

MACHINEDGE

A NEWSLETTER PUBLISHED BY

DEPARTMENT OF MECHANICAL ENGINEERING

INSIDE THIS ISSUE...

- Tech-Talks
- Workshops
- Industrial Visits
- Ongoing Research
- Publications
- Placements

CELEBRATING 25 YEARS



CMRIT

CMR INSTITUTE OF TECHNOLOGY, BENGALURU.

ACCREDITED WITH A+ GRADE BY NAAC

ACKNOWLEDGMENT

MACHINEDGE

**A Newsletter Published by
Department of Mechanical Engineering,
CMRIT, Bengaluru**

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For any project to meet with definite success, it takes a lot of hard work and dedication. More importantly, it takes the support of those involved directly or indirectly in the project. The very existence of the department newsletter is due to the courtesy of our college management. The Editorial Board would like to take this opportunity to thank them profusely for providing a chance to showcase the talents and achievements of our department students and faculty. We would also like to thank them for their constant support and encouragement through the days of making this newsletter.

Our Principal, Dr. Sanjay Jain and Vice-Principal, Dr. B. Narasimha Murthy have left no stone unturned in making this journey an enjoyable one for us at the Editorial Board. We would like to thank them for their undying support, encouragement and for giving us the freedom to build our ideas and carry them forward.

If it wasn't for the mentoring of Dr. H. N. Shankar, Dean, Academics and Research, the making of this newsletter would have been a lot more difficult! We are extremely grateful to him for his guidance.

Our sincere thanks to Prof. B Rajendra Prasad Reddy, Chief Coordinator of MachinEdge '17, for being patient with us despite our lags and delays, while effectively bridging the gap between the Newsletter Committee and the Management. The faculty of department of Mechanical Engineering have been nothing less than supportive. We would like to thank all faculty members for helping us collect the required data without which making this newsletter would not have been possible.

Last but definitely not the least; we would like to thank all the students of department of Mechanical Engineering for being enthusiastic about the newsletter. Without their contributions, this newsletter would not have been possible!



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Message from Principal's Desk



Sanjay Jain

Principal,
CMR Institute of Technology,
Bangalore

MachinEdge reflects the passion of the students and faculty of Department of Mechanical Engineering by elaborating on various curricular and co – curricular activities and reflects upon their various achievements. This helps in the overall development of our students. I am delighted to present the third edition of MachinEdge and would like to take this opportunity to thank the Editorial Team, faculty and all the other contributors of this edition of MachinEdge.

Message from HOD's Desk

Greeting from the department of Mechanical Engineering at CMR Institute of Technology, Bangalore. Our endeavor have always been to impart quality domain knowledge and to develop students in all aspect of professional development by providing committed faculty team with a balance of academic and industrial exposure.

I am happy to inform that our department is now accredited by NBA (National Board Accreditation) which would not have been possible to achieve without the combined and collaborative effort of CMR Management, Staff and Students. With this edition of newsletter, I would like to thank every faculty and student for their contribution.

An institution's recognition is directly linked to the quality of education provided to its students. Therefore, continuous improvement in teaching and training methods assumes greater significance. We seek, in all earnestness, to continuously improve upon our current teaching levels. In this endeavor, we will continue to work even harder to exceed expectations from stakeholders.



