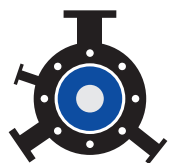


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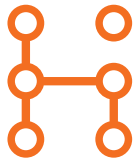
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AD INDEX

| | |
|--|----|
| Aeron Composite Limited..... | 13 |
| Ashtavinayaka Technocrafts Pvt. Ltd. | 7 |
| Dip-Flon Engineering & CoBack Cover Page | |
| Hi-Tech Applicator | 1 |
| Horizon Polymer Engineering Pvt Ltd | 5 |
| Mettler-Toledo India Pvt. Ltd | 9 |
| Mist Resonance Engineering Pvt Ltd | 2 |
| Nickel Alloy Corporation | 11 |
| Sealmatic India Ltd | 4 |
| Vacuum Drying Technology India LLP | 17 |
| VEGA India Level & Pressure Measurement Pvt Ltd. | 15 |

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CONTENTS

GUEST COLUMN

The Case for India as a Strategic CDMO Force in Specialty Chemistry 22



Burjis Godrej
Executive Director, Godrej Agrovet Ltd and
Managing Director, Astec LifeSciences.

Advancing Specialty Chemicals through Sustainable Innovation 25



Mr. Anil Gupta
Founder & Group Managing Director
Krishna Antioxidants Pvt. Ltd.

The Future of Supply Chain Sustainability in Specialty Chemicals 28



Smitha Shetty
Regional Director - APAC
Achilles Information Limited

Indian Specialty Chemicals Industry: Innovation as Catalyst for Future Growth 31



Jeffry Jacob
Partner and Industry Group Leader (Chemicals)
KPMG in India

NEWS FEATURE

Clariant Catalysts wins awards in Best Catalyst and Petrochemical Technology 36



2025 Tata Transformation Prize Recognizes Three Indian Scientists Driving Global Solutions for People and Planet 38

IMPACT FEATURE

Ensure Consistent Quality and Safety with Formulation and Batching Solutions 40



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MICROTECH 42
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NEWS 10

PROJECT UPDATES 19

PRODUCTS 44

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GAIL clocks revenue of ₹35,031 crore, PAT of ₹2,217 crore in Q2 FY'26

New Delhi: GAIL (India) Ltd has reported revenue from operations of ₹69,824 crore for the period April – September 2025 as compared to ₹66,622 crore in corresponding period of financial year 2024-25. Profit before Tax (PBT) for H1 FY26 stood at ₹5,357 crore as compared to ₹7,095 crore for the corresponding period in previous year. Profit after Tax (PAT) stood at ₹4,104 crore in H1 FY26 as compared to ₹5,396 crore in corresponding period of previous year.

The Natural Gas transmission volume stood at 123.59 MMSCMD in Q2 FY-26 and gas marketing volume was 105.49 MMSCMD in Q2 FY26. The LHC and Polymer sale stood at 223 TMT and 209 TMT respectively in Q2 FY26 as compared to 198 TMT and 177 TMT respectively in Q1 FY26. On consolidated basis, revenue from operations stood at ₹71,086 crore in H1 FY26 as against ₹68,803 crore during H1 FY25. PBT in H1 FY26 stood at ₹5,594 crore as against ₹7,583 crore in H1 FY25. PAT (excluding Non-controlling interest) was ₹4,342 crore in H1 FY26 as against ₹5,876 crore in H1 FY25.

Sandeep Kumar Gupta, CMD, GAIL, mentioned that GAIL's Srikakulam Angul i.e. SAPL pipeline has been dedicated to the nation by Prime Minister. Gupta further informed that GAIL has got PNGRB's authorization to lay Vijapur-Bina pipeline involving a capex of ~ ₹450 crore to be completed in three years duration. The company has incurred a capex of ~ ₹1,662 crore during the current quarter, mainly on pipelines, petrochemicals etc., taking cumulative capex upto H1 FY26 to ₹4,838 crore.

Novopor successfully completes TfS sustainability audit



Telangana, Hyderabad: Novopor Advanced Science Private Limited has successfully completed the sustainability audit conducted under the Together for Sustainability (TfS) initiative, marking a significant milestone in the company's commitment to responsible sourcing and environmental stewardship.

The audit, carried out by global consulting firm ERM, resulted in a score of 89.5 and was officially accepted by TfS on 17 October 2025. The audit report is now accessible to all TfS member companies via the TfS platform, reinforcing Novopor's transparency and alignment with international sustainability standards.

Novopor's participation highlights its proactive approach to meeting global expectations in environmental, social, and governance (ESG) criteria.

FAI elects S. Sankarasubramanian as Chairman



The Board of Fertiliser Association of India (FAI) in its meeting held recently has elected S. Sankarasubramanian as Chairman of FAI. S. Sankarasubramanian is the Managing Director and CEO of Coromandel International Limited, one of India's leading agri-solutions providers and part of the Murugappa Group. A Mathematics graduate from the University of Madras, he is a member of the Institute of Cost and Management Accountants of India and an alumnus of the Advanced Management Program at Harvard Business School. He is widely recognised for his sectoral insights, policy advocacy, and strategic leadership across the agri-inputs value chain.

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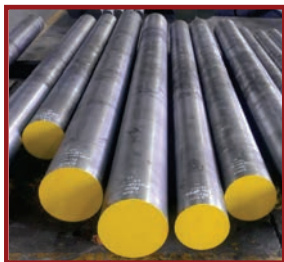


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Coromandel International reports strong Q2 FY26 results; strengthens market leadership

Telangana: Coromandel's total income for the quarter ended September 2025 was at ₹9,771 crore vs. ₹7,498 crore for the quarter ended September 2024. The profit after tax for the quarter was at ₹793 crore as against ₹659 crore for the quarter ended September 2024. Coromandel's total income for the first half was at ₹16,897 crore vs. ₹12,281 crore in the corresponding period of the previous year. The profit after tax for the first half was at ₹1,295 crore as against ₹968 crore in the corresponding period of the previous year.

Commenting on the results, S. Sankarasubramanian, MD & CEO, Coromandel International mentioned, "With favourable monsoons and a strong agrarian sentiment across key markets, the company proactively expanded its sales and distribution efforts to ensure timely availability of fertilisers to farmers. Coromandel's fertiliser plants operated at full capacity and grew sales volumes by 17 per cent in H1 by expanding its presence in existing and new markets, thereby consolidating its position as market leader in phosphatics. The crop protection business delivered a resilient performance, driven by strong growth in technical sales in global markets and healthy traction in domestic formulations segment. The business expanded its product portfolio, launching several new products during H1. The retail business continued its steady expansion, adding around 100 new stores during Q2 and crossed the landmark of 1,000 stores. The company has also announced plans to setup a water-soluble MAP fertiliser facility."

Meghmani sets up wholly owned subsidiary in Brazil

Gujarat: Meghmani Organics Limited (MOL) has incorporated wholly owned subsidiary company under the name 'Meghmani Organics Biodefensivos E Agricolas Do Brazil Ltd.' in Brazil to explore business opportunity in Brazil. The entity is Wholly Owned Foreign Subsidiary (WOFS) of the company, catering to the chemical industry. The objective of new entity is the commercialization, import, export, storage and distribution of chemical products and agricultural pesticides.

KBL's Kirloskarvadi Test Lab earns Hydraulic Institute's Approval, sets benchmark in Pump Industry



Pune: Kirloskar Brothers Limited (KBL) has achieved a landmark milestone as its state-of-the-art pump testing laboratory at Kirloskarvadi, Maharashtra, received approval from the Hydraulic Institute (HI) under its prestigious Pump Test Lab Approval Program. This makes KBL the first company in India to earn this global

GNFC appoints Manoj Kumar Das as Director and Chairman of the company



Government of Gujarat (GoG), Energy & Petrochemicals Department, has appointed Manoj Kumar Das, IAS as Chairman and Director on the Board of Directors of Gujarat Narmada Valley Fertilizers & Chemicals Limited (GNFC). Manoj Kumar Das is currently serving as the Chief Secretary to Government of Gujarat. He is a senior IAS Officer of 1990 batch. He has done B.Tech (Computer Science) from IIT- Kharagpur. He has done specialization in Revenue administration, Urban Management & Civic Issues, Law & Order and Disaster Management. He has also served as Joint Managing Director, Gujarat State Petroleum Corporation Limited (GSPC) and also as Director on the Boards of Gujarat State Petronet Limited, GSPC LNG Limited and Gujarat State Police Housing Corporation Limited.

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Manali Petrochemicals completes sale of Notedome to C.O.I.M. S.p.A for approx. ₹247 crores

London/Chennai: Manali Petrochemicals Limited has completed the sale of its wholly owned step-down subsidiary, Notedome Limited, to Chimica Organica Industriale Milanese (C.O.I.M. S.p.A.), for a total consideration of approximately ₹247 crores. The divestment is part of Manali Petrochemicals strategic portfolio restructuring, aimed at sharpening its focus on its core businesses related its polyols product portfolio and derivatives, within the Indian market. As part of the agreement, Manali Petrochemicals will continue to market its cast elastomers in India under a new trademark. With this strategic acquisition, C.O.I.M. strengthens its international presence in the polyurethane systems sector and further expands its product and service capabilities in key European markets.

Ashwin Muthiah, Chairman of MPL and Founder Chairman of AM International, Singapore, said: "MPL is happy to announce that we have divested our PU Elastomer business of Notedome to optimize MPL portfolio in line with the future strategy of the organisation. This move allows MPL to strategically focus our capital, talent, and R&D efforts on the current, high-growth market segment products with robust and scalable demand - in Automotive, Cold Chain, Construction, Footwear as well as Propylene Glycol derivatives."

UPL's low-methane rice project wins global SBCOP award at COP30 in Food Systems Category

Mumbai: UPL, a global provider of sustainable agricultural solutions, has won the SBCOP Award in the Food Systems category at COP30 in Belém, Brazil. The recognition was awarded for UPL's Low-Methane Rice Project, an initiative aimed at reducing methane



Jai Shroff, Chairman and Group CEO, UPL Group

emissions in rice cultivation across multiple regions. The award is part of the Sustainable Business COP (SBCOP), a global program led by the National Confederation of Industry (CNI) to strengthen private sector participation in climate discussions at COP30 and future summits.

UPL's Low-Methane Rice Project focuses on lowering methane emissions in rice production by developing and cultivating varieties that release less methane and by applying advanced agricultural technologies. This project also aligns with UPL's flagship #AFarmerCan initiative, which empowers farmers globally with tools, knowledge, and sustainable practices to overcome challenges and thrive in a changing climate.

