



## Ready Reckoner- Application Overview

Use of Rodrepel<sup>®</sup>™ and Termirepel<sup>®</sup>™ in Gas Pipelines

## C Tech Corporation

Product Specialization  
Group

Generic Requirements

**Rodrepel<sup>®</sup>™ and Termirepel<sup>®</sup>™** non toxic, non hazardous and environmentally friendly anti rodent and anti termite master batches

A brief overview on the use of Rodrepel<sup>®</sup>™ and Termirepel<sup>®</sup>™ in Gas Pipelines

## TECHNICAL NOTE

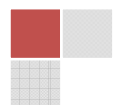
### RODREPEL®™ AND TERMIREPEL®™ FOR GAS PIPELINES

Rodrepel®™ and Termirepel®™ are non-toxic, non-hazardous, environmentally safe additives specially developed for use as master batches in polymeric applications as well as in coating applications.

Rodrepel®™ and Termirepel®™ do not kill but keep the pests away by making use of the sensory mechanisms. They are products of Green Technology and are applicable for a variety of uses in a multitude of sectors.

They are broad spectrum aversives adept at repelling all species of rodents and termites as well as about 600 species of pests including caterpillars, red and black ants, aphids, leafhoppers, beetles, mites, leaf borers and many more.

Polymeric gas pipelines are prone to damage from rodents and termites. Rodents cause large scale damage due to their constant gnawing. Termites and other insects due to their large numbers can cause breaks and abrasions in the gas pipes. Buried gas distribution pipelines especially are frequently affected by subterranean termites. The consequences of this damage can be severe if there is leakage of the gas.



## ❖ LOSSES DUE TO RODENT AND TERMITE ATTACK IN GAS PIPELINES

Rodents and termites are one of the major causes of polymer damage. Rodents are attracted to polymers due to their sweet smell and their tendency to continuously gnaw. Every year hundreds of breaks in gas pipelines are reported. This can be dangerous if there are leaks in the pipelines.

Gas transfer is disturbed by chewing of gas tubing and pipelines. Timesonline, UK News, had reported an incident in which gnawing rodents were to blame for the death of an old woman in a massive explosion that destroyed her home. They rodents had gnawed through the kitchen pipes, causing a gas build-up.



during extrusion.

Also they pose a threat to workers on the shop floor due to the toxic fumes released during processing of the toxic pesticides with the polymers.



The current rodenticides and termiticides used are toxic and do not effectively solve the pest problem. Also their toxic and harmful nature prevents their use in a variety of applications. They cannot be extruded into the pipes due to their toxic nature and difficulty



Thus there is a need to effectively protect polymeric gas pipelines against damage by rodents, termites and other insects.

### ❖ SALIENT FEATURES

- Non-toxic
- Non- hazardous
- Environmentally safe
- Acts as an aversive
- Large life span of 5-40 years
- Thermally stable at temperatures as high as 1400 oC
- Does not leach into Groundwater and soil
- Does not volatize
- No harmful fumes
- Available as a LDPE and EVA masterbatch
- Can be customized according to customer requirement
- Inert in the polymer matrix
- Does not degrade in soil
- Chemically Stable
- Hazardous polymerization not likely to occur
- Not harmful if accidentally inhaled or ingested
- Safe to add in pipes used for drinking water

### ❖ THERMAL STABILITY

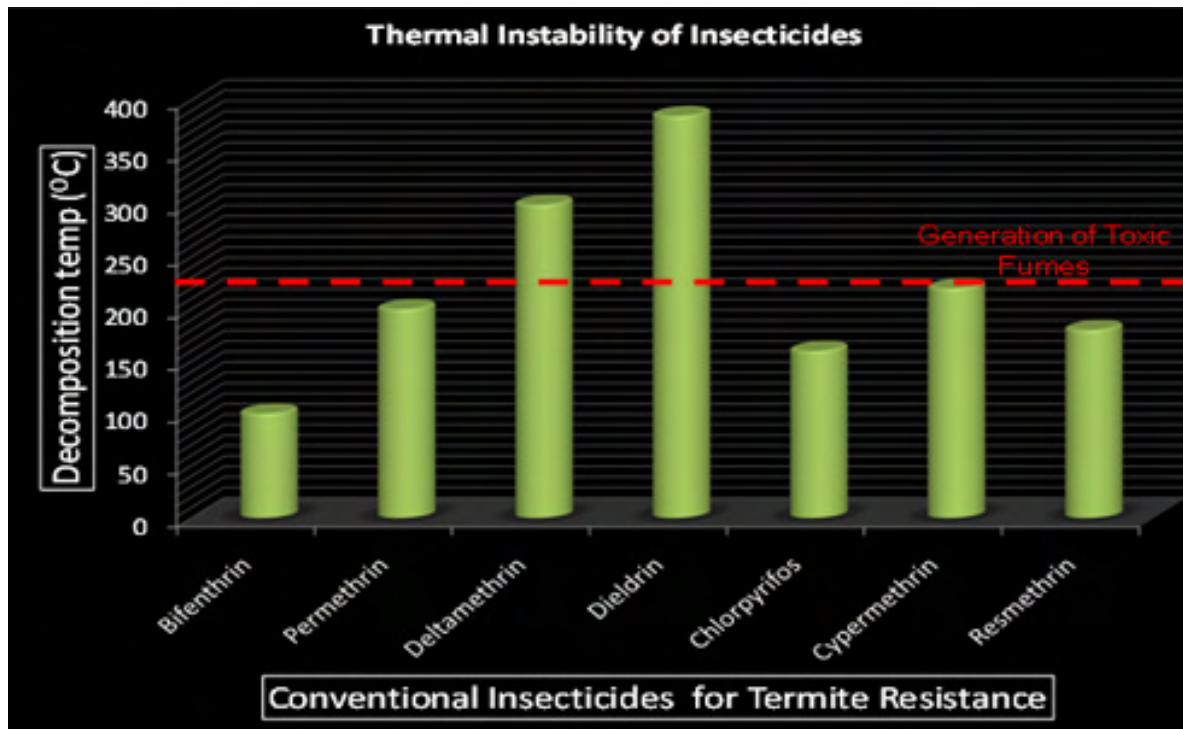
Most of the termiticides and pesticides used volatize at high temperatures releasing harmful fumes. As temperature increases, vapour hazards



