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THE ECONOMIC TIMES

POLYMERS

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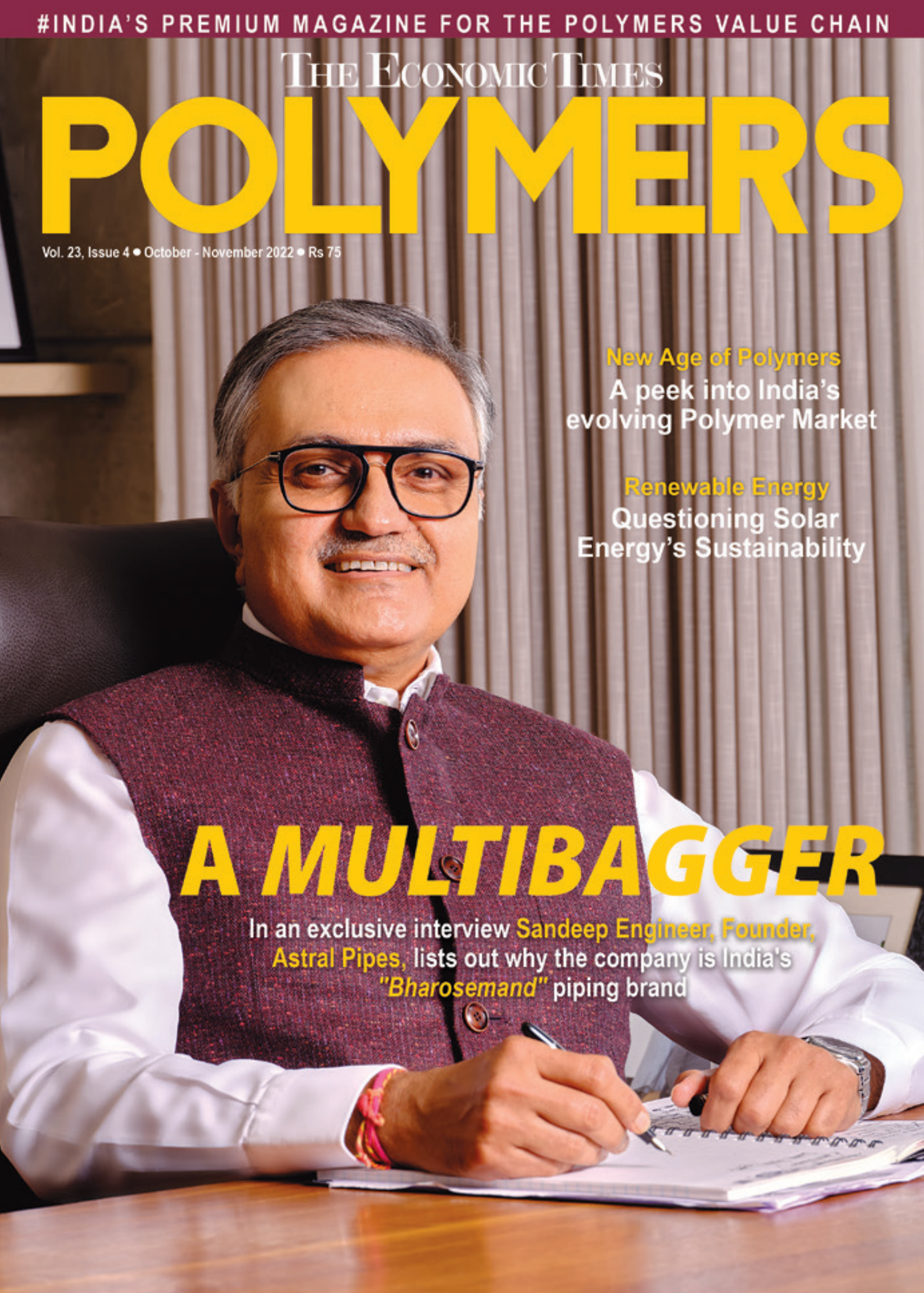

New Age of Polymers

A peek into India's evolving Polymer Market

Renewable Energy

Questioning Solar Energy's Sustainability

A MULTIBAGGER

In an exclusive interview Sandeep Engineer, Founder, Astral Pipes, lists out why the company is India's *"Bharosemand"* piping brand

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EDITOR'S NOTE

THE ECONOMIC TIMES
POLYMERS
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Can green be more than colour?

Modern plastics are ubiquitous materials in our daily lives, from disposable packaging to durable building materials. Their high performance, combined with our ability for tailoring physical characteristics to match any imaginable function, has made them some of the most successful advances over the last century. Globally, over 350 million metric tonnes of plastics are produced every year, highlighting their immense economic importance in almost every sector, from food preservation, car manufacturing, and medical devices, to agriculture, construction, sports and entertainment.

Yet, the landfilling and continuous mismanagement of plastic waste poses a major risk to the environment, as very few plastics are effectively recycled nor designed for biodegradation. New technologies that develop plastic waste management techniques are critical for lowering carbon footprint. Moreover, the plastic industry is an important contributor to greenhouse gas emissions, particularly during their production and final incineration. Current business-as-usual scenarios paint a looming future of depleting resources and highly polluted lands and oceans.

Companies are looking to use more recycled content in their packaging in a cyclical and sustainable pattern. Advanced plastics recycling technology can help upgrade a wide range of plastics, including municipal and industrial waste plastic, packaging materials, and plastic films to name a few. These new technologies can reduce the need for fossil fuels in the creation of virgin plastics, to enable a circular economy for plastics.

Instead, a rethink of the plastic economy is needed from inception to disposal. In this evening of scientific discussion, we will analyse various aspects of the progress, the actions, the solutions, as well as the challenges, to make plastic materials more circular and sustainable.

Sustainability is an umbrella term that has many facets, including social development, clean tech (clean energy, clean water, and sustainable agriculture), and human resources development. Technologies that help organisations achieve their environmental, sustainability, and governance (ESG) goals are now paramount to building a sustainable and successful business. These technological breakthroughs, including cleaner fuels, hydrogen fuel, carbon capture, low global warming potential refrigerants, plastic circularity, energy optimisation, energy-efficient data centres, etc. are here to define a cleaner, greener future.

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Covestro Simulations Help Optimise Polyurethane Foaming Processes

The heart of automotive development – the design phase – is becoming increasingly digital. Automotive manufacturers and direct suppliers in particular often ask for digital verification for specific components, from instrument panels to interior trim. The focus is on simulation calculations that shorten development cycles, reduce complexity and costs, and mitigate risks. Covestro has worked intensively on the simulation of the polyurethane (PU) foaming process and has developed material models and state-of-the-art calculation methods for this purpose, as well as building up powerful computing capacities. To this end, the company will present its current developments at the world's largest plastics trade show, K 2022 in Düsseldorf.

Product and process design is heavily dependent on the engineer's experience with customers. Trial and error in setting up the final process is time consuming and costly. That is why simulations have played an important role in the planning of new products for quite some time. In car interiors, however, it has long been a question not only of simulating structure and form, but of creating a digital twin of the possible manufacturing process. To this end, those involved are relying on the science of materials modeling to simulate the foaming process.

This can be explained using the example of an instrument panel. In this application, semi-rigid PU foams based on Bayfill® have become well established, as they enable the economical and reliable production of components with complex contours. In addition, the foams provide a pleasant feel and noise insulation.

"Thanks to Covestro's digital twin for Bayfill® foams, suppliers and automotive manufacturers receive detailed information about the processing behavior of the material as early as the design phase, before real experiments or trials are necessary," says Dagmar Ulbrich, Head of Automotive Systems R&D at Covestro. "This helps identify potential challenges early on, when product and tooling changes can still be made at low cost."

Polyurethane foams can meet the requirements for instrument panels and other interior parts well, but the foam must be processed within a specific process window. Simulated foaming based on Covestro's material models helps to optimally adjust the process window.

KOEL Kolhapur & Nashik Plant Wins National Award For Energy Efficiency From CII

Kirloskar Oil Engines Limited's (KOEL) - Kolhapur & Nashik plants have won the 'National Award for Excellence in Energy Management' & 'Energy Efficient Unit' from CII for the year 2022. This award is bestowed upon organisations for their energy optimisation, use of best industry practices, use of renewable sources of energy and self-sustenance.

The award was presented to Kirloskar Oil Engines in the presence of eminent dignitaries that included E Freddy Svane, Ambassador at the Royal Danish Embassy in New Delhi, Rakesh K Rai, Secretary, BEE, Ministry of Power, Govt. of India, K S Venkatagiri, Executive Director – IGBC and CII, and P V Kiran Anath, Deputy Executive Director, CII. Santosh Parab, AGM, Utilities Department, and Nitin Kulkarni, Energy Manager received the award on behalf of Kirloskar Oil Engines, Kagal. For the Nashik plant, Paresh Joshi & Hemant Upadhye received the award.

Gauri Kirloskar, Managing Director, KOEL, said, "This is another feather in the cap for KOEL in its efforts towards energy efficiency, using energy efficient sources and sustainable practices. As a market leader in engine technology and power generation solutions, KOEL has always been at the forefront in developing cutting edge technology that is energy efficient and sustainable for our customers. Our manufacturing locations are state of the art and energy efficient – 64 per cent of our energy requirements come from renewable sources, and 58 per cent of our water needs at the plant are self-generated. We will continue to invest, design and develop solutions that are clean and sustainable, at a cost and quality that is acceptable to our customers and our manufacturing locations will continue to be energy efficient"

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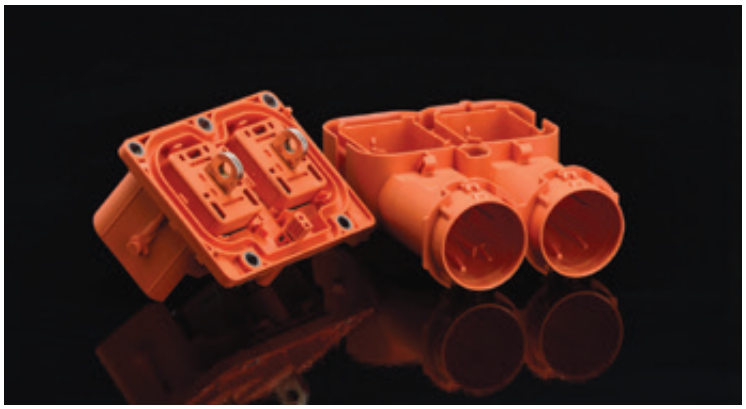
Lanxess Introduces Flame Retardant Emerald Innovation NH 500



Specialty chemicals company Lanxess has developed a non-halogen flame retardant that will soon be offered under the brand name Emerald Innovation NH 500. The phosphorus-based additive is designed primarily for use in glass fiber-reinforced plastics used to manufacture products for the electrical and electronics (E&E) industry.

