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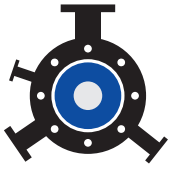


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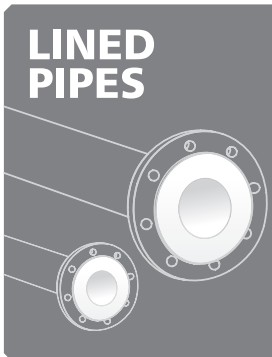
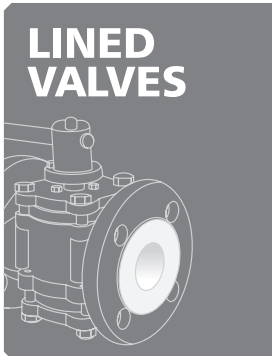
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Indian pharma poised for next growth wave driven by innovation, biosimilars and AI: ASSOCHAM

New Delhi: India's pharmaceutical industry is entering a new phase of growth, with its market size projected to more than double from approximately \$55 billion in 2025 to \$120–130 billion by 2030, according to a report released by ASSOCHAM.

The report highlights the growing opportunities in the biosimilars segment, with the global market expected to expand from \$39.6 billion in 2025 to \$151.6 billion by 2033. Meanwhile, India's bioeconomy has already surpassed \$150 billion and is projected to reach \$300 billion by 2030, driven largely by advances in biologics and biopharmaceuticals.

ASSOCHAM identified four major structural trends that are set to shape the sector's future: the impending patent cliff for biologic drugs, increasing demand for affordable advanced therapies, the adoption of artificial intelligence in drug discovery, and the ongoing realignment of global pharmaceutical supply chains.

Commenting on the sector's outlook, ASSOCHAM Secretary General Saurabh Sanyal noted that India has established itself as a trusted global supplier of affordable medicines and vaccines. He emphasized that the next phase of industry growth will be powered by innovation, biosimilars, AI-enabled drug development, and strong regulatory capabilities. To fully capitalize on these opportunities, he stressed the need for higher investments in research and development, stronger collaborations between industry and academia, and closer alignment with global regulatory standards.

The report also underscored the role of government initiatives such as Biopharma SHAKTI, Bio-RIDE, and the BioE3 Policy in fostering an integrated ecosystem that connects research, manufacturing, and commercialization, thereby strengthening India's position as a global biopharmaceutical hub.

Domestic pharma market rises 10.9% in May; chronic therapies lead momentum

New Delhi: India's pharmaceutical industry registered sales of ₹21,805 crore in May 2026, reflecting a 10.9 per cent increase over the same month last year, according to Pharmarack. Growth was driven by strong demand in chronic therapies such as

diabetes and cardiac care, alongside a gradual recovery in volume expansion.

Unit growth stood at 1.4 per cent, underscoring that price hikes were the main contributor to May's performance. Despite a high base and persistent pricing pressures, the sector maintained resilience. Importantly, volume growth has shown steady improvement — moving from near stagnation in mid-FY26 to 1.9 per cent in the February quarter and 1.3 per cent in the latest quarter — signaling strengthening underlying demand.

Price-led growth contributed 5.7 per cent in the May quarter, while new product launches added 3.6 percentage points, highlighting innovation as a key growth driver.

Among therapy areas, anti-diabetic drugs posted the fastest growth at 16.8 per cent. The cardiac segment, India's largest therapy area with a 14.6 per cent share, expanded 13.9 per cent. Respiratory therapies grew 12.3 per cent, while vitamins, minerals, and nutrients rose 12.5 per cent, reflecting sustained demand for preventive health products. Smaller categories also performed strongly, with anti-neoplastics (cancer treatments) up 13.4 per cent and vaccines surging 17.6 per cent.

On the corporate front, Sun Pharma retained leadership with an 8.4 per cent market share, followed by Abbott and Cipla. Among large players, Torrent Pharma and Intas stood out, recording growth of 14.1 per cent and 13.9 per cent, respectively.

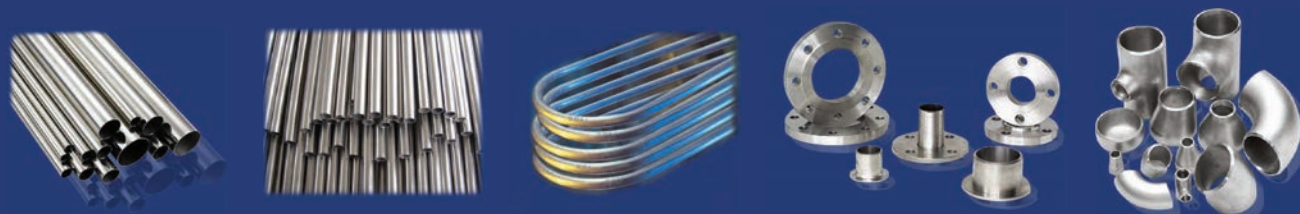
Biopharma SHAKTI envisages launch of 100 biologics by 2047: Smt. Anupriya Patel



Biopharmaceuticals are shaping the future of modern healthcare and India is well-positioned to emerge as a global leader in this transformative sector. The Government of India is committed to strengthening innovation, manufacturing, clinical research, and

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UPCOMING ISSUE - JULY 2026

24TH ANNIVERSARY SPECIAL EDITION

The **July 2026** edition of 'Pharma Bio World' is 24th Anniversary Special Issue. It will include Guest Column, Technical Features, Innovation Articles and Interviews with Industry Leaders. Don't Miss out the opportunity to participate in this special Issue. Send in your contributions on or before 15th July 2026 to editorial@jasubhai.com.

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regulatory capabilities to make India a leading global biopharmaceutical hub, said Smt. Anupriya Patel, Union Minister of State for Chemicals & Fertilizers.

Speaking at the 2nd Pharma Summit & Awards 2026 organised by ASSOCHAM in New Delhi, the Minister said Biopharma SHAKTI initiative envisages launch of 100 biologics by 2047, contributing directly to the goals of Viksit Bharat and Swasth Bharat. The Minister stated that the Government has created strong funding and policy pathways across the pharmaceutical value chain.

Noting that biologics are expected to account for nearly 40 per cent of prescription drugs by 2031, the Minister emphasized that India must strengthen its capabilities in next-generation biologics while building on its established leadership in affordable generic medicines.

The Minister further highlighted the growing importance of advanced therapies and noted that initiatives such as the PRIP Scheme, National Biopharma Mission are helping create a robust ecosystem for innovation, research, and manufacturing. Industrial and manufacturing-related innovations are being supported through BIRAC initiatives such as the Biotech Ignition Grant, SBIRI, and BIPP. She said these programmes are giving a strong fillip to innovation and called upon the industry to collaborate to place India firmly on the global map of novel biologics, while continuing to strengthen its leadership in small molecules and affordable medicines. Addressing the gathering Shri Manoj Joshi, Secretary, Department of Pharmaceuticals, Ministry of Chemicals & Fertilizers, Government of India, stressed on the need to strengthen innovation, accelerate drug discovery, support emerging biopharma capabilities, and build greater supply chain resilience.

Highlighting the transformative potential of the biopharmaceutical sector, he underscored the importance of the Biopharma Shakti Initiative, which aims to position India as a global hub for the development and manufacturing of high-value biologics and biosimilars. He noted that the initiative would strengthen research and innovation, expand clinical research infrastructure, build a skilled workforce, and enhance India's competitiveness in the global biopharmaceutical value chain.

Union Minister of State Smt Anupriya Patel also presented Pharma Excellence Awards to recognize outstanding contributions and achievements across the pharmaceutical sector at the Pharma Summit.

Department of Biotechnology organized webinar on 'Adapt Biomanufacturing to Address Climate Change'

New Delhi: The Department of Biotechnology (DBT), Government of India, organized a webinar on 'Adapt Biomanufacturing 2 Address Climate Change' aligned with the global theme of 'Climate Action #NowForClimate.' The session focused on DBT-driven initiatives that are contributing to biomanufacturing, biodiversity conservation, climate-resilient solutions, and sustainable development.

Dr. Sangita M. Kasture, Scientist G and Head, Biomanufacturing Directorate, DBT, provided an overview of the Department's continued efforts to strengthen the biomanufacturing ecosystem through innovation-driven and sustainable biotechnology solutions. Dr. Rajesh S. Gokhale, Secretary, DBT, DG, BRIC and Chairman, BIRAC, highlighted the growing challenges posed by unsustainable material consumption, increasing waste generation and climate change. He underlined DBT's efforts to support India's climate and sustainability goals through high-performance biomanufacturing under the BioE3 Policy and emphasized the importance of scaling innovations through Biofoundries and Biomanufacturing hubs to bridge research and industrial deployment. He called for translational research and industrial partnerships to accelerate the adoption of bio-based technologies.

Dr. Anil Prakash Joshi, an environmentalist with HESCO, Uttarakhand, delivered a keynote address on Himalayan Ecosystem Conservation. Dr Joshi said that integrated approaches are needed for biodiversity conservation, ecosystem restoration, and climate adaptation to safeguard ecological services and support resilient communities.

Webinar showcased the biotechnological developments happening through the Department's activities for addressing climate change and environmental sustainability. This includes: Closing the Carbon Loop and Turning Carbon into Livelihoods, sustainable biomanufacturing approaches using microbial platforms; restoration of mangrove biodiversity in the Sundarbans through indigenous plant growth-promoting rhizobacteria; development of sustainable aviation fuel and green transportation fuels from biorenewable resources; applications of microbiome science for sustainability and bioeconomy development; ecosystem monitoring and the impacts of invasive

species on ecologically sensitive wetlands; and the seedling traits and drought response in forests.

Department of Biotechnology, Ministry of Science & Technology observes Swachhata Pakhwada 2026



Delhi: The Department of Biotechnology (DBT), Ministry of Science & Technology observed Swachhata Pakhwada 2026 from 1st May to 15th May 2026 at its Headquarters in New Delhi and across all its Autonomous Institutions (AIs) and Public Sector Undertakings (PSUs) as a part of the Government of India's flagship Swatch Bharat Mission.

The Pakhwada was organized in accordance with the Guidelines and Calendar of Swachhata Pakhwada 2026 issued by the Cabinet Secretariat, Government of India.

The Swachhata Pakhwada 2026 commenced on 1st May 2026 with a pledge taking ceremony at DBT, CGO Complex, New Delhi which was participated by the officers/officials of the Department. The collective reading of the pledge reaffirmed the commitment to the values of cleanliness, discipline and civic responsibility and set the tone for the activities that followed over the fortnight. The event witnessed enthusiastic participation and served as a strong motivational start to the Pakhwada. During the fortnight, various cleanliness activities were planned and completed by the DBT and its AIs and PSUs with large participation. Various best practices promoting cleanliness, water conservation and Shramdaan were included in the Action Plan.

Health Check-Up Camps, Environment Awareness Lecture, Signature Campaigns, Tree Plantation Drives, Guest Talk on Awareness on Single-Use Plastic, Stress Management Workshops, Seminars, Painting, Waste to Wealth Competition, Distribution of Jute Bags, Re-using wooden packing material into beautiful pots etc. were

undertaken during Pakhwada. Besides, special talk on laboratory waste management, renovation of toilets, classrooms was undertaken at nearby Government school. Essay / Poem / Slogan writing competitions were also organized by the students of the AIs to educate community about cleanliness.

The Pakhwada was monitored and guided by the senior officers of DBT. Review meetings were conducted to encourage, motivate and guide the participants of the Swachhata Pakhwada. A Committee was constituted to select three best performing offices as per the guidelines. The best performing top three offices namely (i) BRIC - National Institute of Animal Biotechnology (NIAB); (ii) BRIC - National Agri-Food Biotechnology Institute (NABI) and (iii) BRIC - Institute of Bioresources and Sustainable Development (IBSD) were awarded by the Secretary, DBT in a formal ceremony on 2nd June, 2026.

Lincoln Pharmaceuticals reports net profit of ₹87.89 crore

Ahmedabad: Lincoln Pharmaceuticals Limited, one of India's leading healthcare companies, reported a consolidated net profit of ₹87.89 crore for the financial year ended 31st March 2026 as compared to the net profit of ₹82.35 crore in FY25, registering a growth of 6.74 per cent Y-o-Y. Revenue from operations for FY26 was reported at ₹704.48 crore as compared to revenue of ₹645.71 crore reported in FY25, registering a growth of 9.10 per cent Y-o-Y. EBITDA for FY26 stood at ₹131.14 crore as compared to EBITDA of ₹123.97 crore reported in FY25, growth of 5.78 per cent Y-o-Y. EPS for FY26 was reported at ₹43.88 per share.

The company has recommended a dividend of 18 per cent, ₹1.80 per share on the face value of ₹10 per share for the FY 2025-26.

