



SCHOOL OF STUDIES OF ENGG. TECH. GURU GHASIDAS VISHWAVIDYALAYA

DEPARTMENT OF **MECHANICAL ENGINEERING** PRESENTS

THE MASTER STROKE



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FROM THE HOD'S DESK



Prof. TV Arjunan

HOD, DEPARTMENT OF
MECHANICAL ENGINEERING

Welcome to the department of mechanical Engineering, Guru Ghasidas Vishwavidyalaya. The department works with the objective of addressing critical challenges faced by the industry, society and academia. Perhaps even more important is our unceasing commitment to our students, helping them to learn, grow, develop, and achieve their goals in their pursuit to excel in their professional career

Mechanical Engineering is a professional Core engineering discipline that deals with the design, production and maintenance of any product of any industry. The pride of every student and staff would be in his/her department and college. Our department has a team of highly qualified and experienced faculty, good infrastructure and lab facilities. We are striving hard continuously to improve upon the quality of education and to maintain its position of leadership in engineering and technology. We always work with the motto "Nothing can be achieved without genuine effort." The core values of the department help the students to develop their overall personality and make them worthy to compete and work at global level. Our faculty are continuously attending various training programs, publishing research papers, books and filing patents. Many are pursuing research. Our department has been conducting seminar / conferences to keep the faculty and students abreast with the latest developments in the field of technical education. We are happy to share that many students are pursuing higher studies in leading universities in India and abroad. I am certain that our students will prove to be an invaluable asset to an organization.

This newsletter is one of the such effort which will let the students to know about different activities, so that they can heartily involve themselves in various programs of the department.

My warm wishes to the entire team for their excellent work.



MECHANICAL ENGINEERING IS THE
BACKBONE OF MODERN SOCIETY, AND
THOSE WHO CHOOSE TO PURSUE THIS
FIELD ARE THE UNSUNG HEROES WHO
KEEP THE GEARS OF PROGRESS TURN-
ING.

LATEST DEVELOPMENTS

01

Innovative Water-Cooled Motor Promises Increased Energy Efficiency

The Baldor-Reliance HydroCool XT motor offers a combination of flexible design, low maintenance and reliable performance in some of the toughest environments. This product line represents a new generation of water-cooled motors developed in response to market demands for improved technical features. HydroCool XT is available with induction or permanent magnet rotor technology. The motor can achieve the highest level (IE5) efficiency rating for energy savings. The motor's power-dense solution deli-

vers more power in a smaller footprint than similarly sized totally enclosed, fan-cooled motors. Water-jacket cooling offers higher thermal conductivity than air cooling, helping to extend the motor life while eliminating the need for fans or air filters. HydroCool XT provides versatility for extreme marine duty; pulp and paper; water and wastewater pumping; mining; and aggregate applications, among others. The motor is available in four frame sizes from 60-1,250 horsepower (45-932 kW).

SOURCE: MACHINEDESIGN NEWS

02

New welding method could cut the cost of wind farm fabrication.

An international project led by the Belgian Research Centre for Application of Steel (OCAS) will investigate a new single-sided welding method for offshore wind turbine foundations. The method, which could replace the preferred double-sided welding method used across the industry, could cut the cost of wind farm fabrication. The research project, which will run until 2025, will look at the viability of single-sided welds in tubular joints for offshore structures. The project aims to

increase productivity and reduce cost of offshore wind foundations further, on both monopile attachments and jacket foundations. The project is being funded by EDF Renewables, Parkwind, Scottish Power Renewables, Shell, SSE Renewables, TotalEnergies and Vattenfall.

SOURCE: INSTITUTE OF MECHANICAL ENGINEER (IMECH)



03

Electric vehicles (EVs) and hybrids were a rare bright spark in an otherwise difficult year for the UK car industry, new figures for 2022 have shown, representing almost a third of production.

UK car production fell by 9.8% in 2022, according to statistics from the Society of Motor Manufacturers and Traders (SMMT). The annual total of 775,014 cars produced in the UK was 84,561 fewer than 2021 and 40.5% less than the 1,303,135 cars made in 2019, before the Covid-19 pandemic. The main reasons for the decline were the global shortage of semiconductors, structural changes, and supply chain pauses in China. Despite these challenges, the UK still produced a record 234,066 battery electric, plug-in hybrid, and hybrid electric vehicles, which accounted for 30.2% of all car production. These figures reflect the tough year that UK car manufacturing had in 2022.

However, the potential for this sector to deliver economic growth by building more of these zero-emission models is self-evident. The UK's strength in specialist, luxury and performance carmakers was also underlined in the 2022 figures. Output rose 6.6% to 32,575 units, worth an estimated £3.7bn at factory gate prices, driven by a number of new launches and models in high demand from buyers around the world.

SOURCE: INSTITUTE OF MECHANICAL ENGINEER (IMECHE)

04

A new robot can maintain and repair wind turbine blades five-times faster than human workers, its developers have claimed

Latvian start-up Aeronex has unveiled a modular robot that can perform maintenance and repair work on wind turbine blades, with the aim of reducing downtime and costly repairs. The robot uses attachments to perform different tasks, such as refinishing blades' new coatings, and can perform maintenance and repair for early stages of leading-edge erosion. The wind turbine maintenance and repair market is valued

at \$36.27bn in 2022 and is expected to grow to \$63.82bn by 2029. Current methods are "slow and costly", according to Aeronex, which noted that manual rope access technicians face an injury rate of 0.64 per 1,000. The robot can reportedly work in wind speeds up to 15m/s, while technicians are able to work in up to 9m/s. Aeronex has also implemented turbine and erosion modelling using digital twin technology. The company's previous robot, which was not modular, has already been used by servicing teams around the world.