Dr. Vijayananda Kaup

Head of Department,
Dept. of Mechanical Engg.
CMRIT, Bangalore

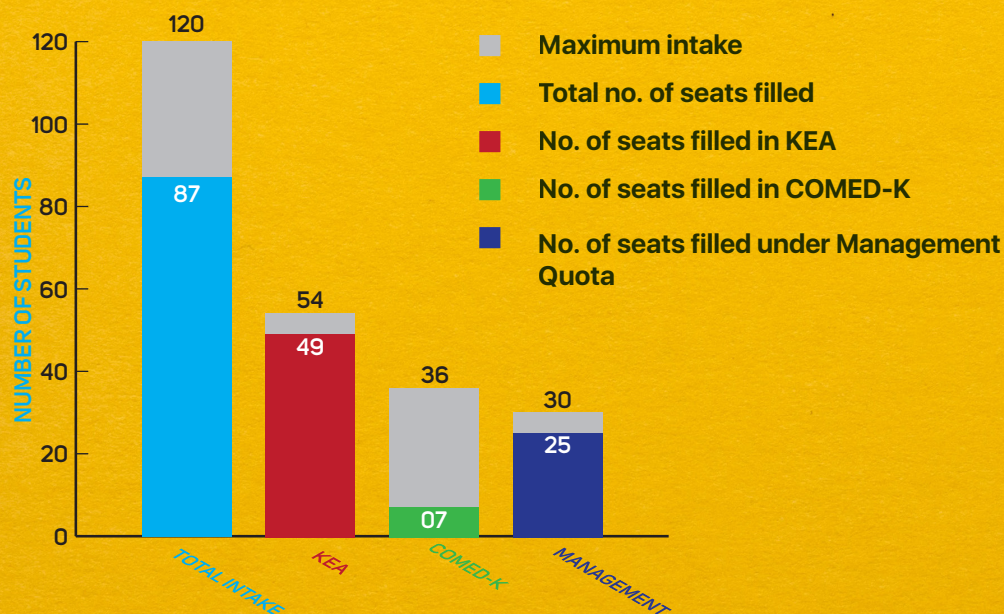


Prof. Rajendra Prasad Reddy

Program Coordinator,
Dept. of Mechanical Engg.
CMRIT, Bangalore

Department Overview

✓ Student admission 2017-2018



✓ Faculty strength

- Professor : 02
- Associate Professor : 06
- Assistant Professor : 21
- Dept. office Executive : 01
- Foreman : 01
- Lab Assistants : 07
- Attendants : 04

✓ Department Library

- No. of books available : 333

✓ Others

- No. of Publications : 02
- Technical Events/ Talks : 05

TECHNICAL TALKS

“Research Opportunities in Bio-fuels”

Speaker: S.N.Sondur
Date: 6th September, 2017
Organisor: SME, CMRIT
Venue: AV Hall, Mechanical Block, Ground floor



About Speaker

Mr. S N Sondur, Principal Scientific Officer and Principal investigator of Biofuel Cell is associated with the Karnataka State Council for Science and Technology (KSCST) since 1987

Mr. S. N. Sondur is a Fellow and Principal investigator on Bio cells. He is associated with the Karnataka State Council for Science and Technology (KSCST) which is an organization which deals with variety of research areas including Biofuels and Renewable energy resources. The organization also aids budding ideas by funding on projects which are related to bio energy.

KSCST was set up in the year 1977 and over the span of 40 years it has funded almost 9000 projects with respect to different branches in Engineering, making Karnataka the first and the only state to be encouraging the development of Biofuels.

He started his speech by introducing the motto of KSCST and providing statistics on the work done by the organization so far. In order to project the need for developing bio energy, he first noted the disadvantages of the conventional energy resources- Fossil fuels. He stated that India invests a great deal of amount on importing fuel from the Middle East. Stating the facts such as Indian Railways used about 13 million liters of fuel per month he tried to demonstrate how dependent the transportation and power generation sectors are on the conventional energy resources due to which they are growing scarce. He also emphasized on the several environmental effects such as Global warming and



Mr. S N Sondur Interacting with students and faculty

Pollution these conventional fuels have been responsible for. Thus making it clear that bio fuels would be very much beneficial to the living in the near future.

He mentioned the three main categories of bio fuels namely, Biogas, Biodiesel and Bioethanol, out of which he concentrated mainly on the generation of biodiesel. He believed that Engineers had a very vital role to play in the development of biodiesel. Biodiesel is generally obtained by converting fatty acids to methyl esters. According to him this operation could be performed easily using some simple machinery which would convert the sources (the major sources of biodiesel are - Tree borne oil seeds, micro algae,

waste cooking oil etc.) to the required form. This is where he saw the scope for engineers. He also pointed out the various social benefits the generation of Bio fuels would lead to, for instance, afforestation, scope for R&D, women empowerment etc.

He finally concluded by sharing the fact that most of the goods transport vehicles like TATA Ace are already using biodiesel for fulfilling 20% of their energy needs and by inviting students who are willing to research in the field of Bio energy to enroll their ideas with the organization and assuring them that KSCTC would fund their projects.

“Yoga, Pranayama & Sudarshanakriye”

Speaker: Shri. Harish Kovilikam
Date: 12th September, 2017
Organisor: SME, CMRIT
Venue: AV Hall, Mechanical Block, Ground floor



At CMRIT, the celebration of the event, International day of yoga was successfully celebrated with the presence of Mr. Shri Harish Kovilikam. The Faculty and students from different department including non-teaching staff actively participated in the event. The objective behind conducting this event was to enhance the awareness about yoga benefits. It was also celebrated to let students know that regular yoga practice leads to the better mental, physical and intellectual health and also positively changes the lifestyle of the people and increase the level of well-being.



“Design and Analysis of Composite Aircraft Structures”



Speaker:	Mr. Hemesh M
Date/Time	6 th October, 2017
Venue:	AV Hall, Civil Block Block, 4 th floor.
No. of Students:	100
Organiser:	SME, CMRIT

The topic chosen by our guest lecturer for the afternoon was “Design and Analysis of Composite Aircraft Structures” which he drew from his own work experience and line of interest. The speaker had previously worked as the coordinator for manufacturing and testing for organisations such as NAL, HAL and TAAL. The seminar hall was occupied by young aeronautical enthusiasts.

