

Project Profile

1. ***Product*** : ***Ferric Alum***
2. ***NIC Code (1998)*** : ***310116708***
(Based on NIC-1998)
3. ***Product Code*** : ***31912***
(Based on ASICC-2000)
4. ***Production Capacity*** : ***2000 M.T. per Annum***
5. ***Month & Year of Preparation*** : ***June, 2011***
6. ***Prepared by*** :

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Government of India
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1. INTRODUCTION OF THE PRODUCT :

Alum is a generic name for double salts of Aluminium Sulphate, Sodium Sulphate or Ammonium Sulphate. In the commercial line Aluminium Sulphate is also known as Alum. It is white in colour. The principal raw material for manufacturing of Alum are Bauxite and Sulphuric Acid.

2. PLANT CAPACITY PER ANNUM : 2000 M.T. per Annum.

3. MARKET & DEMAND ASPECTS :

The product has a very good market as present, as this is extensively used in water purification (to a large extent by different Municipal Corporations), by the leather industries for tanning purposes and by the paper industries. It can also be used as a raw material for detergent cake manufacturing and also in several other products, if quality of Alum is properly controlled.

4. BASIS AND PRESUMPTIONS :

- a. The estimates are drawn for a production capacity generally considered techno-economically viable for model type of manufacturing activity.*
- b. The scheme is based on single shifts of 8 hours per day and 300 working days per annum.*
- c. The interest rate on the borrowed capital has been taken as 13 % per annum.*
- d. The cost in respect of Raw Materials, Packing Materials, Machinery & Equipments has been taken at the time of preparation of project profile and may vary from place to place and time to time.*
- e. The rental Value of production shed is taken as per the prevailing rates and and may vary from place to place and time to time.*
- f. The plant capacity utilization has been taken as 75 % for calculation purposes.*

5. IMPLEMENTATION SCHEDULE :

The project implementation will take about nine months. The break-up of activities with relative time for each activity is as follows:

Sr. No.	Activity	Estimated Time Period (Months)
(i)	<i>Scheme preparation & approval</i>	<i>0 – 2</i>
(ii)	<i>Registration under MSME Act 2006 and sanction of loan</i>	<i>2 - 5</i>

(iii)	Clearance from Pollution Control Board	3 - 6
(iv)	Placement of Orders for Machines	4 - 5
(v)	Power Connection	4 - 6
(vi)	Installation of Machines	6 - 7
(vii)	Recruitment of Staff & Trial run	7 - 8
(viii)	Commercial Production	9 TH onwards.

6. TECHNICAL ASPECTS :

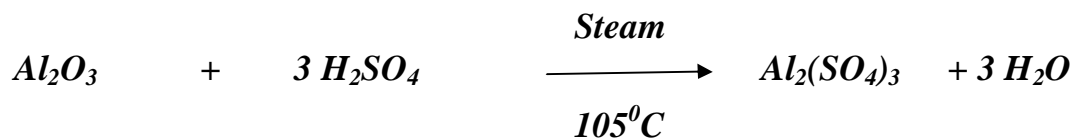
a. PRODUCTION CAPACITY : 2000 MT P.A.

b. QUALITY CONTROL & STANDARDS :

IS 299:1989 (Ferric Alum Grade II)

Sr. No.	Characteristics	Requirement
(i)	Water Soluble Alumina Al ₂ O ₃ , % by mass, Min.	15 .0
(ii)	Soluble Iron Compounds, % by mass, max.	0.7
(iii)	pH of 5 % aqueous Solution, Min.	2.7
(iv)	Insoluble Matter, % by mass, Max.	0.5
(v)	Basicity (as Al ₂ O ₃), % by mass, Max.	0.5
(vi)	Lead, ppm, Max.	30
(vii)	Arsenic, ppm, Max.	6

c. MANUFACTURING PROCESS :



