



Message from National President, NIQR

Dear NIQRians, though we are all in the midst of disturbances caused by the pandemic, industries are making all efforts to reverse to normal and to perform better. To act as an enabler, NIQR have kicked off many initiatives to support industries and society; Your constant encouragement will make us to exhale better in the days to come. As a country, we are in better shape in dealing with the disturbances than the rest of the world in most of the aspects. The current e-Mobility / Digitisation / 3D Modelling, so on and so forth will make us to sail better provided we constantly upgrade our knowledge & skill in an untiring way. Industries & Associations jointly only can bring an industrial revolution. NIQR always supports not only the members but also the industrial forum as a whole including budding students. Wishing all of you and your family members a safe and healthy New Year 2022.



With warm Regards,

K. Manikandan, National President, NIQR

Message from Chairman Chennai Branch



My Treasured Companions, It is indeed a great and immense pleasure to write to you all as the new Chairman of NIQR Chennai Branch. The year gone by was a roller coaster ride with a lot of exceptional significance. Though there were some disruptions, NIQR continued its support to industries by extensive use of digital platform. As a part of giving back to the society and also to nurture a Quality culture in the society and the students, we have structured ourselves into six major verticals to focus more on planning and execution part. We also started our engagement with school students to nurture the Quality Culture as the foundation for the future is built there. The Omicron variant is raising the level of alert again, but overall we are starting to see signs of recovery in the global economy. Behavioral patterns and the state of society under the new normal are also gaining foothold. As we enter the 3rd wave of pandemic, we must be very careful and this is not the time to let our guard down. I

encourage everyone to follow the latest protocols, not just for yourselves but for your families and your communities too. Happy new year to you all!

With warm Regards,

P.T. Bharani Perumal, Chairman - Chennai Branch

Message from Secretary Chennai Branch

“They only live, who live for others, the rest are more dead than alive” – Holy Mother Sri Sardha Devi.

We intend to stand as an example of the above statement to the possible extent. We are in the midst of the fourth industrial revolution – as we are in the process of fully understanding of Industry 4.0. the next level Industry 5.0 has already arrived. Unless we are fast enough to capture and utilise the opportunities to tackle the recent challenges at the speed in which they enter, we will miss the bus to compete.

As NIQR commitment to provide business assistance to MSME's, we have initiated various activities that benefits MSMEs in the long run. The COVID-19 / OMICRON pandemic is impacting every one across the globe whether directly or indirectly affects people in all corners of the world. Let us help one another to come out of this crisis. We are already in the process. None of this would have been possible without the sheer commitment and determination of our entire NIQR team. Thank you once again for all your hard work and looking forward to your continuous support to spread our wings globally and to take NIQR to the next level.



With warm Regards,

Lion Dr Ver Chezhiyan, Secretary - Chennai Branch

From Editorial Desk



The industrial forums / associations contribute a lot to the society provided they communicate what they are doing / plan to do to the rest of the society there by promoting their interest in the members / non-members which leads to enhancement of the competitiveness (to the next level). To do so the innovation becomes one of the main pillars. Many inventions (innovations) are taking place around the globe whether we notice it or not. Through this news letter series we try to capture the thoughts of young / expert brains to reach our members on various subjects through abstracts and articles. We believe that this approach will create a better platform to sustain and to improve further upon. The current COVID 19 crisis has shown just how interconnected the world is today. That may present /

future challenges too, but it also enables us to learn new skills like work from home / remote meetings / effective team work etc., which becomes part and parcel of our life. The newsletter also has trainings / activities conducted / future training calendar for your effective contribution / participation. Together we will make our NIQR reach higher levels in future.

With warm Regards,

P Kothandarman & S S Balasubramaniam
Editorial Committee – Chennai Branch

Executive Committee Members (2021-2023) & Six Pillars of Chennai Branch

NIQR Chennai Branch List of ECMs (2021-2023)

