



Government of India
Ministry of Chemicals & Fertilizers
Department of Chemicals & Petrochemicals



4th

National Awards for
TECHNOLOGY INNOVATION

in

Petrochemicals & Downstream Plastics Processing Industry 2013-14

Thursday, July 17, 2014

Manekshaw Centre, New Delhi.



Shri Ananth Kumar

Hon'ble Minister for Chemicals and Fertilizers,
Government of India
New Delhi-110 001



1. Research and Development play a very critical role in sustaining growth, improving quality and enabling the industry to remain competitive in order to meet the global challenges. I am glad to learn that department of Chemicals and Petrochemicals has institutionalized a scheme for National Awards for Technology Innovation in Petrochemicals and downstream Plastic Processing Industry to incentivize meritorious innovations and inventions in the field of polymeric materials, products, processes and other areas of national and social importance.
2. The Petrochemicals sector is a key sector of the global and Indian economy. The polymeric applications have penetrated in all walks of life including various manufacturing sectors for conservation of natural resources and energy efficiency etc. Continued emphasis on innovation is essential as it will lead to efficient energy consumption, better plastic waste management, increase in product life cycle, development of new products, quality standards, recycling and other emerging areas. This will go a long way in stimulating and sustaining growth.
3. I take this opportunity to compliment the awardees for their meritorious innovations. I also congratulate the team members from the Department, Central Institute of Plastic Engineering & Technology and the Expert Panel who played significant role in the selection process.
4. I look forward to higher level of participation in the coming years and hope that it will create a movement for innovation.

(Ananth Kumar)



Shri Nihal Chand

Minister of State Chemicals & Fertilizers
Government of India
New Delhi-110 001



1. It is heartening to note that recognizing the importance of innovation for the petrochemical sector, Department of Chemicals and Petrochemicals, Government of India is implementing a scheme "National Awards for Technology Innovation in Petrochemicals and Downstream Plastic Processing Industry". This scheme aims at motivating inventors to carry out innovative Research & Development in the areas of petrochemicals industry, which in turn will improve performance and quality of the existing products.
2. I am happy to know that the scheme received tremendous response from the industry, institutions and individuals in its last three editions since 2010-11 and an award function is being organized on July 17, 2014 at New Delhi to felicitate the awardees of the fourth National Award 2013-14. Technological innovation is important not only for driving growth, enabling industry to meet global challenges and remain competitive but also for addressing public apprehensions about the adverse impact of plastics on environment and health.
3. The contribution towards the development of newer technologies in the field of polymers are to be encourage and I hope that National Awards scheme would inspire and motivate the young innovators, scientist and professionals to excel in this vibrant field.
4. My heartiest congratulations to all the awardees and their families. I wish them all the best in their pursuit of excellence and hope that there innovation, enthusiasm and dedication will inspire others to work in this direction.

(NIHAL CHAND)



Shri Indrajit Pal, I.A.S.

Secretary to the Govt. of India
Department of Chemicals & Petrochemicals
Ministry of Chemicals & Fertilizers
Shastri Bhavan
New Delhi - 110 001.

1. Plastics play a very important role in all walks of human life. It is now well understood that development of plastics has a strong correlation with economic growth. Research is aimed at developing new materials with properties that meet stringent quality aspects, engineering challenges and delivery of products at globally competitive prices, using eco-friendly processes and technologies.
2. The Department of Chemicals & Petrochemicals presents the 'National Awards for Technology Innovation in Petrochemicals and Downstream Plastic Processing Industry' with the objective of honouring innovations. I am happy to state that the fourth National Awards function will be held on 17th July, 2014 at New Delhi.
3. The innovations receiving awards are focused on minimising environmental impact, reducing wastage and tailoring polymers to the desired end use performance. This is an exciting time for polymers as they are finding applications in infrastructure, automobile, power, electronics, telecommunications, healthcare, textiles, agriculture, etc.
4. I congratulate the awardees for their meritorious innovations. I also compliment the team members from the Department, Central Institute of Plastic Engineering and Technology and the Experts, who have made possible this memorable event.

(INDRAJIT PAL)



Shri Avinash Joshi, IAS

Joint Secretary

Department of Chemicals & Petrochemicals

Ministry of Chemicals & Fertilizers

Shastri Bhavan

New Delhi - 110 001.

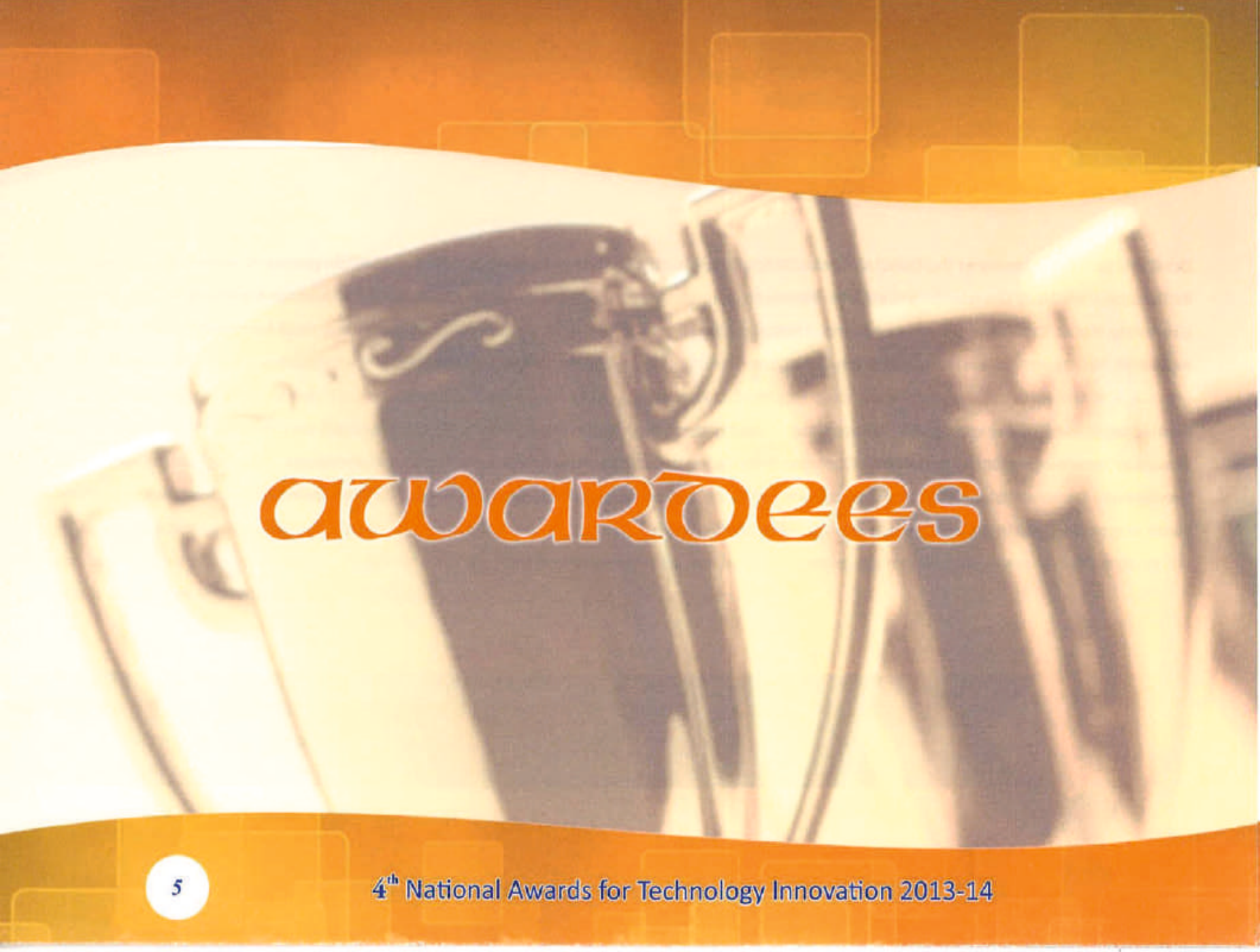


The Government of India has instituted National Awards for rewarding outstanding professionals in the field of petrochemicals and downstream plastics processing industries. Within three years of their introduction, National Awards for Technology Innovation has achieved iconic stature among professionals and researchers working in Industries and R&D Institutions.

The Fourth National Awards for Technology Innovation will also certainly bring out the most outstanding usage of technology to achieve excellence in performance through innovation in the various fields of Petrochemicals .I commend the Central Institute of Plastics Engineering &Technology (CIPET) for successfully executing the 2013-14 edition of the National Awards for Technology Innovation.

My hearty congratulations go to all the awardees. I wish them all the best in their pursuit of excellence and hope that their innovation, enthusiasm and dedication will inspire others in the field of innovation.

(AVINASH JOSHI)



awardees



Dr. Rabindranath Jana

HALDIA INSTITUTE OF TECHNOLOGY

ICARE Complex, Haldia - 721657

West Bengal



Dr. R. N. Jana is a faculty in the Dept. of Chemical Engineering, Haldia Institute of Technology, since 2010. He has 4 years post-doc research experience from Next Generation Solar Cells Research Centre, Konkuk University, South Korea; **Artificial Muscle Research Centre, Konkuk University, South Korea** and Centre for Advanced Materials, Tuskegee University, USA. He has also 10 years industrial experience. He has published more than 70 research papers in reputed international journals and conferences and completed several research projects.

He has organized several international and national conferences as the convener e.g., International Conference on Nanotechnology (ICNT 2013), Emerging Technologies for Safety and Risk Control in Process Industries, Theory and Practice of Separation Processes Including Modern Techniques, Polymer and Composites as Material of Construction in Chemical Process Industries, etc. His research area includes Organic Photovoltaic, Polymer Nanocomposites, Liquid Crystal Polymers, Fuel Cell Membranes, etc.



There is an increasing interest on the cholesteric liquid crystal polymers due to their attractive optical properties. They find wide applications in different areas e.g., non absorbing optical filters, circular polarisers or colour optical memory devices. The cholesteric liquid crystal polymers should have the chiral mesogenic groups either as a side chain pendant, or as the main-chain. Side-chain liquid crystalline elastomers have been widely studied over the past two decades because of their thermo mechanical properties that include large strain reversible actuation and soft elasticity. The thermally stimulated actuation behaviour is explained by a coupling between liquid crystalline order and rubber elasticity resulting from the underlying cross-linked structure. However, the main-chain liquid crystalline polymers, due to their high transition temperatures and processing difficulties, they have not received adequate attention.

The current innovation deals with the "**Development of Liquid Crystal Polymers for Actuator Applications**". Here a series of polyurethane (PU) based side-chain liquid crystal polymers (LCPs) with variable clearing temperatures was synthesized. It was found that the deformed structure was released slowly and the original flat rectangular shape was recovered within 25s. The LCPs were proposed to be a good actuator, as the shape memory recovery was excellent.

