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ADITYA BIRLA CHEMICALS (THAILAND) LTD.

PROFILE
Aditya Birla Chemicals (Thailand) Ltd. forms part of the Aditya Birla Group's Chemical Business which spans over nine units—five in Thailand and four in India. The company is engaged in producing five major chemical groups – Chlor-Alkali products, Epichlorohydrin, Epoxy Resins, Phosphates and Sulphites. Thai Peroxide Company produces Hydrogen Peroxide solutions and related products.

Aditya Birla Chemicals (Thailand) Ltd has built a strong business in Thailand and also exports its products to 58 countries across the globe. It serves customers in a large number of industries such as food, food processing, personal consumer products, coatings, textiles, pulp and paper, detergents, water treatment, metal treatment and more.

Aditya Birla Chemicals (Thailand) Ltd. is the new name of Thai Organic Chemicals Company Limited. This follows the merger in 2005 of Thai Epoxy and Allied Products Company Limited, Thai Sulphites and Chemicals Company Limited and Thai Polyphosphate and Chemicals Company Limited into Thai Organic Chemicals Company Limited. Thai Peroxide Company Limited, which is a joint venture between FMC Corporation of the US, and the Aditya Birla Group, operates as a separate company.

The Aditya Birla Group
A US$ 29 billion corporation, the Aditya Birla Group is in the League of Fortune 500. It is anchored by an extraordinary force of 130,000 employees, belonging to 30 different nationalities. In the year 2009, the Group was ranked among the top six great places for leaders in the Asia-Pacific region, in a study conducted by Hewitt Associates, RBL Group and "Fortune" magazine. In India, the Group has been adjudged the best employer in India and among the top 20 in Asia by the Hewitt-Economic Times and Wall Street Journal Study 2007.

Over 60 per cent of the Group's revenues flow from its overseas operations. The Group operates in 25 countries – India, UK, Germany, Hungary, Brazil, Italy, France, Luxembourg, Switzerland, Australia, USA, Canada, Egypt, China, Thailand, Laos, Indonesia, Philippines, Dubai, Singapore, Myanmar, Bangladesh, Vietnam, Malaysia and Korea.
Chlor-Alkali and Epichlorohydrin
Aditya Birla Chemicals (Thailand) Ltd. commenced production of Chlor-Alkali products and Epichlorohydrin in 1998. It now manufactures Caustic Soda, Chlorine, Hydrochloric Acid, Sodium Hypochlorite and Epichlorohydrin. The plant is situated at the Eastern Industrial Estate at Maptaphut, Rayong Province, Thailand.

Epoxy
Aditya Birla Chemicals (Thailand) Ltd. is a pioneer manufacturer of Epoxy resins in the entire ASEAN region. The success of the Epoxy division is due to the Specialized Epoxy Systems and its in-house Research and Application Development Centre. Its products are marketed under the Epotec® brand.

Peroxide
Thai Peroxide Co. Ltd. (TPL) is a joint venture between the Aditya Birla Group and FMC Corporation of the USA. A pioneer in the manufacture of Hydrogen Peroxide solutions in Thailand, it began operations in 1989. It now manufactures high-quality Hydrogen Peroxide, Calcium Peroxide and Per Acetic Acid.

Phosphates
The Phosphates unit of Aditya Birla Chemicals (Thailand) Ltd. was commissioned in 1984 to produce Sodium Tripolyphosphate. It is the leading manufacturer of Sodium Phosphates in the world. It produces a wide range of specialty phosphates and blended phosphates, too. Polyphos, Seaphos, Noodlephos and Sausplus are the product brands.

Sulphites
Set up in 1995, the Sulphites unit of Aditya Birla Chemicals (Thailand) Ltd. specialises in the manufacture of high-quality Sodium Sulphite, Sodium Metabisulphite and Liquid Sodium Bisulphite. Its products are marketed under the Birlasulf-SS, Birlasulf-SM and Birlasol-35 brands.

