

Pharmaceutical Plastic Packaging Market in Bangladesh: A Study on Demand-Supply Scenario and Strategic Imperatives for Local Enterprises

Md. Abu Zafor Sadek¹ & Sheikh Morshed Jahan¹

¹ Institute of Business Administration (IBA), University of Dhaka, Bangladesh

Correspondence: Md. Abu Zafor Sadek, Institute of Business Administration (IBA), University of Dhaka, Bangladesh. E-mail: azs_sohel@yahoo.com

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Abstract

Pharmaceutical packaging is highly sophisticated industry as quality and safety issues are of utmost priority. Use of advanced technology and high grade plastic materials for pharmaceutical packaging is essence of the market success. In Bangladesh, 30 local pharmaceuticals plastic packaging material producers are capturing almost 70% of the local market while the rest (30%) that require extremely high-tech processing is import dependent. Nevertheless, some local plastic companies are setting up world-class dedicated plant for pharmaceutical plastic packaging, while some pharmaceutical companies such as Square and Acme are extending their facility into backward value segment of the plastic packaging industry. This study strives to determine the market size, major players of the industry—both from supply and demand sides—along with individual contribution in terms of value. It also outlines strategic imperatives for growth and competitiveness of the enterprises involved in the industry.

Keywords: Pharmaceuticals, packaging, plastic, demand dynamics, Bangladeshi enterprises

1. Introduction

Plastic based industry is very promising in Bangladesh which contributes almost 1% of the total GDP (Sazia & Kiptia, 2015). The size of Domestic market is more than thousands billions USD. About 3000 companies are playing their role here where most of them are SMEs (Mansur, 2012). In addition to others plastic is widely used in packaging purposes and it is the most usable material even than papers. (Nazmul, 2015). It is so adaptable, rigid and tough what make it a very protective material to use in packaging industries. If the products needs to be confined and if the packaging for the products has to be convenient, then plastic is the essential element to use as it can be used as a variety of packaging purposes. However, considering compatibility, stability, easy transfer and other safety issues pharmaceutical companies are mostly dependent on plastic materials for packaging purposes which giving boost to the growth of plastic industries of Bangladesh

1.1 Working Definition of Pharmaceutical Packaging

For this study we considered Primary Packaging. Primary packaging means any single part of a container closure system. Typically containers, container liners, screw caps, stoppers, closure liners, stopper over seals, container inner seals, administration on large volume parenteral, overwraps, administration accessories and container labels. In this study a primary packaging component means a packaging component or its direct extension that comes in direct contact with the dosage form.

1.2 Broad Objectives

To identify the demand dynamics and supply dynamics and growth potential of pharmaceutical plastic packaging materials produced by the local enterprises.

1.3 Specific Objectives

- a. To identify the market size of plastic packaging materials for pharmaceuticals in Bangladesh.
- b. To identify the type of commonly use plastic packaging materials for pharmaceuticals in Bangladesh.
- c. To identify the technical specialty for supplying plastic packaging materials for pharmaceuticals.
- d. To identify the underlying causes of importing plastic packaging for pharmaceuticals in Bangladesh.

e. To identify the future prospects of plastic packaging for pharmaceuticals in Bangladesh.

1.4 Methodology

This is a qualitative exploratory research where both primary and secondary data has been used. For primary data an open-ended questionnaire was developed and respondents were interviewed face to face. For secondary data authors relied mostly on different journals, reference books, articles and various reputed websites. Since it is a small scale study, face to face interviews were conducted with the commercial/supply chain managers of top 10 pharmaceutical companies (by value) since they are responsible for the demand management of plastic packaging materials. It is worth mentioning that the top 10 pharmaceutical companies represent more than 69% of total pharmaceutical market of Bangladesh (IMS, 3Q, 16). Besides leadership interviews were conducted with 05 leading industry experts, owners and association leader representing the plastic sector of Bangladesh. This was done to get more insight about the entire industry.

In order to gather further insights the supply chain manager of a multinational pharmaceutical company operating in Bangladesh beyond the list of top 10 was also interviewed. This was done primarily because of the perception that multinationals are very quality conscious and are required to maintain global standard.

Since the study will be qualitative and the answer will be open-ended; so, no special statistical analysis was done.

