1.3.3: Number of students undertaking project work/field work/internship during last year

Dept: B.E. Mechanical Engineering **Academic Year-2023-2024**

Sl.No	Description	Page No.
1	Project Work Details	2-167
2	Internship details	168-225
3	Field work details	226-252

PRINCIPAL
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EXPERIMENTAL INVESTIGATION ON PRODUCTION OF BIODIESEL FROM OKRA (ABELMOSCHUS ESCULENTUS) SEED OIL AND ITS PERFORMANCE CHARACTERISTICS ON COMPRESSION IGNITION (CI) ENGINE

A PROJECT REPORT

Submitted by

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MOHAMED ASHIQ M.Y	**(812420114352)**
MOHAMED ASLAM. H	**(812420114353)**
MOHAMED IMTHIYAS. I	**(812420114356)**

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

MECHANICAL ENGINEERING

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APRIL 2024

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2.	M.Y. MOHAMED ASHIQ (812420114352)		
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ABSTRACT

The present work aims to produce biodiesel from okra seed oil with a catalyst of sodium methoxide ($NaOCH_3$) and evaluate the performance of compression ignition (CI) engine. Biodiesel is an alternative source to world petroleum reserves due to rapidly growing energy demands coupled with environmental concerns has prompted the efforts to explore some alternative sources of petroleum-based fuels.

Okra seed oil is a novel feedstock for biodiesel production. Oil extraction using cold press method gave better result when compared to solvent extraction method. Since, the extracted oil has acid value of 35.2 mgKOH/g of oil, it was subjected to esterification process using hydrochloric acid.

The esterified oil was subjected to biodiesel production using homogeneous catalysts of sodium methoxide ($NaOCH_3$) gave maximum biodiesel yield of 96.8% at reaction conditions of 1:6 molar ratio, 2 wt.% of catalyst, reaction time of 2 hours, temperature of 63°C and 600rpm. The properties of produced biodiesel was within the limits of ASTM D6751 standard.

Next, the produced okra oil biodiesel was investigated to study the performance, combustion and emission characteristics of compression ignition (CI) engine. The performance characteristics examined include brake thermal efficiency (BTE) and brake specific fuel consumption (BSFC). The emission characteristics measured include carbon monoxide (CO), carbon dioxides (CO2), hydrocarbons (HC), oxides of nitrogen (NOx) and smoke.

The results showed that the biodiesel produced from okra seed oil it had BTE and lower BSFC compared to diesel. The cylinder pressure and heat release rate characteristics of the produced biodiesel were evaluated using a combustion analyser and the result showed that biodiesel produced from okra seed oil exhibited superior combustion characteristics than diesel. The emissions characteristics than diesel. The emissions characteristics of produced biodiesel

produced from okra oil exhibited superior combustion characteristics than diesel. The emissions characteristics of produced biodiesel were also analyzed and compared to diesel and the result showed that the emissions of CO, HC, and NOx were lower for the biodiesel produced from okra seed oil compared to diesel. In conclusion this study demonstrates the potential of using catalysts for producing biodiesel from okra seed oil in suitability for use on diesel engine. Finally, it is concluded that the development of a sustainable and environmentally friendly biodiesel production process that is used on diesel engine.

CHAPTER 7

CONCLUSION

- Oil extraction using cold press method gave better result when compared to solvent extraction method. Since, the extracted oil has acid value of 35.2 mgKOH/g of oil, it was subjected to esterification process using hydrochloric acid.

- The esterified oil was subjected to biodiesel production using homogeneous catalysts of sodium methoxide ($NaOCH_3$) gave maximum biodiesel yield of 96.8% at reaction conditions of 1:6 molar ratio, 2 wt.% of catalyst, reaction time of 2 hours, temperature of 63°C and 600rpm. The properties of produced biodiesel was within the limits of ASTM D6751 standard.

- The engine test were conducted to evaluate the engine performance of the produced biodiesel. The B20 blend showed that the improved performance to that of neat biodiesel. It is attributed to the high oxygen content and better lower viscosity of B20 blend because of that it can easily in combustion chamber. And also, the B20 biodiesel blend proves to emission and improves engine efficiency when compared to neat biodiesel.

- In addition, combustion tests are conducted to determine the optimal fuel-ratio and residence time. The result showed that the optimal fuel- air ratio is 1:18 and the residence time is 3 seconds for the complete combustion of biodiesel. The results of the engine study shows that the maximum heat release rate. Finally, emission tests are conducted to evaluate the emissions produced during the combustion process.

DESIGN AND DEVELOPMENT OF POLISHING MACHINE TO PREPARE SPECIMENS FOR METALLOGRAPHIC ANALYSIS

A PROJECT REPORT

Submitted by

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DECLARATION

We hereby declare that the work entitled **"DESIGN AND DEVELOPMENT OF POLISHING MACHINE TO PREPARE SPECIMENS FOR METALLOGRAPHIC ANALYSIS"** is submitted in partial fulfillment of the requirement for the award of the degree in Bachelor of Engineering, Anna university, Chennai, is a record of our own work carried out by us during the academic year 2023 - 2024 under the supervise Sion and guidance of **Mr. R.Narayanan, M.E.,** Assistant Professor, Department of Mechanical Engineering, M.I.E.T. Engineering College, Tiruchirappalli.

The extent and source of our information were derived from the existing literature and have been indicated through the dissertation at the appropriate places. The content embodied in this work is original and has not been submitted for the award of any other degree or diploma, either in this or any other university.

B. Naveen Raj

T. Paul Karunakaran

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A. Vishnu Priyan

I certify that the declaration made above by the candidate is true.

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ABSTRACT

Polishing is a surface machining process used to provide a product a high quality finished surface. To determine a material's microstructure, a metallographic specimen analysis should be performed. Polishing is one step in the preparation of a metallographic specimen. The designing and manufacturing a polishing machine will be very helpful in the process of polishing the metallographic specimen. The purpose of this project was to design and manufacturing a polishing machine on a laboratory scale. The project involves a number of process stages, including model design, tool and material preparation, component fabrication and assembly of the polishing machine. This machine can be used for polishing different materials such as metals, plastics, and ceramics. After the fabrication of this polishing machine, it is observed that a good surface finish can be achieved. This polishing machine's performance was evaluated during the testing phase in terms of surface roughness and material removal rate. The results demonstrated outstanding repeatability and uniformity in producing perfect surface finishes when examining microstructural characteristics under microscope. This polishing machine performs well and can be used for metallographic testing by students and researchers.

CHAPTER 7
CONCLUSION

The polishing machine has successfully completed its design and development. The following conclusion can be made from this project.

- The polishing machine designed consists of motors, spindle heads, and each spindle head carries a rotary disc. The rotary disc is mounted on the spindle head.
- The machine's key features, the disc-type design allows for uniform pressure distribution across the workpiece. Adjustable rotational speed enables customization for different materials and finishing requirements.
- This machine can be used for polishing different materials such as metals, plastics, and ceramics. After the fabrication of this polishing machine, it is observed that a good surface finish can be achieved.
- The performance of the polishing machine was assessed during the testing phase based on surface roughness and material removal rate. The results demonstrated remarkable consistency and repeatability in achieving desirable surface finishes, critical for accurately examining microstructural details under microscopy.
- The polishing machine that was designed is a useful instrument for metallurgical research and quality control in laboratories and companies. It enabling precise and reproducible preparation of specimens for detailed microstructural analysis.

SYNGAS PRODUCTION FROM CATALYTIC BIOMASS GASIFICATION IN A TWO STAGE DOWNDRAFT GASIFIER

A PROJECT REPORT

Submitted by

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

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ABSTRACT

In order to get proper syngas production from waste such as various bio masses in single stage gasification under without Catalyst is not possible. To improve the syngas production from various biomass it must have some potential density in present inside the reaction chamber so that Pellets consists of Sesame stalks, Hemp, Tamarind shell is having potential to work in gasification chamber because of its density. This material is feed into two stage downdraft gasifier the zone of pyrolysis, oxidation and reduction in which the whole biogas enter zone according to the fixed equivalent ratio. In this present work the waste bio material feed in pellet mode, fixed equivalance ratio and dolomite as working catalyst. This study explores syngas production through various methods, including steam reforming, partial oxidation, and biomass gasification. It examines the principles, processes, and technological advancements in each method, emphasizing their efficiency, environmental impact, and economic feasibility. Additionally, the abstract highlights the importance of syngas as a versatile precursor for producing fuels, chemicals, and materials, and discusses potential future research directions in this field Syngas production while mitigating environmental concerns. Furthermore, it underscores the significance of syngas in the transition towards sustainable energy systems and the circular economy, fostering innovation and collaboration across academia, industry.

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CHAPTER 8

CONCLUSION

In conclusion, the entrained flow gasifier project represents a significant stride towards sustainable energy production and environmental stewardship. Through meticulous design, rigorous experimentation, and comprehensive analysis, this project has provided valuable insights into the operation and optimization of entrained flow gasification technology.

The successful implementation of the gasifier showcases its potential as a viable alternative for converting biomass, coal, or waste materials into valuable syngas, which can be utilized for various industrial applications, including electricity generation, chemical synthesis, and fuel production. Moreover, the efficient utilization of feedstock and the minimal production of harmful emissions underscore the environmental benefits of this technology, contributing to the global efforts in mitigating climate change and reducing reliance on fossil fuels.

DESIGN AND DEVELOPMENT OF REACTOR CORE FOR ENTRAINED FLOW GASIFIER AND ITS PERFORMANCE EVALUATION BY USING JULIFLORA BIOMASS AT AIR ATMOSPHERE

A PROJECT REPORT

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ABSTRACT

Entrained flow gasification is a promising technology for converting solid fuels into syngas, which can be further utilized for various applications such as power generation, chemical synthesis, and fuel production. In this study, we investigate the behavior of an entrained flow gasifier within a reactor core, focusing on its efficiency, performance, and environmental impact. The reactor core design plays a crucial role in determining the gasifier's performance. By optimizing the core geometry, residence time, and temperature distribution, we aim to enhance gasification efficiency and syngas quality. Computational fluid dynamics simulations are employed to analyze the flow dynamics, heat transfer, and chemical reactions within the gasifier. Environmental considerations are also addressed, with a focus on reducing emissions of pollutants such as particulate matter, tar, and sulfur compounds. Advanced gas cleaning techniques, including catalytic conversion and scrubbing, are evaluated for their effectiveness in meeting regulatory standards and ensuring environmental sustainability.

CHAPTER 9
CONCLUSION

In conclusion, the utilization of entrained flow gasification technology for processing juliflora offers a promising avenue for sustainable biomass conversion. Juliflora, known for its fast growth and adaptability to arid environments, presents a renewable and abundant feedstock for gasification processes.Entrained flow gasification, characterized by high temperatures and efficient mixing of feedstock and gasifying agents, provides several advantages in converting juliflora into syngas. The technology offers precise control over temperature distribution, facilitating optimal reaction kinetics and maximizing gasification efficiency.

By leveraging entrained flow gasification, juliflora can be efficiently converted into a clean syngas suitable for various energy and chemical applications. Additionally, the process can help address environmental challenges associated with juliflora invasiveness by providing an economically viable means of biomass utilization fabricate the reactor core .Overall, entrained flow gasification holds significant promise as a sustainable solution for converting juliflora biomass into valuable energy products, contributing to both environmental conservation and energy security objectives.

DEVELOPMENT OF ELECTRICAL RESISTANCE HEATING FURNACE FOR MELTING OF NON-FERROUS MATERIALS

A PROJECT REPORT

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ABSTRACT

Furnaces are used to heat Solid Materials to change their shape or properties. Melting furnace is mainly made with non-ferrous metals. An electrical resistance heating furnace is a type of heating system that uses electrical resistance to generate heat. This work developed an electric- powered crucible furnace for the purpose of melting aluminium scraps. It typically consists of heating elements, such as coils or wires, that produce heat when an electric current passes through them. These furnaces are commonly used for space heating in homes and buildings, as well as in industrial applications for processes like melting metals or drying materials. The heating process is fundamentally based on electromagnetic means and graphite was selected as the crucible material. This furnace is a modified model appropriate for labs and workshops. The furnace is intended to provide efficient and controlled heating for various materials, including metals, ceramics, and composites. The liquid aluminium is poured to a desired shape and size either a aluminium block or final product.

CHAPTER 7
CONCLUSION

A custom-designed electrical resistance heating furnace was developed specifically for melting non-ferrous materials. During testing, aluminum weighing 0.5 kg was melted, with continuous recording of temperature and timing as the furnace ramped up. The heating and melting rates were found to be comparable to those of standard furnaces, achieving temperatures well over 950°C within 210 minutes and melting the initial charge in approximately the same time frame. Following the furnace's successful performance, sand and die casting samples were prepared and subjected to hardness testing using a machine. The results revealed a hardness value of 215gm, representing approximately 71.66% compared to established standards, indicating a favorable outcome.

DESIGN AND DEVELOPMENT OF PORTABLE DIRECT EXTRUSION MACHINE

A PROJECT REPORT

Submitted by

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CERTIFICATION OF EVALUATION

College Name : M.I.E.T. ENGINEERING COLLEGE

Department : MECHANICAL ENGINEERING

Semester : VIII

S.No	Name of Students	Title of Project	Name of the Supervisor with Designation
1.	JONES SEBASTIN.K (812420114333)	DESIGN AND DEVELOPMENT OF PORTABLE DIRECT EXTRUSION MACHINE	Dr. B. SELVAM, M.Tech., Ph.D. Professor & Head Department Of Mechanical Engineering M.I.E.T. Engineering College Tiruchirappalli-620007
2.	MOHAMED ARIF.B (812420114348)		
3.	MOHAMED ARSATH.M (812420114349)		
4.	AMOHAMED RIYAZ (812420114359)		

The report of the project work submitted by the above students in partial fulfilment of the award of Bachelor of Engineering Degree in Mechanical Engineering of Anna University was evaluated and confirmed to be the report of the work done by the above students.

Submitted for the Anna University examination held on 13-05-2024

INTERNAL EXAMINER

EXTERNAL EXAMINER

13.5.24

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ABSTRACT

Many researchers required secondary machining processes for casted components such as forging and direct extrusion for developing material data. The existing direct extrusion machines are larger in size so it is not able to move from one place to another place. The direct extrusion machine contains two major processes such as heating the billet and loading the unit. In this research heating chamber is only planned to designed and developed as a portable unit and load can be applied by using a Universal testing machine (UTM). Direct extrusion stands as a fundamental metal working process so this study aims the model and simulate of direct extrusion process. The heating chamber with die setup is produced for temperatures up to 500°C. The metals having re crystallization temperatures up to 350°C can be extruded with an direct extrusion ratio 64:1. The setup is designed and developed. The extruded metal is characterized by measuring the properties such as, hardness, impact strength and Density. The performance of the direct extrusion setup through the measured properties. The toughness, hardness, relative density of AA6063 are 22.3 joules, 51.2 HRB and 98.14% respectively. The determined mechanical properties are more closure to the theoretical values of AA6063 alloy so this portable direct extrusion machine can be used for producing extruded rods.

CHAPTER 5
CONCLUSION

5.1 Conclusion

The portable direct extrusion machine was designed and developed for making extrusion of various non-ferrous alloys having recrystallization temperature of 500°C . Mechanical tests such as density, hardness and toughness for extruded aluminium alloy 6063 and the following conclusions are made from the experimental investigations.

1. The portable direct extrusion machine can be used to the maximum billet heating temperature of 500°C.
2. Extrusion of various non-ferrous metals and alloys billets can be made into rods,
3. The maximum relative density of 98.14% was obtained and it can be applied as secondary manufacturing process.
4. The portable machine is capable to measure the heating coil temperature as well as inside billet temperature.
5. The extruded AA6063 alloy hardness was very closure to the actual theoretical hardness value. The relative hardness value of 96.67% was determined after extrusion.
6. There was no cracks and hot tears were not identified on the extruded AA6063.
7. The toughness value of AA6063 was determined and it is very closure to the other researcher values.

DESIGN AND FABRICATION OF COCONUT ENDOSPERM SCRAPPING MACHINE

A PROJECT REPORT

Submitted by

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MOHAMED SUHAIL. M	**(812420114361)**
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in

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ABSTRACT

Coconut is widely used from cooking to beauty products. In food industry, large amount of coconut is used and it requires more effort to scrap the endosperm from the coconut shell. The existing coconut scrapping machines are not fully automated and it still needs to hold the coconut shell to scrap the endosperm which is used from household application to commercial application. The existing scrapping machine causes injury to hand and not safe while scrapping the endosperm from the coconut shell. It is a labour intensive and time consuming process. To avoid this, a special device is required to scrap out the endosperm from the coconut shell. In this project, a coconut gripper is designed and fabricated to hold any shape and size of a coconut shell. Then a multipoint blade is designed and fabricated with required stiffness to scrap the coconut endosperm. The scrapping blade is fixed at left end and the gripper is moved to the blade from the right end. The motors are used to provide the linear and rotary motion of the gripper based on speed and torque requirements. The screw rod is also used in between the supporting shafts which helps the gripper to move linear motion. Then the control switch setup is arranged to control the gripper at forward and reverse direction. Finally, a coconut scrapping machines is designed and fabricated which reduces the risk of injury, increasing the productivity to scrap the endosperm and reducing the need to hold the coconut shell while scrapping which is benefited to both household and commercial application.

CHAPTER 6

CONCLUSION

The coconut endosperm scrapping machine is a essential equipment to scrapping the endosperm from coconut shell. This coconut scrapper is might be suitable for household appliance and it can be used for commercial application. In this project, a coconut endosperm scrapping machine in designed and fabrication with a low cost for commercial and household appliance.

This coconut endosperm scrapping machine consists of frame, motor, lead screw rod, operating swithes and blades

- The frame is designed and fabricated according to the total load acting on the frame.
- The motor set up is designed and fabricated to rotate the coconut shell holder and drive the lead screw mechanism.
- The lead screw rod is designed and fabricated to drive the coconut shell holder block in forward and backward motion.
- The blade is designed and fabricated such a way that, it scrapping the endosperm from the coconut shell.

The scrapping machine parts are assembled and final equipment was obtained. The performance of the setup was examined and it scrap the coconut endosperm efficiently.

DESIGN AND IMPLEMENTATION OF HEAT EXCHANGER AND SCRUBBER UNIT FOR ENTRAINED FLOW GASIFIER AND PRODUCTION OF SYNGAS BY USING SESAME WASTE

A PROJECT REPORT

Submitted by

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ABSTRACT

Biomass gasification has emerged as a promising technology for converting organic materials into clean energy sources such as syngas, biofuels, and hydrogen. This process involves the partial oxidation of biomass in a controlled environment to produce a synthesis gas rich in hydrogen and carbon monoxide.

The produced syngas can be utilized for various applications, including power generation, heat production, and biofuel synthesis, offering a versatile solution for energy needs. This abstract provides an overview of biomass gasification technology, its operating principles, and key process parameters.

It discusses the types of biomass feedstocks suitable for gasification and explores the various reactor configurations and gasification methods employed. Furthermore, it highlights the environmental benefits of biomass gasification, including reduced greenhouse gas emissions and mitigation of waste disposal issues.

The abstract also addresses the challenges associated with biomass gasification, such as feedstock variability, tar formation, and reactor fouling, along with ongoing research efforts and technological advancements aimed at overcoming these obstacles.

Moreover, the project report highlights the environmental benefits and economic feasibility of EFG technology, showcasing its potential to convert diverse feedstock into valuable syngas while minimizing emissions and waste. Insights gleaned from this study contribute to advancing the understanding the optimization of EFG systems, paving the way for their widespread adoption in sustainable energy production and industrial application.

CHAPTER 9

CONCLUSION

In conclusion, the entrained flow gasifier project represents a significant stride towards sustainable energy production and environmental stewardship. Through meticulous design, rigorous experimentation, and comprehensive analysis, this project has provided valuable insights into the operation and optimization of entrained flow gasification technology.

The successful implementation of the gasifier showcases its potential as a viable alternative for converting biomass, coal, or waste materials into valuable syngas, which can be utilized for various industrial applications, including electricity generation, chemical synthesis, and fuel production. Moreover, the efficient utilization of feedstock and the minimal production of harmful emissions underscore the environmental benefits of this technology, contributing to the global efforts in mitigating climate change and reducing reliance on fossil fuels.

Furthermore, the collaborative efforts involved in this project, spanning across multidisciplinary teams and stakeholders, exemplify the importance of cooperation and knowledge sharing in advancing technological solutions for a sustainable future.

