

DuBois

Cooling Systems

Startup
And
Layup
Procedures



Start Clean!

During winter storage of cooling tower systems, a variety of debris, rust, and airborne dirt or silt will accumulate in the cooling tower. Unless a thorough cleaning is done before starting regular treatment, you will circulate this debris and cause plugging up of strainers, heat exchangers, and condensers and disrupt cooling tower water flow. This will also provide food for microbial growth, potentially increasing health risks. This procedure should be performed ideally on a semi-annual basis, in order to minimize the risk of disease.

The following procedures will help you Start Clean!

Address biogrowth with hyperchlorination protocol (recommended “off-line”)

1. If system is in dry storage, remove all loose debris such as leaves, twigs, etc. Fill with water, circulate and flush to further remove the airborne contaminants which have accumulated during storage. If system is in wet storage, or currently in operation, circulate, flush, and refill with fresh water before proceeding.
2. If possible use a water flowmeter when recharging system with fresh water to determine most accurately the system volume.
3. Physically remove accessible sludge and debris.
4. Add **Penetrex** antifoulant and dispersant at 1/2 to 1 pint/1000 gallons. Circulate 2 to 4 hours on-line. If excessive dead algae or debris overloads system, shovel into empty pails or drums marked for disposal.
5. After shutting off all bleed valves, sprinkle **Deep Crystal** at 2 to 3 lb./1000 gallons of system water (approximately 200 ppm chlorine) into each distributor box or header. Continue to drip feed **Penetrex** – it will assist in penetrating to deeper layers of viable algae in the mats as the outer layers are killed. Circulate **Deep Crystal** and **Penetrex** for a minimum of 4 hours, overnight if desired. If severely fouled, this procedure may be repeated several times – until all algae masses appear gray or brown, indicating that they have been killed. Sweeping, brushing, or hosing may be necessary for complete removal.
6. If your Scale I.D. Kit #409215 indicates any remaining deposits to be composed of greater than 75% carbonate, metal-safe **Super Dica** is recommended. (Off-line).

Descaling (if necessary)

1. Isolate portion of system to be cleaned.
2. Make a solution of **Super Dica** in a separate container then feed to provide 8 to 16 ounces of the original powder per gallon of system water.
3. Circulate to provide optimum contact of water to scale. Allow for venting, and have defoamer available.
4. Maintain pH <3 with further addition as necessary.
5. Complete application procedures are on Technical Data Sheet.

Note: If scale is not primarily CaCO_3 , consult Cleanup Selection Guide/Decision Tree or discuss with Water Systems Department before proceeding. If system is an evaporative condenser or fluid cooler, water flow patterns may prohibit full contact. Consult cleanup guide.

6. Flush with high pressure hose and remove all scale, sludge, silt, debris, etc., from the basin or sump, paying particular attention that all screens and filters are free-flowing.
7. For best results (rapid passivation), add treatment product, preferably one containing molybdenum, phosphate, or similar inhibitors (such as **GCO-10-LM** or **Passivate Plus PBB**) at twice normal dosage for about the first ten days of operation. Then begin maintenance product as normal.

Note: A moderated “on-line” hyperchlorination procedure is also available for interim cleaning.

Finally, the proper method of disposal of any and all “Cleanup” materials must be followed. This may include discussion with regulating body and DuBois personnel.

The stagnant conditions in this tower sump caused extensive biological growth.

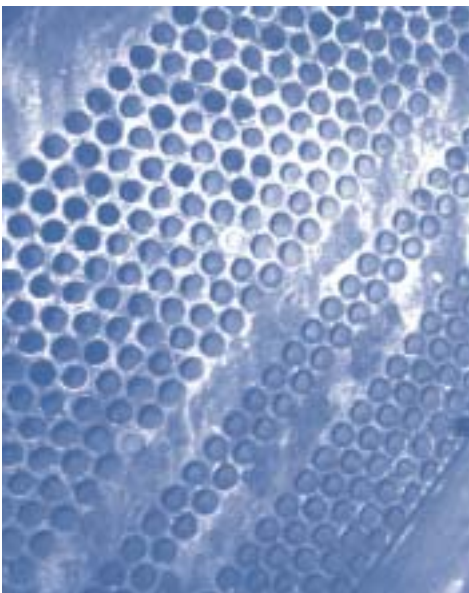


Finish Clean!

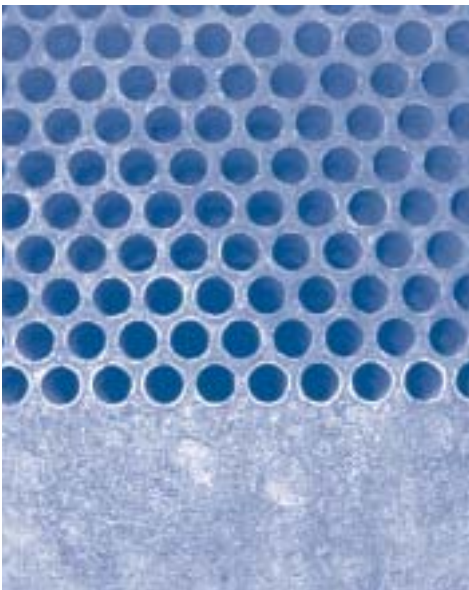
Many cooling tower systems are not operated year round. Prior to shutting down, inspect the tower system for algae, slime, scale, corrosion products, or other foulants such as mud and silt.

