Pre-feasibility Report

Proposed manufacturing unit for salts of Propionic acid at Plot No.E–73 Additional Patalganga MIDC, Dist. Raigad, Maharashtra

by

M/s. Fine Organic Industries Ltd.

Chapter 1: Executive Summary

Company Profile

Founded in 1970, Fine Organics was the brainchild of Mr. Ramesh Shah, a Mumbai-based businessman with experience in chemical trading and Mr. Prakash Kamat, a skilled technocrat from India's most premier chemical technology school. Together, they envisioned the potential of *Oleochemical derivatives* and created an organization founded on the pillars of innovation and passion. Fine Organics introduced the Indian market to high-quality additives for specialty applications with raw materials from locally-grown plant sources and quality levels on par with international standards.

Today, Fine's range of innovative additives have expanded their reach into several specialty applications in food, plastics, cosmetics, textiles, paints, inks, rubber and many more. Our products are appreciated and accepted globally due to their consistent quality and competitiveness. A technology and customer-driven company, Fine Organics enjoys a privileged position in the specialty additives industry globally. Fine Organics owes its growth and success to its expertise on *Oleochemistry*, in-house manufacturing technology, customer-centric research and development and a techno-commercial mindset. We are proud to have highly qualified technocrats in marketing, production and quality control that provide exceptional support to our customers, suppliers and distributors.

Through constant innovation and an unwavering focus on our core competencies, Fine Organics has been able to develop a unique range of specialty additives for a wide variety of applications. Fine Organics is a leading producer of specialty additives for foods, plastics, rubbers, paints, inks, cosmetics, coatings, textile auxiliaries, lubes and several other specialty applications.

Research in manufacturing industry today is about innovation and providing break through solutions to customer demand. In providing Research and Development support, the world is passing through a transformation from empiricism to strategy. In the case of Fine Organics, our competitive, know-how based, integrated approach towards research has consolidated our position globally as a solution provider. We strive to transform our knowledge and experience in Oleochemistry to innovate and formulate newer additives for diverse applications.

The Fine Research and Development Center is a place for applied research, analysis & synthesis in addition to application development integrated with process technology research. We have a team and infrastructure in place that is capable of shaping a concept to an additive up to semi-commercial level in the housed pilot plant facility.

The center is recognized by the Department of Science & Industrial Research of the Ministry of Science & Technology of Government of India. Our R&D cell consists of a fully equipped laboratory with state-of-the-art equipment, a pilot plant with all the accessories that facilitate the scale-up procedure and also, a vast library back-up. Process development and validation are also of prime importance. New equipments which help in the betterment of process conditions are continuously evaluated and modified to achieve higher consistency in quality, new product development and cost efficiency. The facilities at R&D include organic synthesis, analytical method development, scale up synthesis on pilot plants & application development support for plastics and foods. Our highly-qualified team comprises of specialists in the field of Oleochemistry with training from elite institutions such as Institute of Chemical Technology (ICT) in Mumbai. Fine Organics R&D works very closely with its partners at all stages and supports innovation in production process and application development.

All of Fine's facilities are fully geared towards meeting growing global demands. Our products are appreciated by customers worldwide for their consistent quality and packaging standards.

Our manufacturing facilities are located near Mumbai (around 65 km from the port). Additionally, we have joint ventures in Malaysia (since 1988) and Thailand (since 1994). Regardless of their location, these facilities follow the same standards set by Fine's founders in safety, housekeeping, productivity and controls. Our facilities are audited regularly by internal as well as external teams. Owing to our high consistency and low complaint rates, we have been awarded by our major customers as an A+ grade vendor.

By closely working with our process and engineering R&D team, we have developed technology and processes that employ complete automation from raw material storage to product packaging. Our automation system has been designed to follow the strictest standards in

process safety along with data backup and disaster recovery features with a well-qualified team focused on safety, productivity, consistency, and quality and customer satisfaction.

Fine Organic Industries Ltd. proposes to establish a new manufacturing facility of food additives which find its application in the Bakery Industry at plot no- E - 73, Additional Patalganga MIDC, Dist Raigad.

Prior Environmental Clearance is mandated by Ministry of Environment and Forests, as vide EIA Notification SO 1533, dated September 14, 2006 and its amendments for Synthetic Organic chemicals manufacturing units. This project falls under category 'A' and item no. 5(f): Synthetic organic chemicals, as general conditions apply.

