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		Energy Conservation Of An Underfloor Air Distribution System In A High Ceiling Space	*[2]asst. Prof, Dept. Of Mechanical Engineering, Aalim Muhammed Salegh College Of Engineering, Chennai.* Jafarceg@Gmail.Com *[3]iii[rd] Yr Ug Student, Dept. Of Mechanical Engineering, Kcg College Of Technology,Chennai-600097.,* Shriram320@Gmail.Com *[4]iii[rd] Yr Ug Student, Dept. Of Mechanical Engineering, Kcg College Of Technology,Chennai-600097.,* *Dsiddharthchakravarthy @Gmail.Com.*	

ME201

Hybrid Prediction technique Surface roughness of Wire-electrical discharge machining (µEDM)

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ABSTRACT

Present work aims to develop the model and optimize the Surface roughness that is obtained from the highly complex wire electric discharge machining (WEDM) process. Various percentages of Aluminum Nano composites were fabricated by navel ultrasonication method. Artificial neural network (ANN) with back propagation algorithm and genetic algorithm is used in the model for hybrid prediction techniques. In the output parameters are conducting in nature so there is multi combination of cutting parameters, which provides the best machining performance in electrical discharge machining. Experiments have been carried out over a wide range of machining conditions for training and verification of the hybrid model techniques. Testing results demonstrate that the model is suitable for predicting the response parameters. A Hybrid result set has been predicted in this work.

Keywords - Wire Electric Discharge Machining, Surface roughness, Genetic Algorithm, Artificial Neural Network..

ME202

ANALYSIS OF TIG WELDING ON DISSIMILAR METALS

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ABSTRACT

Tungsten inert gas welding is relatively high strength welding technique. This technique are mostly used in fabrication and other industries to join the either similar or dissimilar materials .In particular, it can be used to join high quality strength of metals and alloys. In this paper we discuss about the strength and other physical properties of the materials after the tungsten inert gas welding process. These welded joints have higher tensile strength to weight ratio and finer micro structure. Tungsten inert gas welding of dissimilar materials such as stainless steel, mild steel and copper. These metals have the potential to hold good mechanical and metallurgical properties. Tungsten inert gas welding is a new welding process giving high quality and provides and relatively pollution free products. It provides high stability and defect free weld. Shielding gas of TIG welding is desirable for protection of atmospheric contamination. To do this a thorough literature survey is carried out on various aspects of proposed topic in various journals, patents, books and other research resources

ME203

ENHANCING OVERALL HEAT TRANSFER COEFFICIENT OF NANO FLUIDS USING HEAT EXCHANGER

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ABSTRACT

This paper shows the work on heat exchanger using Nano fluids. Low Heat transfer co-efficient is the primary limitation in the development of energy efficient heat transfer fluid that are required in many industrial applications, power generation and air-conditioning. In this paper we propose an innovative new class of heat transfer fluid can be engineered by suspending Aluminium Oxide Al_2O_3 and water as base fluid. The resulting Nano fluid is expected to exhibit high Overall heat transfer co-efficient compared to those of currently used heat transfer fluids. The enhancement of heating or cooling in an industrial process may create a saving in energy, reduce process time, raise thermal rating and lengthen the working life of equipment.

Keyword: Heat Exchanger, Nano materials

ME204

STUDY AND EFFECT OF CHANGE IN VERTEX ANGLE IN TIG WELDING

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ABSTRACT

In Tungsten inert gas welding electrode vertex angle plays a major role in deciding the weldment shape and heat zone characteristics which then effects the performance of structure and morphology of weldment . Comprehensive set of experiments where conducted using seven different vertex angles(10,30,60,90,120,150 and 180 degrees) in four different base material (steel, cast iron, aluminium and stainless steel).

Welding arc shape, depth and width of weld bead where measured and analysed .

ME205

Hybrid Prediction technique Surface roughness of Wire-electrical discharge machining (µEDM)

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ABSTRACT

Present work aims to develop the model and optimize the Surface roughness that is obtained from the highly complex wire electric discharge machining (WEDM) process. Various percentages of Aluminum Nano composites were fabricated by navel ultrasonication method. Artificial neural network (ANN) with back propagation algorithm and genetic algorithm is used in the model for hybrid prediction techniques. In the output parameters are conducting in nature so there is multi combination of cutting parameters, which provides the best machining performance in electrical discharge machining. Experiments have been carried out over a wide range of machining conditions for training and verification of the hybrid model techniques. Testing results demonstrate that the model is suitable for predicting the response parameters. A Hybrid result set has been predicted in this work.

Keywords - Wire Electric Discharge Machining, Surface roughness, Genetic Algorithm, Artificial Neural Network.

COMPOSITE MATERIAL USING GOAT HAIR WITH JUTE FIBER AND SISAL FIBER

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ABSTRACT

Now-a- days, natural fiber reinforced composite materials are replacing the conventional, synthetic and man-made fibre . Natural fibers are Low-cost and environment friendly materials with improved mechanical properties. These properties can be enhanced by combining natural fibers in different composition. Two natural composite are fabricated with goat hair & coir as fiber and epoxy as matrix. In the process of composite making, three layers of fiber are sandwiched together using epoxy resin. Compression moulding method is being followed to distribute uniform pressure on sandwiched layers. In first combination composite is made by three layers of goat hair. In second combination composite is made by sandwiching one layer of coir fiber between two goat hair layers. These two composites are tested for mechanical properties. Tensile strength, Flexural strength and Impact strength tests are performed. Study has been done by analyzing the mechanical properties of the two composites and reported.

ME207

Emission Control Test On Petrol And Diesel Engine With Smokeless Silencer

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ABSTRACT

Smokeless silencer is mainly used in controlling of emission and noise in Automobile exhaust. Activated Charcoal , perforated tube and outer shell are the components used to construct this silencer. The harmful sulphur , nitrous and carbon from the engine is filtered by using this silencer. Noise also reduced greatly than other silencer. Water surrounds both the perforated tube and charcoal. So, it is also called as an Aqua silencer.

ME208

DESIGN AND DEVELOPMENT OF POLYMER GREEN COMPOSITES

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ABSTRACT

Natural fiber reinforced polymer composites are gaining importance in the field of automobile applications mainly due to their advantages such as light weight and higher thermal efficiency than the conventional composites based on synthetic fibers. In the present work it is emphasized for the development of banana fiber reinforced polypropylene composites with Nano fillers for automobile components.The micro structures of the composite materials are analyzed using scanning electron microscope(SEM).Further,the mechanical, thermal properties of these composites are investigated and the data is used to analyze their performance for automobile components.

ME209

OPTIMIZATION OF STAINLESS STEEL A-TIG FLUX USING RESPONSE SURFACE METHODOLOGY

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ABSTRACT

Gas tungsten arc welding (GTAW) is a popular technique for joining thin materials in the manufacturing industries. This type of welding achieves a high quality weld for stainless steels and non-ferrous alloys. TIG welding is fundamental in those industries where it is important to control the weld bead shape, metallurgical characteristics and weldment morphology. However, compared to the other arc welding process, the shallow penetration of the TIG welding restricts its ability to weld thick structures in a single pass, thus its productivity is relativity low. From the industrial point of view stainless steel is a very commonly used material due to its property of resistant to corrosion and better creep rupture strength. The use of activating flux effects the different properties of the joint produced by the welding. In this work, (Al_2O_3,Cr_2O_3,TiO_2 and SiO_2) were used as activating flux to investigate the effect of activated tungsten inert gas (activated TIG) process on microstructure and hardness profile and depth to width ratio of stainless steels. Finally, the response surface methodology was deployed to optimize the flux combination.