The new polymer additive from Lanxess exhibits very good flame-retardant properties in combination with other additives and easily meets the relevant fire safety tests. A glass-fiber-filled PA66 formulated with Emerald Innovation NH 500 passed the UL 94 fire test of the US testing company Underwriters Laboratories Inc with an outstanding V-0 classification at 0.8 mm test specimen thickness. In glow-wire testing, the highest intended glow-wire flammability Index (GWFI) of 960° C is achieved without difficulty by a specimen of 3 mm thickness. The glow-wire ignition temperature (GWIT) was measured up to 875° C which is significantly higher than that of the reference (775° C).

Lanxess has developed versatile formulations for its new flame retardant. They ensure that the mechanical properties and other functional characteristics of the end products are maintained. In addition, the product can boast excellent thermal stability and a unique morphology. The combination of very good flame-retardant properties and high dimensional stability in engineering thermoplastics, such as polyamide 6 and 66 (PA6, PA66), offers compounders and processors promising applications.

Malabar Gold & Diamonds Invests Rs. 750 Crore to Launch a Manufacturing and Refinery Facility in Telangana

Malabar Gold & Diamonds, one of the largest gold and diamond retail chains in the country, launched the construction of Malabar Gems & Jewellery Manufacturing unit in Telangana with a foundation stone laying ceremony. The facility is set to become the largest jewellery manufacturing unit of the group. K T Rama Rao, Hon'ble Minister of Municipal Administration and Urban Development, Industries, IT, Electronics and Communication, Govt. of Telangana laid the foundation stone of the manufacturing facility on October 15, 2022.

The ceremony took place in the august presence of Jayesh Ranjan, IAS, Principal Secretary, Industries, Commerce & Information Technology (IT), Govt. of Telangana and Ahammed M P, Chairman, Malabar Group of Companies, Abdul Salam KP, Vice Chairman, Malabar Group of Companies, O Asher, Managing Director, India Operations, Malabar Gold & Diamonds, Nishad AK, Group Executive Director, Manufacturing & B2B, Malabar Group of Companies. Shri. P.K. Siraj, Retail Operations Head (Rest of India), Malabar Gold & Diamonds and other distinguished guests.

Located at General Park, Maheshwaram in Rangareddy District and spread over 3.7 acre, the manufacturing facility is slated to be operational soon. It will have the capacity to manufacture 10 tonnes gold jewellery and 1.5 lakh carats of diamond jewellery annually. It will also house a state-of-the-art gold refinery facility with an annual gold refining capacity of 180 tonnes. The manufacturing facility will manufacture a diverse range of jewellery including gold, diamonds, precious gemstones, platinum and uncut diamonds. The facility is equipped with CNC machining, latest technology-enabled chain making machines and laser cut machines in collaboration with industry experts from Italy, USA & Germany. The establishment of the facility is in line with the expansion plan announced earlier as part of its FY 2022-23 strategy

The General Park manufacturing facility which will be built on 2.3 lakh sq. ft. area will have a full-fledged skill development centre, design studio and R&D centre along with accommodation facility for the employees. It will also have an automated warehousing facility. The facility will have 33 percent green space provision and will adhere to environmentally sustainable norms with a focus on limiting carbon footprint.

Malabar Gold & Diamonds will invest Rs 750 crore to set up the manufacturing facility and a refinery in Telangana. The facility is expected to generate about 2750 jobs. Keeping in line with the brand's outlook as a responsible jeweller, the facility has been designed to provide safe and pleasant working conditions to the employees.

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Nu-Vu Conair Inaugurates New Manufacturing Facility In Ahmedabad

Nu-Vu Conair, one of the leading manufacturers of plastic auxiliary equipment in India, organised a ground-breaking ceremony for its new manufacturing facility in Ahmedabad, Gujarat. The ceremony was graced by Filippo Zuppichin, CEO, Piovan Group, Kirk Winstead, CEO, IPEG Inc, Davide Cappellini, CTO, Piovan Group and the Indian management team of Nu-Vu Conair.

This is the third greenfield facility that the company has come up on the recently acquired 75,000 sq ft land adjacent to the current factory in Ahmedabad. Post this new plant, which is expected to be completed in December 2023, the overall manufacturing set-up will reach more than 2,00,000 sq ft. The new plant will help augment the company's manufacturing capabilities by almost 50 per cent to meet growing demand as well as better serve the customers.

Nu-Vu Conair, Ahmedabad, India is a joint venture company between Nu-Vu Engineers, Ahmedabad, India and The Conair Group, Pennsylvania, USA. Conair has manufacturing facilities in the USA in addition to India and manufactures 450 different products. The company also owns two world-class R & D (Research & Development) labs.

Servotech Incorporates Battery Manufacturing Subsidiary Techbec Industries Limited

Servotech Power Systems Ltd has incorporated a subsidiary, Techbec Industries Limited (TIL), which will be engaged in the manufacturing of batteries, particularly lithium-ion batteries, and other allied activities.

TIL was issued the Certificate of Incorporation on September 13, 2022, and Servotech, which will be the holding company of TIL, would hold 63.5 per cent share capital in the newly established battery manufacturing entity. The new subsidiary has been incorporated with the authorised capital of Rs. 10 Lakhs comprising 1,00,000 Equity shares of Rs. 10/- each, Servotech added in the exchange filing.

On this occasion, Raman Bhatia, Founder and Managing Director, Servotech Power Systems, said, "India must produce its own lithium-ion batteries to achieve its EV goals without importing any. The National Mission on Transformative Mobility was established by the government to support initiatives for the stepped manufacture of batteries and EV components. Servotech's newly launched subsidiary will be one of the most bankable and competitive integrated battery storage solutions in the market, extending and facilitating its goal of indigenising battery manufacturing for EVs, E-rickshaws, and varied solar-powered solutions. TIL intends to bring specific focus to support the electric vehicle (EV) segment and the battery-as-a-service business model offering across its portfolio of commercial vehicles."

"In addition to the existing State Transport Undertakings (STUs) and government fleets, TIL will also cater to all business opportunities across passenger mobility applications. These efforts will be bolstered from our tech-enabled, newly-setup manufacturing unit at Safiabad, Sonipat, Haryana. The facility which will shortly be operational is spread in 40,000 Sq. ft. and has the capacity to produce up to 6,00,000 units of battery pack annually. This workshop will be equipped with fully automated, cutting-edge production lines and testing facilities for the making of custom-designed battery modules, packs, and containerisation," he added.

As people become more aware of climate change and its effects on the environment, they are adopting greener practices. People are now considering adopting electric vehicles and sustainable energy sources to lessen their carbon footprints as a result of the issue's increased awareness. The newly-benchmarked IS-17855 standard by the Bureau of Indian Standards is used to assess the performance of lithium-ion battery packs (BIS). In order to evaluate parameters such as energy efficiency, cranking power, quick charging efficiency, temperature-dependent deterioration, loss of charge during storage, and others,

BIS has developed a new set of performance tests for this standard. Lithium battery star ratings were recently introduced by the Bureau of Energy Efficiency (BEE). With this criteria in place, customers would be able to distinguish between various battery packs in terms of safety, quality, and other factors, which may promote adoption and confidence.

K 2022: Starlinger Unveils The Cement Bag Of The Future

Starlinger this year will be showcasing its AD*STAR* block bottom valve sacks with 22 per cent recycled content on our new sack conversion line ad*starKON SXneo at K 2022. Speaking on the occasion, Hermann Adrigan, Sales Manager, Starlinger, said, "This year, we will be producing our AD*STAR* block bottom valve sacks with 22 per cent recycled content on our new sack conversion line ad*starKON SXneo at the Starlinger stand. This way, we want to show that it is possible to use recycled material in woven plastic packaging, which is manufactured in a complex process, without having to accept a loss of quality. Starlinger customers are even producing high-performance packaging such as big bags with recycled polypropylene on our lines."

In addition, Starlinger's new, patented gripTEC technology, which will also be on show at the trade fair stand, can increase the coefficient of friction on the bag surface to significantly reduce slipping of stacked bags. This lowers the risk of personal injury from bags slipping down, and saves tonnes of bulk material and packaging. What's more, the CO2 generated during replacement production is eliminated – another contribution to sustainability.

Starlinger lines can produce and process woven fabric not only with recycled polypropylene (rPP), but also with recycled PET. "As a member of the Austrian platform "Verpackung mit Zukunft" (packaging with a future), creating closed cycles for plastic packaging is of particular importance to us," says Adrigan. "Our circular packaging concept paves the way for a closed packaging cycle in the industrial sector. Industrial packaging such as big bags made of woven polypropylene are equipped with a material passport that allows to trace their life cycle from production and use to return and recycling. This means that new big bags can be made from used big bags without quality loss, and the packaging cycle can be closed." Big bags with rPP content produced by Starlinger customers will be on display at the Starlinger stand. The initiative "Verpackung mit Zukunft" will also be represented at the Starlinger stand, providing information to interested parties on the topic of circular economy.

Mono-material packaging made of PET is virtually made for recycling: In the recycling process, this material can be processed in such a way that it has the properties of virgin material – including food grade quality – and can be recycled repeatedly. With the technology for producing tape fabric from PET and rPET, Starlinger has harnessed this major benefit for woven packaging and is the only supplier to offer this process. PET tape fabric is high-strength, food grade, has excellent creep resistance and can be made from 100 per cent recycled material. As with bottle-to-bottle recycling, this enables 'bag-to-bag' recycling and closes the packaging cycle. This not only lowers raw material requirements, but also CO2 emissions and energy consumption. Both PET and rPET tape fabrics have already been used successfully in the production of big bags. Due to their excellent dimensional stability, PET big bags are ideal for long-term storage of bulk goods and provide a cost-effective alternative to octabins and cardboard cylinders. As a monomaterial solution, they can be recycled easily after use and can be reprocessed as often as desired.

Lohia And Sundarlam Join Hands For Lamination/Coating Machines

Lohia Corp Limited (LCL), a global leader in providing advanced solutions to the woven plastics flexible packaging industry, has joined hands with Sundarlam Industries, Bangalore, India, a trusted name in lamination / coating technology for the woven sack & non-woven industry.

R K Lohia, CMD, LCL, said, "The coated fabric industry is on an exponential growth path and this partnership will benefit the industry as it brings together cost-effective solutions offered by Sundarlam along with trusted Lohia brand offerings at the doorstep of the customers".

The acquisition of Sundralam Industries will further strengthen Lohia's lamination / coating machine portfolio. With this partnership, Lohia will be present in the entire range of the lamination / coating machine market, and it fits into LCL's strategy to be the world number one in woven plastics machinery through innovative solutions.

S Sundaram, Owner, Sundarlam Industries, enthusiastically said, "This venture will not only help Sundarlam to expand its customer base with the sales & marketing network of Lohia, but also bring in technical advancement in the machines through strong R&D capabilities of Lohia". Sundaram will be heading this partnership as a Whole Time Director with minority stake.

