ICE FACTORY

Introduction: Water when made into a solid mass by the application of cooling is known as ice. It is one of the essential medium for short-term preservation of highly perishable commodities such as marine foods, fresh meat and poultry products, dairy products and fruit and vegetables. These goods can be stored for about 2 to 3 days with ice. This fact facilitate the transportation of these foods to the consumer market. Ice is also used in the chemical, pharmaceutical, canning and freezing industries. Besides, it is being used for children and serving synthetic or fruit beverages, Jellies, etc.

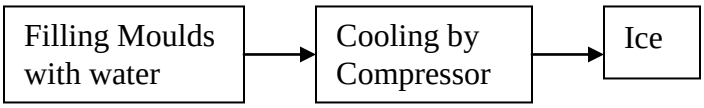
Market: Except for upper middle class and rich house-holds, who own refrigerators, there is hardly any household who may not be using ice during summer season in one form or the other in this country. It is also used by the tea-stalls, hoteliers, restaurants, clubs and industrial houses for storage and hilling purposes. In short, it is being used extensively in all urban areas, small towns or even villages especially during the summer season. Thus there is a good scope for at least one ice plant in a town having a population of 20 thousand which will also cater to the needs of the nearby areas.

Target: Assuming that the Unit shall operate for single shift of eight hours per day for three hundred days per annum the annual installed capacity is estimated at

Quantity	-	200 M.T.
Value	-	Rs.15,84,000/-

Process: The ammonia or feron gas coming from the cooling coil at low temperature and pressure is compressed into liquid and is passed through the cooling coil fixed in the freezing tank. Due to the low boiling point of ammonia it changes its shape from liquid to vapour and is condensed in side the condenser. The tank contains brine of 30% salt, the cold brine is circulated by agitation to maintain uniform temperature through out the tank. The brine temperature is considerably reduced to as low as 15°F, this will take about 24 hours. After the brine reaches the operating temperature the ice cans are filled with water and are immersed inside the brine tank in such a way that the level of the brine should be below the level of the top of the ice can. Due to the high freezing point of water comparing to brine, the water in the can is solidified at 30°F to from ice. To get clear solidised a small quantity of air is passed into the cans. It takes about 18 hours to freeze a 50 kg. ice can. 24 hours to freeze 70 kg can and 48 hours to freeze 140 kg can.

Process Flow:



Raw Material (Annual): Water required for ice making is 10.5 kilo litres and for make up purposes another 4 kilo litres per day in full swing. After initial change of gas and salt, additional charge is necessary to compensate for losses.

(i) 2800 kilo litre water	-	Rs. 16,500.00
(ii) 4 Cylinders Ammonia gas of 60 kg.	-	Rs. 11,000.00
(iii) Salt 6 M.T.	-	Rs. 7,260.00
		Rs. 34,760.00

Power: The power is available from the state Electric supply corporation Grid. The consumption of power is estimated 85500 unit. Annual estimated cost Rs. 2,91,555/-.

Water: The unit will need 15 kilo liter water per day. Cost of drawing of water is shown in power cost

Manpower: Manpower required by the unit including skilled workers is locally available. The requirement and annual costs of manpower at the installed capacity is shown below:

Sl.No.	Category of Manpower	No. of Persons	Annual Cost
1.	Manager	1	Self
2.	Skilled Worker	2	1,32,000/-
3.	Unskilled worker	2	92,400/-
	Total:	5	2,24,400/-

Financial Aspect :

1)	Land & Building :- 90 sq.ft.	-	2,41,000/-
(i)	Construction of tube well & overhead storage tank	-	1,20,000/-
2)	Plant & Machinery		
1.	6′x6′ Heavy Daty, double cylinder Reciprocating ammonia compressor	1	1,32,000/-
2.	40 Hp slipring induction meter suitable for Hperation on 400/440 3 phase, 50 Hiz, complete with starter and capacitor	1	1,26,000/-
3.	Ammonia oil separator 300 mm dia x 900 mm length complete With flanges, oil drain value	1	3,960/-
4.	2 sets of atmosphere type ammonia condensers each having 2 rows of 12 pipes, 6 m long and made of 50 m pipe, complete	2 sets	1,20,000/-
5.	Ammonia receiver	1	32,400/-
6.	Freezing tank	1	2,40,000/-
7.	refrigeration coil made of 32 mm black heavy pipe	1	78,000/-
8.	Brine agitator complete with 3 Hp induction meter	1	9,360/-
9.	Low pressure rotary air blower	1	12,000/-
10.	Condenser water circulating pump	1	9,240/-
11.	240 nos. seam welded ice cans 20cm x 40 cm x 80cm deep		1,92,000/-
12.	250 nos. air fittings consisting of tubes brackets, elbows, hoses And supply headers		15,000/-
13.	150 mm thick thermo foam insulation false ceiling		1,17,600/-
14.	Hand Hoist with crane ends, beam rail and can dump for Single can		18,000/-
15.	First charge of refrigerant & salt		12,000/-
16.	Hydrometer thermometer, tool kit etc.		3,600/-
		Total:	11,21,160/-
3)	**Miscellaneous Fixed Asset**		
a)	Electrification	Rs.	71,500/-
b)	Furniture & Miscellaneous others	Rs.	22,000/-
4.	Provision for contingencies	**Rs.**	55,770/-
5.	Preliminary & pre-operative expenses		**Rs. 1,49,270/-**
		Total Fixed Cost	**Rs.12,70,430/-**

