



# bentonite

## Main end-uses of bentonite

### **The product:**

Bentonite is a plastic clay generated from the in situ alteration of volcanic ash, consisting predominantly of montmorillonite.

Bentonite presents strong colloidal properties and increases its volume several times when coming into contact with water, creating a gelatinous and viscous substance.

The special properties of bentonite (swelling, water absorption, viscosity, thixotropy) make it a very valuable clay for a wide range of uses and applications.

### **Foundry**

Bentonite is used as a binding material in the preparation of molding sand for the production of iron, steel and non-ferrous casting.

The unique properties of bentonite yield green sand moulds with good flowability, compactability and thermal stability for the production of high quality castings.

### **Pelletizing**

Bentonite is used as a binding agent in the production of iron ore pellets. Through this process, iron ore fines are converted into spherical pellets, suitable as feed material in blast furnaces for pig iron production, or in the production of direct reduction iron (DRI).

### **Construction and Civil Engineering**

Bentonite in civil engineering applications is used traditionally as a thixotropic support and lubricant agent in diaphragm walls and foundations, in tunnelling, in horizontal directional drilling and pipe jacking. Bentonite, due to its viscosity and plasticity, is also used in Portland cement and mortars. According to directives of the European Union, bentonite is recommended as a sealing material in the construction and rehabilitation of landfills to ensure the protection of groundwater from the pollutants.

### **Drilling**

Another conventional use of bentonite is as a mud constituent for oil and water well drilling. Its roles are mainly to seal the borehole walls, to remove drill cuttings and to lubricate the cutting head.

### **Pet Litter**

Bentonite is used for pet litter, due to its advantage of absorbing refuse by forming clumps (which can be easily removed) leaving the remaining product intact for further use.

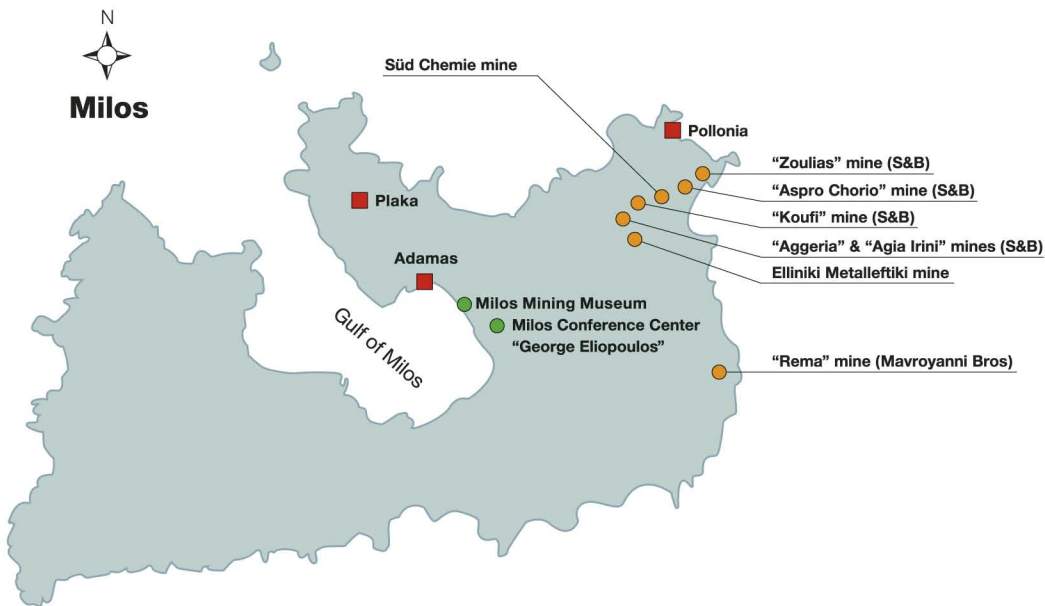
### **Paper**

Bentonite is crucial to paper making, where it is used in pitch control, i.e. absorption of wood resins that tend to obstruct the machines and to improve the efficiency of conversion of pulp into paper as well as to improve the quality of the paper. Bentonite also offers useful de-inking properties for paper recycling. In addition, acid-activated bentonite is used as the active component in the manufacture of carbonless copy paper.

### **Special Applications**

Further to the above mentioned uses, processed bentonite has a wide range of industry applications, such as detergents, pharmaceuticals, cosmetics, oils & food, paints, dyes and polishes.

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From bentonite mines on Milos, approximately 1.3 million tons of bentonite are extracted annually and are exported around the world, after having been processed.



## Images:

1. Bentonite mine on Milos
2. Open-air natural drying and processing unit of bentonite on Milos
3. Iron melting process unit in a foundry
4. Automotive component from a foundry

## Markets/Segments

- Foundry
- Iron and steel making
- Environmental protection, construction projects
- Oil drilling
- Absorbents
- Paper Industry
- Other special applications

## Main End-Uses

- Binder for green sand foundry molds for metal casting
- Binder for the production of iron ore pellets
- Thixotropic additive for foundation engineering, diaphragm wall construction, grouting and tunneling
- Component of soil sealants
- Thixotropic additive for the production of drilling mud
- Pet-litter
- Additive in paper manufacturing, de-inking of recycled pulp and autographic papers
- Additive in detergents, desiccants, waste water treatment, wine purification

M I L O S



M I N I N G  
M U S E U M

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