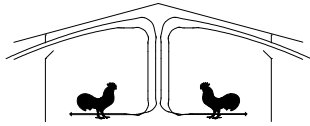




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Poultry Housing Tips

Evaporative Cooling Pad Quality Makes a Difference

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Six-inch evaporative cooling pad systems are a vital part of a tunnel-ventilated poultry house's cooling system. When properly installed and maintained, a six-inch pad system can reduce the incoming air temperature on a hot summer day 20°F or more, dramatically reducing heat-stress-related problems. Furthermore, six-inch pad systems have virtually eliminated the need for interior fogging nozzles which has resulted in cleaner houses, increased equipment life, and reduced risk of electrical shocks due to wet thermostats. Last but not least, six-inch pad systems have eliminated the wasteful run-off associated with traditional two-inch fogging pad systems. Most people would agree that the transition of the poultry industry from fogging and fogging pad systems to six-inch evaporative cooling pad systems has proven to be very beneficial to the birds we grow as well as to growers.

Though on the surface the construction of an evaporative cooling pad looks fairly simple, there is in fact a fair amount of science and engineering that goes into their design. The paper used to construct the pads has to have just the right type and amount of resins that will not only enable the pad to last seven years or more when exposed to the elements, but also allow water to easily "wick" throughout the pad to maximize water evaporation. The "flutes" need to be just the right size and angle to produce maximum cooling of the incoming air while at the same time not causing excessive static pressure that would adversely affect the air moving capacity of the exhaust fans. Last but not least, pad surface coatings need to be formulated and applied in a way that surface rigidity is maximized, while at the same time not adversely affecting pad cooling or air flow through the pad.

The good news for poultry producers is that the vast majority of pads sold in the U.S. are of superior design and quality. The bad news is that because all pads look very similar, producers may unknowingly purchase a pad from a new manufacturer that is not of the same quality as those traditionally sold in the U.S. The following are a few things to look for when considering installing new evaporative cooling pads, that though not always conclusive, can provide some indication as to pad quality.

PUTTING KNOWLEDGE TO WORK

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- 1) Are the pad flute angles actually $45^\circ \times 15^\circ$? Pad flute angles not only determine the cooling produced by the pad but the amount of static pressure generated pulling air through the pad. Figure 1 is a profile view of two “ $45^\circ \times 15^\circ$ ” six-inch pads. The pad on the left has 45 degree flute angles that actually measure 45 degrees. The 45 degree flutes of the pad on the right are significantly less than 45 degrees. The decreased flute angle would reduce the amount of water flowing to the outside surface of the pad as well as tend to reduce cooling efficiency.



Figure 1. Side view of two six-inch pads.

- 2) Do the surface edges have a clean cut? Rough edges can be due to the use of poor quality paper, dull saw blades, or cutting the pads too quickly (Pads are made in large pad “blocks” which are then cut into 6” wide pieces). Rough edges will not only lead to increased static pressure and therefore reduced fan performance, but can also tend to collect more surface dust/trash than clean cut edges. Furthermore, the rough edges can make it harder to clean a pad once it becomes clogged with minerals, algae and dust.

