

**FACT SHEET No. 18**

## FILTRATION . . . .

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A swimming pool must be filtered to remove insoluble particles and to produce clear water. Clear water is desirable not only for aesthetic reasons, but for hygiene and safety.

The quality of filtration depends on the size of the filter media. The finer the media, the higher the purity of water obtained.

Pool water filtration is a balance between water quality and water quantity. Either quality or quantity must be sacrificed to enhance the other. The finer the filter media, the faster the increase in pressure across the filter bed, and the more frequent the need for backwashing or filter replacement.

There are three types of filters in common use in the marketplace today, these are High Rate Sand, Diatomaceous Earth and Cartridge.

### **HIGH RATE SAND FILTER**

The high rate sand filter is the most commonly used filter on both domestic and commercial pools.

The high rate sand filter has one grade of sand - either 16:30 or the finer grading of 18:30 and the sand bed is 200-310mm (8-12 inches) deep, depending on the size of the tank.

Water is forced through the sand bed at such a high rate that a form of mechanical flocculation takes place. The electrical charges are literally scrubbed off allowing the dirt particles to agglomerate and form larger particles. On the next pass through the filter these larger particles are collected.

One of the benefits of the sand filter is its simplicity. When the bed of sand is clogged with dirt, the pressure inside will register on a gauge which indicates the need to flush it out or backwash.

This means switching off the pump and turning the valve to 'backwash'. When the pump is switched back on, the flow of water is reversed and washes up through the sand bed and removes the dirt. After backwashing the valve can be returned to the 'filter' position for normal operation.

The dirty water from the filter is normally discharged into a sewer gully or it can be used to water lawns or shrubs.

Sand filters will normally remove particles down to about 15 microns in size. The sand in the filter will normally only need changing approximately every 5 years, though this will depend on factors such as pool usage, size etc.

### **DIATOMACEOUS EARTH (DE) FILTER**

Diatomaceous Earth is a powder made up from finely crushed coral-like rock.

Inside the DE filter are a series of hollow plastic frames which can be square, round or tubular, depending on manufacturer. Over these frames is stretched a polyester covering or pad.

Water from the pool is forced into the filter tank and through the pad. The water then runs through the centre of the filter and returns to the pool.

To begin filtration, the Diatomaceous Earth is mixed into a slurry and tipped into the skimmer box (with the pump running). It is sucked into the filter, forming a cake on the outside of the pad. As water passes through the pad it must also pass through the cake of D E, where filtering takes place. The DE cake drops from the pad when the pump is stopped, then reforms again when the pump is started.

Since the grains of DE are so fine, this type of filter has superior filtration qualities. It can remove particles down to approximately 5 microns in size. When the pressure rises it is an indication that the DE cake is clogged and the filter needs backwashing.

This is carried out by turning off the pump and turning the valve to the 'backwash' position. What must be remembered is that the used DE cake is also flushed away. Therefore it must be replenished following every backwash.

### **CARTRIDGE FILTER**

The cartridge filter in some ways incorporates the benefits of both sand and diatomaceous earth. The filtering medium is a concertina shaped cartridge providing a large filter surface within a relatively small housing. This large filter area means the filter cycle, or period between cleaning, is increased.

Unlike other filters, there is no provision for backwashing. When the cartridge is clogged, it must be removed for cleaning. Filter cartridges are generally hosed off. However, those used in a heated pool or spa may need to be soaked in a cleaning solution.

One of the advantages of the cartridge filter is that the method of cleaning makes it ideal for use in unsewered areas or where disposal of waste water is a problem.

The filtering ability of this type of filter is somewhere between sand and diatomaceous earth and will remove particles down to approximately 8 – 10 microns in size.

Always refer to the manufacturer for installation and maintenance of filters.

For further information on building, renovating or maintaining a pool, contact;

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