Speaking on the achievement, Jai Shroff, Chairman and Group CEO of UPL Group, said, "This project enables farmers to adopt science-based practices that support productivity and address the environmental footprint of rice cultivation. It strengthens our efforts to build a more resilient and climate-friendly pathway for agriculture."

Archroma Packaging Technologies strengthens global footprint with 3 new COI to support multiple market segments

Pratteln, Switzerland: Archroma Packaging Technologies, a market leader in sustainable packaging solutions, has established three new Global Centers of Innovation (COI) dedicated to driving advancements across key packaging and specialty markets. The three Global Centers of Innovation in Mumbai, India; Prat, Spain; and Charlotte, USA are strategically positioned within the fastest growing regions of each market.

The first global COI to open was in Mumbai, India on September 5th, 2025. The Center has been built with state-of-the-art equipment to cater to the numerous product verticals serviced by Packaging Technologies within the flexible packaging and wood market segments.

Dinakar Gnanamgari, VP, Innovation & Portfolio Expansion, Archroma Packaging Technologies, said,

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“The COI in Mumbai will focus on providing sustainable and value-added solutions to serve important end market segments in the Asia Pacific region and will work in close collaboration with our regional application centers.”

The second Center of Innovation in Prat, Spain opened on September 17th 2025, further enhancing Archroma Packaging Technologies global footprint within Europe. This center’s focus will be on tape and label and is equipped with advanced laboratories and state-of-the-art equipment to better support customers in advancing performance, circularity and sustainability of packaging solutions, and to develop the next generation of tape and label solutions.

The third COI will open later this year in Charlotte, North Carolina, USA with a focus on fiber and board packaging and biomaterials.

Bhageria Industries commences commercial production of New Product ‘Plasticizers & Ethoxylates’

Mumbai, India: Bhageria Industries Limited, a specialty chemicals manufacturer, has launched new plasticizers and ethoxylates product line. The launch was enabled by the consent to operate granted by the Maharashtra Pollution Control Board (MPCB). The newly launched plasticizers are engineered to enhance polymer properties — notably flexibility and durability in PVC — which are critical for applications in cables, flooring, footwear, and automotive components. The company aims to serve both domestic and international markets, leveraging increasing demand in polymer-based value chains.

The company is also planning to expand its H-Acid production capacity from 400 metric tonnes per month (MT/M) to 500 MT/M at Tarapur facility. This 100 MT/M capacity addition is expected to be completed within six months, with an estimated investment of ₹5 crore, funded via internal accruals. Given that current capacity utilization stands at roughly 95 percent, the expansion is projected to add approximately ₹50–55 crore to annual revenue, helping the company meet growing demand in the dyes and pigments sector.

BASF and Carlyle reach binding transaction agreement to create standalone company

Ludwigshafen, Germany, and Washington DC: BASF and funds managed by global investment firm Carlyle, in partnership with Qatar Investment Authority (QIA), have entered into a binding agreement relating to BASF’s automotive OEM coatings, automotive refinish coatings, and surface treatment businesses.

Working closely alongside management, Carlyle will support the future growth of the business through investing in its commercial capabilities, innovation pipeline, and organizational structure to enhance customer focus. Carlyle will leverage its strong track record and extensive experience in successful carve-outs of industrial and chemical assets, following previous investments in Axalta, Atotech, and Nouryon.

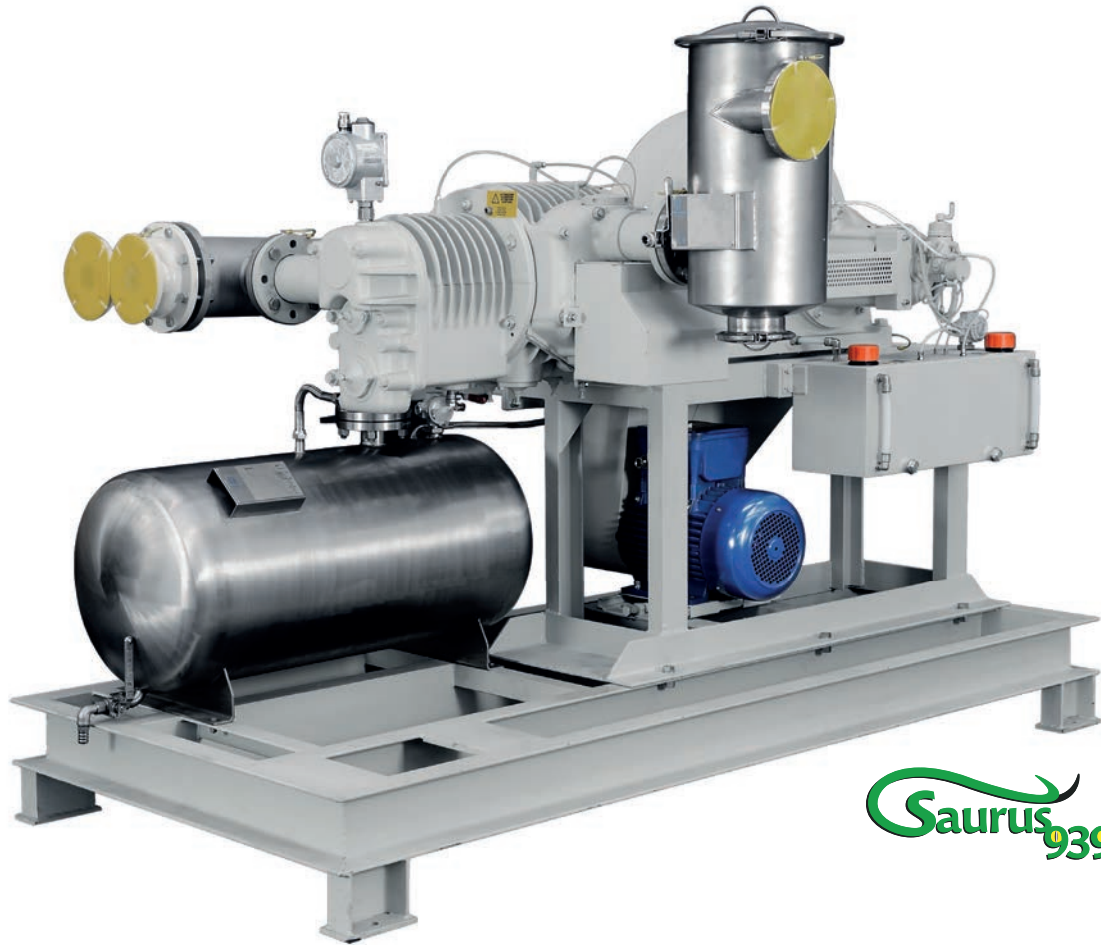
The enterprise value of the transaction amounts to €7.7 billion. Subject to customary regulatory approvals, the transaction is expected to close in Q2 2026. This transaction, together with the already closed divestiture of the decorative paints business, value BASF’s entire Coatings division at an enterprise value of €8.7 billion and an implied 2024 EV/EBITDA multiple before special items of approx. 13x. BASF will also reinvest in the coatings business holding a 40 per cent equity stake and will receive pre-tax cash proceeds of approx. €5.8 billion at closing of the transaction.

BASF Coatings is a global player in the development, production and marketing of innovative and sustainable automotive OEM and refinish coatings as well as applied surface treatments for metal, plastic and glass substrates in a wide range of industries. The business operates in Europe, North America, South America and Asia Pacific, and generated sales of approx. €3.8 billion in 2024.

Sekisui Chemical, Fujitsu, and SAP Japan announce comprehensive modernization of management platform

Japan, Tokyo: Sekisui Chemical Co., Ltd, Fujitsu Limited, and SAP Japan Co., have announced the comprehensive modernization of Sekisui Chemical’s management platform. This modernization project aims to enhance data-driven and agile management

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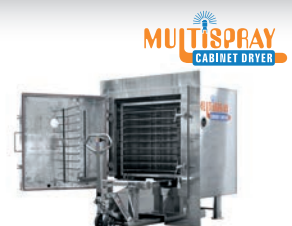
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decision making by implementing SAP S/4HANA® Cloud (1) as the new core system. The first phase, focusing on accounting systems, commenced in April 2025. Moving forward, SAP S/4HANA Cloud will be gradually rolled out to approximately 100 Sekisui Chemical Group companies around the world, enabling Sekisui Chemical to centralize and unify administration and data management across its group companies globally, while also standardizing platforms for sales and purchasing management in addition to the accounting foundation.

Fujitsu, leveraging its original methodology (2) – a culmination of over 40 years of experience as a global SAP partner – provided robust support for the execution and implementation of SAP S/4HANA Cloud and other solutions, including SAP® Business Technology Platform (3). For this project, Fujitsu utilized its Japan Global Gateway and Global Delivery Center in India to establish a system for speedy and high-quality core system modernization. SAP Japan will continue to support Sekisui Chemical in building a management foundation.

Harbour Group's Americo acquires Fusion Chemical

Missouri: Americo Chemical Products, LLC, a Harbour Group company, has acquired Fusion Chemical. Fusion, founded in 2012 by Matt East, formulates and manufactures specialty metalworking fluids. These fluids are designed for both high performance results and low environmental impact and include a full line of next-generation specialty lubricants and coolants used across multiple machining and stamping applications. The company is based in Huntington, Indiana. "We are very excited to add Fusion's Hybrid-Cool product to our offering – it's a game-changer for the industry," commented Chris Bozin, President of Americo.

Harbour Group is a family-owned business based in St. Louis, Missouri that works closely with companies to develop and implement growth-oriented strategies anchored in operational expertise. Harbour Group's companies are engaged in manufacturing and distribution across diverse industries, including pet grooming products, specialty chemicals, outdoor living products, specialty fittings, supply chain condition monitoring solutions, remote monitoring solutions, control solutions, thermal management solutions, professional diagnostic and repair tools, and auxiliary

plastic processing equipment. Since its founding in 1976, Harbour Group has acquired 235 companies in 51 different industries.

Americo is a leading provider of innovative chemical solutions for industries that require surface treatment of metal and other substrates, as well as waste-water treatment. The company, which is headquartered in Elgin, IL was founded in 1989 by Chris Bozin.

Sterling Specialty Chemicals to acquire a portion of Halliburton's Multi-Chem business



Houston, US: Sterling Specialty Chemicals has signed a definitive agreement for the acquisition of a portion of Halliburton's Multi-Chem business. The Multi-Chem business brings a strong heritage of delivering value to customers through services and high-performance specialty chemicals across completion, production, midstream, and downstream applications, with capabilities spanning stimulation chemicals, production chemicals, and advanced water-treatment formulations. The business operates a diversified footprint, featuring five advanced chemical facilities across the U.S. and the Middle East — including the state-of-the-art Desert Rose plant in Jubail, Saudi Arabia — as well as 10 U.S. field locations and key sites such as Geismar, Bayport, Sonora, and the Houston R&D center.

