VOL 21 | ISSUE 2 | SEPTEMBER 2022

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# PharmaBio World

INSIGHT INTO THE PHARMACEUTICAL AND BIOTECH INDUSTRIES

## Indian Pharma Industry - Pharma Machinery

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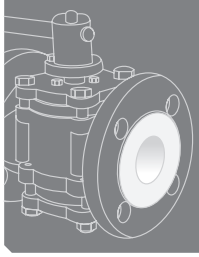
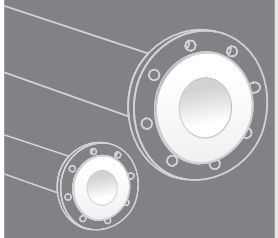
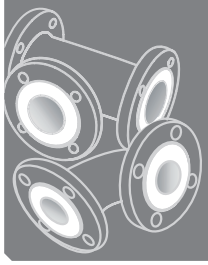


## LINED PIPES



## LINED FITTINGS



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INSIGHT INTO THE PHARMACEUTICAL AND BIOTECH INDUSTRIES

# STEAMING SOLUTIONS FOR ALL INDUSTRIES

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## Pressure regulators

## Control valves

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## Special equipment


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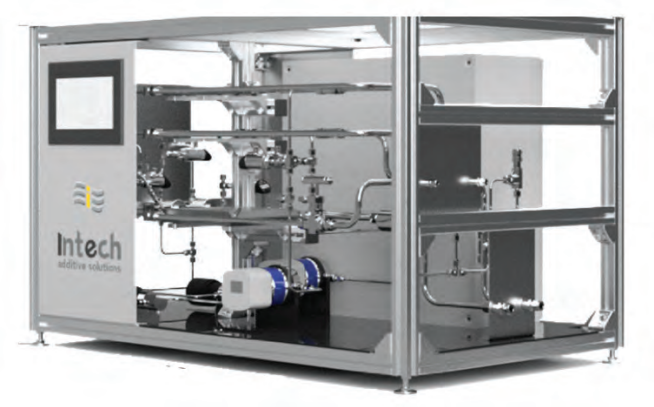
## Centre Grants 'in-Principle' Approval of three Bulk Drug Parks to Himachal Pradesh, Gujarat and Andhra Pradesh

**New Delhi, India:** The Department of Pharmaceuticals has conveyed 'in-principle' approval to the proposals of the three States Viz, Himachal Pradesh, Gujarat and Andhra Pradesh under the Scheme for "Promotion of Bulk Drug Parks", a key initiative to support the Bulk Drugs manufacturing in the country. The Scheme, with a financial outlay of Rs. 3,000 crores (around 400 million USD) notified in 2020, provides for financial assistance to three States for establishing Bulk Drug Parks and aims creation of world class common infrastructure facilities supported by the Central Government.

It will create a robust ecosystem for the Bulk Drug manufacturing in the country and also reducing the manufacturing cost significantly. This scheme is expected to encourage domestic manufacturing of bulk drugs to reduce import dependence and to establish a dominant position in the global market by providing easy access to standard testing & infrastructure facilities. This scheme will also help industry meet the standards of environment at a reduced cost through innovative methods of common waste management system and also to exploit the benefits arising due to optimization of resources and economies of scale.

## Intech Additive Solutions presents India's first Additively Manufactured Flow Reactor System for the Pharma Industry during ACHEMA 2022, Frankfurt.




**Frankfurt, Germany:** Intech Additive Solutions, India's leading Metal 3D Printing Original Equipment Manufacturer (OEM), announces the launch of their Flow Reactor System. The underlying technology is revolutionizing the industry by enabling manufacturers to develop, scale up and implement continuous Active Pharmaceutical Ingredients (API) manufacturing processes within shorter periods, in smaller facilities, and under safer conditions.

The principle of flow chemistry aims to achieve process intensification by performing chemical reactions in a 'continuous flow reactor' as opposed to a traditional batch reactor. The benefits of adopting a flow reactor system are the reduction in time, cost and energy consumption. Intech's robust process skids, meticulously integrated with a selection of high-end components, are a manufacturing powerhouse. The 3D printed flow reactors at the heart of it can be customized for any unit depending on the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## Lupin Receives Tentative Approval from U.S. FDA for Dasatinib Tablets


**Mumbai, India:** Global pharma major Lupin Limited (Lupin) in partnership with Pharmascience Inc. today announced that it has received tentative approval from the United States Food and Drug Administration (FDA) for its Abbreviated New Drug Application (ANDA), Dasatinib Tablets, 20 mg, 50 mg, 70 mg, 80 mg, 100 mg, and 140 mg, to market a generic equivalent of Sprycel® Tablets, 20 mg, 50 mg, 70 mg, 80 mg, 100 mg, and 140 mg, of Bristol-Myers Squibb Company.

Dasatinib Tablets (RLD Sprycel®) had estimated annual sales of USD 1569 million in the U.S. (IQVIA MAT June 2022).

## Pfizer ranked as leading company in Asia for covid-19 response and patient-centric approach by Asian patient groups

**Singapore:** Pfizer had been ranked first in its Covid-19 response, patient centricity, patient safety and bringing innovative, high-quality products amongst pharma companies in Asia in the 'Corporate Reputation of Pharma' survey by patient groups across the APAC region. Overall, the company is ranked second for its corporate reputation across Asian countries. Pfizer moved up in the survey rankings from 4th place to occupy the top ranking in terms of patient groups 'Working' with Pfizer, representing a significant increase in rankings in 2021 vs. 2020, in ten Asian countries.

This survey, conducted by UK-based PatientView, measures various aspects of pharma's performance at corporate reputation—always from a patient perspective. Patient groups responding to this survey are working across therapeutic areas and uniquely positioned to comment on the pharma industry's performance during the pandemic. Opinions from 300 patient groups were collected on the performance of the pharmaceutical industry in 2021. These Asian patient groups had collectively been in communication with nearly 2.7 million Asian patients in 2021. A total of 31 pharmaceutical companies were assessed by Asian patient groups in the 2021 Asia edition of this annual survey.

# SUPERIOR SAFETY FOR CLEANROOMS

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## R. STAHL SERIES 8150 PLUG & SOCKET FOR CLEANROOMS

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## Kyrgyzstan invites Indian pharma investments; to set up special free zone


**Hyderabad, India:** Kyrgyzstan Government will be setting up a special free economic zone for Indian manufacturers, especially for the pharmaceuticals industry. "We have a big interest in promoting Indian pharma investments in our country. The proposed economic zone will offer free infrastructure for manufacturers," Asein Isaev, Ambassador of the Kyrgyz Republic.

The modalities of the zone and tax incentives that might be offered would be discussed at the Inter-Government Committee (IGC), he said. "The plan is to set up the zone in about one year from now", Isaev added.

The country is interested in Indian Generics and is currently importing some drugs from India. It is also possible to arrive at some kind of understanding for mutual recognition of some regulatory processes, the Ambassador said.

## R. STAHL India's newly rebranded customer networking event – "ExConnect" is off to a fantastic start.


**Hyderabad, India:** R. STAHL India – A global leader in the explosion protection industry resumed its annual customer networking event under a new moniker called – ExConnect. Considering the need to engage with its customers, the ExConnect event was resurrected after a long gap. Its resurgence proved to be a massive success in the city of Hyderabad. The customer turnout was above expectation and ended up being a highly engaging and experiential event where R. STAHL introduced its latest HMI series ORCA.