The company reported a profit before tax of ₹115.63 crores for the year ended in March 2026 as against profit before tax of ₹109.19 crore in FY24-25. Foreign Institutional Investors (FIIs) have steadily increased their stake in the company to 5.20 per cent while Domestic Institutional Investors (DIIs) holding was 1.08 per cent as on 31st March 2026. Greenx Wealth Multihorizons Opportunity Fund holds 1.07 per cent in the company while Rimo Capital Fund Lp holds 1.33 per cent in the company.

The company is targeting a revenue of ₹1,000 crore within the next three years, driven by business expansion into

high-value product lines and entry into new markets. This goal is part of a broader strategy to achieve a 15-18 per cent annual growth rate, driven by strong performance in the cardiac, diabetic, dermatology, and ENT segments.

The company is committed to expanding its global footprint while meeting diverse healthcare needs. Speaking on the financial performance and future plans, Munjal Patel, Director, Lincoln Pharmaceuticals Ltd, said, "We are pleased to conclude FY26 on a strong note with healthy growth momentum driven robust demand, improved operational efficiencies and consistent execution across markets. We remain by focused on strengthening our product portfolio, expanding our domestic and international presence and investing in research and manufacturing capabilities. Backed by a debt-free balance sheet and strong fundamentals, we remain confident of sustaining profitable growth and creating long-term value for stakeholders."

The company remains focused on strengthening its presence in regulated and semi-regulated markets. It currently exports to 60+ countries across East and West Africa, Central and North America, Latin America, and Southeast Asia. Company aims to expand this footprint to 90 countries over next 2-3 years. With recent entry into the Canadian market and approvals from TGA - Australia and EU GMP, the company is poised for further global expansion.

The company has a state-of-the-art manufacturing facility unit at Khatraj in Ahmedabad, Gujarat, complying with stringent international quality and compliance norms and certified by EUGMP, TGA, WHO-GMP; ISO-9001:2015, ISO-14001:2015 and ISO-45001:2018. Company has developed 600 plus formulations in 15 therapeutic areas and has a strong product/brand portfolio in anti-infective, respiratory system, gynaecology, cardio and CNS, anti-bacterial, anti-diabetic, anti-malaria among others. Company has filed 25 plus patent applications and is awarded with seven patents. Company showcases its dedication to innovation and growth through a robust portfolio boasting over 1,700 registered products, with 700 more in development.

BD India and HOPE Foundation celebrate 8 years of Impact

Mumbai: BD India team in collaboration with Hope Foundation, celebrated the successful completion of the 8th year program by felicitating 264 youth on their graduation in the 2 skill-based courses - Nursing Assistant and Tally. Students were awarded certificates and trophies in acknowledgment of their hard work and dedication.

BD and Hope Foundation have committed to continue with this partnership for the 9th year with the intent to train 320 youth across Nursing Assistant, Tally, and a new Advanced Excel + SQL course, thereby expanding pathways to employability.

Commenting on the initiative, Atul Grover, Managing Director, BD India/South Asia, said, "We are extremely proud of our partnership with the HOPE Foundation where we are working with a like-minded partner to upskill the youth and enable them to earn sustainable livelihoods. At the graduation ceremony, it was inspiring to witness the journeys of the students and hear first-hand the positive impact this program has had on enhancing their employability and confidence. As a global corporate social citizen, we are immensely proud of creating a better tomorrow for the youth of today, aligned with our objective of advancing together."

K.S. Wungchipem (Apem), Director Skill Development North & East India, Hope Foundation, said, "The partnership with BD has been instrumental in empowering youth by providing skill-based training in Nursing Assistant and Tally. This collaboration not only enhanced employability but also opened avenues for sustainable livelihoods. Through BD's support, young individuals gained practical skills, industry exposure, and confidence to secure meaningful jobs. The initiative stands as a strong example of how partnerships can drive youth empowerment and long-term impact. Over the last 8 years of the partnership, more than 2,200 youth have been trained and more than 1,750 have secured jobs."

The two courses offered by Project HOPE - Nursing Assistant (NA) and Tally training run in parallel for three months each. The criteria to offer the free courses to students is one, a 10th class pass certificate and two, a demonstrable economic need. All the students are also trained in basic English-speaking skills, life skills and there is a provision for hands-on practical sessions

for both courses. The NA students undergo additional on-the-job training for six months in reputed public or private hospitals.

BD is one of the largest global medical technology companies in the world and is advancing the world of health by improving medical discovery, diagnostics, and the delivery of care. BD helps customers enhance outcomes, lower costs, increase efficiencies, improve safety, and expand access to health care.

Jubilant Ingrevia announces Q4'FY 26 results

Delhi: The Board of Jubilant Ingrevia Limited met to approve financial results for the quarter ended March 31st, 2026. Q4 recorded highest revenue in 14 quarters at ₹1,179 crore, up 12 per cent YoY, driven by 10 per cent volume growth. EBITDA stood at ₹172 crore, up 11 per cent YoY and 26 per cent QoQ. PAT was ₹86 crore, up 17 per cent YoY and 84 per cent QoQ. Net debt/EBITDA improved to 0.99x. Our net debt has reduced by 11 per cent in 2026.

Commenting on the company's performance, Shyam S. Bhartia, Chairman and Hari S Bhartia, Co-Chairman, Jubilant Ingrevia Limited, said, "We are pleased to report a healthy performance in Q4 and FY26. Our revenue grew 12 per cent YoY and EBITDA increased 11 per cent YoY in Q4 FY26, reflecting our strong execution. A key highlight for the quarter was our effective handling of the Middle East crisis, with no force majeure and zero production loss. The other highlights include successful dispatch from our newly constructed Agro CDMO facility and the acquisition of Remidex to accelerate the growth of our Human Nutrition business."

The Board has recommended a final dividend of ₹2.50 per share (250 per cent), taking total FY26 dividend to ₹5 per share (500 per cent).

"Overall chemical Industry's demand remains resilient despite Middle East disruptions. Volumes continue to grow, while pricing has firmed up in last few weeks due to higher crude-linked costs, with effective pass-through to customers. Pharmaceuticals continue to anchor growth with strong volumes and consistent demand. Agrochem saw strong growth, with robust export visibility and successful price increases, especially in second half of the quarter. Nutrition and Personal Care markets witnessed volume and price-led growth, driven by Niacinamide, with strong demand in Feed and Cosmetics," they added.

For FY27, the company is expecting growth to be led by Specialty Chemicals and Nutrition, along with recovery in Acetyls. It is expecting a sequential growth in revenue and EBITDA in coming quarters, starting with Q1FY27 itself. It will continue to invest further in the business; the construction of Gajraula Multi Purpose Plant (MPP) is progressing well, this will further strengthen its CDMO growth roadmap.

Commenting on the company's performance, Deepak Jain, Chief Executive Officer and Managing Director, Jubilant Ingrevia Limited said, "Over the past year, we have made strong progress across all strategic pillars, building long-term growth while managing global challenges effectively. Despite Middle East disruptions impacting supply and prices, our diversified sourcing and agility ensured minimal disruption with effective cost pass-through. Strong customer engagement and timely renegotiations have strengthened resilience, reflected in improved performance in Q4."

Zydus Therapeutics' NDA for Saroglitazar granted priority review by US FDA

Ahmedabad: Zydus Therapeutics, a wholly owned subsidiary of Zydus Lifesciences Limited, a global innovation-led health care company, has announced that the US Food and Drug Administration (US FDA) granted priority review to the New Drug Application (NDA) for saroglitazar. The proposed indication is for the treatment of Primary Biliary Cholangitis (PBC) in combination with ursodeoxycholic acid (UDCA) in adults who have had an inadequate response to UDCA, or as monotherapy in patients unable to tolerate UDCA.

The US FDA has assigned a Prescription Drug User Fee Act (PDUFA) target action date of November 27, 2026. Priority Review directs US FDA attention and resources to applications for drugs that, if approved, may provide significant improvements in the safety or effectiveness of the treatment, diagnosis, or prevention of serious conditions.

"The acceptance of our NDA with Priority Review highlights the significant unmet need that exists for patients with PBC and represents an important step in the path to making saroglitazar available in the US," said Managing Director of Zydus Lifesciences, Dr. Sharvil Patel. "We look forward to collaborating with the US FDA during the NDA Priority Review process and will, in parallel, continue to build our medical affairs and commercialization capabilities towards a potential

US launch in the fourth quarter of FY 27." The NDA is supported by the EPICS-III trial Phase 3 results, a randomized, double-blind, placebo-controlled study evaluating saroglitazar in adult patients with PBC who had an inadequate response to or intolerance of UDCA.

Croda introduces Malvallin™

Beijing: Croda International has unveiled Malvallin™, a patent-pending botanical active sourced from the Chinese mallow fruit, marking its debut in the rapidly expanding skin longevity space. This breakthrough ingredient is designed to help preserve youthful, resilient skin by enhancing firmness, hydration, elasticity, and facial volume.

Clinically tested under ISO 16128 natural sourcing standards, Malvallin™ has demonstrated visible improvements in hydration, redness, texture, and cheek volume within just 28 days. Its unique action spans the epidermis, dermis, and hypodermis, supporting renewal and resilience at every layer of the skin.

The launch arrives at a pivotal moment, as Gen Z and Gen Y consumers increasingly shift from "anti-aging" correction toward proactive, preventative skincare. With its premium positioning and strong sustainability credentials, Malvallin™ is poised to become a powerful addition to luxury skincare formulations.

Roche Pharma launches Tecentriq® SC - first subcutaneous immunotherapy for lung cancer

New Delhi: Roche Pharma India has launched Tecentriq® (atezolizumab) SC in India — the country's first subcutaneous (under-the-skin) immunotherapy for lung cancer that can be administered in approximately 7 minutes, compared to conventional IV infusions that can take hours. By reducing treatment administration time to approximately 7 minutes, Tecentriq SC is a breakthrough innovation that has the potential to dramatically improve the cancer treatment experience of patients — reducing treatment time by ~80 per cent, lowering indirect treatment costs, minimising the need to travel long distances, and enabling and caregivers spend less time in hospitals and more time doing what they love.

Dr Sajjan Rajpurohit, Director and Head of Medical Oncology at Medanta, said, "Immunotherapy has transformed the treatment landscape for people living with cancer, but conventional IV administration

can be long and arduous for patients while also placing significant pressure on tertiary care hospitals. Repeated hospital visits and long treatment hours add to the emotional and physical burden of cancer care. Subcutaneous administration can allow patients to be treated much more quickly and easily, improving their overall treatment experience while reducing waiting times and treatment delays."

Commenting on the launch, Roche Pharma India MD & CEO, Rajwinder (Rajji) Mehdwan, said, "At Roche, we are committed to bringing meaningful innovations to India that address not only clinical outcomes, but also the broader realities and challenges patients face during treatment. The launch of Tecentriq SC reflects our continued commitment to improving access to advanced cancer care through solutions that are faster, more convenient, support patient-centric outcomes and importantly enable health systems to be more efficient and effective in providing cancer care." ■



Henkel appoints Pradhyumna Ingle as Country President for India

Henkel has appointed Pradhyumna Ingle as Country President for India. Based in Navi Mumbai, Pradhyumna will be responsible for driving the company’s growth strategy, strengthening market presence, and advancing innovation across its businesses in the country. He will continue to serve in his global leadership roles as Global Head – Infrastructure Protection & Repair and IMEA Head – Manufacturing & Maintenance within Henkel Adhesive Technologies. With more than 25 years of leadership experience across India, Asia Pacific, North America, and the Middle East & Africa, Pradhyumna has built a distinguished track record. ■



Rohit Narang takes charge as CEO of Aquapharm Chemical

Aquapharm Chemical has announced the appointment of Rohit Narang as its new Chief Executive Officer. With over 25 years of experience in the specialty chemicals industry, Narang brings extensive expertise in business growth, operational excellence, and strategic transformation. As CEO, he will spearhead the company’s next phase of expansion and reinforce its position in the specialty chemicals market.

Throughout his career, Narang has held senior leadership positions across leading global organizations. Most recently, at Eastman Chemical Company, he managed global profit-and-loss responsibilities for large business portfolios and played a key role in multi-billion-dollar mergers and acquisitions integrations. ■

Sanofi appoints Paulo Fontoura as Global Head of R&D Pharma

Sanofi has appointed Paulo Fontoura, MD, PhD, FAAN, as Executive Vice President and Global Head of Research & Development Pharma, effective September 1, 2026. Based in Paris, he will join Sanofi’s Executive Committee and report directly to CEO Belén Garijo.

In his new role, Paulo will oversee Sanofi’s full R&D engine – including research, translational medicine, clinical development, and regulatory affairs – driving a differentiated pipeline and accelerating the delivery of transformative medicines. He succeeds Dr. Houman Ashrafian, who is leaving to pursue opportunities outside the company. ■



Lubrizol and Polyhose inaugurate advanced medical tubing facility in Chennai



Chennai: Lubrizol, a global specialty chemicals leader, and Polyhose, a leading manufacturer in fluid conveyance systems, recently inaugurated a new medical manufacturing site in Chennai, Tamil Nadu. The facility will manufacture precision extruded medical tubing for minimally invasive devices, supporting India's rapidly growing medical technology & healthcare sectors.

