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MITSUBISHI CHEMICAL INDIA PVT. LTD.

Mr. Pankaj Kumar Jha - Mobile 9717744260 Email: jha.pankaj@ma.mc-india.co.in
Mr. Basheer Ahmed - Mobile 8291 854027 Email: ahmed.basheer@ma.mc-india.co.in
Mr. Sachin Phadke - Mobile 8291 854026 Email: phadke.sachin@ma.mc-india.co.in
Ms. Winita Dsouza - Mobile 8291 854028 Email: dsouza.winita@ma.mc-india.co.in

2M Business Solutions
Consultant - YUPO Business
Mr. Prashant Mandewal
Mobile: 9987183330
Email: mm.y@2m2.net.in
prashant_mandewal@yahoo.com

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CHIEF EXECUTIVE OFFICER
Deepak Lamba

CHIEF FINANCIAL OFFICER
Subramaniam S

HEAD HUMAN RESOURCE
Meghna Puthawala

VICE PRESIDENT MARKETING
Vidyut Patara

BRAND PUBLISHER
Rishi Sutrave
rishi.sutrave@wwm.co.in +91 9820580009

CORPORATE STRATEGY AND SUBSCRIPTIONS LEAD | **Ritika Masand**
ritika.masand@wwm.co.in

EDITOR | **Rahul Kamat**
rahul.kamat@wwm.co.in

ASSISTANT EDITOR | **Anvita Pillai**
anvita.pillai@wwm.co.in

ASSOCIATE ART DIRECTOR | **Sanjay Dalvi**
sanjay.dalvi@wwm.co.in

EXECUTIVE DELEGATE ACQUISITION | **Shruti Nair**
shruti.nair@wwm.co.in

ADVERTISING

WEST & NORTH
Ranjan Haldar
ranjan.haldar@wwm.co.in +91 9167267474

SOUTH
Mahadev B
mahadev.b@wwm.co.in +91 9448483475

Vaishnavi Ravindran
vaishnavi.ravindran@wwm.co.in +91 9930587550

OVERSEAS PARTNER | **Mike Hay**
Ringier Trade Media
China Taiwan Hongkong & South East Asia
mcchay@ringier.com.hk +852 2369 – 8788

CAREERS
careers@wwm.co.in

SUBSCRIPTIONS
subscriptions.wwm@wwm.co.in

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ESG Goals: Is it a purpose in disguise?

There is a consensus that a company's Purpose refers to what its stakeholders understand or perceive it to be. It is less about what the company says about itself and much more about what others (employees, customers, shareholders, media, etc.) understand it to be. Research and studies from various fields substantiate that better communication and understanding of a company's purpose helps it improve its stock performance, attract better talent and strengthen its 'social license' to operate in the marketplace.

Lesser number of business leaders now state that profit (alone) is their main Purpose. Rather companies have started to focus on their broader ESG goals to define Purpose. Our coverage indicates that areas that are becoming a focus include tackling matters such as workers' conditions, supply chain provenance, waste management, inclusivity and so on - ESG goals and an organisation's Purpose are now intrinsically tied together and they may no longer be possible to pursue either in isolation.

Business leaders are also personally facing immense scrutiny of their actions, especially about when and how they implement their ESG agenda. Today, a plethora of issues are competing for stakeholder (public, media, consumer) attention, which is resulting in severe pressure on how leaders can prioritise issues or causes to champion. This inherent tussle between issues is also making it difficult to correctly understand trade-offs and be politically consistent at the same time.

Firms find themselves vulnerable to negative backlash from stakeholders if their ESG 'efforts' are perceived to be instrumental or (only) profit-seeking i.e. greenwashing, which is a curse in the long term with the potential to severely erode Trust. To effectively manage and mitigate reputation-related crises companies can no longer afford to be lopsided in adequately preparing a timely response. By focusing on environmental, social and governance issues and being up-front about their challenges, companies can earn goodwill with various stakeholders. Only this can make them more resilient in the face of any crisis, which is always lurking around the corner!

While discussing ESG stakeholder activism Henisz explains that companies should and need to be seen as taking positive, long-term ESG action voluntarily and devoid of any stakeholder, activist and compliance pressures. It is also important that the firm's social action is seen as genuinely authentic and never reactionary and provides adequate disclosures. For this, companies have to be prepared almost always and in real-time in today's 'digital-first' world.

It is also sometimes observed in client conversations that a company's ESG positioning is good in some areas but, lacking in others. It can be argued that most companies are overwhelmingly focussed on defining and communicating "E" while "S" & "G" are either routine or do not find equal importance in their overall mix. Since not only investment and rating agencies but also stakeholders desire a holistic view of a company's ESG situation, performance across all three (E, S, and G) domains is critical to enhancing stakeholders' perception of the company's trustworthiness.

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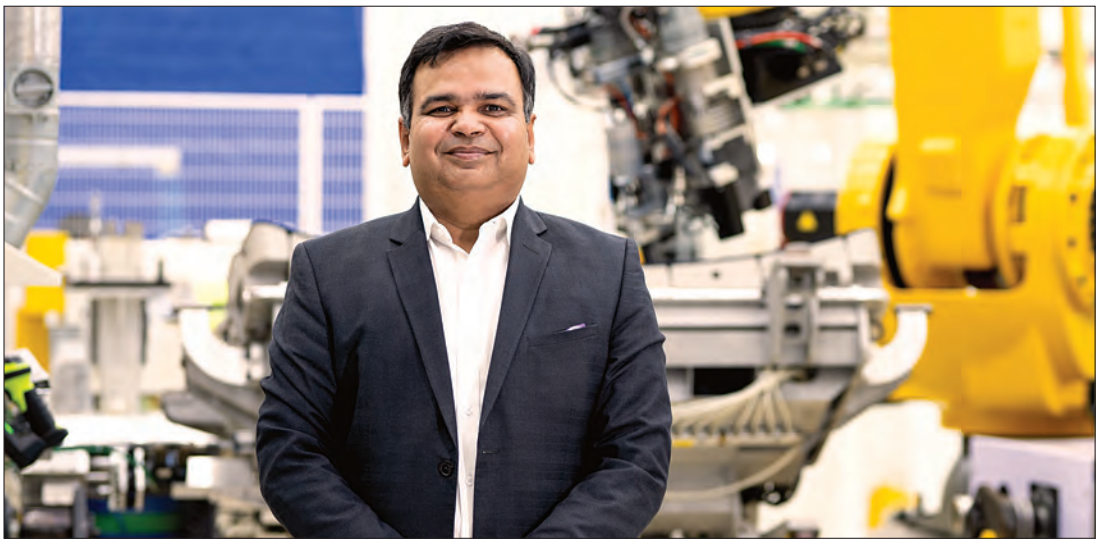

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Lyondellbasell & Audi Create Automotive Plastic Parts From Mixed Automotive Plastic Waste

LyondellBasell and Audi has collaborated to close the loop for mixed automotive plastic waste. Audi is installing plastic seatbelt buckle covers in the Q8 e-tron made using LyondellBasell plastic that supports the sourcing of feedstocks from mixed automotive plastic waste. Plastic components from customer vehicles that can no longer be repaired are dismantled, shredded, and processed by chemical recycling into pyrolysis oil. The pyrolysis oil is then used as a raw material in LyondellBasell's manufacturing process for the production of new plastics, replacing virgin fossil feedstocks. The recycled content is attributed to the Audi product via a mass balance approach.

"As part of the PlasticLoop project, we are working with Audi to establish an innovative closed-loop process, recycling plastic automotive parts for use in new vehicles," said Erik Licht, LyondellBasell Advanced Polymer Solutions' New Business Development Director. "For the first time, we are using chemical recycling to recycle mixed automotive plastic waste into plastic granulate for automotive interior applications. The plastic granulate is then used in the production of the seatbelt buckle covers for the Audi Q8 e-tron."

With this process, LyondellBasell, Audi, and chemical recycler SynCycle (Next Generation Group and BDI), succeed in recycling a stream of material which today is mostly only suitable for energy recovery. This reduces the usage of fossil-based primary materials for the Audi Q8 e-tron and keeps valuable feedstocks in a circular loop. Materials produced from pyrolysis oil are of the same high quality as virgin materials and have the same properties. Chemical recycling offers an alternative to energy recovery and complements mechanical recycling.

"Audi's vision is to use secondary materials wherever it is technically possible, economically viable and ecologically beneficial." said Philipp Eder, Project Manager for Circular Economy in the Supply Chain, Audi. "The PlasticLoop project is part of Audi's circular economy strategy and a good example of cross-sector cooperation within the Audi supply chain. Findings from the project are also incorporated into the product development of future vehicle projects via the "Design for Recycling" approach."

Alexander Gerding To Lead BASF In India

The Board of Directors of BASF India Limited approved the appointment of Alexander Gerding as Managing Director of BASF India Limited, effective January 1, 2023. Gerding will lead the company for a tenure of five years and will be based in Mumbai. He succeeds the present Managing Director of BASF India Limited, Narayan Krishnamohan, who has decided to leave the company.

Krishnamohan will support Gerding's transition to the role, until December 31, 2022. Born in Bremen, Germany in 1979, Gerding has been with BASF for more than 22 years. He joined BASF in 2000 under a dual study program and obtained his Master of Business Administration at UNCG, North Carolina, United States, in 2005. Over this time, he has handled multiple leadership roles across the globe including Argentina, the US, and most recently as Vice President Business Management for Agricultural Solutions for EMEA East based out of Germany. Gerding has over two decades of valuable experience in the Agricultural Solutions business.

As head for BASF Group Companies in the country and Managing Director, BASF India Limited, he will focus on expanding the business, supporting BASF's customers and partners in the country. The board has also approved the appointment of Anil Kumar Choudhary as the Whole-time Director of the company for a term of five years. Choudhary has been with BASF since 2004 and has held various leadership positions, including being the Managing Director of BASF Catalysts India Private Limited. In his last role, he was the Business Director for the Performance Materials business. He will assume the role of Vice President Materials, Industrial Solutions and Surface Technologies, effective January 1, 2023.

He will also be responsible for all manufacturing sites of BASF India Limited. Choudhary replaces Rajesh Naik, who will resign as Whole-time Director as on 31 December 2022, to pursue a regional role in BASF. All appointments will be effective January 1, 2023, subject to shareholders' and other relevant approvals as required.

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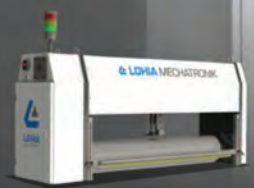

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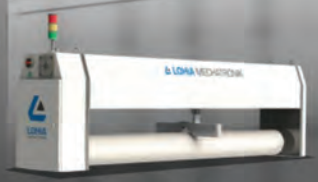

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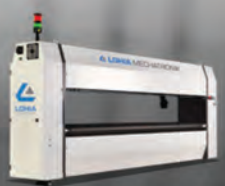

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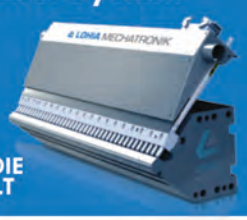

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Igus Meets Metaverse

Fortnite - a computer game that enables people to participate in social events in a 3D simulation - demonstrates how powerful a parallel digital universe can be. 12.3 million players gathered in a virtual space in April 2020, when rapper Travis Scott gave a digital concert with an avatar. A parallel digital universe could have similar importance for industry and commerce. "We are pursuing the vision of the iguverse, a virtual space in which all of our products can be experienced as digital twins, but that is not all," said igus CEO Frank Blase. "Customers from all over the world will have the opportunity to work with engineers and project managers in iguverse to develop machines, systems and vehicles and to immerse themselves projects and applications. This will save time and money."