Caring for the environment
Aditya Birla Chemicals (Thailand) Ltd. has adopted environment friendly processes and disposal methods. In-built safeguards ensure clean and pollution-free surroundings. The company also takes its role in the safety and health of its employees seriously. We are committed to fostering an accident-free ambience by following stringent safety standards.
The Chlor-alkali and Epichlorohydrin division is the first and only one in Thailand to achieve the hallmark of quality excellence by obtaining the Food and Drugs Administration’s approval for its Chlor-Alkali products. The unit has been accredited with ISO-9001:2000, ISO-14001, ISO-TEC:17025, OSHAS-18001 and TIS-18001.

The plant capacity is 161,000 MT of Caustic Soda 50% and it co-produces 71,500 MT of Chlorine. The Chlorine so produced is sold in 100-kg and 1000-kg cylinders. The balance is used to make the following Chlorine derivatives — Epichlorohydrin (15,000 MT), Hydrochloric Acid (72,000 MT) and Sodium Hypochlorite (36,000 MT).

The plant has been built with various safeguards to ensure that the surroundings remain pollution-free. The unit is able to maintain excellence in products thanks to the quality of raw material supplies, stringent internal quality standards and commitment to customers’ needs.

The various chemicals that are produced at this unit include

**Allyl Chloride**

**Applications:**
- As a chemical intermediate in the preparation of Glycerin, Glycerol chlorohydrins, Glycidyl ethers, Allylamines and Allyl ethers of Trimethylpropane, Sodium allyl sulphonate, a series of allyl amines and quaternary ammonium salts, Allyl ethers and a variety of alcohols, phenols and polyols
- In the pharmaceutical field as a raw material for the production of Allyl Isothiocyanate (synthetic mustard oil), Allyl substituted barbiturates (sedatives) and Cyclopropane (anesthetic)
- In the manufacture of specialty resins for water treatment
- To produce barbiturate and hyponotic agents such as Aprobarbital, Butalbital, Methohexital Sodium, Secobarbital, Talbutal and Thiamyl Sodium

**Chlorine**

**Applications:** Used in
- Sodium hypochlorite
- Calcium hypochlorite
- Poly Vinyl Chloride (PVC)
- Polyurethane (PUR)
- Polycarbonate

- Fluoropolymer
- Perachloroethane
- Phosgene
- Epichlorohydrin
- Poly Aluminium Chloride
- Silicon Dioxide (Aerosol)
- Water treatment
- Chlorinated Paraffin Wax (CPW)

**Epichlorohydrin**

**Applications:** Used for production of various synthetic materials like
- Epoxy resins
- Synthetic Glycerin
- Elastomers
- Glycidyl ethers
- Glycidyl methacrylate surfactants
- Polyamide-epichlorohydrin wet strength resin production in paper industry
- Ion-exchange resin
- Polyamide water treatment chemicals
- Flame retardants
- Quaternary amines
- As a crosslinking agent in modified starch
- In the production of Zeospan, which is a specialty polyether rubber used in automobiles
Hydrochloric Acid 35%

Applications: Used in
- Monosodium Glutamate
- Glutamic Acid
- Dyes
- Latex coagulation
- Metal pickling
- Petroleum refinery
- Floor cleaning products
- Leather industry
- Sugar refining
- Brewery
- Galvanising
- Water treatment

Sodium Hypochlorite 10%
Active Chloride

Applications: Used as
- Bleaching agent for rayon, pulp and paper, cotton, linen and jute
- Disinfectant and deodorant in dairies
- Water treatment (Chlorination)
- Household bleach
- Pool chlorination
- Fly control (Sterilisation)
- Germicide

Sodium Hydroxide 50 wt%

Applications: Used in
- Resin regeneration
- Dyes
- Viscose rayon
- Zeolite
- Sodium Polyphosphate
- Sodium Silicate
- Sodium Sulphite
- Monosodium Glutamate
- Refinery
- Soap
- Detergent
- Pulp and paper
The Epoxy division, located within the prestigious Map Tha Phut Industrial Estate at Rayong Province in Thailand, began commercial production in 1992 with technology from Tohto Kasei Co Ltd., Japan’s largest producer of epoxy resins. From an initial capacity of 10,000 MT, its current plant capacity is 37,500 MT. The unit is accredited and certified with ISO 9001:2000 and ISO 14001 in recognition of its quality and environment management systems.

