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Title of the Paper Investigation on Effect of Casting Mould on Tribological and Mechanical Properties of Al-Sn Alloys

Authors **Mr. Rajath Raj U K, Mr. Saurav Manikantan,**
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Title of the Paper **Behaviour of Mg alloys after the combined processes of ECAP and Hot Rolling**

Authors **Mr. Mithesh Gowda J R, Mr. Rajnish Kumar Mishra, Mr. Sadashiv Bellubbi, Dr. Gajanan M Naik, Dr. Ramesh S**


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Title of the Paper **Optimization of process parameters in Electro Chemical Discharge
Machining of silica glass through Analysis of Means**

Authors **Mr. Sadashiv Bellubbi, Mr. Maheshwar A Hipparagi,
Mr. Ravindra Naik, Dr. Sathisha N**


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Meshing and Post-processing Capabilities of Open Cascade SALOME and its Compatibility with Solver Code Saturne for setting up physics and run the simulation

¹Manoj Kumar AP, ¹Suresh KV, ¹Yogish Rao

¹Alva's Institute of Engineering and Technology, Moodbidri, Karnataka, India

Abstract: This paper describes about the features of open cascade SALOME for meshing engineering components, post processing using Solver Code Saturne to run the simulation and post processing by ParaVis to analyze the results. The objective of this study is to explore the features of SALOME/Saturne as an alternate to commercially available CFD tools without compromising the quality of the result. The study includes the comparison of SALOME/Saturne with other commercial tools with respect to cost, ease of carrying out preprocessing and post processing and end result validation. Modeling is also possible with this tool and user can model any part in the Geometry module covered in this paper. In the current paper, an exhaust manifold is taken for carrying out simulation to determine pressure drop and velocity inside the system. The step by step procedure for meshing is well explained and 3D images of pressure drop and velocity are shown. In another example, a simple pipe flow is taken as example and simulation has been carried out using SALOME/Saturne to determine the pressure drop and mass flow rate calculations. The results are validated through theoretical calculation.

1. Introduction

The point of view of this study is on practical side, i.e. usability, software ergonomics and ability to produce high quality mesh are emphasized instead of meshing algorithms. In selecting the software open source has not been a necessary condition since also some proprietary mesh generators are often used with open source solvers. However, a rather inexpensive license pricing is desirable since typically the users of open source software have limited monetary resources. Mesh generation is an essential part of the solution procedure which often consumes the most of the human resources. The accuracy and efficiency of computation depends upon element or cell shape and size, which in turn depends upon speed and numerical efficiency.

For CVM and in most cases FEM, hexahedron elements are more favorable to numerical efficiency, but there isn't any general automatic and robust mesh generation algorithm available for such a mesh type. Due to increase in computational power, the number of elements doesn't have that much significance any more. This has lead to use of automated tetrahedral mesh generators both in CVM and FEM. These meshing tools can produce relatively high quality mesh in just tens of seconds or couple of minutes. The mesh quality is often good enough for structural analysis but in CFD results are more sensitive on mesh type and quality and the use of tetrahedral mesh can lead to a high number of cells to achieve the same computational accuracy than when using hexahedral cells. One solution for the element or cell type issue is the use of a hybrid mesh, i.e. a mesh containing both hexahedral and tetrahedral elements or cells. This allows e.g. creation of hexahedral mesh in critical areas manually and mesh the rest of the volume using automatic mesh generation and tetrahedral elements or cells. There are also methods to automatically create hybrid mesh in arbitrary geometry. This area is not covered in this document.

Code Saturne solves the Navier-Stokes equations for 2D, 2D-axisymmetric and 3D flows, steady or unsteady, laminar or turbulent, incompressible or weakly dilatable, isothermal or not, with scalars transport if required. Several turbulence models are available, from Reynolds-Averaged models to Large-Eddy Simulation models. In addition, a number of specific physical models are also available as "modules": gas, coal and heavy-fuel oil combustion, semi-transparent radiative transfer, particle-tracking with Lagrangian modeling, Joule effect, electronics model, weakly compressible flows, atmospheric flows, rotor/stator interaction for hydraulic machines. ParaVis is a post processing application available in SALOME platform, where results can be viewed and analyzed in 3D.

There are many commercially available software's available to carry out various types of analysis as shown in Figure 1. The license cost is the primary concern, where any organization needs to take a critical decision to buy it, which in turn depends upon budget allocation for software procurement. If the client is not ready to bear the license, organization has to find an alternative ways to meet the current software requirement, which leads to opting freeware software (open cascade platform), where one can carry out similar analysis



A Review on Honge is an Alternate Biodiesel

Pavan Kumar R¹, Varun S¹, Vikas SK¹, Suraj Koli S¹, K. V. Suresh²

U.G. Student, Department of Mechanical Engineering, Alvas Institute of Engineering and Technology Moodbidri,

(Affiliated to Vishvesvaraya Technological University, Belgaum) Karnataka, India¹

Faculty, Department of Mechanical Engineering, Alvas Institute of Engineering and Technology Moodbidri, (Affiliated to Vishvesvaraya Technological University, Belgaum) Karnataka, India²

ABSTRACT: The increasing demand for traditional fuels, their rising costs and their impact on environmental pollution make it necessary to find alternative energy sources. The world's fuel reserves are depleted every day, and modern scientists are facing the problem of finding alternative fuels. ... Biodiesel is an alternative fuel for diesel engines and has attracted worldwide attention. Its main advantage is that it is one of the cheapest renewable fuels, non-toxic and biodegradable, which makes it a suitable substitute for most diesel engines without major modifications. To the engine. Biodiesel is a kind of renewable fuel produced by the country, which can be used as raw materials for producing biodiesel, such as vegetable oil, non-edible oil, and animal fat. Its purpose is to provide a detailed overview of the production of biodiesel from Pongamia pinnata oil, its various characteristics, performance and emissions in compression ignition engines (CI), and its applicability as an alternative fuel for diesel engines. The storage time of red grid biodiesel should not exceed six weeks to prevent fuel deterioration characteristic.

