PP DISPOSABLE SYRINGES

1. INTRODUCTION

Plastics are finding greater use in medical disposables and replacing conventional materials like metals and glass. One such application which has been established in the country is the use of disposable syringes produced from polypropylene resin by the process of injection moulding. The components include the plunger, main body which is graduated to indicate capacity, gasket, needle holder and the sheath cover for the needle.

The individual syringes are over wrapped in a polyethylene film pouch for subsequent sterilization by ethylene oxide/gamma radiation.

PP injection moulded syringes are available in sizes of 1 ml, 2 ml, 5 ml, and 10 ml, & also higher sizes in a variety of designs.

Due to its availability in sterilized condition, cost economics and ready to use form, disposable syringes are replacing glass syringes due to advantages such as crack resistance and safety from damage in transit.

The PP disposable syringes are having many advantages over conventional glass syringes such as light weight, Crack resistant, Leak proof, Disposable, Eco friendly, Sterilisable, See through clarity etc.

2. MARKET POTENTIAL

The advent of AIDS, serum Hepatitis and other dreaded infectious diseases have added now dimension and this let to rapid increased use of disposable syringes in developing countries. Use of disposable syringes is fast catching in India also and therefore offers good scope. In view of
this, the new units will not face any problems in marketing their product in future.

3. BASIS & PRESUMPTIONS

(i) The output capacity is taken as 150 Kgs/hr. The unit will work at 20 hrs. per day for 25 working days in a month and 300 days in a year. The output capacity may vary from machinery to machinery and the cost of machinery may also vary from supplier to supplier.

(ii) The time period for achieving the full envisaged capacity utilisation is six months

(iii) The labour wages are as per the prevailing rates in the market

(iv) The rate of interest for fixed and working capital is taken as 12 per cent

(v) The margin money requirement for this project is 30 per cent

(vi) The pay back period of this project is 5 years

(vii) The rate of land is taken @ Rs. 500/-per sq. mtr. and construction charges are taken @ Rs. 3500 per sq. mtr. This may also vary from place to place.

(viii) The present profile has to be updated taking into prevailing cost of land, building, machinery etc. at the time of implementation of the project

4. IMPLEMENTATION SCHEDULE

The Time requirement for preparation of Project report : Two months

Time requirement for selection of Site : One month

Time required for registration as Small Scale Unit : One Week

Time required for acquiring the loan
Machinery procurement, erection and commissioning: Three months  
Recruitment of labourer etc.: One month  
Trial runs: One month

5. **TECHNICAL ASPECT**

**MANUFACTURING PROCESS**

To manufacture plastic syringes, the machinery required will be injection moulding machines, set of Multicavity moulds and sterilization chamber.

Polypropylene granules are fed into an injection-moulding machine, where they are plasticized and then injected into a Multicavity mould. The mould is held under pressure and material is cooled, the product is then ejected.  
PP syringes are made of:

(a) Barrel  
(b) Plunger  
(c) Gasket  
(d) Protector  
(e) Hub

Barrel and Plunger are made of PP by injection moulding whereas Gasket is made separately.

Syringes produced are packed and then sterilized using Gamma Radiation or Ethylene oxide. This project considers sterilization by Ethylene Oxide.

6. **QUALITY & STANDARD**
For starting unit for the manufacturing disposable syringe, drug licence is essential and are manufactured according to Drug Control Act.

7. **PRODUCTION CAPACITY** (Per Annum)

   (a) Quantity (Lakh) : 5 ml – 150 lakhs
               2 ml - 75 lakhs
   (b) Value (Rs.) : 3,45,00,000.00

8. **TOTAL POWER REQUIREMENT**

   Total connected load (KW) : 215

9. **POLLUTION CONTROL MEASURES**

   The unit does not create any pollution. However, a proper ventilation should be made in the processing area for the better circulation of the fresh air.

10. **ENERGY CONSERVATION**

    Entrepreneurs may select energy efficient machinery and proper planning has also to be made for saving energy in the unit.

11. **FINANCIAL ASPECT**

    A. **FIXED CAPITAL**

    i) **LAND & BUILDING:** Area sq. mtrs. Rate Rs. per Sq. mtr. (Rs.)

       Land 760 300 2,28,000.00
       Building 380 3500 13,30,000.00

       Total : 15,58,000.00

    ii) **MACHINERY & EQUIPMENT:**

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<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description of machines</th>
<th>Qty.(Nos.)</th>
<th>(Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(a) Production Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1)</td>
<td>Injection Moulding M/c. 125 T</td>
<td>01</td>
<td>20,25,000.00</td>
</tr>
<tr>
<td>2)</td>
<td>Sterilisation Plant and Assembling Line</td>
<td>01</td>
<td>1,00,00,000.00</td>
</tr>
<tr>
<td>3)</td>
<td>Clean Room Air System</td>
<td>01</td>
<td>20,00,000.00</td>
</tr>
<tr>
<td></td>
<td>(b) Testing Equipment &amp; Other Accessories</td>
<td></td>
<td>1,25,000.00</td>
</tr>
<tr>
<td></td>
<td>(c) Electrification &amp; Installation @ 10% of cost &amp; machinery</td>
<td>14,15,000.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(d) Pre-operative expenses</td>
<td></td>
<td>1,00,000.00</td>
</tr>
</tbody>
</table>

Total cost of machinery & equipment (a to d) 1,56,65,000.00

(e) Cost of Moulds & Dies & Misc. items 2,00,000.00

(f) Cost of Office Equipment/Furniture/Computers etc. 3,00,000.00

Total: 1,61,65,000.00

Total Fixed Cost = (i) + (ii) = 15,58,000 + 1,61,65,000 = 1,77,23,000.00

B. WORKING CAPITAL

i) Staff and Labour (Per Month)

