

*Diatomite*

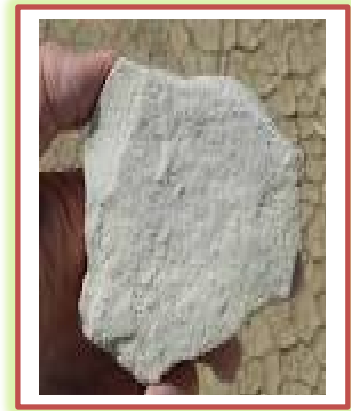


## Diatomite

Diatomite, also known as diatomaceous earth, is the naturally occurring fossilized remains of diatoms.

Diatoms are single-celled aquatic algae. They belong to the class of golden brown algae. Diatomite is a near pure sedimentary deposit consisting almost entirely of

silica. There are many diatomite deposits throughout the world, but those of high-purity which are commercially viable are rare.



The properties which make diatomite valuable include low density, high porosity, high surface area, abrasiveness, insulating properties, inertness, absorptive capacity, brightness, and high silica content.

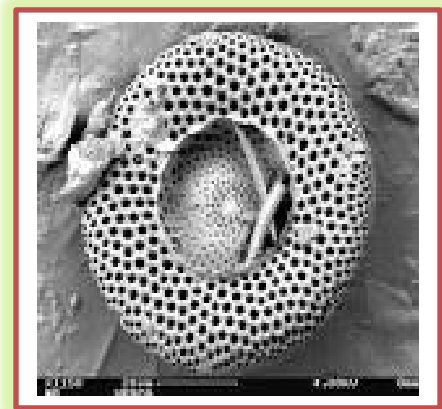
## Uses of Diatomite

Diatomite has a wide variety of uses, and is a component in hundreds of products, or vital to the manufacturing process of thousands more.

**Filter Aids:** The most important use relative of high-quality diatomite is as a filtering media.

The naturally occurring fossilized remains of diatoms have innate filtering characteristics due to their unique honeycomb structure. Their filtering qualities are used in pharmaceutical manufacturing, motor oil processing, and to

filter swimming pool water. For almost 100 years diatomite has been the workhorse of food and beverage processing. Almost every shelf in the grocery store contains a product which has been filtered by diatomite.



**Functional Additives:** In paints, diatomite alters glass and sheen, extends primary pigments, adds bulk and strength, controls permeability and enhances coating adhesion. In plastics, diatomite serves as an anti-blocking agent which helps in the separation of plastic parts in manufacturing, and in the separation of plastic bags by the consumer.

**Absorbents:** Due to such characteristics as porosity and high surface area, diatomite is highly absorbent and is very useful in the clean-up of spills in the automotive, industrial, janitorial and waste remediation industries.

**Soil Amendments:** When diatomite is incorporated into soil, it serves to reduce compaction, and increase water and air permeation. It also increases plant available water, firms soggy soils, loosens hard to work soils, provides better drainage, aids in nutrient transfer, and improves root growth. In such applications as golf courses, and other landscaped areas it helps absorb and hold water, reducing the amount of water used.

**Natural Insecticide:** When insects come in contact with diatomaceous earth, it absorbs their protective wax coating and their shells are damaged by the glassy diatoms. This combination causes them to die by dehydration. There is no survival and no built-up immunity as there is with chemical insecticides. Also, it does not break down as chemicals do.

Other examples of the universe of products and uses which benefit from diatomite include dental fillings, seed coatings, roofing compounds, adhesives, sealants, matches, oil drilling compounds, specialty concretes, and paper.



## Diatomite in Jordan

Diatomite is a sedimentary rock that consists mainly of micro-amorphous silica that is the siliceous remains of microscopic single algae cell called "Diatom".

### Location

The diatomite is located in Azraq area; 110km northeast of Amman, covered an area more than 150km<sup>2</sup>. Qa'a Al Azraq is referred to the whole area where a former lake believed to have been formed in Azraq depression of Miocene time.



### Reserves

Horizon	Reserve (mt)	Diatomite thickness (m)	Overburden (m)
First	1040	4.5-31	11-52.5
Second	212	2-20	37-92.5

### Chemical Properties

Component	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	MgO	Na <sub>2</sub> O	K <sub>2</sub> O	TiO <sub>2</sub> , MnO & P <sub>2</sub> O <sub>5</sub>
%	41-70.7	10-16	2.35-9.9	Traces	2-4	1-2	traces

Comparison between Jordanian diatomite and Danish Diatomite (Moler) as follows:

Components %	Jordanian Diatomite	Moler (Danish Diatomite)
SiO <sub>2</sub>	41-70	68-80
Al <sub>2</sub> O <sub>3</sub>	10-16	8-10
Fe <sub>2</sub> O <sub>3</sub>	2.35 - 9.9	5-7

