Product Information Bulletin
ElectroBrom TM Electrolytic Bromine Biocide Units

PIBE0111

General

Patented[i] **ElectroBrom** units produce electrolytic bromine for use as a cooling water biocide by electrochemical oxidation of a diluted, aqueous scale inhibited solution of sodium bromide and chloride via use of an electrolytic cell made of impregnated graphite and a low voltage direct current power supply. Electrolytic bromine solution is produced at a level of 0.4 to 0.8%, measured as total bromine, classified by OSHA as non-hazardous. After addition to the cooling tower, the electrolytic bromine degrades to non-hazardous bromide ion, eliminating discharge of toxic, hazardous biocide chemicals in the cooling tower blowdown.

ElectroBrom units are for larger cooling towers and are supplied as complete skidded, custom option unit ready to operate as shipped from our Brockway plant. Biocide dose control is via an outside source turning the unit on and off, such as a typical cooling tower controller with a biocide timer function, or via the internal unit PLC. Automatic polarity reversal is provided for self cleaning of the electrodes. Units are capable of dose feed against a maximum back pressure of 40 psi.

ElectroBrom Model EB 30

Blended salt mixture, PCT 3023: blended concentrate aqueous salt solution, PCT 3024: a 40% sodium bromide solution, PCT 3038: or a 100% sodium bromide salt, PCT 3037; are utilized to make the diluted feed solutions and are all USEPA registered for use as biocide precursors. All precursor products are also classified by DOT and OSHA as "non-hazardous". Typically, any potable water source can be used as dilution water.

Sizing

ElectroBrom units should be sized to produce a "slug dose" residual total bromine level of 0.5 to 2.0 mg/l in the cooling water following a maximum of twelve (12) hours unit operation. Units can also be utilized to maintain continuous bromine residual, recommended levels are 0.2 to 0.5 mg/l, with levels controlled by on-off unit operation. For design purposes, a total bromine demand of 3 mg/l is assumed for typical cooling water.

Precursors

All ElectroBrom units are equipped with automatic dilution to makedown various concentrate solutions to the level needed for effective electrolysis.

PCT 3024, while the most costly use basis product, offers the advantage that it is a concentrated liquid containing both sodium bromide and chloride, and the anti-scalant that permits, with polarity reversal, use of hard dilution water. This eliminates potential mix down errors and is very convenient.

PCT 3023 is good for difficult to service locations as it is a dry blended dry salt mixture. This anti-scalant containing product is mixed into a concentrated solution using a mixer equipped solution tank.

PCT 3038 is utilized when a separate brine tank is provided, sodium bromide and sodium chloride concentrate solutions being provided to the ElectroBrom unit by separate chemical pumps. This product contains the required anti-scalant and generally provides the lowest operating costs.
PCT 3037 is used when separate brine tanks are utilized for sodium bromide and sodium chloride concentrate solution supply so as to obtain the absolute lowest operating cost, generally competitive with gas chlorine. Please note that a third chemical feed pump is required for separate feed of the anti-scalant, PCT 6952.

Electrolytic Cell
The electrolytic cell is constructed of two (EB 10), or three (all other EB units), two (2) inch thick polymer impregnated ultra high density graphite plates with 0.25 inch spacing between plates to form the cell. The EB 10 is commonly termed a monopolar cell, while the remaining units are bipolar cells, passing the electric current through two cells in series to increase power use efficiency. Plates are "diamond" mounted with the bottom corner receiving diluted feed solution and the output bromine solution removed from the opposing upper top corner. The entire electrolytic cell is mounted in a steel skid assembly and larger cells are steel plated.

Power Supply
The power supply is a constant current, adjustable, amperage limited transformer type solid state unit designed to provide direct current at the rated output amperage, 6 volts for the EB 10, 12 volts for the remaining unit, maximum output, input power of 110 vac, 220 or 440 1-3 phase optional, and constructed to NEC requirements using UL approved components. The power supply cabinet is completely sealed using exterior heat sinks for cooling and commonly equipped with an amp meter, volt meter, PLC control for polarity reversing and biocide feed event timing, high cell temperature alarm, on-off power switch with indicator, and fuses on both low and high voltage circuits. We can integrate any type of remote interface, remote controller, or digital output in the control panel per customer specifications.

ElectroBrom Unit Specifications

Model	Output as Br lb/hr	Amp Output	Power use kw-hr	3024 use lb/hr	3038 use lb/hr	dilution water use gal/hr	number of cell plates
EB 10	0.42	100	0.75	6	1.3	15	2
EB 15	0.64	90	1.35	5.6	2.0	13.5	3
EB 20	0.83	120	1.8	7.5	2.7	18	3
EB 25	1.0	150	2.25	9.4	3.4	22.5	3
EB 30	1.25	180	2.70	11.2	4.0	27	3
EB 60	2.5	360	5.4		8.0	54	3

Unit dimensions: EB 10 and 15, panel 24" x 24" x 8", frame mount footprint of 30" x 24" x 6' H
EB 20, 25, and 30, skid 3' H X 3' W x 3' L, EB 60 skid 5' H X 4' W x 6' L
Water inlet piping: 1/2" copper Electrolytic solution outlet: 0.375 PE tubing

ProChemTech International, Inc.
"Innovation in Water Management"
Apache Junction, AZ, and Brockway, PA
814-265-0959 **www.prochemtech.com**

[i] US patent #7,927,470