2. Literature Review

2.1 Demand Dynamics

Demand is the relationship between the quantities of a good or service consumers will purchase and the price charged for that good. The law of demand states that the quantity demanded for a good rises as the price falls, with all other things staying the same. The 'all other things staying the same' part is really important. There are other things that can affect demand besides price. They are prices of related goods or services, income, tastes or preferences and expectations. (Aaron Hill, 2003). *From the expert opinion, in case of plastic pharmaceutical packaging materials, quality becomes the key driving factor along with price since they are highly sensitive.*

2.2 At a Glance Plastic Industry of Bangladesh

Plastic is an engineered material used to manufacture a wide variety of products to meet the domestic demand in Bangladesh as well as some products are exported. The plastic industry has emerged as an important industrial sector in the country during the last two decades. At present there are 3,000 plastic manufacturing units, 98% of which belong to the Small-Medium Enterprises (SMEs). Domestic market size is Tk 7,000 crore. Per capita consumption of plastics in Bangladesh is 5 kg per year. The plastic sector constitutes 1% of GDP and provides employment for half a million people. (Mansur, 2012)

2.3 Purpose of Using Plastic Packaging Materials in Pharmaceuticals

Purpose of using plastic packaging materials in pharmaceuticals include physical and chemical stability of the medicine (being an effective barrier to light, moisture, oxygen, bacteria, volatiles, etc. as appropriate), mechanical trauma—protection from damage, During transit, distribution and storage of the product, maintaining product integrity until it's in-use phase is completed or the expiry date stated on the label has passed. (Simon Mills, 2010).

2.4 Development History of Plastic Industry of Bangladesh

Year	Technology & Products
1960	Small products such as toys, bangles and photo frame were made using handmade mould
1970	Automatic machines were installed to manufacture household utensils such as plastic jugs and plate
1980	Film blowing machines to manufacture plastic bags
1991	Plastic accessories especially hangers for exportable garments
2000	Moulded plastic chairs and tables. Water tank made by rotation moulding. Locally developed machines (shredder, Extruder, Pelletizer) for recycling plastic waste
2010	CNC machines are imported by Bangladesh to manufacture the mould locally (<i>Business Review, 2015</i>)

2.5 Common Uses of Plastic Products in Bangladesh

Plastic products come in different forms for different purposes. The most common applications in Bangladesh

are outlined below:

2.6 History of Using Bangladeshi Pharmaceutical Packaging

From history it is known that the story of using Bangladeshi plastic pharmaceutical packaging started in 1978. Among the old companies Siddique Plastic & Luna Plastic were supplying plastic bottles to Reymon Drugs, Pfizer Bangladesh, Squibb Laboratories & Gaco Pharmaceuticals. Thereafter, many other companies like Bengal Plastic, Islam Plastic, Padma Plastic, Polycon, Asia Plastic, Bismillah Plastic etc. also became engaged in supplying plastic packaging for local pharmaceutical companies. Now a day's more than 30 local companies are supplying PET bottle, Spoon, Measuring Cup, Dropper, Nozzle etc to almost all the local companies. Also some plastic products manufacturing companies have dedicated manufacturing plants for pharmaceutical packaging.

Table 1. Common uses of plastic products in Bangladesh

Applications	Products
Accessories for RMG	Packaging material, bags, hanger etc.
Household, Tableware & Kitchenware	Bucket, jug, plate, glass, containers etc.
Furniture ware	Chair, Table etc.
Packaging	All kinds of food and non-food packaging
Healthcare	Toiletries (Soap case, tooth brush), Medical Accessories (blood bag, saline bag, injection, medicine container)
Building and construction	Plastic pipe, door, toilet flush etc.
Electrical and Electronic Equipment	Electrical cables and wires, switches, regulator, computer accessories, telecommunication equipment etc.
Agricultural products	Plastic pipes for irrigation and plastic films for shedding crops
Industrial Applications	Engineering parts

2.7 Plastics Uses in Pharmaceutical Packaging

a. Polyethylene (PE): Provides good barrier against moisture, relatively poor one against oxygen and other gases. High density polyethylene is used with density ranging from 0.91-0.96 leading to four basic characteristics of container, (1) Stiffness, (2) Moisture-vapor transmission, (3) stress cracking and (4) clarity or translucency based on polymer density used.

b. Polypropylene (PP): Polypropylene has features of polyethylene in addition it does not stress-crack in any condition. Hot aromatic or halogenated solvents soften the package. It has high melting point making it suitable for boilable packages and products needed to be sterilized. Brittleness at low temperature is its major disadvantages.

