

Vikane[®]

Specialty Gas Fumigant
 Proven Performance. Superior Support.
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Methods to Control Existing Drywood Termite Infestations

	Vikane [®] gas fumigant	Orange Oil (d-limonene, citrus oil)
Methodology	Whole-structure treatment: The entire structure is tarped and thoroughly fumigated with Vikane, killing all detected and undetected termites, including those inaccessible for spot treatment.	Spot treatment: Only detected, accessible colonies can be treated by drilling small holes at about 5 inch intervals into which orange oil is injected.
Third-Party Validation of Efficacy	Fumigation with Vikane is the most thorough, consistent and efficacious treatment of infested structures 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-structure fumigation, compared to spot treatments, penetrates better into concealed locations, and large volumes of wood are treated more efficiently. ⁴	Recent laboratory research at the University of California Berkeley demonstrated in a best case scenario with complete access to infested wood, orange oil (trade name XT-2000) injected to saturation at 2 inch intervals obtained an average of only 81% control of the drywood termites with up to 100's of termites documented surviving treatment. This termite survival is important because previous research at the University of California Riverside (UCR) showed that drywood termite colonies can reproduce and increase with as few as 20 worker termites. ⁶ Recent laboratory research at UCR has also demonstrated orange oil does not have residual activity; drywood termites with continuous exposure to wood topically treated with orange oil and aged 30 days did not have greater mortality than termites on untreated wood. ⁵
Limitation on Treatment Application by Termite Location in Structure	There are no limitations: Vikane penetrates all airspace in termite galleries within the tarped structure to kill termites. ^{1,2}	Termite colonies must be accessible to the applicator.
Limitations on Efficacy by Applicator Ability to Detect Termites	There are no limitations: Vikane penetrates all airspace in termite galleries to control detected and undetected termites. ^{1,2}	Detecting live termite infestation is critical for treatment efficacy of spot treatment with orange oil: Undetected colonies will not be treated or controlled. Besides visual inspection, other detection methods include dogs, odor detectors, fiber optics, movement-sensitive devices and feeding-sensitive devices. These devices 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 building construction (drywall or other wall coverings) concealing infestations, there is always doubt as to the location and extent of all drywood termite colonies in buildings that restrict accessibility and limit treatment. ⁷
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.	Many injection holes in wood and walls may need to be repaired. Orange oil is an oily liquid which is used as a solvent and a degreaser. Its effect on paint and surface finishes is unknown.
Flammability	Vikane is non-flammable.	Orange oil is flammable with a flash point of 115° F.
Indoor Air Quality	Applicator must follow specific aeration procedures followed by air testing using sensitive detection equipment to confirm airborne concentrations comply with federal label requirements. Aeration procedures and detection equipment have been extensively researched to validate their performance.	Orange oil has a pungent citrus odor. No air testing is conducted after application.
References	¹ Lewis, V.R. and M.I. Haverty. 1996. Evaluation of six techniques for control of the Western drywood termite (Isoptera: Kalotermitidae) in structures. <i>Journal of Economic Entomology</i> 89(4): 922-934. ² Scheffrahn, R.H., N.-Y. Su, and P. Busey. 1997. Laboratory and field evaluations of selected chemical treatments for control of drywood termites (Isoptera: Kalotermitidae). <i>Journal of Economic Entomology</i> 90(2): 492-502. ³ Su, N.-Y. and R.H. Scheffrahn. 1986. Field comparison of sulfuryl fluoride susceptibility among three termite species (Isoptera: Kalotermitidae, Rhinotermitidae), during structural fumigation. <i>Journal of Economic Entomology</i> 79(4): 903-908 ⁴ Lewis, V.R. 2003. IMP for Drywood Termites (Isoptera: Kalotermitidae). <i>Journal of Entomological Science</i> 38(2): 181-199. ⁵ Lewis, V. R. and M. Rust 2009. Drywood termite control — Preliminary laboratory evaluation of chemical local treatments for drywood termites. PCOC. Spring vol. 14-15, 17. ⁶ Unpublished data, T. Atkinson, formerly University of California, Riverside (personal communication). ⁷ Lewis, V.R. 2002., Drywood Termites, Pest Notes, University of California Agriculture and Natural Resources. Publication 7440.	