SOURCE: MACHINEDESIGN NEWS



RESEARCH ARTICLES

Low-cost blood test kit utilising paper and pencil

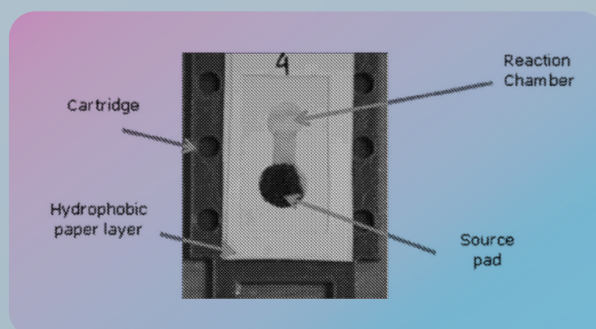


Paper in its many forms is one of the most common materials in all cultures—and a hallmark of civilization when inks applied to it create religious texts, laws, legends, edicts, and art. In modern times, paper-based technology is widely used in medical diagnoses, for hygiene, and as a means of testing the quality of drinking water. For example, current markets have validated an important potential property of paper: acting as the essential building block of a rapid diagnostic kit in the ultra-low-cost paradigm. Examples of this application include pregnancy test strips; alkalinity or acidity tests of beauty and baby soaps using a paper strip; paper strips for checking water quality; and medical diagnosis aided by paper-strip tests of urine, saliva, and blood.

At this junction, a team led by renowned Indian fluid dynamicist and Infosys awardee Prof. Suman Chakraborty from the department of mechanical engineering at IIT Kharagpur has developed a diagnostic kit for testing

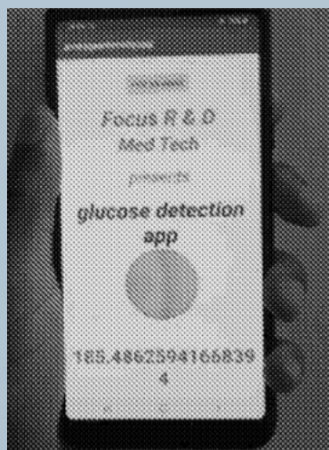
blood by flowing it through micro-channels drawn on a paper strip using a pencil; this procedure is known as «lab on chip.» In this way, his team has innovated a new branch of microfluidics called «paper and pencil microfluidics.» Diagnostics with Finger-Prick Blood on a Paper Strip is an ultra-low-cost, rapid, extreme point-of-care device that can quantitatively measure plasma glucose, hemoglobin, creatinine, and lipid profile from finger-prick blood collected on a paper strip via a smartphone-based app.

On the operational front, the device requires a single drop of finger-prick blood and a drop of reagent in the pa-



per-based reaction chamber. The device is designed to harness the flow of blood from an input source pad to a reaction pad for the diagnosis. Accordingly, blood flow is directed along a desired path, primarily by capillary action. To achieve better reproducibility and control over the blood transportation through the paper matrix, they have implemented electrically driven transport through

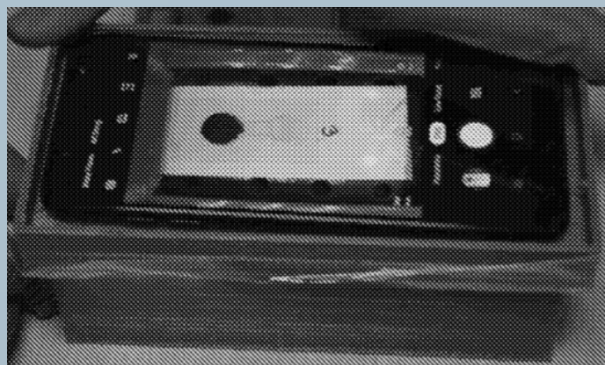
paper channels, mediated by the use of graphite electrodes as deposited by pencil sketches on paper. The reaction is manifested in the form of a change in colour that corresponds to the quantifi-



cation of blood parameters such as glucose and haemoglobin. Further, pictures of changes in colour captured by the smartphone camera are used in the An-

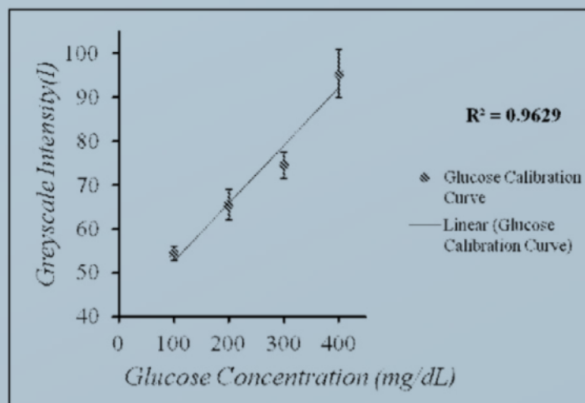
droid app to perform robust image processing and then display glucose and haemoglobin concentration.

Extensive validation tests have been



conducted for blood glucose and haemoglobin at laboratories as well as in the field, both in clinical environments and in villages with limited clinical facilities.

The key aspect of this kit is its operational



simplicity and extremely low running cost.

While under laboratory conditions each test would cost Rs 1 or even less, the cost is expected to marginally vary in the event of commercialization of the product.

«Those days are not far away when such disruptive technology-driven unique innovations in public health will bring in new hopes to millions of poor and deprived people in the underprivileged world,» opined Professor Suman Chakraborty while talking to the media.

Source:

Dey, R., Kar, S., Joshi, S., Maiti, T. K. & Chakraborty, S. Ultra-low-cost 'paper-and-pencil' device for electrically controlled micromixing of analytes. *Microfluid. Nanofluidics* 19, 375–383 (2015)

Patent- Integrated Paper based Device for Simultaneous Separation of Blood Plasma and Determination of Plasma Glucose from a Single Drop of Blood (201931030435 & PCT/IN2020/050615)

- Amit Raj

B-Tech 3rd year, Mechanical

Managing Compressed Air Capacity



Compressed air, along with gasoline, electricity and food is vital to most modern business and commercial processes. It works instruments and system, provides strength for physical management systems and ensures clean, breathable air in contaminated environments. It is applied by almost every business segment from aircraft and automobiles to dairies, food, agriculture and materials. The plant's cost for its compressed air is often thought of just in terms of the price of that equipment. Life prices, However, constitute as much as 70% of the total cost in creating compressed air. As energy rates increase across the country and the cost of maintenance and repair increases, choosing the most effective and dependable compressor grows important.