"BIS Norms On Polymers Will Enhance The Quality Requirements"

In a one-on-one with Rajesh Balachandran, Global Chief Business Officer, STEER Engineering, wherein he discusses the company's long-standing journey in India, the impact of BIS norms, sustainability in the field of plastics & polymers and more. Excerpts…

By Anvita Pillai

With STEER being in India for over three decades, what makes the company stand out in the Indian market? How are you innovating to be a leading player in the Indian market?

STEER Engineering, over a period of time, has a unique positioning with being a vertically integrated technology-driven twin screw extruder manufacturer. Our R&D and foundry operations in Coimbatore brings innovation to the fore and develops MOCs for extrusion processing zone as a value-based wide range of offering to all global key customers for various compounding, engineering plastics, bio-based polymers, battery separator, masterbatch, fire retardant, Fluro polymer applications.

In the last three decades, we at STEER have developed sustainable solutions with over 66 patents which is a testimonial to our efforts in R&D to be a truly technology-driven organisation. Our fractional geometry design platform for elements delivers high productivity and carbon-neutral solutions with power savings efficiency for our customers.

Our safe recycler solution platform will play a pivotal role in providing solutions around recycling paving way for a circular economy in the times to come.

The Department of Chemicals recently proposed the imposition of mandatory BIS norms on polymers being used in India. What would be its ultimate ramifications on the Indian industries? Do you think it would have any collateral effect on your business?

I believe, BIS norms on polymers will enhance the quality requirements, which will be hugely beneficial to our business. Since we are an end-to-end value-based solution provider for various polymer applications, any stringent quality compliance will help deliver a unique customer experience that will have a cascading positive impact on our business.

India has been largely advocating for sustainability, and the plastics and polymers sector is barely at the beginning of the journey. How can sustainability become an ecosystem throughout the business? How can the government further encourage this movement?

With climate change issues that the world is grappling with due to global warming, there is a huge investment commitment from every government to contain this phenomenon. With disposal issues around plastics, there is a larger emphasis on banning single-use plastic and recycling which should get mandated for stricter compliance. This will propagate innovative solutions around environment-friendly bio-degradable applications, intelligent industrial and consumer recycling that goes towards delivering sustainability and a circular economy.

Could you tell us about STEER's business until the Q3 of 2022?

We are on a growth path keeping technology and our end-to-end value proposition story at the forefront of all our offerings that delivers unique customer experience. Thus far it has aided us in delivering high double-digit growth.

What lies ahead for STEER? Can you elaborate on the company's long- and short-term goals?

In the short term, STEER is fully aligned to delivering sustainable solutions for the biggest challenge the world is faced with be it climate change-related impact on the environment, carbon neutral applications, futuristic applications around battery-driven electric vehicle mobility solutions, recycling applications we will be ahead of the curve.

In the long-term, while we continue to aggressively grow our market share and mind share with the polymer customer segment with further innovations around building intelligent compounding, IoT and Industry 4.0, STEER will invest in new segments, like pharma and food, which will be the growth engines for the future.

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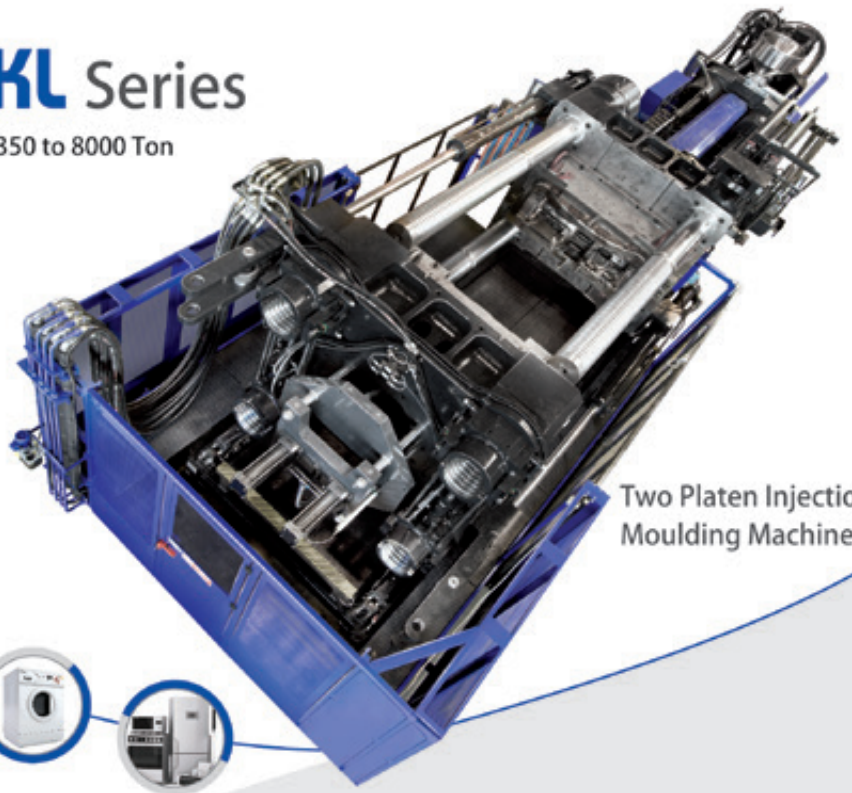

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Is Solar Energy Sustainable?

To make PV more price competitive, many technological developments are being made which may pose a threat to the environment. The article takes us through why it is necessary to recycle solar panels.

By Vinami Shah, Aditya Birla World Academy

Solar energy is a clean renewable source of energy that uses solar radiation to produce electricity. Solar photovoltaics had been introduced as a cleaner, more sustainable alternative to fossil fuels. This is because photovoltaic (PV) energy sources have the potential to generate electricity with drastically lower levels of carbon emissions. However, there are multiple concerns in the PV sector, which may strip solar energy of its 'clean and sustainable reputation.

Firstly, to make PV more price competitive, many technological developments are being made which may pose a threat to the environment. For example, several thin film technologies have recently replaced silicon - a non-toxic and highly abundant material- while aiming for cost reductions.

"TO MAKE PV MORE PRICE COMPETITIVE, MANY TECHNOLOGICAL DEVELOPMENTS ARE BEING MADE WHICH MAY POSE A THREAT TO THE ENVIRONMENT."

To consider the environmental impacts of the new technologies being developed, an early life cycle assessment of the technology is essential, given the fact that design changes are easier to make during earlier stages. This will ensure that environmental trade-offs are identified and quantified and that new technologies do not result in environmental burdens larger than those of the current technology.

Recycle Solar Panels

Moreover, it is also important to encourage industries to consider recycling solar panels at the point of product design and develop environmentally friendly recycling processes. Solar energy is often considered a minimal waste source of energy because during operation, there is no waste produced, and end-of-life

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waste is often overlooked.

However, when solar panels reach their end-of-life stage, they can pose a threat to the environment if not recycled or disposed of correctly due to the hazardous materials present such as lead, cadmium, and bismuth. The disposal of solar panels is becoming a pertinent environmental issue as the number of solar panels reaching their end of life is rising.

The end-of-life waste is projected to be in millions by 2050. Hence, to make solar energy truly sustainable, it is essential to establish low-cost recycling or disposal of technologies in parallel with the increased use of solar energy.

How To Reduce Carbon Emissions

Currently, there are two main types of solar cells: silicon-based solar cells and thin-film solar cells. A silicon solar panel is made up of multiple materials, including the cover glass, encapsulation material, c-Si cells, another sheet of encapsulation material, and a plastic back sheet. An aluminium frame is often the last part of finishing the panel. A thin-film solar cell on the other hand is made by depositing layers of PV material on a supporting material such as glass, plastic, or metal to create a module.

"IT IS ESSENTIAL TO ESTABLISH LOW-COST RECYCLING OR DISPOSAL OF TECHNOLOGIES IN PARALLEL WITH THE INCREASED USE OF SOLAR ENERGY."

The end-of-life waste of both these technologies can be damaging to the environment and hence must be recycled. In both these technologies, the cover glass which makes up two-third of the panel can be recovered and reused directly. This will not only save energy substantially but will also reduce carbon emissions. In this way, the photovoltaic industry's carbon emissions could reduce by more than two million tonnes per year.

In terms of silicon cells, for example, solar-panel recycling can be beneficial for environmental protection, because silicon production consumes a large amount of energy, and the energy and cost needed to recover silicon from recycled solar panels are equivalent to only one-third of those of manufacturing silicon directly.

In terms of thin film cells, for example, there are concerns about the cadmium components which have the potential of leaking out, if not treated properly at end of life. Hence it is essential to collect the modules and recycle the contained metals at the end of their useful life.

In conclusion, to make solar energy a sustainable alternative to fossil fuels, it is essential to carry out a life cycle assessment of new technologies in development and evaluate their environmental impact. On top of this, only a few of the environmental effects of the lack of recycling facilities are discussed and to overcome these as a whole, it is important to develop adequate recycling technologies for the current and emerging types of solar cells to avoid any harm to the environment.

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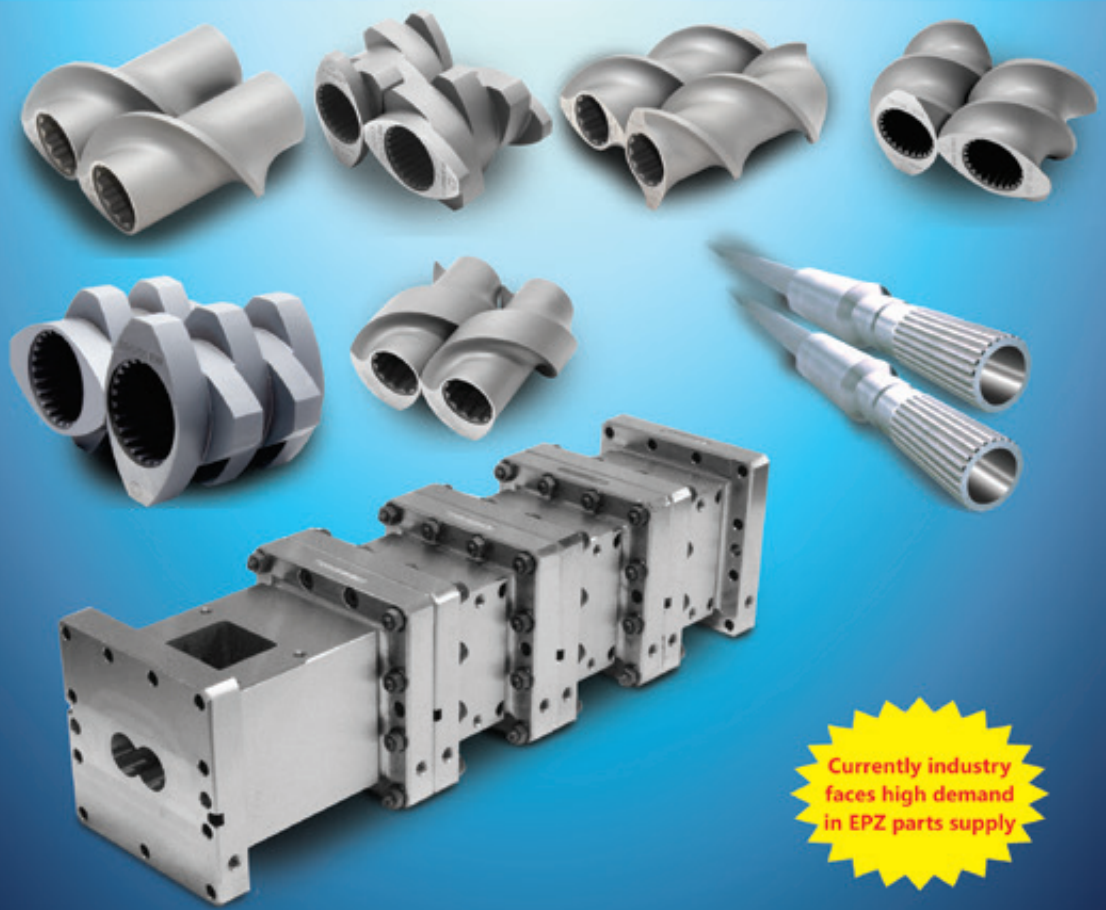

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India Paves Way For Lead-Free Stabilisers

With an increase in the usage o PVCs in India, the prominence of sustainable lead-free stabilisers has also been growing. The article elaborates on how India is paving way for the globe in lead-free stabilisers.

