

Roto-Moulded Plastic Water Storage Tanks

PRODUCT CODE	: 303701005
QUALITY AND STANDARDS	: IS 12701:1989
PRODUCTION CAPACITY	: 9000 tanks of 500 L, 750 L, 1000L and 5000L.
MONTH AND YEAR OF PREPARATION	: January, 2003
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INTRODUCTION

Roto Moulded Plastic Water Storage Tanks are made from Linear Low Density Polyethylene/Low Density Polyethylene. These tanks are light in weight therefore, it is easy to fix them at the place of choice. These tanks require no painting, no rotational moulding, product is formed inside a closed mould rotating biaxial in two plains perpendicular to each other. In batch type-rock-N-Roll type Rotational Moulding machines, frame of the machine is turned in a primary axis while mould is rotated in secondary axis.

As rotational moulding does not involve any injection pressure and high shear rates, this process offers certain basic advantages over other processes and techniques of plastic processing.

a) Complex parts can be moulded without need for post-assembly.

- b) Low machinery cost relative to production capacity.
- c) Double walled items can be produced.
- d) Ease of colour and material change.
- e) Multiple product and multi colours can be moulded at the same time
- f) Minimum wastages.
- g) High production capacity on selected parts.
- h) Production design freedom.

These tanks keep water clean, odour free and maintain the quality of water stores intact. These tanks are economical, practical and hygienic alternative of storing potable water in single or multi storeyed residential units, industrial set-ups, commercial establishments and sites everywhere under the sun. These tanks are becoming

increasingly popular in India and have caught the eyes of many users for their requirement of storing water for domestic and other purposes. These tanks are also used in hostels, hospitals, schools, cinema houses and construction sites.

MARKET POTENTIAL

Roto-moulded Plastic Water storage tanks being lighter in weight are easy in handling and can be easily fitted at any desired place, and are hence preferred and practically replacing the conventional tanks of steel, cement concrete or stone. These tanks are available in market in various sizes and shapes. The prices of these tanks are at the rate of Rs. 3 per litre of water capacity approximately. The demand of plastic water storage tanks is increasing day-by-day. They are not only installed in the individual houses and flats but are also fitted in factories, group housing schemes and multi-storied buildings as well.

Field investigations have revealed that due to increase in the house building activities and preference given by the Government to provide homes to the homeless people, the demand for plastic water storage tanks is likely to increase in the years to come. Hence there is a good scope for establishing a few units for the manufacture of water storage tanks by rot Moulded process.

BASIS AND PRESUMPTIONS

- I. The scheme is based on single shift (8 hours) basis and 300 working days per annum.
- II. The estimates are drawn for a production capacity generally indicated techno economically viable for a model type of activity.

- III. Cost in respect of land and building, machinery and equipments, raw materials and the selling prices of the finished products etc. are those generally obtained at the time of preparation of the project profile and may vary depending on various factors.
- IV. The time period for achieving full/ envisaged capacity utilization is three years.
- V. The interest rates considered are those which are presently charged by state financial institutions.
- VI. The margin money is 25% for fixed capital and working capital.
- VII. The pay back period for the project is 3 years.

IMPLEMENTATION SCHEDULE

- I. Six months period is required for preparation of project report, selection of site and SSI registration etc.
- II. One to one and half years period is required for availability of finance/loan, construction of factory shed, machinery procurement, erection and commissioning, trial runs and recruitment of staff and labour etc.

TECHNICAL ASPECTS

Process of Manufacture

The LLDPE granules are mixed with granules of black colour concentrates. These are extruded and strands are chopped as granules so as to achieve uniform distribution of carbon black.

The granules are pulverized in a special pulverization system from 30 to 40-mesh powder. This powder is fed in the mould in the required quantity. The burners of the Roto Moulding Machine are fired with the help of LPG or Diesel and the moulds are heated to 300°C. Molten powders when rotated in the heated moulds form hollow storage tank. White inner coating is given for better finish. After proper time when the tank is ready, the mould is cooled and opened and the tank is taken out. Finishing of the tanks is done manually.