These assets significantly enhance Sterling's manufacturing, R&D, and service capabilities, enabling us to accelerate our growth beyond traditional oil and gas markets and deliver innovative, high-quality chemical solutions to global customers. ■

Chemdist enters joint venture with JNK India, forms JNK Chemdist Technologies



Chemdist Group has entered into a strategic joint venture with JNK India Ltd, a global EPC leader, Transforming Chemdist, as JNK Chemdist Technologies Pvt. Ltd. This partnership unites Chemdist's process engineering and technology expertise with JNK India's proven EPC execution capabilities, enabling us to deliver larger, more complex turnkey projects with greater speed, reliability, and scale. The tie up will also give an opportunity to leverage Chemdist's IP in Green Hydrogen, Green Chemicals and advanced process technologies with JNK's global reach. The company will also gain the capability to handle mega projects with higher value (single project of 25 million dollars), complexity, and aggressive timelines.

Toyo Ink India to boost liquid ink production capacity by 1.5 times



Toyo Ink India's Gujarat Plant

Gujarat: Toyo Ink India Pvt. Ltd., a member of Japan's artience Group, has planned to expand liquid ink production at its Gujarat plant, to meet burgeoning demand from the country's packaging market. The new facility, which is scheduled to be operational in 2028, is expected to boost the company's total production capacity by approximately one-and-a-half times.

"The decision to expand production capacity comes at a time when our Gujarat plant is nearing full capacity amid India's surging demand," explains Shekhar Barua, head of the liquid ink and plastic colorant business units at Toyo Ink India. "This expansion marks a pivotal step in our journey to lead India's liquid ink market. By scaling up capacity and strengthening our sustainable portfolio, we are committed to delivering innovative solutions that meet evolving customer needs. Our Gujarat plant will not only serve India but also position us as a regional export hub for future growth."

Toyo Ink India's liquid ink operations was launched in 2011 as an import business. Local production began in 2013 when the Delhi plant commenced operations, followed by the Gujarat plant in 2021.

Yasho Industries inaugurates R&D Centre at Pakhajan, Gujarat

Mumbai, Maharashtra: Yasho Industries Limited (YIL), a manufacturer and supplier of specialty and fine chemicals, has inaugurated its advanced Research & Development (R&D) centre at Pakhajan, Gujarat. The new R&D facility, established with a capex investment of ₹23 crore as part of the company's FY26 annual capex plan of ₹100 crore, is a key pillar in Yasho Industries' innovation roadmap. The centre will enhance product development capabilities and process optimization for both domestic and global markets across industrial and consumer segments.

Equipped with cutting-edge analytical and testing instruments, the lab will house a team of 40 specialized chemists and researchers focused on developing high-performance, sustainable solutions in performance chemicals, lubricants, rubber, and specialty polymer applications. Speaking at the inauguration, Parag Jhaveri, Managing Director & CEO, Yasho Industries Limited, said, "The new facility will accelerate product development for our global customers and strengthen our position as a preferred partner in the specialty chemicals space."

With this expansion, Yasho Industries Limited further strengthens its commitment to science-driven innovation, operational excellence, and sustainable chemical manufacturing.

PROJECT UPDATES

Stallion India Fluorochemicals commences groundwork for R-32 manufacturing facility in Rajasthan



The new project is expected to be commissioned by July 2026

Mumbai, Maharashtra: Stallion India Fluorochemicals Limited (SIFL), a leading integrated refrigerant and industrial gas company, has successfully completed the *Bhoomi Pooja* ceremony for its upcoming 10,000 MT R-32 manufacturing facility in Bhilwara, Rajasthan. This milestone marks the formal commencement of groundwork for the project. All key contracting and technology transfer arrangements have been finalized and construction work at the site will begin from 1st November 2025.

Shazad Rustomji, Managing Director & CEO, Stallion India Fluorochemicals Limited, said, "The *Bhoomi Pooja* at our Bhilwara site marks a defining moment in Stallion's journey towards becoming a fully integrated fluorochemicals enterprise. The Bhilwara facility represents a major step forward in our long-term vision of backward integration and self-reliance in fluorochemicals manufacturing. It will provide us with strategic control over key raw materials, enabling sustainable and cost-competitive operations for the years ahead. The project, involving an investment of around ₹200 crores, is targeted for completion within nine months with commissioning by July 2026. Once operational, it is expected to generate a topline of approximately ₹500 crores with a PAT margin in the range of 22-24 percent, reinforcing our growth momentum and profitability trajectory."

BASF completes sale of its Brazilian decorative paints business to Sherwin-Williams

Ludwigshafen, Germany : BASF completed the sale of its Brazilian decorative paints business to Sherwin-Williams, following the approval of the transaction by the relevant Brazilian competition authority. On a cash and debt-free basis, the purchase price amounted to \$1.15 billion.

The transaction included the production sites in Demarchi and Jabotão, related contracts, the Suvinil and Glasu! brands, and the around 1,000 employees. The decorative paints business, which generated sales of approximately \$525 million (approximately €485 million) in 2024, was BASF's only sizeable B2C business. It has a wide portfolio of paints and paint preparation products as well as digital solutions. The business operated almost exclusively in Brazil and had only limited synergies with other coatings businesses within BASF.

Novoloop® and Shanghai Huide Science & Technology join hands to scale Lifecycled™ TPU Production



Novoloop has developed a proprietary chemical process that converts post-consumer polyethylene waste into virgin-quality Lifecycled™ polyols and polyurethane.

Düsseldorf, Germany: Novoloop®, a U.S. technology pioneer in circular innovation, has entered into a strategic partnership with Shanghai Huide Science & Technology Co., Ltd. to scale the production of Novoloop's Lifecycled™ thermoplastic polyurethane (TPU). The collaboration is formalized through a five-year contract manufacturing agreement, which establishes long-term clarity on supply, pricing, and quality standards.

Novolop has developed a proprietary chemical process that converts post-consumer polyethylene waste into virgin-quality Lifecycled™ polyols and polyurethane. This breakthrough technology enables materials traditionally made from fossil resources to be sourced instead from hard-to-recycle waste plastics.

Huide has spent nearly 30 years advancing polyurethane technologies, developing an end-to-end capability from R&D and process scale-up to manufacturing and supply-chain management, providing the foundation to translate material innovation into scalable industrial solutions.

BASF inaugurates expansion of production capacity for Alkyl Polyglucosides in Thailand



Senior officials of BASF at the inauguration of the APG plant in Bangkokong site, Chonburi, Thailand.

Chonburi, Thailand: BASF has expanded its Alkyl Polyglucosides (APGs) footprint in Asia with a new plant at the Bangkokong site in Thailand. BASF currently produces APGs at sites in Düsseldorf, Germany; Cincinnati, Ohio; and Jinshan, China — forming a robust global network to meet diverse industry needs. The expansion in Bangkokong strengthens regional supply capabilities in Asia, while a new APG production line in Cincinnati, scheduled for completion in 2026, will further enhance capacity in North America.

APGs are bio-based and readily biodegradable, and mild secondary surfactants derived from 100 percent natural, renewable feedstocks. They are widely used in various applications across personal care, home care, industrial & institutional cleaning, industrial formulations, and agricultural markets.

Godrej Agrovet signs MoU with Andhra Pradesh State Government for ₹70 crore investment

Mumbai/Visakhapatnam: Godrej Agrovet Limited (Godrej Agrovet), one of India's largest diversified agri-food businesses, has signed a non-binding Memorandum of Understanding (MoU) with the State Government of Andhra Pradesh (AP). Under this MoU, the company would be investing ₹70 crore to expand the dairy processing and value-added product capacities in its dairy business and set up new Samadhan Centers – one-stop solution center for oil palm farmers.

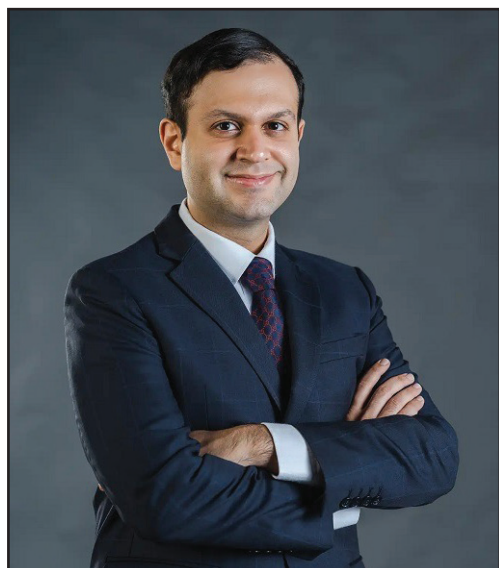
Godrej Agrovet's wholly owned subsidiary Creamline Dairy Products Limited, which sells products under the brand name Godrej Jersey, will be expanding its dairy processing and value-added products capacities in three phases. The company's oil palm business, a largest oil palm processor in India and working directly with the farmers for the entire lifecycle of the crop, will be establishing five new Samadhan Centers. Samadhan is a one stop solution centre that would provide a comprehensive package of knowledge, tools, services and solutions to oil palm farmers.

Rockwell Automation to build new greenfield manufacturing site in Southeastern Wisconsin

Milwaukee: Rockwell Automation, Inc., the world's largest company dedicated to industrial automation and digital transformation, has planned to build a new greenfield manufacturing site in Southeastern Wisconsin. The project marks the next step in the company's previously announced \$2 billion investment in plants, digital infrastructure, and talent to grow share, build resilience, and expand margins over the next five years.

This new facility will span more than 1 million square feet of manufacturing and warehouse space and will be equipped with advanced automation, robotics, and digital systems that will showcase modern manufacturing and demonstrate Rockwell's leadership in industrial automation. ■

The Case for India as a Strategic CDMO Force in Specialty Chemistry



Burjis Godrej

Executive Director, Godrej Agrovet Ltd and
Managing Director, Astec LifeSciences

The next wave of specialty chemicals requires precision at the lab and reliability at the plant. Many global players are discovering that this dual capability is in short supply. India has been closing that gap through expanding its Research & Development (R&D) infrastructure, strengthening its analytical and process development expertise, and upgrading manufacturing through high-performing sustainable technologies. The result is a sector that is no longer defined by pricing advantage alone, but by its ability to deliver Contract Development and Manufacturing Organization (CDMO) solutions that meet global standards for quality, safety and sustainability, emphasizes **Burjis Godrej, ED, Godrej Agrovet & MD, Astec LifeSciences.**

Geopolitical tensions, energy volatility and China+1 strategies have reshaped procurement decisions across the world. Buyers are no longer looking for low-cost, transactional suppliers; they are seeking long-term partners who can co-develop chemistries, protect IP, ensure supply continuity and meet stringent ESG norms.

