PROJECT PROFILE ON PET BOTTLE

Product	**Pet Bottle**
NIC Code (2008)	**2203**
Production Capacity	**300 MT per Annum (with one shift of 8 hours)**
Month & Year of preparation	**June 2020**
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Introduction:

Plastic remains one of the most utilized packing materials than its equivalents like paper, glass, and metal. The low cost of packaging is encouraging its use in various industries. With environmental concerns arising in more and more countries, important players have boosted their investments in research and development to tackle environmental concerns and make plastic bottles safer for use. Plastic packaging has been witnessing an increasing inclination from consumers over other products, as plastic packages are light in weight and easier to handle. Similarly, even the major manufacturers prefer to use plastic packaging solutions, owing to their lower cost of production. The introduction of Polyethylene Terephthalate (PET) and High-Density Polyethylene (HDPE) polymers expanded plastic bottling applications. With PET bottles being the most widely used packaging for water, the consumption of PET is growing in various countries.

The beverage industry in India is primarily dominated by PET bottles, which hold a larger market share in beverage packaging in comparison to glass & plastic bottles. According to FICCI, Indians consume 11 kg of plastic per year in comparison to 109 kilograms by an average American, and this figure is further expected to rise in the coming years. Most of the PET bottles used in the country are manufactured locally, while a minority share of 2% is imported from other nations. On the other hand, new trends in food packaging, like PET bottled rice, are creating new potential for growth in Japan. Most of the PET bottles used in the country are manufactured locally, while a minority share of 2% is imported from other nations. Other packaging materials, such as PP and HDPE, are also finding growing adoption, with companies looking to attract consumers by offering different types of products.

Due to COVID -19 Pandemic there is huge demand of Sanitizer Pet bottle of 50 ml to 500 ml capacity.

Plant Capacity per annum : **300 MT** per annum

Approx. value : Rs.400 lakhs

Market & Demand :

- Marketing is an important area of management in an industrial enterprise. It is a comprehensive term and includes all resources and economic activities necessary to direct the flow of manufactured goods from producers to consumers. The old concept of marketing was product-oriented where as the new concept is customer oriented. Customers are the champions whose needs, tastes, purchasing power, etc. are the guiding factors for the sale of products. Pet bottle being a mass consumption item have shown a dramatic growth since its inception in 1957.
- Thus, highly efficient plastic packaging helps conserve large amounts of resources. Polyethylene terephthalate (PET) is used for the packaging of carbonated drinks due to its high impact-resistant nature, and moisture and gas barrier properties and also has a rigid structure with high strength. The growth of plastic packaging is observed across different beverages segments, like coffee, tea, soup, non-dairy beverages, and others.
- The low penetration of the returnable form of bottle packaging has led to the increasing demand for cheaper packaging solutions in the beverage industry, resulting in substantial growth of the plastic bottles market. There is a substantial market for single-use crushable bottles around the world, chiefly for packaging of bottled water and carbonated beverages. However, the growth of these single-use disposable bottles is challenged by the increasing awareness regarding the high environmental impact of such bottles.

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Technical Aspects:

Manufacturing Process :

Polyethylene terephthalate (PET), bottles manufacturing process involves two basic stages of Pre-form manufacturing and Bottle Stretch Blow Molding.

1. Pre-form manufacturing process consists of following steps:
   a. Resin drying and dehumidification
   b. Melting of resin and injection into mold
   c. Injection blow molding
   d. Primary cooling
   e. Secondary cooling
   f. Ejection and storage
2. Bottle Stretch Blow Molding, process involves:
   a. Pre-form feeding
   b. Pre-form heating
   c. Transfer of heated pre-forms to blow wheel
   d. Bottle stretch blow molding
   e. Bottle ejection

Step 1: PET is first heated up and placed in a tube shaped mold called a parison, which is cut into the correct length after it's cooled

Step 2: The parison gets heated up and placed into a bottle shaped mold, with a screw top included. A mandrel (Steel rod) is inserted into the parison to allow highly pressurized air to enter and stretch the plastic. The molecules then polarize, due to the combination of stretching and high temperature, and produce a bottle

Step: 3 The bottle is cooled quickly to avoid creep and the removed.

Basis & Presumptions:

- The production has been calculated on the basis of single shift of 8 hours and 300 working days in a year.
- The full production capacity presumed to be achieved in the 2nd year of operation.
- Labor wages has been considered basing on market rates but not less than the rates prescribed by the Government at the locality.
- The interest rate on an average has been taken on 10% on capital investment.
- The Cap/Pump of bottle is outsourced.

Quality Control and Standards

There are a number to tests done as per relevant IS as per use of the bottle(IS-12887-1989, 14625-1999,IS-14537) after manufacturing to guarantee that the bottles are safe for use manufacturers will test for the following : -

- Impact resistance,
- Permeability to carbon dioxide
- Transparency
- Gloss
- Resistance to creep

Production capacity :Pet Bottle – 1.0 MT per day/shift or **300 MT** per annum.

Financial Aspects:

i. FixedCost: Rent Rs 80,000

Land 1000 sq.m. Building -750 sq.m

Factory shed including, laboratory , Store, Godawn , Office.

