PLASTICS INDIA

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

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Editorial

Dear Friends,

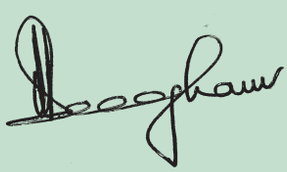
Its time to give a positive thought to Reduce, Recycle and Reuse the most wonderful material - PLASTICS , which has taken over other materials in our day to day life. We have to use and dispose this material responsibly to save our beautiful world.

In the process of recycling a new chapter has been added by a Switzerland based organization - gr3n, has invented a new process that resolves the problem of clothes recycling using chemical recycling of synthetic textile fibers and mixed materials. gr3n developed an innovative process, based on a new application of microwave technology to a well known chemical reaction to economically recycle PET (Polyethylene Terephtalate) and allows an industrial implementation of this recycling method. This new process can potentially change how PET is recycled worldwide with a huge financial benefit for the recycling industry. The process involves depolymerization of the PET or polyester textile / bottles i.e. conversion of PET waste into its building blocks (EG and PTA). The ethylene glycol (EG) and terepthalic acid (PTA) molecules can be used to reproduce virgin PET. Thanks to this technology new virgin PET will be produced from those retrieved monomers instead from those coming from oil thus closing the loop. Earlier attempts over past decades failed to move from lab to industry for lack of commercial viability. Thanks to DEMETO (Depolymerization by MicrowavETechnolOgy) technology developed by gr3n this approach has become viable. gr3n has a massive advantage with respect to its competitors, because it is the only provider of chemical recycling solution, closing the PET lifecycle, offering polymer grade material, treating waste, lowering carbon footprint and most importantly provide relevant cost savings for players in the value chain: it can multiply by 4/5 times PET producers' EBIT margin. The gr3n project was granted by EU trough the Consortium Symbioptima.

Now Lets talk about COVID-19, Corona Virus which has shook the whole world. It has larger impact on the world trade apart the health issues. India depends on China for lot of materials, one being chemicals, across value chains. The impact is complex because not only is China a competitor, but it is also a source of raw materials A sharp slowdown in global growth could offset some of the benefits to Indian companies. The impact of the corona virus epidemic in China on the chemicals sector could be far reaching, depending on the extent of epidemic reach, the period of plant shutdown in China and restrictions on shipments/logistics. We have been looking at two scenarios. The first one is of an epidemic being reasonably restricted to cities, allowing manufacturing sites located outside densely populated centers to continue production. Such a scenario, though it will curtail consumption in China, may still keep the production of manufactured goods steady. This may mean higher exportable surplus than usual, raising the probability of higher dumping of goods into other countries.

The second scenario, which is more likely given the pre-emptive measures taken by Chinese government and the reports on the spread of the virus, is that China's manufacturing economy is also going to be reasonably curtailed for some time. In chemicals, the impact would be felt across the value chain – from key basic chemicals to various value added chemicals having applications for a large number of end-markets. Given this context, we attempt to look at a few chemical value chains in this two part series to understand the impact of the epidemic.

Happy Reading,



Manish Singhania
Co-Editor

Presidential Address

Dear IPFians,

First of all let me greet you all a very happy and joyous Holi which all of you might have celebrated. The world is reeling under the impact of Covid-19 or Corona Virus disease which started in China and have spread to 163 countries. This prompted WHO to declare this deadly disease as pandemic. Due to its contagion effect and fast spread, various governments of all major countries like USA, EU, France, UK, India, South Korea, Germany and others came into action and declared emergency measures to prevent its spread by putting various restrictions on inter country movement of tourists,sealing of borders,closure of places of large gatherings and the like.

The ill effects of this disease may put the global economy into recession. Assessing its adverse effects,the Federal Reserve of USA cut the interest rates two times to make it zero and the US government has declared that it will pump billions of dollars to provide stability to financial markets. Other banks like ECB, Bank of Japan etc made similar announcements.

Despite all these pre-emptive measures, the share markets world over tanked and fell more than 20% to enter into bear market. Even Gold and Silver were not spared and they fell more than 10% and 15% respectively. Clearly, there is nervousness all around and everyone is clueless how to come out of this external problem.

The situation at present is critical and it remains to be seen how things pan out in coming days.

The reported cases in India which were low at 54 suddenly increased and crossed 130 with reported deaths of 3. Our State and Central Governments came fast into action and has taken several measures to prevent its spread.

As responsible citizens of the country, we should also take proper care and follow do's and dont's to safeguard ourselves and our fellow citizens.

The crude has fallen to its record low levels nearing $ 30 a barrel after the talks amongst OPEC and OPEC plus countries failed as to production cuts. The turmoil in crude market does not augur well for oil dependent economies.

India being the net importer of crude may benefit from soft crude prices but it has been seen that too low or too high crude prices have not been good for India because it may cause other economic problems.

It is expected that our government will take all possible measures to lend stability to our financial and other markets to save our economy from going to further slowdown.

It is said the present situation is like the situation of 2008 when we saw global meltdown due sub-prime crisis. This time the situation is not due to financial weakness, its due to disease and no one knows how badly it will impact the global economies.

At this critical juncture, all countries need to make a co-ordinated and concerted effort to come out of this problem.

Let's all pray to God that the entire world which is our extended family, as we believe in "वसुधैव कुटुम्बकम", comes out of this problem and we all again start living peacefully.

Let's we all pray :-

सर्वे भवन्तु सुखिनः सर्वे सन्तु निरामयाः
सर्वे भद्राणि पश्यन्तु, मा कश्चिद् दुःखभाग भवेत्।

Ramesh Kr. Rateria
President

Secretary Message

Dear Members,

For the last over three months we have not been able to keep in touch will each other through this magazine due to the LOCKDOWN caused by the coronavirus pandemic. After UNLOCK 1 has started from June 1, 2020, life is gradually coming back to normalcy. But the manner the pandemic is spreading after UNLOCK 1 has started the future seems to be even more challenging. We have, therefore, started to think how we can reach our members and have taken a decision that the print version of the magazine will be discontinued and we will switch over to web-magazine till the situation does not normalize. Receipt of print magazine by members has also become uncertain since the post office personnel won't risk their lives for delivery of the magazine. Furthermore, many of our members have their addresses in areas marked as containment zones and hence, the question of post men entering those areas is out of the question. Members are requested to help curb spread of the pandemic by going out of their residences only when urgently required. They are also requested to cooperate with the administration by wearing masks, sanitizing / washing with soap their hands and maintaining a physical distance of 6 feet from the next person. Since the Federation was closed for three months, we have decided to club three months issue in one magazine i.e. for April, May & June 2020 into one issue. This may be the last print issue of the magazine. From July 2020 onwards we will commence our web-magazine.

