

**Acid**

A substance which releases hydrogen ions when dissolved in water. An acid is the opposite of an alkali, has a pH rating lower than 7.0.

**Algae**

Photosynthetic plant life containing chlorophyll, can be found in cooling water.

**Alkalinity**

The quantitative capacity of water to neutralize an acid; that is, the measure of how much acid can be added to a liquid without causing a significant change in pH... There are three kinds of alkalinity: carbonate, bicarbonate, and hydroxide alkalinity.

**Anaerobic organism**

An organism that can thrive in the absence of oxygen (air). Some bacteria are facultative anaerobes, meaning they can survive with or without Oxygen.

**Bacteria**

Unicellular microorganisms which typically reproduce by cell division. Although usually classed as plants, bacteria contain no chlorophyll

**Base**

An alkali that releases hydroxyl ions when dissolved in water. Bases react with acids to form a neutral salt and water

**Biocide**

A chemical compound which can kill or inhibit the growth of living organisms such as bacteria, fungi, yeasts, molds, and/or slime.

**Bleed-off**

Continuous ejection or draining of a portion of the concentrated water from a circulating system, which is replaced with water from the normal supply

**Bypass/Spool**

A valve arrangement that allows for sequestering a portion of a system for maintenance/cleaning operations.

**Chemical Feeder (Shot Feeder)**

A mechanical device designed to introduce chemicals into a hydronic piping system

**Closed Recirculating System**

A chilled or hot water system in which water flows in a continuous circuit through heat exchangers. There is no evaporation and therefore little make-up is required.

**Condensate**

Water which has been liquefied from steam.

**Conductivity**

The quality or power to carry electrical current; in water, the conductivity is related to the concentration of ions capable of carrying electrical current. The unit of measure is the mho, which is the reciprocal of resistivity which is the microhm.

**Corrosion**

The destructive disintegration of metals by electromechanical, biological, mechanical means.

**Disinfection**

The treatment process that kills disease causing organisms in water, usually by the addition of chlorine

**Cycles of Concentration**

The ratio of dissolved solids in recirculating water to the dissolved solids in the make-up water

**Filtration**

The process of passing water through a porous substance to remove solids in suspension. Available in media or cartridge type devices

**Gallon**

A common unit of liquid volume; 1 US gallon has a volume of 231 cubic inches or 3.78533 liters, with a weight of 7.48 lbs.

**Galvanic Corrosion**

A form of corrosion which occurs when dissimilar metals in contact with each other and with an electrolyte causes one of the metals to dissolve and go into solution.

**Hardness**

A characteristic of natural water due to the presence of dissolved calcium and magnesium; water hardness is responsible for most scale formation in pipes and water heaters. Hardness is usually expressed in grains per gallon, parts per million, or milligrams per liter, all as calcium carbonate equivalent.

**Inhibitor**

A chemical substance added to a solution to reduce scale, corrosion, or both.

**Inorganic Matter**

Matter which is not derived from living organisms; includes rocks, minerals and metals.

**Ion Exchange**

A process in which ions are released from an insoluble permanent material in exchange for other ions in a surrounding solution, such as cationic water softening

**Langelier Index**

A calculated number that gives an indication of the tendency of water to form a protective film of calcium carbonate scale, to dissolve it or be in equilibrium with it

**Legionella**

A strain of bacteria, including legionella pneumophila, which can cause pneumonia-like illness called Legionnaires disease named after the American Legion convention in Philadelphia where the disease was linked with multiple fatalities.

**Make-up water**

Water from a normal supply which compensates for evaporation, windage, and bleed-off losses

**Micromho**

One millionth of a mho. Used to measure the conductivity and the approximate TDS content of water. Also known as micro Siemens. The specific conductance is the reciprocal of resistance, therefore MHO is OHM spelled backwards.

