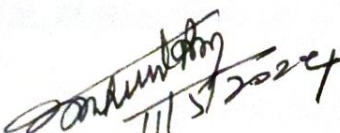
ABSTRACT

The oil and gas industry faces inherent risks associated with hazardous environments, including the potential for gas leaks and adverse environmental conditions. To address these challenges, this study proposes the evaluation of a novel sensor-based alarm system utilizing NodeMCU, DHT11 sensor, gas sensor, and Blynk app. The objectives are to assess the system's effectiveness in minimizing risk and enhancing safety within oil and gas facilities. Key performance indicators (KPIs) are defined to measure the system's performance, including response time to alarms, accuracy of sensor readings, and reliability of the system. Testing is conducted in controlled environments simulating various scenarios such as gas leaks and temperature fluctuations. Data collected from the sensors are analyzed to evaluate the system's performance and identify any limitations or areas for improvement.

Findings indicate that the sensor-based alarm system demonstrates promising capabilities in detecting potential hazards and issuing timely alerts. However, certain challenges such as sensor accuracy and communication reliability with the Blynk app are identified, necessitating further optimization. The study concludes with recommendations for enhancing the system's performance and suitability for deployment in real-world oil and gas environments. These include sensor calibration, firmware optimization, and user interface improvements. The results of this evaluation contribute valuable insights for enhancing safety measures and risk mitigation strategies in the oil and gas industry.

ANNA UNIVERSITY : CHENNAI 600 025**BONAFIDE CERTIFICATE**

Certified that this project report titled “**INVESTIGATION OF UPGRADED BIO-OIL FROM BIOMASS BY MEANS OF THERMO-CHEMICAL PROCESS**” is the bonafide work of “**SANTHOSH B (963520114031), JOHN KEVINSTON J (963520114018), LIBIN SAMUVEL S (963518114022)**” who carried out the project work under my supervision.


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Stella Mary's College of Engineering

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Mr. I.P. RAKHESH M.E.,

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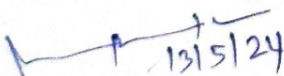
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Internal Examiner


External Examiner

ABSTRACT

Generally the researchers in the world are searching for the alternative fuels in the field of renewable energy. Researchers are working in the production of bio fuel from the natural resources and also scrutiny for the use as alternative energy source. The diminishing reserves and apparent negative effects such as green house gases and acid rain of fossil fuel has lead the world community to recognize the importance of renewable and cleaner energy in the recent years. The recovery of energy from a renewable source like biomass involves chemical, biochemical and thermo chemical processes, depending on the nature of the source. In this work, the research is focused on the extraction of Bio-Oil by means of Fixed Bed Pyrolysis Reactor. The physical properties such as density, flash point, kinematic viscosity and dynamic viscosity are found for the Indian coconut de-oiled cake. For the extraction of oil, the fast type pyrolysis process is taken into account to produce the high yield of oil from both the biomasses. The maximum yield of extraction of oil is obtained at the temperature ranges from 500°C to 550°C. The production of oil is based on the factors such as size of raw material and the range of temperature which is given as input in the fixed bed reactor. In this report, the detailed discussion about the Indian coconut de-oiled cake oil properties with other fuels for any further engineering Application.

1.1 INDIAN COCONUT DE-OILED CAKE

1.1.1 Production Process

1.1.2 Composition

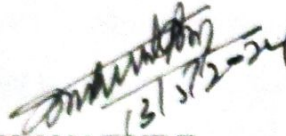
1.1.3 Physical Properties

1.1.4 Chemical Properties

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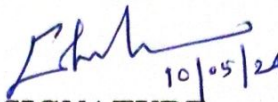
Certified that this Report title **“TECHNO-ECONOMIC ANALYSIS THROUGH INNOVATIVE DESIGN ON CONVENTIONAL MOTOR BIKE TO POWERED ELECTRIC VEHICLE”** is the bonafide work of **“KIBIN KUMAR K (963520114322), VINOTH S (963520114328), ABISH X L (963520114701)”** carried out the work under my supervision.