"Customers are up to nine times as likely to remember experiences in virtual reality." Sales in virtual space: visitors to the IAA Transportation 2022 trade show in Hannover got a foretaste. At the igus stand, they could put on virtual reality glasses and, accompanied by igus employees, take a first look at the beginnings of the igus metaverse. In future, they will look at 3D models of products such as energy chains from all sides in a 360-degree panoramic view. They will experience the igus infrastructure, such as the 3,800-square-meter test laboratory in Cologne, without having to travel, and will be able to immerse themselves in applications that use igus components.

Such applications range from a plastic bicycle to a futuristic minivan with iglidur plain bearings, drylin linear guides and e-chains to an oil platform that uses the modular e-loop energy chain system. These impressions are not nearly as impressive and lifelike when conveyed with traditional media such as catalogues, brochures and multimedia presentations or even videos and previous 3D objects. "The iguverse represents a new way of presenting, selling and engineering," said Blase. "For many, the metaverse is still uncharted territory. We want to learn more, too, and are therefore travelling this path with our customers. It has plenty of potential for future sales. For example, salespeople and customers could put on VR glasses during customer visits and immerse themselves in the iguverse. Studies show that customers are up to nine times as likely to remember experiences in virtual reality and thus understand things better," said Blase.

But digital twins of products and infrastructure are only one stage of expanding into the iguverse. In future, customers, engineers, and material experts will meet as avatars in digital space, where they will carry out entire engineering projects - faster and smoother than is possible in just the physical world.

At a further stage, igus is considering expanding the iguverse to include a B2B platform for other manufacturers. They can then also present machines and systems in virtual space, provided they use igus components. This is a megatrend according to Gartner, a US market research firm. They think that digital channels will represent 80 per cent of B2B sales interactions between suppliers and buyers as early as 2025. igus, however, will use the B2B platform to create a growing reference database for motion plastics, one that can also be accessed virtually.

Kirloskar Oil Engines Signs MOU With RITES To Explore Common Business Interests

Kirloskar Oil Engines (KOEL), a leading Engineering, Power Generation and Solutions company, signed a memorandum of understanding (MoU) with RITES Ltd, a leading Transport Infrastructure Consultancy and Engineering company, to jointly explore business opportunities for products/solutions in the areas of export of railway rolling stock, infrastructure and urban transport for the domestic and overseas markets.

Through this MoU, KOEL will leverage its R&D expertise, manufacturing acumen, state-of-the-art manufacturing facilities, supply chain network and strong channel to develop, manufacture and supply products for RITES customers, while RITES will provide expertise in design, marketing, operation & maintenance, and any other support required for tapping business opportunities.

Vinodkumar Menon, Vice President, Industrial Business, KOEL, said "The strategic partnership between KOEL and RITES leverages the strengths of both the organisations. While we at KOEL are focused on developing world-class products and services, RITES has great design, technical expertise and marketing capabilities. We truly look forward to a long and fruitful association."

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Lanxess Again Ranks Top In Dow Jones Sustainability Indexes

Lanxess, a specialty chemicals company, has ranked first in the Dow Jones Sustainability Index (DJSI) Europe in the 'Chemicals' category, scoring 85 out of 100 points. In the DJSI World, Lanxess came in second as in the previous year. The Group achieved particularly good results in the areas of product stewardship, water and human rights.

"Sustainable, integrative thinking and acting supports our corporate goals and is, therefore, anchored at all levels of the Group," said Hubert Fink, Member of the Board of Management, Lanxess AG. "We consider the renewed very good ranking in the Dow Jones Sustainability Index to be both a confirmation and encouragement of our commitment."

For the Dow Jones Sustainability Indexes, companies are evaluated in the areas of environment, social responsibility and corporate governance. The DJSI World lists the top 10 per cent of assessed global companies per industry, while the DJSI Europe lists the top 20 percent of companies headquartered in Europe.

Numerous external parties have recognised Lanxess' effective commitment to climate protection, most recently the renowned Science Based Targets initiative (SBTi). The joint initiative of the climate protection organization CDP, the UN Global Compact, the World Resources Institute and the World Wide Fund for Nature has validated the Group's targets for reducing its emissions and confirmed that LANXESS is contributing to limiting global warming to a maximum of 1.5 degrees Celsius. This value is the target set by the Paris Agreement and is generally considered the threshold for preventing a climate catastrophe.

To this end, SBTi analysed plans for lowering direct emissions in production (Scope 1), energy sources (Scope 2) and the upstream and downstream value chain (Scope 3). Three years ago, Lanxess had already set itself the goal of becoming climate-neutral in Scope 1 and Scope 2 emissions by 2040. In 2022, the specialty chemicals company extended its target to climate neutrality for Scope 3 emissions. It aims to achieve this by switching to sustainable raw materials, "green" logistics and a climate-neutral product portfolio.

LG Chem Launches Asia's First Plant Material-based Eco-friendly ABS

LG Chem announced that it will begin pioneering the eco-friendly market in earnest by launching the eco-friendly highly functional plastic (Bio-circular balanced ABS) product that applies plant-based bio ingredients.

ABS is a plastic with outstanding heat-resistance and impact-resistance and is LG Chem's number one product for global market share. It can be processed in the shape desired by customers and can be made in various colours, and is thus being used as materials for various products such as toys, household appliances, automobiles, construction materials, etc.

The newly launched eco-friendly highly functional plastic acquired ISCC PLUS (global eco-friendly material certification) by using renewable bio materials. LG Chem is the first in Asia to sell eco-friendly products that acquired ISCC PLUS certification in the ABS sector.

Through LCA (life cycle assessment) that assesses raw material production to shipping for verification of environmental impacts, LG Chem found that carbon emissions were reduced significantly compared to ABS produced in the past.

The eco-friendly highly functional plastic that will play a significant role in achieving 2050 Net Zero was launched by applying LG Chem's eco-friendly integrated brand, 'LETZero.'

This product was first sold to North America's largest toy manufacturer, Mattel that focuses on developing eco-friendly products. LG Chem plans to actively expand and lead related markets based on eco-friendly highly functional plastics. As ESG trends have recently been accelerating, eco-friendly product demand has been continuously increasing for products that are used in everyday life.

As part of its sustainable strategies, LG Chem released diapers and floor materials using biomaterials, and launched eco-friendly remote controls, set top boxes, etc. using recycled plastics as it concentrates on carbon neutrality and resource circulation activities.

Petrochemicals Company President Kug Lae, NOH stated, "We will lead the market and provide an opportunity for valuable consumption to customers to think about the environment with sustainable materials around eco-friendly products."

ŠKODA AUTO Volkswagen India's Aurangabad Plant Turns Green Ahead Of Target

Global auto leader Volkswagen Group's Aurangabad facility has transitioned to 100 per cent 'green' energy, well ahead of its 2025 target. With this achievement, ŠKODA AUTO Volkswagen India Private Limited (SAVWIPL), which manages the Indian region of five Volkswagen Group brands – ŠKODA, Volkswagen, Audi, Porsche, and Lamborghini – has taken another significant step towards fulfilling the Group's goTOzero mission. The facility received its Green Energy Certificate from Maharashtra State Electricity Distribution Company Limited (MSEDCL).

Commenting on the milestone, Piyush Arora, Managing Director and CEO, ŠKODA AUTO Volkswagen India Private Limited said, "Sustainability is a key pillar of the Group's corporate strategy. It is also a cornerstone of our manufacturing processes. In the Volkswagen Group, 'goTOzero' is not only a roadmap for effective climate protection, it is also an integral strategic initiative towards sustainable mobility. We take a holistic approach to decarbonisation – from production through service life to recycling. We are enormously proud of achieving 100 per cent Green Energy Certification for our Aurangabad facility well in advance of the target date. This feat moves us closer to our goal of achieving carbon neutrality in our manufacturing operations by the second half of the decade and motivates us to forge ahead with our Green Future initiatives."

Earlier in 2018, SAVWIPL's Aurangabad Plant increased its capacity usage of 'green' energy and commissioned a 980 kWp rooftop solar power plant to meet 40 per cent of its annual energy requirement. By replacing the external energy supply with renewable energy from MSEDCL, ŠAVWIPL's Aurangabad Plant has become the first automotive facility in Aurangabad to be certified as a Green Energy Plant by MSEDCL.

With this transition to 'green' energy, the Aurangabad plant will achieve an approximately 48 per cent reduction in CO2 every year.

As part of its 'goTOzero' mission, the VW Group aims to become a carbon-neutral company by 2050.

Covestro & TMT Launch Their 1000th Polyurethane Wind Rotor Blade

Under its current five-year plan, China aims at doubling its wind and solar power output by 2025. That is why also the drive for technological progress in the field of renewable energies has never been stronger. Polyurethane (PU) resin, an innovative manufacturing solution for wind turbine blades, has penetrated the epoxy-dominated market in recent years. Covestro and Zhuzhou Times New Material Technology (TMT), a pioneering PU wind turbine manufacturer, recently announced the launch of their 1000th PU wind turbine blade.

PU in wind-blade production is a transformative innovation delivered by Covestro teams around the globe. With better mechanical properties, an efficient production process, and a more cost-effective production solution than conventional fiberglass-reinforced epoxy blades, PU blades are opening a new chapter in the wind blade industry.

Covestro and TMT signed a memorandum of cooperation about a year ago, based on which significant commercialisation results have been achieved. PU wind turbines are now being used in commercial wind farms throughout China.

Dr Binbin Hou, General Manager of Wind Business at TMT, said, "PU wind blades cater to the growing demand for longer wind blade designs. We hope to further collaborate with Covestro to improve the competitiveness of wind energy through continuous technology innovation."

TMT produces PU wind blades ranging from 59.5 meters to 94 meters in length with different blade designs and layup structures to meet the growing demand for longer and larger wind blades. The 94-meter wind turbine blade, capable of generating

8 MW of energy, is the largest PU application for Covestro so far. Multiple TMT factories manufacture these blades under different temperatures, humidity, and altitude, proving the wide applicability of PU resin in the manufacturing process.

In addition to wind turbine development, Covestro and TMT have jointly developed PU railway sleepers, which are more durable and cost-effective in maintenance than traditional wood and concrete sleepers. Covestro, an integrated PU solution provider, will cooperate with TMT to provide various PU resins, coatings, and PU machinery solutions.

The company is committed to becoming fully circular and is striving to become climate neutral by 2035 (scope 1 and 2). Covestro generated sales of 15.9 billion in fiscal 2021. At the end of 2021, the company had 50 production sites worldwide and employed approximately 17,900 people (calculated as full-time equivalents).

Sustainability & Innovation: What's Next For Polymer Industry?

With the demand for sustainability picking up in the packaging sector, the industry is now experiencing a major vacuum to innovate with technology and materials. The article elaborates on the future of packaging sector.

By Pankaj Poddar, Group CEO, Cosmo First

The polymer industry in India is growing rapidly, with packaging and films being one of the major applications. During the forecast period (2022-2027), the Indian packaging market is anticipated to see a CAGR of 12.60 per cent. Films are used extensively in the packaging of food & beverage products, as well as in industrial and consumer goods packaging. India's BOPP film market is expected to grow at a CAGR of 12.2 per cent during the forecasting period (2020-2027). The foremost drivers for the growth of the packaging and film industry are the growth of the packaging industry and the increasing use of flexible packaging in the food & beverage and healthcare industries.

