



GIMPEX LIMITED

BENTONITE SPECIALITIES

Bentonite – A natural resource with super natural properties.

BRANCH OFFICE

GIMPEX LIMITED
Hall No. 9, Sun Plaza
Opp. Commerce College,
Bhuj (Kutch) – 370 001
Gujarat – INDIA.
Email – sudesh@gimpex.co.in

HEAD OFFICE

GIMPEX LIMITED
Gimpex House,
282, Linghi Chetty Street,
Chennai – 600 001 (India)
Email- gimpex@gimpex.com

Bentonite –

Bentonite is the commercial name for the highly swelling natural material. Its main component is a smectite clay mineral, usually montmorillonite. It is formed by the reaction of volcanic ash with water, a process taking place over millions of year.

The clay has the unique capability of expanding in the presence of water and contracting in the absence of the same. This is due to the structure of the clay which consists of tactoids of 20-80 individual platelets.

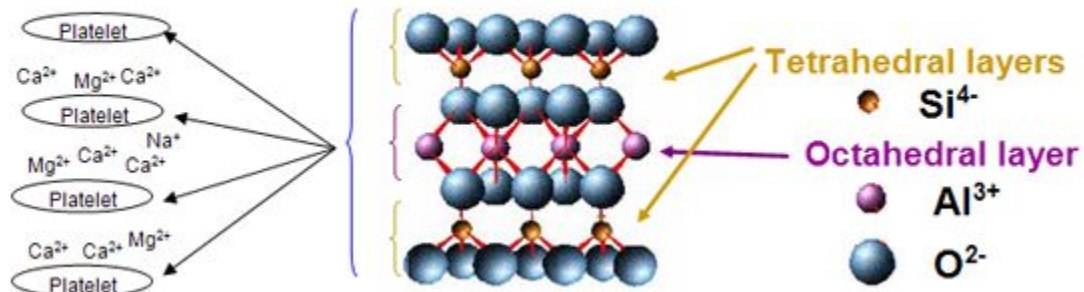
Each platelet of ideal composition $(Al_{1.67}Mg_{0.33})(Si_{3.5}Al_{0.5})O_{10}(OH)_2$ consists of an octahedral layer of Al^{3+} and O^{2-} sandwiched between two tetrahedral outer layers of Si^{4+} and O^{2-} .



**Tactoid is
20-80
Lamellae**

Bentonite

Platelet



The most common members of the smectite mineral group are hectorite and montmorillonite. The clay's products are useful in gelling, binding, thickening, stabilizing, plasticizing, coagulating, emulsifying, absorbing and controlling rheology.

This clay has a net negative charge on the faces of the platelets which arises from isomorphous substitution of the Al^{3+} for low charged species such as Mg^{2+} or Fe^{2+} in the octahedral layer.

The net negative charge must then be counterbalanced – a layer of cations is therefore present between the platelets. Typically these are Mg^{2+} , Ca^{2+} and/or Na^{+}

A montmorillonite platelet can be considered as an inorganic poly anion. These characteristics can be modified for particular purpose by the process of chemical and mechanical activation.

After swelling and dispersing in water it has an extraordinary large specific surface.



GEOLOGICAL OCCURANCE OF BENTONITE IN KUTCH –

Gujarat Kutch Bentonite has resulted from the alternation of Basalt and pyroclastic deposits associated with Deccan traps by epigenic changes. Epigenic changes are those occurring at or near the earth's surface due to weathering action of natural agencies such as air, water and ice in conjunction with climatic conditions.

From the field evidences it is seen that basalt has been geo – chemically weathered in – situ, dominantly into clays of different composition with little or no volume change or movement of the altered products, but has retained the original texture and structure of the basalt. Basaltic rocks containing calcium, magnesium and iron tend to weather to montmorillonite or beidellite. However, this tendency is effected by physical conditions and when subjected to active oxidation and leaching, basalt may on weathering give kaolinite soils. Kutch bentonite does not contain kaolinite.

Bentonite of Kutch occurs in Supra trappean formation of lower Eocene period and lies over trap formation. It occurs in irregular lenticular or tabular pockets. It generally occurs below soil cover of 1 mts to 2 mts and extends downward from 2 mts. to 8 mts.



The Bentonite contains impurities like Calcite, Gypsum and unaltered basalt and these may be between 4 to 10%. While sorting of dried Bentonite these are manually removed to the extend possible before it is subjected to Chemical and Mechanical treatment.

