

ANANYA WATER ENGINEERING

WATER TREATMENT PLANT & EQUIPMENT, WATER TREATMENT CHEMICALS, BOILER WATER SIDE CHEMICALS

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INTRODUCTION LETTER:

We '**Ananya Water Engineering**, pleased to **introduce** ourselves as a young & vibrant organisation representing reputed principles, water treatment plant and equipment and service ,water treatment chemical supply, erection & commissioning of Water & Waste Water Treatment plants & Chemicals in Industries. '**Ananya Water Engineering** ' is promoted by a group of technocrats having diversified, rich industry experience of over 12 years in the field of Water and Waste water treatment, Waste Water Recycle, Zero Liquid Discharge & Trouble shooting .of WTP equipments / Instruments.

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Products & Services supplied by us-

Water Softneing Plants

What makes water "hard"?

Groundwater dissolves rocks and minerals releasing calcium and magnesium ions that cause water to be hard. These dissolved ions give hard water its characteristics.

Problems caused by hard water

Hard water interferes with all types of cleaning tasks. Cleaning problems arise when the cleaning agents do not fully remove dirt and grime. Over time, clothes washed in hard water may look dingy and feel harsh and scratchy. White clothing continually washed in hard water will gradually show a grayish tinge. Dishes and glassware washed in dishwashers using hard water may be spotted when dry. Hard water causes films on glass shower doors, walls and bathtubs. Hair washed in hard water may feel sticky and look dull.

Regular soaps combine with dissolved calcium and magnesium to form soap curds or soap scum. Soap scum is difficult to remove from sinks and appliances.

Household appliance performance may be affected by hard water use. When heated, calcium carbonate and magnesium carbonate are removed from the water and produce a scale buildup in the hot water heater. A large scale buildup slows the heating process and requires more energy to heat water. Water



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heaters with large accumulations of mineral buildup will have shorter life spans. Scale deposits also corrode and plug plumbing fixtures and accumulate in other appliances affecting their performance.

Water testing

Before buying any water treatment equipment, you should know what impurities are found in the water supply. Types and amounts of impurities in your water can be determined by a certified laboratory. The results of the water test will help determine if softening is needed. The water testing may reveal if other water treatment is required.

If you obtain water from a private water supply, water testing is your responsibility. Water testing should be done on a regular basis. If a problem is suspected, test more often.

Community water supplies are monitored and treated to protect users from health threatening water impurities. Ask your supplier for a copy of the latest water test results.

Hard water is considered a nuisance water problem. Hardness removal is not a necessity to protect your health. Water softening is popular because most people prefer softened water for bathing, cleaning and washing.

Types of water softening equipment available

Water softeners are classified in five different categories:

- **Manual:** There are several types of manual softeners. The operator opens and closes valves to control the frequency, rate and time length of backflushing or recharging.
- **Semi-automatic:** The operator initiates only the recharging cycle. A button is pushed when the softener needs recharging and the unit will control and complete the recharging process.
- **Automatic:** The automatic softener usually is equipped with a timer that automatically initiates the recharging cycle and every step in the process. The operator needs only to set the timer and add salt when needed. It is the most popular type of softener used.

WATER SOFTENER

Process

The softening process consists of passing raw water containing hardness through a bed of cation resin in sodium form . the hardness ions Ca & Mg are taken up by resin and in exchange sodium ions are relinquished from the resin . Raw water will continue to get softened till the resin gets exhausted. Bringing back the resin to it original form is called regeneration . softener resin is regenerated by sodium chloride of 10—15 %Concentration.

Requirement for Designing Softener : Hardness of Water, Flow Rate/Hour, Single Charge Softening.

Water Softener Plant

Water softeners are high technology equipments which remove amounts of excess minerals like calcium and magnesium from water, making it soft. It is used to remove ions that cause hardness in water. The process involves using ion exchangers, designed to remove ions, which are positively charged.

Water softeners mainly remove calcium and magnesium ions and sometimes may also remove iron ions. These machines use sodium as the exchange ion and are supplied from dissolved sodium chloride salt. The core of a water softener is a mineral tank, filled with polystyrene beads or resin carrying negative charge. Since minerals like calcium and magnesium carry positive charge, they are attracted and absorbed by the negatively charged beads, as the hard water passes through the tank. Synthetic resin beads or natural zeolites act as the exchange

medium. Hardened minerals are collected in a conditioning tank and flushed out from time to time.

Application of Water Softeners

- Pharmaceutical
- Food
- Beverages
- Health products/drinks

The Industrial Softeners is a manually operated ion exchange unit designed specially for industrial use. It is simple to operate, inexpensive to maintain and is widely used in the industry. The softener comprises Steel /FRP pressure vessels containing a bed of cation exchange resin, a regenerating system and control valves.