<table>
<thead>
<tr>
<th>Designation (Rs.)</th>
<th>Nos.</th>
<th>Salary (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position</td>
<td>Code</td>
<td>Salary 1</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------</td>
<td>----------</td>
</tr>
<tr>
<td>Production Engineer/Manager</td>
<td>01</td>
<td>20,000.00</td>
</tr>
<tr>
<td>Sales Executive</td>
<td>02</td>
<td>10,000.00</td>
</tr>
<tr>
<td>Accountant</td>
<td>01</td>
<td>10,000.00</td>
</tr>
<tr>
<td>Store Keeper-cum-Clerk</td>
<td>01</td>
<td>8,000.00</td>
</tr>
<tr>
<td>Watchman</td>
<td>03</td>
<td>4,000.00</td>
</tr>
<tr>
<td>Supervisor</td>
<td>03</td>
<td>6,000.00</td>
</tr>
<tr>
<td>Skilled Workers</td>
<td>18</td>
<td>5,000.00</td>
</tr>
<tr>
<td>Unskilled Workers</td>
<td>25</td>
<td>4,000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,00,000.00</td>
</tr>
</tbody>
</table>

Add perquisite @ 10% of the Salary: 27,800.00

Total: 3,05,000.00

Or Say Rs. 3,05,000.00

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ii) Raw Material (Per Month) Qty. (M.T.) Rate Rs./MT (Rs.)

<table>
<thead>
<tr>
<th>Material</th>
<th>Qty</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypropylene</td>
<td>15</td>
<td>75,000.00</td>
</tr>
<tr>
<td>Ethylene Oxide Gas, Needles &amp; Packaging Material</td>
<td>1</td>
<td>2,75,000.00</td>
</tr>
</tbody>
</table>

Total: 14,00,000.00

iii) Utilities (per month):

a) Power: 3,22,500.00 (60% efficiency x 215 KW x 500 hrs. x Rs. 5 per unit)
b) Water

2,500.00

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Total: 3,25,000.00

iv) Other Contingent Expenses (Per month) (Rs.)

bbb) Repairs and Maintenance

10,000.00

ccc) Transportation Charges

5,000.00

ddd) Postage and stationery

2,000.00

eee) Telephone/Fax/Computer

3,000.00

fff) Consumable Stores

5,000.00

ggg) Advertisement & Publicity

5,000.00

hhh) Insurance

10,000.00

iii) Miscellaneous Expenses

3,000.00

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Total: 43,000.00

100

12. TOTAL WORKING CAPITAL (Per Month)

i) Staff and Labour

3,05,000.00

ii) Raw Material

14,00,000.00

iii) Utilities

3,25,000.00

iv) Other Contingent Exp.

43,000.00

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Total: 20,73,000.00

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13. **TOTAL CAPITAL INVESTMENT** (Rs.)

A. Fixed Capital
1,77,23,000.00

B. Working Capital for 3 months
62,19,000.00

Total: 2,39,42,000.00

14. **FINANCIAL ANALYSIS** (Rs.)

A. Cost of Production (per year) (300 days)
   (a) Total Recurring Cost
2,48,76,000.00
   (b) Depreciation on building @ 5%
66,500.00
   (c) Depreciation on machinery & equipment @ 10%
15,66,500.00
   (d) Depreciation on Dies & Moulds @ 20%
40,000.00
   (e) Depreciation on office equipment @ 20%
60,000.00
   (f) Interest on total Capital Investment @ 12%
28,73,040.00

Total: 2,94,82,040.00

Or say Rs. 2,94,82,000.00

B. Sales/Turn over (per year)

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty.(Lakhs)</th>
<th>Rate (Rs.)</th>
<th>Value (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable Syringes</td>
<td>5 ml</td>
<td>150</td>
<td>1.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2,70,00,000.00</td>
</tr>
</tbody>
</table>
Disposable Syringes 2 ml  75  1.00  
75,00,000.00  
-----------------  
Total: 3,45,00,000.00

C. Net Profit (Per year)
Sales(Rs) – Cost of Production (Rs.) = Profit (Rs.)
345,00,000  –  2,94,82,000 = 50,18,000.00

D. Net Profit Ratio = Net Profit x 100
Sales
= 50,18,000 x 100 = 13.18
3,75,00,000

E. Rate of Return = 50,18,000 x 100
Total Capital Investment
= 50,18,000 x 100 = 20.95
%
2,39,42,000

F. Break-even Point
Fixed Cost (Per Year) Rs.

a) Depreciation on Building @ 5%
66,500.00
b) Depreciation on Machinery & Equipment @ 10%
15,66,500.00
c) Depreciation on Moulds/Dies & Office Equipment
1,00,000.00
@ 20%
d) Insurance
1,20,000.00
e) Interest on total capital investment
28,73,040.00
f) 40% of salary and wages
14,64,000.00
g) 40% of other contingent expenses
1,85,400.00

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Total: 63,48,440.00

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Or Say Rs. 63,48,000.00

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\text{B.E.P. \%} = \frac{\text{Fixed Cost} \times 100}{\text{Fixed Cost} + \text{Net Profit}}
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\[
= \frac{63,48,000 \times 100}{63,48,000 + 50,18,000}
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\[
= \frac{53,48,000 \times 100}{1,13,66,000}
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= 55.85 \%
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