Alum is made by dissolving Bauxite in Sulphuric Acid. Crude Bauxite is crushed to 1” size in Jaw Crusher and then fed in to a pulveriser for further grinding to 200 mesh size. The powdered bauxite containing about 70-75 % o Alumina, 2 – 3 % of Ferric Oxide is charged in to a lead lined M.S. reaction tank. Sulphuric Acid of 60% concentration is added and the reaction mass is thoroughly agitated by steam. A mechanical lead lined stirrer may also be fitted to the reaction vessel for uniform agitation. The temperature is kept at 105⁰C – 110⁰C by means of steam. Normally an excess of Bauxite is fed to achieve maximum conversion. It takes about 8- 10 hours for complete reaction. When the specific gravity reaches to 60 degree TW, the solution is run to a large settling tank. In the settling tank, flaked glue is also added to facilitate coagulation of suspended materials. After settling, the clear solution of Aluminium Sulphate is decanted or filtered in wooden plate & frame press. The pressed Cake is washed with water and washings can be used in next batch. If pure Aluminium Sulphate is required, Barium Sulphide is added in the form of black ash to reduce Ferric Sulphate, so the Ferrous state effect precipitation of iron. The clear liquor is drawn from the settling tank and send to the concentrator. It takes about 8- 10 hours for concentration and then concentrated liquor is taken at this stage to the plastic moulds, where it solidifies on further cooling.

7. FINANCIAL ASPECTS :

Sr. No.	Description	Quantity	Value (Rs.)
(a)	Land & Building <i>Total 1500 Sq. Mtrs. (Covered area of 300 Sq. Mtrs. On rent</i>	<i>L.S.</i>	<i>15,000</i>
(b)	Machinery & Equipments		
<i>(i)</i>	<i>Jaw Crusher, Single toggle type size 5” x 9” with Manganese steel Jaws & side plates, heavy duty fly wheel, Capacity 1 Ton per hour. Complete with 5 H.P. motor and starter.</i>	<i>1 No.</i>	<i>1,10,000/-</i>
<i>(ii)</i>	<i>Pulveriser, Swing Hammer type 32” size suction blowers, air separator, complete with 40 HP motor and Starter.</i>	<i>1 No.</i>	<i>3,30,000/-</i>

(iii)	<i>Digester M.S. Lead tank, Capacity 3500 litres, inside Lead lined, covered with acid proof bricks fitted with mechanical stirrer operated by 5 H.P. motor along with reduction gear assembly, Lead bonded steam coil and discharge valves.</i>	2 Nos.	5,50,000/-
(iv)	<i>Settling Tank with conical bottom & lined from Inner side with acid proof brick with discharge valve and Other fittings, Capacity : 3500 Ltrs</i>	3 Nos.	1,98,000/-
(v)	<i>Evaporation Tanks M.S. Lead bonded Steam heating, Capacity : 3500 Ltrs.</i>	3 Nos.	1,98,000/-
(vi)	<i>Boiler Coal Fired, Capacity : 300 Kgs./ hrs, Smoke tube, multitubular vertical working pressure 100 psi complete with box, steam generator, water heater, motorised pump and overhead tanks , standard boiler mounting fitting, fire doors and bars, ash plate, chimney and refractory etc.</i>	1 No.	4,40,000/-
(vii)	<i>Water Softening plant</i>	1 No.	1,00,000/-
(viii)	<i>Sulphuric Acid Storage tank, 25 MT capacity made of MS lead lined with acid feeding and discharge attachments etc.</i>	2 Nos.	2,20,000/-
(ix)	<i>Acid Pump 1.5" x 1" complete with 3 H.P. motor</i>	1 No.	39,500/-
(x)	<i>Chain hoist & changing bucket with supporting girders</i>	1 No.	44,000/-
(xi)	<i>Cost of Moulds</i>	L.S.	90,000/-
(xii)	<i>Chemical Balance, Glassware and misc. equipments for Chemical Laboratory</i>	L.S.	57,500/-
(xiii)	<i>Cost of Office furniture & equipments</i>	L.S.	40,000/-
(xiv)	<i>Electrification & Installation Charges @ 10 % of the cost of machinery & equipments.</i>		2,41,700/-
(xv)	<i>Preoperative Expenses</i>	L.S.	25,000/-
		Total	26,83,700
		Or say	26,84,000/-

(c) Raw Materials per Month :

