Vidya Vikas Education Trust's

Universal College of Engineering

Approved by AICTE, DTE, Maharashtra State Goverment and Affiliated to Mumbai University

Accredited with B+ Grade by NAAC | Recognised as Linguistic (Gujarati) Minority Institution

ELECTRONICS ENGINEERING DEPARTMENTMAGAZINE

COMPILED AND DESIGNED BY:

MS. SAMPADA PIMPALE - MAGAZINE COORDINATOR

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DEPARTMENT VISION:

To be recognized for practicing the best teaching-learning methods to create highly competent, resourceful and self-motivated young electronics engineers for benefit of society.

DEPARTMENT MISSION:

- To nurture engineers who can serve needs of society using new and innovative techniques in electronics.
- To improve and apply knowledge of electronics subjects through participation in different technical events.
- To enhance carrier opportunities of electronic students through industry interactions and in plant training.
- To install the passion and spirit among students to pursue higher education in electronics and entrepreneurship.

Departmental Activities

Robotics Workshop

DATE: 11/02/2020

VENUE: Muchhala Polytechnic, Thane

One day on Campus workshop on Robotics and Arduino Board for Diploma students to promote robotics and automation.

Workshop on Wired and Wireless Robot covered following topics:

- Introduction to upcoming technology – ROBOTICS.
- Introduction to wired Robot.
- Introduction to wireless Robots.
- Introduction to Arduino Board (Arduino Platform & Software, LED Interfacing, LCD Interfacing etc.).
- Controlling and designing wired robot using remote control.
- Controlling wireless robot using Bluetooth and ZigBee.

Trainer:

1. Ms. Kaveri Sawant
2. Ms. Sonal Borase

Ms. Kaveri Sawant addressing the student, giving them the introduction to Robotics and Arduino Board explaining them wireless & wired Robot.	Ms. Sonal Borase demonstrating the assembly of wired Robot

Online training as a weapon to fight the new coronavirus

More than 25 000 people across the globe have accessed real-time knowledge from WHO experts on how to detect, prevent, respond to and control the new coronavirus in the 10 days since the launch of an open online training.

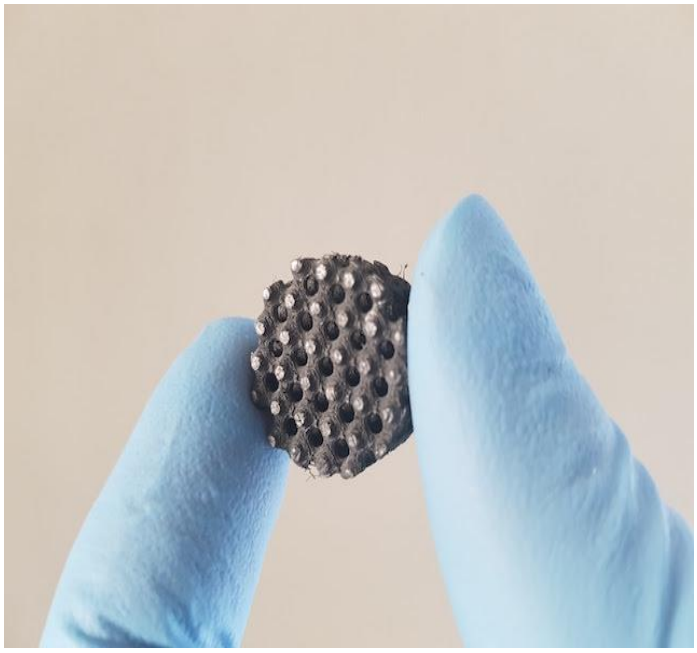
The learning team of the WHO Health Emergencies Programme worked with technical experts to quickly develop and publish the online course on 26 January – 4 days before the 2019-nCoV outbreak was declared a public health emergency of international concern. Approximately 3000 new users have registered for the training every day since its launch, demonstrating the high level of interest in the virus among health professionals and the general public. In addition, more than 200 000 people have viewed the introductory video to the course on YouTube.