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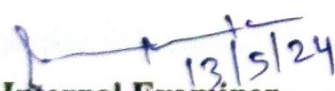

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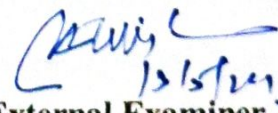
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Assistant Professor

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13/5/24
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ABSTRACT

At the mention of global warming, the first thing that comes to mind is an increasing number of vehicles in traffic, as well as exhaust gasses these vehicles emit. To control the emissions caused by gasoline vehicles, we aim to offer a cost-effective and more environmentally friendly way to travel. So, this project describes a modified procedure for a conversion of a specific IC engine vehicle into an electric-powered vehicle. In this project, instead of making a normal electric vehicle, we are converting the existing traditional petrol vehicle into an electric vehicle by using the concept of retrofitting. We are using the chassis of the traditional vehicle and with the help of the mid drive motor, battery set, and controller. We are using the set of batteries as an energy source.

INTRODUCTION

1.1 GENERAL INTRODUCTION

1.2 ELECTRIC VEHICLE PROMOTION IN WORLD

1.3 ELECTRIC VEHICLE PROMOTION IN INDIA

1.4 REASONS FOR EV DEVELOPMENT

1.5 PURPOSE AND NEED OF ELECTRIC BIKE

1.6 COMPONENTS OF ELECTRIC VEHICLE (EV)

1.7 CONSTRUCTION AND WORKING PRINCIPLE OF ELECTRIC VEHICLE

1.8 TYPES OF ELECTRIC BIKE

LITERATURE REVIEW

2.1 INFERENCE

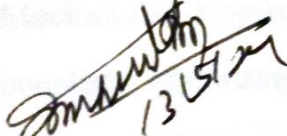
METHODOLOGY

3.1 DESIGN OF ELECTRIC BIKE

ANNA UNIVERSITY : CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this Report title “FABRICATION AND TESTING OF INDUSTRIAL SAFETY HELMETS USING BANANA AND COIR FIBER POLYMER COMPOSITES” is the bonafide work of BOVAS S (963520114313), EFRIN RAJ M (9638520114318), JEBI WINISLIN P (963520114319) carried out the work under my supervision. Certified further that to the best of my knowledge the work reported here in doesn't from any other part of thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.


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Assistant professor

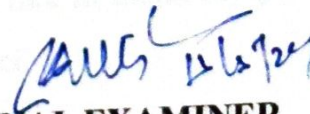
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Submitted for Viva voce Examination held on 13/05/2024


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EXTERNAL EXAMINER

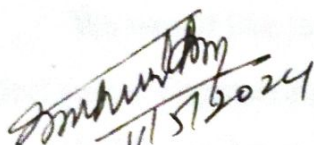
ABSTRACT

Industrial Safety Helmets, commonly known as hard hats, play a vital role in safeguarding workers from head injuries in various industrial settings. These helmets are designed to provide protection against falling objects, impact from protruding objects, electric shock and other occupational hazards. This project explores the key features, standards and benefits associated with industrial safety helmets. This project made an attempt to investigate the strength and rigidity of safety helmets fabricated using Banana Fiber, Coir Fiber and Polyester Resin. Composite Materials are widely used because of their high strength to wear ratio, high performance at elevated temperature. Natural Fibers have the following advantages: high density, low cost, biodegradability, acceptable particular characteristics, and less wear during extraction and composite production. A Polymer Matrix Composite (PMC) is made with Banana Fiber and Coir Fiber loaded with Polyester resins. Three proportions of safety helmets are fabricated and various tests are conducted on the product namely Shock Absorption Test, Penetration Resistance test, Flammability Resistance Test, Electrical Resistance test and Water Absorption Test. As per IS: 2925 – 1984 the results are satisfied.