ME210

WEAR BEHAVIOUR OF COATED DRILL BITS DURING DRILLING OF REINFORCED CONCRETE

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ABSTRACT

This work emphasizes on the investigation of the wear behaviours of Alumina –Titania (Al_2O_3-TiO_2) and Tungsten Carbide-Cobalt (WC-Co) coatings fabricated on the twisted drill bits during drilling of reinforced concrete .Micro structural analysis of the drill bits were performed using scanning electron microscope. Hardness measurements were carried out using the Vickers hardness test by applying the load of 200 grams. Smoothness test of the drilled holes were measured and the details will be presented in this paper

.ME211

3- DIMENSIONAL DEVELOPMENT BY CREATION OF SOLAR PARK ABOVE RAILWAYS

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ABSTRACT

Energy generation through solar has become more tedious due to huge investment required over its equipment and land. Though the equipment cost factor can be managed by latest technologies, availability of land has become a major setback for the development of solar industries. To eliminate the land requirement for the power generation using solar, a concept has been proposed to use the available railway lines for dual purpose. A deck can be formed above 10 m from ground level to establish a solar park of capacity of 50,000 MW using 300 Wp monocrystalline PV moduleat a cost of 5 trillion rupees,which includes module, civil works,installation, commissioning, operation and maintenance cost for a period of 25 years with Return of Investment in 10 years. If the concept is implemented throughout India, it not only increases the power generation capacity through renewable energy but also has other various benefits including longer life of rail tracks & coaches, employment generation and reduce co_2 emission in environment.

ME212

OPTIMIZATION OF ABRASIVE WATER JET MACHINING WITH METAL MATRIX COMPOSITES

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ABSTRACT

In the present study, The Magnesium based hybrid composites with Copper(cu) and Silicon Carbide(Sic) particles is prepared through powder metallurgy (PM) &Subjected to Abrasive Water Jet Machining. The pressure, Stand of distance and Traverse speed, Abrasive size are input process parameters and output response such as key angle, material removal rate(MRR) and Surface roughness(RA) and are measured and optimized using grey relational analysis (GRA).The analysis of variance (ANOVA) and F-test are performed to understand contribution and significant level of important of each input parameter over the output response and also analysis mechanical property Porosity, Hardness .

ME213

INVESTIGATION OF MECHANICAL BEHAVIOUR OF BIO-PARTICULATE HYBRID COMPOSITE MATERIALS

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ABSTRACT

The objective of the project work is to develop a new class of natural particulate based polymer composites to explore the potential utilization of agricultural residue from the natural resources. In nature, agricultural residue such as wood, rice husk, groundnut shell, almond, coir pith, coconut shell ,tamarind seed powder etc., are abundantly available in millions of tons and they are produced during the milling process of base raw materials. There are various researchers conducted the experiments in the evaluation of mechanical, thermal and tribological behaviours of particulate polymer composites. Based on the previous work cited in literatures, the current investigation is focused on the development of coir pith, tamarind seed powder filled hybrid particulate- epoxy composites to make customer value added products.

In the present work, agricultural residue namely coir pith, tamarind seed powder are selected as reinforcement materials due to their low cost, purity, particle size, shape, better mechanical, thermal and tribological properties. For the fabrication of particulate-polymer composites, weight content of reinforcement material varied from 10 to 50 % and matrix material epoxy from 50 to 90 % in compression moulding process and the operating pressure of 2.6 MPa and temperature of 80ºC were allowed for 2 hrs of composite curing. As per the combinations of particulate content and matrix content, three set of composite sheets were prepared as per ASTM standards with the dimension of 300 × 300 × 3 mm.

ME214

EFFECTS OF VARIOUS COOLANTS ON TOOL WEAR IN DRILLING PROCESS

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ABSTRACT

Coolants are normally used in drilling process to prevent the device from overheating or transferring the heat produced by the devices. For the past few decades, water and soluble oil have been widely used as a coolant which inturn will relieve the heat generated due to friction, however will increase the tool wear rate. Hence, this work deals with the investigation on the drilling performances of High Speed Steel (HSS) during drilling of stainless steel using Sun flower and coconut oil as a lubricants.

Key words : Drilling, Stainless steel, Coolants

SYNTHESIS AND TESTING OF FLYASH BASED ALUMINIUM ALLOY (Al 6061) COMPOSITE FOR BRAKE LINING MATERIAL

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ABSTRACT

Brake lining material (asbestos) undergoes a considerable amount of wear and is subjected to high thermal stresses. Due to this, it gets deformed easily. In this research, we try to replace the asbestos material with composite material. Composite material has gained considerable importance in the past few decades due to its light weight, high performance in wear and corrosion resistance and it is eco-friendly. The composite consists of Aluminium(6061), lignite fly ash and graphite as metal matrix composite. As a result, the wear resistance increases. The coefficient of friction also increases, which enhances the effectiveness of brake lining.

KEYWORDS: Metal Matrix Composite, brake lining, stir casting, wear test, SEM analysis.

ME216

STUDIES ON MECHANICAL PROPERTIES OF PINEAPPLE LEAF FIBRE/GLASS REINFORCED POLYESTER (BISPHENOL) HYBRID COMPOSITE

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ABSTRACT

The mechanical reinforcement that could be obtained by the introduction of glass fibers in bio-fiber (pineapple leaf fiber) reinforced polyester composites has been assessed experimentally. Addition of relative amount of glass fiber to the pineapple leaf fiber polyester matrix enhanced the mechanical properties of the resulting hybrid composites. The main chemical constituents of pine apple fiber are cellulose(70-82%), lignin(5-12%) & Ash(1.1%) it has superior mechanical properties due to its high cellulose content. Among matrix resin, unsaturated polyesters (BISPHENOL – $C_{15}H_{16}O_2$) have been commonly used for making Thermoset composites, especially with glass fiber. Randomly Oriented pineapple leaf fiber polyester composite with varying fiber length and fiber volume fraction were prepared by hand layer method. Pineapple leaf fiber (PALF) which is rich in cellulose, relatively inexpensive, and abundantly available has the potential for polymer reinforcement. The tensile strength and Young's modulus of the composites were found to increase with fiber content in accordance with the rule of mixtures. The elongation at break of the composites exhibits an increase by the introduction of fiber. The PALF polyester

composites possess superior mechanical properties compared to other cellulose-based natural fiber composites. Also the optimization equation was obtained using response surface methodology.

Keywords: Biofiber; Glass fibers; Bisphenol resin; Hybrid composites; Mechanical properties

ME217

OPTIMIZATION ON CYLINDRICAL GRINDING PROCESS

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ABSTRACT

Generally in any manufacturing industry, a human process planner select the machining parameters based on his expertise but they do not know the optimal values. The optimization process involves the optimal selection of machining parameters such as surface finish, tool wear and dimensional accuracy . This work enables the industries to have the optimum values of the cylindrical grinding variables and conducting the process based on ptimal values and analyzing the resuts using Response Surface Methodology and ANSYS.

Keywords: Response Surface Methodology(RSM), ANSYS.

ME218

LASER SHOT PEENING

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ABSTRACT

Based on previous research variety of mechanical process such as shot peening, water jet peening, ultrasonic peening, laser shock peening were developed on the various materials. Among these, lasers shot peening emerged as a novel industrial treatment to improve the crack resistance of turbine blades and the stress corrosion cracking (SCC) of austenic stainless steel in power plants. The present study investigates the effect of laser peening on aluminum alloy Al-6061-T6 with a Nd-yag laser. The microstructure, fatigue life, surface residual stress and micro-hardness of peened and unpeened surfaces were studied. The study shows that laser peening can significantly improve surface compressive stress and micro-hardness with trivial increase in surface roughness.

ME219

COMPARISION AND EXPERIMENTAL INVESTIGATION OF CERAMIC COATING ON ALUMINIUM BY HVOF AND PLASMA SPRAY TECHNIQUE

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ABSTRACT

This topic based on research elucidates about the ceramic coating on the aluminium material by using the techniques HVOF and plasma spray for attaining effective experimental results. Various carbides and oxides are coated on the aluminium material in a proportionate ratio by using the above techniques. The carbides and oxides of specific elements are used for reduced wear and increased thermal barrier respectively. Pin-on-disc test is conducted on the specimen to obtain results on various factors such as wear, hardness, SEM, corrosion, etc. and finally report the experimental results.

