



DEPOSITION STUDY
Metofluthrin

Understanding the amount of Metofluthrin left behind in the environment.

In 2021, Thermacell partnered with 3rd party laboratory, [EcoSafe Natural Products Inc.](#), to conduct a study to determine the average concentration of active ingredient (Metofluthrin) deposited on nearby surfaces in a simulated outdoor environment during the use of a Thermacell area mosquito control device.



Are Thermacell products okay to use around people, pets, and in the environment?

“In venturing to answer this important question, we first need to understand the amount of Metofluthrin left behind in the environment after the use of our products. This will allow us to take that data and model what the effects are in different scenarios including with children, infants, and pets [STUDY LINK]. In this first step, we found that the amount of Metofluthrin that remains in the environment after continuous use of a Thermacell device is virtually undetectable (less than 1 billionth of a gram) meaning that **our products operate well below the threshold for concern when considering what is left behind.**” – *Dr. John Hainze, VP of Science & Research at Thermacell*

[VIEW DATA](#)

THE TEST

Methodology:

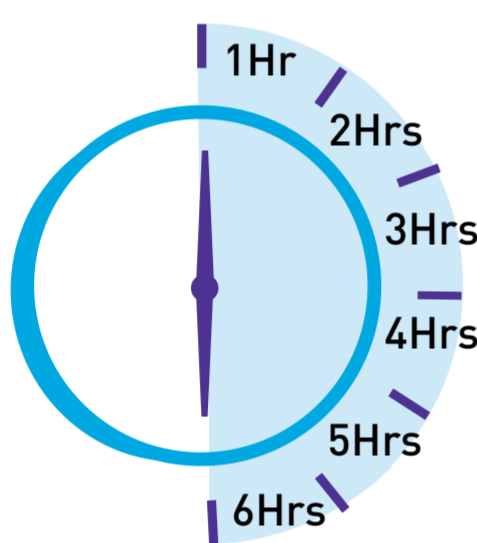
One rechargeable device was placed in the center of a 6 m wide test area and left to run continuously over 6 hours. 12 stands with 3 paper collectors each at varying heights were placed at regular intervals within the efficacious zone creating a total of 36 collection points to be tested.

Profile View:

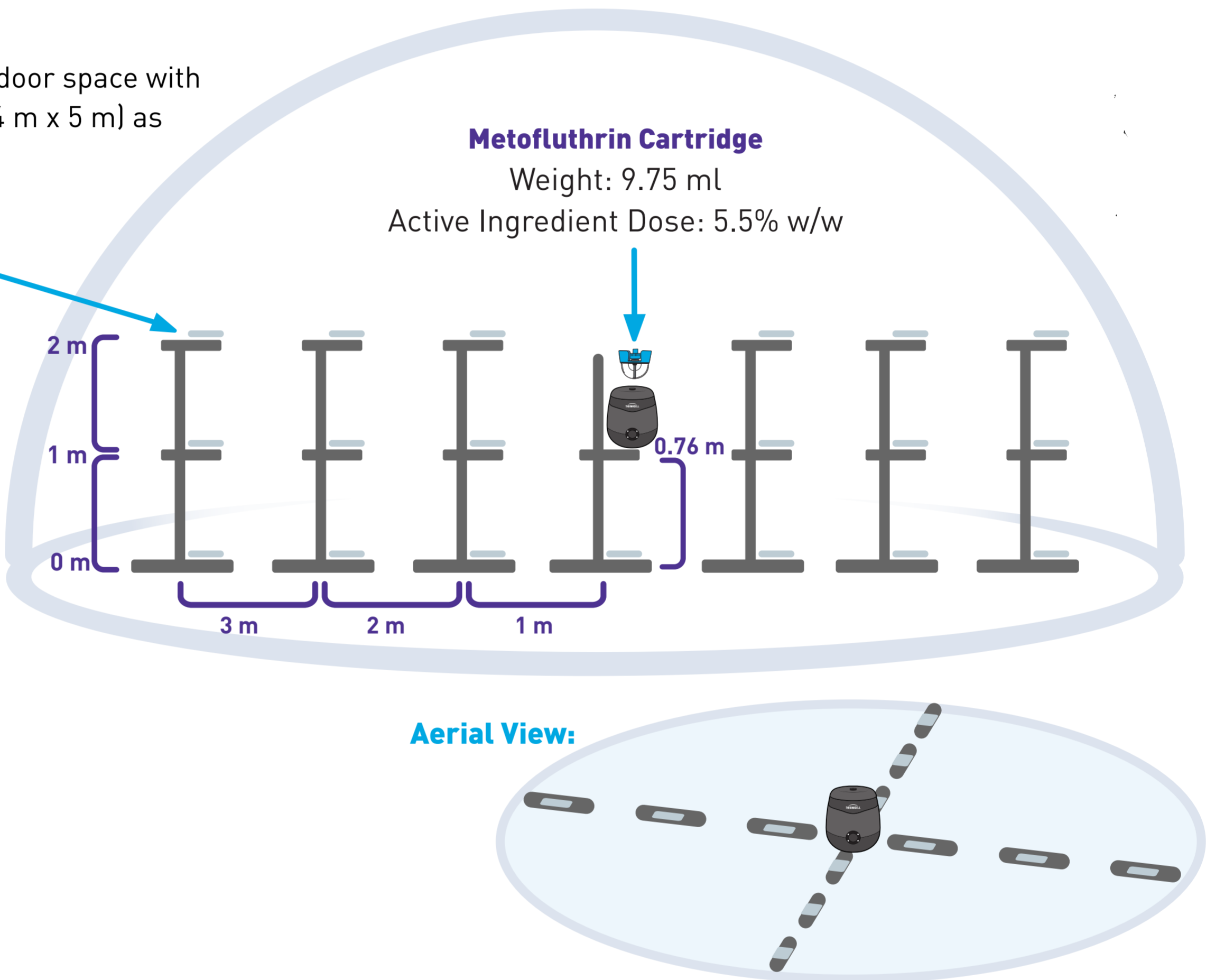
Conducted in controlled, indoor space with no air movement (20 m x 14 m x 5 m) as worst case-scenario

