



What Home Builders Need To Know About Termites: There are a lot of important details that must be taken care of when building a new home. To build a home that will last, certain things have to be done at the right time and in the right way. Termite control is one such detail. Forget to do the termite pretreatment on a new home and the building will not look any different or be any less sound six months after it is completed, but it is almost certain to be infested with termites sometime within the next few years.

Two main species of termites threaten Mississippi homes. The eastern subterranean termite, *Reticulitermes flavipes*, occurs throughout the state. Non-native Formosan termites, *Coptotermes formosanus*, currently occur in 26 Mississippi counties, mostly in the southern portion of the state, and continue to spread slowly. Both species are serious threats to Mississippi homes and buildings. Fortunately the biology of these two groups of termites is similar enough that the procedures for protecting new homes against termite attack work against both species.

The procedures for building a home that is reasonably safe from attack by termites are divided into two major categories: 1} following good termite-deterring construction practices and 2} applying a termite pretreatment. Termite-deterring construction practices include things that are done, or specifically avoided, when building the house to reduce the risk of termite attack. The termite pretreatment is a set of insecticide treatments that are applied by a professional pest control company at specific points in the construction process to help prevent termites.

Termite-deterring Construction Practices: These can be divided into three general categories: 1} Avoid leaving any wood or other cellulose-based debris underneath or near the finished building. 2} Avoid any direct soil to wood contact (including treated wood) in the finished building. 3} Construct the house in a manner that will avoid moisture problems in, around, or under, the finished building. Inadequate attention to any one of these will result in a house that is more susceptible to termite attack. It is impossible to list all of the specific practices one must follow to achieve these goals, but the following list gives examples of some of the more important building practices for reducing risk of termite infestation.

Building Practices that Reduce Risk of Termite Infestation

- Prepare the building site properly. Assure no stumps, logs or other wood debris are left under the building site.
- Be sure all wooden form boards and stakes are removed after the slab or foundation is poured and cured. Failure to follow this practice is a common cause of termite infestations. If grade stakes will be left in place after concrete is poured, do not use wooden stakes; use only metal or plastic.
- Be sure no scrap lumber or other wood debris is left under the finished slab or crawl space. Do not bury scrap lumber, paper, or other cellulose debris in fill dirt under porches or other areas.
- Be sure vapor/moisture barriers are properly installed under slabs and crawl spaces.
- Assure crawl spaces are properly ventilated to minimize moisture problems.
- Assure crawl spaces have adequate ground clearance (minimum of 12 inches to beams, 18 inches to floor) to allow worker access under entire building. This is critical to allow access for future termite inspections, termite treatments, and other work as necessary.
- **Avoid direct soil to wood contact** (including treated wood) **with any portion of the building!**
- For buildings on slab foundations, make sure slabs are thick/high enough to prevent the lower edge of exterior siding from contacting soil (6 inch clearance). Keep in mind that accumulations of leaves, mulch, and soil tend to reduce ground clearance over time. Even if the siding itself is not susceptible to termites, it must not be allowed to contact soil or mulch because termites can enter the building behind the siding without being detected.
- For buildings with crawl spaces, consider installing metal “termite shields” where appropriate to reduce potential for termite invasion. Termite shields are installed between the top of the foundation wall and the sill plate, between support piers and beams, and in similar situations. Properly installed shields prevent invasion through interior cracks in the foundation wall or support piers and make it more difficult for termites to invade a building through mud tubes constructed up the outside of the foundation wall or support piers.
- Consider installing termite-proofing collars on pipes, conduit, and other utilities that penetrate the concrete slab. These collars are usually installed before concrete is poured.
- Use termite resistant treated lumber for sill plates and other areas that are especially susceptible to termite entry or wood decay.
- Assure proper drainage, so water runs away from foundation, rather than under crawl space or against slab.
- Avoid plumbing leaks or other water in crawl space. Drain condensation water from air conditioner and other appliances to outside of house, not under the crawl space.
- Be sure outdoor window ledges, porches, patios, walkways, and final landscape grade slope away from building, so they do not funnel water against or into the building.
- Assure roofing and flashing is properly installed to avoid water leaks.
- Install gutters and downspouts as appropriate to minimize water around foundation wall.

The ultimate goal is a finished building that does not have any wood scraps, stumps, or other cellulose products under, or near the foundation, does not have any wood in direct contact with the soil (not even treated wood), and does not have any water leaks or other moisture problems. Attention to these details will result in a building that is less susceptible to termite attack, but these measures alone will not provide adequate protection. A proper termite pretreatment is necessary to provide maximum protection against termite invasion.

Termite Pretreatment: The termite pretreatment is a set of insecticide treatments that are applied by a professional pest control company at specific points in the construction process to help prevent termites. It is important that all new buildings receive a proper termite pretreatment and that treatments are applied at the proper point in the construction process. Building codes and lending agencies usually require termite pretreatments for new buildings.