Shri Rabindranath Jana is the WINNER of National Awards 2013-14 under the individual Category of
"INNOVATION IN POLYMERIC MATERIAL"





Dr. Raksh Vir Jasra

Head, R&D Centre

M/s RELIANCE INDUSTRIES LIMITED

3rd floor, Maker Chambers IV
222 Nariman Point, Mumbai



Reliance Industries Limited (RIL) is India's largest private sector company with a turnover of US\$ 66.4 billion, cash profit of US\$ 7.1 billion, net profit of (US\$ 3.9 billion, and exports of \$ 44.1 billion. RIL is the first private sector company from India to feature in Fortune's Global 500 list of 'World's Largest Corporations'. RIL's business is integrated from Textiles to Fibre, Polymers and Crude Oil.

RIL is the first private sector company from India to feature in Fortune's Global 500 list of "World's largest Corporation's and World's Top 100 companies, ranking 99th in terms of revenues and 130th in terms of profits in 2012. RIL ranks 68th in the financial Times 'FT Global 500 list of the world's largest companies. RIL is ranked amongst the '50 Most Innovative Companies-210' in the World in a survey conducted by the US financial publication-Business Week in collaboration with the Boston Consulting Group (BCG). In 2010, BCG also ranked RIL as the second highest "Sustainable Value Creators' for creating the most shareholder value over the decade in the world.

Dr. Raksh Vir Jasra, FNAE, PhD from IIT, Delhi has research experience of 33 years in area of chemicals and petrochemicals. He joined Reliance in 2008 as Head of Research & Development Centre, Vadodara which is focused on Petrochemicals research.



There is serious concern faced globally through terrorism, border disputes and civil defense in the recent years. Therefore, paramilitary force, police or armed forces need to be better equipped with anti-ballistic apparel such as bullet proof vests, helmets and related safety gear. The materials suitable for these protective appliances require high strength-to-weight ratios, high modulus and impact resistance. It should also be able to survive for extended periods of time in harsh atmospheric environments.

UHMWPE (ultrahigh molecular weight polyethylene) due its high impact strength, chemical resistance, heat resistance and shelf life has emerged as a superior material designed to manufacture lightweight and flexible body armour used globally. Reliance Industries Limited (RIL) has taken the lead in producing this special polymer by developing a patented technology starting from catalyst to final product. RIL has developed the capability and technology through the innovation of a catalyst which polymerizes ethylene to give UHMWPE having molecular weight ranging from 3-10 million. The polymer has the desired properties to produce high tenacity fibers suitable for defense applications.

M/s Reliance Industries Limited is the WINNER of National Awards 2013-14 under the Industry Category of "INNOVATION IN POLYMERIC MATERIAL"





Shri Vivek Mehta

Senior Manager (PADC)

M/s INDIAN OIL CORPORATION LTD.

Product Application & Development Center (PADC)
Near Panipat Naphtha Cracker Complex, Vill – Baljattan,
Panipat – 132 140



IndianOil Corporation Ltd., Indian Oil Corporation Ltd. is premier energy company of India with core activities of Hydro Carbon refining. IndianOil is the 18th largest Petroleum Company in the World and ranked at 88th position in Global Fortune 500 listing during the year 2013. Their product portfolio comprise of production and marketing of petroleum products such as Diesel, Petrol (Gasoline), LPG, Kerosene etc and petrochemicals such as LAB, PTA, Polymers, Glycols etc. They are also into Biofuels, Oil Exploration & Production and gas marketing. With keen interest into Petrochemical business they are progressively expanding their petrochemicals production capacity and product basket.

Mr. Vivek Mehta Senior Manager (PADC) and associated with Business Development (Petrochemicals group of IndianOil), is a Team leader of PADC group at IndianOil Corporation Ltd., Panipat

Product Application & Development Centre (PADC) is state-of-art application development laboratory & technological support facility of Indian Oil Corporation Limited which has been set-up for IOCL's Business Development Group to support IndianOil's ambitious polymer business. PADC acts as an interface between Polymer plants, Marketing & Customers. PADC has been recognized as an In-house R & D unit by DSIR, Govt. of India.



Homopolymer Polypropylene (Homo-PP) is widely used in various Injection molding application. Major Injection molding applications for Homo PP includes house wares, food containers, caps & closures and furniture. Aim was to develop a PP grade which will differentiate itself compared to any competitive product in domestic market and offer superior technical properties as well as processability. With the above objective, a new high performance PP grade 111OMAS was developed in-house at PADC & launched commercially in the market. Compared to conventional grades in the market, 111OMAS grade offer higher stiffness & higher impact strength, higher productivity upto 18% at processor's end, superior optical properties and better product aesthetics.

For any injection molding applications, higher stiffness is always desirable as its gives better rigidity to the product. But normally, increase in stiffness is associated with drop in impact strength (brittleness). Another key attribute desired in injection molded articles is superior aesthetics as it improves shelf appeal of the end product. Most difficult challenge was to develop such a high performance grade without significant cost increase as any significant increase in cost during manufacturing stage would led to passing on this cost in form of price increase which would have defeated the purpose due to competitive market. Indian Oil could successfully develop a high performance grade 111OMAS in a very cost effective manner so that customers could reap the benefits of this high performance without any additional price increase. Infact, with 111OMAS, customers could realise the benefit of higher productivity and reduction in operation cost (energy consumption) besides superior product properties.

Compared to equivalent grades from co-producers, High Performance grade 111OMAS offers following benefits Higher productivity upto 18%.

- Higher stiffness showing flexural modulus of 1800 MPa compared to ~1400 Mpa for competing conventional grades.
- Better impact strength and superior product aesthetics (good dimensional stability & reduced warpage, gloss.
- All these benefits at no extra cost (selling price of higher performance grade 111OMAS is comparable to competitor's conventional grade)

M/s Indian Oil Corporation Ltd. is the RUNNER-UP of National Awards 2013-14 under the Industry Category of "INNOVATION IN POLYMERIC MATERIAL"





Shri Trebhuwan Singh Raman

SHIA P.G. COLLEGE,
Lucknow



Shri Trebhuwan Singh Raman is an innovative, hardworking, tender heart, sincere and creative person who creates his own dreams and try to fulfill them. He is 41 years young dynamic energetic and having 16 years experience in the filled of Medical Healthcare and Environmental Science. He is a versatile inventor and he has invented eight inventions till now. He is simple Science graduate from the Shia P.G. College Lucknow University Lucknow. Presently living in Jaipur and he is doing his work individually. He has done amazing work and he has been granted three patents from the Govt. of India. He has invented very new and useful products in the filled of medical science. The products and devices which are developed by the Innovator are related with the plastic or concerned with plastic engineering and technologies. His unique invention named **"An Improved Oropharyngeal Airway"** is mentioned here which is very revolutionary product and it has a very important role in filled of Medical Science. His praiseworthy work time to time published in patent journal and National News Papers.



The Improved Oropharyngeal Airway is related with the field of Medical Healthcare Science which is very commonly used in Hospitals and Clinics. This Improved Oropharyngeal Airway completely new in its design and technology, which is first time invented in the field of Medical Science in its kind. By this new Improved Oropharyngeal Airway, all problems will remove which were got acquired to the patients by the conventional airways. It has three suction holes and good shape of structure. It will make suction easy. After using it, there will be no need of leucoplast or adhesive (like micropore) to fix on the body of patients. To make it more comfortable, Velcro is used. Patient will not be able to remove this airway despite of his willingness.

This airway have very important role in the field of cure. It has not any kind of side effects. This Improved Oropharyngeal Airway is used in the serious type of patients to keep their jaws open, and for cleaning any type of dirt present in the mouth. In addition, it can be used, if required for Ryle's Tube, endotracheal Tube and nebulisation. Improved Oropharyngeal Airway has been made using new design and technology, because of which it is very useful and easy to use. By its use, the patient's mouth can be cleaned easily and use of slots on two corners for attaching Velcro's (Fastening Arrangement) This airway is also known as oral airway are Guedel airway in the field of Medical Science.

Shri Trebhuwan Singh Raman is the JOINT WINNER of National Awards 2013-14 under the Individual Category of "INNOVATION IN POLYMERIC PRODUCTS"





Shri Rishi Baid

POLY MEDICURE LTD.

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Industrial area Ballabgarh (Faridabad)



M/s. Poly Medicure Ltd. is a leading manufacturer of high quality of medical disposable products in different range like Infusion Therapy, Central Venous Access Catheters, Anaesthesia, Urology, Gastroenterology, Blood Management, Surgery & Wound Drainage, Dialysis etc. Polymed is an ISO 9001:2008, 13485:2003 certified Company and having its Plants in India, China & Egypt.

Shri Rishi Baid is a Post-Graduate in Engineering Stream from West Virginia Univertisy – USA and currently managing the operations and Technology asepts of Polymed. He is having a good knowledge of Intellectual Property Law in India. Shri Rishi Baid was awarded for National Award – 2011 (Research & Development, from Government of India, Ministry of Micro, Small & Medium Enterprises), Silver Patent Award 2009-10, 2010-11 & 2011-12 for having maximum Patents outside India and Gold Award 2010-11 for maximum export in medical devices by Pharmexcil.

Within 15 years, Polymed has become one of the Top Medical Devices Manufacturing companies in India and exporting more than 100 Medical disposable devices to more than 80 countries. It has a special focus on Research and Development and has developed a team of more than 30 dedicated Engineers who are today involved in developing new products with innovative features which will give a huge competitive advantage to the company in the coming years. Polymed's next three years target is to become No.1 manufacturer & exporter of medical devices in India.

The Main Products are Safety IV. Cannula, IV.Cannula, Blood Bags, IV.Sets, B.T. Sets, 3 way Stop Cocks, Catheters, Infant Feeding Tubes, Urine Bags, Flow Regulators, CVC Catheters, Burette sets, Spinal needles and Fistula Needles etc.



4th National Awards for Technology Innovation 2013-14

Polysafety IV Cannula: - Needle stick Injuries (NSI) are very common and can be a threat to Health Care workers blood borne diseases can be transmitted e.g. Hepatitis B, Hepatitis C, HIV and many more. NSIs are even prevalent in countries like USA & UK e.g. in USA there is an estimated hospital bed strength of 1 million beds and approximately 0.6 to 0.8 million NSIs occur annually and almost similar is the case with UK.

Finding a vein during cannulation is a big challenge for the user and especially when it has to be used in patients like pediatrics, geriatrics and patients undergoing chemotherapy, as in all such cases veins are thin. An IV Cannula offers Quick Flash Back is a boon to the Medical Fraternity. The Polymed Safety Device is a passive activation device & does not need separate user intervention to activate the safety mechanism. This feature makes the Polymed Safety IV Cannula a user friendly device

Shri. Rishi Baid is the JOINT WINNER of National Awards 2013-14 under the Individual Category of "INNOVATION IN POLYMERIC PRODUCTS"





Shri Shrikanth Sarda

Managing Director

M/s VALTREE GLOBAL ASSOCIATE

1-10-317, Bata building, 2nd Floor,
Bowelpally, Secundrabad -500 011



Valtree Global Associate, a part of Valtree Group of Companies and an ISO 9001-2008 certified entity, is into manufacturing of High Quality Valves for various applications including HVAC, Industrial, Water, Fire, Gas, etc., to name a few. We aim at being a Global Leader in supplying World Class Valves with Innovative features and Solutions to major global corporate and clients for their Prestigious Construction Projects Worldwide.