John Valukas, President, Lubrizol Engineered Materials, said, "Today's inauguration is an important milestone in Lubrizol's commitment to India and to supporting our customers in the global medical device industry. By combining Lubrizol's medical device expertise with the manufacturing strength of local partners in India, this facility will deliver advanced tubing solutions for life-saving neurovascular and cardiovascular applications. Our goal is to help our customers bring these critical technologies to patients faster, with reliable local supply and the highest quality standards."

Designed as a world-class operation, the ISO13485 facility provides customers with a reliable source of high-quality medical tubing, backed by dedicated quality control & the same rigorous standards applied across Lubrizol's global manufacturing network. This investment strengthens Lubrizol's ability to serve customers in India and across global markets. Operations focus on delivering precision extruded tubing from a wide range of high-performance materials, including polyamides, nylon, Pebax®, polypropylene, polyethylene, and Lubrizol's medical grade thermoplastic polyurethane (TPU).

Abhishek Shrivastava, Managing Director, Lubrizol IMEA, said, "India is a strategic growth market for Lubrizol and a key hub for our investments in manufacturing, R&D and technical services. This medical manufacturing site in Chennai is another step in building a stronger local ecosystem for high-value, technology-driven products. By working closely with Polyhose and regional stakeholders, we aim to support innovation, create high-skilled jobs and enable India to become a more significant contributor to the global medical device supply chain."

Mittal Shah, Business Head, Medical Devices IMEA, Lubrizol, said, "Minimally invasive procedures are transforming patient care, and high-precision tubing is at the heart of many of these devices. With this Chennai site, we are bringing world-class catheter tubing capabilities closer to our customers in India and across IMEA. This partnership with Polyhose will enable a broad range of devices utilizing high-performance materials, further strengthening our ability to partner with medical device OEMs in India across the full product development lifecycle."

Shabbir Yusuf Jamnagarwala, Founder & Managing Director, Polyhose, said, "For more than three decades, Polyhose has partnered with global customers by delivering innovative extrusion and fluid conveyance solutions. Our collaboration with Lubrizol marks a new chapter in our journey, combining Polyhose's world-class manufacturing strengths with Lubrizol's deep materials science and medical device expertise to deliver advanced medical tubing solutions for the rapidly evolving healthcare industry. This investment reflects our commitment to innovation, creating skilled employment opportunities, and strengthening India's position as a trusted global hub for advanced medical device manufacturing."

The new site is set to expand India's capacity for precision extruded medical tubing, contributing to the country's focus on building domestic medical device manufacturing capabilities, reducing reliance on imports, and enhancing patient access to high-quality, safe product.

Anupam Rasayan India to acquire 43.3-48.2% equity stake of Bliss GVS Pharma Limited

Surat: Anupam Rasayan India Ltd., one of the leading providers of custom synthesis and specialty chemicals, has announced acquisition of 43.3-48.2 per cent equity stake plus open offer to the public shareholders of Bliss GVS Pharma Limited, an India-based pharmaceutical formulations company. The total purchase consideration has been financed through ₹300 crores via term loan; non-controlling non-voting equity instrument for the balance amount.

Bliss GVS Pharma Limited is an India-based pharmaceutical formulations company engaged in the development, manufacturing, marketing, and export of a wide range of dosage forms including suppositories, pessaries, tablets, capsules, syrups, injectables, creams, and ointments. Established in 1984 and listed on the NSE and BSE, the company has built a strong presence across regulated and semi-regulated international markets, particularly in Africa, Asia, and Latin America. The company is globally recognized for its leadership in suppositories and pessaries, with one of the largest product portfolios in this segment and being among the few EU-GMP certified manufacturers in India.

Bliss GVS Pharma has a diversified portfolio of over 150 branded formulations across therapeutic areas such as anti-malarial, anti-fungal, anti-bacterial, anti-inflammatory, and women's healthcare. Key brands such as Lonart, P Alaxin, Funbact, and Lofnac are well-established and hold strong leadership positions across their respective markets. The company operates multiple manufacturing facilities in Maharashtra and Daman with approvals from US FDA, WHO-GMP and EU-GMP. The company has developed strong capabilities in niche dosage forms and continues to expand its R&D, manufacturing, and international marketing footprint to drive long-term growth.

Commenting on the acquisition, Anand Desai, Managing Director, Anupam Rasayan India Ltd., said "We are pleased to inform that we have entered into a definitive agreement to acquire 43.3-48.2 per cent equity stake and are making an open offer to the public shareholders of Bliss GVS Pharma Limited, marking another important milestone in Anupam

Rasayan's vision of building an integrated global life sciences and specialty pharmaceutical platform. This will strategically strengthen our presence across the pharmaceutical value chain, spanning KSMs to finished dosage formulations. Bliss GVS Pharma brings well-established capabilities in niche dosage forms, a strong international footprint, differentiated brands, and expertise across multiple therapeutic segments. Together with Anupam Rasayan's advanced chemistry capabilities, the combined platform would create a broader integrated and diversified pharmaceutical manufacturing ecosystem with deeper backward integration, enhanced global reach especially in the Europe and America market, further strengthened by Jayhawk acquisition. We believe this will unlock significant synergies through expanded product offerings, stronger regulated market presence, improved customer engagement, and accelerated innovation across regulated and semi-regulated markets. This integrated platform approach further reinforces our long-term growth strategy and positions us well to drive sustainable growth, operational efficiencies, and long-term value creation for all stakeholders."

TDB-DST supports Bioneemtec India for commercialization of green chemistry-based pharmaceutical manufacturing technologies



Chennai: The Technology Development Board (TDB), Department of Science & Technology (DST), Government of India, has extended support to Bioneemtec India Private Limited, Chennai, for the project titled 'Manufacturing of Minoxidil, Tranexamic Acid, Dequalinium Chloride, their Intermediates and Drug Liposomes.' The project seeks to commercialize indigenous green chemistry technologies for the production of critical pharmaceutical ingredients and advanced drug delivery systems, contributing to import substitution, sustainable manufacturing, and healthcare security.

► PROJECT UPDATES

The project focuses on establishing advanced manufacturing capabilities for pharmaceutical intermediates, Active Pharmaceutical Ingredients (APIs), and novel drug delivery systems through a combination of batch and continuous-flow chemistry technologies. By adopting modern process technologies, the initiative aims to improve production efficiency, product quality, operational safety, and environmental sustainability while reducing dependence on imported pharmaceutical intermediates.

A key component of the project is the commercialization of an indigenous process for manufacturing Tranexamic Acid, an important therapeutic molecule used in the management of bleeding disorders. Developed using a cost-effective and environmentally responsible synthesis route, the technology is designed to deliver high-purity products while minimizing waste generation and process complexity. The project will also support the domestic production of Minoxidil and Dequalinium Chloride along with their key intermediates, strengthening local manufacturing capabilities in pharmaceutical value chains that presently depend substantially on imports.

Bioneemtec has developed proprietary Drug Liposome APIs based on advanced nanotechnology platforms. These liposomal formulations are being developed for therapeutic applications including breast and skin cancer management and have demonstrated promising results with controlled nanoparticle characteristics. The company has also initiated intellectual property protection for the technology, creating a foundation for future development of advanced targeted drug delivery solutions.

Speaking on the occasion, Shri Rajesh Kumar Pathak, Secretary, TDB, stated, "The future of pharmaceutical manufacturing lies in sustainable, technology-driven production systems that combine quality, efficiency, and environmental responsibility. Indigenous development of advanced APIs, critical intermediates, and novel drug delivery platforms will be instrumental in strengthening India's position as a global pharmaceutical manufacturing hub. TDB is committed to supporting such innovative enterprises that are creating high-value technologies while contributing to import substitution and healthcare security."

Regaal Resources commissions new liquid glucose and maltodextrin powder facilities at Bihar

Bihar: Regaal Resources Limited, one of India's leading maize processing companies, has doubled its maize crushing capacity from 825 TPD to 1,650 TPD. The company has also commissioned a new Liquid Glucose facility with a production capacity of 180 MT per day and a new Maltodextrin Powder manufacturing facility with a production capacity of 50 MT per day at its integrated maize processing complex in Kishanganj, Bihar. With an investment of approximately ₹389 crore, the expansion marks a significant milestone in the company's growth and product diversification strategy, aimed at strengthening its presence in value-added maize specialty products and derivative segments. With maize processing capacity of approximately 1,650 tonnes per day, the facility is expected to generate around 475 additional direct employment opportunities.

The increased crushing capacity and commissioning of the Liquid Glucose and Maltodextrin Powder facilities are expected to accelerate the company's transition towards higher-margin specialty and derivative maize products while supporting growing domestic and international demand. Liquid Glucose is widely used in sweets, confectionery, biscuits, ice creams, jams, jellies, pastries, and liquors, while Maltodextrin Powder finds applications across the food and beverage, pharmaceutical, dairy and nutraceutical industries.

Commenting on the development, Anil Kishorepuria, Chairman and Managing Director of Regaal Resources Limited, said, "The commissioning of our expanded crushing capacity to 1,650 MT per day and new derivative manufacturing facilities for Liquid Glucose of 180 MT per day and Maltodextrin Powder of 50 MT per day marks a significant milestone in Regaal's journey towards becoming a diversified maize-based specialty products company. This expansion strengthens our presence in higher value-added maize derivative products and enhances our ability to cater to evolving customer requirements across the food, pharmaceutical, agriculture, and healthcare sectors. At 1,650 MT per day, Regaal will now operate the largest maize wet milling facility in Eastern India, further strengthening our manufacturing scale & long-term growth prospects." ■

*Nutraceutical Industry***WACKER Opens New Production Site for Specialty Silicones**

WACKER officially opened a new production site for silicones in the Czech Republic. After just two years of construction, the first production line officially went on stream in Karlovy Vary. Here, customized silicones for the automotive, household appliances and medical technology industries as well as for the energy sector will be manufactured.

“Karlovy Vary is an important pillar for our silicone activities in Europe and a central building block in our specialties strategy”, said WACKER Executive Board member Christian Kirsten at the opening ceremony welcoming around 100 guests from politics, business and industry. “With the new site, we are expanding our position as a solution provider for customers in key industries.”

With the commissioning of the new site, WACKER is reorganizing its silicone activities in Europe. Together with the company’s Plzeň, Nünchritz, and Burghausen sites, Karlovy Vary will be responsible for supplying

customers of silicone specialties going forward. In the future, liquid silicone rubber will be manufactured in Burghausen, while thermally conductive silicones, potting compounds for the automotive industry and silicone gels for wound care will be produced in Plzeň. Room-temperature-curing silicones and solid silicone rubber will be located in Karlovy Vary.

“Karlovy Vary will make our integrated production network in Europe much more flexible, agile and efficient”, emphasized Kirsten in his speech. “Karlovy Vary complements our existing sites and, thanks to state-of-the-art production technology, creates the underlying conditions for extremely high levels of efficiency and quality. Going forward, this will enable us to serve our customers even better thanks to high-quality and innovative products. With Karlovy Vary, we are beginning a new chapter in our silicones’ success story.”



WACKER team during the opening of the new production site for silicones in Karlovy Vary. Source: WACKER



At WACKER's new Czech based production site in Karlovy Vary, WACKER will produce silicones for the growth markets of electromobility, medical technology and power-grid expansion. Source: WACKER

Megatrends Drive WACKER's Silicone Business

The main drivers for the silicone business are megatrends such as electromobility, medical technology, renewable energy, grid expansion, and digitalization. Customized silicone elastomers are especially needed where conventional materials cannot meet the high and ever-increasing requirements, such as in thermal management in electric vehicles, wound care and power engineering.

The new production site is located in Business Park Karlovy Vary, a 25,000 square meter industrial park in the north of Karlovy Vary. The land and the building, which WACKER has leased, are owned by the investment group Accolade. The building shell was constructed

by the development company Panattoni. Production facilities and laboratory equipment were designed by WACKER.

"We are proud to have been able to build business facilities in Karlovy Vary that go beyond the region's traditional spa, energy and coal industries. From the very beginning, our goal has been not only to deliver a modern industrial facility of the highest global quality, but also to provide an impetus for the further development of the local economy", said Jiří Zita, Panattoni's Commercial Director in the Czech Republic, during the official ceremony.

Accolade CEO Milan Kratina also praised the project. "The moment we stop talking about the potential of our investments and start seeing how it materializes in practice is the best reward for years of preparation. The Karlovy Vary site is now entering precisely this phase, as WACKER begins operations and gains state-of-the-art facilities for development and production.

For the Karlovy Vary region, this represents a significant strengthening of its industrial development; for us, it confirms that the right location will always find the right tenant", he said. "I would like to thank the entire team that worked on the project, the region and the city of Karlovy Vary for their long-term cooperation, and the tenant WACKER for the trust they have placed in us."