By Dr Michael Schiller, Director, Centre of Innovation & Sustainability, Platinum Industries Pvt. Ltd

India is the seventh-largest country by area and the second most populous country with 1'368'738'000 in 2019 which is 17 per cent of the world population. The total annual water consumption is 761 billion QM, which is the highest worldwide, but the country has only 4 per cent of global water resources. The freshwater availability per capita is 1.125 QM vs 6.000 QM on a global average. India ranks 132 when it comes to water availability worldwide. That's already sad enough but the loss of water in distribution is 40-65 per cent and thus, wastewater management is critical.

PVC Gaining Prominence

1.4 billion people need fresh water every day, which makes pipes one of the most necessary and basic supply equipment. This is also applicable to ensure that the water that is already used once is preserved and transported effectively. Therefore, we can say that pipes are the most important part of the overall water supply network in the country. Pipes made of Polyvinyl Chloride (PVC) are the optimal choice when it comes to costs and performance. 3'180 kt PVC were used in India in 2018 and 3'700 kt in 2021. The annual growth of PVC consumption in India is assumed at 6 per cent and not surprisingly, pipes and fitting applications have the biggest market share at 75 per cent. These materials were traditionally stabilised with lead. However, in 2019, the Indian government announced a draft law to limit lead migration into the water, which posed several manufacturing challenges to the industry. PVC pipes are manufactured through a complex manufacturing process, with more

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than 2000 processors and through extrusion in a variety of dimensions such as cellular core or solid wall construction. In recent years, there has been a huge upsurge in the demand for PVC pipes due to multiple driving factors like usage in the irrigation and construction sectors. Additionally, new investments in technological pipes like o-PVC (bimolecular oriented), foam core, etc., are adding new segments of the market.

It's nearly impossible to mention all the publications about the alternatives to lead stabilisers in PVC. Many of them are published by stabiliser producers to promote their products and also to convince the PVC industry worldwide that calcium-zinc and calcium organic stabilisers are reliable, technical and commercial solutions.

Here are some of the independent publications that have shared light on this:

- Lunde et al. published a sustainability assessment of stabiliser systems for PVC pipes in 2005. They concluded that both calcium-zinc and calcium-organic have the highest potential to become fully sustainable as PVC stabilisers.
- Barth summarised the results of an enormous Round Robin Trial of the German Plastic Pipe Association. Pipes of several converters stabilised with lead, Calcium-zinc, calcium-organic and tin stabilisers from different sources were tested for all properties. The result: all three lead-free stabiliser systems were found suitable technical solutions.
- Everard et al. considered the metals used in PVC stabilisers under the aspect of sustainability. They found that lead and cadmium are toxic but also far away from being sustainable.
- The European VinylPlus is an inspiring initiative and platform supported by an NGO which reports the progress of the European PVC industry towards sustainability. It's an initiative that sets an example for other such areas and plastics. Cadmium-containing stabilisers were entirely replaced in Europe, under a voluntary, responsible programme driven by the PVC Additives suppliers, since 2001 in EU-15 and 2007 in EU-27. Lead stabilisers were phased out in EU-28 in 2015.

Stabiliser Gaining Momentum

The main stabiliser type used in India was based on lead with 80 per cent market share. calcium-zinc, liquid mixed metals and tin occupied the minimal rest. Calcium zinc was either imported or produced by a select few local manufacturers.

Lead-free stabiliser alternatives started gaining some interest in India, especially from PVC pipes and pipe fitting manufacturers in 2004-2006. However, the obstacles of calcium-zinc stabilisers were known. Higher volume requirements for these types of stabilisers and the higher prices due to expensive raw materials plus the lack of expertise of local stabiliser manufacturers posed many challenges. Therefore, the number of Indian producers of lead-free stabilisers was hardly few. The technical support offered by imported materials was difficult as well, due to geographic limitations. Last but not least, it was difficult for a foreign producer to understand the

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special requirements of a dynamic market like India.

Working For The Future, Today

Finally, by 2016 & 2017, several big local manufacturers started producing based on calcium zinc as the stabiliser, successfully moving away from lead. These companies started producing high-quality products in factories with high HSE standards. Trials were successful and thus, this was a huge contribution to growing the business. Eventually, renowned European technology localised to Indian needs was made available to Indian stabiliser manufacturers with an international background, thereby allowing the phase-out of lead completely. Today, many Indian firms have emerged as leaders and gained popularity for producing high-quality lead-free stabilisers, which are not only used for local consumption but are also exported globally. These additives have multiple applications, in a diverse range of industries.

The phase-out of lead stabilisers was supported by the Indian government under PM Modi which was published in September 2019 in the Gazette of India, which mentions the following:

Short title and commencement:

(1) These rules may be called the Lead Stabilizer in Polyvinyl Chloride (PVC) Pipes and Fittings, Rules, 2019.

(2) They shall come into force on the date of their publication in the Official Gazette - Prohibition of the use of lead or lead compounds

(3) The manufacturer of PVC pipes and fittings shall be prohibited to use lead or lead compounds as a stabiliser in the manufacturing of such PVC pipes and fittings as provided in the column of the schedule, from the date specified in column (4) of the said Schedule.

This limits the migration of lead into the water, one step in the right direction for a better life, safer working conditions, a cleaner environment and more sustainability in India. As aptly put by the father of India, Mahatma Gandhi, "The future depends on what you do today."

There are many big players in India today producing high-quality products in clean, modern factories and there are also small ones, some of which are still using lead.

The big players are supporting the phase-out of lead stabilisers by:

- Learning from the European experience and adjusting these to Indian requirements
- Asking for self-audits from their suppliers
- Being aware of HSE, sustainability and PM Modi's policies for a better India.

UPDATE

Photopolymer Film For Next-Gen AR Displays

The Bayfol® HX photopolymer film of Covestro helps the R&D of Sony Group Corporation to realise the prototype of a transparent display. This display delivers novel and fascinating visual experiences, as the images holographically generated within it appear to float freely in a transparent cylindrical column. Viewers can walk around the 360-degree display and look at the displayed image from all angles. Since the holographically evoked image is very bright – but the display is transparent at the same time – the image and background merge almost seamlessly. In the spirit of the augmented reality (AR) system, this transparent 360° holographic display expands reality. Because whatever is displayed in it seems to actually be there for the observer. Covestro is presenting this application of Bayfol® HX at the K 2022 plastics trade fair, which will be held in Düsseldorf from October 19-26, 2022.

Bayfol® HX consists of a transparent film as a substrate and a photoreactive layer that is optimized for specific customer requirements. Bayfol® HX gives designers the greatest possible design freedom. For example, it is flexible enough to be bent – as in the Sony application – so that it can completely enclose a cylinder. It has tailor-made optical properties to produce high-quality holographic images. Both the very high transparency of the photopolymer film and the image brightness it enables were key factors in Sony's decision to use Bayfol® HX for its development project.

The project showed that Bayfol® HX has excellent performance for AR applications. It is imaginable that the prototype display technology will be used, for example, in museum showrooms and corporate presentation rooms – or in the home, for example, to accompany the music with 360-degree videos.

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The Hazards Of Using Plastics In Toys Manufacturing

With the toy market in India growing at a rapid pace, it is important to understand the necessity of sustainable toys over hazardous plastic toys. The article elaborates on how the toy manufacturing industry can enable a shift to sustainability and include children in the journey.

By Kunal Popat, Co-Founder, R for Rabbit

The baby toy market is anticipated to undergo substantial evolution. The advent of advanced technology and machinery has encouraged industry players to produce modern and innovative toys.

At present, the toy market in India is growing at a rapid rate and is expected to reach $35.6 billion by 2022. The Indian toy market is expected to grow by 4 per cent annually over the next five years. Baby toys account for about 20 per cent of the overall market and are the fastest-growing segment.

The Growing Market & Pressing Issues

The main driver of the growth is the rising disposable income, increased inclination toward better quality games and toys for children, and preference to buy battery-operated and innovative electronic toys instead of traditional ones. Additionally, India is the second largest populated country globally, making it a huge toy manufacturer consumer base. The availability of various products with the presence of domestic and international manufacturers also contributes to the demand for baby toys.

With the rise of environmental issues, global warming is a pressing issue. Plastic usage has been one of the most hazardous to the environment. Plastic is being used in numerous products, especially baby toy products that are vulnerable to children and their health. In response to these concerns, toy manufacturing companies have begun to change how they make their products to be more environmentally responsible.

The Tactical Shift

A shift has occurred from manufacturing toys out of plastic, which

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was widely popular but had numerous negative consequences associated with its use. Since the year 2000, there has been a growing concern over the toxic chemicals that can be found in children's toys. These chemicals have been linked to cancer and other diseases. For this reason, many toy manufacturers have taken steps to eliminate these toxic chemicals and use safer alternatives. As a result, in 2007, approximately 70 per cent of all toys manufactured were made with safer plastic materials than before. However, many people are still unaware of these new safety standards.

Although some companies are beginning to incorporate these concerns into their business models, there is still much room for improvement regarding environmentally friendly toy manufacturing practices.

When choosing a toy for your children, it is crucial to consider the baby's safety. For example, bisphenol A (BPA) is a harmful chemical compound often used in manufacturing polycarbonate plastics. Apart from this, the most common plastics used in manufacturing are polypropylene (PP), polyethylene (PE), high-density polyethylene (HDPE) and low-density polyethylene (LDPE). Several potential health risks are associated with using these materials. Therefore, parents must be aware of the detrimental effects of these toxic materials when purchasing any toy for their infants.

