

# Pharma packaging On the right track

The Indian pharma industry is plagued by major issues like increased counterfeiting, drooping patient compliance, need for convenience, communication cost and stability of formulations. An extremely sensitive product like a drug needs to be preserved with maximum care. And packaging is the only way to address this. With new drugs and formulations flooding the market, the packaging industry is developing innovative solutions to solve new challenges. **Rakesh Rao** takes a hard look at a myriad of issues confronting the industry as it gears up to play a key role in ensuring that packaging of exact dosage and medicines are specific to individual needs.

Considering the sensitive nature of pharmaceutical products, packaging plays a critical role in maintaining the quality of the drugs till the time of delivery. The pharma industry has realised that packaging is an important quality component of the product. Hence, packaging design should ensure that the product survives through the diversified climatic conditions across the country for the optimum benefit of the end-user. "Today pharmaceuticals is among the major growing industries and there is an increasing need to provide tailored packaging solutions that guarantee the effectiveness of medicines. Due to environmental factors such as light and humidity, there is always a chance of degradation. Hence, there is often a direct link between packaging and a remedy's efficacy," opines Rajesh Subramaniam, CEO, Vectacraft Machineries Pvt Ltd.

According to Rajesh K Pandya, vice president – Operations, Parikh Packaging Pvt Ltd, some of the reasons for high growth in demand for pharma packaging/medical packaging include:

- The health insurance sector registered very high growth, resulting in high spending on individual medication & hospitalisation
- Advanced ophthalmological, orthopaedics, heart, diabetics and hyper blood pressure treatments & medicines have found increased growth in consumption of non-traditional pharmaceutical products & take-away packs
- Over-all the economy has grown due to rising middle-class income group in India that can afford health-friendly packs
- Spending power has also increased, thus paving the way for companies to adopt high-end packaging

### A crucial component

Packaging is crucial to the stability of the drugs. Most of the drugs

are prone to external and internal reactions, owing to their volatile nature. Dr Mukesh Batra, chairman and managing director, Dr Batras' Positive Health Clinic Pvt Ltd, says, "Packaging plays an important role for homeopathic medicines. Each medicine is packaged in an area which is free of any interference with any other medicine. Wrong packaging can affect the quality of medicines. Homeopathic medicines are packed in amber-coloured glass bottles, otherwise the strong photon activity of light can disrupt the energy pattern of the remedy. Therefore, amber-coloured bottles are chosen to stop the harmful rays of light from entering the bottle. Glass being neutral and non-porous neither interferes with the medicine nor allows contamination. Self-sealed stoppers ensure leakage-resistance and keep the product intact."

Pharma companies are increasingly looking at cost-cutting and enhancing the shelf-life of a product. Packaging plays a pivotal role in providing solutions to these issues. "If packed properly, homeopathic medicines can last forever," claims Dr Batra.

Sanjay Tripathi, deputy general manager - Procurement, Mission Vivacare Ltd, believes that using bulk packaging methods like laminates instead of Al foil/PVC film/ bottles (wherever it does not affect the quality of the formulation), split dosage packing of formulations can add to bottomline.

The packaging of drugs is also used to disseminate important information regarding the drug like its usage, storage, batch number, etc. "The basic function of packaging is to protect and preserve the quality of the product as well as its reachability to the consumer without spillages. Further, the main function of packaging is to communicate the utility information such as brand name, product contents or chemical formula, usage, storage, dosage, precautions related to the

drug usage, dates of manufacturing & expiry, batch number, etc. In a nutshell, packaging communicates what it sells," Tripathi states.

### A protective pack

Packaging is also instrumental in building a relationship between the drug and the patient or consumer. Tripathi says, "Pharmaceutical packaging is quickly becoming an essential part of the drug delivery system as well as a core element of the marketing mix through which manufacturers differentiate their products from those of competitors. The pharma industry is also relying more on packaging and labelling as a media to protect and promote their products, increase patient compliance, and meet new regulations. So, packaging protects the brand identity & improves the product appeal."