Chapter 2: Introduction of the project

2.1 Identification of the project and Project Proponent

This is a new project for the manufacturer of new facility of food additives which find its application in the Bakery Industry, by well-known business house “Fine Organics”. The project is titles as “New proposed manufacturing unit for salts of Propionic acid". Propionic acid is a permitted substance and is closely related to acetic acid familiar in vinegar. Mostly the Calcium and Sodium salts of this acid are used (*Ref: W.J. Fance & B.H. Wragg*). Fine Organics are the major manufacturer of variety of specialty additives with expertise in the field of Oleo-chemistry. Majority of additives goes as Food additives with varied application with exports to more than 80 countries. We would like to start offering salts of Propionic acids to the export market thereby generating revenue. All of Fine’s facilities are fully geared towards meeting growing global demands. Our products are appreciated by customers worldwide for their consistent quality and packaging standards.

2.2 Need of project with description for region and country

India is a major manufacturing house for bakery products and is the third- largest biscuit manufacturing country after USA and China (NPCS, 2013). The Indian bakery market is valued at Rs. 3,295 crore and out of this, bread and biscuits hold 82% of the share (Assocham, 2012). India bread market stood at $ 570.73 million in 2016, and is projected to grow at a CAGR of over 11.29%, in value terms, during 2017-2022, to reach $ 974.39 million by 2022. Market forces and demographic trends are continuously influencing supply and demand; expanding working population and increasing number of health-conscious consumers are aiding India bread market. Changing lifestyles due to increased disposable income in advanced countries led to an increase in demand for processed foods (Wilkinson, 1987). Changes in food consumption patterns contribute to the development of food processing industry (Gopalan, 1994). Processing not only reduces the perishability but also increases shelf life of a product and makes it available to the consumer in a ready-to-consume and convenient form throughout the year is some of the other factors expected to propel demand for bread over the next five years i.e. 2022.

Thus the proposed product finds its increasing demand in Bakery Industry especially Breads and Cake application. Our present manufacturing facility at Dombivali is falling short for catering the increasing demands of domestic needs for these additives and also meets the additional export market needs. Thus we have decided to initiate this proposed project at additional MIDC, Patalganga.

2.3 Export Possibility

Fine's range of innovative additives have expanded their applications in food, plastics, cosmetics, textiles, paints, inks, rubber and many more. Thus, 80% of our products are exported to various countries. Thereby our organization is adding value to our nation's Global business & also benefiting the economy. Similarly the proposed products of this project will find its export business to cater the increasing demand of bread industry. Thus the establishment of the proposed project is very well beneficiary & justified.

2.4 Employment Generation due to Project (Direct and indirect)

The proposed establishment of plant at plot E - 73 will certainly lead to increase in employment generation. We propose to have our Processes be "close loop system processes" & shall run by highly automated technology. We will have employment generation for operation, maintenance, Packaging, Dispatch, administration etc. Also there is great potential for employment in the downstream industries.

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Chapter 3: Project description

3.1 Type of Project:

Proposed manufacturing unit for salts of propionic acid of total capacity 25000MTA by M/s. Fine Organic Industries Ltd at Plot No.E-73 Additional Patalganga MIDC, Dist. Raigad, Maharashtra

As per EIA Notification dated 14th September, 2006 and its amendment thereof comes under category "B" activity - 5(f) Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)

However, project falls under general condition Any project or activity specified in Category 'B' will be appraised at the Central Level as Category 'A', if located in whole or in part within 5 km from the boundary of: (i) **Protected Areas notified under the Wild Life (Protection) Act, 1972 (53 of 1972)**. **Karnala Bird Wildlife sanctuary** falls within 5 km radius of the study area. Hence, proposed project will be approsed at EAC Ind-II, MoEFCC.

3.2 Location of the Project

The project is proposed at Plot No E - 73, Additional Patalganga MIDC, Dist. Raigad, and Maharashtra. The Geographical Location of this plot is at 18°52'30.22"N Latitude and 73° 9'48.79"E Longitude with an elevation of 10 meter above sea level MSL.

This site is in premises of MIDC Estate which is meant for these types of Industries. Land is on plain contour, it is flat terrain. Land ownership is with project proponents. The Land is reserved for Industrial use & the proposed project shall be at the same plot. Presently there is an existing warehouse on the site admeasuring around 2250 sq.mt of area from that of the plot area. The existing Infrastructure around the site like water, electricity, telephone facility, roads already available. Other Infrastructure like, hospital, school, housing, entertainment, daily needs are available easily at Patalganga Town. There is no sensitive establishment in the vicinity such as health resort, hospital, archaeological monuments except Karnala Bird sanctuary which is placed within 5 Km from the project site. GPS Location on Google Imagery of the proposed site is given below.