The newly rebranded ExConnect event encapsulates technical sessions on Lighting, Switchgear, Automation, Basics of Ex and the latest technological advancements from STAHL global. It is also coupled with a

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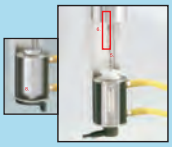
Viscosity Standards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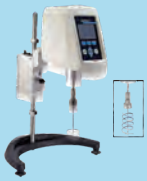
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RHEOLOGY VISCOSITY TEXTURE IN-LINE POWDER MOISTURE GAS

product demo session to give the customers a hands-on experience. With the success of the first ExConnect event, R. STAHL India have decided to expand this event to key markets across the country in the upcoming months.

## Focus on innovation, government-industry synergy key for India to become pharmacy of the world

**New Delhi, India:** Indian pharma industry currently ranks third in terms of pharmaceutical production by volume. This makes us a clear leader in the generics market. However, in terms of value, we rank 14th. To move up the value chain and get into the top 10 by 2030, we must focus on pharma innovation, which accounts for 2/3rd of the global pharma market value, developing an innovation-based pipeline of next-generation drugs and solutions to address the unmet needs of patients of India and the rest of the world.

The Indian pharma industry is strongly positioned in terms of production capacity and is also committed to growth. Many of the larger companies have already increased their investments in innovative drug development and may be boosted further by the government's policies that incentivize their efforts through schemes like production-linked incentives (PLI) and the upcoming research-linked incentive (RLI). Even the small and medium-sized pharma companies can now upgrade their facilities to global manufacturing standards and unlock their innovation potential supported by government schemes aiding technology upgradation, setting up of common research facilities, and effluent treatment plants in pharma clusters.■

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**TRENDS 2022. CONSTRUCTION AND MODERNISATION OF PHARMACEUTICAL PLANTS:** state support measures, foreign investments, new and existing projects.

**DEVELOPMENT OF PRODUCTION FACILITIES.** Introduction of the best practices in construction of new facilities and modernisation of existing ones: the experience of pharmaceutical companies in Uzbekistan, advantages, challenges, and phases.

**CONSTRUCTION.**
Construction projects for pharmaceutical companies. What to consider when developing project documentation? What are the steps from design to commissioning?

**TECHNOLOGIES.**
How to choose the required equipment for a specific production? How to choose and determine the need for auxiliary equipment? How to validate a ready for use facility?

**CASE STUDIES.**
Case studies on modernising pharmaceutical plants in Uzbekistan. What are the methods of increasing the company efficiency? How to choose the best method for your company?

**DESIGN AND LAYOUT.**
How to properly ensure industrial safety at a production site?
What are the requirements for fire safety at production and how to meet them?

**CHANGE OF PROFILING:**
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**INVESTMENTS.**
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- Bulk drugs
- R&D
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- Cold chain
- Packaging
- Contract Research & Manufacturing

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- Biofuels
- Methanol
- Carbon Capture Utilization & Storage
- Renewables – Solar Wind & Hydro

### LOGISTICS

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- Containers
- Supply Chain Management
- Packaging
- Material Handling
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- Cold Chain Management

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# "Transforming Pharma industry through novel solutions for Process measurement and Quality assessment "

**Sanjay Lakhani**
Head – Process Analytics, Mettler -Toledo India



*Mr. Sanjay Lakhani, Head- Process Analytics, Mettler-Toledo India articulates the challenges of the Pharma Industry in terms of their currently used instruments & equipment such as analytical scales, quality control equipment, process analyzers while giving insights on the novel technologies that can bring about the technological advancements, which will culminate towards increasing product quality & quantity significantly.*

**What are some of METTLER TOLEDO's latest technological breakthroughs and trends that help maintain the highest industry standards?**

METTLER TOLEDO's process analytical products are used in in-line or at-line manufacturing processes. In such critical application processes, the reliability of measurement is vital. Our offerings, such as our Intelligent Sensor Management (ISM) technology, are the most reliable to support customers' decision-making processes in all critical applications.

Continuous, real-time monitoring of analytical parameters in cell culture, fermentation, and downstream processes will increase productivity and maximize yield and defined quality attributes. METTLER TOLEDO Thornton is the leader in pure and ultrapure industrial water analytics and water analyzers used in pharmaceutical, biotech, semiconductor, microelectronics, and power generation applications. Its core competence is the online measurement of conductivity, resistivity, TOC, dissolved oxygen, and ozone in determining and controlling water purity, along with its recently launched first-of-its-kind microbial detection system. This at-line process analyzer is designed to complement and replace cell-culture testing as a method to identify microbial contamination in pharmaceutical waters.

**What are some of the recent innovative analytical products developed by METTLER TOLEDO to meet the current pharmaceutical customer needs?**

Continued innovation is critical to driving improvements in production for users of process instrumentation, and METTLER TOLEDO continues to innovate in the field of in-line instrumentation and process analyzers. For example, water is the most widely used excipient in biopharmaceutical manufacturing processes. It is used as an ingredient, reagent, solute, delivery device, and cleaning material. In pharmaceutical production, the accurate measurement and control of water quality are critical in the water purification process. A few products which I would like to particularly mention here are the following:

Online Water Bioburden Analysis (OWBA) offers a recognized method to detect microbial contamination in water systems quickly. The 7000RMS™ shows immediate increases in bioburden, so quick actions can be taken.

Conductivity/Resistivity is a widely used analytical parameter for water purity analysis, monitoring of reverse osmosis, cleaning procedures, control of chemical processes, and in industrial wastewater. Reliable results for these varied applications depend on choosing the right conductivity sensor. The digital UniCond® sensor ensures you meet the accuracy requirement of ±2% and the requirement that the electronics can be calibrated separately from the sensor.

> To be suitable for use in bioprocess engineering, in-line sensors must be sterilizable, should exhibit low drift, and need to operate reliably over days or even weeks. Preferably, sensors should only require simple, infrequent maintenance to help customers save time.

Total Organic Carbon meets USP and EP 2.2.44 requirements for TOC monitoring while ensuring unprecedented control. The 6000TOCi offers real-time monitoring, with built-in reporting on peak TOC levels and trends over time.

**What are the significant challenges of the changing and evolving field of Analytical instruments, and how have you addressed them?**

With the constant change in technology, stricter PAT guidelines, and evolving IT tools, it is becoming critical for Analytical instrument companies and customers to adapt to newer technologies every few years.



We at METTLER TOLEDO design and develop the products keeping two things in mind: 1) ease of interchangeability and 2) value for money. If we look at our process analytical instruments, they meet all the latest industry standards and requirements. Still, they offer the flexibility to adapt them to futuristic needs, and most importantly: they are affordable.

**How can your products adapt to the Biopharma customers changing environment in the field of vaccine development?**

Rapid growth in demand for all vaccine types forces manufacturers to reexamine their production methodologies. Switching from slow egg-based production to more rapid mammalian cell-culture fermentation is becoming more common. To be suitable for use in bioprocess engineering, in-line sensors must be sterilizable, should exhibit low drift, and need to operate reliably over days or even weeks. Preferably, sensors should only require simple, infrequent maintenance to help customers save time. METTLER TOLEDO's portfolio of sensors includes pH, conductivity, dissolved carbon dioxide, and amperometric and optical dissolved oxygen sensors specifically for use in bio-fermentation. All our sensors meet EHEDG guidelines for hygienic use and are highly stable and durable. Our aspiration to continuously improve our products has led to several developments in process analytics that have advanced sensor performance and simplified sensor operations.