LOCKDOWN did not mean that your Federation was sleeping. We were fully aware of our social responsibility and undertook various activities to help the administration. I am happy to inform you that many of our members were frontline workers – CORONA WARRIORS. Some of our activities are given below:

Corona Safety Measure programmes were organised by Indian Plastics Federation (IPF) Team which took over BD and AB Block Markets - Salt Lake, Rani Rashmoni Market - Beliaghata and Maniktolla Market - Maniktolla in Kolkata to educate the shopkeepers and shoppers to maintain Hygiene and Safe Distancing. T Shirts and Poster with information and precautions from Covid 19 were distributed along with Face Masks and sanitizers. Lessons and guidelines on Safe Distancing were shared. Our Federation arranged for complete sanitization of these markets thru professional Pest Control Companies.

Face Masks, Hand Gloves, Sanitizers and PPE kits were distributed to the various government administration office in Kolkata and Districts of West Bengal.

1400-1500 Cooked meal packets per day were distributed to the needy people by IPF where the members supported the cause wholeheartedly. Packed uncooked groceries and food grains were also distributed.

IPF organised a blood donation camp in association with Lions Club, Kolkata .

IPF has been awarded a certificate of appreciation by the State Armed Force Police, 9th Battalion, Sandhya, Krishnanagar, Nadia for donating masks for policemen to contain the spread of Covid-19 menace.

All the above activities were carried out when citizens were keeping themselves locked in their homes, sanitisers, masks and PPE Kits were in acute shortage, our Corona Warriors Mr. Sisir Jalan, Mr Amit Kr Agarwal, Mr Saurabh Garodia, Mr Sudarshan Tawri, Mr Rajat Singhania, Mr Lakhan Dhona, Mr Rajat Rateria, Mr Manish K Singhania, and others were in the field to help the society.

The pandemic has also highlighted the usefulness of single use plastics. Due to spread of Covid19 - Corona Virus, it is very critical that healthcare workers have access to single use plastic products which can literally be the difference between life and death. Items such as IV bags and ventilator machines, which are of the utmost importance right now, have components made of plastics. The single-use hospital gowns, gloves, and masks that protect our healthcare workers every day are also made of plastics. Plastics also plays a vital role in many other areas such as easy packing and protecting our food and keeping it fresh, which reduces contamination and waste. Single-use plastic bags provide a sanitary and convenient way to carry our groceries home while protecting supermarket employees and customers from whatever is lurking on reusable bags. As the COVID-19 virus spreads across the country single-use plastics will only become more vital. We live longer, healthier and better because of single-use plastics. Our members are fully committed to meet all the demand and help required to protect our communities in the fight against Covid - 19. Further details of our activities will be given in the web-magazine to be issued in July 2020.

With best wishes

Sisir Jalan
Hony. Secretary

IPF ACTIVITY DURING LOCKDOWN

On 14.04.2020 auspicious Poila Basak - Bengali New Year day, Indian Plastics Federation (IPF) Team took over BD and AB Markets at Salt lake Area in Kolkata to educate the shopkeepers and shoppers to maintain Hygiene and Safe Distancing during shopping. Face Masks and sanitizers were distributed amongst the shopper and shopkeepers. Lessons and guidelines on Safe Distancing were shared. T Shirts and Posters containing Information and precautions from Covid 19 were also distributed. Our Federation discussed with the Pest Control Companies for complete sanitization of the market. Regular announcements for proper sanitization, use of face masks and stay indoors were made by our team. IPF team received full cooperation of local councillor Sri Arindam Chatterjee in the work. IPF Team is receiving calls from various Councillors in the Salt Lake area for carrying out similar activities in other community markets also.

On 15.04.2020, IPF Team educated people on Corona Safety Measures at Manicktola Market and Rani Rashmoni Bazar, Beliaghata by distributing posters on information and precautions from Covid 19. IPF team distributed face masks and hand sanitisers to the vendors / shopkeepers as well as the shoppers. Our volunteers stood at the entry gates of the market giving lessons on the Social Distancing during shopping. IPF team received full cooperation of local councillor Smt. Alokananda Das at Rani Rashmoni Bazar, Beliaghata who had also sanitized the full market. PPE kits were handed over to the Officer In Charge, Burtolla Police Station, Kolkata.

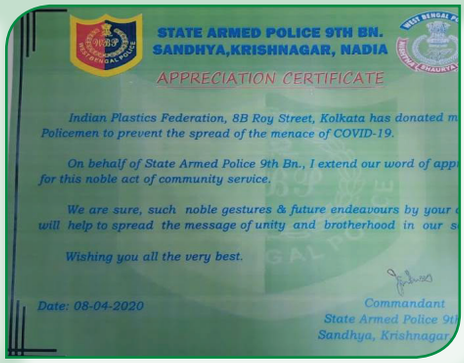
IPF organised free distribution of Food / Ration to the needy. IPF in association with Lions Club, Kolkata organised blood donation camp. IPF has been awarded a certificate of appreciation by the State Armed Force Police, 9th Battalion, Sandhya, Krishnagar, Nadia for donating masks for policemen to contain the spread of Covid-19 menace.

All the above activities were carried out when citizens were keeping themselves locked in their home , sanitisers, masks and PPE Kits were in acute shortage, our Corona Warriors Mr. Sisir Jalan, Mr Amit Kr Agarwal, Mr Saurabh Garodia, Mr Sudarshan Tawri, Mr Rajat Singhania, Mr Lakhan Dhona, Mr Rajat Rateria, Mr Manish K Singhania and other members of IPF were in the field to help the society.