c. Polyvinyl Chloride (PVC): Can be produced with crystal clear clarity, will provide good gaseous barrier and stiffness. Reduction in residual vinyl chloride monomers had further enhanced PVC quality. PVC is used as coating on glass bottles providing shatter resistant coating.

d. Polyvinylidene chloride (PVDC): It is a remarkable barrier against water, oxygen and aromas. It has a superior chemical resistance to alkalis and acids, is insoluble in oil and organic solvents, has very low moisture regain and is impervious to mould, bacteria, and insects. But it is soluble in polar solvents.

e. Polystyrene: Rigid and crystal clear plastic. Not useful for liquid products. Polystyrene has high water and gaseous permeability also these are easily stretchable and breakable. To increase their strength and quality for permeability polystyrene is combined with rubber and acrylic compounds. Based on the composition these are classified as intermediate impact, high impact and super impact packages.

f. Nylon (polyamide): Many dibasic acids and amines combine to provide numerous varieties of nylon. Nylon is extremely strong and is quite difficult to be destroyed by mechanical means. Nylon provides resistance to wide range of acids and alkali only disadvantage of it is being permeable to water vapor for some amount this can also be dealt with coating of PE over the container. Not used for long term storage of products.

g. Polycarbonate: Has an ability to be sterilized repeatedly. It has immense rigidity and is a possible replacement for glass, vials and syringes. It has qualities like high dimensional stability, high impact strength, resistance to strain, low water absorption, transparency, and resistance to heat and flame. Polycarbonates have impact strength five times greater than any other common packaging plastics.

h. Acrylic multipolymers (Nitrile Polymers): These are polymers of acrylonitrile or methacrylonitrile monomers. These provide for packaging of those products which are not packed in usual packages as they provide for high gas barrier, good chemical resistance, and good strength.

i. Polyethylene terephthalate (PET): Condensation polymer formed by reaction of terephthalic acid or dimethyl terephthalic acid with ethylene glycol. It has excellent strength and provides barrier for gas and aroma making it as a useful package for cosmetics, mouth washes and other products. (Pareek et al. 2014).

2.8 Key Issues in Selecting Pharmaceutical Packaging

Plastic packaging systems for pharmaceutical products must be suitable for their intended use. That is, the packaging system should adequately protect the pharmaceutical product, should be compatible with the pharmaceutical product, and should be composed of materials that are safe for use. From a chemical perspective, plastic packaging systems used in pharmaceutical applications should be such that the ingredients of the pharmaceutical product are not adsorbed onto the surface of the packaging system, are not absorbed into the body of the packaging system, and do not migrate through the packaging system (compatibility). Further, the packaging system should not release substances that can accumulate in the pharmaceutical product in quantities sufficient to affect its stability (which addresses compatibility) or to present a risk of toxicity (Rock Ville, 2013).

2.9 Recent Trend in Pharmaceutical Plastic Packaging

Pharmaceutical packaging is a lucrative market-predicted to reach a global value of \$80 billion by 2020. In part that growth is due to aging populations in the developed world as well as better access to pharmaceuticals in the developing world. Yet industry challenges such as child-resistant packaging, CSR, counterfeits and prescription compliance are changing the way pharma manufacturers approach packaging. Here are the trends to watch out for. (Trevor Nicholas, 2016)

2.10 Categories of Pharmaceutical Packaging

Primary packaging system is the material that first envelops the product and holds it i.e., those package components and subcomponents that actually come in contact with the product, or those that may have a direct effect on the product shelf life e.g., ampoules and vials, prefilled syringes, IV containers, etc.

Secondary packaging system is outside the primary packaging and used to group primary packages together e.g., cartons, boxes, shipping containers, injection trays, etc.

Tertiary packaging system is used for bulk handling and shipping e.g., barrel, container, edge protectors, etc. (Nityanand Zadbuke et al., 2013)

2.11 Important Issues Affecting Pharmaceutical Packaging

- a) Bar coding: New US Food and Drug Administration (FDA) rules for drugs for hospital use
- b) Anticounterfeiting: RFID technologies
- c) Encouraging compliance: Noncompliance with drug regimens is an important issue throughout the healthcare system
- d) Cost control: The rising cost of oil-based plastics is leading to the use of new materials and packaging systems
- e) Senior-friendly packaging: Rapid growth in the elderly population and the aging of the baby-boom generation is increasing the importance of bringing senior-friendly solutions to market. (Niels, 2007)

3. Findings

3.1 Market Size & Market Players

From the in-depth interview of Commercial Heads of top 10 companies it is estimated that the approximate market size of Bangladeshi pharmaceutical plastic packaging materials is \$ 25 million (BDT 200 Crore) which is currently growing with an average rate of 25%. By quantity (number of items) less than 20% of the entire market is import dependant but by value it is 30% since imported items are involved with high cost. Locally the market growth shows a consistent upward trend over the last 10 to 15 years. Besides, there is a huge demand for plastic packaging globally which if tapped, would be further boost the growth of the local industry.