The latest of these is Intelligent Sensor Management (ISM), a technology platform for sensors and transmitters that involves microprocessors installed in the head of sensors. This approach allows several significant advantages compared with a pH electrode:

- Calibration using iSense (a software that offers a unique means to optimize the performance of analytical sensors for enhanced reliability and process safety) is simple and accurate. The calibration data is held on the sensor, meaning pH electrodes can be pre-calibrated and stored until required.
- When connected to the transmitter, a

new sensor is instantly recognized because of the configuration data held on the ISM sensor.

- The predictive diagnostics tools constantly monitor the sensor's "health" and display the information on the connected transmitter or iSense.
- ISM sensors use the onboard microprocessor to calculate the value and transmit this digitally to the connected transmitter. This technique provides a more reliable measurement, as the signal generated by the sensing element is physically very close to the circuitry that calculates the process value and therefore does not pass-through long cables that could cause signal degradation.
- As the signal output by the sensor is digital, it too is immune to the degradation seen in analog signals due to cable length, environment humidity, and electrical interference generated by equipment in the vicinity.

Calibration of pH electrodes is a time-consuming procedure that involves taking buffer solutions to the measurement point. In bio-fermentation environments, this carries risks of process media contamination and possible incorrect calibration due to human error. ISM technology circumvents this issue by providing pH electrode calibration away from the process in a more convenient location. The iSense Asset Suite is asset management software for ISM sensors that runs on PCs and laptops. A USB connection between sensor and computer allows the data held on a sensor's microprocessor to be downloaded to iSense, and for new calibration data to be uploaded to the sensor.

**METTLER TOLEDO deals with many industry sectors, from chemical and pharma to engineering. How have you adapted to the changes and transformations in these sectors?**

All the segments we deal have unique product and application requirements. Often the processes are very complex and challenging to understand for a sales consultant who is a generalist and not a specialist. We at METTLER TOLEDO have very well-defined sales channels and application experts who take care of these specific requirements related to particular segments. These individual teams are well trained and professionally qualified to understand segment requirements regarding product, processes, and application needs and can provide one-stop solutions to our customers. Once the right product for the right application is identified, our products can meet the process application requirements. Our technical literature and case studies serve the customers' post-sales requirements. ■

# Digitalisation: The key to smarter facilities monitoring

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*By consequence, the economic surge of pharmaceuticals sector in India has accelerated pharmaceutical pollution across the country. Varieties of pharmaceuticals have been detected in the surface, ground, and even in drinking water, with sources of pollutants traced back to pharmaceutical manufacturing plants, hospitals, and wastewater treatment plants. Furthermore, to ensure the high standards, safety, and efficacy of pharmaceutical products, stringent regulations must be observed.*

In the global pharmaceuticals sector, India has grown from a rising player to a significant contributor. Low cost of production and R&D places India competitively as the world's largest provider of generic medicines, with 20% share of total pharmaceutical exports, and the largest vaccine supplier in the world.

About 3,000 drug companies and 10,500 manufacturing units are advancing the country's reputation for producing high-quality, low-cost generic drugs.

As a solutions provider observing this shift across numerous industries, we have found that digitalisation offers tremendous opportunities to comply to environmental

regulations while improving efficiency. Artificial intelligence (AI) and Machine Learning (ML) make it far easier for reliability engineers and technicians to evaluate water and air filtration systems across sensitive environments like biotech labs and hospitals, maintaining quality control with fewer errors. From processing facilities like cleanrooms to air quality at the manufacturing unit, air purity levels need to be kept pristine to avoid the threat of airborne contamination.

To help customers optimise their filtration systems and the assets they protect, MANN+HUMMEL ventured into providing new digital solutions platforms, STREAMETRIC and qlair, to complement our products. As a company that has been in business for 80 years, constant innovation and support is something our customers can rely on us to provide.

## Predictive monitoring for water systems

The effects of the **accumulation of pharmaceutical residues** in the environment are many folds, affecting species living in the water to the spread of **antimicrobial resistance.** However, facilities can improve the reliability of their filtration systems, reduce engineering hours, and even enjoy enhanced reporting if they implement digital water quality monitoring through a platform like STREAMETRIC.

### Features of AI enabled water monitoring system (Streametric)

- Wide range compatibility in regards to Membrane types.
- Compatible with majorly used PLCs and Protocols.
- High scalability- from pilot plants to full-scale manufacturing facilities.
- Centralized data storage over Cloud with high ease of access.
- Accelerated reporting & digital logging of anomalies.
- Forecasting Membrane permeability and trans-membrane pressure.


Through a streamlined framework, engineers can build cleaning schedules and prediction parameters, use AI-based predictive technology to set limits and detect anomalies, including forecasting membrane permeability

and transmembrane pressure. More importantly, STREAMETRIC is compatible with all membrane types and most major PLCs and protocols, and can be installed on systems ranging from small pilot plants to full-scale manufacturing facilities.

To facilitate reporting for engineers and technicians, managers can also design personalised dashboards for team members, operators, and service providers. All data is gathered and stored in the secure and scalable STREAMETRIC cloud, while a digital logbook allows teams to capture and store all historical data without the need for manual referencing or data entry. When it comes to sustainability and environmental reporting, data and insights can be readily obtained to ensure a facility remains in compliance with company or government regulations.

## Setting the standard for clean air management

Air purification is vital to pharmaceutical companies and it's easy to understand why. Unclean air can contaminate drugs which leads to devastating health impacts, for both workers at the lab as well as those who consume these products. Improved ventilation and filtration in pharma environments can be achieved with intelligent air quality monitoring. Which is why we developed qlair: a platform that leverages machine learning for proactive clean air management in commercial buildings.


qlair's Indoor Air Quality (IAQ) Monitoring platform uses highly accurate sensors that can help pharmaceutical facilities meet air filtration guidelines set forth by ASHRAE, the CDC, and WHO. In addition to getting real-time IAQ data across multiple spaces, technicians can integrate qlair analytics into existing systems for more effective air quality recommendations — all on-the-go through web and mobile applications.

## Enabling user success

With these data-driven insights, companies can generate up to 20% savings in heating, ventilation, and other energy costs. In the case of Atrium Health, a North Carolina-based healthcare group with 40 hospitals and more than 1,400 care locations, the facilities management team was changing out their Air Handling Unit (AHU) filters every 3 months on a time-based schedule. However, by installing AI enabled Filter Life Cycle Monitoring systems, they found that their air handling unit (AHU) filters only need changing every 10-12 months. This led to a cost

savings of 345 USD per AHU, and the ROI from implementing qlair was reached within 9 months.

## Translating Data for accurate interpretation

Besides manufacturing conditions, businesses also need to consider the impact of indoor air quality on occupant health, and the COVID pandemic has made this patently important. Yet, how can facility managers without HVAC expertise be able to maintain optimal IAQ at all times? To solve this, qlair patented the COVID Airborne Infection Risk Score (CAIRS). CAIRs automatically analyses all relevant IAQ factors that have a scientifically proven impact on indoor virus transmission, producing an easy-to-understand score so facility managers can promptly work on factors needing improvement, and occupants enjoy greater health and well-being.