The high engagement levels emerged as the international community launched a US$675 million preparedness and response plan to fight further spread of the new coronavirus and protect states with weaker health systems. The free learning resource is available to anyone interested in novel coronavirus on WHO's open learning platform for emergencies, OpenWHO.org. The platform was established 3 years ago with emergencies such as nCoV in mind, in which WHO would need to reach millions of people across the globe with real-time, accessible learning materials. The online training – entitled "Emerging respiratory viruses, including nCoV: methods for detection, prevention, response and control" – is currently being produced in all official UN languages and Portuguese.

"Our job is to work with technical health experts to package knowledge using adult learning principles, quickly so that it is most useful to health workers and our staff," said Heini Utunen, who manages OpenWHO for the WHO Health Emergencies Programme (WHE). "Our online platform – OpenWHO – is already accessed by users from every country on earth, providing more than 60 courses in 21 languages. Delivering trainings in the local language of responders is really important, especially in an emergency". WHE has been investing in learning and training to strengthen preparedness and real-time response to health emergencies. The programme developed its first-ever learning strategy in 2018 and has a small dedicated Learning and Capacity Development Unit that allows WHE to develop trainings quickly and get know-how to those who most need it at the front line.

Source:https://www.who.int/news-room/detail/07-02-2020-online-training-as-a-weapon-to-fight-the-new-coronavirus

Silicone-rubber combined with graphene to make flexible wearable sensors



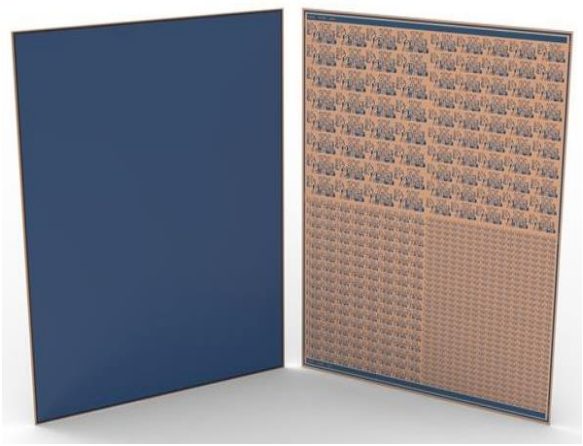
Researchers at UCLA and the Universities of Waterloo and British Columbia have combined silicone rubber with ultra-thin layers of graphene to make a material for 3D-printed durable, flexible sensors for wearable devices. When the material bends or moves, electrical signals are created by the highly conductive, nanoscale graphene embedded within its engineered honeycomb structure. "Silicone gives us the flexibility and durability required for bio monitoring applications, and the added, embedded graphene makes it an effective sensor," said Waterloo's Ehsan Toyserkani. Fabricating a silicone rubber structure with such complex internal features is done by 3D printing equipment and processes. The rubber-graphene material is extremely flexible and durable in addition to highly conductive.

The material and the 3D printing process enable custom-made devices to precisely fit the body shapes of users, while also improving comfort compared to existing wearable devices and reducing manufacturing costs due to simplicity. The rubber-graphene sensor can be paired with electronic components to make wearable devices that record heart and breathing rates, register the forces exerted when athletes run, allow doctors to remotely monitor patients and numerous other potential applications.

Source:https://www.electronicsweekly.com/news/research-news/silicone-rubber-combined-graphene-make-flexible-wearable-sensors-2020-03/

Revolutionising PCB production

The method of printing PCBs has not changed for decades. In the early days of imaging circuit boards a substrate (copper laminate) was screen printed with a liquid etch resist; this was then oven cured. This enabled the resist to act as a mask during the etching process which followed. The screen both applied the coating and also created the exact image of the tracks required on the wiring board.



In the 60's and 70's demand for PCBs grew exponentially and better ways of packing more components on to a board within less space. This led to double-sided boards and multilayered modules. The next step was to find a reliable method to connect boards side to side. Initially, this involved soldered wire links but eventually this gave way to the more reliable 'plated through hole' method which is prevalent method today for connecting one layer to another.

