



National Conference on  
Technological Advancements in Materials and  
Manufacturing for Industrial Environment  
13<sup>th</sup> and 14<sup>th</sup> of March, 2020

Organized by

## Department of Mechanical Engineering



# KPR

Institute of Engineering  
and Technology  
(Autonomous)  
Coimbatore, TamilNadu

PROCEEDINGS



## KPR INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

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**National Conference on**  
**“Technological Advancements in Materials and Manufacturing for**  
**Industrial Environment” TAMMIE 2020**

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Department of Mechanical Engineering  
**KPR Institute of Engineering and Technology,**  
**Coimbatore -641407**

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# Conference Schedule

## Day 1 - 13<sup>th</sup> March 2020

8.30 AM - 9.30 AM	Registration
9.30 AM - 10.00 AM	Inauguration
10.00 AM -11.00 AM	Key note speech-
11.00 AM - 11.15 AM	Tea Break
11.15 AM - 1.00 PM	Parallel Session -I
1.00 PM - 2.00 PM	Lunch
2.00 PM - 3.30 PM	Parallel Session -II
3.30 PM - 3.45 PM	Tea Break
3.45 PM - 5.00 PM	Parallel Session –III

## Day 2 - 14<sup>th</sup> March 2020

9.30 AM - 11.00 AM	Parallel Session -IV
11.00 AM - 11.15 AM	Tea Break
11.15 AM - 1.00 PM	Parallel Session -V
1.00 PM - 2.00 PM	Lunch
2.00 PM - 3.30 PM	Valedication

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## Preface

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National conference on” **Technological Advancements in Materials and Manufacturing for Industrial Environment (TAMMIE’2020)**” provides an efficient knowledge sharing platform for exchange of ideas and views among experts, scientists, practitioners, researchers and academicians. A viable solution to problems faced by engineers may be raised during the productive interaction among them.

In recent days, smart and composite materials have become increasingly important due to their areas in practical applications. Nano – materials research takes a materials science – based approach to nano technology, leveraging advances in materials and synthesis which have been developed in support of micro – fabrication research. In the past few decades, significant changes in the manufacturing environment have been noticed with asking for products with higher quality with low costs, highly customized and with short lifecycle. In these circumstances, the challenge is to develop manufacturing control systems with intelligence capabilities, fast adaptation to the environment changes and more robustness against the occurrence of disturbances. The national conference on “**TECNOLOGICAL ADVANCEMENTS IN MATERIALS AND MANUFACTURING FOR INDUSTRIAL ENVIRONMENT (TAMMIE 2020)**” will address the above issues concerned to material manufacturing industries.

We have received a total of 120 full length manuscripts, out of which 50 manuscripts are short – listed by highly qualified review committee members. The selected manuscripts are of high quality which addresses the current issues and research needs. The new ideas, procedures and techniques to be presented in this conference would address the technological challenges which are very vital to envisage the scenario of “Make in India”

TAMMIE 2020 is aimed at providing a technical platform for international and national experts to deliberate on the key issues of advanced materials, allied processes and the emerging trends in manufacturing processes. On the whole, this national conference would provide quick solution and ideas to quality related issues and problems.

**Editor**

## Chairman Message

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I am happy to know that Department of Mechanical engineering is organizing a **National conference “TAMMIE – 2020 (Technological Advancements in Materials and Manufacturing for Industrial Environment)** during 13<sup>th</sup> and 14<sup>th</sup> March 2020. This conference will act as a summit for researchers, professionals and academicians in the domains of design, manufacturing, materials, industrial engineering, etc.

Growth of manufacturing and industrial sector is the current scenario which necessitates the forum of scientists and researchers to share their knowledge on innovations and technology in the industrial area from across the countries. Given today’s opportunities & challenge, I wish this proceeding would take an important step towards collection of recent technical advancements & researches.

I commend the coordinates for organizing this important conference that would cater to a broad community of researchers and academicians who have taken part in the conference.

**Dr. K. P. Ramasamy**  
**Chairman**  
**KPRIET**

## Chief Executive Message

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I am extremely delighted and pleased that the Department of Mechanical Engineering, KPR Institute of Engineering and Technology is organizing **5th National Conference on “Technological Advancement in Materials and Manufacturing for Industrial Environment (TAMMIE 2020)”**.

TAMMIE 2020 will provide a platform for students, researchers and faculty from academic and industrial progress in the field of Robotics & Automation, Industry 4.0, Advance Materials, Manufacturing, Design and Thermal Engineering etc.,

I hope that the TAMMIE 2020 will inspire and ignite the young minds and in turn benefit to the society as well.

I wish the conference a grand success.

**Prof. Dr. A. M. Natarajan**

**Chief Executive**

**KPRIET**



## Principal Message

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I am delighted that the Department of Mechanical Engineering is conducting the **National Conference on “Technological Advancements in Materials and Manufacturing for Industrial Environment (TAMMIE 2020)”** during 13<sup>th</sup> and 14<sup>th</sup> March 2020. The organizers of this conference have brought together excellent scientific minds which has inspired and encompassed latest trends in research in materials, manufacturing, industrial process and design.

The researchers, professionals and academicians who are participating in this conference are equipped with novel idea sand unique technologies in materials, manufacturing, industrial process and design. The information received and compiled from the papers received for this conference would open up new avenues for researchers, professionals, academicians and provide new ideas to help them in improving their potential.

I trust this conference would provide a platform to share and learn new ideas and gain expertise from lectures delivered in various sessions.

I wish all the very best to every one of you.

**Prof. Dr. M. Akila**  
**Principal**  
**KPRIET**

## HOD Message

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Materials, Manufacturing, Industrial engineering, Design and Thermal engineering are different fields and when combined together is responsible for the innovation and successful launching of many products that are emerging in the market robustly. These products and technologies are responsible for the development of any country globally. **National conference on “Technological Advancements in Materials and Manufacturing for Industrial Environment (TAMMIE 2020)”** is a platform which ensures the successful merging and blending of various ideas of all the researchers, professionals and academicians for the great upbringing of the industrial sector of the country.

On behalf of the Department of Mechanical Engineering, I take great pleasure in welcoming all the innovative ideas and the great minds behind them to the National Conference (TAMMIE 2020) on 13<sup>th</sup> and 14<sup>th</sup> March 2020. Any event can never be successful without the hard work and dedication of the organizers. I would like to thank all the members of the organizing committee for making this event grandeur and successful one. I hope that the participants will find the presentations, discussions and deliberations on the different areas intriguing, interesting and useful. I wish all the participants a beneficial, fulfilling and enlightening conference.

**Prof. Dr. N. Gunasekaran**  
**Professor and Head**  
**Mechanical, KPRIET**

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## **ID No. 1: NATURAL MATERIALS REINFORCEMENT WITH ALUMINIUM ALLOYS FOR AUTOMOBILE APPLICATION**

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### **ABSTRACT**

Aluminum alloy has gathered wide acceptance in the fabrication of light weight structures requiring a high strength to weight ratio. Aluminium alloy has gathered wide acceptance in the fabrication of light weight structures requiring a high strength to weight ratio. The unique characteristics of the composite materials for the specific requirements makes these materials more popular in a variety of applications such as aerospace, automotive (piston, cylinder liners, bearings, clutches), and structural components resulting in savings of materials and energy. AA2219 is reinforced with Natural Ceramic due to its great hardness and strength property by using stir casting method with 2, 2.5, 3wt%. Metal matrix composites produced by stir casting method have more advantages compare with other methods. Hardness were characterized by Brinell hardness machine apparatus to study the influence of reinforcement on the strength behaviour and the images reflected the influence of aluminium. Wear tracks were characterized by pin on disc apparatus to study the influence of reinforcement on the wear behaviour and the images reflected the influence of aluminium on the wear tracks. Impact test were characterized by charpy test to study the influence of reinforcement on the impact behaviour and the images reflected the influence of aluminium.

**Keywords:** AA2219, sea shell powder, Hardness test, Wear test.

## **ID No. 2: SMART PARKING SYSTEM**

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### **ABSTRACT**

The industrial growth of world is reflected by the increase in number of Automobiles. In commercial centers like shopping mall's the search of parking space is a time consuming process which not only affects the time but also social interactions and cost. Hence there is a need for a system which can take all relevant information into consideration for finding parking vaccancy. Normally, parking is a very challenging task. In busy places a major problem while parking is that available space is not used in optimum manner. Also there are high chances for damage occuring. So we have made a solution for this problem. In our parking system there is no chances for damages or accidents. It will be very useful in all commercial centers.The sensor is used to find whether the vehicle is correctly parked or not. Smart parking system is a part of Intelligent transportation systems. If the parking space is vaccant the LED will indicate it. The coding is done using arduino software.

**Keywords:** Intelligent transportation systems, Path planning, arduino.

### **ID No. 3: EXPERIMENTAL INVESTIGATION ON MECHANICAL, CHEMICAL, MOISTURE AND SOUND ABSORPTION BEHAVIOR OF NATURAL REINFORCED HYBRID EPOXY COMPOSITE**

<sup>1</sup>L. Prabhu, <sup>2</sup>Harry Jayakumar, <sup>2</sup>E.R.Gowarthan, <sup>2</sup>Gokul Prasad

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#### **ABSTRACT**

Natural fibers are used in place of synthetic fibers because of environmental concerns. Natural fibers exhibit low specific strength and low density, also they are easy to process and recycle. However poor interfacial adhesion between fiber and matrix, low melting point and lack of resistance to moisture has limited the use of natural fibers. Studies on the use of natural Replacement to man - made fiber in fiber-reinforced composites have and opened up further industrial possibilities.

The composite materials are manufactured using LTF (long fibre thermoplastic) extrusion and compression moulding and the used fibres were sisal, banana, jute and flax, and the matrix was a polypropylene.

Natural-based reinforced composites are gaining significant interest within the structural community, due to their interesting mechanical properties

**Keywords:** Banana fiber, epoxy resin, Alkaline treatment (NaOH), Matrix

## **ID No. 4: IOT BASED WATER LEVEL CONTROLLER**

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### **ABSTRACT**

Water source is necessary and a important factor agricultural and farm production is a key of our quality of life as well. Monitoring water level of a water source, such as water tank or borewell etc., and used to check weekly and daily usage of water through lot. plays a key role in agricultural. For example, if a water level drops below the threshold level for pumping in borewell, the pump motor may get damaged due to dry running. In such case monitoring water level and controlling the water pump accordingly becomes necessary task. There are many other situations where water level monitoring is an important task. It may be used to preserve water or to study the water usage of a water source. This paper propose a prototype system design, implementation and description of required tools and technologies to develop “Internet of Things (IoT)” based water level monitoring system which can be implemented in future smart villages in India.

**Keywords:** Internet of Things, Water level controller, Overflow alarm, Android app Service

## **ID No. 5: DESIGN AND ANALYSIS OF MAGNETIC ENERGY GENERATOR**

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### **ABSTRACT**

Nowadays motors which are used for different applications are powered by electricity, as the requirement of power or electricity is the basic commodity for today’s world, we need a lot of electricity to power all our daily use machines. Electrical energy is converted into different forms of mechanical energy. In our subject we are producing free energy by using the magnetic repulsive energy. This paper proposes a technology to produces electrical energy using repulsion magnet technique. The proposed technology employs the theory of magnetic repulsion. To utilized small amount electrical energy to produce more electrical energy by magnetic repulsion technique. The system uses permanent magnets to produce repulsion and this repulsive force produces a torque which drives a DC generator. The repulsive magnet disc which contains number of permanent magnets are arranged on a circumferential portion of the disc with regular intervals and same magnetic polarity of permanent magnets are located on the shaft of motor. The rotating disc is couple with generator through a set of gears. During driving a load, the motor rotates the disc due to magnetic repulsion which drives a DC generator to produce electrical energy. The power output from the DC generator can be boosted by the voltage booster and to stored in batteries or used to drive any AC loads through an inverter.

**Keywords:** Repulsive force, Permanent magnet, DC generator, Batteries.

## **ID No. 6: DESIGN AND FABRICATION OF WASTE REMOVAL SYSTEM WITH OIL SKIMMER IN WATER BODIES**

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### **ABSTRACT**

Our project deals with the design and the fabrication of the waste removal system with oil skimmer. By ROV navigating system this proposes a new system for oil skimming and solid waste removal. The machine will lift the waste surface debris from the water bodies, this will ultimately result in reduction of water pollution and lastly aquatic animal's death of these problem will reduce. It consist of belt drive mechanism with cup which lifts debris from the water. This system uses a photovoltaic powered conveyor belt made of a thin nano wire mesh to propel itself and collect oil. The Nano material can absorb up to 20 times its weight in oil. The flexible conveyor belt softly rolls over the water surface, absorbing oil while deflecting water because of its hydrophobic properties. The fleet uses cutting edge nanotechnology to solve current environmental problems while envisioning long-term solutions for the future. The use of this project will be made in reverse ponds, lacks and other water bodies for cleaning the floating wastes and oil.

**Keywords::** Oil skimmer, photovoltaic powered conveyor, solid waste removal.



## **ID No. 7: SHORT DISTANCE AUTONOMOUS VEHICLE**

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### **ABSTRACT**

Automation is necessary, in this society and lot of fields are moving towards automation. People who have some disability and handicaps are helped by peoples. So, automation and robotics can be used to help them by various techniques. Transportation is one of the main parts of helping them. This project is a prototype that senses the obstacles and move from one place to other by GPS system. This system is developed as “SHORT DISTANCE AUTONOMUS VEHICLE” based on location which can be implemented for transportation in future.