Sr. No.	Description	Quantity	Value (Rs.)
(i)	<i>Bauxite @ Rs.1200/- per MT</i>	42 MT	50,400/-
(ii)	<i>Sulphuric Acid (98 %) @ Rs.6,000 per MT</i>	57 M.T.	3,42,000/-
(iii)	<i>Glue & other misc. laboratory chemicals</i>	L.S.	10,000/-
		Total	4,02,400/-

(d) Salary & Wages per Month :

Sr. No.	Description	Quantity	Value (Rs.)
(i)	<i>Manager / Chemist</i>	1 No.	6,000/-
(ii)	<i>Skilled labour</i>	3 No.	9,000/-
(iii)	<i>Unskilled labour</i>	8 Nos.	20,000/-
		Total	35,000/-

(e) Utilities per Month :

Sr. No.	Description	Quantity	Value (Rs.)
(i)	Power @ Rs.5.5/ KWH	55 HP	17,500/-
(ii)	Water	L.S.	2,500/-
(iii)	White Coal @ Rs.2,500 per MT	20 MT	50,000/-
		Total	70,000/-

(f) Other Expenses per Month :

Sr. No.	Description	Quantity	Value (Rs.)
(i)	Rent	L.S.	15,000/-
(ii)	Postage & Stationery	L.S.	1,000/-
(iii)	Telephone	L.S.	2,000/-
(iv)	Repair & Maintenance	L.S.	5,000/-
(v)	Insurance @ 2% of the cost of Machinery & Equip.		4,000/-
(vi)	Marketing & Travelling Expenses	L.S.	10,000/-
		Total	37,000/-

(g) Working Capital for One Month (c+d+e+f)	:	Rs.5,44,400/-
(h) Working Capital for three Months	:	Rs.16,33,200/-
	Or say	Rs.16,33,000/-
(i) Total Capital Investment(b+h)	:	Rs.43,17,000/-

9. FINANCIAL ANALYSIS :

(a) Cost of production per Annum :

Sr. No.	Description	Value (Rs.)
(i)	Raw Materials	48,28,800/-
(ii)	Salary & Wages	4,20,000/-
(iii)	Utilities	8,40,000/-
(iv)	Other Expenses	4,44,000/-
(v)	Depreciation on Machinery & Equipments @ 10% p.a.	2,41,700/-
(vi)	Interest on borrowed capital @ 13 % p.a.	5,61,210/-
	Total	73,35,710/-
	Or say	73,36,000/-

(b) Turnover per Annum :

Sr. No.	Description	Value (Rs.)
(i)	1500 MT of Ferric Alum @ Rs.5,700 per MT	85,50,000/-

(c) **Net Profit per Year :**

$$\begin{aligned} \text{Net Profit} &= \text{Total turnover} - \text{Total cost of production} \\ &= 85,50,000 - 73,36,000 \\ &= \mathbf{12,14,000} \end{aligned}$$

(d) **Profit Ratio on Sales :**

$$\begin{aligned} \text{Profit Ratio on Sales} &= \frac{\text{Net Profit}}{\text{Total turnover}} \times 100 \\ &= \frac{12,14,000}{85,50,000} \times 100 \\ &= \mathbf{14.20 \%} \end{aligned}$$

(e) **Rate of Return (ROR) on Total Capital Investment:**

$$\begin{aligned} \text{ROR} &= \frac{\text{Net Profit per annum}}{\text{Total Capital Investment}} \times 100 \\ &= \frac{12,14,000}{43,17,000} \times 100 \\ &= \mathbf{28.12 \%} \end{aligned}$$

(f) **Break Even Analysis :**

(i) **Fixed Cost :**

Sr. No.	Description	Amount (Rs.)
01.	Depreciation on Machinery & Equipments @ 10% p.a.	2,41,700/-
02.	Interest on Total Capital Investment @ 13% p.a.	5,61,210/-
03.	40 % of Salary & Wages	1,68,000/-
04.	40 % of Other Expenses	1,77,600/-
	Total	11,48,510/-
	Or say	11,49,000/-