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report titled **“PERFORMANCE AND EMISSION CHARACTERISTICS STUDY OF BIO DIESEL (Mahua seed) – DIESEL BLENDS IN CI ENGINES”** is the bonafide work of **“JESHVIN.G.SEKHAR (963520114320), PEARLSON PRASANNA RAJA (963520114325), J.SHAJAN (963518114325)”** who carried out the project work under my supervision.


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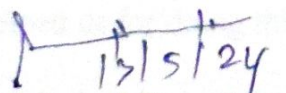
Assistant Professor

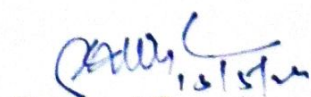
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Submitted for the Project Viva-Voce held on...13/05/24.....


Internal Examiner


External Examiner

ABSTRACT

Nowadays, the interest of researchers from all over the world is growing largely in eco- new line friendly bio-fuel (bio-diesel), especially in the countries like India which are still in their new line development phase. Bio-diesel can be prepared from edible or non-edible vegetable oils by newline heir trans-esterification using low molecular alcohols. These bio-diesels can be blended with newline mineral diesel in different proportion to get an efficient bio-fuel blend. In the recent years, a newline significant amount of research has been done on the single bio-diesel and mineral diesel newline blend as a bio-fuel. On the other hand, a limited amount of work is reported in the field of newline bio-fuel prepared by mixing of two bio-diesels with mineral diesel. Therefore, there is good newline scope to further study and research in this area. This present research work was carried out in newlinetwo phases. In the first phase two suitable bio-diesels were selected after literature survey to newline prepare dual bio-fuel as an alternate fuel to conventional mineral diesel. Further, two step newline trans-esterification method was employed and reaction parameters were varied to produce newline improved quality dual bio-fuel sample blends. The physicochemical properties were analyzed newline for the various sample blends and the samples with better quality were recommended for newline testing on a varying compression ratio engine for combustion and emission characterization. Newline The second phase of research work included the performance of engine and emission newline characterization of the dual bio-fuel samples prepared. Mahua (*Madhuca indica*) newline seed oil has production capacity of approximately 60 MT in India, which has oil content near newline to 35-40% and heat content value almost near to that of conventional diesel.



STELLA MARY'S COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
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DEPARTMENT OF MECHANICAL ENGINEERING

INTERNSHIP DETAILS

Academic Year: 2023 – 2024

Batch No	Register Number	Name of the Student	Topic of the Project
1.	963522423005	LIBIN. J	A STUDY ON SAFETY MANAGEMENT SYSTEM, FIRST AID PRACTICE, ENVIRONMENTAL PROTECTION AND SAFETY PRECAUTIONS FOLLOWED IN IREL (INDIA) LIMITED
2.	963522423010	SAHAYA ABITH AKASH J	SAFETY AUDIT IN INDIA YAMAHA MOTOR PVT LTD
3.	963522423001'	ASWIN .S	SAFETY AUDIT IN COASTAL THERMAL PLANT
4	963522423004	JOEL ANDERSON.I	A STUDY ON FIRE PREVENTION AND EMERGENCIES FOLLOWED IN IREL (INDIA) LIMITED


Head of Department
Department of Mechanical Engineering
Stella Mary's College of Engineering
Aruthenganvilai, Azhikal Post
Kanyakumari District-629 202, Tamil Nadu



DECLARATION

I, **JOEL ANDERSON I (Register number: 963522423004)**, hereby declare that the presented report of the internship titled **“A STUDY ON FIRE PREVENTION AND EMERGENCIES FOLLOWED IN IREL (INDIA) LIMITED”** is uniquely prepared by me after the completion of work at **IREL (INDIA) LIMITED, Manavalakurichi.**

I also confirm that the report is only prepared for my academic requirement, not for any other purpose. It might not be used in the interest of the opposite party of the corporation.


23.2.24

SIGNATURE

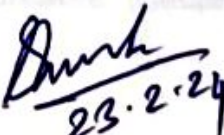
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ASSISSTANT PROFESSOR

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Aruthenganvilai, Tamil Nadu India.



