

# Case Studies



Cutting-Edge Research...  
**Proven to Work!**

"Totally astonishing."

"Massive die-off of bedbugs."

"Groundbreaking. Revolutionary"

## Aprehend® Case Study – Apartment Complex in Tennessee



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### **Abstract**

This case study describes the eradication of bed bugs from a 32-unit complex in Tennessee, using Aprehend®, Cimexa™ and encasements. Over 50% of the apartments showed visual signs of infestation, with two apartments being classified as highly infested and cluttered. Property management had been battling bed bugs for over 6 years with no success. HTP Pest and Termite LLC, took on the contract and conducted treatments in all 32 apartments. The treatments took 2 days to complete, using 4 technicians. The majority (27) of the apartments were treated once only, and 5 apartments (including the two badly infested apartments) received a second application 30 days after the first treatment. Visual inspection 60 days after the initial treatment indicated no live bed bug activity in any apartment. **No reports of ongoing activity have been received as of 6 months after the initial treatment.**

## Background

In December 2017, HTP was asked to inspect an apartment complex containing 32, one-bedroom apartments for bed bug infestation, and submit a bid for remediation. The complex was under new management. HTP had submitted a bid approximately 6 years ago for the same complex but did not win the bid on that occasion.



Upon inspection, HTP identified 16 apartments with visible signs of bed bug infestation. Two units were identified as the likely major sources of the infestation. These units were adjacent to each other, and both were in a similar state of disarray. The beds in these apartments had been fitted with box spring and mattress encasements, but at the time of inspection, these were heavily soiled with bed bug feces.

Figure 1: A heavily soiled encasement from one of the suspected source units



Figure 2: Other signs of the infestation; wall socket & bed frame

It is likely that both apartments had been treated for bed bugs, but no information was available on when, how many times, or which products had been used. The management had initially requested a quote for the treatment of only those units that had been identified as infested during visual inspection. However, given the likelihood that visual inspection had missed some existing low-level infestations, and the high probability that bed bugs were present throughout the entire complex, HTP submitted a quote and justification for treating all 32 units. The management accepted the quote.

### **Treatment protocol**

*(including resident preparation and other products used in combination with Aprehend®)*

#### **Preparation**

Tenants were asked to conduct a minimal preparation for treatment as follows:

- Pick up items from the floor and vacuum in all rooms.
- Strip all bedding from the beds, bag, launder and dry at high heat. Leave items sealed in bags until after treatment.
- De-clutter where possible.
- Ensure all beds and seating surfaces are clear (do not stack items on sofas, beds or chairs).

On arrival for treatment, HTP found that the level of preparation varied. Five apartments had fully prepared according to the instructions, 12 apartments had stripped beds but had not vacuumed or de-cluttered, and 15 apartments, including the two suspected source units had not even stripped the bed. HTP did not refuse to treat any apartment regardless of the level of preparation. Where beds had not been stripped, HTP removed and bagged the bedding and instructed management to ensure that laundering was done prior to replacing on the beds (although it turned out that in some cases this instruction was not followed).

#### **Treatment**

All units were one-bedroom apartments with a kitchen/dinette, living room, and a single dividing wall between the bathroom and bedroom. All units had solid flooring (un carpeted).

Except where stated, the same treatment protocol was used in all apartments regardless of pre-treatment preparation or the level of infestation observed.

### *Bedrooms*

1. Mattresses and box springs were dusted with Cimexa™ and sealed inside encasements (CleanBrands®). Apartments where no visible bed bugs were present did not receive encasements.
2. Aprehend® was applied as a barrier to the bottom and side perimeter of the box spring (where present).
3. Wooden bed frames were taken apart where possible, and Aprehend® applied to cracks and crevices. Beds were then re-built and a barrier of Aprehend® applied around the interior and exterior perimeter, around the bed legs, and rear perimeter of the headboard. Where dismantling of the bed was not practical, bed frames were inverted to ensure access to the undersides of the frame, and Aprehend® was applied as continuous barriers as above.
4. Nightstands and dressers were moved away from the wall and Aprehend® applied to the rear perimeter and around the legs, or if of a ‘box stand’ design, Aprehend® was applied around the perimeter of the three exterior sides at ground level, and inside the cavity underneath.
5. Lamps, phone chargers, alarm clocks etc were left in place, but all cords were sprayed with Aprehend®.
6. With all furniture moved away from the wall, Aprehend® was applied to the top of the baseboards around the entire perimeter of the room.
7. Aprehend® barriers were also applied to the walls around electrical outlets and phone jacks etc.

