MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

MAIT

उद्यमेन हि सिध्यन्ति
कार्याणि न मनोरथैः

ज्ञानसंग्रह

Driving Innovation Through Research

2023-2024

Volume 3

Student Member

Sharmishta Menon (ME)

Editor

Dr. Vipin Kumar Sharma

Department of Mechanical Engineering

Maharaja Agrasen Institute of Technology

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Department of Mechanical Engineering

Vision

To be a global leader in Mechanical Engineering education, research & innovation with ethics and values.

Mission

M1: To deliver industry relevant and skill oriented education in Mechanical Engineering, encompassing production, design, thermal, and emerging areas to address diverse global challenges.
M2: To foster ethical values with professional skills for the benefit of industry and society.
M3:To enhance the teaching-learning process through modern pedagogical tools.
M4:To promote research, innovation and entrepreneurship using sustainable technologies and continuous learning.
M5:To strengthen engagement with alumni, industry and other stakeholders for collaborative growth and capacity building.

Program Educational Objectives (PEOs)

The objectives of the Department of Mechanical Engineering are to produce graduates who will have:
PEO1: Employability, entrepreneurship, leadership skills, and the ability to pursue higher education for the enhancement of knowledge.
PEO2: Ability to lead through research and innovation in the field of Mechanical Engineering.
PEO3: Engineering competence with good communication skills, professionalism, moral values as well as foundation for lifelong learning.
PEO4: Technical capabilities pertinent to Mechanical and allied engineering and to provide innovative and sustainable solutions for industrial and societal problems.

Message from the Head of the Department

It is a matter of great pride and satisfaction to witness the release of the third volume of Gyansangreh, an initiative that continues to uphold the values of academic excellence, creativity, and knowledge-sharing within our department.

I would like to extend my sincere appreciation to Dr. Vipin Kumar Sharma, the editor of this publication, for his dedicated efforts in curating and compiling a rich collection of articles that reflect the diverse intellectual pursuits of our faculty.

Gyansangreh has established itself as a valuable platform that encourages critical thinking, research, and expression. It not only highlights the research talents of our faculty but also fosters a culture of learning and innovation.

I congratulate the entire editorial team and all the contributors for their hard work and dedication. I am confident that this volume will inspire readers and continue to serve as a source of knowledge and motivation for all.

With best wishes for the continued success of Gyansangreh.

Warm regards,
Dr. Vaibhav Jain
Head, Department of Mechanical Engineering
Maharaja Agrsen Institute of Technology

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Comparative performance investigation of a dual evaporator cycle using an ejector with the conventional cycle using a pressure reducing valve

Vaibhav Jain

International Journal of Air-Conditioning and Refrigeration

Abstract

The performance of a dual evaporator cycle using ejector is compared with a conventional cycle employing pressure reducing valve. In both the systems, high temperature evaporator is considered as a flooded evaporator, thus a separator is employed after the high temperature evaporator. However, low temperature evaporator is a kind of conventional dry evaporator. The comparison of both systems, i.e., conventional and ejector assisted, is done for the same cooling capacities and same dryness fraction at the exit of high temperature evaporator with R134a, R152a, and R1234yf refrigerants. The effects of varying the states of refrigerant at the exit of flooded evaporator, and temperatures of both the evaporators and the condenser are analyzed using Engineering Equation Solver. It is found that the compressor work is reduced in both the cycles with the rise in low temperature evaporator temperature; however, a little variation is observed in the total cooling effect. The cooling effect in high temperature evaporator is increased with the increase in dryness fraction at the exit of the high temperature flooded evaporator, but it is decreased in low temperature evaporator.