A meeting of all associations was called by the Hon'ble Chief Minister of West Bengal Smt. Mamata Banerjee to discuss various matters concerning industry during the lockdown. Shri Alok Tibrewala, Past President of the Federation represented the above meeting on behalf of the Indian Plastics Federation.

A representation on the pertinent issues and challenges impacting business were sent by IPF to our Honourable Finance Minister which stated the current scenario with certain points that could benefit the manufacturing sector .

IPF ACTIVITY DURING LOCKDOWN (CONTD.)



INDUSTRY ASSOCIATION CEO TESTIFIES IN CONGRESS ON PLASTIC'S LIFE-SAVING ROLE DURING PANDEMIC

Tony Radoszewski, President and CEO of the Plastics Industry Association (PLASTICS), testified on July 7 at a Congress briefing titled, "Plastic Production, Pollution and Waste in the Time of COVID-19: The Life-Threatening Impact of Single-Use Plastic on Human Health." Radoszewski refuted attacks on a material and an industry that have played a critical role in the U.S. response to the novel coronavirus.

"The idea that single-use plastic medical products . . . are 'life-threatening' contradicts the advice of this subcommittee, which recently urged the President to use all his power to increase production and distribution of masks, face shields, surgical gowns, isolation gowns, goggles, disposable caps, disposable shoe covers, and disposable gloves," Radoszewski told the House Oversight and Government Reform Committee's Subcommittee on the Environment.

As the only witness to highlight the importance of plastics, Radoszewski thanked Ranking Member Fred Keller (R-PA) for giving him the opportunity to describe the plastics industry's effort to meet unprecedented demand for personal protection equipment (PPE), as well as components for ventilators and other medical equipment.

Congressman Keller noted, "As the Covid-19 pandemic began to spread in the United States, one thing became abundantly clear: The frontline workers of America would need access to personal protective equipment at a rate never seen before. The plastics industry kicked production of these life-saving products into high gear."

As COVID-19 began to spread, the federal government and states designated plastics companies and their employees as essential businesses and workers.

"Plastic is one of the most advanced and useful materials humanity ever created, contributing to longer, healthier lives for people across the globe. Without it, disease and hunger would be more common, not less," Radoszewski told the subcommittee, emphasizing the importance of single-use plastics and underscoring the conflict between environmental groups seeking to ban hygienic single-use items and public health officials recommending them to help Americans protect themselves.

Radoszewski also defended plastics in addressing environmental concerns, explaining that "all materials require energy and other resources in their manufacture, and all produce waste. However, over the entire lifecycle in most applications, plastic requires less energy and conserves more resources than glass, paper, or aluminum, saving fuel, energy, and money, especially for busy working families."

PLASTICS supports the Recover Act, which would modernize US recycling infrastructure for the 21st century, preventing plastics from entering the environment and providing plastics companies with recycled materials to create new products.

Source : Plastics Today

PLASTICS MEDICAL PRODUCTS SAVE LIVES CORONAVIRUS PANDEMIC

Plastics are plating a key role in protecting healthcare workers and members of society during the coronavirus pandemic.

Many government bodies, including in the U.S. states of New York and Maine, have stopped plans to implement bans on single-use plastics such as retail shopping bags, as they are less likely to spread germs than frequently reused fabric carriers. Others have un-banned expanded polystyrene food containers, as they are unquestionably effective as packages for take-out and home-delivery food from restaurants.

There is a spike in demand for plastic-intensive products like housings and parts for medical gear such as respirators and ventilators, as well as Personal Protective Equipment (PPE) for healthcare workers such as masks, gowns, and goggles. Other standard plastic medical products continue to help the fight – from polycarbonate syringes and intravenous components, to polyvinyl chloride medical tubing and blood bags.

3D printing has also helped develop critical components. Recently, an Italian 3D printing start-up called Issinova, reverse-engineered a valve for a ventilator machine, and within hours was able to produce replacements for out-of-stock valves that helped to save the lives of several people in a hospital in Brescia. The company several Fused Deposition Modeling (FDM) machines to 3D print a plastic valve at a cost of about $1 per part. The original part costs about $11,000, according to the report. 3D printed plastic parts will help meet demand of medical components in short supply.

Carefully formulated plastic compounds

are also helping the cause. Patented oxidised copper when compounded with different types of resins, yields a material that can kill bacteria. Press-moulded solid surface countertops and tables have been proven to dramatically reduce the incidence of Hospital-Acquired Infections (HAIs), such as staph infections. Testing is on to impregnate the plastic-copper additive in fabrics (such as bed linens, hospital gowns or face masks) to confirm its effectiveness against the Covid-19 virus.

Others have long been incorporating antimicrobial additives into plastic compounds to reduce the transmission of various diseases.

Source: Medical Plastics News

PLASTIC BAGS TO MAKE UP FOR SHORTAGE OF PACKING MATERIAL FOR FOOD GRAINS

The Central government of India has to procure rabi paddy, the target for which was 41 million tons from kharif and about 7 million tons from rabi season.

The GOI is learnt to have asked all states to immediately place orders for plastic bags for packaging of grains, as wheat procurement will start from April 15 and a record 40 million tonne procurement target has been set by all states combined for this year.

The textile ministry had earlier expressed concerns over likely shortage of jute bags for grains. Preparations are continuing to procure both jute and plastic bags in adequate quantity.

The textiles ministry on 7th increased the limit for high-density polyethylene or polypropylene (HDPE/PP) to 2,62,000 bales from the earlier 1,80,000 bales to facilitate its immediate purchase by government agencies involved in procurement in sufficient quantity. The Center may further relax the norm for more use of plastic bags once procurement starts, sources said.

Source: Financial Express

ASCEND FAST TRACKS ANTIMICROBIAL TECHNOLOGY TO COUNTER COVID-19 SHORTAGES

To help guard against the growth of mildew, fungi, and other microbes, Ascend Performance Materials has introduced Acteev Protect, an innovative technology formulated to keep textiles and nonwoven fabrics fresher for longer.

The technology offers protection for face masks, apparel, upholstery, air filters, and more, explained Lu Zhang, PhD, Ascend's Vice President leading the Acteev launch. "Bacteria, mildew, and other microbes growing on fabrics and filters cause the item to break down, discolor, and give off unpleasant smells," she said. "Acteev Protect guards against that microbial growth, keeping the articles clean."

