



EVAPORATIVE COOLING:

PAD MAINTENANCE & WATER TREATMENT

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Evaporative Cooling

- Natural Process of evaporating water into the air
 - Water absorbs heat & the air becomes cooler
 - Widely utilized to provide cooling for poultry, swine, dairy, plants and people
 - Enhanced & improved with fans, cooling systems and specially designed cross fluted pads to mix hot air with a wet paper surface
 - Cooling pads are manufactured with special paper, adhesives, thermosetting resins and anti-rot salts to stand up to the elements
 - Available in various styles and designs
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Benefits

- Provides a cooler, cleaner, drier, more comfortable and productive environment
 - Increased yields
 - Lower mortality
 - Promotes rapid growth
 - Better feed conversion
 - Cost effective
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Most Popular Pad Types:

- 6" Thick Recirculating Pad
 1. 45/15
 2. 30/30
- 4" Thick Recirculating Pad
 1. 45/45
- 2" Thick Fogging Pad
 1. 45/45

Available with or without edge coating



Considerations Which Reduce Maintenance Problems

- Good water distribution
- No water leakage
- Easy access to water distribution for maintenance
- Proper bleed-off
- A trough which can easily be drained and cleaned



Evaporation of Water

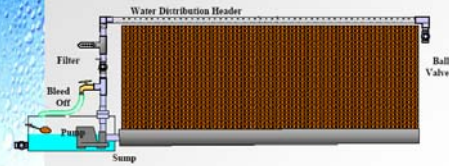
- When water evaporates, only pure water is released.
- Dirt and harmful chemicals are left behind on the pads, in the water and in the sump.
- Eventually, the water becomes so contaminated that it is harmful to the pad and gutters.

Chemicals Are Not Recommended for Daily Pad Maintenance

- Chemicals dry out on the media each time the water is turned off, causing the chemicals to lose their effectiveness
- Some chemicals are corrosive and will harm pads and gutters.
- Some chemicals contribute to microbial growth.
- Many chemicals cause environmental problems.
- Those who use chemicals often feel they can neglect other maintenance requirements

Plumbing and Water Distribution

Having a well designed and maintained water distribution system is the single most important way of prolonging pad life.



Water distribution systems should be neat, clean and easy to access.

Basic Requirements for Pad System

•Water is distributed evenly across the top of the pad.

•All flashing directs the water into the pad without splashing.

•50% support area under the pad

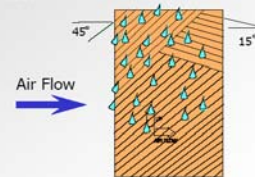


•Holes are on the top of the pipe

•Pad is supported above water even during shut down

Correct Orientation of Corrugated Pads

The unequal angles direct more air to the inlet where it is the hottest, driest, and dirtiest



Algae Must Have Three Essential Elements to Survive

- **LIGHT**
- **MOISTURE**
- **NUTRIENTS**

Dry the Pads Completely Every 24 Hours

- Regular drying of the pads for several hours at a time will retard or stop the growth of most micro organisms. Set automatic controllers so the water to the pads turns off before the fans turn off. The extra air will help to dry the pads.
- Install a separate timer to the pumps which will turn the water off all night. There is little cooling effect from the pads between midnight and sun up.
- Minimize the number of drying cycles, though. Too many will weather the pad.

Nutrients from the Water

- Do not use phosphate type scale control agents or detergents on the pads. They degrade to form phosphate type nutrients.
- Use water from deep wells or municipal supplies. Surface water from lakes and shallow wells may be high in nutrients.

Calculating Disinfectant Dosages

Dose Size (Fluid Ounces) = $\frac{\text{Desired PPM} \times \text{Sump Capacity (Gallons)}}{\text{Percent Active Ingredient} \times 7.8}$

For instance, when treating a 250 gallon tank with chlorine bleach (5.25% active) to a concentration of 2 PPM use the following dose:

Dose Size = $\frac{2 \text{ PPM} \times 250 \text{ Gallons}}{5.25\% \times 7.8} = 1.22 \text{ Fluid ounces}$

Conversely, if the entire gallon of chlorine bleach was poured into the sump, the concentration would be:

$\frac{5.25\% \times 7.8 \times 128 \text{ Fluid Ounces}}{250 \text{ Gallons}} = 210 \text{ PPM}$

Of course, this is way too much chlorine! So, be careful when disinfecting pads and sumps, because overdosing is easy.

Algae Control Checklist

With simple preventative measures, good control can be obtained without chemicals:

- Shade the pads and sump.
- Dry the pads daily.
- Avoid Nutrient Contamination.
- Drain and disinfect the sump regularly.
- Use chemical disinfectants carefully. There are no "miracle" chemicals. Learn to read the label and understand the ingredients.

Reducing Scale Formation


Scale and mineral deposits form on the face of the cooling pad when the mineral content in the water is too high.

- Increase the flow of water over the face of the pad.
- Make certain the flow of water is even from one end of the distributor pipe to the other.
- Clean and flush the distributor pipe regularly, especially if dry streaks appear on the face of the pad.
- Use plenty of bleed-off.
- Bleed off is also important for algae control

Final Checklist

- Shade the pads and sump
- Dry the pads out completely each night
- Bleed off a quantity of water regularly
- Flush and disinfect the entire water distribution system at least quarterly
- Avoid harmful contaminants including dust, fumes, harsh cleaners, and water treatment chemicals
- Run the recommended quantity of water over the pads

Inspect On _____	Inspect On _____	Inspect On _____
<p>Weekly</p> <ul style="list-style-type: none"> • Visually inspect the pads for bowing or sagging or dry streaks. • Dry the pads completely every 24 hours. • Inspect the sump, remove any debris and make sure the water level is correct. • Check the water distribution system for leaks and clogged water distributor holes. 	<p>Monthly</p> <ul style="list-style-type: none"> • Check bleed-off rate and adjust if necessary. • Check water flow rate and adjust if necessary. • Check pumps and clean any debris from the inlet. 	<p>Quarterly</p> <ul style="list-style-type: none"> • Drain and disinfect the entire water distribution system.
<p>Checks to Maximize Pad Life</p> <p>Scale Control</p> <ul style="list-style-type: none"> • Maintain a pH between 7 and 9 in the sump and 6 to 9 for make-up water supply. • Make sure the flow of water is even from one end of the distributor pipe to the other. • Water flow should be 0.75 gpm per linear foot for a 6' pad • Use plenty of bleed off. <p>Algae Control</p> <ul style="list-style-type: none"> • Shade the pads and sump • Allow the pads to dry out completely every 24 hours • Avoid contaminants from contacting the pads and water. Dirt, fumes, fertilizer, phosphates, etc. provide nutrients for algae growth. <p>General Rules</p> <ul style="list-style-type: none"> • Do not cycle the pump on and off using 10 minute timers. This will cause the pads to wear out prematurely. • Use chemicals to clean and disinfect ONLY. 		



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