Thus, the experiment is conducted and the amount of heat transfer and the effectiveness of heat transfer is calculated. From our project we have shown that the spiral tube heat exchanger's effectiveness is more than the normal parallel flow heat exchanger.

The conclusion from their investigations is that scrubber efficiency depends on energy input per unit of gas flow, whether energy is supplied to the air or the water (contact power theory). This conclusion applies only to well designed equipment when the energy is expended in the gas-liquid contacting.

PERFORMANCE AND COMBUSTION CHARACTERISTICS IN DIESEL ENGINE BY USING MIXED BIODIESEL ALONG WITH ANTIOXIDANT ADDITIVE

A PROJECT REPORT

Submitted by

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ABSTRACT

Development of sustainable energy resources is the need of present day in view of the depleting energy resources and increase in the energy demand throughout the world. On the other hand, fossil fuel combustion emits harmful pollutants like oxides of carbon, sulfur, nitrogen and particulate matters, which causes atmospheric pollution. Biodiesel as alternative fuels have various advantages over the fossil fuels such as its renewability, lesser emission of atmospheric pollutants and flexibility to produce from variety of feedstock. Waste cooking oil can be used as a potential feedstock for biodiesel production. Disposal of waste cooking oil itself an environmental challenge due to its adverse environmental impact. Transesterification is the key process for synthesis of biodiesel production with low cost and under mild reaction condition.

The objective of the present work is to produce biodiesel from waste cooking oil mixed with okra seed oil using a homogeneous catalyst. Since the extracted oil has acid value of 12.5 mg KOH/g of oil, it was subjected to esterification process using hydrochloric acid. The maximum biodiesel yield of 97% was obtained under the optimum conditions of molar ratio of 1:6, catalyst concentration of 1.5wt.% (KOH), reaction time of 1.5 hours, at temperature 62°C and 500rpm stirring speed. The biodiesel properties meet the ASTM D7651 standards.

The second objective of the works is to investigate the working characteristics of the produced biodiesel on a compression ignition engine, including its performance, combustion, and emission. In addition, the antioxidant (propyl gallate) 1% was added to the biodiesel and investigated for engine performance. The performance characteristics examined include brake

CHAPTER 7

CONCLUSION

- The present work focused on the production of biodiesel from waste cooking oil and okra oil. The results of FTIR confirmed that complete transformation of biodiesel

- Furthermore, the yield of the esterification process using WCO and okra feedstock was optimised under specific conditions, resulting in a yield of 97%. Similarly, the transesterification process using Potassium hydroxide as catalyst and waste cooking oil and okra seed oil as feedstock is optimised, resulting in an even higher yield of biodiesel at 97%. The results revealed that maximum biodiesel yield of 97% is achieved using eggshell as a catalyst at 1:6MR, 1.5wt % of catalyst concentration, fixed stirrer speed of 500 rpm and 1.5 hours reaction time.

- Finally, emission tests are conducted to evaluate the emissions produced during the combustion process. The results showed that CO, HC and FSN of the B100 and its blends are lower than neat diesel and B20 biodiesel (20% WCO and okra biodiesel and 80% petroleum diesel) is the optimum fuel, as it significantly reduces emissions of carbon monoxide and nitrogen oxides, which are major environmental pollutants while having better performance than B100.

- It is concluded that, this research work successfully demonstrated the suitability of using waste cooking oil and okra as feedstock and catalysts, respectively, for the production of biodiesel. The engine performance, combustion and emission results show that blending biodiesel with diesel is a promising approach to reduce emissions and improve engine

efficiency. The findings of this work are useful for the development of a sustainable biodiesel production process using waste cooking oil and okra oil

7.1 FUTURE SCOPE OF WORK

With a growing global demand for alternative energy sources, the development and optimization of biodiesel production from waste chicken fat and eggshells can offer a promising solution to the energy crisis. The following future scope proposes several directions for innovation and research to ensure the viability of this approach.

- Technological advances and efficiency gains-higher biomass yields per acre and more gallons of biofuel per ton of biomass-could steadily reduce the economic cost and environmental impacts of biofuel production.
- Biofuel production will likely be most profitable and environmentally benign in tropical areas where growing seasons are longer, per acre biofuel yields are higher, and fuel and other input costs are lower.
- Explore the use of different types of feedstocks, such as mustard or jackfruit seed oil.
- Investigate the impact of the process parameters such as reaction temperature, reaction time, and methanol to WCO and okra ratio on the yield.

EXPERIMENTAL INVESTIGATION OF PROTON EXCHANGE MEMBRANE BASED FUEL CELL

A PROJECT REPORT

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ABSTRACT

Proton Exchange Membrane (PEM) fuel cells have garnered significant attention due to their high efficiency and clean energy production. This paper presents a comprehensive overview of a PEM fuel cell setup, detailing its components, operation, and applications. The setup comprises five main components the anode, cathode, proton exchange membrane, bipolar plates, and gas diffusion layers. Hydrogen gas is fed to the anode side, where it undergoes catalytic oxidation, releasing protons and electrons. Protons migrate through the PEM to the cathode, while electrons travel through an external circuit, generating electrical power. At the cathode, oxygen gas reacts with protons and electrons, forming water as the only byproduct. Key factors affecting the performance of the PEM fuel cell include temperature, humidity, pressure, and catalysts. Proper control and optimization of these parameters are essential for maximizing efficiency and durability. Applications of PEM fuel cells range from portable electronics and backup power systems to transportation and stationary power generation. Their versatility, high power density, and low emissions make them a promising solution for clean energy needs.

CHAPTER 9
CONCLUSION

In conclusion, proton exchange membrane fuel cells (PEMFCs) offer a promising solution to the world's energy needs, providing clean and efficient power generation with minimal environmental impact. Through their ability to convert chemical energy directly into electrical energy, PEMFCs hold great potential for widespread adoption in various applications, from transportation to stationary power generation.

Despite their numerous advantages, challenges remain, including cost reduction, durability improvement, and infrastructure development. However, ongoing research and technological advancements are steadily addressing these obstacles, paving the way for PEMFCs to become a key player in the transition towards a sustainable energy future.

Overall, the PEM fuel cell technology shows great potential in the production of electricity sustainable energy source. With further advancements and continued research, it has the capacity to contribute significantly to the transition towards a low-carbon and renewable energy future.

As we continue to invest in the development and deployment of PEMFC technology, it is crucial to prioritize collaboration between industry, academia, and government agencies to accelerate progress and ensure the widespread adoption of this clean energy solution. With concerted efforts, PEMFCs can play a vital role in reducing greenhouse gas emissions, mitigating climate change, and securing a more sustainable energy landscape for future generations.

EXPERIMENTAL INVESTIGATION OF HYDROGEN PRODUCTION USING DRY CELL ELECTROLYSIS PROCESS

A PROJECT REPORT

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DECLARATION

We hereby declare that the work entitled **"EXPERIMENTAL INVESTIGATION OF HYDROGEN PRODUCTION USING DRY CELL ELECTROLYSIS PROCESS"** is submitted in partial fulfillment of the requirement for the award of the degree in Bachelor of Engineering, Anna university, Chennai, is a record of our own work carried out by us during the academic year 2023 - 2024 under the supervision and guidance of MR. R.MANICKAM,M.E.,(Ph.D).
Assistant Professor, Department of Mechanical Engineering, M.I.E.T. Engineering College, Tiruchirappalli.

The extent and source of our information were derived from the existing literature and have been indicated through the dissertation at the appropriate places. The content embodied in this work is original and has not been submitted for the award of any other degree or diploma, either in this or any other university.

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MANIKANDAN.R

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SHRIVARSHAN.B

I certify that the declaration made above by the candidate is true.

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ABSTRACT

At this present modern day, continuous consumption of fossil fuel and consequent harmful emissions demand is the need for alternative fuel. Water electrolysis is the most promising method to produce a Hydrogen-Oxygen (HHO) mixture. However the less energy consumption is aimed to maximize the HHO production. The aim of the research is to produce the maximum gas flow rate from dry cell by modified design configurations. HHO is produced by water electrolysis in parallel plates are brass plate and rubber gasket using different concentration of NaOH and KOH. It is also aimed to study the effects of different parameters such as electrolyte type (NaOH and KOH), electronic concentration, electrode spacing, electrolyte temperature, applied current voltage and operating time to maximize the gas yield in dry cell. Effects of flow current, voltage, electrolyte concentration, temperature, operating time and electrolyte types on HHO flow rate were studied. The voltage increase from 2 to 4 VDC led to the electrolyser efficiency increase to 50% but after that it was decreased. The applied voltage increase from 2 to 11 VDC increased the HHO flow rate from 120 to 460 ml/min. The current increase from 8 to 14 A, produced the electrolyser efficiency of 72 % and decreased after that. The current increase from 6 to 18A, led the actual flow rate increase from 137 to 654 ml/min. After operating time of 30 min., the HHO flow rate reached the highest stable values of 866, 985, 1040 and 1090 ml/min at 5, 10, 15 and 20 g NaOH concentrations, respectively. The electrolyte concentration of 5 g NaOH in cell configuration [4C3A19N] and supplied current of 14 A led to the highest HHO productivity of 866 ml/min and electrolyser efficiency of 72.1%. HHO dry cell is economical and efficient.

Keywords :- AC to DC Converter , NaOH and KOH , Dry Cell stack , Silicon gasket , Acrylic tube , Brass Plate , Electrolyte, HHO.

CHAPTER 10
CONCULSION

In conclusion, the dry cell electrolyzer is a technology that holds great promise in the field of hydrogen production. It is an electrochemical device that uses water as a feedstock to produce hydrogen gas, which can be used as a clean and renewable energy source. The dry cell electrolyzer operates by passing an electric current through water, causing the water molecules to split into hydrogen and oxygen gases through a process known as electrolysis. This technology offers several advantages, including high efficiency, scalability, and the ability to utilize a wide range of water sources. One of the key advantages of the dry cell electrolyzer is its high efficiency in hydrogen production. It has the potential to achieve high conversion rates, meaning that a significant amount of the input energy can be effectively converted into hydrogen gas. This efficiency makes the dry cell electrolyzer an attractive option for large-scale hydrogen production, which is crucial for meeting the growing demand for clean energy. Further more, the dry cell electrolyzer is a scalable technology, meaning it can be adjusted to different production capacities based on the required hydrogen output. This scalability makes it suitable for various applications, from small-scale installations for residential or industrial use to large-scale hydrogen production for transportation or energy storage. Additionally, the dry cell electrolyzer has the advantage of being able to utilize different water sources, including freshwater, seawater, and wastewater. This versatility allows for flexibility in locating the electrolyzer units and reduces the strain on freshwater resources, making it a more sustainable option for hydrogen production. However, it is important to note that there are still challenges that need to be addressed for widespread adoption of dry cell electrolyzers. These challenges include the cost of

materials, durability of the electrodes, and the overall system's long-term stability. Ongoing research and development efforts are focused on addressing these challenges and improving the performance and cost effectiveness of dry cell electrolyzers. Overall, the dry cell electrolyzer technology shows great potential in the production of hydrogen as a clean and sustainable energy source. With further advancements and continued research, it has the capacity to contribute significantly to the transition towards a low-carbon and renewable energy future. The electrolysis process offers significant potential for various industrial, environmental, and energy applications In conclusion, electrolysis represents a promising pathway for sustainable energy production, environmental protection, and industrial innovation. With ongoing advancements and support, electrolysis has the potential to become a cornerstone of the clean energy landscape, driving positive impacts for society and the planet. Electrolysis, driven by renewable energy sources, enables the clean and efficient generation of hydrogen gas without carbon emissions. This method offers versatility across industries, from transportation to industry and energy storage, fostering a transition away from fossil fuels. As electrolyser technologies continue to advance and costs decline, the scalability and commercial viability of hydrogen production are steadily improving. applicable in transportation, industry, and energy storage. Its environmental benefits lie in its potential to decarbonize sectors traditionally reliant on fossil fuels. Advancements in electrolyser technology, coupled with the increasing availability of renewable energy sources, Embracing electrolytic hydrogen production not only reduces reliance on finite resources but also mitigates environmental impacts, contributing to efforts to combat climate change. By investing in and adopting electrolysis for hydrogen production, we can pave the way for a cleaner, greener future powered by renewable energy and sustainable practices.

EXPERIMENTATION OF SYN GAS PRODUCTION FROM WASTE BIO MATERIAL IN TWO STAGE GASIFIER BY AIR AND STEAM MEDIUM

A PROJECT REPORT

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ABSTRACT

At present scenario agricultural waste bio material are not mostly used in the production of Syn gas. So we are using agricultural waste bio material to produce Syn gas. In downdraft gasifier with two stage gasification along with the steam medium is not widely used. In this present work steam and air working as a gasification medium to improve carbon conversion efficiency, tar reduction, gasifier working efficiency.

The experimentation of syn gas from waste bio-material using a two-stage gasifier employing both air and steam as mediums is a promising avenue for sustainable energy production. This study aims to investigate the feasibility and efficiency of this process, offering insights into its potential as an eco-friendly energy solution.

The two-stage gasification process involves the sequential utilization of air and steam as gasification agents. This approach aims to optimize gas yield while minimizing undesired by-products such as tar and char. The choice of waste bio-material as feedstock underscores the environmental benefits of utilizing renewable resources for energy generation.

CHAPTER 8

CONCLUSION

The experimentation of syn gas production from waste bio-material in a two-stage gasifier utilizing both air and steam as mediums holds significant promise in addressing environmental and energy challenges. Through our research, we have observed the feasibility of this approach in efficiently converting waste biomass into valuable synthesis gas, which can be utilized for various industrial applications, including electricity generation and chemical synthesis.

The two-stage gasification process offers several advantages, including improved gas quality, higher gas yield, and better control over the reaction parameters. By incorporating steam into the gasification process, we have demonstrated enhanced gasification efficiency and reduced tar content in the produced syn gas, thereby enhancing its suitability for downstream applications.

DESIGN AND FABRICATION OF CYCLONE SEPARATOR AND ASH COLLECTION BOX FOR CIRCULATING BED GASIFIER

A PROJECT REPORT

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ABSTRACT

To design a cyclone separator abatement system for particulate control, it for circulating fluidized bed gasifier application. In this present work, new the methods for computing travel distance, numbers of turns and cyclone pressure drop are studied. The flow pattern and cyclone dimensions determine the travel is tancein a cyclone. The number of turns is calculated based on this travel distance. The new theoretical analysis of cyclone pressure drop is tested against measured data at different inlet velocities and gave excellent agreement. The results show that cyclone vary with cyclone diameter Cyclone cut-points for different dusts are traced measured cyclone overall collection efficiencies and the theoretical model for calculating cyclone overall efficiency. The cut-point correction models 2D cyclones are developed through regression fit from traced and theoretical cut points Diameter. Experimental results indicated optimal cyclone design velocities, which are for 2D cyclones, is determined based on standard air density. It is important to consider the air density effect on cyclone performance in the design of cyclone abatement systems. The tangential inlet generates the swirling motion of the gas stream, which forces particles toward the outer wall where they spiral in the downward direction. Eventually, the particles are collected in the dust bin locate the bottom of the conical section of the cyclone body. The cleaned gas leaves through the exit pipe at the top. The ash content are collected by an ash collection box, it's fitted in the bottom of cyclone separator.

CHAPTER 7

CONCLUSION

It is observed from the efficiency formula that an increase in the density. Number of turns increases the device's efficiency which is similar to the conclusion which can be made from centrifugal force equation (i.e., increase in particle weight increases centrifugal force which helps in better separation).

Cyclone separators are mechanical systems that control particulate emissions by use of centrifugal separation process. Static pressure drop is the most important factor in evaluating the performance of this pollutant control device. Other factors such as particulate size, Cyclone dimensions, inlet particulate speed and particulate concentration in air are very essential in evaluating the cyclone collection performance. The cyclone particulates collection efficiency increases with increasing particulate size. Thus large diameter cyclones are most effective removing large particulates from large particulates – laden gas steam. Cyclonic separation remains one of the most effective particulate pollutant control measures. If the size of sample is the collection efficiency is almost same for the sample. With an increase in density of the sample, collection efficiency increases linearly. For the same velocity (or for the same power consumption). Highly dense particles are removes with higher collection efficiency compare to low dense particles.

DESIGN AND DEVELOPMENT OF BLENDING MACHINE FOR A VIBRATING BALL MILL USED IN POWDER METALLURGY

A PROJECT REPORT

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ABSTRACT

This project presents the design and fabrication of a ball mill integrated with a vibrating step-up mechanism. Powder metallurgy (PM) is increasingly favored for its efficient output across various industries. The study delves into the application of vibrating ball mills within PM processing, emphasizing their pivotal role in enhancing powder mixing and grinding. The vibrating ball mill showcases notable advantages, including heightened mixing efficiency, reduced processing durations, and operability under controlled atmospheres. However, a significant challenge lies in the time-consuming nature of powder processing conditioning. Traditional ball mills for powder blending often prolong the process, hindering efficiency. To address this drawback, a vibrating source is introduced to facilitate easier blending. The project assesses the time required for powder blending and outlines procedures to optimize efficiency in powder metallurgy processing. By introducing innovative methodologies, this project seeks to streamline the powder blending process, thereby enhancing productivity and output quality in powder metallurgy applications.

CHAPTER 7

CONCLUSION

The integration of double-axis movement and vibration into our powder metallurgy blinding machine represents a significant advancement in powder processing technology. We have demonstrated the tangible benefits of these innovations, including enhanced mixing and blending efficiency, improved material homogeneity, and reduced processing time. By introducing movements in we achieved better dispersion of powder particles leading to a more uniform blend and eliminating the risk of uneven distribution. Additionally,the incorporation of vibration effectively broke up agglomerates, ensuring thorough inter-particle interactions and further enhancing the homogeneity of the final mixture. These enhancements not only improve the quality of powdered materials but also contribute to increased productivity and cost-effectiveness in powder metallurgy processes. Moving forward, the success of this project underscores the importance of continuous innovation in manufacturing technologies, driving advancements that elevate the performance and reliability of industrial processes. With further refinement and optimization, the principles demonstrated in this project hold the potential to revolutionize powder processing methodologies and pave the way for future developments in the field of metallurgy and beyond.

DESIGN AND FABRICATION OF SHELL AND TUBE HEAT EXCHANGER AND SCRUBBER FOR CIRCULATING FLUIDIZED BED GASIFIER

A PROJECT REPORT

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ABSTRACT

Biomass gasification is a promising technology that converts organic materials such as agricultural residues, forest residues, and energy crops into clean, renewable energy sources such as syngas and biochar. This process involves thermo chemical conversion in a controlled environment, resulting in the production of a combustible gas primarily composed of hydrogen, carbon monoxide, and methane. The syngas generated can be utilized for various applications including electricity generation, heat production, and biofuels synthesis. Biomass gasification offers several advantages including reduced greenhouse gas emissions, potential for waste valorization, and energy security. However, challenges such as feedstock availability, technological complexity, and economic viability need to be addressed for widespread adoption. This abstract provides an overview of biomass gasification technology, its applications, benefits, challenges, and future prospects in the transition towards a sustainable energy future.

Circulating Fluidized Bed (CFB) gasification has emerged as a versatile and efficient technology for converting various feedstock's into valuable syngas. This abstract delves into the fundamental principles and operational mechanisms of CFB gasifier, highlighting their unique capabilities in handling a wide range of biomass, coal, and waste materials. By suspending particles in a fluidized state, CFB gasifier offer enhanced heat and mass transfer, facilitating through conversion and minimizing tar formation. This abstract explores recent developments, challenges, and future prospects of CFB gasification, emphasizing its role in advancing towards a cleaner and more sustainable energy landscape.

CHAPTER 8

CONCLUSION

In conclusion, the design and fabrication of the shell-and-tube heat exchanger and wet scrubber have been successfully completed. Through careful consideration of factors such as heat transfer requirements, material selection, and operational efficiency, both systems have been tailored to meet the specific needs of the application. The shell-and-tube heat exchanger provides efficient heat transfer between two fluids, while the wet scrubber effectively removes pollutants from gas streams. The fabrication process adhered to industry standards, ensuring reliability and safety. Overall, these systems represent reliable and efficient solutions for heat transfer and pollution control in industrial processes.

EXPERIMENTAL INVESTIGATION ON PRODUCTION OF BIODIESEL FROM OKRA (ABELMOSCHUS ESCULENTUS) SEED OIL AND ITS PERFORMANCE CHARACTERISTICS ON COMPRESSION IGNITION (CI) ENGINE

A PROJECT REPORT

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ABSTRACT

The present work aims to produce biodiesel from okra seed oil with a catalyst of sodium methoxide ($NaOCH_3$) and evaluate the performance of compression ignition (CI) engine. Biodiesel is an alternative source to world petroleum reserves due to rapidly growing energy demands coupled with environmental concerns has prompted the efforts to explore some alternative sources of petroleum-based fuels.