Wet Resists:

Between the 70's and early 2000's track densities increased and circuits with more than 12 interconnected layers became commonplace. Track widths became increasingly smaller with 100 microns becoming achievable. Traditionally, wet resists are used and still used as the defacto method of printing in the industry. However, the method is not perfect and has a number of disadvantages.

Wet resists are generally inexpensive but need pre curing before being printed and tend to be used in high volume production due to the capital cost of curing ovens. Handling also tends to be problematic as the wet resist cannot be touched. The partly cured resist can also attract dust particles due to its tacky surface. For these reasons, many in the industry are switching to the dry film method.

Basically, dry film is a partly dried wet resist sandwiched between two layers of Mylar. Upon application, one of the layers of mylar is removed on a purpose built laminator and the partly dried resist (dry to the touch) is laminated under heat and pressure on to the copper substrate. Despite dry film being more expensive than wet resist, the convenience of handling has made it the most popular material for imaging and etching PCBs.

Dry film manufacturing:

The manufacture of dry films for PCB use is an exacting task and has to be carried out in strict cleanroom conditions using a purpose-built coating line. Such facilities have typically been dominated by a few large players such as DuPont, Morton Thiokol and Hitachi.

After coating, and part drying, the master rolls are cut to sizes required by PCB manufacturers. To maximise usage, the PCB firm must order the exact width needed for the panel size. If a different panel size is required the roll needs to be changed leading to down time and loss of

production.In warmer climates the film has to be stored in a controlled storage facility which is an added cost. The equipment used to laminate dry film (Cut Sheet Laminator) has become increasingly complex and is a significant cost to purchase and maintain. For example, CLS units can cost upwards of $200,000 and placement of the rubber laminating rollers after they become deformed can cost $600 every 6-8 weeks.

Another issue with dry film is that the PCB manufacturer has to specify the exact widths of film to match the size of the copper panels being used. Changing rolls of film for different widths of panel causes costly downtime. However, perhaps one of the biggest drawbacks to thin dry film is the amount of adhesion to the copper panel.

The copper panel may appear flat to the naked eye but closer examination shows a rough surface with a dendritic (tree like) structure. Everything appears fine until the printed panel is in the etching bath. Etching chemistry can get underneath the dry film (micro fissures) and effectively eat through the thin copper creating an open circuit. Normally this is only discovered after etching and cannot be inspected for as there are no visible signs.

Over the past decade Rainbow has been working on chemistry and systems designed to overcome the issues with the wet film method. Rainbow's proprietary liquid resist and coating system, launched at last year's Productronica exhibition, addresses these issues giving PCB manufacturers complete control over handling and control of coating thickness. The liquid resist flows easily, adheres closely to the surface of the substrate and can be applied at ambient temperature. Moreover, the resist does not require drying before it is imaged.

The panel can still be handled as the resist coating is protected by a layer of mylar. The resist is first applied to a reel of polyester and then laminated directly to the copper panel, leaving the protective polyester carrier in place over the resist transfer coating. After lamination the panel is "singulated" separating it from the carrier web. The panel can then be exposed by any method, including DI/LDI.

Hybrid coating:

To complement this new generation of resists, the company has now introduced its Hybrid Coating Unit (CL21 Hybrid Coating Laminator).The CL21 makes handling wet resists easy and puts the PCB manufacturer in complete control of the printing process. The resist is first applied to a reel of polyester and then laminated directly on to the copper panel, leaving the protective polyester sleeve in place over the resist-transfer coating.

After lamination the panel is "singulated" separating it from the carrier web. The singulated panel can then be exposed by any method, including DI/LDI. The Coating thickness can be from 2-30 microns and thinner resists are ideal for fine line printing. Part numbers and thicknesses can be changed in as little as 2-3 minutes. The coating unit can be configured to coat panels, webs, single or double sided as both an etch or plating resist.