ME220

ANALYSIS AND EXPERIMENTAL INVESTIGATION OF PISTON SKIRT COATING FOR HIGH POWER DIESEL ENGINES

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ABSTRACT

Piston skirt/cylinder bore scuffing is one of the major contributors to the failure of automotive engines. In an internal combustion engine, the performance of the piston skirt an cylinder liner system has been recognized as important in achieving desired engine efficiency. In existing engines, the thermal constraints set in terms of thermal stability of a particular material also limit the efficiency of the engine. Producing engine and combustion chamber components with the help of ceramic materials both lengthen the life of the components and supplement the efficiency of the engine. Coating the piston surface with various ceramic materials improves the features of this material and thus enables the production of components with less weight and volume. Scuffing is invariably the result of excessive heat. It occurs when one or both of two rubbing metal surfaces reach the melting point of the material. If the piston scuffs, it will wipe the metal off the side of the piston. The constant pressure and reciprocating motion causes wear in the piston skirt. The piston skirt coating is to provide scuffing and wear resistances and reduce the friction between piston skirt and cylinder bore. In this study, the surface of a piston in a dieselengine is coated with Tungsten Carbide (WC) coating by using the plasma spraying method, and its surface behaviour are subsequently analyzed. Typical piston materials are light alloys, cast iron, nodular cast iron, and alloyed steels. The pistons for high speed diesel engines are primarily made of aluminium silicon alloys. Due to their structural characteristics and excessive surface roughness and inadequate strength, pistons cause

too much wear in cylinder surfaces. Thus, lengthening the life of the piston will both lengthen life of the engine and contribute to the economy of the engine.

Keywords: Piston Skirt; Wear and Scuffing; Coatings; CeramicMaterials; Aluminium Silicon Piston; Diesel Engine

ME221

Glass Fibers Reinforced Composites-A Review

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ABSTRACT

Glass fibers reinforced polymer composites have been prepared by various manufacturing technology and are widely used for various applications. Continuous glass fibers were first manufactured in the 1930s for high-temperature electrical application. Nowadays, it has been used in electronics, aviation and automobile application etc. Glass fibers are having excellent properties like high strength, flexibility, stiffness and resistance to chemical harm. It may be in the form of roving's, chopped strand, yarns, fabrics and mats. Each type of glass fibers have unique properties and are used for various applications in the form of polymer composites. The synthetic glass fiber is chosen for its excellent mechanical strength. Glass Fibers are among the most multifarious industrial materials used today. Glass fibers exhibit utilizable bulk properties such as hardness, transparency, resistance to stability, chemical attack, and inertness and favorable fiber properties such as strength, flexibility, and stiffness. Glass fibers are utilized in the manufacture of structural composites, printed circuit boards and many other applications.

ME222

A comparative thermodynamic study of transcritical CO_2 and N_2O simple cooling cycles

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ABSTRACT

In this work thermodynamic performances of transcritical CO_2 refrigeration cycle and N_2O refrigeration cycle have been studied. Steady state first law and second law analysis is carried out at different parameters employing standard property codes. The effect of the influencing parameters like evaporator temperature, gas cooler outlet temperature and gas cooler pressure on COP and second law efficiency has been investigated. It has been found that COP of N_2O refrigeration cycle is significantly better as compared to CO_2 cycle and second law efficiency of CO_2 refrigeration cycle is relatively better as compared to N_2O cycle under all operating conditions.

Keywords: Transcritical, energy, exergy, cooling cycle

ME223

DESIGN AND ANALYSIS OF CATCHER CONTAINER FOR MICROGRAVITY DROP FACILITY

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ABSTRACT

Reduced gravity experimentation is important to many diverse fields of research in understanding the fundamental and applied aspects of physical phenomena. To create reduced gravity environment at a low cost, microgravity drop tower is required. The microgravity drop tower consists of drop capsule, release mechanism, Air Bag, Catcher Container, Recovery system etc. A facility of this kind is being setup at IIT Madras which is similar to facilities in NASA Glenn Tower, USA and ZARM Drop Tower, Bremen, Germany. Two of the most critical sub system of the drop tower facility is the Catcher Container & Drop Capsule. This project is undertaken by M/s.ElektroThermalKinetics (P) Ltd, Ranipet and have permitted the author to design these sub systems. The design of these two components has many constraints that need to be addressed while simultaneously adhering to the design codes and standards.

The present design of the container involved the rules specified in ASME Sec VIII Div.1. However, certain constraints in space and location had to be optimized by using SolidWorks Simulation 2014 and ANSYS Workbench 14.0. The final design was approved by IIT Madras and the assembly is under installation.

ME224

Optimization of Production Cost for Integrating Job Shop Scheduling with Production Resources

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ABSTRACT

New manufacturing technologies are emerging every day, pushing the bounds of possible and redefining the world around us. This is especially true in the world of computing where much work goes into the design and development of new planning systems, tools, and software packages. This led to the development of various process analysis and manufacturing software packages. Many of these packages use the heuristic methods for solving the problems. Optimization is a design technique in which the best design solution for a problem is seeded using multiple execution and comparison of analysis results. Optimization is carried out for one or more responses acted upon by various constraints. To achieve truly computer integrated manufacturing systems, the integration of Job shop scheduler with production subsystem is to be emphasized to meet the rapid change in customer requirements. Job shop is an environment for the manufacture of large variety low volume products. Each order may be individually routed to its unique combination of work centers. In manufacturing systems, generally Integration of Production Functional Areas and job shop scheduling are to be considered as too hard and complex. The Production functional areas are Material Requirement Planning, Production Resource Planning, Manufacturing Resource Planning, Employee Time tabling, Human Resource Planning and Lot Size etc. To minimize the loss due to resource allocation, integration of production function resources and job shop scheduling is encouraged. Production resources are resourcing the material, human labors and manufacturing machine tools. Manufacturing assumptions are deployed to found difficult integrated manufacturing systems. In this paper, a hierarchy mathematical modeling approach has been developed to integrate the production resources planning and job shop scheduling. In which, material requirement planning system for material resource arrangement, employee timetabling module for human resource

allocation and manufacturing resource planning for machine allocations are to be considered. For solving the unique hierarchy model, a shuffled frog leaping heuristic algorithm with combing memetic algorithm and particle swam optimization has been proposed and implemented for minimizing production cost. In cost optimization problem, meeting due dates is often the most important goal of scheduling. Finally the integrated system has been tested with real time case studies.
Keywords: Job Shop Scheduling, Production functional resources, Material Requirement Planning, Manufacturing Resource Planning, Employee Timetabling, Heuristics algorithm, Shuffled Frog Leaping Algorithm

ME225

PERFORMANCE ANALYSIS OF A VORTEX TUBE COOLER

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ABSTRACT

Vortex tube, also known as Ranque-Hilsch vortex tube is a simple device and one of the alternatives for small cooling machines. It has no moving parts and splits tangentially entering high pressure air into low pressure hot and cold air streams. A numerical investigation has been carried out in the present work, to study the energy separation in the vortex tube and to predict the hot and cold air temperatures. The effects of inlet air pressure, temperature and cold air mass ratio on the performance of vortex tube have been analysed. Vortex tube irreversibility and efficiency have also been discussed and presented.

Keywords: Vortex tube; Cooling; Energy separation; Numerical simulation; Performance analysis.

ME226

ANALYSIS OF LIGHT WEIGHT GLASS BOTTLE MOLD TO ENHANCE RATE OF HEAT TRANSFER

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ABSTRACT

Narrow Neck Press and Blow (NNPB) process is used to produce light weight bottles. The gob of molten glass is delivered to the blank mold and a specially designed narrow diameter plunger is used to form the finish or mouth and the parison as it presses upwards. Invert and final blow takes place followed by take-out and annealing. Anchor Glass Container Corp. (AGC) uses NNPB technology in their glass making plants. The problem experienced by AGC in the process is that the heat dissipation through out the mold is not uniform and hence there is a non uniform temperature distribution in the finished bottle extracted from it. Specifically the shoulder region of the bottle stays at a higher temperature when compared with the other regions, becoming the limiting factor in determining the rate of bottle production. Excessive temperatures in any region leave the glass insufficiently rigid, allowing the bottle to sag or lean. An

increased rate of production which demands faster and effective cooling of the bottle is desired and is the ultimate goal of this research effort.