Currently there are two primary methods of pretreating a building for termites:

1} Preconstruction horizontal soil treatment, followed by post-construction perimeter treatment, or 2} Borate treatment, followed by post-construction perimeter treatment. Note that both of these pretreatment methods involve two separate treatments. The first treatment is applied early in the building process, either before the foundation is poured or before insulation and inner wall coverings (sheet rock, paneling, etc.) are installed, and the second part of the treatment is applied shortly after the building is completed. It is important to be sure that both treatments are applied at the appropriate stage in the building process. More specific details about each of these pretreatment options are discussed below.

Preconstruction horizontal soil treatment, followed by post-construction perimeter treatment:

The first step in this method of termite pretreatment involves treating the soil underneath the building site with an approved termiticide to establish a horizontal barrier of insecticide treated soil immediately underneath the building. This treatment is applied after form boards, rebar, and sub-foundation plumbing are installed and just before concrete is poured for the slab/foundation (also before any plastic vapor barrier is installed). Once the insecticide is applied, it is important that workers minimize disturbance of the treated soil while installing the vapor barrier and pouring concrete. It is also important for workers to observe the required re-entry interval specified on the termiticide label.

Horizontal soil pretreatments are applied by diluting the termiticide in water to the concentration specified on the termiticide label and spraying this termiticide solution over the soil-surface of the prepared building site. Most pretreatment termiticide labels require that the finished solution be applied at a minimum rate of 1 gallon per 10 sq. ft. This means equipment with large spray tank capacity is required to apply these treatments. For example, it will take at least 300 gallons of finished liquid to treat a 3000 sq. ft. site. In most situations, one of the pyrethroid termiticides (listed in Table 1), which tend to be lower in cost, is used for this portion of the pretreatment.

The second part of this pretreatment method is applied after the building is completed and after final grading and landscaping has been completed around the immediate perimeter of the building. Mississippi regulations require that this perimeter treatment be applied within one year of the date that the preconstruction horizontal soil treatment was applied. This perimeter insecticide treatment is the most important component of the termite pretreatment process and it is important to be sure this treatment is not forgotten. Beginning in December of 2008, Mississippi regulations require pest control companies to post a small, weather-proof sign on the exterior electrical meter box that shows when this perimeter treatment was applied and gives contact information for the company that applied the treatment.

Several different insecticide products are approved as perimeter termiticide pretreatments, and the termiticide used for the post-construction perimeter treatment is often different than the termiticide used for the preconstruction horizontal soil treatment. In most cases, one of the nonrepellent termiticides (listed in Table 1) is preferred for the perimeter pretreatment. Perimeter termiticide pretreatments must be applied according to directions on the termiticide label and in accordance with the minimum standards specified in Mississippi regulations.

Typically, perimeter treatments are applied by trenching around the outside of the foundation, treating the trench with part of the termiticide solution, backfilling the trench, and treating the backfill soil with the remaining solution. The concentration of active ingredient in the termiticide solution and the amount of termiticide solution that must be applied per 10 linear feet of trench is specified on the pesticide label. In cases where concrete porches, walkways, patios, and carports prevent trenching immediately adjacent to the building, holes must be drilled through the concrete at specific intervals so termiticide can be injected into the area where the trench would have occurred. These holes are patched or plugged after treatment is complete. Treatment of additional areas of the building may be required for buildings with crawl spaces, basements, or hollow masonry foundations.

The ultimate goal of the post-construction perimeter treatment is to establish a barrier of termiticide treated soil around the perimeter of the building so foraging termites will be forced to tunnel through this soil and be controlled before they can invade the building. Once this termiticide barrier is established, it is important to assure that it is not disturbed.

Borate treatment, followed by post-construction perimeter treatment: This method of termite pretreatment first became available in 2008. Currently, Bora-Care (disodium octaborate tetrahydrate) is the only product approved for this use. The borate treatment is not applied until the building is in the “dried in” stage of construction (when the roof, studs, exterior wall sheathing, and other framing elements are in place, but before insulation and interior wall coverings (sheet rock, paneling, etc.) are installed—see label for specific details). It only takes a few gallons of finished spray to apply a borate pretreatment, and such treatments are usually applied with small hand pump or backpack sprayers.

For buildings on slab foundations, the product is applied to the lower two feet of studs, sill plates, exposed inside surfaces of exterior sheathing, and other framing elements in contact with the concrete slab, as well as to a narrow strip (2 to 8 inches) of the concrete slab along the sill plate. For buildings with crawl spaces, the product is applied inside the crawl space to all structural wood surfaces within two feet of the soil surface, as well as to exposed surfaces of concrete or block foundation walls. The product is also applied to concrete along expansion joints, wood or concrete around plumbing penetrations, and to other areas exposed to termite invasion. See product label for specific details.

The ultimate goal of a borate treatment is to create a two foot wide zone above the slab, or soil surface, in which all wood surfaces that are exposed at this point in the construction process, as well as all exposed masonry and metal surfaces have been treated with the borate solution. Termites will not survive in wood that has been treated with disodium octaborate tetrahydrate, nor will they build their mud tunnels over surfaces that have been treated with this product. All of these treated surfaces will eventually be covered once inner walls and flooring is installed.