Okra seed oil is a novel feedstock for biodiesel production. Oil extraction using cold press method gave better result when compared to solvent extraction method. Since, the extracted oil has acid value of 35.2 mgKOH/g of oil, it was subjected to esterification process using hydrochloric acid.

The esterified oil was subjected to biodiesel production using homogeneous catalysts of sodium methoxide ($NaOCH_3$) gave maximum biodiesel yield of 96.8% at reaction conditions of 1:6 molar ratio, 2 wt.% of catalyst, reaction time of 2 hours, temperature of 63°C and 600rpm. The properties of produced biodiesel was within the limits of ASTM D6751 standard.

Next, the produced okra oil biodiesel was investigated to study the performance, combustion and emission characteristics of compression ignition (CI) engine. The performance characteristics examined include brake thermal efficiency (BTE) and brake specific fuel consumption (BSFC). The emission characteristics measured include carbon monoxide (CO), carbon dioxides (CO2), hydrocarbons (HC), oxides of nitrogen (NOx) and smoke.

The results showed that the biodiesel produced from okra seed oil it had BTE and lower BSFC compared to diesel. The cylinder pressure and heat release rate characteristics of the produced biodiesel were evaluated using a combustion analyser and the result showed that biodiesel produced from okra seed oil exhibited superior combustion characteristics than diesel. The emissions characteristics than diesel. The emissions characteristics of produced biodiesel

produced from okra oil exhibited superior combustion characteristics than diesel. The emissions characteristics of produced biodiesel were also analyzed and compared to diesel and the result showed that the emissions of CO, HC, and NOx were lower for the biodiesel produced from okra seed oil compared to diesel. In conclusion this study demonstrates the potential of using catalysts for producing biodiesel from okra seed oil in suitability for use on diesel engine. Finally, it is concluded that the development of a sustainable and environmentally friendly biodiesel production process that is used on diesel engine.

CHAPTER 7

CONCLUSION

- Oil extraction using cold press method gave better result when compared to solvent extraction method. Since, the extracted oil has acid value of 35.2 mgKOH/g of oil, it was subjected to esterification process using hydrochloric acid.

- The esterified oil was subjected to biodiesel production using homogeneous catalysts of sodium methoxide ($NaOCH_3$) gave maximum biodiesel yield of 96.8% at reaction conditions of 1:6 molar ratio, 2 wt.% of catalyst, reaction time of 2 hours, temperature of 63°C and 600rpm. The properties of produced biodiesel was within the limits of ASTM D6751 standard.

- The engine test were conducted to evaluate the engine performance of the produced biodiesel. The B20 blend showed that the improved performance to that of neat biodiesel. It is attributed to the high oxygen content and better lower viscosity of B20 blend because of that it can easily in combustion chamber. And also, the B20 biodiesel blend proves to emission and improves engine efficiency when compared to neat biodiesel.

- In addition, combustion tests are conducted to determine the optimal fuel-ratio and residence time. The result showed that the optimal fuel- air ratio is 1:18 and the residence time is 3 seconds for the complete combustion of biodiesel. The results of the engine study shows that the maximum heat release rate. Finally, emission tests are conducted to evaluate the emissions produced during the combustion process.

DESIGN AND DEVELOPMENT OF POLISHING MACHINE TO PREPARE SPECIMENS FOR METALLOGRAPHIC ANALYSIS

A PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the degree

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DECLARATION

We hereby declare that the work entitled **"DESIGN AND DEVELOPMENT OF POLISHING MACHINE TO PREPARE SPECIMENS FOR METALLOGRAPHIC ANALYSIS"** is submitted in partial fulfillment of the requirement for the award of the degree in Bachelor of Engineering, Anna university, Chennai, is a record of our own work carried out by us during the academic year 2023 - 2024 under the supervise Sion and guidance of **Mr. R.Narayanan, M.E.,** Assistant Professor, Department of Mechanical Engineering, M.I.E.T. Engineering College, Tiruchirappalli.

The extent and source of our information were derived from the existing literature and have been indicated through the dissertation at the appropriate places. The content embodied in this work is original and has not been submitted for the award of any other degree or diploma, either in this or any other university.

B. Naveen Raj

T. Paul Karunakaran

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A. Vishnu Priyan

I certify that the declaration made above by the candidate is true.

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ABSTRACT

Polishing is a surface machining process used to provide a product a high quality finished surface. To determine a material's microstructure, a metallographic specimen analysis should be performed. Polishing is one step in the preparation of a metallographic specimen. The designing and manufacturing a polishing machine will be very helpful in the process of polishing the metallographic specimen. The purpose of this project was to design and manufacturing a polishing machine on a laboratory scale. The project involves a number of process stages, including model design, tool and material preparation, component fabrication and assembly of the polishing machine. This machine can be used for polishing different materials such as metals, plastics, and ceramics. After the fabrication of this polishing machine, it is observed that a good surface finish can be achieved. This polishing machine's performance was evaluated during the testing phase in terms of surface roughness and material removal rate. The results demonstrated outstanding repeatability and uniformity in producing perfect surface finishes when examining microstructural characteristics under microscope. This polishing machine performs well and can be used for metallographic testing by students and researchers.

CHAPTER 7
CONCLUSION

The polishing machine has successfully completed its design and development. The following conclusion can be made from this project.

- The polishing machine designed consists of motors, spindle heads, and each spindle head carries a rotary disc. The rotary disc is mounted on the spindle head.
- The machine's key features, the disc-type design allows for uniform pressure distribution across the workpiece. Adjustable rotational speed enables customization for different materials and finishing requirements.
- This machine can be used for polishing different materials such as metals, plastics, and ceramics. After the fabrication of this polishing machine, it is observed that a good surface finish can be achieved.
- The performance of the polishing machine was assessed during the testing phase based on surface roughness and material removal rate. The results demonstrated remarkable consistency and repeatability in achieving desirable surface finishes, critical for accurately examining microstructural details under microscopy.
- The polishing machine that was designed is a useful instrument for metallurgical research and quality control in laboratories and companies. It enabling precise and reproducible preparation of specimens for detailed microstructural analysis.

SYNGAS PRODUCTION FROM CATALYTIC BIOMASS GASIFICATION IN A TWO STAGE DOWNDRAFT GASIFIER

A PROJECT REPORT

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ABSTRACT

In order to get proper syngas production from waste such as various bio masses in single stage gasification under without Catalyst is not possible. To improve the syngas production from various biomass it must have some potential density in present inside the reaction chamber so that Pellets consists of Sesame stalks, Hemp, Tamarind shell is having potential to work in gasification chamber because of its density. This material is feed into two stage downdraft gasifier the zone of pyrolysis, oxidation and reduction in which the whole biogas enter zone according to the fixed equivalent ratio. In this present work the waste bio material feed in pellet mode, fixed equivalance ratio and dolomite as working catalyst. This study explores syngas production through various methods, including steam reforming, partial oxidation, and biomass gasification. It examines the principles, processes, and technological advancements in each method, emphasizing their efficiency, environmental impact, and economic feasibility. Additionally, the abstract highlights the importance of syngas as a versatile precursor for producing fuels, chemicals, and materials, and discusses potential future research directions in this field Syngas production while mitigating environmental concerns. Furthermore, it underscores the significance of syngas in the transition towards sustainable energy systems and the circular economy, fostering innovation and collaboration across academia, industry.

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CHAPTER 8

CONCLUSION

In conclusion, the entrained flow gasifier project represents a significant stride towards sustainable energy production and environmental stewardship. Through meticulous design, rigorous experimentation, and comprehensive analysis, this project has provided valuable insights into the operation and optimization of entrained flow gasification technology.

The successful implementation of the gasifier showcases its potential as a viable alternative for converting biomass, coal, or waste materials into valuable syngas, which can be utilized for various industrial applications, including electricity generation, chemical synthesis, and fuel production. Moreover, the efficient utilization of feedstock and the minimal production of harmful emissions underscore the environmental benefits of this technology, contributing to the global efforts in mitigating climate change and reducing reliance on fossil fuels.

DESIGN AND DEVELOPMENT OF REACTOR CORE FOR ENTRAINED FLOW GASIFIER AND ITS PERFORMANCE EVALUATION BY USING JULIFLORA BIOMASS AT AIR ATMOSPHERE

A PROJECT REPORT

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ABSTRACT

Entrained flow gasification is a promising technology for converting solid fuels into syngas, which can be further utilized for various applications such as power generation, chemical synthesis, and fuel production. In this study, we investigate the behavior of an entrained flow gasifier within a reactor core, focusing on its efficiency, performance, and environmental impact. The reactor core design plays a crucial role in determining the gasifier's performance. By optimizing the core geometry, residence time, and temperature distribution, we aim to enhance gasification efficiency and syngas quality. Computational fluid dynamics simulations are employed to analyze the flow dynamics, heat transfer, and chemical reactions within the gasifier. Environmental considerations are also addressed, with a focus on reducing emissions of pollutants such as particulate matter, tar, and sulfur compounds. Advanced gas cleaning techniques, including catalytic conversion and scrubbing, are evaluated for their effectiveness in meeting regulatory standards and ensuring environmental sustainability.

CHAPTER 9
CONCLUSION

In conclusion, the utilization of entrained flow gasification technology for processing juliflora offers a promising avenue for sustainable biomass conversion. Juliflora, known for its fast growth and adaptability to arid environments, presents a renewable and abundant feedstock for gasification processes.Entrained flow gasification, characterized by high temperatures and efficient mixing of feedstock and gasifying agents, provides several advantages in converting juliflora into syngas. The technology offers precise control over temperature distribution, facilitating optimal reaction kinetics and maximizing gasification efficiency.

By leveraging entrained flow gasification, juliflora can be efficiently converted into a clean syngas suitable for various energy and chemical applications. Additionally, the process can help address environmental challenges associated with juliflora invasiveness by providing an economically viable means of biomass utilization fabricate the reactor core .Overall, entrained flow gasification holds significant promise as a sustainable solution for converting juliflora biomass into valuable energy products, contributing to both environmental conservation and energy security objectives.

DEVELOPMENT OF ELECTRICAL RESISTANCE HEATING FURNACE FOR MELTING OF NON-FERROUS MATERIALS

A PROJECT REPORT

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ABSTRACT

Furnaces are used to heat Solid Materials to change their shape or properties. Melting furnace is mainly made with non-ferrous metals. An electrical resistance heating furnace is a type of heating system that uses electrical resistance to generate heat. This work developed an electric- powered crucible furnace for the purpose of melting aluminium scraps. It typically consists of heating elements, such as coils or wires, that produce heat when an electric current passes through them. These furnaces are commonly used for space heating in homes and buildings, as well as in industrial applications for processes like melting metals or drying materials. The heating process is fundamentally based on electromagnetic means and graphite was selected as the crucible material. This furnace is a modified model appropriate for labs and workshops. The furnace is intended to provide efficient and controlled heating for various materials, including metals, ceramics, and composites. The liquid aluminium is poured to a desired shape and size either a aluminium block or final product.

CHAPTER 7
CONCLUSION

A custom-designed electrical resistance heating furnace was developed specifically for melting non-ferrous materials. During testing, aluminum weighing 0.5 kg was melted, with continuous recording of temperature and timing as the furnace ramped up. The heating and melting rates were found to be comparable to those of standard furnaces, achieving temperatures well over 950°C within 210 minutes and melting the initial charge in approximately the same time frame. Following the furnace's successful performance, sand and die casting samples were prepared and subjected to hardness testing using a machine. The results revealed a hardness value of 215gm, representing approximately 71.66% compared to established standards, indicating a favorable outcome.

DESIGN AND DEVELOPMENT OF PORTABLE DIRECT EXTRUSION MACHINE

A PROJECT REPORT

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ABSTRACT

Many researchers required secondary machining processes for casted components such as forging and direct extrusion for developing material data. The existing direct extrusion machines are larger in size so it is not able to move from one place to another place. The direct extrusion machine contains two major processes such as heating the billet and loading the unit. In this research heating chamber is only planned to designed and developed as a portable unit and load can be applied by using a Universal testing machine (UTM). Direct extrusion stands as a fundamental metal working process so this study aims the model and simulate of direct extrusion process. The heating chamber with die setup is produced for temperatures up to 500°C. The metals having re crystallization temperatures up to 350°C can be extruded with an direct extrusion ratio 64:1. The setup is designed and developed. The extruded metal is characterized by measuring the properties such as, hardness, impact strength and Density. The performance of the direct extrusion setup through the measured properties. The toughness, hardness, relative density of AA6063 are 22.3 joules, 51.2 HRB and 98.14% respectively. The determined mechanical properties are more closure to the theoretical values of AA6063 alloy so this portable direct extrusion machine can be used for producing extruded rods.

CHAPTER 5
CONCLUSION

5.1 Conclusion

The portable direct extrusion machine was designed and developed for making extrusion of various non-ferrous alloys having recrystallization temperature of 500°C . Mechanical tests such as density, hardness and toughness for extruded aluminium alloy 6063 and the following conclusions are made from the experimental investigations.

1. The portable direct extrusion machine can be used to the maximum billet heating temperature of 500°C.
2. Extrusion of various non-ferrous metals and alloys billets can be made into rods,
3. The maximum relative density of 98.14% was obtained and it can be applied as secondary manufacturing process.
4. The portable machine is capable to measure the heating coil temperature as well as inside billet temperature.
5. The extruded AA6063 alloy hardness was very closure to the actual theoretical hardness value. The relative hardness value of 96.67% was determined after extrusion.
6. There was no cracks and hot tears were not identified on the extruded AA6063.
7. The toughness value of AA6063 was determined and it is very closure to the other researcher values.

DESIGN AND FABRICATION OF COCONUT ENDOSPERM SCRAPPING MACHINE

A PROJECT REPORT

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Submitted to the Project viva voce held on 13-05-2024

INTERNAL EXAMINER

EXTERNAL EXAMINER

PRINCIPAL
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CERTIFICATION OF EVALUATION

College Name : M.I.E.T. ENGINEERING COLLEGE
Department : MECHANICAL ENGINEERING
Semester : VIII

S.No	Name of students	Title of project	Name of the Supervisor with Designation
1.	**MOHAMED EMTHIYAS. S** (812420114354)	**DESIGN AND FABRICATION OF COCONUT ENDOSPERM SCRAPPING MACHINE**	**Dr. K. PANNEER SELVAM, M.E.,Ph.D,** Associate professor Department of Mechanical Engineering M.I.E.T Engineering college Tiruchirapalli-620007
2.	**MOHAMED FAHED. A** (812420114355)		
3.	**MOHAMED SUHAIL. M** (812420114361)		
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The report of the project work submitted by the above students in partial Fulfilment of the award of Bachelor of Engineering Degree in Mechanical Engineering of Anna University was evaluated and confirmed to be the report of the work done by the above students.

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ABSTRACT

Coconut is widely used from cooking to beauty products. In food industry, large amount of coconut is used and it requires more effort to scrap the endosperm from the coconut shell. The existing coconut scrapping machines are not fully automated and it still needs to hold the coconut shell to scrap the endosperm which is used from household application to commercial application. The existing scrapping machine causes injury to hand and not safe while scrapping the endosperm from the coconut shell. It is a labour intensive and time consuming process. To avoid this, a special device is required to scrap out the endosperm from the coconut shell. In this project, a coconut gripper is designed and fabricated to hold any shape and size of a coconut shell. Then a multipoint blade is designed and fabricated with required stiffness to scrap the coconut endosperm. The scrapping blade is fixed at left end and the gripper is moved to the blade from the right end. The motors are used to provide the linear and rotary motion of the gripper based on speed and torque requirements. The screw rod is also used in between the supporting shafts which helps the gripper to move linear motion. Then the control switch setup is arranged to control the gripper at forward and reverse direction. Finally, a coconut scrapping machines is designed and fabricated which reduces the risk of injury, increasing the productivity to scrap the endosperm and reducing the need to hold the coconut shell while scrapping which is benefited to both household and commercial application.

CHAPTER 6

CONCLUSION

The coconut endosperm scrapping machine is a essential equipment to scrapping the endosperm from coconut shell. This coconut scrapper is might be suitable for household appliance and it can be used for commercial application. In this project, a coconut endosperm scrapping machine in designed and fabrication with a low cost for commercial and household appliance.

This coconut endosperm scrapping machine consists of frame, motor, lead screw rod, operating swithes and blades

- The frame is designed and fabricated according to the total load acting on the frame.
- The motor set up is designed and fabricated to rotate the coconut shell holder and drive the lead screw mechanism.
- The lead screw rod is designed and fabricated to drive the coconut shell holder block in forward and backward motion.
- The blade is designed and fabricated such a way that, it scrapping the endosperm from the coconut shell.

The scrapping machine parts are assembled and final equipment was obtained. The performance of the setup was examined and it scrap the coconut endosperm efficiently.

DESIGN AND IMPLEMENTATION OF HEAT EXCHANGER AND SCRUBBER UNIT FOR ENTRAINED FLOW GASIFIER AND PRODUCTION OF SYNGAS BY USING SESAME WASTE

A PROJECT REPORT

Submitted by

MOHAMED NIZARUDEEN.N	(812420114358)
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in partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

in

MECHANICAL ENGINEERING M.I.E.T. ENGINEERING COLLEGE
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APRIL 2024

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Certified that this project report **"DESIGN AND IMPLEMENTATION OF HEAT EXCHANGER AND SCRUBBER UNIT FOR ENTRAINED FLOW GASIFIER AND PRODUCTION OF SYNGAS BY USING SESAME WASTE"** is the Bonafide work of **N.MOHAMED NIZARUDEEN (812420114358), S.PRAVIN JOSEPH (812420114374), S.RAVI KUMAR (812420114377)** and **M.SURYA (812420114390)** who carried out the project work under my supervision.

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ABSTRACT

Biomass gasification has emerged as a promising technology for converting organic materials into clean energy sources such as syngas, biofuels, and hydrogen. This process involves the partial oxidation of biomass in a controlled environment to produce a synthesis gas rich in hydrogen and carbon monoxide.

The produced syngas can be utilized for various applications, including power generation, heat production, and biofuel synthesis, offering a versatile solution for energy needs. This abstract provides an overview of biomass gasification technology, its operating principles, and key process parameters.

It discusses the types of biomass feedstocks suitable for gasification and explores the various reactor configurations and gasification methods employed. Furthermore, it highlights the environmental benefits of biomass gasification, including reduced greenhouse gas emissions and mitigation of waste disposal issues.

The abstract also addresses the challenges associated with biomass gasification, such as feedstock variability, tar formation, and reactor fouling, along with ongoing research efforts and technological advancements aimed at overcoming these obstacles.

Moreover, the project report highlights the environmental benefits and economic feasibility of EFG technology, showcasing its potential to convert diverse feedstock into valuable syngas while minimizing emissions and waste. Insights gleaned from this study contribute to advancing the understanding the optimization of EFG systems, paving the way for their widespread adoption in sustainable energy production and industrial application.

CHAPTER 9

CONCLUSION

In conclusion, the entrained flow gasifier project represents a significant stride towards sustainable energy production and environmental stewardship. Through meticulous design, rigorous experimentation, and comprehensive analysis, this project has provided valuable insights into the operation and optimization of entrained flow gasification technology.

The successful implementation of the gasifier showcases its potential as a viable alternative for converting biomass, coal, or waste materials into valuable syngas, which can be utilized for various industrial applications, including electricity generation, chemical synthesis, and fuel production. Moreover, the efficient utilization of feedstock and the minimal production of harmful emissions underscore the environmental benefits of this technology, contributing to the global efforts in mitigating climate change and reducing reliance on fossil fuels.

Furthermore, the collaborative efforts involved in this project, spanning across multidisciplinary teams and stakeholders, exemplify the importance of cooperation and knowledge sharing in advancing technological solutions for a sustainable future.

Thus, the experiment is conducted and the amount of heat transfer and the effectiveness of heat transfer is calculated. From our project we have shown that the spiral tube heat exchanger's effectiveness is more than the normal parallel flow heat exchanger.

The conclusion from their investigations is that scrubber efficiency depends on energy input per unit of gas flow, whether energy is supplied to the air or the water (contact power theory). This conclusion applies only to well designed equipment when the energy is expended in the gas-liquid contacting.