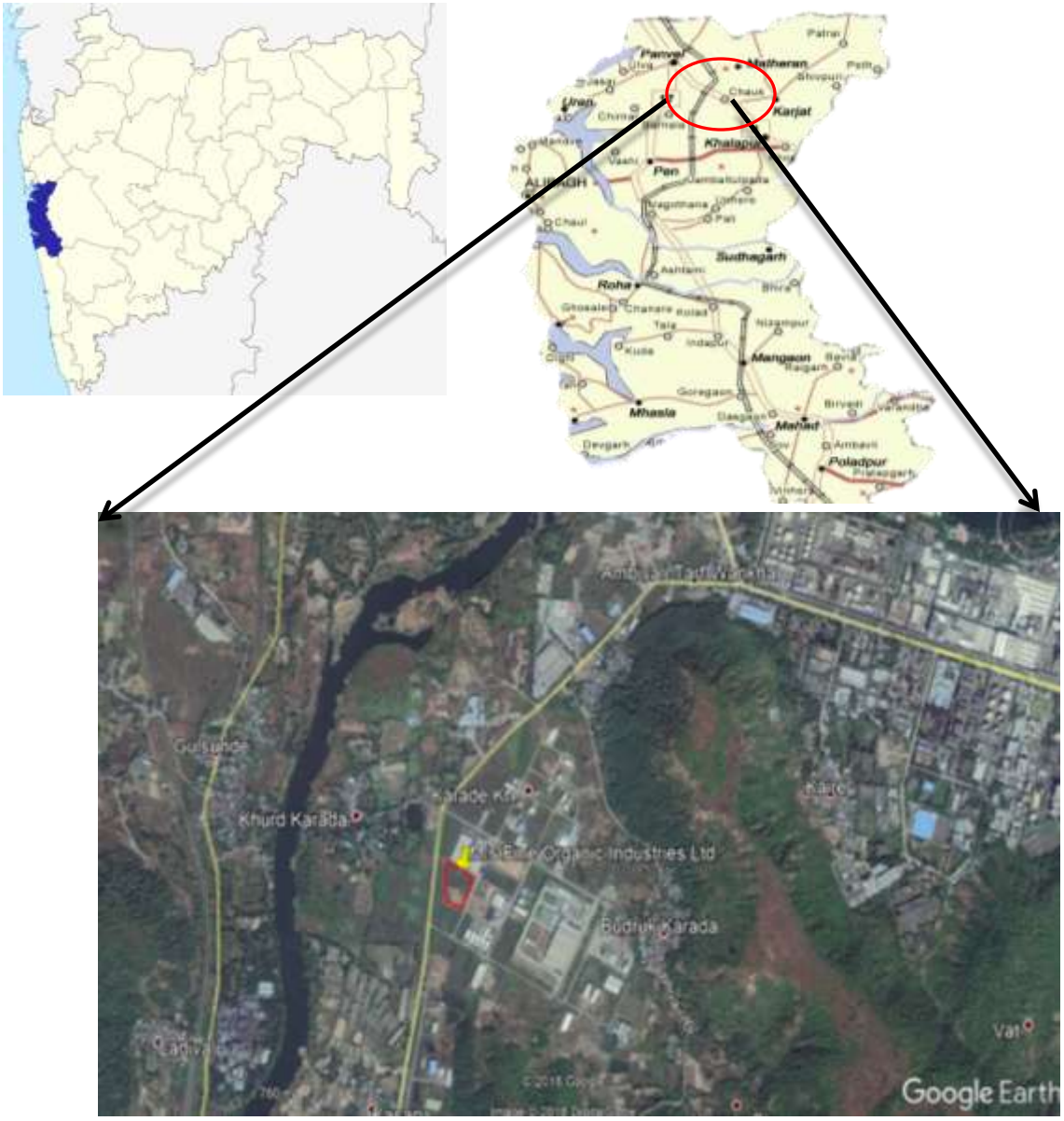


Figure 1: General Location

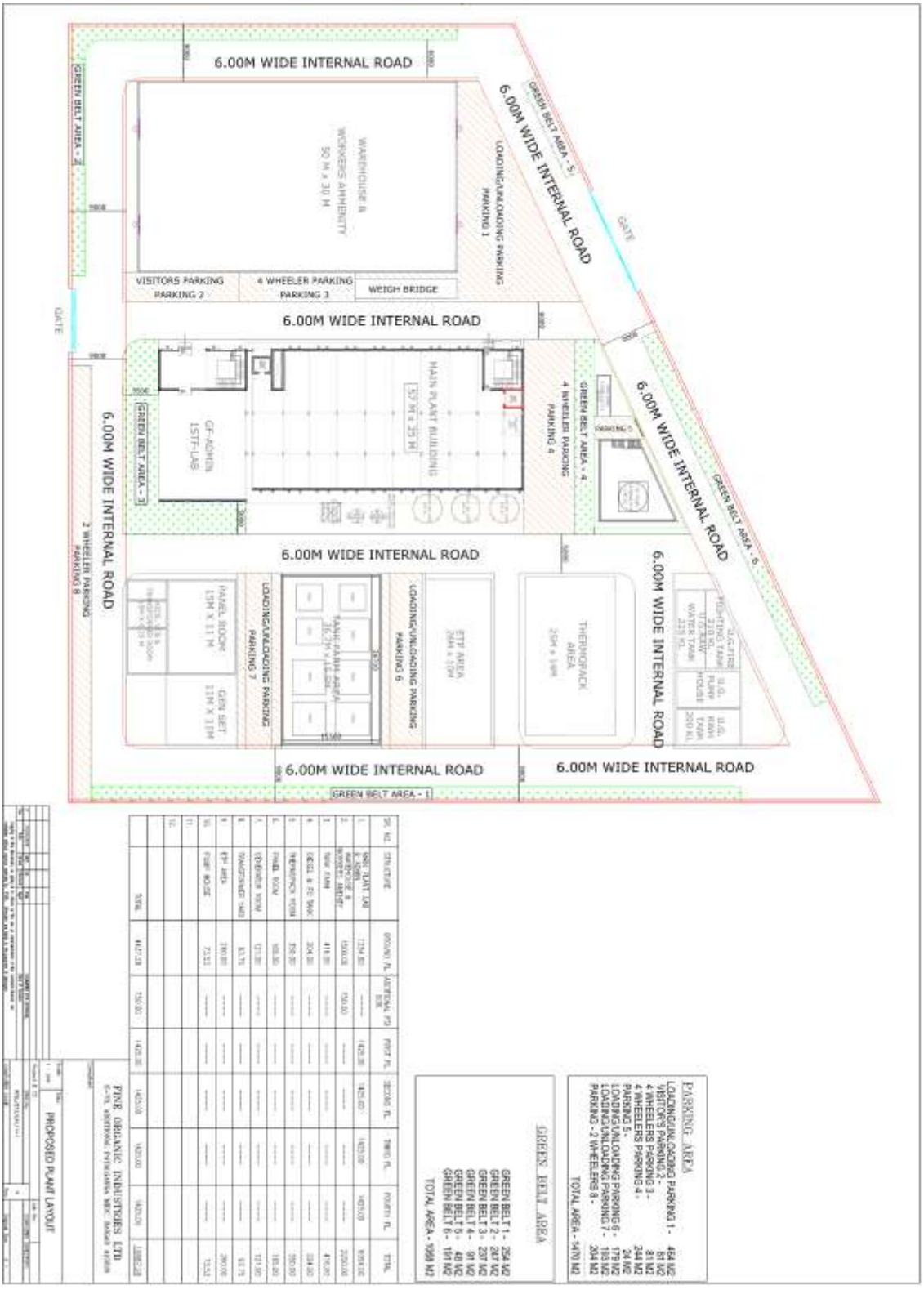


Figure 2: Plant Layout

3.3 Details of the alternate sites

No alternate sites have been examined. Proposed land is in possession.

3.4 Size or magnitude of operation

Size and magnitude of proposed unit is briefed in Table 1.

Table 1: Magnitude of operation

Sr No	Particulars	Details		
1.	Name of Company	Fine Organic Industries Ltd.		
2.	Products	Calcium Propionate & Sodium Propionate		
3.	Location	Plot no E - 73, Additional Patalganga MIDC, Dist Raigad, Maharashtra, India.		
4.	Name of the project	Proposed manufacturing unit for salts of Propionic acid (Calcium Propionate/ Sodium Propionate) (1) Spray Drying method – 10,000 MTPA (2) Mixing method – 15,000 MTPA Total Production – 25,000 MTPA		
5.	Total land area of the plot.	12,000 sq. m.		
6.	Total built up area	10900 sq. m.		
7.	Raw material	**Raw Material**	**Unit**	**Quantity**
		Propionic acid	MT	20,000
		Hydrated Lime / Lime	MT	9900
		Sodium hydroxide	MT	500
8.	Water	Total fresh water requirement shall be approximately 220 CMD. It will be source from MIDC.		
9.	Power	Total power requirement is 2000 KVA. It will be sourced from MSEDCL.		
10.	Thermopac	2 + 1 = 3 (15 lack cal/hr)		
11.	DG set	2 DG sets of total 1000 KVA (each) capacity are proposed to be installed at this site.		
12.	Fuel	Furnace oil 354 Kg /hr		
13.	Manpower	Approx. 80 (65 + 15) skilled and unskilled		
14.	Waste water quantity (estimate)	Total effluent generation approx. 5.01 CMD and it will be treated in 5 CMD ETP cum STP.		
15.	Air emissions	The air emissions will be from Thermic fluid heater and DG set. DG sets shall act as stand by source of electricity for		