The second step of this pretreatment process is to apply a post-construction perimeter termiticide treatment as previously described. This treatment must be applied within one year of the date of the borate treatment. Only EPA registered termiticides with labels/24c supplemental labels approved for this use in Mississippi may be used for this post-construction perimeter treatment following a borate pretreatment.

Other Treatment Methods: 1} Use of treated wood: According to Mississippi regulations, wood treatment alone may not be used as the only method of termite protection/pretreatment. Note that this does not mean treated wood cannot be used, but only that use of treated wood alone does not constitute an adequate termite pretreatment. Treated wood should be used where appropriate in the construction to provide additional protection against termites and wood decay organisms. 2} Termite baiting systems: Termite baiting systems are sometimes used to treat or protect existing buildings from termites, but baiting systems are not recommended as a stand-alone termite pretreatment for new construction. However, Mississippi regulations do contain provisions for requesting an exception. Home builders who wish to use baiting systems as the sole method of termite pretreatment must provide the pest control operator with a written request and the pest control operator must keep a copy of this request on file. Of course, this request must be made before any other type of pretreatment is applied. 3} Physical barriers: Physical barriers are not recommended as stand-alone termite pretreatments. However, physical barriers such as termite shields, termite-proofing collars, and other barriers, such as stainless steel mesh foundation barriers can be used to enhance overall termite protection.

How Long Does a Termite Pretreatment Last?: Termite pretreatments do not last forever. The degree of protection they provide declines over time (see Table 1). This is the result of chemical degradation of the termiticide products, as well as physical changes that affect the integrity of the termiticide-treated barriers (see Extension Publication 2568, Protect Your House from Termites). In trials conducted by the U.S. Forest Service at their Mississippi test site, the pyrethroid termiticides typically used for horizontal pretreatments provided 90% control or greater for five to seven years, with products containing bifenthrin providing the longest control. In similar studies, the non-repellent termiticides most often used for perimeter treatments maintained this level of control for two to twelve years, with products containing fipronil or chlorantraniliprole providing longest control. Borate products are not evaluated in the same type trials as the soil-applied termiticides. In a seven-year study conducted by the Mississippi State University Department of Forest Products the Bora-Care treatment provided seven years of protection in a situation that was manipulated to create heavy termite pressure around the miniature test houses used in the study.

Getting Bids for Termite Pretreatments: In most cases the termite pretreatment is arranged and paid for by the building contractor as part of the overall construction cost. But if you are building or subcontracting the house yourself, this is one of the jobs you will need to arrange to have done. Start by getting bids from several pest control companies so you can compare prices and get information about the company. Keep in mind that the lowest bid may not always be the best bid. Be sure the bid specifies which products will be used for each step in the pretreatment process and the rates at which they will be used. Most bids will be priced based on the lowest labeled rate of termiticide, and this is the recommended rate for most situations. Also, be sure you understand the type of contract that will be provided with the pretreatment, whether it can be renewed and the cost of any annual renewal fee.

Maintaining the termite contract by paying the annual renewal fee is the best way to maintain continuous termite protection on a home. The terms of such contracts usually include a yearly inspection for termites and retreatment of any termite infestations detected while the building is under contract. Most contracts do not cover repair cost due to any termite damage incurred, although some do. Be sure you understand the terms of the contract. Because termiticides degrade over time, it will usually become necessary to have a building retreated at some point in order to re-establish termite protection.

For additional information on termites, termite biology, how to identify termite damage, factors that increase risk of termite infestation, and how to control termites in existing buildings, see Extension Publication 2568, Protect Your House from Termites. You can access this publication by going to www.msucare.com, clicking on “Publications” and searching for the title.

Table 1. Commonly Used Termiticide Active Ingredients

Active Ingredient	Brand Name ¹	Repellent to Termites ²	Type of Chemistry	Years with at least 90% Control ³	
				Miss. Test Site	Avg. of MS, SC & FL Test Sites
bifenthrin	Talstar	Yes	Pyrethroid	7	10
cypermethrin	Demon	Yes		5	4
permethrin	Dragnet	Yes		6	4.5
imidacloprid	Premise	No	Non-repellent	2	6
fipronil	Termidor	No		12	11.5+
chlorantraniliprole	Altriset	No		7 (ongoing)	7 (ongoing)
disodium octaborate tetrahydrate	Bora-Care	Yes	Borate	NA	NA

¹ Brand names are for the original proprietary product. Older active ingredients with expired patents may also be sold under other brand names, as “generics”.

² Lack of repellency is a positive attribute for soil-applied termiticides because termites are unable to detect and avoid treated soil.

³ From USDA Forest Service Termiticide Report, Pest Management Professional, Feb. 2012. Data for “Concrete Slab” test, for the lowest rate labeled for product. Products are considered to have “failed” when level of control drops below 90%.

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This information is for educational and preliminary planning purposes only. Brand names mentioned in this publication are used as examples only. No endorsement of these products is intended. Always read and follow the insecticide label.