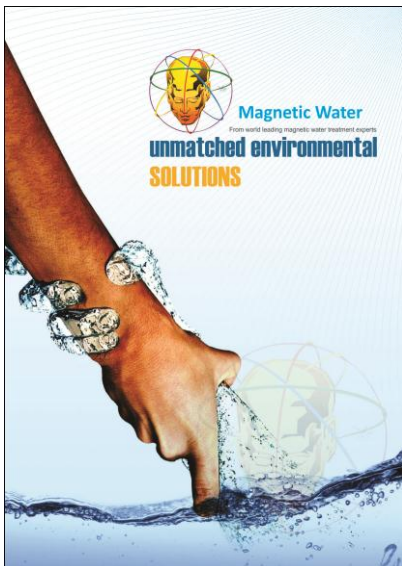


2014

Magnetic Water - Earths Own Technology

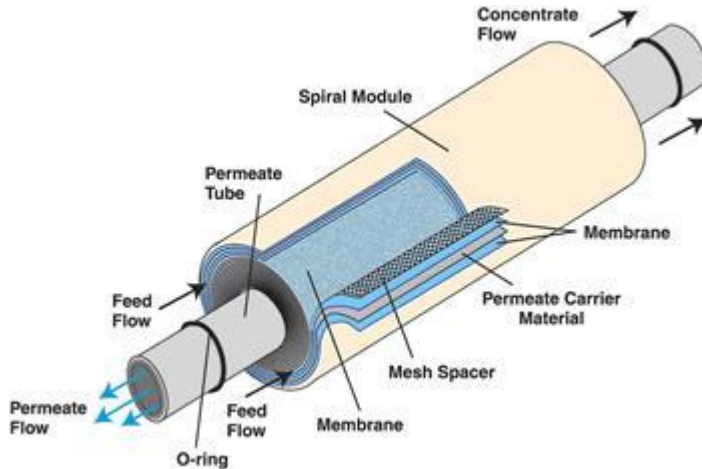


Magnetic Enhancement of RO Systems



Magnetic
Technologies
LLC UAE
[V2]

Advantages in 'Magnetizing' post treated R.O Water /Chlorinated water



Introduction:

R.O Water: The water is de-mineralized. Since most mineral particles including magnesium, calcium, potassium, iron etc, being larger than the water molecules are removed by the semi-permeable membrane of the R O system. Removing the minerals makes the water acidic.

Drinking acidic water will not help maintain a healthy pH balance in the blood, which should be slightly alkaline. Like acidic beverages, acidic water will often cause a leaching of essential minerals such as calcium and magnesium from the body, especially from the bones and the teeth, in order to neutralize the acidity.

This will produce mineral deficiency which will upset the balance of our system, leading to undesirable effects. When body water become more acid than alkaline (pH above 7), our body tends to produce more free radicals, those atoms or groups of atoms which are unstable and damage organ cells, causing cancer.

(An alternative purification technology which is recognized by the U.S. EPA (Environmental Protection Agency) as the best available technology for removing contaminants without demineralization, is multi stage activated carbon filtration)

Chlorinated water: Un-fortunately, the primary reason adding chlorine to water for disinfection is not because it is the safest or most effective, because it is a lesser evil and the cheapest known technology to dis-infect water.

What the studies have found is that chlorine itself is not the main problem; rather it has to do with what happens when the chlorine mixes with any type of organic matter in the water.

In the 1970s scientists discovered that when chlorine is added to water, it forms Trihalomethanes (THMs), one of which is chloroform. THMs increase the production of free radicals in the body and are highly carcinogenic (cancer causing). Water memory stores this energy even after filtration

If not removed has serious implications to our health.

Cancer risk among people using chlorinated water is as much as 93 percent higher than among those whose water does not contain chlorine," according to the U.S. Council of Environmental Quality.