Sustainability has also been achieved through its group-wide unique world-class manufacturing strategy for enterprise excellence.

With the setting up of its R&D Centre along with the Application Development Centre in 2001, the division has moved from being a ‘product supplier’ to a ‘solution provider’, working closely with customers to provide superior value through tailored solutions and specialty formulations and systems.

The division produces a wide range of epoxies, hardeners and modifiers that vary in the chemical structure, molecular weight, viscosity and functionality. Marketed under the Epotec® brand, they include liquids, solids, solutions, blends and other multifunctional products.

These products are used across a wide array of applications like aircraft and aerospace, automotive, construction and heavy engineering, electrical and electronics, food and beverage, coatings, light engineering, etc.

The epoxy division exports over 75 per cent of its production, selling in over 30 countries worldwide including the USA, Canada, Asia and large parts of Europe.

Major applications of Epotec® epoxy products

Composites

Epotec® Composite Resin Systems are suitably designed to meet process requirements such as resin transfer moulding (RTM), resin infusion (RI), hand lay up, prepregs, filament winding and pultrusion. They are used in windmill blades, sports goods, CNG cylinders, pipes of different shapes and sizes, and for applications in automobile, marine, aeronautics, defence, civil and infrastructure, and other industries.
**Civil**

Epotec® Epoxy products can be used widely in civil engineering for industrial floors, epoxy grouts, chemical resistant coatings and epoxy linings. Epotec® Epoxy-based floors offer better advantages compared to conventional concrete floors.

**Electrical / Electronics**

Epotec® Epoxy resins for electrical applications are best known for castings into mould, cavities, cores and patterns. They are also used for encapsulation and protection of electrical and electronic components. Room-temperature curing resins are preferred for low voltage, small components. Heat-cure resins offer extremely high physical, thermal and chemical properties, and are used for medium and high voltage applications in electrical and electronic industries.

**Coatings**

Epotec® Epoxy resins offer a wide range of products for coating applications. They are based on different building blocks such as Bisphenol A, Bisphenol-F, cycloaliphatics and modifications thereof to impart specific properties such as adhesion, flexibility and chemical resistance to fulfill needs of end-use applications such as marine coatings, industrial maintenance paints, coil coatings, packaging coatings and powder coatings. Epotec® range of Epoxy resins can be combined with Epotec® range of curing agents to achieve the desired performance.

**Adhesives and Tooling**

Epotec® Epoxy products are used for formulating adhesives for the broadest possible substrates because of their versatility coupled with performance dependability. Our products can be used to meet specialised needs such as thixotropy, high temperature and non-sag among others. Epotec® Epoxy products can be used for low thermal expansion precision moulds with excellent strength to weight ratio in tooling applications.
Thai Peroxides Ltd. (TPL) uses state-of-the-art technology from FMC Corporation, the world’s fourth largest producer of hydrogen peroxide solutions. The US firm has made major contributions in the field of peroxygen technology over the last 80 years, and has extensive research facilities at Princeton, New Jersey.

TPL, located at Sarabui in Thailand, manufactures H₂O₂ - 35% concentration for industrial and food applications and H₂O₂ - 50% concentration for technical and high purity grades. It also offers specialty products like Per Acetic Acid and Calcium Peroxide to suit the customer’s needs.

Hydrogen Peroxide is a versatile and environment friendly chemical that decomposes into water and oxygen after use. It is used extensively in textiles, pulp, paper and leather industries for its oxidising and bleaching properties. It is also used in the food, pharmaceutical and chemical industries and for treating industrial and municipal waste water for reducing COD, BOD, odour and heavy metals.

The company exports its technologically advanced products to South East Asian countries including Malaysia, Vietnam and Singapore.

