Treating the hard to treat

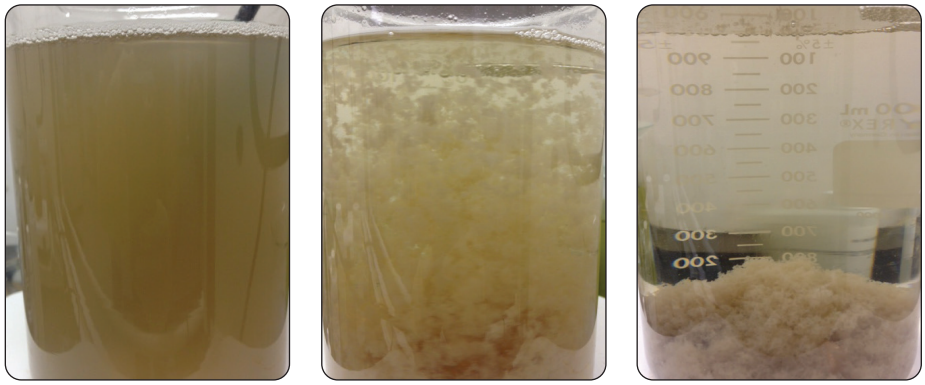
AquaPure™

Hubbard-Halls offers a true total industrial wastewater treatment system that improves your process and productivity while keeping you compliant.

Our experts will work with you to review the processes and equipment you use upstream and determine precisely the treatment system you need downstream. In addition, we can work with and train your team on proper implementation, process maintenance, and testing.

In this catalog, you'll find chemistry to remove metals, oils, and nutrients as well as deliver BOC/COD reduction, including:

- Coagulants
- Metal Precipitants
- Flocculants - anionic and cationic
- Odor controllers
- Defoamers
- Bioaugmentation



With a variety of formulations designed to address specific contaminant challenges, Hubbard-Hall's AquaPure line is a cost-effective means of treating wastewater problems and achieving compliance objectives.

Why AquaPure

- 98.9% metals removal
- 44% average reduction in yearly waste cost
- 1-step treatments to meet compliance regulations
- Our experts have over 150 years of combined expertise
- Tank side assistance
- Complimentary treatability study and process analysis
- Onsite expert for plant trial and start up

"Hubbard-Hall identified our water treatment problem and worked until they fixed it. Today, we use their AquaPure chemicals for our process water and we haven't had any issues in over two years."

John Z. HSE Specialist
Hampton, Virginia

Cationic Coagulants - Inorganic and Organic Blends

Coagulants are added to wastewater to facilitate the charge neutralization needed to allow the suspended particles to settle and co-precipitate. These are usually blends of inorganic salts and organic polymers to allow for co-precipitation of metals.

PRODUCT	FUNCTION	FEATURES & BENEFITS
AquaPure™ I-300	• Ferrous based cationic polymer blend • GMF and metal processing WWT • All-purpose coagulant for WWT	• Versatile • Co-precipitation with other divalent metals • Chrome reduction to Cr+3 • Offers excellent clarity and settling • Produces heavy floc
AquaPure™ ACP	• Aluminum based solution with calcium and organic components • General wastewater solutions coagulant	• For collection tanks • Multiple action-based formulation • Works well on Zn and Cu removal
AquaPure™ CAL 40	• Liquid • Calcium chloride blend	• Easy to work with pH 5 – 6 • A replacement for lime • Used for phosphate reduction • Eliminates haze
AquaPure Cal 50 Plus	• Blended inorganic coagulant • Removes ortho and pyrophosphates	• Concentrated coagulant • Blended liquid • Easy metering, will not affect pH • Versatility
AquaPure Cal 76	• Blended inorganic coagulant • Removes ortho and pyrophosphates	• Designed for optimal treatment of waste streams • Works at lower pH ranges • Easy to meter • Can remove FOG, TSS and Metals
AquaPure RT-Plus	• Liquid aluminum coagulant • Designed to provide a wide latitude of applications	• Ready to use, no dilution needed • Quick settling • Wide pH range of use • Forms good size floc for easy removal
AquaPure AP 99	• Concentrated coagulant • Enhanced liquid/solid separation	• Works well on chelated wastewater • Destabilizes suspended solids • Reduces FOG • Liquid can be metered in for ease of use

Metal Precipitants

Precipitation of metals in wastewater can be accomplished with caustic soda at the pH that corresponds to the lowest solubility of the that metal. When chelators or complexors are present it is difficult to precipitate all the metals without the use of a metal precipitant. These are blends of carbonates, sulfides and/or carbamates that chemically react to break the bonds of the chelates allowing the metals to precipitate as an insoluble solid that can be removed from the water.