Babies and toddlers are at the most significant risk of exposure to chemicals in plastics because they put everything into their mouths.

There has been a resurgence of wooden baby toys in the marketplace in the last few years. Parents are starting to realise that wooden toys are safe, sustainable and durable and encourage creativity and individuality.

WITH THE RISE OF THE INTERNET AND GROWING AWARENESS ABOUT THE ENVIRONMENT, PEOPLE ARE SHIFTING TOWARDS SUSTAINABLE TOYS. BY CHOOSING WOODEN TOYS OVER PLASTIC ONES, YOU'RE HELPING OUR ENVIRONMENT BY REDUCING POLLUTION CAUSED BY MINING MATERIALS USED IN PLASTICS PRODUCTION.

In recent years, there has been a lot of talk about the benefits of wooden toys. However, many parents have started questioning whether these toys are worth the cost and effort. Have you ever tried using wooden toys for your baby? If you have never given them a chance, you should.

Wood can be considered an epochal part of a kid's development from start to end. For babies, wooden toys have proven to help children develop fine motor skills, cognitive skills, social-emotional development and language development. These skills are essential for school readiness and their future. They are available in different shapes and sizes and are suitable for different ages. Various wooden products available for babies, such as wooden puzzles, blocks, cars and lots more, can help develop the child's skills and abilities. Additionally, they are more durable and offer a unique sense of nostalgia for most people who grew up playing with them as children themselves.

'Wood' There Be Sustainable Toys In Future?

We've all heard about the importance of using sustainable products, but how can we ensure that our children grow up with a sense of environmental responsibility? The answer is simple: teach them, from an early age, what it means to be a responsible consumer and display the correct modelling behaviour for them.

With the rise of the internet and growing awareness about the environment, people are shifting towards sustainable toys. By choosing wooden toys over plastic ones, you're helping our environment by reducing pollution caused by mining materials used in plastics production. They also let children connect with nature in a meaningful way, which helps them understand how their choices affect the environment around them and encourages children to learn about sustainability. The future of toys in India is looking bright. Many new toys are being constructed of bamboo, sugarcane fibres, and other sustainable raw materials in order to follow the sustainability trend and promote a greener environment. Even the paints that are utilised are organic. This industry is about to flourish as businesses adopt creative strategies.

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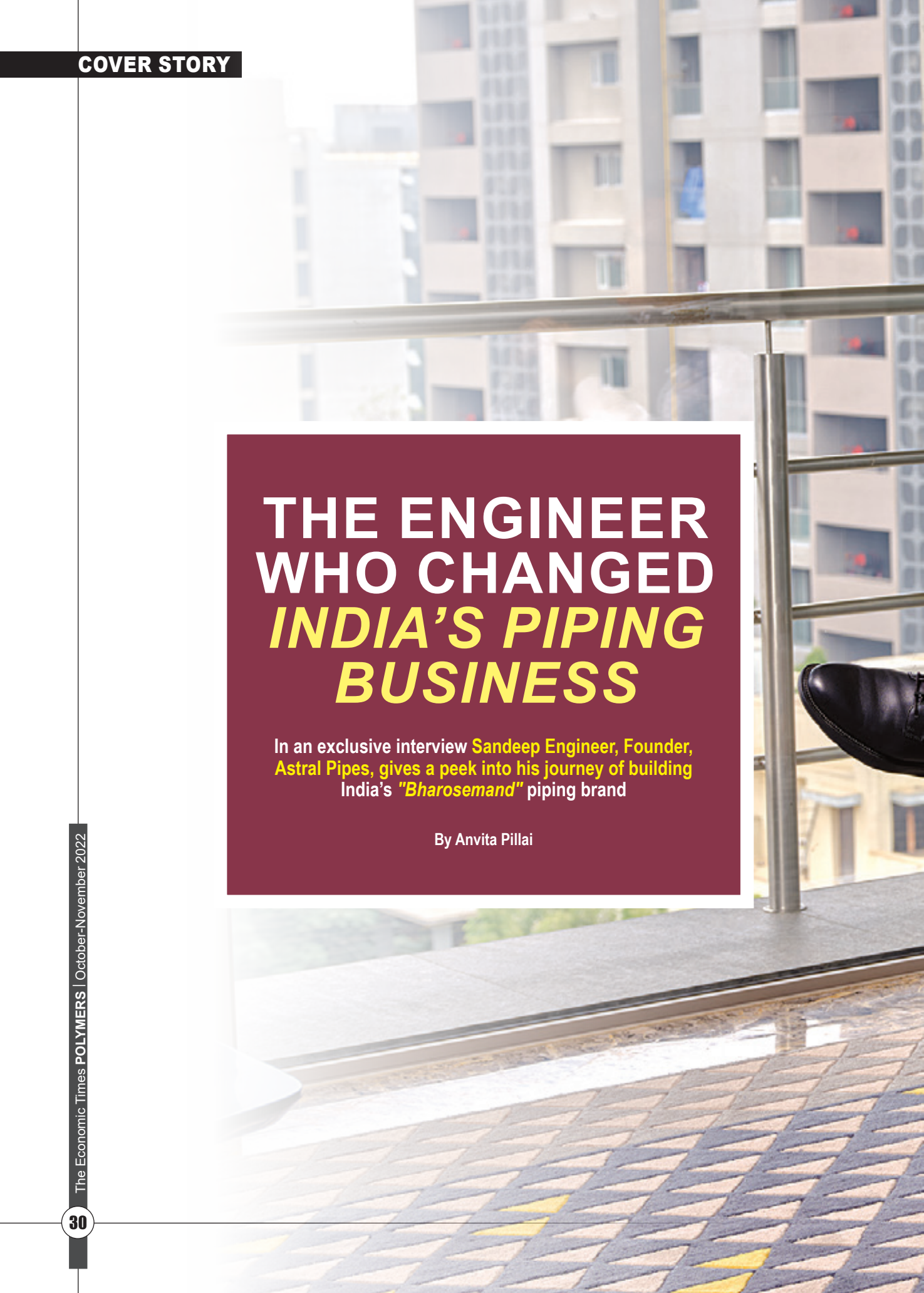


THE ENGINEER WHO CHANGED *INDIA'S PIPING BUSINESS*

In an exclusive interview Sandeep Engineer, Founder, Astral Pipes, gives a peek into his journey of building India's *"Bharosemand"* piping brand

By Anvita Pillai

From being a project engineer at Cadila Pharmaceutical in Ahemdabad to building a billion-dollar company, Astral Pipes' founder, Sandeep Engineers' journey to success is no less than a story from some Bollywood movie. With a background in chemical engineering, Engineer wanted to be more than an employee of Cadila. He wanted to be an entrepreneur. He founded his first venture in 1987, Shree Chemicals, which although not a successful start to his journey as an entrepreneur, only motivated Engineer to do better. He went on to start an alternate product line in pharmaceutical altogether and started Kairav Chemicals.

Building Ground Up

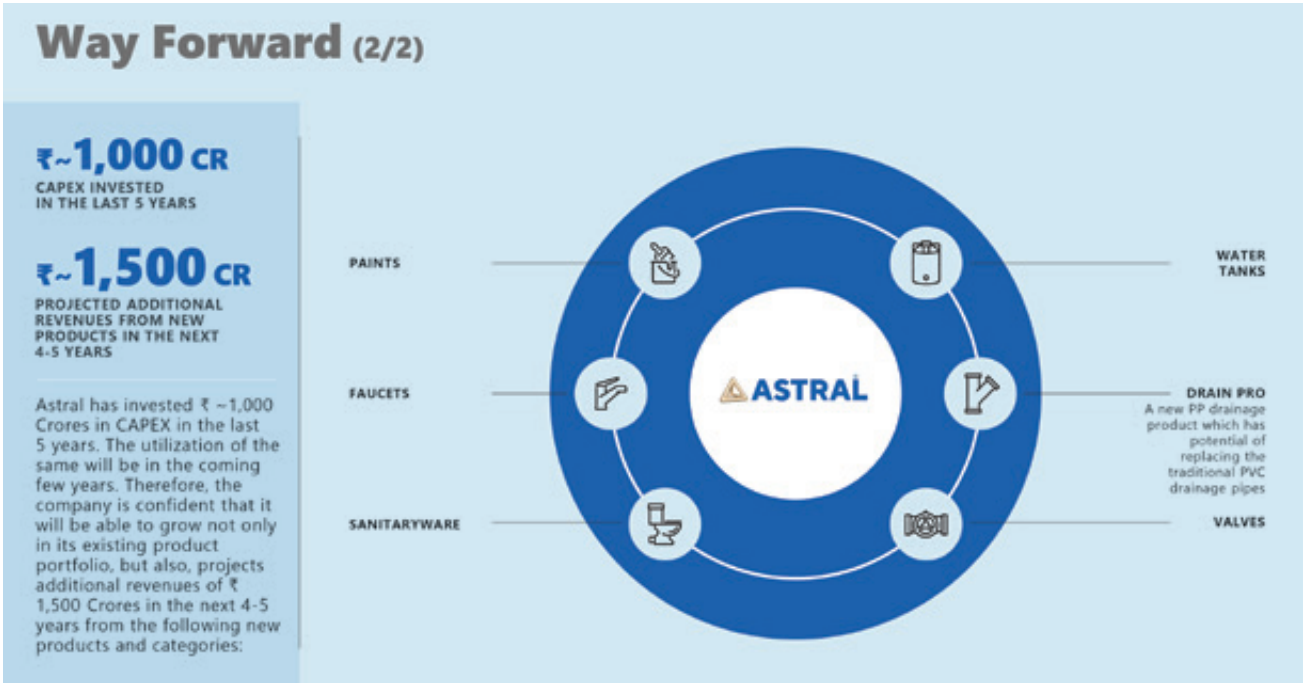
Kairav Chemicals, albeit a fairly successful venture, wasn't really Engineer's ticket to success. It wasn't until Astral Pipes and CPVC business that Engineer found his true métier. "Plastic came by fluke," confesses Engineer, "It was an experiment to bring CPVC for industrial pipes in India," he adds.

Building Astral was not easy, and getting CPVC polymer accepted in India was an extremely laborious task, he reminisces. "It did not click initially in the industrial pipes segment and took us nearly four years to make the product." There was a point in Astral's journey, where the company was nearly bankrupt and he had his house up on securitisation, revealed Engineer. From being bankrupt to becoming a billion-dollar, globally high-performing organisation manufacturing pipes and adhesives, the journey has been worthwhile states industrialist. "It has been an exciting and rewarding journey, where we had to face many challenges and also where we could contribute to a great extent in improving category standards and providing cutting-edge products to the customers in the very low involvement category."

Rising Above & Beyond

Convincing traders and plumbers that CPVC can withstand hot water and be used instead of metal pipes was possibly the toughest challenge Engineer and his team encountered while entering the Indian market. "We had to reach out to them and pursue them to adapt to new technology," he mentions. However, this hurdle was only a scratch on the surface of building the company in India. The category in which Engineer was trying to build his business was dominated equally by both organised and unorganised players with virtually next to no involvement from consumers. "But we firmly believed in doing the right things, providing good quality and providing value for money over and over again which helped us build trust among trade and consumers," he reveals.