Together with the company's Plzeň, Nünchritz, and Burghausen sites, Karlovy Vary will be responsible for supplying customers of silicone specialties going forward. In the future, liquid silicone rubber will be manufactured in Burghausen, while thermally conductive silicones, potting compounds for the automotive industry and silicone gels for wound care will be produced in Plzeň. Room-temperature-curing silicones and solid silicone rubber will be located in Karlovy Vary.



View of production facilities at the new site. Going forward, room-temperature-curing silicones and high consistency rubber will be produced in Karlovy Vary. Source: WACKER

Production in Karlovy Vary, WACKER's second site in the Czech Republic

WACKER has been present in the Czech Republic since the 1990s. In Plzeň, the company has been operating a production site for ready-to-use silicones since 2008. Meanwhile, thermally conductive silicones and silicone gels are also manufactured here. In 2023, Plzeň also became home to an Excellence Hub, which provides services for the entire Group. Since 2026, WACKER is now active in the Karlovy Vary region too. Up to 200 jobs are to be created there by 2028 and filled by qualified specialists from the region.

"Our goal is to create the conditions for quality jobs, the development of regional infrastructure, and a long-term competitive economy. The signing of this memorandum therefore represents an important step and a catalyst for strengthening economic development in the Karlovy Vary Region. Our partnership with WACKER opens up new opportunities in the areas of innovation, education, and sustainable industry, and enhances the region's appeal for further investment," said Petr Kubis, Governor of the Karlovy Vary region, during the signing

of a cooperation agreement between WACKER, the city and the district.

Karlovy Vary Mayor Andrea Pfeffer Ferklová, too, praised the commitment of the project partners. "The arrival of a strong international partner such as WACKER is an important expansion of the portfolio of job opportunities and the local business environment for Karlovy Vary. The memorandum will allow us to leverage further synergies in the development of the city and its infrastructure, as well as in engaging the local community. I am very much looking forward to our mutual cooperation increasing the attractiveness of the city for its current and potential future residents, as well as for other investors." ■

Nutraceutical Industry

Nutrify Today Eurasia Sumflex: A New CIS Corridor for Responsible Nutrition

Nutrify Today's Sumflex platform has entered a new phase of global expansion with the launch of Nutrify Today Eurasia Sumflex in Tashkent from 20–22 May 2026. The event also marked Uzbekistan's emergence as a strategic corridor for responsible nutrition, pharmaceuticals, medtech and health-sector collaboration across the Commonwealth of Independent States (CIS) region.



Abdulla Azizov, Director of the agency for the Development of the Medical and Pharmaceutical Industry, Ministry of Health of the Republic of Uzbekistan.

Eurasia Sumflex

The three-day convergence drew nearly 3,000 attendees from Eurasia, bringing together nutraceutical companies, pharmaceutical stakeholders, medtech innovators, investors, policymakers, distributors and health-sector leaders. The event positioned Tashkent not merely as a host city, but as a serious regional hub for the next phase of preventive healthcare and evidence-led nutrition commerce.



Amit Srivastava, Founder & Chief Catalyst, Nutrify Today

The event was marked by the leadership presence of H.E. Abdulla Azizov, Director of the Agency for the Development of the Medical and Pharmaceutical Industry under the Ministry of Health of the Republic of Uzbekistan, whose engagement underscored Uzbekistan's intent to build a modern, investment-ready healthcare and life-sciences ecosystem.

For Nutrify Today, the Tashkent edition represents more than geographic expansion. It signals the evolution of Sumflex from a single flagship industry event into a multi-venue global scale-up architecture, where regional hubs can serve their own markets while remaining connected to a larger responsible nutrition movement.

The underlying idea is straightforward: the world no longer needs to depend on one major global convergence point for nutraceutical business development. Companies can now choose regional hubs that offer better proximity, sharper access, stronger local relevance and more efficient business outcomes.

Tashkent, with its central location, reform-led healthcare agenda and access to CIS markets, is now being shaped as one such hub.



Nutrify Eurasia Sumflex

“Precision is beautiful because it has ROI,” said Khasim MTI, Executive Director of Nutrifly Today, reflecting the company’s operating philosophy. “The idea at Nutrifly Today is not to play the number game, but to create strategic connections that convert into measurable business outcomes.”

That positioning was visible across the event format. Nutrifly Today Eurasia Sumflex was designed not only as a nutraceutical conference and expo, but as a multi-sector convergence platform. Dedicated tracks in pharma and medtech created parallel opportunities for collaboration, allowing stakeholders to look beyond category silos and explore integrated health solutions.

This is significant because the future of nutrition is increasingly moving closer to mainstream healthcare.

Preventive health, metabolic wellness, healthy ageing, post-therapy nutrition, women’s health, sports performance and disease-risk management are no longer isolated supplement categories. They are becoming part of a broader healthcare conversation involving clinicians, regulators, pharmacies, hospitals, digital platforms and evidence-backed product developers.

Emerging Role of Uzbekistan

Uzbekistan’s role in that transition could be important. The country offers access to a young consumer base, a strategic geography connecting Central Asia and wider CIS markets, and a government posture increasingly oriented toward healthcare modernization, industrial development and investment partnerships.



Nutrify Today Eurasia Sumflex.



Nutrify Today Eurasia Sumflex.

During the Sumflex week, the Nutrify Today delegation also met with H.E. Abdulla Azizov to discuss a stepwise pathway for building a sustainable and responsible nutraceutical industry in Uzbekistan. The discussions focused on how the country can evolve from being a promising market into a structured regional platform for responsible nutrition, standardized ingredients, CDMO capabilities, regulatory alignment and cross-border health commerce.

The broader vision is to help Uzbekistan position itself as a responsible nutrition and life-sciences bridge for Eurasia — a market that can attract products from India, the United States and other regions, while also developing its own evidence-backed botanical and health-product strengths for CIS and global markets.

For Nutrify Today, the Tashkent launch also validates its wider Sumflex strategy. The platform began as a focused leadership event in India and has grown into a business-convergence model built around curated access, strategic meetings, regulatory intelligence, investor conversations and commercialization pathways.

Global nutraceutical markets are becoming more complex. Consumers are demanding credible products. Regulators are tightening scrutiny. Investors are looking for evidence and defensibility. Pharma companies are entering nutrition. Medtech is moving into preventive health. Retail channels are shifting from passive distribution to guided wellness commerce.

Conclusion

In such an environment, industry events that merely gather large crowds may have limited utility. The new premium is on precision: who meets whom, what decisions are enabled, what corridors open, and what measurable outcomes follow. That is the strategic bet behind Nutrify Today's Sumflex model.

The Tashkent edition demonstrated that a regional hub can be more than a trade show. It can become a catalyst for policy dialogue, market entry, investment mapping, healthcare collaboration and responsible product movement across borders. With nearly 3,000 participants, strong Eurasian representation and visible government engagement, Nutrify Today Eurasia Sumflex has given Tashkent a new position on the global nutrition and life sciences map.

The next test will be execution: whether the conversations translate into structured regulatory pathways, early investor participation, responsible product pilots, pharmacy and retail access, and a credible Uzbekistan-led corridor into CIS markets.

For now, the signal is clear. Nutrify Today is no longer building only an event. It is attempting to build a distributed global operating system for responsible nutrition scale-up — one regional hub at a time. ■

Process Analytical Technology in Pharma and Biopharma: Building Quality In, Not Testing It Out



Amjad Banedar

Associate Director
Glatt Systems Pvt. Ltd.

*For decades, pharmaceutical quality was a verdict delivered after the fact. Batches were manufactured, samples were pulled, laboratories ran their assays, and only then did manufacturers learn whether what sat on the floor met specification. By that point, the time, materials, and energy were already spent. If the answer came back wrong, so were the consequences. Process Analytical Technology, or PAT, reverses that logic, emphasizes **Amjad Banedar, Associate Director, Glatt Systems Pvt. Ltd.***

Process Analytical Technology (PAT) is the scientific and regulatory framework that allows manufacturers to design, analyze, monitor, and control production through timely measurement of Critical Quality Attributes (CQAs) and Critical Process Parameters (CPPs). The idea is straightforward in principle: instead of measuring quality at the end, you measure it as it happens, and you steer the process while the steering still matters.

That single shift in philosophy carries large operational consequences. PAT moves quality assurance from a downstream gate to an upstream design choice. It treats the manufacturing line as an information-rich environment rather than a black box waiting to be opened in QC. And it builds confidence through visibility rather than through inspection.

The objective, in the regulator's own language, is to build quality into the process, not to test it into the product.

Why It Matters Now

Pharmaceutical manufacturers operate under a steadily tightening set of pressures. Margins are under scrutiny. Portfolios are diversifying toward complex biologics, cell and gene therapies, and personalized medicines. Continuous manufacturing is moving from aspiration to expectation. Regulators in every major market are explicit about wanting deeper process understanding and more robust control strategies.

PAT addresses these pressures directly. It compresses the feedback loop between observation and action, often



Cleanroom infrastructure enabling quality, compliance, and operational integrity.

from hours or days down to seconds. That compression is what enables proactive process management, lower batch failure rates, faster release, and the ability to detect drift before it becomes deviation.

The economic case has matured alongside the regulatory one. Companies that have implemented PAT well are reporting measurable gains in yield, throughput, cycle time, and capital utilization. What began as a quality framework is increasingly understood as a competitive lever.

The Analytical Toolkit

Modern PAT draws on a range of analytical technologies, each chosen for what it can observe and how quickly. Near-Infrared (NIR) and Raman spectroscopy deliver rapid, non-destructive insight into chemical composition. Chromatography, increasingly online, supports impurity profiling and product characterization. Particle size analysis informs everything from dissolution to flowability. Moisture monitoring underpins drying and granulation. High-speed imaging adds visual context that complements spectroscopic data, while machine learning turns raw signals into operational decisions.

The toolkit matters less than what it enables: a manufacturing environment where the right measurement is taken at the right moment, and where

that measurement actually drives behavior. Real-Time Release Testing, once a future ambition, is now operating in commercial facilities.

PAT in Oral Solid Dosage Manufacturing

Tablets and capsules still account for the largest share of pharmaceutical output, and the unit operations that produce them (blending, granulation, drying, milling, compression, coating) remain among the most studied and most instrumented in the industry.

Blend uniformity is one of the clearest PAT success stories. NIR spectroscopy can verify homogeneity in real time during blending, identifying the precise moment a blend reaches uniformity and avoiding both under-mixing and the segregation that over-mixing can introduce.

Granulation control benefits from continuous monitoring of moisture content, granule growth, and drying endpoints. Wet granulation and fluid bed granulation become more predictable when sensors track what is actually happening inside the chamber, rather than relying on fixed-time recipes.

Drying optimization in fluid bed systems is a textbook PAT application. Moisture sensors enable endpoint detection that responds to the actual material state, eliminating the waste of over-drying and the risk of under-drying that time-based programs invite.

Tablet compression monitoring brings weight, hardness, thickness, and content uniformity under continuous observation, with automatic corrective action when trends drift outside expected ranges.

Coating processes are increasingly monitored in-line for thickness, uniformity, color consistency, and defects. Confirming coating quality during the run, rather than after, materially reduces dependence on offline testing.

Particle size distribution, which influences dissolution, bioavailability, flowability, and compressibility, is now routinely characterized in real time using vision-based

systems that complement laser diffraction and traditional methods.

PAT in Biopharmaceutical Manufacturing

Biopharmaceutical processes operate under a different kind of complexity. Living systems are inherently variable, and the analytical demands placed on bioprocessing reflect that.

In **upstream processing**, continuous monitoring of cell density, viability, pH, dissolved oxygen, dissolved carbon dioxide, glucose, lactate, and temperature provides the visibility needed to manage cellular metabolism actively. With that data in hand, manufacturers can refine feeding strategies, anticipate metabolic shifts, and improve titer and product quality consistency.

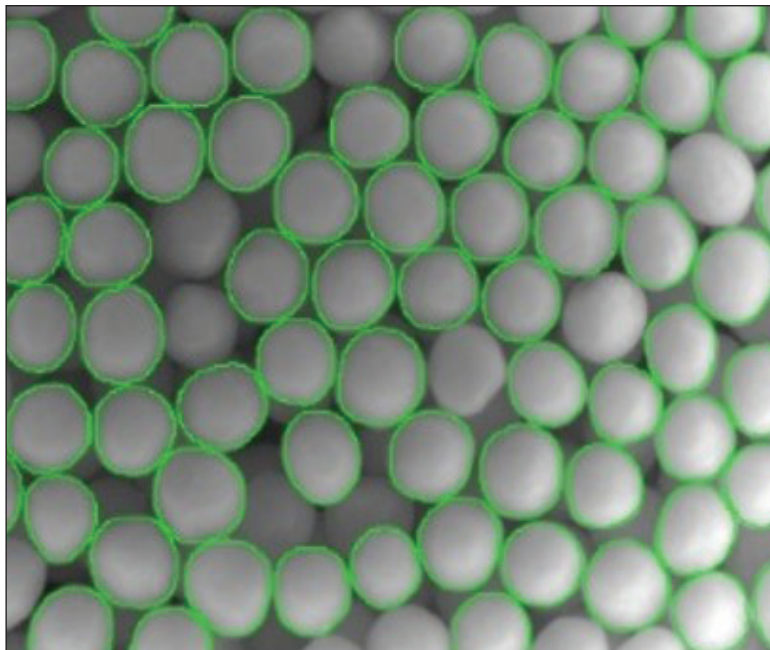
Downstream processing has its own PAT story. Chromatography optimization, real-time protein concentration measurement, impurity tracking, and purification control all benefit from analytical methods that move faster than offline QC.

