The University of Georgia

College of Agricultural and Environmental Sciences
Cooperative Extension

Poultry Housing Tips

Blown Stabilized Fiberglass Insulation

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Figure 1. Blown stabilized fiberglass insulation.

Having quality ceiling insulation is of significant benefit to poultry producers year round. During cold weather, hot air produced by the brooders, furnaces and the birds quickly rises towards the ceiling. If the ceiling is not properly insulated, this valuable heat will pass through it, resulting in lower house temperatures and higher heating costs. Conversely, during summertime, ceiling insulation keeps the amount of heat entering the house through the ceiling to a minimum. On a hot summer day, attic temperatures in dropped-ceiling houses can easily exceed 130°F. If a ceiling is not properly insulated, heat from the attic space will enter the house, leading to higher house temperatures and lower bird performance.

The most common form of insulating material used in dropped ceilings today is blown cellulose insulation. Blown cellulose insulation has a good R-value, relatively easy to install and, most of all, inexpensive. Though for the most part cellulose insulation, when properly installed, has proven to be a very effective insulating material for dropped ceiling poultry houses it is not without problems. The most common problem with blown cellulose insulation is its tendency to, over time, "slide" away from the peak of the ceiling which can leave the peak of the ceiling with little or no insulation. The movement of the cellulose insulation away from the peak of the ceiling is generally caused by the fact that most dropped ceilings are sloped, the plastic used to support the insulation is relatively slick, and constant cycling of exhaust fans tends to cause the ceiling to vibrate. The movement of blown cellulose insulation tends to be most problematic in houses where a minimal amount of cellulose insulation was blown in the ceiling when first installed and in houses where powerful circulation fans are placed near the ceiling causing the ceiling to vibrate. Another problem sometimes seen in houses with blown cellulose insulation is that if the eave openings into the attic space are too large strong winds have a tendency to blow the insulation away from the side wall. Though for the most part this problem can adequately be handled by assuring that the size of attic eave openings are

kept to a minimum, the problem of insulation shifting down away from the peak of the ceiling has generally proven a more difficult and costly one to solve.

A question that many producers have that have discovered that their cellulose insulation has shifted is first how to fix the problem and secondly, how to keep it from happening in the future. Traditionally most producers simply blow more cellulose in the areas that have thinned over time. Some have placed a ten foot length of fiberglass batt insulation at the peak of the ceiling. Both of these methods have proven somewhat effective but now there appears to be a third option, blown stabilized fiberglass insulation. Stabilized fiberglass insulation is a fiberglass insulation product with special binders that causes the fiberglass insulation to tend to stick together after it is installed. Blown stabilized fiberglass insulation was developed for use in ceilings in residential houses with slopes as high as 45 degrees where as you might expect getting a blown insulation to stay in place would be a challenge. It has been installed in a number of both new and existing poultry houses over the past few years and results to date look promising.

Figure 2. Missing ceiling insulation.

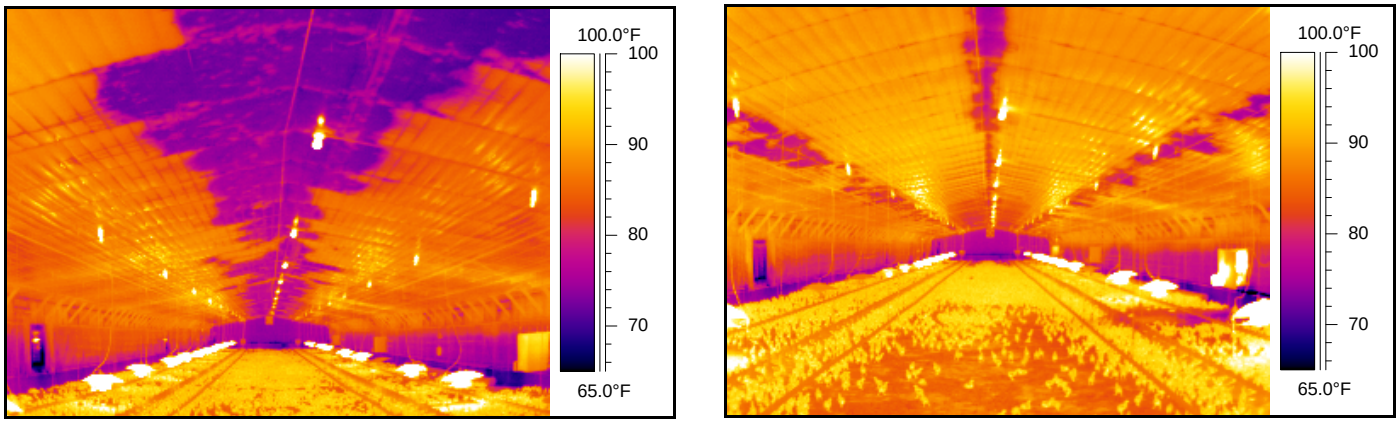

Figure 3. Thermal images taken during brooding in houses that were not reinsulated with the stabilized fiberglass insulation.