The Indian packaging industry is growing rapidly, but it also demands innovations to meet the needs of a changing market. In particular, the industry needs to prioritise sustainability in order to meet the needs of a growing population and protect the environment. The industry is facing numerous challenges, including the need to develop more sustainable packaging solutions. The population of India is expected to grow to 1.5 billion by 2030, and this will put a strain on resources. The packaging industry will need to find ways to reduce the amount of waste it produces and use more recycled materials. Margins are expected to remain under pressure as new capacities are added across the globe.

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a widespread choice for packaging. It is durable and lightweight, making it ideal for packaging products of all shapes and sizes. It is also moisture-resistant, making it an ideal material for packaging food and beverages. In addition, plastic packaging can be easily printed with product information and branding elements, making it an efficient marketing tool. Plastic packaging is strong and durable, making it ideal for protecting products during transport. It's also lightweight, which helps to keep shipping costs down, and because it can be moulded into any shape, it's perfect for creating custom packaging designs.

But plastic packaging isn't just about utility. It can also be used to create beautiful, eye-catching packaging that helps to sell products, and because it's so easy to recycle, plastic packaging is also a sustainable choice. Out of the total plastic waste generated, around 94 per cent comprises thermoplastic content (such as PET, LDPE, HDPE, PVC, etc), which is recyclable. The remaining 6 per cent belongs to the family of thermosets and other categories of plastics such as SMC, FRP, multi-layered, thermocol, etc, which are not so recyclable. According to a study done by the Northern Ireland Assembly, making paper bags require more than four times as much energy as making plastic ones. Paper bags, in contrast to plastic bags, need forests to be cleared in order to be made. In comparison to producing plastic bags, the production process, according to the research, also generates a larger concentration of harmful compounds. A study by Environment Agency found cotton bags need to be reused 131 times, 128 times more than plastic bags for life in order to have a lower global warming potential. Moreover, paper bags have a greater mass in terms of solid waste and can weigh seven times more than plastic bags for recycling to plants to process which leads to a seven-fold increase in greenhouse gas emissions.

Sustainable Packaging For Circular Economy

In a circular economy, waste and pollution are designed out of the system from the outset. This means that resources are used more efficiently, and products are made to be reused, reduced, or recycled back into the economy instead of being discarded as waste. Sustainable packaging is a key part of a circular economy. It keeps products safe and fresh while using fewer resources and generating less waste. Polymers are essential materials for sustainable packaging. They are durable, lightweight, and can be easily recycled. However, current recycling rates for plastics are low, and most of these materials end up in landfill or being incinerated. This is a wasted opportunity to keep these valuable materials in the economy and out of the environment.

There is a need for more innovative and sustainable packaging solutions that make use of plastics and polymers in a more effective way. We need to design packaging that is fit for purpose and can be easily recycled back into the economy. Innovative packaging solutions that make use of plastics and polymers in a more effective way will help to close the loop in the circular economy and keep these valuable materials in the economy. These PP and PE films can still be widely used in today's recycling waste stream because they are a component of the larger polyolefin family. For instance, consider thin, high-performance films, heat-resistant and transparent barrier films, as well as coated films that facilitate a circular economy and do not impede recycling. This will help to reduce waste and pollution and create a more sustainable future for us all. Sustainable packaging is an important part of the circular economy. Packaging made from recycled plastics and polymers can be just as strong and durable as new packaging. It is also often cheaper to produce. This makes sustainable packaging a win-win for businesses and the environment. If successfully implemented, it will result in an economy where we only produce eco-friendly, long-lasting polymers that can be easily recycled and used in a variety of ways.

ACCORDING TO A STUDY DONE BY THE NORTHERN IRELAND ASSEMBLY, MAKING PAPER BAGS REQUIRE MORE THAN FOUR TIMES AS MUCH ENERGY AS MAKING PLASTIC ONES. PAPER BAGS, IN CONTRAST TO PLASTIC BAGS, NEED FORESTS TO BE CLEARED IN ORDER TO BE MADE.

Innovation In Technology

The speciality films and packaging industry in India are continuously innovating in technology which is facilitating the growth of the sector. This is evident from the fact that the industry has invested in state-of-the-art manufacturing facilities and has developed a strong R&D infrastructure. The industry is also collaborating with leading global technology providers to develop new and innovative solutions. Some of the key technology trends that are being adopted by the industry include the development of metallised films, which offer superior barrier properties and are widely used in food packaging. Another example is the use of nanotechnology in the production of speciality films, which allows for the creation of thinner and more flexible films with enhanced properties.

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technologies is helping the speciality films and packaging industry in India to remain competitive in the global market. In addition, it is also enabling the sector to meet the ever-changing needs of customers and to stay ahead of the competition. However, there is a lot more scope for the industry to innovate such as using biodegradable and compostable materials, developing intelligent packaging solutions, and use of smart labels. Another area of innovation is in the area of reusable packaging. This includes both reusable containers and packaging that can be returned to the manufacturer for reuse. Reusable packaging can help to reduce the amount of waste that is generated, as well as the energy and resources required to produce new packaging.

What's Next?

In the upcoming years, the goal of the industry should be shifting to packaging material films with PCR content that are chlorine-free and have characteristics that will reduce the consumption of plastic and also help with easy recyclability. Many companies are now using recycled materials in their products, and some are even developing products that can be reused or recycled. This commitment to sustainability is not only good for the environment, but it also helps create a more positive image for the industry.

There is a growing movement to develop more sustainable packaging options that are less harmful to the environment. One promising area of innovation is the development of biodegradable packaging materials. These materials can either be made from renewable resources or be designed to break down more easily in the environment. Finally, there is also an increasing focus on developing packaging that is easier to recycle. This includes using more recyclable materials and designing packaging that can be easily disassembled for recycling. By making recycling more convenient, it is hoped that more people will be willing to recycle their packaging materials.

Technology, consumer behaviour, and regulations are all transforming, and the polymer industry is keeping up. Packaging is a key aspect that drives the customer experience. For this reason, it is vital to develop sustainable packaging, and the entire packaging industry can look forward to more sustainability in the future backed with innovations. Sustainability is becoming an increasingly important issue for consumers, and the packaging industry needs to respond to this rising need. To meet the needs of a growing population and protect the environment, the industry needs to prioritise sustainability. The goal of the recycler should be to make a recycled granule that is as similar in property to the virgin raw material as feasible to foster a sustainable circular economy.

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How Pandemic Accelerated Transformation In PVC Sector

The pandemic has not left any industry unturned with an eye-opening revolution. The article elaborates on the effects pandemic had on the PVC sector in India.

By Ajit Venkataraman, CEO, Finolex Industries

The onset of pandemic resulted with India undergoing significant amount of economic disruption in the manufacturing sector. Globally, the manufacturing sector, being at the core, was adversely affected, which resulted in low-scale operations and eventually had a negative effect on production volumes. This ultimately had an adverse effect on turnover and income. Both the complete and partial lockdowns had an effect on the manufacturing industry from the demand and supply sides. The production network was impacted on the supply side by the confined transportation of goods, services, and personnel. Demand fell too, an all-time low as customers shifted to necessities and essentials. Employment decreased as a result of the decline in economic activity and the general slowdown in production. These supply impacts were further aggravated because of the demand side facing uncertainties such as reduced disposable income, savings, and increased uncertainties.

The Indian markets were comparatively stable as it embraced digitalisation gracefully. And the effects of it were clearly seen as India set a benchmark. The pandemic accelerated consumption among customers, and the internet changed the way business was done. It created new opportunities for brands wanting to reach dealers and consumers directly in India and abroad.

Since marketplaces were closed during the lockdown, manufacturers and customers could communicate online, and both groups were quick to recognise the opportunity it presents.

Brands were able to understand customers better, who in turn, were able to choose from a wide range of products and pricing options online. This trend has expanded tremendously during the last two years. India is on the verge of a direct-to-consumer (D2C) revolution right now.

The manufacturing sector's outlook can be better understood

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by an analysis which explains the current conditions and the impact on the industry post pandemic. Various efforts by government as well as manufacturers have been made to promote and maintain the industries essence and to help Indian economy get back on track which was evident as India fared well on the global index as compared to other developed and developing economies.

Transformation In PVC Sector

The demand of pipes also saw an upward shift in the sector, as water supply and irrigation infrastructure spiked and helped the PVC sector in many ways. During pandemic the market size of India's plastic pipes industry was Rs 30,000 crore and the industry had posted a CAGR of 10 per cent over last five years (highest growth rate in the building materials space). The industry's products are made from resins, such as PVC, CPVC, PPE and HDPE, with a variety of end user applications across agriculture, plumbing and infrastructure sectors.

The long-term growth story was preserved, nevertheless, due to factors like a variety of end-user applications, value-added goods, the switch from metal to plastic pipes, continuous consolidation, and anticipated infrastructure demand.

The size of the global PVC pipe market is anticipated to increase between 2022 and 2032 at a CAGR of almost 7 per cent. The rise in water consumption driven by increase in number of households – residential & commercial projects, infrastructure projects & growing demand for irrigation in agriculture segment will be a major driving factor in growth of the PVC markets, in the future.

As per analysis by CRISIL, revenue of polyvinyl chloride (PVC) pipes and fittings manufacturers will surge ~35 per cent this fiscal, riding on higher realisations and a modest volume growth this fiscal. Next fiscal, sustained healthy demand from government initiatives in water sanitation, and improving real estate demand will see the sector revenue grow another 7-10 per cent despite the high base.

In addition, operating profitability will be strong despite a slight decline from the high recorded last fiscal year as a result of an increase in input costs. Despite an anticipated increase in capital expenditure (capex) throughout the current and following fiscal years, healthy cash accruals and solid balance sheets will maintain stable credit profiles.

Newer approaches like smart manufacturing have transformed the whole manufacturing industry by building upon the solid 4.0 framework and integrating that with cutting-edge technologies, such as AI, ML, digital twins, predictive and prescriptive analytics, to efficiently deliver high-quality products, delight customers & bring necessary change from predictive from reactive & take smart manufacturing one step further. The value chain is becoming more and more intertwined with it. Smart manufacturing has enabled access to real-time data and insights needed to make smarter and faster business decisions which promoted the growth and helped to have and upward shift in such times.

Disruption For Transformation

Further to add, disruption in the global supply chain has opened opportunities for large-scale manufacturing in India, aided by significant policy initiatives such as production-linked-incentive (PLI) schemes and low corporate tax rates for new manufacturing, among others.

To assist Indian businesses in joining global value chains and taking advantage of the opportunity, the government has proposed a $27 billion PLI scheme for 13 sectors. Costs associated with logistics are anticipated to drop dramatically as a result of the PM Gati Shakti - National Master Plan (NMP), which unites 16 ministries to enable integrated planning and coordinated implementation of infrastructural linkages. For new manufacturing, the corporate tax rate has been lowered to 15 per cent.

All this has promoted and helped to maintain the balance in the India's PVC pipes market and has helped witness Y-O-Y growth in the sector. Resulting in an accelerated performance, larger outputs, better management of supply and demand and overall transformation in the PVC sector.

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Innovative Use of IMC Process for EVs

Electric vehicles have been gaining traction across the globe. The technical paper elaborates on a combination of two processes as the IMC Process and reinforced thermoplastics laminates, and how it will enhances the property of laminates providing better strength.

By Anil George & Bhushan Khachane

Over the last decades, climate change due to fossil fuel burning has taken centre stage in all discussions. The automotive sector has been facing these challenges to reduce pollutants in the air by

A. Reducing emissions
B. Increasing energy efficiency
C. Use of renewable energy

One of the alternatives by the automotive industry was to have a phased introduction to Electric Vehicles (EV). Now-a-days, EV has challenges in making vehicle lightweight to achieve range and improve fuel efficiency without sacrificing safety.