Sadly, chlorine in drinking water is not the only problem. According to the Journal of Public Health, "Up to two-thirds of the harmful effects of chlorine are due to inhalation and skin absorption while showering." since the shower is warm or hot, our pores are wide open and our skin readily absorbs the chemicals. And then there is the cosmetic effect of chlorine – it strips the protective oils from the skin and hair, causing excess drying and wrinkling of skin as well as dry and brittle hair.

Magnetizing advantage: Healthy cells require the conditions of alkalinity and high molecular oxygen (O₂) to produce ATP's. (Adenosine Tri Phosphate carry chemical energy within cells for metabolism).

When clusters of bi-polar water molecules are subjected to magnetic field, they sever their hydrogen bond with each other and break their cluster and exist as single molecules, for an effective period of time. This will improve their hydration properties excellently as their surface tension and viscosity is reduced. Because magnetized water is wetter and therefore more penetrating, it furthers better assimilation of the various nutrients and vitamins in the cells and exfoliations of toxins.

Most importantly, since cell membrane's are selectively permeable, absorptions of nutrients through them are possible when they go through 'aquaporins', specialized protein carrying channels , which allow nutrient ions only when they come in water having small molecules cluster size or when water molecules exist independently. Something which is achieved when water is exposed through specially induced magnetic fields. Which cannot happen in the best of R.O Water systems.

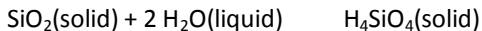
Magnetic treatment of water not only removes chlorine from the municipal/tap water but also removes all the harmful dissolved gases and chemicals from the water. It adds oxygen to the water by producing hydroxyl ions, which are very important for living cells. Magnetic water is structured water addressing all the requirements of body.

The Silicon Challenge

Silicon is never found in nature in free form. In crystallized form it is only reactive under conditions of extremely high temperatures. Silicon is part of various minerals, from which it may be released during weathering processes. It is also released under water during volcanic activity. It is a common contaminant in most waters because of the many natural deposits that dissolve in water over time. Natural physical and chemical weathering processes also produce many extremely small particles or colloids of silicate materials. The solid crust of the earth contains 80 to 90 compounds of silicon such as silica or silicon dioxide. Most silicate salts are only slightly soluble in water and are widely distributed in nature. Minerals such as asbestos, mica, talc, lava, etc. contain silicates.

Silicon compounds differ in water solubility.

Silicon oxide is relatively water insoluble compared to other minerals. Upon dissolution the following equilibrium is formulated:



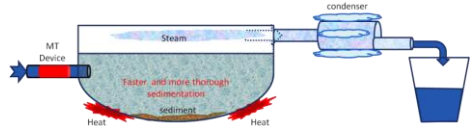
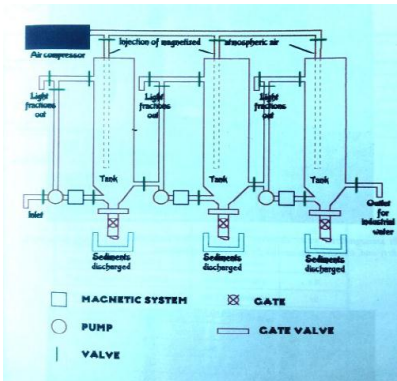
This balance contains silicic acid, a weak acid that also forms during silicon mineral hydrolysis:



Silicon dioxide has a water solubility of 0.12 g/L, whereas for example silicon carbide is water insoluble.

Silica (SiO₂) is an oxide of silicon, and is present in almost all minerals: It is found in surface and well water in the range of 1 - 100 mg/l. Silica is considered to be colloidal in nature because of the way it reacts with adsorbents. A colloid is a gelatinous substance made up of non-diffusible particles that remain suspended in a fluid medium. *Silica is objectionable in cooling tower makeup and boiler feed water. Silica evaporates in a boiler at high temperatures and then re-deposits on the turbine blades. These deposits must be periodically removed or damage to the turbine will occur.* Silica is not listed in the Primary or the Secondary Drinking Water Standards issued by the US EPA.