If biogrowth is present (even in small quantities) perform a cleanup with **Deep Crystal** and **Penetrex** prior to shutdown. This will help alleviate the corrosion and health hazards associated with stagnant water in the piping.

If other deposits are found, select the appropriate DuBois product from your Cleanup Selection Guide/Decision Tree.



Improper storage of chiller can lead to corrosion.



When the chiller is properly laid up and stored, the system is corrosion free.

Dry Layup of System

(This is the preferred method if storage is for longer than 1 month.)

1. Before draining, circulate **GCO-LM*** or **EZ Cool PBB** at a dosage sufficient to provide 30 ppm molybdenum (about triple the normal level) for 7 to 10 days, with normal to heavy bleed. This initiates metal passivation and helps to eliminate biogrowth. (Passivation may also be initiated with phosphate-based products such as **Passivate Plus PBB**. Biocide addition will be required).
2. Drain system and blow dry with air where possible.
3. If possible, place suitable desiccant in plastic trays into heat exchangers and piping and “blank” them off from the air.
4. If it is not possible to close up the system (the cooling tower itself will still be exposed), at least close off the tower basin drain and allow thorough air drying throughout the rest of the system.

Wet Layup of System

(When dry layup is not possible or for shorter durations of storage.)

1. Ten days prior to shutdown, add sufficient **GCO-LM*** or **EZ Cool PBB** to provide about 30 ppm molybdenum (triple the normal level) and circulate with normal to heavy bleed. (Passivation may also be initiated with phosphate-based products such as **Passivate Plus PBB**. Biocide addition will be required.)
2. Upon shutdown, add sufficient uninhibited glycol for freeze protection. This combination affords protection from excessive corrosion by providing metal passivation and added biological control. It is advisable to circulate the water for a few hours at least twice a month during wet storage. Add treatment as needed to maintain proper levels. This helps to avoid “stagnant” water conditions.

Other approaches are possible, depending on special needs. Should you have questions, contact DuBois WSD.

Passivation

“White Rust” is a common enemy of galvanized systems. Your DuBois Representative can provide information and excellent products such as **Passivate Plus PBB**.

Passivation of galvanized metals and mild steel may be required at any time under many conditions. DuBois protocol and products can provide ultimate protection.

* GCO products are not compatible with “polymer” products. Systems using “polymer” products should be discussed with Water Systems Department before proceeding.

DuBois Cleanup Products

Deep Crystal: A fast-dissolving dry source of chlorine for cleaning heavy algae deposits from cooling towers. It is also used to prevent algae growth and buildup which reduces tower efficiency. The dosage rate is two to three pounds of **Deep Crystal** per 1000 gallons of system water.

Penetrex: Dispersant/Antifoulant designed to be highly effective in penetrating and dispersing microbial growth such as algae and slime stringers. It is also used for emulsifying oil and sludge in cooling water systems for easy removal. Penetrex helps **Deep Crystal** clean up a system more rapidly with tremendous results. Dosage is generally 1/2 to 1 pint per 1000 gallons of system water.

Super Dica: An acid descaler, a superior cleaner, which is galvanized metal-safe. This free-flowing powder is used at 8 to 16 ounces per gallon of system water to derust, (in conjunction with NaCl), descale and remove proteinaceous deposits from boilers, heat exchangers, evaporators, cooling jackets, refrigeration and air conditioning equipment. It is safer to handle and easier to use than more corrosive mineral acids. Level of pH should be maintained at 1 to 4. Refer to Technical Data Sheet for complete using procedures.

DuBois PBB – Drum Free Water Treatment Solutions

New – **DuBois PBB** – (Powder in a Bag-in-a-Box) is a full line of Drum-Free cooling water products. It provides excellent scale and corrosion control, both for maintenance and for storage. Use appropriate biocides along with DuBois PBB Products.

Supertrex PBB: Packaged in a safe, convenient water-soluble pouch, this product represents a major advancement in high hardness and alkalinity water.

Supertrex LM PBB: Packaged in a safe – convenient water-soluble pouch, this product provides excellent corrosion protection in storage or daily service.

EZ Cool PBB – Molybdate-based Drum-Free product for widely variable water quality. Biocide may be included.

Passivate Plus PBB – new Drum-Free, molybdate-free product which provides excellent white-rust* and mild steel passivation.

**White Rust potential must be addressed on both new and operating galvanized towers. Ask your DuBois Representative.*

Patented GCO Family Cooling System Treatment Products

GCO-10/GCO-10 with Visigard® *
GCO-30/GCO-30 with Visigard® **: A versatile blend of scale control agents, corrosion inhibitors and EPA Registered biocide. It provides superior control of scale and corrosion and provides control of many biofouling organisms occurring in open recirculating water cooling towers.

GCO-10-LM/GCO-10-LM with Visigard® *
GCO-30-LM/GCO-30-LM with Visigard® **: Specially formulated to provide superior protection in soft or low alkaline water. Contains corrosion inhibitors, scale control agents and an EPA Registered biocide.

**Optional Visigard® - is DuBois unique visual tracer used for monitoring product concentration.*



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