Rotary-screw compressors

The primary component of the circular screw compressor is made up of two short clearance helical-lobe rotors that move in parallel material. As the rotors

revolve, the fuel is pushed into the decreasing inter-lobe structure until it reaches the discharge side. At lubricated units, the masculine rotor drives the hu-



man and oil is injected into the chamber serving as the lubricant, coolant and as the oil coating to decrease backslippage. On non-lubricated cases, timing gears are accustomed to running the rotors and multi-staging is needed to keep fuel temperatures from getting too high.

Different ways to manage the compressed air capacity

- **Start/stop** - The power is resumed once there is a requirement for air again. The image of a light switch makes it simple to visualize this idea. Start/stop should only be used for procedures that don't have regular on/off cycling and frequently involve tiny compressor actions. Similar to how repeatedly turning on and off a light switch will cause the switch to fail too soon.

- **Inlet modulation** - Inlet modulation adjusts the inlet to decrease incoming airflow and, consequently, pressure in response to a decrease in demand. As a result of the system requirements needed to maintain proper operating pressures, this approach only offers limited capacity control.



Variable displacement - Variable displacement control enables the compression chamber's effective length to expand and contract in response to changes in air demand. Through specifically created air ends with bypass ports, this is accomplished. Bypass ports are opened, which reduces the compression chamber's volume and lowers the amount of compressed air while consuming less energy. Although the method for opening and closing these ports differs depending on the compressor manufacturer, the concept is the same.

- **Variable displacement** - A VSD automatically changes the motor speed to produce more or less compressed air

depending on demand fluctuations. The most accurate production-to-demand correlation among the different control methods is made possible by this direct connection to the compressor motor. In keeping with our prior comparison of a car, the VSD functions similarly to a smooth gas pedal, gradually increasing and lowering speed.

How do you choose the greatest option for a facility when there are so many options? A thorough audit of your compressed air system is just the optimal place to begin. These audits can be used to find the best options for enhancing compressed air operations. The ability to model several choices for compressor sizing and control mechanisms is one of the main outcomes of most audits. This enables businesses to decide what will work best for their facilities.

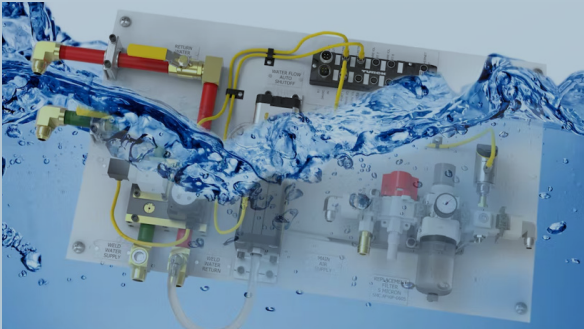
Source:

Source: David Andrews, 2022

- Pravallika Padamata

B-Tech 3rd year, Mechanical

Prevent Downtime: The Importance of Monitoring Water Supply and Flow During Welding



A turnkey, pre-engineered weld water control system has a few advantages over custom solutions.

Welding is an essential process in many industries, including automotive, aerospace, and white goods manufacturing. The process requires an adequate supply of coolant to maintain the temperature and prevent the welding tips from melting. However, monitoring the coolant supply and flow during welding can be a challenging task. This is where a turnkey weld water control system can come in handy.

A pre-engineered weld water control system has several advantages over custom solutions. The assembly arrives ready to integrate with piping and fittings, with no need for threading or fabrication on site. The system designer specifies sensors to meet the control and data collection needs of the end-user, saving time and reducing complexity during commissioning. Furthermore, the system can be tested using onboard

pushbuttons and user interfaces, eliminating the need for a PLC programmer.

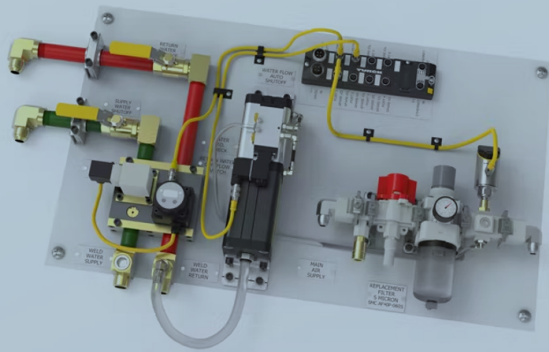
One of the key benefits of a turnkey weld water control system is improved process control. The system offers features like tip-off detection, insufficient flow alerts, and the ability to monitor all process variables in real time. In case of a decrease in flow, the system stops the incoming flow from the coolant supply line and attempts to siphon the existing coolant out of the system to minimize spillage.

The weld water control system also en-



ables the user to monitor critical process parameters simultaneously. Data on flow, pressure, temperature, and control variables is available over a single IO-Link connection, allowing operations to collect and analyze detailed insights into process parameters. This includes metrics from ancillary systems such as pneumatic pressure and weld current, giving the operators a complete picture of the welding process and

putting them in control of the system. The use of a weld water monitoring system can also result in cost and time savings. By closely tracking the amount of coolant needed in each cell, welding operations become more efficient, reducing waste and saving water. Energy



savings and energy efficiency are also potential benefits of a weld water monitoring system. In addition to financial benefits, a weld water monitoring system also offers safety considerations. It allows users to catch potential leaks sooner, preventing spills of chemicals and glycol solutions. In case of a spill, the cell must be disabled for maintenance workers to enter and clean up, leading to costly downtime.

A continuous monitoring system en-



sures that users are alerted in case of any faults that may cause the coolant supply to shut down, preventing hazards and ensuring safe operations. In conclusion, a turnkey weld water



control system offers several advantages over custom solutions. Improved process control, cost and time savings, and safety considerations are some of the key benefits that the system offers. The use of an off-the-shelf system for implementing a weld water control system makes more sense from a financial and safety perspective, and the potential savings multiply when multiple welding robots are used in a facility.