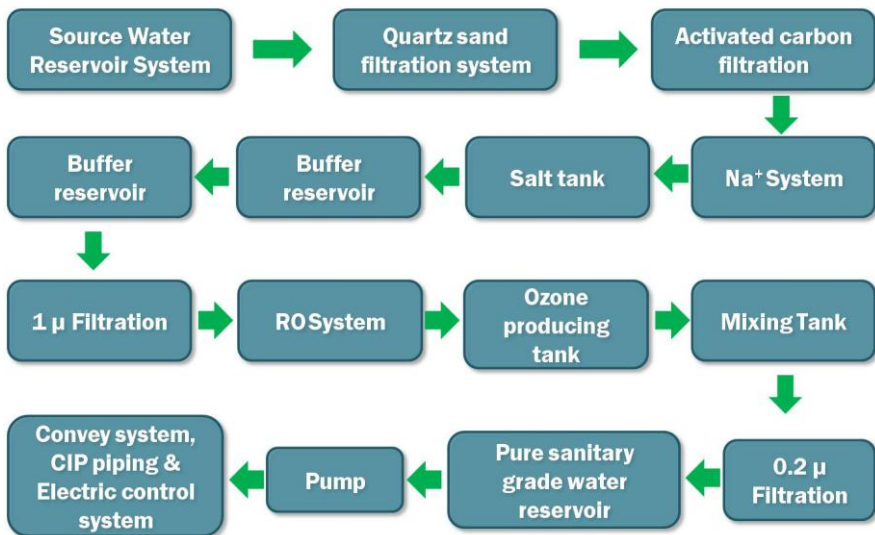
Two options of MT removing Sediments



MT enhanced System for heavy suspended materials removal

MT enhanced dissolved material sedimentation

PROCESS OF MINERAL WATER PURIFICATION



Processes involved in mineral water preparation:

Chlorine dosing System: (Cl₂)

Raw water may contain living micro-organisms and organics which are objectionable to R.O. Membrane as it may cause fouling to deteriorate the performance. Even water may contains ferrous which can be oxidized to ferric oxide which is settle down in storage tank. We have offered a Hypo chlorite dosing system for this purpose. About 3-4 ppm of

sodium hypo chlorite solution is dosed in raw water storage tank. This reacts with water to form a hypo chlorite acids which acts as disinfecting agent.

For this purpose one no. of HDPE hypo chlorite solution preparation tank along with One nos. of dosing pumps are provided. Required suction / discharge pipe work in pvc construction is provided with isolation valves. Dosage rate is adjusted as per the actual requirement, which may vary on case to case basis.

Raw water storage tank: (RWST)

One No. of Raw water is required in for storage of chlorinated water having appropriate capacity. The tank is fitted with PVC pipe work & isolation valves and suitable type of level indicator.

Raw water supply pump: (RWP)

A Horizontal Centrifugal type of pump in Stainless Steel construction has been provided for supplying Raw Water to Pressure Sand Filter Unit. Necessary Suction / discharge pipe work in s.s construction with isolation valves are also provided up to PSF Unit.

Pressure sand filter: (PSF)

Raw Water is first filtered by filtration unit in series prior feeding R.O.Plant. Pressure Sand Filter Unit is provided for removal of suspended matters & turbidity from raw water. PSF Unit is a SS vertical Pressure Vessel. Internally, it is fitted with bottom collecting system. A uniform grades silica quartz sand is charged on the supporting media of pebbles and gravels. This unit is fitted with SS frontal pipe work and Multiport Valve externally. During service cycle water is passed in down ward direction through sand bed, thus entrapping suspended matter & turbid particles. Over a period of time, sand bed gets choked due to suspended matters resulting higher pressure drop and lesser flow. At this stage filter bed need to be backwashed.

When pressure drop across the sand bed increases beyond the specified limit (0.5 kg/cm²) or quality of filtered water deteriorates, whichever is earlier. Regeneration involves backwash & rinsing of Sand Bed as below. For backwashing service water is passed in reverse direction of service cycle to loosen the filtering media bed. Due to this, entrapped suspended matters get free and come out along with effluent water. Backwashing is continued for about 10- 15 minutes or till the effluent coming out is clear.