**Keywords:** Location, GPS & GSM module, Obstacle sensing, Arduino program.

## **ID No. 8: ENERGY EFFICIENT REFRIGERATION SYSTEM WITH SIMULTANEOUS HEATING AND COOLING**

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### **ABSTRACT**

In normal refrigeration system the heat is rejected in condenser is get wasted. Here we utilized the heat rejected in the condenser. This rejected heat is used for the home purpose such as water heating and cooling the water which can be used for drinking, bathing and washing clothes. The main advantage is cooling and heating process works simultaneously along with the cool air blower all these set up is working by using a single compressor which helps to reduce the electricity consumption while comparing to the system which runs with their respective compressor. It does not need a separate system. It saves cost. The refrigerant is a substance that transfer heat in refrigeration system that absorb heat in evaporator and rejected heat in condenser. The copper tube is used as heat exchanger which gives the great efficient in exchanging or transferring the heat. The COP has to be calculated for selected good refrigerant. Refrigerant should have low boiling temperature and high critical temperature and higher liquid thermal conductivity these properties makes this as a good refrigerant. Here we used R134a environment- friendly refrigerant.

**Keywords:** condenser , heat exchanger, heating, cooling, air blower.

## **ID No. 9: LOW COST AND AFFORDABLE SMART AUTONOMOUS REMOTE MONITORING SYSTEM FOR AGRI – HORTICULTURE**

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### **ABSTRACT**

About 75–85 % population of India is dependent of agriculture for their livelihood . There is a need to revive agricultural productivity . Farmers have to deal with numerous problems such as complete loss of crops , non – availability of seeds , lack of irrigation facility , scarcity of fodders , non – availability of modern farming equipments , transportation and marketing problems . Farmers don't have the access the access to new machines and modern farming equipment as they are economically weak . These are the major threats faced by the farmers but there are some of the factors like monitoring the farms can also be the solution . For this we have created a monitoring system for agri-horticulture which can afforded by poor farmers .

**Keywords:** autonomous, monitor, horticulture

## **ID No. 10: POWER ASSISTED STEERING CONTROL FOR HANDICAP IN TWO WHEELER**

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### **ABSTRACT**

The project is about make steering control of two wheeler easier for handicaps by actuating by knob. The steering controller controls the steering actuator to follow the desired steering angle. Its become very challenging for handicaps like people who lost their body parts like hands to drive and handle the two wheelers. The steering control and balancing vehicle become major hindrance for them. Steering a two wheeler by handed humans means that the driver plans a path by preview and controls the lateral deviation of the vehicle from the planned path by the steering wheel. But unhanded or unleged humans are an knob to control steering. The knobs are fixed in near the leg, the unhanded or unleged humans are easy to control the knob. the knob is fixed in convenient place. the unhanded peoples are control the knob by legs. the unleged peoples are control the knob by mouth. Our project is to eliminate such difficulties by having the power assisted steering.

**Keywords:** Power assisted steering control, knob to control the steering, handicaps(unhanded or unleged )are easy to control the steering.

## **ID No. 11: MOBILE BIOGAS GENERATOR**

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### **ABSTRACT**

One of the greatest challenges facing the societies now and in the future is reduction of green house gases emissions and thus preventing the climatic change. It is therefore important to replacing the fossil fuels with renewable sources, such as biogas. Biogas can be produced from varies organic wastes and steams or as a byproduct from the industrial processes. Beside energy production, the degradation of organic waste through ANAEROBIC DIGESTION offers advantages are such as the prevention of odor release and the decrease of pathogens. Further the wastes are used as organic fertilizer. A wide range of waste streams, including industrial, and municipal waste waters agricultural municipal, and food industrial wastes, as well as plant residues, can be treated with this technology.

**Keywords:** Mobile biogas, Digestion waste, Co-Digestion waste

## **ID No. 12: DESIGN AND FABRICATION OF CORRUGATED STRUCTURED PANNEL FOR SMART CLASS ROOM SOUND DAMPING APPLICATION**

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### **ABSTRACT**

Due to higher weight of laminated composites now the people are fast emerging to corrugated structure which provides less weight and high performance. Camellia Sinensis / Ananas Comosus / GFRP / Epoxy Polymer composites are widely accepted to be a better material for sound damping materials It also reduces the usage of the material which are highly dumped in laminated type. Two different natural fibers such as pineapple, tea powder 20wt%, 10wt.% respectively are made in corrugated structure composites amalgamated by Epoxy matrix. The samples are subjected to acoustical testing and their output responses (sound absorbing capacity) are obtained. A best optimized solution is found and it can be chosen for the application of smart class room sound damping.

**Keywords:** Acoustic panel, corrugated structure, natural fiber, sound absorption capacity.

## **ID No. 13: DESIGN AND FABRICATION OF MULTIPURPOSE BAG FILLER**

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### **ABSTRACT**

Agriculture is the backbone of world’s economic development and farmers are the most important persons in the world. Farmers on working on agricultural lands, produces variety of food products for human and animal consumptions. They usually after spending lot of energy on agricultural lands, they need to fill their sack bags with their harvested grains such as rice, wheat, etc. The main aim of this project is to the design and fabricate the bag filling apparatus required for the farmers to fill the bags with grains or other particulates in a simplified way. This bag filler thus utilizes only one person to fill those bags. It is compact and portable so it can be moved from one place to another place easily. This new multipurpose bag filling apparatus thus eliminates the disadvantages in conventional automatic bag fillers like bulky machines, spillage of grains while handling and the necessity of having skilled operators thereby provides a long-term solution for the farmers.

**Keywords:** Bag filler devices, Grains Packing, Agriculture, Farmers, Sack filling

## **ID No. 14: DESIGN AND FABRICATION OF TELECOMMUNICATION TOWER CLIMBER**

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### **ABSTRACT**

Safety at work place is given prime importance during the current days by all industries in almost every fields. The broad range of problem arises when a technician climb to do his work in the cell phone tower, it is all about the safety of technician. There are many cases where technician fall from the top of the tower due to many reasons starting from his physical health to slip off while climbing or getting down. These may pose greater threat to the life of the climber and may even cost his life. In-order to get rid of this problem, a setup is designed in this project, where a platform will be provided for the technician to stand and it will be elevated to required heights Adequate space is provided for carrying the equipment along with the climber and the system is operated by rope that aids the movement of the platform to a required height. These movements are the result of motor action which is placed at the bottom of the tower. The platform movement is assisted by a roller for a smooth and unhindered motion. A control panel is placed in the platform so that the climber can have easy control over the platform movement. Materials selected for the platform and the entire setup is of moderate weight so that the design and fabrication becomes simple. Current project is expected to reduce the accidents that are taking place during the tower climbing and mainly focusses on the welfare of the society.

**Keywords:** Tower climber; Platform; rope drive; safety



## **ID No. 15: THERMAL ANALYSIS OF SOLAR PV USING PCM**

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### **ABSTRACT**

Solar photovoltaic (solar PV) is the direct conversion of incident solar radiation into electrical energy. The efficiency of conversion is happened to be 6% to 18% depending upon the material of solar PV panel employed. Further, the efficiency of the panel is majorly influenced by surface temperature of panel. In recent times, it is reported that the increase in 2°C of the panel reduces 0.5% panel efficiency and also reduces panel lifetime. In this paper, an attempt is made to fabricate a thermally improved solar PV panel with the integration of a phase change material (PCM), which will help to improve the thermal performance of panel.

**Keywords:** Solar PV, thermal analysis, PCM.

## **ID No. 16: DESIGN AND FABRICATION OF WHEELCHAIR MOVER FOR PHYSICALLY CHALLENGED PERSONS**

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### **ABSTRACT**

Physically challenged persons finding their movements very tough when they are moving the wheelchair with their own hand. Even though there are many devices available for their movements but its cost is high. The main aim of this project is to fabricate a wheelchair mover for physically challenged persons. The wheelchair mover is an equipment with electric hub motor attached to it. The motor is operated by 12V battery supply and movement of the equipment is controlled by handle analog with accelerator. It is connected and disconnected easily with the wheelchair. So they can move from one place to another place without the help of a third person. This device is very useful in public places like parks, railway stations, crossing roads etc. It is a low cost equipment so everyone can buy and make their movement easily.

**Keywords:** Wheelchair Mover, Physically Disabled Persons, Hub Motor, 12V Battery

## **ID No. 17: DESIGN AND ANALYSIS OF STEPPED FINS WITH INDENTATION**

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### **ABSTRACT**

The stepped fin is a choice for enhancing the heat transfer from a flat stepped surface. This typical fin shape is easy in design aspects that might be considered while designing. With consideration of spherical notches and high heat transfer capacity material, heat transfer can be increased. Secondly, spherical notches are provided for increasing the surface area of the fin even further and it also acts as a mechanism for trapping the air into the spherical dimples thus, increasing the duration of air contact with the surface of the fin which ultimately improves the performance of the fin. This design of fin also helps to reduce the overall drag on the fin structure which reduces the area of wake zone and increases the air flow over the fins which increases the overall heat transfer of the fin.

**Keywords:** Stepped fin, heat exchanger, fins with indentation.

## **ID No. 18: INVESTIGATION OF MICROSTRUCTURAL CHARACTERISTICS OF HASTELLOY C-2000 (NICKEL BASED) BY USING LASER BEAM WELDING**

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### **ABSTRACT**

The main aim of the research is to investigate the microstructure characteristics of advanced corrosion resistant alloy C-2000 welded with Laser Beam Welding (LBW) process. Laser welding is a high-power-density fusion-welding process that produces high aspect ratio welds with a relatively low heat input compared with other arc-welding processes. Dinolite macro analyzer was used to determine the weld bead width and penetration depth. The micro structural characteristics of the weldments are analyzed with Optical and Scanning Electron Microscope (SEM). The micro segregation of alloying element and existence of secondary TCP phases in interdendritic regions is quantified by Energy dispersive X-ray spectroscopy. The result shows that micro segregation of alloying elements is significantly reduced in the weld zone Interdendritic region. Secondary TCP phase formation was also mitigated which will offer greater mechanical properties.

**Keywords:** Alloy C2000, Laser beam welding, Secondary TCP phases.

## **ID No. 19: ANALYSIS ON MULTI-PURPOSE SOLAR CROP DRIER USING PHASE CHANGE MATERIAL**

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### **ABSTRACT**

Solar energy becomes the most preferred predominant renewable energy source, because of its abundant and cheap availability. The Indian government is eternally taking initiatives to make awareness and to promote the technologies for harvesting solar energy to supplement the energy demand of the country. However, the concern with the solar energy is its lack of availability for longer duration. This dispute can be suitably addressed by utilizing a suitable energy storage medium which could store the solar energy during its availability and supply the same when the demand arises. This project utilizes solar energy for drying crops, food items, clothes etc., for domestic and industrial purposes. The intermittent supply of solar energy is regulated as per the demand with the help of a Phase Change Material (PCM). The drier principally consist of a flat plate solar collector, a blower, PCM container and the drying room. The incorporation of PCM significantly improved the drier performance and extended the working of solar drier even during the poor solar day.

**Keywords:** Solar drier, cabinet drier, flat plate collector, PCM.

## **ID No. 20: DESIGN AND FABRICATION OF SOLAR BASED SMART IRRIGATION SYSTEM WITH WATER MANAGEMENT**

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### **ABSTRACT**

Agriculture is the primary occupation in our country for ages. In India about 70% of population depends upon farming and one third of the nation’s capital comes from farming. But, now there is hindrance in agriculture due to the water scarcity and poor water management system, problem due to frequent power cuts or non-availability of grid supply and labour issues. Cost effective solar power system can be the answer for all our problems in energy requirements. In addition, Smart irrigation system with interfaced IoT and a suitable water management programme can be the solution to water scarcity and labour issues. This system consists of a solar powered water pump along with an automatic water flow control using IoT and sensors, which conserves electricity by reducing the usage of grid power and conserves water by reducing water losses. The farmers are also notified through mobile phones if the field needs a care. Farmer can automate the motor from anywhere in the world without depending on labour.

**Keywords:** irrigation, water management, IoT, solar system.

## **ID No. 21: EXTRACTION OF NATURAL FIBERS – A REVIEW**

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### **ABSTRACT**

Natural Fibers received an increased attention as an alternative to synthetic fibers. The use of natural fibers is to make low cost and eco friendly composite material is a subject of green importance. They are renewable, cheap, completely or partially recyclable and biodegradable. There are wide varieties of natural fibers which can be reinforced to form composites and used for various applications. Composites are multifunctional material systems that provide characteristics that are not obtainable from any separate material. The reinforcement of fibers within the matrix becomes easy, only when the fibers are extracted from the plants, hence the extraction process is necessary in fiber reinforcement. There are various methods of fiber extraction, which include mechanical decortication, water retting process and manual extraction method. The extraction of fibers involves the retting process which is followed by the decortication process. From the above various methods, a suitable extraction method is selected based on the parts of the plant from which the fiber is to be extracted. Choice of extraction method governs the characteristics and properties of composites fabricated out of it. This review paper discusses the various methods of extraction and the feasibility of its application for various plants and fibers.