The speaker started his lecture with the basics of composite design as he believes that an engineer should be judged on the basis of his fundamentals. The lecture covered topics such as design, manufacture, types, properties, stress curves of composite materials. He emphasized on the strict difference between modelling and designing. He had previously worked

on missile configuration of the R73, P5.

He ranged the application of composites right from the floor of an aeroplane to the weapons used in the movie series Bahubali. His lecture involved a blend of engineering sciences, humour, sarcasm and predominantly practical experience which was the reason why the audience was in complete awe. He ended his speech by summarising the content of his talk and a few video clips on strength test, fabrication and manufacture of composite materials followed by a brief interaction with the faculty members and students. The token of appreciation was handed over by our SME Faculty coordinator Mr. Harisha P.

“Modeling and Simulation-Aircraft perspective”



Dr. P Lathasree
Senior Principal Scientist,
CSIR- National Aerospace
Laboratories, Bangalore

Speaker: Dr. P Lathasree
Date: 6th October, 2017
Venue: AV Hall, Mechanical
Block, Ground floor.

No. of Students: 130

About Speaker

P Lathasree obtained her ME in 1992 from PSG College of Technology, Bharathiar University, Coimbatore, Tamilnadu and Ph.D. from University of Mysore in 2017. She is presently working as Senior Principal Scientist and also heading Flight Simulation Group at Flight Mechanics and Control Division, CSIR- National Aerospace Laboratories,

Research Interest

Flight Simulation, Flight control and Air Traffic Management Simulation.

Dr. P Lathasree addressed about 130 students coming from different branches of Engineering.

She started her lecture by introducing the attendees the basic dynamics of an aircraft, which included the difference between dynamics and kinematics and how Newton's laws of motions can be used to study the dynamics of different aircrafts. She also introduced us to the Aircraft Equation of Motion and provided us with helpful hints to solve the same.



Students @ guest talk



Dr. P Lathasree addressing students at CMRIT

She continued her speech by mentioning various equations and methods to solve those equations which could be useful in aircraft simulation. She also educated us about the Mechanical Degrees of freedom of an aircraft.

She also gave us an overview of the role of flight simulation in an aircraft design. She also specified the need for adequate and complex modeling in different scenarios and the advantages of the same.

Finally she concluded her speech by introducing us to the mechanics of a Fighter Aircraft and various subsystems involved in them. Her lecture also included a few videos that could lead us to better understanding of aircraft simulation. Concluding her lecture she invited our students to enroll for projects on simulation and modeling.



Dr. P Lathasree addressing students at CMRIT



Dr. P Lathasree delivering the lecture and Dr. Bijayani Panda proposing vote of thanks





EDIFY Racing is a professional racing team formed by group of M.Sc. graduates from Oxford Brookes University, UK. EDIFY is currently setting up India's first professional racing school which certifies a degree in Automotive, Motor sports and Race engine design. EDIFY

racing offers driver development programme to young race driver aspirants who are willing to make a career in motor sports. EDIFY research has conducted studies on effects of various components of automotive emissions and current area of research is on low temperature





This programme consisted of discussion on various racing engineering concepts such as aerodynamics, vehicle dynamics, tyre theory and drivers training. The seminar lasted for 2 days, 6 hours each day and each session was followed by 15min Q&A session.



EDIFY offers various workshops to schools and colleges. They provides technical understanding about motorsport and other forms of vehicle engineering , the edify team also offers them all sorts of designing and analysis software training to students as well as to the corporate companies . Edify has research lab in Bangalore where projects from corporate world are undertaken and customized solutions are provided. Edify racing team compete in various racing championships across india , and engineers are recruited for their racing team.





DAY-1

Being quick is important in racing, being quicker than your opponent is the goal in race engineering. Considering most drivers are almost equal skill-wise, its vital for the technicians to set up the car precisely to achieve the best laptime on track.

Students were introduced to race engineering concepts which effect the laptime of a car and made to build a steady state laptime simulator for a track which will be set up in the venue.

The theoretical part would consist of:

Details of engineering technology in the world of motor racing were discussed in this session and the major focus was on engine and race car vehicle dynamics.

Vehicle Dynamic

1. Weight transfer - Longitudinal and Lateral.
2. G- forces in racing.
3. Cornering forces in a race car.
4. Newton's law of motion.
5. Understanding loading as a design parameter.

Aerodynamics

1. Bernouli's theorem
2. Negative lift
3. Effect of wings on downforce
4. Drag and downforce coefficients
5. Vortices and airflow around wings



DAY-2

On day-2, students were introduced to different racing terminologies.

