

Menthol Crystal

PRODUCT CODE	:	313183007		
QUALITY AND STANDARDS	:	IS 3134		
PRODUCTION CAPACITY	:	per annum		
		Item	Qty.	Value(Rs.)
		(a) Menthol Flakes	85.05 MT	4,25,25,000
		(b) De- mentholised oil (DMO)	36.5 MT	5,83,2000
MONTH AND YEAR OF PREPARATION	:	January, 2003		
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INTRODUCTION

Mint oil and its derivative menthol is widely used as flavouring ingredient for various products such as tooth paste, dental cream, cough syrups, confectionery, pan masala, chewing gums and in pain relieving preparations.

Mentha cultivation in India has proved quite remunerative to the growers, particularly to small holders and fitted well in the existing cropping system in mint growing area in the country. Mint growers consider mentha as a bonus crop as it does not disturb or replace the cultivation of any major winter (Rabi) or rainy season (Kharif) crop. Being a labour intensive crop mentha provides various employment opportunities in cultivation, distillation, processing field particularly in rural areas.

There are several species and varieties of mint oil which are cultivated in one or the other parts of the world, five of them are grown on commercial scale in India, these are (I) *Mentha arvensis* (ii) *Mentha-piperita* (iii) *Mentha spicata* (iv) *Mentha-veridish* (v) *Mentha-citrata*.

The important mint producing regions in India are in the states of Uttar Pradesh and Punjab. The former accounts for about 90% of total area under mint production, the important mint production cultivation districts are Jalandhar, Ludhiana and Hoshiarpur.

PRODUCT AND ITS USES

Mentha oil is obtained from the leaves/entire plant of various mentha species and varieties. The Japanese mint

(*Mentha arvensis*) is mainly cultivated in our country. The oil of Japanese mint is used as a source of natural menthol and dementholised oil (DMO). Because of its refreshing aroma and cooling effect, Mints have very wide spread use as flavouring agent in different pharmaceutical preparations.

MARKET POTENTIAL

The mint oil and its derivatives, menthol and DMO are now being marketed at various locations in North India as also being exported. The marketing of Japanese mint oil and menthol is wide spread. India is the second largest country in production of mints and its derivatives. India is exporting mints and its derivatives throughout the world worth Rs. 60-70 crores annually.

BASIS AND PRESUMPTIONS

1. The project is based on single shift basis and 300 working days in a year.
2. Cost of machinery and equipment indicated in the profile refer to a particular make and prices are approximate to those prevailing at the time of preparation of project profile.
3. Cost of installation, electrification etc. are taken as 10% of the cost of machinery and equipment.
4. Depreciation on machinery and equipment has been taken as 10% of the cost of machinery and equipments.
5. Margin money has been taken as 30% of the total capital investment.
6. Break-even point has been calculated at the full capacity utilization.

IMPLEMENTATION SCHEDULE

The following steps are involved in the implementation of the project:

Selection of site	1 month
Preparation of project profile	1 week
Registration of the unit from D.I./D.I.C.	1 week
No objection certificate from Pollution Control Board	2 weeks
Calling of quotations and preparation of detailed Project report	1 month
Approach to commercial bank	1 month
Installation and electrification of machinery and equipment	2 weeks
Recruitment of staff	1 month
Arrangement of raw materials and packaging materials	2 weeks

Keeping in view overlaps of some of the activities, the period normally required to implement the project is 5 to 6 months.

TECHNICAL ASPECTS

Process of Manufacture

The formation of menthol crystals involves:

- I. Freezing of the mint oil.
- II. Removal of the oil crystals from the residual oil by centrifuging.
- III. Drying of the crystals.

After collection of the mint oil from farmers/brokers, it should be filtered prior to cooling as it usually contains some water and mucilaginous impurities, which prevent ready formation of the menthol crystals. For crystallization some producers use filter and centrifuge the oil.

(I) Crystallization

Purified oil is slowly and gradually cooled progressively to lower temperature whereby menthol crystals form in each operation. The freezing process usually comprises three steps (I) cool at 14°C (II) 10°C and (III) -5°C for hours. Some times, actual process takes 48 hours and cooling up to -20°C temperature. Some manufacturers employ large refrigerators compartment. The large plants are equipped with regular freezing rooms. The gradual and slow cooling permits the formation of large and more regular crystals.

(II) Separation of Menthol Crystals from the Dementholised Oil

This is performed by first decanting the remaining liquid oil from the crystal and centrifuging the crystals in large centrifuges rotating at the speed of about 1200 RPM. Some producers wash the crystals with small amount of water during the centrifuge process.

(III) Drying of the Menthol Crystals

The centrifuged crystals are spread upon the trays in large compartments or Special room dried for approximately 36 hours in a slow current of air at a temperature of about 26°C. This operation must be undertaken very carefully. Now the crystal is ready for packing and marketing.

Quality Control and Standards

Menthol crystals are to be made as per IS 3134.

Production Capacity (per annum)

Capacity	:	
(a) Flakes		86,050 kg.
(b) De-mentholated oil		36,450 kg.
Value	:	Rs. 4,83,57,000

Motive Power

20 K.W.

Pollution Control

The raw materials and process are non-polluting. However, relevant guidelines and no objection certificate must be obtained from the State Pollution Control Board.