PERFORMANCE AND COMBUSTION CHARACTERISTICS IN DIESEL ENGINE BY USING MIXED BIODIESEL ALONG WITH ANTIOXIDANT ADDITIVE

A PROJECT REPORT

Submitted by

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Submitted for the Anna University examination held on 13/05/2024

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ABSTRACT

Development of sustainable energy resources is the need of present day in view of the depleting energy resources and increase in the energy demand throughout the world. On the other hand, fossil fuel combustion emits harmful pollutants like oxides of carbon, sulfur, nitrogen and particulate matters, which causes atmospheric pollution. Biodiesel as alternative fuels have various advantages over the fossil fuels such as its renewability, lesser emission of atmospheric pollutants and flexibility to produce from variety of feedstock. Waste cooking oil can be used as a potential feedstock for biodiesel production. Disposal of waste cooking oil itself an environmental challenge due to its adverse environmental impact. Transesterification is the key process for synthesis of biodiesel production with low cost and under mild reaction condition.

The objective of the present work is to produce biodiesel from waste cooking oil mixed with okra seed oil using a homogeneous catalyst. Since the extracted oil has acid value of 12.5 mg KOH/g of oil, it was subjected to esterification process using hydrochloric acid. The maximum biodiesel yield of 97% was obtained under the optimum conditions of molar ratio of 1:6, catalyst concentration of 1.5wt.% (KOH), reaction time of 1.5 hours, at temperature 62°C and 500rpm stirring speed. The biodiesel properties meet the ASTM D7651 standards.

The second objective of the works is to investigate the working characteristics of the produced biodiesel on a compression ignition engine, including its performance, combustion, and emission. In addition, the antioxidant (propyl gallate) 1% was added to the biodiesel and investigated for engine performance. The performance characteristics examined include brake

CHAPTER 7

CONCLUSION

- The present work focused on the production of biodiesel from waste cooking oil and okra oil. The results of FTIR confirmed that complete transformation of biodiesel

- Furthermore, the yield of the esterification process using WCO and okra feedstock was optimised under specific conditions, resulting in a yield of 97%. Similarly, the transesterification process using Potassium hydroxide as catalyst and waste cooking oil and okra seed oil as feedstock is optimised, resulting in an even higher yield of biodiesel at 97%. The results revealed that maximum biodiesel yield of 97% is achieved using eggshell as a catalyst at 1:6MR, 1.5wt % of catalyst concentration, fixed stirrer speed of 500 rpm and 1.5 hours reaction time.

- Finally, emission tests are conducted to evaluate the emissions produced during the combustion process. The results showed that CO, HC and FSN of the B100 and its blends are lower than neat diesel and B20 biodiesel (20% WCO and okra biodiesel and 80% petroleum diesel) is the optimum fuel, as it significantly reduces emissions of carbon monoxide and nitrogen oxides, which are major environmental pollutants while having better performance than B100.

- It is concluded that, this research work successfully demonstrated the suitability of using waste cooking oil and okra as feedstock and catalysts, respectively, for the production of biodiesel. The engine performance, combustion and emission results show that blending biodiesel with diesel is a promising approach to reduce emissions and improve engine

efficiency. The findings of this work are useful for the development of a sustainable biodiesel production process using waste cooking oil and okra oil

7.1 FUTURE SCOPE OF WORK

With a growing global demand for alternative energy sources, the development and optimization of biodiesel production from waste chicken fat and eggshells can offer a promising solution to the energy crisis. The following future scope proposes several directions for innovation and research to ensure the viability of this approach.

- Technological advances and efficiency gains-higher biomass yields per acre and more gallons of biofuel per ton of biomass-could steadily reduce the economic cost and environmental impacts of biofuel production.
- Biofuel production will likely be most profitable and environmentally benign in tropical areas where growing seasons are longer, per acre biofuel yields are higher, and fuel and other input costs are lower.
- Explore the use of different types of feedstocks, such as mustard or jackfruit seed oil.
- Investigate the impact of the process parameters such as reaction temperature, reaction time, and methanol to WCO and okra ratio on the yield.

EXPERIMENTAL INVESTIGATION OF PROTON EXCHANGE MEMBRANE BASED FUEL CELL

A PROJECT REPORT

Submitted by

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Submitted for the Anna University examination held on 13.5.24

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ABSTRACT

Proton Exchange Membrane (PEM) fuel cells have garnered significant attention due to their high efficiency and clean energy production. This paper presents a comprehensive overview of a PEM fuel cell setup, detailing its components, operation, and applications. The setup comprises five main components the anode, cathode, proton exchange membrane, bipolar plates, and gas diffusion layers. Hydrogen gas is fed to the anode side, where it undergoes catalytic oxidation, releasing protons and electrons. Protons migrate through the PEM to the cathode, while electrons travel through an external circuit, generating electrical power. At the cathode, oxygen gas reacts with protons and electrons, forming water as the only byproduct. Key factors affecting the performance of the PEM fuel cell include temperature, humidity, pressure, and catalysts. Proper control and optimization of these parameters are essential for maximizing efficiency and durability. Applications of PEM fuel cells range from portable electronics and backup power systems to transportation and stationary power generation. Their versatility, high power density, and low emissions make them a promising solution for clean energy needs.

CHAPTER 9
CONCLUSION

In conclusion, proton exchange membrane fuel cells (PEMFCs) offer a promising solution to the world's energy needs, providing clean and efficient power generation with minimal environmental impact. Through their ability to convert chemical energy directly into electrical energy, PEMFCs hold great potential for widespread adoption in various applications, from transportation to stationary power generation.

Despite their numerous advantages, challenges remain, including cost reduction, durability improvement, and infrastructure development. However, ongoing research and technological advancements are steadily addressing these obstacles, paving the way for PEMFCs to become a key player in the transition towards a sustainable energy future.

Overall, the PEM fuel cell technology shows great potential in the production of electricity sustainable energy source. With further advancements and continued research, it has the capacity to contribute significantly to the transition towards a low-carbon and renewable energy future.

As we continue to invest in the development and deployment of PEMFC technology, it is crucial to prioritize collaboration between industry, academia, and government agencies to accelerate progress and ensure the widespread adoption of this clean energy solution. With concerted efforts, PEMFCs can play a vital role in reducing greenhouse gas emissions, mitigating climate change, and securing a more sustainable energy landscape for future generations.

EXPERIMENTAL INVESTIGATION OF HYDROGEN PRODUCTION USING DRY CELL ELECTROLYSIS PROCESS

A PROJECT REPORT

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DECLARATION

We hereby declare that the work entitled **"EXPERIMENTAL INVESTIGATION OF HYDROGEN PRODUCTION USING DRY CELL ELECTROLYSIS PROCESS"** is submitted in partial fulfillment of the requirement for the award of the degree in Bachelor of Engineering, Anna university, Chennai, is a record of our own work carried out by us during the academic year 2023 - 2024 under the supervision and guidance of MR. R.MANICKAM,M.E.,(Ph.D).
Assistant Professor, Department of Mechanical Engineering, M.I.E.T. Engineering College, Tiruchirappalli.

The extent and source of our information were derived from the existing literature and have been indicated through the dissertation at the appropriate places. The content embodied in this work is original and has not been submitted for the award of any other degree or diploma, either in this or any other university.

LOGESH.M

MANIKANDAN.R

OMKAILESHWARAN.T

SHRIVARSHAN.B

I certify that the declaration made above by the candidate is true.

Mr. R.MANICKAM, M.E.,(Ph.D).

Assistant Professor

Department of Mechanical Engineering

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ABSTRACT

At this present modern day, continuous consumption of fossil fuel and consequent harmful emissions demand is the need for alternative fuel. Water electrolysis is the most promising method to produce a Hydrogen-Oxygen (HHO) mixture. However the less energy consumption is aimed to maximize the HHO production. The aim of the research is to produce the maximum gas flow rate from dry cell by modified design configurations. HHO is produced by water electrolysis in parallel plates are brass plate and rubber gasket using different concentration of NaOH and KOH. It is also aimed to study the effects of different parameters such as electrolyte type (NaOH and KOH), electronic concentration, electrode spacing, electrolyte temperature, applied current voltage and operating time to maximize the gas yield in dry cell. Effects of flow current, voltage, electrolyte concentration, temperature, operating time and electrolyte types on HHO flow rate were studied. The voltage increase from 2 to 4 VDC led to the electrolyser efficiency increase to 50% but after that it was decreased. The applied voltage increase from 2 to 11 VDC increased the HHO flow rate from 120 to 460 ml/min. The current increase from 8 to 14 A, produced the electrolyser efficiency of 72 % and decreased after that. The current increase from 6 to 18A, led the actual flow rate increase from 137 to 654 ml/min. After operating time of 30 min., the HHO flow rate reached the highest stable values of 866, 985, 1040 and 1090 ml/min at 5, 10, 15 and 20 g NaOH concentrations, respectively. The electrolyte concentration of 5 g NaOH in cell configuration [4C3A19N] and supplied current of 14 A led to the highest HHO productivity of 866 ml/min and electrolyser efficiency of 72.1%. HHO dry cell is economical and efficient.

Keywords :- AC to DC Converter , NaOH and KOH , Dry Cell stack , Silicon gasket , Acrylic tube , Brass Plate , Electrolyte, HHO.

CHAPTER 10
CONCULSION

In conclusion, the dry cell electrolyzer is a technology that holds great promise in the field of hydrogen production. It is an electrochemical device that uses water as a feedstock to produce hydrogen gas, which can be used as a clean and renewable energy source. The dry cell electrolyzer operates by passing an electric current through water, causing the water molecules to split into hydrogen and oxygen gases through a process known as electrolysis. This technology offers several advantages, including high efficiency, scalability, and the ability to utilize a wide range of water sources. One of the key advantages of the dry cell electrolyzer is its high efficiency in hydrogen production. It has the potential to achieve high conversion rates, meaning that a significant amount of the input energy can be effectively converted into hydrogen gas. This efficiency makes the dry cell electrolyzer an attractive option for large-scale hydrogen production, which is crucial for meeting the growing demand for clean energy. Further more, the dry cell electrolyzer is a scalable technology, meaning it can be adjusted to different production capacities based on the required hydrogen output. This scalability makes it suitable for various applications, from small-scale installations for residential or industrial use to large-scale hydrogen production for transportation or energy storage. Additionally, the dry cell electrolyzer has the advantage of being able to utilize different water sources, including freshwater, seawater, and wastewater. This versatility allows for flexibility in locating the electrolyzer units and reduces the strain on freshwater resources, making it a more sustainable option for hydrogen production. However, it is important to note that there are still challenges that need to be addressed for widespread adoption of dry cell electrolyzers. These challenges include the cost of

materials, durability of the electrodes, and the overall system's long-term stability. Ongoing research and development efforts are focused on addressing these challenges and improving the performance and cost effectiveness of dry cell electrolyzers. Overall, the dry cell electrolyzer technology shows great potential in the production of hydrogen as a clean and sustainable energy source. With further advancements and continued research, it has the capacity to contribute significantly to the transition towards a low-carbon and renewable energy future. The electrolysis process offers significant potential for various industrial, environmental, and energy applications In conclusion, electrolysis represents a promising pathway for sustainable energy production, environmental protection, and industrial innovation. With ongoing advancements and support, electrolysis has the potential to become a cornerstone of the clean energy landscape, driving positive impacts for society and the planet. Electrolysis, driven by renewable energy sources, enables the clean and efficient generation of hydrogen gas without carbon emissions. This method offers versatility across industries, from transportation to industry and energy storage, fostering a transition away from fossil fuels. As electrolyser technologies continue to advance and costs decline, the scalability and commercial viability of hydrogen production are steadily improving. applicable in transportation, industry, and energy storage. Its environmental benefits lie in its potential to decarbonize sectors traditionally reliant on fossil fuels. Advancements in electrolyser technology, coupled with the increasing availability of renewable energy sources, Embracing electrolytic hydrogen production not only reduces reliance on finite resources but also mitigates environmental impacts, contributing to efforts to combat climate change. By investing in and adopting electrolysis for hydrogen production, we can pave the way for a cleaner, greener future powered by renewable energy and sustainable practices.

EXPERIMENTATION OF SYN GAS PRODUCTION FROM WASTE BIO MATERIAL IN TWO STAGE GASIFIER BY AIR AND STEAM MEDIUM

A PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that this project report **"EXPERIMENTATION OF SYN GAS PRODUCTION FROM WASTE BIO MATERIAL IN TWO STAGE GASIFIER BY AIR AND STEAM MEDIUM"** is the bonafide work of **R.KISHORE HIRAN (812420114336), SHEIK ABDULLAH S (812420114383), HARI HARAN M (812420114502)** and **MOHAMED ARSATH M (812420114701)** who carried out the project work under my supervision.

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The report of the project work submitted by the above students in partial Fulfillment of the award of Bachelor of Engineering Degree in Mechanical Engineering of Anna University is evaluated and confirmed to be the report of the work done by the above students.

Submitted for the Anna University examination held on 13-05-24

INTERNAL EXAMINER **EXTERNAL EXAMINER**

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ABSTRACT

At present scenario agricultural waste bio material are not mostly used in the production of Syn gas. So we are using agricultural waste bio material to produce Syn gas. In downdraft gasifier with two stage gasification along with the steam medium is not widely used. In this present work steam and air working as a gasification medium to improve carbon conversion efficiency, tar reduction, gasifier working efficiency.

The experimentation of syn gas from waste bio-material using a two-stage gasifier employing both air and steam as mediums is a promising avenue for sustainable energy production. This study aims to investigate the feasibility and efficiency of this process, offering insights into its potential as an eco-friendly energy solution.

The two-stage gasification process involves the sequential utilization of air and steam as gasification agents. This approach aims to optimize gas yield while minimizing undesired by-products such as tar and char. The choice of waste bio-material as feedstock underscores the environmental benefits of utilizing renewable resources for energy generation.

CHAPTER 8

CONCLUSION

The experimentation of syn gas production from waste bio-material in a two-stage gasifier utilizing both air and steam as mediums holds significant promise in addressing environmental and energy challenges. Through our research, we have observed the feasibility of this approach in efficiently converting waste biomass into valuable synthesis gas, which can be utilized for various industrial applications, including electricity generation and chemical synthesis.

The two-stage gasification process offers several advantages, including improved gas quality, higher gas yield, and better control over the reaction parameters. By incorporating steam into the gasification process, we have demonstrated enhanced gasification efficiency and reduced tar content in the produced syn gas, thereby enhancing its suitability for downstream applications.

DESIGN AND FABRICATION OF CYCLONE SEPARATOR AND ASH COLLECTION BOX FOR CIRCULATING BED GASIFIER

A PROJECT REPORT

Submitted by

LOKESH BABU.R	**(812419114340)**
MADESHWAR.R	**(812419114341)**
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in

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APRIL 2024

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ABSTRACT

To design a cyclone separator abatement system for particulate control, it for circulating fluidized bed gasifier application. In this present work, new the methods for computing travel distance, numbers of turns and cyclone pressure drop are studied. The flow pattern and cyclone dimensions determine the travel is tancein a cyclone. The number of turns is calculated based on this travel distance. The new theoretical analysis of cyclone pressure drop is tested against measured data at different inlet velocities and gave excellent agreement. The results show that cyclone vary with cyclone diameter Cyclone cut-points for different dusts are traced measured cyclone overall collection efficiencies and the theoretical model for calculating cyclone overall efficiency. The cut-point correction models 2D cyclones are developed through regression fit from traced and theoretical cut points Diameter. Experimental results indicated optimal cyclone design velocities, which are for 2D cyclones, is determined based on standard air density. It is important to consider the air density effect on cyclone performance in the design of cyclone abatement systems. The tangential inlet generates the swirling motion of the gas stream, which forces particles toward the outer wall where they spiral in the downward direction. Eventually, the particles are collected in the dust bin locate the bottom of the conical section of the cyclone body. The cleaned gas leaves through the exit pipe at the top. The ash content are collected by an ash collection box, it's fitted in the bottom of cyclone separator.

CHAPTER 7

CONCLUSION

It is observed from the efficiency formula that an increase in the density. Number of turns increases the device's efficiency which is similar to the conclusion which can be made from centrifugal force equation (i.e., increase in particle weight increases centrifugal force which helps in better separation).

Cyclone separators are mechanical systems that control particulate emissions by use of centrifugal separation process. Static pressure drop is the most important factor in evaluating the performance of this pollutant control device. Other factors such as particulate size, Cyclone dimensions, inlet particulate speed and particulate concentration in air are very essential in evaluating the cyclone collection performance. The cyclone particulates collection efficiency increases with increasing particulate size. Thus large diameter cyclones are most effective removing large particulates from large particulates – laden gas steam. Cyclonic separation remains one of the most effective particulate pollutant control measures. If the size of sample is the collection efficiency is almost same for the sample. With an increase in density of the sample, collection efficiency increases linearly. For the same velocity (or for the same power consumption). Highly dense particles are removes with higher collection efficiency compare to low dense particles.

DESIGN AND DEVELOPMENT OF BLENDING MACHINE FOR A VIBRATING BALL MILL USED IN POWDER METALLURGY

A PROJECT REPORT

Submitted by

KIRUBANITHI P (812420114335)

SOLOMON LAWRANCE B (812420114387)

VIJAY S (812420114394)

in partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

in

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ABSTRACT

This project presents the design and fabrication of a ball mill integrated with a vibrating step-up mechanism. Powder metallurgy (PM) is increasingly favored for its efficient output across various industries. The study delves into the application of vibrating ball mills within PM processing, emphasizing their pivotal role in enhancing powder mixing and grinding. The vibrating ball mill showcases notable advantages, including heightened mixing efficiency, reduced processing durations, and operability under controlled atmospheres. However, a significant challenge lies in the time-consuming nature of powder processing conditioning. Traditional ball mills for powder blending often prolong the process, hindering efficiency. To address this drawback, a vibrating source is introduced to facilitate easier blending. The project assesses the time required for powder blending and outlines procedures to optimize efficiency in powder metallurgy processing. By introducing innovative methodologies, this project seeks to streamline the powder blending process, thereby enhancing productivity and output quality in powder metallurgy applications.

CHAPTER 7

CONCLUSION

The integration of double-axis movement and vibration into our powder metallurgy blinding machine represents a significant advancement in powder processing technology. We have demonstrated the tangible benefits of these innovations, including enhanced mixing and blending efficiency, improved material homogeneity, and reduced processing time. By introducing movements in we achieved better dispersion of powder particles leading to a more uniform blend and eliminating the risk of uneven distribution. Additionally,the incorporation of vibration effectively broke up agglomerates, ensuring thorough inter-particle interactions and further enhancing the homogeneity of the final mixture. These enhancements not only improve the quality of powdered materials but also contribute to increased productivity and cost-effectiveness in powder metallurgy processes. Moving forward, the success of this project underscores the importance of continuous innovation in manufacturing technologies, driving advancements that elevate the performance and reliability of industrial processes. With further refinement and optimization, the principles demonstrated in this project hold the potential to revolutionize powder processing methodologies and pave the way for future developments in the field of metallurgy and beyond.

DESIGN AND FABRICATION OF SHELL AND TUBE HEAT EXCHANGER AND SCRUBBER FOR CIRCULATING FLUIDIZED BED GASIFIER

A PROJECT REPORT

Submitted by

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ABSTRACT

Biomass gasification is a promising technology that converts organic materials such as agricultural residues, forest residues, and energy crops into clean, renewable energy sources such as syngas and biochar. This process involves thermo chemical conversion in a controlled environment, resulting in the production of a combustible gas primarily composed of hydrogen, carbon monoxide, and methane. The syngas generated can be utilized for various applications including electricity generation, heat production, and biofuels synthesis. Biomass gasification offers several advantages including reduced greenhouse gas emissions, potential for waste valorization, and energy security. However, challenges such as feedstock availability, technological complexity, and economic viability need to be addressed for widespread adoption. This abstract provides an overview of biomass gasification technology, its applications, benefits, challenges, and future prospects in the transition towards a sustainable energy future.

Circulating Fluidized Bed (CFB) gasification has emerged as a versatile and efficient technology for converting various feedstock's into valuable syngas. This abstract delves into the fundamental principles and operational mechanisms of CFB gasifier, highlighting their unique capabilities in handling a wide range of biomass, coal, and waste materials. By suspending particles in a fluidized state, CFB gasifier offer enhanced heat and mass transfer, facilitating through conversion and minimizing tar formation. This abstract explores recent developments, challenges, and future prospects of CFB gasification, emphasizing its role in advancing towards a cleaner and more sustainable energy landscape.