Advance exergy and coefficient of structural bond analysis of dedicated mechanical subcooled vapor compression refrigeration system

Naveen Solanki

International Journal of Refrigeration

Abstract

The dedicated mechanical subcooled (DMS) refrigeration system is examined in the current study, based on the configuration of energy and exergy. The performance of a simple vapor compression refrigeration system (VCRS) and dedicated mechanical subcooled system are evaluated while maintaining the same cooling capacity (i.e. 100 kW). The results of comparative study showed an improvement of 8.2% in the coefficient of performance (COP) of the DMS system. Additionally, it has been discovered that the exergetic efficacy of the VCRS and DMS systems is 32.8% and 35.2%, respectively. The above results proved that, the suggested system perform better with more efficient cooling technology, which proves it to be a better option for design engineers in water chilling application in the foreseeable future.

The coefficient of structural bond (CSB) and advanced exergy analysis (AEA) methodologies along with environmental benefits of the DMS system are also looked into in light. The value of CSB for conderser-1 is observed to be highest (2.08), with total irreversibility rate of 22.7%. However, in case of compressor-1 the highest irreversibility rate of 34.8% is observed but its CSB value is only 1.09. Therefore, by enhancing the performance of system components, it is possible to avoid 42.9% of the overall irreversibility rate of the dedicated mechanical subcooled system using enhanced exergy analysis.

Performance enhancement and environmental analysis of vapor compression refrigeration system with dedicated mechanical subcooling

Vaibhav Jain

International Journal of Air-Conditioning and Refrigeration

Abstract

The primary focus of this study is on the energy, exergy, and environmental (3E) analysis of a dedicated mechanical subcooled vapor compression refrigeration (DMS-VCR) system for applications involving commercially available water chillers that employ R134a (in both subcooler and main cycle). For a cooling capacity of 100-kW water chillers, the mathematical model of the DMS-VCR system is built to determine the performance parameter of the system. The DMS-VCR system reduces electricity usage by 15.52% and increase in COP by 9.5%, which results in a significant reduction in CO 2 emissions of about 15.55%. When compared to equivalent vapor compression refrigeration system (VCRS), the system's exergetic efficiency is also increased by 8%. Since the computer simulation results will undoubtedly give design engineers a better option, the subcooling and superheating of the vapor compression refrigeration system become alluring in this study. Consequently, the DMS-VCR system performs better as per the combined 3E study.

Simultaneous optimization of process parameters during abrasive water jet machining on glass fibre reinforced polyer

Anil Kumar Dahiya

International Journal on Interactive Design and Manufacturing

Abstract

For hard-to-cut materials and composites abrasive water jet machine (AWJM) has been identified as a lucrative and competent material removal technique, in which a high-speed jet of abrasive and water strikes the workpiece surface to erode the desired material. In this paper, the influence of key input parameters (water pressure, standoff distance, traverse rate and abrasive mass flow rate) on responses such as surface roughness (Ra), kerf taper (Kt), and maximum delamination length (Max. DLL) of machined specimen during AWJM of glass fibre reinforced polymer (GFRP) composite is examined through experimental investigations. Response surface methodology (RSM) based central composite design (CCD) approach and Taguchi design based L16 orthogonal array is used for experimentation. Moreover, a hybrid approach of RSM-Desirability and Taguchi Methodology-Grey Relational Analysis (TM-GRA) are used for Multi-response optimization (MRO) and their results are compared for evaluation of process parameters of AWJM on GFRP. Confirmation tests are carried out to validate the experimental results, and they showed that using the RSM-Desirability approach, at the optimum level of parameters, the percentage errors for Ra, Kt, and Max. DLL have been less than 6.312%, 7.229%, and 6.78%, respectively. As per the results Ra, Kt and Max. DLL improves by 12.6%, 14.4% and 73.6% respectively by using RSM-Desirability approach as compared to TM-GRA. The microscopic features of optimally machined surfaces are investigated using the scanning electron microscope (SEM).