This problem can be effectively solved by increasing the amount of heat transferred from the mold to the cooling air, which can be done by increasing the surface area of the cooling passages. A mathematical model for calculating the amount of heat transferred to the cooling air is proposed in this thesis. The air properties at the exit of the mold and the amount of heat transferred by each cooling passage were obtained by using UNIGRAPHICS

.ME227

LOW & HIGH VELOCITY IMPACT STUDIES ON HYBRID COMPOSITE PANELS

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ABSTRACT

Composite materials are replacing the conventional materials, because of their superior properties and light weight. In this work jute and glass fiber mat are arranged in 3 layers & by changing its layer arrangement, they are tested in low and high velocity in ballistic testing machine. The composite plates are fabricated by hand layup method, of size150x150mmx6mm thick. After impact testing, damage occurred in each panel is measured and followed by energy observed in it are calculated. In a high velocity impact, fracture often occurs in an impacted zone. For a low velocity impact, invisible cracks often occur, but they

cannot be seen using the naked eye. It is important to understand the deformation and damage mechanisms involved in the impact of targets, for the effective design of composite structures.

ME228

FLEXURAL STRENGTHENING OF RC SLABS USING HYBRID LAMINATES

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ABSTRACT

Due to increase of traffic volume ,incident actions (e.g. Earthquake and fire disaster),ageing of materials and functional degradation of structures ,structural strengthening and rehabilitating of existing reinforced concrete (RC) structures is becoming an increasingly demand in civil engineering. Compared with traditional materials such as concrete and steel ,fibre reinforced polymer(FRP) such as Basalt fibre reinforced polymer (BFRP),glass fibre reinforced polymer(GFRP),and Aramid fibre reinforced polymer (AFRP), has become excellent strengthening and rehabilitating materials because of its premium properties of low density, high strength to weight ratio, good ductility, good fatigue resistance and good

corrosion resistance, which constitute the large-scale application in strengthening and rehabilitating of existing structures by the externally bonding method. The failure process of reinforced concrete slabs is exactly the emergence and propagation process of cracks. According to the principle of Fracture Mechanics, if the cracks were retarded in RC slabs, the structure performance would be improved. Hybrid fibre reinforced polymer (HFRP) sheets are proposed to retard crack propagation in RC slabs, and the crack arresting and strengthening mechanism of the HFRP composite in strengthening of RC slabs is revealed and bending improvement of RC slabs with externally – bonded hybrid glass/basalt FRP (Hybrid GFRP/ BFRP)sheets.

Keywords : Glass fibre reinforced polymer ,Basalt fibre reinforced polymer, crack-arresting, strengthening, fatigue resistance.

ME229

LINEAR ANALYSIS OF A NEW 3D SKIP FLOOR STAGGERED SHEAR WALL STRUCTURE

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ABSTRACT

Shear walls are structural systems which provide stability to structures from lateral loads like wind,seismic loads. These structural systems are constructed by reinforced concrete, plywood/timber unreinforced masonry, reinforced masonry at which these systems are sub divided into coupled shear walls, shear wall frames, shear panels and staggered walls. The present paper work was made in the interest of studying and linear analysis of various research works involved in enhancement of staggered

shear walls and their behaviour towards lateral loads.When RCC Multi-Storey building is designed withoutshear walls then column sizes are quite heavy and steel required is large. So there is lot ofcongestion at these joint and it is difficult to place and vibrate concrete at these place anddisplacement is quite heavy which induces heavy forces in member. Shear wall may becomeessential from the point of view of economy and control of horizontal displacement. Thereare lots of literatures available to design and analyze the shear wall. However, the decisionabout the location of shear wall in multi-storey building is not much discussed in anyliteratures. It is very necessary to determine effective, efficient and ideal location of shearwall. When shear walls are situated in advantageous positions in a building, they can be veryefficient in resisting lateral loads originating from wind or earthquakes. The primary objective is to achieve a configuration where the lateral displacement and storey drift are minimum.

ME230

EXPERIMENTAL INVESTIGATION OF FLEXURAL BEHAVIOR OF RC BEAM IN RUBBER TUBE FILLED WITH CRUMBBED RUBBER AND CEMENT PASTE IN CONCRETE

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ABSTRACT

One of the major environmental challenges facing municipalities around the world is the disposal of worn out automobile tires. Use of tyre increases day to day and there is no reuse of the same to decrease the environmental pollution. The utilization of recycled and hazardous waste materials in construction applications and the solution of environment problem by recycling are becoming greater concern. Hazardous materials can be classified as chemical, toxic or non-decaying material accumulating with time. The accumulation of rubber can be considered non-decaying materials that disturb the surrounding environment. The scrap tyres are used as rubber crumbs. Crumb rubber is a waste material that is ideal for

use in concrete applications. This has an additional advantage of saving in natural aggregates used in production of concrete which are becoming increasingly scarce. It is feasible to reuse scrap rubber, regardless its particle size, as aggregates for concrete mixtures since the main characteristics of the concrete are not deteriorated. In the last decade Spain has generated 250.000 tons of used tires, from which 45% goes to landfilling without any treatment, 15% is deposited after being crushed, and 40% is not controlled. Concrete with rubber particles of larger size tends to have a higher workability and fresh density than that with smaller particle sizes. However, the rubber aggregates with smaller or continuously graded particle sizes are shown to have higher strengths and lower water permeability. Beam is casted with steel reinforcement and another beam is casted with steel reinforcement, in the neutral axis rubber tube is inserted and the air is filled after the days of curing the air is passed away and crumbed rubber with cement paste is filled in the rubber tube and it is kept for curing. An experimental investigation is carried out on a concrete containing rubber tire waste. Material was produced, tested and compared with conventional concrete in terms of workability and strength. These tests were carried out on standard beam of 700*150*150 mm for 28 days to determine the mechanical properties of concrete. Analytical investigation is carried out using ANSYS.

ME231

AN EXPERIMENTAL INVESTIGATION OF THE MECHANICAL BEHAVIOUR ON BI-LAYER CERAMIC COATED ALUMINIUM ALLOY BY HVOF AND ATMOSPHERIC PLASMA SPRAY

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ABSTRACT

The main objective of this paper is to investigate the mechanical behavior of ceramic coating over aluminium alloy. In this regard, coated and uncoated aluminium alloy specimens were prepared. A bi-layer coating of Chromium carbide and alumina was coated over a casted aluminium alloy specimens. A chromium carbide layer of 100 microns thickness was coated by HVOF process and then a 100 microns

thick layer of Alumina was coated over it by Plasma spray technique. Both the coated and uncoated specimens were tested for their surface hardness, corrosion and wear. The results demonstrate that the hardness of the coated alloy increases almost twice the rate that of the uncoated alloy. Also when examined for 24 hours under the salt spray corrosion test, the corrosion resistance of the coated specimen increases. No rust formation was observed in the coated specimen during the test time. It is also observed that the wear resistance of the coated specimen increases and the rate of wear in the ceramic coated pin is less and is uniform when compared with the uncoated alloy.

ME232

INVESTIGATION ON WELD FUMES OF THE ARC WELDED MILDSTEEL

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ABSTRACT

Fume reduction from the welding process is an important perspective of environmental pollution and protection to the health of the welder. Hence, an attempt is made to reduce the weld fumes by providing

alumina coating over the electrode. Further, the weld bead appearance and its cross sectional morphologies were analyzed using optical microscope (OM).The elements present in the fumes will also be analyzed using gas analyzer. The mechanical properties of the welded joints will also be discussed in detail.

Keywords : Weld Fumes; Alumina; Mechanical Properties.