Innovative plastics and fibre-reinforced composite materials offer a means to lightweight vehicle structures. Injection Moulding Composites (IMC) is one of the technologies to achieve this light weighting target. The IMC Process is the combination of the injection moulded material and some reinforcement material to achieve the result for suitable application and increase strength and weight saving on the parts. As a result, IMC are increasingly venturing into new application fields.

For a clear understanding of the technology, we have taken

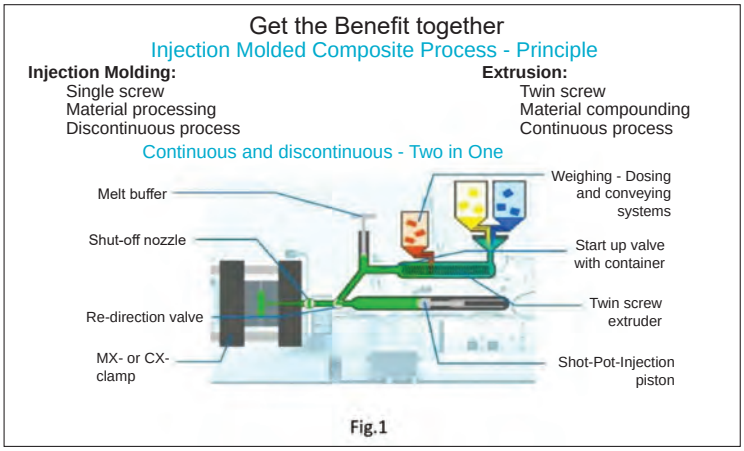

Fig.1

IMC Principles:

What makes an IMC suitable for long glass fibre

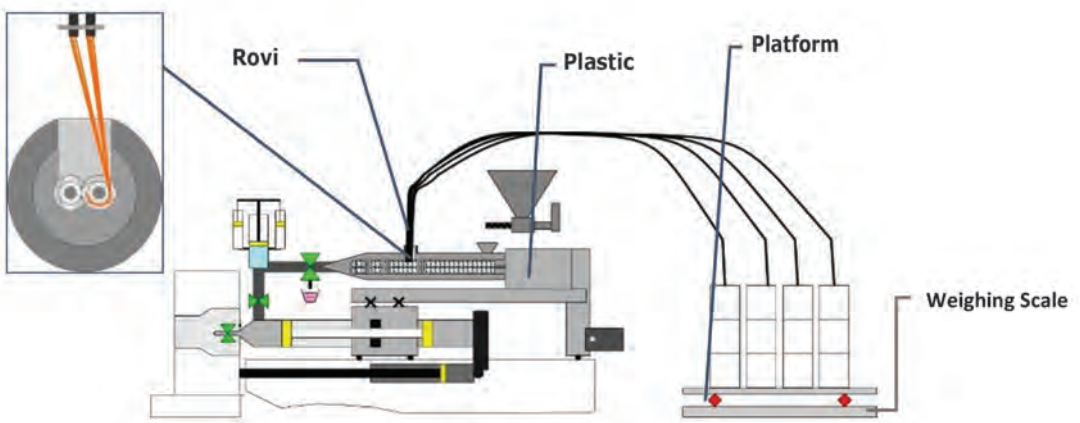

Fig.2

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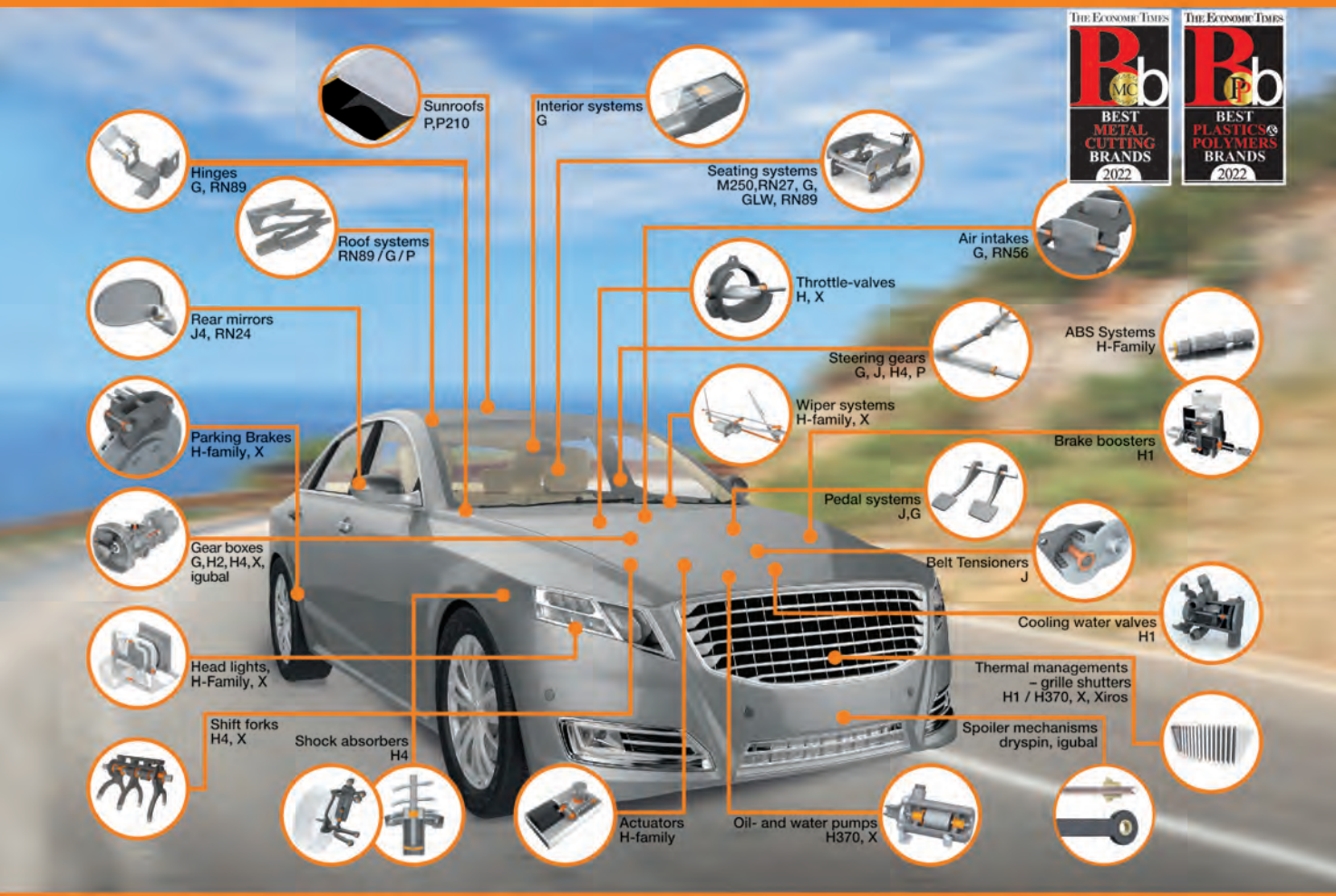

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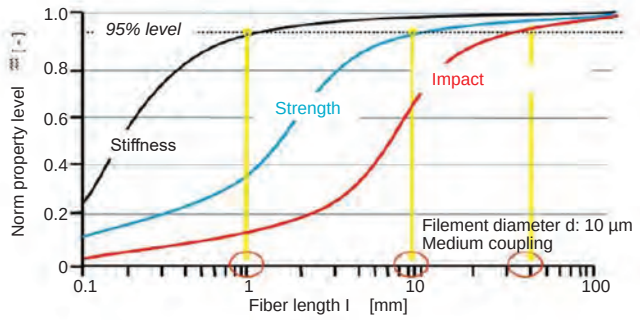
Material Properties:

Influence of fiber length on mechanical properties

Long glass fiber - PP/GF (qualitative)



Source: FH Rosenheim. Prof Schemme based on Thomas on & Vlug

Fig.3

Fig.4

the example of seat pan which we developed for an OEM using the IMC process. Initially, this seat pan was mainly available in metal, so we had the challenges to convert metal design into the plastic design. We have selected plastic RM with appropriate percentage of glass filled content and validated the result in the design. These results were good at the part level and design packaging space became a constraint. There was a major limitation on the space available for a plastic design because the sheet metal was only 1.2 mm thick. However, to overcome the space challenges, we introduced the laminate sheet technology in combination with the IMC process. The design was developed to eliminate further thickness addition and removing complicated ribbing structure. This led to weight saving in part with minimum 30 per cent reduction and other sub-process reduction needed in the metal design like coating which was not environment-friendly.

So, with the help of combination of the IMC process and reinforced thermoplastics, we have developed the parts like seat pan, battery lower tray, bounded spare wheel tub mainly for EVs and many more for other applications with the IMC process.

Introduction On The IMC Process:

The plasticization capacities of injection moulding machines have considerably increased in recent years.

Sr. No	Property	Specification	Condition	Unit	Conventional Injection molded part	IMC molded part				
1	MATERIAL				PP GF 20 (APPCOM G2CC BK UV)	PP GF 20	PP GF 15	PP GF 10	PP GF 5	PP MFGF 1010
2	FILLER CONTENT	ASTM D 5630	800 °C	%	20	20.7	15.82	11.25	5.54	19.46
3	IMPACT STRENGTH	ASTM D 256	23 °C	kg.cm/cm	3.98	10.95	7.91	6.41	4.72	6.69
4	TENSILE STRENGTH	ASTM D 638	23 °C	kgf/cm²	109.5	480	475	453	375	439
5	ELONG. At Break	ASTM D 638	23 °C	%		4.9	6.03	6.24	8.11	6.69
6	FLEXURAL MODULUS	ASTM D 790	23 °C	kg/cm²	6075	34785	22370	21648		23746
7	FLE. Strength	ASTM D 790	23 °C	kg/cm²		855	753	623		584
8	SPECIFIC GRAVITY	ASTM D 792	23 °C	gm/cc		1.037	1.014	0.984	0.942	1.029
9	HDT AT 4.6 Kg/cm2	ASTM D 648	23 °c	°C						

Table.1

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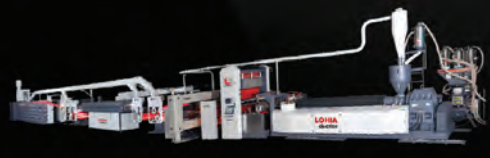

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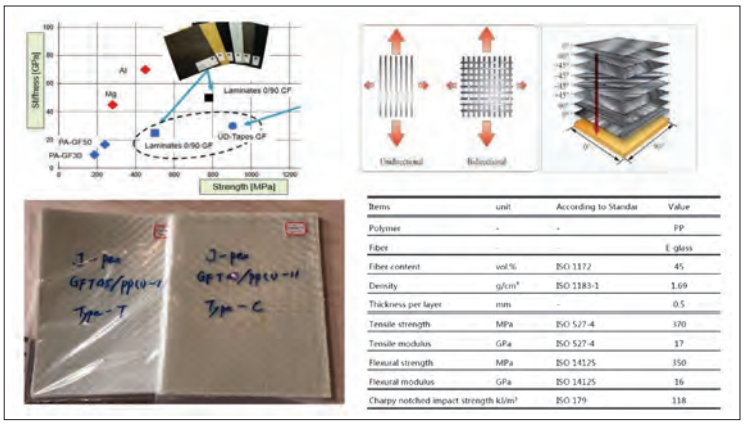
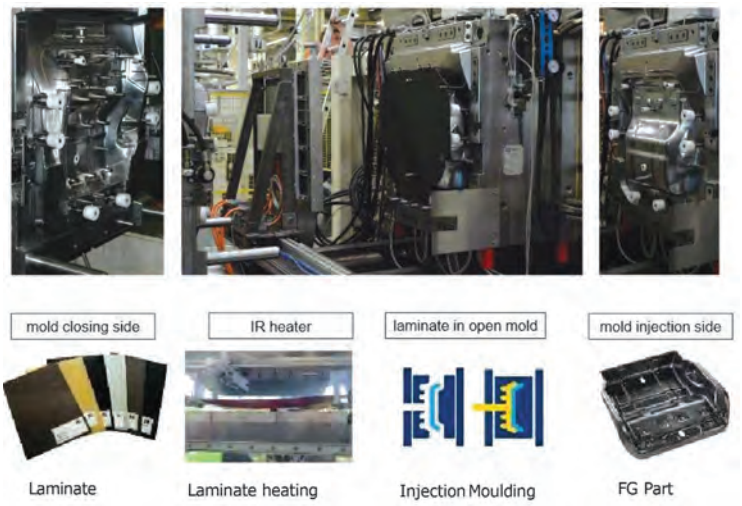