- Sharda Vibhar
B-Tech 2nd year, Mechanical

Source:
machinedesign.com

Microwave Absorbers: An Amulet against the Necessary Devil

Let me introduce our readers to the basic terminologies and the necessity surrounding our central character, i.e., microwave absorbing materials. The two most essential terms in microwave absorbing materials depicting strong absorption response are “Reflection loss” and “Absorption bandwidth corresponding to 90% wave absorption”. In layman terms, we can say that reflection loss represents the amount of microwave absorption and absorption bandwidth represents the frequency range up to which an absorber could maintain this 90% wave absorption. The higher these values, the better is the microwave absorber. The extensive use of microwaves operated electronic appliances in C (4-8 GHz), X (8-12 GHz), and Ku (12-18 GHz) frequency bands for domestic, defence, communications, and healthcare applications has interwoven the world into one without which our modern society cannot grow. But these microwaves, apart from being a boon to human society has some evil sides. The microwave signals emitted by various appliances interfere with each other’s proper functioning, thus; rendering it less efficient and causing electromagnetic pollution problem apart from causing serious health issues such as cancer, DNA damage, etc.

The impact of microwave absorbers to the defence sector is also immense as they provide camouflaging features to combat aircrafts and vehicles, which is of utmost importance for national security. Thus, the answer to these problems of electromagnetic pollution, health, and national security can be resolved by “microwave absorbing materials” which can serve as an amulet against these evil sides of microwaves.

For our readers, the various factors that influence the microwave absorption response in materials have been shown in the fishbone diagram.

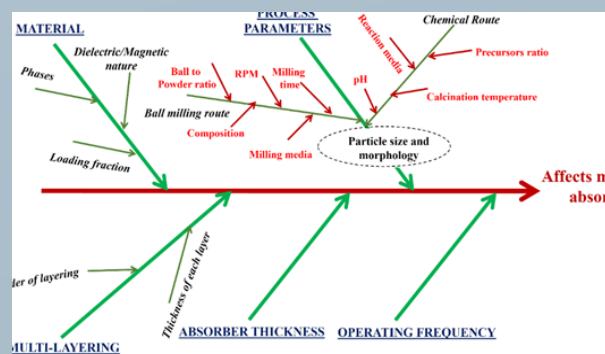
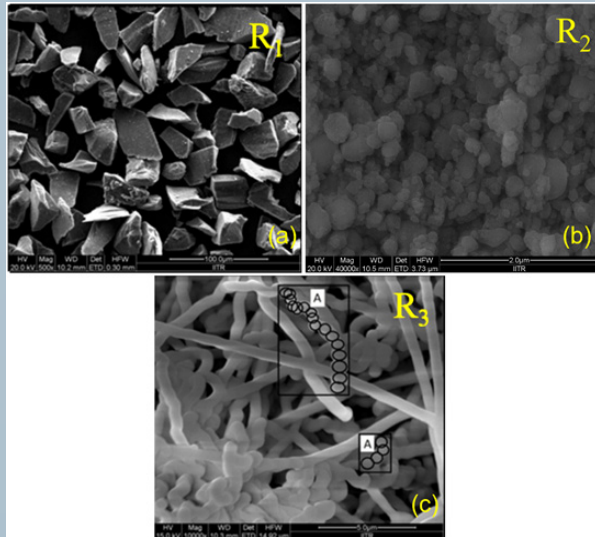


Figure 1: An illustration of factors influencing microwave absorption.

A case study from one of my published article has been presented on how the morphology of SiC particles can influence the microwave absorption characteristics.

In our published work, ball milling and subsequent heat treatment processes were used to modify the irregularly shaped as-received micron-size SiC particles to spherically shaped nano-size SiC and 1D SiC/Si₃N₄ micro-whiskers composite system with 3D network structure, respectively as shown in Figure 2.

Figure 2: FE-SEM image of SiC (a) as-received, (b) milled for 20 h and

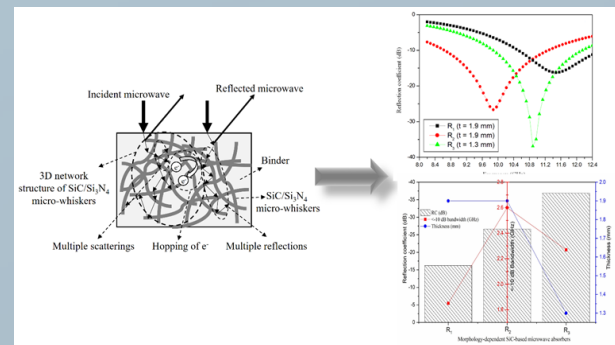


(c) heat treated after 20 h of milling.

The results depicted in Figure 3 indicate that the enhancement in the various absorption phenomenon such as multiple scatterings, multiple reflections, dipole and interfacial polarizations work synergistically to improve the microwave absorption properties for spherically shaped nano-size SiC and 1D SiC/Si₃N₄ micro-whiskers as compared to the as-received counterpart. The microwave absorption performance depicted a considerable improvement in

8.2-12.4 GHz range for the shape modified SiC absorbers. The reflection loss or reflection co-efficient (RC) values decrease from -16.27 dB in case of irregularly shaped micron-size SiC particles to -26.62 dB and -36.87 dB for spherically shaped nano-size SiC and 1D SiC/Si₃N₄ micro-whiskers, respectively. Therefore, shape modification indicates better microwave absorption performance for the spherical and 1D micro-whiskers morphology with great potential for realizing into an efficient absorber for practical applications.

Figure 3: An illustration of fac-



tors influencing microwave absorption with the absorption results.