increase. The vapors from many pesticides increase three to four times for each 10 C increase in temperature.

Rodrepel®™ and Termirepel®™ are designed to withstand the high temperature of polymer processing. Rodrepel®™ and Termirepel®™ are stable up to 1400 C and hence are safe to use in severe temperature conditions.

Thus they can safely be used even in high temperature applications like polymer processing with complete stability.



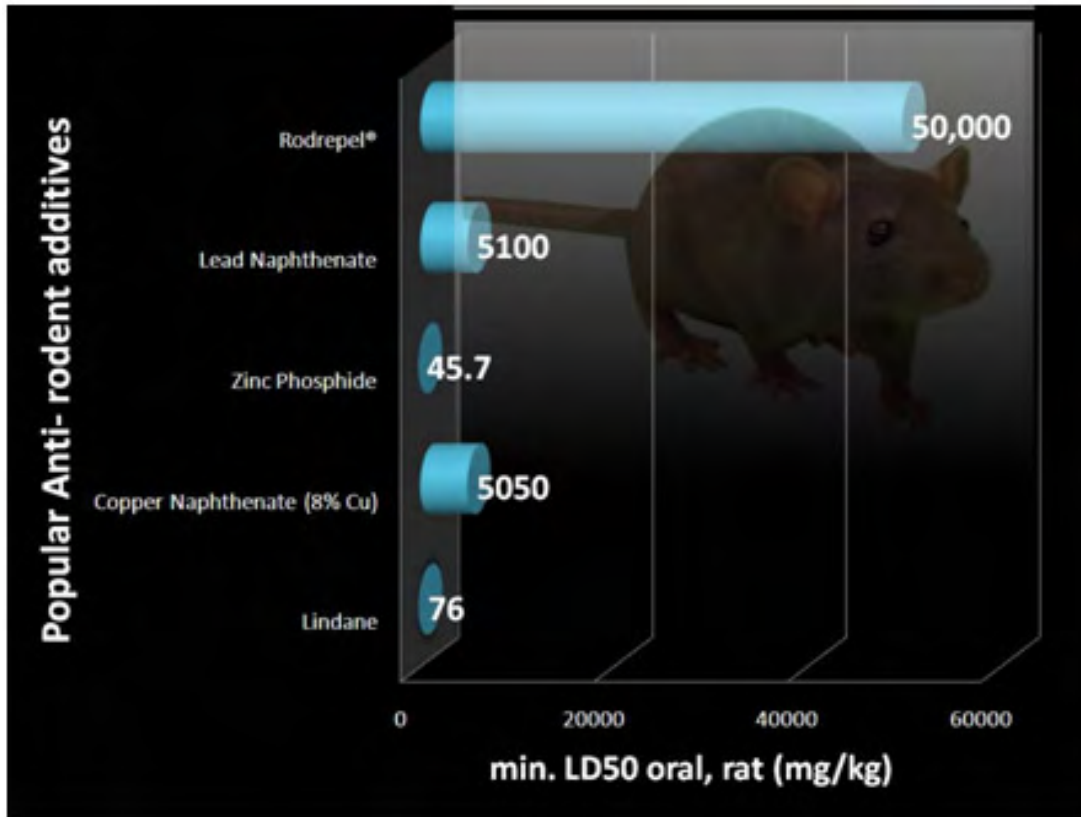
The thermal instability of commonly used pesticides