A comprehensive parametric and structural bond analysis of an actual vapor compression refrigeration system with dedicated mechanical subcooled system

Naveen Solanki

Journal of Mechanical Science and Technology

Abstract

This study compares the performance of dedicated mechanical subcooled vapor compression refrigeration (DMS-VCR) system and actual vapor compression refrigeration (VCR) system of same capacity (100 kW), and evaluates them on the basis of energy, exergy, and coefficient of structural bond (CSB) configuration. Results indicate that DMS-VCR system outperforms VCR system at constant condenser temperature (Tcond = 40° C) with varying evaporator temperatures (Tevap = 0 °C, 5 °C and 10 °C).The most significant results occurs at 0 °C, resulting in a coefficient of performance (COP) 4.60 % higher than actual VCR system's COP and exergetic efficiency 4.38 % higher than actual VCR system's exergetic efficiency, making it a more favourable choice for water chilling applications. Additionally, the study investigates the potential of the CSB method in improving system efficiency by reducing irreversibility rate in a specific component. It finds that improving the efficiency of a component can significantly decrease the total irreversibility rate of the system. The CSB value of condenser-1 and evaporator are observerd to be highest (i.e. 1.96 and 2.27) and hence the performance of DMS-VCR system can be greatly improved by changing the efficiency parameter of evaporator and condenser-1 of the DMS-VCR system.

A comprehensive energy, exergy, environmental, and economic analysis of dedicated mechanical subcooled vapor compression refrigeration system

Naveen Solanki

Journal of Thermal Analysis and Calorimetry

Abstract

In the modern world, the vapor compression refrigeration (VCR) system is essential in various global applications, including climate control, refrigeration, and food preservation, contributing significantly to energy consumption. The significant energy demands associated with these applications highlight the urgency for sustainable and energy-efficient alternatives that can help diminish our dependence on electrical power. To reduce energy consumption and enhance energy efficiency, a dedicated mechanical subcooled (DMS) system can be integrated with a vapor compression system (VCR) system. This study aims to evaluate and optimize the dedicated mechanical subcooled-vapor compressor refrigeration system (DMS-VCR) system using refrigerant R134a for a 100 kW commercial chiller used for water cooling application. The primary objective is to assess the system from multiple angles which include energy, exergy, environmental, economic analysis (4E's) and optimizing it to enhance its overall effectiveness to reduce the system's annual cost. It is thermo-economically optimized, allowing for independent optimization of the evaporator, condenser-1, condenser-2, and sub-cooler components. The proposed system reduces electrical energy consumption by 17.24% and CO2 emissions by 12.4%. The DMS-VCR system outperforms the standalone VCR system. The DMS-VCR system's annual operating costs are 6.71% lower than an equivalent VCR system, and optimization further reduces costs by 1.88% (case-I: irate = 10%, Ny = 5 years, and toper = 4000 h) and 16.36% (case-II: i rate=2%, Ny=10 years, and toper=5000 h).The study underscores the importance of subcooling within the DMS-VCR system, highlighting its desirability as it varies with the recovery factor and annual operation period. As a result of the DMS-VCR system's better efficiency, design engineers are likely to find it more attractive.

Performance analysis of a novel ejector-assisted condenser outlet split dual-evaporator refrigeration system

Vaibhav Jain

International Journal of Air-Conditioning and Refrigeration

Abstract

The performance of an ejector-assisted condenser outlet split dual-evaporator cycle is compared with a conventional dual-evaporator cycle albeit consisting a pressure reducing valve. The cycles do not employ any separator due to its inability to efficiently separate the liquid and the vapor phases. The comparison of both the cycles has been made for the same cooling capacity in low-temperature evaporator and unit flow rate of R134a and R1234yf as refrigerants. The impacts of changing the operating temperatures of evaporator and condenser have been examined in the current investigation. The study reveals that with the increase in temperature of the high-temperature evaporator, the cooling capacity of the high-temperature evaporator yields, while that of the low-temperature evaporator plummets in both the cycles. Further, the compressor work is allayed in the ejector-assisted cycle; thus, the COP is enhanced considerably. The percentage COP improvement over the basic cycle is obtained from 14.7 to 17.53% for the refrigerant R1234yf and from 14.45 to 17.32% for R134a; however, the COP of both the cycles with R12134yf is slightly lower than with R134a. The ejector has been modeled assuming a constant pressure theory. The observed trend indicates that the entrainment ratio is improved with the rise in the temperature of low-temperature evaporator, whereas it is decreased with the rise in the temperature of high-temperature evaporator.