This shift plays to India's strengths. It is reported that **India's chemical exports (excluding pharmaceuticals and fertilizers) rose to ₹3,73,285 crore¹ in FY 2023–24**, and the sector now accounts for 10.31 percent of India's total exports.

Process Technology: A Competitive Lever

A defining change in the Indian ecosystem has been the diversification of process technologies used for commercialisation. Companies are investing in high-pressure and high-vacuum systems for complex reactions, automated process controls that reduce variability, multi-purpose plants capable of handling diverse chemistries, and in-house engineering talent to optimise energy, emissions and yields.

This modernisation is not just technological; it is also strategic. According to a recent annual report, India's total chemical production capacity is projected to

increase² from 257 MMTPA to 310 MMTPA by 2028, signalling serious scale-up intent. For Contract Development and Manufacturing Organization (CDMO) work, this matters because global customers want partners with demonstrated throughput, regulatory discipline and long-term operational stability.

Rising Scientific Depth in CDMO Offerings

The strongest CDMO relationships begin in the lab, long before a molecule reaches the plant. India has built credible strength here. Research teams across the country are working on reaction optimisation, catalytic improvements, solvent systems, purification strategies and routes that reduce impurities at source. These capabilities are the backbone of specialty chemical development; they influence yield, cost, safety and environmental performance in direct and measurable ways.

In recent years, laboratories have expanded into pilot units equipped with continuous flow, process-intensification tools and advanced analytical systems. This integrated setup reduces the distance between molecule design and industrial execution. It also gives global customers a more predictable scale-up environment: one of the most valuable attributes in CDMO partnerships.

Innovation and IP as long-term value creation

CDMO relationships increasingly hinge on the ability to co-develop differentiated chemistries. Indian companies are strengthening their innovation pipelines by focusing on greener routes, biodegradable additives, energy-efficient intermediates and performance materials that align with global regulatory expectations.

Central to this is the creation of intellectual property. Industry-academia partnerships, shared pilot infrastructure and structured co-development agreements are helping Indian firms secure IP positions that carry long-term commercial advantages. The commercial model is shifting: rather than competing only on capacity or cost, companies are competing on originality, problem-solving and the ability to move an idea from concept to compliant production.

Embedding Sustainability into Manufacturing Systems Efficiency

Sustainability has shifted from a nice-to-have to a must-have in CDMO partnerships. Global customers

In recent years, laboratories have expanded into pilot units equipped with continuous flow, process-intensification tools and advanced analytical systems. This integrated setup reduces the distance between molecule design and industrial execution. It also gives global customers a more predictable scale-up environment: one of the most valuable attributes in CDMO partnerships.

increasingly demand transparency on metrics such as solvent recovery, energy intensity, waste streams, and carbon emissions.

Indian companies know this. Several are building solvent-recycling systems, integrating heat recovery, and improving yields through catalytic and process optimisation. These efforts align directly with international ESG standards, making India a credible partner for climate-conscious firms.

Recent reports indicate meaningful progress in resource circularity across India's chemical sector. On the ground, this takes the form of heat-integration upgrades, continuous reaction systems, green hydrogen pilots, biomass-based steam and closed-loop water systems. R&D teams are using digital tools and predictive analytics to cut solvent use, reduce reagent waste and optimise process mass intensity. Some companies have already achieved³ 36 per cent carbon reduction, 47 per cent water reduction and 51 per cent waste reduction.

Policy Support that Enhances Competitiveness

Government policy continues to reinforce this direction. Incentives for green technologies, tax support for R&D investment and the creation of chemical clusters with testing and analytical infrastructure are reducing barriers for companies moving into advanced manufacturing.

Schemes aligned with sustainability and "Make in India" goals have created fertile ground for long-term investment. Faster regulatory timelines, stronger environmental compliance infrastructure and support for pilot-scale commercialisation can accelerate this momentum further.

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For India, the opportunity is clear: evolve from being a dependable supplier to becoming a strategic development and manufacturing partner for the world.

From Supplier to Strategic Partner

Global companies are reassessing how they structure their supply chains. They want resilience, but they also want collaborators who can contribute to molecular design, streamline pathways, strengthen ESG profiles and deliver high-quality intermediates consistently.

India has the ingredients to meet this demand: scientific depth, manufacturing maturity, a large engineering workforce and the operational flexibility required for specialty molecules. What now matters is pace. The countries that respond fastest to this shift will define the next decade of CDMO alliances.

For India, the opportunity is clear: evolve from being a dependable supplier to becoming a strategic development and manufacturing partner for the world. ■

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Advancing Specialty Chemicals through Sustainable Innovation



Mr. Anil Gupta

Founder & Group Managing Director
Krishna Antioxidants Pvt. Ltd.

India pledged to achieve net zero emissions by 2070 at the 2021 COP26 Summit in Glasgow. This landmark commitment has catalysed a transformation across industrial sectors. Out of all, the specialty chemicals industry has emerged as one of the most proactive, aligning its growth trajectory with sustainability goals. The sector accounts for roughly 4 per cent of India's total greenhouse gas emissions and traditionally energy-intensive processes have positioned it at the forefront of the country's green transition. **Anil Gupta, Founder & Group Managing Director, Krishna Antioxidants Pvt Ltd**, emphasizes further on sustainable innovation.

The global supply chains are now undergoing a structural shift towards sustainability and in line with this, Indian specialty chemical manufacturers are actively embedding sustainable innovation at every stage. Sourcing, process design, waste recovery and energy management are a part of this process. The result is a new paradigm where economic competitiveness and environmental stewardship are no longer mutually exclusive but mutually reinforcing.

Indian specialty chemical companies are moving towards technologies like low-carbon manufacturing,

sustainable innovation and renewable feed stocks. This evolution shows a broader global shift. Sustainability is no longer a peripheral consideration; it is becoming central to long-term business viability.

Decarbonising: Innovation and Collaboration

The complex value chains are one of the key challenges in decarbonising specialty chemical manufacturing. Life Cycle Assessment (LCA) studies show that a significant portion of emissions, often Scope 3 (upstream), arise from raw material extraction and supply chain operations instead of direct production.

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Indian companies are now adopting cross-sector collaboration and technology-oriented partnerships to address this challenge. Organisations in the specialty chemical segment are now aligning their R&D and collaboration efforts with process routes and formulations to reduce hazardous by-products and improve overall atom economy. Innovations emphasise process safety, solvent recovery and safer reaction pathways tailored to specialty additives and intermediates. These initiatives reduce direct emissions and help upstream suppliers and downstream customers lower their scope-3 impact through cleaner formulations.

Waste to Wealth: Circular Economy

The circular economy model is another important lever for sustainability. It focuses on waste minimisation and resource recovery maximisation.

A practical approach to circularity starts with a few simple but essential steps — separating waste carefully at its source, recovering solvents and reagents wherever possible, and finding safe, meaningful ways to reuse by-products. Every operation must prioritise safety and integrity, guided by the idea of causing “zero harm” to people, property, or product. Instead of chasing technologies that don’t fit the nature of the business, companies can achieve better results by using tried-and-tested recovery methods — such as solvent distillation or catalyst regeneration — that align with existing chemical processes and maintain both product quality and workplace safety.

Organisations in the specialty chemical segment are now aligning their R&D and collaboration efforts with process routes and formulations to reduce hazardous by-products and improve overall atom economy. Innovations emphasise process safety, solvent recovery and safer reaction pathways tailored to specialty additives and intermediates. These initiatives reduce direct emissions and help upstream suppliers and downstream customers lower their scope-3 impact through cleaner formulations.

In the specialty chemicals segment, polymer intermediates and additives can be regenerated from end-of-life plastics in certain value chains; however, the most impactful circular actions often lie in internal resource recovery and supplier engagement to reduce virgin raw material dependency. Indian manufacturers are piloting closed-loop systems in contexts that fit their product mix, evaluating opportunities where chemical compatibility and product quality can be guaranteed.

Carbon Footprint Reduction and Energy Efficiency

Manufacturers are setting Science-Based Targets (SBTs) to reduce emissions. This is in line with India’s net-zero ambitions.

Sustainability roadmaps in the chemical sector increasingly focus on pragmatic energy decisions: deployment of solar rooftop installations where roof area and regulatory approvals permit; energy efficiency programmes including motors and compressor optimisation; and heat integration to capture and reuse process heat. These measures improve energy intensity and lower operating costs. Where applicable and verifiable, such reductions create opportunities to participate in carbon credit schemes — a potential revenue and investment lever being explored by forward-looking organisations as part of their broader decarbonisation strategies.

Energy audits, ISO 50001 frameworks and investments in waste heat recovery or micro-grids are useful tools for tracking and improving performance. In addition, supply-chain optimisation — more efficient logistics, bulk procurement and reduced freight distances — further contribute to Scope-3 reduction across the value chain.

Meeting Global Sustainability Benchmarks

The International Council of Chemical Associations (ICCA) says that net carbon emissions in global chemical manufacturing is attached to accelerated investments in low and zero-carbon technologies, cross-sector partnerships and research roadmaps.

Indian specialty chemical companies are in alignment with global ESG frameworks, including the UN Global Compact, Responsible Care Certification and Global Reporting Initiative (GRI) standards, strengthening their reputation with global investors and supply chain partners.

ESG governance is being integrated into their corporate strategy as well, establishing a dedicated management layer and focused R&D efforts to achieve key global sustainability milestones.

Digitalization as a Sustainability Enabler

A key enabler of sustainable transformation is digitalization. AI and machine learning are catalysing the predictive process deviations, waste reduction and improving yield optimisation. IoT-enabled monitoring systems allow real-time tracking of emissions and effluents, enabling companies to proactively address inefficiencies.

Block chain technology is also being tested to trace raw materials for ethical sourcing and sustainable procurement. All these tools can improve compliance and enhance customer trust, giving a competitive edge to Indian specialty chemical exporters in global markets.

Way Forward

India's specialty chemicals sector is recognised for its cost advantages and manufacturing excellence. And it is now positioning itself as a sustainability leader. Digital excellence and renewable energy are together creating a new generation of chemical plants.

Government initiatives like Make in India, PLI schemes, and green finance incentives are accelerating this transformation by encouraging investments in R&D, infrastructure, and cleaner technologies.