If packaging can communicate with the patients regarding its brand name, it will prevent substitution of the brand. Major pharma brands suffer from problems of counterfeits. This leads to major loss of revenues, apart from the danger posed to patients. Good and effective packaging solutions can come to the



## Rajesh Subramaniam

CEO, Vectacraft Machineries Pvt Ltd



An increased focus on marketing of pharma products drives the need for flexibility in various pack types and sizes. And of course, cost being a major driving force in pharma, packaging machines have to become more user-friendly and efficient and should offer robustness as well as ease-of-operation

rescue of pharma companies facing such challenges. Besides, there are innovative and effective solutions like security packaging and holograms to fight the challenges of counterfeiting.

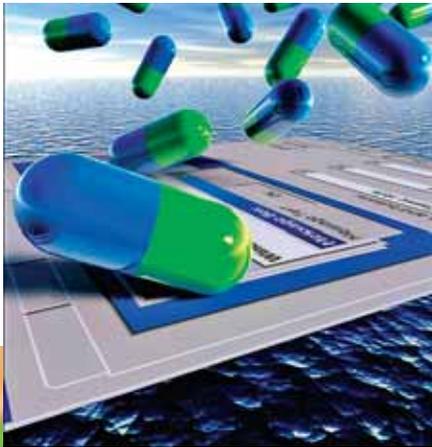
"Use of bar codes, holograms, Al foil with hologram seal, registered trademarks, and registration of design & packaging specifications under patents & copyright act as well as use of tamper-proof packaging can protect the pharma products against counterfeits," he observes.

Besides using its looks and colours to convince consumers to buy the drug, packaging also has a more serious role to play when it comes to drug delivery. Subramaniam says, "Traditionally, majority of medicines have been taken orally in the form of tablets, powders, liquids or capsules, which are either packed in blister packs, strips or plastic bottles. However, there are other methods for taking medicines. These include

parenteral or intravenous, inhalation and transdermal methods."

### Material matters

Today, the Indian packaging industry displays a wide range of packaging varieties starting from loose/strip/blister packing to aluminium (alu) packing. The packaging industry for that matter has come up with a number of options in plastics, glass, aluminium, PET bottles, alu-alu, blister technology or paper.



Pandya informs, "The traditional materials like glass, aluminium, tin bottles and containers are witnessing reduced/reverse growth due to the high costs of material, energy and packaging equipment. Some of the disadvantages with these materials include low speed & productivity and a limited spectrum of vendors." According to him, some of the highlights of the Indian market include:

- High-end retort packaging materials are in short supply as there are not many manufacturers in the domestic market
- Very high potential for growth
- Many packaging materials are still imported
- High-end medical & pharma products are yet to be developed (eg: steam sterilisation)

Though packaging is yet to be regarded as an integral part of the product, one cannot ignore the signs of growth and innovation in this valuable segment. Barrier coatings with PVC for blisters, PET-based vials, easily peelable and sterilisable packs for medical devices tamper identifiable inks, labels and holograms are some typical examples. Interestingly, packaging in pharma sector has an additional role to play because it is also related to compliance issues and convenience of the patient. This is compounded in the case of pediatric and geriatric patient groups.

Tripathi opines, "The packaging also offers various innovative as well as effective solutions such as security packaging, holograms to fight challenges of counterfeiting, child proof and easy-to-use packaging for old age patients, etc."

### New materials

Some of the new generation packaging materials are peelable webs (coated & uncoated paper, coated & uncoated Tyvek, peelable films and laminates & die-cut lids), forming films (sullying forming films, nylon forming films, and polyolefin forming films), and cold forming laminates/alu alu (OPAI/AL/PVC cold-forming compound Al foil hard chip). "Low-costs, high-speed & productivity, lower equipment costs, and broader vendor spectrum are some of the advantages of new generation packaging materials," explains Pandya.