Continuous bioprocessing depends on PAT in a more fundamental sense. Without real-time analytics, continuous operation simply is not viable at the level of process control or regulatory assurance. As the industry shifts toward perfusion and connected unit operations, PAT becomes the nervous system of the facility.

Beyond unit operations, advanced analytical tools monitor protein concentration, aggregation behavior, glycosylation profiles, and product purity, supporting both quality and regulatory consistency for biologics whose efficacy depends on subtle structural attributes.

Vision Systems

Vision-based PAT technologies are emerging as powerful tools for both OSD and biopharmaceutical manufacturing. By combining high-speed imaging, advanced analytics, and artificial intelligence, vision systems provide real-time insights into particle characteristics, coating quality, process behavior, and product appearance.



Measuring layer thickness in-line ensures a controlled process and product.

Glatt Vision Systems complement traditional PAT technologies by delivering enhanced process visibility, supporting data-driven decision-making, and enabling more advanced process control strategies.

The Business Case

The benefits of PAT are no longer hypothetical. Organizations implementing it well are achieving better product consistency, fewer batch failures, faster release through Real-Time Release Testing, lower waste, deeper process understanding, and more flexible operations.

What is worth being honest about is that PAT also asks for something in return. Initial investment in instruments, automation, software, and integration is significant. Successful implementation requires expertise across pharmaceutical sciences, process engineering, automation, chemometrics, and data analytics, capabilities that few organizations have fully in-house. Regulatory documentation around evolving PAT models demands careful lifecycle management. And cultural change, the move from a quality-by-testing mindset to data-driven manufacturing, often takes longer than the technology installation itself.

These are real challenges, but they are challenges of adoption rather than of value. The companies that have worked through them are not looking back.



Process Analytical Technology Tool

What Comes Next: AI, Digital Twins, and the Adaptive Factory

The frontier of PAT runs straight through the broader digital transformation of pharmaceutical manufacturing.

Artificial intelligence and machine learning are already reshaping how PAT data is interpreted. Predictive process monitoring, anomaly detection, and intelligent optimization are moving from pilot to production.



Process Analytical Technology

Soft sensors, mathematical models that infer critical quality attributes from existing process data, are reducing the need for some physical instrumentation entirely.

Digital twins, virtual representations of physical processes calibrated against real-world data, are emerging as a way to simulate process behavior, test optimization strategies in silico, and predict deviations before they materialize on the floor. The combination of digital twins and PAT produces something genuinely new: a manufacturing environment that can be reasoned about, not just operated.

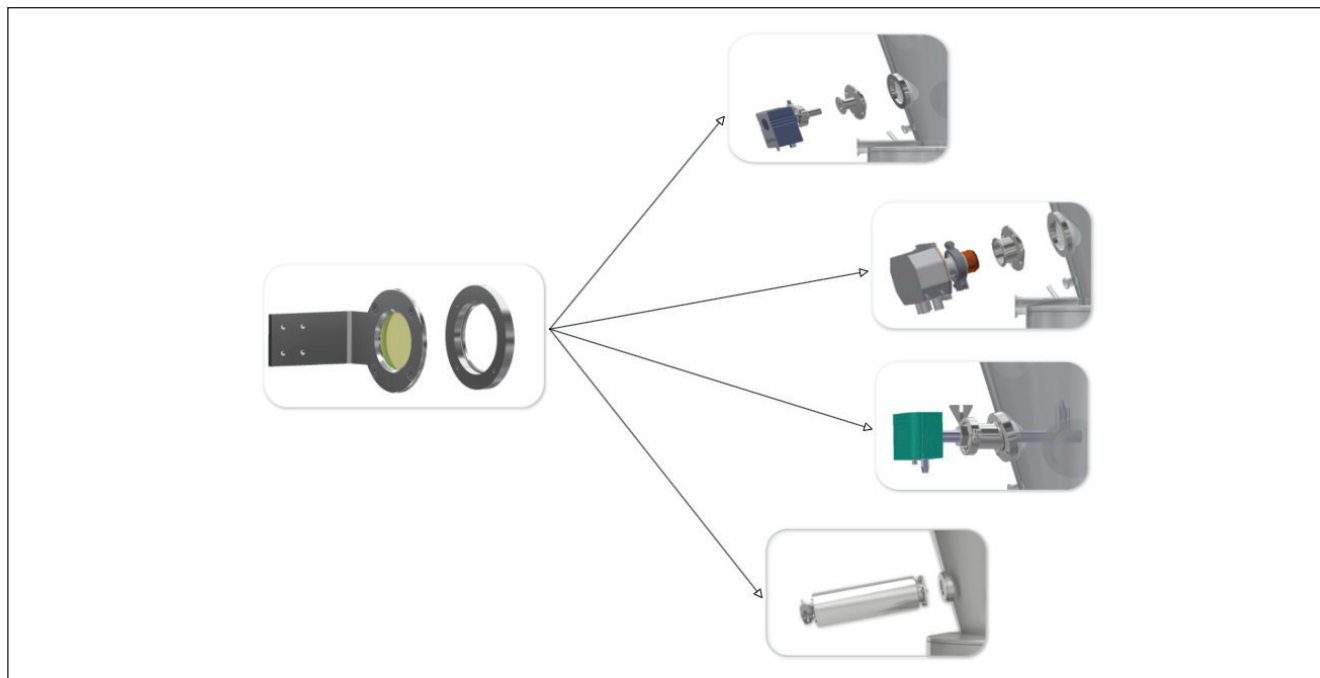
As the industry transitions from Industry 4.0 toward Industry 5.0, with its emphasis on human-machine collaboration, resilience, and sustainability, PAT will sit at the foundation of intelligent, connected, adaptive, and increasingly autonomous pharmaceutical production.

How Glatt Supports the PAT Journey

Glatt offers an integrated PAT solution that combines process expertise, pharmaceutical equipment, analytical technologies, automation, digitalization, and training. The approach spans the full manufacturing lifecycle, from process development to commercial production, and is designed to help customers improve product quality, reduce variability, optimize efficiency, and meet evolving regulatory expectations.

The Glatt PAT offering includes process development and Quality by Design (QbD) support, Loss on Drying (LOD) monitoring, blend uniformity monitoring via NIR spectroscopy, particle size distribution analysis through Glatt Vision Systems, tablet hardness, weight and compression monitoring, coating thickness and quality monitoring, sensor integration with new and existing equipment, PLC, SCADA, MES, and DCS integration, Advanced Process Control (APC) and data analytics, retrofit solutions for legacy facilities, continuous manufacturing and Real-Time Release Testing support, and structured PAT training and knowledge transfer programs.

Whether the context is a greenfield facility or the modernization of existing production



One PAT Port for multiple solutions and maximum flexibility

lines, Glatt delivers an end-to-end solution that turns process data into actionable insight, with measurable impact on quality, efficiency, manufacturing risk, and regulatory standing.

The One PAT Port concept adds another layer of flexibility, allowing multiple analytical technologies to be deployed through a unified interface that simplifies integration, shortens deployment timelines, and protects future technology choices.

By combining PAT with deep expertise in fluid bed processing, coating, granulation, drying, automation, and digital manufacturing, Glatt offers customers a partner capable of delivering complete solutions for the pharmaceutical factory of the future.

PAT has moved well past its origins as a regulatory initiative. It is now a cornerstone of how high-performing pharmaceutical operations are designed, run, and continuously improved. Real-time understanding, real-time control, and the data infrastructure to support both are no longer differentiators reserved for the most advanced manufacturers. They are becoming the baseline.

As AI, machine learning, digital twins, and Industry 5.0 technologies mature, PAT will only grow more central to building smart, connected, and increasingly autonomous

pharmaceutical factories. The organizations that invest in PAT today are positioning themselves to meet tomorrow's regulatory expectations, to compete on cost and speed, and, most importantly, to deliver high-quality medicines to patients more reliably than ever before. ■

To see PAT in action and meet our experts, visit Glatt at Hall 6, Booth E01, Pharma Pro & Pack 2026, 9 to 11 July 2026, Hyderabad.

Beyond Compliance: How Global Regulatory Expectations Are Reshaping Pharmaceutical Manufacturing in Emerging Markets



Vijay Kumar Aggarwal

Managing Director
Medicef Pharma

*There was a time when stringent quality controls in pharmaceutical manufacturing were primarily seen as a regulatory requirement — an essential step to gain market access and meet country-specific compliance standards. Success was often measured by the ability to pass inspections and satisfy audit expectations. Today, that perspective has undergone significant changes. In the modern pharmaceutical landscape, quality is no longer a regulatory obligation; it has become the foundation for long-term sustainability and global competitiveness. For pharmaceutical manufacturers in emerging markets, compliance is now considered the baseline rather than the end goal. India's journey reflects this transformation, emphasizes **Vijay Kumar Aggarwal, Managing Director, Medicef Pharma.***

Recognised globally as the Pharmacy of the World, India has established itself as a dependable and quality-focused pharmaceutical partner, consistently supplying medicines across international markets with reliability. This reputation has been built not only on manufacturing capacity but also on a growing commitment to quality excellence. A similar shift is taking place across emerging economies seeking to strengthen their position in global pharmaceutical

manufacturing. The objective is no longer limited to producing at scale or entering regulated markets — it is about creating systems that inspire confidence and deliver sustainable value. As a result, the industry's focus has evolved. The key question is no longer, "How do we clear an inspection?" but rather, "How do we build a manufacturing environment that earns global trust?"



Cleanroom infrastructure enabling quality, compliance, and operational integrity.

Today, regulatory expectations extend beyond compliance and increasingly emphasise data integrity, quality-driven manufacturing, patient safety, supply chain transparency, and continuous improvement. The future of pharmaceutical manufacturing will belong to organisations that embed quality into their culture — because in this new era, trust has become the true measure of excellence.

Beyond Volume: Elevating Manufacturing Standards in Emerging Markets

The pharmaceutical landscape across emerging markets is undergoing a significant strategic transformation. Countries such as India, China, Brazil, and several Southeast Asian nations have become indispensable contributors to the global pharmaceutical supply chain by delivering generic medicines, APIs, biosimilars, and other critical therapies at competitive costs. Their success has historically been supported by advantages such as large manufacturing capacities, an extensive workforce, and economies of scale.

For years, the ability to manufacture high volumes at lower costs created a strong competitive position in global markets. However, the dynamics of pharmaceutical manufacturing are changing rapidly. Today, global buyers and healthcare stakeholders are evaluating manufacturers through a much broader lens. Competitive pricing and production capacity

remain important, but they are no longer sufficient to establish long-term partnerships.

Purchasing decisions are increasingly influenced by factors such as regulatory inspection history, quality culture, effectiveness of Corrective and Preventive Actions (CAPA), process robustness, supply chain resilience, and environmental and sustainability commitments. As a result, emerging markets are moving beyond their traditional identity as cost-

efficient production hubs and positioning themselves as strategic and trusted healthcare partners. The new competitive advantage lies not in how much can be manufactured, but in how consistently quality can be delivered. Regulatory maturity, adoption of innovative manufacturing technologies, development of resilient quality systems, and the ability to remain a reliable partner under changing market conditions have become defining differentiators. In this evolving environment, pharmaceutical manufacturers that combine operational scale with quality excellence and long-term trust will be best positioned to lead the next phase of global healthcare growth.

From Following Rules to Managing Risk: The New Regulatory Mindset

Traditionally, pharmaceutical quality management systems operated on a “detect and correct” philosophy. Success was often measured by the ability to identify issues after they occurred and implement corrective actions to restore compliance. Manufacturing organizations focused heavily on preventing batch failures, minimizing deviations, reducing market complaints, and responding quickly through investigations and product recalls whenever issues emerged. While this approach helped maintain regulatory compliance, it is no longer sufficient in today’s pharmaceutical environment.



Advancing manufacturing through controlled and future-ready production systems.

Regulatory expectations across global markets are evolving from reactive quality management toward predictive and preventive quality systems. Authorities increasingly expect manufacturers not only to respond effectively to problems but to anticipate and prevent them before they impact product quality or patient safety. This shift reflects a broader transformation in how manufacturing excellence is defined.