## Conclusion

In a climate of uncertainty and fluctuating costs, having reliable real-time data to manage your research or manufacturing facility's air and water quality can provide a much-needed dose of confidence in remaining productive and profitable. Digitalisation is the way forward, and as a global leader in filtration, we will continue to innovate and provide key technologies alongside the pharmaceutical industry to ensure a healthier planet. ■

# Sustainable Manufacturing and Circular Economy in Pharma Industry

**Jaynil Pankaj Doshi**
Head – Business Development
Pioma Chemicals



*Sustainable manufacturing and circular economy maintenance being one of the major concerns for pharma industry, the author here in this article has given a comprehensive account of where does the industry stand, as well as what Pioma Chemicals has been practicing towards it, thus making the article a time-compliant read.*

## Why Sustainability and Circular Economy?

Sustainability is no longer a value addition to your existing circumstances, but a necessity for a better future. The Pharmaceutical Industry is largely based on the intensive research & development initiatives with an objective to provide healthy life and also to cure the existing health problems. So, in order to stay at par, it won't be very wise for pharma industry not adapting to the sustainable development in terms of the manufacturing, supply chain, as well as the research & development initiatives. All these initiatives prevent the disastrous consequences of industrial

activities upon the life & environment of all living beings. Hence, the collective efforts are mandatory to curb the stress on our environment with an ultimate intention of improving the human health. Approaches across the industry have started with a reduction-reuse-and-recycle approach across the levels. Installing water treatment systems have become mandatory for factories applying for certifications, whether it's for domestic use or for export. To promote the reuse of goods, the raw material industry has shifted from HDPE & LDPE drums to Double Liner Bags, Fibre Drums, Cartons, and Tin Drums. This has not only reduced the use of plastic & non-biodegradable material causing to environmental hazards, but also has increased the usage of reusable material.

Circular Economy is the need of the hour. It is about changing the mind-sets and the business models. Even though this approach requires time and patience, in the long run – this will lead to waste reduction across the levels and across the industry. Circular economy will ultimately end up relieving the pressure on our resources and our environment. The intension is to provide our economy a more sustainable direction.

- Reducing carbon footprint is the major step which will have a direct impact on the positive improvement of our health & lifestyle.
- Innovation, efficient material usage, and long-term business value improvement will get the major boost with a prominent focus on circular economy.

## Restrains and Improvement Areas:

It is important to note that implementing sustainability and circular economy will face some major challenges for the pharmaceutical sector as it is not easy to change the existing methods & goods (raw materials as well as packaging materials) being used for medicines and vaccines. The reason being, these goods – unlike the other goods – must meet many different regulatory requirements to ensure the product quality.

Operational excellence & innovation are two of the core areas that need to be

**Circular Economy is the need of the hour. It is about changing the mind-sets and business models. Even though this approach requires time and patience, in the long run – this will lead to waste reduction across the levels and across the industry.**

reworked according to the concept of circular economy. The factory is to be so designed that it can facilitate the natural flow of the goods towards the production advantage, to prevent additional energy usage, and also towards the reduction of efforts for goods movement on the floor. To add further, raw material manufacturers at times face wastage issue when the material gets stuck in the huge vessels and pipes while processing. This material can be removed separately during the cleaning process. However, this is not viable for further use, because it may or may not comply with the regulatory requirements enforced in the pharmaceutical industry. In this regard, it is of note that instead of disposing, these goods can alternatively be used for non-pharma purpose thereby reducing the waste.



## Pioma Practicing Circular Economy:

With an industrial experience of over 3 decades and with the requisite technical expertise, we have come around with the idea of sustainable product development and are also making it a priority. It has been a conscious effort from our side towards making a better future. We have also come up with an idea of using our strengths, i.e. the products and the application oriented knowledge, with a further touch of innovation towards the mentioned purpose. To name a few – reducing the waste, shifting to renewable energy resources, and reusing the products are some of the common practices that being adopted towards aiding the process. And in continuation to this, we have come up with a solution of reducing raw material consumption in product manufacturing, thereby reducing the stress on the entire chain right from the root. We have also come up with certain combinations of our polymers ranging in Hydrocel & Biopol® with an intention to reduce the quantity of excipients in a formulation, as well as the average weight & size of tablet. Though it appears as a small change, rippling effect is to be understood here to gauge the bigger picture. Reduced tablet size, in turn, will also lead to the reduction of raw material consumption and increased output from the same batch size. As a further consequential toting – reduced packaging material, required for smaller units, can be used to ultimately reduce the overall wastage of solvents and raw materials. With such reduction in consumption, the requirement for raw materials & packaging materials will also come down resulting to efficient production and drug delivery, with the compliance of regulatory requirements.

## Initiatives by the Industry:

So far, many companies have taken initiatives towards carbon footprint reduction and to the broader extent – towards Sustainability and Circular Economy.

- One such is moving towards renewable energy resources. This would be a major movement in context of difficulty in changing or replacing the plastic for medicines & vaccines due to regulatory requirements, as mentioned earlier.
- Another initiative taken up by the pharma sector as well as encouraged by the regulatory bodies is: the reuse of water & solvents. As per certain regulatory requirements, setting up of an ETP and Water treatment plant in the factory premises has become a mandatory element. This norm is in existence, both in developed as well as in developing industries. In the pharmaceutical industry, water is one of the major ingredients in many medications, and also used in large quantities on daily basis for cleansing purpose. Recovery & reuse of water have become a major source of waste reduction, thus can be counted on as a sustainability quotient.
- Raw material & packaging material manufacturers have been increasing their use of computerized systems and artificial intelligence to reduce the human intervention in the process & automation, which has further led to improved output & reduced wastage while maintaining the product quality. This has been one of the most impressive steps towards reducing wastage while enjoying the product consistency from batch to batch.
- Presently, the need for plastic elimination is at an all-time-high across the globe. However, Pharmaceutical Industry still continues to be a major consummator of plastic and is yet to find an alternative option. And at the current scenario, this confers to the major challenge of unavailability of suitable alternatives. Nonetheless, it is of note that efforts are in place to recycle the plastic waste to the maximum possible extent.

## Benefits in Nut-shell:

Circular Economy brings multiple benefits to the table.

- It helps in waste and carbon footprint reduction, with output increment and efficacy improvement. It also reduces the environmental damage caused by

resource extraction. There would be less pollution entering the earth's life support systems.

- It also leads to increased resource savings which confers to a positive impact on our economy as well as on our environment having a statistics of alarming resource depletion.
- It makes provision for new jobs in the green industries because of the increased requirement of labour towards reducing, reusing, and recycling of goods. It in turn makes an impact through the unemployment rate reduction thereby helping in the economy growth.
- It's been a stimulus to increase the efforts towards innovation and is a big boost to it. Though this may or may not have a direct impact on the economy, it surely has a positive process oriented outcome.

