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AN OFFICIAL ORGAN OF INDIAN PLASTICS FEDERATION

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Servo mega
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Editorial

PLASTICS INDIA

A journal for the growth and development of plastics trade & industry

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Hi Friends,

Hope you enjoyed the hot summer and ready for the sultry weather for next 3 months ahead.

Suddenly, we are hearing lots of noise for & against plastic. Plastics are the most eco friendly materials and the most misunderstood too …

Misinforming campaigns mislead the public. Propagation of half baked information & ill founded concepts against plastic tend to malign the sincere efforts

Of the plastic industry, here are some interesting plastinfo shared by our own fraternity friend Mr Pradip Chopra. You can also share & propagate to the non loving plastic activist become a lover of plastic like us JJJ

(1) Strict & stringent FDA worldwide have permitted the use of plastics in various processes & product related to foods & drug

(2) China uses over 1.25 million tons of polyethylene in agricultural application alone

(3) Rain water harvesting , used for collecting the rain water & reusing it have been practiced for around 100 + years in Rajasthan & Gujarat

(4) Plastics does not cause ACID RAIN in fact, it's thermal power station (sulphur oxide) & motor vehicles (nitrogen oxide) which account for 90% 0f the cause for acid rain. This shows that there is no connection between acid rain & plastics

(5) In most of the developed economies with disposable lifestyle, plastics contribute less than 12 % by weight to municipal solid wastes

The rest consists of organic matter, paper, wood, metal, glass etc.

(6) The solution lies in proper waste management along with the timely cleaning of sewers & drains especially before the monsoons

(7) It's a delight to share that almost 50% + of plastics from Industry & Urban waste streams are already recycled in India. Global average is approx. 30%.

Last but not the least, Plastic industry is a responsible & caring industry. Plastics do not litter but people do REDUCE ***** REUSE ***** RECYCLE ***** RECOVER

Keep sharing your love for plastics. In case, you have any interesting data, do share with me

Happy monsoon, Keep Smiling

Manish Kr. Bhaia
Editor

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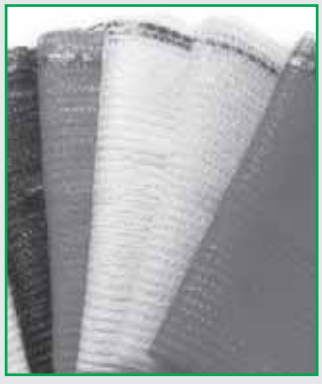

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PRESIDENTIAL ADDRESS

Dear Friends,

It is always my pleasure talking to you and sharing my thoughts with you.

The assembly elections' results have been announced. As expected, Trinamool Congress Party under the able leadership of Ms Mamata Bannerjee has got thumping victory getting absolute majority. The people of West Bengal have reposed faith in her and I am sure that the mission and vision of Ms Bannerjee is to take West Bengal fast forward and rapid industrialisation of the state. Congratulatory letters on behalf of IPF have been sent to her and her ministers for this outstanding win. We hope that this government will understand the needs of plastic industry and will extend its assistance and co-operation for further promotion of plastic industries of the state. We are in constant touch with WBIDC and industry ministry for the allotment of suitable land for development and establishment of second Poly Park. With new government already installed, we shall have to speed up our efforts in this regard. We are hopeful of getting all help and co-operation from the present government for setting up Poly Park-II.

Crude prices which touched a low of $27 a barrel a few months back, have slowly and steadily touched $50 a barrel and rupee has also weakened slightly to hover around 66.75-67.50 levels. With this, the feedstock prices have also firmed up gradually and the negative sentiments prevailing in the market have frittered away. International offers for polymers are slowly firming up and we may see the start of uptrend from June end. The domestic producers, who have been till now reporting very low liftings, have suddenly noticed rise in orders and much improved liftings. Improved buying sentiments are expected to remain for next two -three months with upward revision in prices from time to time.

After facing continuous two years of drought, the Meteorological Department of India has predicted normal monsoon this year with adequate rainfall. The favourable monsoon is going to boost rural demand and consumption and, thus, bring cheers to the people. As our agriculture is still largely dependent on monsoon, normal rainfall will bring prosperity to the rural masses and will further improve our GDP numbers. Our present GDP growth rate is already 7.4% and we have become the fastest growing economy of the world surpassing China. The entire world is looking at us and is very keen to do business in India and increase their trade volume. This is evident from the unprecedented welcome and greetings which our Prime Minister has been receiving on his visit to foreign countries. The world has started to recognize the role of India which she can play in the growth of global economy and fight against terrorism.

The work for our dream project at Poly Park has restarted and 90% work is complete on ground floor and first floor. We are exploring the possibilities of starting short term courses along with machine training for students by making tie-up with some knowledge imparting agencies or institutes. We are hopeful of making the IPF-KC operational on self sustaining basis. As we have a total capital outlay of Rs.25 crores for this project, we require generous contributions from our members to fast complete the same.

I conclude my message by quoting these beautiful lines:-

एक मौज अगर मचल जाए, तो तूफाँ बन जाए,
एक फूल अगर चाहे, तो गुलिस्ताँ बन जाए,
एक खून के कतरे में है तासीर इतनी कि
एक कौम की तारीख का उनवा बन जाए।

Ramesh Kr. Rateria
President

From the Desk of Hony. Secretary

Dear Members,

It is always a privilege to communicate with you all through this magazine. I once again request all members of the Federation for more active participation in IPF activities.

In my previous communication to you I had appraised that IPF is taking a delegation to K-2016 being held at Messe Dusseldorf, Germany from 19th to 26th October 2016. K-2016 is the largest trade fair in the world for Plastics and Rubber. At K global leaders to young spin-offs present their impressive capabilities. High caliber trade visitors from over 100 countries make use of K-2016 as the ideal business platform for information and investment. Around 3220 exhibitors put up their stalls with over 2 lakh domestic and foreign visitors. The Federation has appointed Orbit Corporate & Leisure Travels (India) Pvt. Ltd. as travel partner for IPF delegation. It will be an 8 nights / 9 days tour with accommodation in 4 star hotels in Paris, Amsterdam and Cologne (Germany). The package includes a tour of Paris, Brussels and Amsterdam with 3-days entry ticket to K-exhibition. The charge fixed is very reasonable with Rs.1,60,000/- for double occupancy and Rs.1,90,000/- for single occupancy. Members who have still not enrolled themselves for this tour may contact IPF Secretariat immediately before it is too late. This fair is held once in three years.

I am happy to inform you that IPF Knowledge Centre pending work has commenced in full swing. Earlier 70% of the work in ground and first floor had been completed. We now intend to complete the balance 30% work. Once the ground and first floor is completed, skill development programs can begin at the Centre.

The 15th Taipei International Plastics & Rubber Industry Show (TaipeiPLAS 2016) will be held at Taipei Nangang Exhibition Center, Hall 1 in Taiwan from August 12 – 16, 2016. IPF members have been offered free 4-nights hotel stay at Taipei for attending the exhibition. Mass emails have already been sent to all members. Since hotel rooms are limited it is being offered on first come, first serve basis subject to availability of rooms. Members interested in visiting this exhibition may directly contact Ms Chaitali Paul, email: chaitali.paul@taitra.org.tw (Phone: 033-4004 2796) with copy to IPF secretariat.

Myself alongwith our President Shri Ramesh Kr. Rateria represented the Federation in a meeting called by The All India Plastics Manufacturers' Association, Mumbai on 23rd May 2016 at its Auditorium to discuss and prepare a Road Map for "Plastics Image Building". The objective of the meeting was to address the issues related to ban on plastics in various states, to review cases collectively and chalk out a nation-wide effective and strong strategy towards "Plastics Image Building". At the meeting it was agreed that both the processors and end users are responsible for plastic waste management and they should contribute for this activity.