Quality Control and Standards

Roto Moulded Tanks are manufactured as per IS 12701:1989.

This standard covers the requirements of materials, dimensions, construction shape, tolerances on dimensions, fittings, workmanship, performance requirements and inspection and testing of rotational moulded polythene water storages tanks. This standard is applicable only to water storage tanks subject to the following two conditions:

- a. Own hydrostatic head of water.
- b. Tank with uniform flat base support.

The internal and external surface of the water storage tank should be smooth, clean and free from other hidden internal defects, such as air bubbles, pits and metallic or other foreign material inclusions. The mould parting line and excess material near the top rim of the tank should be cut and finished to the required leave Defects like air bubbles and pits at mould parting line and at top rim of the main man hole should be repaired by hot air filler rod welding method.

Production Capacity

Capacity of the unit (per annum) - 3000 Nos. of Roto Moulded Plastic Water Storage Tanks of various capacities varying from 100 Litres to 5000 litres on single shift basis.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building

	Area sq.mtrs.	Rate (Rs.) sq.mtr	Value (Rs.)
Land Built-up area	2500	Rented	25,000
Including store	1000		

(ii) Machinery and Equipments

Description	Qty.	Value (Rs.)
<i>Production Unit</i>		
1. Biaxial rotation Moulding Plant 3 arm 1000 lits.Cap. With motor, reduction gear for each arm AC drive (1000-2,750-4,500-4)	1	16,00,000
2. Rock-N-Roll Moulding Machine with motor, reduction gear for 6 Nos. rolling, hydraulic Pump upto 10,000 Ltrs.	1	8,00,000
3. Chain pulley with stands	1	25,000
4. Pulverising Machine with 20 H.P. Motor RPM 800/Min.	1	7,00,000
5. Extruder Machine 1000 mm with reduction gear, pyrometric panel Board, 20 H.P. Motor.	1	4,00,000
6. 18" heavy duty grinding machine with 15 H.P. Motor	1	25,000
7. Weighing Machine	1	1,00,000
8. Cutter machine for rejection Tank	1	30,000
9. Testing Equipments		20,000
10. Electrification and Installation		3,70,000
Moulds 100 litres to 10,000 litres cap		4,50,000

Description	Qty.	Value (Rs.)
Furniture and Fixtures		30,000
Total Cost of Machinery		45,50,000
Pre-operative Expenses (Project cost, non-refundable deposits)		20,000
Total		45,70,000

B. Working Capital (per month)

(i) Personnel

Designation	Qty.	Salary (Rs.)	Total (Rs.)
Works Manager	1	10,000	10,000
Accountant-cum-store keeper	1	5,000	5,000
Skilled Workers	4	4000	16,000
Unskilled Workers	6	2000	12,000
Peon/Watchman	2	1500	3000
Total			46,000
Perquisites @ of Salaries			6,900
Total			52,900
Or say			53,000

(ii) Raw Materials Including Packaging Requirement (per month)

Particulars	Qty. Kgs.	Rate (Rs.)/Kg.	Value (Rs.)
LLDPE	37,400	41	15,33,400
Master batch black	2,00	50	1,00,000
LPG (19 Kgs. Cap)	500	500	3,50,000
Industrial gas	Nos.	bottle	
Total			19,83,400
Or say			19,84,000

(iii) Utilities (per month)	(Rs.)
Power (Total connected load 145 H.P.)	50,000
Water	2,000
Total	52,000

(iv) Other Contingent Expenses (per month)	(Rs.)
Postage and Stationery	1,000
Telephone	2,000
Consumable Store	1,000
Repair and Maintenance	2,000

Transportation Charges	10,000
Advertisement and Publicity	3,000
Rent	25,000
Miscellaneous Expenditure	2,000
Total	46,000

(v) Total Recurring Expenditure (per month) Rs. 21,35,000

Staff and Labour	53000
Raw Materials	19,84,000
Utilities	52000
Other contingent expenses	46000
Total	21,35,000

(vi) Total Working Capital (on 3 months basis)

Rs. 64,05,000

C. Total Capital Investment

i. Fixed Capital	45,70,000
ii. Working Capital	64,05,000
Total	1,09,75,000

Machinery Utilization

The unit will be working on single shift basis. Lids required for the tank are to be made from outside. 2% extra raw material is taken as wastage. The details of raw materials required are given below.