Experimental analysis of an ejector assisted dual-evaporator vapor compression system

Vaibhav Jain

Energy Conversion and Management

Abstract

Condenser split dual-evaporator vapor compression systems (C-DEVCS) have been used to maintain the two evaporators of a single refrigeration system at different temperatures for long. The throttling process occurring in the expansion valve of these systems is irreversible in nature and thus responsible for a part of energy loss. It has been found that the isenthalpic expansion loss can be reduced using ejector as a throttling device which provides isentropic expansion. Moreover, it recovers some of the energy lost in expansion and reduces compressor work. In the current work, an experimental test facility of ejector assisted dual-evaporator vapor compression system (EA-DEVCS) is developed for R-134a working fluid and analyzed for different condenser temperature. The overall COP of EA-DEVCS is found to increase from 1.982 to 2.925 and 9.8 % decrease in compressor power consumption when the water temperature at the inlet of condenser is decreased from 35 ◦ C to 27 ◦ C. The entrainment ratio of the ejector gets increased from 0.396 to 0.701 with the decrease in condenser temperature.

Optimisation of FSP parameters in cast magnesium alloy using hybrid GRA methodology

Sumit Joshi

Int. J. Materials and Product Technology

Abstract

The current investigation utilised the grey relational analysis (GRA)-Taguchi-principal component analysis (PCA) methodology to discover the optimal friction stir processing (FSP) parameters for the treatment of cast Mg-2%Al-1%Si alloy derived from AS series magnesium alloys. The input parameters of the rotation rate, traverse speed, and shoulder size were chosen based on the L9 Taguchi design, and the maximum tensile strength, Ductility or % extension, and microhardness were the multiple responses. By using an optimisation strategy, these responses were combined into a single response called grey relational grade (GRG). The optimised combination of process parameters was determined as 800 rpm rotation rate, 50 mm/min traverse speed and 20 mm shoulder size, which produced the largest GRG value. The ANOVA analysis revealed that the rotation rate parameter exerted a significant influence on the process. Furthermore, the predicted results were verified through a confirmation experiment and were found to be consistent with the experimental outcomes

Experimental analysis of an ejector assisted dual-evaporator vapor compression system

Vaibhav Jain

Energy Conversion and Management

Abstract

Condenser split dual-evaporator vapor compression systems (C-DEVCS) have been used to maintain the two evaporators of a single refrigeration system at different temperatures for long. The throttling process occurring in the expansion valve of these systems is irreversible in nature and thus responsible for a part of energy loss. It has been found that the isenthalpic expansion loss can be reduced using ejector as a throttling device which provides isentropic expansion. Moreover, it recovers some of the energy lost in expansion and reduces compressor work. In the current work, an experimental test facility of ejector assisted dual-evaporator vapor compression system (EA-DEVCS) is developed for R-134a working fluid and analyzed for different condenser temperature. The overall COP of EA-DEVCS is found to increase from 1.982 to 2.925 and 9.8 % decrease in compressor power consumption when the water temperature at the inlet of condenser is decreased from 35 ◦ C to 27 ◦ C. The entrainment ratio of the ejector gets increased from 0.396 to 0.701 with the decrease in condenser temperature.