KEYWORDS: Conventional fuel, biodiesel, Pongamia pinnata, alternate fuel, diesel engine, blend, transesterification, emissions

I. INTRODUCTION

Diesel motor burns inside the motor which utilizes warmth pressure for starting and consume the fuel which as been infused for the ignition chamber. They initially utilized more proficient substitution for fixed steam motor since the starting point of the submarines, ships, trains (like auto, truck) hefty gear and furthermore in power age plants. Different vegetable oils have both palatable and also non consumable is considered as a elective hotspot for an diesel motor. The majority of an created nations sunflower, nut and few of them are utilized as a elective source are consumed by the Indian setting[1]. Accordingly agricultural nations, its alluring for delivering biodiesel from an non consumable oil which is broadly filled in waste terrains to the country. The utilization of fuel for the motor is more on the street and rough terrain vehicles that has been developed dramatically and keeps on doing as such, the fuel used in the diesel motor is Diesel, The motor starts because of the pressure of air blend and infulsion of fuel. Fuel (Diesel) has been started from the test led by an Germany researcher and also designer Rudolf Diesel for the pressure started motor as his imagination, Through the different sources like oil, biomass, creature fats, biogas, petroleum gas, coal diesel was created[2]. It have been accounted for that a non eatable oils accessible for Indians is pongamia and jathropa elastic Seeds and so on anyway the significant hindrance of vegetable oil as theirs thickness. The diesel(fuel) infulsion framework is diesel motor is more delicate for more consistency change, more consistency of an vegetable oil prompts helpless atomization. Thistly prompts helpless burning, ring staying, injector coking, injector stores, injector siphon disappointment and greasing up oil weaking by wrench case polymerization[3].

II. BIO DIESEL

A. Need for Biodiesel:

The utilization of the oil rose from an 2000 millions tons to 4500 millions tons each Year the cost of unrefined petroleum in worlds markets went up to 20 US dollars per barrel, the examiners expects more oils cost for long haul. India vehicular populace assessed for having increment multiple time in course of recent many years contributing about 243.3 million tons of fossil fuel by-products internationally, 65 millions metric tons of diesel is utilized in India. In the planet with regards to non-renewable energy source utilization India ranks at fifth position. considering rising costs, the climate and environmental change concerns, nations everywhere on the world have dispatched biodiesel projects to create options in contrast to customary fuel[4].

Effect of Compression Ratio on the Performance and Emission Characteristics of CI Engine Fuelled with Honge, Hybrid Bio-Fuel with Diesel

THANGJAM SEEMASHWORI DEVI¹, SRINIVAS C. S², K V SURESH³, PETER FERNANDES⁴, and RAJU K⁵

- ¹ UG Student, Department of Mechanical Engineering, Alva's Institute of Engineering and technology Moodabidri 574225, India. email: seemthangjam5@gmail.com
- ² Asst. Professor, Department of Mechanical Engineering, Alva's Institute of Engineering and technology Moodabidri 574225, India. email: srinivasa@aiet.org.in
- ³ Research scholar, Department of Mechanical Engineering, Alva's Institute of Engineering and technology Moodabidri 574225, India. email: kvs_a@yahoo.com
- ⁴ Professor, Département of Mechanical Engineering, Alva's Institute of Engineering and Technology, Moodabidri, 574225, India. email: principalalet08@gmail.com
- ⁵ Professor, Department of Mechanical Engineering, St. Joseph Engineering college Mangalore, 575028, India. email: rajuksjec@gmail.com

ABSTRACT: In this present study, the performance and emissions of a single-cylinder Kirloskar diesel engine using a non-edible Honge oil and waste edible oil (WEO) with diesel and its blends were carried out. The bio-fuel blends H5W5 (5% Honge, 5% waste edible, 90% diesel), H10W5, H15W5 and H20W5 were prepared and tested at various load conditions (0%, 30%, 50%, 70% and 100% of full load) compared with diesel at different compression ratio (14.5:1, 15.5:1 and 16.5:1). Results indicated that the brake thermal efficiency of H20W5 was 30.75% at 16.5:1 compression ratio comparatively similar to that of diesel (32.36%). The lower emissions of CO, hydrocarbon except NO_x were encouraging to recognize H20W5 as an optimized fuel blend for a compression ignition engine at 16.5:1 compression ratio compared low compression ratio. Results were also showed that performance and emissions of Honge and WEO biodiesel blends were near to diesel.

Keywords: compression ratio, biodiesel, blends, Honge oil, Waste Edible oil, Emission

INTRODUCTION

There is increased thrust for use on renewable and nature friendly fuels in the compression ignition engines to cater to the solution to twin problems, such as source of energy and pollution control. The ability of biodiesel to mix with petro diesel at any proportion without any additional processing puts an edge over other alternative fuels for the CI engine. Its advantages in terms of renewability, reduced problem to the environment and opportunity to improve the economy and revive environment, has encouraged the researcher to work further more on this fuel. Biodiesel in CI engines has proved for

its increased combustion efficiency due to its oxygen content reported by Kumar et al (2018). Biodiesel is the name of a clean burning alternative fuel, produced from domestic, renewable resources such as soybeans, sunflowers, honge, waste cooking oil, or animal fats. Bio diesel is made through a chemical process called Transesterification in which glycerine is separated from fat or vegetable oil. Nowadays, there is great interest in mixing biodiesels produced from different feedstock in order to exploit the benefits of each type of biodiesel. A number of researchers have adopted approach an implemented these fuels in diesel engines as per As per Kent Hoekman et.al (2012)

H. O. D.



Electro Chemical Discharge Machining Process –A Review

Asha NB¹, Chanadana G S¹, Chandrika M¹, Soujanya H M¹, Peter Fernandes²

U.G. Student, Department of Mechanical Engineering, Alvas Institute of Engineering and Technology
Moodbidri, (Affiliated to Vishvesvaraya Technological University, Belgaum)