CHAPTER 8

CONCLUSION

In conclusion, the design and fabrication of the shell-and-tube heat exchanger and wet scrubber have been successfully completed. Through careful consideration of factors such as heat transfer requirements, material selection, and operational efficiency, both systems have been tailored to meet the specific needs of the application. The shell-and-tube heat exchanger provides efficient heat transfer between two fluids, while the wet scrubber effectively removes pollutants from gas streams. The fabrication process adhered to industry standards, ensuring reliability and safety. Overall, these systems represent reliable and efficient solutions for heat transfer and pollution control in industrial processes.

CERTIFICATE

OF INTERNSHIP

This internship program certificate is proudly awarded to

AK. ABDHUL KANI

For his outstanding completion of the internship program at firm **CKEE ENGINEERING PRIVATE LIMITED** for the role of **Laser Machine Trainee** from **19.06.2023** to **30.06.2023.**

He is found to be hardworking, sincere and diligent. We wish him all the best for future.

G. Marimuthu
General Manager

CKEE ENGINEERING PVT LTD. TUTICORIN

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This internship program certificate is proudly awarded to

K. SAKAYA MANSTON

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CERTIFICATE OF INTERNSHIP

This Internship program certificate is proudly awarded to

KEVIN CHRISTOBAR RAJ .P

Student of MIET Engineering College, Trichy (Reg. No. : 81242114018), For his outstanding completion of the Internship program at Toolfab Engineering Industries Pvt. Ltd, Trichy from 20.06.2023 to 04.07.2023.

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Date: 05/07/2023

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We wish him all success in his future endeavors.

For High Energy Batteries (India) Ltd

N Balamurugan
Deputy General Manager (Personnel)

High Energy Batteries (India) MATHUR 622 515

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We wish him all success in his future endeavors.

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We wish him all success in his future endeavors.

For High Energy Batteries (India) Ltd

N Balamurugan
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We wish him all success in his future endeavors.

For High Energy Batteries (India) Ltd

N Balamurugan
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Pudukkottai-621316, Tamilnadu, India. +9894675725
Website : www.ranegroup.com
CIN : U35999TN1987PTC014606

12.07.2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that ***Mr.K.R.Vijay Hariharan****, who is pursuing his Second Year B.E.Mechanical Engineering at MIET Engineering College, Trichy has completed his Internship at our Organization in between 22.06.2023 – 08.07.2023.*

For ZF Rane Automotive India Pvt, Ltd.

L.Manikantan
AGM - HR

12/7/23

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Indian Auto Agency.

TATA MOTORS

TATA Authorised Service Station

20/07/2023

To whom so ever it may concern

This is to certify that Mr.I.SANTHOSH S/o S.ILANGOVAN a student of MIET ENGINEERING COLLEGE ,TRICHY has successfully completed 15 days practical training in automobiles repairs from 23/06/2023 to 07/07/2023 at our garage. During the period of his training his punctuality, sincerity and ability to observe is highly appreciated by us. We wish him prosperous with his career.

Yours,

For INDIAN AUTO AGENCY

Proprietor.

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Thanjavur Main Road, ...dapathy ... Ayyappan Panchayat Tiruverum - 6?3 ?5?
... agenciestvr@gmail.Com

Cell : 98422 49251

SHRI VELAN CONES

Manufacturing of : Paper Cones

9/186, Saradha Nagar, Tholampalayam Road, Karamadai,
Coimbatore - 641 104.

Ref. Date :

Date : 08/07/2023

CERTIFICATE

This is to certify that Mr. S. Vikram (R. No.812421114031), studying Second Year B.E.,Mechanical Engineering at M.I.E.T. Engineering College, Trichy, had done his internship training in our Organization during the Period 26/06/2023 to 08/07/2023, During this Period, he Showed interest in learning new things.

We wish him all Success in his future endeavors.

For Shri Velan Cones

SHRI VELAN CONES

S. Senthil Murugan, (Partner)

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Cell : 98422 49251

SHRI VELAN CONES

Manufacturing of : Paper Cones

9/186, Saradha Nagar, Tholampalayam Road, Karamadai,
Coimbatore - 641 104.

Ref.

Date :

Date : 08/07/2023

CERTIFICATE

This is to certify that Mr. B. Keerthick Henz (R. No.812421114017), studying Second Year B.E.,Mechanical Engineering at M.I.E.T. Engineering College, Trichy, had done his internship training in our Organization during the Period 26/06/2023 to 08/07/2023, During this Period, he Showed interest in learning new things.

We wish him all Success in his future endeavors.

For Shri Velan Cones

SHRI VELAN CONES * CBE *

S. Senthil Murugan, (Partner)

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

18

Cell : 98422 49251

SHRI VELAN CONES

Manufacturing of : Paper Cones

9/186, Saradha Nagar, Tholampalayam Road, Karamadai,
Coimbatore - 641 104.

Ref.

Date :

Date : 08/07/2023

CERTIFICATE

This is to certify that Mr. B. Mohamed Anas(R. No.812421114021), studying Second Year B.E.,Mechanical Engineering at M.I.E.T. Engineering College, Trichy, had done his internship training in our Organization during the Period 26/06/2023 to 08/07/2023, During this Period, he Showed interest in learning new things.

We wish him all Success in his future endeavors.

For Shri Velan Cones

VELAN CONES AIMS CBE

S. Senthil Murugan, (Partner)

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Cell : 98422 49251

SHRI VELAN CONES

Manufacturing of : Paper Cones

9/186, Saradha Nagar, Tholampalayam Road, Karamadai,
Coimbatore - 641 104.

Ref.

Date :

Date : 08/07/2023

CERTIFICATE

This is to certify that Mr. C. Matheshwaran(R. No.812421114020), studying Second Year B.E.,Mechanical Engineering at M.I.E.T. Engineering College, Trichy, had done his internship training in our Organization during the Period 26/06/2023 to 08/07/2023, During this Period, he Showed interest in learning new things.

We wish him all Success in his future endeavors.

For Shri Velan Cones

SHRI VELAN CONES * CBE *

S. Senthil Murugan, (Partner)

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

14

Aero Construction Equipments

Plot No:15, Angelo Nagar,
Kosappur, Madhavaram,
Chennai - 600060.Tamilnadu.
Ph: 044- 69060260,79659599.
Mobile: 09940024686
salesnservices@aceipl.in
www.aceipl.in,www.aceipl.com.

Dealers in Jetting Pumps, Vaccum Pumps,Control valves, PTO, Power Packs, Hydraulic cylinders & Tanks, Split Shaft Units.

GOVT APPROVED WORKSHOP NO: 84 /5694 / 2023-2 MAJOR 2023-2025

INTERPUMP HYDRAULICS

CERTIFICATE

Prainsoli

This is to certify that **Mr. A. Arun kumar S/O Alagu** student of IV year, B.E.(Mechanical Engineering), M.I.E.T. Engineering collage, has under gone **Internship Training on Sewage Cleaning Equipment's (Automobile) of CMWSSB Board "** conducted at our firm for a period of Two weeks From **29.06.2023** to **13.07.2023.**

RZB

AERO CONSTRUCTION EQUIPMENTS CHENNAI 600 060

TRAINER

For AERO CONSTRUCTION EQUIPMENTS

Authorised Signatory

HEAD OF CENTRE

Jurop

MORO KAISER COMPONENTS

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Aero Construction Equipments

Plot No:15, Angelo Nagar,
Kosappur, Madhavaram,
Chennai - 600060. Tamilnadu.
Ph: 044- 69060260,79659599.
Mobile: 09940024686
salesnservices@aceipl.in
www.aceipl.in,www.aceipl.com.

Dealers in Jetting Pumps, Vaccum Pumps,Control valves, PTO, Power Packs, Hydraulic cylinders & Tanks, Split Shaft Units.

GOVT APPROVED WORKSHOP NO: 84 /5694 / 2023-2 MAJOR 2023-2025

INTERPUMP HYDRAULICS

Pratissoli

CERTIFICATE

This is to certify that **Mr. S. Akash S/O A.Subbiya** student of IV year, B.E.(Mechanical Engineering), M.I.E.T. Engineering collage, has under gone **Internship Training on Sewage Cleaning Equipment's (Automobile) of CMWSS Board "** conducted at our firm for a period of Two weeks From **29.06.2023 to 13.07.2023.**

RZB

AERO CONSTRUCTION EQUIPMENTS

TRAINER

For AERO CONSTRUCTION EQUIPMENTS

Authorised Signatory

HEAD OF CENTRE

jurop

MORO KAISER COMPONENTS

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Aero Construction Equipments

Plot No:15, Angelo Nagar,
Kosappur, Madhavaram,
Chennai - 600060.Tamilnadu.
Ph: 044- 69060260,79659599.
Mobile: 09940024686
salesnservices@aceipl.in
www.aceipl.in,www.aceipl.com.

Dealers in Jetting Pumps, Vaccum Pumps,Control valves, PTO, Power Packs, Hydraulic cylinders & Tanks, Split Shaft Units.

GOVT APPROVED WORKSHOP NO: 84 /5694 / 2023-2 MAJOR 2023-2025

INTERPUMP HYDRAULICS

Pratissoli

CERTIFICATE

This is to certify that **Mr. S. Dharun S/O M. Shanmuga Priyan,** student of IV year, B.E.(Mechanical Engineering), M.I.E.T. Engineering collage, has successfully under gone " **Internship Training on Sewage Cleaning Equipment's (Automobile) of CMWSS Board** " conducted at our firm for a period of Two weeks From **29.06.2023 to 13.07.2023.**

RZB

AERO CONSTRUCTION EQUIPMENTS CHENNAI 600 060

For AERO CONSTRUCTION EQUIPMENTS

Authorised Signatory

jurop

TRAINER

HEAD OF CENTRE

MORO KAISER COMPONENTS

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

BUNGE

17

15-07-2023

Internship Certificate

This is to certify that **Mr. Jambukeshwaran S**, (Reg No: E2222037), a student of B.E (Mechanical Engineering) at M.I.E.T. Engineering College has successfully completed Internship from 29-06-2023 to 14-07-2023 at our factory, Bunge India Pvt ltd, in Edamalaipattipudur, Trichy.

During the tenure of visit, the student trainee was observed to be punctual, objective & dedicated.

We wish him all Success in future endeavors.

For, Bunge India Private Limited.

15/7/23.

Srivathsan S

Manager – HR

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Bunge India Private Limited
Edamalaipatti Pudur,
Trichy - 620 012.
Phone : 91-0431-2471765 / 2471766, Fax : 91-0431-2471769
www.bunge.com

Corporate Office :
601 C & 601 D 6th Floor, The Capital,
C-70, G Block, Bandra Kurla Complex,
Bandra East, Mumbai - 400 051.
CIN No : U74110MH1958PTC174267

Nitro Auto Components Manufacturers Private Limited
Address : No : 147/3 , Kannampalayam, Trichy Road, Sulur, Coimbatore - 641405
www.autocomponents.in

18

COMPLETION CERTIFICATE

This is to certify that **Mr. J.MOHAMED NAFEEZ,** Student of **BE (Mechanical Engineering)** at **M.I.E.T. ENGINEERING COLLEGE, TRICHY** , has successfully completed the internship training for a period of 2 weeks with organization **"Nitro Auto Components Manufacturing, Coimbatore "** from **03.07.2023 To 17.07.2023** . As per our measurements and reporting structure he is hard working and has been excellent during the training program.

Nitro Auto Components Manufactures Private Limited * Coimbatore *

Production in charge
(M. Kumar, B.E)

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Mail.Id : nitroautocomponents@gmail.com, Mobile : 8122350345

Nitro Auto Components Manufacturers Private Limited
Address: No. 147/3, Kannampalayam, Trichy Road, Sulur, Coimbatore - 641405
www.autocomponents.in

COMPLETION CERTIFICATE

This is to certify that **Mr. S.ABDUL AFSAR AHAMED,** Student of **BE (Mechanical Engineering)** at **M.I.E.T. ENGINEERING COLLEGE, TRICHY** , has successfully completed the internship training for a period of 2 weeks with organization **"Nitro Auto Components Manufacturing, Coimbatore "** from **03.07.2023 To 17.07.2023** . As per our measurements and reporting structure he is hard working and has been excellent during the training program.

Nitro Auto Components Manufactures Private Limited * Coimbatore *

Production in charge
(M. Kumar,.B.E)

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Mail Id: nitroautocomponents@gmail.com, Mobile: 8122350345

VTE

Valve Tech Engineering
Heavy Machinery,
No.D 85, SIDCO Developed Industrial Estate,
Thuvakudi, Trichy - 620 015
Tamilnadu, India.

Tel :
Cell :
GSTIN : 33AAHFV4915A1ZJ
E-mail : valvetechengg@gmail.com

17.07.2023

CERTIFICATE

This is to certify that Mr. A. Mohamed Imran (Roll No.E2222045) S/o I. Arif Basha, studying in second year B.E Mechanical Engineering at M.I.E.T Engineering College, Trichy had done his internship training in our organization during the period 04.07.2023 to 17.07.2023. During this period, he shown interest in learning new things.

We wish him all success in his future endeavours.

For Valve Tech Engineering

Authorised Signatory

Valve Tech Engg Trichy-15 Thuvakudi

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

GSTIN : 33AABFA0407E1ZF 30376

Altec Fabricators

ISO 9001:2015 Certified

STRUCTURAL ENGINEERS AND CONTRACTORS

D-9 & D-10, DEVELOPED PLOT ESTATE
THUVAKUDI, TRICHY-620 015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. A. Yenish (Roll.No. E2222058), Studying Second Year B.E. Mechanical Engineering at M.I.E.T Engineering College, Trichy, had done his internship training in our organization from 05.07.2023 to 15.07.2023.

He has worked on a project titled **5S certification & training**. This project was aimed at implementation and understanding 5S System of the project.

During his internship he has demonstrated his skills with self-motivation to learn new skills. His performance exceeded our expectations and he was able to complete the project on time

We wish all the best for his upcoming career.

For Altec Fabricators

S.Lakshmikanthan
Manager

ALTEC FABRICATORS * TRICHY-15 *

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Phone : 0431-2500472, Telefax : 0431-2501393, E-mail : al_fab@altecfab.com web site : www.altecfab.com

GSTIN 33AABFA0407E1ZF 30376

Altec Fabricators

STRUCTURAL ENGINEERS AND CONTRACTORS

D-9 & D-10, DEVELOPED PLOT ESTATE
THUVAKUDI, TRICHY-620 015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. C. Ramachandran (Roll.No. E2222052), Studying Second Year B.E. Mechanical Engineering at M.I.E.T Engineering College, Trichy, had done his internship training in our organization from 05.07.2023 to 15.07.2023.

He has worked on a project titled **5S certification & training**. This project was aimed at implementation and understanding 5S System of the project.

During his internship he has demonstrated his skills with self-motivation to learn new skills. His performance exceeded our expectations and he was able to complete the project on time

We wish all the best for his upcoming career.

For Altec Fabricators

S.Lakshmikanthan

Manager

ALTEC FABRICATORS TRICHY-15

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

GSTIN 33AABFA0407E1ZT 30376

Altec Fabricators

STRUCTURAL ENGINEERS AND CONTRACTORS

D-9 & D-10, DEVELOPED PLOT ESTATE
THUVAKUDI, TRICHY-620 015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. P. Pradeep Aldoh (Roll.No. E2222050), Studying Second Year B.E. Mechanical Engineering at M.I.E.T Engineering College, Trichy, had done his internship training in our organization from 05.07.2023 to 15.07.2023.

He has worked on a project titled **5S certification & training**. This project was aimed at implementation and understanding 5S System of the project.

During his internship he has demonstrated his skills with self-motivation to learn new skills. His performance exceeded our expectations and he was able to complete the project on time

We wish all the best for his upcoming career.

For Altec Fabricators

S.Lakshmikanthan
Manager

ALTEC FABRICATORS TRICHY-15

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Phone : 0431-2500472, Telefax : 0431-2501393, E-mail : al_fab@altecfab.com web site : www.altecfab.com

GSTIN : 33AABFA0407E1ZF 30376

Altec Fabricators

STRUCTURAL ENGINEERS AND CONTRACTORS

D-9 & D-10, DEVELOPED PLOT ESTATE
THUVAKUDI, TRICHY-620 015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. V.S.B. Daksesh (Roll.No. E2222034), Studying Second Year B.E. Mechanical Engineering at M.I.E.T Engineering College, Trichy, had done his internship training in our organization from 05.07.2023 to 15.07.2023.

He has worked on a project titled **5S certification & training**. This project was aimed at implementation and understanding 5S System of the project.

During his internship he has demonstrated his skills with self-motivation to learn new skills. His performance exceeded our expectations and he was able to complete the project on time

We wish all the best for his upcoming career.

For Altec Fabricators

S.Lakshmikanthan
Manager

ALTEC FABRICATORS * TRICHY-15 *

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

GSTIN : 33AABFA0407E1ZF 30376

Altec Fabricators

STRUCTURAL ENGINEERS AND CONTRACTORS

D-9 & D-10, DEVELOPED PLOT ESTATE
THUVAKUDI, TRICHY-620 015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. U. Kishore (Roll.No. E2222041), Studying Second Year B.E. Mechanical Engineering at M.I.E.T Engineering College, Trichy, had done his internship training in our organization from 05.07.2023 to 15.07.2023.

He has worked on a project titled **5S certification & training**. This project was aimed at implementation and understanding 5S System of the project.

During his internship he has demonstrated his skills with self-motivation to learn new skills. His performance exceeded our expectations and he was able to complete the project on time

We wish all the best for his upcoming career.

For Altec Fabricators

S.Lakshmikanthan
Manager

ALTEC FABRICATORS TRICHY-15

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

GSTIN : 33AABFA0407E1ZF [30376]

Altec Fabricators

ISO 9001: 2015 Certified

STRUCTURAL ENGINEERS AND CONTRACTORS

D-9 & D-10, DEVELOPED PLOT ESTATE
THUVAKUDI, TRICHY-620 015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. J. Joyal Mathew Raj (Roll.No. E2222039), Studying Second Year B.E. Mechanical Engineering at M.I.E.T Engineering College, Trichy, had done his internship training in our organization from 05.07.2023 to 15.07.2023.

He has worked on a project titled **5S certification & training**. This project was aimed at implementation and understanding 5S System of the project.

During his internship he has demonstrated his skills with self-motivation to learn new skills. His performance exceeded our expectations and he was able to complete the project on time

We wish all the best for his upcoming career.

For Altec Fabricators

S.Lakshmikanthan
Manager

ALTEC FABRICATORS TRICHY-15

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Phone : 0431-2500472, Telefax : 0431-2501393, E-mail : al_fab@altecfab.com web site : www.altecfab.com

GSTIN : 33AABFA0407E1ZF

30376

Altec Fabricators

ISO 9001:2015 Certified

STRUCTURAL ENGINEERS AND CONTRACTORS

D-9 & D-10, DEVELOPED PLOT ESTATE
THUVAKUDI, TRICHY-620 015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. S. Mohamed Abdul Kadar Bhasith (Roll.No. E2222043), Studying Second Year B.E. Mechanical Engineering at M.I.E.T Engineering College, Trichy, had done his internship training in our organization from 05.07.2023 to 15.07.2023.

He has worked on a project titled **5S certification & training**. This project was aimed at implementation and understanding 5S System of the project.

During his internship he has demonstrated his skills with self-motivation to learn new skills. His performance exceeded our expectations and he was able to complete the project on time

We wish all the best for his upcoming career.

For Altec Fabricators

S.Lakshmikanthan

Manager

ALTEC FABRICATORS TRICHY-15

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Phone : 0431-2500472, Telefax : 0431-2501393, E-mail : al_fab@altecfab.com web site : www.altecfab.com

GSTIN : 33AABFA0407E1ZF 30376

Altec Fabricators

STRUCTURAL ENGINEERS AND CONTRACTORS

D-9 & D-10, DEVELOPED PLOT ESTATE
THUVAKUDI, TRICHY-620 015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. V.R. Nishanth (Roll.No. E2222049), Studying Second Year B.E. Mechanical Engineering at M.I.E.T Engineering College, Trichy, had done his internship training in our organization from 05.07.2023 to 15.07.2023.

He has worked on a project titled **5S certification & training**. This project was aimed at implementation and understanding 5S System of the project.

During his internship he has demonstrated his skills with self-motivation to learn new skills. His performance exceeded our expectations and he was able to complete the project on time

We wish all the best for his upcoming career.