- *Basic terminology - Apex, Racing lines etc.*
- *Gear shifting, smooth steering.*
- *The importance of vision - where driver should be looking*
- *Racing is not just about driving fast*
- *Quick brush-through of flags*
- *Students then step out to see a demo car (stock car is usable)*
- *Why to wear a seatbelt, correct steering hold position, optimizing driver's seat position*
- *Quick slalom run*

INDUSTRIAL VISITS

Hindustan Machine Tools, Bangalore

Date of visit : 13th OCT 2017

No. of participants : 80

Hindustan Machine Tools is a public sector undertaking of the Government of India. In 1953, the latter incorporated the machine tool manufacturing company by the name of Hindustan Machine Tools Limited. HMT as a brand is popular among the masses as a premium watch making company. However, since its very inception, HMT Limited is into a lot of other things as well. Over the years HMT, (as Hindustan Machine Tools is popularly known) has diversified into watches, tractors, printing machineries, metal forming presses, die castings & plastic processing machineries, CNC systems and bearings. HMT has also been successful in absorbing technology in all product groups by collaborating with recognized manufacturers from all over the world. Moreover, Hindustan Machine Tools have also evolved through continuous in-house Research and Development (R & D).

Students visit at HMT, Bangalore



It was a good experience, which has provided industrial exposure to the second year students. The students were

benefited in terms of the technical details provided by the company on an important part of Recruitment Policy of the Company and Various Career Opportunities in other industries. The students of second year Mechanical Engineering and all the three faculty members have enjoyed the technical endeavor at this organizations. The company also appreciated our students after the question answer sessions. The visit was very informative and gave a good learning experience. It was a unique example of 'EDUTAINMENT' i.e. Education & Entertainment. Points observed in details:

- 1. Pattern making section:** Observed pattern making methods, its design parameters, methods of preparation, machines involved and thermo cool pattern making for single piece production and wood pattern for batch production.
- 2. Casting section:** Observed melting of Cast Iron by Induction furnace, molding sand preparation, Jolt type of mold making method and procedure, method of molten metal pouring, breaking of mold after solidification, fettling operation and Air blasting to remove sand particles on component.
- 3. Machining Section:** Observed machining of Heavy duty Lathe Headstock Spindle Part, machining of tailstock sleeve, machining of Planner bed part on its child parts on CNC Planner, CNC Lathe, CNC Drilling, CNC Milling machines and also quality checking methods like OD & ID tolerance checking.
- 4. Assembly section:** Observed assembling of child parts of radial drilling, CNC Lathe and Planner machine.
- 5. Heat treatment section:** Observed age hardening procedure for few components.
- 6. Electrical assembly section:** Observed electrical parts assembling to CNC Lathe, Radial drilling machine.



BFW, Peenya, Bangalore

Date of visit : 13th NOV 2017

No. of participants: 50

It was a good experience, which has provided exposure to the III year students with industrial life. The students were benefited in terms of the technical details provided by the company on an important part of Recruitment Policy by Company and Various Career Opportunities in industries.

The students of 3rd year Mechanical Engineering and the faculty members have enjoyed the technical endeavor at this organizations. The company also appreciated our students after the question answer sessions. Visit was very informative and gave good learning experience.

The observations of the industrial visit are as follows:

1. **Engine block manufacturing:** Working of 5- axis CNC milling machine during the process. The speed with which machine was producing the parts were observed.
2. **CNC Milling:** Process of design and manufacturing in CNC milling machines were studied.
3. **CNC TURNING:** Process of design and manufacturing in CNC milling machines were studied.
4. **CNC Production:** The students saw the making of CNC machines right from the design, manufacturing and testing phases.

Students visit at BFW, B'lore



TVS Motors, Hosur

Date of visit : 31st OCT 2017

No. of participants : 50

TVS Motors plant at Hosur is 40 percent automated and 60 percent manual. Students were amazed to see the speed at which the processes occurred and how the automated systems works according to the requirements. The manufacturing processes adopted by them is a combination of batch and mass production. The industrial visit was an enriching experience for the students in getting exposure to different technologies used in manufacturing industries which can help them in their internships and further career enhancements.

The observations of the industrial visit are as follows:

1. Engine block manufacturing:

Working of 5- axis CNC milling machine during the process. The speed with which the machine was producing the parts were observed.



2. Engine assembly line:

Process and type of automation being used in assembling of engine block along with child parts.

3. Painting section:

Coating or Paginating of the bike parts.

4. Bike assembly line:

Automation system & procedure followed during assembling of bike parts.

