Water Filtration

Ultra Filtration

Ultrafiltration (UF) is a type of membrane filtration in which hydrostatic pressure forces a liquid against a semipermeable membrane. A semipermeable membrane is a thin layer of material capable of separating substances when a driving force is applied across the membrane.UF can be used for the removal of particulates and macromolecules from raw water to produce potable water. It has been used to either replace existing secondary and tertiary filtration

When treating water with high suspended solids, UF is often integrated into the process, utilising primary (screening, flotation, filtration) and some secondary treatments as pre-treatment stages.

Nano Filtration

A nano-filtration membrane is also ion-selective. This is the ability to distinguish various ions from one another. Because a nano-filtration membrane collects solid loaded groups in its membrane structure, electrostatic repulsion/attraction forces may occur between the components in the liquid and the (nano-filtration) membrane surface, which results in a certain degree of ion selectivity. Based on the sieve effect (pore size 1 nm) and the molecular size of chlorides (0.12 nm in size) and sulphates (0.23 nm in size), these ions are expected to diffuse through the membrane. Despite this, the retention for chlorides is maximum 90 % and that of sulphates is minimum 90% (also see effectiveness paragraph).

A nano-filtration membrane can be tubular, spiral or flat in shape. A spiral module (see figure below) consists of polyamide membrane layers wound in spiral form. At the edge of the membrane, the wound layers are sealed using a cap. A permeate collection tube is located in the centre of the wound module. All the clean water is passed through the spiral windings and collects in this tube.

Water Softener

A typical water-softening system removes calcium and magnesium ions from hard water and replaces them with sodium ions. Calcium and magnesium ions interfere with the action of household soaps and detergents, but sodium does not. The water-softening process thus helps detergents to more effectively remove dirt and oils from clothing and dishes. It also helps soaps to give a “slippery” feel to your skin when you wash. Most manufacturers of water softeners recommend that you reduce the amount of soap and detergents you use after installing a water softener.

As water enters the softener, it passes over a resin bed in a special tank. The resin consists of tiny beads of a plasticcalled styrene. These beads attract and hold sodium ions and exchange the sodium for hardness ions whenencountered. Over time, the resin becomes saturated with hardness ions and no longer removes hardness materials.The softener goes into a “regeneration” to flush hardness materials to the drain and refresh the resin with sodium.Regeneration is typically programmed to take place in the middle of the night when little or no water is in use.