



TERMIREPEL[®]™



**Non Toxic
Insect & Termite
Repellent**



WHITE PAPER ON TERMIREPEL®™

Termites have been around since time began. They are social insects that feed upon dead plant material, usually wood. They live in colonies that can number in the millions and are found heavily concentrated in the tropics and within fifty degrees of latitude either side of the equator. There are an estimated 4,000 species of termites; of these 10% are the type that can cause problems to the human living. Termites have a social system, with a king, queen, workers, and soldiers.

Royal Society Naturalist Smeathman reported **that tropical termites build nests 10 to 35 ft. high** (sometimes miscalled ant-hills), the largest structures built by any animal except man. Then onwards, the termites are undisputedly the most destructive of all structural pests. Each year around millions of human beings is the direct or indirect victims of these so-called safe insect.

C Tech Corporation offers novel and unique **non hazardous and non toxic masterbatches of Termirepel®™** for keeping away the insect. The paper deals with why to use these products & how they actually work.

The Problems: Let us get to the point!

In an article entitled, "**Termite Control: Answers for Homeowners**" Mike Potter, Extension Entomologist for the University of Kentucky College of Agriculture, asserts that "**Entomology departments often receive more calls about termites than any other household insect.**" It is safe to say that most of the calls probably involve questions about **how to get rid of the termites**. It is also another way of saying that the power of

the termite attack is greater than the power of the human defense. Meanwhile the ingenious termites are also learning how to circumvent man. How severe is the problem?

Termites hold a diverse portfolio which lists the vulnerable areas susceptible to the damage they can unleash defying the norm that 'small is beautiful', rather in this case 'small is vicious'

The Portfolio:

Heritage Sites:

Every year new heritage structures are added to the **list of Most Endangered Sites of UNESCO**. This world over heritage structures which are the symbol of pride for any country suffer the ignominy of being vandalized by insects/termites who dwell in these heritage structures and make a mess of their internal structure. Heritage sites like Taj Mahal of India, Blue Mosque of Cairo, West Bank of River Nile, and Jantar Mantar of India have lost their pride and are fighting for their existence.



Railways:

The experience of a railway passenger, "As soon as I entered in the compartment I felt some abnormal ambience inside as the coach seemed to be quite old & unmaintained but thought it may be due to administrative exigencies or owing to the rainy season but no sooner we went to bed, some **big cockroaches started crawling in the compartment**. I thought that some railway employee would come and spray some insecticides & relieve us but no one came throughout the night. After the cockroaches some insects started biting, I thought it may be mosquitoes but it started getting worse, & to our

surprise **the bed was fully possessed by bed bugs.** It was too irritating & troublesome, that I did not sleep for a single minute throughout my journey.” It’s a story of every common man travelling by trains throughout the world. We always have the company of roaches or bed bugs or mosquitoes or termites. The condition becomes worse in the case of long distance journeys. Moreover, the pantry cars are also vulnerable to cockroach and other insect infestation which contaminate the food via droppings, wings etc., and an open invitation to thousands of diseases.

The Agricultural Sector:

In 1877, farmers in Minnesota were fearful they would experience a devastating locust plague. One had already been experienced in the summer of 1876, and if a similar plague occurred in 1877, the farming future of thousands of families would be wiped out permanently. The crops today also the **losses are tuned to 10,000 hectares of paddy crops** due to insects and worms.



Several agricultural plants suffer significant damage due to termites such as sugarcane, upland rice, groundnut and eucalyptus. Other crops include maize, cotton, peanuts, soybean, coffee, fruit trees and vegetables. **Termites may cause injury to plants by feeding on roots, leaves, stems and woody tissue.** Termites are major agricultural pests, particularly in Africa and Asia, where crop losses can be severe. According to a 1990 survey of extension specialists throughout the United States, **stored grain losses exceeded \$500 million for the year.**

Timber Damage:

One of the news report says, "U.S. scientists admitted that one war is being lost-this year the 58 U.S. varieties of termites, frail, pale, ¼-inch-long insects, will destroy the US property (by boring into and eating the wooden framework of buildings), and almost nothing can stop them".