Karnataka, India¹

Faculty, Department of Mechanical Engineering, Alvas Institute of Engineering and Technology Moodbidri,
Karnataka, India²

ABSTRACT: Electrochemical Discharge Machining (ECDM) is an rising nontraditional machining method, which mixes the deserves of each spark machining and chemical science machining. it's employed in micromachining non-conductive materials, like glass, ceramics, and composites. Over the previous few years, the will for nonconductive materials has adult speedily in medical, optical, electrical, and region applications. As these applications need machining with high accuracy and high reliability, ECDM has high scope during this field. There are other ways which will machine nonconductive materials, however have bound limitations conjointly. Recently, ECDM could be a developing method and researchers are endlessly attempting to develop and modify it as an improved answer to machine nonconducting materials. within the current paper, a study on continuous enhancements in ECDM in machining of glass, ceramics, composites, and hybridization of ECDM are dispensed with their impact on Material Removal Rate (MRR), Surface finishing, and tool Wear Rate (TWR). it absolutely was more proved that semiconductors and composites were less researched comparatively.

INTRODUCTION

In recent years, the growth within the field of the many industries like nuclear, automotive, region etc. need nonconventional machining method which supplies high productivity and accuracy. So researchers developed hybrid micro machining method. Electro chemical discharge machining (ECDM) is one such novel hybrid machining method used for machining each conducting and nonconducting engineering materials combining the options of Electrochemical (ECM) and Electro discharging machine (EDM) processes.

1 a . LITERATURE : The productivity comes from, the ECDM is incredibly abundant then that of ECM and EDM method. In the ECDM method the removal of material is completed by thermal melting. The discharge takes place of tool through electrolyte, the spark can seem once the electrically non conducting work piece of just kept, below the tool within the solution. In 1996 Basak and Ghosh propose the theoretical clarification of the Mechanism of spark generation throughout ECDM method. They reported, the switch of process is an electric circuit. In 1999 a standard mechatronics machining setup which may machine ceramic materials was Designed and developed by Bhattacharya. Later 2014 Paul and Hiremat carried response surface modelling (RSM) of ECDM and chemical etching method where, Gotham and Jain conducted the experiment on borosilicate glass and quartz work piece material with using various kinematic tools like motility, stationary, eccentrically, rotating tools. Its be mentioned that the ECDM velocity mechanism over gravity feed mechanism. The taper side wall flat front too tip form was discovered because it was found to be simplest to regulate machining so circular holes is created absolutely. we can use varied sorts of tools with completely different shapes in ECDM method. As per the form that we've to be created on work material. The various form of tools the sq. cross section with centrally micro hole are used for nonconductive optical fiber reinforced composites. Wuthrich in 2005 shows that adding of surfactants within the electrolytic solution can't be only moisturize the conductor surface, however can also decrease the surface tension, and conjointly will increase the contact extent between the gas bubbles and also the electrode. This makes the advance within the gas film wrapping, effectively lowers the critical voltage, and permits the flows of the electrolytes to decrease the concentration of the variations between the areas and conjointly it will increase the reaction rates. even if the machining scale reaches the order of micrometer, the fundamental properties of such small conductor aren't understood well.



The proton exchange membranes for fuel cell applications - A Review

Ritesh s shetty¹, Rohan prabu², Y.S.Rao³, Rathanakara Naik⁴, Rakshith RM⁵

Department of Mechanical Engineering , AIET¹⁻⁵

Abstract: PEMFCs (proton-exchange membrane fuel cells) are a promising technology for producing safe and effective electricity in the twenty-first century. The primary components in a fuel cell system are proton exchange membranes (PEMs). The aim of the researchers was to develop a proton exchange membrane with high proton conductivity, low electronic conductivity, low fuel permeability, low electroosmotic drag coefficient, good chemical/thermal stability, good mechanical properties, and a low cost. The "iron triangle" of efficiency, durability, and cost is used to classify these. The current PEMFC technology is based on costly perfluorinated proton-exchange membranes (PEMs) that only work when completely hydrated. There is a lot of interest in lowering membrane costs and expanding the operating window of PEMs because of the applications. The creation of 'water-free' electrolytes that do not need hydration could minimize the complexity of PEMFC systems. It also allows the PEMFC to work in 'warm' conditions (above 100°C), improving its performance even more. Since fewer Pt could be used in colder climates, capital costs could be further reduced. This paper provides an overview of the main requirements for proton exchange membranes (PEM) in fuel cell applications, as well as a review of the existing membrane materials and their ability to meet these requirements. This paper examines and discusses a variety of potential alternative candidates. Some new products, innovations, and research directions are also explored in order to meet the PEM fuel cell industry's demanding efficiency and durability requirements. Alternative PEMs are divided into three categories: modified Nafion® composite membranes, functionalized non-fluorinated membranes and composite membranes derived from them, and acidebase composite membranes. In the sense of composite membranes, many widely used inorganic additives are discussed. Finally, general methods for calculating and analyzing proton exchange membrane properties, such as proton conductivity, ion exchange potential, water absorption, gas permeability, methanol permeability, longevity, thermal stability, and fuel cell efficiency testing, have been investigated.