ME233

Review on investigation and mechanical behaviour of Kevlar and Kevlar-glass fibre composite

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ABSTRACT

Nowadays usage of automobiles (i.e.) two and four wheelers is vastly increasing day by day. As a result large number of automobiles accessories is facing irreparable damage and new accessories are replaced in the same vehicle in the ratio of 3:1 as per world survey of American Society of Manufacturing Excellence

(AME). Similarly, some of these irreparable products after twice or thrice repaired condition such as tyre are facing a huge problem in recycling and degradation. So in-order to overcome this issue, we are choosing natural fibers which are quite easily degradable after usage.

Keywords : Kevlar, Kevlar-glass fiber, Mechanical behavior

ME234

PERFORMANCE OF MULTI CYLINDER PETROL ENGINE WITH THROTTLE BODY INJECTION SYSTEM

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ABSTRACT

In the present work a four stroke multi cylinder carburetted petrol engine is modified to throttle body injection system using a separate fuel injector and fuel pump accessories and a Performance, Morse test was conducted on the engine and the result were compared with conventional carburettor multi cylinder

petrol engine. The result shows there is a measure in Brake Thermal Efficiency and reduction in brake specific fuel consumption was obsorbed. The Throttle Body Injection Engine Runs Smoothly During Idling Compared To Conventional Engine

Keyword: Throttle Body Injection, Morse Test

ME235

EXPERIMENTAL STUDY ON FLEXURAL BEHAVIOR OF PARTIALLY REPLACED PROSOPIS JULIFLORA CONCRETE

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ABSTRACT

The experimental investigations are carried out to study the effect of prosopis juliflora in RCC structure by partial replacement or adding on cement. Prosopis juliflora inflorescence is small, green-yellowish spikes without any particular fragrance or attractiveness, though relished by bees. Prosopis juliflora is one of these species that has performed much better than many native woody species. At the moment, prosopis juliflora provides approximately 75% of fuel wood needs of rural people in arid and semi arid regions of India. These species has become naturalized and spread over the greater part of north-west,

central, west and south India. Prosopis juliflora is xerophytic and is adapted to many soil types under a wide range of moisture conditions. Prosopis juliflora has been used to arrest wind erosion and stabilize sand dunes on coastal areas. It is fast growing, nitrogen-fixing and tolerant to arid conditions and saline soils. Under the right conditions, Prosopis juliflora can produce a variety of valuable goods and services: construction materials, charcoal, soil conservation and rehabilitation of degraded and saline soils. But wide spread prosopis juliflora has became an invader species so removal of the plant is into necessity now. Mostly the plant is remeoved by uprooting and is burnt. An experimental investigation is carried out on a concrete containing waste prosopis juliflora ash in the range of 0% to 30% by weight for M-20 grade concrete. Material was produced, tested and compared with conventional concrete in terms of workability and strength. These tests were carried out on standard beam of 700*150*150 mm for 28 days to determine the mechanical properties of concrete.

Thus, the flexural strength of the structure is relatively analyzed by taking more trials with different proportions P.J ash can be achieved.

ME236

Analysis of thermal and residual stresses developed in plasma sprayed coatings

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ABSTRACT:

This work emphasises on the investigation of thermal and residual stresses developed in Al_2O_3, Al_2O3-TiO_2, andWC-CO coatings fabricated using Atmospheric Plasma Spraying technique (APS).The micro structural analysis will be carried out using Scanning Electron Microscope (SEM). Hardness test will be performed using Vickers's Hardness Testing Machine by applying a load of 200g. The thermal and residual stresses generated on the above coatings will be analysed usingAnsys software and the results of which will be dealt in detail.

Keywords: Atmospheric Plasma Spraying, Microstructure, Hardness, Ansys

ME237

EXPERIMENTAL INVESTIGATION OF (SAPOTE SEED OIL AND PUNNAI OIL) AS A BIO DIESEL FUEL BLENDED WITH DIESEL IN A SINGLE CYLINDER DI DIESEL ENGINE

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ABSTRACT

In the present study Sapote seed oil (Manilkara Sapodilla) and punnai oil (calophyllum inophyllum) is chosen as biodiesel fuel blended with diesel and performance and emission characteristics were carried out in various blends ranging from SPO20 (10% Sapote seed oil +10% punnai oil + 80% diesel), SPO40 (20% Sapote seed oil +20% punnai oil + 60% diesel), SPO 60(30% Sapote seed oil +30% punnai oil + 40% diesel), SPO80(40% Sapote seed oil +40% punnai oil + 20% diesel) & SPO100 (50% Sapote seed oil+ 50% punnai oil) in a single cylinder four stroke, direct injection diesel engine and the results were compared with neat diesel. The results show there is a marginal increase in brake thermal efficiency and specific fuel consumption with reduced emissions of Carbon Monoxide (CO), Unburned Hydrocarbon(UBHC), Smoke Emissions and increase in emissions of oxides of Nitrogen (NO_x).

KEYWORDS: Sapote seed oil, Punnai Oil, CO, UBHC, Oxides of Nitrogen, Direct Injection.

ME238

MODELING AND COMPUTATIONAL FLUID DYNAMIC ANALYSIS FOR DESIGN IMPROVEMENT IN CENTRIFUGAL PUMP

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ABSTRACT

The objective of this work is to improve the design of centrifugal pump.Centrifugal pumps have been widely used for water or slurry transportation in thermal power plants, chemical process plants, sewage pumping etc. Computational Fluid Dynamics (CFD) has become more popular approach for designing and performance evaluation of such complex machines.A CFD solver namely CFX is employed in order to simulate fluid flow characteristics with well-defined constraints and boundary conditions defining the problem. To spearhead and facilitate this analysis program, a numerical approximation tool with high degree of convergence rate called ANSYS software is used. The ANSYS software avoids tedious calculations in the design procedure and uses ultimate numerical tool to approximate the solution of the partial differential equations associated with continuity, momentum and energy phases of a flow problem in a 3-D model. In this work, numerical simulations for different designs of centrifugal pump casing will be performed to obtain design improvements with the existing design of the pump.

Key words: Computational Fluid Dynamics, Centrifugal pump, Casing

ME239

Comparison Of Emission Test In Petrol & Diesel Engine With And Without Aqua silencer

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ABSTRACT

Air pollution is most important from the public health of view and It's contribute heavily to contamination of our Environment. so it is imperative that serious attempts should be made to conserve earth's environment from degradation. Aqua Silencer deals with control of emission and noise in automobile exhaust. An Aqua Silencer is fitted to the exhaust pipe of engine. Sound produced under water is less hear able than it produced in atmosphere. This mainly because of small sprockets in water molecules, which lowers its amplitude thus, lowers the sound level. Because of this property water is used in this silencer and hence its named as AQUA SILENCER. The noise and smoke level is considerable less than the conventional silencer, it is cheaper, no need of catalytic converter and easy to install.

Key Words: Aqua Silencer, activated charcoal, perforated tube, outer shell, sulphur, oxides of Nitrogen, noise.

ME240

HYBRID REINFORCED CONCRETE BEAMS USING STEEL AND BFRP BARS

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ABSTRACT

Concrete is the most widely used construction material in civil engineering industry because of its high structural strength and stability.Basalt fiber reinforced polymer (BFRP) application is very effective ways to repair and strengthen structures that have become structurally weak over their life of the span. They are made from basalt rock, are very light and have tensile strength, over twice as high as steel. BFRP Repair systems provide an economically viable alternative to traditional repair systems and materials. BFRP bars have high tensile strength and low elastic modulus compared with steel bars. The bond strength between BFRP bars and concrete is similar to the bond strength of steel bars and concrete and shows good bond performance. The superior properties of polymer composite materials like high corrosion resistance, high strength, high stiffness, excellent fatigue performance and good resistance to chemical attack etc., has motivated the researchers and practicing engineers to use the polymer composites in the field of rehabilitation of structures. In this paper Combination of steel and basalt fibers was used as hybrid fibers. FRP composite materials have been successfully used in the construction and can be applied to strengthen the beams, columns and slabs of the buildings and bridges. FRP materials possess great promise for the future construction and in rehabilitation of existing structure. An experimental investigation is carried out on a concrete beam of standard size 700 ×150 ×150mm for M-20 grade concrete.Material was produced, tested and compared with conventional concrete in terms of workability and strength. These tests were carried out on standard slab for 28 days to determine the mechanical properties of concrete.