While the technology has been in development for several years, the recent shortage of microbe-resistant articles prompted Ascend to accelerate the product launch by partnering with independent labs for testing and by re-allocating resources to scale up production. "The current global scarcity of microbe-resistant materials is not going to end unless manufacturers are able to obtain the right media," said Zhang. "We saw a way we could quickly meet those urgent needs with this innovative technology."

Acteev Protect combines zinc ion technology with polyamide-based woven, nonwoven, and knit fabrics. The active zinc ions are embedded in the polymer matrix, providing long-lasting solutions that do not wash away, like topical finishes or coatings, said Ascend. The polyamide fabrics are durable yet soft to the skin, and the nonwoven filtration media — available as nanofibers, melt-blown, or spun-bond — efficiently keep out unwanted particles.

The embedded zinc in its ionic form is a powerful inhibitor of bacterial growth, said Vikram Gopal, PhD, Ascend's Senior Vice President, Technology. "Zinc is an essential element needed for bacterial growth, so bacteria readily allow it inside the cell body," he explained. "But the zinc ion out-competes other essential elements, such as manganese and magnesium, and chokes their ingestion channels. Without those minerals, the microbes can't grow or reproduce."

Gopal noted that while other products use silver as an antimicrobial, that metal comes with unwanted environmental consequences. "Silver is typically used as a finish or a coating, a process that is water-intensive, and the excess silver has to be disposed of, eventually ending up in our waterways," he said, adding that zinc is designated "generally regarded as safe" by FDA.

Additionally, the fabrics feature all the benefits of premium polyamides, which offer more comfort than polypropylene in single-use masks and allow knits and wovens to be dyed, printed on, and laundered. Also, these features will last the lifetime of the garment. "Because the zinc ions are embedded during the polymerization process, knit and woven articles made with Acteev Protect stand up to 50 washes or more," commented Harrie Schoots, president-elect of the America Association of Textile Chemists and Colorists and Senior Business Leader of Ascend's textile business.

Acteev Protect is the company's first

product offering available in ready-to-use fabric form. The company plans to extend the line in the coming months to include polyamide 66 fabrics for medical applications and engineered plastics for high-touch surfaces.

Source : Plastics Today

UNIVERSITY RESEARCHERS SEEK WAYS TO RECYCLE 'UNRECYCLABLE' POLYMERS

It's tough enough to recycle the easily recyclable plastics, such as PET and HDPE, but dealing with "unrecyclable" polymers is a whole new challenge. Case Western Reserve and the University of Wisconsin-Madison are advancing solutions for difficult-to-recycle polymers.

George Huber, a professor of chemical and biological engineering at the University of Wisconsin-Madison, noted in the university's news publication that he hopes to "close the loop on plastics recycling through a new research venture that leverages his expertise in biofuels" via pyrolysis technology. Huber co-founded Anellotech (Pearl River, NY) in 2008, a company that recently announced a laboratory demonstration of its Plas-TCat technology, which transforms mixed plastic waste directly into chemicals.

Recently, Anellotech successfully converted a Lay's potato chip bag into paraxylene, the primary chemical used to make virgin PET for beverage bottles. The conversion also produced high yields of benzene, toluene, and olefins that are used to make a range of plastics, including polyethylene, polypropylene, nylon, ABS, and polycarbonate.

For the last 15 years, Huber has focused primarily on biomass, leading efforts to turn wood waste and other sources of plant biomass into sustainable liquid fuels, a process involving pyrolysis at a facility in Silsbee, TX. Motivated by reports of unrecycled plastics polluting the oceans, Huber began working on the same technology for plastics. Pyrolysis can break the plastic down into chemical feedstock that can then be recycled into fuel or even used to create virgin plastic in a process that is repeatable multiple times.

In other polymer research, Case Western Reserve University researchers have developed a new technology that could change non-recyclable thermoset plastics into recyclable ones and reprocess them into new products. Thermosets, once the material is cured, cannot be remolded. Thermoset polymers are designed for industrial, automotive, and electrical applications, among others, where stability and durability are required. Given the fact that thermoset polymers are also quite expensive, the ability to recycle them becomes quite important.

Leading the research and development at Case Western Reserve in Cleveland is Ica Manas-Zloczower, Distinguished University Professor and the Thomas W. and Nancy P. Seitz Professor of Advanced Materials and Energy in Macromolecular Science and Engineering, and Liang Yue, a post-doctoral researcher in Manas-Zloczower's lab.

Manas-Zloczower and Yue have found a new way to take previously rigid thermoset plastics and break them down into a resin that can be used to make an entirely new product, just like with thermoplastics.

A strong chemical cross-linked molecular network is what makes thermoset plastics resistant to heat, corrosion, and other environmental factors. That same strength, however, also makes them far more difficult to break down and recycle, said Case Western Reserve's press release.

Manas-Zloczower and Yue are solving this problem by converting permanent, cross-linked structures into dynamic ones. The dynamic cross-linked network allows reshaping and reprocessing by conventional methods, such as hot-press molding or injection molding, to fabricate a new product with comparable or better value.

Yue began working on the concept in Manas-Zloczower's Case School of Engineering lab in 2018, using a solvent-assisted approach to diffuse the appropriate catalyst into epoxy and polyurethane networks. They call the new process "vitrimerization," because it converts the thermoset plastics into a new class of materials known as vitrimer polymers, which can be reformed and reprocessed. So far, Yue has performed the experiment with small amounts of material in the lab. But he and Manas-Zloczower are in discussions with industrial partners about using a process known as "mechano-chemical ball-milling" to produce tons of reusable powder resin, without the use of solvents.

Manas-Zloczower said the work over the past two years was funded in part by the National Science Foundation, but that she and Yue are working closely with the Great Lakes Energy Institute and Case Western Reserve's Technology Transfer office to identify potential industry partners, research funders, or investors to take the next steps toward fully testing the process at industrial scale.

Source : Clare Goldsberry

INDIA VENDOR GOES BIG IN PCR RIGID PLASTICS FOR MAJOR BRANDS

Based in Bangalore, 30-plus-year-old Manjushree Technopack Limited (MTL) is India's largest rigid plastic packaging

company. The supplier of rigid plastics caters to the packaging requirements of the fast-moving consumer goods (FMCG), pharma and liquor industries in working with some of the biggest brands in these segments. These include Coca Cola, PepsiCo, Cadbury, GlaxoSmithKline, Procter & Gamble, Nestle, Heinz, Unilever, Tata Tea, Marico, USL, Diageo, and more.