Keywords: Polymeric electrolyte, Proton exchange membrane Fuel cell, Nafion , Composite membranes

1. INTRODUCTION

Fuel cells are on the brink of causing a massive disruption in the world of electricity due to their unique properties. By definition, a fuel cell is an electrochemical device that converts chemical energy from fuel into electrical energy without burning it. As a result, the chemical energy associated with the electrochemical reaction of the fuel with the oxidant is directly converted into water, electricity, and heat in a fuel cell device. H₂, methanol, gasoline, and other fuels have traditionally been used in fuel cells. In conclusion, the reactions that occurred in a fuel cell can be explained as follows: The hydrogen in the anode electrode transforms into a hydrogen ion, releasing electrons. The electrical current is generated by electrons moving through a foreign circuit towards the cathode. The following anodic and cathodic reactions were performed in the PEM fuel cell with H₂ gas in the anode:

Anode electrode: $\text{H}_2 \rightarrow 2\text{H}^+ + 2\text{e}^-$

Cathode electrode: $\text{O}_2 + 4\text{H}^+ + 4\text{e}^- \rightarrow 2\text{H}_2\text{O}$ the two above reactions will be change the following general reaction after the combination:

General Reaction of cell: $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$

The most important feature and, in other words, the fuel cell's integral heart is the membrane electrode assembly (MEA), which is made up of two parts: electrocatalyst and

DESIGN OF SOWING MACHINE-A REVIEW

Ganesh M R¹, Veena V², Sree Raksha³, Mardan Ali Nadaf⁴, Sachin V Reddy⁵

¹Assistant Professor, ^{2,3,4,5}Student, Mechanical Engineering Department, Alva's Institute of Engineering and Technology, Moodbidri, Dakshina Kannada-574225, Karnataka, India

Abstract - In the cultivating cycle, frequently utilized customary cultivating of seeding activity takes extra time, that's just the beginning work. The seed feed rate is all the more however the time needed for the absolute activity is more and the all-out expense is expanded because of work, recruiting of gear. The customary seed planting machine is less proficient, tedious. So, this machine decreases their endeavour's and diminishes the expense of seed planting measure with extraordinary productivity and exactness with inducements in labour prerequisite. This strategy limit and defeat detriments happened in past cycle and will accomplish the dividing between two seeds and profundity of sowing seed.

Key Words: Hopper, Metering mechanism, Wheel, Power transmission system, Seed distributor, Tiller.

1. INTRODUCTION

This strategy limit and defeat detriments happened in the past cycle and will accomplish dividing between 2 seeds and profundity of the sowing seed. The main advantage is it can be operated manually, can be used as tractor and is suitable for any type of lands. The fundamental target of planting activity is to place the seed and manure in columns at wanted profundity and dividing, cover the seeds with soil what's more, give appropriate compaction over the seed. Machine spreads and sows the seed according to the decision. Thus, works for diminishing seeds. The establishment cost can be high; however, the expense of support is very low. It is productive than other present-day hardware utilized in farming. [2]

2. OBJECTIVES

The examination acquainted was with evaluate the establishment, perseverance, and advancement in four years ensuing to developing considering three drugs were used to make clearings and two techniques for planting seeds. Few investigations have evaluated direct developing. Investigated this medications, and recorded results over a lot period of time.[9]



Fig1. Broadcast sowing



Fig2. Seed sowing

3. LITERATURE SURVEY

The computerization in horticulture would help ranchers diminish their endeavours. The vehicles are created for measures for ploughing and sowing seed. These capacities are not performed utilizing solitary vehicle. In these robots are created to pack effective way and further more is required to play out activities self-governing. Energy needed for this machine is less as contrasted and farm haulers and agrarian instrument contamination is likewise a major issue which is wiped out by utilizing sunlight-based plate. As there are no productive gears to help ranchers. There is a requirement for new strategies to be actualized. Beforehand the thought was figured, plan alternatives were settled. Not many of them are portrayed here.[3]



Environmental Review: Reducing Plastic Waste Using Green, Sustainable Manufacturing

Ashish Pinto¹, Sudeep Kumar Jain¹, Sourabh R¹, Ritvik S Shetty¹, **Sudheer²**

U.G. Students, Department of Mechanical Engineering, Alva's Institute of Engineering and Technology Moodbidri,

(Affiliated to Vishvesvaraya Technological University, Belgaum) Karnataka, India¹

Faculty, Department of Mechanical Engineering, Alva's Institute of Engineering and Technology, Moodbidri, Karnataka, India²

ABSTRACT: In addition to being inexpensive, lightweight, and durable, plastic can be easily moulded into a wide range of objects for a variety of uses. The result is that plastic output has grown dramatically over the past 60 years, but current levels of use and disposal are posing an increasing number of environmental problems. The oil and gas industry is a primary source of plastics, which account for around 4% of global production. Approximately 3-4% of that quantity is used to provide the energy necessary to manufacture plastics. Packaging made of plastics is disposable and used only for a year before it is discarded. To mitigate these global impacts, recycling is one of the most useful solutions available today, and it has also become one of the fastest-growing areas of the plastics industry. The amount of waste that must be disposed of can be reduced because recycling reduces oil consumption. The purpose of this section is to briefly examine the effectiveness of recycling in comparison with some other approaches to waste reduction, such as down gauging or product reuse, the use of alternative biodegradable materials, and energy recovery. In today's global environment, resources are scarce and populations are growing rapidly. Climate change threatens the delicate balance of the global ecosystem. In several nations, the recycling of packaging materials has exploded in recent decades as a result of the increased recycling of plastics since the 1970s. Technological innovations and systems are opening a new range of recycling opportunities, and if the public and industries collaborate to divert the majority of plastic waste from landfills over the coming decades, it may be possible to divert the majority of plastic waste from landfills to recycling. Governments and the private sector cooperate.

KEYWORDS: Plastic packaging, waste management, plastics recycling, chemical recycling, and energy recovery are among the topics discussed.

1. INTRODUCTION

Today's global environment is characterized by a shortage of resources and a rapidly growing population. The world becomes unbalanced due to climate changes. There has been a recommendation to establish a new quality management system for products as well as an environmental management system. The primary goal of this initiative is to reduce the amount of environmental damage caused by industries. Due to the expanding demand and limited supply, the cost of energy and resources will always be rising since it is necessary to develop a new production process, i.e. C. Tan., et al. (2002). Further, price trends can scarcely be predicted, so corporations must work within the vast price ranges of energy and resources to produce successfully. The one technique to accommodate price changes consists of transferring marks to clients. The price increase, on the other hand, might necessitate product upgrades. In addition, increasing the efficiency of production, it is possible to achieve through taking steps to reduce the intake of resources making manufacturing a more efficient and effective process, can help to stabilize costs. Nancy Diaz-Elsayed and others (2013). This article's major goal is to bring attention to the producer who is manufacturing the product as a mass product. This article discusses various waste management and green manufacturing strategies that may be used to reduce waste and increase the use of sustainable energy. The benefits of green manufacturing are not only beneficial for the environment but are often beneficial for business as well. Other initiatives to reduce energy and materials used in manufacturing processes are often similar, what's good for the environment is usually good for the financial statement as well.