The specialty chemicals industry sits at a defining moment. By embedding sustainability into its DNA — through innovation, collaboration, and responsible operations — India's chemical sector is not only meeting global benchmarks but also shaping them. ■



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The Future of Supply Chain Sustainability in Specialty Chemicals



Smitha Shetty

Regional Director - APAC
Achilles Information Limited

The future of supply chain sustainability in specialty chemicals hinges on innovation, collaboration, and technology. By building resilient and sustainable supply chains, the specialty chemicals sector is not only responding to global demands for accountability but also unlocking new opportunities for growth and innovation.

The specialty chemicals industry occupies a vital niche, crafting specialized solutions for diverse sectors ranging from pharmaceuticals and agriculture to automotive and aerospace. Unlike their commodity counterparts, specialty chemicals are precisely formulated in smaller batches to meet unique demands, prioritizing quality, safety, and consistency. This focus on tailored solutions drives a thriving market, projected to grow at an annual rate of 5.1 per cent through 2030, fueled by factors such as performance enhancement, sustainability demands, and expanding applications in sectors like healthcare and construction.

This growth trajectory, however, intersects with an increasingly complex landscape where sustainability is no longer a choice but a necessity. Driven by consumer awareness, evolving regulations, and the inherent advantages of responsible practices, the industry is embracing innovation to navigate this new era.

Renewable Sourcing & Circular Economy

Renewable sourcing is a cornerstone of sustainable supply chain strategies for specialty chemicals. By transitioning to renewable feedstocks, companies are reducing their reliance on finite fossil resources and

lowering carbon emissions. The circular economy amplifies these efforts by enabling waste materials to be reused in production processes.

The packaging industry provides an example, where biodegradable materials derived from plant-based chemicals are replacing traditional plastics. Another instance is the growing adoption of bio-based surfactants in the personal care sector, which aligns with consumer preferences for sustainable and ethical products.

Collaboration across supply chains is essential to scale renewable sourcing initiatives. Partnerships between manufacturers, suppliers, and end-users foster innovative solutions, ensuring the viability and scalability of renewable materials.

Green Chemistry: Transforming Processes and Products

Green chemistry has become an important area of focus for the specialty chemicals industry. By designing processes and products that minimize environmental impact, companies are reducing hazardous substances, improving energy efficiency, and enhancing the sustainability of their supply chains. This approach resonates with global efforts to curb emissions and conserve resources while meeting customer expectations for eco-friendly solutions.

For example, the automotive sector is increasingly turning to Metal-Organic Frameworks (MOFs) to enhance fuel storage in vehicles, as these structures optimize energy efficiency and reduce environmental impact. Similarly, bio-based polymers derived from agricultural waste are replacing traditional petroleum-based products in industries ranging from packaging to healthcare. Such innovations demonstrate environmental commitment and offer cost savings through reduced reliance on fossil fuels.

Health & Safety with Sustainability Focus

The specialty chemicals industry has always placed a premium on health and safety. However, the integration of sustainability into these practices is now reshaping the landscape. Advances in digital technology allow for real-time tracking of compliance with Health, Safety, and Environmental (HSE) regulations, providing transparency and reducing risks to workers and the environment. Technology, coupled with periodic ethical

on-site audits, further strengthens the mission of workplace health and safety by ensuring supply chains remain compliant and watchful to HSE issues.

Ethical audits go beyond regulatory compliance by evaluating the real-world application of safety protocols, labour practices, and environmental management. These audits create opportunities to identify gaps that may not be apparent through remote assessments or self-reporting. By engaging with suppliers and their teams on-site, businesses can better understand operational challenges and foster a culture of continuous improvement.

One example is the adoption of closed-loop systems for hazardous chemical handling. These systems safely recycle chemicals, minimizing exposure and environmental contamination. Regular audits ensure that these systems function as intended and that any deviations are promptly corrected, further protecting workers and the environment. Similarly, the development and monitored use of low-toxicity materials reduce inherent risks in production and application, aligning with global sustainability goals like the United Nations Sustainable Development Goals (SDGs). Incorporating ethical audits into their operational frameworks allows companies to drive greater accountability and resilience throughout their supply chains.

AI-Powered Risk Management: Enhancing Resilience

The specialty chemicals industry operates within highly intricate supply chains that are vulnerable to disruptions caused by natural disasters, geopolitical instability, or material shortages. Artificial intelligence (AI) is emerging as a critical tool to mitigate these risks and strengthen supply chain resilience.

AI-enabled risk management platforms provide real-time monitoring of supply chains, identifying vulnerabilities and issuing predictive alerts about potential disruptions. For instance, during the COVID-19 pandemic, AI-driven platforms helped several chemical companies adjust sourcing strategies by predicting material shortages and optimizing inventory management. These systems also offer insights into compliance risks, ensuring suppliers adhere to environmental and safety standards.

By integrating AI into their operations, companies also enhance efficiency. Tools that optimize inventory

management, logistics and procurement reduce waste and minimize emissions. These capabilities are particularly valuable as organizations strive to balance resilience with sustainability. AI-powered systems empower decision-makers to make smarter, quicker and well-informed decisions, helping companies remain resilient and future-proofing them against the evolving landscape.

Supply Chain Visibility & Resilience

Transparency is vital for managing the complexities of specialty chemical supply chains. Multi-tier mapping provides a comprehensive view of supply networks, identifying potential vulnerabilities beyond direct suppliers. Studies have shown that up to 85 per cent of supply chain disruptions occur in sub-tier levels, highlighting the importance of extending visibility across the value chain.

Technology is instrumental in achieving this transparency. For instance, blockchain provides an immutable record of a product's lifecycle, ensuring traceability and compliance with sustainability criteria. Meanwhile, the Internet of Things (IoT) and sensor technologies enable real-time monitoring of conditions like temperature and humidity during transportation, ensuring the safe handling of sensitive chemicals and reducing spoilage.

Companies are also leveraging predictive analytics tools to model scenarios and prepare for potential disruptions. These tools enhance agility, enabling businesses to adapt quickly and maintain continuity in the face of challenges.

Examples of Proactive Supply Chain Strategies

Recent geopolitical shifts have highlighted the importance of supply chain diversification. For example, companies in the electronics sector, such as Apple, have strategically expanded their supplier base to countries like Vietnam and India to reduce dependency on single-source suppliers. This approach is equally relevant to specialty chemicals, where the geographic concentration of raw materials or suppliers can pose significant risks.

In addition to diversification, collaboration with suppliers is key. Gartner reports that 77 per cent of companies are investing in stronger supplier partnerships to drive innovation and mitigate risks. In the specialty chemicals

industry, this could mean engaging with suppliers on sustainability initiatives, co-developing environmentally friendly products, or aligning on shared goals for compliance and transparency.

Role of Technology in Enabling Collaboration

Supply chain sustainability digital platforms are fostering deeper collaboration by integrating supply chain data across stakeholders. For instance, AI-driven monitoring systems can send customized alerts about regional disruptions and provide heatmaps or supplier performance, enabling companies to respond swiftly.

Technology also helps organizations stay ahead of regulatory requirements. Automated systems can monitor evolving environmental and regulatory standards globally and alert compliance officers to changes, ensuring adherence to laws while avoiding costly penalties.

Conclusion

The future of supply chain sustainability in specialty chemicals hinges on innovation, collaboration, and technology. By building resilient and sustainable supply chains, the specialty chemicals sector is not only responding to global demands for accountability but also unlocking new opportunities for growth and innovation. This commitment to a sustainable future will ensure the industry remains a vital partner in addressing some of the world's most pressing challenges. ■

Indian Specialty Chemicals Industry: Innovation as Catalyst for Future Growth



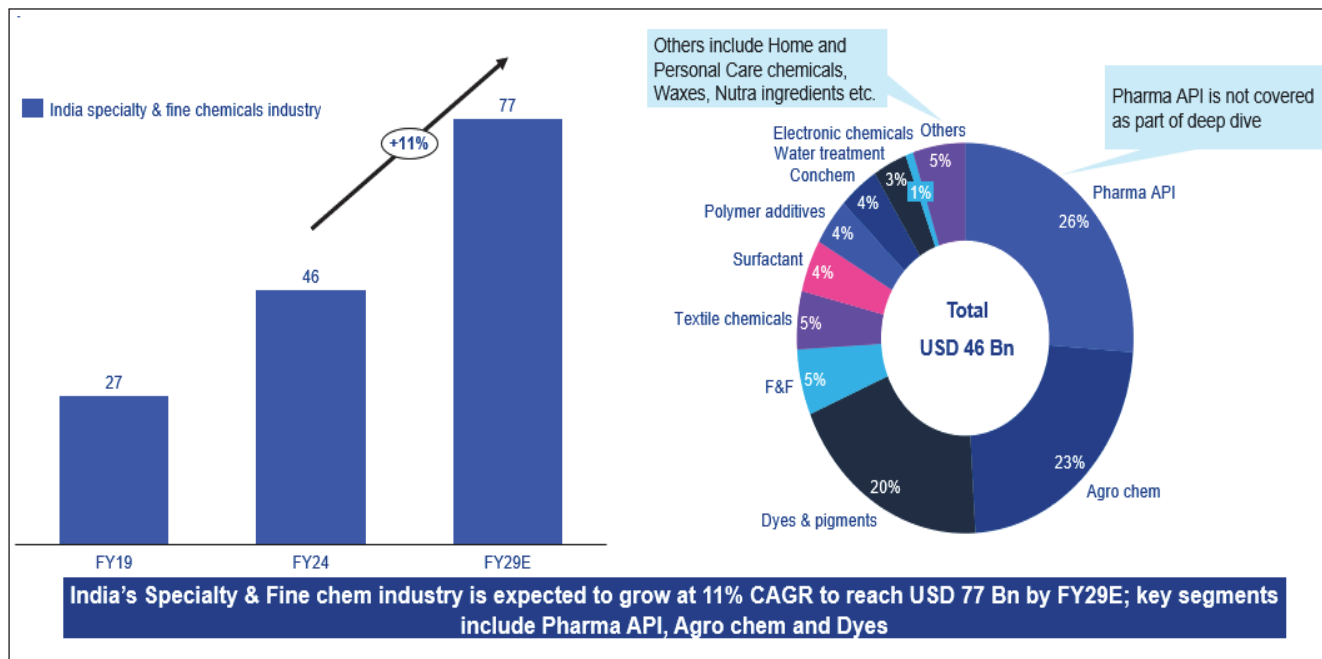
Jeffrey Jacob

Partner and Industry Group Leader (Chemicals)
KPMG in India

The growth of the Indian specialty chemicals industry over the last decade has indeed been remarkable. It has been globally valued for its unique products and high value-addition in diverse end-use sectors, such as pharmaceuticals, agrochemicals, and consumer goods, and represents a key pillar of India's manufacturing and export landscape. But what worked well in the past may not necessarily be the recipe for future success. **Jeffrey Jacob, Partner and Industry Group Leader (Chemicals), KPMG in India**, throws light on the growth opportunities for the Indian Specialty Chemicals industry.