3.1.1 Company-Wise Approximate Demand Contribution (%)

Top two pharmaceutical companies consume more than one-fourth of the total market demand, while top 11 accounts for more than 70%. The table below shows the demand distribution of plastic packaging for pharmaceuticals:

Table 2. Buyers who drive the industry

SI #	Buyer Company	Demand %	SI #	Buyer Company	Demand %
1	Square	18	7	Aristopharma	4
2	Incepta	10	8	A.C.I.	4
3	Beximco	8	9	Healthcare	4
4	Opsonin	6	10	Acme	4
5	Renata	5	11	General	2
6	Eskayef	4	12	Others	29

Source: Authors' compilation, based on depth interview.

3.1.2 The Major Local Suppliers and Their Categories

The study has identified 30 notable manufacturers. Based on their business relationship with top 10 pharmaceutical companies, these are categorized as large, medium and small. Table below presents the classification.

Table 3. Major local suppliers who feed the industry

SI #	Manufacturer	Category	SI #	Manufacturer	Category
1	Bismillah Plastic	Large	16	DFL Plastic	Small
2	Luna Plastic Ltd	Large	17	Diba Plastic	Small
3	Pharmatech Polymer	Large	18	Hasan Polymer Ltd	Small
4	Square Plastic	Large	19	JMM Traders	Small
5	JMI Syringe	Large	20	Plastic Advantage	Small
6	Asia Plastic Ltd	Medium	21	JS Plastic Ltd.	Small
7	Chistia Plastic Ltd	Medium	22	MA Polymer	Small
8	Jamuna Plastic Ltd	Medium	23	Moitry Plastic Ltd	Small
9	Leos Plastic Limited	Medium	24	Piticon Industries Ltd	Small
10	Liza Plastic Limited	Medium	25	Saif Plastic Ltd.	Small
11	Q Pali Limited	Medium	26	Sanai Plastic	Small
12	Metalon Industries Ltd	Medium	27	Quality Plastic	Small
13	Padma Polymer	Medium	28	Sunrise Plastic	Small
14	Polycon Industries Ltd	Medium	29	ZK Plastic Limited	Small
15	Best Plastic	Small	30	SS Plastic	Small

Source: Authors' compilation, based on depth interview

Large: Regular business relationship with more than five (5) of top 10 pharmaceutical companies, Medium: Regular business relationship with four (4) or more top of 10 pharmaceutical companies & Regular business relationship with three (3) or less than 3 of top 10 pharmaceutical companies.

3.1.3 The Major Foreign Suppliers Include the Followings

As mentioned earlier, packaging products requiring top quality processing are sourced by import. The study has identified major foreign companies (along with their country of origin) doing business with Bangladesh. These are as follows.

Table 4. Major source of import

SI #	Foreign Company	Country	SI #	Foreign Company	Country
1	Wuxi Sunmart	China	9	BprexPharma	India
2	Nuplas	Dubai	10	Doctor Pack	India
3	Rexam	France	11	Meditalia	Italy
4	ACG	India	12	F.D. Enterprise	Taiwan
5	Struble	Germany	13	JOMA	Austria
6	West Pharma	USA	14	Gerresheimer	Poland
7	Shriji Polymer	India	15	BestPack	UK
8	Bilcare	India			

Source: Authors' compilation, based on depth interview

3.2 Commonly Used Plastic Materials for Pharmaceutical Packaging

There are many different forms of plastic packaging materials that are being used in pharmaceutical packaging. Among them PVDC film, PVC film and PET bottle together accounts for, in terms of value, 37%. The Table below presents description of major plastic materials used in pharmaceuticals, along with their respective share and source of procurement.