Litre	Kgs.	Per day No.	Qty. Kgs.	per month Kgs.
500	18	10	180	4500
750	25	10	250	6250
1000	33	5	165	4125
5000	190	5	950	23750
Total				38625
+2% Wastage				777
Total				39400

FINANCIAL ANALYSIS

1. Cost of Production (per year)	(Rs.)
a. Total recurring cost	2,56,20,000

b. Depreciation on machineries @10%	4,07,000
c. Depreciation on office equipment @ 20%	6,000
d. Depreciation on Mould @ 20%	90,000
Interest on total Capital	
e. Investment @14%	15,36,500
Total	2,76,59,500
Or say	2,76,60,000

2. Turnover (per year)

Items	Qty. Nos.	Rate (Rs.)/Piece	Values (Rs.)
500 Ltrs. Tank	3000	1250	37,50,000
750 Ltrs. Tank	3000	1875	56,25,000
1000 Ltrs. Tank	1500	2500	37,50,000
5000 Ltrs. Tank	1500	12500	1,87,50,000
Total			3,18,75,000

3. Net Profit (per year)

$$\begin{aligned} \text{Profit} &= \text{Turnover} - \text{Cost of Production} \\ &= \text{Rs. } 3,18,75,000 - 2,76,60,000 \\ &= \text{Rs. } 42,15,000 \end{aligned}$$

4. Net Profit Ratio

$$\begin{aligned} &= \frac{\text{Net Profit per year} \times 100}{\text{Turnover}} \\ &= \frac{42,15,000 \times 100}{3,18,75,000} \\ &= 13.22\% \\ &= \frac{\text{Net Profit per year} \times 100}{\text{Total Investment}} \\ &= \frac{42,15,000 \times 100}{1,09,75,000} \\ &= 38.40\% \end{aligned}$$

5. Break-even Point (% of Total Production Envisaged)

(i) Fixed Cost	(Rs.)
a) Depreciation on machinery and equipment	4,07,000
b) Depreciation on office equipment	6,000
c) Depreciation on Mould	90,000
d) Interest on total capital investment	15,36,500
e) Rent	25,000

f) 40% of salary and wages	2,54,400
g) 40% of other contingent expenses	1,00,800
Total	23,94,700
or Say	23,95,000

(ii) Net Profit (per year)

$$\begin{aligned} \text{B.E.P.} &= \frac{\text{F.C} \times 100}{\text{F.C} + \text{Profit}} \\ &= \frac{23,96,000 \times 100}{23,95,000 + 42,15,000} \\ &= 36.23\% \end{aligned}$$

Addresses of Plant and Machinery Suppliers

1. M/s. National Plastics
Plot No. 84, G.I.D.C., Odhav,
Ahmedabad-382415.
2. M/s. Jai Industrial Works
22-26 A, Industrial Estate,
22, Godam,
Jaipur.
3. M/s. Super India
B-45, Lawrence Road,
New Delhi-35.
4. M/s. Batliboi and Co. Ltd.
P. B. No. 479, V.B. Gandhi Road,
Fort, Mumbai-400023.
5. M/s. N.A. Corporation
3725, GIDC, Phase IV, Vatva,
Ahmedabad-382445.
6. M/s. fixopan Machine Pvt. Ltd.
71, Nehru Place,
New Delhi-110019.

Addresses of Raw Material Suppliers

1. M/s. Indian Petrochemicals Corp. Ltd.
P.O. Petrochemicals,
Vadodara (Gujarat),
2. M/s. Reliance Petrochemicals
Maker Chamber IV, 3rd Floor,
222, Nariman Point,
Mumbai-400021.