Grain Collector Technology –A Review

Thachery Dhaxith¹, Vignesh PS¹, Vineeth R Shetty¹, Vishal S¹, K.V.Suresh², Hemanth Suvarna²

U.G. Student, Department of Mechanical Engineering, Alva's Institute of Engineering and Technology Moodbidri,

(Affiliated to Vishvesvaraya Technological University, Belgaum) Karnataka, India¹

Faculty, Department of Mechanical Engineering, Alva's Institute of Engineering and Technology Moodbidri,

Karnataka, India²

ABSTRACT: After the harvest of any crop, drying them is always a pivotal process. The custom of sun-drying or solar drying is a practice performed since many decades because of its effectiveness and being economical without the need for any tools, so it would not be feasible to consider other alternative process for drying. At the terminal point of solar drying process it would be necessary to accumulate the far-flung grains from the ground before further processing. To alleviate this arduous task several grain collecting machines have been designed and developed in the recent years. Every grain collector has been designed and fabricated such that they expedite the task whilst being simple to operate. A single grain collector would be a substitute to several human laborers. The purpose of a grain collecting machine is to quickly hoard all the grains into piles or sacks ere processing. Several expedient mechanism ideas such as sweeper wheel collection, tossing collection, vacuum collection have been implemented and meliorated. The literature review is conducted of all the grain collectors with their resulting performance, cost effectiveness and other prospects shall be analogized..

KEYWORDS: sun-drying, grain collector, design, sweeper wheel, tossing, vacuum

I. INTRODUCTION

Agriculture is the largest industry in the world with over a billion people in it, yet today it faces the tremendous problem of significant decrease in the number of manual labourers in the occupation of farming and milling. Even during the Covid-19 pandemic the global demand for food and agricultural crops kept multiplying because of the deficient supply of grains and lack of labourers. Such disorders brought up the ineluctable need for machines as a substitute for human labourers. Grain collector is one such machine which has been designed and fabricated for the purpose of stacking or piling of the grains quickly after threshing and field drying. An detailed literature survey unveils that several types of grain collectors have been successfully developed, tested and used. Hence a research shall be carried to find scope of improvement and also to overcome the drawbacks of all the grain collectors that have been developed till date. The grain collectors have been classified based on their fundamental principle and the working mechanisms, Id est sweeper wheel type grain collector, hopper type grain collector, engine driven vacuum type grain collector, electric powered vacuum type grain collector. Authors are cited for every design referred throughout the literature survey.

Sweeper wheel type grain collector, It is a simple design. Confecting it out of the basic available materials and with no complex mechanism involved makes it easy and economic but but it still consumes a considerable amount of time because of the partial manual force requirement. The factor of self working makes it convenient for small scale work in remote areas without the requirement of any power source for the functioning of the machine. [1]

Hopper type grain collector, like the sweeper wheel grain collector even this is a manual driven grain collector, this model is equipped with a hopper which should be lifted to transfer the grains from the hopper to the container. Being economic and simple to operate this model has a bag that is attached to it which reduces the bagging time compared to the previous design. With all the jostle the rate of grain collection still remains a drawback with this development. [2].



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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A Review on Solar Seed Drying Technique

¹Srivathsa H S, ²Naveen Kumar H C, ³Raghavendra M G, ⁴Arjun R, ⁵Deepak Kothari

¹Student, ²Student, ³Student, ⁴Student, ⁵Assistant Professor

^{1,2,3,4} Department of Mechanical Engineering

^{1,2,3,4} Alva's Institute of Engineering and Technology, Mijar, India

Abstract: This study describes the design and development of a solar-powered seed dryer that removes moisture from seeds after harvesting. Solar energy, with its almost infinite potential, is the most promising renewable energy source. For years, direct solar energy has been used to dry seeds and foods. Crops are dried in the field, stack, or windrow by the sun and wind. Artificial drying has been used to enhance this process in order to increase harvest rates during bad weather or reduce field losses. However, due to the high expense of artificial dryers, many farmers are unable to use them. This review paper on solar seed drying techniques aims to give an overview of the drying processes of seeds and the quality of the dried product that is dried using variously developed solar dryers that have been developed by several research scholars, and thus to give an overview of all those dryers and techniques, the effect of temperatures, humidity, air velocity, and a variety of other factors.

Index Terms – Solar Energy, Arduino Uno, Solar Panel, Light Sensor, DC Motor

I. INTRODUCTION

Drying is one of the earliest solar energy technologies, in which products such as vegetables, fruits, fish, and meat are dried by exposing them to the sun directly. It is a straight forward procedure for removing moisture from a natural or industrial product in order to meet the required specifications. Because of lower operational costs compared to other drying methods, this process is more cost effective on a wide scale.

This approach has a number of drawbacks, including product spoilage caused by rain, dust, wind, animal attack, bug infestation and fungi. As a result, solar dryer technology will provide an alternate technique for processing products in a clean, safe, and hygienic manner, resulting in higher-quality, more nutritious foods. In overall, this solar dryer has reduced energy consumption, labour intensity, time, and the amount of space required for drying.

The 3 varieties of sun dryers are Direct, Indirect, and Mixed mode, which are characterized on behalf of the passive manner of drying and whether or not the object to be dried is uncovered or not. Secondary power is needed to run the energetic sun drying system. The combined mode sun dryer, on the opposite hand, combines each radiation and warmth conduction thru the obvious cloth say glass or plastic and the warmth convection from the sun air heater.