Among all pharmaceutical packaging products, blister packaging



is considered as the growth driver in this segment. Broad adaptability to unit dose, clinical trial compliance, institutional, over-the-counter and sterile drugs are the advantages of blister packs. Dr Batra elaborates, "Blister packing is an emerging trend in the packaging of homeopathic medicines wherein automatic machines are packing the medicines. Opening medicines in the presence of strong perfumes, mothballs, incense or any strong odour may disturb the efficacy of the medicine. In blister packing, each dose is separate, and while one dose is taken, the other doses are not exposed to any external factors. Medicines in blister packs can be consumed without touching the medicine, hence contamination can be avoided."

#### On the machinery front...

The upbeat trend in the pharma industry has also opened up considerable opportunities to the packaging machinery development in the country - both on the packaging line operations and end-of-line operations. Pharma packaging machinery for the domestic market needs to have low-cost, low-maintenance and should give high output. Most importantly, the machines need to be easy-to-operate since domestic producers have their facilities in remote areas like Baddi, Jammu, Sikkim, Roorkee, etc. Another feature of these machines is that they offer low-wastage of packaging material, thus reducing the cost of packaging.

"An increased focus on marketing of pharma products drives the need for flexibility in various pack types and sizes. And of course, cost being a major driving force in pharma, packaging machines have to become more user-friendly & efficient and should offer robustness as well as ease-of-operation," discloses Subramaniam.

The strength of the packaging machinery sector lies in the fact

#### Rajesh K Pandya

vice president – Operations, Parikh Packaging Pvt Ltd



“Demand for packaging material is expected to be robust in next three years due to lifestyle changes & advanced medical services. Mergers & takeovers of medium & large Indian pharma companies will lead to total modernisation, including packaging & packaging systems for domestic as well as export markets”

that virtually everything needs to and can be packed - be it solids, granules or liquids. Tripathi says, "The pharma packaging industry in India is growing at a rapid pace, mainly due to increasing availability of state-of-the-art technology and new packaging machines in the country."

Besides catering to the domestic market, machine manufacturers are now catering to the global market. "The erstwhile leaders have been the European machinery manufacturers. Due to the extreme rise in labour costs in these countries as well as appreciation of the Euro; buyers have been looking out for substitutes. Asia is the option and India emerges as the leader, rivalling China, Korea and Taiwan, due to the former's awareness of quality & robustness as important aspects of packaging machinery. Again, it is not that all & sundry in India can sell in the export market and only the top two or three in each segment are good enough at present, for supplying to the developed nations as well as the growing economies," explains Subramaniam.

#### MNCs foray

Globalisation is one of the major trends driving the pharma packaging machinery industry. This is inevitable as more Indian companies target the generics segment in regulated markets. At the same time, multinationals are setting up their manufacturing bases in India with the objective of making it a production hub for the Asian market.

As drug-producing sectors upgrade and diversify, the packaging market is also witnessing rapid growth. The Indian pharma packaging market is now also being targeted by many foreign multinational players of the sector. "Today, many multinational giants in the field of packaging machinery are entering the Indian market and making their presence felt with more variety of products as well as services. This will further revolutionise the pharma packaging industry at large," feels Tripathi.

Many such players have entered the Indian market lately and putting in place the plans to tap the Indian pharma packaging segment. For

#### Dr Mukesh Batra

chairman and managing director, Dr Batras' Positive Health Clinic Pvt Ltd



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## Sanjay Tripathi

deputy general manager - Procurement, Mission Vivacare Ltd



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example, the German company, Bosch, opened its first packaging division in Goa in December 2007. While the company announced that its new facility will produce and assemble packaging technology equipment for requirements such as candy wrapping, solid food and biscuit packaging, it will also produce & assemble packaging equipment for pharma products like vials, ampoules and syringes.