Our products include Eco friendly-Energy efficient Preinsulated : Butterfly Valves, Balancing Valves, Dual Plate Check Valves, Wafer Check Valves, Ball Type NRVs, Y-Strainers (WYE Type Strainers), Pot Strainers. Also in the product range are, Gate/Sluice Valves, Non Return Valve (Reflux Valve), Double Air Valves, Single Air Valves, Ball Valves (with and without Strainer) and Industrial Castings presently.

Shri Shrikanth Sarda, has exceptional interpersonal and managerial skills, and is instrumental in transforming the vision of the **Valtree Group** into reality. A hardcore professional with a keen focus on Innovation, he is responsible for successful invention of most awaited world class “**Pre Insulated Technology of Preinsulation on Valves & Strainers**” for the first time across Globe and which is Patented Worldwide by him. He plays an instrumental role in business development strategies of the organization that makes **Valtree Global Associates** and out in today's competitive environment. His efforts have resulted in creating a Corporate Entity that is developing various new products of International Standards for the benefit of Industry.



4th National Awards for Technology Innovation 2013-14

Valtree Preinsulated Valves & Strainers comes with factory preinsulated technology and in a ready to fix solution. Generally as insulation plays an important role in HVAC&R, we have found a solution which avoids existing problems. This insulation comes exactly on the surfaces of the valve metal body unlike conventional system where insulation is done after the bolting and not on the valves surface first, which creates huge air gaps and henceforth formation of condensation leading to corrosion.

Valtree preinsulation valves & strainers stands over and above any on site insulated valves & strainers by reduction in capital investment to end user by eliminating additional activities like procurement & installation of "valve/strainers + labour + insulation material + cladding + material wastages + time" at site.

It avoids corrosion related problems & adds lot of "Value for Money" to the investors. Moreover, it enhances India's competitiveness, since this technological advancement has happened in India for the first time by us. Naturally the cost, availability, serviceability and adaptability shall always be an advantage to local, national, international end user with respect to capital, maintenance & energy costs, life cycle performance as well when compared with any other available alternatives.

M/s Valtree Global Associate is the WINNER of National Awards 2013-14 under the Industry Category of "INNOVATION IN POLYMERIC PRODUCTS"





Dr. R.K. Malhotra

Director, R&D

M/s INDIAN OIL CORPORATION LTD.

R&D Centre, Sector-13

Faridabad – 121 007, Haryana, India



IndianOil Research & Development Centre was started at Faridabad in 1972 with the primary objective of carrying out R&D in lubricants for import substitution. Subsequently, research activities in refining technology and emissions research area were initiated in 1984-85. Around 1995, in order to expand R&D activities, initiative related to technology scale up, setting up of pilot plants and bioremediation activities were taken up. In 2003, renewed emphasis was laid on commercialization of refining technologies, catalysts development, demonstration plants, research in first generation bio fuels etc.

In its Golden Jubilee year of 2009, the company redrew its vision statement for emerging as the "Energy of India" and being a globally admired energy company having thrust on environment, technology and innovation in all its actions and business. Thus, today, Indian Oil Corporation Limited lays great emphasis on harnessing frontier technologies through its world class R&D centre located at Faridabad, Haryana. IndianOil has ventured into some of the promising Alternative & Renewable Energy areas such as biofuels & bio-energy, wind energy, solar energy, etc.

IOC-R&D Centre has drawn up a comprehensive Master-plan for "R&D in Solar Energy" which is synergistic with IOC's existing & future path of progression with clearly defined goals and objectives in areas of Solar Hydrogen, Solar Thermal & Solar Photovoltaics, revolving around three-pronged R&D approach of infrastructure creation & expertise development; product development & technology evaluation; and basic research.



The **Solar-LED-Light** has been innovatively designed as a green and environment friendly product having an aesthetic & utilitarian shape that would appeal to urban as well as rural consumers providing value for money. The USP of the design is 5-in-1 application features wherein the same product can be used as Solar Room Lamp, Solar Portable Lantern, Solar Bulb, Solar Torch and Solar Mobile Charging Device. Most solar powered devices in the market can be used in not more than 3 of the above described ways.

The light from the product emanates in 540° direction owing to the light diffuser design having a convex top portion diverging light like a torch. High quality LEDs having lower wattage but more light output and efficient PCB results into longer & better operational duty time per complete recharge. The high diffusion efficiency of diffuser has been achieved by careful design of diffuser geometry as well as extensive trials of different diffuser materials with respect to mold surface finish. The product has a sturdy body and efficient electronics & electrical components resulting into long operational and service life.

The **Multi Utility Solar-LED-Light** has received the "Innovative Energy Saving Product" from CII in its prestigious 14th National Award for Excellence in Energy Management – 2013. IOC is now in the process of commercializing the **Solar-LED-Light** through its vast retail network of marketing touch points situated throughout the length & breadth of the country and abroad.

Indian Oil Corporation Ltd. is the RUNNER-UP of National Awards 2013-14 under the Industry Category of "INNOVATION IN POLYMERIC PRODUCTS"





Dr. Basudam Adhikari

INDIAN INSTITUTE OF TECHNOLOGY (KHARAGPUR)

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The Indian Institute of Technology Kharagpur is offering academic courses in multifarious knowledge domains including engineering, architecture, entrepreneurship, sciences, medical sciences, law, economics, humanities & social sciences. The graduates of the Institute have made great strides in the corporate world—domestic and global. The Institute is also actively engaged in sponsored research and has developed technologies in various fields, many of which are in commercial application.

Dr. Basudam Adhikari, a doctorate from University of Calcutta in polymer science, is a senior professor in the Materials Science Center, IIT Kharagpur. He is currently involved in developing natural fiber based composites, jute fiber reinforced cement concrete, conducting polymers in gas sensing, taste sensors, polymers in drug delivery, and other projects of social relevance. He has guided 28 Ph.D.s, published more than 150 scholarly papers in international journals, and filed 14 patents.

Dr. Koel Chaudhury is Associate Professor at the School of Medical Science & Technology, IIT Kharagpur. Her research areas include womans' health, infertility, natural antioxidant nanoparticles, proteomics and metabolomics in reproductive health. She has guided several Ph.D.s and published many scholarly papers.

Dr. Manoj Kumar Mondal, a Chemical Engineer and Ph. D. from IIT Kharagpur. He has filed more than a dozen patents and received gold medal for one of his innovations from Lockheed Martin through University of Texas at Austin and FICCI.

Shri Hirak Kumar Dey is a postgraduate working in the project as 'Job Assistant'. He also worked in several bio-polymer and bio-sensor projects.

Ms. Sridevi Avancha, a research scholar of Prof. B. Adhikari, has submitted thesis for award of Ph.D. from Materials Science Centre at IIT Kharagpur.

Ms. Manisha Sharma is a postgraduate in Biotechnology with a diploma in Bioinformatics. She is a scientific assistant in the project.

Shri Sumit Das is a research scholar at Kalyani University and pursuing his Ph.D. on bio-composite & is the Junior Project Officer in the project.



The present invention relates to manufacturing process of a superabsorbent polymer (SAP) bound on a natural polymer to be used in personal hygiene products such as diaper and sanitary napkin. It also relates to process technology for using jute (particularly waste or low quality jute) as an alternative absorbent fiber source in lieu of cotton or wood pulp used in traditional products.

The invention is related to detailed methodology for manufacturing both cellulosic fiber and the SAP and for placing them in traditionally available film or cloth to manufacture pads that can be used as diaper or napkin. Sanitary napkins have been produced using these materials in a commercial unit and distributed among women for their use. The users have expressed superior performance compared to other low cost products used by them.

The invention provides a cheaper and superior alternative to existing materials. Thus, the technology provides unique competitive advantages and sustainability to small manufacturers, while making such personal hygiene products affordable to rural poor. The technology is ready for commercialization.

Indian Institute of Technology is the WINNER of National Awards 2013-14 under the Academics and R & D Institution Category of "INNOVATION IN POLYMERIC PRODUCTS"





Laboratory for Advanced Research in
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Shri Bishnu Prasad Panda Dr. Smita Mohanty Prof. (Dr.) S. K. Nayak

LARPM is an exclusive R&D wing of Central Institute of Plastics Engineering & Technology (CIPET) in the field of Material Development and Characterization, equipped with state-of-art facilities and infrastructure, located at Bhubaneswar. LARPM was set-up in 2008 with an objective of developing high-end polymeric materials in the area of Polymer Blends and Alloys, Composites and Nanocomposites, Polymer Synthesis, Fuel Cells, E-waste Recycling and Biodegradable Polymers. LARPM has established its recognition in terms of high global citations through International Publications in Peer-Reviewed Journals, Patented Technologies, Textbooks, Industry-Academic Tie-Ups and Collaborative Research with Universities in India and abroad. The laboratory also handles several prestigious projects from different Govt. sponsoring agencies and industrial consultancy assignments.

Prof.(Dr.) S K Nayak holds the position of Director General, CIPET and Prof. & Chair of R&D wings of CIPET with 28 years of experience in Teaching and Research. He has several publications in peer-reviewed International Journals and Patented Technologies in the area of Advanced Polymeric Materials & Characterization. He has successfully completed many projects sponsored by Govt. agencies and industries. He has authored several Textbooks published under prominent publishers like Wiley, Springer, Tata McGraw Hill etc. He also acts as the Editor-in-Chief of International Journal of Plastics Technology (IJPT), co-published by M/s Springer.

Dr. Smita Mohanty is the Senior Scientist and In-charge of LARPM with more than 10 years of Research and Teaching experience. She has published ~100 papers in major International journals and has 05 Indian Patents to her credit. She has also initiated several advanced areas of research at LARPM, which includes burning topics like E-waste Recycling, Biopolymers from Natural Resources, Polymer Electrolytes etc. She has guided many Ph.D and M.Tech students working under regional universities. In the capacity of Investigator, she has successfully completed several sponsored projects and has authored many textbooks / chapters, published under renowned publishers.

Shri Bishnu P. Panda is working as Junior Scientist in LARPM, CIPET Bhubaneswar. He has 07 years of Teaching, Research and Industrial experience in the area of Polymeric Materials & Processing and has guided many M.Tech students in the area of Composites, Nanocomposites, Toughened Polymer Blends and Fracture Analysis. He has published 10 nos. of articles in various peer-reviewed International Journals.