**Keywords:** Natural fibers, decortification, retting, separation

## **ID No. 22: PERFORMANCE CALCULATION AND EFFICIENCY ENHANCEMENT OF BOILER**

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### **ABSTRACT**

As the demand for electricity has been increasing day by day due to population in our country. Upgrading thermal power plant is an obvious choice. Our main objective of the project is to increase the efficiency of boiler in thermal power plant. The existing range of efficiency in lignite based thermal power plant is 35% - 45%. Which means around 60% of energy is unused or lost. The boiler efficiency is 76.78% the efficiency is enhanced by the chemical & heat treatment process in lignite. Hence the lignite is washed with ethanol (chemical process) which involves removing the moisture. Hence the excess amount of heat can be utilized for lignite burning. Then the lignite is heated in muffle furnace at 500°C for 2 hours. Which increases the carbon/unit sample and volatile matter is removed. Therefore, the losses incurred by the presence of volatile matter in lignite is eliminated. So, the efficiency is further increased from existing efficiency 76.86% to 90%.

**Keywords:** Moisture, Volatile matter, Lignite, Efficiency



## **ID No. 23: DESIGN, ANALYSIS AND OPTIMIZATION OF VERTICAL AXIS WIND TURBINE**

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### **ABSTRACT**

Increasing demand for energy in recent years has seen a rise in development of alternative energy sources. Wind being one of the most abundant and easily available sources is an excellent alternative to conventional energy sources. Vertical Axis Wind Turbines (VAWT's) are of two type's viz. Darrieus (lift based) and Savonius (drag based). The problem associated with Darrieus is the lack of self-starting while the Savonius has a low efficiency. In order to overcome these flaws, an innovative design has been created by incorporating both the types into one single unique structure not tested before. In this design, the Darrieus blades are helically twisted to get even torque distribution. The Savonius blades are of half drum type and at the center of the assembly. This unique design allows the use Savonius as a method of self-starting the wind turbine which the Darrieus cannot achieve on its own. There are 3 Darrieus blades placed circumferentially and 2 Savonius couples attached perpendicular to each other along the shaft. The cross-section of the Darrieus blades is of NACA-4415. The objective is to eliminate the need for external motors for self-starting purposes and study the performance of the model. The testing of the model was carried out for different wind velocities. Initially the Darrieus and Savonius blades were tested independently and then the new model which combines the two designs was tested.

**Keywords:** wind turbine, VAWT

**ID No. 24: EXPERIMENTAL EVALUATION OF MECHANICAL AND MOISTURE ABSORPTION BEHAVIOUR OF NATURAL FIBER AFTER CHEMICAL TREATMENT**

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**ABSTRACT**

In present days natural fiber composites are used instead of synthetic fibers because of low density, easy to manufacture, eco-friendly, recyclability, sustainable production, bio degradability and attractive mechanical properties. However, the drawback of these natural fibers are poor wet ability, lack of interfacial bonding between fiber and matrix and high degree of moisture absorption. In present study the natural fiber is subjected to alkali treatment (Mercerization) and the effect of these treatments on fibers were studied. Morphological analysis of the natural fiber was carried out after the chemical treatment.

**Keywords:** absorption, natural fiber, chemical treatment

## **ID No. 25: APPLYING LEAN THINKING FOR EFFECTIVE UTILIZATION OF RESOURCES IN EDUCATION SECTOR**

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### **ABSTRACT**

Lean thinking is a methodology to organize human activities to improve efficiency and effectiveness by eliminating waste. Apart from the manufacturing sector, its application in the service sector is gaining momentum in recent years. However, only a few studies were carried out for implementing lean in an educational institute. This study aims to apply lean thinking for the identification and minimization of various wastes in an educational institute. After a review of the relevant literature, various processes in the institute were studied, potential sources of wastes are identified, and its effects were quantified based on cost, space, and ease of work. Solutions for the identified problems are proposed, and implementation was carried out followed by a gap analysis. The findings revealed improved workflow and a substantial decrease in waste and unwanted motion.

**Keywords:** Lean thinking, service sector, education, implementation, work flow.

**ID No. 26: DESIGN AND ANALYSIS OF CUSTOMIZED MATERIAL HANDLING LAYOUT IN A PUMP INDUSTRY**

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**ABSTRACT**

Productivity and quality of a pump industry depends on the layout of the material handling for uninterrupted work flow. The work flow in this industry starts from casting of components to pumps. The increase in down time is due to improper arrangement of work cell. The sequence of operations in the industry are pre-machining, turning, facing, grinding, drilling, slotting, finishing, winding, test for winding, assembly-motor assembly, pump assembly, test for assembly, painting, packing and dispatch. Thus, the objective of this paper is to develop/reconfigure the layout problem with alternative process routings. It also aims to improve the production flexibility and minimize the material handling costs.

**Keywords:** Quality, Productivity, Material handling, Down time, Layout.

**ID No. 27: FLAX/BANANA FIBRE REINFORCED HYBRID COMPOSITES:  
EFFECT OF GRANITE PARTICLES AND MERCERIZATION**

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**ABSTRACT**

Nowadays, natural fibres are used as a reinforcing material in polymer composites, owing to severe environmental concerns. Among many different types of natural resources, banana plant fibres have been extensively exploited over the past few years. This paper aims at introducing new natural fibres for use as fillers in a polymeric matrix enabling production of cost-effective, biodegradable, and lightweight composites for load carrying structures. In this experimental study, eco-friendly hybrid composites are to be fabricated by using compression moulding techniques with different fibre weight fraction. The mechanical, moisture absorption and sound absorption properties of the alkali treated continuous hybrid composites to be characterized as per ASTM standard. The chemical and morphology of the fractured surfaces of the composites to be analysed using FTIR and scanning electron microscopy. Kenaf and glass fibres with two different fibre orientations of 0° and 90°

**Keywords:** Banana fibre; eco-friendly composites; Hybrid composites; mechanical properties; sound absorption property composites.

**ID No. 28: DEVELOPMENT OF CARRY BAGS FROM CELLULOSE OBTAINED FROM WASTE PAPER TO ALTERNATE POLYTHENE BAGS**

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**ABSTRACT**

Owing to irreversible environmental damage caused due to utilization of plastic to various form for civil utilization and to restore the ecosystem at its best, researchers were working to replace place the plastic bags with environmental friendly matter over decades. The present method used to make carry bag is plastic material which is under 50 microns. This in turn will cause serious harm to the human being and environment due to its extended years for degrading. On the other hand, using plastic material above 50 microns which is reusable which will not be pocket friendly for common peoples. It was found that cellulose by-product of paper recycling will be the best alternatives for the plastic products, especially carry bags which accounts for 20-23 % of total utilization of any product in plastic form. It is a type of fiber which is separated from wastepaper to make a thread like structure for manufacturing the carry bag. The waste paper which is to be collected from various sources were subjected to recycling for ink removal, by which it is followed for recycling and cellulose extraction process for producing carry bags. This will be affordable than 100% organic bags and environ friendly in nature.

**Keywords:** Cellulose fibre, Extraction.

## **ID No. 29: MATERIAL SYNTHESIZATION OF AA2219 REINFORCED WITH NATURAL CERAMIC**

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### **ABSTRACT**

Aluminium alloy has gathered wide acceptance in the fabrication of light weight structures requiring a high strength to weight ratio. The unique characteristics of the composite materials for the specific requirements makes these materials more popular in a variety of applications such as aerospace, automotive (Brake drum, piston, cylinder liners, bearings, clutches), and structural components, resulting in savings of materials and energy. Aluminium Alloy AA2219 is going to reinforce with natural ceramic powder by using stir casting method with weight % 2, 2.5, 3. The addition of ceramic will result in improvement of Mechanical Properties such as hardness, wear and machinability.

**Keywords:** Synthesis, Reinforced, Hardness, Wear.

## **ID No. 30: SOLAR SEED SOWING MACHINE**

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### **ABSTRACT**

The aim of this project is to design a seed sowing machine operated by solar energy. The seed sowing machine plays a vital role in agriculture. The growing population demands high crop productivity by implementing new techniques without affecting the soil texture. The traditional sowing method will not suffice the need of modern time. In order to overcome the energy crisis in the near future, solar energy will only be the suitable alternative source of energy. The machine attached with solar panel converts solar energy into electrical energy. The power is then transmitted to the DC motor to drive the wheels.

**Keywords:** sowing machine, solar, energy crisis, solar panel



## **ID No. 31: AUTOMATED SMALL SCALE IRRIGATION SYSTEM**

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### **ABSTRACT**

The aim of the project is to reduce the wastage of water in irrigation by monitoring the soil moisture using Arduino Microcontroller and Sensors. These kind of intelligent systems senses the moisture level of each variety of plants, since different species of plants has different moisture levels. This project concentrates both the moisture of soil and the minimum water level required by plants so that, it can allow water to plants only if needed. The major difference between the current irrigation system and the small scale irrigation system is the implementation of solenoid valves the solenoid valves play a vital role in this project by controlling the direction of water flow during irrigation. It reduces further human intervention.

**Keywords:** Irrigation, Arduino Board, Soil Moisture Sensor.

## **ID No. 32: IMPLEMENTATION OF OBSTACLES AVOIDANCE AUTONOMOUS VECHILE**

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### **ABSTRACT**

Autonomous cars are the future smart cars anticipated to be driver less and obstacles Avoidance. Several automaker have started working in this area and solve the problems in this area to get expected outcome. This transformation of convention vehicle into autonomous vehicle by adopting different upcoming technologies. This car is capable of sensing the environmental condition, navigation and fulfillment of human needs. It is a big step in future automation cars. Autonomous car is classified into 5 different levels. Level 1 - Driver assistance. Level 2- Partial automation. Level 3 conditional automation. Level 4-High automation. Level 5- Full automation. A internet controlled autonomous car is presented in this paper. Main objective is to minimize tha risk of human life and ensure high safety while driving. An idea of car which can be driven from anywhere using Iot. It reduces driver's stress and motorists can play, work and rest while driving. It may reduce high risk driving, crash risk and chauffering burdens.

**Keywords:** Autonomous, Internet of things, server, Obstacles Avoidance.

## **ID No. 33: EFFECTIVE HEAT TRANSFER IN SOLAR PARABOLIC TROUGH COLLECTORS USING MICRO HEAT PIPES**

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### **ABSTRACT**

The objective of the project is to design and fabricate receiver tube for solar parabolic trough collector by employing micro heat pipes. The idea of research is to concentrate the solar energy at focal point to generate enough temperature that can possibly produce steam that can be used to run steam turbines. Solar energy is available everywhere and been utilized since long both as electricity and as a source of heat. the sunlight which enters the parabolic trough its focused along the focus line where the micro heat pipes are positioned that are intended to be heated. the micro heat pipes are used to increase the heat transfer rate. The working medium is heated to a high temperature by the energy of the sunlight. then it is changed to steam. The steam is given to the turbine and it is converted into mechanical energy and can be utilized to produce electricity.

**Keywords:** Solar Parabolic Trough Collector, Solar Energy, Electricity and As A Source of Heat, Micro Heat pipe.

## **ID No. 34: AUTONOMOUS VEHICLE TO SHUTTLE BETWEEN TWO POINTS**

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### **ABSTRACT**

Autonomous vehicle is known as an unmanned or driverless vehicle and it is designed for the short distance travel. Design of this autonomous vehicle includes the design of a system which allows the vehicle to move to the predefined point of the destination and to avoid obstacle during the motion using the information getting from sensors which are installed on the vehicle and it is controlled by the Arduino board. It uses Global Positioning System (GPS) to locate the vehicle and the Global System for Mobile communication (GSM) to communicate.

**Keywords:** Aurdino, Global Positioning System, Global System for Mobile communication, Ultrasonic sensor.

## **ID No. 35: MECHANICAL AND ACOUSTICAL PROPERTIES OF DESIGN AND FABRICATION OF IOT BASED LAWN MOWER**

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### **ABSTRACT**

A normal grass cutter moving with IC engine will run based on the energy from petrol. The major drawbacks of this technology are high running cost; create noise pollution and air pollution. Also, an IC engine requires periodic maintenance such as changing the engine oil, mechanical maintenance. It is an innovative technology of cutting grass without any pollution, electric grass cutter are environmental friendly. Nowadays, the labor charge is increased day by day. This technology can help the people who are living in rural areas. This project is mainly proposal for reduce the manpower and usage of electricity. The system control is done by the IOT technology. The grass cutter and vehicle motors are interfaced to a controller circuit which is controlled with the help of web for performing the working of all the motors.

**Keywords:** Internet of Things, Web Server, Electric DC Motor, Grass Cutter.

## **ID No. 36: CONVECTIVE HEAT TRANSFER CHARACTERISTICS OF NANOFLUIDS FOR AUTOMOBILE RADIATORS**

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### **ABSTRACT**

In automobiles, radiators and fuel cell are the vital components in the control of the engine temperature. The water–glycol mixture (EG-H<sub>2</sub>O) is used as the coolant in the automobile radiators. With the sudden growth in automotive industries the trend goes towards the speed, performance and the reduced size of equipments which demands large heat removal rates. In order to remove these high heat fluxes, special and high performance cooling techniques are needed. Because of very high surface heat fluxes that can be achieved during convective heat transfer, such a process is certainly one of the most effective modes of heat transfer and hence often preferred in various thermal applications. Although the mechanism of convective heat transfer of nano fluids is relatively well known today, it remains nevertheless a very complex physical phenomenon, even for a common liquid such as ethylene glycol (EG) and ethylene glycol-water mixture respectively. Recently, nano particles are being dispersed in conventional heat transfer fluids such as water, Ethylene glycol to produce a new class of high efficient heat exchange fluids in order to improve the performance of the systems. Therefore, a significant attention has been focused on the study of heat transfer phenomena of nano fluids with different concentrations and different sizes of nanoparticles which can be used as an efficient coolant in the automobile radiators and fuel cells. Findings related to convective heat transfer characteristics for nano fluids will pave way for better design of radiators which will enhance the heat transfer phenomenon. Thus there is a need for experimentally validated models to analyze the convective heat transfer characteristics of nano fluids.