SIX PILLARS/VERTICALS OF CHENNAI BRANCH

	Sl.No	Name
Chairman	1	Mr.P.T.Bharani Perumal
Vice Chairman	2	Mr.S.Murugan
Vice Chairman	3	Mr.R.Sriram
Vice Chairman	4	Mr.Ganapathiyappan
Secretary	5	Dr.Ver Chezhiyan
Joint Secretary	6	Mr.S.Manikandan
Joint Secretary	7	Mr.S.Mahendran
Treasurer	8	Mr.S.Raja
	9	Mr.S.S.Balasubramaniam
	10	Mr.K.Baranitharan
	11	Mr.K.S.Chakaravarthy
	12	Ms.K.Geetha
	13	Mr.M.Gurunathan
	14	Mr.N.Jagannadha Rao
	15	Mr.PM.Karthick
	16	Mr.P.Kothandaraman
	17	Mr.V.Kumar
	18	Mr.R.Muthuraman
	19	Mr.P.Ramesh
	20	Mr.D.Rathinasabapathy
	21	Mr.C.Sundaravidvelu
	22	Mr.VK.Venkataramani
	23	Mr.S.Srinivasan
	24	Mr.Vijayaraghavan
	25	Mr.Sathianarayana
	26	Mr.S.Kumar
	27	Dr. S.Nagendra Boopathy
EX-Officio	1	Mr.R.Sethuraman
NIQR CEO	1	Mr.S.Raj Srinivasan

PILLARS	MEMBERS	OBJECTIVE
MEMBERSHIP	Dr.Cheziyan – Lead Mr. Murugan, Mr. Mahendran, Mr.Sathyanarayana, Mr. Muthuraman, Mr. kumar, Mr.Manikandan, Dr.Vijayaragava	Increase the membership base by 20 % from the current level. Base line 741 life members
TRAINING PROGRAMS	Mr.Murugan – Lead Mr. Srinivasan	Creating Training modules & Calendars Conducting Training programs
E- MAGAZINE	Mr. Kothandaraman – Lead Mr.SS Balasubramanian	Preparing and releasing newsletter
SCHOOL STUDENT CHAPTER	Mr.Raja – Lead Mr. Ganapathiappan	i)Adopting 5 schools ii) Creating Quality awareness iii) Conducting competitions
STUDENT CHAPTER	Mr.Manikandan – Lead Dr.Vijayaragavan	i)Increasing student chapter from 6 to 20 ii) MOU sign-off with collages iii) Guest Lectures, Paper presentation, Conducting Work shops
LECTURE PROGRAMS	Mr.Mahendran – Lead Mr.Kumar	Conducting lecture programs

Composite Materials- An Overview

Dr R Ramanarayanan, Ex Scientist,

Defence Research Development Laboratory (DRDO), Hyderabad



A composite material is combination of two materials with different physical and chemical properties; when they are combined, they create a material that is specialised to do a certain job, for instance to become stronger, lighter or resistant to electricity. They can also improve strength and stiffness. The reason for their use over traditional materials is because they improve the properties of their base materials in many situations. These constitute materials have notably dissimilar chemical or physical properties unlike the individual elements Within the finished structure, the individual element remain separate and distinct, distinguishing composites from mixtures and solid solutions.

Shape memory Polymer composites are high performance composites, formulated using fiber or fabric reinforcements and shape memory polymer resin as the matrix. Since a shape memory polymer resin is used as the matrix, these composites have the ability to be easily manipulated into various configurations, when they are heated above their activation temperature, and will exhibit high strength and stiffness at lower temperatures. They can also be reheated and reshaped repeatedly without losing their material properties. These composites are ideal for applications such as light weight, rigid, deployable structures, rapid manufacturing and dynamic reinforcements.

Engineering for a Cause

Dr. E. Vijayaragavan, Coordinator - Centre for Lean And Six Sigma (CLASS)

Department of Mechanical Engineering, SRM Institute of Science and Technology, Kattankulathur



Engineering for a cause! One of the best gifts science has given the mankind. Engineering is a topic that is endless and boundless to imagine its extension. A field that is infinite and evolving, just like we all imagined or dreamed once in our childhood to be an astronaut, to explore infinity time, and complexity. Today evolution happened due to technology in every aspect of our lives, even 100 years back no one ever thought that there will be a display for engagement of the people at a single point, such a point which controls various activities from seeing your dear ones live, booking tickets, to connecting people through the internet, arranging meetings and what not. As a matter of fact even I am writing this article on my mobile phone notepad on a flight from Chennai to Calcutta! The aerospace industry made today's flight possible, 200 years back no one could have even imagined of flying over kilometers in a mere period of time.