IPF participated in the 83rd Meeting of the Governing Council of CTTC held at Guwahati on 3rd June 2016. During the meeting we have told them to organise a seminar with IPF members to enable them to know more about the activities of CTTC and how to avail the same. We have also suggested that the cost of their moulds should be equivalent to the market price. We have also offered our services for developing customised courses for different sectors in plastic industry for the education of their employees.

We always welcome your advice and suggestions.

With Best wishes.

Sisir Jalan
Hony. Secretary

PETROCHEMIAL MARKET TO REGISTER CARG OF 8.8% FROM 2015 TO 2022

Global petrochemical market is projected to reach US$758.3 bln by 2022, registering a CAGR of 8.8%, as per Grand View Research, Inc. Increasing demand for petrochemical products in industries including transportation and construction is expected to drive growth over the next seven years. Furthermore, infrastructure development coupled with transportation industry growth in BRIC nations is expected to propel demand over the forecast period.

Growing demand for petrochemical products is attributed to the presence of abundant raw materials in Middle East & Africa. Furthermore, rising shale gas exploration in North America coupled with E&P in China is expected to propel growth. However, fluctuating crude oil and naphtha prices due to political instability in OPEC nations and supply-demand gap is expected to hinder industry growth.

Ethylene accounted for over 25% of total share in 2014 and was the leading product segment. Increasing use of polyethylene in the packaging industry is projected to drive demand for ethylene over the forecast period. Propylene accounted for over 15% of the market share in 2014. The product is widely used across industries such as packaging, rubber, electronics and plastics. Increasing use of propylene derivatives along with adoption of improved technologies such as light steam cracker is expected to have a positive impact on growth.

Methanol is poised to be the fastest growing segment in terms of revenue, growing at a CAGR of over 15% over the forecast period. Growing methanol to olefins industry is expected to further propel use of methanol over the forecast period. Moreover, its widespread use in manufacturing bio diesel is expected to drive the demand over the forecast period. In addition, government initiatives to reduce carbon emission are further projected to augment the biodiesel demand which is expected to propel its use going forward till 2022.

China was the leading consumer of petrochemicals in 2014. Increasing use for plastic products such as polypropylene, polyethylene terephthalate, polyethylene and engineering plastics from flourishing industries such as packaging, automotive and construction industry is expected to drive growth over the forecast period. China is projected to witness highest growth of over 10.0% over the period of 7 years. North America accounted for over 20% market share in 2014. Rising shale gas exploration activities in U.S. and Canada is projected to drive growth in the region. In addition, rising use of benzene and xylene from industries including lamination and packaging is expected to further bolster the growth over the forecast period. Petrochemical market is dominated by large multinationals which are integrated along the value chain. Key players in the industry are BASF, Dow Chemical Company, Chevron Corporation, and Exxon Mobil.

Source : Plastics News Daily

GROWING DEMAND FROM PACKAGING, AUTOMOTIVE, BUILDING AND CONSTRUCTION BOOST MASTERBATCH MARKET IN QATAR

The masterbatch market in Qatar is projected to cross US$23 mln by 2021, as per TechSci Research. Masterbatch is a solid or liquid mixture of pigments or additives used as a raw material in plastic processing for imparting color or other special characteristics to processed goods. Globally, masterbatch are increasingly replacing the conventionally used dry pigments and compounds. However, in Qatar, pigments and compounds continue to be widely used in various industries such as PVC pipe industry, thereby restricting volume consumption of masterbatches in the country. Masterbatch are broadly categorized as white, black, color and additive, with the market for masterbatch in Qatar being dominated by white masterbatch, in volume terms, in 2015. Plastic processing industry in Qatar is concentrated in two major industrial areas, that is, Doha Industrial Area and Mesaieed Industrial Area, of which Doha Industrial Area accounted for the majority share in the Qatar masterbatch market in 2015.

Majority demand for masterbatch emanates from the processors using blown film extrusion process, which is used for manufacturing plastic packaging products. In addition to blown film, masterbatch are also used in significant quantities in roto molding process, predominantly in the production of storage tanks and builders plastic products. Cable manufacturing is another major end use application for masterbatch suppliers inQatar, wherein color masterbatch is the dominant product segment. Cable manufacturers predominantly use green, red, blue and yellow masterbatch to comply with color coding for easy and safe identification of cables.

Qatar masterbatch market is entirely dependent on downstream market, i.e., polymer or plastics industries in the country. Demand for masterbatch continues to be propelled by increasing demand for polymer resins, as masterbatches are incorporated in polymer resins for the production of plastic in various shape and size. During 2013-2015, Qatar polymer market exhibited robust annual growth of 39.12% in volume terms. In 2015, the output of the polymer industry of Qatar stood at 2.1 million metric tons as compared with 1.7 million metric tons in

2014, exhibiting a sturdy year on year growth rate of around 23.53%. Major types of resins/polymers manufactured inQatar include Low Density Polyethylene (LDPE), Linear Low Density Polyethylene

(LLDPE), High Density Polyethylene (HDPE), Medium Density Polyethylene (MDPE), etc. In addition to domestic market, Qatar serves the export demand as well. Augmented demand from the plastic processing industries is expected to steer the Qatarmasterbatch market at a healthy pace through 2021.

"Demand for masterbatches is increasing at a moderate pace on account of rising demand for plastics, coupled with supportive initiatives taken by the Government of Qatar. Masterbatch suppliers in Qatar are witnessing growing demand for additive masterbatch on account of increasing preference for high grade and speciality products coupled with rising demand for bio degradable plastics. All these factors are expected to directly boost the masterbatch demand in Qatar over the course of next 5-10 years", said Mr. Karan Chechi, Research Director with TechSci Research, a research based global management consulting firm.

Source : Plastics News Daily

(FOCUS) GLOBAL DISTRIBUTION OF BIOPOLYMERS

As one of the best approaches to ease the pressure of plastics pollution, biopolymer witnessed rapid development in recent years. This paper highlights over 10 categories of bio-based materials, their features and global production capacity. Polylactic acid (PLA) is the most common type of bioplastics, with the largest production volume and extensive applications in the world. Carbon dioxide-based copolymer (ABC) is stirring up an investment fever in China. So to speak, this is a must-read for biopolymer enterprises.

Biopolymer is either bio-based or biodegradable, offering three major advantages - low carbon emission, recyclable and biodegrability. Methods to produce biopolymers include: Modified biopolymers made by mixing biomaterials and petrochemical-based plastics; synthetic biopolymers made using biomaterials through fermentation.

Modified biopolymers

Categories already produced in industrial scale include starch/polymer blend and soy protein fully degradable materials, and wood plastics composite. Other material types are still developing but with great promise.

Synthetic biopolymers

Synthetic biopolymers are generally synthesized through biological fermentation and chemical synthesis. They can be divided into two categories: biodegradable polymers and bio-based materials.

1. Biodegradable polymers

Biodegradable polymers consists five categories. Of this group, polylactic acid (PLA) has the largest volume and is the most commonly used material. Polyhydroxyalkanoicacid (PHA) can be divided into: 1G (first generation) products PHB, 2G products PHBV, 3G products PBHH and 4G products P34HB. Synthetic aliphatic polyester can be based on binary acid, dihydric alcohol and most recently, bio butanedioic acid. The fourth is carbon dioxide based copolymer (ABC), which, known as aliphatic polycarbonate, is a hot topic in China that attracts large amount of investments.

China holds a leading position in the world in APC synthesizing technology. Lastly, Poly ε-caprolactone (PCL), as a preferred material for implants in human body. It can be used as material for surgical suture thread. PCL is often combined with other degradable plastics as modififer to reduce cost and improve performance.

2. Bio-based material

(1) Bio-based polyester. PTT, an engineering plastics developed by DuPont, is based on an alcoholic synthetic monomer comes from biological material with a bio content of around 40%.

(2) Bio nylon, mainly including PA 1010 (Arkema, France), PA 11 (Atochem, France, 10,000T/year), PA 12 (AG, Germany, 16,000T), PA 1012 (Suzhou Hipro; Evonik, Germany), PA 610 (DuPont, the US), PA 410 (DSM, the Netherlands), PA 10T (Guangdong Jinfa) and PA 56 (Shandong Cathay).