INNOVATION OF POLYMER PROCESSING MACHINERY & EQUIPMENTS

"Development of Flat and Curved bottom FRP Liquid Helium Dewar
for SQUID based application including Magnetoencephalography (MEG)"

Shri Bishnu Prasad Panda, Dr. Smita Mohanty, Prof. (Dr.) S. K. Nayak

This innovation includes novel developmental approach for helmet dewars incorporating Superconducting Quantum Device (SQUID) based Magnetoencephalography (MEG) for the measurement of tiny magnetic fields. In the present invention, Carbon-fibre Reinforced Plastic (CFRP) based dewar set-up has been designed to maintain a low noise environment with minimized magnetic signals for optimum performance of SQUID sensors. Fabricated dewars were tested initially under liquid nitrogen for thermal expansion and strength under cryogenic environment. Excitation spectrum measurements in high pulsed magnetic fields of up to 50T revealed its suitability and applicability for MEG using SQUIDs. System noise of the component was possibly reduced to $\sim 5\text{fT}/\sqrt{\text{Hz}}$ with 30 - 40% increase in material strength and stiffness. Scaling up of such systems could significantly reduce the interference of magnetic and electric fields, thereby enhancing the sensitivity of SQUID magnetometers for clinical application.

Team-Shri Bishnu Prasad Panda, Dr. Smita Mohanty & Prof. (Dr.) S.K. Nayak of LARPM is the WINNER of National Awards 2013-14 under the Category of "INNOVATION OF POLYMER PROCESSING MACHINERY & EQUIPMENTS"





Shri Niranjn C. Dave

Head

M/s DAVE TECHNICAL SERVICES

Soni Compound, Churiwadi, Goregaon East,

Mumbai - 400 063

Dave Technical Services (DTS) founded in 1982 by Mr Niranjn Chunilal Dave, a young Entrepreneur from Baroda, Gujarat, are Manufacturers of Plastic Blow Moulding & Injection Moulding Machines, Moulds and Product Developments Based in Mumbai, India.

Shri N. C. Dave, an engineer by qualification has to his credit over 42 years of experience in field of Plastic Machines, products & material Processing. He started his career in early 70's as service engineer. PLASTIC was newly introduced then; so most of his learning on subject was through books, seminars and personal interaction with customers, industry people.

Shri Parag N. Dave, a second generation entrepreneur, who is a Science graduate, holds Diploma. Plastics Eng, Diploma MBA & Master degree in Marketing Management joined him in 2009 handling Marketing, Plastic Technical Handbook, assisting in Innovations and Machine manufacturing.

Apart from commercial activities, Mr. N. C. Dave from beginning had a vision of providing low cost - effective & efficient plastic machine in hands of Entrepreneurs to promote Industry Development and Self Employment in Rural-Urban areas of our country. Fulfilling his dream he has developed a wide range of Mini Models Blow and Injection Moulding Machines.

Dave Technical Services has been awarded **PLASTICON Awards** in 2005 in Winners category for developing compact, Fully Automatic yet easy operation, Single Phase (No Motor in Machine) Fully Pneumatic (operates on Air) Blow Moulding machine suitable for commercial production, training in colleges and adapted to run in rural areas too. DTS also Received **Recognition of Excellence** in the category of Machinery for Package Conversion, 2010 from IPMMI for Mini Blow and compact Injection Moulding Machines. Also, publishing **Plastic Technical Handbook** for plastic industry Entrepreneurs and students, since 1994.

DTS today enjoys good reputation in Indian and overseas markets with its ethical and honest business conduct & will strive to continue its innovations, offering quality machines and solutions to plastic & packaging industry.



Dave Technical Services developed new Blow Moulding Technology which offers for the first time in world Unique flexibility of producing 2 different products of different materials (polymers) having different shapes, size and thickness as required simultaneously at the same time on same machine.

The Patent Protected Blow Moulding machine model is specially developed keeping in mind the customer's requirement of low power consumption & smallest floor space utilization, providing efficiency, convenience and high productivity (profitability).

The machine is compact, fully AUTOMATIC, PNEUMATIC (No Motor in the machine) works on air pressure (compressor), operates on both Single / 3 phase power providing considerable power savings and can be installed in Rural areas too.

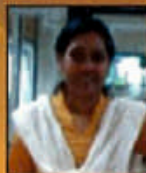
Machine is very simple to operate (eliminates high skilled operators & reduced man power requirements), can handle wide product range on it to cater to various industry requirements by just changing moulds on same set up and process polymers like LDPE, LLDPE, HDPE, Polypropylene, PS, HIPS, EVA, TPE others.

Ideal for fast production of small blow products offering smallest component by volume / weight (products starting from 0.2 ml and thickness as low as 0.2 mm). Option of Double Head on single or both stations for higher production output also available.

Few Applications: Bottles, bellows, toy parts, straws, tubes, float ball, droppers and pipettes, Tools handle, single dose packs for Liquids, Semi Solids and many others. Packaging application in pharmaceutical, cosmetic, medical, chemicals, oral care, Agrochemicals, veterinary products and others.

M/s Dave Technical Services is the WINNER of National Awards 2013-14 under the Industry Category of "INNOVATION OF POLYMER PROCESSING MACHINERY & EQUIPMENTS"





Dr. JANDAS P. J. Dr. SMITA MOHANTY PROF. (DR.) S. K. NAYAK

Laboratory for Advanced Research in Polymeric Materials (LARPM)

B/25, CNI Complex Patia Bhubaneswar - 751 024



LARPM is an exclusive R&D wing of Central Institute of Plastics Engineering & Technology (CIPET) in the field of Material Development and Characterization, equipped with state-of-art facilities and infrastructure, located at Bhubaneswar. LARPM was set-up in 2008 with an objective of developing high-end polymeric materials in the area of Polymer Blends and Alloys, Composites and Nanocomposites, Polymer Synthesis, Fuel Cells, E-waste Recycling and Biodegradable Polymers. LARPM has established its recognition in terms of high global citations through International Publications in Peer-Reviewed Journals, Patented Technologies, Textbooks, Industry-Academic Tie-Ups and Collaborative Research with Universities in India and abroad. The laboratory also handles several prestigious projects from different Govt. sponsoring agencies and industrial consultancy assignments.

Prof.(Dr.) S K Nayak holds the position of Director General, CIPET and Prof. & Chair of R&D wings of CIPET with 28 years of experience in Teaching and Research. He has several publications in peer-reviewed International Journals and Patented Technologies in the area of Advanced Polymeric Materials & Characterization. He has successfully completed many projects sponsored by Govt. agencies and industries. He has authored several Textbooks published under prominent publishers like Wiley, Springer, Tata McGraw Hill etc. He also acts as the Editor-in-Chief of International Journal of Plastics Technology (IJPT), co-published by M/s Springer.

Dr. Smita Mohanty is the Senior Scientist and In-charge of LARPM with more than 10 years of Research and Teaching experience. She has published ~100 papers in major International journals and has 05 Indian Patents to her credit. She has also initiated several advanced areas of research at LARPM, which includes burning topics like E-waste Recycling, Biopolymers from Natural Resources, Polymer Electrolytes etc. She has guided many Ph.D and M.Tech students working under regional universities. In the capacity of Investigator, she has successfully completed several sponsored projects and has authored many textbooks / chapters, published under renowned publishers.

Dr. Jandas P J is a Research Associate working at LARPM, CIPET Bhubaneswar. He was awarded Ph.D in Chemistry from Utkal University, Bhubaneswar in 2013. He has 10 nos. of International publications in various high impact factor journals. He has also co-authored 02 nos. of book chapters and has filed 01 no. of Indian patent. His Ph.D work was recognized as the Best Ph.D Thesis by Polymer Processing Academy (PPA) in 2012.



4th National Awards for Technology Innovation 2013-14

INNOVATION IN POLYMER WASTE MANAGEMENT & RECYCLING TECHNOLOGY

"High Impact Recycled Plastics from Waste Electrical & Electronic Equipments (WEEE)
for Thin Walled Outer Casing Applications"

Dr. Jandas P.J, Dr. Smita Mohanty & Prof. (Dr.) S.K. Nayak

Recycling of plastics waste produced from various sectors like automobile industries, electronic appliances etc. has become one of the prime tasks among the scientists and environmentalists today. According to United Nations Environmental programme-2012, around 16% municipal solid waste comprises plastics. In the plastics waste, contribution of electronic waste is around 21% and possibly it may increase to 30-40% in the near future. Present study has developed a systematic method for physical recycling of plastics from WEEE and a composition of recycled plastics with high mechanical properties. The composition contains a primary polymer (Recycled ABS), a secondary polymer (recycled PC/ABS) and residual additives like reactive compatibilizer, impact modifier, fire retardant, flow modifier etc. to adjust the properties as per projected application. The reactive compatibilizer GMA has been utilized as a bridging unit among the polymer matrices and other additives like impact modifier and cross-linker. The final recycled composition can reduce the cost of the production of thin walled plastic materials by around 70-80% in comparison with the existing products in the market.

Team – Dr. Jandas P.J, Dr. Smita Mohanty & Prof. (Dr.) S.K. Nayak of LARPM is the WINNER of National Awards 2013-14 under the Category of "INNOVATION IN POLYMER WASTE MANAGEMENT & RECYCLING TECHNOLOGY"





Shri S. ANAND

Shri S. ANAND

B.E (civil engineering) 2/151, Pillaiyan Koil ST
Koniliyargudi - 610 106 Thappalampuliyum Thiruvannur



Sathyabama University was established under section (3) of the UGC Act, 1956 (A Christian Minority Institution) which was formerly known as Sathyabama Engineering College established by JEPPIAAR EDUCATIONAL TRUST in 1987.. The institution's progress and contribution in the field of technical education for over two decades made the Ministry of Human Resources Development, Govt. of India to grant Deemed University status on 16th July , 2001 and University status on 13th September, 2006 under section(3) of the UGC Act, 1956. It has been awarded as Category " A " University by Ministry of Human Resource Developemnt (MHRD) on 19th October, 2012.

Shri Anand Selvarajan is a Civil Engineer graduated from Sathyabama University, Chennai on 2012. Recently he has completed Master Diploma in CADD Designing. He won second prize in NATIONAL LEVEL SYMPOSIUM held on SUDHARSAN ENGINEERING COLLEGE, Puthukottai, Tamilnadu. He had participated in Technovation in NATIONAL LEVEL SYMPOSIUM held on Sathyabama University, Chennai. Presently he is pursuing Structural Analysing Course in USAM Academy. He always looking forward to noval ideas and implementing his views to innovative product. He would like to sincere thanks to DR.S.Nandhakumar, M.Sc.,Ph.D., Assistant Professor from the department of civil Engineering, Sathyabama University having concern in my project.



The use of plastic waste in Fly Ash Bricks is desirable because of benefits such as use of disposed plastics without being discarded, increased workability and reduction of Quarry Dust consumption. However, the use of plastic waste leads to an increased strength with long duration. The concurrent use of the two byproducts will lead to remarkable range of economic and environmental benefits. Quarry dust increases the compressive strength of concrete but reduces the workability that is compensated by addition of plastic waste. In this study, we mixed Fly Ash, Cement, Quarry Dust, Plastic waste, Lime and water together. The solution was then conveyed to mould machine through conveyer belt and the bricks are moulded as per the mould. Then the process of curing and drying is done for 25–28 days and 5–7 days respectively. After curing and drying, tests such as Compression strength test and Water Absorption tests are conducted. The present study attempts to investigate the influence of partial addition of plastic waste to quarry dust on the compression strength and water absorption by moulded bricks.