India today accounts for ~4 per cent^[1] of the global specialty chemicals market, with a size of ~USD 46 billion^[2] in FY24. Active Pharmaceutical Ingredients (API), Agrochem, Dyes and Pigments accounts for nearly 70 per cent of this market with a number of well-established domestic and international players operating in the country. Strong domestic tailwinds in the form of increasing per capita usage due to changing customer preferences and shift towards premiumization of end-products, together with increasing consumption is expected to continue to drive strong growth in key segments at over 9-12 per cent^[3] CAGR going forward.

While China is the world leader in the chemicals space driven by its strong ecosystem, availability of raw materials, investment-friendly policies, and dedicated chemical zones, exports from India have been witnessing an increasing uptick in recent times. This was further accentuated by the 'China plus One strategy' being adopted by several MNCs post Covid. The shift was driven by several factors including trade tensions, changes in Chinese manufacturing policy, environmental regulations, and desire for supply chain resilience.



India specialty chemicals market size growth (FY19-29E) and breakup of market (FY24)

India today produces 20-25 per cent^[4] of the global demand of dyes and pigments and has emerged as the preferred destination especially for specific segments like reactive dyes, phthalo pigments, synthetic food colors etc. We have also established a strong position globally in manufacturing of APIs, agchem, textile chemicals, construction chemicals and Flavors & Fragrances (F&F) ingredients. Improvement in several business levers, improving cost competitiveness vs. China, and increase in ease of doing business has further cemented India's position, leading to a number of MNCs actively considering India for their next phase of investments.

Driven by these trends, the specialty chemicals industry in India is expected to grow at 11 per cent CAGR to reach USD77 billion by FY29E^[5]. However, to truly seize the future opportunities the industry must align itself with the key global mega trends and drivers of future growth. This means that the manufacturers must focus on fostering innovation and introducing new products by developing strong capabilities in newer chemistries. The Indian electronic chemicals market, for example, which is relatively small today at USD 0.4 billion, is expected to grow at over 32 per cent CAGR to reach USD1.4 Bn by FY29E^[6]. Innovation will not only help increase efficiency and provide opportunities for greater margins and higher value capture, but will also

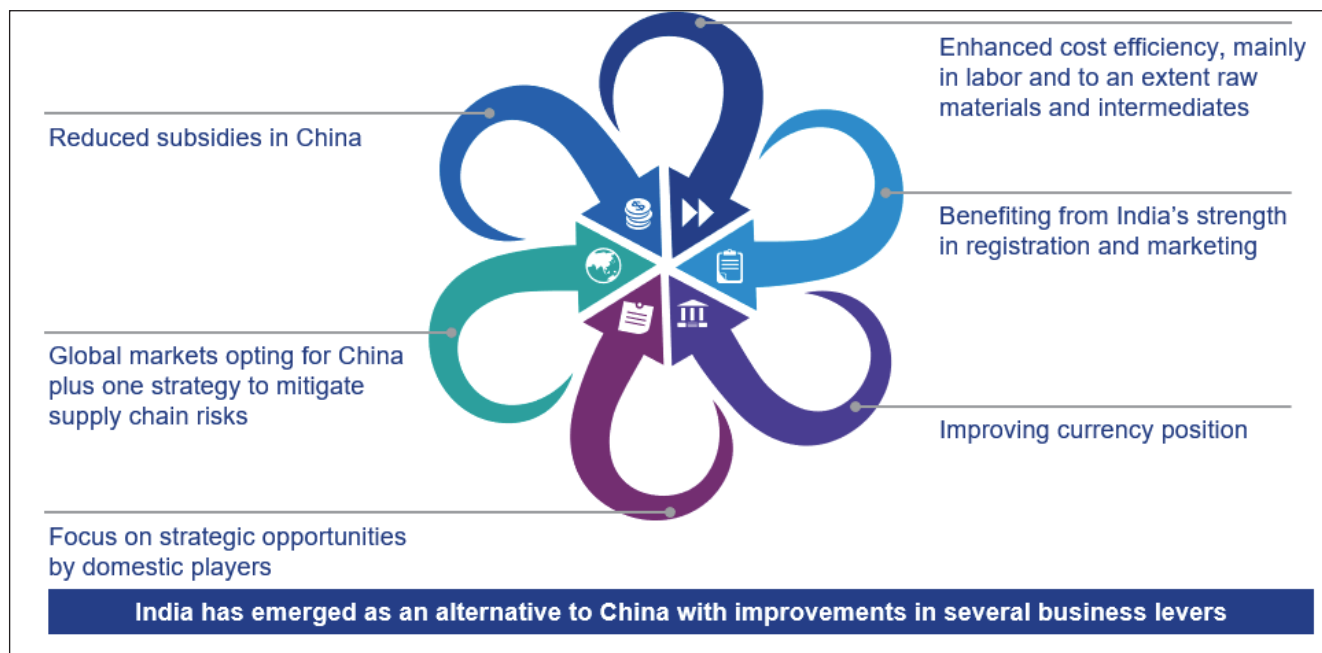
ensure alignment with global trends of sustainability, performance improvement, and increasing compliance.

Key areas for innovation include:

Green Chemicals: There is a rising global demand for environmentally friendly chemicals. Green chemicals, which are designed to reduce waste and toxicity, present a large opportunity for India to differentiate itself. Some examples of these could include areas such as bio-degradable plastics, ecofriendly paints and bio-based alternatives to lubricants and detergents.

Semiconductor Chemicals: The semiconductor industry requires chemicals of the highest purity levels, e.g. electronic-grade solvents, photoresists, and wafer-cleaning solutions. These materials are essential to semiconductor fabrication, and innovation here can give India a competitive edge in supplying these highly technical products. With the Indian Government's clear direction and focus on developing large scale semiconductor manufacturing in India, this presents a large opportunity for manufacturers to make in India for the world.

Battery Chemicals for EVs: With the growing long term trend towards electric vehicles, India has an opportunity to focus on battery chemicals, particularly lithium-ion and solid-state battery materials. Developing safer,



Advantage India.

higher-performance battery materials can position India as a major global supplier in this sector. A few leading Indian companies have already started working in this area and are actively evaluating global partnerships and tie-ups.

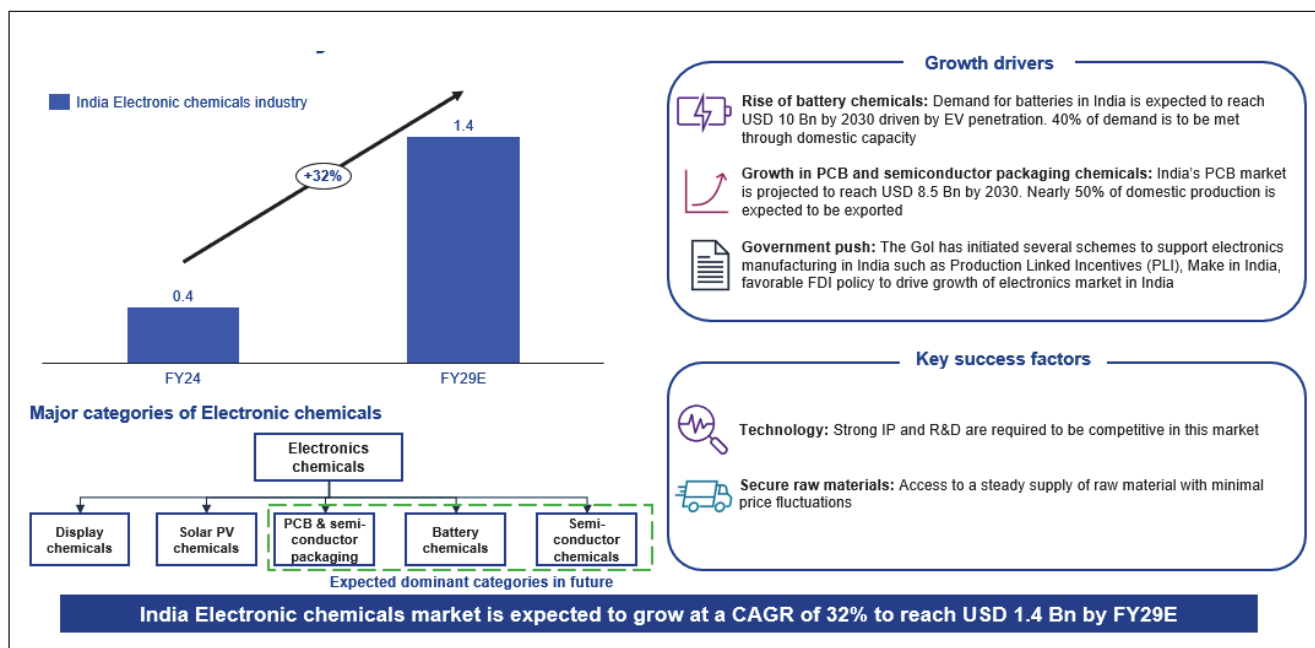
High-Performance Materials for Emerging Industries: Specialty chemicals companies have the opportunity to explore advanced materials tailored for sectors like aerospace, automotive, and construction, where demand for high-performance and sustainable materials are on the rise.

By investing in research and establishing collaborative partnerships with global players and research institutions, Indian companies can create unique products that cater to niche and high-demand markets. However, realizing the potential of the specialty chemicals sector requires several pro-active measures, both from the industry and the Government. Some of the key enablers include:

- **Increasing investments in R&D:** Traditionally, Indian companies have shown a strong ability to excel globally in areas such as differentiated process and technical customization, process optimization and cost competitiveness. However, going forward the focus should be on product

innovation in new and emerging areas. Private companies should focus on setting up dedicated world class R&D facilities, with a focus on sustainable and cost-effective solutions. Public-private partnerships as well as academia-industry collaborations in R&D, particularly in sectors like green chemicals, semiconductor chemicals, and battery materials, can help significantly accelerate the pace of development.