Recent Biomass-Based Aviation Fuels: A Study

Sidharth

Journal of Biofuels

Abstract

The escalating environmental concerns associated with traditional aviation fuels have intensified the search for sustainable alternatives within the aviation sector. Biomass-based aviation fuels, derived from organic sources, have emerged as a promising solution to address both the environmental impact and the finite nature of conventional fuels. This research paper aims to provide an in-depth exploration of the potential of biomass as aviation fuel, delving into the current state of research, technological advancements, and the challenges that must be navigated for the widespread adoption of these fuels.

Parametric optimisation and experimental modelling of AWJ machining of GFRP composite

Anil Kumar Dahiya

Int. J. Materials Engineering Innovation

Abstract

Abrasive water jet machining (AWJM) is extensively employed for machining composites such as glass fibre-reinforced polymers (GFRP). AWJM is proven to be efficient and economical for material processing in manufacturing industries, in which a high-speed abrasive water jet is impinged on workpiece surface to erode material to get the desired shape. In this paper, experiments are performed to study the kerf taper (Kt) in AWJ machined GFRP composite according to response surface methodology (RSM) based on the central composite design (CCD) approach. Water pressure (WP), traverse rate (TR), stand-off distance (SOD) and abrasive mass flow rate (AMFR) are considered to study their influence on kerf taper. Optimisation of parameters is executed by applying the desirability technique to minimise the kerf taper. In order to validate the results, confirmation tests have been carried out and which show less than 4.535% of error. Thereafter, an experimental model (second-order mathematical) is made for kerf taper by using RSM. From the analysis, it has been found that the predicted values are very close to the experimental results with a deviation of less than 4%.

Recent Biomass-Based Aviation Fuels: A Study

Deshdeep Gambhir

Journal of Biofuels

Abstract

The escalating environmental concerns associated with traditional aviation fuels have intensified the search for sustainable alternatives within the aviation sector. Biomass-based aviation fuels, derived from organic sources, have emerged as a promising solution to address both the environmental impact and the finite nature of conventional fuels. This research paper aims to provide an in-depth exploration of the potential of biomass as aviation fuel, delving into the current state of research, technological advancements, and the challenges that must be navigated for the widespread adoption of these fuels.

Ultrasonic non-destructive evaluation of composites: A review

Ramakant Rana

Materials Today: Proceedings

Abstract
Ultrasonics is an NDT (Non-Destructive Testing) technique used to detect faults in structural components by applying a set of techniques and classifying them accordingly. This paper aims to bring together the most relevant published work on different types of techniques for Non-Destructive Evaluation (NDE) of various defects using Ultrasonic. The Ultrasonic testing techniques are relatively simple, highly sensitive and less time-consuming hence have been approved for use on various domains like composite testing, aerospace, automotive and transport. The fundamentals, their applications and constraints of various techniques are covered, along with motions to assess the performance of the techniques. Ultrasonic testing became popular, and with the progress made, new methods were discovered and corrected which resulted in defect detection and improving various material properties

Advanced exergy, economic, and environmental evaluation of an Organic Rankine Cycle driven dual evaporators vapour-compression refrigeration system using organic fluids

Ramakant Rana

International Journal of Refrigeration

Abstract

The current research combines a dual evaporator vapour-compression refrigeration system with an organic Rankine cycle. The integrated system is a renewable energy-based technology that can provide refrigeration at different refrigeration temperatures and capacities. The system's performance is compared using five different organic working fluids: butane, pentane, isopentane, hexane, and R245fa, to recommend the most suitable fluid for the system. Coefficient of performance (COP), exergy efficiency (ηex), total cost (Ctot), and payback period (PB) are taken as the performance parameters. Moreover, the system's exergy performance is analysed using advanced exergy analysis (AEA), and sensitivity analysis to determine the optimal operating condition for system components. The result indicates that butane is the optimal fluid for improving energy, exergy, economical, and environmental performance. The system has a COP of 0.377, an exergy efficiency of 10.91%, a total cost of $33,091, and a payback period of 5.8 years. Boiler, compressor, condenser, and EPG make up 31% of the total exergy destruction that can be avoided by adequately selecting their operating condition. The optimal condition for boiler temperature, condenser temperature, the pinch-point temperature difference in condenser and boiler, and compressor efficiency is 120 ◦ C, 40 ◦ C, 3 ◦ C, 10 ◦ C, and 0.7, respectively.