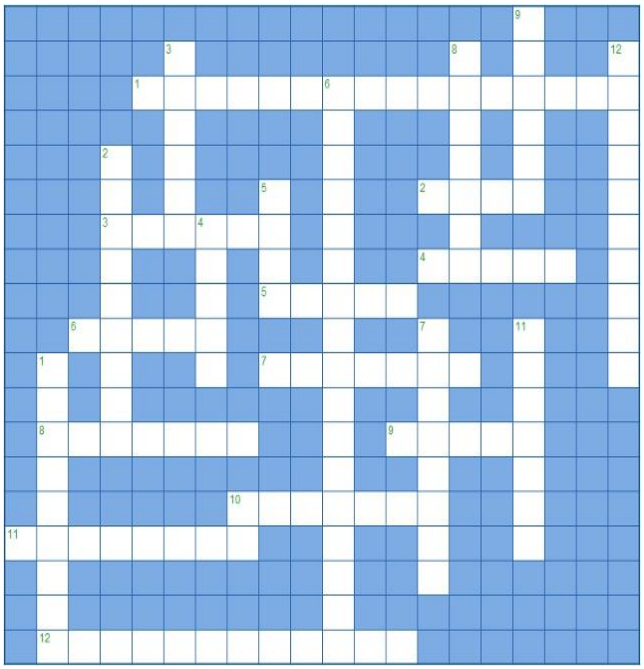
When the proprietary liquid resist is combined with the CL Coater, the aim is to save PCB manufacturers considerable amounts of time and money as well as improving the quality of the end product and reducing defects.

Source:https://www.newelectronics.co.uk/electronics-technology/revolutionising-pcb-production/224849/

Electronics Crossword

Across

1. Two resistors connected together, across a power supply (9, 7)
2. Process used to remove unwanted copper from a PCB (4)
3. Colour band used to indicate the number 7 (6)
4. Colour band used to indicate the number 0 (5)
5. Connects the components together on a PCB (5)
6. A component which allows current to flow only in one direction (5)
7. Makes a sound (7)
8. A collection of components, connected together (7)
9. The L in LED (5)
10. Flows through a circuit (7)
11. Electronics that works with real voltages (9)
12. Type of capacitor, which is polarised (12)



Down

1. Shape of the schematic symbol for a resistor (9)
2. Stores charge (9)
3. Electrically joints components to a PCB (6)
4. Energy that allows the electronics to work (5)
5. Check the board works, after construction (4)
6. A chip / part with two row of pins (10, 7)
7. Component with coloured bands to determine it's value (8)
8. Something that can only be true / false, 0 or 1 (7)
9. Used to turn things on and off (6)
10. Letters used to mark commercial electronics sold in Europe (2)
11. Measured across components such as batteries (7)
12. A component that acts like an electronic switch (10)

** Look for answers in next month edition….

Funny Technical Quotes

- *ENGINEERING FACT: 4 YEARS, 40 SUBJECTS, 400 EXPERIMENTS, 4000 ASSIGNMENTS, 40000 HOURS.....*
  A NORMAL HUMAN BEING CAN'T DO IT....
  THOSE SUPERHEROES ARE CALLED.....
  "ENGINEERING STUDENTS"
- *AFTER JOINING ENGINEERING, I REALLY APPRECIATE MY BRAIN, WHICH IS DIVIDED IN TWO PARTS:*
  RIGHT AND LEFT
  1. *IN RIGHT NOTHING IS LEFT.....*
  2. *IN LEFT NOTHING IS RIGHT.....*

- *ENGINEERING FACT: AN OPINION WITHOUT 3.14 IS AN ONION.....*
  YOU'LL UNDERSTAND HOW.....
- *ONE MAN'S MAGIC IS ANOTHER MAN'S ENGINEERING. SUPERNATURAL IS A NULL WORD.*
- *OTHER KIDS WENT OUT AND BEAT EACH OTHER UP OR PLAYED BASEBALL, AND I BUILT ELECTRONICS.*