5. Bike testing:

Final stage of testing of assembled bike (Star City bike). Students got to see the automated assembly line of TVS which concentrated on BMW bikes, G-310 R, TVS Star City, and TVS Jupiter

6. Assembly Line

The students saw the manufacturing process of scooters right from product design and planning to assembling and painting and also understood the different types of plant layouts and Production Systems.

Students visit at TVS Motors, Hosur



EXTEMPORE

EVENT NAME:	Tech Pick and Talk
DATE OF THE EVENT:	25 th September, 2017.
TIME OF EVENT:	02:00 PM – 03:30 PM
VENUE:	Classroom No. 101, Mechanical Block,
ORGANIZER:	Society of Mechanical Engineers, CMRIT.
JUDGES:	Prof. Amith and Prof. Shashank Dubey.

INTRODUCTION:

After observing the interest shown by the students of mechanical engineering in the “Tech Pick and Talk” event organised initially on the 12th of September, 2017, SME club decided to open the event for all the other branches and conducted the same on 25th of September, 2017.



THE EVENT:

The Tech Pick and Talk held on the 25th of September had student participants from various departments coming forward to showcase their orating skills. The participants picked a topic, organized their thoughts in 2 minutes and were given additional 2 minutes to speak on the topic. The participants were judged on their spontaneity, vocabulary, confidence and content.

The top 3 candidates from mechanical department were put up against the top 3 from other departments in round 2. Some of the topics suggested by the judges in round 2 were:

- Will robots outdo us in the near future?
- Technology- a necessary evil

All the 6 participants spoke with utmost zeal and passion but the chase to the top 3 positions was cut with a marginal difference in their scores.

Impressed with their support and cooperation, participation certificates were awarded to all the candidates and the top 3 received mementos which were handed over by the Head of Department of Mechanical Engineering.



ONGOING RESEARCH

Research on systematics of Mechanism Design

Over the last four decades, computers are aiding the transformation of the process of mechanism design from an art to a structured scientific discipline. There are various means by which the designer can work through to the discovery of solutions to a problem. One of these concepts uses the concept of associated linkages or kinematic chains. The process of determining all possible kinematic chains is referred to as structural synthesis in the field of mechanisms. Structural synthesis essentially involves (a) the selection of a particular type of mechanism, for example, the choice of a link mechanism or a cam mechanism or a gear mechanism, based on the desired kinematic performance (b) number synthesis, which is the study of the permutations of a given combination of links and joints. Step (b) is basically applied to linkages having simple joints only since these linkages can most readily be transformed to accommodate multiple revolute joints, cam pairs, geared joints, belt-pulley mechanism and so on.

In the field of kinematics, Dr. Vijayanand Kaup, Dr. Harish Babu and Prof. Manikandan are actively engaged in the development of several algorithms to carry out systematics of mechanism design. Some of the problems which are actively pursued are:(1) Development of a computer-based test for detection of isomorphism in simple- and multiple-jointed chains (2) Isomorphism test for epicyclic transmission systems (3) Detection of planarity of chains and transmission systems (4) Identification of degenerate sub-chains in a kinematic chain (5) Synthesis of multiple-jointed chains. Python is the programming language that is predominantly used for the implementation of the said algorithms.



Principal Investigator
Dr. Vijayananda Kaup

Effect of various parameters on the liquid metal embrittlement of stainless steel when welded to galvanized steel

A Project funded by Department of Science and Technology (DST), Government of India under Young Scientist Scheme. Duration: 3 years. Fund: 18.4 lakhs.

In construction and automotive industries, austenitic stainless steels are preferred over carbon steels due to their superior mechanical and corrosion properties. These components are frequently welded to galvanized carbon steels. Typical examples are galvanized carbon steel washers welded to stainless steel pressure vessels in paper industries and galvanized steel access platforms, stiffeners, column support and stairways welded to structural components like stainless steels storage tanks. Welded structures are subjected to high stresses due to thermal expansion and contraction of the base metal or due to structural transformation occurring during the weld cycle. Therefore, there are chances of penetration of molten zinc into the stainless steel, leading to crack generation by the process of liquid metal embrittlement (LME). Some of the zinc burns off by the heat of the arc, removing the protective zinc coating at the weld location. Zinc melts at about 482°C and vaporizes at about 906°C. Since steel melts at approximately 1510°C and the welding arc temperature is 8,300 to 11,090°C, the zinc near the weld is vaporized. Nonetheless, some of the molten Zn can still penetrate the steel surface and result in cracking. Some of the typical cleaning procedures used on-site to remove the galvanized layer before welding are power wire brushing and grinding. However, it has been found that these methods are not completely effective in preventing Zn contamination during welding. These cracks can lead to catastrophic failure of structural components since they



Principal Investigator
Dr. Bijayani Panda

remain undetected at times, mainly because the cracks may be hidden underneath the top Zn layer. A recently published article reported liquid metal embrittlement in the heat affected zone of a stainless steel car body part welded to a galvanized steel component. The authors conclude that the zinc that had evaporated from the weld zone had condensed back on the steel substrate and had penetrated below the stainless steel surface in molten form.