Table 5. Plastic materials used in pharmaceutical packaging

Sl	Products	Source	% Contribution by value (approx)
1	PVDC/HDP Film	Local/Import	14
2	PVC Film	Local/Import	12
3	PET bottle	Local Manufacturers	11
4	Cap & Closure	Local Manufacturers	8
5	Measuring Spoon	Local Manufacturers	6
6	Eye drop bottle	Local/Import	5
7	Nasal drop bottle	Local/Import	5
8	LVP Container (Flexible)*	Local (*)	5
9	Dropper	Local Manufacturers	5
10	LVP Container (Non-Flexible)	Import	5
11	Special Tube-Type container	Import	4
12	Syringe	Local	4
13	Infusion Set	Import/Local	4
14	Measuring Cup	Local Manufacturers	3
15	Stopper	Local/Import	2
16	Ear drop bottle	Local/Import	2
17	Inhaler Component	Import	1
18	Measuring Cylinder	Local Manufacturers	1
19	Applicator	Import	1
20	Prefill-Syringe	Import	1
21	Spray Pump	Import	1

Source: Authors' compilation, based on depth interview

* LVP= Large Volume Parenteral. Granules are imported and they are processed by the automated large volume parenteral manufacturing machine to produce container along with parenteral liquid.

3.3 Technical Issues of Pharmaceutical Packaging Materials

As drug products come into direct contact with packaging systems and their plastic materials of construction. Such contact may result in interactions between the drug product and its packaging system. The packaging systems must protect and be compatible with drug products and not compromise their stability, efficacy or safety. In turn, the ingredients of a drug product should not be absorbed onto the surface or migrate into the body of the plastic packaging system.

However, top local manufacturers imports food grade virgin active ingredients for producing plastic packaging materials from Korea, Taiwan, Malaysia, Saudi Arabia, UAE, China etc which are little costly and the pharmaceutical manufacturer have some quality parameters to select that same. Apart from basic materials working environment & machine also play role in the quality of the products.

Top local manufacturers have world class high standard machine & environment for producing plastic packaging materials but some other plastic manufacturer are far behind that standard.

The pharmaceutical companies who are exporting medicine to semi-regulated & regulated markets are very careful about the sources of plastic materials since there are some strict guidelines for packaging materials from regulatory body. Therefore, they expect certain SOP (Standard Operating Procedure) & COA (Certificate of Analysis) from the plastic manufacturer. Therefore, these export oriented companies limited their purchase only from top class plastic manufacturer.

3.4 Import Issues

PVC/PVDC/HDP films, Flexible large volume parenteral container, Special Tube Type Container, Infusion Set,

Actuator, Applicator and Spray Pumps are the items that import on regular basis. Some local companies are manufacturing PVC/PVDC film but due quality, appearance, perception and price they are not getting good market access. Special Tube Type Container is used by very few pharmaceutical companies and quantity is not very high. Therefore, local manufacturer are not interested to produce that same but they have the capacity to do it. Flexible large volume parenteral container production involved with very sophisticated technology; hence, local companies are not manufacturing it. Some containers for sterile liquid preparation like ophthalmic sterile liquid container are being imported since desired sterilization facility is unavailable but these containers are easy to manufacture. However, import of pharmaceutical packaging items also involved with some challenges like long lead time, uncertainty, high duty, price increment in final goods etc.

At a glance item-wise underlying cause of import

Table 6. Underlying causes of import of plastic packaging products for pharmaceuticals

SI #	Item	Underlying Cause of Import
1	Stopper	Limitation in mechanical facility
2	Eye drop bottle	Special Sterilization Facility is not available
3	PVC/PVDC/HDP Film	Quality of local products is not good enough. The blister that produced by using it is not homogenous and porosity standard is not up to the mark. Apart from the above price of the local product is also higher than imported price
4	LVP Container (Non-Flexible)	Due to auto filling basic ingredients (resin) for the container need to be given in the machine and basic ingredients are not produced in Bangladesh
5	LVP Container (Flexible)	Technological Limitation
6	Prefill Syringe	Technological Limitation
7	Actuator	This involves with very high technology and specific measurement. This technology is not available.
8	Applicator	Technological Limitation. Due to limited demand local companies are not very interested about it.
9	Spray Pump	This involves with very high technology with specific measurement. This technology is not available.
10	Special Tube-Type container	Since required quantity is not vast so local manufacturer are not interested to manufacture

Source: Authors' compilation, based on depth interview.

3.5 Growth Potential

The global pharmaceutical packaging market is expected to witness significant push due to incessantly rising demand of biologics. Advances in biotechnology often lead to the introduction of new therapies that must be injected; the pharmaceutical packaging market is expected to witness fastest growth from pre-fillable syringes and parenteral vials. Availability of raw materials and price volatility coupled with changing health regulations are the major deterrents which is curbing the growth of this market.

