

ALUMINIUM HYDROXIDE GEL

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SECTION I

PRODUCT CHARACTERISTICS AND SPECIFICATION

1.1. General details

Aluminium Hydroxide gel is a aqueous suspension of hydrated aluminium oxide together with varying quantities of basic Aluminium carbonate and bicarbonate. It contains not less than 3.5% w/w and not more than 4.4% w/w of aluminium oxide. It may contain glycerin, sorbitol, sucrose or saccharin as sweetening agent, peppermint oil or other suitable flavours. It may also contain suitable antimicrobial agents.

1.2 Physical and chemical properties

Appearance : The dried gel is a white, odourless, tasteless, amorphous powder.

Category : Antacid

Solubility : Insoluble in water but soluble in dilute solutions of mineral acids and fixed alkalies.

On drying it assumes a glassy appearance.

1.3 Specifications

pH of 4% slurry	9.5 to 10.1
Arsenic traces, max.	0.5 ppm
Heavy metals traces, max.	60 ppm
Chloride and sulphate	Nil
Neutralising capacity	25 ml 0.1 N Max.34 ml.
NaOH	0.1 NaOH
Al ₂ O ₃	53.25%Min. 47%
Dose	7.5 to 15 ml

Aluminium Hydroxide tablets

Aluminium hydroxide tablets should be masticated before being swallowed.

Usual strength: 0.5 g

Aluminium Hydroxide tablets contain a quantity of Aluminium oxide equivalent to not less than 0.5% of the stated amount of dried aluminium hydroxide gel. The tablets may contain a flavouring agent.

SECTION II

PRODUCT APPLICATIONS

Aluminium hydroxide gel powder is one of the antacids used in pharmaceutical preparation. It is an insoluble antacid and is very reactive (neutralising capacity) and strongly anti proteolytic.

Aluminium hydroxide gel is either used in powder or paste form, depending upon the final product (i.e.) tablet or suspension.

It is used externally as a mild astringent and dessicant and internally as antacid and protective. Since it is used as a drug item, special care is taken during processing to avoid any contamination and precautions are taken for standardisation to IP grade.

Aluminium hydroxide mixture is used to provide symptomatic relief in gastric and ulcer and in reflux oesophagitis and is used in the treatment of hyperchlorhydria. It may be administered in doses of 7.5 to 15 ml every 2 to 4 hours or more frequently in water or milk or tablets containing the dried ingredients may be sucked or chewed.

It is also used as astringent in cases of marked hyper acidity.

Aluminium hydroxide mixture diluted with 2 to 3 parts of water may be given by intragastric drip at a rate of 15 to 20 drops a minute throughout the day.

Aluminium hydroxide is also used as an adjuvant in absorbed vaccines to increase their potency and reduce the incidence of undesirable reactions by delaying the release of antigen.

SECTION III

INDIAN MANUFACTURERS

There are a number of units producing Aluminium hydroxide gel in the country. Most of the units are in small scale sector.

Important Indian manufacturers of Aluminium Hydroxide gel include the following:

- * Taurus Chemicals (P) Ltd.,
Plot No.133,Venkateswara Co-operative Indl. Estate,
Bollaram, Narsapur Taluk,
Dist. Medak-502 328

- * Santosh Dyes Pvt. Ltd.
Plot No.148 to 150, I.D.A. Mallarpur,

Hyderabad - 501 507.

- * Piyush Chemicals & Pharmaceuticals (P) Ltd.
Balgopalpur I.E.,
Balasore-756 020.
- * Uma Industries
6, Burroshibtola Main Road,
Calcutta-700 038.
- * Shital Chemicals
Factory: C-1/200 - 201/4, G.I.D.C. Estate,
Naroda, Dist. Ahmedabad-382 330.
- * Advent Pharma Pvt Ltd
Plot No.187,GIDC,Vapi,Dist Bulsar,
Gujarat
- * Chitra Chemical Industries.
Factory : Shed No.J-2323, 3rd Phase Area,
G.I.D.C., Vapi-396 195, Gujarat.
- * Creative Chemicals.
Office : Bunder Road, Post Box No.78,
Bhavnagar-364 001.
Phone : 27968.
Fax : 91-278-28021.
- * Dentochem Industries.
Factory: Near G.I.D.C. Estate,
National Highway, Bamanbor,

Dist. Surendranagar, Gujarat.