(ii) **Break Even Point (B.E.P.) :**

$$\begin{aligned} \text{B.E.P.} &= \frac{\text{Fixed Cost}}{\text{Fixed Cost} + \text{Profit}} \times 100 \\ &= \frac{11,49,000}{11,49,000 + 12,14,000} \times 100 \\ &= 48.62 \% \end{aligned}$$

Name and Addresses of Plant and Machinery Suppliers:

1. *M/s. Batliboi & Co., 26, R.N. Mukherjee Road, Kolkata - 1.*
2. *M/s. Rank & Co., Ring Road, Wazirpur Industrial Estate, New Delhi – 52.*
3. *M/s. Megatech International Pvt. Ltd., G-1, 1428, RIICO Industrial Area, Phase 5, Bhiwadi (Rajasthan) Contact Person : Shri Praveen Kumar Sharma
Tel. No.91-1493-512430, Mb.919772214144.
Web site :<http://www.cement-plant.com>*

Boilers:

4. *M/s. Ross Boilers, 33, Burhani Industrial Estate, Kondhwa Bhudruk, Pune – 411 037. Tel. No. 020 - 24269393, 24272293, Fax No.020 – 24269562
Mb. No. 09822012844, 09922433674, Web site : www.rossindia.com*
5. *M/s. Micro Dynamics Pvt. Ltd., T – 181 – 1/A, MIDC Bhosari, Pune – 411 026.
Tel. No.020-27120839 / 30685454, Fax No. 020 – 30685466,
Mb:09371313151.
Web site : www.indiamart.com*

White Coal :

1. *M/s. Hadoti Biotech Pvt. Ltd., Spl. 3(1) Chambal Industrial Area, Opp. Multimetals, Kota. (Rajasthan) – 324 004, Contact Person: Mr. Shankar Lal Mittal, Phone No. 0744-2209807, Fax No. 0744-2481990,
Mob. No. 09414189139 /09413351815, Web : www.hadotiboitech.com
E-mail ID: hadotibiotech@rediffmail.com*

2. *M/s. Havisha Biotech, 301 Oasis Complex, Opp Ankur High School, Ahmedabad(Gujarat) – 380 007, Telephone – 079-65220205, Fax: 079-30009780*
Contact person: Ms. Dhruvi S., Mob. No. 9898003339,
Web: www.havishachemcom
3. *M/s. Bhakti Bio Coal Engery, A-56, MIDC Katol, Dist. Nagpur (Maharashtra).*
Contact Person : Shri Ramarao Kadu Mb: 09423677519.

Name and Addresses of Raw Material Suppliers:

Bauxite :

1. *M/s. Rupa International, 602-P, Majumder Road, 2nd Floor, Kolkata – 700 078*
Tel. No.91-33-24842263, Mb:919339206988, 919831561152
Website : www.indiamart.com/rupainternational/
2. *M/s. Om International, 83, 1st Floor, Jai Bhawani Colony, Khatipura, Jaipur (Rajasthan) – 302 012. Tel. No.91-141-2351935, Mb.91-9314602190,*
Website : www.minerals-ominternational.com
3. *M/s. Dani Impex, 402, Tirupati Plaza, Beside Collector Office, Nanpura, Surat (Gujrat)- 395 003. Tel No.91-261-2783757, Mb.91-9328404040.*
Website : www.indiamart.com/dani-impex/menerals.html

Sulphuric Acid:

4. *M/s. Triveni Chemicals, 135, Pancharatna Char Rasta, G.I.D.C., Vapi -396 195 (Gujrat). Tel 91-260-6618618, 91-260-6618624, Mb. 91-9227788155.*
Website : www.trivenichemical.com
5. *M/s. B.K.Chemicals, B-2, Shrusti Apartment, 1st Floor, Near Century Enka, Colony No.2, Pune – Nasik Highway, Bhosai, Pune- 411 039 (Maharashtra).*
Tel.91-20-27111941, Mb:91-9371020040, 91-9881418345.
Website : www.bkchemicals.in
6. *M/s. Surya Fine Chem, C/102, Sai Grece, Near Eagle Hotel, PCMC Link Road, Near Petrol Pump, Pune – 411 033 (Maharashtra).*
Tel. 91-20-65103846, Mb.91-9890443743
Website : www.suryafinechem.com