For Rinsing of Sand Bed : Service water is passed in down ward direction to settle down the sand bed. The effluent water is drained for about 5 minutes time to ensure all unclear water is drained down.

Activated carbon filter: (ACF)

Natural water may contain Colour, Odour, Chlorine & Organics in different proportion, which is undesirable for potable application, and hence, it is necessary to remove the same from water. If raw water is chlorinated for die-infection, it is necessary to remove the free Chlorine feeding to R.O System. Chlorine being a strong oxidizing agent, it damages R.O.Membranes. Activated Carbon can remove Chlorine, Odour, & Colour while passing the water through carbon bed along with Odour & colour. This Carbon granules having larger surface area and specific property to absorb organics. ACF Unit is a FRP vertical pressure vessel. Internally it is fitted with strainer on bottom collecting system. The unit is fitted with SS frontal pipe work & MPV externally. A granular activated carbon is charged on the supporting media of Coarse & Fine Silex. During service cycle water is passed in down ward direction through Carbon Bed, which removes Chlorine & Odour from water.

When pressure drop across the Carbon Bed increased beyond the specified limit of (0.8 kg/cm²) or quality of filter water deteriorates, whichever is earlier the unit is isolated for regeneration. The regeneration involves, backwashing & rinsing of Carbon Bed. Over a period of time, life of carbon gets exhausted which can be checked during laboratory testing. Particularly iodine value is most important for this application. Generally carbon is replaced once in a year.

SMBS Dosing system: (SMBS)

The Chlorinated water may oxidize the membrane and to avoid the same precautionary we have provided Sodium MetaBiSulphite dosing system Dosage rate is 4-5 mg/liter. A HDPE chemical preparation tank with an electronics diaphragm type dosing pump is provided for this.

Anti scalent dosing : (Anti Scalent)

The hardness salts of calcium & magnesium are likely to be precipitated if concentration exceeds its solubility limit & it may faults the membranes resulting into scaling which ultimately leads to poor treated water quality from R.O.System. To prevent this a anti Scalent dosing (scale inhibitor) dosing system is provided. Normally a scale inhabitator like Perma care 191 or equivalent chemical is dosed in feed water. Dosage rate is 4-5 mg/liter. A HDPE chemical preparation tank with an electronics diaphragm type dosing pump is provided for this.

Micron cartridge filter: (MCF)

This kind of Micron Cartridge Filter having Series of filtration with the **20 Micron , 10 Micron , 5 Micron , 1 Micron , 0.45 Micron & 0.2 Micron Nominal & Absolute Micron Cartridge**. This is a Consumable Cartridge and should replace it after Days of operation. This for Extra Safety of your Product water as it comes through the followed filtration and there are some chances to slippages for any particles which can be stop through the Cartridge also 1 , 0.45 , 0.2 micron cartridge filter will also take care of Bacteriological growth up to 0.2 micron.

High pressure pump: (HPP)

For Reverse Osmosis Process to take place feed pressure of water need to be raised. For this purpose a Vertical Multistage Centrifugal High Pressure Pump in S.S construction is provided R.O. System requires operating pressure of about 14-16 kg/cm² . High-pressure pump is fitted with S.S. discharge pipe work with necessary control valves. Necessary instruments like a High Pressure Switch, Pressure Gauge and recirculation valves are provided for safer operation of system.

Reverse osmosis system: (ROM)

Reverse Osmosis System rejects 97 – 99% of total dissolved solids by the principle of 'Osmosis'. This system consists of a R.O. Module assembly mounted on M.S.Skid. High pressure rating FRP Pressure Vessel is fitted on the skid which houses spirally wound membrane elements in series.

In RO System feed soften water is divided into two streams viz Product & Reject water. Product water is treated water having lesser TDS. Reject water is highly concentrated water, which is not to be used for any purpose but drained. Feed water at elevated pressure is first fed to first Pressure Vessel; treated water is collected in center core tube. Treated water from each membrane is collected jointly in a common product water storage tank and reject is drained.