PRODUCT	FUNCTION	FEATURES & BENEFITS
AquaPure™ P 601	• 40% DTC based liquid, used to assist in ppt of complexed metals • Apply at 7-12 pH range	• Workhorse metal precipitant • Low dosing • Used on the alkaline side • Works well on divalent metals
AquaPure™ T-500	• Liquid -trithiocarbonate blended sulfide • Lowers metals to <0.5 ppm range • Apply at 8-12 pH for best results	• Can be sewer or direct discharge • Offers lower residual metals • Controlled by ORP • Used on the alkaline side
AquaPure™ T-1000	• Liquid blend of sulfides and DTC • Will open chelation bonds allowing metals to precipitate out • For use in systems on the alkaline side 7-12 pH	• Easy to use • Lower odor than sulfides • Blended to break more chelation bonds
AquaPure™ BA	• For precipitation of Barium	• Compliance
AquaPure T-900	• Metal precipitant • ORP based dosing	• Ready to use • Versatile • Easy to use

Cationic Flocculants

Cationic Flocculants are typically polyacrylamides that are cationic in nature and have been reacted to give properties of specific charge density and molecular weight. Certain equipment like centrifuges require very high mole weight, low charge density to give a good firm sludge that dewaters nicely. These are either powders or liquid emulsions. Work best with organic contamination.

PRODUCT	FUNCTION	FEATURES & BENEFITS
AquaPure™ B-Cat	• Cationic liquid concentrate emulsion • Designed for organic contaminate removal	• High charge, high molecular weight emulsion polymer • Works well with metal coagulants • Low dosing for easily settable mass
AquaPure™ Low Cat	• Low charge cationic powder • Works well to mass organic solids	• Low charge, high molecular weight powder • Works well on organics and metals • Powder form for long shelf life
BCT 8642	• Low charge cationic linear cat • Designed to treat all wastewater systems	• Ready to use emulsion • Easy to meter into continuous flow
AquaPure™ TVP	• Powdered cationic flocculate	• Mid-weight/mid-charge cationic • Powder form for long shelf life • Easy to make down to 0.2% • De-water biological sludges

Anionic Flocculants

This series of flocculants are anionic in nature and work well on metal removal. Flocculants help bind pin floc (small floc) together into a large mass for easy settle-ability. Like cationics, they are also polyacrylamides that come in powders or liquids. A favorite product (like our AquaPure AN Clear) is one where the polymer has already been prediluted and only requires a feed line into the drum – no tank is necessary.

PRODUCT	FUNCTION	FEATURES & BENEFITS
AquaPure™ AS Plus	• Anionic high charge, high mole wt, powder • 100% active • Use is 0.1-0.3%/ wt.	• Hardworking anionic flocculant powder • Low dosing • Versatile for mixed metal applications • Available in bags
AquaPure™ AN CLEAR	• Anionic flocculant • Settles suspended precipitates in wastewater treatment	• Ready to use • Versatile • Easy to use
AquaPure™ AS LOW	• Anionic low charge, mid mole weight, emulsion	• Used for phosphorus removal • Easy to use emulsion • Can be used in centrifuge

Bioaugmentation

Biological removal is a 'final polish' to achieve permit limits and reduce disposal costs. This solution is not a one-size-fits-all but a tailored approach that reinforces and rebuilds existing biological treatment systems to meet your specific stringent discharge permit limits. Hubbard-Hall offers custom blends of specially selected bacterial strains that work under aerobic and anaerobic conditions with no caustics or acids, ensuring the safety of your pipes and wastewater equipment.

Bioaugmentation Line: Our full line of bioaugmentation products include microbes and nutrients to build a healthy biological colony for trickling filters, SBRs, MBBRs or any type of biological system. The microbes are designed to handle high strength wastes that are generated from industrial manufacturing processes. They are tailor made for removal of BOD, COD, FOG, TKN, and TP. Microbes will also help reduce TSS in biological systems. An AquaPure Specialist can assist in determining the correct bio-blend for your needs.