**Keywords:** radiators, nano particles, nano fluids, convection

## **ID No. 37: DESIGN AND FABRICATION OF MINI PADDY CUTTER MACHINE**

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### **ABSTRACT**

This project is to help small scale farmers to meet an increase the demand for local grains ,by designing a mini paddy cutter machine to harvest grains more efficiently . Our research work will focussing on ease of harvesting operation to small land holders for harvesting varieties of crops in less time and at low cost by considering different factors as power requirement , Cost of equipment , ease of operation , field conditions , time of operation and climatologically conditions .The operating , adjusting and maintaining principles are made simple for effective handling by unskilled operator.

**Keywords:** Paddy cutter machine, Agriculture purpose, Decrease time duration.

## **ID No. 38: DESIGN AND FABRICATION OF FOOT STEP POWER GENERATOR**

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### **ABSTRACT**

In this project we are generating electrical power as Non-conventional method by simple mechanism . Non-conventional energy production is very efficient as it safe to environment .This project does not requires any fuel source power to generate the electrical power. It works on the simple gear mechanism such as rack and pinion assembly and dynamo are used for generating power by utilization of force which is obtained while stepping on surface of the device. The generated power is stored by means of battery and it is utilized when needed as of requirements. This is one of the compact and efficient systems for generating electricity which can be easily installed in many regions.

**Keywords:** Non-Conventional Method , fuel source



## **ID No. 39: FABRICATION OF CONNECTED DRONES**

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### **ABSTRACT**

A drone in technological terms, is an unmanned aircraft. Drones are more formally known as unmanned aerial vehicles. Drones are now used in a wide range of civilian roles ranging from search and rescue, surveillance. Farmers use them to check on fields and crops. Firefighters fly drones over forests to check for wildfires. Filmmakers may use them to record scenes in movies. Scientists may fly drones into big storms to gather information such as temperature and wind speed. Some companies think drones could help grow their business. For example, Amazon and Walmart are interested in using drones to deliver goods to people's homes. Drones can deliver goods in minutes. People would not have to wait for goods to arrive in the mail. Other companies want to use drones to deliver food.

**Keywords:** drones, aerial vehicle

**ID No. 40: DESIGN AND FABRICATION OF LOW-COST MINI SPUD  
FOR AGRICULTURAL APPLICATION**

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**ABSTRACT**

The main aim of this project to design and fabricate a mini spud to remove the weed with minimum effort and low cost. In the present situation farmers are often bow to carry out work the farming process. Over a period of time it causes physical pain and mental fatigue to farmers. A specially designed mini spud can effectively minimized these issues and simplify the weed removing process. In addition this device can also be used to carve grasses smoothly. Major components in device are made with high carbon steel in order to avoid corrosion, rust formation and maintain the sharp cutting edges. Dead weight is used to pierce the plow into the soil. Depth of plow penetration is controlled by dead weight adjustment. The advantage of this includes effortless removal the weed, minimum human effort, no need of electricity, low manufacturing and maintenance cost.

**Keywords:** Weed remover, spud, High carbon steel, dead weight.

**ID No. 41: EXPERIMENTAL ANALYSIS OF AA 6061&AA 8011 WELDED USING FSW BY EVALUATING MECHANICAL PROPERTIES AND MICROSTRUCTURE OF WELDED JOINT**

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**ABSTRACT**

Friction stir welding (FSW), a solid-state joining technique, is being extensively used in similar as well as dissimilar joining of Al,Mg, Cu, Ti, and their alloys. In the present study, friction stir welding of two aluminium alloys—AA6061 and AA8011. This focus on the study in welding property of AA 6061& 8011.. The microstructure, hardness distribution and tensile properties are to be investigated. Tools used in FSW is circular headed. The main advantage in FSW is there is no change in properties of the welded portion because new materials is not induced into the weld.

**Keywords:** Friction Stir Welding, Aluminium alloys

## **ID No. 42: REINFORCEMENT OF 3D PRINTED PLA WITH HYBRID COMPOSITES**

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### **ABSTRACT**

The materials present in the composites are Jute fibers and unidirectional poly lactic acid (PLA) where fibers of Jute from reinforcement and the poly lactic acid is the matrix. The objective of the study to fabricate a Bio-degradable composite with Unidirectional oriented natural fibers through compression moulding. Composite plates are cut to obtain required specimen for performing tests which reveal the Young’s modulus, unidirectional stresses and shear stress of the composites.

**Keywords:** hybrid composites, uni directional stresses, Young’s modulus

## **ID No. 43: EXPERIMENTAL INVESTIGATION ON MECHANICAL AND ACOUSTICAL PROPERTIES OF GRANITE PARTICLE REINFORCED HYBRID POLYMER COMPOSITE**

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### **ABSTRACT**

In present days natural fibre composites are used for the replacement of synthetic fibres because of low density, easy to manufacture, eco-friendly, recyclability, sustainable production, bio degradability and attractive mechanical properties. In present study the natural fibres is subjected to alkali treatment (Mercerization) and the effect of these treatments on fibres were studied. The hybrid composite laminates were fabricated with the maximum volume fraction of 40%. The fibres are obtained from mechanical decortication process. Morphological analysis was carried out to inspect equivalent distribution of fibres' in the matrix, internal cracks and internal structure of the cracked surface are estimated by using scanning electron microscope. Outcome of this research work is to implement the environmental friendly acoustic material for construction application

**Keywords:** Alkali Treatment, Reinforced Hybrid Composite, Metal Matrix

## **ID No. 44: ADAPTION OF LEAN PRINCIPLES IN SMALL SCALE INDUSTRY**

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### **ABSTRACT**

Lean is a business strategy used to improve quality, service, waste reduction, reduce time and costs, and enhance overall organizational effectiveness. Challenges in competitive market have prompted many small and medium-sized enterprises (SMEs) to adopt the lean to enhance firm’s competitiveness. This paper attempts to present an overall-inclusive study and it examines various factors associated with the implementation of lean in SMEs. The findings suggest that most of SMEs have a relatively accurate understanding of lean concept and philosophy. By implementing lean cost can be reduced, improve profit margin, improve utilization of plant/facility, and maintain competitive position. Lean tool such as VALUE STREAM MAPPING shows that there exist quite significant differences in terms of the degrees of lean implementation in SMEs. The paper provides evidences that major lean barriers are encountered by SMEs regarding management or people related factors as well as key knowledge and know-how.

**Keywords:** lean principles, SMEs

**ID No. 45: HYBRIDIZATION EFFECT OF FLAX AND JUTE FIBERS REINFORCED WITH SIC FILLED EPOXY BASED HYBRID COMPOSITES**

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**ABSTRACT**

Development of the Natural fiber based Composites from renewable sources is a sustainable alternative material for emerging engineering fields like automotive, aerospace and marine. The aim of this work is to incorporate the flax and jute fibers with the epoxy polymer and by adding silicon carbide filler to the both flax and jute fibers. Five different hybrid composites were prepared by compression moulding method. The physical and mechanical properties of hybrid composites were tested according to ASTM. Results show that addition of silicon carbide filler can improve the mechanical properties such as tensile, flexural, impact and interlaminar shear strength. Failure of hybrid composites generally occurs due to the reduced adhesion bonding between fibers and epoxy matrix and fibers pull out.

**Keywords:** Flax, Jute, SiC, ASTM, NaOH

## **ID No. 46: DESIGN AND ANALYSIS OF ERGONOMICAL CLOSET SUPPORT**

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### **ABSTRACT**

In the civilized world our habits are being evolved over a period of time, one such evolution is development of western toilets. It has been introduced for the disabled people i.e. people who were not able to sit in their normal squatting position due to some of health problems or inability due to their age, but now western toilets have become a fashion, people think that using western toilet is more sophisticated. Though it has served many people it has some disadvantages too. In the 90 degree squatting position, constipation is one of the main obstacles for many of the people. Urinary tract infection that occurs frequently in some cases. So, we fabricated the closet support which make the squatting position to 35 degree, convenient for puborectail muscle while excretion. It helps in eliminating the strain on the puborectail muscles and also reduces constipation

**Keywords:** Western Toilet, Constipation, Puborectail muscle, squatting



## **ID No. 47: AUTONOMOUS VEHICLE TO SHUTTLE BETWEEN TWO POINTS**

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### **ABSTRACT**

Autonomous vehicle is known as an unmanned or driverless vehicle and it is designed for the short distance travel. Design of this autonomous vehicle includes the design of a system which allows the vehicle to move to the predefined point of the destination and to avoid obstacle during the motion using the information getting from sensors which are installed on the vehicle and it is controlled by the Arduino board. It uses Global Positioning System (GPS) to locate the vehicle and the Global System for Mobile communication (GSM) to communicate.

**Keywords:** Aurdino, Global Positioning System, Global System for Mobile communication, Ultrasonic sensor.

## **ID No. 48: COST EFFICIENT NOTCHING FIXTURE**

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### **ABSTRACT**

Pipe Notching is most commonly performed to make ‘T’ shape joint or similar joints on tubes. This project focuses on designing, analyzing and fabrication of a portable tube notching fixture at low cost. It consists of a mild steel table, tube or pipe (work piece) holder, tool holder setup and motoring unit. In this project, the Mild Steel Table acts as base, the work piece holder of same material is capable of holding tubes of different diameter. A Notching Tool holder setup is perpendicular to work piece vice, which consist of shaft that holds the Notching tool at left end, which is mounted to monitoring unit with a freedom for angular movement. The Monitoring unit may be of a single 0.25 hp motor or angle grinder unit. The modeling of the notching fixture is done using SOLIDWORKS 19-20 software and analysis is made through FUSION 360 software. This project concentrated mostly on cost efficiency.

**Keywords---** Notching tool holder, work piece vice, 0.25 hp motor or angle grinder unit, SOLIDWORKS, FUSION 360

## **ID No. 49: IMPLEMENTATION OF 5S**

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### **ABSTRACT**

Due to the insufficient production systems and their setups generally the small and medium scale organizations (SMES) are facing problems of product accuracy and quality. The firm Bannari Garments is also facing the same problems in par with the customer satisfaction and competitor’s impact also. Due to increased customer demands, high product variety, and a push production system, the organizations have been suffering from excessive wastes, average work stations set up, and its environment. In such cases continuous improvement process using advanced manufacturing technologies are most useful as solution , our project aims to identify the performance factors and their characteristics in Bannari Garments Industry, where the 5s is applicable to the file searching process and the efficiency is achieved through the reduction of process time in simple manner and the same will effect on the supply line also to the customer end.In this way 5S techniques would strongly support the firm.

**Keywords:** 5S, productivity

## **ID No. 50: WIRELESS PENDRIVE**

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### **ABSTRACT**

A wireless USB drive is an device is used to transfer files without using wire or cable connection with the help of bluetooth and Wi-Fi hotspot connection. This can be also connected with mobile and television This is more compact and incase of Low battery condition we can use as a normal pen drive It can be operated even from 10 m. Wireless USB was based on the Wimedia 's Ultra wide band (UWB) common radio platform, which is capable of sending 10 Mb /Secs. Wireless USB is used printers, scanners, digital cameras, media players. It is also suitable for transferring parallel video streams, using USB over ultra-wideband protocols.

**Keywords:** Wireless USB Drive , Bluetooth, Wi-Fi ,Hotspot, File Transfer.

**ID No. 51: REINFORCEMENT OF 3D PRINTED PLA WITH  
HYBRID COMPOSITES**

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**ABSTRACT**

The materials present in the composites are Ripe Bulrush fibers and unidirectional polylactic acid(PLA)where fibers of Ripe Bul rush from reinforcement and the poly lactic acid is the matrix. The objective of the study to fabricate a bio- degradable composite with unidirectional oriented natural fibers through compression moulding. Composite plates are cut to obtain required specimen for performing tests which reveal the youngs modulous, unidirectional stresses and shear stress of the composites.

**Keywords:** PLA, composites

**ID No. 52: SYNTHESIS AND CHARACTERIZATION OF AL6061 AND AL6063  
BASED SURFACE COMPOSITE BY FRICTION STIR PROCESSING**

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**ABSTRACT**

Improved surface properties with the retainment of bulk properties are necessary for a component for enhanced wear characteristics. Friction stir processing (FSP) is used to produce surface composites. Fabrication of 6061 and 6063 aluminium alloy with reinforced layers of boron carbide (B<sub>4</sub>C) and Zirconium Carbide through FSP was carried out. Micro and nano sized B<sub>4</sub>C and ZrC particles were used as reinforcements. The friction processed surface composite layer was analyzed through optical and scanning electron microscopically studies. The number of passes and the size of reinforcement play a vital role in the development of surface composites by FSP. Mechanical properties of the friction stir processed surface composites were evaluated through micro hardness and universal tensile tests. The results were compared with the properties of the base metal. The role of reinforcement and number of passes on properties were also evaluated. The surface composite layer resulted in total number passes with nano particle reinforcement exhibited better properties in hardness, tensile behavior and corrossions resistance compared to the behavior of the base metal.