For Altec Fabricators

S.Lakshmikanthan
Manager

ALTEC FABRICATORS TRICHY-15

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

GSTIN 33AABFA0407E1ZF 30376

Altec Fabricators

STRUCTURAL ENGINEERS AND CONTRACTORS

D 9 & D 10 DEVELOPED PLOT ESTATE
THUVAKUDI, TRICHY-620 015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. S. Yaswanth (Roll No. E2222057), Studying Second Year B.E. Mechanical Engineering at M.I.E.T Engineering College, Trichy, had done his internship training in our organization from 05.07.2023 to 15.07.2023.

He has worked on a project titled **5S certification & training**. This project was aimed at implementation and understanding 5S System of the project.

During his internship he has demonstrated his skills with self-motivation to learn new skills. His performance exceeded our expectations and he was able to complete the project on time.

We wish all the best for his upcoming career.

For Altec Fabricators

S.Lakshmikanthan

Manager

ALTEC FABRICATORS TRICHY-15

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

YAMAHA

S S MOTO CORPZ.

20-JUL-2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. R. Veerapandiyan, a student of the 5th semester, has a B.E. in Mechanical Engineering from M.I.E.T. Engineering College, Trichy. He underwent internship work from 6-JUL-2023 to 19-JUL-2023 (2 weeks), and as an intern, he showed involvement and wiliness to learn. He completed the internship under the technical guidance of our workshop manager. His performance was satisfactory during the internship. We wish him all success in his future endeavors.

SS MOTO CORPZ * 155.30 * Cantonment, Trichy

Managing Director

SS MOTO CORPZ
Authorized Dealer for YAMAHA MOTOR INDIA PVT LTD
Trichy

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

HEAD OFFICE : M1, Royal city, Chatram Bus Stand, Karur Bye-Pass Road, Trichy - 620002. ©+91 431 - 4012166 +91 92446 44440
BRANCH - I : 22/A, Ramakrishna Nagar, Pudukkottai Road, Kallukuzhi, Trichy-620 020. ©+91 431 - 2414187 + 91 94437 24400
BRANCH - II : 17-A, Williams Road, Cantonment, Trichy - 620 001. © + 91 94899 49083 / 94899 49087

YAMAHA

S S MOTO CORPZ.

20-JUL-2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. J. Mohamed Aslam**, a student of the 5th semester, has a B.E. in Mechanical Engineering from M.I.E.T. Engineering College, Trichy. He underwent internship work from 6-JUL-2023 to 19-JUL-2023 (2 weeks), and as an intern, he showed involvement and wiliness to learn. He completed the internship under the technical guidance of our workshop manager. His performance was satisfactory during the internship. We wish him all success in his future endeavors.

Managing Director

SS MOTO CORPZ
Authorized Dealer for YAMAHA MOTOR INDIA PVT LTD
Trichy

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

HEAD OFFICE : M1, Royal city, Chatram Bus Stand, Karur Bye-Pass Road, Trichy - 620002.©+91 431 - 4012166 +91 92446 44440
BRANCH - I : 22/A, Ramakrishna Nagar, Pudukkottai Road, Kallukuzhi, Trichy-620 020.©+91 431 - 2414187 + 91 94437 24400
BRANCH - II : 17-A, Williams Road, Cantonment, Trichy - 620 001. © + 91 94899 49083 / 94899 49087

YAMAHA

S S MOTO CORPZ.

20-JUL-2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. M. Vigneshwaran,** a student of the 5th semester, has a B.E. in Mechanical Engineering from M.I.E.T. Engineering College, Trichy. He underwent internship work from 6-JUL-2023 to 19-JUL-2023 (2 weeks), and as an intern, he showed involvement and wiliness to learn. He completed the internship under the technical guidance of our workshop manager. His performance was satisfactory during the internship. We wish him all success in his future endeavors.

S S MOTO CORPZ

Managing Director

SS MOTO CORPZ
Authorized Dealer for **YAMAHA MOTOR INDIA PVT LTD**
Trichy

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

HEAD OFFICE : M1, Royal city, Chatram Bus Stand, Karur Bye-Pass Road, Trichy - 620002. ✆+91 431 - 4012166 +91 92446 44440
BRANCH - I : 22/A, Ramakrishna Nagar, Pudukkottai Road, Kallukuzhi, Trichy-620 020. ✆+91-431 - 2414187 + 91 94437 24400
BRANCH - II : 17-A, Williams Road, Cantonment, Trichy - 620 001. ✆+ 91 94899 49083 / 94899 49087

YAMAHA

S S MOTO CORPZ.

20-JUL-2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. N. Ahamed Batcha, a student of the 5th semester, has a B.E. in Mechanical Engineering from M.I.E.T. Engineering College, Trichy. He underwent internship work from 6-JUL-2023 to 19-JUL-2023 (2 weeks), and as an intern, he showed involvement and wiliness to learn. He completed the internship under the technical guidance of our workshop manager. His performance was satisfactory during the internship. We wish him all success in his future endeavors.

Managing Director

SS MOTO CORPZ
Authorized Dealer for YAMAHA MOTOR INDIA PVT LTD
Trichy

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

HEAD OFFICE : M1, Royal city, Chatram Bus Stand, Karur Bye-Pass Road, Trichy - 620002. ✆ +91 431 - 4012166 +91 92446 44440
BRANCH - I : 22/A, Ramakrishna Nagar, Pudukkottai Road, Kallukuzhi, Trichy-620 020. ✆ +91 431 - 2414187 + 91 94437-24400
BRANCH - II : 17-A, Williams Road, Cantonment, Trichy - 620 001. ✆ + 91 94899 49083 / 94899-49087

YAMAHA

S S MOTO CORPZ.

20-JUL-2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. A. Azees, a student of the 5th semester, has a B.E. in Mechanical Engineering from M.I.E.T. Engineering College, Trichy. He underwent internship work from 6-JUL-2023 to 19-JUL-2023 (2 weeks), and as an intern, he showed involvement and wiliness to learn. He completed the internship under the technical guidance of our workshop manager. His performance was satisfactory during the internship. We wish him all success in his future endeavors.

S S MOTO CORPZ
155.30
Cantonment Trichy

Managing Director

SS MOTO CORPZ
Authorized Dealer for YAMAHA MOTOR INDIA PVT LTD
Trichy

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M.I.E.T. ENGINEERING COLLEGE
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BRANCH - I : 22/A, Ramakrishna Nagar, Pudukkottai Road, Kallukuzhi, Trichy-620 020.©+91 431 - 2414187 + 91 94437 24400
BRANCH - II : 17-A, Williams Road, Cantonment, Trichy - 620 001. © + 91 94899 49083 / 94899 49087

YAMAHA

S S MOTO CORPZ.

20-JUL-2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. M. Guruadhithyan,** a student of the 5th semester, has a B.E. in Mechanical Engineering from M.I.E.T. Engineering College, Trichy. He underwent internship work from 6-JUL-2023 to 19-JUL-2023 (2 weeks), and as an intern, he showed involvement and witness to learn. He completed the internship under the technical guidance of our workshop manager. His performance was satisfactory during the internship. We wish him all success in his future endeavors.

S S MOTO CORPZ

Manager/Director

SS MOTO CORPZ
Authorized Dealer for YAMAHA MOTOR INDIA PVT LTD
Trichy

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M.I.E.T. ENGINEERING COLLEGE
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BRANCH - 1 : 22/A, Ramakrishna Nagar, Pudukkottai Road, Kallukuzhi, Trichy-620 020.(0)+91 431 - 2414187 + 91 94437 24400

YAMAHA

S S MOTO CORPZ.

20-JUL-2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. S. Naveenkumar,** a student of the 5th semester, has a B.E. in Mechanical Engineering from M.I.E.T. Engineering College, Trichy. He underwent internship work from 6-JUL-2023 to 19-JUL-2023 (2 weeks), and as an intern, he showed involvement and wiliness to learn. He completed the internship under the technical guidance of our workshop manager. His performance was satisfactory during the internship. We wish him all success in his future endeavors.

S S MOTO CORPZ - 31 Cantonment, Trichy

Managing Director

SS MOTO CORPZ
Authorized Dealer for YAMAHA MOTOR INDIA PVT LTD
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M.I.E.T. ENGINEERING COLLEGE
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BRANCH - II : 17-A, Williams Road, Cantonment, Trichy - 620 001. ✆ + 91 94899 49083 / 94899 49087

CNH INDUSTRIAL
GSTIN : 33AEVFS653IDIZU

SRI MURUGAN TRACTORS

SRI MURUGAN TRACTORS
#3/19, Dindigul Main Road,
Ramji Nagar, Trichy - 620009.
+91 72000 49421, +91 94439 49421
srimurugantractors22@gmail.com

INTERNSHIP CERTIFICATE

This is to certify that Mr. MOHAMMED NOWFAL.M(Reg No:E2222047) a student of B.E(Mechanical Engineering) At M.I.E.T Engineering College has Sucessfully Completed Internship form 07-07-2023 to 22-07-2023 At our company, New Holland agriculture branch Sri Murugan Tractors in 3/19,Dindigul main road Ramjinagar,Trichy-9.

During the tenure of unit, the student trainee was observed to be punctual, objective& Dedicated

We wish him all success in future endeavors.

For

Sri Murugan Tractors

SRI MURUGAN TRACTORS TRICHY

Manager

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

NEW HOLLAND AGRICULTURE

CNH INDUSTRIAL
GSTIN : 33AEVFS653IDIZU

SRI MURUGAN TRACTORS
#3/19, Dindigul Main Road,
Ramji Nagar, Trichy - 620009.
+91 72000 49421, +91 94439 49421
srimurugantractors22@gmail.com

INTERNSHIP CERTIFICATE

This is to certify that Mr. Ragul Roshan.M (Reg No:E2222051) a student of B.E(Mechanical Engineering) At M.I.E.T.Engineering College has Sucessfully Completed Internship form 07-07-2023 to 22-07-2023 At our company, New Holland agriculture branch Sri Murugan Tractors in 3/19,Dindigul main road Ramjinagar,Trichy-9.

During the tenure of unit, the student trainee was observed to be punctual, objective& Dedicated

We wish him all success in future endeavors.

For

Sri Murugan Tractors

SRI MURUGAN TRACTORS TRICHY

Manager

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

NEW HOLLAND AGRICULTURE

Rane Engine Valve Limited

CIN No : L74999TN1972PLC006127
GST No : 33AAACT1279M1Z6
PAN No : 33AAACT1279M
www.ranegroup.com

Plant - 5
Survey No. 109 - 111,
P.B.No.001,Seniapatti,Kasavanur Village,
Viralimalai Post, Pudukkottai Dist,
Tamil Nadu - 621 316. India.
Tel : 9790016637, 9790016639

24.07.2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. E. Aravind , 2rd Year BE Mechanical, MIET Engineering College, Tiruchirappalli has completed his In plant training at RANE ENGINE VALVE LTD, Survey No. 109 – 111, Seniapatti, Kasavanur Village, Viralimalai Post, Pudukkottai Dist. – 621316 from 07th July 2023 to 20th July 2023.

During his Internship training, his performance was found to be good.

We wish him all success in his future endeavors.

For RANE ENGINE VALVE LTD.,

B. Muralidharan

Manager - HR

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Rane Engine Valve Limited

CIN No : L74999TN1972PLC006127
GST No : 33AAACT1279M1Z6
PAN No : 33AAACT1279M
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Plant - 5
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Viralimalai Post, Pudukkottai Dist,
Tamil Nadu - 621 316. India.
Tel : 9790016637, 9790016639

18.07.2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. B. Abishek , 2nd Year BE Mechanical, MIET Engineering College, Tiruchirappalli has completed his In plant training at RANE ENGINE VALVE LTD, Survey No. 109 – 111, Seniapatti, Kasavanur Village, Viralimalai Post, Pudukkottai Dist. – 621316 from 07th July 2023 to 18th July 2023.

During his Internship training, his performance was found to be good.

We wish him all success in his future endeavors.

For RANE ENGINE VALVE LTD.,

B. Muralidharan

Manager - HR

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

प्रमाण पत्र सं / Certificate No.: 561/2023

दिनांक / DATE: 22-07-2023

दक्षिण रेलवे
SOUTHERN RAILWAY

कर्मशाला प्रशिक्षण केंद्र / WORKSHOP TRAINING CENTRE
केंद्रीय कर्मशाला, पोनमलै / CENTRAL WORKSHOP, PONMALAI

(An ISO 9001:2000,14001:2004, OSHAS 18001 : 2007 & EnMS 50001:2011 CERTIFIED WORKSHOP)

तिरुच्चिराप्पल्लि / Tiruchirappalli – 620 004

प्रमाण पत्र / CERTIFICATE

यह प्रमाणित किया जाता है श्री / श्रीमती / कुमारी .....

पुत्र / पुत्री ..... , ... के विद्यार्थी ने केंद्रीय कर्मशाला, दक्षिण रेलवे, पोनमलै – 620 004 में दिनांक ..... से ..... तक की अवधि के दौरान इन्टर्नशिप प्रशिक्षण प्राप्त

This is to certify that Shri / Smt / Kum. K. HARISH B.E MECH *S/o/D/o.* R.T. KUMAR *Student of* M.I.E.T ENGINEERING COLLEGE, TRICHY *has undergone Internship Training in Central Workshop, Southern Railway, Ponmalai - 620 004 during the period from* 10-07-2023 *to* 22-07-2023

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

मुख्य अनुदेशक / कें प्र कें / पोनमलै
CHIEF INSTRUCTOR / WTC / GOC

प्राचार्य / कें प्र कें / पोनमलै
PRINCIPAL / WTC / GOC

FICUS
RUBBER WORKS

+91 98435 97085
ficusrubbers20@gmail.com
D 74A,Developerd Plots Estate,
Thuvakudi, Trichy, Tamilnadu-620 015
GSTIN : 33JSOPK4460D1ZM

DATE : 24/07/2023

CERTIFICATE

This is to certify that Mr.K.Balakumaran (R.No.812421114009) , studing second year B.E., Mechanical Engineering at M.I.E.T.Engineering college, Trichy, had done his internship training in our organization during the period 10/07/2023 to 23/07/2023. During this period, he showed interest in learning new things.

We wish him all success in his future endeavours.

For Ficus Rubber Works,

FICUS RUBBER WORKS

proprietor.

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

FICUS
RUBBER WORKS

+91 98435 97085
ficusrubbers20@gmail.com
D 74A,Developerd Plots Estate,
Thuvakudi, Trichy, Tamilnadu-620 015
GSTIN · 33JSOPK4460D1ZM

DATE : 24/07/2023

CERTIFICATE

This is to certify that Mr.P.Haribalan (R.No.812421114011) , studing second year B.E., Mechanical Engineering at M.I.E.T.Engineering college, Trichy, had done his internship training in our organization during the period 10/07/2023 to 23/07/2023. During this period, he showed interest in learning new things.

We wish him all success in his future endeavours.

For Ficus Rubber Works,

proprietor.

FICUS RUBBER WORKS

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

FICUS
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+91 98435 97085
ficusrubbers20@gmail.com
D 74A,Developerd Plots Estate,
Thuvakudi, Trichy, Tamilnadu-620 015
GSTIN : 33JSOPK4460D1ZM

DATE : 24/07/2023

CERTIFICATE

This is to certify that Mr.M.Mohamed Irfan (R.No.812421114318) , studing second year B.E., Mechanical Engineering at M.I.E.T.Engineering college, Trichy, had done his internship training in our organization during the period 10/07/2023 to 23/07/2023. During this period, he showed interest in learning new things.

We wish him all success in his future endeavours.

For Ficus Rubber Works,

proprietor.

FICUS RUBBER WORKS

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

FICUS
RUBBER WORKS

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ficusrubbers20@gmail.com
D 74A,Developerd Plots Estate,
Thuvakudi, Trichy, Tamilnadu-620 015
GSTIN : 33JSOPK4460D1ZM

DATE : 24/07/2023

CERTIFICATE

This is to certify that Mr.N.Jasim Ahamed (R.No.812421114310) , studing second year B.E., Mechanical Engineering at M.I.E.T.Engineering college, Trichy, had done his internship training in our organization during the period 10/07/2023 to 23/07/2023. During this period, he showed interest in learning new things.

We wish him all success in his future endeavours.

For Ficus Rubber Works,

FICUS RUBBER WORKS

proprietor.

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPPALLI-620 007

V.S.T. MOTORS PRIVATE LIMITED
Commercial Vehicle Dealer
TATA MOTORS

DATE: 28/07/2023

INTERNSHIP CERTIFICATE

GINO ALEXANDER.V, a student of **B.E.Mechanical Engineering** from **M.I.E.T. Engineering College, Trichy** has successfully completed Internship from **11/07/2023 to 27/07/2023**.

During this Internship assignment he worked on "Sales & Service Department".

Wish him best for future endeavours.

V.S.T. MOTORS PVT. LTD. CVD SALES TRICHY 01

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GONDUR, TIRUCHIRAPALLI - 620 007

H.O. : 199, Anna Salai, Chennai - 600 002. PHONE : 044 - 2860 2488 / 89
CIN No. : U34300TN1945PTC033210. GST No. 33AABCV8244R1ZU

V.S.T. MOTORS PRIVATE LIMITED
Commercial Vehicle Dealer
TATA MOTORS

DATE: 28/07/2023

INTERNSHIP CERTIFICATE

AMARNATH R.V, a student of **B.E.Mechanical Engineering** from **M.I.E.T. Engineering College, Trichy** has successfully completed Internship from **11/07/2023 to 27/07/2023.**

During this Internship assignment he worked on "Sales & Service Department".

Wish him best for future endeavours.

V.S.T. MOTORS PVT LTD. CV SALES TRICHY 01

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M.I.E.T. ENGINEERING COLLEGE
TRICHIRAPALLI - 620 007

H.O. : 2-D DINDIGUL ROAD, TRICHY - 620 001.
PHONE : (0431) 457223,
H.O. : 199, Anna Salai, Chennai - 600 002. PHONE : 044 - 2000 2495 / 96
CIN No. : U35999TN1949PTC002310. GST No. 33AABCV6744R1ZU

V.S.T. MOTORS PRIVATE LIMITED
Commercial Vehicle Dealer
TATA MOTORS

DATE: 28/07/2023

INTERNSHIP CERTIFICATE

AROCKIA SANTHOSH KUMAR.S, a student of **B.E.Mechanical Engineering** from **M.I.E.T. Engineering College, Trichy** has successfully completed Internship from **11/07/2023 to 27/07/2023**.

During this Internship assignment he worked on "Sales & Service Department".

Wish him best for future endeavours.

V.S.T. MOTORS PVT. LTD. CVD SALES TRICHY 01

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
TRICHIRAPALLI - 620 007

H.O. : 2-D DINDIGUL ROAD, TRICHY - 620 001
PHONE : (0431) 4072229,
H.O. : 192, Anna Salai, Chennai - 600 002. PHONE : 044 - 2000 2488 / 89
CIN No. : U29309TN1995PTC033210, GST No. 33AABCV6244R1ZU

V.S.T. MOTORS PRIVATE LIMITED
Commercial Vehicle Dealer
TATA MOTORS

DATE: 28/07/2023

INTERNSHIP CERTIFICATE

MARTIN.I , a student of **B.E.Mechanical Engineering** from **M.I.E.T. Engineering College, Trichy** has successfully completed Internship from **11/07/2023 to 27/07/2023**.

During this Internship assignment he worked on "Sales & Service Department".

Wish him best for future endeavours.

V.S.T.MOTORS PVT.LTD. CVD TRICHY

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M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

H.O. : 2-D DINDIGUL ROAD, TRICHY - 620 001
PHONE : (0431) 4972221.
H.O. : 199, Anna Salai, Chennai - 600 002. PHONE : 044 - 2860 2468 / 88
CIN No. : U50598TN1948PTC003210. GST No. 33AABCV0244R1ZU

SD

SPF
SHANMUGHA PRECISION FORGING
Forging Ahead

To Whomsoever It May Concern

This is to certify that the following student of Third year- Mechanical of MIET Engineering college - Trichy has done his internship in our organization.

Sl. No.	Name	Roll No.	Duration
1	K. Mohamed Ashiq	E1212019	12 Jul 23 to 20 Jul 23
2	S.Harish	E1212013	12 Jul 23 to 20 Jul 23
3	C.Yogesh	E1212029	12 Jul 23 to 20 Jul 23
4	A:Manojkumar	E1212016	12 Jul 23 to 20 Jul 23

During they stay with us, we found all of them are diligented and we wish them all success in his future endeavors.

