

PURIFIBER®

REMOVAL OF OILS FROM POOL WATER – D.E. TYPE FILTERS PURIFIBER® vs. DIATOMACEOUS EARTH

A. The Process

1. **DE:** In vertical grid filters, a fresh charge of D.E. migrates rapidly from the inlet at the top of the canister to the bottom. Analysis of the grids and the bottom of the canister after charging shows light caking of D.E. at the top of the grids with increasing thickness to the bottom of the canister. There is nearly always residue settled to the bottom of the container. The rapid migration past the grids and deposit of the material is a direct result of the density and heavy weight of the D.E.
2. **Purifiber®:** In vertical grid filters, the ultra-light weight of the Purifiber® material allows for the accumulation of oil. Due to the even slurry, caking on the grids is uniform from the top to the bottom with no residue or sediment at the bottom of the can. Flow rates on start up are usually greater with Purifiber® even though the clarity level is at 2µ or better. The fibrous nature of Purifiber® media allows for coating of the entire grid surface, even with small ruptures or less than perfect seals. The result is 100% filtration.

B. Oils: The Problem

1. **D.E.:** In problematic pool & spa situations with higher than normal oils present (high bather loading), significant quantities of oils simply flow through the filter and return to the vessel. This can create the illusion of lower long term operating pressures since so much of the light oils are not being trapped by the D.E. In fact, however, the oils that are trapped by the D.E. tend to bond the filter cake to the grids and eventually impregnate the grid material itself. The end result is large volumes of water needed to backwash (incompletely) the D.E. from the grids, fouled grids and increasing build-up of D.E. at the bottom of the filter. Un-removed oils will result in scum lines in the pool/spa and reduced water clarity. Continued operation with D.E. will require filter tear down, clean out and grid degreasing on a regular basis due to rising start-up pressure after each backwash. Three to four back washes with D.E. is the most one can expect before tear down is required.
2. **Purifiber®:** As discussed above, the oils will concentrate at the top of the vertical grid filter. Since Purifiber® coats grids evenly from top to bottom, the filter cake at the top is able to deal with the added oil loading. Purifiber® is a cellulose filter media, produced from virgin pulp. As such, Purifiber® has a natural affinity for oils. Rather than merely trapping a portion of the oils as with D.E., Purifiber® actually “wicks” the oils from the water. By absorbing the oils into the Purifiber® filter cake, the oils are not permitted to reach the filter grid material, preventing filter fouling. Because the cellulose filter cake is composed of soft, cellulose fibers that “weave” a cake onto the filter grid, the cake easily releases upon backwash.

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With D.E., the abrasive nature of the diatoms results in penetration of the D.E. into the grid material, making 100% backwash virtually impossible. It is for this reason that when changing from D.E. to Purifiber® on older filter systems acid washing of the grids is recommended to remove the D.E. and other deposits (lime, etc.) from the filter material (septum).

C. Correct Usage of Purifiber® in Severe Oil Situations

1. Start with a clean filter canister and clean filter grids.
2. Use approximately 1/3 the weight of Purifiber® as previously used D.E.
3. Note start-up filter pressure; document filter pressure on each routine service call.
4. Backwash when pressure indicates it is required. NOTE: It should take far less time and water to remove the spent Purifiber® cake than was previously experienced with D.E.
5. Carefully monitor and document filter pressures on each service call and frequency of backwashes.
6. Proper dosages of commercial grade enzyme treatment will assist in breaking down the accumulation of oil build-ups in and around the pool. Used according to manufacturer's directions, this will accelerate the time required for the Purifiber® to remove the oils from the system.

D. The Bottom Line

It should be remembered that D.E. has very little capability in actually removing oils from the water. Although trapped in the filter cake, upon backwash much of the oil is released and may be retained in the system. In addition, the oils passing through the D.E. foul the grids and remain on the filters. Oil build-up is inevitably the result. When such a filter is converted to Purifiber® often the filter cycles are initially shorter than previously experienced with D.E. What is initially taking place is that the Purifiber® is removing the accumulated oils from the water. As the oil build-up is reduced through backwashing of the spent Purifiber®, filter runs will lengthen, pool clarity will greatly improve, and scum lines will gradually fade. The process can be accelerated over the first 2 to 4 weeks by the appropriate dosing of the pool with oil ingesting enzymes.

In any event, the need to routinely break apart the filter and clean & degrease the canister and grids will be dramatically reduced. Time, labor, chemicals, and water usage will all be significantly reduced. In addition, the Purifiber® sludge is bio-degradable once it leaves the filter, so it is safe for discharge to sanitary sewers. Direct discharge onto a lawn will result in the Purifiber® breaking down naturally over time much like grass clippings. Ultimately it is reasonable to anticipate filter run improvements of 3 – 6 times longer than previously experienced with D.E.

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