The various case studies available in literature motivated the investigators to take up the above problem for further research study. In this project we are studying the effect of various parameters like stainless steel composition, galvanized layer thickness and welding parameters on zinc induced LME of stainless steel. This study will be unique of its kind and would give the much required insight into the above problem. The research outcome will be published and can

be used as reference by welding engineers, researchers and failure analysts. In addition, we will work out plans to include the research results in product specification sheets of leading welding consumable manufacturers.

The principal investigator of this project, Dr. Bijayani Panda holds a Ph.D from the Department of Materials Science and Metallurgy, IIT Kanpur (2008). She obtained her M.Tech Degree also from the Department of Materials Science and Metallurgy, IIT Kanpur (2003). She has previously worked as a scientist in the Material Science Division of National Aerospace Laboratories (NAL), Bangalore (2012-2013) and as a Senior Researcher at EWAC Alloys, Larsen & Toubro Ltd., Mumbai (2008-2011). She is presently working as an Associate Professor in the Department of Mechanical Engineering, CMRIT. She has 12 journal publications and 14 conference presentations to her credit.

Optimization of biodiesel production from Schizochytrium microalgae oil and conducting experimental studies on the performance of CI engine with diesel- biodiesel blends.

Microalgae is a third-generation biomass and can be cultivated without affecting the production and prices of food crops. The heterotrophic marine alga Schizochytrium is a prolific producer of docosahexanoic acid (DHA), which has been demonstrated to have beneficial effects on human life as a dietary supplement too. In addition to DHA, this microalgae contains high lipid content, which is ideal for producing biofuels. The free fatty acid content of Schizochytrium oil was 0.1%, which is



Principal Investigator
Prof. Rajendra Prasad Reddy

well within the recommended value for one-step alkaline transesterification. This study was aimed at optimizing the process parameters for the production of biodiesel from Schizochytrium oil through transesterification. The process parameters involved were the volumetric percentage (% v/v) of methanol, weight percentage (% w/v) of catalyst, stirring speed, reaction temperature and reaction time. A conversion efficiency of 99.99% was observed through gas chromatography with mass spectroscopy (GC-MS) analysis for a 30% v/v methanol, 0.4% w/v KOH, 400 rpm stirring speed, 60°C reaction temperature and 90 min reaction time. The proton nuclear magnetic resonance ($^1\text{H NMR}$) spectra confirmed this result by indicating that the biodiesel derived from these optimum parameters contained only methyl esters of fatty acids and is devoid of mono, di, tri-glycerides and glycerol in the fuel synthesized. The properties of the biodiesel obtained were also found to be well within the recommended limits of biodiesel standards specified by ASTM. The kinematic viscosity was found to be $3.7 \text{ mm}^2/\text{sec}$ and the flash point was found to be 170°C . The cloud and pour points were found to be 5°C and 0°C , respectively. The calorific value was found to be 39.48 MJ/Kg .

Experiments were conducted to analyze the combustion, performance and emission characteristics of the Schizochytrium micro algae biodiesel blends and petro diesel fuelled single cylinder, water cooled, four stroke cycle, Kirloskar diesel engine. Tests were carried out using B20, B40, B60

biodiesel blends and petro diesel at an engine speed of 1500 rpm and 16.5:1 compression ratio. However this trend was reversed for B20 biodiesel. The performance parameters calculated were Brake specific fuel consumption, brake specific energy consumption and brake thermal efficiency. The exhaust gas emissions like Carbon monoxide, Carbon dioxide, Oxygen, Nitrogen oxide, and Hydro carbon were analysed. The combustion characteristics of biodiesel blends were compared with those of petro diesel. The peak in-cylinder pressures for B40 and B60 biodiesel blends were found to be respectively, 1.42% and 3.01% higher than that of petro diesel at full load. However, it was 0.95% lower for B20 biodiesel blend when compared to that of petro diesel. The reduction in ignition delay for B20, B40 and B60 biodiesel blends was respectively, 6.04%, 5.11% and 4.18% when compared to that of petro diesel. The Brake thermal efficiency was reduced by 3-4% for B20, B40 and B60 biodiesel blends when compared to that of petro diesel.