A strongly acidic cation exchange resin in sodium form is used to exchange sodium ions for the hardness – forming calcium and magnesium ions, and thus produce soft water . At the end of each service cycle, the ion exchange resin is regenerated with sodium chloride solution, after which the units is ready for the next service cycle.

For larger plants, a brine measuring tank is provided, and a separate salt saturator, preferably in concrete, is recommended for bulk storage of salt and preparation of brine. Standard equipments is available to soften water, upto a maximum flow rate of 275m³/h.

Features :

- The series of softeners are attractive, compact, easy to operate & maintain, & use international quality materials of construction, introduced for the first time in India.
- Softeners are available in MS, MSRL, FRP, operating in Manual / Auto mode.

Advantages :

- Easy to install and operate.
- Produces clear ,soft and non – scale forming water.
- Low operating costs.
- Incorporates high-capacity polystyrene bead type cation exchange resin which is remarkably stable and has a long life.

Applications :

- Boiler feed.
- Textile processing.
- Beverage production.
- Cooling water make-up.
- Hospitals, hotels, laundries & air-conditioning plants.

Specifications :

- One Mild Steel/FRP pressure vessels provided with an inlet distribution, an outlet collecting system and a brine distributor. Mild Steel vessels is painted externally with a protective coat of red oxide and internally with anti-corrosive bituminous paint
- One set of control valves, with all piping to inlet and outlet terminals.
- One combined salt tank/brine measuring tank, provided with brine suction piping with adjustable indicating clamps, hydraulic ejector and control valves.
- One orifice board for indicating wash and rinse flow rates (to be fitted in the drains sump.)
- One charge of softener cat ion exchange resin with supporting under bed.
- One hardness test kit for testing the softened water.

Optional :

One set of fittings for concrete salt saturator, wherever applicable, to be constructed by the clients.

Water Softening Plants

Most and least tolerable chemical impurities in water are the hardness producing ions, calcium and magnesium in different concentrations. And they are responsible for the hard scale that deposits and builds up in boiler tubes, pipe lines, condensers jackets, circulating system, cooking utensils and other equipment contracted by hot water.

20 SOLUTIONS Softener is used primarily to produce Zero soft water by highly acidic cation exchanger, which removes calcium and magnesium ions. Which are dissolved hardness producing compounds in the water and are replaced by sodium ions?

The H₂O SOLUTIONS series of water softeners are designed for counter current regeneration with up flow rate and co-current regeneration with down flow rate.

H₂O SOLUTIONS series softeners are designed for longer operating cycles, low regeneration cost. The systems incorporate the proven technique Of counter and co-counter currant regeneration flow rate to economically to suit the demand of soft water for medium scale industries and commercial use.

APPLICATION Boiler & Cooling water feed. Process water for chemical & textile.

Hospital/Hostels/Homes/Commercial & institutional waterpower plants/Ice plant.

DM plants and MB Demineralizer Systems

There are two basic kinds of demineralizer systems, separate-bed and mixed-bed. In a separate-bed system, cation resins and anion resins are loaded into separate pressure vessels. During the service cycle, water passes through the cation bed first, where undesirable positive ions (cations) such as sodium (Na⁺), calcium (Ca⁺²), and magnesium (Mg⁺²) are exchanged for hydrogen (H⁺) ions. The water next passes through the anion bed, where a similar process removes undesirable negative ions (anions) such as chloride (Cl⁻), sulfate (SO₄⁻²), and bicarbonate (HCO₃⁻), replacing them with hydroxyl (OH⁻). Pure water is produced from the combination of hydrogen and hydroxyl ions. In a mixed-bed system, also referred to as a polisher, the cation and anion resins are loaded into the same vessel.



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Where they are in contact with each other. This allows the hydrogen and hydroxyl ions to combine instantaneously to produce water of the highest possible purity. In any demineralizer, the capacity of the resins to exchange ions is finite. As the capacity becomes stressed, ion leakage occurs in the effluent. This is called the breakthrough point. When the breakthrough point is detected, the bed is switched from a service cycle to a regeneration cycle. During the regeneration cycle, the beds are backwashed to flush out particulate matter, then chemically regenerated with acid and caustic. Finally, the beds are rinsed thoroughly to yield a service cycle ready condition.

The breakthrough point of a demineralization bed is impacted by its ion exchange capacity, which is affected by water flow rate, ion contaminant concentration, and feed water composition. Regeneration of a bed is costly, due to the need for chemicals and rinse water, pretreatment, regeneration waste treatment, and labor. Thus the goal is to maintain the service cycle of the bed as long as possible, while ensuring that the system continues to deliver water of the required purity.