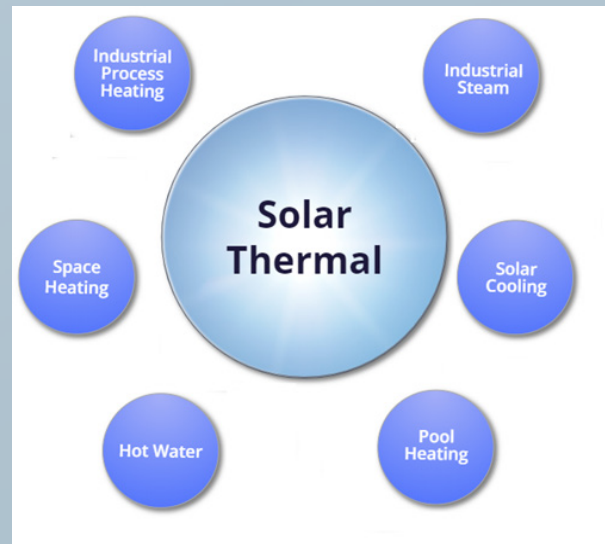


- Dr. Samarjit Singh
Assistant Professor

Solving the Energy Crisis with Solar Thermal: A Sustainable Solution

Solar thermal energy is a form of renewable energy that harnesses the heat generated from the sun to produce electricity or provide heating for buildings and industrial processes. The technology is based on capturing energy from the sun's through solar collectors, which then heats a fluid that can be used for various purposes. One of the primary advantages of solar thermal energy is its ability to produce heat in a cost-effective and sustainable manner. It is also a reliable source of energy since the sun's energy is abundant and readily available. Additionally, solar thermal technology is highly versatile and can be used in a range of applications, from providing hot water for homes to powering industrial processes. There are two main types of solar thermal systems: passive and active. Passive solar thermal systems are simple systems that rely on the natural circulation of air or water to transfer heat from the collector. In contrast, active system use fans/pumps to move the working fluid from the collector.

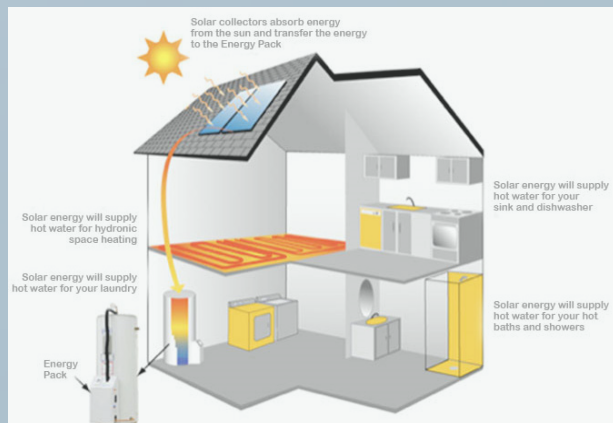
The production of hot water for homes and businesses is the most common application of solar thermal energy. Solar water heaters consist of a collector and a water storage tank which is insulated to reduce the heat loss from the system. The collector absorbs the sun's energy and transfers it to the working fluid, which then heats the



water in the storage tank. Solar thermal energy can also be used for space heating, either in homes or larger buildings. In such cases, solar collectors are typically integrated into the building's roof or walls to capture the sun's energy. The heated fluid is then circulated through a heat exchanger to provide warmth for the building's interior.

Another application of solar thermal energy is in the generation of electricity. Concentrated solar power (CSP) systems use mirrors/lenses to focus the solar energy onto a small area, where it heats a working fluid that drives the prime mover to generate electricity. CSP technology is particularly effective in areas with high levels of direct sunlight, such as deserts. The importance of solar thermal energy lies in its potential to provide a reliable and

sustainable source of energy. Unlike fossil fuels, which are finite resources and contribute to climate change, solar thermal energy is abundant and emits no greenhouse gases. Solar thermal energy systems are also highly efficient and have a long lifespan, requiring minimal maintenance. In addition to its environmental benefits, solar thermal energy also has economic advantages. The cost of solar thermal technology has declined significantly, making it an affordable option for homeowners and businesses. Solar thermal systems can also help reduce energy bills, particularly in areas with high electricity prices.



Source: <https://uenergysolar.com/solarthermal.html>

Furthermore, solar thermal energy can contribute to energy independence and security, particularly in regions with limited access to traditional energy sources. In rural areas or developing countries, solar thermal systems can provide a reliable source of energy for homes and small businesses, improving quality of life and promoting economic

development. In conclusion, solar thermal energy is a versatile and sustainable source of energy that can be used for a range of applications, from heating water to generating electricity. It is a cost-effective and reliable source of energy that contributes to energy security and independence. As the world continues to transition towards clean and renewable energy sources, solar thermal energy will play an increasingly important role in meeting energy demands while reducing greenhouse gas emissions.



- Prof. T.V. ARJUNAN.
HOD of the department

NON - TECH ARTICLES

SLUMDOG MILLIONAIRE

The Story of Israel's Economic Miracle

Rags to riches isn't a story anyone wants to hear until after it's done.

-Maggie Stiefvater.



The Economic Miracle

The story is about innovation and entrepreneurship and how one small country, Israel, came to embody both. Israel represents the greatest concentration of innovation and entrepreneurship in the world today. Israel's economic miracle began in the late 1950s, when the country adopted free market policies. This allowed for private business to flourish and encouraged foreign investment in the country.

Israel then experienced a period of rapid industrialization that was further aided by its strong adherence to technological innovation and education. The government took various initiatives such as reducing taxes and providing subsidies to business, as well as investing in infrastructure and research which resulted in the creation of a strong manufacturing sector that accounted for around 15% of Israel's gross domestic product (GDP).

How has Israel diversified its economy?

It began in the late 1970s and early 1980s, Israel's main focus was on high-tech industries, such as computing, telecommunications and software, which became a major driver of economic growth. This new focus led to an influx of foreign capital in the form of venture capital investments and direct foreign investment. The trade agreements with countries such as the United States, Canada, Mexico and China bolstered Israel's economy and opened up export markets and allowed Israel to tap into new sources of capital.