The fastest growth in the pharmaceutical packaging market is expected to come from pre-fillable syringes and parenteral vials, which will continue to expand as advances in biotechnology lead to the introduction of new therapies that must be injected. The increasing demand for biologics will strengthen demand for innovative product packaging solutions in the global pharmaceutical packaging market. All these factors, along with the growing pharmaceutical industry, will continue to drive demand for packaging. However, the packaging industry will have to overcome challenges, such as the availability and price volatility of raw materials and changing health regulations, in order to meet increasing demand from the growing pharmaceutical industry.

The growth of this industry is directly proportional with the growth of pharmaceutical industry. The market growth of this industry is expected to be very high since both local & global market of Bangladeshi pharmaceuticals is growing very fast. Some top plastic manufacturers are planning to export pharmaceutical packaging to Europe & America where market size is robust. Pharmatech Polymer is setting up dedicated plant for pharmaceutical plastic packaging, Pran Group is focusing on pharmaceutical plastic solution, Square and Acme are extending their facilities to produce plastic packaging materials. These all indicate that local companies are improving their capacity & quality in plastic packaging which is giving hope in import reduction, ultimately increase in local product demand.

World demand for pharmaceutical packaging products will increase 6.5 percent annually to over \$100 billion in 2019. Because of advanced and diverse drug-producing industries, almost 60 percent of global demand will come from the developed economies of Canada, Japan, the US, and Western Europe. India and China will form the fastest growing markets due to rapidly expanding pharmaceutical manufacturing capabilities and the adoption of more stringent regulations aimed at improving the quality and integrity of domestically produced medicines. Russia, Turkey, Mexico, Iran, Argentina, and Brazil are among other developing markets that are expected to expand and diversify drug-producing industries and register above average gains in pharmaceutical packaging demand. The Africa/Mideast region will be the fastest growing market, followed by the Asia/Pacific region and Central and South America. Primary containers will remain the dominant segment, led by prefillable syringes and parenteral vials. (Markets & markets, 2016). Due to low production cost Bangladesh may be an impressive hub for plastic packaging materials.

4. Conclusions & Strategic Imperatives

Considering the recent growth of the pharmaceutical industry in Bangladesh coupled with technological advancement involving plastic packaging, it may be concluded that the growth potential of plastic-based pharmaceutical packaging is quite high. If the local manufacturers concentrate on customer-centric innovations and maintain quality consistently, then they will be able not only to capture the entire local market, but also to enter into the global market. However, in order for them to reach that height, it is therefore recommended that initiatives are taken around the following:

4.1 Use of High Quality Basic Materials

Pharmaceutical plastic packaging materials needs to be produced from Food Grade Virgin materials but there are some manufacturers who are using general grade materials to minimize the cost. Local manufacturers are importing basic materials from different sources and producing the final goods here. Due to changes in sources of raw materials quality of final goods sometimes become changed. Therefore, quality of basic materials needs to be ensured.

4.2 Technological Up-Gradation

Still now our producers are not in shape enough to produce so many items due to technological limitation. Also, there are some companies who use semi-automated or manual machine where chance of contamination is very high. To avoid such limitations technological up gradation is utmost priority.

4.3 Ensuring Standard Working Environment

Although very few companies have good working environment and supplying packaging materials to multinational companies but many companies are not marinating pharmaceutical standard. Even there are some companies who have not any SOP for meeting the compliance.

4.4 Proper Documentation

In case of pharmaceutical plastic packaging item production documentation is basic requirement but our local manufacturers are putting very less attention on that. This issue needs to be addressed to meet regulatory guidelines.

4.5 Continues Innovation

In maximum cases our manufacturers usually collect samples from different sources including pharmaceutical companies and produce the copy products. They have limited or no R&D facilities. Due to this limitation aesthetic value of local products is behind the global standard and there is no variation in size & shape. Therefore, innovation in size, shape & appearance is important.

4.6 Entrepreneurship

Except one or two there is no dedicated pharmaceutical plastic packaging manufacturer in the country. Those who produce pharmaceutical plastic packaging materials also produce other plastic items. For pharmaceutical supply additional precaution & sensitivity are required which involved high cost whereas by using the same cost more output can be obtained in other items as quality issues do not get so priority. This motivates the entrepreneurs to make a check and balance between pharmaceutical packaging & other items which have a direct impact on quality standard. Therefore, if some dedicated plants are established then a class of manufacturers can be distinguished themselves from others and will easily get more market access considering quality parameters.

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