Recently a study of stabilized fiberglass insulation, manufactured by Guardian Building Products (800-968-8265) was initiated at a six house farm with a severe problem with shifting cellulose insulation (Figure 2). Large areas of insulation were missing from near the peak of the ceiling as well as in spots over the feed lines of all six houses on the farm (Figure 3). Not only did the producer feel that the lack of proper ceiling insulation was affecting his heating costs but during cold weather condensation would form on the uninsulated areas of the ceiling and drip onto the floor causing wet spots. The severity of the problem was likely caused by the fact that the cellulose insulation was not blown to the minimum recommended depth of five inches when the houses were built seven years ago as well as due to the fact that 24" circulation fans were used to mix the air in the house during cold weather which were often directed up towards the ceiling causing significant ceiling vibration.

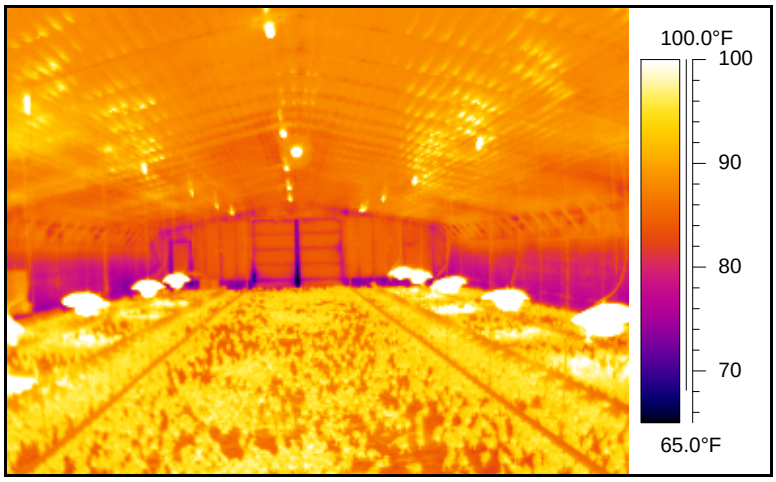

Figure 4. Thermal image of one of the houses after being reinsulated with the blown stabilized fiberglass insulation.

Three of the houses on the farm were reinsulated with blown stabilized fiberglass insulation to bring the total level of insulation even with the top of the bottom 2" X 6" cord of the truss (Figure 1). Though the blown stabilized fiberglass insulation did not form a solid matt of insulation, it did appear to bind together better than traditional blown cellulose insulation. Thermal images taken of the houses after the addition of the blown fiberglass insulation confirmed the fact that the blown insulation had significantly reduced heat loss through the ceiling (Figure 4). The producer reported that propane usage of the three houses that were reinsulated with the blown stabilized fiberglass insulation was 20% lower compared to the houses which were not reinsulated.

Another significant benefit of reinsulating the ceilings was the fact that the litter was significantly drier in the houses that were reinsulated. Condensation will tend to form during cold weather on any uninsulated surface. This is because of the fact that as warm, moist air comes in contact with a cool surface the moisture in the air will come out of suspension and be deposited on the surface. When there are large areas of the ceiling that are poorly insulated these areas will tend to become covered with moisture during cold weather. Not only will the moisture accumulating on the ceiling tend to drip on to the litter causing wet spots but they can lead to an overall increase in house moisture. The humidity in a house tends to increase overtime due to the moisture the birds expel as they breathe as well as the moisture that comes from the wet manure the birds deposit on the floor. Complicating matters is where there are additional wet surfaces in a building (i.e, condensation on ceilings, walls). These wet surfaces tend to add additional moisture to the air resulting in a higher house humidity. The situation in a sense feeds on itself. The higher the relative humidity, the lower the amount of moisture pulled off of the litter and condensation laden house surfaces, the wetter everything becomes, which increases the humidity even more and so on. Having fewer cold surfaces for condensation to form slows the process down and tends to lower overall house humidity. Lower humidity, drier litter, less ammonia, more healthy birds.

One of the keys to the long term stability of blown stabilized fiberglass insulation, as with blown cellulose insulation, is making sure the proper amount of water is added to the insulation as it is blown. The “stabilizer” in blown stabilized fiberglass insulation is essentially dry glue which requires the proper amount of water to help the fiberglass insulation “stick” together. Too little water, the insulation will not stick together and the insulation will very likely migrate over time. Too much moisture and the insulation will become too dense and its insulation value will be decreased. There are specific tests that should be conducted from time to time as the insulation is being applied to assure the proper amount of water is being added to the insulation. Information on these tests can be obtained from the manufacturer.

One other unique benefit of blown stabilized fiberglass insulation is that because it has approximately the same density of traditional fiberglass it can be blown on top of existing fiberglass batt insulation. This can be very helpful in a situation where a producer wants to increase the level of ceiling insulation in an existing house with fiberglass batt insulation. Blowing cellulose on top of existing fiberglass batt insulation would not only compress the existing batt insulation, but require the installation of additional banding to the dropped ceiling to support the weight of the relatively heavy blown cellulose insulation.

Though the initial results look very promising the fact remains only time will tell whether or not blown stabilized insulation will suffer from the same migration issues as traditional blown cellulose insulation. This farm as well as others where the blown stabilized insulation has been installed will be monitored in the future and our findings will be published in future *Poultry Housing Tips*.

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