PRODUCT	FUNCTION	FEATURES & BENEFITS
BCT-BAS	• A bacterial blend for use in high COD industrial wastewater • Used to treat high-strength industrial wastes	• Promotes floc and biofilm formation • Improves settling and lowers polymer demand • Degrades inhibitory compounds • Degrades BOD/COD and decreases upset recovery time
BCT-ELM	• A concentrated micronutrient source • Designed for deficiencies in key micronutrients or trace metals	• Vitamins for bacteria • Improves overall systems performance, including floc and biofilm formation • Long shelf life • Inorganic minerals and nutrients do not break down over time
BCT-EZB	• An enzyme blend of protease, amylase, lipase, esterase, and urease • Quickly degrades complex compounds	• Increases removal rates of proteins, carbohydrates, fats, esters, and urea • Increases the solubility of complex compounds • Fast acting • Helps mitigate odors and improves cleaner performance
BCT-FGM	• Microbial blend for fat, oil, and grease control • Formulated to break down and digest fats, greases, olefins, and vegetable oils suspended in wastewater	• Diverse bacteria • Degrades fat, oil, grease, olefins, & organic acids • Performs under aerobic facultative & anaerobic conditions
BCT-HCR	• Bacteria blend for degradation of petrochemicals • Degrades light, heavy, and complex hydrocarbon compounds	• Promotes floc and biofilm formation • Degrades inhibitory compounds • Degrades BOD/COD and lowers polymer demand
BCT-LNSR	• Liquid blend of nitrifying strains. • Applicable to aerobic treatment systems	• Improves removal of ammonia and nitrogen compounds • Reduce upset recovery times • Helps reduce municipal surcharges and fines for pretreatment systems • Budget Saver

Defoamers

Foam production can be chemical, mechanical, bacterial or a combination of the three. Where foam is occurring, what the foam looks like, and the equipment you are using will all help determine the correct product to use. We have defoamers for evaporators, process chemistry, and wastewater. Foam can be air induced under the surface or surface occurring. We also have membrane friendly defoamers and defoamers for bio systems where *nocardia* is present.

PRODUCT	FUNCTION	FEATURES & BENEFITS
AquaPure™ DF-SI	• 10% silicone emulsion • Can be used as is or diluted tank side	• Hardworking silicone defoamer • For use in all applications • Quick knockdown and persistence • Injection or sprayed • Can be metered in • Versatile • Kosher
AquaPure™ DF-P	• Defoamer concentrate • For tank side additions as is or diluted	• Versatile defoamer
AquaPure™ DF	• Oil based emulsion	• For general metal finishing and WWT
AquaPure™ Bubble Breaker	• 40% modified silicone defoamer concentrate	• Good in evaporators • Ready to use • Oilfield, down hole drilling
AquaPure™ Foam Drop	• Enhanced veg. esters • Works well on firefighting foam for tank transfer	• Membrane friendly • For use in primary and secondary WWT • Can be metered in
AquaPure™ NO FOAM	• Specialized defoamer • Acidic waste streams	• No problem with subsequent rinsing • Works very well on zinc pickling baths • No black rolling foam • Versatile

Odor Control

Whether in your sludge, water or head space, we have a product that will eliminate or reduce odor. These products can be used in misting applications (green products) or in the head space above the sludge press (or drier). Tank side additions of pucks, blocks or liquid products are all viable for production odor control. Ask our technical sales representatives about what will work for you.

PRODUCT	FUNCTION	FEATURES & BENEFITS
AquaPure™ Bio 52L	• Liquid concentrate for use in water • Can be used in tandem with Bio 20 • Use at 4:1 to 20:1 dilution	• Eliminates slime odor in pipes • For use in wet wells, traps, lift stations, and sewers • Formulated to work in all environmental areas
AquaPure™ Aqua Pucks	• For use in wastewater • Easy to use tablets to reduce H2S • Placement should be under wastewater	• Can be used in: lift stations, car washes, pits, and traps • Easy to use tablets – no measuring • Is sold in 30 lb. pails
AquaPure™ Odor Zap	• Liquid concentrate, to be applied upstream	• Liquid – easy measuring

Glossary of Terms

Aerobic Conditions
Biological environments that are high in Oxygen concentration.

Anaerobic / Anoxic Conditions
Biological environments that contain no or very low Oxygen concentration.

BOD / COD
Organic strength of a wastewater stream. BOD/COD functions as both a pollutant to be removed chemically or biologically and as a food source for biological processes.

Bleed and Feed
A method of treating concentrated baths by adding small amounts of the concentrates, continually to the whole system to treat the contaminants.

Coagulation
The destabilization of solids by charge neutralization using chemical additions. These coagulation chemicals are usually blends of safe metal salts along with organic components to aid in the clarification of the water.

Enzymes
Chemicals produced by biological means that help initiate the degradation of complex compounds into simple compounds.

Equalization Tank
A tank (usually with a mixer) to mix wastewater from various source and properties to make the water homogeneous before treatment.