Modern pharmaceutical operations are now expected to embed proactive quality frameworks into everyday decision-making and process design. Concepts such as Quality Risk Management (QRM), Process Analytical Technology (PAT), Continued Process Verification (CPV), and robust Pharmaceutical Quality Systems (PQS) are becoming central pillars of manufacturing strategy rather than regulatory formalities. The expectation today is clear: manufacturers must demonstrate deep process understanding, maintain stringent control over variability, and provide scientific justification for critical decisions throughout the product lifecycle. Quality can no longer depend solely on inspection outcomes or post-event corrections.

The most resilient pharmaceutical organizations are those that build systems capable of identifying signals early, controlling risks proactively, and continuously improving performance. In this evolving regulatory landscape, prevention is no longer an ideal — it has become the defining standard of quality excellence.

The future belongs to manufacturers who move beyond correcting failures and focus on ensuring they never occur.

Data Integrity: The New Standard for Pharmaceutical Excellence

In today's pharmaceutical environment, reliable data is synonymous with reliable medicines. Product quality can only be assured when the data supporting every stage of manufacturing is accurate, complete, and trustworthy. Traditionally,

quality has often been viewed as the responsibility of the Quality department alone.

However, modern pharmaceutical manufacturing demands a broader perspective — quality is the responsibility of every individual and every function within the manufacturing ecosystem. From production and quality assurance to engineering, supply chain, and laboratory operations, each department contributes to the integrity of the final product.

At the centre of this transformation lies continuous learning and capability building. Organizations must foster a culture where training extends beyond compliance requirements and becomes a driver of continuous improvement. Developing a quality-first mindset across all teams strengthens operational discipline, reduces deviations, and builds greater regulatory confidence. Such a culture cannot exist without strong data integrity practices.

Data provides the foundation for identifying trends, understanding process variability, and uncovering insights that support proactive decision-making and continuous improvement. Regulatory authorities worldwide continue to place significant emphasis on the ALCOA+ principles of data integrity—ensuring that records are attributable, legible, contemporaneous, original, and accurate, while also being complete,



New era of efficient material management and modern manufacturing practices.

consistent, enduring, and available throughout the data lifecycle. To support these expectations, pharmaceutical companies are increasingly adopting digital technologies such as Electronic Batch Records (EBR), Manufacturing Execution Systems (MES), Laboratory Information Management Systems (LIMS), and Artificial Intelligence-enabled monitoring solutions.

These technologies reduce manual complexity, strengthen process controls, and improve decision-making. Ultimately, digital maturity and data integrity are no longer operational advantages — they are essential foundations for delivering quality medicines and sustaining trust.

Sustainability: The Emerging Standard of Pharmaceutical Quality

Sustainability is rapidly becoming a defining pillar of pharmaceutical manufacturing strategy in emerging markets. While environmental stewardship remains an

important outcome of sustainable practices, the business case extends far beyond environmental impact. Optimizing energy consumption, improving operational efficiency, and reducing resource wastage are increasingly contributing to cost savings, profitability, and long-term business resilience. Modern pharmaceutical manufacturers are recognizing that sustainable operations create value not only for organizations but also for

society and national economic growth. Efficient use of resources supports broader social responsibility goals while strengthening competitiveness in a rapidly evolving global market.

Today, quality expectations extend beyond the medicine itself. Global stakeholders increasingly expect pharmaceutical facilities to demonstrate environmental responsibility alongside product excellence. Regulatory and market expectations now emphasize reducing



Integrating automation and control for reliable pharmaceutical output.



Redefining manufacturing with modern and sustainable practices for a new global era

carbon emissions, conserving water resources, implementing efficient waste management systems, adopting green chemistry practices, and improving energy efficiency across manufacturing operations.

As sustainability metrics become integrated into business performance indicators, they are emerging as essential measures of manufacturing excellence in a carbon-conscious economy. Looking ahead, regulatory expectations are likely to evolve further — linking product quality with environmental stewardship and social accountability. The pharmaceutical manufacturers that succeed in the future will be those that deliver not only safe and effective medicines, but also responsible and sustainable operations.

The Road Ahead for Emerging Market Manufacturers

The evolving global pharmaceutical environment has delivered a clear message to emerging market manufacturers: transformation is no longer optional — it is essential. Investments in automation, digital systems, sustainability initiatives, data integrity, and continuous workforce development may appear demanding in the short term, but they have become critical enablers of long-term competitiveness and growth.

Global expectations today extend far beyond cost efficiency and manufacturing scale. Companies are

increasingly expected to demonstrate operational excellence, regulatory maturity, environmental responsibility, and a deeply embedded culture of quality. Achieving these standards requires commitment, strategic investment, and a willingness to continuously evolve. While these changes may involve significant resources, they should not be viewed as a cost burden but as an investment in future readiness. Manufacturers that embrace this shift

will strengthen resilience, build trust with global stakeholders, and position themselves for sustained success.

More importantly, this transformation opens doors to broader international acceptance, accelerated market expansion, and access to premium outsourcing and strategic partnership opportunities. In a highly competitive pharmaceutical landscape, trust and reliability have become the strongest differentiators. The next generation of pharmaceutical leaders will not be defined by how much they manufacture, but by how responsibly, consistently, and intelligently they deliver quality to the world. ■

'Heel-to-Health' Connection: Why Foot Care is More Than a Cosmetic Concern



Ajay Kakar

Founder and CEO
Salve Group of Companies

*Foot care is often treated as a cosmetic issue, limited to dry heels, rough skin or appearance-related concerns. In reality, the condition of the feet can reveal far more about a person's overall health than most people realize. Dermatologists and medical professionals increasingly describe the feet as a 'health mirror' because they can reflect circulation issues, nerve damage, infections, mobility problems and chronic conditions such as diabetes, opines **Ajay Kakar, Founder and CEO, Salve Group of Companies.***

Despite carrying the body's entire weight every day, feet remain one of the most neglected parts of personal healthcare. The numbers highlight the scale of the issue. According to the International Diabetes Federation, India is home to over 100 million people living with diabetes.

One of the most serious complications associated with the condition is diabetic foot disease, which can develop from unnoticed wounds, poor circulation and nerve damage. Research published in the National Library of Medicine states that nearly 15 per cent of people with diabetes may develop a foot ulcer during their lifetime.

Foot Damage

What makes foot-related complications dangerous is how easily they are ignored in the early stages. Dryness,

cracks, thickened skin or small cuts may appear minor, but they can become serious when left untreated, especially in individuals with reduced sensation in the feet.

The connection between foot health and mobility is equally important. Healthy feet are central to balance, posture and movement. When pain develops due to cracked heels, calluses, infections or inflammation, people naturally begin to change how they walk. Over time, this altered movement can affect the knees, hips and lower back. Medical experts often point out that mobility is directly linked to quality of life, particularly as people age. A seemingly small foot problem can gradually reduce physical activity, which then affects cardiovascular health, weight management and joint function.

Environmental conditions also contribute significantly to foot damage. Prolonged standing, friction from footwear, heat exposure, sweat accumulation and walking barefoot can weaken the skin barrier over time. This is especially common in countries like India, where open footwear is frequently used due to the climate conditions.

Cracked Heels

Cracked heels are one of the clearest examples of neglected foot health. The skin around the heels naturally becomes thicker because it handles constant pressure. However, when moisture levels drop, the skin loses elasticity and begins to split. In severe cases, cracks can become painful enough to bleed or increase the risk of infection.

This is why dermatologists often recommend ingredients such as urea and salicylic acid for foot care. Urea helps improve hydration while softening hardened skin and salicylic acid supports exfoliation of dead skin build-up. These ingredients are widely used in therapeutic foot creams because they address both dryness and thickening simultaneously.

Preventive Healthcare Awareness

The conversation around foot care is also changing because of preventive healthcare awareness. People are becoming more conscious of identifying health issues early rather than reacting after symptoms worsen. Feet can often provide those early signals. The phrase 'heel-to-health' reflects a larger shift in perspective. Feet are not separate from overall well-being. They support daily life in the most direct physical sense possible. Ignoring them often means ignoring early signs of broader health concerns.

For example, persistent swelling may indicate circulation issues. Changes in nail colour can sometimes point toward fungal infections or nutritional deficiencies. Cold feet may reflect vascular concerns, while numbness can be associated with nerve-related conditions. Importantly, good foot care does not require complicated routines. Consistent hygiene, proper hydration, supportive footwear and early attention to cracks or infections are often enough to prevent larger problems.

The phrase 'heel-to-health' reflects a larger shift in perspective. Feet are not separate from overall well-being. They support daily life in the most direct physical sense possible. Ignoring them often means ignoring early signs of broader health concerns.

As awareness around preventive healthcare continues to grow, foot care is finally moving beyond the beauty category and entering a space where it truly belongs - essential wellness.

Healthcare professionals also stress that foot care should not be seasonal. Many people focus on dry skin only during winter, but summer and monsoon conditions can create equally serious concerns through sweat, fungal growth and dehydration.

The growing focus on wellness has expanded conversations around skincare, nutrition and fitness. Foot care deserves to be part of that same discussion. It is not simply about appearance or grooming. It is about comfort, movement, independence and long-term health.

'Heel-to-Health'

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As awareness around preventive healthcare continues to grow, foot care is finally moving beyond the beauty category and entering a space where it truly belongs - essential wellness. ■

Rising Consumption of Personal Care is Driving Aroma Chemicals Demand



Mahesh P. Babani

Chairman & Managing Director
Privi Speciality Chemicals Ltd

The global personal care and home care industry is witnessing a significant shift in consumer preferences. Fragrance, once considered an additional product attribute, is now becoming central to how consumers evaluate products across categories such as shampoos, deodorants, soaps, detergents, hand wash, fabric care, and air care. This shift is directly influencing demand across the aroma chemicals industry, emphasizes

Mahesh P. Babani, Chairman & Managing Director, Privi Speciality Chemicals Ltd.

The world market size of fragrances stands at more than USD 50 billion, while the world market of aroma chemicals reaches around USD 6 to 7 billion with annual growth of almost 5 to 7 per cent. The value of the global aroma chemicals market stood at more than USD 6 billion in 2024 and is expected to increase to more than USD 10 billion by 2033.

The Asia Pacific segment presently occupies the largest share of the worldwide aroma chemical market owing to increased consumer demand from emerging markets like India and China. This is particularly crucial because Asia-Pacific is not just developing as a region of consumption, but also as a manufacturing destination for some of the largest fragrance and FMCG corporations globally who require diversification in their supply chains.

The growing usage of fragrance in consumer goods makes aroma ingredients all the more significant when it comes to differentiating one product from another, retaining customers, and adding value to brands. India seems to be assuming strategic importance in this regard, especially considering the fast growth rate above 8 per cent to 10 per cent per year expected in India's personal care segment due to urbanization, premiumization, increased disposable incomes, and awareness about grooming and hygiene.

Personal and Domestic Applications Generate Structural Demand

Growing fragrance usage in personal and home care is driving structural demand for aroma chemicals worldwide. Fragrance performance plays an important

▶ GUEST COLUMN

role in differentiating personal care products like shampoos, soaps, skin care preparations, deodorants, cleaning agents, fabric softeners, air fresheners, and detergents.

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Fragrances are now more than ever associated with cleanliness, quality, well-being, comfort, and luxury. According to consumer trend reports and industry analysis on fragrances, fragrance performance can be an important factor affecting repeat purchases of detergents, shampoos, and personal wash products.

This has necessitated significant investments in fragrance research and development and more durable scent profiles in both mass and luxury markets. In India, the luxury fragrance market is experiencing high growth rates, driven by younger demographics, online shopping, and growing disposable incomes. This growth in premium and niche segments will fuel demand for higher-value aroma compounds with enhanced stability and functionality.

Why India Is Emerging as a Strategic Manufacturing Hub

Over the last few years, multinational companies have actively diversified their sourcing strategies to reduce dependence on concentrated supply chains. What began as a China+1 strategy has now evolved into a broader push toward multi-origin sourcing models that prioritise supply continuity, operational resilience, and long-term supply security. This shift is creating significant opportunities for India's speciality chemicals sector, particularly in aroma chemicals.

India's chemicals industry, valued at nearly USD 250 billion in 2024, has steadily strengthened its position across speciality and performance chemicals. Manufacturing clusters in Gujarat and Maharashtra, availability of skilled process engineering talent, improving port infrastructure, and increasing regulatory alignment have helped India emerge as an important manufacturing base within global chemical supply chains.

The country is also benefiting from its growing export competitiveness. India's speciality chemicals exports have continued to expand steadily over the last few years, supported by strong manufacturing capabilities and increasing global demand for diversified sourcing partnerships. Government-led initiatives focused on manufacturing growth, infrastructure development, and ease of doing business have further strengthened the sector's global positioning.

Free Trade Agreements are also expected to play an important role in supporting long-term export growth for Indian manufacturers. Agreements with regions such as the UAE and Australia, along with ongoing discussions with the UK and the European Union, are expected to improve market access, strengthen trade flows, and enhance India's competitiveness in global speciality chemicals exports over time.