**Keywords:** AL6061, AL6063, friction stir

## **ID No. 53: THERMAL COMFORT IN CHAIRS USING PCM**

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### **ABSTRACT**

While sitting on a chair continuously for long time a thermal illness will be created on our rectal. It may be a office chair or bus seats it create a medical illness to our body. So we reduce the thermal illness on chairs by using thermal energy absorption. Phase change material is used as the absorption material because it is capable to absorb and release heat energy when it undergoes heating, cooling and phase transition process. Paraffin based phase change materials were selected to be used as the absorption material in this study because they are able to fulfil most of the criterion to be used as thermal energy absorption. However they possess low thermal conductivity characteristic which leads to poor performance in energy absorption. In this study different types of carbon was mixed into pure paraffin based phase change material and acts as additive to improve its thermal absorption. Different types of phase change material were tested in experiment. And the thermal illness reduction was integrated with thermal energy absorption using different phase change material was compared and discussed. In the end the thermal illness of rectal was absorbed using phase change material. Paraffin wax mixed with carbon was found to have the best performance among the phase change materials used in this study due to its enhanced thermal absorption characteristic.

**Keywords:** PCM, energy, thermal, phase change

## **ID No. 54: IOT BASED TWO WHEELER FOR PHYSICALLY CHALLENGED WITH REVERSE MECHANISM**

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### **ABSTRACT**

In our country, there are many thousands of physically challenged persons who use the same old vehicles meant for handicapped persons. Normally, a handicapped vehicle does not have reverse gear. To overcome these difficulties of handicapped people by implementing our project, presented in this paper, whose main aim is to help physically challenged persons to move their vehicle in reverse without the help of others. For the reverse motion of the vehicle a compact, self contained hub motor is to be mounted on the front wheel in order for a wheeled vehicle to be driven electrically. The wheel has a hub within which is mounted a stationary center shaft. Mounted about the center shaft is a motor housing which is rotationally mounted on the center shaft. The specialty of the vehicle lies in the way that the steering mechanism has been designed, here we use a pedal controlled steering mechanism which is very helpful for person without arm to move the vehicle in directions. The accelerator and the brake mechanism has been designed in the same way like the steering mechanism. This vehicle can also be controlled using the voice recognition by IOT. The functions controlled by IOT includes ignition (on\off), head lamp (on\off), indicators (on\off), horn.

**Keywords:** Reverse mechanism (hub motor), Internet of things (IOT), Pedal (accelerator, brake and steering mechanism).



## **ID No. 55: FABRICATION OF SOLAR POWERED GRASS CUTTER**

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### **ABSTRACT**

Rapid growth of various high-tech tools and equipments makes our jobs done comfortable and sophisticated. The project aims at fabricating a grass cutting machine system which makes the grass cutter based Motor running through solar energy. Due to the continuous increase in the cost of fuel and the effect of emission of gases from the burnt fuel into the atmosphere, this necessitated the use of the abundant solar energy from the Sun as a source of power to drive a grass cutter. A solar powered grass cutter was designed and developed, based on the general principle of mowing .This seminar is deal with designer of solar powered grass cutter comprises of direct current (D.C) motor, are chargeable battery, solar panel, a stainless steel blade and control switch. The solar powered grass cutter is operated by the switch on the board which closes the circuit and allows the flow of current to the motor which in turn drive the blade used for mowing. The battery recharges through the solar charging controller. Performance evaluation of the developed machine was carried out with different types of grasses.

**Keywords:** Solar energy, Principle of Mowing , Solar charging controller

## **ID No. 56: GEAR CUTTING ARRANGEMENT OF LATHE MACHINE**

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### **ABSTRACT**

As gear cutting operation is mostly done on milling machine the cost of the milling machine is very high, which is not economical for the small scale industries. This gear cutting arrangement in lathe machine reduce the initial investment of small scale industries for milling which can use their lathe machine for gear cutting operations. This is also reduce the space covered the machines and the remaining space can be used for other productive work output. Still, it is facing some difficulties like machining of gear cutting on the shaft. To overcome this difficulty it is necessary to design an attachment for the lathe. Which is able to overcome these difficulties and flexible to use it. In this arrangement we are not using an indexing device to change the angle of the gear. Instead of that we are using an finished work gear to produce an gear with the help of knife edge and gear cutter.

**Keywords:** Gear cutter , Knife edge , Attachment , Lathe machine, Optimization

## **ID No. 57: IMPLEMENTING 5S PRACTICE IN FOUNDRY SHOP**

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### **ABSTRACT**

Small scale industries plays an important role in Indian economy. It has emerged as powerful tool in providing relatively larger employment next to agriculture. It contributes more than 50% of the industrial production in terms of value addition and generate one third of the export revenue. Global markets are continuously changing and the customers are demanding high quality products with affordable cost. Such products can be produced using lean manufacturing process, a management philosophy that aims at reducing all types of wastes (non – value added activities) to achieve higher quality products with low cost. One such Lean technique is 5S. 5S a lean concept is a Japanese method of organizing the workspace in a clean, efficient and safe manner in order to achieve a productive working environment. Our project focuses on implementing 5S practice in foundry shop to enhance the safety of working environment, so that productivity and employee morale can be improved.

**Keywords:** Global market, Lean Manufacturing, 5s

## **ID No. 58: IMPROVING PRODUCTIVITY USING LEAN TECHNIQUE IN A PUMP MANUFACTURING INDUSTRY**

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### **ABSTRACT**

At the present scenario, the Lean Manufacturing has become a worldwide phenomenon. A large number of organizations are following Lean technologies and experiencing vast improvement in quality, production, customer service and profitability. M/s ABC Company is a manufacturing company that manufactures variety of centrifugal pump set for domestic and industrial applications. In this work to adopt the Lean manufacturing concept in this industry by using Value Stream Mapping (VSM) technique and to reduce the wastes such as long lead time, defects, material waste etc. Our project focuses on creating current and future state value stream maps which, when implemented will decrease the current lead time of manufacturing thereby improving the productivity of industrial shop floor. From their pump variety, the team chose 5HP and 10HP centrifugal pump set as product family and worked on them. From the Current Value Stream Map created the lead time for the stator coil winding product is found to be 60 to 90 min right from the processing of coil wires till the stator winding is completed. From the map created, various stages that contain bottlenecks in process were clearly identified and remedial measures were taken to eliminate those bottlenecks. Various lean tools such as Kaizen Bursts, 5S and other methods to eliminate the wastes were identified and implemented effectively. After remedial measures were adopted the data is tracked again and Future Value Stream Map is drawn. From the map it was clear that the lead time for the product was reduced to a certain extent of up to 15 min per motor. Therefore our primary goal of the object was achieved by adopting lean techniques and the productivity of the organization was increased.

**Keywords:** Lean manufacturing, Value stream mapping, Productivity, Centrifugal pumps.

## **ID No. 59: DEVELOPMENT OF FILAMENT EXTRUDER FROM WASTE PLASTICS**

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### **ABSTRACT**

A Plastic filament extruder produces plastic filaments of specified diameter using corresponding dies. Input materials (waste plastics) used in the form of granules and pellets are crushed in the crusher. Suitable heaters are used to melt the input material. Heater is provided with a hopper and a barrel like hardened steel projection in order to push the plastic material out. The toxic gases evolved are redirected into the water bath to reduce the environmental pollution. The molten plastic material is sent to the next channel where it is maintained under the required temperature. Several other additives can be added as per the requirement. The filament is tested for its quality. This project focuses on designing and fabricating a portable 3D printer filament making machine. By using this machine, a filament is produced of 1.75 mm or 3 mm.

**Keywords:** screw extruder, plastic filament, 3D printer, waste plastics.

## **ID No. 60: DESIGN AND FABRICATION OF AN INDUSTRIAL ROBOT FOR HIGH RISK, NON-REPETITIVE OPERATION**

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### **ABSTRACT**

In places where material handling is not feasible using bare hands due to various factors like safety, weight, etc., robots are often used. But, programming and using an industrial robot where there is very less uniformity in its operation to function as an autonomous entity is not feasible. With an objective of creating a system to handle heavy/ hazardous materials, a special type of robot is designed and fabricated in this project. Tele-operated robotics is employed to carry out heavy/ hazardous materials, where a sensor embedded wearable to the hand will be employed to control an industrial robot with an end effector. This kind of arrangement can be made and employed in an industrial scenario, where direct human contact to a hazardous/ heavy material can be eliminated by using the concept of tele robotics. In this fabrication based study, a prototype of a similar kind of an industrial robot is controlled by an Arduino led flex sensor. A collection of servo and stepper motors are controlled, thereby enabling the end effectors' movement. After fabrication, it is planned to be tested in a suitable environment, and its usability is discussed. The automated arm outlined has 4 degree of freedom (DOF) arrangements and it is made to remember and repeat, and accomplish some basic under takings such as light material handling and handling of hazardous chemicals.

**Keywords:** Robot, Hazardous, Heavy, Sensor, Wearable, Arduino, Tele robotics.

## **ID No. 61: IOT BASED WATER VENDING MACHINE**

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### **ABSTRACT**

Water has become the most commercial product of this century. About 71% of earth is covered with water, but sadly only 2.5% of it is drinking water. Freshwater scarcity is one of the major problems in metropolitan cities are facing across the world. To meet the safe drinking water requirements at public places, water is to be supplied to the consumer through his/her bottle/container or through cups (in selected public locations). This vending machine will be essential for betterment of the environment as the usage of consumer’s own bottle/container would minimize the usage of plastic/bottles for drinking purposes and also it decreases the wastage of water. This machine consists of both hot and normal water based on the people requirement. The water dispenser consists of the following components Stainless Steel tank, heating coil, Insulating material, valves, Ph and temperature detecting sensors, microcontrollers and GSM module. This machine mainly works on IOT.

**Keywords:** IOT-Internet of Things, Sensors, Aadhar Card, Cashless Payment, Microcontrollers.

## **ID No. 62: AXLE HOUSING KITTING DESIGN**

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### **ABSTRACT**

This paper focuses on the axle housing kitting by modifying the existing kitting design by considering the ergonomic factors. Normally the subassembly exceeds the line-side space due to various reasons. These results loss in downfall of the production. This could adversely affect the production of the company. It also presents some valuable suggestions to reduce the line-side space in this assembly process. If this work is executed, there will be a substantial save in the line-side spacing as well as increase in business potential for the manufacturer. A new kitting will be designed in order to reduce the various factors like inventories, work in progress. An increase in line-side storage space and part number creates longer operator walking and searching times at the assembly line. One way to decrease the line-side storage and operator and searching times is to deliver parts in these type of kits. In manufacturing system, the practice of delivering components and subassemblies to the shop floor in predetermined quantities that are placed together in specific containers is generally known as “kitting”. Kitting provides the opportunity to decrease line-side storage, line-side replenishments and operator walking time for kitting. The design was also planned to reduce the inventory level by reducing the number of trolleys and it pursues the work of 12 kitting trolley in a single kitting. Kitting trolley model is designed with various design parameters for the manufacturing industries and CAD model is constructed using CREO- software. The designed frame was analyzed with Finite Element Method. The analysis was required to check the values of induced stresses and deflections caused due to the weights of components. The STEP file structure was meshed and analyzed using ANSYS Workbench for stresses and displacements during various loading conditions.

**Keywords:** Line-side storage space, Ergonomic factors, Kitting, 3D Modelling, CREO, Finite Element Analysis, ANSYS.



## **ID No. 63: DETERMINATION OF BENDING STRENGTH OF MACHINING FIXTURE BY USING FINITE ELEMENT ANALYSIS**

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### **ABSTRACT**

This project focuses on the lathe mandrel by analyse the strength of maximum load withstand by mandrel. Then design by considering the ergonomic factors. machining fixture for conical wedge of post tensioning system of pre-stressed concrete needs to be designed .The component is first machined from round bar stock giving to it the conical shape with a threaded hole (Threading meant for only better grip on tensioning wires).Finally the cone is to be cut in to three equal wedge shaped pieces by slitting saw. The component is required on fairly large scale and the cost of machining needs to be kept to minimum. Thus the need arises for the development of a low cost, and efficient machining fixture. The company’s main aim is to reduce the cost of the machine without compromising on the quality of the output. Machining process include Turning (using lathe), Drilling, Milling, Grinding, Shaping etc. Lathes are also called turning machines, since the workpiece is turned or rotated between two centers. They are primarily used to produced cylindrical, plain and tapered surfaces and also used for knurling and thread cutting on metal parts. A lump of round Metal can be machined into various circular shapes to achieve a desired result to a high tolerance. Anything from a small shaft too large machine parts ranging from mm in diameter and length. Results of the literature analysis are then used to make suggestions for future research to make suggestions for future research.