### *ONLY WHEN EVIDENCE OF ACTIVITY WAS PRESENT*

1. Aprehend® was applied around crown moulding, and window frames.
2. Curtains were treated with a barrier of Aprehend® at the top and bottom on the back and front.
3. An Aprehend® barrier was applied around the closet and bedroom doorframes.

### *Living rooms*

Seating in living rooms was highly variable, and strategies for application of Aprehend® had to be decided on an ad-hoc basis. In general, applications were as follows:

1. Futons – mattress/cushion removed from the base. Aprehend® was applied to the base ensuring that a complete barrier was achieved. Cracks and crevices were treated where possible. Aprehend® was applied to the zipper line along the side of the cushion.
2. Sectionals and sofas – cushions were removed, and Aprehend® applied around the inner seating perimeter and cushion zippers. Seating was flipped over and an Aprehend® barrier applied to the bottom perimeter. Where present, the dust

ruffle was sprayed with Aprehend®. Any gaps, folds or crevices were exposed and sprayed with Aprehend®. Aprehend® was sprayed around each of the legs.

3. Recliners were treated as per the sofas above, but with careful attention to the undersides, which needed to be exposed with the recliner in the recline position.
4. One leatherette sofa had upholstery buttons, which were treated by applying Aprehend® to a cloth and wiping the underside of each button with the sprayed cloth to transfer the Aprehend®.
5. Perimeter baseboards, door and window frames were treated as described in the bedroom and according to the level of infestation.

#### *Dining area*

Where infestation was suspected, dining tables were turned over and Aprehend® applied underneath and around each leg. Dining chairs were treated similarly, particularly if they had upholstery.

#### *Bathrooms*

1. Aprehend® was applied around baseboards and the door frame of the linen closet.
2. Where present, the clothes hamper was sprayed with a perimeter treatment close to floor level.

#### *Connecting Hallways between apartments*

The hallways were carpeted so Cimexa™ was applied at the carpet/baseboard interface.

**Treatment of the entire 32-unit complex, including the connecting hallways, took two, 8-hour days and four Technicians, and a total of five 16 oz bottles of Aprehend® (an average of 2.5 fl oz per apartment).**

#### ***Monitoring methods and follow-up schedule***

No monitoring devices were used to detect bed bugs either before or after the treatment. Visual inspections, and tenant reporting were used to determine presence or absence of active infestations.

Follow-up had been agreed with the management at 30 and 60 days after treatment. Just prior to the 30-day follow up, the management contacted HTP to report that tenants from four units had indicated that they were still seeing bed bug activity. Three of these units had been identified as having infestations prior to the treatment, while the other was a unit where bed bugs had not been found during the initial inspection. In the latter

case, one live bed bug had been found on the sofa shortly after the treatment.

Interestingly, the two suspected source apartments had not indicated to management that there was any on-going bed bug activity.

When HTP arrived for the 30-day follow-up, they inspected the unit where a single bed bug had been found on a sofa. The resident had not seen any further bed bugs, and inspection indicated no bed bug activity. The other three apartments where on-going activity was reported were inspected. No live bed bugs were found in any of these apartments, but a tenant had caught a single live specimen. HTP placed this specimen in a zip-lock bag for further investigation (see below\*). Each of the three apartments received additional spot treatments on the couches and in the bedrooms using Aprehend®. HTP noted that the bedding had been replaced without having been laundered.

The two suspected source apartments were also inspected during the 30-day follow-up. These received a second full application of Aprehend®.

Large numbers of dead bed bugs were observed in many of the worst units. No bed bug activity was detected in any of the other apartments.

