

Clemson University Department of Pesticide Regulation

Use of Foam Insulation Below Grade May Provide Access for Subterranean Termites



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Bulletin 9

A Guide for Builders and Homeowners

The Clemson University Department of Pesticide Regulation is advising that any building techniques that use foam insulation at or below grade (contacting soil) can make termite protection and control very difficult.

Common building methods that are a problem include (1) insulation forms made of foam (polystyrene, polyisocyanurate, or similar products) between which concrete foundation walls are poured, and (2) rigid board foam insulation that extends below grade.

Foam Insulation in Contact with the Ground Makes Termite Inspection, Treatment, and Prevention Very Difficult

Buildings constructed with foam insulation at or below grade cannot be properly inspected or treated for control of subterranean termites with liquid termiticides for the following reasons:

1. Foam insulation at or below grade provides the structure-to-ground contact that termites exploit to reach the wood undetected.
2. While termites do not eat foam insulation, they will quickly “mine” through it and make galleries to reach the wood in a structure.
3. A termite infestation inside foam insulation is often not visible to a homeowner or a pest control operator during a pest control inspection, until swarming and significant damage to the wood of a structure have occurred. Foam insulation installed behind stucco makes termite infestation even more difficult to detect.
4. To date, research regarding the incorporation of pesticides into foam during the manufacturing process has shown no effectiveness in stopping termites.

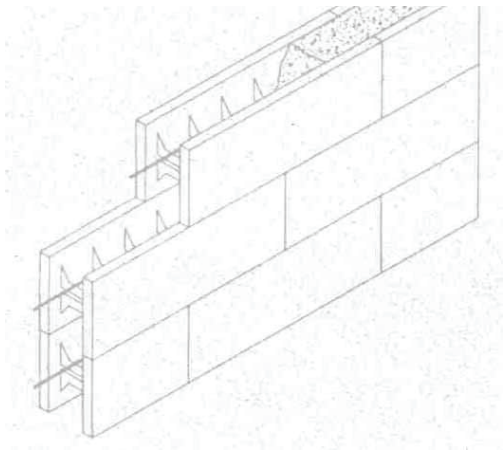
Foam Insulation in Contact with the Ground Could Result in Costly Damage

Foam insulation has excellent thermal qualities, making it a good choice for energy conservation. Problems with termite infestations arise when the foam insulation is placed as a continuous sheet with portions of it resting below grade.

Termites can use the below-grade insulation as an easy conduit into a structure by tunneling through the foam or between the foam and masonry. Because insulation is hidden from view by aluminum siding, wood, paint, stucco, etc., the termites can remain undetected until significant damage has occurred. For this reason, any energy savings that foam insulation results in may be negated by the cost of termite damage to the structure. **Waterproofing or coating the foam insulation will not keep termites out.**

Treatments for Building Techniques

1. Insulated Concrete Forms (ICFs) are wall forms made of foam insulation between which concrete foundation walls are poured.



1 Proposed Solutions

New Construction

- Build a conventional masonry or concrete wall below grade and start the foam insulation wall six inches above grade to provide for inspection and treatment.

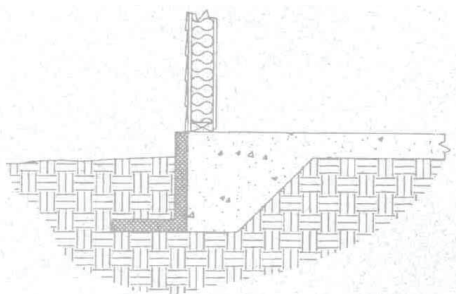
Existing Construction

- Remove outside foam insulation wall six inches above grade.
- For crawlspaces, remove the inside foam wall six inches above grade.

Unresolved Problem

- For slabs, the inside foam wall cannot be removed and is an access point for termites.