The Bentonite deposits are lenticular or tabular in shape and occur in between traps and / overlying supratrappean laterites. These occur below an overburden of 1 to 2 m. thick soil and extend downward to a depth of 10 m. where altered basalts passes into fresh rock. A few meters of the top are contaminated with soil, blown sand and lateritic material. The main part of the bentonite contains impurities of calcite, gypsum, ferruginous and basaltic material. Calcite and gypsum contents decrease with depth.

Many bentonite pockets show spheroids analogous to exfoliation weathering ranging in diameter from few cm to 75 cm. it is observed that the bentonite covers the periphery and successively less weathered basalt is seen towards the center.

The Bentonite content decrease from the outer rim of spheroid to the core.



There are two types of Bentonites. i) Sodium Bentonites and ii) the Calcium Bentonites. The Bentonites which have Na as the chief exchangeable ions in their lattice are known as sodium types. The Bentonites of this area are Sodium Bentonites and are of very high quality.

In hand specimen, freshly dug bentonite lump is deep green and contains moisture. In appearance it can be compared to fine grained glassy basalt with white spots. Laboratory tests have shown that the material constituting the white spots swells 20.4 times its original volume while the clays a whole in which it is enclosed swells only 3 to 4 times.

The multi-properties of Bentonite (hydration, swelling, water absorption, viscosity, thixotropy make it a multi-application product for diverse industries). Primarily two varieties of Bentonite are available – Sodium Bentonite (high swelling, gelling and thermal durability) and Calcium Bentonite (more commonly available worldwide but with less swelling).

The color of Kutch Bentonite is yellowish green to dark grayish.



GIMPEX LTD., BHUJ – BENTONITE OPERATIONS -

We have large Bentonite mines of Calcium and Sodium based in Kutch (Gujarat state, India). At any given time we have four mines operating and hold one lakhs tons of stock of various grades of bentonite. Gimpex is in a position to assure back to back consistency.

As the occurrence of Bentonite due to its natural formation is inconsistent, our job is to give consistent supply. The company caters nationally and internationally Bentonite in lumps, powder, granules. Bentonite for traditional application and specialized application are also available. We are specialized in customize solution.

Gimpex bentonite is mainly of very high quality Sodium variety with higher iron content and very fine particle size resulting in superior swelling capacity and bonding powers.

Kutch Bentonite is subjected to strong sunshine and natural drying which eliminates the artificial drying process. Making it a more cost effective choice. State of the art processing facilities and in-house R&D allow us to conform to specific customer requirements and batch to batch consistency Proximity to ports and cheap labour allow us to be price competitive.



Highly versatile Bentonite products are for both traditional usage foundry, iron ore palletizing, metal casting, civil engineering, drilling and also specialty applications. agro to cosmetics to medicine are made by Gimpex.

Gimpex specialty minerals is devoted to the development and supply of the highest quality products, specifically tailored for a European markets, and has built a reputation for outstanding customer service.

Gimpex emphasis on expertise in research and development, excellence and accuracy in processing technology, coupled with our unmatched mineral reserves, has enabled us to become the quality producer of smectite clays, specifically sodium and calcium montmorillonites bentonite.



DIFFERENT GRADES THAT GIMPEX PRODUCES

Paper
Drilling
Ceramic
Foundry
Fertilizer
Cat litter
Pesticides
Palletizing
Detergents
Agriculture
Animal Feed
Water proofing
Electrical Earthing
Paint / Dyes / Polishes
Oil / Liquor / Food Marking
Construction and Civil Engineering
Pharmaceuticals / Cosmetics / Medical Markets



Registered Grades of Bentonite

- GIMFILL®
- GIMDRILL®
- GIMGEL®
- HYDROGIM®
- SMECTOGIM®
- GIMSULF®
- GIMBOND®
- GIMDET®



Kutch Bentonite has resulted from alteration of Basalt and pyroclastic deposits associated with Deccan traps.

From field evidence it is evident formed in SITU.

This gives Bentonite with varying contents of active ingredient.

Montmorillonite and various colors from pale green, dark green, red, black, etc.



After trial pits and careful evaluation of the various layers, Gimpex decides the best method of mining and chemical dosage.

Our mining team and lab people have more than 25 years of experience and hence Gimpex can assure the buyer consistent quality.

