



High performance pool filter media

TECHNICAL INFORMATION FOR THE POOL PROFESSIONAL

WHAT IS ZELBRITE

ZB is an advanced filtration material that outperforms the traditional pool filtration mediums of sand and Diatomaceous Earth.

It is manufactured from zeolitic material which is formed as a result of volcanic activity. There are a range of different zeolitic materials produced with varying properties. The key active ingredient in Zelbrite is the mineral clinoptilolite. Clinoptilolite has a proven scientific track record in water treatment and Zelbrite now brings these advanced filtration features which produce superior water quality and economic benefits, to the pool and spa industries.

THE ACTIVE INGREDIENT CLINOPTILOLITE

Clinoptilolite is a mineral with very special properties.

One of its properties is that it has an infinitely extending "cage" like structure resulting in large internal pore spaces.

It also has a very high surface area, in the range of 20 to 30 m² per gram. This is best appreciated as a teaspoon of Zelbrite having enough surface area to cover a football field. Imagine the effective surface area in a Zelbrite filter!

A further amazing property of clinoptilolite is that it is chemically active. Within its structure it has calcium, magnesium and sodium ions which it can exchange for pollutants such as ammonium which will be present in the pool water. This process is called "ion-exchange" and is an important mechanism in Zelbrite providing a chemical treatment action in tandem with physically trapping pollutants in water.

In addition to Zelbrite's ion-exchange capacity, it also has the ability to adsorb a range of pollutant organic-molecules present in swimming pool water. This ability results from its unique surface structure and surface electrical charge on the surface of the crystalline structure and from a secondary pore structure existing between individual crystals which can trap larger organic molecules.

WHY ZELBRITE WORKS AS A SUPERIOR FILTER

With all the unique properties of clinoptilolite working in Zelbrite, the pool water not only gets a superior "physical" treatment but an additional "chemical" treatment, resulting in cleaner pool water. No other filtration medium on the market (such as sand and DE) can produce this "double whammy" treatment of pool water!

The difference in "physical" performance can be explained by the fact that the surface of sand is quite smooth and non-porous. Contaminants can only be trapped between the sand grains. Zelbrite not only traps contaminants between grains, but additionally traps contaminants onto its vast pitted surface area and within its porous structure. Thus its ability to attract, capture and hold dirt and other contaminants is far greater than conventional filtration materials. It also traps finer particles such as colloids and can filter to diatomaceous earth standards or better. This translates to exceptional pool-water clarity and sparkle.

From the "chemical" perspective, it is important to understand that most contaminants in pool water are of organic origin produced by bathers (human detritus from skin cells to urea). These complex organic substances containing nitrogen eventually breakdown to ammonia/ammonium. Chlorine, used for disinfection, combines both with the ammonia and with these organic pollutants, to form both irritating and dangerous compounds.

For example, when ammonium ions mix with chlorine, chloramines are formed (these register as combined chlorine in testing). Chloramines are the compounds generally responsible for the acrid odours and burning eyes in pools.

By removing ammonium by ion-exchange, Zelbrite significantly reduces the propensity to form these compounds. Additionally, the chemical adsorption qualities of Zelbrite, remove harmful organic pollutants and again lessen their interaction with chlorine.

Besides the superior water quality produced for bathers, chlorine usage is markedly reduced as ammonium and organic contaminants are removed, and the chlorine is utilised in disinfection (free chlorine) rather than combining (combined chlorine) with contaminants.

As a consequence the ancillary chemical requirements are reduced and total dissolved solid (TDS) build-up is also reduced.

HOW LONG DOES ZELBRITE LAST

The active component clinoptilolite is encased in a very solid and stable mineral complex which results in a very robust Zelbrite filtration particle.

In fact most zeolitic material around the world is quite soft and would be totally unsuitable to withstand the rigours of filtration, backwashing and constant contact between particles.

As a result Zelbrite has a prolonged life, similar to sand, due to its exceptional hardness and resistance to attrition.

The physical properties of a Zelbrite filter keep working year after year with normal filter maintenance such as backwashing.

On the chemical side, the Zelbrite can be considered as a "chemical sponge". Once the sponge is fully saturated, it needs to be regenerated if all the chemical benefits are to be retained.

REGENERATION OF ZELBRITE

In order to restore the "chemical" capacity of Zelbrite, the ion-exchange process is effectively reversed. This is achieved by making sodium ions displace the captured ions such as ammonium.