Shri S. Anand is the RUNNER-UP of National Awards 2013-14 under the Individual Category of "INNOVATION IN POLYMER WASTE MANAGEMENT & RECYCLING TECHNOLOGY"





Shri Rajesh Shukla

Chairman & Managing Director

M/s MONTAGE HEALTH CARE & BIO CHEM PRIVATE LIMITED

Montage Bhavan, Plot. No 217/c, Office 001
Lourdes Colony, Oriem Malad West Mumbai- 400 064



Montage Health Care & Bio Chem Pvt. Ltd. is a Company which believes in Vision and Implementation. Our success always speaks in the way of the result and we believe that result only want to help grassroot people and human beings. The Innovation of the Bioconversion of Mango Kernel an Agri-Waste is future changing technology.

The Company is under the leadership of dedicated Scientists viz, Prof. P L Nayak, Ph.D, D.Sc - Expert in the field of Biodegradable plastics, Dr. K S Sastri, Ph.D - Former DD of Indian Space Research Center (ISRC) and Dr. Ashwin Madia, Ph.D along with a team of highly experienced professionals viz. Shri Ramesh Kelkar (Ex GM –Union Bank), Mr. P K Khandelwal (Ex DGM – Union Bank) , Mr.Vijay Shenoy (Ex Tata Capital)

Shri Rajesh Shukla is the Chairman & Managing Director, who is an MBA from Delhi School of Economics and MCA specialized in Financial Investments in Companies from the London School of Economics. He worked with British Petroleum, Meristopes and British Airways. He was the advisor for Hindustan Sales Company. He has been awarded by Nation Bharat Vikas award by Chief Election Commissioner in 2002.



INNOVATION IN GREEN POLYMERIC MATERIALS & PRODUCTS

"Bioconversion of Mango Kernel an Agri-Waste to Bioplastics"
M/s Montage Health Care & Bio Chem Private Limited

The innovation involves in Development of low cost, time and energy intensive biotechnological processes for development of green products utilizing local agricultural waste as raw material. Company's R&D team has developed cost effective low energy intensive process for manufacturing biodegradable polymer (Poly-lactic acid), using locally available agricultural waste. The Biodegradable plastics developed from agricultural waste will degrade into soil under compost condition, enriching soil fertility.

Utilization of agricultural waste in developing high value biodegradable green products will result in generating additional income to the farming community, enrich soil fertility, reduce ground water contamination besides addressing global warming, being alternatives to petrochemical products, valuable foreign exchange is saved while decreasing carbon foot print. Reuse of disposable syringes is responsible for 20-30 percent of HIV-AIDS cases in India (WHO report) Use of cheaper biodegradable syringe effectively reduces reuse.

The biodegradable polymers are used in multiple industries. World Demand for it's expected to expand nearly 16 percent per year to 1500 million pounds in 2012, valued at \$1650 million.

M/s Montage Health Care & Bio Chem Private Limited is the WINNER of National Awards 2013-14 under the Industry Category of "INNOVATION IN GREEN POLYMERIC MATERIALS & PRODUCTS"





Dr. R.K. Malhotra

Director, R&D

M/s INDIAN OIL CORPORATION LTD.

Research & Development Centre,
Sector -13, Faridabad, Haryana -121 007



Indian Oil Corporation Ltd. is India's largest company by sales with a turnover of Rs. 4,14,909 crore and profit of Rs 5,005 crore for the year 2012-13. IndianOil is the highest ranked Indian company in the latest Fortune 'Global 500' listings, ranked at the 88th position. IndianOil R&D centre is the largest downstream petroleum R&D in the Asia-Pacific region engaged in research of lubricant, refinery, alternative energy and petrochemical and polymer domains. Recognized by many national and international awards for its pioneering work in these domains, IOC R&D holds an IP portfolio of more than 270 patents including more than 110 US patents.

Dr. Bhasker Bantu, Dr. Sukhdeep Kaur and **Dr. K. Naresh Kumar** are Sr. Research Officers & **Dr. Gurmeet Singh** is Dy. Manager Research and they are working in the area of Ziegler-Natta catalyst development.

Dr. Shashikant is working as "Scientist Emeritus" having more than 35 years of industrial experience in the area of Petrochemical, Polyolefin Catalysts, Processes, Products and New Grade Development.

Dr. G.S. Kapur is Dy. General Manager & is recipient of prestigious international fellowships like Humbolt & UNESCO. Presently he is heading the Petrochemical & Polymer R&D activities of Indian Oil Corporation.

Dr. B. Basu is Executive Director (Lubricant Technology) & presently, he is leading development of Lubricant Technology, application of Hydrogen-CNG in Automotive Sector, Pipeline Transportation, petrochemicals and polymers and Engine Testing for Fuels & Lubricants.

Dr. R.K. Malhotra is Director, R&D and a full time member of the Indian Oil Board. During his career spanning last 37 years, he has been engaged in the R&D activities related to Fuel Quality, Lubricants, Refining Processes & Catalysts and Alternative & Renewable Energy etc.



Di-Iso Butyl Phthalate (DIBP) is very important to the production of Polypropylene (PP), as majority of the PP produced globally is based on the 4th generation Ziegler-Natta (ZN) Catalyst systems that contain DIBP as Internal Donor. However, **DIBP**, besides many other phthalates, is now part of the Authorization List under **REACH** regulations. Hence world over, polyolefin catalysts and PP manufacturers are working on development of REACH Compliant based internal donors (IDs).

Indian Oil Corporation, thru its concerted R&D efforts is the **First Indian Company to have developed a series of novel and REACH compliant Internal Donors, based on 1,2-phenylene dioates molecular skeleton**. Based on these novel REACH complaint IDs, Ziegler-Natta (ZN) catalysts have been successfully synthesized and have been extensively evaluated w.r.t. Propylene polymerization.

Here, most important fact is that since phenylene dioates are new molecules, it was a challenge to incorporate these compound into the support matrix of the catalyst, led to formation of active matrix which is very essential for any ZN catalyst. The catalyst synthesized using these internal donors were quite active for propylene polymerizations and as well as gave good hydrogen response. Also these catalysts showed the sensitivity towards different external donors used during polymerization and hence difference in isotacticity of final polypropylene was observed.

Hence, usage of such REACH compliant 1,2-phenylene dioates internal donors for ZN catalyst system provides PP, which is phthalate free, and hence can meet public perception and can be used o those jurisdictions where usage of cleaner plastic is in demand.

M/s Indian Oil Corporation Ltd. is the **WINNER** of National Awards 2013-14 under the Academics and R & D Institution Category of "INNOVATION IN GREEN POLYMERIC MATERIALS & PRODUCTS"





Shri Sheo Shekhar Shukla

**M/s M.P. WAREHOUSING
& LOGISTICS CORPORATION,**

Office Complex, Block 'A', Gautam Nagar, Bhopal – 462 023



M.P. Warehousing & Logistics Corporation is a Statutory Corporation constituted under the Warehousing Corporations Act 1962. Corporation provides scientific storage facilities for Notified Commodities, agricultural inputs and produce, cotton bales, minor forest produce, industrial raw materials, Public Distribution items and consumer durables in Madhya Pradesh. Its primary mandate is to provide scientific storage and preservation of agriculture produce in the State and to develop State as "Warehousing & Logistics hub" of the nation. It started its journey from 6 branches and 11000 MTs capacity in 1956 and has grown manifolds with 295 branches and present storage capacity of about 65 LMTs. We are striving hard to enhance the present storage capacity of 91 LMT (both government and private) to 150 LMTs by the end of 2015. This is the biggest storage augmentation program taken up in any State in the country.

Shri Sheo Shekhar Shukla, IAS is the Managing Director of M.P. Warehousing & Logistics Corporation since January 2012. Before this he has served as Collector Burhanpur, Sagar, Ujjain and Bhopal districts and Commissioner, NREGA, Deptt. Of Rural Development, Govt. of M.P. In his leadership, Madhya Pradesh becomes the first State going to establish Steel Silo in 10 districts of Madhya Pradesh in PPP mode. He also envisaged the economically efficient mode of storage in Silo Bags thus making Madhya Pradesh the first State to use this innovative method.



With high growth of production in Madhya Pradesh, M.P. Warehousing & Logistics Corporation, being the Nodal Agency of the Government, its Endeavour is to create sufficient warehousing facilities with all mode of storage facilities, M.P. Warehousing & Logistics Corporation since last three years is using silo bag as an alternate to store food grains in the Rabi Season 2011-12, 2012-13 and now in Rabi Marketing Season 2014-15, MPWLC plans to store about 12 LMTs of procured food grains in silo bags.

We have also innovated in introducing "appropriate technology" such as "storage in silo bags" to provide cost effective and efficient storage solution to the nation. It tangibly saves the recurring cost of wooden crates, tarpaulin, gunny bags and fumigation cost etc. besides reducing transport/re-transport as well as multiple handling (loading, unloading and staking) It is the most suitable and convenient backward integration for complete supply of bulk supply chain with minimal manual handling. It is environmental friendly, economically cost effective with no loss of nutrition. Silo bags are filled with grains and sealed airtight. The bag is designed to stretch by 10% ensuring the grain is packed tightly and most air is expelled during filling. After filling and sealing the few pockets of air/oxygen are eliminated by the grain breathing thus producing a modified atmosphere, rich in CO₂.

Team – Shri Sheo Shekhar Shukla and Shri Uma Kant Pandey of M.P. Warehousing & Logistics Corporation is the WINNER of National Awards 2013-14 under the Category of "POLYMERS IN AGRICULTURE AND WATER CONSERVATION"





Shri Sushant Upadhyaya

MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY

Department of Chemical Engineering,
Jaipur – 302 017



Malaviya National Institute of Technology Jaipur (MNIT Jaipur) was established in 1963 with the name as **Malaviya Regional Engineering College, Jaipur** as a joint venture of the Government of India and the Government of Rajasthan, Subsequently; on June 26, 2002 the college has been given the status of National Institute of Technology and on 15 August 2007, Proclaimed Institute of National Importance through Act of Parliament. More than 12,000 students have already been graduated since its establishment.

Shri Sushant Upadhyaya holds B.Tech (Chemical Engineering); and M. Tech. degrees. He has submitted his PhD thesis entitled "Mathematical Modeling and Experimental Study of Vacuum Membrane Distillation for Desalination" in the department of Chemical Engineering at NIT Jaipur. He joined MNIT as a Assistant Professor of Chemical Engineering in 2008 and is serving as a Assistant Professor continuously. The major areas of his research are Polymer Process Modeling ,Membrane Separation , Piping Engineering ,Transport Phenomena, Modeling And Simulation , Wastewater Treatment, Computational method for linear/non-linear Problems and Mass Transfer. He has published/presented over 40 papers in various international/national journals/conferences, guided about 6 Masters' theses, taken up several research projects, and received shikshak shree award. He has delivered many keynote addresses and invited talks at International/national conferences and institutions. He has also conducted international and National Conference for water desalination and water quality management in 2013.