PUBLICATIONS

Consolidation & Factors Influencing Sintering Process in Polymer Powder Based Additive Manufacturing

Sagar M Baligheid, Assistant Professor, Dept. of Mechanical Engg., CMRIT

Abstract:

Additive Manufacturing (AM) is two decade old technology; where parts are build layer manufacturing method directly from a CAD template. Over the years, AM techniques changes the future way of part fabrication with enhanced intricacy and custom-made features are aimed. Commercially polymers, metals, ceramic and metal-polymer composites are in practice where polymers enhanced the expectations in AM and are considered as a kind of next industrial revolution. Growing trend in polymer application motivated to study their feasibility and properties. Laser sintering, Heat sintering and Inhibition sintering are the most successful AM techniques for polymers but having least application. The presentation gives up selective sintering of powder polymers and listed commercially available polymer materials. Important significant factors for effective processing and analytical approaches to access them are discussed.

Published in International Journal of Materials Science and Engineering

DOI:10.1088/1757-899X/225/1/012075



Sagar M. B.

Asst. Professor, Dept. of Mechanical Engineering, CMRIT

Characterization of graphene reinforced Al-Sn nanocomposite produced by mechanical alloying and vacuum hot pressing

Bijayani Panda, Associate Professor, Dept. of Mechanical Engg., CMRIT

Abstract:

In the present work, graphene (Gr) reinforced Al-Sn matrix nanocomposites were prepared by ball milling and vacuum hot pressing. The powder morphologies of Al-Sn and graphene during different intervals (2, 4, 8 & 12 hours) of time were studied using Scanning Electron Microscope (SEM) and Energy Dispersive Spectroscopy (EDS). Further the 12 hours ball milled nanocomposite powders were subjected to vacuum hot pressing at a temperature and pressure of 540°C and 40 MPa respectively. The size of Al-Sn/Gr powders decreased with the increasing in milling time due to fracturing of big particles. The graphene was seen on the surface at the initial hours of ball milling but found to disappear in the Al-Sn powders at end of 12 hours of ball milling. The presence of high weight fraction of graphene in Al-Sn matrix grain boundaries made sintering process difficult leading slight drop in experimental density values when compared to that of theoretical density. However, the addition of 1 and 2 wt% graphene to Al-Sn showed about 27 and 48% increase in the microhardness values respectively.

Keywords: Graphene, Composite Materials, Ball milling, Powder Metallurgy, Microhardness



Dr. Bijayani Panda
Associate Professor, Dept.
of Mechanical Engineering,
CMRIT

Consolidation & Factors Influencing Sintering Process in Polymer Powder Based Additive Manufacturing

S. Gopi, Assistant Professor, Dept. of Mechanical Engg., CMRIT

Abstract:

Additive Manufacturing (AM) is two decade old technology; where parts are build layer manufacturing method directly from a CAD template. Over the years, AM techniques changes the future way of part fabrication with enhanced intricacy and custom-made features are aimed. Commercially polymers, metals, ceramic and metal-polymer composites are in practice where polymers enhanced the expectations in AM and are considered as a kind of next industrial revolution. Growing trend in polymer application motivated to study their feasibility and properties. Laser sintering, Heat sintering and Inhibition sintering are the most successful AM techniques for polymers but having least application. The presentation gives up selective sintering of powder polymers and listed commercially available polymer materials. Important significant factors for effective processing and analytical approaches to access them are discussed.



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Department of Mechanical
Engineering, CMRIT

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Engineering

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PLACEMENTS

A dedicated placement training program (PREPARE) focuses on the imperative needs of students preparing for campus selection process. The utmost importance in this program is given to the best match between interests of students and opportunities offered.

Like every year, the number of participating companies escalate giving students a wider range of opportunities to spring their career. Our department aims at inviting companies from various industries offering hefty pay packages. Accreditation and validations by companies like TCS, Infosys, L&T, IBM, Amazon, Decathlon, Atkins and Precision Engineering etc. speak volumes of the high standard maintained at CMR Institute of Technology. For 2013 - 2017 batch, 40 students were successfully placed in various prestigious companies like TCS, L&T Infotech, Amazon, Atkins, IBM, pinclick, Decthlon, RMC, Precision Engineering, Tailwind and Cyient.

With a plethora of placement opportunities available for students, CMRITians often boast of multiple jobs offers much before they finish their course.