Conductivity sensors are successfully employed on demineralizers to monitor the operation of the bed and to predict and signal the all-important breakthrough Point.

In a cation bed, salt impurities are converted to an acid form, typically hydrochloric acid (HCl). When this happens, the conductivity of the water increases dramatically, because the hydrogen ion is far more conductive than the mineral ion it has replaced.

CLEARION water demineralisers come in various capacities. The smaller capacity demineralisers are of portable type and there are 4 such models.

The smallest, models are bench models and are essentially cabinet made of FRP in which is housed to FRP Cylinder for cation & anion, Access to the inside of the cabinet is from behind where a sliding door is provided. Conductivity cell, meter & circuit box, a multiply valve manifold, are fitted inside the cabinet. The demineraliser is operated by controlling the knobs of the valve manifold. The conductivity meter indicates the condition of the plant, i.e. Whether the plant is producing demineralised water or it requires regeneration. A PVC regeneration tank is also provided.

Larger units are of Mild Steel Rubber lined construction. They are provided with distribution & collection systems. For diameters up to 600 mm strainer on plate type system is employed. For diameters up to 600 mm, header-letter type of system is employed. Up flow type of units are offered up to 600 mm diameter. For diameters above 600 mm the downflow type of units are offered.

The Demineralisers employ educators for injecting acid and alkali during regeneration. For cation, FRP tank is supplied and for anion a mild steel tank is provided.

Wastewater from the units are led to sump made of concrete & suitably lined which acid / alkali proof lining. Orifice board is provided to facilitate measurement of flows during regeneration.

INSTALLATION

CLEAR-ION Portable demineralisers are very easy to handle and install. Smaller models sent in knocked down condition in two separate cases. The first case contains the tubular frame with a Panel Mounted on it sent the six- valve manifold secured on the panel. Hose connectors are also fixed on the valve manifold and hose lugs a regenerate tank conductivity cell, conductivity circuit box and motor. The connectors in the FPF cation and anion cylinders are removed prior to dispatch and placed in this case to avoid breakage during transit.

The second case contains only the FRP cation and anion cylinders fitted with trainers and filled with respective resins. The resin are sent in regenerate condition and hence then the plant is assembled and

put on to service, one should not demineralised water. However it is advised that regeneration be carried out as per the procedure but lined in this manual.

DM PLANT

Demineralization or deionization is the process of removing dissolved salts from water by using Ion Exchange Resin . Basically Ion exchange demineralization is a two step process with both Cation and Anion resin . The raw water called influent water is first passed through the Cation resin bed containing SAC Resin in H + form . Ca , Mg & Na are removed and the salts are converted to their respective acids .The corresponding acid containing anions like Cl , SO₄ , NO₃ are removed by passing the cation effluent through Anion column containing Anion resin in Hydroxyl Form. The hydrogen ion from cation neutralizes the hydroxyl ion and produces pure water.

Ion exchange is an equilibrium reaction which is reversible . In the hydrogen cation Resin , Cations like Ca , Mg are exchanged for H ions. After some period The resin is not able to exchange any more ions. The bed is exhausted . The Resin has to be brought back to its original form . This is done by the regenerating the resin with strong acid and the process of restoring the resin back to its original condition is called

Regeneration. Similarly the Anion resin is restored back after exhaustion by regenerating it with Alkali.

Requirement for Designing DM : Conductivity, Chloride, Sulphate, Nitrate, Alkalinity, Silica, Flow Rate and qty of water required in single charging/regeneration.

Deionizers Plants are available in a wide range with maximum flow rates from 10 Ltrs/hr to 250000 Ltrs/h in standard plants.

Two Bed DM Plant comprise of two mild steel rubber-lined /FRP pressure vessels filled with strong acidic cation exchange resin and strongly basic anion exchange resin. They are available in a range of diameters. The modular construction permits flexibility in the selection of cation and anion units to cater to different types of raw water. Degasser modules for the range Of CA units are also available. These are useful for raw waters containing a significant amount of alkalinity. Treated water of conductivity less than 10 microsiemence/cm with ph of 7.5 to 8.5 is achieved at Two Bed DM Plant outlet .

Mix Bed DM Plant comprise of one Mild steel rubber-lined/FRP pressure vessels filled with strong acidic captions exchange resin and strongly basic anion exchange resin in mixed form. They are available in a range of diameters. Mix Bed DM Plant is usually used as polishing unit at outlet of Two Bed DM Plant/RO Plant. The modular construction permits flexibility in the selection of cation and anion units to cater to different types of raw water. Treated water of conductivity less than 1 microsiemence/cm with ph of 6.5 to 7.5 is achieved at Mix Bed DM Plant outlet.