Even though it was difficult in the initial phase, slowly and gradually, the category started accepting the newer products. The early hurdle only made their purpose to innovate more resolute. "We took it as a challenge to introduce better products, and innovative technologies and thereby we could enhance the category benchmarks



and the plumbing standards across the country," Engineer cites. "There were no shortcuts to success, and we stuck to our mantra of hard work and customer satisfaction – which is what has worked for us so far," he adds.

Presence & Growth

The acceptance of CPVC and proving to the players invested in the sector that it is the perfect alternative to metal pipes was the game-changing moment for Astral in India. From the company going almost bankrupt after launching in 1996, today, Astral has grown into a Rs 300 cr company with nearly 18 manufacturing units in three countries with over 6000 employees. The pipe manufacturing company today has built a network of nearly 3,000 distributors (1,035+ pipe and 1,500+ adhesive and sealant distributors) and over 1 lakh dealers (35,000+ pipes and 1,45,000+ adhesive & sealant dealers). Its manufacturing facilities currently possess a production capacity of nearly 3.70 metric tonnes per annum.

Despite a volatile polymer and chemical market, Astral has been keeping up with the numbers. The company has, thus far, delivered its best growth quarter on a consolidated basis in Q1 of this year in its India business. The company, in the last five years, has invested a CAPEX of Rs 1,500 crore, which is expected to be utilised in the coming few years. Its plumbing and adhesive business have delivered 73 per cent and 45 per cent growth in the top-line respectively. Its EBITDA (Earnings Before Interest, Taxes, Depriciation and Amortization) growth jumped 30 per cent in its pipe business and 43 per cent in the adhesive business in 2022 Q1.

Commenting on the business rundown, Engineer says, "Despite unprecedented inflation and a challenging macroeconomic environment in FY22, the company's financial performance has remained strong. The financial position remains solid with a robust net cash position and the industry's shortest working capital cycle." He continues, "The company continues to be one of India's most profitable piping solutions companies. For the eighth consecutive year, the profitability has grown. The company has favourable return ratios, and with most of the capital expenditures to be completed by FY23, these metrics are expected to further improve over time." Astral's robust balance sheet and cash flows have sustained it through various cycles, and Engineer posits that they are committed to maintaining their disciplined capital management strategy.

Progress In Manufacturing

Astral has been on a rampant growth journey; with expansion in the east of India almost nearing its completion, Astral has started rolling out its products such as water tanks, SWR and PVC pipes. The work on its adhesive plant in Dahej, Gujarat, is expected to conclude by the end of this year, and the plant is expected to commence production by the end of the next fiscal. Astral recently also acquired a fully functioning manufacturing plant in Jamnagar,

Gujarat, to expand its ceramicware and faucet business line. The facility will play a key role in propagating Astral as a homeware brand by helping manufacture ceramicware and faucets in-house. Gem Paints, a paints manufacturing company in which Astral acquired majority stakes earlier this year, is expected to be integrated into its business with product distribution starting in India in the next couple of quarters.

Astral is no longer just a pipe company and has been rapidly expanding across verticals where many innovative products are lined up. Engineer mentions, "Astral Drain-Pro, Anti-Viral Water Tanks, range of bath ware, and our very unique BondTite Pro are such examples. We aim to provide functional benefits to the customer so that wherever they apply our products, they get value for money." The manufacturing company has now projected an additional revenue of Rs 1,500 crore from its new product categories such as paints, faucets, sanitaryware, water tanks, etc.

Sustainability In PVC Business

PVC today is amongst the most widely used polymers in the world. With sustainability taking the reins globally and companies becoming mindful, employing sustainability throughout product lines has become a necessity. "As the realities of climate change are becoming more and more evident, there is a need for climate action and an emphasis on ESG factors in our operations. We are deeply

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committed to achieving our ESG objectives covering the environment, society, and communities, water management, health and safety and robust governance. Since Astral is a fast-growing organisation, there is a need to divert our attention towards managing our environmental footprint by building up our processes and policies to ensure that our operations are sustainable," says Engineer.

In the journey to make their business sustainable, Astral has in place a piping system for water harvesting and products that are made from recycled plastic. The company has installed solar rooftop panels with a capacity of 4,989 kWp at its Santej, Dholka, Ghiloth, and Sangli production facilities. Astral registered an 11.1 per cent reduction in emission intensity, has started consuming more recycled material, and registered a 56.3 per cent increase in total renewable energy consumption, so far. "We regularly measure our stake emissions of Sox, NOx, and particulate matter following legislative regulations. We also abide by all the environmental norms and regulations set forth by the regulatory authorities. In addition, effective water management and waste management help us establish sustainable manufacturing facilities," mentions the business tycoon.

Going further, Engineer believes, "We have to embrace a robust ESG policy that also applies to employees and other stakeholders, like vendors, suppliers, and value chain partners. This holistic approach would help us implement it effectively and also will be able to generate awareness and wide acceptance."

Tapping the Piping Hot Market

Right from Salman Khan to Ranveer Singh and now Allu Arjun, Astral has always managed to create impactful communications that the category and its buying audience could relate to. This has helped them create brand preference and top-of-the-mind recall of the brand across the country. Speaking on the coming year, he is certain that business would be further consolidated. "We have entered into newer business categories and started making inroads. Groundwork in these businesses and consolidation in the existing ones will be the focus area," signed off Engineer.

Indian Polymer Industry And Its Coming Of Age

With Make in India gaining prominence, India's polymer sector is not privy to the movement. The article elaborates on how the Make in India movement could elevate India's polymer sector globally.

By Arun Singhal, Founder & CEO of Source.One

Indian plastic processors are ramping up their game, and the world is taking note. Favourable population dynamics along with low penetration of the wonder material puts India in a unique position: of leading the growth charts, both in production and consumption.

India is on the precipice of becoming a globally recognised, developed nation within the next couple of decades. What is tipping the scales in the favour of the country is an ebullient polymer ecosystem (projected to be a whopping $30 billion by 2025) that is responsible for strengthening the Indian economy. Fathom this: An average Indian consumes 15 kgs of plastics per year, compared to 62 kgs for an average Chinese.

| Arun Singhal

A Brief Context

• A strategic five-year plan led by expert committees greatly accelerated the polymer industry's growth after 1970. In 1979, Indian Polymers Corporation Ltd (IPCL) commissioned India's first integrated polymer complex with six downstream units at Vadodara, Gujarat, which sparked the development of downstream process industries.

- Today, with 44 producers, 50,000 plastic processors and a thriving ecosystem, comprising machinery manufacturers, masterbatches and additive processors, and a high number of small and large distribution companies, India's polymer industry is not only thriving but also attracting global attention.
- There has been a handsome growth in technology and advancement of machines, and more complicated chemistry is being tried to result in India producing most of its plastic components in-house.
- As of today, India ranks sixth in the global sale of chemicals and fourth in Asia. Over two million people are employed in the country's chemical and polymer industries, which produce over 80,000 varieties of chemicals.

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Key Growth Indicators of Self-Reliant Indian Polymer Domain

As a self-reliant manufacturing and distribution powerhouse, the polymer sector has also demonstrated six key growth indicators:

1. **Raw Material Production**

Indian polymer producers are stepping up their game. The total increase in PE & PP capacity alone is expected to be ~11 million Mt a growth of 90 per cent of the current capacity of 12.3 million Mt over the next five years (Source: Plastics Industry Status Report – India – 2021-22)

The next five years will also witness the entry of at least five new players into the polymer production domain, including the Adani group. Roughly 60 per cent of new capacity installation is led by new entrants: a testimony to the potential and confidence enjoyed by the Indian polymers industry. The producers are not shying away from tie-ups and joint ventures, to explore synergies of finance and technological know-how.

There is an increasing interest towards producing high-value, high-realisation polymers i.e., CPVC, engineering polymers. While achieving self-sufficiency remains a pipedream, Indian producers are increasingly exporting the resins, and monetising the global volatility: the sign of a matured trade ecosystem.

2. **Investment**

Indian manufacturers have not only been investing more but also smarter in the last few years. According to PMMAI, the total new investment in plastic processing machinery, in FY22, was $1.32 bn, to install 15000 new machines. And the core processing machinery growth has been 8.5 per cent over the past four years. The expected investment for the next five years, in machinery, moulds and converting lines, is $14 bn! 70 per cent of this continues to be in injection moulding.

Indian machinery manufacturers now export to 50+ countries, mostly focussed on high-value segments medical and electronics (Source: PMMAI). With the stupendous growth in installed processing capacity, and raw material production, the final jigsaw in the growth puzzle is consumption.

3. **Consumption:**

While plastics consumption has ever been growing, covid has put this in high gear: not only by nudging millennials and middle-class to embrace packaging into their lifestyles, but also pushing work towards comfort, something that boosts demand for lifestyle goods.

An average Indian is today 28 years, and will only age by a few years, over the coming decade. This plays into the consumption pattern: not only growth in the quantity of consumption, but also quality, as more areas of consumption will be dominated by plastics and replacing their alternatives.

The demand for engineering plastics and high-performance materials is increasing with rapid urbanisation and industrialisation led by the aforementioned transitions in automotive, electronics, consumer goods, construction, and other sectors.