(3) Bio polyolefin.Brazilian chemical giant Braskem is developing a bio-based polyethylene (PE), a renewable PE made of sugarcane ethanol.

(4) Bio epoxy. Chinese Academy of Sciences (CAS) Ningbo Advanced Material Research Institute successfully developed a fully bio-based epoxy in 2012, where monomer comes from tri-functionality containing natural rosin; curing agent includes rosin and tung oil based curing agent and all raw materials come from nature.

(5) Bio rubber. There are a lot of bio-based rubber producers around the world.

Source : CPRJ Editorial Team

FIRST SNOW CHAINS WITH LINKS MADE ENTIRELY FROM PLASTIC INTRODUCED TO MARKET

French textile and rubber company, Joubert Productions, introduces to the market the first snow chains with links made entirely from plastic. This has become possible with Elastollan, the thermoplastic polyurethane (TPU) from BASF.

As introduced, the snow chains made from the two Elastollan grades B90A15 and B60A10WH meet the ÖNORM 5117 standard, which applies across Europe, are suitable for different tire sizes, and easy to fit.

The Elastollan versions are abrasion resistant, flexible at low temperatures, and resistant to loose chippings and road salt. They thus ensure that the snow chains have optimum grip on ice and snow. Besides, as the Elastollan links are much lighter than the conventional metal mesh, the snow chains are easy to handle and quick to remove.

For this new plastic application, Elastollan offers an excellent combination of

lightweight construction and serial production: the conventional metal chain mesh is replaced by two Elastollan grades of different colors that chemically adhere to one another in the injection-molding process, and so do not have to be additionally assembled.

The black Elastollan B90A15 with a harder setting displays very good mechanical properties along with great flexibility at low temperatures; the red Elastollan B60A10WH is more flexible and easy flowing. In compact injection molding, the black chain links are overmolded with the red Elastollan in one mold where they join chemically. As TPU adheres to TPU very well, there is no need for another assembly step as is necessary with metal meshes.

"Tailor-made quality products are the most important part of our business. BASF not only supported our idea of producing lightweight, easy-to-fit snow chains by providing the right material. What is crucial for us is that BASF has been with us right from the initial idea via finding the appropriate mold through to the finished product, thus enabling us to set up with an optimum production process," says Régis Kaelin, who is responsible for R&D at Joubert.

The Austrian standard ÖNORM 5117 is designed for metallic chain links which cover the full tread of tires and must be in contact with the road surface whatever position the wheel is in.

Source : CPRJ Editorial Team

THE KEY TO MEDICAL PLASTICS SUCCESS IN 2016

The medical plastic device sector is continually seeking improvements to improve the health and well-being of us all. Developments in materials, design and manufacturing processes are key to the success of the sector. In recent years technology has been a key focus with increased emphasis on wearable and connected devices. The move towards patient self-care and management has had a visible effect on the market such as the drug delivery sector as manufacturers recognise the need to be part of this 'smart market'.

This is a vibrant market, keen to explore ways of improving its products and the benefits they offer society. Improved manufacturing processes are always a key focal point as of businesses strive to work more efficiently taking advantage of opportunities and market growth.

According to the organisers of this year's Chinaplas, the global medical products industry has never been more dependent on plastics and rubber suppliers to help its meet today's healthcare needs. The medical applications incorporating polymers are diverse and numerous, including: drug-delivery systems; sophisticated diagnostic imaging equipment; surgical tools; prostheses and life-maintaining implantable devices; pharmaceutical packaging; various disposables such as tubes, infusion bags, catheters, syringes, and also increasingly, interactive healthcare monitoring. The US trade association Advamed, estimates that the medical device industry is currently worth $120 billion globally.

Growing news: According to Christoph Lhota, growth is being driven by the diagnostics market including laboratory products and point-of-care applications

Market share

According to Christoph Lhota, vice president Engel, medical, the market for plastic products for medical technologies will grow slightly in 2016.

"We also see potential in Europe but it is strongest in North America," he adds.

Lhota says growth is being driven by the diagnostics market including laboratory products and point-of-care applications. In all areas, innovative technologies are preparing the way for new functionalities, more cost-effective production and safer patient care.

He cites four major examples:

- Medication delivery devices such as inhalers and auto-injectors are becoming increasingly intelligent. Thanks to the integration of electronic functions, they network themselves with other systems in order to ensure the unbroken documentation of therapy-relevant information;
- In diagnostics, sample vessels are becoming widely used that have functionalised surfaces to either specifically initiate or prevent interaction between the sample and the vessel wall;
- Barrier functions are at the focus for pharmaceutical packaging. They pave the way for the further substitution of plastics for glass;
- Innovative, highly integrated processing methods help achieve a more cost-effective production and therefore make high-quality medical products affordable worldwide. For instance, the needles of injection syringes are overmoulded directly in the mould, not only making the production more efficient but also saving raw material.

Thomas Kinisky, president and CEO of Saint-Gobain Performance Plastics

Keeping it personal

Thomas Kinisky, president and CEO of Saint-Gobain Performance Plastics says: "Looking forward in 2016, Saint-Gobain Performance Plastics (PPL) is expecting to see a few trends influencing medical plastic manufacturing."

Kinisky says that firstly we should see an acceleration of cell therapy as it moves on to the development phase.

"We expect personalised medicine to require a higher volume of engineered and customised plastic disposables in the mid-term, as the commercialisation of treatments gains traction.

Saint -Gobain PPL is also making strides in regards to quality/regulatory/validation (QRV) requirements. This comes as the use of plastic-based disposables continues to gain share, particularly in bio-processing. The QRV requirements will continue to increase for the manufacturers of the plastics disposables. End-users will have to demonstrate quality across the supply-chain, so suppliers will have to expand their

compliance systems."

Supply and demand: Eric Resnick says that 2016 will see an increased demand for innovative and effective drug packaging and delivery

Importance of packaging

Eric Resnick, president, pharmaceutical delivery systems, proprietary products, West says that in 2016, many drug manufacturers will focus on the development of large-molecule antibodies for new therapeutics and we will see an increased demand for innovative and effective drug packaging and delivery that can accommodate larger doses given over a longer period of time.

"Additionally, we will see a continued interest in alternatives to glass such as polymer-based systems for drug packaging and delivery systems, especially for biologics, which can be sensitive to glass containers. Since biologics are sensitive drug products, there is a need for ultra-clean packaging components to ensure that there is a low risk of contamination or particulates.

"The connected health movement will drive forward the convergences of digital technologies and drug delivery systems. With that, wearable injector systems for the treatment of chronic conditions will become increasingly popular. This will lead to an increased focus on innovations for new, integrated drug container systems that further aid patient adherence, comfort and safety.

In terms of device manufacturing, 3D printing technology will show its disruptive potential, as many industry players will start working to integrate it into the development and manufacturing processes. This in turn will, however, require additional insights and expertise regarding the material and chemical compounds and processes," he adds.

Expand

Two becomes one: The connected health movement will drive forward the convergences of digital technologies and drug delivery systems says Resnick

On the up: Sven Kitzlinger, application technology consulting, medical technology at Arburg, says there will be an increase in the automation of production processes

Automation of production

"In the medical technology segment, we expect an increase in the automation of production processes through the integration of downstream processing steps in the coming year, 2016. There will also be a focus on the use of high-speed machines for the packaging of pharmaceutical products," explains Sven Kitzlinger, application engineering medical technology at Arburg. "In both cases there are increasing synergies with the packaging department, where we also have a high level of expertise."