## Conclusion:

Overall, circular economy has all the positives in every aspect thereby making our lives and environment friendlier as well as brighter for the future. Circular economy is about all green and no red. Its benefits once achieved will be felt at every level of the environmental chain and every level of the pharmaceutical industry. It is the spearhead of the sustainable development that the world has been talking about for years at various forums, in political agendas, as well as through national policies. However, with increased awareness & proactive steps being taken on regular basis and with innovation adding to the existing stream of efforts, we must look ahead at a positive outcome provided we do not cease or get discouraged when we do not achieve the immediate or short term results. It's a process to be devised for longer term and needs patience as well as proactive approach towards immediate action without losing the faith in the process to relish the benefits and to be proud of it in the coming future. ■

# Innovative Filtration Technologies to Shoulder Responsibility for Pharmaceutical

**Ashok Pandey**
Director- Automotive, Pharma & Consumer Filtration
Freudenberg Filtration Technologies India Pvt. Ltd.

**George Graf**
Regional Representative India
Head of Freudenberg Regional Corporate Center India



**Freudenberg Filtration Technologies India:** One of the enormous difficulties confronting the society today is safeguarding the cleanliness of air and liquids, both now and in the future. Freudenberg Filtration Technologies makes a fundamental commitment to this by developing exciting filtration solutions.

Reliable protection against fine dust, improvement in the quality of indoor air, proficient treatment of clean water – FFT designs reliable, economical and sustainable solutions for our customers for these and many more filtration applications. Always on the basis of our in-depth know-how in the field of filter technologies and application engineering. We are convinced that economic efficiency, social responsibility and protection of the environment are indistinguishably connected. Along these lines, we are committed to the promotion of sustainable technologies and product solutions of the highest possible quality. Our focus is always on energy efficiency. Since industrial and commercial filtration systems have a high level of energy

consumption, rising energy costs are a key issue for our customers. In developing energy-efficient filters, we make an important contribution to the protection of the environment. Our customers also benefit from this. By using our energy-efficient filtration solutions, they save money while at the same time reducing their impact on climate change.

**Filtration in Pharmaceutical:** Air filtration is a key to keeping the pharmaceutical business run effectively and successfully. One small mistake could risk the contamination of products, employees, the general public, or any close environment. The pharmaceutical industry requires high-tech demands for maximum air purity in the production of pharmaceutical drugs and active ingredients. It uses special safety zones for certain production steps, protecting the product from contamination. The industry has to abide by strict rules on personnel safety, raw material safety, and environmental safety and the main focus is on avoiding cross-contamination of products. To ensure proper protection, air filters in HVAC systems need to function at much higher levels of efficiency.

**The need for Air Filtration:** Anything that comes in contact with the pharma product can contaminate it. Unfiltered air contains dust, viruses, bacteria, and pollen. In addition to airborne particles and hazardous gases also germs need to be filtered reliably from the air. High air purity is the essential requirement for sensitive controlled technical processes. Cleanrooms are used as they ensure a low-particle or, when necessary, a low-germ environment. This is especially important in biotechnology, the pharmaceutical industry, and the production of foods and cosmetics.

Advance air filtration is essential to the protection of pharma staff. Good filtration minimizes the risk of infection from inhaling chemicals that could cause problems.

Good air filtration systems that are easy to maintain while removing all potential contaminants maximizes your production rate and product quality. The best air systems will maintain proper conditions for pharma raw material and finished products, extending their life and preventing spoilage. Thus, it's important to use efficient multi-stage air filtration systems to achieve the required clean-air quality.

Freudenberg Filtration Technologies develops high-performance, energy-efficient concepts for the filtration of air and liquids that protect people and optimize processes. Our global brands Viledon® and micronAir® stand for high-quality filtration elements and systems for industry and consumers

The pandemic has changed the view of users towards filtration, people are focusing more on efficiency of filter – right from phase 1 while previously it was only in the terminal stages of filter.

Initially, the attention was on HEPA (a type of pleated mechanical air filter) and mini-environment and pre and fine filters were overlooked. Nowadays, the thinking process of users has changed and pre & fine filters have also gained equal importance as HEPA.

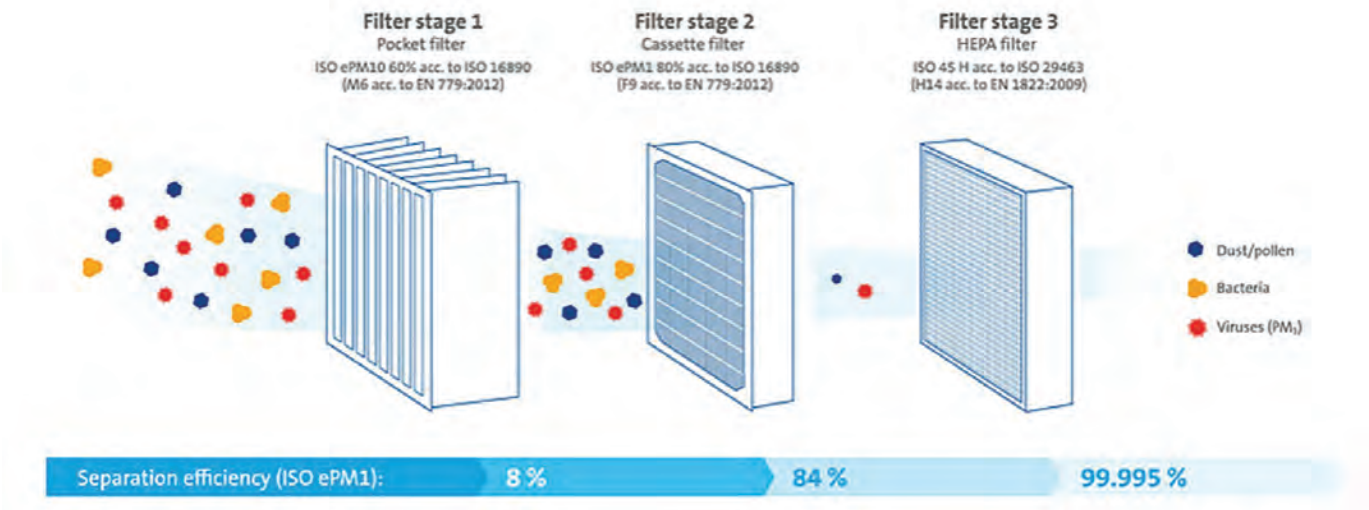
**The multi-stage Viledon air filtration system for better air quality:** To ensure the proper protection of people's health, air filters in HVAC systems need to function at much higher levels of efficiency. Compliance with relevant standards and guidelines is of particular importance in this respect. The filters used must ensure that the level of dust, bacteria, fungi and biological constituents circulating in rooms does not exceed that of the air outside the building.

To achieve the required indoor air quality, we combine air filters of different classes and designs into multi-stage systems. Usually a two-stage prefiltration consisting of Viledon pocket filters and cassette filters removes coarse to fine particles. Viledon EPA, HEPA and ULPA filters are used as a final filter stage. They are responsible for reliably arresting finest particles and germs.

**Development and implementation of filtration standards:** The advantage of the pharma industry is it focuses on improving and upgrading the standard to provide better indoor air quality for manufacturing.

For pre and fine filters standard BSEN779-REVISED has changed to ISO 16890. The earlier standard was focusing on 0.4-micron particles whereas ISO focuses more on relevant particles of 10 Micron, 2.5 Micron, and 1 Micron. ISO has provided an opportunity to select filters based on applications.

If the outside air is directly passed through HEPA it will block the HEPA filter in a short period, so we will be forced to replace it in a short period. Protection to HEPA is provided by using coarse filters at low



efficiency and fine filters with higher efficiencies.

Looking at the criticality of HEPA and cleanroom performances testing of HEPA at the manufacturer's end is also recommended to have EN 1822 test rig. This process scans every individual filter for MPPS (Most Penetrating Particle Size) efficiency.