Flocculation
The agglomeration of particles by the addition of a polymer to mass the solids together through gentle stirring thus allowing them to fall to the bottom because of their increased weight.

FOG
Fats, oils, and grease.

Heavy Metals,
Heavy metals, when in significant concentrations in water, may pose detrimental health effects. Heavy metals include: lead, silver, mercury, copper, nickel, chromium, zinc, cadmium, tin and selenium that must be removed to certain levels to meet discharge requirements. Heavy metal precipitants that can be used are dimethyldithiocarbamate, sodium trithiocarbonate, and sodium sulfide blends.

Heterotrophic Bacteria
Bacteria that primarily degrade BOD/COD.

Ion Exchange Unit
A reversible chemical reaction where an ion (either negative or positive) is exchanged for a similarly charged particle in a column packed with polyelectrolytes. These electrolytes are either zeolites or resins packed in a large column. These columns are used to remove metal salts, acid and bases not oil. The water from this unit is pure water. Columns haves a regeneration cycle where by it is flushed with caustic soda to regenerate the particles.

Mercaptans
Compounds containing sulfur which have an extremely offensive skunk-like odor. Also described as smelling like garlic or onions.

Micronutrients
Trace minerals and metals in concentrations less than 1 mg/L. Micronutrients function as a vitamin source for bacteria and help increase the efficiency of biological degradation of pollutants.

Nitrifying Bacteria
Bacteria that primarily degrade Nitrogen Ammonia compounds.

ORP
Oxidation Reduction Potential (mV) - most commonly used to measure the effectiveness of water disinfection systems using sanitizers such as chlorine, bromine, ozone, peroxy-acetic acid, Hydrogen Peroxide etc. It is also commonly used in wastewater treatment for oxidation of cyanide waste, chrome reduction etc. ORP standards have been long established for water sanitation, and are recommended over ppm measurements with traditional test kits.

Oxidation
Combining elemental compounds with oxygen to form a new compound. When used with a catalyst (AquaPure OE) can be used to precipitate out sulfide from H2S and reduce odor.

Peristaltic pump
A type of positive displacement pump. Preferred for use in waste treatment systems.

pH
A term used to describe the acid-base characteristics of water, typically measured by a pH meter. Specifically, the concentration of H+ ions in water. Formally, pH is the negative logarithm of the H+ concentration of a water:
pH < 7 refers to acid solutions
pH > 7 refers to basic solutions
pH = 7 refers to neutral solutions

Pin Floc
Excessive solids carryover. Pin floc may occur from time to time as small suspended sludge particles in the supernate.

Potable Water
Water that does not contain objectionable pollution, contamination, minerals, or infective agents and is considered satisfactory for drinking.

POTW
Publicly Owned Treatment Works, as opposed to an industrially owned facility or pipe system.

PPM
Parts per million. One PPM is equivalent to 1mg per liter. It is used in measuring the level at which metals are contaminating water.

Reducing Agent
Any substance, such as the base metal (iron) or the sulfide ion that will readily donate (give up) electrons. The opposite of an oxidizing agent.

RO Unit
Reverse Osmosis Unit for water purification. RO Units utilizes a membrane under pressure to filter dissolved solids and pollutants from the water. Often used for organic contaminants such as oil, and chelates

Sewage
The used water and water-carried solids from homes that flow in sewers to a wastewater treatment plant. The preferred term is wastewater.

Sludge
The settable solids separated from liquids during processing. Also the deposits of foreign materials on the bottom of streams or bodies of water.

Supernatant
Liquid removed from a tank once the solids have settled. This liquid is usually returned to the influent tank or to the primary clarifier.

TSS
Total suspended solids

TDS
Total dissolved solids

Turbidity
The amount of suspended matter in wastewater, obtained by measuring its light scattering ability. Commonly referred to as water “clarity.”

Upset
A term used to describe a change in a wastewater system whereby normal chemical additions will not work well to remove contaminants. This may happen when a concentrated tank is dumped without the knowledge of the operator and the water becomes higher in metals, surfactants or chelators. Chemical feeds have to be turned up to help clear this problem. Usually waste water is somewhat dilute with rinses. Spent baths, if treated and not hauled away, are bled into the system so as not to “upset” the balance of treatment.

Waste Treatment
A treatment to remove contamination of oils, metals, and solids in water. This treatment employs the use of various equipment and chemicals for removal.

Weir
A wall or plate placed in an open channel or tank and is used to measure flow of water or to allow for oil to be skimmed off the surface.

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Chemistry and Expertise for Manufacturing’s Toughest Problems

Hubbard-Hall

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