With a capacity of 1,50,000 million tons per annum, MTL is one of the top 500 mid-sized companies in India.

When the vendor makes a deeper move into sustainability, it has ramifications for packaged goods throughout the country of nearly 1.4 billion people and beyond.

On June 15 and backed by Advent International, the company launched a "Born Again" initiative to deliver recycled packaging material to its customers in order to create a greener world and become vertically integrated with the plastic waste collection ecosystem. It is MTL's first step towards building an ecosystem of circular consumption, the objective of which is to reduce the amount of plastic waste going to landfills and to deliver virgin-like quality post-consumer recycled (PCR) content resin — polypropylene and high-density polyethylene — to brand customers.

The company sees the move towards 100% recyclable packaging is an opportune time to enable brands with packaging solutions made from recycled plastics. Already, MTL has in-principle arrangement with several global and domestic FMCG brands for their PCR requirements. In the first phase, MTL will use PCR resins to produce non-food packaging (personal care, home care, lubricants, paints, etc.) and secondary packaging for food products.

MTL INAUGURATES FIRST OF SEVERAL RECYCLING PLANTS.

The first of the company's state-of-the-art recycling plants was inaugurated June 15 in Bidadi Industrial Area, Bangalore. Mr. Radha Mohan Gupta, Regional Procurement Director (South Asia), Reckitt Benckiser, lit the ceremonial lamp virtually and Mr Ullas Kamath, Joint Managing Director, Jyothy Labs, cut the ribbon at the venue.

The plant has the capacity to process more than 6,000 metric tonnes (MT) of rigid plastic virgin-like quality PCR resin per annum. The company intends to set up multiple recycling plants across India over the next 2 years with a total capacity of close to 20,000 MT.

Sanjay Kapote, CEO, MTL commented "Sustainability is an integral part of our business goals. Today, brands are eagerly looking for reliable solution providers who can help them with post-consumer recyclable waste material of their products. We are very keen to support the circular economy and strongly see the potential to become one of the few players in the industry to offer brands end-to-end solution for recycling and EPR (Extended Producer Responsibility). MTL's recycling plant in Bangalore and our collaboration with SZW is our first step towards bringing more structure to the highly unorganised collection of plastic waste."

The demand for Post-Consumer Recylables is projected to grow from USD 7.7 billion in 2019 to USD 10.2 billion by 2024. However, the biggest factor hindering production of PCR at scale in India is disorganized waste collection and segregation mechanism leading to scrap contamination. For the recycling plant in Bangalore, MTL has partnered with a leading social enterprise, Saahas Zero Waste (SZW), to collect the plastic waste generated across the city. SZW manages 38 tonnes of waste per day across Bangalore, Chennai, Hyderabad, Mumbai and Goa.

Source : Plastics Today

EXTRUSION BASICS: ENERGY YOU CAN COUNT ON

People use the term energy in a non-countable way: "Look at him, full of energy" or "I don't have the energy to go out today." I squirm when I hear this, as to me energy is countable and indestructible. Also, it takes many forms:

- Chemical, as in a battery or food/ beverages (including "high-energy" drinks);
- potential, as when something is high and can fall (water before a waterfall);
- thermal (heat = how fast the molecules are moving);
- kinetic (wind, tide, a moving car);
- electrical (electrons running through wires); and
- light (photocells, ultraviolet to kill viruses and give us sunburn).

Physicists can explain magnetism (which I never quite understood) and sound (which, as an amateur musician, I do understand), but the others should be enough to make my point.

We are especially reluctant to count in connection with food, but that's a subject worth discussing at another place and time. With regard to extrusion, the counting will help understand the costs of manufacture and justify or challenge the money-saving claims of equipment and materials.

There is a direct correlation between your electric power consumption and money. You see it on the electric bill, but it's not usually broken down to what is costing how much.

For an extruder, we can get the energy

used by the motor — the usual primary source — if we multiply time by the power actually used **(power = motor amps times volts).** Amps are read directly and volts are easy with a DC motor, if you know the top speed and reduction ratio. With AC, you have to know something more about the motor, but it's not rocket science — it just isn't always done. There is often a reluctance to quantify costs, as there is to count the Calories you eat.

So, if you read or hear me tell you that energy is a minor cost of extrusion, you have some numbers to prove (or disprove) it. Measure production in weight per hour, divide that by average power, and you get lb. or kg per kW-hr. Since we pay by kW-hr, that should be enough to show the real cost per pound or kilogram of product. If you want calorie-based units, one kW-hr = 860 Kcal.

Not so fast. Although most energy input is usually through the motor, barrel/die heating may also be important for small machines, high-temperature polymers like nylons and PC, extrusion coating and slow screw speeds such as twins with PVC. Preheating, often used for drying, can also be useful for energy addition and feed temperature uniformity. In those cases, if you know the wattage of heaters and the percentage of the time they are on, their contribution can be included.

There is heat loss by radiation from hot die surfaces, fan or water-cooling of the barrel, and conduction to the hopper or extruder cover, but these won't matter in the calculation of power costs, because we're paying for the input. The control settings may have an influence, and desired melt temperature range may vary with application and rate. These may need consideration if a more precise analysis is wanted, but usually the power cost is so low that, once demonstrated, it suggests we look for more fruitful places to save money, such as material choice, full re-use of scrap, and thickness control.

An important diversion regarding units: A calorie (small c) is the amount of energy needed to heat 1 gram of water 1°C. Not very much — just one breath at rest may use six to seven calories to heat the exhaled air (e-mail me if you want to know how I did this). We can use a K (kilo) to signify 1000 calories (see last month's article about "Greek up, Latin down") and get the more practical Kcal unit. However, that looks funny and is hard to pronounce so we just call them all calories; or use a capital C = Calories to signify kilocalories; or use the international Joule, which is even smaller than a calorie (4.184 Joules = 1 cal); or a variety of other units appropriate to the application. A common misunderstanding is with food, where the values on our packages and in our minds are Calories = kilocalories: 9 Kcal/gram for fats, 7 for ethyl alcohol, and 4 for proteins, sugars, and starches dry weight. Yes, all three are similar, whether animal or vegetable origin, which is yet another reason that some people avoid counting.