The desalination of the sea water and ground water was conducted through Solar assisted Vacuum Membrane Distillation (VMD) set up . In this work Polymeric membrane of PTFE (hydrophobic) is used for desalination & the vacuum pump was used at the downstream side to enhance the flux as well as for saving the energy as compare to RO. The whole VMD set up was fabricated and integrated with solar energy.

This integration saves the energy during desalination to a great extent and also the results obtained for ground water through VMD were within permissible limit according to the WHO guideline for drinking water. The whole set up was fabricated to be based on completely on renewable energy. In our work, the research is being conducted on pilot scale based on coupling of solar collector for heating the fluid to desired level and the usage of photo voltaic panel is done for running the various types of pump like centrifugal pump and vacuum pump.

MD is a technique which leads to an almost **complete water recovery**. This process can work on **high solute concentration at feed side, at low concentration gradients, moderate temperature and atmospheric pressure**. The rejection obtained was more than 99 % for feed concentration upto 40000 ppm. The concentration of different ions in permeate was found within permissible limits as per World Health Organization standards and Indian Standard guidelines. The percentage rejection was found to be more than 99% in all cases.

Theoretically 100% rejection of ions, colloids, macro molecules & other non volatiles, lower operating pressure than conventional pressure driven membrane separation processes, lower operating temperature than conventional distillation, reduced vapor pressure compared to conventional distillation processes.

Shri Sushant Upadhyaya is the RUNNER-UP of National Awards 2013-14 under the Individual Category
of "POLYMERS IN AGRICULTURE AND WATER CONSERVATION"





Shri Tushar Jain

Group CEO

M/s AUTOMAT IRRIGATION PVT. LTD.

Plot No. 4 & 5, Sec- 3A, IIE ,
Sidcul, Haridwar, U.K.



M/s Automat Irrigation Pvt. Ltd. has been in the fore front for creating innovative products in plastics for application in the Micro Irrigation space. We are constantly evolving as an organization and building innovative products to empower consumers. The products built use resources and technologies across geographies, sold Worldwide and are constantly improved to match the best in their product categories. Right from plastic impact sprinklers to replace brass sprinkler and a fertilizer injector to replace bulky and expensive steel fertilizer tank and finally Engineering plastic Hydrocyclone (sand separator) to replace the steel equivalent. The challenges before the development team were finding the right polymer which is economical for the farmers of emerging markets, a material and construction that would be more durable than the steel equivalent in terms of impact resistance.

Promoter of the organization, **Mr. Tushar Jain** is a Management Post Graduate with 20 Years of experience in engineering industry. Driven by a passion to produce innovative products for the emerging markets & empowering the Indian farmer. He has guided a team of 10 engineers to conceive, develop and manufacture 50 different kinds of innovative products. Having travelled to more than 45 Countries and with presence in more than 80 Countries, the organization is at forefront of an agricultural revolution which has swept the world over for feeding ever increasing global population.

The product conceptualization was done by **Mr. Tushar Jain (Group CEO)** and **Mr. Amit Jain (President - Irrigation Division)**.

Innovation and execution of the product was done by **Mr. Anil Kumar Kaushal (VP - Sales & Marketing)**, **Mr. Durga Pada Ghosh (Sr. Manager - R&D/QC)** and the development team based at the plant led by **Mr. Vijay Warke (VP - Operations)**.



POLYMERS IN AGRICULTURE AND WATER CONSERVATION

"Plastic Hydrocyclone Filter for Micro Irrigation"

M/s Automat Irrigation Pvt. Ltd.

There was a latent need of substitution in the material of Hydrocyclone. It was made in collaboration with multiple technology partners - DuPont for material and mould makers from Malaysia and Italy. The product is corrosion resistant, improves durability, reduction in weight, easy to handle & low cost of transportation, cost effective, benefit to farmers, quicker production as compared to metallic Hydrocyclone where delays are there due to fabrication activities, timely delivery to irrigation companies and can meet the demand of Micro Irrigation sector easily. The product is not just successful but hugely in demand. The Product reduces the ultimate cost of drip irrigation equipment. All performance testing facilities, manufacturing, assembly etc are developed internally by the team.

M/s Automat Irrigation Pvt. Ltd. is the WINNER of National Awards 2013-14 under the Industry Category of "POLYMERS IN AGRICULTURE AND WATER CONSERVATION"





Dr. Roy Joseph



Shri C.V. Muralaeddharan

**SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL
SCIENCES AND TECHNOLOGY,**

Bio Medical Technology Wing, Poojapura, Trivandrum-695 012



Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum is an Institute of National Importance under the aegis of Department of Science and Technology, Govt. of India. The Institute has been instrumental in establishing a medical device industry base in India by successfully developing and transferring technologies such as blood bag, oxygenators, hydrocephalus shunt, artificial heart valve, etc.

Dr. Roy Joseph took his PhD in the area of biomedical materials from the University of London. He has 22 years of research experience in the area of biomedical materials. He is a recipient of commonwealth scholarship; published 31 papers in peer reviewed journals, awarded with 8 Patents and implemented several projects. His research interests include development of biomedical devices, X-ray opaque polymers and hydrogels.

Mr. C.V. Muralaeddharan, Scientist-G, has 28 years of R&D experience in medical devices development covering areas of design, evaluation, pilot production and technology transfer. He played a key role in the development and commercialization of various medical devices such as heart valve, hydrocephalus shunt, vascular graft and membrane oxygenator. He has authored 4 book chapters, 28 journal publications and has 18 patents. Presently he is the Scientist-in-charge of the Device Testing Laboratory and Associate Head of Biomedical Technology Wing.



Vascular grafts are tubular medical devices used to replace diseased blood vessels. Synthetic vascular grafts made of polyethylene terephthalate fabric are to be made impervious to blood prior to implantation either by pre-clotting the graft with blood of the patient, or by coating with a suitable biocompatible sealant.

In this innovation, Roy Joseph and CV Muraleedharan developed a non-toxic, biodegradable sealant formulation consisting of oxidized alginate and gelatin. The sealant composition was deposited onto the external surface of the graft by spray coating, which reacts to form a three dimensional polymeric network while drying. At the time of implantation the sealant absorbs water forming a hydrogel which effectively restricts the leakage of blood through the wall of the graft. After serving the purpose the hydrogel degrades into harmless amino acids, mannuronic acid and guluronic acid. These degraded products are non-toxic and easily absorbed/excreted from the body. The graft is also given an additional coating of a fluoro-polymer to reduce thrombogenicity and promote healing.

The device was successfully evaluated for mechanical performance, toxicological studies, hemocompatibility tests and pre-clinical studies in pig model. It is anticipated that with this innovation an economical and effective device could be made available to Indian population.

Team - Dr. Roy Joseph, Shri C.V. Muraleedharan of Sree Chitra Tirunal Institute for Medical Sciences and Technology is the WINNER of National Awards 2013-14 under the Category of "POLYMERS IN PUBLIC HEALTH CARE"



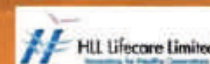


Dr. M. Ayyappan

M/s HLL LIFECARE LTD.

(Corporate R & D Centre)

Akkulam Sreekariyam Post, Trivandrum - 695 017.



Dr. M. Ayyappan, Chairman & Managing Director, HLL Lifecare Limited. Joined HLL in 1991 as Head Marketing, He was instrumental in setting up a World class Marketing infrastructure. He has been at the helm of affairs at HLL since 2003. Under his dynamic leadership HLL has metamorphosed from a "Condom Company" to an "Integrated Healthcare Delivery Company".

As Chief Executive, his job has always been to find the future of the company through the process of **Innovation & Marketing**. During last 5 years HLL witnessed rapid business growth with a CAGR of more than 35%. He has a penchant for innovation and technology development and this has evidenced itself in the sound R & D base of his organization. He strongly believes '**Corporates to be value driven**' and 'ordinary people are capable of doing extraordinary things. He takes personal interest in developing leaders. He could bring a new culture in HLL which was recognised recently by **ECONOMIST**, as "HLL's concern for customer choice resembles that of private company".

He founded three institutions that have the potential to change the healthcare delivery scenario across the globe. He founded the "Life Spring Hospitals" (JV with Acumen Fund, USA) a chain of maternal care hospitals that offers high quality maternal care at affordable rates. He is also the Chairman of Hindustan Latex Family Planning Promotion Trust – one of the largest Social Marketing Organizations in India today.

Recently HLL gave birth to HLL Biotech Ltd (HBL), a state-of-the-art WHO-pre-qualified vaccine manufacturing facility at Chengalpeta, near Chennai. HBL, a project of national importance, aims to boost India's vaccine security with an uninterrupted supply of vaccines at affordable prices.

Dr. Ayyappan holds his doctorate degree in "Social Marketing" from University of Kerala & is a fellow of All India Management Association and has a deep passion for research and teaching. He is a mentor and teacher to the budding managers, academics, corporate and is a most sought after speaker by academic institutions.



Copper containing Intrauterine devices (Cu-IUD) represent an important contraceptive option for a very large number of women, which is about 160 million worldwide. HLL is the major supplier of Copper IUD in the country as part of the National Family Welfare Programme and procurement agencies like UNFPA. Cu-IUD is being increasingly used for contraception by many users because of its long life span, complete and quick reversibility to fertility and high effectiveness. However usage of Cu-IUD is associated with adverse effects such as initial heavy inter-menstrual bleeding, pelvic pain and cramps, which result in discontinuing the use of Cu-IUDs in some women. It is reported that these side effects are related to the high copper corrosion rate during the initial few days or even months, when Cu-IUD is inserted in to the uterus. Copper not only significantly increases the extent of the inflammatory reaction, but impede sperm transport from the cervix to the oviduct after coitus and the ovum is not fertilized.

The present innovation provides a new and improved reversible contraceptive mode of copper containing intrauterine device covered with a thin layer of a biodegradable polymer, which degrade over a clinically relevant period of time.

This coated device will minimize the burst release of copper ions and maintain the copper ion released to a level which in turn will reduce the side effects such as pain, bleeding and cramps caused due to bulk release of copper ions and the patient compliance will be more due to fewer side effects.

M/s HLL Lifecare Ltd. is the WINNER of National Awards 2013-14 under the Academics and R & D Category of "POLYMERS IN PUBLIC HEALTH CARE"





Dr. Reddithota J. Krupadam

**NATIONAL ENVIRONMENTAL
ENGINEERING RESEARCH INSTITUTE,**

Jawaharlal Nehru Marg, Nagpur - 440 020



National Environmental Engineering Research Institute (NEERI), a constituent laboratory of Council of Scientific & Industrial Research (CSIR) endeavours to provide Leadership in Environmental Science and Engineering for sustainable development. NEERI would continue to strive for providing innovative and effective solutions for environmentally sustainable development and to help government, industry and the society, especially the 800 million underprivileged people of India.