## Mineralogical Properties

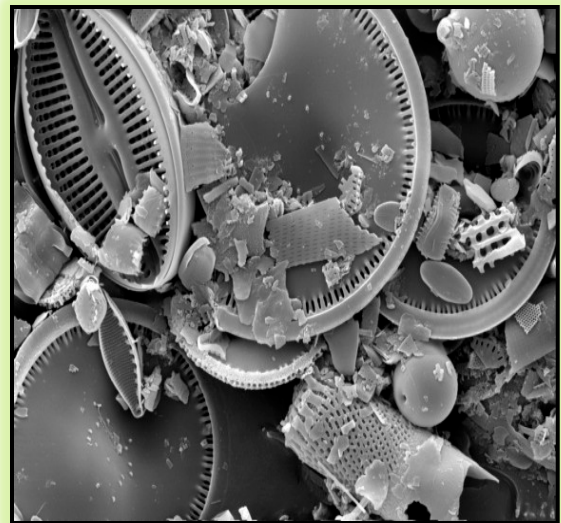
Azraq diatomite deposit is mainly composed of diatomite mixed with clay minerals. Illite/ smectite and kaolinite are commonly present. Overburden mainly composed of smectite, illite, palygorskite and kaolinite. Few gypsum beds mixed with clay are at top clay layers.

## Physical Properties

Oil Absorption	pH	Surface area	Dry density	Specific gravity
47-72gr/100gr	6.2-8.1	23-64m <sup>2</sup> gr.	666-791kg/m <sup>3</sup>	2.27-2.63

## Particle Size Distribution

Grain size	<2μ	<10μ	<20μ
Wt%	9.4 -16.3	82 - 94.5	93.3-99.5



## Investment Opportunities

According to the chemical and physical properties, the Jordanian diatomite could be used in the following industrial applications after simple treatments:

### Liquid Absorption

The high absorption capability of the raw and calcined diatomite indicated that could be used absorbent powders for liquid such as oil, fuel oil, liquid chemicals and transported toxic chemicals used in industrial applications.

### Adsorption of Toxic Pollutants

Scientific experiments carried out by researchers at the University of Jordan pointed out that Azraq diatomite has been found to be effective at removing toxic metals from contaminated water. Investigations showed that the Jordanian diatomite or diatomaceous earth has good sportive properties for various pollutants such as Cr, Pb, Cu, Cd, Hg, PO<sub>4</sub>, NO<sub>3</sub>, and phenolic.

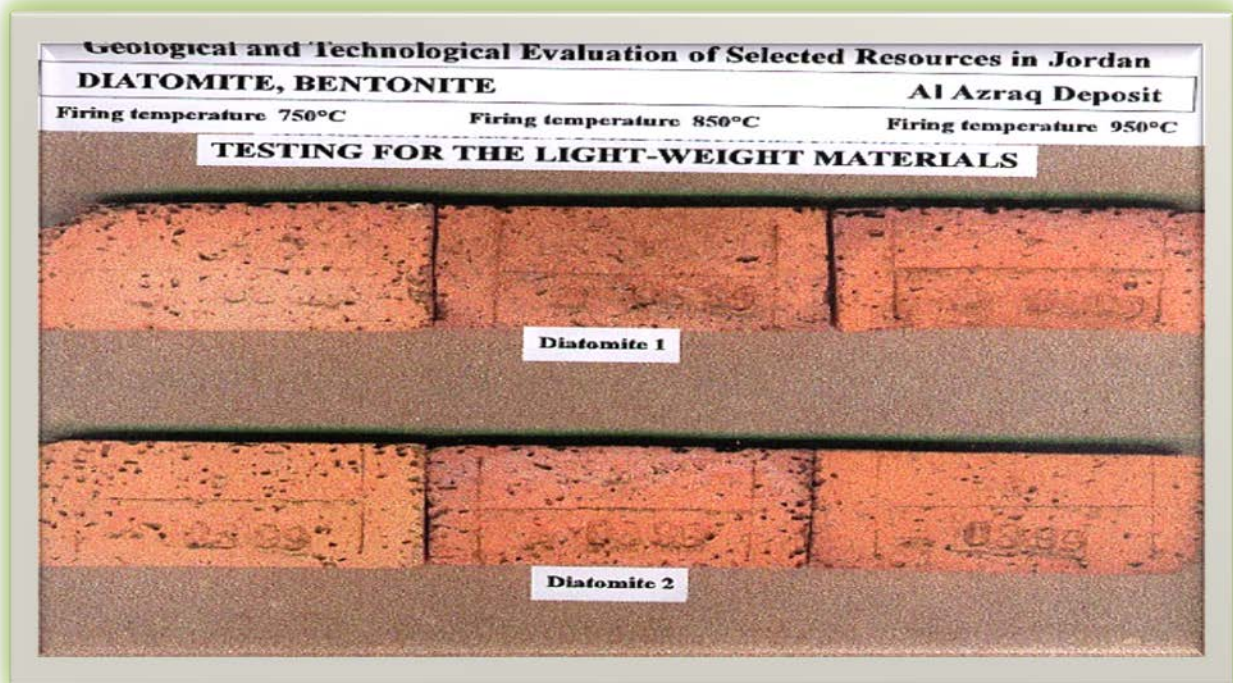


## Mild Abrasive and Polishes

Due to the delicate structure of the diatomite shells, Diatomite possesses hardness sufficient to produce abrasion on metal. It could be used as a mild abrasive on such surfaces.

## Light weight construction mass

Clayey diatomite with SiO<sub>2</sub> content about 65% are used as a raw material for manufacturing of the light weight construction masses. Advantage of related construction products is consisting in both the sonic and the temperature insulating properties.



Note: For More Information and inquiry can be contacted at the following address:

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