- * Elite Chemicals.
Factory : 94/5, Chitra Industrial Estate,
Bhavnagar-364 002.

- * Fine-O-Pharma.
Plot & Shed No.A/26106, Fourth Phase,
G.I.D.C., Vapi, Gujarat.

- * Hansa Chemicals
C/32-35,Vithalwadi Indl Estate,
Bhavnagar-364 001

- * Jehovah Organics/Jehovah Laboratories Pvt. Ltd.
Factory : Kakarolia,Tal Jambughoda,Dist Panchmahals,
Gujarat-389 390

- * Melox Chemicals.
Factory: 355/1, G.I.D.C., Bhavnagar, Gujarat.

- * Omkar Chem.
Factory : C-1-B/773,GIDC Indl Estate,40 Sheds Area,
Vapi-396 195.Dist Valsad,Gujarat

- * Par Inorganics
333/1,GIDC.Chitra,Phase II,
Bhavnagar-364 004

- * Phaljig Pharmacopoeial Pvt. Ltd.
Factory : 335, G.I.D.C. Industrial Estate, Phase II,

- Chitra, Bhavnagar-364 004.
- * Quality Chemical Industries,
108/A, G.I.D.C. Industrial Estate,
Phase I, Chitra,
Bhavnagar-364 004. Gujarat.
 - * Vimalnath Chem (P) Ltd
No-1,Hemant Park Society,Maheshwari Apartment,
Acher Road, Ramnagar,sabarmate
Ahmedabad-380 005,
 - * Wadhwa Pharmochem (P) Ltd.
Kala Amb 173 001.
Dist. Sirmour,Himachal Pradesh.
 - * Maharashtra Chemical Products,
A-1, Dattaguru Co-operative Hsg. Soc. Ltd.,
Deonar, Mumbai-400 088.
 - * Aalics Chemicals
1 A,K.K.Shah Compound,Manor Road,
Palghar
DistThane
 - * Arun Industries
33-A,Vrindavan,Ramachandra Lane,Malad (W),
Mumbai-400 064
 - * Chandra Chemical Industries

Factory : W-66 (A),MIDC Area,Badlapur,Dist Thane,
Maharashtra-421 503

- * De Chem Industries.
Factory: 14-B, M.I.D.C. Industrial Estate,
Engineering Zone,
Ambarnath-421 501.

- * Harman Finochem Pvt Ltd
107-A, Vinay Bhavya Complex,
159, C.S.T Road,Kalina,
Santacruz (E), Mumbai-400 098.

- * Hem Industries
Gala No- ` O', Inside padamsee Annexe,
Opp.Union Bank Of India
Mumbai-400 003

- * Marathwada Chemical Industries (P) Ltd.
Factory: S.No.43/2, Satara Road,
Usmanpura, Aurangabad-431 001

- * Puneet International.
Office : Hanuman Building, 2nd Floor,
Picket Road, Mumbai-400 002.

- * Ravikiran Chemicals Pvt. Ltd.
2-A, Vrindavan,Ramchandra Lane,Malad (W),
Mumbai-400 064.

- * Ravindra Pharma-Chem.
Factory : J/21,GIDC,Vapi,Gujarat.