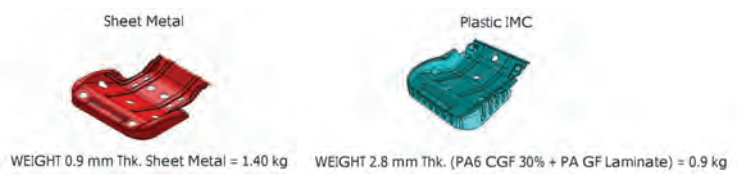
Nevertheless, the traditional single screw, discontinuously operating plasticization system reaches its limits in certain applications. At high screw speeds, the machine and material come under very high mechanical loads. High shot weights can only be achieved with large metering strokes of the screw. This reduces the effective screw length and also, to a comparable extent, the melt homogeneity. To improve the production of reinforced large-volume parts, Krauss Maffei Kunststofftechnik GmbH has developed a system that combines the advantages of injection moulding and extrusion. IMC was first presented at K 2001. Its characteristic feature is the twin-screw IMC technology which opens up new fields of application injection moulding compounders. The combination of injection moulding with continuous plasticization offers processing advantages – particularly where it is important to achieve high throughputs, to manufacture products with high filler contents or to solve complex plasticization and compounding problems. As a result, injection moulding compounders are venturing more and more into new application fields.

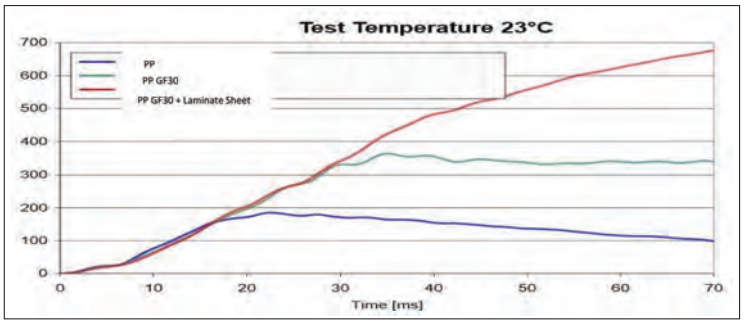
In the injection moulding compounder, the twin-screw extruder is directly integrated into the injection moulding Translated from Kunststoffe 8/2005, pp. 34–37 concept (photos: Krauss-Maffei)2 2 © Carl Hanser Verlag, München Kunststoffe plast Europe 8/2005 SPECIAL extruder, which is directly integrated into the injection moulding concept (Fig. 1).

The continuous plasticization process significantly increases the throughput. In addition, the injection moulding compounder has a significant advantage over a traditional injection moulding machine. With the IMC, the processor can compound his own material himself, i. e. introduce fibres, fillers or master batches, into the process directly during processing. Since material purchasing represents the largest cost block in the injection moulding of a part, the use of an injection moulding compounder increases cost efficiency. Compared with premixed compounds, the purchasing of individual components is much more cost-effective.

IMC process principle (fig.2) consist of a platform where continuous glass fibre rolls are kept and continuously feeding towards Hopper and as per requirement and percentage of glass fibre required in the application its feed to the extruder. This process is continuously monitored and performed with the help of the weighing scale. So, appropriate percentage of glass fibre is mixed with plastic RM.

As shown in fig.3 fibre length up to 1mm stiffness increases but strength and impact are at a low level. In the case of fibre length up to 10 mm stiffness, strength is almost achieved to the 95 per cent level but





Material	Density (Ton/mm³)	Youngs modulus (Mpa)	Poisson's Ratio	Ultimate strength (MPa)
PA 6	1.35 X 10-9	9800	0.39	180
PP Glass laminate	1.69 X 10-9	17000	0.44	370
Steel	7.87 x 10-9	210000	0.3	280

the impact is less so up to 10mm fibre length is known as long glass fibre. To get the impact results of almost 95 per cent, we need to increase the fibre length as per the graph (fig.3) up to the 13mm length of the fire we achieve the result on and above 95 per cent level in stiffness, strength and impact property.

We have also calculated the fibre length by testing on the part level and testing specimen from the actual moulded part. The results shown in fig. 4 follows: Part thickness was in the range of 2.5 to 2.7 mm.

Fibre length - GF Injection molding = < 0.5

LFT / LGF Injection Moulding = < 1mm

IMC = minimum 5mm & even more than 30mm in many areas

As per the different material property, we have tested the sample from the actual moulded parts for different material with different GF per cent and following are the results we observed with the different material property. (Table.1). It is observed that results are far better in the IMC molded parts compared to normal injection molded parts.

Combination Of IMC Process Reinforced Thermoplastics Laminates

We have proposed or introduced a combination of two processes as the IMC process and reinforced thermoplastics laminates. We have enhanced the property of laminates and checked the result with its datasheet and found it ok with the validation for better strength.

With the help of this laminate, we introduced the combination process of In-moulding laminate sheet forming and over moulding with the plastic seat pan. Stages for this process are given below in which there are two processes combined like thermoforming and over moulding.

Comparison between metal seat pan with plastic seat pan with IMC and thermoforming laminate process:

Sustainable Long-Term **Benefits- IMC Process:**

1. Weight reduction of 30 per cent to 50 per cent - Impact due to specific gravity difference between metal & plastics.
2. Cost reduction of 10 per cent to 20 per cent - Impact due to
   - Process cost - Combination of two processes of extrusion & injection moulding to one process of IMC.
   - Raw Material Cost - Elimination of RM cooling, drying, packing, transport and then re-melting granules in injection moulding to make parts. Can select RM ingredients and compound & injection in one shot.
   - Quality improvement – Better retention of polymer properties by reducing one melting cycle.

Innovating With A *Sustainable DNA*

In an exclusive interview with GK Sharma, Country Director and Managing Director – India, Intelligent Exterior Systems, Plastic Omnium, he speaks about the India business, new processes in play, trends set to pick up and more. Excerpts...

By Anvita Pillai

What are some of the fundamental trends from a sustainability perspective that you envision picking up in the Indian plastics and polymers sector? Further, what are the challenges expected to incur along the way?

Climate change is a critical challenge to us all, as citizens and as manufacturers. Our ambitious goal of reaching carbon neutrality in 2050 reflects our longstanding commitment to reducing environmental impacts at every stage of our value chain. A commitment that enables us to target carbon neutrality in our scope one & two activities by 2025 and a 30 per cent cut in scope three emissions by 2030.

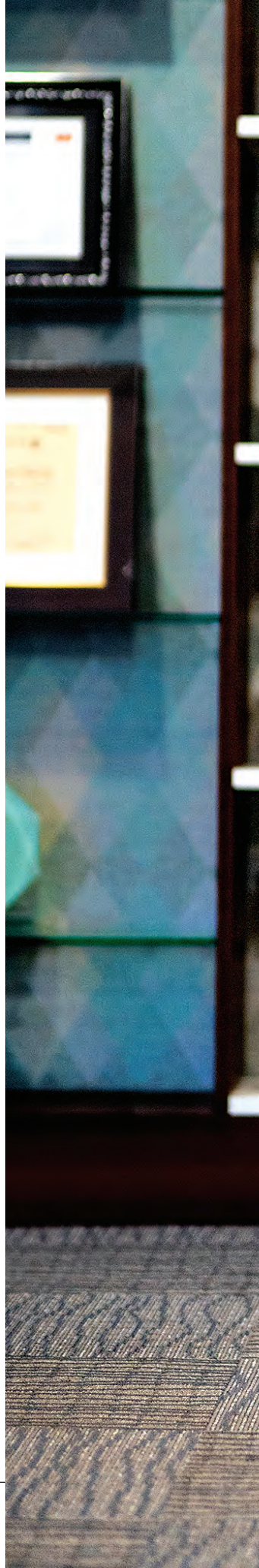
Sustainability is central to our DNA, derived from our family values. We are determined to play a driving role in the shift to green mobility. As a technology company, we design and manufacture solutions for the clean mobility of the future. Sustainable mobility is at the heart of our business and our innovations. As a responsible manufacturer, our CSR policy is a central axis of our strategy. We have formalised our CSR policy in the ambitious Act For All™ program based on three key pillars:

Responsible Entrepreneurship: Business ethics, our code of conduct, responsible purchasing and transparency are the fundamentals that make us a locally involved, globally responsible entrepreneur.

Care For People: Safety, equal opportunities and prospects for growth: care for people, their health and their working conditions should be priorities.

Sustainable production: To address the challenges of the energy transition, we, as responsible manufacturers, need to aim at reducing its carbon footprint and energy use, recycling the materials used in its plants and developing the use of renewable energy.

We see some major trends in the way the auto industry is transforming - further drive towards vehicles that are lightweight, connected, and autonomous – all inclined towards sustainable mobility. A lot of innovation will go into bringing new and enriching experiences to end users. We also challenge ourselves to further engineer for recycling as well as to reuse. In Europe, regulations are already taking full shape towards electrification, and we are a part of the accelerated response from our customers there. With the Indian authorities upgrading regulations on safety, emissions and strict guidelines on the obsolescence of older cars, I am sure that plastic part manufacturers will play a



key role in developing the future of Indian mobility.

Advanced plastics and polymer composites are integral to automotive design – from safety and performance to efficiency and aesthetics. Do you think this is driving automakers to rapidly invent mobility solutions for a responsible automotive future?

In our sustainable roadmap, yes, this is clear. Our solutions can bring weight savings of up to 25 per cent compared to steel solutions and provide infinite freedom for styling. This is crucial when it comes to innovation in the auto sector where there is no room for compromise between form and function. Lightweight aerodynamic bodies are integral in cutting down carbon emissions. The polymer industry will be a major enabler in achieving those targets.

For example, we recently launched a thermoplastic tailgate for the first time in India for XUV7OO. We were able to demonstrate sustainable solutions and the response from the end user is phenomenal. Our engineering team provided significant lightweight solutions for our customers and still, they achieved an NCAP rating of five stars.