And those energy drinks! There is a great variety — some with a lot of sugar (energy), some with a lot of caffeine, some with elements like sodium (the same sodium as in salt) — and although they are sold as sports drinks, most are consumed by nonprofessionals. Not all bad, but of miraculous power a ghost.

So the next time you hear someone talk of how much or how little energy someone has, don't say anything lest they think you're one of us nerd engineers. Instead, think of the machines you help run and how useful it is to put energy needs in a countable perspective.

If you're looking for my usual declaration of polymer nontoxicity, you can read that and much more in my "Open Letter to Plastiphobes," including the reasons why so many people all over the world love to hate us.

As for live seminars, nothing planned in the near future — you know why — but I converted my live event into a digital audio visual seminar: No travel, no waiting for live dates, same PowerPoint slides (187) but with my audio explanations and a written guide. Watch at your own pace, ask questions, and get thorough answers by e-mail. Call 301-758-7788 or e-mail me at algriff@griffex.com for more information.

Source : Allan Griff

NATIONAL SCIENCE FOUNDATION AWARDS GRANT TO RENSSELAER POLYTECHNIC FOR RESEARCH INTO NEW PLASTIC

With the support of a $300,000 grant from the National Science Foundation, chemical engineers from Rensselaer Polytechnic Institute in Troy, NY, aim to develop a new polymer that can replace polystyrene (PS). While PS is inexpensive and easy to make, it is difficult to break down into its original components for re-use through a process called depolymerization. Founded in 1824, Rensselaer is America's first technological research university.

"One of the problems is that polystyrene is rarely used in its pure form, which makes it harder to be re-used," said Sangwoo Lee, an assistant professor of chemical and biological engineering, who is leading this research effort. "We aim to establish a new class of polymer that is still tough and clear but can be easily depolymerized and converted into raw materials for re-use."

The researchers will examine potential polymers that may be suitable for use in plastic products. They will develop a library of recyclable copolymers that they will synthesize, characterize, study,

and evaluate as polystyrene substitutes. Research will cover alternatives to both clear rigid PS as well as expanded polystyrene.

The team is looking for materials that will depolymerize on their own when a specific chemical is introduced. In order for such a solution to be adopted, it must be practical and affordable.

This effort builds upon a finding Lee and his team came upon as they were developing a polymer membrane to use in energy conversion. The membrane they developed kept breaking down in a systematic way, prompting Lee and his lab to explore how else it could be used. That led to this current pursuit of an economical and environmentally friendly solution to plastic re-use.

"What's exciting about this research is that we will establish a new approach to convert used plastic into raw material," Lee said. "It will be economical, which is one of the elements that's missing in the process."

Source : Clare Goldsberry

NEW BIOCOMPATIBLE THERMOPLASTIC COMBINES TOUGHNESS AND PROCESSABILITY

A tough new thermoplastic biomaterial that is also easy to process and shape has been developed by researchers at the University of Birmingham in the United Kingdom.

A type of nylon, the material's shape-memory properties enable it to be stretched and moulded, and to revert to its original shape when heated. This makes it useful for medical devices such as bone replacements, where minimally invasive surgery techniques require additional flexibility in implant materials.

The material was developed in the university's School of Chemistry by a team investigating ways to use stereo-chemistry — a double bond in the backbone of the polymer chain — to manipulate the properties of polyesters and polyamides.

Biocompatible polymers are widely used in medicine, from tissue engineering to medical devices such as stents and sutures, notes the press release distributed by the university. Although much progress has been made in the area of resorbable materials that are broken down by the body over time, there are still only a handful of non-resorbable polymers that can be used for longer-term applications.

This new material can be made using standard chemistry techniques and offers a stable, long-lasting option, with mechanical properties that can be tuned for different end products.

"This material offers some really distinctive advantages over existing products used to manufacture medical devices such as bone and joint replacements," said senior researcher, Professor Andrew Dove. "We think it could offer a cost-effective, versatile and robust alternative in the medical device marketplace."

A further advantage of the material is its amorphous structure. "For many plastics, including nylon, the toughness is often dependent on their semi-crystalline structure, but this also makes them harder to shape and mold," explained Josh Worch, the postdoctoral researcher who led the work. "However, our new plastic is as tough as nylon, but without being crystalline so it is much easier to manipulate. We believe this is only possible due to the way we have used stereo-chemistry to control our design."

The research team was able to design and produce the plastic, which is now covered by a patent, and test it in rats to prove its biocompatibility. The team now plans to explore further ways to fine-tune the material and its properties before seeking a commercial partner.

Source : Plastics Today

NEW COMPOUNDING TECHNIQUE FOR NANOCELLULOSE COMPOSITES SHOWS PROMISE

A team of Purdue University innovators hopes its new technology provides a more business-friendly option to utilize sustainable cellulose nanomaterials for use in vehicles, food packaging and other manufactured items. The Purdue team developed a new way for manufacturers to use nanocellulose derived from plant matter. Normally to process nanocellulose, solvents or other dispersants are usually added to the mixture to improve the material's dispersion in polymers. "These methods can be very expensive for manufacturers, who must add additional processes and machinery to comply with emission standards that may be impacted by the use of the solvents," said Jeffrey Youngblood, a professor of materials engineering in Purdue's College of Engineering.

The Purdue innovators created a method that involves mixing the nanocellulose in additives for the polymer material, such as plasticizer, and then compounding that mixture into the polymer instead of directly mixing them. This technique could be applicable to a wide variety of polymers, including polyamides used in the automotive industry and polylactic acid (PLA) and ethylene vinyl alcohol (EVOH) copolymer used in food packaging. It enables nanocellulose to be easily extruded or injection molded into useful products with better properties that are more sustainable.

"We created a way to use the additives that are normally in polymers as the 'solvent' to disperse the nanocellulose during melt processing," Youngblood said. "In this way, you still have increased properties, but without the pieces of the manufacturing process that require additional emissions-

lowering components. This makes the process of using the nanocellulose, which is biodegradable, more sustainable as well."