Termites are wood-destroying pests most commonly found all over the planet. Development of new and centrally heated homes all over the United States, Europe and Australia has made them the breeding centers of termites. According to Bjostad, termites cause **\$22 billion in structural damage annually around the world.** This

includes **\$11 billion in United States,** including many residents are infestation. The estimated **200 million Euros per year.**



annual damage in the damage in Colorado, where unaware of termite **cost of termite treatment is**

If added the cost of repairs, replacement or destruction of structures, furniture, walls and other woodwork, the annual cost in France would be around 500 million Euros a year. In mathematical terms, **this equals the annual damage done by rats, mice or weevils, and exceeds that of tornadoes, earthquakes or arsonists.**

The Reason....

Questions to ponder... why do termites attack wood and plastics only??? Research has shown that **termites have the almost unique power of digesting cellulose.** Hence, unlike most animals, they have little natural competition to check their increase. Most insects depend upon a seasonal food supply, and their life cycles allow them only brief intervals to feed and breed. Termites almost never stop eating.

They live in and on cellulose. They build and bore for themselves airtight galleries which shut out light, diseases, most enemies. These galleries also keep their colonies humid and draftless, so that the soft-bodied insects do not dry up. This sheltered existence makes termites hard to fight. When soil-nesting termites travel to find wood, **they construct long covered runways, which may reach even to the second floor of a house.**

A termite digests cellulose with the help of the swarms of protozoa (one-celled animals) which are present in its guts. Since termites reduce cellulose (the toughest part of plants) to humus and provide food for new plants, their destruction of wood is really a vital part of the vegetative cycle of growth and decay.

The Solution....

Each year around millions of human being is the direct or indirect victims of these so-called safe insect killers. C Tech Corporation offers novel and unique **non hazardous and non toxic masterbatches of Termirepel[®]™** for the aversion of insect. These universal masterbatches are available in the form of plastic granules with a recommended **addition level of 1-5%** depending on end application.

Termirepel[®]™ works on the insect by the following six principles:

Aversion – It acts as an aversive and insects avoid going to the treated areas.

Feeding Disruption – They find the smell and taste of the treated area extremely unpleasant.

Oviposition Deterrence – It temporarily impairs the ability of insects to reproduce, i.e. the female will not lay eggs.

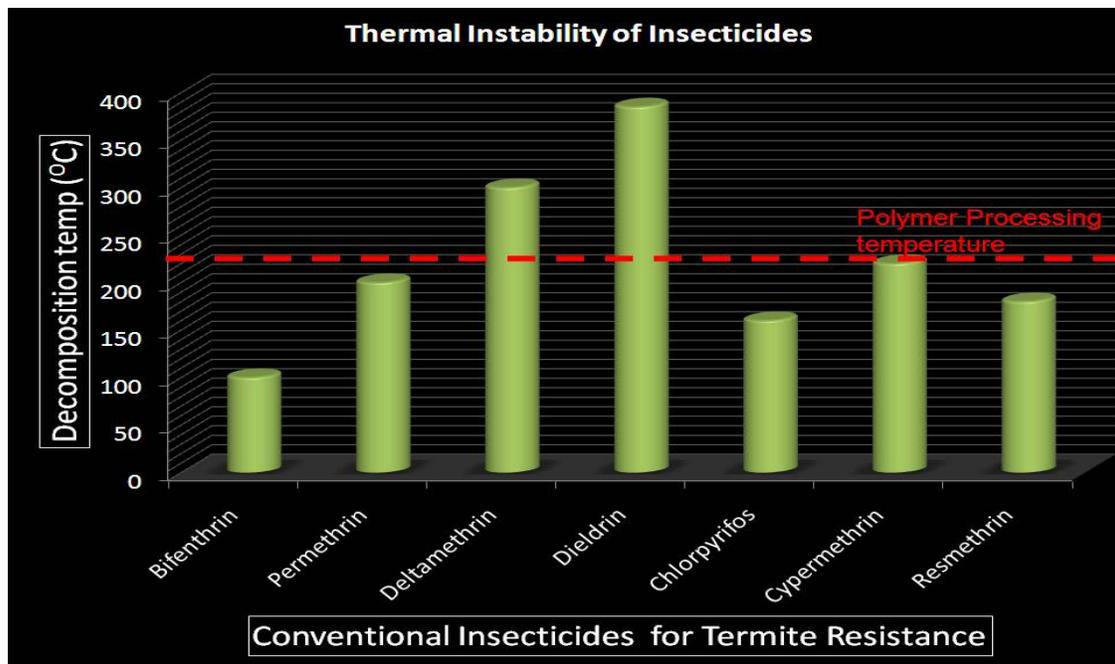
Growth Inhibition - It temporarily blocks the insect's reproduction system by hindering the release of the vital hormones for growth.