### Automated gains

As the packaging requirements are undergoing transformations, the need for sophisticated automation system is increasing. Shashikant Ghorpade, business development manager, Siemens Ltd, opines, “The pharmaceutical industry is growing by leaps & bounds and so is packaging. With emerging technologies introduced by new players in the packaging sector, this sector now faces new challenges. Individualised consumer behaviour, changing forms & designs, low production costs and

implementation of guidelines like FDA are some of the new challenges for the machine manufacturers in pharma sector today. These machines must demonstrate flexibility, accept fast product change, have short re-equip times. Further, due to their mechatronic design their mechanical components can be replaced with intelligent software modules. Be it a blister machine, a palletiser or a case-packer, automating packaging machines in the pharma industry are a need-of-the-hour today.”

Siemens' *Simotion V4.1*, the state-of-the-art motion controller, with its new handling functions and specific industry add-ons meets the requirements of high-performance packaging tasks in pharma industry.

He adds, “Other than performance demands on packaging machines with respect to throughput, repeatability and accuracy, authorities are placing strict regulations on the safety of pharmaceutical products which necessitates the integration of packaging machines into ‘track &

trace system’. The correctness of the packaging and package inserts must be documented while at the same time the legibility and the correctness of the product codes printed on the packaging should be ensured.”

Using auto ID in pharmaceutical packaging lines provides confirmation that the right packaging material, inserts and leaflets have been used. Ghorpade says, “In a packaging line protected against manual intervention, auto ID prevents any defective product moving into transport packaging and therefore, into the market. Packaging components, inserts, and leaflets can be detected automatically by means of bar codes or data matrix and the direct interpretation of the text and graphics in printed material is possible with machine vision technologies.”

### Emerging trends

According to Pandya, some of the trends in the Indian market include:

- Disposable/single use & throw concept is picking up very fast
- Rise in health awareness has created high demands for hygienic packs and use & throw packaging
- Increasing usage of forming films for pharma packaging: needles, spikes, injectibles, medical kits, etc
- Increasing usage of alu-alu films due to overall growth in the pharma sector

Extreme competition due to globalisation has already seen the need for smaller batch sizes so that they are available at all times. “Hence, the need for high-speed machines along with flexibility for quick changeovers wherein a format change should be possible within a few minutes. For example, although high-speed blister packers were available in India, the downstream cartoners to couple with it, were not available until a couple of years back. Today, 300 carton/minute is not a big deal with cartoner manufacturers in India

## Shashikant Ghorpade

business development manager, Siemens Ltd



“Other than performance demands on packaging machines with respect to throughput, repeatability and accuracy, authorities are placing strict regulations on the safety of pharmaceutical products which necessitates the integration of packaging machines into ‘track & trace system’”



and the same can also be linked with liquid filling lines, where sometimes much higher speeds are required for the smaller sizes," says Subramaniam.

He continues, "For small batch sizes, top-loading solutions in the packaging of cartons are the emerging trend. Side-loading - though preferable due to the obvious ease of functioning - has failed because of the changeover time. But with the use of robotics in top-loading,

many things are taken care of and the changeover process becomes faster. However, this may not become a norm for low- & medium-speed applications."

Experts believe that the fast growth of the pharma packaging industry in India can be attributed largely to the increasing availability of better quality technology and new packaging machines in the country. Subramaniam seconds, "With new technologies like robotics available in India, we do not have to look westward for solutions. We are now able to develop new designs as the brain power was always there, but the lack of accessibility to technologies was the hindrance."

#### Gaining speed

As the packaging industry is directly or indirectly involved in the drug manufacturing process, it becomes ethically mandatory to

understand and incorporate scientific methods in packaging. This would also help the Indian packaging industry to compete internationally. Pandya believes, "The demand for packaging material is expected to be robust in next three years due to lifestyle changes & advanced medical services (medical tourism is growing at a rate of 70 per cent annually in India/Asia). Mergers & takeovers of medium & large Indian pharma companies will lead to total modernisation, including packaging & packaging systems for domestic as well as export markets."

The packaging industry has tremendous potential. Moreover, the entry of new players and introduction of new technologies have changed the face of the industry. In tandem with the growth of the Indian pharma industry, the packaging industry too is expected to grow at a faster pace.

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