Youngblood said the main advantages to the Purdue technique for large-scale polymer production are solvent-free compounding of nanocellulose into polymers and Homogenous mixture of hydrophilic nanocellulose and hydrophobic polymer.

The innovators have worked with the Purdue Research Foundation Office of Technology Commercialization to patent the technology. They are looking for additional partners and those interested in licensing the technology.

Source : Stephen Moore

HIGH-TECH THERMOPLASTICS FOR VEHICLES OF THE FUTURE

Lanxess will have several emphases during its appearance at the VDI Congress Plastics in Automotive Engineering (PIAE), which is being held virtually due to the COVID-19 pandemic. "Among other things, we will present lightweight solutions based on our Tepex-branded continuous-fiber-reinforced thermoplastic composites for brake pedals as well as structural components of the vehicle body and high-voltage battery," says Thomas Malek, Business Development manager for Tepex Automotive in the High Performance Materials (HPM) business unit at Lanxess. "We will also be concentrating on blow-moldable and injection-moldable polyamide compounds for tanks and hollow parts for the air management of turbocharged engines."

A highlight of Lanxess's presentation will be the tank of a BMW Motorrad road machine, which is made from Durethan BC550Z 900116 DUSXBL. The unreinforced and impact-resistant modified polyamide 6 is injection-molded into two half-shells, which are welded to the tank by means of hot plate welding. Thanks to this material, the engines can be manufactured cost-effectively in large quantities despite their complex geometries. The limit values for fuel emissions through the tank walls are undershot by a considerable margin.

The potential of Tepex-branded composite materials for use in lightweight applications will be demonstrated on several exhibits – for example, on an all-plastic brake pedal developed for a battery-electric sports car will also be showcased. The composite component is around 50% lighter than an equivalent steel construction. It meets all load requirements thanks to the tailor-made fiber layer construction of the Tepex insert and local reinforcement using additional tapes.

Further example of systematic lightweight design using Tepex is an A-pillar with a 3D hybrid design that Porsche has developed for vehicles such as convertibles and roadsters and is employing for the first time in the Porsche 911 convertible. The A-pillars with hybrid inserts are just as stable in the event of a crash as previous designs featuring high-strength steel tubes but they reduce the weight of the vehicle body by a total of around five kilograms.

Tepex also has enormous potential to be applied in structural components and housing parts for high-voltage batteries in electric vehicles. This is due to its inherently outstanding flame-retardant properties that it displays even without flame-retardant additives in various tests based on established norms and standards. Not only do the composite materials here present a lightweight alternative to aluminum, but they also enable cost-effective component solutions thanks to the cost-reducing integration of functions and simple processing without the need for rework in the hybrid molding method.

In addition to the powertrains of electric vehicles, there is also enormous potential for technical thermoplastics from Lanxess in the electric mobility charging infrastructure. The Durethan polyamides and Pocan polybutylene terephthalates are mainly used for components of charging plugs, sockets, and stations as well as wallboxes in garages and carports, for example. The materials are also used in components in inductive wireless charging systems for high-voltage batteries. "We have a broad range of compounds that feature a high level of dimensional stability and surface quality especially for charging plugs. They are also impact-resistant and therefore mechanically robust," says Christopher Höfs, project manager in the HPM e-Powertrain team. "In addition, our plastics are characterized by outstanding flame-retardant properties and good electrical characteristics such as high creepage current resistance."

Source : Stephen Moore

THE FUTURE OF SINGLE-USE PACKAGING IN A POST-PANDEMIC WORLD

Back in the summer of 2019, plastic packaging—particularly single use—was taking a beating and it looked like the future was bleak. Social media and viral videos made plastics the villain, singularly responsible for polluting the planet. Some plastics professionals were even pondering if they should jump to a different career path before it all came crashing down.

In a way, it was reminiscent of the era leading up to the Tylenol tampering in 1982, where the consumer battle cry of the time was "over packaging." For those of us who were around at the time, we know that a few months later, tamper-evident devices were mandated for over-the-counter pharmaceuticals. Many consumers did an about face and started complaining "why weren't these devices on the packages to begin with?"

In the first quarter of this year we were thrust into a health crisis that the world has not experienced since the Spanish Flu pandemic of 100 years ago.

The COVID-19 pandemic impacted life for virtually every single human being on the planet. All of a sudden, we quickly needed soap, sanitizers, disinfecting wipes and sprays to combat the virus. There was a huge demand for these essential commodities and workers were called upon to support the manufacturing efforts

of suppliers who were overwhelmed with a surge in demand.

Once again, we have seen a remarkable "opinion" turnaround. Even the most vocal anti-plastic critic was now relying on a soap or sanitizer pumped or poured from a plastic container. Grocery stores were telling customers their reusable bags were no longer welcome, and disposable gloves were flying off the shelves. Suddenly disposable was good; reusable was bad. The demand is expected to continue well into next year as the approaching winter will likely bring with it an upward flu spike and potential second wave of COVID-19.

However, this is not the time to do a victory lap. What we need to be doing with this lull in the plastics assault is push ahead with solutions for how to create a sustainable future. We have been presented with a unique opportunity (and the gift of time) to create solutions that impact the environment in a more positive fashion.

Multi-use containers are on-trend.

Firms are already looking for sustainable solutions which call for multiple-use containers. As the world pivots towards a circular economy, we should support efforts to innovate towards a solution where we can reduce waste and improve hygiene at the same time.

For example, single-use packaging can evolve towards lightweight cartridges used in conjunction with durable soap and sanitizer dispensers. The lighter package, which may not have ideal aesthetics, could be hidden inside a shroud or housing so that it is not visually jarring. The design of the dispenser itself can be optimized for minimal human contact, or even touchless, to help improve hygiene and sanitation.

COVID-19 has shown that demand for clean bottled water and healthy juices and beverages remain at an all-time high as stores limit the quantity that can be purchased by each customer. These have predominantly been single-use containers, but more brands are trying to push increased use of recycled content plastic to address consumer concerns. Also, there are different technologies being developed to use plastic recycled from non-mechanical processes, such as chemical recycling. The success of these efforts will have a huge bearing on use of single use plastics.