HEPA filters are the only filters that are required to be tested before they are shipped from the manufacturer. They are certified for performance and labeled for their efficiency and other performance parameters.



As filter manufacturing technology has changed and improved and the cleanliness requirements of product manufacturers have also increased. Now HEPA filters are developed that have efficiencies of 99.99995% at 0.12Microns

HEPA filters are used in high-tech precision manufacturing applications such as semiconductor and pharmaceutical manufacturing. The highest efficiencies are used in the semiconductor industry as a single sub-micron size particle can compromise the circuitry of the Microprocessor chip. HEPA filters are typically installed in a ceiling of a room that only allows less than 1 particle per cubic foot of air. The common atmospheric air sample has tens of thousands of particles. Pharmaceuticals commonly use HEPA filters in the 99.97% at 0.3 microns to 99.99% efficiency. The demands in pharma are not as stringent as the semiconductor industry but they still employ cleanroom technology to protect the integrity of their products.

Hygiene guideline VDI 6022 defines clear specifications for ventilation and air-conditioning systems and units in sensitive application areas such as cleanrooms. These requirements are in place to ensure the removal of harmful microorganisms and of inorganic and organic dust to protect sensitive products and processes.

As a member of the Freudenberg Group, we are pioneers in the manufacture of synthetic high performance filter media. With our competence in the design and assembly of filter elements, we can quickly and efficiently respond to changing market situations and customer requirements and can set new standards in air and liquid filtration based on high process reliability and dependable quality in filter solution applications. We also pursue this principle of innovation and quality in our new filtration technologies such as gas phase filtration and process water treatment.

Our lookout for future envisages higher efficiency filters in all stages of filtration as installed across various plants considering the awareness level amongst users. We also foresee even smaller players like micro and medium scale industries would adopt better technologies infiltration over coming days. ■

# Functions of packaging and labeling in pharmaceutical perspective

**Jayanti Sawant**
Pharma Packaging Consultant

*Packaging & labeling are vital and need to be done correctly in new product development, production, and supply chain, until the product reaches the consumer.* ***Jayanti Sawant, Pharma Packaging Consultant*** *explains the functions of packaging and labeling in the pharma industry.*



The pandemic has had devastating impact on almost all industry sectors and so on the global economy. The pharmaceutical and healthcare sector, however will continue to grow as the need of medication remains and cannot be ignored at any cost.

In such a crisis, the pharma and healthcare sector successfully are delivering essentials to the suddenly grown demand .There is a continuous demand of one time use packaging or disposable packaging. The scenario will surely be different for packaging materials after the world is done dealing with Covid-19 .Most of the medicines are being ordered online during lockdown and hence, cardboard packaging , plastics will be in demand. Shortage of waste paper may result in hiked prices of cartons during this phase and glass will continue to be dominating injectable sectors.

The use of masks and sanitary products has c aused a sudden demand and a pressure on packaging industry. Packaging is under essential services for all kinds of industries. Labeling is a vital part of packaging, and both, packaging and

labeling need to be done correctly in new product development, production, and supply chain, until the product reaches the consumer.

Functions of packaging and labeling in pharmaceuticals.

Over the last two decades, pharmaceutical packaging has evolved . At one point it was a simple packing operation of finished goods which has now emerged as a separate, intricate process. The term ' packaging technology' is appropriate to indicate that this process is an amalgam of art, science and technology .

The development gained momentum in last decade due to availability of various kinds of materials , upgradation in printing technology , availability of professionals in this field , and even changed regulatory requirements. Globalisation resulted in complete transformation of pharma packaging and labeling .

Pharma packaging and labeling are two sides of the same coin, fused or merged to complete the definition of a package of any product. It is an integral part of product development and remains crucial until the consumption of the drug by the customer . Hence packaging and labeling have defined functions which if not identified correctly during product development , can result into serious complaints and ruin the brand image in the market .

## Packaging

For packaging operations, Once the bulk drug or the batch is ready, all the operations like washing, filling, sealing ,packing will be treated as 'packaging' .For instance, the silicon tubing for injectables or any such material in direct contact with the product during production, may call for the detailed studies of extractables and leachables with respect to regulation compliances. These are packaging compliances. Hence the word 'packaging Technology' emerged and replaced 'packing'.

There are certain regulatory requirements that have to be fulfilled, such as suitability, safety, protection, convenience, compatibility, quality control, vendors and stability. The content of the dosage forms are often very sensitive towards external elements such as light and moisture. Hence, once the product is packed it is to be completely safe from direct exposure to light and moisture. Simultaneously sealing the pack should be excellent and shouldn't allow reactive gases like oxygen, as this might lead to dangerous consequences like failing of the product in stability. Moreover, if any leakage is found in this sealing, it might raise a question on sterility and closure integrity of the container.

## Labeling

Labeling on the other hand is the factor that determines the safety and briefly

introduces integrity of the product. This operation includes both printing on the carton and pack inserts provided individually with the pharma products.

The primary purpose of labeling is to make identification of the product unambiguous.

Labeling information is important for both healthcare professionals and patients to prescribe and consume, respectively. This is crucial also because people have an obvious belief on medicines' company that they will provide right information on the product. Hence, the faith of the customer or end user is associated with the brand which is created by packaging and labeling. Thus , with evolution from packing to packaging , functions of packaging and labeling evolved.

## FUNCTIONS OF PACKAGING .

1. To carry the product: It is the first and foremost function of the pack and his been right since the time we have evolved as humans, from the zeitgeist of wrapping food in leaves to carrying it in modern day revolutionary packaging.

2. To protect a product from damage or contamination: The product must be protected from any damage during transit or storage The product must also be protected against the climate, including high temperatures, humidity, light and gases in the air.

3. To act as a marketing tool: It identifies and represents the brand . Packaging is the main way products are advertised and identified. To the manufacturer, the package clearly identifies the product inside and it is usually the package that the customer recognises when shopping .Thus it helps to sell the item and create a brand identity.Marketing communications and graphic design are applied to the surface of the package and often to the point of sale display. Most packaging is designed to reflect the brand's message and identity on the one hand while highlighting the respective product concept on the other hand.

4. Protection during Transport and Ease of Transport. A package should be designed to make it easy to transport, to move and lift. A regular shaped package can be stacked without too much space between each package without space being wasted. This means that more packages can be transported in a container thereby systemising logistics and supply chain.

5. Stacking and Storage: In stacking and storage, symmetric packs lead to minimum errors in the transit and in distribution.

**The choice for a packaging material usually depends on:**

1. The level of protection required: Highly hygroscopic dosage forms like

amoxicillin and clavulanic acid tablets need high barrier packaging.

2. User friendliness: The size ,shape and weight matter. It should be easy to carry, accorded to taste of the product , and dispensed carefully.
3. Filling method of the dosage form
4. Compatibility with the dosage form
5. Sterilization method: The pack has to withstand the sterilization process.
6. Reusability of the pack: Refill packs should be sturdy as they undergo multiple use at the hands of the end user.



**Functions of packaging materials also vary for different packaging materials.**

These types can be divided as:

1. Primary Packaging Material (PPM)
2. Secondary Packaging Material (SPM)
3. Display Packaging Or Intermediate Packaging (Mainly Used For Food Products )


4. Tertiary Or Transport Packaging, (TPM)

Here we consider primary, secondary and tertiary packaging which are mainly used in pharma .