From the mid-1980s onwards, Israel has continued to develop its high-tech sector and diversify its economy, making it one of the most dynamic economies in the world. Today, the country is a global leader in fields like aerospace engineering, Telecommunications, biotechnology and medical research, and software development.

The success of Israel's economy isn't often attributed to its culture of entrepreneurialism and innovation but its vibrant culture and highly educated population which have helped to keep the economy healthy and also maintained a high standard of living for its citizens, even during periods of economic hardship and crisis. The reason for its success has been fos-

tered through the country's universities and research centres, as well as by its highly educated population. In addition to funding its own businesses, the government has actively sought out foreign investment in Israel. This includes strategies like encouraging direct foreign investments, providing incentives for multinational companies to do business in Israel, and signing free trade agreements with various countries. These efforts have helped open up markets for Israeli products, boosting exports and spurring even more economic growth.



Israel's economic miracle is an inspiring example of how a small country can defy the odds and create a vibrant economy and is ranked among the top countries with respect to the quality of its healthcare and education systems with high living standards. It has attracted investors, innovators, and entrepreneurs from around the world, all of whom have been key to transforming Israel into one of the most prosperous nations in the world. By embracing free trade and investing heavily in innovation, they have made Israel an economic

powerhouse with a bright future ahead.

Israel's economic success is attributed to its flourishing technology sector. Since 2000s, the country has become a global hub for tech, startups and research. Companies such as Intel, Google, Microsoft, Apple and Facebook have all established large offices in Israel, creating thousands of jobs and injecting billions into the Israeli economy. The tech industry has also encouraged other sectors to become more competitive. By introducing advanced technologies, businesses in Israel have become more efficient and productive, helping the nation grow and prosper.

Israel's economic miracle is truly remarkable. By harnessing the power of technology, Israel has become an innovative and competitive economy that continues to attract foreign investors from around the world. With its strategic location near major international trade routes and a vibrant tech industry, it's no wonder why so many businesses are drawn to this Middle Eastern country. As long as they continue investing in advanced technologies and welcoming global partners, there's no telling how far their success will go in years to come.

*- Ananya shri chaurasia
Btech 3rd year, Mechanical*

FACULTIES ACHIEVEMENT

Month: October, November and December

Publications:

S. No	Name of the Faculty	Title of the article / Book chapter / Book	Journal / Book Name	Vol, Issue	Indexed in (Scopus/ sci/ ugc-Care/ others)	Month & Year
01	Prof. T V Arjunan	A case study on thermo-hydraulic performance of jet plate solar air heater using response surface methodology	Case Studies in Thermal Engineering	Vol. 34	Elsevier-SCI-IF-6.2	
02	Prof. T V Arjunan	Investigation of mechanical and wear properties of Al6061/Si3N4/MgO hybrid composite fabricated by stir casting method	Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering,		Sage-SCI-IF-1.8	
03	Prof. T V Arjunan	Study on tribological behaviour of aluminium hybrid composites strengthened with novel groundnut shell ash and boron carbide	Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering		Sage-SCI-IF-1.8	
04	Prof. T V Arjunan	Experimental Investigation on the Effectiveness of Solar Still and Its Effect on Adsorption with Various Dyes	Adsorption Science & Technology, Hindawi		SCI-IF-4.2	

S. No	Name of the Faculty	Title of the article / Book chapter / Book	Journal / Book Name	Vol, Issue	Indexed in (Scopus/ sci/ ugc-Care/ others)	Month & Year
05	Prof. T V Arjunan	Parametric study of evacuated tube collector solar air heater with inserted baffles on thermal network for low-temperature applications	Journal of Cleaner Production	Vol. 367	Elsevier SCI-IF-11.7	
06	Prof. T V Arjunan	Utilization of zinc-ferri-rite/water hybrid nanofluids on thermal performance of a flat plate solar collector-a thermal modelling approach, , Springer	Environmental Science and Pollution Research	Vol. 29	SCI-IF-5.1	
07	Prof. T V Arjunan	Design optimization and experimental evaluation of novel photovoltaic modules in comparison with a conventional photovoltaic module	Energy Sources, Part A: Recovery, Utilization, and Environmental Effects	Vol. 44	SCI-IF-5.1	
08	Dr. Anoop Kumar Sahu	Lean-agile-resilience-green practices adoption challenges in sustainable agri-food supply chains			Wiley-SCI-IF-10.11	

S. No	Name of the Faculty	Title of the article / Book chapter / Book	Journal / Book Name	Vol, Issue	Indexed in (Scopus/ sci/ ugc-Care/ others)	Month & Year
10	Dr. Anoop Kumar Sahu	Surface topography and optimal machining characteristics investigation for advanced engineering material inconel 825 alloy exploring statistical tgra accompanied with t-topsis methodology,	Surface Review and Letters, World Scientific Journal-		SCI-IF-1.7	
11	Dr. Anoop Kumar Sahu	Impact of Social Media Usage on Civic Engagement towards Societal Problems: Qualitative Modelling Approach,	Discrete Dynamics In Nature and Society, Hindawi-		SCI-IF-2.1	
12	Dr. Anoop Kumar Sahu	Decision-making framework for supplier selection using an integrated MCDM approach in a lean-agile-resilient-green environment: evidence from Indian automotive sector,	The TQM Journal-		Web of Science-ESCI+ SCOPUS+B ranked in ABDC	
13	Dr. Anoop Kumar Sahu	Quantify the Behaviour Intention of Individuals to Control SC Performance by Exploring Cloud Storage Services: An Extended UTAUT2 Approach,	International Journal of Technology and Human Interaction (IJTHI), , No. 7, IGI Global-	Vol. 18	Web of Science-ESCI+ SCOPUS+C ranked in ABDC	
14	Dr. Anoop Kumar Sahu	Spectrophotometric Determination of Zinc in Food Waste Water Samples in the Presence of Surfactants Using Dithizone Method.	International Journal of Social Ecology and Sustainable Development (IJSESD), , No. 3, IGI Global	Vol. 13	SCOPUS	

STUDENTS ACHIEVEMENT

PLACEMENTS



Ayush Kumar

UI/UX Designer

48 LPA

Growing up, I always had an interest in design. However, as a young man, I pursued a technical entry scheme 41 for joining the Indian Army. Unfortunately, due to my mother's health issues, I had to drop out of the program and pursue normal engineering.