Source : Medical Plastics Journal

CONSUMERS CAN BE CONFIDENT IN THE SAFETY OF POLYSTYRENE FOOD PACKAGING

The American Chemistry Council (ACC; Washington, DC) offered up a science lesson in a press release late last week assuring consumers that they can be confident that their food packaging is safe. Styrene is not to be confused with polystyrene, stressed the ACC. "Styrene is a liquid substance used to make polystyrene, an inert plastic used to make many consumer products," wrote the ACC. "There should be no confusion between styrene and polystyrene; these are two different materials."

The California Office of Environmental Health Hazard Assessment (OEHHA) has added styrene to its Proposition 65 list, pursuant to the Safe Drinking Water and Toxic Enforcement Act of 1986. In response, the ACC's Senior Director for Plastics Foodservice Packaging Group, Mike Levy, issued a statement highlighting the differences between these two materials and the safety of polystyrene foodservice packaging.

"Consumers can be confident that California's Proposition 65 action on styrene does not affect the decades-long safety assessments of polystyrene packaging used for foodservice. For more than 50 years, the U.S. Food and Drug Administration (FDA) has determined that polystyrene is safe for use in foodservice packaging, and regulatory bodies around the world agree, including the European Commission/ European Food Safety Authority," said Levy.

"There are important and obvious differences between styrene and polystyrene. They are fundamentally unalike and display distinctly different properties. Styrene is a raw material used to create high-performance plastics, car tires, carpet backing and reinforced fiberglass composites, such as those used in bathtubs, automobile body panels and wind turbines. Once these products are manufactured they are inert.

"Officials in California said their decision to add styrene to the Prop 65 list was based on styrene's listing in the U.S. National Toxicology Program's (NTP) 12th Report on Carcinogens in 2011. California officials determined that NTP's listing merits a Prop 65 listing. NTP does not question the safety of polystyrene food service packaging. As the NTP director was widely quoted: 'In finished products, certainly styrene is not an issue.'"

While science lessons from the plastics industry aren't typically given much credence—and certainly not much media attention—it's at least an attempt to differentiate science from hype. It's good to see the ACC stepping up to the plate with scientific information from which consumers can benefit . . . if they take the time to read it.

Levy continued by stating: "Polystyrene is an FDA-approved and hygienic material of choice for foodservice packaging to serve foods in schools, hospitals, restaurants, food carts and sports stadiums. Its inherent insulation properties maintain food temperatures and help keep food fresh, hot or cold and ready-to-eat. Polystyrene is also used in a variety of other everyday consumer products such as cushioning for shipping delicate electronics, energy-saving insulation, kitchen appliances, smoke

detectors and toys."

Most consumers are not even aware of the many benefits that plastic provides in the thousands of products we use every day. Recently, I was talking to some plastics people at a meeting about this topic, and one person said whenever people start bashing plastics around him, he tells them that the next time they have to go the hospital they should request that nothing containing plastics should be used on them.

Source : Plastics Today

GLOBAL GLASS FIBERS MARKET ESTIMATED TO REACH US$14 MLN BY 2020

The global glass fibers market is said to be expected to reach a valuation of US$14 mn by 2020, increasing from US$8 mln in 2013, as per Transparency Market Research. Glass fibers exhibit properties of light weight, high tensile strength, and high sturdiness. Due to their high bulk strength and light weight, glass fibers are favored in many applications over even metals. The report says that the global glass fibers market is largely driven due to the usability of the material across a wide spectrum of applications. This includes wind turbines, transportation, building and construction, and consumer goods, among others. The exponential growth of practically all application areas of glass fibers has tremendously boosted the growth of the glass fibers market. Glass fibers are used on a large scale in fiber-reinforced plastics.

Glass fibers are suitable for a host of applications due to their high structural strength and resistance to impact. Particularly in wind turbine operations, the lightness of turbines including consisting of fibers facilitates smooth power generation; in automotive design, lightness of the vehicle is important for reducing greenhouse gas emissions. Thus, glass fiber reinforced plastics are commonly used in wind turbines and automotive components.

Of all the glass fiber types, E-class glass fibers display a clear dominance over other glass fiber type segments. This segment currently accounts for a share of more than 80% in the global market due to the low cost, high modulus, and high tensile strength of E-class glass fibers. Other glass fiber types such as S-class, D-class, and C-class are more expensive to manufacture, but outdo E-class fibers in matters of performance. This is the reason why these glass fibers are collectively known as performance glass fibers and are commonly used for technical applications.

Application-wise, building and construction is the largest application segment of this market. Glass fibers are used for residential and non-residential insulation applications. Glass fibers are also used in the fabrication of bathroom fittings and indoor furniture; the material is increasingly being used as an alternative to timber, aluminum, steel, and concrete for these applications.

In 2013, Asia Pacific stood as the largest regional market for glass fibers, accounting for a share of 45% in the global market. The easy availability of labor at low wages and readymade manufacturing facilities in China and India is the reason for this.

Source : Plastics News Daily

POLYMER IMPLANTABLE DELIVERY PLATFORM PROVIDES CHEMOTHERAPY TO PANCREATE TUMORS

A novel implantable delivery platform can provide local chemotherapy for treating pancreatic ductal adenocarcinoma (PDAC), according to a new study. Developed by researchers at the Massachusetts Institute of Technology (MIT, Cambridge, MA, USA) and Massachusetts General Hospital (MGH; Boston, MA, USA), the implant is a biodegradable polymer flexible film made of poly lactic-co-glycolic acid (PLGA), and is designed to release high doses of chemotherapeutic drugs for up to 60 days. For delivery, the film is rolled into a tube and inserted through a catheter; once it reaches the pancreas, it unfolds and conforms to the shape of the tumor, releasing the embedded drugs only from the tumor-facing side to reduce side effects. To compare the device's efficacy to that of traditional chemotherapy, a study was conducted in mice carrying human pancreatic tumors. One group of mice was treated with the implant carrying the chemo drug paclitaxel, while the other group received injections of the same drug for four weeks, simulating current treatment for human patients. The results showed that tumor growth slowed in mice with the implant; in some cases, the tumors even shrank. After four weeks, the implant group showed five times the paclitaxel concentration in their tumors that the intravenous group did.

In addition to successfully delivering the drug to the pancreas, the researchers also observed other positive effects. The localized treatment increased the amount of necrotic tissue, and since there are few blood vessels in pancreatic tumors, the paclitaxel tended to remain in-situ, preventing toxic effects in healthy tissues. Additionally, by acting as a physical barrier, the film was able to reduce metastasis to nearby organs. The study describing the implant and the murine study was published early online on March 31, 2016, in Biomaterials. "The greatest benefit of this device is the ability to implant it with minimally invasive procedures, so we can give a tool to oncologists and surgeons to reach tumors that otherwise would be difficult to reach," said lead author Laura Indolfi, PhD, of the MIT Institute for Medical Engineering and Science (IMES) and the MGH Cancer Center. "You can implant our device to achieve a localized drug release to control tumor progression and potentially shrink the tumor to a size where a surgeon can remove it."

Pancreatic cancer patients often suffer from blockage of the bile duct, which interferes with digestion and is very painful. The duct

can be reopened with a stent, but usually gets blocked again, requiring the patient to have the old stent removed and a new one inserted. According to the researchers, the film could also be used as a coating for such a stent, helping to prevent the cancer cells from spreading into the bile duct and blocking it again.

Source : Plastics News

HIGH PERFORMANCE TRANSISTORS CREATED ON FLEXIBLE PLASTIC SHEETS

Using a technique known as nanoimprint lithography, researchers at the University of Wisconsin-Madison (UW Madison) and partners have created a breakthrough method to allow the simple manufacture of inexpensive, high-performance, wireless-capable, flexible Metal Oxide Semiconductor Field Effect Transistors (MOSFET) that overcome many of the operation problems encountered in devices manufactured using standard techniques. Created on large rolls of pliable plastic, these MOSFETs could be used to make a host of devices ranging from wearable electronics to bendable sensors.

MOSFETs are semiconductor components that have rapidly replaced common bipolar transistors in electronic circuits due to their low current requirements, high-frequency capabilities, and generally improved performance. These semiconductors operate by modulating what is known as a charge concentration via internal capacitance along channels between its electrodes to produce current flow.

