Commissioner of Industries
Hyderabad
Andhra Pradesh

Detergent Grade Zeolite-A Powder

1. Nature of Product and Its Applications:

Zeolites are crystalline sodium alumino silicate and used as detergent building and is promoted as the ideal water softener. Due to the hue and cry about pollution effects of the phosphates used in most of the detergent powders all over the world, legislative measures were imposed in many countries to stop or curtail use of phosphate based detergent builders. Therefore it is essential to replace phosphate detergent builders by various substances to reduce environmental degradation.

2. Market Potential:

Zeolite is said to be the most environmental friendly input for detergent and has replaced STAPP (sodium Tri Polyphosphate) as the softening agent.

The worldwide production Zeolite-A is estimated at 2.75 million tonnes by 2000 AD. At present, there are only a few manufacturers in India, meeting partly export and domestic markets. Keeping the increasing demand for detergent powders which was at 13.50 lakh tonnes in 1990 and environmental consciousness among consumers, the scope for non-polluting detergent building products is very good in future.

3. Installed Capacity:

The installed capacity of the unit is to manufacture 600 TPA of detergent grade Zeolite-A powder based on 300 working days per annum and 3 shifts per day.

Production Capacity	:	2 Tonnes/day
Assumed Capacity Utilisation	:	80% (in 3rd year)

4. Raw Materials:

The major raw materials required for the manufacture of detergent grade Zeolite-A powder are sodium alluminate, sodium silicate.

At the installed capacity, the raw materials requirement are 444 Tonnes/annum of Sodium Aluminate and 540 tonnes/annum of Sodium silicate. The above raw materials are available with agents/dealers in most of the state capitals and major cities.

5. Manufacturing Process:

a) Preparation of Sodium Aluminate solution:

Based on percentage of Al2O3 and Na2O content in the raw sodium aluminate, known quantity of it is dissolved in calculated volume of deionised water, previously taken in settling cum stirred solution tank. To adjust % of Na2O content in the final solution, calculated quantity of Caustic soda is also added to the solution, after almost complete dissolution of sodium aluminate in water, Heavy impurities such as iron, silt etc. are allowed to flocculate using true-flock solution and settle down in the same tank. Clear sodium aluminate solution is then taken for further reaction.

b) Preparation of Sodium Silicate Solution:

Based on analysis and quantity, sodium silicate is added to calculated volume of deionised water, previously taken into double jacketed S.S. reactor. After adjusting Na2O and SiO2 content using caustic soda, the mixed solution is then stirred in S.S. reactor.

c) Preparation of Gel:

Prepared sodium aluminate solution is added at a controlled rate to the sodium silicate and caustic solution prepared in S.S. reactor, at room temperature under constant agitation. The complex gel formation system takes place in the reactor.

d) Ageing of Gel:

After gel formation, immediately whole mass is heated in the same double jacketed S.S. reactor under constant agitation. The temperature is raised and is allowed to age for the optimised duration. Formation of final complex composition of Zeolite-A takes place.

e) Filtration of Zeolite-A slurry:

After cooling down the product slurry in S.S. jacketed reactor, it is then filtered in P.P. plate and frame filter press. The filtrate which is mostly containing caustic soda is stored in proper storage tank and can be partly recycled in the process and can be sold out as bye product.

f) Drying of wet cake:

The wet cake obtained from filter press is then dried in a tray drier at 110 degree C temperature.

g) Pulverising and Packing:

The dried lumps from tray drier are then pulverised in micro or impact pulverised in micro or impact pulveriser and powdered product is then packed into standard polypropylene bags.

6. Plant & Machinery:

6.1 Major Equipments:

The major equipments required for the proposed unit are as follows:

S.NO.	Particulars of Machinery	Qty (Nos.)
1.	Sodium Aluminate solution cum settling tank with stirrer and motor assembly - 7000 Lit. Capacity	2
2.	Double jacketed S.S. reactor of 6500 Litres Capacity completely with stirrer and motor assembly	1
3.	Polypropylene plate and frame type filter press having 3"x3"x2" size	1
4.	200 trays capacity standard tray drier steam operated along with accessories	2
5.	Micro pulveriser having pulverisation capacity of 150 Kg/hr	1
6.	Boiler with capacity 1 Ton/hr at 100 psig	1
7.	Sodium silicate storage tanks	1
8.	Water storage tank (underground & overhead)	2

9.	Filterate (NaOH) storage tank	1
10.	Product wet cake storage	3
11.	Pumps	5
12.	Air Compressor	1
13.	Weighing Balance	1
14.	Laboratory and Testing Equipments	L.S.

6.2 Suppliers of Equipments:

1. Hiranya Chem-Elec Equipment (P) Ltd.,
   D-64, P-123, Ph-V,
   IDA, Jeedimetla, Hyderabad - 55.

2. Paramount Chem-Plas Equipment (P) Ltd.,
   Tilak Road, Hyderabad - 500 001

3. Chem Project Engineers
   Plot No. B-35,
   BHE-AIC, R C Puram,
   Hyderabad - 500 032.

4. Balaji Engg. Co.
   5, IDA, Balanagar,
   Hyderabad - 500 037.

7. Location:

Nearer to market, Availability of the raw materials, skilled and cheap labour and infrastructure facilities shall be the main consideration for the location of the proposed unit.

8. Infrastructure:

Manpower : 19 Nos.
Power : 20 HP
Water : 30 KL/day
Fuel (Coal) : 0.5 M.Tonnes/day

9. Cost Of The Project And Means Of Finance:

Cost Of The Project:

	Particulars	**Rs. Lakhs**
a)	Land & Land development (2000 Sqm)	3.00
b)	Building & Civil construction (465 Sqm)	13.00
c)	Plant and Machinery	27.50
d)	Miscellaneous Fixed assets	3.00
e)	Preliminary & Pre-operative Expenses	2.46
	Total fixed capital	48.96

Working Capital Margin	6.78
Total Project Cost	55.74

Total working capital required in 1 year : Rs. 25.32 Lakhs

Means of Finance: (Rs. Lakhs)
- Promoter's Contribution : 23.92
- Term Loan : 31.82

10. Annual Operating Expenses:

Assumed Operation @ 80% of Installed Capacity in 3rd year:

	Particulars	**Rs. Lakhs**
a)	Raw Material	127.54
b)	Packaging Material & Consumables	5.74
c)	Utilities	3.77
d)	Salaries & Wages - Prodn.	4.06
e)	Factory Overheads	0.55
f)	Admn. & Management Expenses	7.15
g)	Financial Expenses: Interest on Term Loan Interest on Working Capital	3.86 4.57
h)	Depreciation	1.82
i)	Selling Expenses	1.92
		160.98

Net Sales realisation : Rs. 186.28 Lakhs
Pre-tax Profit : Rs. 25.30 Lakhs

a) Break Even Point @ 80% Cap. Utilisation : 36.85%
b) Rate of return on Investment before Taxes : 45.39%