Congratulations to the students successfully placed in L & T Infotech

- Rishabh Tripathi
- Aslam Khan
- Sagar Kumar T S
- Varun S
- Avishek Manhas
- Siddhu Patil
- K. Rao
- Raj Kumar Rachapudi
- Udit Narayanan
- Rakhith Somaraju
- Roshan Singh
- Biswajeet Gourav *& the process is still in progress . . .*

SERVICE AWARDS



Prof. B Rajendra Prasad Reddy receiving service award for completing 10 years of service at CMRIT



Prof. Harisha P receiving service award for completing 5 years of service at CMRIT



Prof. Puneeth Kumar N receiving service award for completing 5 years of service at CMRIT



Prof. Venkatesh Naik receiving service award for completing 5 years of service at CMRIT



Prof. Sagar M B receiving service award for completing 5 years of service at CMRIT



Prof. Narendra N receiving service award for completing 5 years of service at CMRIT

Mr. Prabha receiving service award for completing 5 years of service at CMRIT



STUDENTS' ACHIEVEMENT



Mr. Prabhu Madari of 7th semester receiving Scholarship on Founder's Day, 2017



Mr. Pranav H L of 7th semester receiving Scholarship on Founder's Day, 2017



Mr. Dillip Kumar
K. R. of 7th
semester receiving
Scholarship on
Founder's Day, 2017

Mr. Sagar P
Reddy of 3rd
semester receiving
Scholarship on
Founder's Day,
2017



Mr. Arif Ali of 5th
semester receiving
Scholarship on
Founder's Day, 2017

MINI PROJECTS

- A mini project on **Design & Development of 3D Printer Filament Extruder** is done by a group of 3rd semester students – Akash M Tigadi, Aman Bhandari and Adarsh Kumar Tiwari which is guided by Prof. Sagar M B.
- A mini project on **Refrigeration with the Help of Peltier Effect** is being done by students of 5th semester – S Allen Livingston, S M Srinivas and Shashank J H which is guided by Prof. Pranshu Dube.
- A mini project on **Swing Operated Reciprocating Pump** is being done by students of 5th semester – Vibhanshu, Shubhanshu Kumar, Sai Krishna Vamsi and Poornesh H N which is guided by Prof. Chethan Kumar G.
- A mini project on **Easy to Operate Centre Stand for Motorcycle** is being done by students of 5th semester – Vamsi Sai, Shreyas G Reddy, Shivaprasad Rao and Sakthi Bharathi K C which is guided by Prof. Maharudresh A C.
- A mini project on **Fabrication of Electrically Operated Hoverboard** is being done by students of 5th semester – Chandan Kumar S, Charan N, Devaraju S and Kaushal Gowda which is guided by Prof. Navaneeth. B.
- A mini project on **Design and Fabrication of Relector Zero Gravity Fixture for Space Craft** is being done by a student of 3rd semester – Rudra Gowda which is guided by Prof. H Manikandan.
- A mini project on **Design and Fabrication of Mechanical Cruise Control in Automobiles** is being done by students of 5th semester – Abhinav Suresh, Harish N, Federick Sharon, Amar Vaikunth and Asher John Sathya which is guided by Prof. Vijeesh M V.
- A mini project on **Design of RC plane** is being done by 1st semester students – Raunak, Sanchita, Samridhi, Praveen, Saket and Rithika which is guided by Prof. Divyesh Mistry
- A mini project on **Design and Fabrication of V2 Engine Prototype** is being done by 1st semester students – Tanish R, Tanish Shridhar, Gokul, Ritika and Tejaswini which is guided by Prof. Akhil C. 10.
- A mini project on **Mechanical Charaterization of Polyamides** is being done by 7th semester students – Kiran, Paritosh, Anjan, Revanth and Gautham which is guided by Prof. Cyril S.
- A mini project on **Fabrication of Automated Sand Rammer** is being done by 3rd semester students – Krishnirishi, Gopikrishna and Venkatakhil which is guided by Prof.

Chidhananda R S

- A mini project on **Sewage Water Purification** is being done by 1st semester students – Abhinav Mishra, Hitesh Balotia, Souptik Mukherjee, Bhuvaneshwar Reddy and Yashas Reddy which is guided by Prof. M Srinivas Reddy.
- A mini project on **Electricity Generation by Speed Brakers** is being done by students of 5th semester – Sayak Bhattacharya, Sulagna Chaterjee, S P Rakshith and Srinikhil B K which is guided by Prof. Shashank Dubey.
- A mini project on **Multi Direction Dump Body** for Trucks is being done by 7th semester students – Puneeth R, Chethan Gourish, Bharath T K and Shivann which is guided by Prof. Venkatesh Naik.
- A mini project on **Working Model of Wind Mill** is being done by 1st semester students – Rashmi, Pavana and Sachin which is guided by Prof. Chandan K R.
- A mini project on **Power Generation by Free Energy Sources** is being done by 5th semester students - Sai Venkata Krishna Reddy, Arif Ali, Kurmahari P, Naresh C E and Chetan R which is guided by Prof. Joseph Sajan.
- A mini project on **Unmanned All Terrain Vehicle** is being done by 1st semester students - Arjun S, Bharath N, Arvind M, Ashvin and Anil kumar which is guided by Prof. Venkatesh Naik



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