The display or intermediate packaging holds secondary units , for example, a bunch of cartons, tetra packs or bottles and facilitates distribution channels , displays brand , supports consumer in bulk purchasing . It also provides strength to the main pack while in storage and during display .

**The image below is self explanatory, showing different levels of packaging .**

1) Primary packaging: it includes blisters, ampoules ,vials etc. This is the material that is in direct contact with the product and holds/envelops the product. It is, therefore, the most important and undergoes difficult selection for sensitive products .

The most important function of primary packaging is to protect and preserve the product from external damage, contamination, spoiling and spillage . It also serves the purpose of keeping the product in storage, often for a long period of time .It also defines shelf life of the product and contributes to shelf life studies .

It should be able to withstand the product sterilization process , develop good barrier against microorganisms and

environmental contamination .It should support the product in WVTR ,MVTR and OTR as the more the migration through PPM to product , more will be damage to product in terms of shelf life .

The objects enclosed in the package may require protection from mechanical shock, vibration, electrostatic discharge, compression, temperature, etc.

A barrier to oxygen, water vapor and dust is often required. Permeation is a critical factor in design. Some packages contain desiccants or oxygen absorbers to help extend shelf life. Modified atmospheres or controlled atmospheres are also maintained in some cold packages. Keeping the contents safe for the duration of the intended shelf life is a primary function.

2) Secondary packaging: Cartons have been used to put together single products or many primary packages. It does not come in direct contact with the product.It:

- Markets the brand by creating brand identity : Since this pack is directly seen by the end user , its design and aesthetics get registered in consumers while browsing through shelves in medical shops or pharmacies . Thus it is one of the P's of marketing since it displays the brand . .
- Protects the primary pack and provides mechanical support to the product and primary pack thereby enhancing product protection , product appeal and safety .
- Is an intermediate block for the supply chain ,hence a low quality grade shipper can damage the entire product if it fails to withstand the transit hazards like shocks ,vibrations , multiple handlings and compression due to stacking during storage .
- Provides convenience and security to the pack at the consumer's end .This concept has given entry to small portion packs or one time use sachets like vitamin D pouches, rehydration solution pouches .

3) Tertiary packaging: Shippers are mostly used for bulk handling, warehouse storage, and transport . They are the backbone of the supply chain.

Tertiary packs are generally not seen by the customer . most of the shippers are tertiary packs which give protection to the product by safeguarding the primary and secondary packs .

Thus it protects the product from damage , moisture and environmental hazards while in transit and in storage warehouses

If the product is not delivered on time, notwithstanding the fact that it is a successful product, it will become useless to market. Hence, timely delivery of the product with the intact product is the tool for success in supply chain and hence for marketing also. Many a times , quality

of the tertiary packs is still a last minute development in many organizations . Even now, the problems include hidden or invisible damages which crop up suddenly in transit. Damages to the shippers, buldging of shippers in new product launches are a phenomena.

Hence transport packs are important for any business. We can categorically define functions of these packs:

▪ **Most important tool of transport:**

Optimum size transport pack or shipping box helps in successful transition of goods anywhere in the world and there by makes the product available where it is needed the most .Thus , it's a building block of any supply chain .

▪ **Protects goods inside:**

It protects the primary , secondary packaging and the product . During transport ,when goods arrive from a supposed port A to port B in a damaged condition , it may have to undergo replacement of damaged goods, which then becomes an additional cost .

Apart from the extra cost , it will beget sour relationships with customers , distributors which can affect the image of the organisation .

▪ **Conveys important information:**

There can be a lot of important information that distributors need to know about your product. Your transport packaging is the perfect place to display this information.

A lot of different things can be printed on your boxes. It could be something simple, like the order in which the packages need to go, or a declaration that the contents are fragile. You can also specify more detailed handling instructions, such as temperature range your products need to be stored at.

▪ **Makes storage and transport possible:**

Perfectly designed shipper or transport box uses optimum space on pallets .These boxes on pallets fit perfectly in containers , providing safety from damage to the goods till they reach the destination port and are further distributed .Hence, while designing shippers, following technical specifications is important .

GSM, Burst Factor , Virgin Or Recycled, Edge Crush , Compression , Bursting Strength , Type Of Flute Used . With correct use of combinations the strength of 7 ply box can also be obtained in 5 ply box

Image below shows perfectly designed shipper -optimum utilization of pallets .

▪ **Helps to sell:**

Good logistics are preferred by the retailers , distributors as they help in protecting the goods in storage and such packs are always preferred by the supply chain personnel.

The display labels carry detailed information about the product which helps in identification of the brand, thus helping in selling the product . We will see labeling in detail under the labeling section.

**Functions of labeling:**

Pharmaceutical labeling is a complex and stringently done process with increasing global quality compliances , regulatory requirements.

For local markets ,it is governed by Drugs And Cosmetics act 1945 has to be updated in accordance with the updated provisions .For export , labeling is governed by the concerned regulatory body or ministry of health of the countries. The term label refers to all labels which display content of the medicines along with other important matters about the drug or its formulation .

A label may be of paper , printed packaging materal like foil or laminates, sleeves , ceramic or screen printing on ampoules ,paper tags .Label matter should be approved by FDA , Hence the content of the artworks shall also be FDA approved .

The minimum legal information that needs to be on the label is :

- Brand name and generic name of the product
- Composition
- Storage
- Strength and dosage form
- Quantity or pack size
- Instructions for use
- Mfg Lic No , B.no, Mfg Date ,Expiry date ,MRP
- Name and address of Manufacturer.
- For prescription drugs : The pack should display Schedule G,H,H1 and X warnings in accordance with latest updated guidelines of Drugs and Cosmetic Act, 1945 .These guidelines are released in Gazette of india as and when updated .

**Pharma labeling:**

- Provides detailed product information to the consumers , doctors , pharmacists about the product's content .

- Helps in safe usage of the product by providing detailed such informative labels .
- Secures the brand by providing anticounterfeit measures .

For instance, Betadine gargle pack has got a tamper evident cap with a holographic label, helping the brand to be secured .The shape of the bottle is unique combination of square and round which creates an intricate mold which is difficult to copy .Thus packaging and labeling are effectively used to protect and secure the brand .

- Helps in brand development and acts a marketing tool since it identifies the brand: For instance, a customer can easily choose or identify Crocin among all other paracetamol brands as the design and pack are easily distinguished by consumers for years .Hence the brand name Crocin has become a synonym for Paracetamol .
- Aids brand development: Packaging and labeling combined together create a brand identity in market . A standard pack with various label shades segregates variants of the same brand . A few images will help us understand this concept. For example,.Iodex pain balm, Headfast balm, Iodex gel: Shipping boxes are crucial to supply chain since they carry significant information right since warehouse storage, till distribution.

It is labeled or printed with brand name , generic name , batch number, manufacturing date, expiry date ,storage , gross weight, net weight, shipper number, address of the manufacturer, and that of the importer and exporter .

It also displays 1d code label adhering to DGFT compliances for export and it has to be treated as per the guidelines released by the DGFT . This label has a relation with the secondary packaging, which can track the goods in transit and is considered to be one of the most powerful tools to arrest spurious drugs . That also makes it an anticounterfeit tool.

It also displays common instructions for handling it since the shipper undergoes tremendous handling, loading and unloading during the entire cycle of distribution .

Packaging and labeling together offer product security and are largely used as anticounterfeit tool. Let's look at anticounterfeit techniques.