On the 60-day follow-up visit, no evidence of live bed bugs was found in any apartment, and management had received no further reports of bed bug activity.

### ***Observations on efficacy of this protocol in comparison to previous protocols***

HTP report that Aprehend® performed amazingly, and that it would not have been feasible to even take on the bed bug remediation in this complex using their previous treatment protocols, which included encasements, steam, silica dust (Cimexa™), Phantom®, Alpine® and Zenprox®. The time saved by the implementation of Aprehend® into their treatment protocol not only enabled HTP to take on and win this contract, but also resulted in them being awarded the annual contract for general pest and termite control for the management company, following the success of the bed bug remediation.

HTP returns to the property on a regular basis for their routine pest control services and have had no reports of sightings of active bed bugs since the 30-day follow-up visit in January 2018.

The management have since revealed that HTP had quoted 1/5th of the price of the competing quote from a truck-mounted heat treatment company, and that the estimated time frame for the heat treatments only in the visibly infested apartments had been two weeks.

Following this success, HTP have been using their ‘single application’, Aprehend® protocol for all their bed bug remediation jobs. This year, they have conducted over 40 treatments and have had just 3 call-backs. They report that none of these had any obvious signs of continuing bed bug activity.

#### ***HTP suggestions for other PMPs?***

- If you haven’t tried it yet, you REALLY need to!
- Great for one-man operators.
- Incredible labour savings.
- Think like a bed bug!

#### ***HTP suggestions for product improvements?***

- Applicator can be “fiddly” to fill when on the job. A larger applicator bottle to reduce the number of fills would be great
- An extendible handle to facilitate treatment of baseboards without stooping would be greatly appreciated.

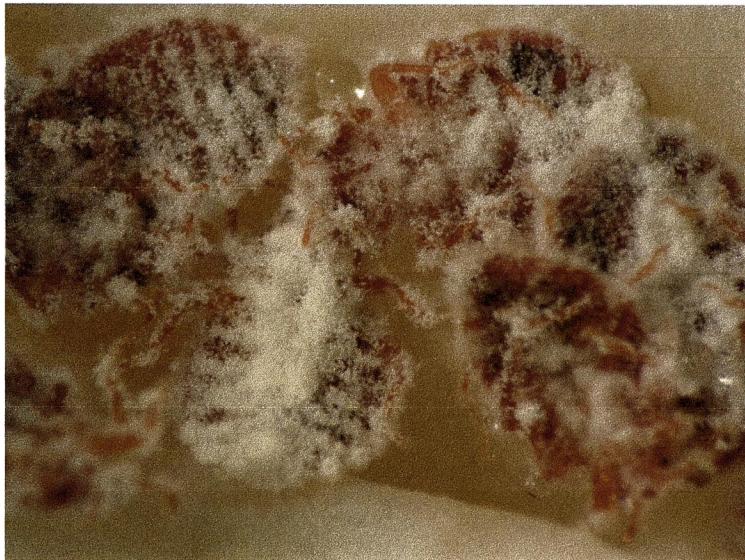
#### **\* The zip-lock bag test**

It is easy to verify whether a bed bug (living or dead) has been exposed to Aprehend®. Bed bugs that are found during follow-up visits can be placed in a zip-lock bag on top of a wet paper towel.

- 1) The paper towel should be wetted under the tap and squeezed to remove excess water.
- 2) Place the moist paper towel in a zip-lock bag and place the live or dead bed bug on the paper towel.
- 3) Zip up the bag and leave it at room temperature for three or four days.
- 4) Inspect the bed bug. If it was sick or dead from the fungal disease in Aprehend®, the bed bug will have become white and fuzzy with the fungus (*Figure 3*)

**NOTE** - this will only happen at 100% humidity. “Fuzzy” bed bugs will never occur under normal room conditions.

(The live bed bug collected during the 30-day follow-up died in the bag and produced the fuzzy bloom confirming that it was sick and would have died from exposure to Aprehend® within a day, even if it had been left in the apartment.)



*Figure 3: Bed Bugs with external sporulation after the “zip-lock” test*

**ConidioTec**  
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