In other words, by applying a voltage to one electrode (known as the "gate"), an electric field is created in the substrate located between the two other electrodes (known as the "source" and "drain"), which causes a channel to open up for electron flow between them. Modulating the voltage applied to the gate electrode then has the effect of increasing or decreasing current flow, and so can be used for amplification in a circuit.

However, substantially reducing the size of MOSFETs to meet the demand for ever-shrinking integrated circuits has met with problems. Specifically, the ability of MOSFETs to produce current flow efficiently, because standard semiconductor manufacturing techniques tend not to be able to control the level of doping (the introduction of impurities in silicon designed to render it either positively or negatively charged) accurately enough to ensure consistent channel performance across individual components.

Ordinarily, MOSFETs are produced by growing a layer of silicon dioxide (SiO_2) on top of a silicon substrate and then depositing a layer of metal or polycrystalline silicon over that. However, this method can be relatively imprecise and difficult to fully control, so the doping can sometimes leak into areas it isn't wanted in to create what has been dubbed the "short channel" effect.

(The short channel effect is, in essence, where etched channels on a MOSFET that allow the conduction of electricity via a field effect are reduced in size in relation to the depletion layer – or insulation area – as a result of dopant leakage, thereby decreasing performance. If the problem does not render the component defective in production process testing, then this can result in individual MOSFETs being released to market with varying performance characteristics.)

This is where the new technique developed by UW Madison and its partner universities around the US comes in.

To improve the quality of semiconductors by reducing the likelihood of this dopant leakage, the researchers employed a process of electron-beam lithography (a technique first mooted for commercial use in semiconductor production by Fujitsu and Advantest a decade ago where a process of scanning a focused beam of electrons is used to etch custom shapes on a surface covered with an electron-sensitive film known as a "resist"). This was then followed by molding and subsequent etching to produce a much more physically-controlled production process.

In detail, the team began by coating a surface with a positively doped layer of silicon, 270 nm thick. Nanoscale trenches were then produced in the device layer using electron-beam lithography, followed by dry etching to create a silicon nanomembrane. The researchers then removed the silicon nanomembrane layer and transferred this onto another substrate consisting of adhesive coated plastic (polyethylene terephthalate "PET") film. The final fabrication steps then involved adding additional dry etching to isolate and define the channel region and deposit the gate dielectric layers and metal gate.

While this may sound like a lot of work, it is in fact a relatively straightforward process and arguably less complex than some doping and deposition based techniques used in ordinary semiconductor manufacture today. The benefit of such controlled, precise, and minuscule engineering in this case, though, results in a semiconductor endowed with a unique, three-dimensional current-flow pattern which means that it consumes far less energy and runs much more efficiently than standard versions of these semiconductors.

In fact, the new transistors have been reported to operate at a record speed of 38 gigahertz, with simulations showing that they may even be capable of operating at a lightning-fast 110 gigahertz with just a little tweaking.

But speed hasn't been achieved by compromising size; the new method has provided a way of cutting much narrower trenches than conventional fabrication processes are able to do, so it may be possible to jam more of these transistors into smaller devices than ever before achieved.

The researchers also claim that the new transistor is eminently suitable to radio frequency applications, as it is designed to transmit data or transfer power wirelessly.

Cond....pg.17

CURRENT STATUS OF IPF KNOWLEDGE CENTRE

The work on IPF Knowledge Centre has restarted under the Chairmanship of Shri J.C.Agarwal. There is some pending work of plastering on outside wall, electrical, plumbing and flooring. We expect the work will be completed in next 3-4 months. The IPF KC sub- committee met at the site twice on 5th and 6th June and took stock of the current position and pending work to be done. Meeting with the consultant was done on 6th June at the site to discuss modus operandi for the working and the skill development courses, which can be taken up at the centre with the help of Government department. The consultant will submit its report in due course.

Some of the pictures taken during the two visits by the IPF KC team consisting of Mr J.C. Agarwal- Chairman, Mr. K.K.Seksaria, Mr. Rajesh Mohta, Mr. Ramesh Kumar Rateria and Mr Ashok Jajodia is given below.









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This ability could prove particularly useful in applications ranging from wearable electronics to sensors.

Flexible semiconductors may not be a new concept by any means, with wearable electronics and flexible membranes the products of recent research, but the researchers say that this alternative, low-cost process to produce such high-performance semiconductors is particularly groundbreaking. Especially as they believe it could be easily scaled-up for use in roll-to-roll processing of plastic sheets that would enable semiconductor manufacturers to endlessly replicate the etching patterns and mass-produce many hundreds of thousands of devices on a single roll of flexible plastic.

"Nanoimprint lithography addresses future applications for flexible electronics," said Zhenqiang (Jack) Ma, the Lynn H. Matthias Professor in Engineering at UW Madison. "We don't want to make them the way the semiconductor industry does now. Our step, which is most critical for roll-to-roll printing, is ready."

Conducted in collaboration with the University of Michigan, the University of Texas and the University of California, Berkeley, details of this research were recently published in the journal Scientific Reports.

Source: UW Madison

RECYCLABLE THERMOSETS AND THERMOPLASTICS RECYCLING TECHNIQUES TO WATCH OUT FOR

The global market for recyclable thermoset polymers has attracted considerable attention in the past few years and the field has significantly advanced toward the development of new classes and varieties of thermosets with recycling capabilities, as per Transparency Market Research. Thermosets refer to the covalently cross-linked polymers that have superior resistance to a variety of environmental, mechanical, and thermal factors even at high temperatures and have excellent dimensional stability compared to conventional thermoplastics, which are also called thermoset polymers. Thermoset polymers are linear polymers that can be recycled and reprocessed using thermal energy owing to their easily accessible melting points. However, thermoplastics are not durable enough to be used in high performance applications, and are replaced by thermosets for applications that require materials that are indestructible or are virtually impossible to break down/melt or process using conventional thermoplastic recycling techniques. Consequently, discarding these thermosets in landfills than trying to recycle them has been the most preferred course of action of working around with thermosets. But developments in the global recyclable thermosets market are projected to bring a substantial change in this scenario.

There has been rising awareness regarding environmental protection by avoiding the accumulation of unrecyclable polymers in landfills and unregulated places. Tax incentives and regulations have been introduced to encourage the development of recyclable thermosets. In response, researchers have designed some novel polymers that do not only have high performance features in line with conventional thermosets, but are also recyclable. The favorable research activities have substantially boosted the global market for recyclable thermosets. The changing regulatory scenario and the rising consumer awareness regarding the importance of reducing the use of fossil fuels are also crucial for the market's growth and will significantly drive the market over the report's forecast period. Some of the key recyclable thermosets available in the market currently are polyhexahydrotriazine (PHT), hemiaminal dynamic covalent networks (HDCNs), polyhexahydrotriazine added with carbon nanotubes, epoxy/polyepoxide resins, phenol formaldehyde, and unsaturated polyester resins (UPR). End use industries such as aerospace, electronics, and automobiles are projected to lead to an increased demand for recyclable thermosets to manufacture a variety of products and product parts.

Asia Pacific is likely to be one of the largest consumers of recyclable thermosets over the report's forecast period owing to the rising production of automobiles in the region. The rising population, coupled with strengthening economies, and rising disposable incomes in Asia Pacific have led to significant growth of the automobiles sector in the past few years, thereby enhancing growth prospects of several allied industries. This has also benefitted the market for recyclable thermosets in the past years and is expected to do so over the report's forecast period. Demand for recyclable thermosets is also expected to increase in developed regional markets such as North America and Europe where stringent government regulations pertaining to material recycling are stimulating manufacturers to switch to recyclable varieties of core materials.