Date : 27.09.2023

Place : THANJAVUR

For Shanmugha Precision Forging

V. Sundaraj

Authorised Signatory

(A Unit of Vee See Bee Trust)
ISO 9001 / ISO 14001 / ISO 45001 Certified
121/6A, Trichy Main Road, Thirumalaisamudram, Thanjavur - 613 401, Tamil Nadu, INDIA
Tel : +91 4362 264271 E-mail : sales@spfindia.com www.spfindia.com
GSTIN : 33AAATV0477C1ZS

SPF
SHANMUGHA PRECISION FORGING
Forging Ahead

To Whomsoever It May Concern

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4	A.Manojkumar	E1212016	12 Jul 23 to 20 Jul 23

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Date : 27.09.2023

Place : THANJAVUR

For Shanmugha Precision Forging

V. Sundararaj

Authorised Signatory

(A Unit of Vee See Bee Trust)
ISO 9001 / ISO 14001 / ISO 45001 Certified
121/6A, Trichy Main Road, Thirumalaisamudram, Thanjavur - 613 401, Tamil Nadu, INDIA
Tel : +91 4362 264271 E-mail : sales@spfindia.com www.spfindia.com
GSTIN : 33AAATV0477C1ZS

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Forging Ahead

To Whomsoever It May Concern

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4	A.Manojkumar	E1212016	12 Jul 23 to 20 Jul 23

During they stay with us, we found all of them are diligented and we wish them all success in his future endeavors.

Date : 27.09.2023

Place : THANJAVUR

For Shanmugha Precision Forging

V. Sundaram

Authorised Signatory

(A Unit of Vee See Bee Trust)
ISO 9001 / ISO 14001 / ISO 45001 Certified
121/6A, Trichy Main Road, Thirumalaisamudram, Thanjavur - 613 401. Tamil Nadu, INDIA
Tel : +91 4362 264271 E-mail : sales@spfindia.com www.spfindia.com
GSTIN : 33AAATV0477C1ZS

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

SPF
SHANMUGHA PRECISION FORGING
Forging Ahead

To Whomsoever It May Concern

This is to certify that the following student of Third year- Mechanical of MIET Engineering college - Trichy has done his internship in our organization.

Sl. No.	Name	Roll No.	,Duration
1	K. Mohamed Ashiq	E1212019	12 Jul 23 to 20 Jul 23
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3	C.Yogesh	E1212029	12 Jul 23 to 20 Jul 23
4	A.Manojkumar	E1212016	12 Jul 23 to 20 Jul 23

During they stay with us, we found all of them are diligented and we wish them all success in his future endeavors.

Date : 27.09.2023

Place : THANJAVUR

For Shanmugha Precision Forging

V. Sundararaj

Authorised Signatory

(A Unit of Vee See Bee Trust)
ISO 9001 / ISO 14001 / ISO 45001 Certified
121/6A, Trichy Main Road, Thirunalaisamudram, Thanjavur - 613 401, Tamil Nadu, INDIA
Tel : +91 4362 264271 E-mail : sales@spfindia.com www.spfindia.com
GSTIN : 33AAATV0477C1ZS

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

SHIV MOTORS

myTVS

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **M.WASIM (Reg.No 812421114032)**, a student of B.E, MECHANICAL ENGINEERING II YEAR, M.I.E.T ENGINEERING COLLEGE. Has Undergone Inplant Training at Our **SHIV MOTORS (MY TVS) KUMBAKONAM**. From **12.07.2023 to 22.07.2023**.

We wish him every success in life.

SHIV MOTORS KUMBAKONAM

For Shiv Motors

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

No : 370/3, Chennai Salai, Koranattu Karuppur Post, Kumbakonam - 612 501.
Cell : 75400 44490/91/92/93 Email : shivmotors.kmu@gmail.com

ROCKFORT MOTOHUB PVT. LTD.

Near IOC Petrol Bunk, Old Chennai Trunk Road, T.V. Kovil, Trichy - 5.
Mob. : 73394 18113

DATE: 29/07/2023

INTERNSHIP CERTIFICATE

This is to certify that **Mr. SHEIK MOHAMMED.M** S/o **A.MOHAMMED IBRAHIMSHA** doing Second year **B.E.Mechanical Engineering** student of **M.I.E.T. Engineering College,Trichy** has undergone the Internship Training as in **Sales Department** for the period of **12/07/2023 to 28/07/2023** in our concern.

During this Period his involvement was very good..

ROCKFORT MOTOHUB PVT. LTD. 620005 TRICHY

Authorized Signature.

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

ROCKFORT MOTOHUB PVT. LTD.

Near IOC Petrol Bunk, Old Chennai Trunk Road, T.V. Kovil, Trichy - 5.

Mob. : 73394 18113

DATE: 29/07/2023

INTERNSHIP CERTIFICATE

This is to certify that **MrABUTHAHIR.A S/o S.AMANULLAH** doing Second year **B.E.Mechanical Engineering** student of **M.I.E.T. Engineering College,Trichy** has undergone the Internship Training as in **Sales Department** for the period of **12/07/2023 to 28/07/2023** in our concern.

During this Period his involvement was very good.

ROCKFORT MOTOHUB PVT. LTD. 620005 TRICHY

29/7/2023

Authorized Signatory

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

HONDA

ROCKFORT MOTOHUB PVT. LTD.

Near IOC Petrol Bunk, Old Chennai Trunk Road, T.V. Kovil, Trichy - 5.

Mob. : 73394 18113

DATE: 29/07/2023

INTERNSHIP CERTIFICATE

This is to certify that **MR. SURYA NARAYANAN.A S/o K.N.ANGAMUTHU** doing Second year **B.E.Mechanical Engineering** student of **M.I.E.T. Engineering College,Trichy** has undergone the Internship Training as in **Sales Department** for the period of **12/07/2023 to 28/07/2023** in our concern.

During this Period his involvement was very good.

ROCKFORT MOTOHUB PVT. LTD. 620005 TRICHY 2023

Authorized Signature.

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Department of Energy and Environment
National Institute of Technology, Tiruchirappalli – 620015, India
E-mail:vmjagan@nitt.edu, Tel : +9197108 29732, Fax : 0431 - 2503135

19.09.2023

Internship Certificate

This is to certify that Mr.N.S. Amjath Hussain (Reg Number: 812420114006), final year B.E (Mechanical) student, from M.I.E.T:Engineering College, Trichy has been working in the Department of Energy and Environment, NIT Trichy, under my supervision. His internship spanned from 17th July 2023 to 17th September 2023. During his tenure, Mr.N.S. Amjath Hussain focused on the area of Product Design, utilizing Fusion 360 for design purposes, working with 3D Printing technology, and implementing Arduino for various projects. His performance throughout the internship period was satisfactory, displaying commendable conduct and dedication.

Yours truly

Dr. Jaganathan VM

Dr. V.M. JAGANATHAN
ASSISTANT PROFESSOR
DEPARTMENT OF ENERGY AND ENVIRONMENT
NATIONAL INSTITUTE OF TECHNOLOGY
TIRUCHIRAPPALLI, TAMIL NADU-620 015.

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

17-08-23

From :

MECHANICAL IV YEAR students.
MIET Engineering College,
Gundur, Trichy - 07

17th August 2023

To.

The Head of Department.
MIET Engineering College.
Gundur, Trichy - 07.

Respected Sir,

We are interested in attending an Industrial Visit that will enhance our knowledge regarding mechanical field. So, We kindly request you to permit us for the industrial visit as per your guidance. We assure you that no negative actions will arise during our industrial visit.

Yours faithfully

MECHANICAL IV YEAR
Students.

forwarded to HOD
17/8/23

To / Mr. S. Saravanakumar Lecturer for Letter for approval
Kindly Prepare
17/08/23

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

MIET
INSTITUTIONS

manickam r <manickam.r@miet.edu>

Re: Industrial visit request Letter

1 message

Human Resources @seablue <hr@seablueshipyard.com> Sat, Sep 16, 2023 at 1:45 AM
To: "manickam.r" <manickam.r@miet.edu>

Your request is approved. Entry fee Rs. 100 per student. Regards, ED Xavier

On Sat, 16 Sep, 2023, 1:14 pm manickam.r, <manickam.r@miet.edu> wrote:

> Dear Sir,
>
> **On behalf of M.I.E.T. Engineering College, Trichy where I serve as the Assistant Professor in the Department of Mechanical Engineering, I wish to request for permission to conduct an industrial visit at your company Sea Blue Shipyard, Kochi. Our M.I.E.T. Engineering College is reputed at providing quality education in the various courses in Trichy.**
>
> **We wish to undertake an industrial visit at your company on 23.09.2023 at 10.00 am to acquire practical knowledge in Marine Engineering. Our academic curriculum focuses on engaging students in practical experiences to observe the implementation of what they are taught in M.I.E.T. Engineering College. We believe that your company will give our students relevant knowledge during this visit.**
>
> **A group of Mechanical Engineering students in Final year and faculty members intend to participate in this industrial visit. We are planning to attend the visit with the total strength of 100 students and 3 faculty members. Kindly make arrangements for a tour in the relevant departments in your company.**
>
> **Please allow us to conduct an industrial visit to your company and meet your skilled employee. Kindly contact us on Contact info. If there are other requirements for the visit.**
>
> **Thank you in advance.**
>
> Contact info
>
> **R.Manickam, ME., (PhD)**
>
> Assistant Professor,
>
> Department of Mechanical Engineering,
>
> M.I.E.T. Engineering College,
>
> Trichy, Tamil nadu.
>
> Contact Number : 6381463803, 9566502519.
>
> Email Id : manickam.r@miet.edu

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MIET INSTITUTIONS

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Trichy - Pudukkottai Road, Tiruchirappalli - 620 007. Phone: 0431 2660 303
Website: www.miet.edu | email: principal@miet.edu, controller@miet.edu

21/08/2023

From

Mr.S.Sathish Kumar,
Industrial Visit Coordinator,
Department of Mechanical Engineering,
M.I.E.T. Engineering College,
Trichy - 620 007.

To

The Chairman,
M.I.E.T. Engineering College,
Trichy - 620 007.

Through Proper Channel

Respected Sir,

Subject: Requesting permission for Industrial Visit – Reg.

Industrial visit is also the part of curriculum to enhance the practical knowledge for the engineering students. Final year Mechanical Engineering students may be permitted to visit **M/s.Sea Blue Shipyard**, Kochi and **ISRO**, Trivandrum as an Industrial visit from 21/09/2023 to 23/09/2023. Kindly request you to permit the students (55 persons) along with 2 faculty members.

Thanking You

IV Coordinator
(S.SATHISH KUMAR)
AP/Mechanical

HoD

Principal

Chairman

Prepared to industrial visit only 2 m/s Sea Blue Shipyard

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Website: www.miet.edu, E-mail: principalengg@miet.edu, contact@miet.edu

Industrial Visit Feedback Form from Industry

Course & Department	B.E Mechanical Engineering
Semester / Year	Final year
No.of students visit	53
Accompanying staff members	Two
Name and address of the company	Sea Blue Shipyard Ltd. 1/212 VP Road Azheekal P.O Vypin
Feedback about the students	Good students
Technical details about the company	Ship repairs & Ship building
Authorized signatory with name / designation with seal	Tojen. E Director Sea Blue Shipyard Ltd Kochi - 682503
Any other comments	Try to arrange students for Industrial visit in the 1st years itself

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Trichy – Pudukkottai Road, Tiruchirappalli – 620 007. Phone:0431-2660 303
Website:www.miet.edu, E-mail:principalengg@miet.edu, contact@miet.edu

Department of Mechanical Engineering

Report on Industrial Visit

Company Name : Sea Blue Shipyard Limited, Kochi,
Fort Vypin, Kerala - 682305

Date of visit : 23.09.2023 (Saturday)

No. of Students : 53

Year / Semester : IV / VII

Objective of the visit: During the industrial visit the student able

- To realize the construction of Boats and Ships.
- To acquire the knowledge of Maintenance of Ships.
- To impart the knowledge of Anti Corrosive spray coating on Ships.

About the Visit (Student's observation):

- Students learned about variety of ships and coast guard and Luxury ship building.
- Gaining the knowledge of Docking of ships in respected areas and maintenance work such as Sprayer and patch work on it.
- Analyze of Sea water and Corrosion, Erosion and other environmental impacts on Ships.

Outcome of the visit:

After the completion of industrial visit, the student able to

- To explain the variation of ships and boats according to services and appearance.
- To design and developing the Marine oriented parts.
- To explain the importance of Spraying the Anti corrosive material layer on ships.
- To design the special parts to minimize the corrosion effects of Ships.

CO AND PO, PSO MAPPING

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2
H	M	-	-	-	M	L	H	H	L	-	-	H	M

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Geo -tagged Photos

27/9/23
Industrial Visit Coordinator

29/09/23
HoD / Mech

27/9/23
Principal

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Sea Blue Shipyard Ltd.

(CIN : U35111KL2003PLC016677)

SBSL-IV-032/2023-24

Date: 23/09/2023

Certificate

This is to certify that, 53 - students of final year B.E Mechanical Engineering, accompanied by two faculty members of **M.I.E.T Engineering College, Gundur, Tiruchirapalli, Tamil Nadu,** visited our Shipyard on 23/09/2023 as a part of their curricular activity.

For, Sea Blue Shipyard Ltd.

Ashir Thankachan

Assistant Manager HR

Sea Blue Shipyard Ltd * Kochi - 682508 *

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Website:www.miet.edu, E-mail:principalengg@miet.edu, contact@miet.edu

DEPARTMENT OF MECHANICAL ENGINEERING

Students Name list for Industrial Visit (2023-2024) - Kerala

S.No	Reg Number	Roll Number	Student Name
1	812420114008	E1202008	ARAVINTH R
2	812420114013	E1202013	HAJI MOHAMED S
3	812420114015	E1202015	JEYAPRADEEPKUMAR C
4	812420114018	E1202018	MOHAMED FAYIZ S
5	812420114022	E1202022	MUTHUSAMY S
6	812420114024	E1202024	PUGAZHENTHI M
7	812420114027	E1202027	SHAJAKHAN S
8	812420114029	E1202029	SUBASH A
9	812420114030	E1202030	SUBRA K
10	812420114031	E1202031	THOUFIQ UMAR S
11	812420114033	E1202033	VIJAY K
12	812420114035	E1202035	YUVARAM S
13	812420114303	E 2212038	AKASH S
14	812420114305	E 2212040	AMJETH A
15	812420114308	E 2212043	ARUN S
16	812420114309	E 2212044	ARUN KUMAR A
17	812420114310	E 2212045	ASHIK AHAMED S
18	812420114311	E 2212046	ASHIK FEROZ T M
19	812420114312	E 2212047	BHARATHVAJ S
20	812420114315	E 2212050	DEVA T
21	812420114316	E 2212051	DHANUSH VERMAN A
22	812420114317	E 2212052	DHARUN S
23	812420114318	E 2212053	DHINAKARAN AKASH RAJ R M
24	812420114322	E 2212057	GOKUL M
25	812420114323	E 2212058	HARIHARAN M
26	812420114324	E 2212059	HARI HARAN R
27	812420114326	E 2212061	IMAM KHAN R
28	812420114329	E 2212064	JASEEM KHAN H
29	812420114331	E 2212066	JAYASURYA S
30	812420114503	E 3192134	BALAJI S

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Trichy – Pudukkottai Road, Tiruchirappalli – 620 007. Phone:0431-2660 303
Website:www.miet.edu, E-mail:principalengg@miet.edu, contact@miet.edu

S.No	Reg Number	Roll Number	Student Name
31	812420114332	E 2212067	JEEVANANDHAM S
32	812420114333	E 2212068	JONES SEBASTIN K
33	812420114335	E 2212070	KIRUBANITHI P
34	812420114336	E 2212071	KISHORE HIRAN R
35	812420114338	E 2212073	LOGESH M
36	812420114339	E 2212074	LOGESWARAN R
37	812420114343	E 2212078	MANIKANDAN R
38	812420114348	E 2212083	MOHAMED ARIF B
39	812420114351	E 2212086	MOHAMED ASHIK S
40	812420114356	E 2212092	MOHAMED IMTHIYAS I
41	812420114357	E 2212093	MOHAMED NAWAZ A
42	812420114364	E 2212087	MOHAMMED ASHIK S
43	812420114369	E 2212104	OMKAILESHWARAN T
44	812420114371	E 2212106	PAUL KARUNAKARAN T
45	812420114373	E 2212108	PRAGADESH K
46	812420114375	E 2212110	PREMKUMAR P
47	812420114377	E 2212112	RAVIKUMAR S
48	812420114385	E 2212120	SHRI VARSHAN B
49	812420114386	E 2212121	SOLAI PANDIYAN S
50	812420114387	E 2212122	SOLOMON LAWRANCE B
51	812420114390	E 2212125	SURYA M
52	812420114394	E 2212129	VIJAY S
53	812420114395	E 2212130	VISHNU PRIYAN A
54	812420114397	E 2212132	YUVANRAJ R

Faculty Member Details

Sl.No	Name	Mobile No	
1	Dr.G.Pranesh	8122616534	
2	Mr.S.Sathish Kumar	8675036637	

HoD/Mechanical

M.I.E.T. ENGINEERING COLLEGE TRICHY-7

Principal

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007.

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
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Trichy – Pudukkottai Road, Tiruchirappalli – 620 007. Phone:0431-2660 303
Website:www.miet.edu, E-mail:principalengg@miet.edu, contact@miet.edu

16.02.2024

From

R.Manickam,
Assistant Professor,
Department of Mechanical Engineering,
M.I.E.T. Engineering College,
Trichy - 620007.

To

The Chairman
M.I.E.T. Engineering College,
Trichy - 620007.

Through Proper Channel

Respected Sir,

Subject: Requesting permission for Industrial Visit at ISRO Bangalore - Reg.

Industrial visit is also part of the curriculum to enhance the practical knowledge of engineering students. Third year Mechanical Engineering students may be permitted to ISRO Satellite Center, Bangalore as Two days Industrial Visit from 08.03.2024 to 09.03.2024. We request you to give us kind permission for an Industrial Visit. (Totally 50 students along with 2 faculty members).

Thanking You,

IV Coordinator (R.MANICKAM/AP/MECH)

HoD

Principal

Chairman

MIET
Mohamed Institute of Education & Technology
INSTITUTIONS

manickam r <manickam.r@miet.edu>

Re: Permission for Industrial visit ISRO, Bangalore

1 message

manickam r <manickam.r@miet.edu> Tue, Feb 20, 2024 at 4:19 PM
To: studentvisit@ursc.gov.in

Dear Sir/Madam,

Warm greetings from M.I.E.T. Engineering College, Trichy, Tamil Nadu.

With reference to the subject mentioned above, we have attached the details of students and faculty members for your reference. Thank you so much for granting permission to visit your esteemed organization.

On Mon, Feb 19, 2024 at 10:16 AM student visit <studentvisit@ursc.gov.in> wrote:

> Dear Sir/Madam,
> Warm Greetings from U R Rao Satellite Centre, Bangalore.
>
> With reference to the subject mentioned above, please find enclosed herewith visit approval letter.
> You are requested to provide:-
>
> 1. Details of students and your faculty members.
>
> You are requested to confirm your visit within 3 days of receipt of this email. If no response received within stipulated time, slot will be allotted to other college.
>
> Please note, all Students/Faculty shall strictly follow Covid Appropriate Behaviour inside URSC Premises, including Wearing of Face Mask. Entry is not permitted without mask.
>
> Please note that URSC is not open for Private visits. Only students along with Teachers/Faculty are allowed to visit.
>
> Note: Visit is allowed to Exhibition area at U R Rao Satellite Centre.
>
> With Regards
> LDOD Office, URSC
>
> ----- Message from manickam r <manickam.r@miet.edu> ---------
> Date: Fri, 16 Feb 2024 13:02:10 +0530
> From: manickam r <manickam.r@miet.edu>
> Subject: Re: Permission for Industrial visit ISRO, Bangalore
> To: studentvisit@ursc.gov.in
>
> > Respected sir,
> >
> > We are delighted to confirm the visit of approximately 50 third-year students accompanied by two faculty members from the Mechanical Engineering department to the ISRO Satellite Center on **08.03.2024, from 10:00 a.m. to 11:00 a.m.** also attached the scanned copy of the signed authorization letter requesting an Industrial visit.

PRINCIPAL
MIET ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

We extend our heartfelt appreciation for your cooperation in facilitating this educational excursion. It is an invaluable opportunity for our students to gain practical insights into the fascinating work conducted at ISRO. We are confident that this visit will inspire and enrich their understanding of space technology and its applications.

Thank you once again for your assistance. We look forward to a memorable and enlightening visit to the ISRO Satellite Center.