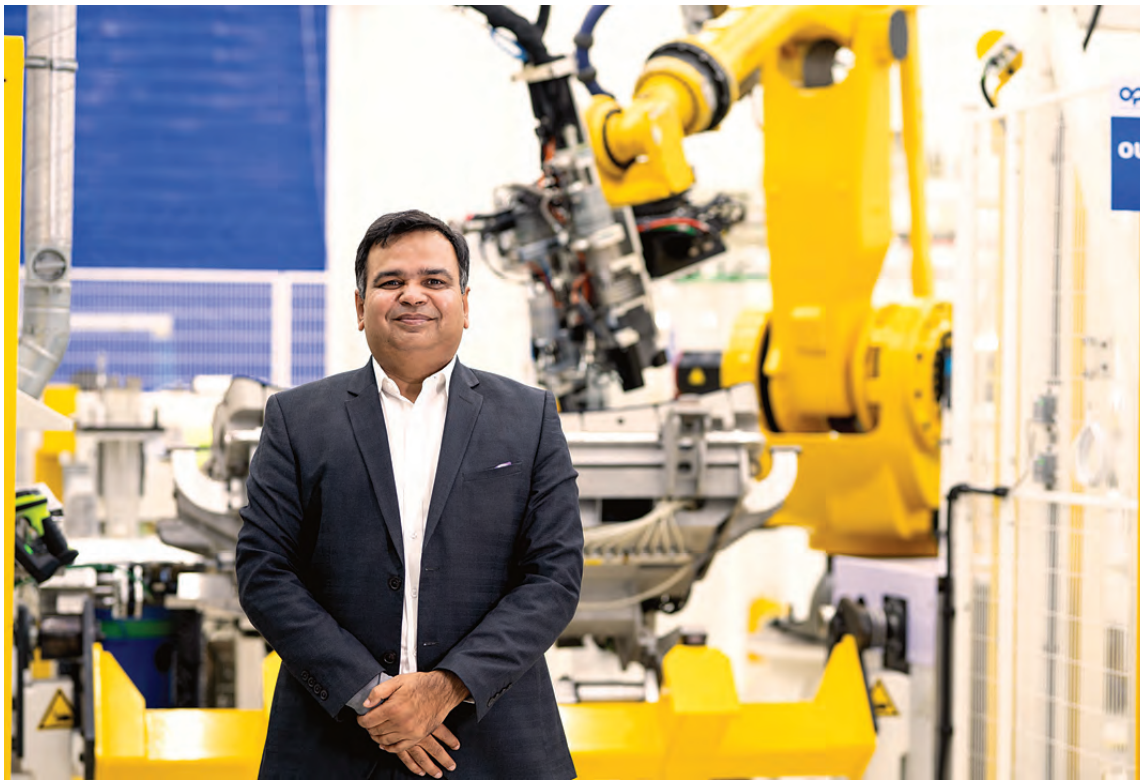
Plastic Omnium recently entered into a tie-up with France's CEA. Can you elaborate a bit on the partnership? Also, can you elaborate on how this tie-up will benefit not only your global business but also your India business?

Plastic Omnium and the CEA (French Alternative Energies and Atomic Energy Commission) signed an agreement in November 2022 to develop cutting-edge technologies for smart energy control and management, control and power electronics, software and optronics, delivering innovation, performance and efficiency for electric vehicles. For example, Plastic Omnium and the CEA will work on optimising the integration of photovoltaic panels into car body panels, and on developing algorithms and integrated battery pack sensors to control battery performance and lifespan. This collaboration forms part of the Group's strategy for diversifying into high-added-value technologies.

India will play an important role in terms of software development, and engineering support from our India technical centres and be future-ready with new solutions for Indian mobility

'Smart' and 'customisation' has become a recurring term in the automotive industry. How is Plastic Omnium working on offering such solutions to your customer industries? How is it setting you apart in the market from your competitors?

We strongly believe that our customers get more value from integrated solutions. In fact, within our product offers, we already have some great examples. Consider the smart face and smart tailgate – these are developed by Plastic Omnium with the highest focus on design and interactivity. The high-performance, aesthetically pleasing materials make weight reduction possible while integrating smart features for ADAS and communication. Thanks to major acquisitions in 2022, we are now present throughout the entire lighting value chain and are in a position to provide a differentiating offer of connected solutions like



customised dynamic projection lighting into exterior systems, for example. The future of integrated solutions, from lighting to front-end modules, is very exciting.

We are also taking major steps towards the "software-defined vehicle", by implementing a profound transformation of its product portfolio through a significant increase in the role of software. A dedicated software house has been created, gathering current software competencies that are responsible for ensuring a differentiated performance and a perfect match of our technologies with the manufacturer's owned software and newly defined architecture.

> **WITH THE INDIAN AUTHORITIES UPGRADING REGULATIONS ON SAFETY, EMISSIONS AND STRICT GUIDELINES ON THE OBSOLESCENCE OF OLDER CARS, I AM SURE THAT PLASTIC PART MANUFACTURERS WILL PLAY A KEY ROLE IN DEVELOPING THE FUTURE OF INDIAN MOBILITY.**

Can you elaborate on hydrogen mobility and how it can be a game-changer for the automotive industry? Further, how is Plastic Omnium working

> **IN INDIA, LIKE IN ANY COUNTRY, INFRASTRUCTURE READINESS AND AVAILABILITY OF GREEN HYDROGEN ARE KEY CHALLENGES FOR THE AUTOMOTIVE ECOSYSTEM. WE CONSIDER THE RECENT INITIATIVE BY THE GOVERNMENT OF INDIA ON THE PROMOTION OF GREEN HYDROGEN VERY PROMISING AND WE ARE CLOSELY FOLLOWING THE MARKET.**

on integrating it into the current Indian automotive ecosystem?

Plastic Omnium is a pioneer in the field of hydrogen and believes that hydrogen will play an essential part in mobility's decarbonisation process. Thanks to sustained investments since 2015, the Group now controls the entire value chain, from high-pressure vessels to fuel cells. This unique array is attracting a growing number of customers in the automotive, heavy mobility, public transport, rail and aerospace sectors. In India, like in any country, infrastructure readiness and availability of green hydrogen are key challenges for the automotive ecosystem. We consider the recent initiative by the Government of India on the promotion of green hydrogen very promising and we are closely following the market.

Can you give us a rundown on Plastic Omnium India's number for the quarter that ended in September? Further, what does your order book look like for the coming fiscal?

We have grown significantly compared to last year and the last few quarters, biggest challenge still lies with semiconductor shortage, geopolitical issues and an unpredictable global supply chain. We have a very healthy order book which is significantly higher compared to previous years. All our customers are expanding their capacities due to higher demand which is very exciting.

Even though automakers have been increasing the use of lightweight plastics in their vehicles, the weight of many cars and trucks has been increasing with consumer demand for additional safety and interior features. Do you think that the trend towards heavier cars must be reversed?

Weight reduction is indeed a challenge, especially in the era of electrification and the race for the longest range that is influenced by the size of a battery pack. We conceive smart designs that bring weight reduction as well as engineering performance. There are some very good examples with our Indian customers for whom we were able to optimise existing designs and replace metal components with new plastic parts, achieving system weight reductions of up to 30 per cent. Those cars went on to secure a five-star rating in Global NCAP ratings.

When designing new solutions, we always manage simultaneously safety and sustainability. Those two dimensions are major automotive megatrends that are driving innovation in our organisation.

Meanwhile, to do so, automotive designers need new material solutions. Give us an example of how your companies use advanced plastics and polymer composites which is essential on this journey to the future of mobility.

We have a very ambitious advanced materials roadmap to increase the use of recycled or bio-sourced materials. We have developed specific new product offers with a recycled materials ratio of up to 50 per cent and we are also using bio-fillers to reduce our CO2 footprint. We have designed for some customers proven concepts for brand new sustainable looks using visible natural fibres. We will continue our global approach to recycling, working with several suppliers to first characterise recycled materials in our labs, and then to create portfolio references for specific applications in our products.

How is Plastic Omnium working on further strengthening its roots in India? What are long-and short-term strategies in place to enable the same?

The Plastic Omnium India team celebrated 15 years in India. We see the 15 years to come with higher growth and participation in the Indian automotive market and the company's growth. We are continuously working with current Indian customers to further strengthen our business. We are also in close contact with two major Indian OEMs who have shown keen interest in our product offers. We have recently opened a second technical centre in Bengaluru which is one step further towards our long-term strategies to expand our footprint in India, gain access to a bigger talent pool and thereby cater to our global business needs. On the people dimension, we have had a strong drive in 2022 to support youth employment and gender diversity in our Indian operations. Our plants have an excellent track record of safety & sustainability. We will continue to enforce our mission towards society through our CSR Initiatives, Act for All.

Securing Industrial Environments: Not An Option, A Necessity

With the growing threat of cyber invasion, having an end-to-end secure industrial environment is pivotal. The article elaborates on how manufacturing plants can secure their digital set-up effectively and why it is need of the hour.

By Dick Bussiere, Technical Director for APAC, Tenable

Industry 4.0 has been the buzzword among Indian manufacturers since they began their digitisation journey. A recent NASSCOM study found that 50 per cent of the tech spend by Indian manufacturers is on Industry 4.0 technologies amounting to $11.7 billion. And in the next 18-24 months, these manufacturers plan to increase investments in emerging network tech, big data analytics, central and remote-controlled monitoring, and automation. New methods of connectivity, external influences, new software development practices, and rapid cloud adoption have blurred the lines between IT and OT. The widespread digitisation of industrial systems and the desire to connect and automate everything is now an unshakable reality. While it has increased the operational efficiency manifold, it also increased the attack surface of industrial environments.

And yet, the longstanding issue is that industrial environments still lag behind when it comes to maintaining cyber hygiene. This is because some organizations have not prioritised cybersecurity and are largely blind to unsecured environments being a strategic business risk. Historically, these organisations haven't had to think of interconnectivity or digitisation and the strategic business risks they pose, and they also haven't been regulated with cybersecurity in mind.

In the existing circumstances, the sheer volume of data and assets has become an exposure risk. Shadow IT, public cloud, ephemeral assets, distributed infrastructure and app deployments have made the attack surface transient. Its perhaps why manufacturers struggle to deal with the intersectionality of IT and OT infrastructure and face vulnerability overload. They have no way of knowing when changes are made to the environment and cannot detect active attacks.

For instance, solar power units in homes are generally maintained by third-party organisations. Any manipulation by bad actors would cause solar power operators of critical power infrastructure to make inaccurate decisions. Insecure industrial environments have the ability to impact daily life. With remote work becoming the new normal, employees too could become victims of phishing attacks, leading to production disruptions or safety issues when critical infrastructure is accessed remotely. This will result in costly and lasting reputational damage.

Existing Regulations Cannot Be The Only Cybersecurity Initiatives

The cybersecurity controls deployed by any organisation are generally subject to governmental regulations.

In India, the Information Technology (Amendment) Act 2008 and various rules such as the Information Technology (Information Security Practices and Procedures for Protected System) Rules, 2018 govern cybersecurity mandates for organisations. These regulations must be viewed as a guide to cybersecurity and not the end goal as every industrial environment is different, requiring different security strategies, solutions and protocols.

The compliance-driven view to cybersecurity is why attackers are still successful because there persist gaps in coverage, unenforced security policies, and poorly secured intersections between IT and OT infrastructure, not to mention exterior networks.

Besides, cybercriminals are increasingly successful because many of the systems within the OT world are unpatched, or unsupported. It is such weaknesses that threat actors look for to perpetrate malicious activities.

In addition, many OT networks operate on a system of trust, where any object on the network is implicitly trusted just because it's there. As industrial environments are air-gapped, it is perceived that the facility is safe, when in reality, the interconnectedness of IT and OT make air gaps irrelevant. With little to no vertical security measures within most industrial environments, an attack entering one point of the plant will also propagate to other sections. If no monitoring is present, the attack will go unnoticed until it's too late.

How To Secure Digitised OT Environment

The first step is to take a full inventory of all assets of all types, firmware version, patch level, state, configuration, software present on each device and vulnerability positions of everything that's present within the OT infrastructure. This includes "Commercial Off the Shelf (COTS)" operating systems such as Windows or Linux, which serve as platforms for Digital Control Systems or Human Machine Interfaces.