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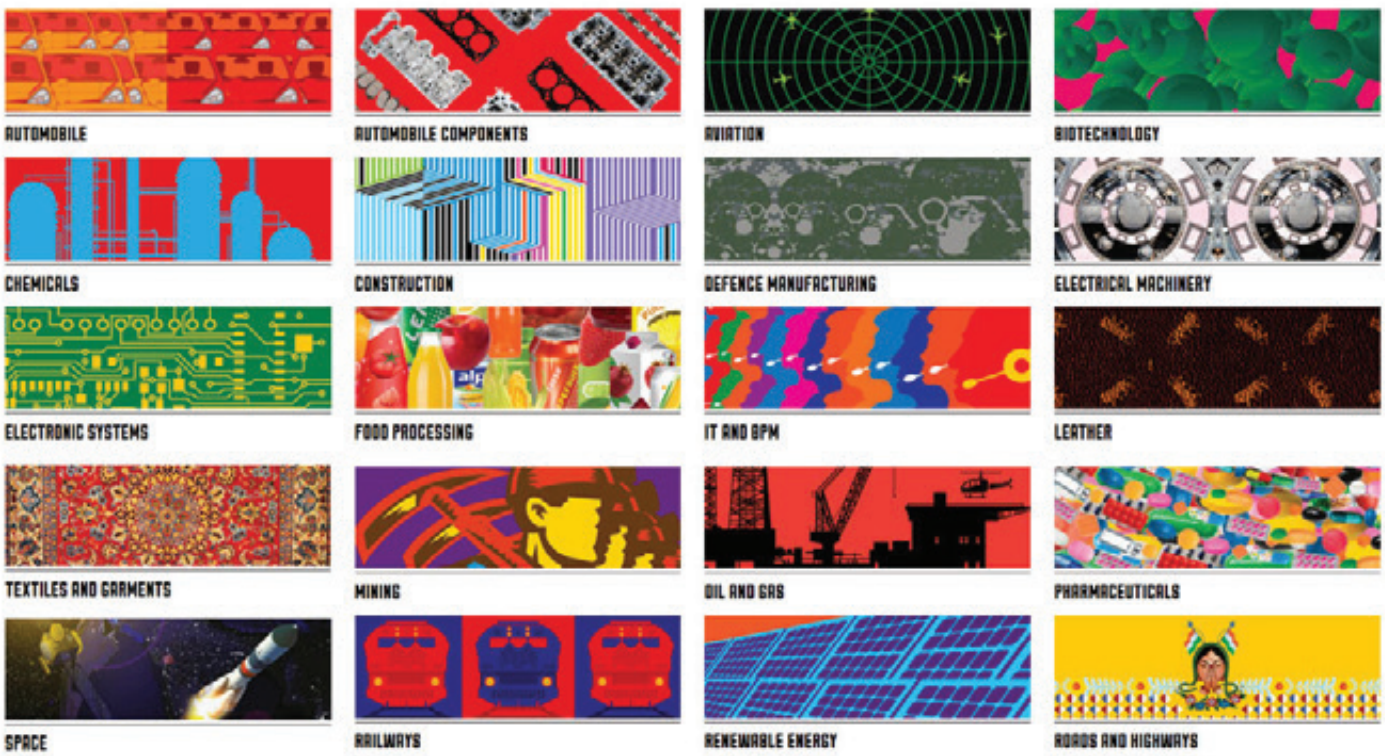

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There are a lot of areas where plastic applications are yet to enter, leave alone dominate. This ranges from high-end medical applications to run-of-the-mill packaging applications. E.g., we still have Roto moulding applications geared largely towards water tanks. The application has global usage in varied industries like transportation and toys, something we have not witnessed yet.

4. **Per Capita Growth:**

India's low per capita consumption, at 15 kgs, remains the biggest growth opportunity. Though this per capita number has been increasing at 15-18 per year each year (this number was 12 kgs in 2016), it is still paltry compared to the top two consumption countries: seven times (the US at 112 kgs) and four times (China at 62 kgs).

Indian Poly-Ethylene consumption (4.6 kgs) is still roughly equal to that of Polypropylene (4.4 kgs). With increasing urbanisation and a shift towards packaged and pre-packaged products, will increase by 40 per cent over the coming few years.

Increased consumption of packaged food & beverages, and increased spending on mobile phones, automobiles, and other electronic devices, will shape a lot of patterns.

5. **Global Trade & China Factor**

Although many high-valued finished products are still imported, there is now considerable investment in plastics processing operations, driving polymer demand upwards. With a higher per capita income, the demand for personal care and hygiene products has increased leading to an increased demand for plastics.

Industrial opportunities for the Indian market have further arisen from disruptions in the Chinese polymer supply chain due to even stricter environmental norms creating uncertainty in the market. This has mobilised international buyers to shift their sourcing destination from China to India.

Indian plastic and polymer manufacturers are, therefore, on the lookout to upgrade their technology to gain credence in a rapidly digitising global market. This in turn establishes a playing field for machinery manufacturers, robotics & industrial automation service providers, as well as polymer R&D companies to target Indian manufacturers.

India stands third in polymer consumption globally after China and the US. Although demand for Polymers has increased 20 times in the past 20 years, compared to the 1.5x population increase in the same period. This is quite low compared to the global average.

6. **Circular Economy**

There is a circular economy principle at play here. A gravitating trend toward sustainability and value-added principles for balancing the social, environmental, and economic ramifications of innovation has accelerated the polymer industries' transition into a sustainable business culture.

Increased consumer demand for environmentally friendly products is helping these committed businesses meet their sustainability targets through a shift towards responsible investing and new standards and a reduction in greenhouse gas emissions. The lightweight and durability factor of polymers has further motivated a shift from the use of metal-based components across industries, to polymer-based parts.

The Way Ahead

More investments, specifically in infrastructure and consumer electronics will ensure that India becomes a hub for plastic products, leading to increases in plastic production. Reinforced plastic is now being tried in a big way, to become the best alternative to metal components in demand from sectors like construction, aerospace, pharma, military, etc., utilising reinforced plastics on a large scale owing to their versatility, lightweight and durability.

Some other growth sectors that are looking to drive the impetus on India's polymer ecosystem supply-demand, are solar energy, rail, road & port infrastructure, packaging, and defence. New joint ventures and R&D spending can help us attain a more proactive Polymer supply chain that can sustain the growth of >8 per cent.

India already enjoys the industry ranking of the world's largest two- & three-wheeler manufacturer, with some 29 odd two-wheelers sold per minute. We are now also the world's largest vaccine maker, virtual incubator, second largest smartphone manufacturer.

To truly make it India's decade, India's polymer industry will play an instrumental role.

Sustainable And Cost-Efficient Surface Finishing Of Balancing Weights

The case study throws light on how Rösler's Smart Solutions helped Wegmann Automotive Production Systems attain technical and economic benefits for its cleaning and recycling process.

Today centrifuges are the most used systems for cleaning and recycling the process water required in mass finishing operations. For example, the globally leading supplier of balancing weights, Wegmann Automotive, is utilising a fully automatic Rösler centrifuge, model Z1000. As a pilot customer, Wegmann expanded the software for its centrifuge with the 'advanced version' of the innovative digital process water management system from Rösler Smart Solutions. Compared to the previously practised manual process control, the new software package with its digital algorithms has produced considerable benefits. It helped not only to improve the overall product quality but also resulted in substantial cost savings.

When it was founded in 1882, the company initially was building carriages. From these modest beginnings, Wegmann expanded into a corporate entity with three different business units. In their respective fields, all three units are global market and technology leaders. The Krauss-Maffei Wegmann GmbH & Co. KG develops and produces a wide range of products in the field of national defence. Schleifring GmbH is a leading provider of systems for the transfer of energy, electrical signals, data and electronic media. With a huge portfolio of balancing weights, tire valves, battery terminals, and tire pressure control systems, including suitable service kits and special weights, Wegmann Automotive GmbH supplies not only numerous automobile manufacturers but also serves the entire automotive aftermarket. The company, located in Veitshöchheim, Germany, produces more than one billion components per year. As a global leader in balancing weights, Wegmann Automotive produces percussion and adhesive weights for steel and aluminium wheels.

Mass Finishing Operations Must Meet Stringent Demands

The balancing weights are made as stampings from steel and galvanised steel as well as die-castings from zinc or zinc alloys. Eugen Weizel, the department manager for mass finishing and coating at the Wegmann Automotive company, explains, "After the stamping or die-casting process the weights undergo a part-on-part mass finishing operation in a rotary vibrator. The goal is to completely remove the residual oil left over from the stamping process and the water-based mould release agent left over from the die-casting operation. At the same time, the utilised compound provides corrosion protection for the steel parts. On the other hand, the zinc die-castings require a certain surface tension for the subsequent coating step. The surface tension is carefully monitored and controlled." Weizel's colleague Manuel Salomon, as WAPS (short for Wegmann Automotive Production Systems) responsible for setups in the coating department, training and lean Management, adds, "A high compound concentration in the process water is beneficial for the corrosion protection on the steel parts. But if it is too high, we will not achieve the required surface tension on the zinc components. This can cause inadequate coating results and may even force us to scrap some products."

Product Quality Depends On The Quality Of Process Water

Since the process water is recycled, the process water cleaning operation with a fully automatic Z1000 centrifuge from Rösler and the control of the compound concentration are key factors that determine the quality of the balancing weights. Salomon continues, "When the mass finishing machine and the centrifuge were commissioned, we quickly recognised that there is a close correlation between the process water quality and the quality of our products. Therefore, we carefully measured the compound concentration once

per week and recorded the measured results. This allowed us to precisely define the compound concentration for our finishing process and correct it as needed." Since measuring and recording the concentration values was quite time-consuming, Wegmann gladly accepted Rösler's offer to utilise the advanced version of the "digital process water management system" as a pilot user. Weizel concludes, "We quickly recognised the benefit to further develop and refine the software package together with Rösler, and, at the same time, to deepen our process knowledge."

The new, interactive monitoring and control system for process water cleaning and recycling with semi- and fully automatic centrifuges is integrated into the centrifuge controls and allows the monitoring, recording and evaluation of all relevant process parameters. At Wegmann, this includes measuring the compound concentration by titration or refraction (BRIX), the pH value, the process water conductivity, the water hardness, the microbiological contamination with bacteria, yeast and fungi, chloride contents, CSB value (chemical oxygen demand) and BIT concentration (biocide in the process water. The system also monitors the appearance and the smell of the process liquid. The process water parameters to be monitored can be individually selected and their values adapted to the respective finishing requirements.

In the basic version of the digital process water management system from Rösler Smart Solutions, the samples are taken manually and analysed with suitable measuring devices that can also be supplied by Rösler. After the data have been entered into the system, the algorithm in the software determines if the measured values are within the specified limits. In case of deviations, the dashboard displays suitable actions, which can be immediately implemented. In addition, the technical background and corrective actions are explained in detail. This allows the operator to undertake the measures required to bring back the values into the acceptable range and to secure the desired process stability. Since all parameters are stored in the system, they can be retrieved at any time, for example, in the form of a table or a chart. The latter helps to prevent unwanted and costly downtimes by carrying out necessary process water changes during periods when they are not interfering with the manufacturing operations. The complete documentation of the operational parameters is also a valuable tool to prove the process quality and process stability during quality audits as well as for validation purposes.

Recommended actions can also be called up in case of events that affect the overall quality of the mass-finishing process. This includes foaming during the process, corrosion of the workpieces or insufficient workpiece cleanliness that could negatively affect subsequent manufacturing steps. Salomon comments, "The pointers and recommended actions are extremely helpful. In the past, we measured the process parameters. But when it came to the necessary corrections, we were entirely on our own. And in case of process problems, we had to search for solutions ourselves, or we had to ask for help by telephone. Today the digital system provides all the support we need. This is especially helpful for colleagues with little knowledge of mass finishing and process water cleaning and recycling."

A Simple Solution That Can Be Quickly Implemented

The smart process water management system has been in operation at Wegmann Automotive since the middle of March this year. Weizel remarks, "The software structure is well organised and easily understandable. And the system can be fully utilised after a short training. All critical data are arranged so that they can be viewed at a glance. And the entire information is presented in an easy-to-understand manner."