Technology is a growing sector, a sector that encourages not only creativity, but also creative minds who have got willpower, ideas, leadership quality, strong belief in science, minds which think ahead of time, find potholes in our environment which causes the problems and so on. Today, there are often two categories of students who pursue engineering, one with peer pressure and another one with proper interest and creativity. To the readers, creativity and being skilled do not necessarily have to deal with academics. We all have been compared at some point in our lives, comparison leads to mediocrity and consequently, mediocrity leaves people being average, if this system keeps on continuing like a cycle then this system is what killed the great minds of our nation. Being Creative is a gift, not a mandatory task just like how being academically good is, it is something we either welcome or let die by other's judgmental views. Engineering is highly dominated by such minds, minds which dig deep and work as a problem solver, minds which work for their love for technology. Engineering has its roots growing from civil to mechanical to playing with electricity, but now just like technology the sectors in engineering are spreading their wings from mechatronics to nanotechnology and even more to come in the future. We engineers have always been an explorer, and what do we explore for? Diamonds? Gold? We, engineers, explore problems in our environment,

World's First Colour Changing Car

Mr Suriya Devalan AR, 3rd year, B.Tech

Department of Mechanical Engineering, SRM Institute of Science and Technology, Kattankulathur



BMW demonstrated a new technology that creates a new customization on exterior color changing in CES 2022. The concept car, known as the BMW iX Flow, uses electronic ink technology usually found in e-readers. The car's exterior turns in to patterns with grey and white as primary colors. The fluid color changes in wide spectrum. It uses E Ink Technology transforming the body skin to take on the desired coloration. No energy is required to keep up the color the owner needs. The company further plans to create a dedicated application which runs in our regular gadgets like mobile. No external energy is required to withstand the pattern which the owner likes. Further technology is expected to expand with a color spectrum. There are few advantages in this model; the car's color can be adjusted with respect to environment for example black absorbs heat, the car can be kept in white to avoid capturing of heat. It also reduces the amount of energy consumed by the vehicle electrical system especially in electric vehicle which results in more range. E Ink technology is one of the energy efficient methods when compared to displays or projectors. The current only flows through the cell during the changing phase. Generative design process was implemented to reflect the traits on the vehicle and the results vary with respect to light and shadow; the generative design algorithms make it formable and flexible to get it similar to a paper; the entire body is guaranteed to produce uniform trans-phases. It is expected to be remained as a testing model, since further studies are currently undergoing. But still, they have a dream to release it in the market.

“NIQR Activities of this Quarter”



Ayudha Puja celebrations
at NIQR Office on 14th Oct 2021



Presidential address by
Shri. M V Ramesh Babu,
President, CODISSIA, Coimbatore
on 23.10.21 during Guest Lecture



Guest Lecture by
Shri. Syed Shorub Jainaladeen,
AGM-Central Quality,
Ashok Leyland, on 23.10.21 on
“VEHICLE RECALL POLICY IN INDIA”
under Central Motor Vehicle Rules (CMVR)”



NIQR Monthly Program on PIP- WPM (Productivity Improvement Program Through Workplace management) by Mr S Murugan, Vice Chairman, NIQR Chennai Branch on 30.10.21 at National Productivity Council, Ambattur.

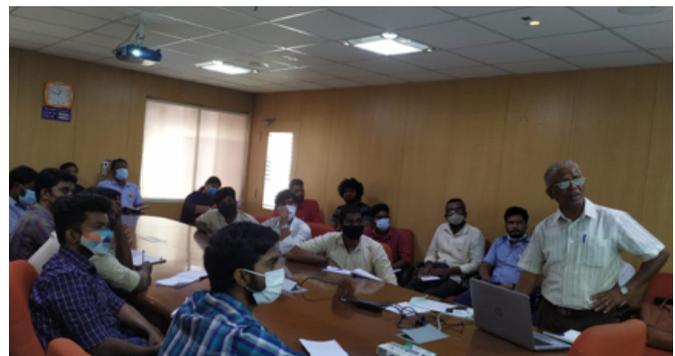
Shri. Ln. Dr. VSV. Verchezian,
Secretary, welcomed the participants.

This was followed by Presidential Address delivered by **Mr. P.T. Bharani Perumal, Chairman, Chennai Branch.**

The entire program was highly interactive and informative for all the participants.