Mating Disruption – It temporarily inhibit the mating cycle of the termites.

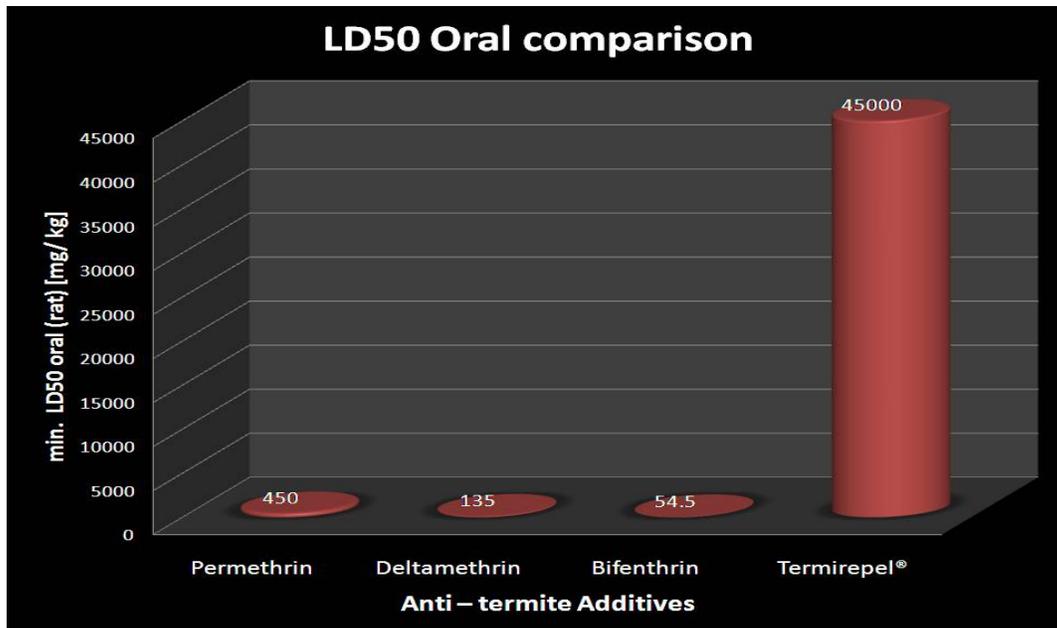
Chemo sterilization – It temporarily hampers the reproduction cycle of insects by sterilization.

Safety, Health and Environment...does SHE comply???

Termirepel[®]™ can be added to polymer during the process of extrusion. Several conventional insecticides are not meant for extrusion processes because of their highly volatile nature and toxic fumes (some special cases). Some of them even degrade at



higher temperature losing their functionality. The graph shows that the most of the insecticides nowadays have low thermal stability for the process of extrusion.



Lower the LD₅₀ value more toxic the product!!!

Termirepel[®]™ is completely inert within the polymer matrix. Thus it doesn't leach out to pollute and as a result wouldn't contaminate the groundwater, surface water reserves and soil. Moreover it has a low vapor pressure which means that it doesn't volatilize easily, thus not resulting in vapors mixing with the atmosphere. Also it is thermally stable at temperatures as high as 1400°C.

The Gist...

Employing environmentally safe additives which can effectively safeguard against the insects/termites as also not pose a threat to humans, animals and the environment is the call for the day. TERMIREPEL[®]™ satisfies both these criteria since it is relatively much more effective than all other insecticides and is the only non-toxic and non-hazardous product in this category. Innovative non-toxic and eco-friendly options need to be encouraged to enter the fascinating secret world of insects and work closely with the end users to assist them in their struggle against the hardships caused by insects.

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