Energy Conservation

Regular maintenance of plant and machinery is required for better performance and conservation of energy.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building		(Rs.)
Land 300sq. mt. @ 600 sq mt.		1,80,000
Covered area 200 sq. mt. @ Rs. 3,500 and boundary wall		7,00,000
	Total	8,80,000

(ii) Plant and Machinery

Sl. No.	Particulars	Nos.	Rate (Rs.)	Value (Rs.)
1.	Chilling plant cap. 492 litre, temp. (50°C) chart type	6	31,500	1,89,000
2.	Centrifuge heavy duty R.P.M. 1200	2	40,000	80,000
3.	S.S. reaction vessel with stirrer cap. 200kg	6	30,000	1,80,000
4.	Dryer capacity 100 kg 12 trays. with Thermostat temperature control	1	1,80,000	1,80,000
5.	Vacuum filter	2	20,000	40,000
6.	S.S Tray for storage	12	5,000	60,000
7.	Laboratory Equipment	-	-	50,000

8. Transportation and installation charge @ 10% of the cost of plant and machinery	-	-	77,900
Total			8,56,900

B. Working Capital

(i) Staff and Labour (per month)

Sl. No.	Designation	No.	Salary (Rs.)	Total (Rs.)
1	Chemist/Manager	1	10,000	10,000
2	Technical Assistant	4	5,000	20,000
3	Skilled Worker	6	4,000	24,000
4	Typist /Clerk	1	4,000	4,000
5	Watchman	4	3,000	12,000
	Total			70,000
	<i>Perquisites @ 15%</i>			10,500
	Total			80,500

(ii) Raw Materials and Packing Materials (per month)

Sl. No.	Particulars	Qty.	Rate (Rs.)	Amount (Rs.)
1.	Mint oil	11,250 kg.	300 kg	33,75,000
2.	Chemicals	-	-	10,000
3.	Packing materials	-	-	20,000
	Total			34,05,000

(iii) Utilities (per month)

Particulars	Qty.	Rate(Rs.)	Total (Rs.)
Power	1250 unit	@ Rs.4	5,000
Fuel			5,000
	Total		10,000

(iv) Other Contingent Expenses	(Rs.)
1. Postage/Stationery	1,000
2. Telephone	500
3. Repair/maintenance	5,000
4. Transportation	10,000
5. Advertisement/publicity	5,000
6. Miscellaneous expenses	2,000
Total	23,500

(v) Total Working Capital (per month)

$$= \text{Rs.}80,500 + 34,05,000 + 10,000 + 23,500$$

$$= \text{Rs. } 35,19,000$$

Total Capital Investmentm

Fixed capital	17.36,900
Working capital (3months)	1,05,57,000
Total	1, 22,93,900

Machinery Utilization

Full machinery utilization has been taken in this project.

FINANCIAL ANALYSIS

(1) Cost of Production (per annum)	(Rs.)
Total recurring expenditure	4,22,28,000
Depreciation on building @ 5%	35,000
Depreciation on plant and m/c @ 10%	85,690
Interest on total capital investment @ 14%	17,21,146
Total	4,40,69,836
Or Say	4,40,69,850

(2) Turn Over (per annum)	(Rs.)
By sale of :	
(I) Flakes 85050 kg @ 500 kg	4,25,25,000
(II) De-mentholised 36450 kg @ Rs160kg	5,83,2000
Total	4,83,57,000

(3) Profit (per annum)

$$\text{Rs.}4,83,57,000 - 4,40,69,850 = \text{Rs. } 42, 87, 150$$

(4) Rate of Return

$$= \frac{\text{Profit} \times 100}{\text{Total capital investment}}$$

$$= \frac{42,87,150 \times 100}{1,22,93,900}$$

$$= 35.0 \%$$

(5) Net Profit Ratio

$$= \frac{\text{Profit} \times 100}{\text{Sale}}$$

$$= \frac{42,87,150 \times 100}{4,83,57,000}$$

$$= 8.86\%$$

(6) Break-even Point

(i) Fixed Cost	(Rs.)
a. Depreciation on building @ Rs. 5%	35,000
b. Depreciation on plant and machinery @ 10%	85,690
c. Interest on total capital investment @ 14%	17,21,146
d. 40% of salary	3,86,400
e. 40% of other expenses	12,800
Total	22,41,036

B.E.P.

$$\begin{aligned}
 &= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{profit}} \\
 &= \frac{2241036 \times 100}{23,41,036 + 42,87,150} \\
 &= \frac{2241036 \times 100}{6528186} \\
 &= 34.3\%
 \end{aligned}$$

Addresses of Machinery and Equipment Suppliers

1. M/s. Wisdoms Scientific Works
10, West Sadar Thana Road,
Delhi-110006
2. M/s. Sandeep Instruments and Chemicals
3229, Ranjit Nagar,
New Delhi-110008
3. M/s. Blue Star Limited
Block 2A, DLF Corporation Park,
DLF Qutab Enclave,
Phase-II, Gurgaon (Haryana)
4. M/s. India Projects and Equipments Pvt. Ltd.
D-170, Okhla Ind. Estate,
Phase-I,
New Delhi-110020

5. M/s. Fric India Ltd.
Jeevan Vihar-3,
Parliament Street,
New Delhi.
6. M/s. Jindal Refrigeration
26, Netaji Subash Marg,
Darya Ganj,
New Delhi-110002
7. M/s. Valcan Laval Ltd.
Depodi,
Pune-I, (M.S.)
8. M/s. Adair Dut and Co India Pvt. Ltd.
2, Asaf Ali Road,
New Delhi-110002
9. M/s. Chemida (India)
Nagabkakk Bazar,
347, Grant Road,
Mumbai.
10. M/s. Hind Hungl Caccum Co. Pvt. Ltd.
1024, Chord Road,
Rajaji Nagar,
Bangalore.
11. M/s. Anup Engineering Ltd.
Anil Starches Premises,
Anil Road,
Ahmedabad
12. M/s. A. R. Packaging Systems Ltd.
Sarvodaya, 1-10-6/3,
Begumpet,
Hyderabad - 110016

Addresses of Raw Material Suppliers

Mint oil be collected for U.P. Namely from Badaun, Bareilly, Muradabad, Rampur and Barabanki etc.