Applications in various industries

Aquaculture

Shrimp farming — water cleaning agent (H₂S, organics removal); oxygen supplier, algae control, nitrite reduction, fish bleaching.

Chemicals manufacturing

Used in the manufacture of epoxides of oils, intermediates (steroids), organic peroxygens, peracids, MEK peroxydes, specialty organics, lactones, alcohols, polysulfide curing agents, initiator for polymers, emulsion solution polymerisation, oxides of sulfur and nitrogen, sulfoxides, sulfones, amine oxides, inorganic peroxygens, CaO₂, ZnO₂, perborates, percarbonates, arsenic acid, chemical processing, H₂SO₄ decolorisation, mineral bleaching, starch modification, oil bleaching and formulations for cooling water treatment.

Cosmetics

Hair bleach, perm waves, hair dye setting through oxidation, facial creams.

Detergents and peroxide based bleaches

Perborates, percarbonates, liquid H₂O₂ bleach, thickened / galled peroxides, peracids.

Disinfection

Sea-food, fruits, vegetable packaging, Process water, Drinking water tanks/ equipments/ pipelines/ Water tube–wells, Cooling Towers/ Air conditioning (at hospitals, hotels), Beverage industry and breweries, Poultry farm, Pools/ Spa/ Fountains, Floors and tiles at hospitals/ hotels/ schools, Transport vehicles.

Effluent treatment and Emission control

Inorganic pollutants — reduced sulfur compounds (H₂S, SOX, Thiosulfates), cyanides (simple and complex), active chlorine compounds, Nox, Metals removal (Fe, As, Cr, etc); Organic pollutants — Phenolics, Aromatic hydrocarbons, Organo sulfur compounds (mercaptans, sulfides), Chlorinated
hydrocarbons (vinyl chloride, trichloroethylene, tetra chloroethylene, etc), pesticides, aldehydes; General — Bioreclamation of aquifers and ground water, COD and BOD reduction, bulking control/sludge densification, supplements DO, slime removal, clean-up of contaminated soils.

**Electronics**

Etching and cleaning of PCB.

**Electroplating and metallurgy**

Cleaning, engraving, brightening or passivation of metals and alloys, recovery and purification of precious metals, eg. cobalt, palladium, tungsten.

**Food**

Aseptic packaging of milk, fruit juices, etc, leaching/decolorising agent, modification of starches to lower the viscosity, food preservative (milk, whey), sugar syrup decolorisation, cleaning solutions for equipment and pipes.

**Leather tanning**

Bleaching skin and hair removal, proteins extracted from skin as animal feed.

**Mining**

Gold and silver processing, heap and agitated cyanides leaching enhancement, cyanide detoxification.

**Oilfield**

Gel / polymer formation and breaking, slime removal in injection wells, emulsion breaking, stimulation and permeability enhancement, natural gas sweetening, H₂S removal in brines.

**Pharmaceutical**

Topical antiseptic formulations, mouthwash, denture cleaner, contact lens cleaner, Oxygen therapy.

**Poultry**

In hatcheries to destroy microorganisms, to Pasteurise egg whites, desugar egg whites and prevent browning.

**Power plant**

SOX control, slime control in cooling water.

**Pulp and paper**

Bleaching mechanical and chemical pulp, de-inking and bleaching of recycled paper.

**Textile**

Bleaching cotton, rayon, linen, silk; desizing (CMC, starch, PVA), denim processing, antichlorination, dye fixation.

**Uranium**

Yellowcake purification (V, Mo, Na removal), in-situ leaching, oxidant in acid or alkaline leaching, recovery of uranium from wet process phosphoric acid, copper/molybdenum, flotation separation, copper leaching, acid mine drainage (heavy metal removal), phosphate rock purification.

**Wood bleaching**

Cream color furniture.
The Phosphate Division is one of the leading producers of Sodium Phosphates in the world.

Apart from the Technical Phosphates, the unit produces a wide range of Specialty Phosphates and Blended Phosphates, which find use in critical food applications. The division has earned a global reputation of being one of the most efficient and reliable suppliers of high-quality Phosphates due to its excellent business infrastructure and committed employees. The plant has a capacity of 85,000 MT.