- **Regulatory Support:** Streamlined regulations and faster approvals for environmentally sustainable chemicals will be essential. Policies that reward innovation, such as tax incentives for R&D or streamlined processes for 'green' products, can support growth.
- **Infrastructure and Chemical Parks:** Government initiatives to develop chemical parks with advanced infrastructure and shared resources can enable cost reductions and help leverage ecosystem benefits for smaller companies, encouraging more players to innovate and scale.
- **Skill Development and Talent Pool:** As the industry becomes more technology-intensive, building a talent pool equipped with advanced technical skills will be essential. Government led programs focusing on skill development in chemical



Electronic chemicals market in India (FY24-29E).

engineering, semiconductor manufacturing, and material science can contribute to enhancing the sector's innovation capacity.

- **Sustainability Incentives:** As global clients increasingly prioritize sustainable sourcing, government programs promoting sustainable practices, such as energy-efficient manufacturing or waste management, will support Indian companies' export competitiveness.

In order to truly seize future opportunities, the Indian specialty chemical manufacturers must focus on fostering innovation, especially in areas like green chemistry, semiconductor chemicals, and other high-performance materials essential for new-age industries. By prioritizing innovation, both in products and processes, Indian companies can develop a competitive edge and move up the value chain. India's specialty chemical industry stands at a critical juncture, where through concerted efforts by all key stakeholders and the right investments in innovation and technology, it can establish itself as a preferred global supplier for new-age industries, thereby ensuring a bright future for the sector. ■

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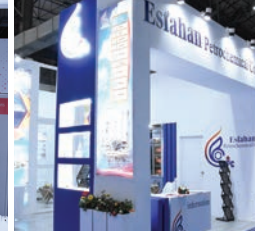
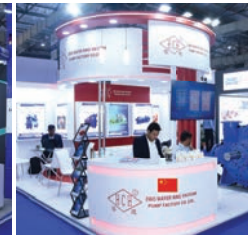
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Clariant Catalysts wins awards in Best Catalyst and Petrochemical Technology

Clariant's Chromium-free HySat™ catalyst platform for hydrogenation processes won "Best Catalyst Technology"; "Best Petrochemical Technology" was jointly awarded to Clariant and Linde for EDHOX™ Technology used in ethylene and acetic acid production and StyroMax™ UL-100 and VIVAZ were also finalists for "Best Catalyst Technology" and "Best Health, Safety or Environmental Contribution (Upstream)," respectively.

Clariant, a sustainability-focused specialty chemical company, has won two awards at the 2025 Gulf Energy Information Excellence Awards. The company won "Best Catalyst Technology" for its chromium-free HySat catalyst platform for hydrogenation processes and shared the "Best Petrochemical Technology" prize with its partner Linde for their jointly developed EDHOX Technology. Moreover, Clariant was selected as a finalist for its StyroMax UL-100 catalysts and VIVAZ services in the categories "Best Catalyst Technology" and "Best Health, Safety or Environmental Contribution (Upstream)," respectively. The award ceremony was held in Houston, Texas.



Jens Cuntze, President of Clariant Catalysts commented, "We are truly honored to have received this valued recognition amongst more than 500 submissions from highly respected peers. We owe this incredible achievement to the dedication of our teams. It is also a testament to Clariant's commitment to developing innovative, sustainable catalyst solutions that address critical industry challenges. Both Cr-free HySat catalysts and EDHOX Technology demonstrate how cutting-edge chemistry can simultaneously improve performance, contribute to sustainability and create commercial value for our customers."

HySat catalyst platform

The HySat Cr-free catalyst platform is a major innovation, eliminating hazardous hexavalent chromium (Cr VI), a Substance of Very High Concern under REACH regulations. Matching or exceeding the performance of conventional catalysts, it is effective across multiple applications such as oxo-alcohol and fatty alcohol production, SMPO processes and more.

The catalyst's reliability has been confirmed by commercial use and repeated sales, while formats like tablets and powders allow easy integration into existing systems without equipment changes. HySat Cr-free catalysts deliver enhanced safety, regulatory compliance, and sustainable high-quality performance in hydrogenation processes.

EDHOX Technology

Co-developed by Clariant and Linde, EDHOX Technology uses OxyMax™ E, a proprietary

"Both Cr-free HySat catalysts and EDHOX Technology demonstrate how cutting-edge chemistry can simultaneously improve performance, contribute to sustainability and create commercial value for our customers."

- Jens Cuntze, President,
Clariant Catalysts

heterogeneous catalyst, to convert ethane and oxygen into polymer-grade ethylene and glacial acetic acid in a single step process. The process operates at temperatures below 400°C under mild pressure conditions and is electrified by design. Heat from the reaction is efficiently removed via molten salt in a multi-tubular reactor, enabling high selectivity and energy efficiency. Regarding Scope 1 CO₂ emissions, process CO₂ is upgraded into a purified CO₂ stream ready for downstream use in other applications. Even if vented, the process reduces Scope 1 CO₂ emissions by at least 60 per cent and requires up to 70 per cent less energy than conventional ethylene production processes.

EDHOX™ offers CAPEX and OPEX advantages over conventional methods and up to 5 per cent greater carbon efficiency, while enhancing safety and minimizing equipment wear. Commercially validated, EDHOX is suitable for Greenfield projects, retrofits, and downstream integration, especially for Vinyl Acetate Monomer (VAM), Polyvinyl Alcohol (PTA), and Ethylene-Vinyl Acetate (EVA) production. The innovation sets a new benchmark in sustainable, efficient petrochemical manufacturing. ■



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 Session 3 : Innovation for driving Net zero for Specialty Chemicals Industry
 Session 4 : New Frontiers; Advantage India- Panel Discussion on Theme

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2025 Tata Transformation Prize Recognizes Three Indian Scientists Driving Global Solutions for People and Planet

The New York Academy of Sciences and Tata Sons has announced the Winners of the 2025 Tata Transformation Prize.

Established to advance innovation and support visionary scientists in India developing breakthrough technologies to address India's most significant societal challenges in Food Security, Sustainability, and Healthcare, the Tata Transformation Prize aims to generate improved quality-of-life outcomes and scale up the implementation of high-reward research for India and beyond. The 2025 prize winners are Padubidri V. Shivaprasad, PhD, National Centre for Biological Sciences, for Food Security; Balasubramanian Gopal, PhD, Indian Institute of Science, for Sustainability and Ambarish Ghosh, PhD, Indian Institute of Science for Healthcare.

Selected from a competitive pool of 212 nominations spanning 27 Indian states, the three winners were chosen by an international jury of eminent scientists, clinicians, technologists, and engineers. Each Winner will receive ₹2 crores to advance their research and scale its real-world impact. The jury, consisting of experts from leading academic, industrial, and governmental institutions across India, the U.S., Europe, Asia, and Australia, included representatives from IBM Research, Biocon, the Bill & Melinda Gates Foundation, the University of Messina (Italy), Murdoch University (Australia), the Indian Institute of Management Bangalore, the National Institute of Advanced Studies, and the CSIR – Central Drug Research Institute.

2025 Tata Transformation Prize Winners

Food Security Winner: Padubidri V. Shivaprasad, PhD, National Centre for Biological Sciences

Padubidri V. Shivaprasad, PhD, addresses one of India's greatest challenges: feeding a population projected to reach 1.5 billion by 2050 amid shrinking farmland and worsening climate stress. His ground-breaking work uses epigenetic engineering and small RNA-based modifications in rice, India's primary staple crop, to



Padubidri V. Shivaprasad

enhance stress tolerance and nutritional quality. By precisely altering the expression of key genes, Prof. Shivaprasad's approach surpasses the limits of conventional plant breeding, which can be slow and unpredictable. His engineered rice varieties promise to reduce

fertilizer and pesticide dependence, lower production costs, and improve nutrition for millions. Beyond India, this innovation offers a sustainable blueprint for staple crops worldwide in the face of global climate change.

Sustainability Winner: Balasubramanian Gopal, PhD, Indian Institute of Science



Balasubramanian Gopal

India's growing biomanufacturing sector urgently needs cleaner, cost-effective alternatives to traditional energy-intensive chemical synthesis methods. Balasubramanian Gopal, PhD, has developed a green chemistry platform that

harnesses bioengineered E. coli bacteria to produce key chemicals used in pharmaceuticals, cosmetics, and agriculture. Integrating artificial intelligence with experimental biology, his lab rapidly designs efficient enzymes and optimizes microbial strains for high yields, without antibiotics or harmful additives. This sustainable technology can replace traditional

chemical manufacturing, thus reducing pollution, enhancing domestic production, and positioning India as a global leader in environmentally responsible biomanufacturing.

Healthcare Winner: Ambarish Ghosh, PhD, Indian Institute of Science



Ambarish Ghosh

Ambarish Ghosh, PhD, is pioneering a breakthrough in cancer treatment using magnetic nanorobots – tiny, helical devices that can be safely guided through the body using magnetic fields. These nanorobots are designed to navigate complex biological environments, deliver

drugs directly to tumors, and distinguish cancerous tissue from healthy cells. His team is also creating real-time imaging tools to track and steer the nanorobots during treatment. This technology promises more precise, less invasive cancer therapies with fewer side effects, with the potential to revolutionize cancer care worldwide and make advanced treatments more accessible and affordable in India and other low- and middle-income countries.

“The scientific advancements achieved by this year’s winners – creating climate-resistant crops, sustainable bio-manufacturing, and targeting cancer with fewer side effects – are the result of years of dedication and sacrifice. Their work is significant for India, and for humanity at large,” said N. Chandrasekaran, Chairman of Tata Sons.

“The 2025 Winners exemplify the power of Indian science to drive meaningful global change,” said Nicholas B. Dirks, President and CEO of The New York Academy of Sciences. “Their innovations span biology, engineering, and sustainability, reflecting the spirit of creativity and social purpose that this prize was designed to honour.” ■

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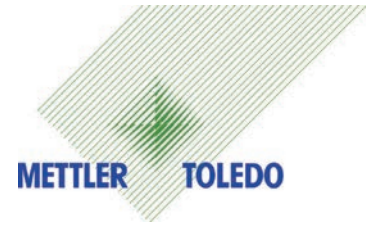
The December 2025 edition is 60th Anniversary issue of Chemical Engineering World. The Special Edition will include authored articles from industry leaders, covering the entire gamut of the chemical process industry comprising agrochemicals, specialty chemicals, refining and petrochemicals, oil and gas, fertilizers, wastewater treatment, EPC and other allied sectors. It will include articles on the latest in research and development; trends in chemical industry; future trends of the chemical industry, amongst others. Besides, it will also feature regular columns such as News, Project Updates, Impact Feature and Products.

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Ensure Consistent Quality and Safety with Formulation and Batching Solutions



The fine and specialty chemicals sector, crucial for industries like pharmaceuticals and agrochemicals, demands precision, safety, and compliance in manufacturing. With challenges such as strict regulations, high raw material costs, and the need for traceability, efficient formulation and batching solutions are pivotal to optimizing operations and ensuring product quality.