		the site. Adequate 39.5 m stack height as per statutory norms will be provided to all the utilities.
16.	Project cost	Approx. 40 Crores
17.	EMP cost	Rs. 60. 00 lakhs

3.5 Project Description with Processes Details

Brief Process Description:

Process I - Spray Drying method

It is a Neutralization process where Propionic acid is neutralized with mixture of Hydrated Lime + water in case of Calcium Propionate. Whereas in case of Sodium Propionate Propionic acid is neutralized with Sodium hydroxide (Caustic soda) + water, with suitable process parameters. All the starting raw materials are mixed till they get completely neutralized. After this the neutralized mixture is passed through a Filter press to obtain the semi-finished product in liquid phase. This is then spray dried to obtain the Calcium Propionate / Sodium Propionate powder as finished product. The steam formed due to drying process will be scrubbed + condensed out to obtain all the traces of product, if any, and it will be again recycled at the stage of neutralization of next batch of product.

Water used in the scrubber will get saturated over a period of cycles & once it reaches the saturation level then it will be charged to the mfg process at the stage of neutralization of next batch of product.

Process block diagram of Process I: Spray Drying method

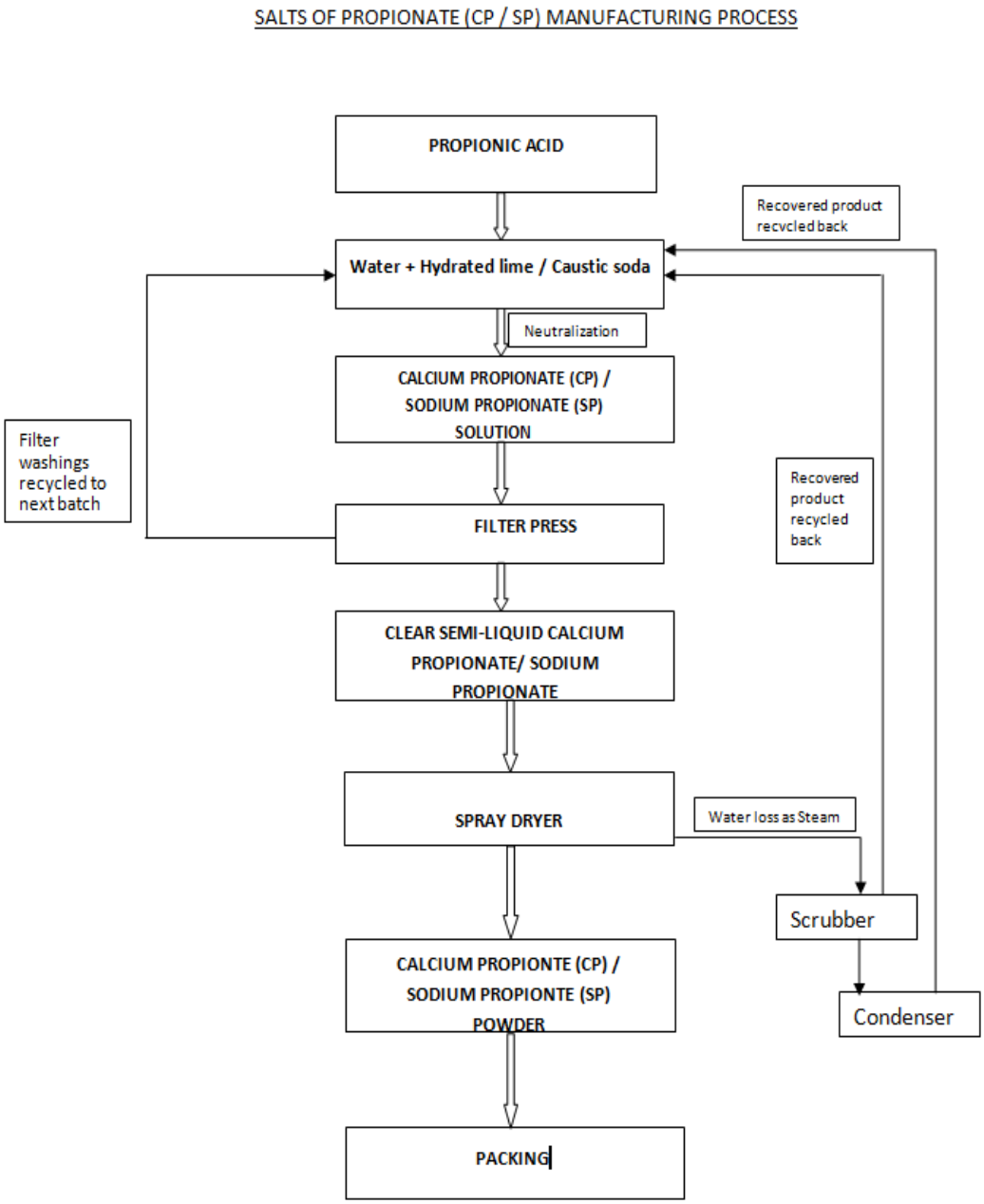


Figure 3: Salts of Propionic acid by Spray Drying method

Process II - Mixing method

It is an also a Neutralization process where alkaline salts are mixed with Propionic acid in a blender. Due to chemical reaction steam is generated which is passed through a condenser and the condensate is

collected separately. This condensate can be used in Process I at the stage of neutralization for a fresh batch of Calcium Propionate.

After blender the semi-finished product is send to Disintegrator to get the final product in desired size. After this product is send to sifter so as to obtain the granular grade of Calcium Propionate & Fine grade of Calcium Propionate.

Process block diagram of Process II: CALCIUM PROPIONATE MANUFACTURING PROCESS BY MIXING PROCESS