This inventory of vulnerabilities, misconfigurations, and identity access of all assets within the OT environment is critical because organizations cannot defend what they cannot see. Organisations must also baseline communication patterns to understand what is normal so suspicious activities can be spotted. This is important because within an OT environment, communications are predictable and use a finite number of OT-specific protocols.

Once the inventory is done, these assets, users, systems and networks must be constantly monitored as no environment remains the same all the time. Continuous monitoring will give organisations a clear picture of what their environment looks like and the ability to identify changes in configurations as it could be an indication of a cyberattack. OT organisations also require real-time alerting capabilities and audit trails both for security and compliance purposes.

While digital transformation may not seem new to IT teams, it is relatively new for manufacturers. The last two years have seen a major revamp with cloud adoption, remote work and more to keep operations going. But the scale of interconnectedness between OT and IT systems is a new phenomenon which requires updating legacy systems with modern solutions. While manufacturers and critical infrastructure operators navigate these rapid changes, they must bear in mind the increased risk in the process. This places more importance on ensuring OT must be secured the same way IT would be. But more importantly, cybersecurity is now a necessity for the safe functioning of industrial systems.

Role Of Bulk & Specialty Chemicals For 'Atmanirbhar Bharat'

The Indian bulk and specialty chemicals industry has been one of the strongest sectors of the Indian economy until 2021. Now, great strides are being taken to make the sector self-reliant. The article elaborates on how the specialty and bulk specialty chemicals can become Aatmanirbhar for India's brighter future.

By Arun Singhal, Founder and CEO, Source.One

India's chemical industry is one of the strongest sectors of the economy, generating a revenue of $230 billion in 2021. Out of this, the bulk and speciality chemicals segment constitute 25 per cent at approx. $60 bn & 21 per cent at $45 bn respectively. The main drivers for this growth have been the increasing domestic demand from end users and robust export growth. As the chemical industry accounts for 18 per cent of manufacturing output and 14.35 per cent of total exports, the onus is on the Indian government to take adequate measures to safeguard its future in the bulk and specialty chemicals domain to play a role in the 'Atmanirbhar Bharat' mission.

The Status Quo

With more than 80,000 commercial products, the chemical industry in India is highly diversified. The industry is broadly divided into bulk chemicals, specialty chemicals, agrochemicals, petrochemicals, polymers, and fertilisers.

Segments Of Chemicals & Specialty Chemicals

1. ***Agrochemicals***

As the fourth largest agrochemical production market globally, India's speciality chemicals market is worth $9.2 billion. The agrochemicals sub-segment accounts for most of this market, and it has seen strong growth in recent years' exports. Major international companies, like Bayer, BASF, and Syngenta, operate in the Indian market, but it is dominated by domestic players.

2. ***Nutraceuticals***

The nutraceutical ingredients industry in India has seen significant growth over the past five years. Only a few MNCs operate in this segment, and the market is largely dominated by domestic companies. The Indian market makes up for only 3 per cent of the entire global nutraceutical ingredients market.

3. ***Flavours & Fragrances***

In 2019, the Indian F&F industry was valued at $1.4 billion. The segment experienced a high historical

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Compound Annual Growth Rate (CAGR) of 14.2 per cent between 2014 and 2019. Global giants such as Firmenich, Givaudan, IFF, and Symrise dominate the Indian market, accounting for around 65 per cent market share with the balance being constituted by domestic players.

4. ***Dyes & Pigments***

The Indian speciality chemicals industry has seen strong growth in recent years. A large part of the dyes and pigments produced in India are sold domestically, due to the high demand from end-user markets. The market is dominated by domestic players, with only a handful of multinational companies operating in this space.

To offer more high-value, high-performance solutions, players must be able to advance up the value chain and comply with strict environmental compliance rules.

5. ***Surfactants***

Surfactants industry in India is growing at an estimated 11 per cent CAGR over the next five years. This growth is being driven by increasing penetration of surfactant-based products, such as cleaning agents and detergents. The surfactants market is characterised by a large number of unorganised players who cater to unbranded soap and detergent manufacturers. Close to 70 per cent of surfactants are used in home and personal care products.

6. ***Personal Care Chemicals***

The personal care chemicals industry in India has been growing rapidly, with a CAGR of 15 per cent or more during the 2014-2019 period. As of 2019, the industry was valued at around $1 billion. With the strong growth of the Indian cosmetics and personal care products market, this segment is expected to continue growing at a CAGR of 15 per cent over the next five years.

Key Characteristics Of Specialty Chemicals Industry

1. ***Strong Export Presences***

India's speciality chemicals industry is emerging as an export hub. Exports of the country's top 10 speciality chemical manufacturers have grown at a CAGR of 20.8 per cent between FY 15-20. India's low-cost manufacturing capabilities and availability of manpower are enabling it to tap into global markets. The leading chemical companies in India boast a strong reputation with consumers all over the world. This is due in part to the stringent environmental compliance standards these companies adhere to as well as the increased number of products they offer that meet globally acceptable registration requirements, such as reach.

2. ***Potential Growth In Domestic Market***

India's speciality chemical consumption per person is still much lower than in developed markets. However, things like growing disposable incomes and more people moving to cities are increasing the demand for products that use speciality chemicals. This looks promising for the future of the speciality chemicals industry in India.

3. ***Low Focus On R&D***

India's speciality chemical industry is largely 'genericised' with only a handful of companies developing truly innovative products. Some of the larger players in India spend less than 3 per cent of their revenue towards R&D activities vis-à-vis 6-10 per cent spent by their global counterparts. This indicates a potential lack of commitment to innovation in the country.

There is an inverse relationship between the size of the unorganised market in the speciality chemicals industry and the level of R&D and innovation required. As a result, sub-segments such as agrochemicals, nutraceuticals, functional ingredients for flavours & fragrances and construction chemicals have much smaller shares of unorganised players.

4. ***Businesses Focusing On Sustainable Chemistry***

In India, the term 'green chemicals' or 'sustainable chemistry' has been evolving rapidly. As awareness about the impact of harmful chemical elements on human health and the environment increases, there is more concern about the environmental impact of chemicals. This has caused governing bodies and other people involved to consider moving towards sustainable methods of manufacturing chemicals.

Impact Of COVID-19 On The Industry

The Indian speciality chemicals industry has been on a strong growth

path in recent years. The outbreak of the novel coronavirus (COVID-19) led to unprecedented disruptions in manufacturing activity, with lockdowns being imposed across the country. Initially, the lockdown led to supply chain disruptions for the specialty chemicals industry. However, it was one of the first sectors to return to normalcy. Several players were able to resume work, albeit partially, within the first few weeks of the lockdown.

There have also been efforts by the Indian government to increase the production of several bulk chemical commodities, including methanol, which is essential to produce formaldehyde, pharmaceuticals, pesticides, and dyes.

COVID-19 has forced Middle Eastern manufacturers to shut down methanol plants, driving up the price of the bulk chemical. With a capacity to produce 525 metric tons per day, Gujarat State Fertilizers & Chemicals has restarted methanol production after seven years, to help mitigate the increased costs. The state-run Rashtriya Chemicals & Fertilizers (RCF) has also begun producing methanol with a capacity of 242 metric tons per day at its Mumbai plant. In the past, RCF imported methanol.

Among the world's exporters of chemicals (excluding pharmaceutical products), India ranks 11th, and among the world's importers, it ranks sixth (excluding pharmaceutical products). However, due to the COVID-19 pandemic, both the government and businesses have been forced to take action to contain the virus. For those units reliant on imports of intermediates and feedstocks, especially from China, the supply chain disruption during the pandemic phase had a severe negative impact. In addition, China's chemical industry structure is altering as a result of stricter environmental regulations, which may have long-term effects on the supply chain.

Atmanirbhar 'Bulk & Specialty Chemicals' Going Forward

Thanks to the automatic route, 100 per cent FDI is allowed in the chemicals sector (except for certain hazardous chemicals). Chemicals (excluding fertilisers) attracted $20.4 billion in foreign direct investment from April 2000 to June 2022. In the fiscal year 2021–2022 (up to June 2022), the total exports of major chemicals and major petrochemicals grew to Rs 36.52 thousand crores from Rs 34.68 thousand crores. Over the same period last year, imports rose from INR 42.48 thousand crores to Rs 55.26 thousand crores. Between 2020 and 25 the demand for chemical products is anticipated to increase at a rate of about 9 per cent per year, according to Invest India.

As an example of self-reliance in the bulk and specialty chemicals sector, the government has enacted a Bureau of Indian Standards certification that blocks the dumping of poor-quality chemicals in the country. Plus, the government has implemented several reforms over the past few years to promote business growth by removing pointless regulations, streamlining administrative procedures, and improving process transparency, responsiveness, and accountability.

Ethanol is another bulk chemical with increased domestic production. A glut of sugar has led to the government encouraging sugar mills to divert sugarcane for ethanol production. As part of its efforts to reduce fossil fuel imports, India has set a target of increasing ethanol blending in petrol to 10 per cent in the next two years. In September, the government further promised revenue increases to bulk ethanol producers and extended soft loans to 349 sugar mills and 13 distilleries. Self-reliance can be achieved by ramping up in-house production facilities.

The previous government is also to be touted in this regard, as it was them that unveiled the "Petroleum, Chemicals, and Petrochemicals Investment Region" (PCPIR) policy in April 2007, which promotes the environmentally responsible and integrated development of international integrated and environmentally friendly global industrial corridors.

Chemical and petrochemical companies like Opal, ONGC, Gujarat Petronet, BASF, GACL, Gujarat Fluorocarbon, SRF, Hindalco, Lanxess, Welspun, and Reliance produce basic petrochemicals like Ethane C2, Propane C3, and Butane C4; downstream petrochemical products, i.e., polymers and fibres, heavy chemicals, pigments, and additives, are housed in the PCPIR.

More than two million people are employed in the Indian chemical industry. With more than 1.12 lakh crore invested in 180 operational industrial units, it has developed into one of the nation's fastest-growing industrial clusters. Additionally, 650 units are under various phases of building. 1.35 lakh indirect jobs were created by the industries established in this PCPIR, in addition to 45,000 direct jobs.

The Indian chemical sector must protect itself under this drive for self-sufficiency by developing local capacity for these essential intermediates and specialised chemicals. If the industry is to adapt to the demands of the evolving market, the clearance process for new facilities must be quicker. The industry will need between $75 billion and $100 billion in capital investment to build new manufacturing facilities in India, as well as increased capital expenditures for feedstock facilities and a shift away from reliance on imports and a concentration on exports. Investment in support infrastructures, such as a strong port network and economical, reliable electricity and water supplies, is also crucial to ensuring effective and ongoing operations.

Innovation & Change: The New Age Of Plastics In Automotive

ET Edge, in association with media partner ET Polymers, recently hosted the sixth edition of the Economic Times Global Conference on Plastics in Automotive 2022. The report shares a glimpse of the stalwart discussions that took place. Excerpts...

The use of plastics and advanced composites has been growing over the last few decades in the automotive sector. In the current age and time, its use has been primarily focused on making vehicles more sustainable through lightweight along with offering more flexibility while making products more long-lasting at a minimal cost.

Despite plastics contributing to a variety of innovations in elements such as safety, performance, fuel efficiency, etc., there is still ample room for improvement and innovation to bring into next-generation vehicles.

In a modern vehicle, nearly 70 per cent of the plastics components used derive from four main polymer components – polypropylene, polyurethane, polyamides, and PVC.