The Speaker and Secretary issued a Certificate of Participation to all the participants.

The participants feedback on the program was very positive.



Monthly Program by **Shri. D Rathnasabhpathy, ECM,** NIQR Chennai Branch on 24.12.21 On “Awareness on Basic 7 QC Tools” at NIQR Conference Hall. The whole session was highly informative and interactive. Participants informed that knowledge of the tools imparted through the training will be helpful in their working environment. NIQR issued a “Certificate of Participation” to all the participants



NIQR members gathering at School Program

Program on “School Student Chapter Program Innovative ideas, & Team Work”,

at Govt. Boys’ High School, Mogappair West on 18.12.21 (55 Students) Our Chairman Mr.B.T.Bharani Perumal Felicited the School Head Master **Mr. D.Vijaya Kumar** by a Memento as a token of love. The School also honoured all our NIQR Chennai Team with Plant Samplings by representing the green environment.

Speaker Mr. S. Raja educated the students passionately on topics like Small kaizens, Team Work (How to be in team), Reduce, Reuse and Recycle, Problem Solving Technique and Innovative ideas for Small Projects Which was highly informative to the students. The Whole Session was Interactive and mind blowing. NIQR Awarded the Students who are more interactive.



Creativity makes you proud”

R.Srinivasan, Former Chairman , NIQR Chennai Branch Management Advisor



Creativity involves breaking out of established patterns, in order to look at things in a different way - Edward De Bono.

Edward Charles Francis Publius de Bono was a Maltese physician, psychologist, author, inventor, philosopher, and consultant. He originated the term lateral thinking, wrote the book Six Thinking Hats, and was a proponent of the teaching of thinking as a subject in schools. You and your team members can learn how to separate thinking into six clear functions and roles. Each thinking role is identified with a coloured symbolic “thinking hat.” By mentally wearing and switching “hats,” you can easily focus or redirect thoughts, the conversation, or the meeting.

The White Hat calls for information known or needed. “The facts, just the facts.”

- The Yellow Hat symbolizes brightness and optimism. Under this hat you explore the positives and probe for value and benefit.
- Risks, difficulties, Problems – The risk management Hat, probably the most powerful Hat; a problem however if overused; spot difficulties where things might go wrong, why something may not work, inherently an action hat with the intent to point out issues of risk with intent to overcome them.
- The Red Hat signifies feelings, hunches and intuition. When using this hat, you can express emotions and feelings and share fears, likes, dislikes, loves, and hates.
- The Green Hat focuses on creativity; the possibilities, alternatives, and new ideas. It’s an opportunity to express new concepts and new perceptions.
- The Blue Hat is used to manage the thinking process. It’s the control mechanism that ensures the Six Thinking Hats guidelines are observed.

Remarkable achievements have been made by corporates of the world after embracing the successful model of Six Thinking Hats. Creativity has no boundaries nor human limitations. Creativity has a strong root since very olden days. That is why you see the constant improvement in all walks of life be it Agriculture, Engineering, Automotive, Health care and education etc.. Individual creativity is the use of one's mind to generate something original. This is in contrast to team creativity where a group of individuals work together to improve inventiveness. In a company, group creativity often occurs through brainstorming sessions, meetings, or collaborative projects. At the same time, individual creativity can occur when employees are allowed, or encouraged, to find time and space for themselves to contemplate imaginatively on their own.

Benefits of Individual Creativity : There are actually numerous benefits to individual creativity. If your company policy clearly allows for employees to be individually creative, you'll likely increase an employee's energy and motivation to be inventive. After all, who doesn't like coming up with revolutionary ideas?

Enthusiasm and Involvement : Since the employee knows the company values individual creativity, they'll likely become more enthusiastic about their work and more involved in the company's success as well. But this kind of creativity cannot thrive unless you allow for an employee to have the time and space, they need to be creative. By giving them these assets, employees will be able to more quickly and easily solve problems in creative ways, increasing the productivity as the result. One more highly satisfying outcome is the reduction of stress and self esteem boost. This makes you proud and your team gets elated.