Food and crop materials are extremely susceptible for the drying conditions. Due to excess or under drying, the quality of dried product will be degraded if the drying time is very short. As a result, selecting a drying temperature is one of the most critical steps in ensuring that the product's colour, texture, flavour, and value do not deteriorate.

As a result, a novel high-efficient solar drier for small-scale drying was developed and tested upon a variety of foodstuffs, including fruits and fish. As a result, some of the most efficient and well-engineered dryers, as well as research findings, are contrasted in this article.

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H. O. P.
Dept. of Mechanical Engineering
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

A Review on Mechanical and Physical Properties of Hybrid Polymer Composites

Srinivasa C S¹, Sanket S Shetty², Sudarshan B², Yashas B Shetty², Shashank V Poojary²

Assistant Professor, Department of Mechanical Engineering, Alva's Institute of Engineering and Technology, Moodbidri, (Affiliated to Vishvesvaraya Technological University, Belgaum) Karnataka, India¹

U.G. Student, Department of Mechanical Engineering, Alva's Institute of Engineering and Technology, Moodbidri, (Affiliated to Vishvesvaraya Technological University, Belgaum) Karnataka, India²

ABSTRACT: For researchers, polymer composites have recently become one of the important aspects in so many different fields. This is because the strength-to-weight ratio of polymer composites is higher than that of most traditional alloys and composites that are used for different fields today. In addition, to reach the maximum mechanical properties and physical properties, researchers are also coming up with different kinds of hybrid polymer composites. Therefore, the focus of this analysis of hybrid polymer composites is on the different Mechanical features and physical characteristics. This thorough analysis is an effort to achieve the key elements of this area as research holes that are not done to date. The bond of the materials would result in epoxy resin in the hybrid composite. By applying the filler to the composite material, the performance of composites can be further improved. Production of natural fiber and filler composites for certain engineering applications as a sustainable alternative material, especially in the field of aerospace and automotive applications.

KEYWORDS: Hybrid Composites, Impact, Flexural, Tensile Strengths, Mechanical strength, Thermal stability, Morphology, Flame retardancy, Crystallinity.

I. INTRODUCTION

Scientists and researchers have been in the midst of earlier research and development to find better energy sources such as gas, steam, crude oil, etc. But researchers have been looking constantly for structural materials in today's world that can transcend the limitations of current traditional materials. Composite materials which are made out of fibers that are naturally available will have the better benefit of lightweight, very good biodegradability character and also available at low cost compared to other materials[1]. The use of polymer composites in structural components will also help to reduce major problems such as corrosion and fatigue, resulting in material loss and therefore resource loss. Although it has very good reasonable properties, composite materials are still evolving with the technologies. Lots of innovations are ongoing for better yield [2]. This also finds its use in aircraft, tanks, and bulletproof jackets for military combat. Polymer matrix composite products are used by the electrical and electronic industries in laptops, computers, cell phones, printers, fans, coolers, air conditioners, watches, etc. Although synthetic fibers have very good exhibiting properties than the natural fibers it has some disadvantages [3]. Many of the corrosion problems are resolved by polymer matrix composite in consideration of many engineering applications. Among all the composite materials seashell has a very good biodegradability feature [4]. Because of the environment-friendly nature and the problem-free disposal and nontoxic in nature fibers which are naturally available play a major role[6].

II. HYBRID POLYMER COMPOSITES

If a component has a mixture of two or more different reinforcement fibers or other materials is called hybrid polymer composites. Either it is polymer-based, metal-based, or ceramic-based irrespective of the base which came from these reinforcements gives strength and very good bonding with the matrix as well as the composite material. Different fibers have different densities, a structural diameter that is extracted, and different mechanical strength values.

A Review on Performance and Emission Characteristics of Bio Diesel with Diesel Particulate Filter (DPF)

Anil Kumar S¹, Tajuddin H I¹, Ashish Shetty¹, Pavan kumar S¹, **Manoj Kumar A P²**

UG Student Dept. of Mechanical Engineering, Alvas Institute of Engineering & Technology Moodbidri

(Affiliated to Visvesvaraya Technological University, Belgaum) Karnataka, India¹

Associate Professor, Dept. of Mechanical Engineering, Alvas Institute of Engineering & Technology
Moodbidri Karnataka, India²

ABSTRACT: As fossil fuels are fast diminishing in the atmosphere, the attention has shifted to alternative sources with sustainable development, energy conservation, efficiency, and environmental protection, which has become increasingly important in the current scenario. Biodiesel is an excellent natural source of alternative fuel that also has environmental benefits. Because diesel has become scarce and expensive in recent years, we have turned to biodiesel as a substitute. This research looks into the number of emission characteristics of bio diesel in the proportion 80:20, 70:30, 90:10 at various conditions and compared with diesel fuels. The biodiesels are blended in different ratios and to obtain a perfect blend. Comparatively the biodiesel emissions are lower compared to diesel emissions, to achieve further emission control Diesel Particulate Filter (DPF) is installed. After-treatment devices are required to meet current exhaust pollution rules, and Diesel Particle Filters (DPFs) are necessary to lower particulate emissions from diesel engines. Which reduces the particulate matter (PM) emissions. NO_x levels are higher, whereas HC, CO, and PM levels are lower. The best biodiesel-to-diesel mixture for CRDI engines was discovered to be B20.