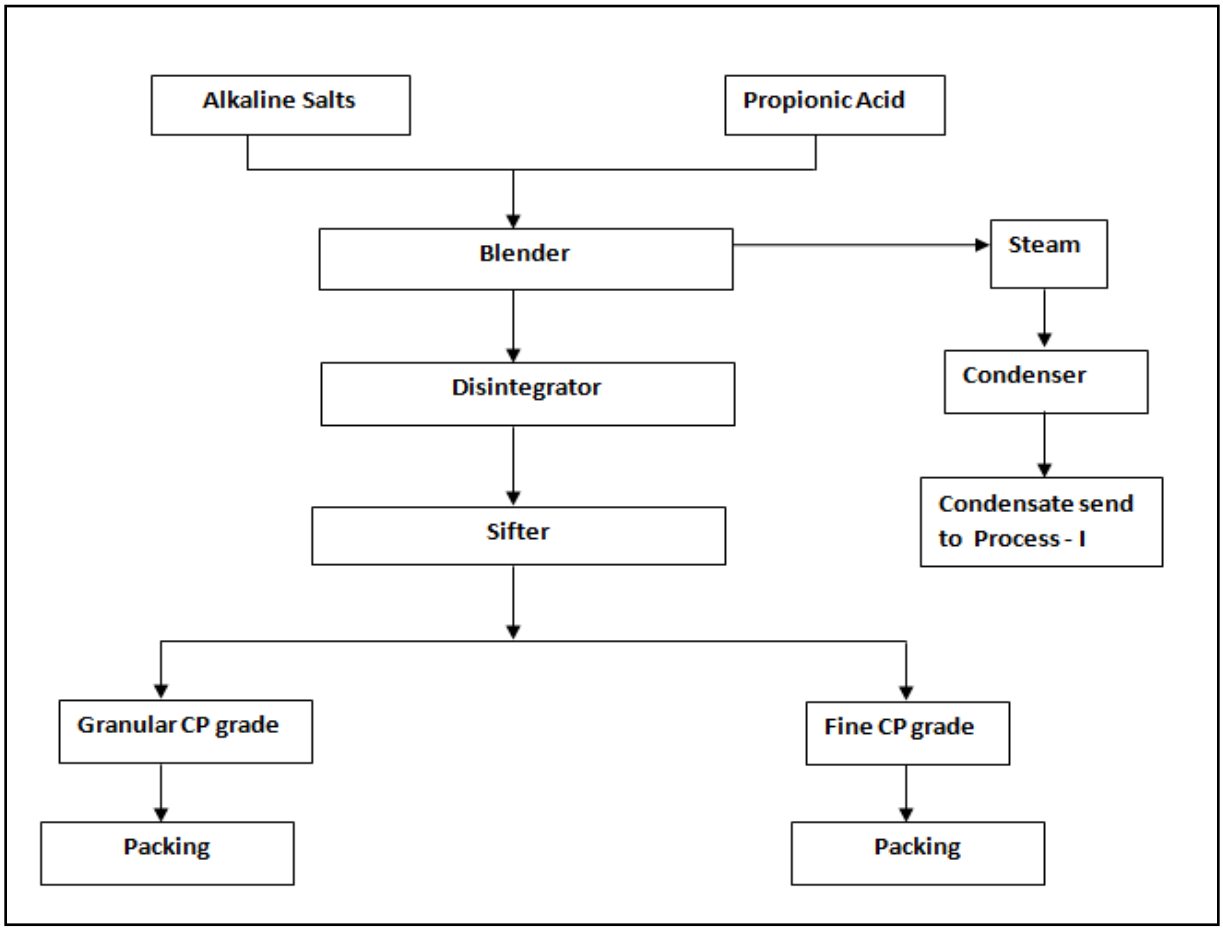


Figure 4: Calcium Propionate Manufacturing Process

3.6 Raw material requirement

The basic raw material for the product capacity is submitted herein below.

Source for Raw Material Procurement: Raw Material is easily available in the local market.

Mode of Transport of Raw Materials: Few of the raw materials will be transported locally and few will be imported from the International Market. Mode of transport to site is by road truck/tankers.

List of Major Raw Material & Storage

Table 2: Major Raw materials and its storage

Sr. No.	Particulars	Unit	Total consumption Qty. per year	Storage condition & capacity in KL	
	Raw Material		**proposed**		
1	Propionic acid	MT	20,000	Tank	5 x 250
2	Hydrated Lime / Lime	MT	9900	Bags	-
3	Sodium hydroxide	MT	500	Silos	5

3.7 Resource Optimization:

Fine Organics are desirous to establish the manufacturing facilities for the products indicated above. The resource optimization shall be carried out at the site and with other Fine organic site in order to reduce wastage and minimum transport needs.

3.8 Availability of Resources (Water, Energy/Power Requirement):

Power: The proposed power requirement for the facility is 2000 KVA which will be source from MSEDCL grid.

Water: The total water requirement is about 220 CMD for domestic, process, cooling and gardening purpose. It will be source from MIDC which is available at site.

3.9 Quantity of wastes generation

3.9.1 Liquid Waste Generation

Effluent arises from process, domestic and from other miscellaneous sources. Total effluent generation will be **75.01 CMD; out of that 70 CMD** will be recycling in the process. Domestic effluent and lab effluent will be treated in proposed ETP of **5 CMD** capacity. Detail water consumption and effluent generation is given below,