❖ **NON-TOXICITY**

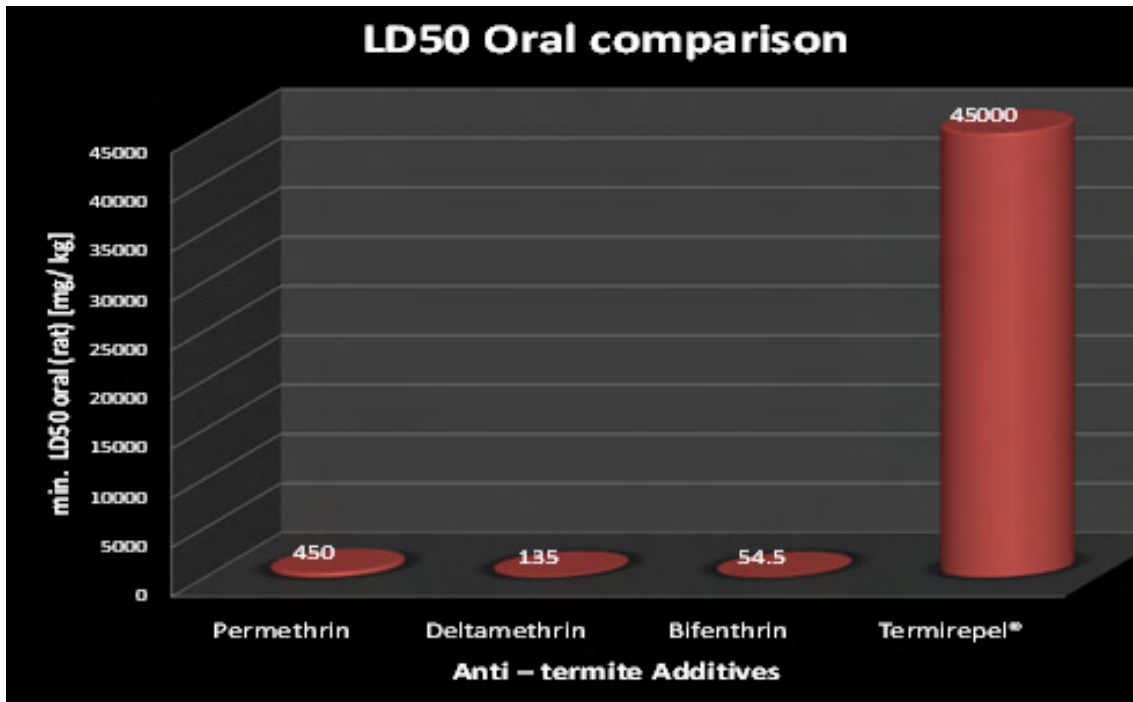
The Lethal Dose and Lethal Concentration are used to determine the toxicity of most chemicals. The testing is mostly done with rodents and mice. The LD50 is a method to measure the toxicity of a material. It is the amount of a chemical substance per 100 grams or per kilogram of the weight of the test animals that would cause the death of half (50%) of the test species.

Lower the LD50 value, higher is the toxicity as lesser quantity of the substance is enough to cause toxic effects. Rodrepel®™ has a very high LD50 value thus showing its non toxic nature.



**The non-toxicity of Rodrepel®™ when compared with harmful rodenticides**





Higher the LD50 value, lower is the toxicity

❖ CRITICAL PARAMETERS

Sr. No.	Property	Test	Limits prescribed
1.	Effectiveness	Anti-rodent and anti-termite testing for evaluating the bioefficacy of the finished sample comprising of Rodrepel®™ and Termirepel®™	Weight loss < 2% Average gnawing factor < 0.02
2.	Non toxicity	Oral LD50 tests for evaluating the toxicity of the masterbatch	Acute Oral LD50 (rat) > 8000mg/kg
3.	Long life span	Accelerated ageing tests followed by anti-rodent and	Weight loss < 3% Average gnawing factor < 0.025 ( Here



		anti- termite bioefficacy test to check the rodent and termite repellence of the aged cables	initial weight would be the weight of the aged cable sample)
4.	Compatibility	Testing to check the compatibility of the aversive masterbatch with the polymeric material of the gas cables.	The master batches are specially developed for use in polymeric applications and hence are perfectly compatible with the gas pipelines

❖ **APPLICATIONS:**

Rodrepel®™ and Termirepel®™ can be customized for use for a variety of applications

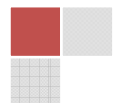
**Polymeric Gas Pipelines**

Sensitive applications such as gas transfer are disrupted due to gnawing on of rubber gas tubing and pipelines by rodents and damage by termites. It is dangerous since the gas is odourless and colourless. This has now compelled the pipeline and rubber tubing manufacturers to fabricate products, with anti-rodent and anti-termite properties, complying with government specifications.



Rodrepel®™ and Termirepel®™ can be incorporated into the gas tubing to protect them against damage from pests. These products being inert do not affect the gas in any way.

They are completely inert in the polymer matrix apart from performing their primary function of acting as an aversive.





Thus Rodrepel®™ and Termirepel®™ added gas piping and tubing can be used to safeguard against pipeline breaks due to rodent and termite damage.

❖ **SAFETY AND VERSATILITY**

- Rodrepel®™ and Termirepel®™ are thermally stable and do not degrade on exposure to heat and light. They are soil stable and do not leach out to pollute the soil or air.
- They are completely inert in the polymer matrix apart from acting as an aversive.
- They are compatible with a number of polymeric bases depending on the end application and can be safely used in gas applications.
- Rodrepel®™ and Termirepel®™ are RoHS and REACH compliant and FIFRA exempted.



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