KEYWORDS: Biodiesel, Diesel particulate filter (DPF), Emission, Hydro Carbon (HC), particulate matter (PM)

I. INTRODUCTION

Almost every country relies on petroleum fuel to meet their energy needs. The underground has been impacted by the increase in energy demand caused by population growth. Researchers are looking for alternative energy sources. [26] In recent years, indiscriminate mining and usage of fossil fuels has resulted in environmental damage and energy scarcity. Because of rising demand for fossil fuels and rising environmental costs, conventional energy is no longer the only option. Partially replacing fossil fuels is one method that blends with sustainable development and energy consequences. [8]. Every year, we consume the amount of more than 11 billion tonnes of oil in the form of fossil fuels. The world's crude oil reserves are depleting at a rate of 4 billion tonnes per year. If current trends continue, oil reserves will be depleted by 2052. [28] As a result, in the future, that safe option will be explored and exploited. Biofuel would be a primarily viable choice because it can be obtained from renewable resources [17,14]. For the compression ignition (C.I.) engine, blends of varied proportions of jatropha curcas oil and diesel were created, evaluated, and compared to diesel fuel. [29] Because biodiesel contains oxygen, combustion processes are more complete, leading in reduced CO, particle, and visible smoke emissions. [11]

Even though biodiesel has many advantages, because of engine problems its use is restricted to maximum 20% only [27] There are several challenges with using vegetable oils directly and using oil blends. Pyrolysis, It has been studied the splitting of animal fats into smaller molecules by using thermal energy and petroleum catalysts. [12]. Several technologies have been used to control the specific matter emission of diesel engine [15] To meet legal exhaust NO_x and PM emission limits, aftertreatment systems such as diesel oxidation catalysts (DOCs), diesel particulate filters (DPFs), and selective catalytic reduction (SCR) systems have become essential. [6]. Among these, DPF is rated as the best diesel after-treatment technology for meeting increasingly stringent emission standards. [15,13] Catalyst materials coated on DPF flow-wall substrates play an important role in improving soot oxidation activity during passive

A review on Vibration analysis of Hybrid Natural Fiber Reinforced Polymer Composites

Praveen K C¹, Pramod Badyankal¹, Shanthi kumar N², Sanjay M², N Sunil Naik², Hernanth P²

¹Assistant Professor, Department of Mechanical Engineering, Alva's Institute of Engineering & Technology, Moodbidri, Dakshina kannada - 574225, Karnataka, India

²Student Scholar, Department of Mechanical Engineering, Alva's Institute of Engineering & Technology, Moodbidri, Dakshina kannada - 574225, Karnataka, India

Abstract

Plastics have been used widely in both water and food packaging due to their natural properties such as inertness and low bulk densities, which make them suitable move materials and little risk to contaminants. Plastic bottles and sachets have become prevalent all over the country, particularly, urban areas. The packaging revolt has not been backed by proper plastic waste management policy, which has left a lot of cities in India littered with plastic wastes, hence, creating horrible visual troubles and other community health problems. Growing environmental awareness and reduction in available landfill capacity have prompted plastic recycling programmes in most developed countries. Currently, however only between 5 to 25% of plastic waste is being recycled. The paper discusses prospects of plastic waste management schemes. It is concluded that the existing rate of environmental worsening is likely to continue unless long term remedial measures are adopted for plastic wastes management in the country.

Keywords: Hybrid Composites, Natural fibers, Epoxy resin, Hand layup, Frequency response function.

1. Introduction

In today's world, the natural fiber reinforced composites have become important better structural material. The good features of the natural fibers like jute, sisal, coir, basalt, pineapple leaf, coconut sheth, luffa cylindrica, kenaf, flax and banana having light weight, cheaper, specific modulus is high, renewable, and biodegradable. The concept of composite materials were known from earlier days, the improvement of composite materials which are advanced like Kevlar epoxy, Carbon epoxy boron epoxy, glass epoxy, Banana polyester, kenaf polypropylene, jute polypropylene, sisal polyester etc., these composites are used for advanced engineering applications. Non-conventional fibers such as jute, sisal, coir, banana, palm fibers, basalt, luffa cylindrical, kenaf, pineapple, flax, sansevieria cylindrical etc., are extracted from fruit, leaf, stem of plants[2]. By the usage of the natural fibers other than that of synthetic fibers we can reduce the weight, cost, less pollution during manufacturing, recycleability and ecofriendly, we can replace large segment of glass and other synthetic fibers.

These types of composites are used where the application area includes load carrying capacity, wear resistance, vibration characteristics durability[1]. Banana fiber is good for the analysis because of its moderately good mechanical behavior among other natural fibers. It was reported that the impact damage resistance of banana fiber epoxy composite is poor due to interfacial bonding attributed to the hydrophobic - hydrophilic incompatibility with the matrix.[1], like this there are many natural fibers which are having some limitations, so to overcome these type of limitations a concept of Hybrid Composites are Introduced.

Hybrid Natural Fiber Reinforced Composites are prepared by using two are more Natural Fibers which are Reinforced in the Polymer Resin, such as, Sisal-Bagasse Epoxy[2], Basalt-Jute



Review on Mechanical Properties of Composite of Coconut Shell Powder

Karthik Prabhu¹, Abhijith², Pavan³, Sharath Chandra Prabhu⁴

^{1,2,3,4}Mechanical Engineering, Final year BE student AIET, Mijar, Moodabidri, Karnataka, India

ABSTRACT

The composite materials are being widely used in various application since last decades. The natural rubber is agricultural product and Coconut shell is an agricultural waste which is abundant to the environment and waste raises the risk to health as well as environment. Coconut shell powder (CSP) is a solid non-food waste, which can be potentially exploited to reduce the usage of synthetic fiber. Coconut shell is also low-cost and low weight material that can be used to reduce the production cost of and fuel consumption for transportation. Currently, most of the researchers are investigating the use of waste material which can reduce the cost of construction and increase the strength. Some of the waste materials are used in construction for instance palm oil fuel ash, rice husk, fly ash, slag, sludge, coconut shell and etc. Thus, to reduce the risk of pollution, researchers have developed a new technology by using agro-wastes to produce bio composites. This review has focused on the research carried out on the CSP loaded into different types of matrices, highlighting the fundamental, mechanical, physical, and thermal properties of CSP composites. This article also provides critical review of the development for CSP composite and the summary of the results presented in the literature, focusing in the properties of CSP with polymeric matrices and the application design for economical products.