For safe operation of system following instruments are provide on Panel.

- Feed & Reject Pressure Gauge to indicate respective pressure of R.O.System.
- Feed & Reject Flow Indicator to indicate respective flow of R.O.System.
- T.D.S Meter to measure TDS of Raw & Treated water.
- High Pressure Switch for tripping high pressure pump in case of excessive feed pressure of R.O.System.
- Time Totaliser for counting working hours of H.P Pump/ R.O.System.

Product water storage tank: (PWST)

One No. of Treated water from R.O. System is stored in a our supplied a S.S. constructed storage tank of appropriate capacity. The tank is fitted with S.S. pipe work & isolation valves and suitable type of level indicator. One no. of transfer pump is provided in S.S. material of construction to feed the water in MCF.

Micron cartridge filter – II & III : (MCF)

During storage, atmospheric or any other contamination may take place in treated water. Hence, after passing water from R.O. System, water is once again passed through a micron cartridge filter. This is a S.S.316 Vessel fitted internally with P.P spun micron cartridge elements having absolute ratings of 1.0 micron & 0.2 microns which removes all bacterial impurities present in the water and make the water free of particulates.

Ultra violet sterilizer: (UVS)

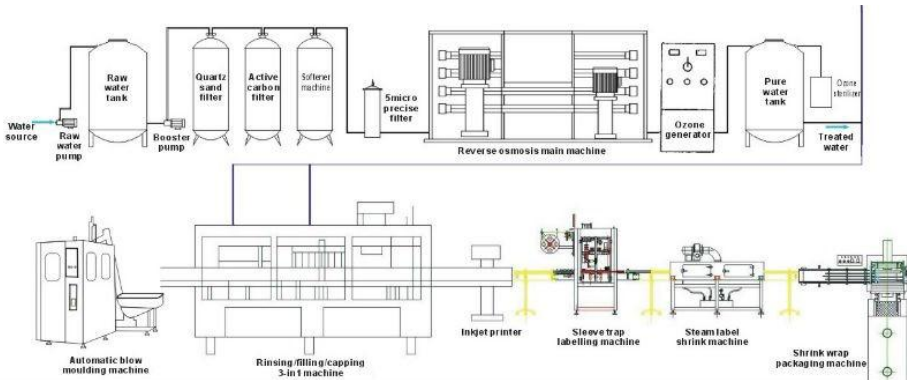
Through R.O. treated water is free from all the micro-biological impurities like Bacteria, Virus, etc. it may redevelop again in water during prolonged storage. For dis-infection of water is essential for Reverse Osmosis Application before Filling & Sealing in bottle. Hence, a online Ultra Violet Steriliser is provided for disinfection of R.O. treated water before filling in pre-cleaned PET Bottles. The water to be disinfected, is passed through U.V.System , which consists of U.V.Tubes which radiates high intensity Ultra Violet Rays, which in turn kills the micro organisms. This systems consists of a S.S finished surface housing with Ultraviolet Lamps fitted in it. The water to be treated is surroundings this tubes during treatment. An electrical systems is provided for production of high voltage required for U.V.Rays generation.

Ozone generator: (OZONE)

Though R.O. System rejects all the micro – organisms like bacterial & virus and even after passing through U.V. System it may redevelop in packed bottles over a period of time. Hence, it is necessary to disinfect R.O.Product water prior to bottling filling. This is very much essential to ensure good Mineral Water Quality as per the standards. This Ozone Generator will give your water **Oxygen Rich** water and remove the Bacteriological growth and also provide you the **Shelf Life of your Packed Bottle water** unless it open for some period of time. Also this Ozonation of water can add some taste in to your treated water.

Ozone Re-circulating tank: (ORT)

For required ppm Ozone gas mix up in finish product water. In ozone re-circulating tank water re-circulating by required flow rate pump . Ventury of ozone install out let of Pump it suction ozone and mix-up help with static mixer. This tank is provided with one no. of re-circulating pump and one no. of product water transfer pump to the filling section.



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