Machinery & Equipment:

Sl.No.	Description	Qty / Nos.	Amount (Rs.)
1	Injection molding mechine	1	26,00,000
2.	Accessory		
	a) Hopper Dryer-400 kg	1	1,50,000
	b) Auto Loader		65,000
	c) Cooling tower	1	45,000
	d) Grinder	1	2,50,000
	e) Chiller	1	6,00,000
	f) Dehumidifies	1	8,00,000
3.	24 Cavity Mold and fitting	1	15,00,000
4.	Blow molding machine autometic	1	21,00,000
5.	Misc. equipment including exhaust, weighing machines etc.	1	1,00,000
6.	Furniture/fixtures	LS	1,00,000
7.	Erection, Electrification and commissioning	LS	2,00,000
8.	Generator set	1	5,00,000
	Total		**90,10,000**

Working Capital:

a) Staff & Labor

1. Manager/Chemist	1 No.	25,000	25,000
2. Plant operator	4 No.	15,000	60,000
3. Clerk	1 No.	12,000	12,000
4. Skilled Workers	2 Nos.	11,000	22,000
5. Unskilled Workers	1 Nos.	8,000	8,000
6. Watchman	1No.	8,000	8,000
Add: Perquisites @ 15%			20,250
	TOTAL: Rs		**1,55,250**

b) Raw Materials:

Polyethylene Terephthalate (Pet)

22.5MT @ Rs. 90,000 PMT — Rs. **20,25,000**/Month

c) Utilities:

Power(12000KWh)/ Water — Rs 1,50,000/ month

d) Other Contingent Expenses:

i.Repairs, maintenance and replacement		10,000
ii. Office expenditure		5,000
iii. Insurance		5,000
iv. Telephone		1,000
v. Transport		20,000
vi. Miscellaneous expenses		4,000
vii Rent of Building		80,000
		125,000
Total recurring expenditure per month	a+b+c+d	**24,55,250**
Total working capital for 3 months		**73,65,750**

Total Capital Investment:

a. Fixed Capital 90,10,000

b. Working Capital for 3 months. 73,65,750

TOTAL: **1,63,75,750**

or say **1,63,76,000**

Machinery Utilization:

80% of utilization has been taken into consideration on all the machinery.

Financial Analysis:	
1. Cost of Production per annum:	
a. Total recurring cost	2,94,63,000
b. Depreciation on machinery & equipments 10%	9,01,000
c. Interest on total capital investment @ 10%	16,37,600
TOTAL	**3,20,01,600**

Turnover per year:

1. Pet Bottle (200 ml /500 ml)

A) Pet Bottle (200 ml of 26 gms)

Mold Cavity =24

Machine cycle time = 20 Sec

No. of Preforms per day = 34560

Less 1% wastage =34210 No.

No. of Preforms per year = 1,02,63,000

No. of pet bottle per year = 1,02,63,000

Cost of Pet Bottle10263000 @ 4.0(Rs) = **4,10,52,000**

2. Pet Bottle (500 ml of 36 gms)

Mold Cavity =24

Machine cycle time = 27 Sec

No. of Preforms per day = 25350

Less 1% wastage =25100 No.

No. of Preforms per year = 75,30,000

No. of pet bottle per year = 75,30,000

Cost of Pet Bottle75,30,000 @ 5.50(Rs) = Rs. **4,14,15,000/-**

Net profit per year

4,10 ,52,000– 3,20,01,600 = Rs **90,50,400**

Net Profit Ratio:

Net profit per year × 100 /Turnover = **22.0 %**

Break Even Point: Fixed Cost:

Total Depreciation	9,01,000
Interest on total capital investment	16,37,600
40% of personnel expenditure	7,45,200
40% of utilities	7,20,000
40% of other contingent expenditure	2,16,000
Rent	9,60,000

Total fixed cost : Rs 51,79,800

Rate of return:

Net profit × 100 /Total investment = 55.3%

Break Even Point:

Fixed Cost X 100 / Fixed Cost + Profit

$$\frac{5179800 \times 100}{5179800+9050400} = 36.4\%$$

Suppliers of machinery and equipment:

1.	Bajaj Processpack Ltd, B136, Sector 63, Noida Uttar Pradesh. Ph. 911204639950-99,
2.	M/s Electronica Plastic Machines Ltd., S-16 2nd Floor, DDA Shopping Centre, Mayur Vihar, Phase-I, Delhi. Ph .91-11-22756324, 22756325, 42547338 Mob No.9313228931
3	SR Tools Plot No. 27, Subhash nagar last bus stop , IDA Jeedimetla Hyderabad. Mob.No.8919849070
4	M/s Milacron India Pvt Ltd ,93 /2 & 94/1 GIDC Vatwa Ahmedbad Gujarat -382445 Mob No, 7961341700 ,9099066886

Suppliers of raw materials:

1.	M/s. Reliance Petrochemicals, Maker Chamber IV, 3rd floor , Nariman Point , Mumbai
2.	M/s. Kalpataru Polymer, B-101 Mahal Sai Krupa Bhagat compound Kopar Road Dombivli , Mumbai
3.	M/s 21 Century polymer ,M 86 Sector -2, Bawana Industrial area ,Bawana ,Delhi

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