Table 3: Water and waste water balance

Sr. No.	Consumption	Input CMD	Output CMD	Effluent CMD	Disposal
1.	Coolingwater requirement if any	130	2.5	2.5	Blow down is very less and not come out daily. Based on the cycles of concentration (COC) water will be recycled in cooling tower makeup water or send to ETP
2.	Domestic	4.0	2.5	2.5	Send to ETP cum STP
3.	Process, laboratory, washing and Other misc.	80	70 from process + 0.01 from Lab	0.01	Entire 70 CMD process water will be recycled. Lab water will be treated in combined ETP followed by MEE.
4.	Gardening	6.0	-	-	-
5.	**Total**	**220**	**75.01**	**5.01**	-

3.9.2 Solid waste generation and management

There will be negligible non-hazardous solid waste generation and it will send to authorized recycler. Hazardous waste will be Sludge (20-25 kg/m) and filter material from the process (45-50kg/m) that will be to CHWTSDF.

3.9.3 Air pollution

No process emission from the manufacturing process. Air emissions are anticipated from Thermopac stack and from DG set. However, DG set will be utilized in case of power failure. D.G set will be placed in acoustic enclosure. Thermopac with adequate 39.5 m stack height. Wet scrubber will be provided as an air pollution control equipment to stack.

The air pollutant that are discharged from the proposed unit are,

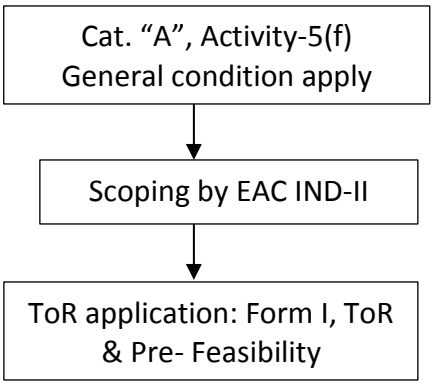
- Dust particulate from vehicular movement in the premises
- Particulate matter, Sulphur-di-Oxide and Nitrogen oxide etc. from DG and stack

3.9.4 Schematic representation of the feasibility drawing on information of EIA purpose

As per EIA Notification dated 14th September, 2006 and its amendment thereafter project comes under category “A” activity - 5(f) Synthetic organic chemicals industry (dyes & dye

intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates).