Keywords: basalt, fibres, BFRP, FRP, tensile strength, bond strength, rehabilitation, workability.

ME241

DESIGN AND FLOW ANALYSIS OF ENHANCED KAPLAN TURBINE

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ABSTRACT

This project presents the study of fluid flow analysis in enhanced Kaplan turbine. By changing the blade design, the turbine can consume the more energy even at low pressure of water flow. This turbine works on the principle of Archimedean screw that convert's the potential energy of water on an upstream level into kinetic energy. Water flows into the turbine and its weight presses down onto the blades of the turbine, which in turn forces the turbine to turn. Water flows freely off the end of the turbine into the river. Also this study is focused to find the variations of velocity components and the pressure by average circumferential area (ACA) from inlet to outlet of the blades and used as factors to analyzed the flow inside the blades, the results of this analysis shows a good prediction of the flow behavior inside the blades and this lead to acceptable blade design, which can be used in Kaplan turbine. Blade complex geometry and design have been developed by using the coordinate's point system on the blade in PRO-E /CREO software. Based on the flow rate and heads, blade profiles are analyzed using ANSYS software to check and compare the output results for optimization of the blades for improved results which show that by changing blade profile angle and its geometry can be optimized using the computational techniques with changes in CAD models.

Key words: Kaplan turbine, Energy, Blades, Creo, Ansys, CFD.

ME242

HEAT EXCHANGER USING PHASE CHANGE MATERIALS

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ABSTRACT

In this work, Phase change materials is applied and packed in a heat exchanger to find the overall heat transfer co-efficient of the following materials ‘Paraffin Wax’ and ‘Ethylene Glycol’ separately and compare the results to find out the suitable one for many applications like cold storage plant, refrigeration, house heating, automobiles and many more. Phase Changing Materials(PCM) is a substance with a high latent heat of fusion which, melting and solidifying at a certain temperature, is capable of storing and releasing large amount of energy. PCM’s help in maintaining the temperatures of hot and cold environments respectively. PCMs in particular, have been a main topic of research for the last 30 years. Phase change materials supply thermal regulation at a particular phase change temperatures by absorbing and emitting the heat of the medium for thermal energy storage(TES).

KEYWORD: Phase Change Material(PCM); Heat Exchanger; Thermal Energy Storage(TES).

ME243

Performance and Combustion Characteristics of DI diesel engine with partially stabilized zirconia coated piston using CSOME blend as fuel

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ABSTRACT

This work emphasizes on the performance and combustion characteristics of DI diesel engine with partially stabilized zirconia coated piston using CSOME blend as fuel. Various fuel blend percentage (5%, 10%) were used to carry out this analysis. The efficient and effective output is obtained at 5% and 10% blend of biodiesel with fuel in DI diesel engine with partially stabilized zirconia coated piston. The performance and combustion characteristics were analyzed using engine management system. The efficiency of the engine seems to decrease for the blend (5% and 10%) when compared to the neat diesel in partially stabilized zirconia coated piston.

Keywords:Piston Coating, Biofuel, Performance Characteristics, Combustion Characteristics

ME244

INVESTIGATION OF MECHANICAL PROPERTIES FOR COMPOSITE MATERIAL USING KENAF & JUTE FIBER AND EPOXY RESIN

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ABSTRACT

The composites manufactured using long unidirectional fibers has been shown to have better performance than short randomly distributed fibers. However, the length of natural fibers that suitable for the manufacturing of fiber composites is 5 feet and this length may not be enough for manufacturing long fiber reinforced plastic(FRP) plate. In this project work, hybrid Kenaf-Jute fiber composite is fabricated using hand layout method. A rectangular plate of specified dimensions is fabricated in order to conduct testing. Further, specimens are cut through in the plate by following ASTM standards. The specimens are then tested for tensile, flexural and impact strength. In addition, water absorption test is also carried out and compared with the existing fiber composit

ME245

EFFECT OF ANNEALING ON THE MICROSTRUCTURE AND CORROSION BEHAVIOR OF PLASMA SPRAYED ALUMINA COATED STAINLESS STEEL.

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ABSTRACT

This work deal with the investigation on the microstructure and the immersion behavior of plasma sprayed Al_2O_3 coating after subject it to annealing at varying temperature. The microstructure of the as-sprayed coating will be analyzed using scanning electron microscope (SEM), hardness testing will be carried out using Vickers hardness testing machine. Further, the corrosion behavior of the as-sprayed and the annealing coated will be subjected to immersion test in 3.5% NaCl solution and the result will be reported in detail.

Keywords:Al_2O_3, plasma spraying, annealing and scanning electron microscope (SEM).

ME246

FRACTURE MECHANICS FOR TOUGHNESS ASSESSMENT OF POLYMER COMPOSITE

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ABSTRACT

Composite materials are replacing the conventional materials, because of their superior properties such as they are being used in automobile industries, aeroplane wings, wind blades etc. Polymer nanocomposite is a kind of composite material having any one constituent in nano dimension. Nowadays polymer nano-composite attracts a lot of researches due to its multifunctional features like high specific strength, flame resistance, lightweight and biodegradability. In this work nano composites are prepared by using unsaturated polyester resin as matrix material, and jute fibre as a reinforcement and filler agent as nanoclay. The laminates are prepared by hand lay-up method with various weight % of jute fibre and optimum % of nanoclay. Then the plates are cut into required dimensions as per ASTM standard for fracture toughness assessment. Fracture toughness is calculated for all composite plates.

ME247

AN EXPERIMENTAL INVESTGATION AND MECHANICAL BEHAVIOUR OF TiAlN and AlCrN COATED EN8 STEEL BY PVD TECHNIQUE FOR AUTOMOTIVE BRAKE

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ABSTRACT

The wear of components while they are in service is a predominant factor controlling the life of automotive and machine components. Metal parts are often damaged because of wear-driven failures causing the loss of dimensions and functionality. In order to reduce wear, researchers follow two paths: (i) use new, wear resistant materials, or (ii) improve the wear resistance of materials by adding alloying elements or performing surface treatments like surface coating. Thin film hard TiAlN and AlCrN coatings are seen as a viable way to enhance the mechanical properties wear resistance of metallic materials, thus extending the lifespan of products. This research works investigate the wear resistance of TiAlN and AlCrN based coatings obtained using physical vapor deposition (PVD) technique. The results of thin film coatings deposition on the wear and mechanical performance and on the coefficient of friction are investigated. The advantages and disadvantages of coating methods are discussed. Finally, recent developments and new possibilities for coating manufacturers to produce films with enhanced wear performance are briefly discussed.

ME248

Effect of TiAlN coated roller burnishing on surface properties of EN 24 work piece material

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ABSTRACT

Burnishing is chip less cold working process which involves plastic deformation by hard pressed tool against the workpiece. The effect of various input parameters such as spindle speed and number of passes on the output parameters such as surface roughness and surface hardness while machining EN24 workpiece material is studied. The tool is coated with Titanium Aluminium Nitride (TiAlN) using PVD technique. The effect of TiAlN coating on the output parameters are then discussed. After burnishing the surface roughness was reduced upto 78 %(0.37μm) and surface hardness was increased upto 26 %(345 HV).The optimum speed for minimum surface roughness and maximum hardness is around 300 rpm for all conditions, beyond which surface roughness values have wide range of values.

Key Words: Burnishing, TiAlN coating, EN24workpiece material

ME249

REVIEW PAPER ON TUNGSTEN INERT GAS WELDING OF ALUMINIUM ALLOY

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ABSTRACT

The present study is to investigate the microstructure, hardness and tensile properties of aluminium AA7039 fabricated by Gas Tungsten Arc Welding(GTAW). The preferred welding process of aluminium alloy is frequently tungsten inert gas welding(TIG)due to its comparatively easier applicability and better economy In this project work two rectangular plates of AA7039 of specified dimensions is fabricated in order to conduct testing. Further, specimens are cut through in the plate by following ASTM standards. The specimens are then tested for tensile, hardness and microstructure.