6. **Working Capital (P.M.)**

a)	Raw Material	Rs. 8,690/-
b)	Utilities	Rs. 72,710/-
c)	Salary & Wages	Rs. 56,100/-
d)	Other expenses	Rs. 55,000/-

Total working capital: **Rs. 1,92,500/-**

Total Project Cost: Rs. 14,62,930/-

Means of Finance:		**Urban**	**Rural**
1.	Composite loan	10,23,400/-	8,77,800/-
2.	Promoter's contribution	73,150/-	73,150/-
3.	Subsidy	3,65,750 /-	5,12,050/-
4.	Debt equity ratio	2.33:1	1.50:1

Profitability: (Rs. in Thousands)

Sl.No.	Description	1st year	2nd year	3rd year	4th year	5th year
1.	Capacity utilized as percent of installed capacity	60%	70%	80%	80%	80%
2.	Annual Sales Realization in Rs.	950	1109	1267	1267	1267
3.	**Annual Costs in Rs.**					
a)	Raw Materials	21	24	28	28	28
b)	Utilities	175	204	233	233	233
c)	Selling expenses	64	75	85	85	85
	Variable Cost	**260**	**303**	**346**	**346**	**346**
d)	Wages & Salaries	135	157	180	180	180
e)	Administrative expenses	132	154	176	176	176
f)	Depreciation	127	127	127	127	127
g)	Interest on Composite Loan	127	103	75	45	15
	Fixed & Semi Variable Cost	521	541	558	528	498
4.	**Total Cost**	**781**	**844**	**904**	**874**	**844**
5.	Annual Profit	169	265	363	393	423
6.	Return on Investment	11.55%	18.11%	24.81%	26.86%	28.91%
7.	Return on sales	17.78%	23.89%	28.65%	31.01%	33.38%
8.	Annual contribution	690	-	-	-	-
9.	Break Even Point	45.30%				
10.	Cash accrual	296	392	420	520	550
11.	Debt Servicing Capacity	423	495	565	565	565
12.	Repayment of Composite Loan	166	194	227	221	221
13.	Debt Serviced	293	297	297	266	236
14.	Pay Back Period	1 year 5 months 8 days				
15.	Debt Service Coverage Ratio	1.44:1				

Cash Flow Statement (Rs. in Thousands)

Sl. No.	Description	Pre-operative Period	Operating Years				
			First	Second	Third	Fourth	Fifth
1.	Increase in Promoter's contribution	73	-	-	-	-	-
2.	Increase in Term loan	1024	-	-	-	-	-
3.	Subsidy	366	-	-	-	-	-
4.	Depreciation	-	127	127	127	127	127
5.	Profit before interests	-	296	368	438	438	438
A.	**TOTAL SOURCES**	**1463**	**423**	**495**	**565**	**565**	**565**
6.	Increase in capital investment	**1270**	-	-	-	-	-
7.	Increase in working capital	193	-	-	-	-	-
8.	Interest	-	127	103	75	45	15
9.	Repayment of Term Loan	-	166	194	222	221	221
B.	**TOTAL DISPOSALS**	**1463**	**293**	**297**	**297**	**266**	**236**
C.	**OPENING BALANCE**	**NIL**	**NIL**	**130**	**328**	**596**	**895**
D.	**NET SURPLUS**	**NIL**	**130**	**198**	**268**	**299**	**329**
E.	**CLOSING BALANCE**	**NIL**	**130**	**328**	**596**	**895**	**1224**

Projected Balance sheet:

Sl.No.	Description	Amount in Rs. Thousnad as at the end of the				
		1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	5th Yr.
1.	Capital Account of Promoter	73	242	507	870	1263
2.	Surplus from operation	169	265	363	393	423
	NET WORTH:	242	507	870	1263	1686
3.	**Subsidy**	**366**	**366**	**366**	**366**	**366**
4.	Term loan outstanding	858	664	442	221	-
	TOTAL LIABILITIES	**1466**	**1537**	**1678**	**1850**	**2052**
1.	Gross Block	1270	1270	1270	1270	1270
	Less Depreciation	127	254	381	556	683
	NET BLOCK	**1143**	**1016**	**889**	**762**	**635**
2.	Working capital	193	193	193	193	193
3.	Cash & Bank Balance	**130**	**328**	**596**	**895**	**1224**
4.	**TOTAL ASSETS**	**1466**	**1537**	**1678**	**1850**	**2052**