Applications :

- Easy to install.
- Simple to operate .
- Complete with regeneration equipment & control .

Specifications :

- Mild steel pressure vessels internally lined with rubber/FRP provided with internal fittings and initial charge of cation and anion exchange resin.
- One set of regeneration equipment including hydraulic ejectors, acid & alkali tanks.
- One set of frontal pipe work & valves.
- One mild steel base frame for mounting cation & anion units.
- One conductivity meter to monitor treated water quality.

Water Demineralisers

The industry is constantly asking for a higher quality of Demineralise water at affordable price. And Its found that, naturally available water is hardly suitable for industrial demands because of its dissolved

contaminations like number of mineral salts and compounds of Ca, Mg, Na, K & Fe carrying positive ions and SO_4 , Cl, CO_3 , HCO_3 and SiO_2 etc carrying negative ions as well as organic and inorganic impurities.

The industrial requirement is a higher quality (dissolved salts free) of water, for the particular process formulations and utility of latest costly equipment, which cannot be satisfied by natural water sources.

H₂O SOLUTIONS Demineralisers are designed based on latest cost effective ion exchange technique of counter current regeneration. The units consist of two corrosion free pressure vessels internally connected in series. The first column containing Cation absorbing exchanger and second column charged with an anion absorbing exchanger. The water flow through the bed of a Cation exchanger then the bed of an anion exchanger. Thus the systems remove dissolved salts from water to a specified degree.

After using total exchange capacity of systems Cation and anion regeneration must be carried out. The Cation exchanger is regenerated with an acid and anion exchange resin is regenerated with an alkali solution.

H₂O SOLUTIONS Demineralisers consists of acid/alkali proof pressure vessel with internal fittings and initial charge of Cation and Anion exchanger, set of regeneration equipment, hydraulic ejectors, acid and alkali tanks and conductivity meter to monitor treated water quality. These Demineralisers offer a practical range of capacities and flow rates necessary to serve wide variety of applications

RO Plants and UV Systems

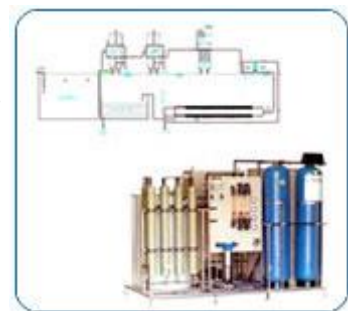
Water Treatment Plants

We design, develop and engineer various types of water purifier systems and water treatment plants. In addition to it, we also manufacture standard and optional spare parts for our systems like RO plant, demineralization plant, iron removal plant and water softening plants. Our systems are manufactured using good quality raw materials and components ensuring durable and effective services. Some of our product range includes:

Reverse Osmosis Plant

Reverse osmosis systems works as here under :-

The liquid has tendency to flow from low concentration to high concentration through a semi permeable membrane, in the Osmosis Process. In reverse osmosis the direction of flow is reversed by increasing the pressure at high concentration liquid side than the low concentration side, which results in the reversed flow of the liquid from high concentration to low concentration, through a semi permeable membrane, leaving behind dissolved minerals.



The above semi permeable membrane for reverse osmosis application consists of a polymeric material, which is several thousand Angstroms thick, thin film. [:: Request a Quote](#)

There are two major groups of polymeric materials, which can be used to produce satisfactory reverse osmosis membranes: cellulose acetate (CA) and polyamide (PA). The performance of membrane elements in reverse osmosis systems is affected by the feed water composition, temperature, pressure and permeate recovery ratio.

The feed water, depending on its source, may contain suspended solids and dissolved matter, in varying concentrations. Suspended solids may consist of inorganic particles, colloids and biological debris such as microorganisms and algae. Dissolved matter may consist of highly soluble salts, such as chlorides, and sparingly soluble salts, such as carbonates, sulfates, sulfates, and silica. During the RO process, suspended particles may settle on the membrane surface, thus blocking feed channels and increasing friction losses (pressure drop across the system). Sparingly soluble salts may also precipitate from the concentrate stream, create scale on the membrane surface, and result in lower water permeability through the RO membranes. Therefore, the feed water pretreatment, to improve its quality to the level, which would result in reliable operation of the RO membranes is a must. The common indicators of suspended particles used in the RO industry are turbidity and Silt Density Index (SDI). The maximum limits for turbidity are 1 NTU and SDI of 4. In the continuous operation of an RO system with feed water, the average values of turbidity and SDI in the feed water should not exceed 0.5 NTU and 2.5 SDI units, respectively. The indicators of saturation levels of sparingly soluble salts in the concentrate stream are the Langley Saturation Index (LSI) and saturation ratios. Negative values of LSI indicate the possibility of calcium carbonate precipitation. The saturation ratio is the ratio of the product of the actual concentration of the ions in the concentrate stream to the theoretical solubility of the salts at a given condition of temperature and ionic strength. These ratios are applicable mainly to sparingly soluble sulfates of calcium, Barium and Strontium. Silica could also be a potential scale forming constituent. Depending on the raw water quality, the pretreatment process mainly consists of removal of the followings:-