Within aroma chemicals specifically, India has developed capabilities across terpene chemistry, speciality molecule manufacturing, and integrated production systems that support both domestic and export demand. Indian manufacturers today are increasingly supplying to global fragrance houses, FMCG companies, and flavour and fragrance ecosystems that require large-scale, reliable, and compliant sourcing partners. India's growing domestic consumption base is also strengthening this position.

This expanding domestic demand allows manufacturers to continuously invest in scale, process optimisation, product development, sustainability initiatives, and technology capabilities while simultaneously supporting global supply requirements.

Portfolio Breadth and Integration are becoming Key Advantages

As fragrance formulations become more advanced, global customers are increasingly looking to consolidate sourcing relationships with suppliers that can offer broader product portfolios, consistent quality systems, and integrated manufacturing capabilities

Modern fragrance systems rely on multiple aroma ingredients working together across different applications and performance requirements. This is increasing the importance of manufacturers that can support diverse formulation needs through strong process chemistry capabilities and large-scale production infrastructure.

India has steadily strengthened its position in this area over the last decade. The country today has growing capabilities across terpene chemistry, speciality aroma molecules, and integrated manufacturing platforms

Global markets, particularly Europe and developed export regions, are introducing stricter expectations around ingredient traceability, environmental compliance, and sustainable sourcing practices. Regulations such as REACH and IFRA standards are increasingly influencing procurement decisions across the fragrance and FMCG ecosystem.

supporting a wide range of fragrance applications.

Product portfolios across the industry have also expanded significantly to include molecules such as Dihydromyrcenol, Ionones, Nitriles, Acetates, Amber Fleur, and sandalwood derivatives that are widely used across personal care, fabric care, and home care formulations. Dihydromyrcenol alone is estimated to be present in nearly 99 per cent of modern perfumes because of its role in freshness and performance profiles.

At the same time, India-based manufacturers are increasingly becoming part of long-term global supply chains serving leading fragrance houses and FMCG companies. This reflects the growing importance of

manufacturing consistency, portfolio depth, regulatory support, and reliable large-scale supply capabilities within the aroma chemicals industry.

Sustainability is Reshaping Global Procurement Priorities

Another major shift underway in the industry is the increasing focus on sustainability and regulatory compliance. Global markets, particularly Europe and developed export regions, are introducing stricter expectations around ingredient traceability, environmental compliance, and sustainable sourcing practices. Regulations such as REACH and IFRA standards are increasingly influencing procurement decisions across the fragrance and FMCG ecosystem.

As a result, sustainability is becoming a commercial requirement rather than only a compliance consideration. Global customers are increasingly evaluating suppliers based on renewable feedstock integration, lower-carbon manufacturing systems, waste reduction capabilities, and broader ESG alignment. This is accelerating investments in green chemistry and bio-based manufacturing pathways across the aroma chemicals sector.

India is also seeing growing momentum in this area through investments in bio-based production routes for ingredients such as furfural, ferulic acid, bio-vanillin, and maltol using renewable and agricultural feedstocks. These developments are helping create alternatives to petroleum-derived ingredients while also strengthening supply chain traceability and sustainability credentials for global customers.

India's Position in the Global Aroma Chemicals Industry is Strengthening

The global aroma chemicals industry is entering a phase where manufacturing reliability, sustainability, technical capability, and supply chain resilience are becoming as important as cost competitiveness.

India's strengths across speciality chemicals manufacturing, process engineering, integrated production capabilities, and domestic demand growth are positioning the country favourably within this

▶ GUEST COLUMN

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transition. The opportunity today extends beyond being a low-cost manufacturing base. India is increasingly emerging as a strategic supply partner for global fragrance and FMCG companies looking for long-term sourcing reliability, portfolio depth, and sustainable manufacturing capabilities.

As demand for higher-performance fragrance ingredients continues to rise globally, India's role within the aroma chemicals value chain is expected to become significantly more important over the coming decade. ■

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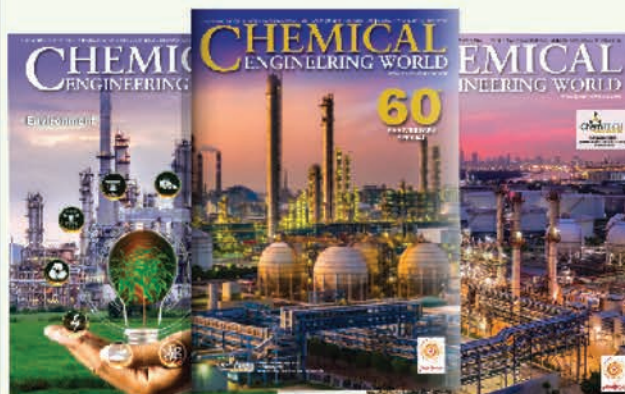
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M E D I A

Can India Turn Ayurveda From Heritage Into Intellectual Property?



Shafiulla Hirehal Nuruddin

Founder & Director
Greenspace Herbs

*India has provided much of the world's traditional knowledge on wellness, but the intellectual property based on that knowledge has been owned largely by others. **Shafiulla Hirehal Nuruddin, Founder & Director, Greenspace Herbs**, says that to close that gap, Indian ingredient companies will have to invest serious money in proprietary science — and be upfront about what that money means.*

Much of my career has been spent working with Ayurvedic botanicals – their chemistry, traditional uses, and potential for modern wellness formulations. In those years I have seen Indian ingredients go around the world and come back to us with somebody else's name on them. The ashwagandha that leaves our shores as dried roots comes back to Indian pharmacies as a patented extract with a foreign trademark, at ten times the price. We own the knowledge. It is not possession.

This is well known. What I have found increasingly difficult to swallow is how long we have tolerated it as an industry. India's contribution to world wellness is remarkable, not only as a provider of raw botanicals but as the originating civilisation of one of the world's most sophisticated pharmacological traditions. Ayurveda

is not a folk medicine. It is a codified and empirically derived system of health science that predates modern pharmacology by millennia. And yet, it is regularly treated as a source of cheap inputs in the global nutraceutical market.

I would like to ask this industry a direct question: When do we say that Indian knowledge should give rise to Indian Intellectual Property (IP)?

What the Real Value Chain Looks Like...

The vague statements about "India deserving more" do not really get the conversation anywhere. Let me be specific about the problem. There is a definite hierarchy in the global botanical ingredients market. The base consists of suppliers of raw materials - farmers, collectors and primary processors. Then above them

are standardised extract manufacturers who provide defined potency levels. Higher up are companies with proprietary processing technologies, clinical data packages and branded ingredient platforms. And at the top, with the highest margins and most durable commercial relationships, are those who own the intellectual property: the patents, the clinical substantiation, the trademarks you see on finished product labels.

India has always been in the bottom two tiers historically. We are pretty good at standard extraction. We have substantial manufacturing infrastructure in place. But the proprietary layer – the IP layer – has been largely absent from our industry’s ambition. This is what I want to change and led me to develop the Quantum Ayurveda platform at Greenspace Herbs.

India’s contribution to world wellness is remarkable, not only as a provider of raw botanicals but as the originating civilisation of one of the world’s most sophisticated pharmacological traditions. Ayurveda is not a folk medicine. It is a codified and empirically derived system of health science that predates modern pharmacology by millennia.

I want to be clear that this matters commercially, not just philosophically. Branded, clinically substantiated ingredients command price premiums that can be 5-20x the commodity price for the same botanical. They generate royalties, licensing agreements and long-term supply agreements that are far more stable than commodity contracts. They discover a cheaper source and establish market positions that competitors cannot easily replicate. The case for moving up the value chain for Indian companies looking to invest is not sentimental but financial.

Why Ayurveda Specifically and Why Now

This effort is timely because there is a certain moment in global wellness. In the past few years consumer demand for natural evidence-based health solutions has grown exponentially. US, European and Gulf

formulators are looking for botanical actives that can be substantiated, differentiated and positioned with scientific credibility. The market is no longer happy with ‘plant-based’ being a good enough claim. It needs mechanisms, bioavailability data, reproducible results.

Ayurvedic botanicals are ideally placed to meet that demand – if we treat them with the rigour the market demands. The classical texts give us a body of empirical observation accumulated over the centuries. Modern analytical techniques give us the tools to understand why those observations were correct - what the active constituents are, how they interact, what conditions optimise their efficacy. The gap we need to close is between that traditional knowledge, and validated, proprietary science that global markets will pay for.

This is what Greenspace Herbs is trying to do with Quantum Ayurveda. Our methodology, AYUQUANTA 7™, employs controlled frequencies and resonance techniques to botanical extracts to improve their bioavailability profile without altering the botanical source material. This is not easy science. I am not going to tell you all the questions have been answered, because they haven’t. But our data on CurcuminQA™ and AshwagandhaQA™ show meaningful improvement in absorption and retention versus conventional preparations and that data is the beginning of a validation process, not the end of a validation process.

What Real Rigorous Validation Requires

I know the nutraceutical industry has a credibility problem, and some of that problem is self-inflicted. Claims of efficacy not backed by peer-reviewed evidence, bioavailability data produced only in favorable in-house conditions, clinical studies that would not stand up to independent scrutiny – all this has damaged the sector’s reputation with regulators, physicians and savvy consumers alike. I don’t want Quantum Ayurveda to add to that problem. I want it to be a part of the solution.

What that really means in practice is a validation pathway that I think has to be non-negotiable for any Indian ingredient company serious about moving into the proprietary tier. First, peer-reviewed publication in indexed journals, not as a marketing exercise but as a genuine submission to scientific scrutiny. Second,

There are no short cuts to IP ownership. The investment is real, the timelines are long, the risk of scientific failure is real. But the alternative – to continue to supply commodity ingredients while others create IP on the back of our traditional knowledge – is a worse outcome for the industry and for India.

independent replication of key efficacy findings, preferably by institutions without commercial ties to the company. Third, regulatory dossiers developed to the standards of target markets: The US, EU and GCC all have different requirements and meeting these requires dedicated regulatory affairs expertise that our industry has historically underinvested in.

Fourth, and arguably most important, consistency of manufacture at commercial scale. An ingredient that works in a lab but can't be reliably produced at volume isn't a commercial proposition. From the start, the AYUQUANTA 7™ framework has been designed with scalability as a constraint, not as an afterthought. But I am under no illusions that showing consistency at scale is a different proposition to showing efficacy in development.

Sharing this because I think Indian ingredient companies need to be honest with themselves and their customers about what the validation journey entails. There are no short cuts to IP ownership. The investment is real, the timelines are long, the risk of scientific failure is real. But the alternative – to continue to supply commodity ingredients while others create IP on the back of our traditional knowledge – is a worse outcome for the industry and for India.

The Model We Need to Build

And when I look at what the most respected branded ingredient companies in the world have built the pattern is consistent. They started from a real scientific insight, they invested patiently in clinical validation, they built their regulatory files carefully and they built commercial relationships based on performance demonstrated rather than price competition. Indian companies have that option available to them. We have the botanical

knowhow, the manufacturing capacity and increasingly the scientific talent to do it. What has sometimes been missing is the belief that it is worth trying.

The decision to launch Quantum Ayurveda in the US before bringing it to India was deliberate. Before we said we were successful back home I wanted to try it out in one of the toughest regulatory and commercial environments in the world. The reception has been good, but I'm more interested in the questions it has raised than the endorsements. Serious buyers ask tough questions. Those questions have sharpened our thinking and our roadmap for validation.

A Question Worth Asking Seriously

I began this article by posing a question: At what point do we decide that Indian knowledge is Indian intellectual property? I don't think the answer is a policy announcement or a government initiative, although both would be helpful. I think it starts with individual companies deciding that it is a worthwhile investment to do proprietary science and then doing the work to demonstrate that decision with rigorous evidence.

Ayurveda has stood the test of thousands of years because the principles behind Ayurveda are sound. The opportunity before us is to demonstrate the soundness in the language that contemporary science and global markets understand. It is a betrayal of no tradition. I would say this is the most respectful way ahead.

I know Quantum Ayurveda has a lot to establish. I would rather own that and be held to the standard it implies, than make claims I can't yet fully back up. The questions the industry will rightly ask about mechanisms, reproducibility and regulatory compliance are not hurdles, they are the road ahead. We mean to travel it. ■

Filtration: An Important Unit Operation



Filtration is an important 'unit operation,' where solid cake is separated from the 'mass.' K G Tijare, Proprietor, Excellence Consultants, in this article, explains in detail about the major filtration systems, generally used in chemical and pharma industry and their selection criteria.

Following major filtration systems are generally used in chemical industry.

Filter Presses: Assembly of filter plates and filter cloth. Filter presses have been old 'work horse' in the chemical industry, with disadvantages of large footprint area, manual messy jobs, filtration performance not very satisfactory and high time-cycles.

Solid Bowl Decanters: These are used for slimy slurries, does not use filter media, utilizes high bowl RPM for separation. These are mainly utilized for ETP sludges, as an alternative to filter presses.