The company has pioneered the quality management system in the phosphate industry and has ISO 9001:2000, ISO 14001 and OSHAS 18001 certification. It has received many awards for environmental conservation, productivity and safety. It has implemented TPM and WCM, and is also the recipient of the GMP certification. All its Food Phosphates are FDA, Halal and Kosher certified. The unit exports a wide range of high-quality Specialty Phosphates.

In order to meet the changing customer needs, the unit focuses on its goal to continuously develop new products and their grades. Its Quality Control laboratory has state-of-the-art equipment that can determine impurities in the products at the PPB level.

The R&D facilities are well-equipped to meet challenges and offer “a complete solution” to customers by simulating the various processes carried out at the customer’s end. New “tailor-made” products and grades are developed to suit customers’ needs. The division collaborates actively with various research organisations and universities in Thailand.

With the focus shifting from being a commodity supplier to a value added one, the development of Specialty and Blended Phosphates in the Bakery, Seafood and Meat industry assumes greater importance. Food and Technical Phosphates produced in this unit are used both in the general and food industries.

The wide range of phosphates that are produced at this unit include

FOOD GRADE

Blended phosphates

Blended Phosphates provide a ‘synergistic’ effect in the applications and improve the ultimate results in the end product thereby making it more ‘appealing’ to the consumers. The major uses of Blended Phosphates are in raw and cooked Shrimps, Meat Sausages, Salamis, Surimi, Meatballs, Fish Fillets, Chicken & Fish balls. They are also used in the manufacture of Noodles.

Dipotassium phosphate

Applications

It is used as a buffering agent and as an emulsifier in the manufacture of Coffee Creamer. It also finds uses in the manufacture of Cheese and Evaporated Milk.
**Monosodium phosphate**
Applications: Animal feed, toothpaste, evaporated milk

**Sodium acid pyrophosphate**
Applications: Leavening agent in bakery products, canning seafood, potato treatment

**Sodium hexametaphosphate**
Applications: Dairy products, sausages, seafood and meat processing, canning of seafood

**Sodium tripolyphosphate**
Applications: Meat processing, seafood, frozen shrimp, sausage, modified starch

**Tetrasodium pyrophosphate**
Applications: Meat processing, seafood, pet food, toothpaste and ABS (Acrylonitrile butadiene styrene) plastic

**Trisodium phosphate**
Applications: Cereal food, toothpaste and processed cheese

**TECHNICAL GRADE**

**Chlorinated trisodium phosphate**
Applications: Cleaning agent

**Disodium phosphate**
Applications: Dyestuff, metal treatment

**Monosodium phosphate**
Applications: Dyestuff, metal treatment, and enzymes

**Sodium acid pyrophosphate**
Applications: Oil drilling, detergent, chemical stabiliser

**Sodium hexametaphosphate**
Applications: Boiler water treatment, paint, textile, ceramic tiles, and refractories

**Sodium tripolyphosphate**
Applications: Detergent, cleaning agent, ceramic tiles, water treatment, metal treatment and paints

**Tetrasodium pyrophosphate**
Applications: Detergent, metal treatment, cleaning agents and paints

**Trisodium phosphate**
Applications: Industrial detergents, metal treatment, toilet floor cleaners
The Sulphites division of Aditya Birla Chemicals (Thailand) Ltd. was set up in 1995. The state-of-the-art manufacturing plant is located in Saraburi Province, about 110 kilometres from Bangkok. It has a capacity of 45,000 MT.

It specialises in the manufacture of high-quality Sodium Sulphite, Sodium Metabisulphite and Sodium Bisulphite. The products are marketed under the brand names Birlasulf®-SS, Birlasulf®-SM, and Birlasol®-35-SS, Birlasulf®-SM, and Birlasol®-35.

The division has strengthened and developed its own processes and technology. Its focus on the customer’s needs has gained it a “Preferred Supplier” reputation with many multinational companies, and its products are exported across the globe.