Dr. Reddithota J. Krupadam is currently Senior Scientist at National Environmental Engineering Research Institute (NEERI), Nagpur and is also Faculty of Academy of Council of Scientific and Innovative Research (AcSIR), New Delhi. He obtained his Ph.D and M.Sc (Tech.) from Jawaharlal Nehru Technological University Hyderabad. He published about 40 research articles in International Journals related to Environmental Materials and Polymers. He delivered invited talks in various International Conferences/ Meeting. He organized an "International Conference on "Nanobiomaterials for Environmental Applications" (ICNEA) & and Indo-UK Seminar on "Molecular Imprinting: Strategies, Applications and Future Perspectives" in 2014 in NEERI. Dr. Krupadam is the Visiting Professor to The University of Melbourne (Australia) and Louisiana State University (USA) and he is the member of American Chemical Society (USA) and Society of Molecular Imprinting (Sweden). He received NEERI Golden Jubilee Outstanding Scientist Award (2008) and Sir CV Raman Fellowship from CSIR, New Delhi (2010).



Developments of highly selective polymers have tremendous applications in environmental monitoring and remediation, biomedical and defence applications. A novel approach called "molecular imprinting" was used to tailor the polymer to incorporate selective pores (binding sites) useful in separations, chromatography and sensors. Sensing of a group molecules by the polymer sensor is one the greatest achievement in molecular imprinting research; where eight carcinogenic air pollutants were separated and detected in complex environmental systems with greater accuracy. A highly sensitive sensory polymer was prepared using polymer-lanthanides composite for detection of benzo [a] pyrene (BAP) at ppt levels. The molecule BAP is a carcinogenic pollutant and also air pollution marker molecule monitored by the environmental regulatory agencies. A smart reusable polymer adsorbent was developed for treatment of polycyclic aromatic hydrocarbons contaminated drinking water. Molecular modelling and simulations were used to design smart and environmentally benign polymers capable of discriminating similar molecules and structural analogues with the perfection similar to antibody-antigen immune system. Recently, nicotine specific polymer was prepared and applied for biological systems. This nicotine imprinted polymer has immense potential to treat tobacco addicted patients in near future.

Dr. Reddithota J. Krupadam is the WINNER of National Awards 2013-14 under the Individual Category of "RESEARCH IN THE FIELD OF POLYMER SCIENCE & TECHNOLOGY"





Dr. Tejraj M. Aminabhavi

SONIYA COLLEGE OF PHARMACY

S.R. Nagar, Karnataka, Dharwad – 580002



Soniya College of Pharmacy was established in 1992 and offers programs in D. Pharm, B. Pharm and M. Pharm by imparting theoretical and practical skills to students in the field of Pharmaceutical Sciences. Throughout the history, college has developed a tradition of excellence and reputation for producing outstanding pool of students. Many students have occupied industrial and academic position in India and abroad.

Dr. Tejraj M. Aminabhavi is director of research at Pharmacy College, Dharwad. His main research activities include the applications of polymer as membranes in separation science and drug delivery areas. He has pioneered the development of thermodynamic/hydrodynamic models and their applications to fluid mixtures, membranes and complex three-phase systems.

His group has investigated extensively on the physico-chemical properties of various types of multiphase components, suggesting improved design procedures for membrane-liquid/gas transport processes. In addition, many improvements in technologies concerning membrane separations, and recovery of oil from crude tar in hydroprocessing and hydrocracking were achieved. A major achievement was the development of design and scale up procedures for natural gas separation through novel membranes.

Dr. Aminabhavi has established international credibility for his work on molecular transport phenomena, hydrocarbon liquid and gas separations, molecular modeling of transport phenomena/polymer surfaces. He has supervised 40 Ph. D theses and published more than 550 papers with citations exceeding 18000 and H index of 61.



My research in the field of polymers in membrane science are offered improved processes of gas and liquid separations through polymeric membranes and understanding of fundamental physico-chemical phenomena at molecular and microscopic level. The novelty of process development led to successful separations of hydrocarbon mixtures from downstream processes as demonstrated by pervaporation/gas separation. Other downstream processes include: electrodialysis, ultra, micro/nano-filtrations and reverse osmosis for water desalination, and their large scale operations. Studies on hydrocarbon property assessment have created an impact on downstream processes and in understanding of environmental pollution issues. Fundamental studies on molecular transport phenomena of liquids and gaseous mixtures through developed novel nanocomposites/membranes obtained from carbon based compounds opened-up new avenues in fuel cells and battery applications. Being environmentally benign, the technologies developed to produce carbon-based nano-fibers are energy and labour intensive, with greater potential for scale-up and zero emission.

My research in the area of drug delivery area dealt with the development of drug loaded formulations using a variety of natural and synthetic polymers. Various classes of drugs of interest having short plasma life times have been investigated for extending their release times. The formulations were prepared in the form of microparticles and nanoparticles as well as hydrogels of interpenetrating and semi-interpenetrating polymers prepared by graft and copolymerization methods. Particularly, in the area of nanoparticles, several nano-enabled delivery systems were developed for insulin in the form of pH sensitive hydrogels. The kinetics of release patterns have been systematically studied and in vivo kinetics studies have shown improved release kinetics. Some biodegradable polymers were also used in dental applications.

Dr. Tejraj M. Aminabhavi is the RUNNER-UP of National Awards 2013-14 under the Individual Category of "RESEARCH IN THE FIELD OF POLYMER SCIENCE & TECHNOLOGY"





Dr. Anjana Jain



Shri P. Siva Subba Rao



Dr. Rajeev Jain

CSIR - NATIONAL AEROSPACE LABORATORIES,

HAL Airport Road, Bangalore - 560 017

Gas turbine Research Establishment (GTRE)

Bangalore 560 093 (Karnataka)



National Aerospace Laboratories (NAL), a constituent of Council of Scientific and Industrial Research (CSIR), is India's only pre-eminent high technology oriented civil R&D institution in aeronautics and allied disciplines. Its contributions over last five decades have enabled it to create a niche in advanced aerospace research and technology developments.

Gas Turbine Research Establishment (GTRE) is the pioneering research and development laboratory of Defense Research and Development Organization (DRDO) under the ministry of Defense, Government of India. The charter of the establishment is to design and develop gas turbine engines besides carrying out research work in the areas of aero-engine.

Dr. Anjana Jain is Principal Scientist at CSIR-NAL and obtained doctorate in the field of Aerospace polymers. Her interest includes development of piezoelectric smart polymers for transducer applications. She has supervised M.Tech and Ph.D students, published more than 100 papers, Chaired/organized conferences/seminars, member of professional bodies, delivered Invited talks and got many awards.

Shri P. Siva Subba Rao is Principal Scientist at CSIR-NAL and obtained M.Tech in the field of Digital-Systems & Computer-Electronics, Diploma in Management and perceiving Ph.D. His expertise includes servo control systems and power electronics. He earlier worked in CSIR-NML, Doordarshan, and Akashvani.

Dr. Rajeev Jain is Group Director at GTRE. He specializes in the field of non-linear finite element analysis pertaining to design of gas turbine engine components. Academically, he obtained his M. Sc (Engg.), Ph.D from Indian Institute of Science, Bangalore supervised Ph.D, M. E. students, published more than 50 papers, member of professional bodies, organized symposium/conferences and delivered several invited talks.



RESEARCH IN THE FIELD OF POLYMER SCIENCE & TECHNOLOGY

"Development of Polyvinylidene Fluoride (PVDF) Polymer Composite Films and Demonstration as an Actuator for Flapping Wing of Micro Air Vehicle"

Dr. Anjana Jain, Shri P. Siva Subba Rao & Dr. Rajeev Jain

Poly-Vinylidene-Fluoride (PVDF) polymer and Lead-Zirconate-Titanate (PZT) ceramic composite have huge potential in the applications of sensors and actuators. This innovative composite derives flexibility from polymeric and high piezoelectric charge coefficient ($d_{33}=100$ pC/N) from piezo-ceramics materials respectively. It has high electromechanical response and can revolutionize the present day sensors and control system technology with applications ranging from house-hold gas lighter to the aerospace structural health monitoring. This sensor can also find application for healthcare, automobiles, power electronics, and communication industries.

The novelty of present work lies in using this composite as an actuator for flapping, wing of Micro Air Vehicle (MAV) to attain desire motion and lift. Piezo-electric composite film actuator is fixed to light weight structure of Mylar sheet performing as a wing. This actuator, flap the wing after getting excited from varying input voltage at the natural frequency of wing structure. Finite element technique has been employed to design the wing at anticipated frequencies. Analysis of wing structure finite element model consisting of three dimensional piezo-electric and solid brick elements has been done to correlate tip deflection of the wing with prototype model in the frequency range of 2-16 Hertz.

This simple and innovative mechanism can replace complicated currently used crank and gear mechanism used for flapping wing of MAV and can also reduce weight of the air vehicle to accommodate additional payloads. This new conceptual prototype vehicle will mimic the nature's flyers flapping motion. Another advantage of this vehicle will be low inertial losses with increase endurance limit.

Team - Dr. Anjana Jain, Shri P. Siva Subba Rao & Dr. Rajeev Jain is the WINNER of National Awards 2013-14 under the Academics and R & D Institution Category of "RESEARCH IN THE FIELD OF POLYMER SCIENCE & TECHNOLOGY"





Dr. Leela Edwin



Dr. P. Muhammed
Ashraf



Dr. Nikita
Gopal



Dr. M. Ajith
Peter



Dr. Sreeja A.



Dr. Saly N.
Thomas



Dr. B. Meena
Kumari

CENTRAL INSTITUTE OF FISHERIES TECHNOLOGY (ICAR) CIFT

Junction, Matsyapuri P.O, Cochin – 682 029



The Central Institute of Fisheries Technology is the only national institute under the Indian Council of Agricultural Research that is dedicated to research and extension activities in fisheries harvest and post-harvest sectors. The Institute has been instrumental in modernizing both the fishing and fish processing sectors in the country and continues to support both these industries through need based research and technology interventions. The interventions have resulted in better harvesting and utilization of fishery resources. The institute started functioning at Cochin in 1957. Research centers function at Veraval (Gujarat), Visakhapatnam (Andhra Pradesh) and Mumbai (Maharashtra).

Dr. Leela Edwin, Principal Scientist & Head, Fishing Technology Division has 28 years of research experience in the field of fishing technology and has been engaged in the development of alternative materials for fishing vessel construction. She is currently engaged in developing green fishing systems for energy and resource conservation in fisheries sector. **Dr. P. Muhammed Ashraf**, Senior Scientist, Fishing Technology Division of ICAR has 16 years of experience in research on material science and marine pollution. He is currently working in nano technology applications in curbing marine corrosion and fouling. **Dr. Nikita Gopal**, Senior Scientist, Extension, Information & Statistics Division of ICAR has 16 years of experience in fisheries economics and has been involved in technology evaluation and is presently working on management dimensions in fisheries and gender. **Dr. Saly N. Thomas**, Principal Scientist, Fishing Technology Division of ICAR has 28 years of research experience in the field of fishing technology and specializes in fishing craft and gear materials. She is currently associated in developing green fishing systems with specific reference to gill netting. **Dr. B. Meenakumari**, Deputy Director General (Fisheries), ICAR, New Delhi has 34 years of experience in fisheries research and administration and has been associated in the work. **Dr. M. Ajith Peter**, currently Quality Control Officer, Mathura Refinery (Indian Oil Corporation), Mathura, UP was Senior Research Fellow of the project under which this innovation was developed. He was involved in studying the leaching of chemical constituents into the aquatic environment and its control through FRP sheathing.