Despite the setback, I refused to let it keep me down. I started exploring things that I enjoyed, such as graphic designing. I used free resources such as YouTube and ebooks to teach myself the skills needed to succeed. However, I knew I needed more, so I started attending a design course to hone my skills.

One of the biggest challenges I faced while studying was my attendance. I was so focused on designing that I often forgot about my classes. My professors and HOD were incredibly understanding and supported me in every step. They could see my passion for design and knew it was something I needed to pursue. I'm eternally grateful for their kindness.

Through consistent hard work and dedication, I overcame distractions and learned from my failures. I shifted my career to become a UI/UX designer. It wasn't easy, but I never gave up. I spent countless hours learning and practicing, trying to improve my design skills.

Eventually, my hard work paid off. I was offered the highest placement in the history of my college. It was a surreal moment, and I couldn't believe that my passion for design had led me to such success.

Below is a list of students who have been placed in Plan Reality



Diksha Gupta
7.2 LPA



Shivam Mishra
7.2 LPA



Lomesh Patre
7.2 LPA



Madhav Mishra
7.2 LPA



Abhijeet Kumar
7.2 LPA



Shankar Thakur
7.2 LPA



Hero Lal Tandan
7.2 LPA



Abhishek Kumar
7.12 LPA

Below is a list of students who have been placed in High-Tech-Next Engineering & Telecom Private Limited .

S. No.	Name
01	Abhijeet Kumar
02	Abhishek Kumar
03	Alok Tirkey
04	Aman Ratre
05	Avinash Raj
06	Gallugubariki Chinna Babu
07	Harsh Kumar Singh
08	Hero Lal Tandan
09	Jyoti Prakash
10	Kumar Shivam
11	Lomesh Kumar Patre
12	Madhav Mishra
13	Manik Raghuwanshi
14	Md Shoyeb Akhter

S. No.	Name
15	Nelapati Raviteja
16	Prakash Sahu
17	Preethavi Singh
18	Prince Kumar
19	Rahul Kumar
20	Rahul Paikra
21	Rittik Kumar
22	S. Sravan Kumar
23	Sampanna Kumar Dewangan
24	Sanjay Chandra
25	Saurabh Kumar
26	Suman Kumar
27	Vaibhav Dewangan
28	Vikas Kumar Shrivastva



VISHAL VIJAYAN

A final-year student, for securing placement in **TCS** with a package of **7.02 LPA**.



HERO LAL TANDAN

A final-year student, has been offered a placement in HR at **Homiwise.com**.



MD SHOYEB AKHTER

A final-year students in our department, has secured a placement **5 LPA** with **Adda 24x7**. Congratulations to him on this accomplishment.



Mohammad Asad Raja

A first-year student, has successfully completed a Digital Marketing workshop organized by **Google**.



AVINASH RAJ

A final-year student, has obtained a remarkable score of **90% in CAT 2022**.

STUDENTS ACTIVITIES

REVOLUTIONARY POUNDING MACHINE FOR SPICE CRUSHING



Spices play a vital role in enhancing the taste and aroma of our food. Traditionally, spices were pounded with a mortar and pestle, but as technology advanced, large-scale spice mills replaced manual pounding methods. However, the use of chemical emery stones or blades in these mills leads to nutrient loss, essential germ oil loss, and excessive gluten content due to high temperatures.

We are excited to announce our new innovative solution for spice pounding. The Automatic Electric-powered lever-based pounding machine. This machine can be used to pound a variety of spices, roots, and grains. Unlike traditional grinding methods, this machine pounds spices at a low temperature, ensuring maximum retention of nutrients and germ oil.

This project is led by Mr. Bhushan Singh, Assistant Professor, Mechanical Engineering with team Arjun Singh, B Vennela, Rahul, Vikas Kumar Shrivastav. And is being delivered to LOVE KHUSH FOOD Enterprises, Koni because the project fund is provided by Enterprise owner Smt. Meena Bai c/o Dr. Dilip Kumar (Assistant Professor) Dept of Rural Technology and Social Development.

The machine is portable and designed with a lever and cam, allowing for the pounding operation to be achieved through rotary motion with minimal human effort. The device is easy to maintain as it is detachable.

Currently, the machine developed is electric-powered and commercial-sized, but we plan to improve it further to be more environmentally friendly. Our goal is to make it easily integrable with household electricity and solar panels, making it a sustainable choice for your kitchen.

This pounding machine serves multiple purposes with low energy input and high efficiency, making it an excellent addition to any kitchen. In addition to grinding spices, it can also be used for a variety of other purposes.

DEPARTMENTAL ACTIVITIES

S. No.	Faculty Name	Title of the Event	National/International	Date	Venue
01	Dr. Pankaj Kumar Gupta	Two days training programme ANSYS - Mechanical and CFD	National	6th - 7th Dec. 2022	FM Lab, GGV Bilaspur
02	Mr. Pradeep Patanwar	Seminar on "Cloud Computing"	National	22nd Dec. 2022	G14, GGV Bilaspur

ANSYS Mechanical & CFD Training Programme



Seminar on "Cloud Computing"



QUIZ - NEWSLETTER

Quiz questions are based on Student Articles. Answer to the first part lies in the respective article. For the second part, you need to think and do some research. Its answers are not given in the article.

Managing Compressed Air Quantity

1. (a). Which machine element is used to change the effective length of the combustion chamber in the corresponding method to manage compressed air capacity with changes in air demand?

(b). What method is used in rotary-screw compressors to keep fuel temperature in control, if lubricant isn't used?
2. (a). Name the main types of compressors and where do rotary-screw compressors lie there?

(b). Why are compressors generally multi-staged?

(c). Why is second stage physically smaller than the primary stage in a compressor?