Source : Plastics News Daily

(CIPET) THE CENTRAL INSTITUTE OF PLASTICS ENGINEERING & TECHNOLOGY TO DEVELOP RS.50 CRORE FACILITY AT VIJAYWADA

(CIPET) will develop a center at an investment of INR 50 crores at Vijayawada in Andhra Pradesh, as per The Hindu Business Line. The Centre and State Governments will share the costs equally. The AP Government has allotted 12.04 acres at Surampalli village of Gannavaram mandal for the facility. It is expected to help plastics industry in Vijayawada, Visakhapatnam, Kakinada, Rajahmundry, Guntur and Renigunta in the State.

Cipet had launched its training activities

since August 2015 at the premises of the Vijayawada Auto Cluster Development Company, Kanuru near Vijayawada. It is offering specialised and practical oriented courses in plastics engineering & technology in line with the industry requirements. So far, 675 students have been trained through various skill development programmes and many have been employed in plastics and allied industries. Plans are to train around 14,500 students in the next three years.

CIPET, which is under the Department of Chemicals & Fertilisers has operations from 28 locations in the country. It offers diploma, post graduate, doctoral programmes in the entire gamut of plastics engineering and technology. In addition, Cipet runs two R&D centres and offers technology support services in all key sectors of the economy. As per industry estimates, there are about 1.18 mln direct technical manpower employed in plastics processing industries and a protected 1.16 mln more are required by 2023-24. During 2015-16, Cipet has trained 63,020 people through its training programmes and has set a target of achieving 6.2 lakh by end of 2022.

Source : Plastics News

NEW REPORT SHINES A LIGHT ON RECYCLING AUTOMOTIVE PLASTICS

It was about three years ago that Kendra Martin first attended an automotive event as an employee of the Society of the Plastics Industry Inc.

And at that gathering she got the sense that recycled plastic was still being viewed as cheap.

But in the years that have followed, the senior director of industry affairs at SPI has seen a huge change in the perception of using recycled-content plastic parts.

"That seems, for the most part, to be gone. That doesn't seem to be the attitude anymore," she said at SPI's inaugural Re|focus Recycling Summit & Expo in Orlando. "That's a pretty quick shift."

Automotive plastic recycling has become such an important emerging issue for SPI that the trade group is out with a brand new report highlighting the opportunities and challenges that face that segment of the industry.

End-of-life vehicle recycling, for years, has essentially focused on metal recycling. For decades really. And why not? The metal recycling industry has essentially perfected ways to capture the overwhelming majority of metal in an automobile. It's one of the great success stories in recycling.

But with plastic components becoming more and more a part, no pun intend, of new vehicles, SPI wants to put a greater emphasis on examining the opportunities to recycle those materials instead of seeing them essentially head to the landfill.

SPI's latest Plastics Market Watch report shines a light on automotive recycling, examining what's going on in the business from both an end-of-life perspective as well as recycled content going into new automobiles, Martin said.

"We just looked at here's what we see going on. The big autos are committed to a bunch of different areas of introducing recycled content and using that in their vehicles. And also the end of life issues," she said.

The report also hits on zero-waste efforts by manufacturers that necessitate a second life for their scrap.

"Everything that's going on in automotive. It's really a thought piece about laying out ideas of where the industry could be going and how to get around some of the challenges," Martin said.

"I was surprised to see how many brand owners have made commitments to using recycled content," said Kim Holmes, senior director of recycling and diversion at SPI. A lot of those commitments use non-automotive sources of recycled resin, such as PET bottles, she pointed out.

"But they are least creating a supply chain that is engaging recyclers," Holmes said.

The idea of the report is to not only reach SPI members with a message to promote automobile plastics recycling, "but also key partners and customers in the plastics life cycle, including auto manufacturers and designers, scrap recyclers and policymakers," the report states.

"It is critical that stakeholders outside of the plastics industry recognize the value of the material not only in the automotive manufacturing process, but also in terms of post-industrial and post-consumer recycled material that can be used in products, both in auto applications as well as other industries," the report continues.

Plastics now make up about 50 percent of the volume of materials in a new vehicle. But they still only account for about 10 percent of the weight, the report states.

"I think the takeaway is it's a priority for the industry on three fronts," Holmes said about plastics recycling. "Using recycled content. Zero waste manufacturing, which seems to be a priority for everybody. And look at, 'Are there opportunities to recover plastics?' Because they are only going to increase."

SPI reports that 39 different types of plastics are used in vehicles. A new project by the trade group this year aims to examine the potential to begin whole part recovery of certain plastic vehicle components, before automotive shredding, at the end of a vehicle's life. This initial work will center on parts made from polypropylene and thermoplastic polyolefins.

With 12 million to 15 million vehicles being scrapped each year in the United States, there is an opportunity to make a difference in plastics recycling by tackling that market.

And that opportunity is only expected to grow in the years ahead. Consulting firm IHS Inc. estimates that the amount of plastic in a typical car will grow to 770 pounds by 2020, the report states. That's up from 440 pounds in 2014.

Source : Plastics News

COMMISSION AUTHORISES DEHP USE FOR RECYCLED SOFT PVC

The European Commission has granted authorisation to three recycling companies to use the phthalate plasticiser DEHP in recycled soft PVC.

The Commission's final decision follows an assessment by its Reach Committee. Members of the European Parliament had earlier passed a non-binding resolution asking the Commission not to grant authorisation to DEHP, due to concerns that the plasticiser may be an endocrine disruptor.

"Recycling should not justify the perpetuation of the use of hazardous legacy substances," the MEPs said in November 2015.

The Commission announced its decision on 20 April to grant a four-year authorisation for uses of DEHP in recycled soft PVC in compounds and dry-blend to VinyLoop Ferrara (based in Italy), Stena Recycling (Sweden) and Plastic Planet (Italy).

The European Council for Plasticisers and Intermediates (ECPI) said it welcomed the decision. It said the decision is in accordance with the EU's Reach regulation of chemicals, and it endorses a recommendation by the European Chemicals Agency (ECHA) to grant authorisation of DEHP in recycled articles.

"We are pleased to see that the European Commission has taken its decision based on ECHA expert committees' recommendation which came after a thorough evaluation of both scientific and socio-economic data," said ECPI spokesperson Michela Mastrantonio.

"This decision is of great value for the PVC supply chain and represents an important positive precedent towards legislative consistency and predictability. This also confirms European Commission's commitment to the Circular Economy and the recognition of science as crucial on such a technical dossier. PVC recycling contributes to a more efficient use of our resources and the reduction of emissions bringing huge benefits to the environment," said Mastrantonio.

But European Environmental Bureau (EEB), a Brussels-based environmental organisation, said the authorisation "imposes strict conditions on these companies in order for them to reapply for authorisation after the review period as it obliges downstream users to make monitoring and biomonitoring information available to ECHA before 31 December 2016".

Dolores Romano, EEB senior policy officer for chemicals, said that even with the Commission's conditions, "we deeply regret this decision as it not only breaches the Reach Regulation, but also establishes a very negative precedent that compromises upcoming decisions and undermines the aims of Reach to ensure that toxic substances are replaced by safer alternatives".

Source : Plastics News Europe

STUDENTS DEVELOP COMPOSITE MATERIAL FROM WASTE POLYMER

Global Institutes of Management and Emerging Technologies (GIMET) has claimed to have developed a composite material from waste polymer, which will be effective in making helmets, car bumpers and windmill blades stronger.

Students and faculty of the Mechanical Engineering Department of the institute achieved the milestone by developing a composite material using waste polymer. "This is perhaps the first innovation of its kind, which is created by waste, including shavings of polymer such as PVC pipes etc," claimed Prof Vijay Bhanot, associate professor, Mechanical Engineering.

The new type of composite material was developed by Angel Bajaj, Amrojpreet Singh, Amritpal Singh, Amoldeep Singh and Amritjot Singh, fourth year students of the MET, under the guidance of Prof Vijay Bhanot.

Talking about the material created, Prof Vijay said, "Major components of the polymer material are PVC waste, hardener, binder, lubricant and metal sheets for preparation of dyes etc."