ME250

ANALYTICAL ESTIMATION OF MECHANICAL PROPERTIES OF FIBER MATRIX COMPOSITE BY FINITE ELEMENT ANALYSIS

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ABSTRACT

A composite is a material system consisting of two or more phases (matrix and reinforcement) on a microscopic scale, whose mechanical properties are designed to be good to those of constituent materials acting independently. Fiber reinforcement composites (FRP) are slowly emerging from the realm of materials and are replacing conventional materials in a variety of applications. In this work both analytical approach (Rules of mixture and Halpin-tsai) and numerical approach (representative volume element) has been considered to calculate properties of composites material by using volume fraction of the fiber. Material properties namely tensile strength, young's modulus, shear modulus, Poisson's ratio are evaluated in longitudinal & transverse direction. It is found that, both methods predicted same values in longitudinal and Halpin-Tsai predicted lower values in transverse direction due to reinforcing factor. Finite element model with necessary boundary conditions is developed using ANSYS to predict the mechanical properties of the composite.

Key points:- rule of mixture, halpin-tsai, RVE model, epoxy resin, E-Glass fiber ,and its mechanical properties.

ME251

INFLUENCE OF SHOT PEENING ON THE MICROSTRUCTURE AND CORROSION BEHAVIOUR IN CERAMIC COATED 316 STAINLESS STEEL

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Abstract

This work deals with the effect of shot peening on the microstructure and corrosion behavior of plasma sprayed Alumina (Al_2O_3), Alumina-Titania (Al_2O_3-TiO_2), and Tungsten Carbide-Cobalt (WC-Co) coatings. The microstructure of the sprayed coatings were analyzed using scanning electron microscope (SEM). There has been a substantial improvement in the hardness of WC-Co coating and this is attributed to the presence of bi-modal microstructure. The microstructural analysis revealed that the shot peened Tungsten Carbide-Cobalt (WC-Co) coating offers better corrosion resistance when compared with that of the other two coatings and this is ascribed to the presence of low porosity.

Keywords: Plasma Spraying, Microstructure, Shot Peening, Immersion Test.

ME252

PERFORMANCE IMPROVEMENT AND ANALYSING THE INCONEL SURFACE COATING ON STAINLESS STEEL & ALLOY STEEL SUBSTRATE FOR GAS TURBINE BLADE MATERIAL

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ABSTRACT

Gas turbine is an important machinery for its applications in aeronautics and industrial process. Materials used in turbine blade could not survive more than hundred hours because the turbine operates at extremely high temperature. As many as, 42 percent of the failure in gas turbine engines are only due to the problems in the blades and failure in these turbine blades can have the adverse effect on the safety and performance of the gas turbine engine It is leads to the fatigue failure, hot corrosion and wear. It results in decreasing the efficiency of the turbine. So, it needs some super alloys or surface coating over it.In order to overcome these difficulties, analysis done on the nickel substrate coated with Inconel powder.

ME253

EXPERIMENTAL STUDY ON STRENGTH BEHAVIOUR OF CONCRETE USING FOUNDRY SAND AS FINE AGGREGATE

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ABSTRACT

The main idea is to study the quality target of the piloted foundry specimens to fulfil the product requirements for re-using the cleaned sand as substitute ground construction materials or other geo-engineering applications and to keep contaminated foundry waste sands away from landfills. It is most essential to develop profitable building materials from foundry sand. In the project work, the fine aggregate will be replaced by foundry sand accordingly in the range of 0%, 10%, 20%,30%, 40%,50% & 60% by weight for M-25 grade concrete. Two types of foundry sand such as green sand and chemically bonded sand are used .Concrete mixtures should be tested and compared in terms of work ability and 7, 14 and 28 days strength with the conventional concrete. The tests are carried out to evaluate the mechanical propertiesfor7, 14 and 28days.This research work is concerned with experimental investigation on strength of concrete by replacing fine aggregate via. 0%, 10%, 20%,30%, 40%,50% & 60% of used foundry

and .Keeping all these views, the aim of investigation is the behaviour of concrete while adding of waste with different proportions of foundries and in concrete by using tests like compression strength, split tensile strength and flexural strength. Analytical investigation is carried out for each proportion of foundry sand and it will be studied using ANSYS 13.0.

ME254

FLEXURAL BEHAVIOR OF REINFORCED CONCRETE BEAM WITH HOLLOW CORE IN SHEAR SECTION

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ABSTRACT

Concrete materials are still a dominant material for construction due to its advantages such as workability, low cost and fire resistance as well as its low maintenance cost. It is formed from a hardened mixture of cement, fine aggregate, coarse aggregate, water and some admixture. Nowadays research efforts are continuously looking for new, better and efficient construction material and method. We have responsibility to reduce the effect of the application of concrete materials to environmental impact. The concrete should be used as efficiently as much as possible.This research focuses on structural material optimization by introducing hollow core using PVC pipe in RC beams. By material optimization, we can reduce the dead

loads which contribute to seismic effect in high rise structures. The Beam is casted with steel reinforcement and another beam is casted with steel reinforcement and hollow pvc pipe along with closure cap/plug. So, that the use of hollow pvc pipe the volume of concrete and weight of concrete is reduced .An experimental investigation is carried out on a beam. The Material was produced, tested and compared with conventional concrete in terms of workability and strength. These tests were carried out on beam of 1500*150*200 mm for 28 days to determine the mechanical properties of concrete.AnAnalytical investigation is carried out using ANSYS.

ME255

Synthesis of Motion Generation with Six-link Mechanism and Non-circular Gears

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ABSTRACT:

A general procedure to synthesize non-circular gear pitch profiles for any given function of position and orientation within a determined range is presented. The link parameters of the six-link mechanism are assumed and the motion of the coupler is identified. The mechanism is synthesized with the help of inverse kinematics to find the unknown angles with mathematical expressions derived to present the non-circular profile.

Keywords – Pitch profile, Determined range, and Inverse kinematics.

ME256

DESIGN AND ANALYSIS OF DIESEL ENGINE POPPET VALVES

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ABSTRACT

In the diesel engines, the poppet valves play a major role in sealing the working space inside the cylinder against the manifolds. Since engine and engine components are the heart of the vehicle, the present study focuses on the poppet valves. These valves are subjected to high temperature and pressure during the operating conditions. To withstand this condition, the

material should possess some important properties like hot strength, hardness, fatigue resistance, creep resistance, corrosion resistance, thermal conductivity and least coefficient of thermal expansion. So, the suitable material has to be selected based on the availability, durability, reliability, life of the material etc.. The design of these valves are complex and delicate. The commonly used low power engine has standard material selection procedure and design calculations. The requirement of the future is a higher power engine with the better performance. The design of poppet valves for these engines are more complex, as it has to withstand high operating temperature and load. Considering the failures of the valves, the geometrical parameters has to be thoroughly studied and design concepts have to be considered for the best output. The aim and objective of the project are to design and analyze the intake and exhaust valves for 1500 hp diesel engine. In the first phase, the design of the poppet valve is carried out and in the second phase, analysis to be carried out in Ansys 15.0.

ME257

REVIEW PAPER ON GAS METAL ARC WELDING OF AA 7039

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ABSTRACT

The present study is to investigate the microstructure, hardness and tensile properties of aluminium AA7039 fabricated by Gas metal Arc Welding(GMAW). The preferred welding process of aluminium alloy is frequently meal inert gas welding(MIG)due to its comparatively easier applicability and better economy In this project work two rectangular plates of AA7039 of specified dimensions is fabricated in order to conduct testing. Further, specimens are cut through in the plate by following ASTM standards. The specimens are then tested for tensile, hardness and microstructure.