**Keywords:** Fixture Design, 3D Modelling, CREO, Finite Element Analysis, ANSYS.

## **ID No. 64: IMPLEMENTATION OF GEAR CUTTING ATTACHMENT IN LATHE MACHINE**

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### **ABSTRACT**

This project is dealing with the gear cutting operation using the existing lathe machine. A study of the lathe machine at NanoTech showed that most of the machines were conventional and some of them were CNC lathe machine and VMC machine. Generally, gear cutting operation is done by using milling machines in the industry. The cost of the milling machines is too high. It occupies more space and not economical for the small-scale industries. To overcome this problem, one special attachment is to be fitted on the lathe machine for gear cutting operation. This gear cutting attachment is added to the existing lathe machine to eliminate the need for the milling machine. It is designed and it is to be mounted on the lathe machine. This attachment will reduce the initial investment needed for the milling machine in the small-scale industries. This will also reduce the space occupied by the machine and the remaining space can be used for other production processes.

**Keywords** - CNC - Computerized Numerical Control, VMC - Vertical Machining Centre

## **ID No. 65: PRODUCTIVITY IMPROVEMENT AND WASTAGE REDUCTION IN RUBBER INDUSTRY**

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### **ABSTRACT**

The work emphasizes the design and simulation of an automatic pneumatic work system in rubber moulding trimmer machine. A study of rubber moulding trimmer machine at Bhargave Rubber industry showed that most of the machines were manual and some of them were hydraulically operated. But the cost of these machines too high for small scale industries. These machines were well suited for high-pressure trimmer machine. To overcome this problem, an attempt has been made in developing an Automatic Pneumatic work system in rubber moulding trimmer machine. The pneumatic system can be worked up to 8 bar pressure based on the compressor used. In this machine, Compressed air can be Filtered, Regulated and Lubricated by FRL unit. The pneumatic circuit simulation on the Automation studio 5.0. In this chapter, some advantages and disadvantages of compression moulding and also introduce moulding materials for compression moulding such as rubber moulding compound and bulk moulding compound. To obtain high quality products, it is important to optimize mould design and processing conditions. Process moulding such as flow and cure analysis is especially useful to predict the knit line formation, part curing, fiber orientation and separation in the final product. Result shows that, the productivity efficiency of the industry has been increased 35% and the manpower work has been reduced. So the work aimed to solve the problem of small-scale industries, where small-sized rubber components are manufactured.

**Keywords** -FRL- Filter, Regulator and Lubricator

## **ID No. 66: REDUCING TOOL CONSUMPTION IN FORGING PROCESS**

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### **ABSTRACT**

It is becoming increasingly essential to predict the exact behavior of cold forging die during the forging process and it is also important to optimize the die design for its durability and to reduce the production cost of die. Optimization of cold forging die design is required to reduce the production cost of die as well as the forged part and also to increase the accuracy of the die and the forged part. Since the past few years computer aided engineering (CAE) techniques have been widely used for the research in the metal forming. The present work is a review of the existing die design techniques which are used in forming process which will improve the performance of die. In cold forging the die will undergo the high loads, hence it is essential to know fatigue behavior and fatigue failure of the die when it has been under go cyclic loading. The study end up with future challenges of the die design and its processes, the approaches adopted to develop an optimum system that can fulfill the customer demand.

**Keywords** –forging process- bolt forming-2D design

## **ID No. 67:REDUCTION OF DEFECTS IN STEEL INDUSTRY**

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### **ABSTRACT**

Global competition leads customers to demand high quality product, product variety had a major impact on manufacturing industries. This paper focused on identification of defectives and its causes in a steel industry. Quality assurance is inevitable for all industries, it includes regulation of the quality of raw materials, assemblies, products and components, services related to production and management, production and inspection processes. For this 100% quality control is maintained in this industry. Quality control is a system of maintaining standards in manufactured products by testing a sample of the output against the specification. Inspection is a major component of quality control, where physical product is examined visually. Product inspection will be conducted with lists and descriptions of unacceptable product defects. Now a day's most of the waste generated in the steel industries is in the form of rework which lean considers it as its waste. Lean manufacturing is a technique employed to increase the value of a product by eliminating wastes. Here critical defect of the products is identified using pareto chart and the wastes occurring in the various departments of the steel industry are identified. The causes and sub-causes of the wastes are then analyzed with the help of fishbone diagram and the suitable remedies and improvements are suggested.

**Keywords:** Defects; steel industry; fishbone diagram; pareto chart.

## **ID No. 68: INCORPORATING FLEXIBLE MANUFACTURING SYSTEM FOR ENHANCING THE PRODUCTIVITY**

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### **ABSTRACT:**

The manufacturing industry has been experiencing a competitive environment and striving hard to find methods to reduce manufacturing cost, waste and improve quality. Flexible manufacturing concepts are used by the industries for automation. Productivity improvement is one of the core strategies towards manufacturing excellence and it also is necessary to achieve good financial and operational performance. The aim of this research is to modify and improve the layout in a rubber seal industry with clear focus on improving productivity. Cycle time has appeared as an important thing to produce a high productivity. The project study is carried out at BHARGAV INDUSTRIES PRIVATE LIMITED, MADURAI. An effort is made to study the entire layout design of production line right from raw materials stage until finished product output. The problem in the current layout was identified. Efforts are made to reduce the motion waste in the shop floor. Then the layout is modified and the results are compared with the current layout. The results revealed an improvement of 5% in productivity.

**Keywords:** productivity, layout, cycle time, reduce

## **ID No. 69: STUDY ON GREEN SUPPLY CHAIN MANAGEMENT IN CHEMICAL INDUSTRY**

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### **ABSTRACT**

Green Supply Chain Management (GSCM) has appeared as an environmental innovation which integrates environmental concerns into supply chain management. This paper is focused on identifying various drivers and barriers of green supply chain management. Driver's helps to accelerate or speed up the green supply chain. The various drivers identified are employee motivation, health, safety, customer awareness, pressure, support, green image, global marketing, competitiveness, supplier's pressure, willingness, economic benefits or cost reduction benefits, society or public pressure, environmental concerns, government rules & legislation. The most important barrier identified was high cost. Another thing is to identify the influence of green supply chain management in developed countries and developing countries. And to identify the driving power and dependence of each driver's by using cross-impact matrix multiplication applied to classification (MICMAC) analysis.

**Keywords:** Supply chain management, Green supply chain management, Chemical plant, MICMAC

## **ID No. 70: LEAN PROCESS PRODUCTIVITY ENHANCEMENT VSM FRAMEWORK IN TILLER MANUFACTURING UNIT**

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### **ABSTRACT**

Lean manufacturing is a production management strategy whose main role is to focus on customer value creation through eliminating the wastes involved. Nowadays in competitive market, companies implement lean manufacturing to keep their competitiveness by improving the manufacturing systems productivity. Value Stream Management (VSM) is a lean production enabler to plan how and when they ought to create the enhancements. VSM tool is employed for analysing the material and information flow of a selected product flow. The goal of the paper is to improve productivity by eliminating wastes and finding quality problems within a value stream using a newly developed structured framework which incorporates both lean tools and six sigma tools under one roof. At the beginning of project relevant data from the process were collected and process charts were plotted then quantification is done through Work study and yield calculations. Subsequently the initial process was mapped using current state VSM and then six sigma analysis is conducted. Root cause of wastes and quality were identified through this process. Solutions were generated and line balancing is done based on it. Finally, the paper formulates Future state VSM which suggests improvements in the flow of information and materials.

**Keywords:** Value stream mapping, Line balancing, Work study, Six sigma, lean manufacturing



**ID No. 71: AN ANALYTICAL STUDY ON BIOMEDICAL WASTE  
MANAGEMENT IN HOSPITALS IN TRIVANDRUM CITY**

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**ABSTRACT**

Risks associated with healthcare waste management have gained attention across the world at local and international conferences. This is due to the hazardous nature of these wastes and the potential threat to spread deadly diseases to humans and other living organisms. Poor management of healthcare waste may expose health workers and public to hazardous wastes from healthcare establishments. It is mandatory by law that every medical organization that generates waste should have a system, process and resources in place for segregating biomedical waste within the organization for proper disposal. It is therefore important to review the adopted practices in hospitals and suggest a model for examining the awareness along with perceived outcome.

**Keywords:** healthcare waste; waste management; infectious waste; waste disposal

## **ID No. 72: NUMERICAL ANALYSIS OF A RADIATOR USED IN POWER TRANSFORMERS**

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### **ABSTRACT**

The present study is based on the concept that, by breaking a boundary layer the average heat transfer coefficient increases. Natural convection is a cost-effective way of cooling radiators of a power transformer. The typical length of a radiator panel is 1.67 m for a 30 MVA transformer cooled by Oil Natural Air Natural (ONAN) radiator panel. The radiator used for the analysis is made of steel and consists of 26 panels in a module. The length of the radiator panel is varied (halved and quartered) in this study based on this central idea. The numerical analysis is carried out based on Boussinesq approximation for laminar, steady flow conditions. The analysis is conducted for three cases (1) single panel -base case (2) halved length panel (3) four-piece panel. All these panels have the same area, but the length is halved and reduced to one fourth respectively. The analysis showed that for the modified panels the heat transfer coefficient is found to be higher than the base panel (single panel) radiator. Out of the two cases studied, the four-piece panel is found to have a better heat transfer performance of 6.14% higher than the base panel radiator. In terms of heat transfer, for single panel the heat transfer accounts to 148.5 W, and for the module it turns out to be 3860 W. For the case studied, for a four-piece panel the heat transfer per panel becomes 156 W, and for the module it is 4056

W. The additional heat transfer of 196 W can be accounted for a case with a module of 24 panels thus resulting in material cost. Further study is required to incorporate the actual manufacturing and material cost incurred due to the modification of the panel and a comparison with the net amount of heat transfer. But this is out of the scope of the present contest.

**Keywords:** radiator, natural convection, fluid dynamic approach, heat transfer coefficient.

## **ID No. 73: DESIGN OF BIN AND HOPPER IN SESAME OIL PRODUCTION**

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### **ABSTRACT**

In Sesame Oil Production processes, large quantities of particulate solids of different nature are handled, which need to be adequately stored and discharged. On discharging these materials, flow stoppages as a result of doming in the bin, size segregation, etc. can occur. Some of these problems can be minimized and even suppressed by appropriate bin design. In this study, the theory has been applied to bin design for three types of particulate materials: Sesame Oil production. For these materials the maximum angle that the wall needs to form with the vertical in the bin discharge zone, and the minimum outlet diameter required for appropriate, material flow during discharge were calculated. The influence was also analyzed of the bin surface on the type off low. A key design requirement is to make the empty space in the screw available evenly along its exposed length below the hopper or bin. The evenness of the flow depends on the drawdown flow pattern, which in turn depends on the screw and hopper design, shape of the particles and wall friction effects. If the drawdown is not even then compositional variations in the outgoing stream can be created. The strongly varying residence time distributions for particles within the bin can also lead to quality issues.

**Keywords:** Oil, Bin, Hopper, Screw Feeder.

## **ID No. 74: STUDY ON INFLUENCE OF FACTORS IN TIME OVERRUN OF CONSTRUCTION PROJECT**

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### **ABSTRACT**

Success of a construction project depends on its performance. There are several factors affects performance of construction ensuing into delay in construction or failure in construction. Project cost is one among the most necessary criteria of success of project and is of high concern to people who are concerned within the construction industry. However, studies show that some projects are complete within stipulated budget and scheduled time. Performance measure received substantial attention from researchers and also the construction industry over the past twenty years, therefore awareness of the importance of the utilization of appropriate performance measures and its role in supporting the application of construction ideas. Following this, the paper reports on the findings of a survey targeting project owners, contractors and engineers. It is attempt to shed some light on how every project party perceives the relative importance of those factors. Numerous factors obtained from the literature survey affecting the project performance of construction firms is prioritized using the Relative Importance Index value and verify the important factors have an effect on the development project performance. During this study SPSS is used for factor analysis of those factors. Structural Equation Model (SEM) showing the relation between these factors and their impact on project performance created using SPSS-AMOS software system. Finally, the paper formulates variety of recommendations so as to bridge the gap between the various perceptions therefore improving the extent of project performance.

**Keywords:** Types of delay, Delay factors, Factor analysis, SEM

## **ID No. 75: A NOVEL APPROACH TO REDUCE THE EMISSION IN BURNING FIREWORKS WASTE**

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### **ABSTRACT**

Virudhunagar District is the natural choice for fireworks production. Low rain fall and a dry climate prevailing in the Virudhunagar District contribute to unabated production. What could have been consumed in three hours of the Diwali Day comes to be produced in 300 days, always with overtime jobs throughout the year. Burning Fireworks wastes are one of the most unusual sources of pollution in atmosphere; although transient, these pollution episodes are responsible for high concentrations of particles especially metals and organic compounds and gases. The combustion clouds contain harmful fumes sulfur dioxide, oxides of nitrogen and particulate matter released at the surface. This study is focused on controlling the pollutants emitted during burning of fireworks waste at SONNY fireworks limited, Sivakasi. For this study two experimental set up was fabricated. One set up is developed with mesh to control the particulate matter and the other set up is developed with filter to control the CO<sub>2</sub>, CO and SO<sub>2</sub>. Experimental results show a significant reduction of pollutants. Definitely this study will enhance the scope for co-benefits and to attain the air quality standard.