Project attracts general conditions of the EIA notification. Karnala Bird Wildlife sanctuary within 5 km radius of the study area



Chapter IV: Site analysis

<table>
<tr><td>Connectivity</td><td>Fine Organic’s new facility will be located at Plot E-73, Additional Patalganga MIDC in Raigad district, Maharashtra.<table>
<tr><td>Road</td><td>Savroli – Kharpada road adjacent Mumbai –Pune express way 5 km</td></tr>
<tr><td>Railway</td><td>Railway station: Rasyani at 2.4 km,
Apta at 1.72 km
Panvel Railway station 13.46 km</td></tr>
<tr><td>Air</td><td>Chhatrapati Shivaji international airport 39.5 lm</td></tr>
<tr><td>Nearest town/city</td><td>Rasyani at 2 km, Panvel at 13.51 km</td></tr>
</table></td></tr>
<tr><td>Land form, land use and land ownership</td><td>The total land is in possession with management.</td></tr>
<tr><td>Topography</td><td>Land is with flat with some undulating patches</td></tr>
<tr><td>Existing land use pattern</td><td>Vacant plot with scanty vegetation</td></tr>
<tr><td>Existing Infra structure</td><td>NA</td></tr>
<tr><td>Soil classification</td><td>Black and red.</td></tr>
<tr><td>Climate</td><td>Weather is sunny across the year. Heavy rain during monsoon. May is the warmest month of the year. The temperature in May averages 30.3 °C. The lowest average temperatures in the year occur in January, when it is around 23.4 °C. Average annual temperature of Panvel is 27.0 °C</td></tr>
<tr><td>Social infrastructure available</td><td>Social infrastructures like community center, hospital and electricity are available in the area.</td></tr>
</table>

Chapter V: Planning in Brief

5.1 Planning Concept:

- Plot is at well-established Additional Patalganga MIDC area
- Purified Water supply from MIDC
- Well-developed roads and connectivity.
- Infrastructure facilities available established MIDC site
- Integration with the existing nearby Fine Organics manufacturing facility

5.2 Population Projection:

The proposed activity required 30-50 workers during construction and during operation 80 (Permanent and contractual) will be needed.

1.3 Land use planning

No	Description	Area in sq. m.
1	Total plot area	12,000
2	Area under explosives	204
3	Proposed built up area	10900
4	Parking area	1575
5	Green belt	1068

5.4 Amenities/Facilities

Facilities like cafeteria, rest rooms and other common facilities will be provided.

Chapter VI: Proposed Infrastructure

Sr. No.	Particulate	Description
1.	Industrial area	All necessary infrastructure will be provided
2.	Residential area	NA
3.	Green belt	1068 Sq.m.
4.	Social Infrastructure	NA
5.	Connectivity	The site is well connected with communication facilities
6.	Drinking water management	Total 220 CMD water will be required for drinking propos (source Municipal corporation)
7.	Sewerage system	To ETP cum STP
8.	Industrial waste management	Proposed 5 CMD ETP
9.	Solid waste management	Non-hazardous waste to recyclers/sale Hazardous waste to CSWTSD facility
10.	Power requirement & Supply / Source	Total power requirement : 2000 KVA Connected: 2000 KVA Demanded: 1500 KVA

Chapter VII: Rehabilitation & resettlement plan

The proposed new facility shall be at plot of the company which is located in Additional Patalganga MIDC area. It does not require acquisition of Land and the Infrastructure so there is no need of any kind of activity related to Rehabilitation and Resettlement carried out.

Chapter VIII: Project Schedule and Cost estimate

8.1 Time schedule of the Project

It is expected that the project shall be completed within 12 months from date of grant of Environmental clearance.

8.2 Estimated project cost (Economic Viability of the Project)

Total estimated project cost is Approx. 40 Crores

Chapter IX: Analysis of Proposal

9.1 Financial and Social Benefits

The proposed establishment of our products is due to increase in market demand of our products requirement. As described earlier nearly 80% of our products are getting exported to different countries which are certainly increasing the foreign exchange. Also many of our products are equal or better in quality to that of certain imported products. This reduces the dependency as well as money of our customers by importing the products.

Our project will definitely open an avenue for the young generation of our nation by generating employment at our project site.

We will be hiring the local residents nearby our project site for employment, as per their competency. This will create employment to these people & thereby will improve their living standard. The proposed project is already located in MIDC area so area development will be as per MIDC, which will improve the living standards of the local people.