

AG-TITE

SPECIAL REPORT #3

Save Big \$\$\$ Building & Operating New Poultry Houses

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As the poultry industry continues to move look for ways to build more affordable houses, a new factor has entered into the equation – energy savings. With high sustained propane costs now a reality, it is critical to address three issues when building a poultry house.

- 1. How can you build a solid sidewall poultry house at an affordable price if traditional building materials (wood, plastic, etc.) have gone up in price ?**
- 2. How can you use new technology to reduce that cost and time associated with building a new house?**
- 3. When the houses have been finished, are they air tight so that they are energy efficient and maintain a good air flow for the correct ventilation throughout the house?**

The purpose of this special report is to educate the reader as to how new technologies in the soy sealant industry can address some of these issues so that poultry houses can be built less expensively and with a higher performance than traditional building materials. Of course, polyurethane foam has been used a lot in many other industries, from boat builders to residential house manufactures, but it has not really taken a prominent place in the agricultural business until just recently.

AG-Tite soy sealant was designed specifically for the harsh environments of a poultry house. With its closed cell construction, it is impervious to moisture and water and because of its high R value (5.5 per inch) it is the best insulator in the world. AG-Tite is very effective in helping in the work of retrofitting of a poultry house so with this in mind, how would this foam address the three issues listed above?

New House Installation

June 29 – July 1, 2005

Fancy Farm, KY.



Background

These two pullet houses were built in Kentucky for a farmer who grows for Pilgrim's Pride. Just prior to the framing of the houses, EDGE Enterprises and the builder discussed the possibility of eliminating the interior walls of the house which were designed to be OSB board and spray foaming from the inside just the interior walls of the house which were made of sheet metal. Construction continued until the last week of June, 2005 at which time the spray sealant crew arrived to put a 1.5" average coverage of AG-Tite Sealant onto the interior walls of the sheet metal.

Specifications

1.5" Average Thickness (7 R)
5,200 Sq Ft. of coverage per house
78 Panels @ 5' height + Gabel Ends
Estimated Cost of Installation Per House @ \$6,000
Estimated Cost of Sealing Footers Per House @ \$ 600
Estimated Time of Installation Per House @ 1 day

Installation

There are many advantages to spray sealant against sheet metal so this is an ideal material for this application. Here are just a few of those benefits:

- Better adhesion for the spray sealant because metal gets hot
- Better yield because the sealant will not be absorbed into the material
- Smoother finish which allows for a good air flow
- Easier to seal because the joints are more squared out
- Improved structural stability because the metal , wood posts and sealant all make one unit (see attached report)



Material Cost Comparison

Traditional Building Material

OSB Board @ \$3,500

178 sheets @ \$20.00 sheet

R-13 Insulation @ \$2000

Batting @ .23/sq. ft.

Nails, etc.@ \$20.00

Waste @ ????

Total @ \$5,520

AG-Tite Installation

1.5" Average @ \$6,000

Included

Included

No Waste

Total @ \$6,000

Labor Cost Comparison

Traditional Building Material

OSB Board Installation @ \$1,000

R-13 Installation @ \$850

Time @ 2-3 Days

Total @ \$1,850

AG-Tite Installation

Included

Included

Time @ 1 day

Total @ 0

Benefits Comparison

Features

Seals Air Tight

Structural Stability

All Temp Insulation

Energy Savings

Repairable

Traditional Building Material

No

Yes

No

No

No

AG-Tite Sealant

Yes

Yes

Yes

Yes

Yes

Conclusion

Over the past several years, AG-Tite (www.ag-tite.com) has proven to be effective in retrofitting older poultry houses and bringing them up to specifications close to any new house. What this case study shows is that AG-Tite Soy Sealant can now be used to raise the standard on new poultry house construction so that the building can operate efficiently in an environment of higher propane fuel costs.



WHY SHOULD I WORRY ABOUT WALL STRENGTH?

Your walls are the main structural component of your poultry house. In wood frame construction, the weight of the roof and any snow on the roof push down on the walls with a compressive force. Strong winds and wind gusts impose lateral loads onto your house walls that tend to distort the walls with a shearing force. Building codes require that walls be designed to withstand these loads. However, when walls are built to minimum standards, while safe, you may sense wall creaking during high winds or shaking when doors are closed.

WHAT IS A SHEARING FORCE?

A shearing force on a wall tends to distort the wall from its original shape as a rectangle into a parallelogram. To test a wall's resistance to the shear forces imposed by wind loading, engineers use a "racking test." An 8 ft. x 8 ft. model wall is built and placed in a large frame. The base of the wall is secured to the frame and a horizontal (lateral) force is applied at one upper corner. The force is increased in 400 lb. increments until the wall structure fails.



Stud wall as built. Stud wall under shear load (exaggerated)

WHAT IS THE EFFECT OF AG-TITE SEALANT ON WALL STRENGTH?