**Keywords:** SO<sub>2</sub>, CO<sub>2</sub>, CO, Particulate Matter, Air Quality.

## **ID No. 76: EFFECT OF TQM ON PERFORMANCE OF INDIAN HOSPITALS**

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### **ABSTRACT**

TQM methods are developed in order to optimize production processes and enhance production efficiency. The TQM methods were successfully adapted by other sectors such as services, construction, logistics, tourism etc. TQM is now used as a powerful health-care tool. But very less is reported about the applicability of TQM among the Indian hospitals. This article analyses the concepts and models relating to TQM applications as stated in the production research literature and expand the model for exploring the same among the hospitals selected in India. The key success factors of TQM and performance measures in the manufacturing context are used to form a structural equation model linking the TQM constructs with the performance outcome of hospitals. The model is tested with empirical survey data. The responses are collected using a structured questionnaire from the respondents working / availing the services of the hospitals included in the study. The linkage of the factors of awareness, intention and procedures of quality management concepts with the performance outcome are tested by the hypotheses formed. Data is analysed with SPSS – AMOS statistical package and results are validated using Exploratory and Confirmatory factor analysis. The difference in the patterns of the models of manufacturing and health care are interpreted.

The findings of this study may be useful to the healthcare industry to enhance the TQM for a better performance result and service to customers.

**Keywords:** Total Quality Management (TQM), performance outcome, Structural Equation Modeling, Factor Analysis

## **ID No. 77: INFLUENCE OF TOTAL QUALITY MANAGEMENT ON ORGANISATIONAL PERFORMANCE OF CONSTRUCTION INDUSTRY**

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### **ABSTRACT**

This study explores the impact of TQM on the performance of the Indian construction firms. Abundant literature explains the linkage of TQM practices and manufacturing sector firms. Very less is reported from the construction sector. A framework and model exploring TQM usage in the manufacturing sector is selected as the base line and a model applicable to the construction sector is framed by incorporating few modifications. Data is collected by means of a standard questionnaire survey tool. Respondents are grouped into managerial staff and workers. The firms included in this study are selected from the registry of contractor’s license. Questionnaire items used for the manufacturing / service sector are proven for content / construct validity and are adapted in this study. Structural Equation Modeling is used to test the hypothesis formed, from referring to the previous research papers. IBM SPSS Statistics and AMOS 25 are used for the analysis. This study agrees with the previous research findings, by establishing positive linkage between TQM constructs and the indicators of Organizational Performance. The areas where the model linking TQM and manufacturing / service firm performance differ from that of the model linking TQM and construction firm performance are identified and the differences are interpreted. This paper concludes with the listing of the practical ways to link TQM more effectively to improve the construction industry performance. Findings of this study are beneficial to the practitioners and researchers dealing with construction firm management.

**Keywords:** TQM, Construction industry, Organizational Performance, hypotheses, questionnaire survey

## **ID No. 78: SELECTION OF SUPPLIER BASED ON SELECTION ATTRIBUTES BY USING AHP IN CHENNAI AUTOMOBILE SECTOR**

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### **ABSTRACT**

In the supplier selection process, the most important progeny is to determine the befitting decision-making attribute criteria for selecting the right supplier. This exploration aimed to identify the most dignified selection attributes for supplier selection in automobile sector by the concept of Analytical Hierarchical Process (AHP). The results are based on the feedback from purchase managers of various automobile firms in Chennai. The plebeian AHP survey was used for data cluster/congregation. Sample sizes (n) of 55 firms are selected for the data collection. After screening, the selected responses are included in the analysis. The work based on nine selection attributes from the literature survey is used to create AHP model, which gives the prioritization of rank by the purchase managers to make decision about the selection of suppliers in automobile sector. In this study, IBM SPSS v.23 and Super Decision v.3.2 are used for the analysis whereas the previous literature used MS- Excel application for the analysis. From this study, the nine selection attributes used for the automobile sector have been ranked. Quality and Delivery are observed to be the most important attribute priority for supplier selection with highest Eigen value. The findings can feasibly be used as a threshold for a firm to fortify supplier selection activities and assessment of the capabilities of the purchase manager’s decision-making skills. It is suggested that every automobile firm should consider the prioritized selection attributes for selecting the suppliers to achieve competitiveness in the market.

**Keywords:** Supplier Selection, Selection Tools, Analytical Hierarchical Process, Chennai Automobile Sector.



## **ID No. 79: STUDY ON THE EFFECT OF ENGINEERING CHANGE MANAGEMENT IN THE SUPPLY CHAIN OF AEROSPACE VALVES**

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### **ABSTRACT**

Aerospace valves are realized using design customised parts & standard bought out parts procured from prominent suppliers, through well defined processes and procedures. As engineering changes (EC) are inevitable, a change in any of the configuration items viz. parts, drawings, material, process, procedure and specification; has a significant impact on the supply chain.

After comprehensive study on the work flow involved in the engineering change management (ECM) process, a framework with web interface among stake holders was developed. This framework was prepared based on a questionnaire survey conducted with concerned stakeholders involved in the supply chain. Survey revealed the difficulties in handling the EC manually and also in assessing the impact of change. In the proposed web interface framework, each stakeholder will be intimated about the engineering change prior to implementation. The roles and responsibilities of each stakeholder were configured in a systematic manner using RACI matrix. The categorization of engineering change and its dependencies with each Configuration Item were captured using a Design Structure Matrix. ECM in web interface platform will ensure effective & efficient management of the supply chain. This framework is conceptualized to integrate changes in to the product development cycle with various stakeholders involved in the supply chain, with few disruptions as possible.

**Keywords:** Engineering Change Management, Configuration Management, DSM, Product Data Management, Aerospace Industry

## **ID No. 80: GREEN SYNTHESIZE OF SILVER NANOPARTICLES USING HEDYOTIS UMBELATTA LEAVES**

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### **ABSTRACT**

Silver nanoparticles (AgNPs) are known for its anti-microbial, anti-fungal and anti-biotic characteristics and high electrical conductivity. They are thus increasingly used in various fields including medical, consumer products, food, health care etc. However, its synthesis has always been a challenging one in terms of cost and environmental impacts. Green route synthesis is employed to be an alternative. This research work focuses on synthesizing silver nanoparticle by phytochemical method using the leaf extract of Hedyotis Umbelatta,, a plant belonging to Rubiaceae family. So the obtained product was characterized using UV spectra, FT-IR spectra, X-ray diffraction (XRD) pattern and microscopic images that confirmed the formation of AgNPs. The silver nanoparticles thus obtained could be examined for drug delivery applications and incorporation into fabrics.

**Keywords:** Silver nanoparticles, green synthesis, HedyotisUmbelatta, drug delivery

## **ID No. 81: DESIGN OF PNEUMATIC FIXTURE IN MILLING MACHINE**

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### **ABSTRACT**

Our project is focus on pneumatic fixture. Pneumatic fixture is a special process device which is assembled and fixed in the process of machining. Its performance directly affects the quality of products. The rationality of the fixture design is to ensure that the work piece quality, improve labour productivity, reduce labour intensity, the basic way to reduce the manufacturing cost. Therefore, the continuous development of pneumatic clamp is a great power, to push forward manufacturing current fixture research is widespread attention from domestic and international manufacturing industry . Pneumatic clamping in processing technology in a key position, therefore to design a reasonable and advanced fixture has a realistic significance to the development of manufacturing industry. Fixture is required in various industries according to their applications. Design of new fixture is a modified over the old fixture due to some drawback. The fixture setup for component is done manually therefore more cycle time is required for loading and unloading the material. So, there is need to develop system which can help in improving quality of operation is possible. The company uses plate fixture having pins for adjustment and locating work pieces. The main objective of our project is to modify the fixture by replacing the manual handling fixture to pneumatic fixture. The pneumatic fixture is the simple and easiest way to clamp and unclamp the component in the fixture.

**Keywords:** Fixture Design, 2D Modelling, SOLID WORKS, Pneumatic, ANSYS.

**ID No. 82: EXPERIMENTAL STUDIES ON WEAR AND IMPACT PROPERTIES OF ALUMINIUM ALLOY 6061 MATRIX AND RUBBER ASH-SILICON-MAGNESIUM PARTICLES REINFORCED COMPOSITES**

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**ABSTRACT**

The objective of this work is to fabricate and investigate the wear and impact behaviour of aluminium based metal matrix composites which are reinforced with fine particles of rubber ash, magnesium and silicon respectively. In this present investigation three different aluminum alloy composition were made by using stir casting technique. The required composite specimens were taken over from the composite plates using water jet machining process as per the ASTM standards. Aluminium 6061 and rubber ash, magnesium, silicon particles were used as matrix and reinforcement material correspondingly. Experiment has been conducted as per the ASTM standards by varying weight fraction of reinforcement materials (35%, 25% and 15%) whereas keeping all supplementary parameters invariable. The experimental results exposed that the wear and impact properties of the developed aluminium composites were increased outstandingly with increase in weight percentage of reinforcement materials.

**Keywords:** Aluminium alloy 6061, rubber ash-Mg-Si particles, experimental studies, wear, impact, properties.

## **ID No. 83: IMPLEMENTATION OF AUTOMATIC PNEUMATIC WORK SYSTEM IN RUBBER MOULDING CURING MACHINE**

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### **ABSTRACT:**

This work emphasizes the design and simulation of an automatic pneumatic work system in rubber moulding curing machine. A study of rubber moulding curing machines at Bhargave Rubber industry showed that most of the machines were manual and some of them were hydraulically operated. But the cost of these machines is too high for small scale industries. These machines are well suited for high-pressure curing machines. To overcome this problem, an attempt has been made in developing an Automatic Pneumatic work system in rubber moulding curing machine. This pneumatic system can be worked up to 17 bar pressure based on the compressor used. In this machine, Compressed Air can be Filtered, Regulated and Lubricated by FRL unit. Directional valve is controlled by the Timer on delay circuit of PLC. The Pneumatic circuit with PLC system simulation on the Automation studio 6.0. Result shows that, the production efficiency of the machine has been increased 15% and the manpower work has been reduced. So this work aimed to solve the problem of small scale industries, where small-sized rubber components are manufactured.

**Keywords:** moulding, curing machine, PLC

**ID No. 84: A STUDY ON FACTORS AFFECTING CRITICAL FACTORS OF WORK FLOW RELIABILITY IN CONSTRUCTION PROJECTS**

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**ABSTRACT**

Work flow in construction project has significant influence on project performance. Work flow is the movement of materials, information, labor, equipment etc. during the construction process. Unreliable work flow will lead to waste creation and poor labor productivity. A reliable work flow can improve the project performance. Abundant literature explains the single factor of work flow reliability, very less is consider the all factors. In this study nineteen variables identified from various literatures which will affect the reliability of the work flow. A questionnaire was prepared to collect the data and factor analysis applied to identify the critical factors of work flow reliability. The respondents are grouped into project managers, foremen and workers. This study will help the project managers to understand work flow easily and assist in take corrective measures to improve project performance.

**Keywords:** Construction, Reliability, Construction Management, Workflow, Critical factors

**ID No. 85: REDUCING REWORK AND CONSTRUCTION PROJECTS  
QUALITY THROUGH TQM USING BIM**

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**ABSTRACT**

Rework is the activity that should be done more than once or the activity that removes previously installed work. Therefore, rework could be a persistent drawback in construction that results in time delay, increased cost, quality issues and nearly each criteria of project success. In this study, the most causes of rework were known through a comprehensive literature review. A questionnaire survey was conducted to prioritize the causes of rework by doing factor analysis. Additionally, this study expresses the requirement for implementing TQM through BIM by incorporating it with the known factors.

**Keywords:** Rework, Quality, Construction Projects, Total Quality Management (TQM), Building Information Modeling (BIM).

**ID No. 86: BARRIERS OF GSCM IMPLEMENTATION IN FOOD AND BEVERAGE MANUFACTURES IN ERNAKULAM**

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**ABSTRACT**

This paper investigates the barriers of food and drink makers in Ernakulum district of Kerala. Inexperienced supply chain management (SCM) has vital role in pollution management and maintaining a property production. It improves the manufactures social responsibility and waste reduction. It's troublesome to implement GSCM in industries. This study is to spot the barriers of GSCM implementation its responsibleness with SPSS software package. By prioritizing the barriers, we are able to scale back the difficulties in GSCM implementation. Super decision software package is employed for prioritization. These results give necessary implications for makers and researchers to beat the GSCM barriers that improve the performance.

**Keywords:** Green Supply Chain Management, AHP, GSCM barriers



## **ID No. 87: PERFORMANCE STUDY ON HYBRID NANO FLUID MIXED WITH R600a IN A DOMESTIC HOUSEHOLD REFRIGERATION SYSTEM**

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### **ABSTRACT**

Nanofluids are considered an effective heat transfer fluid for diverse thermal applications. An investigational study was conducted on TiO<sub>2</sub>, MgO, CeO<sub>2</sub> nanoparticle of size less than 50nm are mixed with R600a in different proportions and used in a domestic refrigeration system with little reconstruction. Various weight proportions of nanoparticles 1.25:1.25, 1.25:0.75, 0.75:0.75, 0.75:1.25 with two different combination of nano materials such as MgO+CeO<sub>2</sub> & MgO+TiO<sub>2</sub> are mixed with the mineral oil for improved effect. The efficiency of the refrigerator was then examined for estimation of the refrigeration effect and coefficient of performance (COP). The results indicate that nano particle mixed R600a refrigerant works in the refrigerator efficiently and safely and the efficiency was better than pure R600a device.