Juices and beverages will require additional shelf life attributes if these packages are further light weighted. There has been a push to develop technologies where use of barrier materials is in sync with approved recycling protocols and quality metrics. Many resin companies are working hard to find solutions to these problems.

What we have experienced is that every crisis creates a novel set of opportunities and we, as plastics professionals, need to capitalize on them. No other category of material has such a wide array of properties that can be customized to meet the needs of a global community. Our collective objective should be to proceed down this path with creativity and determination if we want to ensure that we don't squander this opportunity.

Source : Sumit Mukherjee

THERMOPLASTIC HONEYCOMB TECHNOLOGY REDUCES TRUNK FLOOR WEIGHT BY 20%

EconCore, a specialist in lightweight thermoplastic honeycomb core technology, and DPA Moldados, a tier 1 automotive supplier, have developed innovative technology which has reduced the weight of the Hyundai Creta's trunk floor by 20%. The thermoplastic composite, combining a sandwich panel of polypropylene (PP) honeycomb and glass mat thermoplastic (GMT) composite skin.

The technology developed and patented by EconCore is unique in design. The thermoplastic honeycomb is produced continuously while direct lamination of the sandwich skin layers is most often in-line integrated in the highly automated process.

José Carlos Ricciardi, managing director of DPA Moldados, a Brazilian Tier 1 supplier that has partnered with Econcore to develop this lightweight solution, said: "OEMs are calling for weight reduction but unless we are talking about motorsport, they are not quite willing to accept it if the costs are higher than conventional solutions. We had been seeking a way to address this for a while working with thermoplastic composites, and on that journey we combined forces with EconCore and their German daughter company ThermHex Waben."

EconCore's solution is effective because sandwich panels are the most suitable structure when it comes to delivering rigidity at low weight, indeed, trunk floor assemblies of many cars are made of a combination of paper honeycomb and polyurethane / glass fibre composites.

Given the high performance of the honeycomb structure, the use of material is very limited. A low-density honeycomb, when combined with skin layers, delivers a performing sandwich panel. Within Econcore's technology, the application of skin layers takes place directly as the honeycomb core is made, all within an integrated production process delivering maximum of cost-efficiency.

EconCore also recognize that sustainability within manufacturing processes is currently at a forefront of its consumers' minds. Tomasz Czarnecki, COO of EconCore, explains: "With regards to recyclability, our process is using thermoplastic honeycomb core and thermoplastic skin layers that on their own can be already based on partly or even fully recycled materials. At the end-of-life our product, and the thermoplastic finishing carpets that automotive parts require for decorations, are recyclable. Upon molding and integration of the carpets into the sandwich structure, they are not contaminated by other materials such as polyurethanes, so at the end of product's life, they can be disintegrated and fully recycled."

Additionally, EconCore's process uses thermoplastic honeycomb core and thermoplastic skin layers that comprise partly or sometimes fully recycled materials and at the end of product's life, the part can be easily recycled.

Source : Stephen Moore

FINANCIAL LESSONS FROM SATYABHAMA

Dr. Devdutt Pattanaik

Krishna was raised by cowherds and then he moved from Vrindavan to Mathura and thence to Dwarka, where he married many women, often princesses from surrounding kingdoms. But his status in the Yadava clan was ensured by his marriage to Satyabhama, daughter of the richest Yadava clan lord, Satrajit. Her stories often give us insights into financial prudery.

Satyabhama was the daughter of a Yadava chieftain, Satrajit. He had a sacred jewel called Syamantaka. This jewel gave him a lot of prosperity. Krishna felt this jewel should belong to the entire tribe. He believed everyone should have prosperity. However, Satrajit refused to part with the jewel. One day Satrajit's brother, Prasenjit, went out hunting, wearing the jewel on his body. In the jungle, a lion killed him. A bear, in turn, killed the lion, claimed the jewel and took it to his cave. When the news of Prasenjit's death reached Dwarka, everyone accused Krishna of murder. Krishna investigated the scene of the death and surmised it was not a murder. It was a hunting accident. Krishna found the jewel in the bear's cave and returned it to Satrajit.

Satrajit was very ashamed of falsely accusing Krishna. He not only begged Krishna to accept the jewel but also offered his daughter's hand in marriage to him. Krishna refused to keep the jewel but became his son-in-law. This is how Satyabhama became Krishna's wife. However, some men, who were angry that Satrajit gave Satyabhama to Krishna in marriage. They murdered Satrajit, and stole Syamantaka. Krishna punished the killers and brought back the jewel, but there was no way to reverse the tragedy. The jewel that could have brought prosperity to the entire country was restricted to one's man house, where it brought prosperity but also envy and misfortune. The men who wanted to marry Satyabhama really wanted to marry her to get the jewel in dowry.

Another story associated with Satyabhama speaks about financial transactions. It's about how people are eager to take a favour without wanting to return it. Indra, the king of Swarga needs Krishna's help to defeat the demon king, Naraka. Krishna does do this successfully. He's accompanied into battle by his wife, Satyabhama, who feels that her husband deserves a reward. She asks Indra for the Parijat tree which she can plant in her garden. Indra refuses to part with it, leading to a battle between him and Krishna, which he loses. Indra, who seeks help from Krishna in battle, is not willing to part with the Parijat tree, in return for the help. This reminds us of people who are constantly seeking help, but are not willing to reward those who help them.

When Krishna's friend, Sudama comes to Dwarka for help, Krishna in his love, offers all his fortune in exchange for the puffed rice, he is given by his friend. It is Satyabhama who warns Krishna to keep a portion of the wealth for the family and not give all of it away to his friend. Thus, she is the prudent wife; the one who reminds him of the importance of worldly wealth and power. Satyabhama is a demanding wife and Krishna knows her value. It is by marrying her, he becomes a part of the Yadu-vamsa clan. All his other wives belong to other tribes; she alone is from the Yadava family. This gives him the status of a nobleman. Otherwise, he would be just the child of a cowherd. The final story associated with Satyabhama and wealth is when Narada ask Krishna's wives for something equal to Krishna's weight. Taking the meaning literally, Satyabhama offers Narada all her gold. Rukmini offers him a sprig of tulsi as the symbol of her love. The symbol of love outweighs all the gold in Satyabhama's treasury.

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