In practice, this is simply carried out by fully soaking the filter with a 10% salt solution (1kg of NaCl for every 10 liters) for 6 to 12 hours, or simply overnight. For each kilogram of Zelbrite, approximately 1 litre of the 'regenerant' solution will be required.

After soaking for the required time, the recharged filter should be backwashed in the normal way before bringing it back to service.

For detail on regeneration for large commercial installations, please contact our company for additional information.

A SUMMARY OF THE BENEFITS OF THIS AMAZING FILTRATION MATERIAL

The benefits can be grouped into the following general areas:

Water quality, Health benefits, Environmental and Economic benefits:

Water quality benefits:

- Higher dirt holding capacity and removal of finer particles (down to diatomaceous earth standards or better) provides cleaner pool water which can be measured as lower suspended solids (SS).

A SUMMARY OF THE BENEFITS OF THIS AMAZING FILTRATION MATERIAL

- Chemical ion-exchange and also adsorption lead to a marked reduction of ammonia/ammonium and a reduction in a range of organic contaminants. This can be measured by taking ammonia readings and combined chlorine readings which will be lower.

- As a result of lower chemical usage, pool water total dissolved solids (TDS) will be significantly lower. This can be confirmed by the measurement of TDS

Health Benefits

- The unpleasant effects of stinging eyes, irritating or dry skin, acrid chemical smells are mostly eliminated. These are generally caused by mono-and di-chloramines formed by the reaction of ammonia/ammonium (present from the breakdown of human organic detritus) and the chlorine used for disinfection. Zelbrite by removing ammonia/ammonium from the water prevents the formation of these irritating and dangerous compounds.
- Water quality and health specialists believe that some of the compounds formed between the interaction of ammonia/ammonium, organic contaminants and chlorine are potentially carcinogenic. By removing ammonia/ammonium and organic contaminants with Zelbrite filtration media before they interact with chlorine, the risk of forming these dangerous compounds is dramatically reduced.
- Bacteria causing infections and disease seek protection wherever they can. They will inhabit the dirt particles in a pool and to some extent be protected from chlorination. By providing a cleaner pool, Zelbrite enhances the effectiveness of chlorination to eradicate these bugs and provide a safer and healthier swimming pool.

Environmental factors

- The greater dirt-holding capacity of Zelbrite means that there is less frequency of backwashing and hence less discharge of wastewater to the environment.
- The chemical action of Zelbrite and its "buffering" capacity results in a more efficient use of chlorine and a reduction in other chemicals used for pH control. As a result the total dissolved solids (TDS) discharged to the environment is lower.

A SUMMARY OF THE BENEFITS OF THIS AMAZING FILTRATION MATERIAL

Economic

Although Zelbrite will initially cost more than filter sand, a consideration of economic benefits shows that 'life-cycle' costs are in fact much lower. Key economic benefits include:

As the frequency of backwashing is lower, this can give considerable savings in water costs. As the backwash water contains 'heat' and chemicals that have been applied, these have to be replaced. Therefore there are immediate savings from less frequent backwashing in water costs, heating costs and chemical cost. Backwashing has often been reduced by up to 50%.

- The more efficient use of chlorine (resulting from the removal of ammonia/ammonium and organic contaminants) leads to very significant reduction in chlorine usage. Typically chlorine usage reductions of 30% or greater are achieved.
- The natural 'buffering' characteristics of Zelbrite and lower use of disinfectants results in lower use of chemicals (such as carbon dioxide) for pH control.
- The less dense nature of the Zelbrite filtration particle and its specific structure results in the filter medium being less restrictive to water flow than sand. This manifests ultimately as a saving in power/electricity.
- With specific equipment such as salt chlorinators (installed downstream of the Zelbrite filter) the electricity consumption is less. This results in the extension of the plate life of the chlorinator.

THESE REMARKABLE ECONOMIC SAVINGS IN THE USE OF THE ZELBRITE FILTRATION MEDIUM ARE NOT ACHIEVED WITH ALTERNATIVES SUCH AS SAND AND D.E.

THERE ARE COMPELLING REASONS FROM THE POOL AESTHETIC, WATER QUALITY, HEALTH AND SAFETY, ENVIRONMENTAL AND ECONOMIC POINTS OF VIEW TO NOW USE THIS ADVANCED FILTRATION TECHNOLOGY IN SWIMMING POOLS AND SPAS.

For further information on this new advanced pool filtration medium please contact:

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