ME258

POWER GENERATION USING WAVE ENERGY ALONG LIQUID TRANSMITTER HOSE

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ABSTRACT

There is a new source of Renewable Energy, Where neither lack of sun light does not matter norabsence of wind, but instead, an endless supply of Green Energy. As cities expand and population is rapidly increasing there is growing energy demand, we are constantly searching for Alternative energy sources. The Ocean holds 50 billion killo watts worth of energy it is very stable and reduces zero pollution. There is a wild range of sea wave energy solutions.Solitary Waves velocity increases as it approaches towards the shore. Wave energy is basically a concentrated form of solar energy. Difference in heating of the Earth's surface causes wind to blow. As wind passes over sea surface, it transfer some of its energy to the water in the form of wave,slain trapped ocean water is being pushed towards the penstock and the pressurized water is forced on the turbine blades and generate electricity using clipping concept.

Key Words : Renewable energy, Green Energy, Alternative source, shore, Clipping.

ME259

INVESTIGATION OF CRYOGENIC TREATED TOOL DURING DRILLING OF AUSTENITIC STAINLESS STEEL

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ABSTRACT

Stainless steels are considered to be difficult to machine due to specific properties such as high toughness, work-hardening, and low heat conductivity. Built-up edge andirregular wear situations are often faced in the machining of stainless steel parts. In addition, various problems such as low surface roughness and breakage of drill tool occurred in the drilling of these materials. In this study, Cryogenically treated TungstenCarbide (WC) tools are used for drilling on AISI 304. The objective is to study about the best influencing input parameters such as feed rate, cutting speed for surface roughness , burr height and ovality by using a Cryogenically treated tungsten carbide drill tool. Different tests are going to be carried out and the best output parameters are determined using Taguchi orthogonal array.

ME260

Investigation on

PVD -BilayerCoated High Speed Steel Tool

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ABSTRACT

Tool life is one of the important economic considerations in metal cutting. A lesser tool life is uneconomical. Tool life can be improved in many ways like changing the tool material, applying proper coolant, optimizing feed, speed, depth of cut and surface coating technique etc. Here we are using PVD coating technique to enhance the tool life.In this present investigation HSS tool material has been taken as cutting tool material. In this case here we applied the bi-layer coating of different coating material over the two HSS tools. One is Titanium Aluminum Nitride with Aluminum Chromium Nitride(TiAlN+AlCrN) and the other is Aluminum Chromium Nitride with Titanium Nitride(AlCrN+TiN) by physical vapor deposition method. Comparison of these two coated tools with the uncoated HSS tool were carried out in performance aspects.

Keywords: PVD, HSS, TiAlN,AlCrN, TiN

ME261

Assessment of factor influencing surface roughness on machining of Mg/Cu Nano B4C hybrid composites

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ABSTRACT

The utilization of Al/SiC particulate composite materials in many different engineering fields has undergone a tremendous increase. Accordingly, the need for accurate machining of composites has increased enormously. In the present study, an attempt has been made to assess the factors influencing surface roughness on the machining of Al/SiC particulate composites. Experimental design concept has been used for experimentation. The machining experiments were conducted on lathe using tungsten carbide tool inserts (K10) with two levels of factors. The factors considered were: % volume fraction of SiC, cutting speed, depth of cut and feed rate. A procedure has been developed to assess and optimize the chosen factors to attain minimum surface roughness by incorporating: (i) response table and response graph, (ii) normal probability plot (iii) interaction graphs and (iv) analysis of variance (ANOVA) technique.

ME262

Design and Fabrication of Solar Umbrella

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ABSTRACT

An outdoor umbrella includes a foldable umbrella awning, an umbrella frame, a Solar Mobile Charger and lighting system mounted on the umbrella frame.A solar power supply arrangement which converts solar energy into electrical energy and provides the converted electrical energy to the lighting system for lighting up the lighting system. The solar power supply arrangement includes a solar collecting device supported by the main supporting stem, wherein the solar collecting device has a collecting surface arranged to expose to sunlight for extensively collecting solar energy.

ME263

A Review Paper on Solar Tower

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ABSTRACT

Green technology is related to technological advances made in the field of power generation from non conventional energy source that are considered to be environmentally friendly and non polluting. Every form of energy collection will result in some pollution Electricity is merely a secondary energy derived from these sources. At present the energy consumed all over world relies mainly on five main energy sources like coal,petroleum,naturalgas,water and nuclear energy.The consumption of petroleum constitutes approximately 60% of energy used from all sources. Statistics show that daily consumption of petroleum is 40 million barrels.In accordance fuels are burnt poisonous materials such as carbon monoxide,hydrocarbons,carbon and 50nitrogen oxideare emitted into atmosphere every year causing Green House Effect.

ME264

Mechanical Properties of Aluminium Alloy 6061and Nano SiC composites by Powder Metallurgy

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ABSTRACT

Metal Matrix nanocomposites based on aluminum alloy 6061 reinforced with different hybrid ratios of SiC (0.5, 1.0 and 1.5 vol. %) were successfully fabricated using Powder metallurgy process.The fabricated cast specimens were characterized using SEM , hardness test, tension test and impact test. Compared to the un-reinforced alloy, the room temperature hardness and tensile strength of the hybrid composites increased quite significantly while the ductility and

impact strength reduced marginally. The combination of 1.0 volume percentage SiC. The major reason for an increase in the room-temperature mechanical properties of the hybrid composites should be attributed to the larger hybrid ratio of SiC and the coefficient of thermal expansion mismatch between matrix and hybrid reinforcements and the dispersive strengthening effects.

ME265

Amelioration in Mechanical Properties of Engineering Materials and its Applications

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ABSTRACT

Mechanical properties of a material greatly decide its use in the field of engineering and manufacturing. Every material has its own mechanical characteristics which can be enhanced or undermined according to its application. In this study the possible ways by which mechanical properties of a material can be enhanced and its applications are discussed. Surface coating, equal channel angular press (ECAP) and cryogenic rolling are some of the

methods by which the mechanical properties of a material can be altered to a greater extent. These techniques used are simple and show a good result. Surface coatings offer the potential to improve the efficiency of internal combustion engines, aero engines as well as stationary gas turbines. Electron Beam Physical Vapour Deposition (EBPVD) and Atmospheric Plasma Spraying (APS) are the techniques utilized for the surface coating of materials. ECAP and Cryogenic Rolling are the technique used to enhance the mechanical properties of the existing material under the application of load and heat. These techniques allow the refinement of crystal structure leading to the formation of material with more mechanical capacity. The result of applying all these techniques to the materials shows that the tensile strength, toughness, hardness and other mechanical aspects are increased by 10 to 15% when compared with that of the asreceived sample. The materials obtained from these enhancing techniques have a wide range of industrial and engineering applications.

Keywords— Mechanical properties, Surface coatings, Physical Vapour Deposition (PVD), Atmospheric Plasma Spraying (APS), Cryogenic Rolling

ME266

ENERGY CONSERVATION OF AN UNDERFLOOR AIR DISTRIBUTION SYSTEM IN A HIGH CEILING SPACE

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ABSTRACT

The air distribution in HVAC has grown in popularity in buildings and the method chosen to deliver the conditioned air is strongly associated with increasing concerns about indoor environmental quality and its effect on occupants' well-being. In the underfloor air distribution system, air is directly supplied to the base of the occupied zone, which causes temperature stratification from the lower to the upper layer of the zone. This flow pattern gives UFAD the advantage of using less energy while providing better thermal comfort than overhead air distribution system. This study to analyze the effectiveness of UFAD in a large space with a higher ceiling for various velocities of supply air and locations of diffusers at an identical air supply temperature. This analyzed to provide the satisfactory comfort conditions for the occupants. Computational fluid dynamics (CFD) software is used to simulate the thermal environment and air flow distribution, along with the control variables for a huge space equipped with a UFAD system. Results show that the UFAD is capable of creating smaller vertical and horizontal variations of air velocity and temperature and more comfortable environment in the supply air velocity 0.5 m/s than other inlet conditions.