- SUSPENDED SOLIDS OR TURBIDITY
- DISINFECTION
- REDUCTION OF ALKALINITY, BY PH ADJUSTMENT.
- ADDITION OF SCALE INHIBITOR OR SOFTENING.
- RESIDUAL FREE CHLORINE REMOVAL.
- STERILIZATION.

Seldom Chlorination may be used to oxidize iron and manganese in the well water before filtration or biological removal.

- RO system consists of the following basic components:-
- Feed water supply unit.
- Pretreatment systems.
- High pressure pumping units
- Membrane element assembly unit.
- Instrumentation and Control System.
- Permeate treatment and storage unit.
- Cleaning unit.

WATER FILTER



Pressure sand filter

Filter is used for separating water suspended solid. For better operation of filter, suspended solid should be coagulated. The advantages of pressure filter are high speed of filtration, less space, low charge and prevent heat loss after the warm or hot lime process.

Karizab pressure filters, which may be vertical or horizontal, have cylindrical steel shells and dished heads. The flow in pressure filters is downward. Usually sand or anthracite is the filter medium in a bed consisting of either one or two grades of sand or anthracite. A gravel bed supports the filter medium, prevents fine sand or anthracite from passing into the underdrain system and distributes backwash water.

The water, which should be filtered, enters over the top of filter and pass from its bed then they collected at the bottom of filter. The suspended matter is strained out of the water and held in the voids between the filtering granules. The accumulation load of suspended matter in the bed causes an increasing loss of pressure during the filter run. When this loss reaches a predetermined limit, the filter is backwashed upward, discharging the suspended load out to the sewer.

ACTIVATED CARBON FILTER

Fluid Systems manufactures complete range of Activated Carbon Filters in different sizes and materials both manually operated or fully Automatic

The Activated carbon Filters are designed to remove free chlorine, organic matter, odour and Colour present in the feed water with minimum pressure drop.

Operating Principle

Water enters the filter and percolates through the filter bed. Free chlorine, organic matter, odour and Colour are adsorbed by the Activated carbon. Treated water then goes via the filtration nozzles through the filter outlet.

Media

The Activated Carbon Filters consist of Activated carbon granules of defined Iodine Absorption values as per the application

Application

Pretreatment to all forms of Industrial water treatment
Pretreatment to all forms of potable Water treatment
Metal Recovery

Advantage

Easy to operate & Practically no Maintenance.
Better filter quality at higher flow rate than conventional filters.
Negligible Pressure drop

Water Treatment Chemicals (COOLING TOWER & BOILER WATER SIDE CHEMICAL)



Combining decades of experience as an industrial water treatment company with highly specialized chemical technology, our Water Treatment for cooling and heating services allow our customers to design, improve, and validate their operations and processes thereby enhancing their own businesses and maintaining a safe and compliant work environment.

Stop paying for water and only buy active ingredients critical to your treatment needs! Our water treatment chemicals include:

- [Biocides to control microbiological activity](#)
- [Boiler Aid for the prevention of scale](#)
- [High-performance chemicals to maximize operational performance of Boilers, Cooling Towers and Closed Loops](#)
- [Chemicals to control foam formation or eliminate foam from forming](#)

The most common natural polymers include tannins and lignosulphonates, while the synthetic polymers available to you include polystyrene sulphonates and maleic acrylate copolymer. These chemicals act as softening agents in order to minimize the buildup of scale in your boiler

Erection, commissioning & Sales after Service

ANANYA WATER ENGINEERING

Over last couple of years we have successfully developed strong business relationship & dedicated customer base for the products promoted in various Industry segments like Pharmaceuticals, Chemical, Food & Beverages, Sugar/Co-Gen, Distilleries & Engineering OEMs. Reputed Principles, technologically proven products, strong **R&D** back up at Principles, customer centric approach & **24x7 service** response have been key to our success in industry.

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