Paper Collectors

Collect deposited active ingredient within the efficacious zone



Samples tested after 6 hours running in closed space



Positive Control:

Ten Metofluthrin-spiked filter paper samples were prepared. Half were air dried for 10 minutes and half were air dried for 6 hours. These samples were analyzed to determine if significant loss of Metofluthrin had occurred through transit and over the test duration.

Negative Control:

Five blank samples were prepared and exposed to the air for 6 hours at the test site. After 6 hours, the blank samples were collected and analyzed to determine if any significant cross-contamination occurred during the field test, transit, and analysis.

THE RESULTS

Conclusion:

The study concludes that **extremely low levels of Metofluthrin are deposited on surrounding surfaces**, even in a still air, indoor environment. While this is not the intended use of the product, the results indicate no reason for concern about use outdoors.

Virtually Undetectable Amounts Left Behind

The amount landing on surfaces is virtually undetectable by sophisticated scientific instruments in 23 of 36 measures and less than 1 billionth of a gram per centimeter squared. **That's less than 1 billionth of a raisin.**

During the field test, the liquid cartridge lost 1.95 g over 6 hours. The cartridge contained an average target of 5.5% metofluthrin (high 5.78%, low 5.23%), so approximately 110 mg of Metofluthrin was released during the field test. 36 field samples were analyzed for total Metofluthrin content and the results were given in the table below.

The Metofluthrin content of all field samples was between 0.0351 µg/cm² to 0.000602 µg/cm² or below the limit of detection/limit of quantitation using the methods of analysis described for this study.

When developing an analytical chemistry method, it is important to understand how sensitive it is or the minimum amount of active ingredient that can be detected (LOD) and the minimum amount that can be measured (LOQ). The LOD and LOQ are specific to the chemical being tested. This analytical testing method was **based on OECD and ECHA guidelines**.

Distance (m)	Height (m)	Metofluthrin Concentration (µg/cm ²)			
		Line A	Line B	Line C	Line D
1	0	<LOD	0.00209	<LOQ	0.00125
	1	0.00843	0.0351	<LOD	0.000891
	2	<LOD	<LOD	<LOD	<LOD
2	0	<LOD	0.00131	<LOD	0.000776
	1	0.00235	0.0016	<LOD	<LOQ
	2	<LOD	<LOD	<LOD	<LOD
3	0	<LOQ	0.00113	<LOD	0.000602
	1	0.000963	0.000607	<LOD	<LOQ
	2	<LOD	<LOD	<LOD	<LOD

Table Key

LOD	Limit of Detection	0.000160 µg/cm ²
LOQ	Limit of Quantitation	0.000534 µg/cm ²

Study Reference

Bradbury, S.G. (2021), Determination of Metofluthrin Deposition in a Simulated Outdoor Environment from Thermacell Repellents Inc.'s Thermacell Radius Zone Anti-Mosquito VI-G1, EcoSafe Natural Products Inc., #16-6782 Veyaness Road, Saanichton, BC V8M 2C2, Canada, Study number: ESN354-37, March 26, 2021