**Keywords:** Nanofluids, R600a, Thermal applications, refrigerator

**ID No. 88: EXPERIMENTAL INVESTIGATION OF MECHANICAL PROPERTIES AND SOUND ABSORPTION TEST OF PALM AND JUTE FIBER HYBRID EPOXY COMPOSITES**

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**ABSTRACT**

Natural fibers now a days play a major role as reinforcement in composites due to the significant properties like light weight bio degradability and non toxicity. The present work deals with the fiber extraction, fiber properties, manufacture and sound absorption testing of hybrid composites made from palm fiber and jute fiber and epoxy resin matrix. reinforcement with natural fibers in composites has lately gained attention due to low cost, easy availability, Biodegradability and recyclable in nature and eco friendly. Palm and jute fiber were extracted and its mechanical properties like tensile, impact and flexural test were conducted experimentally. Palm and jute fiber reinforced hybrid composite with epoxy resin were prepared with weight ratio (palm fiber-20%, jute-15%, epoxy resin-65%) by compression molding technique as per ASTM standard D638. The sound absorption test was carried out using impedance test tube method on the prepared samples in accordance with ASTM E1050-98 to measure the sound absorption coefficient. The results revealed that sound absorption coefficient of specimen was good from 250Hz to 2000Hz within the range of 0.04 to 0.47. The results obtained above are compared with existing fiber composites.

**Keywords:** Palm fiber, jute fiber, mechanical properties, reinforced composite materials, Sound absorption.

**ID No. 89: EXPERIMENTAL INVESTIGATION AND PARAMETER OPTIMIZATION OF NEAR DRY ELECTRICAL DISCHARGE MACHINING USING GREY RELATIONAL ANALYSIS**

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**ABSTRACT**

The present paper Investigation of Machining performance of near dry wire cut electrical discharge machining process. Water mixed with compressed air as used as dielectric medium and it's sprayed by separate pneumatic circuits. In this machining process the pulse width, current, pressure and water flow rate are used to set an input variable factors and material removal rate and surface roughness are response parameters. The HSS M12 plate is machined under respective input variables and response was observed. The design of experiments study reduces the number of trails during at the time experiment. The gray relational analysis is used to find out the best combination of input values to give maximum response. Based on individual factors the response parameter was analyzed using ANOVA table. Lastly, significant factors and levels are identified and Experiment is validated by confirmation of experiments. This kind of approach to increased machining performance and machine works efficiently and effectively.

**Keywords** : Non-Conventional Machining, Near Dry Process, signal to Noise Ratio, Grey Relational Analysis, ANOVA,

## **ID No. 90: EXPLORATION OF MECHANICAL PROPERTIES AND SOUND ABSORPTION TEST ON JUTE AND PALM FIBER REINFORCED EPOXY COMPOSITES**

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### **ABSTRACT**

A composite material is a material made from two or more constituent materials with significantly different physical or chemical properties that, when combined to produce a material with characteristics different from the individual components. The present work deals with the fiber extraction, fiber properties, manufacture and sound absorption testing of hybrid composites made from palm fiber and jute fiber and epoxy resin matrix. Reinforcement with natural fibers in composites has lately gained attention due to low cost, easy availability, Biodegradability and recyclable in nature and eco friendly. Palm and jute fiber were extracted and its mechanical properties like tensile, impact and flexural test were conducted experimentally. Palm and jute fiber reinforced hybrid composite with epoxy resin were prepared with weight ratio (palm fiber-30%, jute-5%, epoxy resin-65%) by compression molding technique as per ASTM standard D638. The sound absorption test was carried out using impedance test tube method on the prepared samples in accordance with ASTM E1050-98 to measure the sound absorption coefficient. The results revealed that sound absorption coefficient of specimen was good from 250Hz to 2000Hz within the range of 0.04 to 0.47. The results obtained above are compared with existing fiber composites.

**Keywords:** Palm fiber, jute fiber, mechanical properties, reinforced composite materials, Sound absorption.

## **ID No. 91: ANALYSIS OF MECHANICAL PROPERTIES AND SOUND ABSORPTION OF PALM AND JUTE FIBER REINFORCED HYBRID EPOXY COMPOSITE**

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### **ABSTRACT**

Increasing concern about global warming and high intensity of sound has made scientist of focus more on the use of natural fibers the profuse availability of natural fibers in idea gives an a attention on the development of natural fiber composite primarily to look at value added application avenues . The present work deals with the fiber extraction, fiber properties, manufacture and sound absorption testing of hybrid composites made from palm fiber and jute fiber and epoxy resin matrix. reinforcement with natural fibers in composites has lately gained attention due to low cost, easy availability, Biodegradability and recyclable in nature and eco friendly. Palm and jute fiber were extracted and its mechanical properties like tensile, impact and flexural test were conducted experimentally. Palm and jute fiber reinforced hybrid composite with epoxy resin were prepared with weight ratio (palm fiber-25%, jute-10%, epoxy resin-65%) by compression molding technique as per ASTM standard D638. The sound absorption test was carried out using impedance test tube method on the prepared samples in accordance with ASTM E1050-98 to measure the sound absorption coefficient. The results revealed that sound absorption coefficient of specimen was good from 250Hz to 2000Hz within the range of 0.04 to 0.37. The results obtained above are compared with existing fiber composites.

**Keywords:** Palm fiber, jute fiber, mechanical properties, reinforced composite materials, Sound absorption.

## **ID No. 92: ENERGY OPTIMIZATION AND PERFORMANCE ANALYSIS FOR A HOUSEHOLD REFRIGERATION SYSTEM WITH NANO FLUID**

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### **ABSTRACT**

Nano refrigerant is the combination of Nano-particle with the refrigerant for the sake of better refrigeration process. It has been observed that, as compared to alternative refrigerant, there is better improvement in heat transfer capacity of the refrigerant after addition of nanoparticles. The use of Nano-particles along with the conventional refrigerant with vapor compression cycle is relatively a new idea, where Nano-refrigerants, so obtained are found to have their improved thermo-physical properties over the conventional refrigerants. Nano-particles can be used along with refrigerant in order to improve the performance of domiciliary refrigeration system. In this (SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub> & CeO<sub>2</sub>) nanoparticles in various proportions such as 1.25:1.25, 1.25:0.75, 0.75:1.25, 0.75:0.75 of 50nm are dispersed in refrigerant R600a to improve its heat transfer performance to have their improved thermal, exergy analysis and physical properties over the conformist refrigerants.

**Keywords** : Nano refrigerant, Nanoparticles, refrigerants, exergy analysis

**ID No. 93: ENERGY ANALYSIS FOR THE SMALL-SCALE DOMESTIC REFRIGERATOR WITH HYBRID NANO-REFRIGERANT MgO+Al<sub>2</sub>O<sub>3</sub> & MgO+ZnO**

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**ABSTRACT**

The project is to enhance the coefficient of performance by mounting the heat dissipation and also to trim down the power consumption throughout the refrigeration process. In the normal refrigerant such as ammonia, sulphur dioxide causes the ozone depletion by the emission of Fluoro carbon, especially chlorofluorocarbons. In order to increase the performance, Nanoparticle of size less than 50nm is mixed with the refrigerant where the maximum heat dissipation has to be maintained by adding the Nanoparticle ( MgO, Al<sub>2</sub>O<sub>3</sub>) & (MgO, ZnO) in various weight proportions such as 1.25:1.25, 1.25:0.75, 0.75:1.25, 0.75:0.75 to the Refrigerant R600a. The hybrid nano refrigerant results to increase the heat dissipation, the effectiveness and COP, for the domestic small-scale refrigeration system. The available energy of the refrigeration system is also calculated and analyzed. By using this Nano-Refrigerant, the energy consumption for the refrigeration process has been abridged in a nominal range.

**Keywords** : Heat dissipation, Nanoparticle, available energy

**ID No. 94: PERFORMANC ANALYSIS OF VAPOUR COMPRESSION REFRIGERATION SYSTEM WITH SIO<sub>2</sub>, TIO<sub>2</sub> & CEO<sub>2</sub> NANO-REFRIGERANT**

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**ABSTRACT**

Nano refrigerant is the amalgamation of various Nano-particle with the refrigerant for the sake of superior refrigeration process. It has been detected that, as likened to alternative refrigerant, there is healthier improvement in heat transfer capacity of the refrigerant after totting of nanoparticles. The use of Nano-particles along with the conventional refrigerant with vapour compression cycle is relatively a new-fangled inkling, where Nano-refrigerants, so obtained are found to have their improved thermo-physical properties over the conventional refrigerants. Nano-particles can be used along with refrigerant in order to improve the performance of vapour compression refrigeration system. In this nanoparticles (SiO<sub>2</sub>,TiO<sub>2</sub>&CeO<sub>2</sub>) in various proportions such as 1.25:1.25,1.25:0.75,0.75:1.25,0.75:0.75 of 50 nm are dispersed in refrigerant R600a to improve its heat transfer performance to have their improved thermal and physical properties over the conventional refrigerants.

**Keywords:** Nano refrigerant, Nanoparticles, Heat transfer performance



## **ID No. 95: DESIGN AND FABRICATION OF PV/T SYSTEM**

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### **ABSTRACT**

Photovoltaic Thermal (PV/T) combine the solar thermal and photovoltaic systems. This technique benefits from both light and heat of the solar radiation to produce electricity and hot fluids. Research in PV/T systems is rapidly growing with more methods and techniques to increase the overall efficiency, reduce the cost, improve the modeling, and maintain the system for long periods of time and employing them for suitable application. The paper aims to study some of the research conducted in this field in order to understand and derive key points to producing more research and providing constructive criticism for the work presented. Also a detailed explanation of PV/T systems' principles and operation is presented. Classifications of PV/T in terms of absorber design, shape of pipes, PV configuration, type of working fluid (base-fluid) and type of PV panels are all discussed in the literature survey. Finally, it is concluded that there is a clear lack in electrical, economic and environmental evaluations, where most of articles in PV/T are dominated by the thermal study of the system

**Keywords:** Solar PV/T, thermal analysis.

**ID No. 96: MECHANICAL GYROSCOPE POWERED SELF BALANCING MODEL FOR TWO WHEELED AUTONOMOUS VEHICLE**

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**ABSTRACT**

Autonomous four wheeler vehicles are being developed all over the world and the future relies on autonomous vehicles but, the development of autonomous two wheeler vehicles are seen rare due to the problem of balancing two wheeler vehicles. Mechanical gyroscopes are already employed in many applications for stabilization. The project proposes to build a prototype model incorporating mechanical gyroscope to stabilize the two wheeled vehicles. The prototype is built of a symmetric rectangular frame with two wheels housing a gimbal where the motor is mounted to which the Flywheel is attached. The Flywheel is designed in a way so that the weight is distributed to the outwards of the Flywheel. The rotation of the Flywheel at higher RPM provides the required precession, since the gimbal is placed perpendicular to the frame. The weight of the flywheel is 1/11th of the weight of the frame. The modelling of the frame, flywheel and gimbal is done using Solidworks.

**Keywords:** Autonomous vehicle, two wheeler, mechanical gyroscope, stabilization, precession, gimbal and flywheel.

## **ID No. 97: REINFORCEMENT OF 3D PRINTED PLA WITH HYBRID COMPOSITES**

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### **ABSTRACT**

The materials present in the composites are Jute fibers and unidirectional poly lactic acid (PLA) we here fibers of Jute from reinforcement and the poly lactic acid is the matrix. The objective of the study is to fabricate a Bio-degradable composite with Uni directional oriented natural fibers through compression moulding. Composite plates are cut to obtain required specimen for performing tests which reveal the Young's modulus, unidirectional stresses and shear stress of the composites.

**Keywords :** Composites, Bio-degradable, Natural fibers

**ID No. 98: MECHANICAL AND ACOUSTICAL PROPERTIES OF FLAX / SNAKE GRASS FIBRE REINFORCED HYBRID COMPOSITES: EFFECT OF BIO FILLER AND MERCERIZATION**

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**ABSTRACT**

Nowadays, natural fibers are used as a reinforcing material in polymer composites, owing to severe environment concerns. Among many different type of natural resources, snake grass fiber have been extensively exploited over the past few years. This paper aims at introducing new natural fibers for use as fillers in a polymeric matrix enabling production of cost-effective, biodegradable, and lightweight composites for load carrying structure. In this experimental study, eco-friendly hybrid composites to be fabricated to using compression moulding techniques with different fiber weight fraction. The mechanical, moisture absorption and sound absorption properties of the alkali treated continuous hybrid composites to be characterized to be analyzed using FTTR and scanning electron microscopy. Snake grass fiber and flax fiber orientations of 0° and 90°

**Keywords :** Snake grass fiber; eco-friendly composites; Hybrid composites; Mechanical properties; sound absorption property composites.

## **ID No. 99: IMPLEMENTATION OF 5S IN TEXTILE INDUSTRY**

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### **ABSTRACT**

The 5S (Seiri, Seiton, Seiso, Seiketsu, and Shitsuke) is one of the tools of lean manufacturing that strongly supports the main objectives of small and medium scale organizations to achieve improvement in performance and productivity. The 5S contributes to the development of the industry by improving the quality and safety of the workplace organization. This quality improvement technique describes how to organize a workplace for efficiency and effectiveness by identifying and storing the tools/equipment used, maintaining the area and machines used, and sustaining the new order formed. The adoption of this methodology also results in waste reduction and proper utilisation of resources in the manufacturing organization.

**Keywords** : 5S, productivity, quality, efficiency, effectiveness