The division is committed to quality, environmental controls and health and safety measures and has current certifications from BVQI, including ISO 9001:2000, ISO 14001 and OHSAS 18001.

It has excellent infrastructural facilities in terms of power, water, roads and raw material supplies, all of which serve as strong concentration points for its world-class manufacturing site.

**SULPHITES**

**A look at the product range and the various applications**

**Birlasulf®-SS, Sodium Sulphite**

*Formula:* Na₂SO₃  
*Grade:* The product is manufactured in the following grades — photo, food and technical  
*Properties:*  
Molecular weight: 126.05  
CAS No: 7757-83-7  
*Appearance:* Free-flowing crystalline odourless powder  

**Applications**

- **Pulp and paper**  
  - In the production of pulp by sulphite semi-chemical and chemi-thermo-mechanical means  
- **Water treatment**  
  - As an antichlor  
- **Boiler water**  
  - Oxygen scavenger.  
- **Chemicals and drugs**  
  - A moderate reducing agent in the manufacture of sodium thiosulphate, sulphonated chemicals, sulfomethylation and acetaminophen

**Natural latex rubber**  
- Preservative  
**Photography**  
- As a stabiliser  
**Food industry**  
- Antioxidant, enzyme inhibitor and anti-microbial  
**Fibre industry**  
- A solvent for raw materials, an additive for precipitation baths, for bleaching and for de-sulphurising bobbins  
**Leather**  
- Sulphitisation of tanning extract  
**Explosive**  
- In the manufacture of trinitrotoluene (TNT)  
**Minerals**  
- Oil well flotation — oxygen scavenger  
**Detergents**  
- Manufacture of sulfosuccinates and shampoo  
**Sulphur Dioxide scrubbing**  
- Power plants  
- Pulp and paper mills
**BIRLASULF-SM®, Sodium Metabisulphite**

**Formula:** \( \text{Na}_2\text{S}_2\text{O}_5 \)

**Synonyms:**
- Sodium Metabisulfite
- Sodium Disulphite / Sodium Disulfite
- Sodium Pyrosulphite / Sodium Pyrosulfite

**Grade:** This product is available in three grades — photo, food and technical

**Properties:**
- Molecular weight: 190.12
- Appearance: White, free-flowing crystalline powder
- Odour: Slight odour of sulphur dioxide

**CAS No:** 7681-57-4

**Applications**

- **Food**
  - As a preservative in fruits and starch
  - Enzyme inhibitor to control Melanin formation (black and brown spots)
- **Treatment of waste water**
  - As an antichlor and detoxification of Cyanide and Chromate
- **Chemical and Pharmaceutical**
  - Purifying and isolating Aldehydes and Ketones
  - Destroying waste Bromine
- **Textile**
  - Bleaching of wool and jute
- **Leather**
  - Solubilising tanning extracts
- **Pulp and paper**
  - Bleaching ground wood
  - Antichlor
- **Photographic and film**
  - For developer solutions and acidifying fixing baths

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**Birlasol®-35, Sodium Bisulphite**

**Formula:** \( \text{NaHSO}_3 \)

**Synonyms:**
- Sodium Bisulfite
- Sodium Hydrogen Sulphite
- Sodium Hydrogen Sulfite

**Grade:** Food and technical grade

**Properties:**
- Molecular mass: 104.06
- CAS No: 7631-90-5

**Applications**

- **Food**
  - As a preservative in fruits and starch
  - Enzyme inhibitor to control Melanin formation (black and brown spots)
- **Treatment of waste water**
  - As an antichlor and detoxification of Cyanide and Chromate
- **Chemical and Pharmaceutical**
  - Purifying and isolating Aldehydes and Ketones
  - Destroying waste Bromine
- **Textile**
  - Bleaching of wool and jute
- **Leather**
  - Solubilising tanning extracts
- **Pulp and paper**
  - Bleaching ground wood
  - Antichlor
- **Photographic and film**
  - For developer solutions and acidifying fixing baths
In addition to Thailand, the Chemicals Business of the Aditya Birla Group is also based in India. The Group has four companies in India that are involved in the production of chemicals, including caustic soda, liquid chlorine, hydrochloric acid, aluminium fluoride, Speciality fluorides and hydrofluoric acid.