INTRODUCTION

Coconut has grown in more than 93 countries and one of the origin countries is South East Asia [1]. Coconut shell (CS) is one of the main polluters that contributes to the world's pollution trouble as it is a solid waste in form of shell with approximately 3.18 million tons annually, which represent over 60% of national waste volume [2]. Coconut shell, has cause copiously obtainable agricultural waste from local coconut industries [3]. Coconut shell is bio waste as others such as bamboo, jute, hemp, oil palm shell and rice husk have great potential as reinforcement in thermoplastics [4-6]. These bio wastes have contributed many environmental advantages like low density, low cost, lower pollution, good thermal properties, high toughness, reduced tool wear and biodegradability over traditional reinforcing filler such as glass and carbon [7-15]. Besides that, coconut shell also categories as Metal matrix composites (MMC) with fly ash and rice husk which can ameliorate characteristics such as great precise strength, precise modulus, good weather resistance and great damping capacity contrast to unreinforced alloys. Coconut shell ash and rice husk ash also are the cheaper and low-density reinforcement as solid waste by-product. These advantages can make CS become a very important agricultural product around the world as the new source of energy-biofuel [2, 8] rather than burnt to produce CO₂ and methane emissions [8].

Since natural fibers exhibit strong polarity and hydrophilicity, poor compatibility arises between natural fibers and polymer matrix which often shows significant hydrophobicity. This incompatibility leads to poor interfacial adhesion, in-adequate wetting of filler in the matrix, agglomeration of filler particles, and finally in lowering material properties [9]. Surface modification of natural fibers is inevitable in order to improve the compatibility. Hydrophobicity is induced into the hydrophilic natural fibers, either via physical or chemical methods. Chemical modification methods include the development of hydrophobic coating on the surface of filler. Different successful methods adopted for the chemical modification are silane treatments, isocyanate treatment, graft copolymerization, alkalization, peroxide treatment, acylation and benzylation. The improvement in interfacial properties leads to the enhanced surface properties such as wetting, adhesion, etc. Several experiments have demonstrated the efficacy of various silane coupling agents in the modification of natural fibers.

LITERATURE SURVEY

The composite of epoxy resin and coconut shell has a high strength, when we have increased the activated carbon 4% to 8% so the tensile stress of the composite also increases. In this process coconut shell is burnt at 80 degrees Celsius until 5 min so that it becomes pulverized ash so getting maximum strength. The entire specimens were prepared using SRM (silicon rubber

Dept. Of Mechanical Engineering
Alva's Institute of Engg. & Technology
Mijar, MOODABIDRI- 574 225

A Review on Three Wheeler Electric Vehicle

Pramod K N, Prashant D H, Akash Shetty, Karthik K, Abhishek B

Dept. of Mechanical Engineering,
Alvas Institute of Engineering & Technology,
pramodnk90@gmail.com

Abstract- Electric vehicles are believed to be an effective solution for reducing greenhouse gas emissions. Despite extensive study on the attributes and characteristics of electric vehicles and their charging infrastructure design, the development and network modelling of electric vehicles are still evolving and limited. This article provides a comprehensive review of electric vehicle studies and identifies existing research gaps in the aspects of theories, modelling approaches, solution algorithms and applications.

Keywords- Powertrain System, Chassis, Bodywork, Suspension, Handling, Battery, Three Wheeler.

I. INTRODUCTION

Into days India has a huge vehicle population over its area. Moreover, two wheelers, including gasoline powered bikes and mopeds are leading category for population, this category of vehicles is one of the biggest factor for noise and air pollution as they emit a huge amount of CO₂, CO, NO. Thus, electrical tricycle is proposed as an alternative to replace gasoline powered two wheelers.

In the last couple of years, there has been a lot of discussion around the prices of fuel – apart from the deregulation of petrol prices. Moreover, the threat of disruption of supplies from the Middle- East has led to the increase in the debate on energy security, this has resulted in the use of alternate drivetrain technologies.

The potential for alternative technologies in automobiles such as electric vehicles (EV) in India, depends on improving battery technologies, driving ranges, government incentives, regulations, lower prices and better charging infrastructure

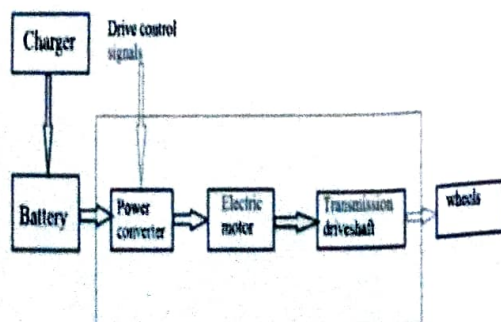


Fig 1. Block diagram of Electric vehicle.

As the population is increasing there is increase in demand of automobiles. Due to increase in automobiles, people will require space for driving and also for parking.

As we know there is limited space available and due to increase in the number of cars on roads they are causing traffic congestion and with that they require a place for parking. In addition to these pollution is also a priority nowadays. The pollution is reaching new limits day by day. So the idea of a portable electrical vehicle comes into concept

II. POWERTRAIN SYSTEM

Identified the major challenges for HEV design which were managing multiple energy source, highly dependent on driving cycles, battery sizing and battery management.

Electric scooter prototype was developed with design and analysis. Real time traffic and speed were recorded for further analysis. S.M.H.S. a series of analyses to design, optimize and control the performance of a powertrain FC electric vehicle to be used in participating in energy-efficient races.

Several experiments were conducted beforehand regarding controlling the vehicle, FC efficiency testing, vehicle dynamics modeling, track mapping analysis, DC motor characteristics and driving strategy techniques. These ensured the optimized sizing of the powertrain system for the vehicle and that the vehicle was controlled automatically to operate at maximum efficiency in each part of the powertrain system. Through technology review and comparative analysis it shows that HEVs can significantly reduce harmful emissions of gases.

This paper summarizes the key initiatives and features of showed that automation of maximum quasi-static loads calculation (using twoway connected MBD and CAD-model) and automatic loads transfer to FEA allows saving time costs for full geometry-loads-stress evaluation cycle. This significantly reduced time costs for cyclic loads and stress recalculation due to frequent geometry update.