Development and characterization of AA6063 matrix composite reinforced with B4C, graphite and groundnut shell powder

Ramakant Rana

Materials Today: Proceedings

Abstract
In due course of time, the role of natural reinforcement for Aluminium matrix composites (AMCs) composite manufacture has gained the interest of many researchers. It is cost-effective and at the same time environmentally friendly as it helps in the use of certain disposable or pollution creating substances. The manufacturing of various automotive parts, biomedical, and aerospace parts can be done by using these naturally occurring fibers or particulates. An effort has been made to study the effect of such industrial waste on the Aluminium metal matrix composite and evaluate it in terms of characterization. A comparison has also been made with solid lubricant reinforcement and compares wear for both types of composite. The focus of this study is on the characterization of the AA 6063 reinforced hybrid composite with desired material produced using stir casting. The AA 6063 is fabricated with the composition of B4C + Graphite (Gr.) and B4C + Groundnut Shell Powder (GSA) composition. The hybrid composite constituting hybrid composite of two types has been formed i.e. Al6063 + 6 %B4C + 4 % Gr and Al6063 + 6 % B4C + 3 % GSA. FeSEM images revealed the homogenous composition of the reinforcement particles. A tribological study revealed the average wear rate of 67.14 lm for Al6063 + 6 %B4C + 3 % GSA and 60.02 lm Al6063 + 6 %B4C + 4 % Gr. Microscopic images of the worn samples of composite reveal that both show good wear resistance, more for Gr. reinforced composite followed by SBA, the reason being the selflubricating property of the Gr. reinforced hybrid composite. Thus as a result it can be cost-effective to find certain automotive applications where strength to weight ratio is

Design and Application of Cutting Brake for ATV with Open Differential

Rakesh Chander Saini

International Research Journal of Engineering and Technology

Abstract
Braking is an essential aspect of vehicle safety and control, serving as the primary mechanism for slowing down or stopping a vehicle. It plays a crucial role in preventing accidents by allowing drivers to respond to obstacles, traffic, and emergencies effectively. Beyond safety, brakes contribute to overall vehicle handling and stability, distributing weight properly among the wheels and ensuring balanced braking. Efficient braking systems minimize stopping distance, reduce wear on other vehicle components, and enable drivers to maintain control during downhill descents. In modern vehicles, cutting brakes are used . to increase maneuvering characteristics of an ATV

Paper Presentation at Conferences 2023-2024

S.no.	Paper Title	Faculty / Author	Conference details
1	Dual Reduction Gearbox Of All Terrain Vehicle With Transfer Case And Switching Mechanism To Convert 4wd To 2wd And Vice-Versa	Rakesh Chander Saini	RIST 2024
2	Manufacturing,Testing And Tuning Of Continuous Variable Transmissions For An Atv	Rakesh Chander Saini	RIST 2024
3	Design and manufacturing of suspension and steering system of a F3 vehicle.	Rakesh Chander Saini	ICGTS-2024, MAIT, Delhi
4	Review of dynamic wireless charging of electric vehicle	Rakesh Chander Saini	ICGTS-2024, MAIT, Delhi
5	Lithium-ion battery and its second life.	Rakesh Chander Saini	ICGTS-2024, MAIT, Delhi
6	Design and manufacturing of quadcopter	Rakesh Chander Saini	ICGTS-2024, MAIT, Delhi
7	Comparision and selection of steering geometry for 4-wheel efficycle.	Rakesh Chander Saini	ICGTS-2024, MAIT, Delhi
8	Selection and CAE analysis of suspension system for 4-wheel efficycle.	Rakesh Chander Saini	ICGTS-2024, MAIT, Delhi
9	3D printed bionic arm using arduino and electromyography	Rakesh Chander Saini	ICGTS-2024, MAIT, Delhi
10	Design and optimization of chassis and drivetrain of formula student vehicle	Rakesh Chander Saini	ICGTS-2024, MAIT, Delhi
11	Exploring the Potential of 3D Printed Molds for Rapid and Affordable Prototyping of Carbon Fiber Composites	Sumit Joshi	ICGTS-2024, MAIT, Delhi
12	The expected contribution of AI adoption in supply chain management"	Piu Jain	RIST 2024, Kerela
13	Factors affecting the performance of Indian aviation industry	Piu Jain	RIST 2024, Kerela
14	Logistics Efficiency Enhancement Program	Piu Jain	RIST 2024, Kerela
15	Enablers of Sustainable Supply Chain Management:Literature Review	Piu Jain	ICGTS-2024, MAIT, Delhi