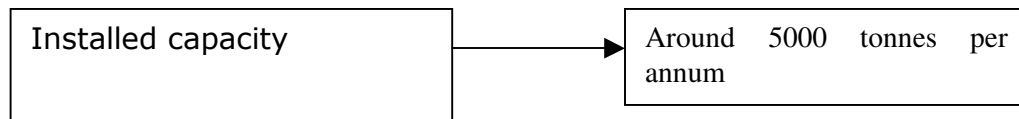
122, New Anand Bhuvan,
257/65, Narsi Natha Street,
Mumbai-400 009.

* Sri-chem Laboratories
Office : Station Road,
Rayagada-765 001.
Koraput District, Orissa.

* Navneeth Chemical Industries Pvt. Ltd.
23, Ninth Cross, Brindavan,
Pondicherry-605 013.
Phone : 27343

Of the above units, the large producer of Aluminium hydroxide gel is Tarus Chemicals P.Ltd., A.P. It employs spray dryer technology for the product.

Another unit Vasundhara Rasayans, Maharashtra, has a large plant of capacity 1200 tonnes per annum and also employs spray dryer technology.



SECTION IV

IMPORT/EXPORT TRENDS

4.1. 4.1 IMPORT DETAILS

4.1.1. Present Import level : Around 50 tonnes per annum

4.1.2. Sample of import details of Aluminium Hydroxide Gel

Period 2002

Name of the Importers	Quantity in tonnes	Value in Rs.	Country	Date	Port
Serum Institute of India	0.050	23779	Denmark	08.04.2002 to 15.04.2002	Mumbai

4.2 Export Details

4.2.1. Present Export level : Around 150 tonnes per annum

5. 4.2.2. COUNTRYWISE EXPORTS

6. PERIOD APRIL 2001 TO MARCH 2002

Country	Quantity in Kgs
Angola	1000
Australia	24000

Belgium	433
Finland	11990
German F REP	4000
Ghana	5250
Kenya	1200
Malaysia	10000
Malta	11000
Mayanmar	9316
Mozambique	514
Nepal	3500
Netherland	3000
Nigeria	4000
Singapore	12070
Spain	21000
Sri Lanka	14257
Tanzania REP	8380
Uganda	1800
Zimbabwe	450

4.2.3. Sample of individual exports of Aluminium Hydroxide Gel

Period 2002

Name of the exporters	Quantity in tonnes	Value in Rs.	Country	Date	Port
Heubach Colour P.Ltd.,	1.000	64395	Colombo	01.01.2002 to 16.01.2002	Mumbai

				2	
Vilco Chemicias & Cos.	2.500	149062	Mombasa	17.01.200 2 to 31.01.200 2	Mumbai
Taurus Chemicals P.Ltd.,	0.300	26756	Singapore	17.01.200 2 to 31.01.200 2	Mumbai
Vasundhara Rasayans	1.000	75513	Port Kelang	16.02.200 2 to 28.02.200 2	Mumbai
Godavari Exports	10.000	467838	Lagos	16.03.200 2 to 31.03.200 2	Mumbai
Vasundhara Rasayans Ltd.,	10.000	727500	Santos	16.03.200 2 to 31.03.200 2	Mumbai
Taurus Chemicals P.Ltd.,	2.000	165397	Tema	16.03.200 2 to 31.03.200 2	Mumbai
Taurus Chemicals P.Ltd.,	0.800	69467	Tema	16.03.200 2 to 31.03.200 2	Mumbai
Tricon Enterprises P.Ltd.,	1.000	80000	Bangkok	01.04.200 2 to	Mumbai

				30.04.200 2	
Excelsior Exporters	2.000	94187	Tinkan	01.04.200 2 to 30.04.200 2	Mumbai
Vilco Chemls. & Cosmetics	3.000	175680	Mombasa	01.06.200 2 to 15.06.200 2	Mumbai

SECTION V

PRICE TRENDS

Period: November, 2002

Ex-factory price Rs.56 per kg

Excise duty 16%

CST 4%

SECTION VI

INDIAN DEMAND

Gastric antacids such as Aluminium hydroxide gel is one of the pharmaceutical raw materials used in relieving gastric hyperacidity and peptic ulcers.