2. Rigid board foam insulation sheeting that extends below grade (used where footings are built above the frost line).



#2 Proposed Solutions

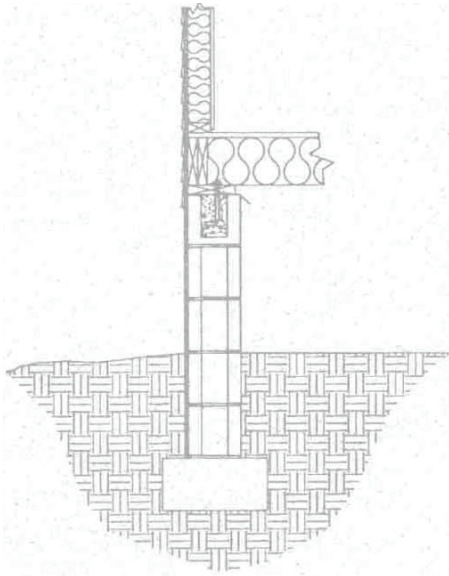
New Construction

- Build footings below the frost line and do NOT install foam board at or below grade.

Existing Construction

- Remove foam board.

3. Rigid foam board sheeting continued below final grade.



#4 Proposed Solutions

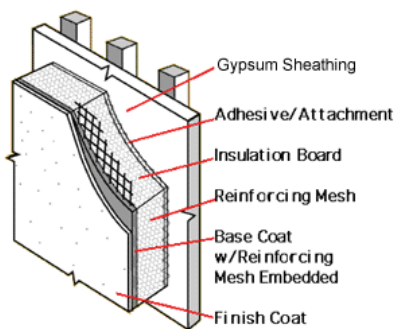
New Construction

- Do not install foam board within six inches of final grade.

Existing Construction

- Cut foam board at least six inches above final grade.

4. Exterior Foam Insulation Finish Systems (EIFS) with rigid foam extending below grade.



#4 Proposed Solutions

New Construction

- Terminate rigid foam construction at least six inches above grade. Make certain that the bottom edge of the rigid foam is sufficiently back-wrapped with the base coat and finish coat extending below the bottom of the rigid foam onto the masonry foundation.

Existing Construction

- Cut bottom of rigid foam a minimum of six inches above grade. Terminate this edge as stated above.

Remember

Building techniques using foam insulation have been used since the early 1980s. By 1992, it was estimated that 50 percent of new buildings used some form of foam insulation. If any of these new building materials are placed below grade, termites will be provided access to reach the wood. Basic termite biology is being ignored in use of these materials below grade.

DPR and Extension Service Support Building Codes

The Department of Pesticide Regulation and the Clemson University Cooperative Extension Service are proponents of Section 2304.1.4.1 and Section 2304.1.4.2 the *Standard Building Code*:

2304.1.4.1 *“In areas where hazard of termite damage is very heavy..., foam plastics including, but not limited to, extruded or expanded polystyrene or polyisocyanurate shall not be installed below grade on foundation walls or below grade on the exterior of slab foundation.”*

2304.1.4.2 *“In areas where hazard of termite damage is very heavy..., clearance between earth and foam plastics applied to the exterior wall shall not be less than 6 inches (152 mm).”*

The Termite Infestation Probability Map included in the Standard Building Code lists South Carolina among the “very heavy” states. In other words, South Carolina is an area “where hazard of termite damage is very heavy.”

Pest Control Companies May Choose NOT to Treat Houses with Foam Insulation

Pest control operators surveyed in South Carolina revealed that many times they choose NOT to treat structures that have foam insulation. The most common reasons given were that they could not guarantee the job or that they viewed the problem as being uncorrectable.

Synthetic Stucco that is Improperly Installed May Also Create a Moisture Problem

Exterior Insulation Finish Systems (EIFS), commonly called synthetic stucco, is a popular exterior finish that uses foam insulation. There are some unique aspects of the installation that may allow moisture damage if not properly installed.

Synthetic stucco is an acrylic polymer that is applied over a fiberglass mesh. The mesh covers foam insulation board that is attached to gypsum sheathing board, plywood, or a masonry wall. The gypsum sheathing and the plywood are nailed to wood framing. The glass fiber mesh is coated with a base coat and a finish coat of acrylic, resembling traditional stucco.

Wafer board, also known as oriented strand board (OSB), is NOT recommended in construction of synthetic stucco wall, because of a tendency to absorb water, according to a spokesperson for an EIFS manufacturer. EIFS also states that if used, the gypsum sheathing that uses a glass mat backing—rather than a paper surface—is preferred.

A builder familiar with decay and correction of synthetic stucco problems should inspect the structure to determine if water is getting behind the stucco-like finish. Appropriate flashing, caulking, or sealing measures should then be taken.

Questions about termite treatments should be directed to the Clemson University Department of Pesticide Regulation at 864.646.2150.