Explaining about the technicalities of such material in global use, Prof Bhanot said, "Nine samples were designed by crushing PVC wastage into 850, 600, 425 microns and these were mixed with different compositions of hardener and binder. After the solidification of the samples, they were tested for surface roughness, tensile strength, compressive load and impact load. The testing was carried out by CIPET."

Results found that the composite material could be used at various levels. It could be used for manufacturing car bumpers and helmets. It was ideal material for interiors, home decorations, domestic, office and outdoor furniture also.

Source : Tribune News Service

WALNI VILLAGERS USE PLASTIC WASTE TO CONSERVE WATER

Even as the state government harps on water conservation , the quality of works executed under its schemes leaves a lot to be desired. Against the government's claims of farm ponds providing round-the-year water supply, they are drying up even before advent of summer. Farmers of Walni , a village about 20kms from city on Kalmeshwar Road , are among the sufferers of poor quality of these works.

Some years back, there were 30 farm ponds in Walni but they proved not to be of much use as they could not retain water when it was most needed. Most of the water would percolate into the ground and the ponds would dry up after December, leaving hardly any water for irrigation. Seeing no positive results, many farmers

of the water-stressed area filled up their ponds with earth.

Some others did an experiment with household plastic waste last year. They collected plastic waste like wrappers and polythene bags and stitched them together to make big sheets. These sheets were then used as linings at the bottom of a pond to prevent water from percolating into the ground. The sheet was first covered with one-foot layer of soil.

The experiment turned plastic waste into a blessing for farmers. "We did this experiment in March last year and the water that would previously dry up before summers stayed till April and even May ," said a social worker who has been active in the region for a quarter of a century. Interestingly, he didn't want his name revealed as "the credit for the effort should go to a lot of people and not just me."

Seeing the success of first attempt, many farmers extended the innovative initiative in their farm ponds. "Every Sunday we collect the plastic and hand it over to the women to make big sheets by stitching them together. We are in the process of laying these sheets in other farm ponds," the villagers said. At a time when plastic pollution is one of the major environmental challenges, this technique promises to curb the adverse effects of unscientific plastic disposal. "Earlier, we would burn the plastic as transporting it to the dumpyard in city was not very feasible," said a villager.

Though the state government has introduced subsidy for plastic paper used for lining the pond under Shet Tale Yojana, it is not economical for the farmers. "The plastic sheets are very expensive. Using household plastic waste is a much better alternative and should be promoted widely as it will not only help the farmers but also make cities free of plastic waste. Collection centres should be set up in cities plastic should be provided to farmers," said another social worker associated with the project.

With water availability hopefully increasing this year, the farmers have also decided to promote efficient modes of drawing water. "Now that water will be retained in ponds, we will be using treadle pumps that run on human effort and give more output," said a farmer. An expert TOI spoke to had a word of caution even though she found it a good move. "The villagers must ensure the plastic sheet is of good quality, preferably of high density polyethylene (HDPE) used as a cover in bottled milk, water, juice, cosmetics, shampoo, dish and laundry detergents, and household cleaners. Bags for groceries and cereal box liners are also made out of the stuff," said Kavita Rattanadding, "HDPE will avoid leaching harmful chemicals into the ground." Rattan has done extensive research on health hazards of plastic.

Source: Times of India

NEW MATERIAL TEMPORARILY TIGHTENS SKIN

Scientists at MIT, Massachusetts General Hospital, Living Proof, and Olivo Labs have developed a new material that can temporarily protect and tighten skin, and smooth wrinkles. With further development, it could also be used to deliver drugs to help treat skin conditions such as eczema and other types of dermatitis.

The material, a silicone-based polymer that could be applied on the skin as a thin, imperceptible coating, mimics the mechanical and elastic properties of healthy, youthful skin. In tests with human subjects, the researchers found that the material was able to reshape “eye bags” under the lower eyelids and also enhance skin hydration. This type of “second skin” could also be adapted to provide long-lasting ultraviolet protection, the researchers say.

“It’s an invisible layer that can provide a barrier, provide cosmetic improvement, and potentially deliver a drug locally to the area that’s being treated. Those three things together could really make it ideal for use in humans,” says Daniel Anderson, an associate professor in MIT’s Department of Chemical Engineering and a member of MIT’s Koch Institute for Integrative Cancer Research and Institute for Medical Engineering and Science (IMES).

Anderson is one of the authors of a paper describing the polymer in the May 9 online issue of Nature Materials. Robert Langer, the David H. Koch Institute Professor at MIT and a member of the Koch Institute, is the paper’s senior author, and the paper’s lead author is Betty Yu SM ’98, ScD ’02, former vice president at Living Proof. Langer and Anderson are co-founders of Living Proof and Olivo Labs, and Yu earned her master’s and doctorate at Mimicking skin.

As skin ages, it becomes less firm and less elastic — problems that can be exacerbated by sun exposure. This impairs skin’s ability to protect against extreme temperatures, toxins, microorganisms, radiation, and injury. About 10 years ago, the research team set out to develop a protective coating that could restore the properties of healthy skin, for both medical and cosmetic applications.

“We started thinking about how we might be able to control the properties of skin by coating it with polymers that would impart beneficial effects,” Anderson says. “We also wanted it to be invisible and comfortable.”

The researchers created a library of more than 100 possible polymers, all of which contained a chemical structure known as siloxane — a chain of alternating atoms of silicon and oxygen. These polymers can be assembled into a network arrangement known as a cross-linked polymer layer (XPL). The researchers then tested the materials in search of one that would best mimic the appearance, strength, and elasticity of healthy skin.

“It has to have the right optical properties, otherwise it won’t look good, and it has to have the right mechanical properties, otherwise it won’t have the right strength and it won’t perform correctly,” Langer says.

The best-performing material has elastic properties very similar to those of skin. In laboratory tests, it easily returned to its

original state after being stretched more than 250 percent (natural skin can be elongated about 180 percent). In laboratory tests, the novel XPL's elasticity was much better than that of two other types of wound dressings now used on skin — silicone gel sheets and polyurethane films.

"Creating a material that behaves like skin is very difficult," says Barbara Gilchrest, a dermatologist at MGH and an author of the paper. "Many people have tried to do this, and the materials that have been available up until this have not had the properties of being flexible, comfortable, nonirritating, and able to conform to the movement of the skin and return to its original shape."

The XPL is currently delivered in a two-step process. First, polysiloxane components are applied to the skin, followed by a platinum catalyst that induces the polymer to form a strong cross-linked film that remains on the skin for up to 24 hours. This catalyst has to be added after the polymer is applied because after this step the material becomes too stiff to spread. Both layers are applied as creams or ointments, and once spread onto the skin, XPL becomes essentially invisible.

High performance

The researchers performed several studies in humans to test the material's safety and effectiveness. In one study, the XPL was applied to the under-eye area where "eye bags" often form as skin ages. These eye bags are caused by protrusion of the fat pad underlying the skin of the lower lid. When the material was applied, it applied a steady compressive force that tightened the skin, an effect that lasted for about 24 hours.

In another study, the XPL was applied to forearm skin to test its elasticity. When the XPL-treated skin was distended with a suction cup, it returned to its original position faster than untreated skin.

The researchers also tested the material's ability to prevent water loss from dry skin. Two hours after application, skin treated with the novel XPL suffered much less water loss than skin treated with a high-end commercial moisturizer. Skin coated with petrolatum was as effective as XPL in tests done two hours after treatment, but after 24 hours, skin treated with XPL had retained much more water. None of the study participants reported any irritation from wearing XPL.

"I think it has great potential for both cosmetic and noncosmetic applications, especially if you could incorporate antimicrobial agents or medications," says Thahn Nga Tran, a dermatologist and instructor at Harvard Medical School, who was not involved in the research.

Living Proof has spun out the XPL technology to Olivo Laboratories, LLC, a new startup formed to focus on the further development of the XPL technology. Initially, Olivo's team will focus on medical applications of the technology for treating skin conditions such as dermatitis.