Contact info

R.Manickam, ME., (PhD)
Assistant Professor,
Department of Mechanical Engineering,
M.I.E.T. Engineering College,
Trichy, Tamil nadu.
Contact Number: 6381463803, 9965682162.
Email Id: manickam.r@miet.edu

On Thu, Feb 15, 2024 at 11:35 AM student visit <studentvisit@ursc.gov.in> wrote:

Dear Sir/Madam,
Greetings from U R Rao Satellite Centre, Bangalore.

8th March 2024, 10 to 11AM slot is available. Please confirm immediately if this time frame suitable for your visit with letter

Please send Across **Scanned copy of signed authorization letter (on letter head) requesting for visit from your HOD with seal and signature addressed to Group Director, MDOG** as an attachment to the email address - studentvisit@ursc.gov.in

Students in standard 9 and above are allowed to visit.

Visits on Saturday, Sunday and Govt Holidays are not allowed

Please note that visit is allowed to Exhibition area at U R Rao Satellite Centre.

Please note that URSC is not open for Private visits. Only students along with Teachers/Faculty are allowed to visit with Institution ID cards.

Regards
LDOD office

----- Message from manickam r <manickam.r@miet.edu> ---------
Date: Thu, 15 Feb 2024 11:13:37 +0530
From: manickam r <manickam.r@miet.edu>
Subject: Permission for Industrial visit ISRO, Bangalore
To: studentvisit <studentvisit@ursc.gov.in>

Respected sir..

As you may be aware **M.I.E.T. Engineering College, Tiruchirappalli, Tamilnadu** is one of the most reputed **Engineering institutes in Tamil Nadu** and known for its

excellent record in academics and co-curricular activities. The college offers undergraduate programs in Civil Engineering, Mechanical Engineering, Electrical & Electronics Engineering, Electronics & Communication Engineering, Computer Science & Engineering, BioMedical Engineering, Artificial Intelligence and Data Science, and Information Technology. Additionally, it provides postgraduate programs in Structural Engineering, Manufacturing Engineering, Power Electronics & Drives, VLSI Design, Computer Science & Engineering, and Master of Business Administration.

The state-of-the-art facilities and competent faculty provide an excellent climate for the all-round development of the students. As a part of the curriculum, the students are required to undertake the students are required to undertake Industrial Visits to a few industries of repute. We feel it will be fruitful that the students with academic background have a glimpse of the industry in order to have a better appreciation of practical applications of theory. In the above background, we would like to send a batch of **50 students of Mechanical Engineering branch of IIIrd year accompanied by 02 faculty members to visit esteemed ISRO, Bangalore preferably on Friday, March 8th, 2024, at 10 a.m.**

I request you to kindly accord the necessary permission for the above visit as soon as possible. We assure you that our students will observe the rules and regulations that are prescribed by your ISRO officials for the visitors and will in no way disturb the functioning of the company during their visit. We shall be grateful for a favorable response.

Thanking You,

Contact info

R.Manickam, ME., (PhD)
Assistant Professor,
Department of Mechanical Engineering,
M.I.E.T. Engineering College,
Trichy, Tamil nadu.
Contact Number: 6381463803, 9965682162.
Email Id: manickam.r@miet.edu

----- End message from manickam r <manickam.r@miet.edu> -----

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

-With Best Regards,
Library, Documentation & Outreach Division

Mission Infrastructure Documentation and Outreach Group- MDOG office
U R Rao Satellite Centre
Indian Space Research Organization
HAL Airport Road
Bengaluru 560017
email:studentvisit@ursc.gov.in

----- End message from manickam r <manickam.r@miet.edu> -----

-With Best Regards,
Library, Documentation & Outreach Division
Mission Infrastructure Documentation and Outreach Group- MDOG office
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Indian Space Research Organization
HAL Airport Road
Bengaluru 560017
email:studentvisit@ursc.gov.in

details of students & Faculty members.pdf
2386K

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Trichy-Pudukkottai Main Road, Tiruchirappalli - 620 007. Ph : 0431 - 2660 303
Website : www.miet.edu, Email : principalengg@miet.edu, contact@miet.edu

16.02.2024

To

The Group Director,
Personal Planning Evaluation Group Office,
ISRO Satellite Center, Old Airport,
Bangalore – 560071,
Karnataka.

Respected Sir/ Madam,

Sub: Confirmation of industrial visit to ISRO Satellite Center on 08.03.2024– reg.

We are pleased to confirm that on 08.03.2024, from 10:00 a.m. to 11:00 a.m., a group comprising approximately 50 third-year students along with two faculty members from the Mechanical Engineering department, will be visiting the ISRO Satellite Center. We would like to express our sincere gratitude for your cooperation in facilitating this visit.

Thanking You,

M.I.E.T. ENGINEERING COLLEGE TRICHY-7

With regards,

16/02/24

Dr.B.Selvam,
HEAD OF THE DEPARTMENT
MECHANICAL ENGINEERING
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TRICHY - 620 007.

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
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Website:www.miet.edu, E-mail:principalengg@miet.edu, contact@miet.edu

20.02.2024

Department of Mechanical Engineering

Student Name List for ISRO Industrial Visit

S.No	Roll Number	Register Number	Student Name
1	E1212002	812421114002	ABDUL AFSAR AHAMED S
2	E1212003	812421114003	A.ABUTHAHIR
3	E1212004	812421114004	AHAMED BATCHA.N
4	E1212005	812421114006	AMARNATH R V
5	E1212006	812421114008	AROCKIYA SANTHOSH KUMAR S
6	E1212007	812421114009	BALAKUMARAN.K
7	E1212008	812421114010	GURUADHITHYAN M
8	E1212009	812421114011	HARIBALAN.P
9	E1212010	812421114012	HARISH .K
10	E1212011	812421114013	HARISH S
11	E1212015	812421114018	KEVIN CHRISTOBAR RAJ P
12	E1212016	812421114019	MANOJ KUMAR A
13	E1212017	812421114020	MATHESHWARAN.C
14	E1212018	812421114021	MOHAMED ANAS.B
15	E1212019	812421114022	MOHAMED ASHIQ K
16	E1212020	812421114023	MOHAMED NAFEEZ. J
17	E1212021	812421114024	NAVIN RT
18	E1212022	812421114025	PRAVEEN K
19	E1212023	812421114026	SAKAYA MANSTON.K
20	E1212025	812421114028	SHEIK MOHAMMED
21	E1212026	812421114030	VIJAY HARIHARAN.K.R
22	E1212028	812421114032	WAHSIM.M
23	E1212029	812421114033	YOGESH.C
24	E2222030	812421114301	ABDULL RAHMAN M
25	E2222031	812421114302	ABISHEK B
26	E2222032	812421114303	ARAVIND E
27	E2222033	812421114304	AZEES A
28	E2222034	812421114305	DAKSESH VSB
29	E2222036	812421114308	HARIHARAN K
30	E2222037	812421114309	JAMBUKESHWARAN S
31	E2222038	812421114310	JASIM AHAMED N
32	E2222039	812421114311	JOYAL MATHEW RAJ J

MIET ENGG. CLG. DEPT OF MECH.

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33	E2222041	812421114313	KISHORE U
34	E2222042	812421114314	MARTIN I
35	E2222043	812421114315	MOHAMED ABDUL KADER BASITH S
36	E2222044	812421114316	MOHAMED ASLAM J
37	E2222045	812421114317	MOHAMED IMRAN A
38	E2222046	812421114318	MOHAMED IRFAN M
39	E2222047	812421114319	MOHAMMED NOWFAL M
40	E2222048	812421114320	NAVEENKUMAR S
41	E2222049	812421114321	NISHANTH VR
42	E2222050	812421114322	PRADEEP ALDOH P
43	E2222052	812421114324	RAMACHANDRAN C
44	E2222053	812421114325	SURYA NARAYANAN A
45	E2222054	812421114326	THIRUVARUTSELVAN S
46	E2222055	812421114327	VEERAPANDIYAN R
47	E2222056	812421114328	VIGNESHWARAN M
48	E2222057	812421114329	YASWANTH S
49	E2222058	812421114330	YENISH A
50	E3212060	812420114337	KISHORE RAAH T

List of Faculty Members

S.No	Employee Number	Faculty Name	Designation / Dept	Contact Number
1.	E121234	R. MANICKAM	Assistant Professor / Mech	6381463803
2.	E122243	K.BASKAR	Assistant Professor / Mech	9965682162

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Dr.B.Selvam, 20/02/24

HOD/Mech

HEAD OF THE DEPARTMENT
MECHANICAL ENGINEERING
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GUNDUR, TRICHY - 620 007.

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Department of Mechanical Engineering

Report on Industrial visit

Company Name : **ISRO Bangalore**
Date of Visit : **08.03.2024**
No of Students : **50**
Year / Semester : **III / VI**

Objective of the visit:

1. Gain insights into space science, satellite technology, rocket systems, and ISRO's achievements.
2. Learn how theoretical concepts are applied in satellite and spacecraft design, integration, and testing.
3. Inspire innovation in STEM fields, explore career opportunities in space technology, and understand required skills.

About the visit (student observation):

1. Students explored satellite development, launch vehicles, and mission control, highlighting India's space achievements.
2. The visit offered practical insights into satellite assembly, testing, and ISRO operations, bridging theory and real-world applications.
3. Interactions with scientists and exposure to cutting-edge projects inspired students toward careers in space science and innovation.

Outcome of the visit:

1. Gained insights into the advancements and applications of satellite technology, launch vehicles, and space missions developed by ISRO.
2. Inspired by ISRO's achievements in space exploration and their efficient use of resources, fostering a deeper interest in science and engineering.
3. Observed real-world applications of theoretical concepts in areas like satellite communication, remote sensing, and spacecraft development.

CO, PO AND PSO MAPPING

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
H	M	-	-	-	M	M	L	M	M	-	-	H	M

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GEO TAGGED PHOTOS

Industrial Visit Coordinator

HoD

Principal

PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Permission letter

Date : 17/5/2024.

From.
IInd Year Mechanical students,
B.E. Mechanical Engineering,
M.I.E.T Engineering college,
Trichy.

TO
The Headd of the department,
M.I.E.T Engineering College,
Trichy.

Respected sir,

Subject : Regarding Iv (Industrial visit).

As we need a permission from you sir regarding the Industrial visit (Iv) for the current year (2023-2024) so, we request you to grant us permission.

Thank you.

Yours faithfully
IInd year Mechanical
students.

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Industrial Visit Feedback form from Industry

Course & Department	B.E & Mechanical Engineering
Semester / Year	IV & II - year
No. of Students visited	31
Accompanying Staff Members	Dr. K. Kirubakaran Mr. R. Narayanan
Name and Address of the Company	Shanthi Gears Limited C-unit, Avinashi Road, Muthugounden Pudur post, Coimbatore - 641 406.
Feedback about the students	Good
Technical details about the Company	manufacturer of Gears, Gear boxes, Gear motors, Customized Helical Gear boxes, OEM Parts, Foundry & Service.
Authorized signatory with Name / Designation and Seal	S. Tamilselvan S. Tamilselvan, - HR-Technical Training
Any other comments	- Nil -

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22.05.2024

From

Mr.S.Sathish Kumar,
Assistant Professor,
Department of Mechanical Engineering,
M.I.E.T. Engineering College,
Trichy - 620007.

To

The Chairman,
M.I.E.T. Engineering College,
Trichy - 620007.

Through Proper Channel

Respected Sir,

Subject: Request-Permission-Industrial Visit - Shanthi Gears, Coimbatore - Reg.

Industrial visit is also part of the curriculum to enhance the practical knowledge of engineering students. Second year Mechanical Engineering students may be permitted to Shanthi Gears, Coimbatore as One day Industrial Visit on 03.06.2024. We request you to give us kind permission foran Industrial Visit (35 students and 2 faculty members).

Thanking You,

IV Coordinator (S.SATHISHKUMAR) AP/MECH

HoD

Principal

Chairman

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MIET INSTITUTIONS

NARAYANAN R <narayanan.r@miet.edu>

Industrial visit permission -Reg

NARAYANAN R <narayanan.r@miet.edu> Fri, May 3, 2024 at 10:52 PM
To: Narayanan R <narayananaccet@gmail.com>

---------- Forwarded message ---------
From: **NARAYANAN R** <narayanan.r@miet.edu>
Date: Sat, Apr 27, 2024 at 9:21 PM
Subject: Re: Industrial visit permission -Reg
To: TamilselvanS-Senior Officer-Technical Training-SGL <stamilselvan@shanthigears.murugappa.com>

Dear sir..

Thanks for your valuable information. We will plan and visit along with students as per your schedule.

Thanking you

R.Narayanan
Assistant Professor
Department of Mechanical Engineering
M.I.E.T.Engineering College (Autonomous)-Trichy
9003462231

On Sat, Apr 27, 2024 at 5:10 PM TamilselvanS-Senior Officer-Technical Training-SGL <stamilselvan@shanthigears.murugappa.com> wrote:

> Dear Sir,
> Good evening.
>
> Greetings from Shanthi Gears Limited,
>
> We would like to share you the Agenda & Safety protocols for your kind reference and actions please.
>
> **Visit Date:** 03.06.2024

Connect to Campus – Agenda		
Timings	**Topics**	**Speakers**
10:00 am to 10:15 am	Welcome & SGL Profile	BU/Head HR
10:15 am to 10:45 am	Our Capabilities, Manufacturing Process, Scope of Work (ITI,DME,BE)	L& D- Technical Trainer
10:45 am to 11:00 am	Safety Orientation	Head – EHS
11:00 am to 11:15 am	Tea Break	
11:30 am to 01:00 pm	C Unit Plant Tour (Machineshop I, II,III & Assembly)	HR/Operations/L&D Representative
01:00 pm - 01:30 pm	Lunch in Shanthi Gears Canteen	

> **Safety Protocols:**
>
> - Vehicle to be parked outside the entrance gate
> - All Students must sign in and out upon entering and leaving the SGL campus
> - All students will be issued a dated visitors pass along with Helmet, which should be returned to the issuing party when signing out
> - Mobiles to be handed over in gate as photography is strictly prohibited

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- Full Sleeve shoes are mandatory for students (Male/Female)
- Don't touch any equipment/material
- Safety orientation will be given by EHS team before the visit
- They will have a SPOC in case of emergency
- They should always have accompanied by SGL employee

Address:

Shanthi Gears Limited,
C Unit, Avinashi Road,
Muhugounden Pudur Post,
Coimbatore - 641 406.

SIPOC : Mr.Tamilselvan S
HR - Learning & Development
Mob: 9500941276

Location:

https://maps.app.goo.gl/gswetSBnEyJiAKT79

If you need any clarifications, Please contact the SIPOC.

Regards,
Tamilselvan S
95009 41276

From: NARAYANAN R <narayanan.r@miet.edu>
Sent: Wednesday, April 24, 2024 2:47 PM
To: TamilselvanS-Senior Officer-Technical Training-SGL <stamilselvan@shanthigears.murugappa.com>
Subject: Re: Industrial visit permission -Reg

Dear sir
We are very happy of your permission to visit your plant on 03.06.2024. We will plan and visit along with students as per your schedule. Kindly mention the time of the visit on 03.06.2024.

Thanking you
R.Narayanan

On Wed, Apr 24, 2024 at 9:50 AM TamilselvanS-Senior Officer-Technical Training-SGL <stamilselvan@shanthigears.murugappa.com> wrote:

> Dear Sir,
> Good morning.
>
> We request you to plan for Industrial visit of Shanthi Gears Limited by 03.06.2024 .
>
> Kindly please confirm your visit plan.
>
> Regards,
> Tamilselvan S

From: NARAYANAN R <narayanan.r@miet.edu>
Sent: Thursday, April 11, 2024 12:02 AM
To: SultanIbrahimA-Head-Sales & Marketing(Domestic)-SFW-SGL <sultanibrahima@shanthigears.murugappa.com>
Cc: TamilselvanS-Senior Officer-Technical Training-SGL <stamilselvan@shanthigears.murugappa.com>
Subject: Re: Industrial visit permission -Reg

Thanks for your information sir..

On Wed, Apr 10, 2024 at 12:15 PM SultanIbrahimA-Head-Sales & Marketing(Domestic)-SFW-SGL <sultanibrahima@shanthigears.murugappa.com> wrote:

> Dear Mr. Narayanan,

M.I.E.T. ENGINEERING COLLEGE
GUNDUR, TIRUCHIRAPALLI - 620 007

Company address: **Shanthi Gears Limited,**
C Unit, Avinashi Road,
Muhugounden Pudur Post,
Coimbatore - 641 406.
Staff IV coordinators:

Mr R.NARAYANAN Dr K.KIRUBAKARAN

S.NO	ROLL NUMBER	NAME
1	E1222001	ABDULLAH AASHIK SM
2	E1222002	ABDULLAH M
3	E1222004	AJAY R
4	E1222005	ARUN P
5	E1222007	DARWIN NIKHIL D
6	E1222008	DENYSON A
7	E1222011	JOSHVA S
8	E1222012	MARTIN LOORTHU C
9	E1222013	MOHAMED RASIK M
10	E1222015	NEW WINSON B
11	E1222018	SAMYOK P
12	E1222019	SANJAY KUMAR V
13	E1222020	SANTHOSH J
14	E1222021	SRIRAM M
15	E1222022	VISHWA A
16	E 2232023	AAKASH R
17	E 2232024	AKASH A
18	E 2232025	DHANUSH YESUDOSS P
19	E 2232026	EISHWAANTH K P
20	E 2232027	FARHAN SHERIF S
21	E 2232028	JOSHVA S
22	E 2232029	KARTHICK D
23	E 2232030	MAGESHWARAN V
24	E 2232031	MOHAMED YUSUF M
25	E 2232032	MOHAMED ZAMIRUDEEN M Y
26	E 2232033	NAVEENRAJ M
27	E 2232034	SAMEER AHAMED M
28	E 2232035	SARAVANA KUMAR K
29	E 2232036	SHAIK THOUFEEQ AHAMED S
30	E 2232037	SHEIK ABDULLA K
31	E 2232041	UVAIS AHAMED H

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Department of Mechanical Engineering

Report on Industrial Visit

Company Name : Shanthi Gears Limited, C – Unit
Avinashi Road, Coimbatore - 641406

Date of visit : 03/06/2024 (Monday)

No. of Students : 31

Year / Semester : II/ IV

Objective of the visit: During the industrial visit the student able to

- Understand the production processes and various types of gears.
- Acquire the knowledge on service procedures for various customer gear boxes.
- Impart the knowledge on heat treatment processes of gears.

About the Visit (Students observation):

- Students learned variety of Gears used in industries and its wide range of application.
- Gaining the knowledge of servicing procedures of various gears boxes.
- Heat Treatment plant and its processing steps for different categories of gears.

Outcome of the visit:

After the completion of industrial visit, the student able to

- Explain the gears manufacturing processes and applications of gears.
- Identify and modify the existing service procedures.
- Make heat treatment can be done according to the applications of gears.

CO AND PO, PSO MAPPING

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2
H	H	M	L	-	L	M	H	H	L	-	-	H	M

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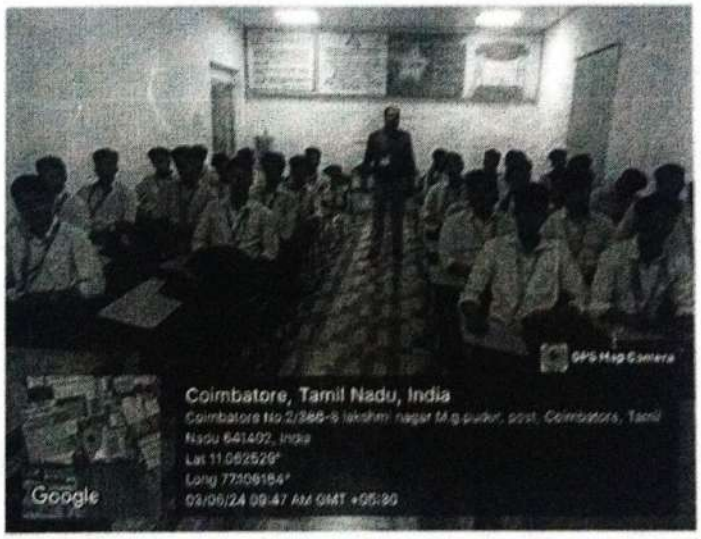
Geo -tagged Photos

Students with safety wear to plant visit

HR- Technical was sharing the company profile



Students were observing lectures given by HR Technical

Industrial Visit Coordinator

[R.NARAYANAN, AP/Mech]

HoD / Mech

Principal

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