Chief Guest, Dr Reji Mathai, Director, Automotive Research Association of India (ARAI) during his opening note

This makes the role of plastics and composites in the design and manufacturing of vehicles more pivotal with stringent regulations and changing consumer behaviour converting and increasing the demand for more affordable, lightweight, and fuel-efficient vehicles.

To explore in depth the role that plastics play in the development of the automotive sector and how suppliers will respond to the industry changes, the Economic Times hosted its sixth edition of the Global Conference on Plastics in Automotive in association with Powered by Partner Yudo Hot Runners India Pvt Ltd, Gold Partners Ansys and Haitian Huayuan Machinery (India), silver partners JJ Plastalloy Pvt Ltd; Kandui Industries Pvt Ltd; Roehm Chemicals India Private Limited and associate partner

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igus (India) Pvt Ltd. With the theme 'Sustainable plastics for innovation in the automotive industry' the conference ensured that the changing dynamics of the industry was the centre of discussion.

Innovation, Trends & Recognition

To shed light on the changing plastics and polymers market in India, the event kick-started with an opening note from the Chief Guest, Dr Reji Mathai, Director, Automotive Research Association of India (ARAI). Elaborating on the trends of plastics in automotive, he mentioned, "The trend of plastics in the automotive industry continues to be robust. Plastics are showcasing themselves as one of the most competitive solutions for the industry."

The event then proceeded to The Automotive Hall of Fame, wherein the ET Polymers' editorial team evaluated and shortlisted companies and members of the industry who have contributed greatly and are widely recognised for their inspirational leadership in the industry. As part of the recognition, companies Faurecia India Pvt. Ltd. and Mahindra & Mahindra Ltd were recognised for making a mark in the industry through their products and services

Subsequently, the show then engaged its audience with a panel discussion on Innovative Materials in Plastics, Polymers, and Composites for Automotive. The discussion, moderated by Rafiq Somani, Area Vice President - India, and South Asia Pacific, Ansys Inc, focused on the growth of plastics & composites in India, its growth factors, advanced materials, trends, challenges sustainability and more. Talking about the changing industry dynamics, Mrunal Hatwalne, Deputy General Manager, Tata Motors, mentioned, "The notion towards plastics is rapidly changing in the industry. The automotive

Panel on Sustainability & Innovation in Automotive with moderator (L to R) Anvita Pillai, Assistant Editor – B2B Division, Worldwide Media and panelists Shailendra Shukla, Managing Director - Vehicle Group, Eaton India; Uday Narang, Chairman Anglian, Omega Group and Omega Seiki Mobility; Ravi Kumar Panga, Director & CEO, Causis Group

industry is undergoing great transformation. We are adapting very quickly to sustainable plastics."

"It is not easy to recycle but we are maturing on it by working on the technology and the mechanical engineering part of it. Besides, we are also encouraging reusing more and more," said Vinith Vijayan, Director – India Technical Centre, Plastic Omnium, taking the topic further. Adding to it, Sunil Koparkar, Vice President / Executive Director - India, Japan and Thailand, IAC Group, pointed out, "The biggest bottleneck we find is having an appropriate infrastructure that can process the kind of raw materials we have. Further, a lot more understanding has to happen from a design perspective because not every material will behave exactly the way we want. From an infrastructure perspective, if raw materials can be made in India, it will increase the usage of sustainable materials." Adding to the point of using sustainable materials, Dr Mohammed Rahail Parvez, Head of CoC – Material and Product Development, Varroc mentioned, "There are easy ways of recycling. Producers should not rely on end users but rather work on identifying and using regenerative materials to ensure recycling and making vehicles and products sustainable."

Further, Amit Kavrie, Managing Director, Supreme Treon, said, "Innovations happen globally and not just locally. We need to relook at things and learn from not just the world but other industries, too." Concluding the discussion on a high note, Jaiprakash Ramani (JP), Business Director - Interiors Business Unit, Faurecia India, emphasised, "Every time we use plastics, we use energy, and if we are using energy, we are not really being sustainable. So, the philosophy is simple, use less, use better, and use longer."

Spotlighting Customer & Sustainability

Moving on, to discuss how companies can work on creating an experience with products, the event proceeded to a fireside chat on Building Customer Experience in Automotive, moderated by Vishal Agarwal, President, Yudo Hot Runner India. The discussion took off with Bhila Patil, General Manager Design & Development, Lumax Industries, elaborating on the importance of precision in tooling. He mentioned, "Every part of tooling requires accuracy. Other than machines, involvement of the entire infrastructure is important." Adding to the talk, Chetan Chaudhary,

Head – Interior & Exterior CVBU Pune, Tata Motors, cited, "Making less serviceable cost while keeping in mind mileage, safety and aesthetics is important. So, we need to look at materials that are lightweight as well as safe and sustainable."

Since nearly 70 per cent of the plastics used in modern vehicles come from polypropylene, polyurethane, polyamides, and PVC, the role of sustainability in the manufacturing of automobiles has never been more essential. The event then proceeded to a panel on Sustainability & Innovation in Automotive moderated by Anvita Pillai, Assistant Editor – B2B Division, Worldwide Media. Elaborating on the changing landscape of automotive, Ravi Kumar Panga, Director & CEO, Causis Group, mentioned, "In mass mobility, there has to be a complete solution. In India, what we are missing is the commonality of charging infrastructure. We don't have charging stations for electric vehicles like we do for ICEs. The skill set in the EV ecosystem is quite limited. And for the right skill set, we have to poach from our competitors. There is a large scope for the electric bus business in India. We are here to collaborate and cooperate."

Adding further to the topic, Uday Narang, Chairman Anglian, Omega Group and Omega Seiki Mobility, emphasised, "Rome was not built in one day. As responsible citizens of this country, we all need to focus on creating a cleaner environment. All of us can join and make better products and align to make this country cleaner." Rounding off the discussion, Shailendra Shukla, Managing Director - Vehicle Group, Eaton India, said, "I see sustainability through four lenses. And I believe collaboration is possible in terms of what goes inside the vehicle, how to run a vehicle in terms of fuel, and how to improve manufacturing. We must commit to long-term goals."

The application of plastics and polymers in automotive vehicles has been increasing over decades, with more recent uses being focussed primarily on making vehicles more energy-efficient through lightweight engineering, together with providing more durability and design flexibility at a low cost. In automotive design, although plastics have contributed to a multitude, the industry requires new research and improvement to meet the needs of next-generation vehicles. The conference then proceeded to discuss and debate the 'Evolving trends in plastics & polymers in automotive'. Moderator, Arun Singhal, Founder & CEO, Source.One started the discussion with a question on the growing acceptance of alternate fuel vehicles. To which Govindarajalu Raju, CEO & Board Member, BAPL Rototech Ltd, responded, "In the next 5–10 years we will see a significant moment for hydrogen vehicle combined batteries in the passenger vehicle segment. This will lead to faster adoption of vehicles. This way different levels of plastic will come into use much more quickly."

Adding to the topic, Rahul S Mahajan, Deputy Director, Engineering Design and Simulation (EDS), The Automotive Research Association of India, (ARAI), said, "Several moving parts are moving away with EV so there is a good potential to convert several parts to plastics now."

Further, Balaji V, Principal Engineer – Materials Technology & Product Development – Automotive Division, Mahindra Research Valley, said, "Cars are becoming a fashion accessory. So, from a polymer perspective, smartness is going to be a trend that picks up. It will be critical to increase the use of interfaces that sense and send back messages as well as how this ensures the safety of autonomous mobility."

Starting Up India

India has turned into one of the prime spots for start-ups. Their ideations and innovations have fast-tracked India's growth and stepped us on a global level. To have a detailed discussion on how start-ups are the secret sauce to India's success, the event proceeded with a panel on Building Start-ups, Building India.

Moderator Dheeraj Tiwari, Co-founder & CEO, Capgrid Solutions, kick-started the panel with a question about how government support can help start-ups in India. Responding to it, Kapil Shelke, Founder & CEO, Tork Motors, said, "From a government perspective, they have lent in all the benefits to accelerate EVs in the Indian market. With regards to the Indian market for EVs, although the turnaround time is slightly slower, the market is booming with potential and has immense scope to grow."

Summarising the discussion, Raj Mehta, Founder, Greta Electric Scooters, said "Currently, many companies are using metal components to build EVs. However, plastics make the vehicle light and are essential in EV manufacturing. So, India needs to develop moulding solutions that are affordable and accessible."

Creating Sustainable Tomorrow

As the Indian automotive industry changes and the dynamics of its supplier plastics industry, plastics systems and parts suppliers must cope with a quickened development pace and the shifting needs of OEMs and consumers. The Economic Times Global Conference on Plastics in Automotive 2022 managed to explore trends, issues and opportunities, as well as the latest innovations, in automotive interiors, body panels, powertrain systems, under-the-hood applications and more.

Unlike other events, ET GCPA 2022 helped the industry personally drill down on individual challenges, hopes and dreams to ensure the meeting provides a platform to inspire, collaborate and network, to change what's possible.

GODI Manufactures 5.2 Ah 21700 Li-Ion Cells

GODI India, the first Indian company to get BIS certification to sell lithium-ion cells made with home grown technology, has achieved another milestone by manufacturing India's first ever 5.2 Ah 21700 cylindrical lithium-ion cells with an energy density of 275 Wh/kg based on silicon anode technology. The electrode composition has been indigenously developed as per the market requirement. With the use of silicon in the anode, an electric vehicle could achieve a greater range, up to 15-20 per cent compared to graphite, on a single charge due to the increased energy density.

Aiming to solve the never-ending demand of commuters related to EV range anxiety, GODI India is making inroads in the manufacture of high energy density lithium-ion cells using Silicon, which is one of the most abundant elements on earth's crest.

Sharing more details on the future plans, Mahesh Godi, Founder and CEO, GODI India, said, GODI India is continuously innovating in the anode and cathode

areas and planning to achieve >5.6Ah high-energy and high-power cells for the first time. GODI India has firmly planned for a 100 MWh pilot production facility for 5.0 - 5.2Ah cells followed by a GWh plant to cater to the requirements of the highly demanding electric two wheeler's needs, which is more than 50GWh by 2030 exclusive for electric two wheelers battery segment.

With a lithium-ion cell market size of $5 billion for E2W by 2030, silicon is the future of energy storage as it can store nearly ten times the energy when compared to the traditional graphite anode. However, it comes with close to 400 per cent of volume expansion during its charge and discharge process making it difficult to stabilize. GODI India has developed an eco-friendly water-based electrode manufacturing process to stabilise the silicon, which has been successfully utilised in the manufacturing of the 5.2 Ah lithium-ion cells. In an attempt towards formulating a sustainable future, GODI India is also practising home-grown, clean, and environment-friendly processes in achieving its high energy density goals and ESG guidelines.

EVM Launches New USB 3.2 Flash drive 'EnStick'

Hundia Info Solutions Pvt. Ltd. is one of the leading vendors of computing and mobility products and the brand owner of EVM. Recently, it introduced its newest offering in the range of flash drives. The homegrown accessory maker has launched a new USB 3.2 Type-A Flash drive, 'EnStick'.

Ideal for the use of students and professionals in India, the flash drive comes in a durable ABS casing with shock and drop resistance, offering great portability, big storage, and efficient transfer speeds. With blazing fast USB 3.2 Gen 1 performance of up to 100MB/s read and writing up to 30mB/s, access to content can be granted anytime and anywhere in a split second. EnStick provides a unique 10-year warranty, giving consumers the finest in after-sales assistance. Another feature includes a pick-up and drop-off service as part of its after-sales service.

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