16	Energy and Exergy analysis of vapor compression refrigeration system with integrated mechanical subcooling using R134a, R450a, R513a & R515a	Vaibhav Jain	ICGTS-2024, MAIT, Delhi
17	Comparative Thermodynamic Analysis of Vapour Compression Refrigeration System with Dedicated Mechanical Subcooling	Vaibhav Jain	ICGTS-2024, MAIT, Delhi
18	Theoretical Evaluation of Vapor compression refrigeration cycle with integrated mechanical subcooling	Vaibhav Jain	ICGTS-2024, MAIT, Delhi
19	Experimental Performance Evaluation of Ice Slurry Refrigeration System using PG & EG Depressants	Vaibhav Jain	ICGTS-2024, MAIT, Delhi
20	Thermodynamic Analysis of Vapour Compression Refrigeration System with Dedicated Mechanical Sub-cooling	Vaibhav Jain	ICGTS-2024, MAIT, Delhi
21	Development of lOT based Air Conditioning Trainer assisted with Four Way Reverse	Vaibhav Jain	ICGTS-2024, MAIT, Delhi
22	Performance evaluation of vapour compression refrigeration system in heating and cooling mode assisted with IoT technology	Vaibhav Jain	ICGTS-2024, MAIT, Delhi
23	Thermodynamic Analysis of Vapour Compression Refrigeration System with Dedicated Mechanical Sub-cooling	Kanchan Mudgil	ICGTS-2024, MAIT, Delhi
24	Theoretical Evaluation of Vapor compression refrigeration cycle with integrated mechanical subcooling	Kanchan Mudgil	ICGTS-2024, MAIT, Delhi
25	Applications of fly Ash as a potential coating material on metal substrates	Vipin Kumar Sharma	ICGTS-2024, MAIT, Delhi
26	Higher Alcohols as an alternative fuel for a diesel engine	Sidharth	ICGTS-2024, MAIT, Delhi
27	Tribological Study of 3D Printed Materials	Vipin Kumar Sharma	ICGTS-2024, MAIT, Delhi
28	Fabrication of Micro Textures using Aluminium and Copper tool Electrode by EDM Fabrication of Micro Textures using Aluminium and Copper tool Electrode by	Vipin Kumar Sharma	ICGTS-2024, MAIT, Delhi
29	Fabrication of Micro Textures using Aluminium and Copper tool Electrode by EDM Fabrication of Micro Textures using Aluminium and Copper tool Electrode by	Sidharth	ICGTS-2024, MAIT, Delhi
30	Energy and Exergy analysis of vapor compression refrigeration system with integrated mechanical subcooling using R134a, R450a, R513a & R515a	Naveen Solanki	ICGTS-2024, MAIT, Delhi

31	Design Optimization of Hexacopter Frame using Generative Design and Additive Manufacturing	Surabhi Lata	IMECE
32	Study of design issues in MTO and MTS systems in Automobile sector	Surbhi Upadhyay	ICGTS-2024, MAIT, Delhi

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