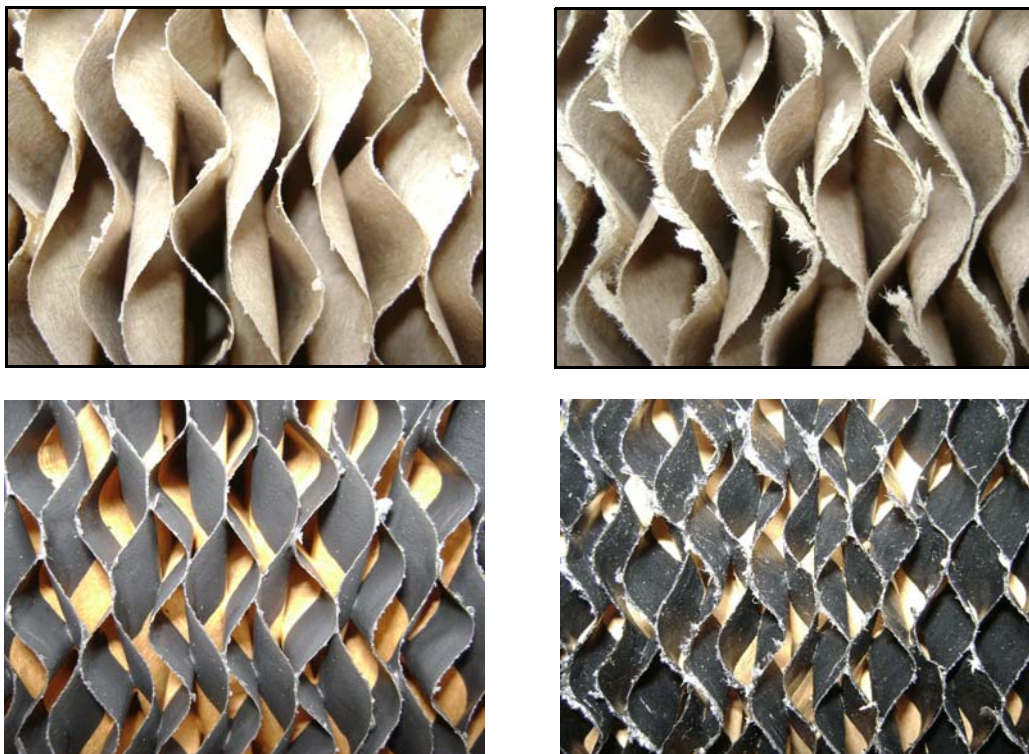


Figure 2. Clean cut edges vs Rough cut edges (coated and uncoated surfaces).

- 3) Does the surface coating actually increase the surface rigidity of the pad? This is the primary purpose of the surface coating. The pad in Figure 3 has a surface paint rather than a coating and as a result is very flexible. A rigid pad surface not only allows the pad to be cleaned with a brush without damaging the surface, but also increases the usable life of the pad. The fact is that in many ways it is the strength of the surface edges which determines pad life. Once surface edges lose their integrity and “fall over”, static pressure climbs, air velocity in the house decreases, and the birds suffer.

A proper pad coating is also formulated to help keep dirt and algae from adhering to the pad as well as retard the growth of algae on the pad. Furthermore, a pad coating should have a relatively flat finish so that it does not repel water from the surface of the pad.

Figure 4 provides a good illustration of how a surface coating can dramatically increase the life of a pad. The pad on the left in Figure 4 is seven years old, the pad on the right is six years old. The pads are on the same farm and are managed and cleaned the same way. The pads on the left have a surface coating and are in very good shape and should last at least a few more years. The pads on the right do not have a surface coating and need to be replaced.



Figure 3. Soft surface coating.



Figure 4. Two pads approximately the same age, on the same farm.

- 4) Is the pad paper impregnated with proper amount of quality resins? A pad is only as good as the paper it is constructed of. One simple test of resin quality is to thoroughly wet a pad, put it on its side, and simply push down on the pad. Does it hold its shape? The new pad in Figure 5 once wetted was easily crushed and is obviously of poor quality. Poor quality paper will likely lead to pads “bowing”, “shrinking” and falling out of the distribution system in a relatively short period.

- 5) Does the pad have strong glue joints? Much of the strength of a pad can be attributed to the quality of the glue joints between the individual sheets of paper. One simple test to get some idea of pad quality is to wet the pad and try to pull an individual sheet of paper from the side of the pad. Is it possible to easily pull off an entire sheet of paper from the pad? If so, the pad may not have the rigidity to last.



Figure 5. Pad constructed of poor quality paper.



Figure 6. Weak pad glue joints.

- 6) How long has the pad been manufactured and used in poultry houses? The simple fact of the matter is that if a pad has been used in poultry houses for five or more years and is still on the market chances are it is of adequate quality. If you are considering installing a pad from a new manufacturer you may want to ask for an extended warranty period.

Though the above pad tests may not distinguish between a good and a great evaporative cooling pad, they should at least keep you from purchasing a pad that you might have to replace in just a few years.


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