Are we ready to devote some portion of our weekly time for focusing on creativity which has been ingrained in our society? It is not about how creative you are may be small or big, but with the commitment how high was your elevation, self esteem and happiness. Thus, **Creativity makes you Proud.**

“A WAY TO ACHIEVE A DREAM EV”

Mr A.SUGANESHWAR, EEE II year, Meenakshi Sundararajan Engineering College

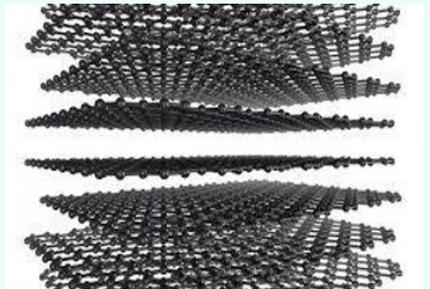


Hello my dear technical enthusiasts, this is my very first article in our legendary newsletter of NIQR. I feel so blissful to meet you guys through my words on your screen. Now, without making further delay and wasting space in the page, let's explore the technological world, Here let's go!!



Have you ever tasted rasam, how tasty it is? you know guys? what if someone from somewhere says that they are going to generate and store energy from tamarind shell what will you think...its tastes sour as tamarind to mind right? But it's sweet truth, yes guys technical enthusiasts from “Nan yang technological University” Singapore has found a way to convert it as an energy source. Guys imagine that our future transportation going to be sweet from the sour fruit's shell. In that you're going to your own company, your office, your sweet home and making your moves in that, yeah, I am saying to imagine a vehicle for future which is going to be run by tamarind shells, okay let's stop imagining, the upcoming words are waiting for your eyesight, lets see and exclaim further.

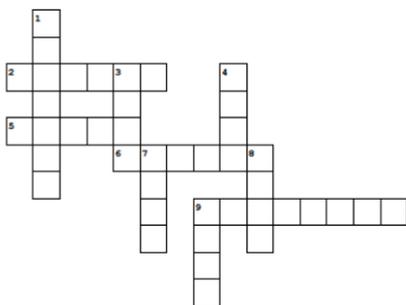
The great challenge in electric vehicles is battery management system. Even though the usual batteries like lead acid, lithium ion, lithium polymer batteries are okay to run a vehicle but they are having numerous disadvantages like low battery life, low energy density, high cost, weight, energy holding capacity. To overcome those problems graphene battery technology comes into picture. Graphene is a good conductor of heat and electricity and they are having high energy density due to carbon and Nano particles present in it, cost efficient, instant chargeable, less weight, it has improved battery life cycle of fifty times than the lithium-ion batteries. This makes graphene superior to lithium-ion batteries. since it is carbon-based energy storage device, to manufacture the carbon nano sheets the enthusiasts found a green way to make future brighter. “Tamarind shells” are rich in carbon. By extracting it we can use it to make carbon Nano sheets. They are aiming to achieve an eco-friendly alternative for industrially produced particles and to stop waste at same time which are usually disposed as agricultural waste. After a comparison they came to know that the performance of the tamarind shell carbon Nano sheets was comparable to the industrially made one in terms of porous structure and electrochemical properties. To manufacture the Nano sheets, they handled the steps follows:



1. Washed tamarind shells are dried at 100°C for around six hours before grinding them into powder.
2. The ground powder is baked in a furnace for 150 minutes at 700-900°C in absence of oxygen to convert them into ultrathin sheets of carbon called carbon nanosheets.

The secret behind their energy storing capacity lies in their porous structure leading to large surface area which help the material to store large number of electric charges. The tamarind shell carbon Nano sheets also showed good thermal stability and electric conductivity, this proves that they are good options for energy storage. The team of enthusiasts presently working on reducing the energy needed for production process and making it more environmentally friendly and they are also working to improve electrochemical properties of tamarind shell Nano sheets further. India is the largest tamarind manufacturing country that means tamarind shells too. On present world solving the challenges has become big challenge. Let's get inspired from the nature and solve more challenges to make the future brighter to brightest. My ears are always open for your valuable words for my wellness and constructive suggestions. I feel so contented guys. “Time is gold” so I am thankful for your gold. bye take care.