Counterfeit products are growing day by day and are a nuisance for businesses all over the world .These are fake products that have been copied exactly like the original in every sense , resulting in huge economic losses and harm to the consumer. Pertaining to pharmaceutical products ,if the drug is spurious , it will be certainly life threatening to the consumer or end user .This need of protecting the drug and its pack from being spurious

or prevent it from being copied has led to demand of anticounterfeit packaging which can protect brands from being easily replicated .


Packaging and labeling in pharma have to protect the brand and the product , also tell apart the brand from other brands with unique anticounterfeit features included in the pack . Day by day , the demand of such packaging material is increasing, and the anti-counterfeiting labels and packaging market will continue to grow and evolve.

One of the first steps brand owners can take towards protecting their brand is learning about various anti-counterfeiting techniques so they can find suitable and cost effective solutions for them.

Most widely used Anti-Counterfeit Labels and Packaging Techniques:

There are two main types of anti-counterfeiting techniques for labels and packaging which are often used together to create a comprehensive security solution. Overt and covert features are noticeable and hidden details, especially, make it easier to detect fakes and increase traceability across the supply chain, and make it harder to counterfeit products.

**1) Track and trace:** A two-dimensional (2D) barcode looks like a square or rectangle and contains many small, individual dots. The two most popular types are Quick Response (QR) Code and Data Matrix,but there are other options available. According to GS1, "A single 2D barcode can hold a significant amount of information and may remain legible even when printed at a small size or etched onto a product.

Track and trace works like parental child tracking methods where every secondary unit will have a unique serial number under the main or parent shipper or pallet which helps in tracking the shipment or a particular pack in transit. This is a directive from DGFT for export.

**2) Watermarks:** watermarks are images or patterns that are embedded into the design of a package or paper to authenticate products and support brand identity. Watermarks can be

generic or customized using a logo, brand name, or other symbology.

**3) Microtext:** Like watermarks, microtext is used to authenticate products. Extremely small text, codes, or symbols are tricky to replicate or copy without using advanced detection and printing equipment. Microtext can be inserted into overt images, larger text, and other design elements without being noticeable to the naked eye. Since microtext is not easily noticeable, counterfeiters would be unaware that it exists in the pack.

**4) Holograms:** A hologram is a three-dimensional image formed by the interference of light beams from a laser or other intense light source. Hologram technology is popular for anti-counterfeiting because it can incorporate various data forms and product tracking information.

It can be used as a label to close a carton, thus acting as a tamper evident seal also.It can be a part of a blister embedded in a foil.


**5) RFID Tags:** Radio frequency identification (RFID) technology uses radio waves to automatically identify people or objects.

**6)Tamper Evident Seals:** Tamper evident seals can be printed in different styles to fit your security and packaging needs. shrink sleeve labels with a perforated seal or shrink bands are full-body labels that make products stand out with visually attractive graphics that completely wrap around a container. They are more than a pretty face – they are harder to counterfeit than pressure sensitive labels because they're more complex and need high volume products to be cost effective.

Shrink bands are film strips that are shrunk to fit around the cap and neck of a bottle or jar to show the product has not been opened. You can choose between non-perforated or perforated for easy removing, and blank or custom printed design (recommended for brand identity and anti-counterfeiting).

Tamper evident seals and anti-counterfeiting techniques offer brand owners many benefits like product security, brand identification, and product authentication.

**7) Epedigree :** The E Pedigree label tracks the origin of prescription drugs through an electronic pedigree and

provides data on the history of a particular batch of a drug. When the system is set up, this tracking is done during the reception and dispatching of batch.

Thus Anti-counterfeit packaging is mainly intended to prevent brand reproduction. It enables brand protection and enables clients distinguish between original and counterfeit.

## Conclusion:

All in all, it is difficult to imagine pharmaceutical industry sans the functions of packaging and labeling which are integral part of production activities once the new pack has been developed and commercialised .The products meant to safeguard human beings will be useless if they are not packed and labeled in accordance with the compliances .It is of utmost importance that the drug retains its original quality until consumed by the end user . Packaging and labeling ,though different activities , intermingle and together lead to the creation of a quality pack .

The success and failure of any product depends on how the end user or the customer has responded, especially the healthcare sector. While the end user reacts, he /she is educated enough to check the packaging and labeling of the pack, hence packaging and labeling are crucial and important factors of the pharma domain. ■

## Torrent Pharma to acquire Curatio Healthcare

**Ahmedabad, India:** Torrent Pharmaceuticals Limited (Torrent Pharma) has entered into definitive agreements to acquire 100% of Curatio Healthcare (I) Private Limited (Curatio) for Rs. 2,000 crores (around 260 million USD). The consideration includes Rs. 115 crores around (15 million USD) (on the date of signing) of cash and cash equivalents in the acquired business indicating an Enterprise Value of Rs. 1,885 crores (around 251 million USD). Curatio has a strong presence in the cosmetic dermatology segment with a portfolio of over 50 brands, marketed in India.



Curatio's portfolio consists of leading brands such as Tedibar, Atogla, Spoo, B4 Nappi, and Permite, which are ranked amongst top 5 brands in their covered market. Top ten brands of Curatio account for ~75% of total revenue. With this acquisition, Torrent Pharma will add a Field Force of 600 MRs and a distribution network of 900 stockists.

Commenting on the acquisition, Aman Mehta, Director, Torrent Pharma said "We are delighted to enter into this deal with Curatio. The acquisition offers Torrent the opportunity to enhance its presence in dermatology with a differentiated portfolio and is a strong strategic fit. Curatio has built a commendable set of high market share brands in cosmetic and pediatric dermatology that we look forward to adding to our product offerings.

## Avery Pharmaceuticals Pvt Ltd. starts commercial production of unit at Sanand.

**Ahmedabad, India:** Avery Pharmaceuticals Private Ltd. has started the commercial production of pharmaceutical & nutraceutical products in its manufacturing unit situated at Sanand, Ahmedabad on August 17th, 2022.

This plant is a dedicated for Mouth dissolving strip (MOS) manufacturing and company has signed an MOU at Vibrant Gujarat and has the commissioning of the plant been appreciated by the Government of Gujarat for the launch of Novel technology and raising the standards of Drug delivery system. The Plant houses a facility for in-house testing of the products where as there is a separate provision for QC chemical and Micro testing of products. The production method follows semi-automatic and automatic processes, with high precision sensors for manufacture of quality products and entails minimal human intervention.

## NATCO is finding companies with turnover of Rs. 100-200 crores for acquisition

**Hyderabad, India:** NATCO Pharma is interested in an entity with a revenue of ₹100 crore to ₹200 crore. Rajeev Nannapaneni, Director and CEO of NATCO Pharma Ltd. said, "The domestic business is steady, but we have money in

the bank and we are looking at different acquisitions. Hopefully, we will be able to strengthen our domestic with an acquisition."

The company is interested in an entity with a revenue of ₹100 to ₹200 crore and all depends on how the negotiation works, and the nature of the portfolio and its profitability.

To improve its base earnings, NATCO is working towards further strengthening its subsidiary business and enhancing its domestic reach through an acquisition or with new launches, the Nannapaneni said. In January, Hyderabad-based their US subsidiary had acquired the US-based Dash Pharmaceuticals LLC, a pharmaceutical sales, marketing and distribution entity, for a cash consideration of $18 million. ■

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