आईआरईएल (इंडिया) लिमिटेड
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(Formerly Indian Rare Earths Limited)

(भारत सरकार का उपक्रम)

(A Govt. of India Undertaking)

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ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Company



MK/HRM/ICIS/2023/ 2262

August 21, 2023

प्रमाण - पत्र / CERTIFICATE

This is to certify that **Shri JOEL ANDERSON I**, I Year M.E (Industrial Safety Engineering) student of **STELLA MARY'S COLLEGE OF ENGINEERING, ARUTHENGANVILAI, KALLUKATTI** has undertaken the Internship Training in **IREL (India) Limited, Manavalakurichi** on the subject of "A Study on Work Injury Prevention, Fire Prevention and Emergencies followed in **IREL (India) Limited, Manavalakurichi Unit**" during the period from 01.03.2023 to 17.04.2023.

This certificate is issued for the limited purpose of submission to **STELLA MARY'S COLLEGE OF ENGINEERING, ARUTHENGANVILAI, KALLUKATTI** as proof of Internship Training, as part of his course curriculum.


Dy. General Manager-HRM

मणवालकुरिचि, कन्याकुमारी जिला, तमिलनाडु - 629 252.

Manavalakurichi, Kanyakumari Dist, Tamil Nadu - 629 252.

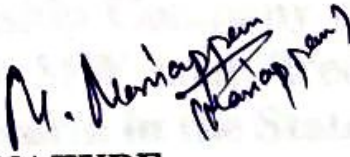
पंजीकृत कार्यालय: प्लॉट नं. 1207, वीर सावरकर मार्ग, सिद्धिविनायक मंदिर के पास, प्रभादेवी, मुंबई - 400 028.

Regd. Office: Plot No.1207, Veer Savarkar Marg, Near Siddhivinayak Temple, Prabhadevi, Mumbai - 400 028.

फोन / Tel. : 022 - 2421 1630 / 2438 2042 फैक्स / Fax : 022 - 2422 0236

BONAFIDE CERTIFICATE

Certified that this Project Report "SAFETY AUDIT IN COASTAL THERMAL PLANT" is the bonafide work of ASWIN.S (963523423001) who carried out the work under my supervision.

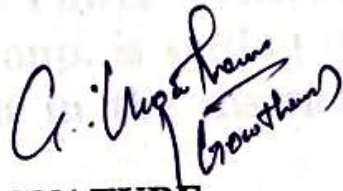

SIGNATURE

MANAGER

Safety Department

Coastal Thermal Plant

Thoothukudi


SIGNATURE

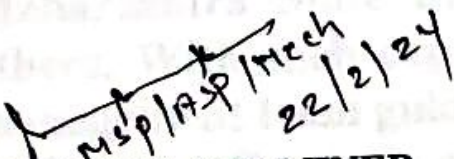
Asst.MANAGER

Safety Department

Coastal Thermal Plant

Thoothukudi

Submitted for the Anna University Examination held on ..22/12/2024....


INTERNAL EXAMINER

EXTERNAL EXAMINER

BONAFIDE CERTIFICATE

Certified that this Project Report "SAFETY AUDIT IN INDIA YAMAHA MOTOR PVT LTD" is the bonafide work of SAHAYA ABITH AKASH.J (963523423010) who carried out the work under my supervision.



SIGNATURE

MANAGER

Safety Department

Yamaha motor Pvt ltd

Sriperumpudur, Chennai



SIGNATURE

Asst.MANAGER

Safety Department

Yamaha motor Pvt ltd

Sriperumpudur ,Chennai

Submitted for the Anna University Examination held on ...22/09/2024..

MSP / ASP / Mech
22/09/24
INTERNAL EXAMINER

EXTERNAL EXAMINER

DECLARATION

I hereby declare that the report on the Internship training done at IREL(INDIA) LIMITED is the original work carried out by me during the Internship training from 01-03-2023 to 17-04-2023 under the supervision and guidance of **Mr. S. SUDARSHAN KUMAR**, HSE officer, IREL(INDIA) LIMITED.



Signature of the Student

LIBIN J

(REG NO: 963522423005)