Aditya Birla Nuvo Ltd. is the Aditya Birla Group's most diversified conglomerate. It is a leading player in all its key business segments including viscose filament yarn (VFY), branded garments, carbon black, textiles, insulators and chemicals.

Indian Rayon, a unit of Aditya Birla Nuvo, has a 58,400 TPA Caustic Soda capacity, which is being expanded by another 14,600 TPA. Its caustic plant has been rated by UHDE, Germany, as a benchmark unit amongst Indian chlor-alkali plants, and comparable with any other world-class plant. Its client list includes Reliance Industries, Aarti Industries, Karnavati Chemicals, Gul Bransden Chemicals, Transpec Industries and Meghmani Organics.

Bihar Caustic and Chemicals Ltd. is a subsidiary of Hindalco, a Group company. It was originally a joint venture between the Aditya Birla Group and Bihar State Industrial Development Corporation.

It was commissioned in 1984 with an initial caustic soda capacity of 100 TPD. A 30 MW captive power plant was commissioned in January 2001, contributing to the overall growth of the company.

The company's product range includes Caustic Soda Lye with a capacity of 78,750 TPA, Liquid Chlorine - 57,000 TPA, Sodium Hypochlorite - 1050 TPA, Hydrochloric Acid (32%) - 40,000 TPA and Compressed Hydrogen Gas -18 lakh Nm³ per annum. The company has plans to expand its capacity by 26,250 TPA and to produce Anhydrous Aluminium Chloride.

Grasim Industries Ltd. is a flagship company of the Group and ranks among India's largest private sector companies. Starting as a textile manufacturer in 1948, Grasim's businesses today encompass Viscose Staple Fibre (VSF), cement, sponge iron, chemicals and textiles. The company holds a dominant position in all its businesses.

Grasim set up a caustic soda unit at Nagda, in the state of Madhya Pradesh, in 1972, to achieve a reliable and economical supply of rayon grade caustic soda, an important raw material in VSF production. The unit has a capacity of 190,800 TPA, including an 18,250 TPA flake plant, making it the country's second largest caustic soda unit. The unit also produces Poly Aluminium Chloride, Stable Bleaching Powder, Chlorosulphonic Acid and Hydrochloric Acid.

For more information on chlor-alkali products of any of our companies, write to: chlor-alkalimktg@adityabirla.com

Tanfac Industries Ltd., one of India's largest suppliers of fluorine chemicals, commenced operation in 1985. It is a joint sector company promoted by Aditya Birla Group and the Tamilnadu Industrial Development Corporation (TIDCO).

Its plant and facilities are spread over 60 acres in the chemical complex of SIPCOT at Cuddalore near Pondicherry, about 200 kms from Chennai, in the state of Tamil Nadu. Tanfac is engaged in the manufacture of inorganic fluorine-based chemicals such as aluminium fluoride, anhydrous hydrofluoric acid and various speciality fluorides such as sodium silica fluoride, ammonium bifluoride, potassium fluoride, potassium titanium fluoride, potassium silica fluoride, potassium fluoborate and other organic fluorine-based chemicals.

For more information, write to: fluorinemktg@adityabirla.com
### ADITYA BIRLA CHEMICALS (THAILAND) LTD.

#### Contact Us

<table>
<thead>
<tr>
<th>Plants</th>
<th>Marketing offices</th>
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<tbody>
<tr>
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<td><strong>Sulphites</strong></td>
<td>888/162-3, 16th Floor, Mahatun Plaza, Ploenchit Road, Lumpini, Bangkok 10330, Thailand.</td>
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<tr>
<td>54 Moo 5, Sudbunted Road, Tambol-Tarndiew, Kaengkhoi, Saraburi 18110, Thailand.</td>
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