



Methods to Control Existing Drywood Termite and Other Wood-Boring Insect Infestations



	Vikane® gas fumigant	Chemical liquids, dusts, aerosols and foams	Electrocution (Electro-Gun)	Freezing	Heat
Methodology	Whole-structure treatment: The entire structure is tarped and thoroughly fumigated with Vikane, killing all detected and undetected termites.	Spot treatment: Detected, accessible colonies are treated by drilling small holes into which chemicals are injected.	Spot treatment: Detected, accessible colonies are treated with high-voltage, low current, which kills termites in a localized area. ⁶	Spot/localized treatment: Treatment of small items that can be placed in a freezer at 10°F or lower for 3 days is the most common use for this technique. Use of nitrogen within a structure requires all areas of infestation to be identified and accessible. The use of nitrogen results in rapid reduction of oxygen levels to below the minimum acceptable level for workers (<19.5%). ⁸	Spot/localized treatment: The temperature inside the structure is raised with propane heaters to 140° to 150°F for several hours to one day. Internal wood temperatures must be raised to 120°F for at least 33 minutes to kill termites. ^{6,7} (This method requires tarping to treat the entire structure.)
Third-Party Validation of Efficacy	Most thorough, consistent and efficacious treatment of infested structures were evaluated in more than 20 years of university research and nearly 50 years of commercial use. ^{1,2,3} Researchers and pest control operators acknowledge that whole-house fumigation, compared to spot treatments, penetrates better into concealed locations and large volumes of wood are treated more efficiently. ⁴	Research indicates surface treatment alone is inadequate to control existing infestations. ² The efficacy is highly variable based on active ingredient and formulation. Research documents that surface treatment or gallery injections of liquid borate formulations did not provide adequate control of drywood termites. ^{2,5} There is no published, peer-reviewed research on efficacy of many active ingredients (fipronil, imidacloprid, citrus oil) and formulations (foam) when applied in infested structures.	Efficacy in limited field trials is highly variable and dependent upon the drill-and-pin method (drill holes to insert copper wire into termite galleries to direct current). ¹	Validated field studies of use of nitrogen for control of powderpost beetles is not known. Laboratory studies have indicated a exposure to temperatures at or below -32.08°F can control all life stages of powderpost beetles. Only areas in the immediate vicinity of the introduction point are likely to achieve the required temperature. To be effective all areas of known infestation and any void within the structure that is potentially infested would require treatment. ⁸ Wood is a poor thermal conductor and may not reach the appropriate temperature providing harborages for termite and other pest survival. ¹	Efficacy in limited field trials is variable and dependent upon the lethal temperatures achieved in the cores of all infested wood. ¹
Limitations on Treatment Application by Termite Location in Structure	There are no limitations. Vikane penetrates all airspaces in termite galleries within the tarped structure to kill termites. ^{1,2}	Termite colony galleries must be accessible to the applicator. ^{2,5}	Termite colonies must be accessible to the applicator. Common building materials, such as metal, concrete and glass, ⁶ and depth of termites in wood ¹ can interfere with application and limit control.	All infestations of powderpost beetles and other wood destroying insects must be accessible for localized treatment to be effective. Results of the laboratory study indicate construction of walls, inclusion of fire breaks and insulation significantly limits the efficacy of nitrogen. ⁸	Termite colonies must be accessible to the applicator for localized treatment. Large, structural beams and wood in contact with heat sinks, such as concrete and tile, can retard heat distribution. ^{1,6,7}

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Limitations on Efficacy by Applicator Ability to Detect Termites	There are no limitations. Vikane penetrates all airspaces in termite galleries to control detected and undetected termites. ^{1,2}	<p>Detecting live termites and wood-boring beetles is critical for treatment efficacy of spot and localized treatments. Undetected infestations will not be treated or controlled.</p> <p>Besides visual inspection, other detection methods include dogs, odor detectors, fiber optics, movement-sensitive devices and feeding-sensitive devices. These detection methods are infrequently used and, except for feeding-sensitive devices, adequate research has not been conducted to confirm their reliability to detect drywood termites. With the uncertainty of current detection methods, the secretive behavior of drywood termites and other wood-boring insects, and building construction (drywall or other wall coverings) concealing infestations, there is always doubt as to the location and extent of all infestations in buildings that restrict accessibility and limit treatment.⁶</p>			
Possibility of Damage by Treatment Application	The possibility of damage is low when Vikane is used according to the label. Improper tarping may cause damage.	Injection holes in walls may need repair.	Up to 80 percent of treated wood in field trials had visible damage, including burn marks. ¹ Holes from the drill-and-pin method damage wall coverings, walls and wood members. ⁶ Electronic equipment may be damaged.	Tiles and other items adjacent to treated areas or within the treated space may be damaged due to extreme cold and frost formation. Injection holes will need repair. ^{1,8}	Heat treatment is a potential fire hazard. ¹ Heat may irreversibly damage heat-sensitive contents, including paint, ⁷ plumbing, ¹ electronic devices and appliances, cable wiring, plastic blinds, photo materials, audiotapes, videotapes, CDs, plants, batteries, food, cosmetics, spray cans, ammunition, Plexiglas and wooden artwork.

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