They are either used in powder or paste form, depending upon the final product, i.e. tablet or suspension.

The number of antacid formulations involving Aluminium hydroxide gel either singly or together with other antacids are estimated to be around 300.

Considering the use level of Aluminium Hydroxide Gel in the formulations in terms of percentage used as well as a number of formulations, the estimated demand for Aluminium hydroxide gel is 3500 tonnes per annum.

Growth rate in demand

Growth rate in demand for Aluminium hydroxide gel would be in tune with the growth of the pharmaceutical sector.

The growth rate in demand is likely to be in the region of 8 to 9% per annum.

SECTION VII

BROAD OUTLINE OF MANUFACTURING PROCESS

7.1. Chemical reaction

The reaction between Soda Ash and Aluminium Sulphate solution that takes place in the process is as follows



7.2. Process outline

The batch process for the manufacture of Aluminium hydroxide gel consists of the following steps.

Raw material solution preparation:-

Known quantity of commercial grade Soda Ash and Aluminium Sulphate are dissolved in calculated volume of water respectively to get the desired degree baume of the dilute solutions.

Reaction:

After analysing both dilute solution, known quantity of Aluminium Sulphate solution is allowed to react at controlled rate with soda ash solution in a wooden reactor fitted with stirrer. During the reaction, medium speed agitation is provided and pH is measured at regular intervals. At optimised pH, addition is stopped and product slurry is allowed to age for optimum period.

Filteration:

After ageing of the product, the slurry is filtered in wooden plate and frame filter press and wet cake is washed with water till it becomes free-form soluble salt.

Drying and pulverisation

The wet cake from the filter press is then dried in a tray drier at low temperature. Dried lumps are then pulverised in micro pulveriser to get the desired degree of fineness of the powder.

* Central Salt and Marine
Chemicals Research Institute,
(Council of Scientific & Industrial Research)
Gijubhai Badeka Marg, Waghawadi Road
Bhavnagar -364 002

Fax:0278-567562, 566970
E-mail : salt@bhavnagar.com, salt@csir.res.in
Website : www.csmcri.org

6.1. MAJOR PLANT AND MACHINERY AND SUPPLIERS

Name of the equipment	Name of the company
Reactors	Chemitherm Plants & Systems P. Ltd., 30, Anandha Street Alwarpet, Chennai-600 018 Texel Fabricators Pvt. Ltd., 335, Sidco Industrial Estate, Ambattur, Chennai-600 098, Tamil Nadu
Filter press	Fluid Control Equipments 77/574, Mount Road, Chennai-600 006 Sri Ranga Industries SF, 739, Ramraj Nagar, Goldwins, Coimbatore-641 014
Tray dryer	Richard Engineering (Bombay) Pvt. Ltd. 42, IIF, Veerabadran Street Near Valluvar Kottam Nungambakkam, Chennai-600 034 Ganson Ltd. 645, Anna Salai,

	Chennai-600 006
Boilers	<p>Cethar Vessels Ltd., No.4, Dindigul High Road, Trichy</p> <p>Firetech Boilers Pvt. Ltd. No.211, 2nd Cross, 38th Main, B.T.M. Layout 2nd Stage, Bangalore-68</p>
Pulveriser	<p>Frigmaires Engineers PO Box 16353, 8, Janata Industrial Estate Senapati Bapat Marg Opp Phoenix Mill, Lower Parel (W) Mumbai-400 013</p> <p>Kaps Engineers 831, GIDC, Makarpura Vadodara-390 010</p>
Air compressors	<p>ELGI Equipments Ltd., Elgi Industrial Complex III, Trichy Road, Singanallur, Coimbatore-641 005 Phone : 91-422-574691-5 Fax : 91-422-573697, 576826 E-mail : ramann@elgi.jet.co.in, gopinaath@elgi.jet.co.in</p> <p>K.G. Khosla Compressors Ltd., 19.8 KMS, Delhi-Mathura Road, Faridabad-121 003, Haryana</p>