Nutsche Filters: These filters use filter cloth for separation and agitator for mixing and washing. Filtration by pressurization, batch equipment, long time cycles. These are used in pharma industry.

Rotating Vacuum Drum Filters (RVDF): RVDF uses vacuum for filtration, a continuous equipment, but the operation is messy and separation is not very clear. Not recommended for acidic streams as the vapors lead to corrosion of vacuum system.

Basket Centrifuges: These are commonly used equipment in chemical industry. Filter cloth is used for separation. Centrifugal force by rotation of basket leads to separation. The centrifuge basket comes in different MOCs/lining for filtration duty of acidic streams.

Peeler Centrifuges: Improvised basket centrifuge with semi continuous operation, cycle is feeding, washing cake discharge. These come with options for MOC for acidic slurries.

Pusher Centrifuges: These are used for separation of slurries of particle size above 50 - 100 microns. They utilize slotted screen for separation. These have multiple

basket rotating at the same RPM with reciprocating motion of inner basket for cake discharge.

Tower Pressure Filters: These are commonly used in mining industry, initially with large volumes to handle. With their sizes and automation, they have become an excellent alternative in chemical and pharma industry. Options of various material of constructions like SS / PP / Teflon / SS 904 etc, no rotating baskets like centrifuges, replaceable filter cloths and modular construction for increase in capacity, cake washing, automated cake delivery, makes this equipment technically superior to available filtration system.

Filtration Systems: Selection Criteria

To sum up, the criteria for selecting the right filtration system, would be based on the following:

- Nature of slurry to be processed
- Capacities to be handled
- MOC required as per process parameters
- Operating cost and manpower requirement
- Commercial viability of the equipment for the required duty ■

Author



K. G. Tijare
Proprietor
Excellence Consultants

Suraj Limited: Dedicated towards Technical Excellence & Quality Products

Suraj Limited, is an ISO-9001:2015, 14001:2015, OHS AS 45001:2018 certified company, PED approved and Government Recognized Export House and one of the world's leading producers and exporters of stainless steel, alloy steel, carbon steel seamless pipes, tubes, fittings and flanges. With over three decades of expertise, we serve critical industries including Oil & Gas, Petrochemicals, Power, Nuclear, Defense, Fertilizers, and Water Treatment across 60+ countries.

Manufacturing Infrastructure

Suraj Limited operates from two state-of-the-art plants in Gujarat, India:

- **Thol Plant:** Dedicated to seamless pipes, tubes, and fittings with hot extrusion, cold pilgering, and finishing facilities.
- **Chandarda Plant:** Specialized in carbon and alloy steel forged fittings and flanges with advanced forging, heat treatment, and machining lines.

Our total installed capacity exceeds 24,000 MT per annum.

Quality Assurance

We have our own in-house testing laboratory with modern testing equipment to carry out all mandatory as well as optional tests on the products. Complex tests for which we do not have in-house facilities will be conducted at an external third party approved test house. Products will also be supplied under third party inspection where customer demands.

Certifications & Approvals

- Our manufacturing is PED 2014/68/EU approved, and we hold product approvals from IBR, EIL, ONGC, BHEL, NTPC, and major global EPCs.
- We are also approved by international inspection agencies like Bureau Veritas, DNV, TUV, Lloyd's, and SGS.

Commitment

At Suraj Limited, we believe every customer has unique needs. Our technical and commercial teams work closely with clients to offer customized solutions, reliable delivery, and dedicated after-sales support.

Key Highlights

- **Gujarat-based Suraj Limited is one of the world's leading producers and exporters of stainless steel, alloy steel, carbon steel seamless pipes, tubes, fittings and flanges.**
- **SO-9001:2015, 14001:2015, OHS AS 45001:2018 certified company.**
- **PED approved and Government Recognized Export House.**
- **Operates from two state-of-the-art plants in Gujarat.**
- **Company's total installed capacity exceeds 24,000 MT per annum.**

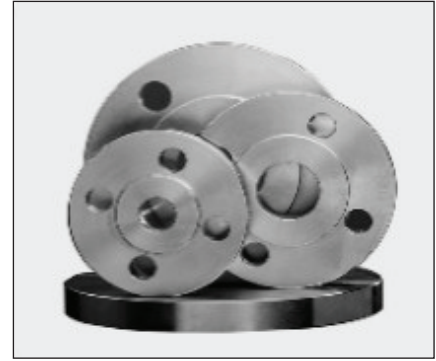
IMPACT FEATURE



Seamless Hot Finish Mother Pipe



Stainless Steel Seamless Heat Exchanger U-Tubes



Stainless Steel Flanges



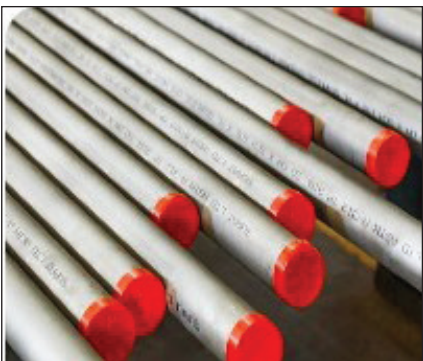
Stainless Steel Seamless Butt-weld Fittings



Stainless Steel Seamless Heat Exchanger Tubes



Stainless Steel Forged Rings



Stainless Steel Seamless Pipes

- **Heat Exchanger 'U' Tubes:**
12.70 mm to 50.80 mm OD
- **Hydraulic & Fuel Injection Tube:**
6.00 mm to 114.00 mm OD

Grades: AISI-304, 304L, 304H, 304N, 304LN, 309, 310, 310S, 316, 316L, 316H, 316Ti, 316N, 317, 317L, 321, 347, 405, 410

Duplex: UNS-S32750, S32760, S31803, S31500, S32205, S32304 and Its Equivalents in DIN, NFA, JIS, etc.

Length: Pipes up to 11.800 meter long and tubes up to 20 meter long ■

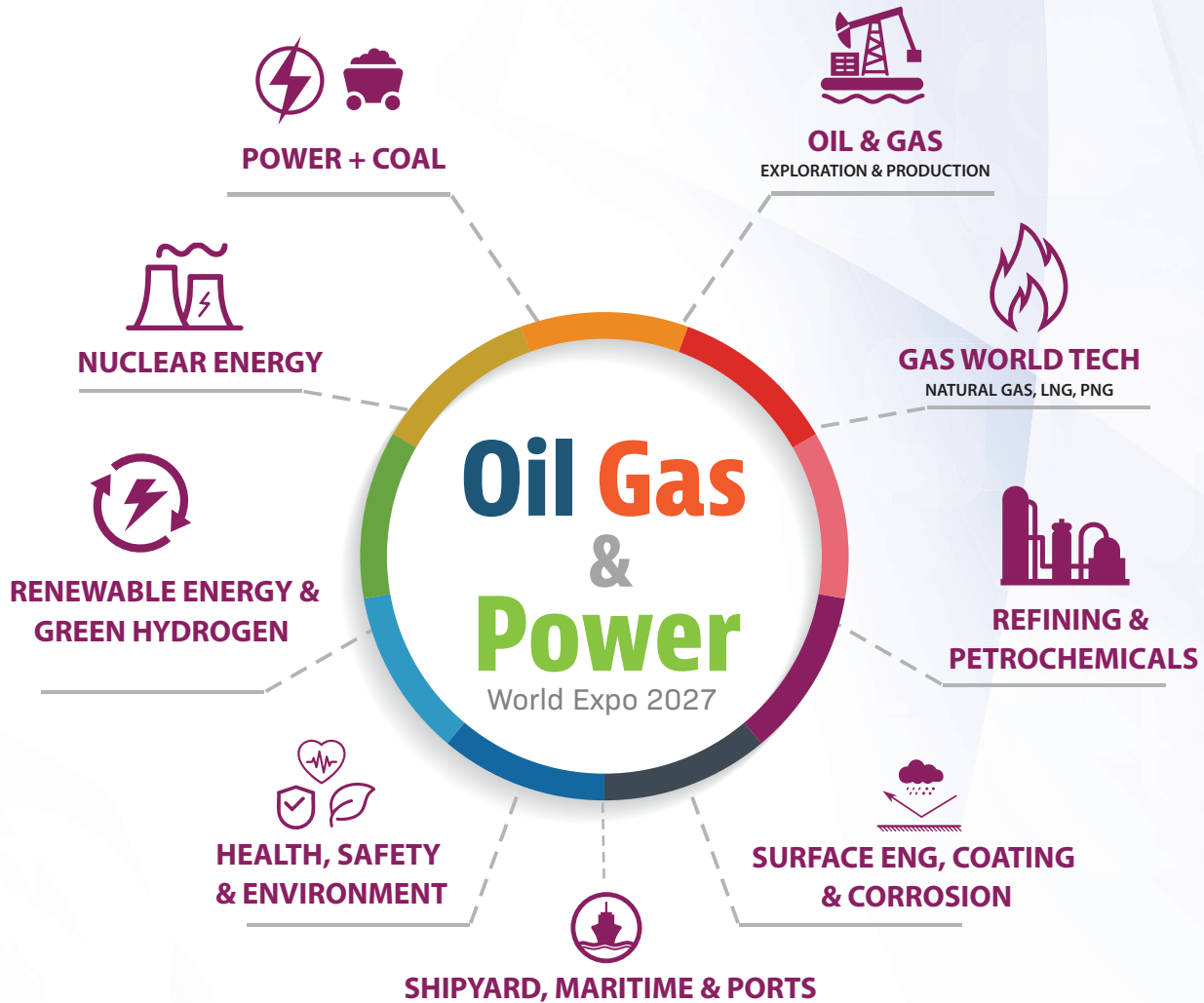
For detailed product information, please visit : www.surajgroup.com

Product Range

- **Stainless Steel Seamless Pipes:**
1/8 NPS to 6 NPS
- **Stainless Steel Seamless Butt-weld Pipe Fittings:** ½ NPS to 12 NPS
- **Stainless Steel Seamless Stubends (Type A):**
½ NPS to 12 NPS
- **Stainless Steel Flanges:** ½ NPS to 40 NPS
- **Stainless Steel Forged Rings:**
Max. 1200 mm OD
- **Heat Exchanger Tubes:**
6.00 mm to 101.60 mm OD

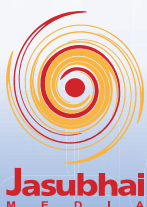


International Integrated ENERGY Exhibition & Conferences



3-5, March 2027

Venue: Bombay Exhibition Center, Goregaon (E), Mumbai, India



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33rd International Exhibition & Conferences

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Announcing

Concurrent Events



Scope for ChemTECH World Expo

- Plant Machinery & Industrial Consumables
- Engineering Consultants
- OEMs for Chemicals & Pharmaceutical Processing Equipment
- Metals & Metallurgy
- Bioprocessing Equipment
- Construction Services Providers
- Plant Maintenance Services Providers
- Logistics & Supply Chain Solutions Providers
- Instrumentation & Process Control
- Industry Automation (Process & Factory)
- Systems Integration & ERP Solutions Providers
- Water & Waste Water Treatment Consultants
- Environment Solutions Providers
- Waste Management Consultants
- Financial Institutions
- Fire & Safety Solutions Providers
- Material Handling Solutions
- Certification Bodies
- Welding Solutions
- Quality Health & Environment Solutions
- Analytical & Laboratory
- Packaging Materials, Machinery & Systems
- Business Consultants

Scope for Specialty Chemicals World Expo

- Agrochemicals Intermediates
- Adhesives & Sealants
- Agrochemicals & Crop Protection
- Bulk Drugs & Intermediates
- Enzymes
- Colorants, Dyes & Pigments
- Cosmetics & Personal Care Ingredients
- Hygiene & Cleaning Chemicals
- Laboratory Chemicals
- Surfactants
- Water Treatment Chemicals
- Catalysts
- Electronic Chemicals
- Flavours & Fragrances
- Contract Manufacturers

Scope for Biopharma World Expo

- Materials Processing
- Pharma Machinery
- Pharma Ingredients
- Plant Engineering, Process Plants & Equipment
- Laboratory & Analytical Solutions
- Process Measurement & Inspection
- Sterilization & Clean Room Solutions
- Biopharma R&D And Manufacturing
- IT Solutions
- Water & Waste Treatment Solutions

HIGHLIGHTS OF CHEMTECH WORLD EXPO 2028

800+ EXHIBITORS FROM 15+ COUNTRIES	26000+ VISITORS FROM 50+ COUNTRIES
9 TECHNICAL CONFERENCES	1500+ BUSINESS DELEGATES
250+ GLOBAL SPEAKERS	100+ GLOBAL CLIMATE TECH STARTUPS
1200+ ENGINEERING PHARMA & SCIENCE STUDENTS AT STUDENT OUTREACH PROGRAM FROM 28 STATES & UNION TERRITORIES	40 TECHNICAL PRESENTATIONS

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