

# A New Option

By James B. Ballard

According to the following research, a new mattress liner can be used as part of a comprehensive program to help control bed bug infestations.

As the industry continues to battle bed bugs, initial trials indicate there is a new option for PCOs' toolboxes.

The ActiveGuard mattress liner is a patented polyester, fitted liner impregnated with permethrin that kills both bed bugs and house dust mites on the mattress and prevents the mattress from becoming reinfested, says manufacturer Allergy Technologies. The firm's mattress liner is registered by EPA, all 50 states and the District of Columbia.

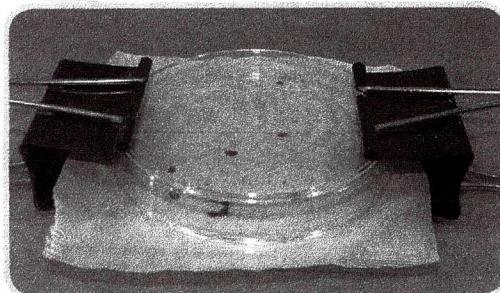
Originally developed by doctors in the United Kingdom to kill dust mites in mattresses for up to two years, ActiveGuard has shown promise as part of a comprehensive control program to kill bed bug infestations, the manufacturer reports.

For use in a bed bug control program, the ActiveGuard mattress liner is installed on top of a bed mattress (like a fitted sheet), pulled down tight and pushed under the bottom edge of the mattress to produce a tight, smooth fit on the mattress. The liner is then covered by a mattress pad/bottom sheet.

The best, most practical way of using ActiveGuard mattress liners is to install them onto mattresses as part of an overall bed bug control program, Allergy Technologies says. The pest management professional first should clear the mattress of bed bugs and eggs and then install the appropriate size ActiveGuard mattress liner onto the mattress. Any missed bed bugs or nymphs hatching from missed eggs will be killed by the mattress liner later, the company reports. Easy installation means a single pest management professional can install a mattress liner on a mattress.

In trial one, bed bugs were easily killed within 24 hours (see

A test unit used to measure the mortality of 10 bed bug adults confined to the ActiveGuard mattress liner fabric.





## /// MANUFACTURER RESEARCH UPDATE

Table 1, right). In trial 2, most mortality occurred within 24 hours — with a 100 percent kill within 72 hours (see Table 2 on page 147). Two field strains of bed bugs were reared from bed bugs collected from accounts where bed bug control had been problematic, but they also died within 72 hours.

**FIELD TRIALS.** For the field trials, bed bug control programs were implemented by pest management professionals at bed bug-infested structures. Mattresses were treated to eliminate bed bugs and eggs. ActiveGuard mattress liners were then installed with a follow-up call made to the customer to determine the success of the overall treatment. The number of complaints logged after the follow-up call was the measure of success (see Table 3 on page 147).

**REPELLENCY AND RESISTANCE.** Laboratory research, which has indicated the repellency of bed bugs to pyrethroids (such as permethrin), was not observed and does not interfere with control efforts. A wide range of resistance has been measured in the field that may influence the time required to control bed bugs. In testing two bed bug populations collected from the same building, one population had measurable resistance and the other was susceptible to pyrethroids. It is important to note that resistance does not mean no control, it usually means control takes longer to occur. The pyrethroid deltamethrin had a LT50 of 61 minutes for susceptible bed bugs and 14 days, 8 hours for a highly resistant field strain of bed bugs. (Author's note: LT50 is lethal time to kill 50 percent of the test insects.)

**USING ACTIVEGUARD MATTRESS LINERS.** Given that bed bugs can go months between feeding and be spread throughout a structure, control programs tend to be labor and product intensive. The actual level of success of a control program can take months to determine. Once the bed bug population has been significantly reduced as a result of initial control measures, the use of additional control measures that kill bed bugs over a long period of time is important. According to Allergy Technologies, the ActiveGuard mattress liner is a good tool to introduce into a control program to kill residual bed bugs on mattresses and to prevent mattresses from becoming bed bug harborages.

**CONCLUSION.** ActiveGuard mattress liners kill both susceptible and field strains of bed bugs. Initial field trials indicate that the installation of ActiveGuard mattress liners on mattresses that have been largely cleared of bed bugs is a viable use of the product within a bed bug control program. **PCT**

The author is PhD, a Board Certified Entomologist and the owner of Ballard Pest Management Consulting. He arranged the research reported here on behalf of Allergy Technologies ([www.allergytechnologies.com](http://www.allergytechnologies.com)), the manufacturer of ActiveGuard mattress liners. Contact Ballard at [jbballard@glemedia.com](mailto:jbballard@glemedia.com).

### References

- Moore, D.J. and D.M. Miller. 2006. Laboratory evaluations of insecticide products for control of *Cimex lectularius*. *J. Econ. Entomol.* 99(6):2080-2086.
- Potter, M.F., A. Romero, K.F. Haynes, and W. Wickemeyer. 2006. Battling bed bugs in apartments. *PCT* 34(8):45-52.
- Romero, A., M.F. Potter, D.A. Potter, and K.F. Haynes. 2007. Insecticide resistance in the bed bug: a factor in the pest's sudden resurgence? *J. Med. Entomol.* 44(2):175-178.
- Russel, D. 2006. Evaluation of a permethrin-treated fabric for killing bedbugs. ICR-Project No.:0206-383-0136.
- Snell, E. 2008. Mortality of selected bed bug strains exposed to ActiveGuard mattress liner fabric. Trial report and pictures from Snell Scientifics.



Treatment	USDA-Susceptible Strain % mortality (24 hours)
ActiveGuard mattress liner containing (0.9% permethrin)	100
Untreated fabric	10

Table 1. Laboratory Trials. Good Laboratory Practices (GLP), five repetitions of 10 adults each, confined to fabric, one strain of bed bugs.

Treatment	Harten Susceptible Strain % mortality (72 hours)	NJ2 Field Strain % mortality (72 hours)	NJ3 Field Strain % mortality (72 hours)
ActiveGuard mattress liner (1.64% permethrin)	100	100	100
Untreated mattress ticking	0	3	0

Table 2. Laboratory Trials. Four repetition of 10 adults each, confined to fabric, three strains of bed bugs.

Home/Condo #	ActiveGuard Mattress Liner Installed	Number of Months with No Complaints
MA-1	1 king, 3 twins	12
MA-2	2 twins	5
MD-1	1 queen, 6 twins	1
MD-2	1 queen	1
MD-3	1 queen	1

Table 3. Field trials.