Food for the Thought



Food for Thought - “PUZZLE TO SOLVE”

- Across**
2. What everyone looks for in a factory
 5. Used to measure deviation statistically
 6. Guidelines for Operation / Service
 9. Any deviation is measured from this

- Down**
1. It is not added to the product but built into it
 3. Always more than the contributions of sum of individuals
 4. Method to enumerate possible failures
 7. Building blocks of elements
 8. Denote fitness for a factory too
 9. Not symmetrical in shape

Mr V RAGHAVAN, National Treasurer NIQR

The great semiconductor shortage How industries are responding to the crisis”

Mr Sooraj. S, 4th Year

Department of Mechanical Engineering, Meenakshi Sundararajan Engineering College



The automotive industry is seeing a shortage of semiconductors globally. Semiconductors enable most of the vital innovation in vehicle development. They are key elements in heads-up displays, autonomous driving aids, sensors, cell phone and communication integration. The demand has also grown with the rise in vehicle electrification. But what is the reason for this shortage?

The start of COVID - 19 pandemic saw a surge in the purchase of electronic devices and a fall in the purchase of automotive. Hence the semiconductor industry remained unaffected unlike others. However, when the automotive sector began to pick up in later stages of the pandemic, the semiconductor suppliers found it difficult to cater to the needs as they turned to clients from other sectors. Supplying semiconductors for electronic gadget manufacturers is also a more profitable deal. This has sent ripples across the automotive supply chain. Automotive manufacturers like Toyota, Volkswagen and Volvo are finding it difficult to get hold of semiconductors now that sales are reviving up after the lockdowns. Toyota cut its production forecast for FY2022 by nearly 3,00,000 units due to this chip crisis. However, this has helped the industries to re-strategize and has proven to be a learning opportunity. Automotive manufacturers have become inventive/creative to tackle this unprecedented crisis

Information sharing is key to supply chain success & lack of transparency may create a bullwhip effect resulting in inaccurate forecasts and ultimately over or under production. Mercedes Benz has set up a direct line of communication with all chip suppliers to avoid information distortion.

Volkswagen has come up with a low bill of material solution. They have modified their automotive software such that its architecture uses fewer semiconductors with the same functionality.

Daimler relies on new designs for control units. Rather than using one specific chip, these are designed to work with an alternative (less scarce) chip.

Meanwhile, General motors has partnered with global giants like Qualcomm to develop a microcontroller that will combine the functionalities of individual ones unlike earlier ones.

BMW is using delayed differentiation strategy to tackle the shortage. The entire vehicle is built except for a missing part, and can then be completed easily when it shows up.



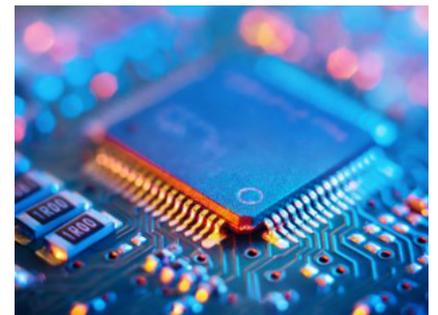
Ford decided to become self-reliant in semiconductors and steps into the chip business to develop chips in-house. A similar decision has been taken by Tata Motors too.

Stellantis is working on semiconductor standardization rather than using distinct chips for different vehicle models.

Renault and Nissan stopped the production of high-end variants and cut down the features to battle the crisis.

However, Tesla remained unaffected even during this crisis. In fact, it delivered nearly 100% more cars when compared to 2020. Tesla's customers generally belong to the elite class who buy cars as a status symbol. Hence, their sales weren't down during the pandemic. Tesla continued to receive supplies even during the pandemic. Hence, they didn't get short of semiconductor supplies. Tesla also manufactures many components in-house. Also, the vehicle's infrastructure uses a consolidated chip setup and the engineering team at Tesla re-programmed their software such that they can work with any hardware setup. Hence the supply chain of Tesla remained robust throughout.

Taiwan is the global supplier of semiconductors. The manufacturing of semiconductors requires high technology equipment, huge investments and continuous supply of resources like water and electricity and is indeed an expensive affair. This is the reason why India is not a forerunner in semiconductor manufacturing. However, having said this, government is now incentivising global chip manufacturers to bring them to India to rejuvenate the manufacturing industry. In December 2021, Government approved Rs.76,000 crore scheme to boost semiconductor manufacturing within India. Thus, there is no doubt that nearness to semiconductor suppliers would be a key factor while setting up new industries in the future.



National Institution for Quality & Reliability

Chennai Branch

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