	<p>Kaeser Kompressoren India 9 & 10, Symphony `C' Bldg., Range Hill Road Shivaji Nagar, Pune-411 020</p>
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SECTION VIII

RAW MATERIAL REQUIREMENTS AND AVAILABILITY

8.1. Raw material requirements:

Basis : one tonne of Aluminium hydroxide gel

Soda ash 925 kgs

Aluminium sulphate 1150 kgs

8.2. Utility requirements:

Power required 1245 units per tonne of product

Steam 160 litres per tonne of product

Water 5000 litres per day

8.3. Availability of raw materials

Aluminium sulphate:-

There are around 50 units in the organised and unorganised sector in the country engaged in the manufacture of Aluminium sulphate, which is in the form of ferric alum and non ferric alum. The units spread all over the country meet the local requirements. No problems are anticipated in procuring this material.

Soda ash:-

At present, there are six major soda ash manufacturing units in the country with a total installed capacity of 15,50,000 tonnes per annum. All the existing plants are planning substantial expansion of capacity and several modernisation projects are underway.

No problems are anticipated in procurement of soda ash.

Source of supply of raw materials

6.1.1 Name of the raw materials	Name of the company
Aluminium sulphate	Dharamsi Morarji Chemicals Co. Ltd., Bombay, Coastal Chemicals Ltd., Andhra Pradesh. Ayes Dyes & Chemicals, Chennai Kumar Chemical Corpn. Cuddalore Pondicherry Chemicals, Mettupalayam The Coastal Chemicals Ltd., Visakhapatnam
Soda Ash	Tuticorin Alkali Chemicals & Fertilisers Ltd., Tuticorin Atul Ltd., Gujarat Birla VXL Ltd., Jamnagar DCW Ltd., Gujarat Gujarat Heavy Chemicals Ltd., Gujarat Svichem Industries, Bharuch Tata Chemicals Ltd., Jamnagar

SECTION IX

GLOBAL SCENARIO

7. GLOBAL PRODUCERS

- * Kyowa Chemical Industry Co. Ltd.,
Hanwa Bldg., 530 Fushimicho
Higashi-Ku, Osaka 541.
Japan

- * Chen Yah Chemical Works Ltd.,
91, Hou Kang St., Shin Lin, Taipei.

- * Summith Research Labs
45, Silver Road, Suite 300,
Flemington NJ 08822 USA

- * Westwood Chemical Corp.,
46, Tower Drive, Middletown,
NY 10941.

- * Reheis Inc.
235 Snyder Avenue,
Berkeley Heights
NJ 07922

- * Chattem Chemicals Inc.
3801, St Elmo Avenue,
Chattanooga, TN 37409, USA

- * Rhone-Poulenc North American Chemicals

Rhone-Poulenc Pharmaceutical Ingredients
CN 7500, Cranbury, NJ 08512-7500

R-PR sells off aluminium hydroxide businesses

SPI Polyols, a subsidiary of Canadian company Harrowston, has bought two magnesium and aluminium hydroxide businesses from Rhone Poulenc Rorer for about \$20 million.. However, R-PR will supply all raw material for the pharmaceutical intermediates produced at the two sites in Septemes-les-vallons in France and Delaware in the US.