**Micron Rating**

The term applied to a filter/medium to indicate the particle size above which all suspended solids will be removed, throughout the rated capacity. The smallest particle visible to human eye is 40 microns

**Milligram per Liter**

(mg/l) A unit concentration of matter used in reporting the results of water and wastewater analyses. In dilute water solutions, it is practically equal to the part per million, but varies from the ppm in concentrated solutions such as brine, with greater densities.

**Mineral**

A term applied to inorganic substances, such as rocks and similar matter found in the earth's strata.

**Open Recirculating system**

Water which goes over a cooling tower. This water is reused a number of times before it is either evaporated away to provide cooling, or discharged as waste. This system is called open because the water comes in direct contact with the air, which provides cooling for the water. During the cooling, a large amount of water evaporated, and must be replenished by make-up. Since only a small proportion of the water is discharged, the water in the open system tends to become very concentrated with dissolved and suspended solids.

**Organic**

Having the characteristics of or being derived from plant or animal matter.

**Oxidation**

A chemical process in which electrons are removed from an atom, ion or compound. The addition of oxygen is a specific form of oxidation. Combustion is an extremely rapid form of oxidation, while the rusting of iron is a slow form. Oxidation never occurs alone but always as a part of the oxidation-reduction (redox) reaction.

**Oxidizing Agent**

A chemical substance that brings about the oxidation of other substances in chemical oxidation and reduction reactions. Examples of oxidizing agents include oxygen, ozone, chlorine and peroxide.

**Ozonation**

The process of generating ozone gas by means of an ozone generator. Ozone is considered an excellent biocide.

**Particulate**

A term used to describe visible sediment particles, used as both singular and plural.

**Parts Per Million (ppm)**

This is a standardized means of expressing the quantity of material in water. It is especially convenient to use in water treatment since many of the items we deal with are only present in water at these low levels.

**pH (potential of Hydrogen)**

pH refers to the acidity or alkalinity of water. The pH scale ranges from 0 (extremely acidic) to 14 (extremely basic). The neutral point is 7.0 at which point the water contains no excess hydrogen or hydroxide ions.

**Phenolphthalein**

An acid-base indicator which produces no color in an acid solution but turns pink/red in an alkaline one. Phenolphthalein Alkalinity (p Alkalinity) is the measure of alkalinity in water titrated to a pH of 8.3.

**Potable Water**

Water which is considered safe and fit for human consumption and domestic purposes and meets the requirements of the health authority having jurisdiction.

**Precipitate**

To cause a dissolved substance to form a solid particle that can be removed by settling or filtering. The term also refers to the solid thus formed.

**Reverse Osmosis (RO)**

A process for the removal of dissolved ions from water, in which pressure is used to force the water through a semi-permeable membrane, which will transmit the water but reject most other suspended and dissolved materials.

**Sacrificial Anode**

An anode placed in device to accept the electrolytic activity and to protect device from corrosion.

**Scale**

Scale is defined as a homogenous, crystalline deposit formed on surfaces in contact with water./ The most common scale that we see in water treatment are calcium carbonate and calcium sulfate. They are formed when a normally soluble material exceeds its solubility in water and plates out directly on the surface involved.

**Suspended Solids**

Solids not in true solution and can be removed from the water by filtration.

**Total Dissolved Solids**

The weight of solids per unit volume of water which are in true solution, usually determined by the evaporation of a measured volume of filtered water, and determination of the residue weight. TDS is expressed as ppm per unit volume of water. An electrical conductivity test provides only an estimate of the TDS since non-conductive substances cannot be measured by electrical means.

**Ultraviolet Light**

Radiation having a wave length shorter than 4000 angstroms (visible light) down to 100 angstroms on the border of the x-ray region. Ultraviolet light is used as a disinfectant.

**Water Analysis**

The chemical analysis of the dissolved materials in water. It also includes determination of pH and the amount of suspended solids.

**Water Conditioning**

Virtually any form of water treatment designed to improve the quality of water, by neutralization, inhibition or removal of undesirable substances.

**Water Softening**

The reduction or removal of calcium and magnesium ions, through ion exchange, which are the principle cause of hardness in water