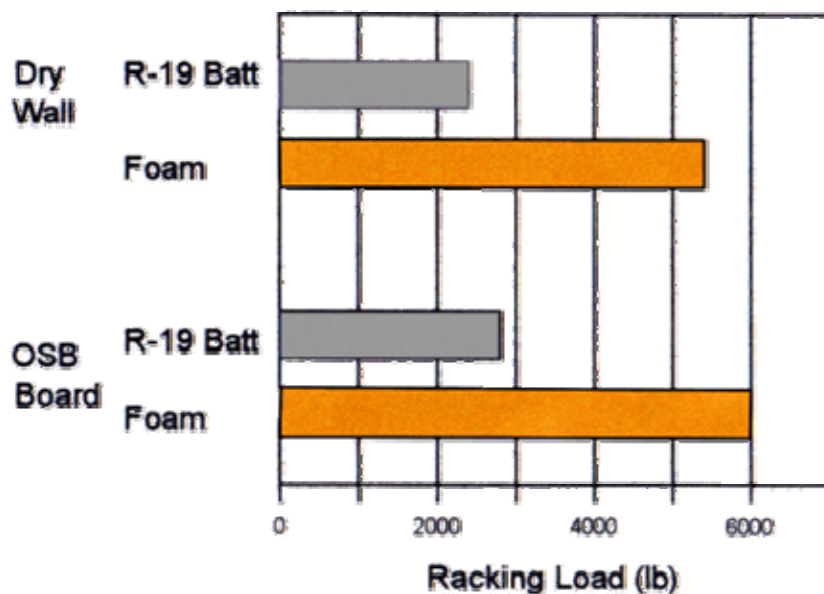
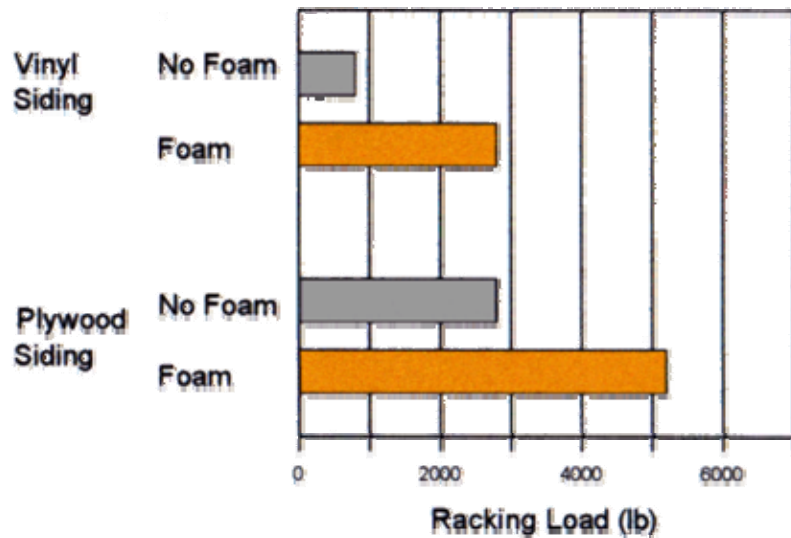
In a series of racking tests^{*}, walls with and without spray-applied polyurethane foam insulation were compared. Two exterior facing materials were tested:

- (1) Vinyl siding over 15-lb. building paper; and
- (2) 5/8-inch textured plywood siding.

All wall panels were faced with ½-inch sheetrock on the interior side and used 16 inch stud spacing. For the stud wall panels that were insulated with spray-applied polyurethane foam, the stud cavities were essentially completely filled with foam of 1.5 lb/ft³ density.

As the graph indicates, stud walls filled with spray-applied polyurethane foam add significant strength to home walls. Furthermore, for each load applied, the foam filled walls deformed less and offered greater resilience.

In a second series of racking tests** spray-applied polyurethane foam insulation was compared with conventional R-19 glass fiber batts. In one comparison, the wall panels were faced both sides with dry wall. In the other comparison, the wall panels were faced one side with OSB (oriented strand board) with dry wall on the opposite side. In both cases, the wall panels used steel studs spaced 24 inches on center and the average foam density was 2.26 lb/ft³.



WHAT DOES THIS MEAN TO ME?

When AG-tite is sprayed into your stud walls and fully adheres to the exterior sheathing and studs, you get a reinforcement of both. With this added rigidity, there will be less wall movement due to shaking and vibration. Additionally your walls have greater than code required resistance to "racking events" such as hurricanes or other strong wind situations.

With AG-Tite, you get more . . .

*Test results are reported in "Testing and Adoption of Spray Polyurethane Foam for Wood Frame Building Construction" (May 25, 1992) prepared by NAHB Research Center for The Society of the Plastics Industry/Polyurethane Foam Contractors Division.

**Test results are reported in a letter from Bob Dewey, Mechanical Engineer, NAHB Research Center to Mason Knowles, The Society of the Plastics Industry/Spray Polyurethane Foam Division (November 18, 1996).

Last updated:

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