Low-cost blood test kit utilising paper and pencil

1. (a). What physics principle accounts for directing fluid through the desired path in a lab-on-chip procedure?

(b). Why is the name 'Paper and Pencil microfluidics' given to the new branch of microfluidics?
2. (a). What are microfluidics and microchannels?

(b). Why were graphite electrodes used in electrically driven transport system?

(c). Is it possible to use the paper and pencil microfluidics technique to test the soil nutrient levels and, if so, how is it accomplished?

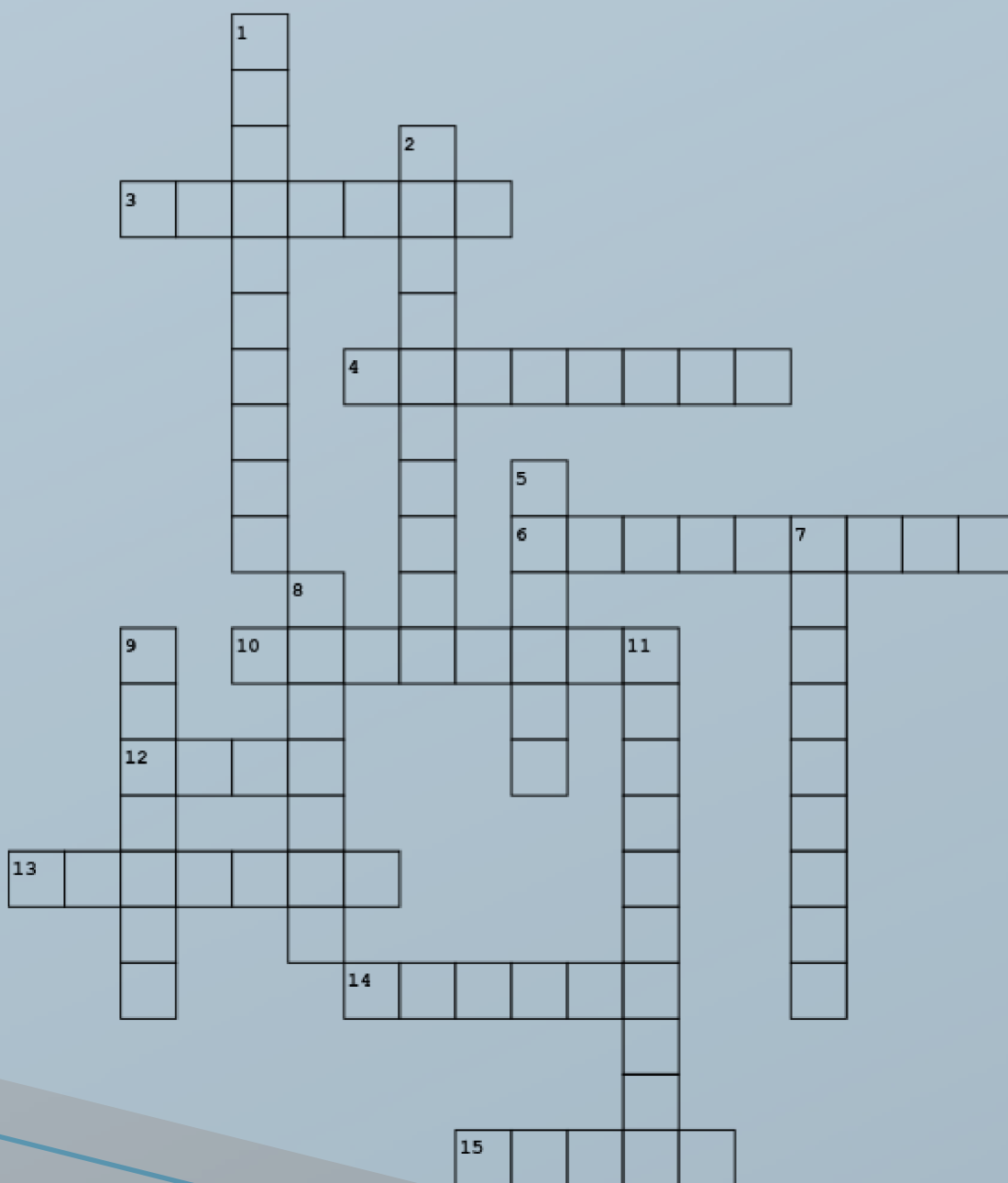
CROSSWORD PUZZLE

Across

3. The negative of the ratio of transverse strain to lateral or axial strain
4. A three-phase reaction in which a liquid transforms into two solid phases at the same time on cooling
6. A thermodynamic process in which no heat transfer takes place between system and surroundings
10. Dimensionless number that is the ratio of inertia force of a flowing fluid to its viscous force
12. A circle representing the magnitude of normal and shear stress at the various planes in a given stress element'
13. The fundamental operating cycle of all power plants where an operating fluid is continuously evaporated and condensed
14. The maximum useful work possible during a process that brings the system into equilibrium with a heat reservoir
15. Type of gears in which the axes of shafts intersect at right angles

Down

1. The phenomenon in which the static pressure of a liquid dips below its vapour pressure, leading to the formation of small vapour-filled cavities
2. The mode of heat transfer between a solid surface and the adjacent fluid, with the latter having no bulk motion
5. A reaction turbine used at low heads, operating under high discharge
7. The heat treatment process in which a metal or alloy is heated to a predetermined temperature, held for a certain time, and then cooled to room temperature
8. A mechanical element that permits relative motion between 2 parts with minimum friction
9. A type of fluid flow in which all the streamlines are straight and parallel
11. An important application of the inversion of double-slider crank mechanism in which one of the sliders is fixed.



*answers will be publish on upcoming newsletter.

TEAM MEMBERS



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Assistant Professor
Mr. Biplas Das

*Big thanks to each team member for their outstanding work on **The Master Stroke**. Their dedication and attention to detail have been essential in creating a valuable resource for the readers. We appreciated all that they did for our team and are thankful for their contributions to the project.*

THE END