Dr. Sreeja A, currently Research Associate, Institute of Wood Science & Technology, Bangalore was Senior Research Fellow of the project under which this innovation was developed. She was involved in studying the effect of leaching of chemical constituents on aquatic biota.



The utilization of FRP for sheathing treated rubber wood has made the use of rubber wood possible for boat building. The researchers have studied in detail the leaching of the chemical wood preservative constituents into the aquatic environment and the role of FRP sheathing in preventing it, thus making the technology eco-friendly. The use of two layers of sheathing was standardized through mechanical strength studies. Prototypes of the fishing canoes were made and field tested in participatory mode with actual stakeholders, through fishermen cooperative societies and the trials have completed ten years. The simple and innovative technology developed by the project team has given the small scale fisheries sector a durable, maintenance free, environmentally friendly, and affordable artisanal fishing canoe, using treated rubber wood with a two layer FRP sheathing. This is expected to make a significant impact in the small scale marine and inland fishing sectors of the country. This technology spares the sparse and costly wood of our fast depleting forests, thus saving the environment and ensures a good market for the hitherto less utilized rubber wood. The economic viability was acknowledged by the fishermen who carried out the extended field trials as the FRP sheathed rubberwood canoe were practically maintenance free and had a life more than that of the conventional canoes. This is a laudable, simple, appropriate and relevant technology for the benefit of one of the weakest sections of the society.

Team - Dr. Leela Edwin, Dr. P. Muhamed Ashraf, Dr. Nikita Gopal, Dr. M. Ajith Peter, Dr. Sreeja A, Dr. Saly N. Thomas
Dr. B. Meenakumari is the RUNNER-UP of national awards 2013-14 under the academics and R & D
institution category of "RESEARCH IN THE FIELD OF POLYMER SCIENCE & TECHNOLOGY"





4th National Awards for Technology Innovation in Petrochemicals & Downstream Plastics Processing Industry (2013-14)

by Prof. (Dr.) S. K. Nayak

Director General - CIPET &
Chairman - 4th National Awards Committee

The plastic industry is the most important segment of petrochemical industry today and is poised for significant changes with sustained double digit growth rate of 14 %. Plastics have created tremendous impact on human society. To begin with plastics were viewed as the replacements for conventional material like glass, wood, paper, jute, tin etc., because of its unique identity. The demand for plastics materials and its products are increasing day by day due to its durability, light in weight, non-toxic and non-corrosive. The plastics materials have excellent properties and apart from economic and ecological advantages also conserve the resources. India is significantly mounting in the industrial world with economic growth and is expected to be one of the largest by the turn of this decade. Virtually, in all key sectors of economy Agriculture, Infrastructure, Healthcare, Textiles and Consumer durables, polymers occupy a very important role. Polymers provide critical inputs which enable other sectors to grow.

The consumption of plastics in India has gone up from a mere 1 million tonnes during 90s to about 8.5 million metric tonnes during 2011-12. In line with the global trend, the per-capita consumption of plastics has also increased and today it stands around 9.5 kilograms and is expected to increase to around 12 kg. by the year 2017. During the 12th five year plan there is potential to grow up to 14 million tons (2016-17). The focus will be on value additions to remain competitive, innovative designing for sustainable development and penetrating into high technology segments. Currently the expenditure on R&D in the Petrochemical sector is less than 1% of industry turnover. This needs to be increased in phases to 2 to 3%. The research in science and technology is essentially to achieve progress in economic growth, social development and environmental protection. The investment will allow India to continue to enjoy the many societal benefits that will flow from research and development in polymer science and engineering.

In order to promote & encourage the development of environmental friendly cost effectively polymeric material, products & process / technologies in line with the guidelines of National Policy on petrochemicals, Department of Chemical & Petrochemicals (DCPC), Govt. of India has announced a scheme –National Awards for Technology Innovation in Petrochemicals and downstream Plastics Processing Industry, with the core philosophy of “Reward the innovation suitably with an Award”.



4th National Awards for Technology Innovation in Petrochemicals and Downstream Plastics Processing Industry (2013-14)

Central Institute of Plastics Engineering and Technology (CIPET), an extended arm of Dept. of Chemical & Petrochemicals, Govt. of India has been entrusted with the task of processing of the applications/nominations, scrutiny and evaluation of nominations through field experts till the completion of organizing successfully the award function.

During 2010-11, 09 nominations were declared as winners and during 2011-12, 15 nominations were declared as winners and 10 nominations as runner up and during 2012-13, 11 nominations were declared as winners and 05 nominations as runner up. The winners of National Awards were awarded with Shield, Citation & Cash award and runners-up were awarded with Shield & Citation.

The categories classified as given below:

1. Innovation in Polymeric Materials:

New Polymers, Blends & Alloys, filled materials, fibers, Polymer, Composites and Nano composites, Smart Materials etc.,

2. Innovation in Polymeric Products:

New / creative product design, Non conventional application / Replacement of conventional materials (eg. Metals, ceramics etc.), Modification of product design for performance improvements.

3. Innovation of Polymer Processing Machinery & Equipments:

Development of new processing techniques, Modification of machinery for higher efficiency/productivity / Automation, Energy conservation, product quality improvement, Improvement in moulds, dies and auxiliary equipments

4. Innovation in Polymer Waste Management & Recycling Technology:

Newer technology in plastic waste utilization into products/energy recovery, Recycling Technology, Plastic waste collection, segregation techniques, Product design for improved recyclability

5. Innovation in Green Polymeric Materials & Products:

Biopolymers, Biodegradable / compostable Polymers, Time controlled degradation, Green material filled polymers, Biodegradability evaluation techniques



4th National Awards for Technology Innovation in Petrochemicals and Downstream Plastics Processing Industry (2013-14)

6. Polymers in Agriculture and Water Conservation:

Water transportation, mulching, canal lining, Drip irrigation, Sprinkler system, Low Tunnels, Poly house etc., Controlled release system for fertilizer, pesticides, micro nutrients, etc., Innovative packaging for agriculture, floriculture and horticultural produce, Controlled permeability films & packaging for improved shelf life Novel Usage of plastics for food security.

7. Polymers in Public Health care:

Affordable / cost effective implants, implements and devises, New innovative products for medical application, Polymer based new drugs delivery system, Polymer body implants, Drinking water storage & transportation, Polymer membrane for water purification / Desalination, Devices for waste water, drainage, sewage treatment system

8. Research in the field of Polymer Science & Technology

Individual / Team of researchers in R & D Institutions & laboratories, original research work in polymeric materials processing etc. leading to proto type development & future industrial applications.

IMPLEMENTATION FRAMEWORK & OPERATIONAL MODALITIES :

313 numbers of application/nominations received for awards were scrutinized and valued by the nominated field experts headed by the Director General, CIPET & Chairman of 4th National Awards with the representatives from administrative Ministry / Government institution / Research laboratories / Academics Institution, National Level Industry Associations associated with petrochemical products and other representatives from Government of India. The recommendation of the Expert Committee was deliberated at the Prize Award Committee headed by the Joint Secretary of the Department of Chemicals & Petrochemicals. 17 nominations were finally selected and rewarded as WINNER, 06 nominations were rewarded as RUNNER-UP.

The fourth National Award Function - to encourage and to promote Technology Innovation in Petrochemicals and Downstream Plastics Processing Industry (2013-14) is being organized on 17th July, 2014 at Manekshaw Centre, New Delhi.





Central Institute of Plastics Engineering & Technology (CIPET) is a premier National Institution devoted to Academic, Technology Support & Research (ATR) for the Plastics & allied industries in the India. Today CIPET operates a Hubs & Spoke= model with 23 locations spread across the length & breadth of the country, which includes 5-High Learning Centers, 11-Other Learning Centers, 2-R&D wings, 4-Specialized Centres, 2-Vocational Training Centres. All the CIPET centres have uniform infrastructural facilities in the areas of Design, CAD/CAM/CAE, Tooling, Plastics 'Processing, Testing & Quality Control to cater to the needs of plastics and allied industries in the country.

CIPET offers blend of various specialized Academic Programmes in the field of Plastics Engineering & Technology (Doctoral, Post Graduate, Undergraduate, Post Diploma or Diploma) in order to provide qualified human recourses to plastics & allied industries. The Technology Support service (TSS) to the industries and ingenious Research are the important product portfolios of CIPET.

CIPET renders Technology Support Services in Design, Tooling, Plastics processing, and Testing & Quality Assurance in India and abroad. CIPET's expertise as a third party inspection agency for plastics products as recognized by various Central & State Govt. organization for pre-dispatch/ delivery inspection of plastics & allied products.

CIPET has a R&D vision to be recognized as global R&D hub, in the area of Polymer Composites, Nanocomposite, Biopolymers, Functional Plastics, Carbon Nanotubes, Polymer Membranes, Conducting Polymers, Fuel Cells, E-Waste recycling etc., & Innovative product concept development & commercialization by aid of CAD/CAM/CAE expertise. Accordingly, CIPET has established two exclusive R&D centres viz. Advanced Research School for Technology & Product Simulation (ARSTPS) at Chennai and Laboratory for Advanced Research in Polymeric Materials (LARPM) at Bhubaneswar.

CIPET has signed various memorandum of Understanding (MoUs) for joint collaboration in faculty & staff exchange, student exchange, cooperative research exchange of academic materials etc., with leading international universities/ organizations at USA, Canada, Australia, Germany, France, Korea, Poland Mexico, China & Brazil.

With strong Alumni base of about 60,000 professionals, CIPET has emerged as an apex plastics technology institution, not only in India but a unique institution of its kind in Asia.



5th NATIONAL AWARDS FOR TECHNOLOGY INNOVATION

in Petrochemicals & Downstream Plastics Processing Industry



Government of India
Ministry of Chemicals & Fertilizers
Department of Chemicals & Petrochemicals

INVITES

Nomination from Individual / Team,
Small / Medium / Large scale Industry, Academic / R&D Institution for



Close of Nomination : 31st October, 2014



Organised by:
POLYMER DATA SERVICES (PDS)
CENTRAL INSTITUTE OF PLASTICS ENGINEERING & TECHNOLOGY (CIPET)
(Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilizers, Government of India)

For details visit: www.cipet.gov.in, www.pds.gov.in & www.chemicals.nic.in



4th National Awards for Technology Innovation 2013-14

Organized by:



सेन्ट्रल इंस्टिट्यूट ऑफ प्लास्टिक्स इंजीनियरिंग एण्ड टेक्नोलॉजी (सिपेट)

CENTRAL INSTITUTE OF PLASTICS ENGINEERING & TECHNOLOGY (CIPET)

(Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilizers, Govt. of India)

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