Key Industry Challenges

- Managing complex formulations with multiple, high-value raw materials.
- Ensuring compliance with stringent regulations and documentation requirements.
- Operating safely in hazardous environments with real-time monitoring.
- Achieving error-free production to reduce Out-Of-Specification (OOS) batches.
- Maintaining consistent batch quality and productivity.

Safety and Efficiency Through Technology

Digital transformation plays a vital role in addressing these challenges. Technologies like IoT, AI, and cloud computing enhance operational safety and enable proactive risk management through real-time monitoring.

METTLER TOLEDO's solutions support these trends by improving accuracy, repeatability, and automation, which help reduce human error and improve workflow adherence.

Formulation & Batching Solutions Portfolio

1. Simple Manual Solutions:



- Designed for hazardous zones (Zone 1/21 and 2/22) with intrinsic safety approvals (IECEX, ATEX, FM).

- Features user-friendly operator guidance and dual

scale connectivity.

- Example: IND256x indicator enhances dispensing efficiency by accurately weighing from grams to kilograms, allowing management of two scales for streamlined processes.

2. Advanced Manual Solutions:



- Centralized data management and user-friendly workflows accelerate material and data flow.

- Tailored formulation methods ensure precise control and traceability.

- Example: FormWeigh.Net software improves recipe management efficiency and ensures batch consistency, especially with small quantities

3. Dosing Solutions:



storage of material information.

- Example: Smart Floor Scale and Indicator support high-level automation and easy system integration for enhanced efficiency.

4. Automatic Batching Solutions:



- Example: SWB605 PowerMount™ and IND360 indicator monitor load cell performance, alerting users proactively to safeguard quality and maintain control.

- Configurable control software with high-precision digital weighing.

- Active alerts for inaccuracies and local

- Simplifies data transfer and continuously monitors equipment.

- Provides immediate alerts for deviations to prevent bad batches.

In summary, leveraging advanced formulation and batching solutions enables fine and specialty chemical manufacturers to meet quality standards, optimize costs, and enhance safety. These integrated technologies and workflows are essential to navigating the complexity of modern chemical production and supply chains.

About METTLER TOLEDO

METTLER TOLEDO is a leading global manufacturer of precision instruments. The Company is the world's largest manufacturer and marketer of weighing instruments for use in laboratory, industrial and food retailing applications. The Company also holds top-three market positions for several related analytical instruments and is a leading provider of automated chemistry systems used in drug and chemical compound discovery and development. In addition, the Company is the world's largest manufacturer and marketer of metal detection systems used in production and packaging. Additional information about METTLER TOLEDO is available at www.mt.com. ■

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Benefits of METTLER TOLEDO Solutions

- Significant reduction in OOS batches through improved measurement accuracy.
- Enhanced workplace automation reduces operator errors.
- Reproducible and consistent measurements bolster quality and productivity.
- Software and hardware integration ensures strict adherence to workflows and facilitates compliance.
- Routine calibration and testing maintain equipment within optimal tolerances.

Microtech Engineering Works: Engineering Precision, Delivering Performance & Empowering Industries



For over two decades, MEW Valves has been at the forefront of precision engineering setting new benchmarks in valve and fittings manufacturing. As one of India's most trusted names in flow control, MEW delivers excellence that powers the pharmaceutical, chemical and process industries with unmatched performance, safety and reliability. **Govind Rathod, Director, Microtech Engineering Works**, throws more light on the company products, supported by a case study and shares further details as the company prepares to participate in Chemtech 2026.

Our story is one of evolution – from a modest workshop to a globally recognized brand. An ISO 9001:2015 certified organization, MEW has combined craftsmanship with advanced technology, ensuring every valve leaving our planet meets international quality and performance benchmarks.

Manufacturing & Infrastructure

Our modern facility integrates advanced CNC machining, in-house hydrostatic and pneumatic testing,

hygienic assembly line for pharma valves and strong designing tools. Our high production capacity and lean manufacturing systems guarantee shorter lead times and consistent quality.

Why Pharma Companies choose MEW Valves?

Pharmaceutical processes demand purity and precision – and that's where MEW valves excel. Our valves are designed for CIP/SIP compatibility, zero dead-leg design, and contamination-free flow paths, ensuring sterile and consistent performance across all process lines.

Technical Superiority that Sets us apart

- Precision engineered with high grade stainless steel.
- 100 percent hydrostatic and pneumatic testing for zero leakage.
- Designed for easy maintenance & clean validation.
- Compliant with ASME, API and ISO standards.
- Proven in critical pharma and biotech applications.



IMPACT FEATURE

| S.No | Performance Metric | Before MEW | After MEW |
|------|-------------------------|----------------|----------------|
| 1 | Valve Leakage Incidents | 6 per quarter | 0 incidents |
| 2 | Average Lead Time | 10-12 weeks | 4 weeks |
| 3 | Annual Maintenance Cost | ₹12 lakh | ₹4 lakh |
| 4 | Production Downtime | 22 hours/month | <5 hours/month |

- CIP/SIP-compatible configuration ensuring clean, sterile flow paths.
- High-polish internal surfaces (Ra<0.4um) to prevent material buildup.

Factory Direct Advantage - Cost Effective & Faster

Unlike traders, MEW is a true manufacturer. We design, produce and stock under one roof - eliminating middlemen, reducing cost and guaranteeing faster delivery. By stocking standard models, we ensure quick supply and unbeatable pricing - direct from our factory floor.

Production Strength that Keeps You Ahead

Our agile production system meets large-scale orders efficiently while maintaining world-class quality. We specialize in both standard and customized valve solutions for pharma and process industries - ensuring on time delivery, every single time.

Case Study

Client: Leading API Manufacturer, Pune, India.

Industry: Pharmaceuticals | Application: Food Granules Transfer and Process Line Isolation.

Product Used: MEW SS316L Ball Valves (Full Bore, Tri-Clamp End, Mirror Finish)

The client, one of India's largest Active Pharmaceutical Ingredient (API) producers, faced recurring challenges with valve failure due to design issues, delayed deliveries and inconsistent quality from multiple local suppliers. These issues led to downtime losses, cross-contamination risks and increased maintenance costs. The company required a single source manufacturer capable of supplying pharma grade, zero leakage valves with complete documentation, validation and fast turnaround.

MEW's Approach

After a detailed site study and process audit, MEW's technical team proposed:

- A custom engineered Ball Valve design compliant with ASME BPE standards.

- Quick-turnaround manufacturing and stocking plan for ready availability.

MEW also deployed a dedicated application engineer at the plant during initial installation and validation, ensuring perfect line fitment and zero performance deviations.

Results & Impact

Within just 60 days of implementation, the client recorded measureable improvements (See table).

The switch to MEW Valves delivered a 65 percent reduction in downtime and improved line efficiency by 30 percent. The client now relies on MEW as a strategic valve partner across two facilities in India. ■

Join us at ChemTECH Expo 2026 and experience firsthand how MEW Valves is redefining flow control through engineering precision and manufacturing excellence. Explore our complete range of industrial and pharma-grade valves designed to deliver reliability, efficiency and performance that go beyond expectations.

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Author



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Director

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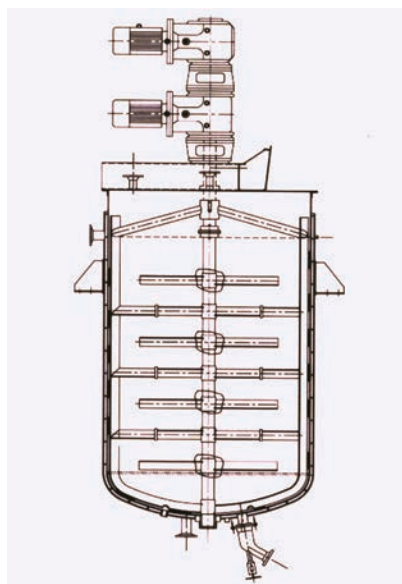
SAFE unveils screw compressor for applications in biogas & biomethane segments



SAFE S.p.A., a leading player in compression solutions for biomethane, CNG and hydrogen, brings in the new package with screw compressor developed for compressing biogas in the upgrading process to biomethane. The unit is designed to ensure continuous 24/7 operation, maximize energy efficiency and simplify plant integration. It is available in a containerized "plug & play" configuration to minimize installation and commissioning times. The new SAFE compressor has been developed to operate under very low suction conditions (100–500 mbar), maintaining stable performance with variable flow rates up to 2,500 Sm³/h and discharge pressures up to 16 barg. The new screw-compressor range spans installed power up to 400 kW, making it suitable for integration in both small-

and large-scale plants. The water-cooling system (with SAFE-supplied air cooler — installable on the top of the container or at ground level alongside it) and the oil-flooded screw configuration, with triple gas filtration, ensure thermal stability, reliability and service quality. The sound level of the compression package in operation is limited to 60 dB(A) @1 m. The heart of the unit is the compressor body on a slide-out removable skid, a solution that enables immediate access and fast replacement during maintenance services. Machine control is oriented toward maximum efficiency: service regulation is based on maintaining suction pressure, with automatic motor speed adjustment, and a recirculation line to handle processes with variable flow rates and pressures — extending the operating envelope. Options include a heat recovery system, sub-cooling with chiller and outlet biogas temperature control. These extensions have been developed and made available to increase overall service efficiency and facilitate integration with plant interfaces. ■

Double motion grease kettles from Punja Petrokem Engineering



The double motion grease kettles from Punja Petrokem Engineering - designed, manufactured, and supplied, are used in many process industries in India and abroad. The kettles are in standard manufacturing range of the company and suitable for vertical installation. They are supplied with flat top cover or flanged dome cover as per client's requirement.

The kettle has twin motion agitation system with external convection cooling jacket for cooking, finishing and cooling the grease. The stirrer is attached with spring loaded scrapper with teflon tip covering entire surface in operation. The kettles are designed and manufactured as per the international codes and standards and are supplied with inspection certificate from third party like LLOYD'S Register Asia apart from performance guarantee.

The operation uses a twin motion counter rotating agitator to process the grease and impart suitable properties apart from cooling the entire mass through direct base oil addition and cooling water circulation through Jacket. The grease coming out of the Kettle is then milled/

homogenized to obtain desired consistency and texture. ■

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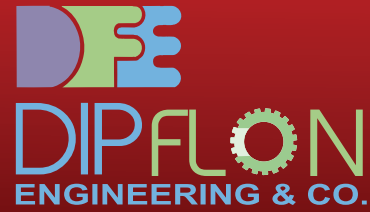
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