Other authors of the paper include Fernanda Sakamoto and Rox Anderson of MGH; Soo-Young Kang of Living Proof; Morgan Pilkenton and Alpesh Patel, formerly of Living Proof; and Ariya Akthakul, Nithin Ramadurai, and Amir Nashat ScD '03, of Olivo Laboratories.

Source : MIT News

POLYPROPYLENE PRODUCERS BANK ON ASIAN AUTOMOTIVE DEMAND TO GUARD AGAINST HEAVY COMPETITION

Producers are moving toward polypropylene impact copolymers and other higher value PP for automotive applications, banking on rising automobile demand in Asia to lift profits, as the market for commodity grade PP homopolymers becomes increasingly competitive, as per industry sources in Platts.

Japan's Mitsui Chemicals and Prime Polymer, in which Mitsui Chemicals has a 65% stake, announced plans to raise its global PP compound capacity by 5% to 1.05 mln tpa by fiscal 2017 (April 2017-March 2018) in response to growing demand from the automotive sector, in a joint press release earlier this month. Production capacity in Asia, excluding Japan, is expected to increase 5.7% to 280,000 tpa while in North America, capacity is set to expand by 7.3% to 440,000 tpa, according to the release.

Saudi Basic Industries Corp.'s executive vice president of polymers Abdulrahman Al-Fageeh said: "We have shifted some of our portfolio in our local production [from homopolymer to copolymer] here in Sinopec Sabic Tianjin Petrochemical [SSTPC] to cope with [China's automotive] demand." SSTPC is a 50:50 joint venture between Sabic and Sinopec with a nameplate capacity of 450,000 m tpa of PP and 600,000 m tpa of polyethylene.

In Southeast Asia, PP demand from the automotive sector remains a bright spot, said Thailand's IRPC in April during the Chinaplas 2016 conference. IRPC has invested heavily in a 100,000 m tpa PP plant at Rayong using compounding technology licensed from Japan Polypropylene Corporation, or JPP, suitable for automobile bumpers and instrument panels, company sources said. The plant is expected to start up in end-2017. Thailand is a key PP exporter to China. China's automobile demand is expected to grow by 1.4 mln units in 2016, or up 7% year on year, to around 21.4 mln units, according to Scotiabank's 2016 Global Auto Report, outpacing demand growth rate of 4% to 33.6 million units across Asia this year.

So far, growth in China's automobile sales has broadly been in line with Scotiabank's forecast. Between January and April, sales in China grew 6.1% year on year to 8.7 mln units, according to China Association of Automobile Manufacturers (CAAM).

Chinese production grew by 5.7% to 8.8 million units over the same period, roughly in balance with demand. Revenue figures provided more evidence of demand growth in 2016, with sales for the first four months rising 7% to about US$181 billion from the same period last year, according to latest data from China's National Bureau of Statistics.

Source : Plastics News

Devdutta Pattanaik's Business Lessons from Mythology

Dr. Devdutt Pattanaik

We tend to tiptoe around the role of power in management, and fail to openly acknowledge how the animal desire to dominate often destroys the best of organizations. But power is a critical tool that affects the implementation of any idea.

These lines are from author-mythologist Devdutt Pattanaik's new book, An Indian Approach To Power—The Leadership Sutra, which takes you through Indian mythology and its parallels with corporate life while offering "made in India" sutras (concepts) related to the human quest for significance and the importance of rules. It follows the thread of his earlier book, Business Sutra.

In an email interview, Mumbai-based Pattanaik explains how rules in business spaces are based on ideas similar to those found in mythology, and the lessons that can be drawn from them. Edited excerpts:

Ram's obsession with rules dehumanized him; it deeply affected Sita's life. Should there be a limit to following rules in the workplace?

It depends on what price we are willing to pay. That Ram always follows the rule makes him dependable. You know what to expect from him. That's a good quality too. It also means that around him, there will be Sitas who will suffer. Every benefit has a cost—an idea that is poorly understood by many leaders today who assume "good actions" only have "good reactions".

The Pandav Bhim and Ravan lived by their own rules, something which today's millennials do too.

Advantage, you live by your rule and can lead your pack of domesticated submissive followers. Disadvantage, no one sees you as dependable or reliable. And you will have problems trying to delegate—a problem in many family-owned corporations, where the founder cannot let go of his powers, even to his own children.

Recognition has always been seen as a big motivator among employees, managers, even chief executives. Is there any downside to it?

I think we need to understand what recognition means. It means an invisible employee is made "visible". This matters a lot to humans. There is the rush of power (called Durga). However, it can become an addiction and can lead to depression when one realizes that what people look at is your achievement, not you. You are just as good as your results—a sad reality of the business world today.

One of the premises in the book is that marketing and business are all about 'maya' (delusion). In interviews and markets, candidates and products, respectively, are measured through scales. Could there be any other approach to distinguish between what's good and what's average?

Maya is a world seen through measurement and comparison. It is a delusion that we cannot escape. It's water to the value-seeking fish. Hence, the world is maya. We play this game of measurement: Thus you are better or worse than your colleague based on how the management measures you and rewards you. You can measure your worth based on the salary and perks you receive. I don't say it's a bad thing. Wisdom is realizing the power of measurement/comparison in our lives and the lives of people around us. And knowing that we can even live in a world where we don't have to measure and compare, at least privately.

You've mentioned that the corporate world is teeming with pretenders and mimics. They think they know how to walk the walk and talk the talk…but are nowhere close to knowing what true leadership actually means. Could you provide an example to explain why there's a disconnect?

Take the case of why MBA (masters' in business administration) students wear suits when they come for interviews, even on hot summer days. They are following a code, a uniform. They are mimicking as they are expected to mimic. Yet we ask them to think out of the box, be innovative and subversive. Investment bankers clone each other's mannerisms as they want to fit in. So do computer nerds.

Leadership is about paying attention to the other, and enabling people not to mimic or pretend, but to be genuine/authentic about their fears. This means creating an ecosystem where people can be vulnerable and thus feel secure and empowered, for example, to express uncomfortable views without fear of censure. Mimicry and pretension means we are hiding. We are not being true. If a leader cannot sense fear in people around him, if a leader feels good when people around him are frightened into pretending, there is a problem. Power flows towards the leader or, rather, boss rather than towards the organization.

In one of the sections of the book, you say innovation is not possible unless rules are broken. Please explain.

Innovation is about rendering the old ways inefficient and ineffective. It is essentially about breaking the way things are. Some imagined a world where phones did not have wires. Someone imagined a world where you did not have to come to office to work. That was achieved through trial and error, often not within corporations, which seek alignment and compliance, but outside corporations, in garage start-ups. Someone essentially "broke" the rule. The hero. Or Vasudeva, of the Jain tradition.

Often, leaders ask employees to leave an organization because they have broken a rule. What's the ideal way to deal with such a case?

This is classic Abrahamic mythology: The assumption that rule-breaking makes one wrong and evil. It does not take context into consideration. It sees latitude as amoral. It sees allowing as indulgence. Management is then an angry God of Moses, who punishes Moses for taking God's name in vain, thus breaking the commandment. We have assumed that this is the right way. We are so deeply entrenched in this belief that an alternative sounds like fantasy.

People make mistakes. In fact, only through mistakes do we learn. Mistakes allow us to discover new things. Mistakes help us grow. But for corporations, mistakes are expensive. In a competitive, jungle-based ecosystem, that is not permitted. In fact, forgiveness is seen as weakness, and a sign of favouritism. One reason why we don't have a leadership pipeline. We are expected to be right all the time, compliant all the time, like domesticated animals who are one day expected to lead a pack of wolves.

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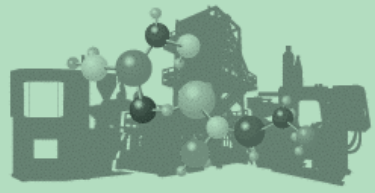

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