SECTION X

**DISCUSSIONS ON ECONOMIC CAPACITY, PROJECT COST AND
PROFITABILITY PROJECTIONS**

Economic capacity : 150 tonnes per annum
Project cost : Rs.102 lakhs

Assessment of project cost

1. Land

S.No.	Description	Cost Rs.in lakhs
1.1	Cost of land of one acre at Rs.5.5 per acre	5.5
1.2	Cost of levelling, laying internal roads/fencing and Compound wall	0.55
	Subtotal	6.05

2. Building

S.No.	Description	Cost Rs.in lakhs
2.1	Factory building of area 400 sq.m. at Rs.3200/sq.m.	12.8
2.2	Non-factory building of area 100 sq.m.at Rs.4500/sq.m.	4.5
	Subtotal	17.3

3. Cost of Plant & Machinery

S.No.	Description	Cost Rs.in lakhs
3.1	Cost of basic plant and machinery	29
3.2	Instrumentation and control	2.2
3.3	Pipelines and valves	3
3.4	Structurals for erection	1.5
	Subtotal	35.7
3.5	Octroi, excise duty, sales tax, etc.at 12%	4.3
3.6	Packaging and insurance charges (2%)	0.8
3.7	Transportation charges (2%)	0.8
3.8	Machinery stores and spares (2%)	0.8
3.9	Foundation charges (2%)	0.8
3.10	Installation charges (2%)	0.8
	Total cost of plant and Machinery	44

4. Technical know-how fees

Rs.2.2 lakhs

5. Miscellaneous fixed assets

S.No.	Description	Cost Rs.in lakhs
5.1.	Electrification	2.2
5.2.	Steam boiler and auxillaries	3.2
5.3.	Water storage tank, borewell etc.	2.2
5.4.	Fuel storage tank	1.0
5.5.	Laboratory equipment	0.8
5.6.	Office machinery & equipment	1.5
5.7.	Material handling equipment, packaging machinery, Weigh balance, etc.	1.0
5.8.	Diesel generator	4.4
5.9.	Effluent treatment	1.5
	Total	17.8

6. Preliminary & Pre-operative expenses:

S.No.	Description	Cost Rs.in lakhs
6.1.	Preliminary expenses	0.4
6.2.	Pre-operative expenses:-	
6.2.1	Establishment	0.4
6.2.2	Rent rates and taxes	0.4
6.2.3	Travelling expenses	0.7
6.2.4	Interest and commitment charges on borrowings	4.2
6.2.5	Insurance during construction period	0.6
6.2.6	Other preoperative expenses and deposits	--
6.2.7	Interest on deferred payment	--
	Total	6.7

7. Provision for contingency Rs.6.7 lakhs

8. Working capital margin Rs.1.2 lakhs

Total project cost **Rs.102 lakhs**

10. Means of Finance

Promoter's contribution Rs.41 lakhs

Term loan from financing institutions Rs.61 lakhs

Total project cost Rs.102 lakhs

11. Financial statements (Rs. in lakhs)

A. Variable Cost	
Raw material and utilities	31.1
Spares and maintenance	26
Selling expenses	4.2
Total variable cost	37.9
B. Fixed Cost	
Salaries and wages	6.0
Interest on term loan and working capital loan	11.7
Depreciation	6.4
Administrative expenses	2.5
Total fixed cost	26.6
C. Total cost of production(A + B)	64.5
D. Selling price per kg. (in Rupees)	56
E. Annual sales turnover	84

F. Net profit before tax (E – C)	19.5
G. Breakeven point in %	57%

SECTION XIII

SWOT ANALYSIS

1.1.1.1 Strength	1.1.1.2 Growing demand in pharmaceutical sector
1.1.1.3 Weakness	1.1.1.4 Competitive condition
1.1.1.5 Opportunity	1.1.1.6 Technology improvement and Export
1.1.1.7 Threat	1.1.1.8 Lack of entry barrier and mushroom growth

SECTION XIV

FACTORS INFLUENCING THE POSITION FOR A NEW INDUSTRY AND RECOMMENDATIONS

Aluminium hydroxide gel is a important pharmaceutical intermediate product.

The project is of interest since Aluminium hydroxide gel is estimated to have a growth rate in demand of 8 to 9% per annum and its economic capacity is small.

Considering the fact that the raw materials are readily available and indigenous technology is adequate and the export potentials of the product is also of considerable importance, there is case for additional capacity creation.