Flowchart of Operations

Bentonite in Situ has moisture upto 35% and it is mined by Hitachi and as per the quality it is heaped in various dumps.

From the wet dumps it is spread by tractors in the drying platform. The wet lumps are repeatedly ploughed and sliced using rotovetor. At these stage impurities like Gypsum, unaltered Basalt is removed.

The dried bentonite is chemically treated by dissolving soda ash and other chemicals in water and sprayed by tankers in 3 to 6 cycles. Dosage of chemicals depends on quality of raw lumps and quality of end product.

The activated lumps are sun dried to the required moisture. Bentonite contains main active ingredient montmorillonite upto 85% and other associated minerals like Calcite, Gypsum, Feldspar, etc. plus unaltered Basalt and total is 4% to 10%. These impurities are further manually removed during this process.



The activated lumps are heaped in various dumps and are ready for dispatch either to the grinding units or shipped directly.

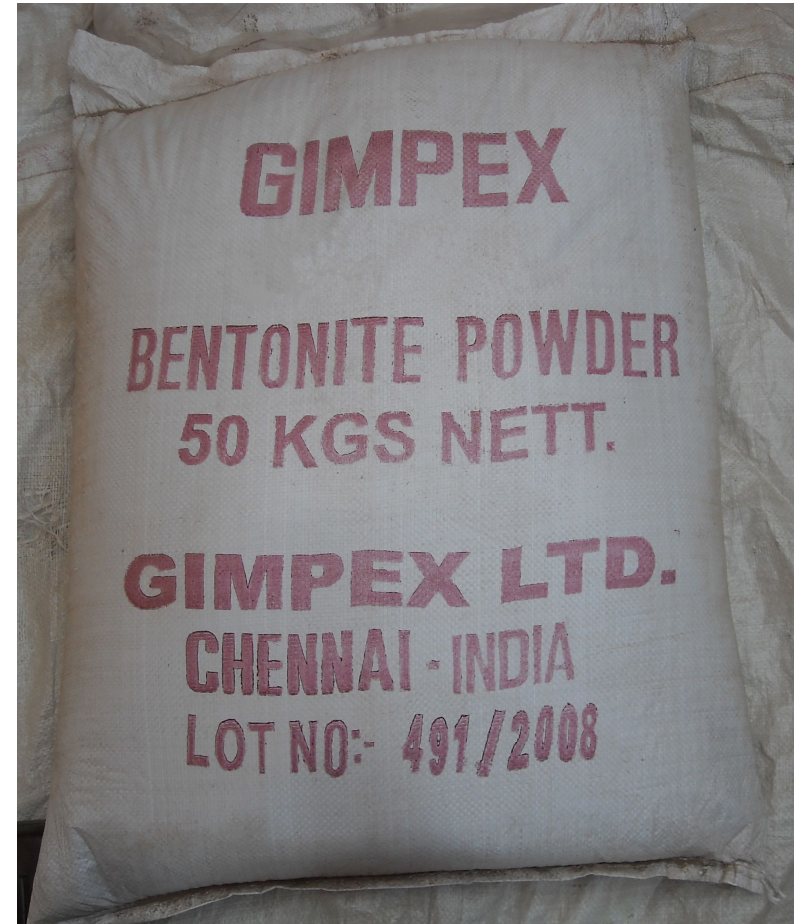
Different colours of Bentonite



Bentonite occurs in different colors in natural forms.



Gimpex has been from time to time hiring grinding units for its grinding operations. We are in the process of consolidating all the various types of grinding units as one captive unit in our upcoming Processing Unit at Dhunai.



Gimpex Bentonite Powder packed in 1000 KGS Jumbo Bags, 50 Kgs & 25 Kgs



Export of Gimpex Jumbo Bags to different countries

Transportation through Sea by GIMPEX Bentonite



15000 MT Consignment ship

Transporting Material through Ship



Transportation through Rail by GIMPEX Bentonite



**Bags loaded inside
the container**



Stuffed Container





Thanking you

**Sudesh Sansgiry – Sr. G.M.
GIMPEX LIMITED
Hall No. 9, Sun Plaza,
Opp. Commerce College,
Bhuj (Kutch) – 370 001
Gujarat – INDIA.
Ph.: (02832) 231148
Fax: (02832) 230041
Cell: (+91) 90990 28252
Email: sudesh@gimpex.co.in**