How much Volclay® to use

HOW MUCH TO USE

The amount of VOLCLAY® needed to produce a satisfactory seal will vary with conditions. Minimum application rates for several of the most common soils are tabulated below:

MINIMUM APPLICATION RATE

Kg per sq. Metre

SOIL TYPE	SG	SP
Fractured Rock or Gravel	10	8
Clean Sand	10	8
Silty Sand	8	5
Sandy Silt	8	5
Clay	6 to 9	7

VOLCLAY SG is granular bentonite applied via the sprinkle method

VOLCLAY SP is posdered bentonite applied via the blanket method, pure or mixed.

Date shown is for 50mm - 75 mm seal.
Conditions may require a thicker seal.

The depth and character of cover material will vary with the severeness of the disturbing actions. In silty to sandy soils, the water line is a critical zone requiring a protective layer above the VOLCLAY® layer – usually a minimum of 150mm of soil or rock. In contrast, the bottom area of a deep pond with constant water level will require little or no protective cover.

PROTECTIVE COVER

The need for a layer of cover material above the VOLCLAY® layer will vary widely with conditions. Bank and bottom areas must be protected that are subjected to:

1. high water velocities
2. wave-cutting
3. wading and burrowing animals
4. fluctuating water depth
5. active root growth

VOLCLAY international

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VOLCLAY

Effective Water Stoppage

VOLCLAY international

What is Volclay®

VOLCLAY® is a special kind of bentonite clay. It has practically the same chemical constituents as other clay substances but it has a unique molecular structure which accounts for its remarkable ability to absorb many times its own weight of water and to swell enormously in the process the increase at full wetting ranging up to 15 times its dry bulk.

VOLCLAY® bentonite's swelling ability is reversible; it can be dried and reswelled an infinite number of times. It will exhibit less swelling when wetted with hard water than with soft water or water of low mineral content.

Produced in the Black Hills of Wyoming and South Dakota. VOLCLAY® occurs naturally in beds from two to three feet thick, usually holding 30 to 40% moisture. It is dug by open pit methods, dried, and then powdered or granulated for commercial use. Ongoing reclamation of processes are employed by allowing a speedy return of surface mined land back to productive use.

VOLCLAY® is inert except for a light alkalinity, containing only an occasional trace of organic matter. It is harmless to the human system, having been used for many years in varied applications ranging from an ingredient in medicines to a filtering agent for wine and drinking water. It imparts no taste or odour to water.

How Volclay® Works

Each small grain of dry VOLCLAY® is an aggregate of millions of smaller particles. When sprinkled very slowly into water, these grains of VOLCLAY® avidly draw water into their spongelike structures, causing each grain to expand like an accordion. When wetted in this manner and then stirred, a single cubic centimtre of dry VOLCLAY® will separate into more than 600,000,000,000 extremely small plate-like particles, each flake surrounded by a hull of "bound-water". Thus, if VOLCLAY® is allowed to satisfy its thirst for water, it swells.

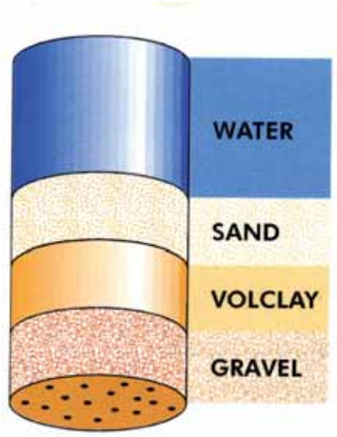
Under confined conditions, such as when VOLCLAY® is placed dry as a buried membrane or admixed with a pervious soil, the swelling of VOLCLAY® will be retarded and the passage of water impeded. On contact with water, the grains at the surface of the confined mass of VOLCLAY® will swell, pressing more tightly against their neighbours and the swollen grains will reduce the amount of water that can reach the next layer of grains so reducing the rate of passage of water.

VOLCLAY® never permanently sets or hardens; it has existed underground in its present mineral form for many thousands of years. Its flexible, expanding, and self-sealing properties are important advantages of VOLCLAY® when used for water impedance purposes. These properties are especially important in situations where foundation cracking, such as caused by uneven settlement, earth tremors, or faulty sub-grade materials, can develop after placement of the VOLCLAY® barrier.

A Demonstration of VOLCLAY® Effectiveness

Puncture the bottom of a container with a number of holes to make a sieve and cover the bottom with 25mm of gravel or coarse sand. Water will flow through freely. Now cover the sand or gravel with 10mm of VOLCLAY® SG and put a layer of sand over it. Fill with water. It will not penetrate!

An earth – VOLCLAY® mixture can be substituted for the straight VOLCLAY® in the above experiment, and the result will be practically the same.



Sealing Ponds & Lagoons

The use of bentonite such as VOLCLAY® for water impedance purposes has grown steadily in recent years, having been used in major structures such as the coffer-dams across rivers during construction of dams and as cut-off trench material on waterside construction sites.

A few of the applications of this unique and useful material are outlined in this bulletin. If you have any questions not answered by this information, remember that we are always glad to offer advice based on many years of experience. Send us all possible data concerning your seepage problems and we will answer promptly with suggestions and recommendations.

For large complicated seepage problems, we recommend that you obtain local engineering help in addition to the assistance we can provide.

Where possible, VOLCLAY® used for sealing porous subsoil should be placed in dry form. In this way, its swelling and self-sealing potential is best utilised. This is not always feasible; therefore, wet placement methods are sometimes necessary.

SURFACE PREPARTATIONS

If possible drain the area to be sealed by VOLCLAY®. Clean or remove obstructing deposits of sand, silt or vegetation. Add gravel, rock or coarse sand to stabilise eroding or cutting areas of the banks or bottom. Level and smooth with a drag. Before spreading VOLCLAY®, wait until the surface soil is dry.

Not all these steps are possible in every case; complete as many as possible. Ignoring the need for such work will shorten the life and decrease the effectiveness of the seal produced with the VOLCLAY®.

USE OF FILLER MATERIAL

Fill large holes and crevices in the bottom or banks with a mixture of VOLCLAY® and a sandy silt filler.

Mix the VOLCLAY® into the filler soil before placement in the holes or crevices. Use about 1 part of VOLCLAY® to 5 parts of a sandy silt soil (by weight). This mixture may be applied (1) in holes and crevices, (2) as a blanket material over coarse rocky materials with not less than a 25mm layer thickness, or (3) as a mixture for multiple-dam applications where the mixture is washed into place.