While in the past the compound concentration was only measured once per week, now it is measured twice, once in the morning and once in the afternoon of a particular day. In addition, the pH value is recorded, and the appearance and smell of the process water are monitored. "This approach provides us with valuable information about our process. For example, the development of the compound concentration tells us that due to a higher volume of oily work pieces we must increase the compound dosing rate to maintain the required process water quality," explains Salomon, continues, "Another example is the microbiological contamination. In the past, we did not control this at all. If the contamination is too high, it can have an adverse effect on the corrosion protection of steel parts."

Significantly Improved Process Stability And Cost-Efficiency

For monitoring the various parameters with the digital process water management system Wegmann Automotive needs about 20 minutes per week. Compared to the once-per-week measurement of the compound concentration this requires about 15 minutes more. But the technical and economic benefits achieved by the digital system are so significant that the company gladly accepts the fact that a bit more time must be invested. Weizel concludes, "With the digital process water management system we find out quickly if, for example, the compound concentration is no longer adequate. Since this could have an adverse effect on subsequent manufacturing steps, we are grateful to have such a valuable, early warning system. Our finishing process is now not only a lot more stable but also more economical." Therefore, it is not surprising that the company is interested in the next version of the digital process water management system from Rösler Smart Solutions. This allows the automatic measurement, evaluation and recording of the process parameters.

Courtesy: Rösler Oberflächentechnik GmbH

Excellence In Innovation: Rajoo Engineering

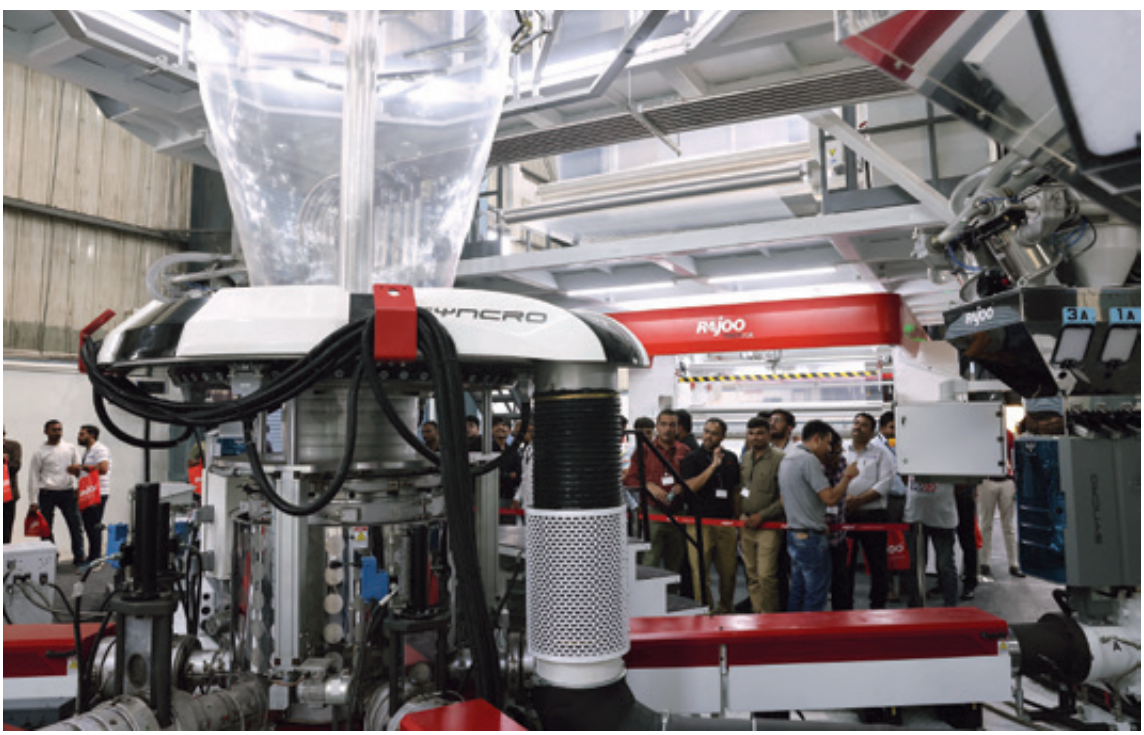
A report on the recent visit to the Rajkot plant of Rajoo Engineering.

Spread across an expansive 2.5 acres of land in the interiors of Rajkot, Gujarat, Rajoo Engineering has been building excellence in extrusion in India and globally for the last 37 years. Building a blend of expertise, excellence and experience, Rajoo Engineering's solutions today include the widest range of mono and multilayer blown film lines (up to nine layers), an impressive range of sheet lines (up to seven layers), water-quenched downward extrusion lines (up to seven layers), lines for PE and PS foamed film and sheets (for various standard and special applications) as well as end-to-end thermoforming solutions. Lines for cross-lamination films and extrusion coating & lamination are the recent additions to the product portfolio. The extrusion lines cover the processing of a wide range of polymers like LOPE, LLOPE, MOPE, HOPE, PP, EVA Surlyn, elastomers, plastomers: barrier materials like Polyamide, EVOH: thermoformable materials like PET, PS, PP and including new generation bio-based & exotic polymers.

Because the company has persistently focused on blown film, sheet extrusion lines, and thermoformers, it currently controls the market in these areas. Technology-driven, Rajoo has developed a reputation for product innovation, high quality, cutting-edge workmanship, increasing energy efficiency, and high levels of sophistication and automation over the past few decades, positioning the company's products on a global platform, and competing with world leaders. With representations in many countries of the world and customers in over 70 countries, the company's exports have multiplied after its debut in the international market in 1990.

Plant Set-up & More...

The 2.5-acre property in Gujarat employs nearly 1200-1400 staff spread across various activities. The company's state-of-the-art R&D department, with nearly 35 engineers, customises machines in-house based on customer



requirements. The engineers use the SAP backend to plan out everything right from designing a machine to material purchasing to the manufacturing of screws, dies, panels, etc.

The company is known for its customised machines based on European machine standards and the customer service attached to them. To provide beyond-par services, the company works extensively on the Make in India motto with its in-house extruder and winder assembly. The plant hosts India's biggest 5-axis die-making machine from DMG Mori – and not just one but three. Additionally, to manufacture its in-house screws, the company uses the Saporiti 400, which takes nearly 30-70 hours to manufacture screws depending on its size. Ultimately, depending on the machine size, Rajoo Engineering takes anywhere between three to six months to build a machine and deliver it to its customers. To date, the company has sold over 4000 machines worldwide.

Launching Ahead And Updates

Constant innovation has what let Rajoo Engineering stay ahead in the Indian market. Their motto of 'excellence in engineering' has been a core driver of the Indian market. Recently, the company launched its new product – Pentafoil® - POD – 5-layer Blown Film Line. Pentafoil®- POD is the latest addition to the portfolio with several advanced features. It incorporates relEX 4.0 Extruders, leading to 27 per cent increased output; CSD 3.0 with a 550 mm die delivering an output of 720 kg/hr; and Flexiwind 3.0 Surface-Center-Gap Winder, with a maximum line speed of 150 MPM. It includes thickness control by air and temperature. It is Industry 4.0 compliant with remote diagnostics and support through Smart Glasses.

Pentafoil® - POD was introduced at Rajoo's open house event at Rajkot, on September 09, 2022, and was well attended by processors from all over the country and even neighbouring nations.

Speaking on the product and its launch, Khushboo Chandrakant Doshi, Managing Director, Rajoo Engineers Limited said:

"We are pleased to share with you all the launch of the latest addition to our portfolio, at our open-house event for 2022 that was in Rajkot today. We have introduced 'Pentafoil®-POD'; the new generation 5-layer blown film line."

She continued, "Pentafoil®-POD is an innovative, state-of-the-art product with 27 per cent higher output and enhanced features such as thickness control by air and heat, flatness enhancer for flat film, fully automatic surface-centre-gap winder and remote diagnostics and support, among others. This product exemplifies our relentless efforts towards product development offering the most 'appropriate technology', which is the core motto of Rajoo Engineers."

"I would like to take this opportunity to thank everyone in the Rajoo family that have worked relentlessly towards continual product development and innovation to enable us to offer not just new products but help us evaluate our customers' needs and endeavour to meet them and walk the extra mile ensuring customer satisfaction," she signed off.

Plastic Recycling On The Rise

It may be good for everyone to be in the plastic recycling business, whether you are a recycler or a producer. New regulations in many countries now require producers to use a higher percentage of recycled content in flexible and rigid packaging products. The instability of raw material prices and supplies also forces plastic producers to better recycle their production waste.

With the great importance of recycled-based plastic products, the global demand for plastic recycling is expanding. Recyclers are now purchasing more advanced technologies and much plastic equipment at once, as well as bigger pelletising extruders.

Cutter-Compactor Recycling Lines

A cutter compactor has a clear advantage, especially for larger-sized recycling extruders. Through natural heat and friction generated from the rotation, it can quickly compact and densify the light-weighted material into a more solid form to be fed into the extruder at a constant rate.

That's why the Repro-Flex model from a Taiwan-based recycling machine manufacturer Polystar has become one of the most popular models among recyclers due to its high level of efficiency and stability in recycling both soft and hard plastic scraps in a variety of forms. As of today, 1,200 Repro-Flex recycling machines are in operation worldwide.

Two-stage Plastic Recycling Machine Adds Flexibility For Recyclers

For recyclers who process washed and fully printed post-consumer waste, Polystar offers an option of adding a second extruder to the Repro-Flex model. Also, having a cutter compactor built in and operating with the same working principles, the two-stage model Repro-Flex Plus has a total of three degassing zones and two filtration steps throughout the entire recycling process. This model is also ideal for processing post-industrial laminated/multi-layered waste.

When processing post-consumer materials, the cutter-compactor reduces the ink and moisture level of the material coming from the washing lines, such as washed flakes (from film and woven bags) as well as regrind waste from milk and shampoo bottles. At the same time, it stabilises the material being fed into the extrusion pelletising line to ensure consistent production output and better pellets quality.

Raffia Palletising Machine

The reusability of recycled pellets has become more important than ever for plastic producers who recycle and reprocess their in-house waste. Besides packaging film producers, woven bag producers now also require higher quality recycling (minimal material degradation) to reduce production costs as much as possible.

The Repro-One recycling technology from Polystar is a combination of a shredder, extruder, and pelletiser in one machine. This one-step, powerful (shredder) yet gentle (low processing temperature) process produces the best possible pellets quality at the lowest operation cost, enabling the producers to reuse all of the pellets back in PP tape extrusion lines.

In India, the requirement for more advanced recycling machines is rising, especially for PP raffia, woven bags, and FIBC producers who need to process their internal waste. More than 105 Repro-One recycling machines have been installed in the sector of India alone, and 350 more around the globe.

Less Expensive to Maintain, Faster Delivery

Lower maintenance cost is a key advantage of using a Polystar. The cost of consumable parts is 2.5~3 times lower compared to European machine suppliers of similar built quality.

As the demand for recycling machines remains strong, Polystar continues to prepare in-stock recycling machines and spare parts to avoid long delivery times, providing their worldwide customers with simple solutions.

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