

# Effective Treatment of Bed Bug Infestations

For Facility Managers and Service Providers



White Paper  
By Michael Schaffer, President, Tornado Industries





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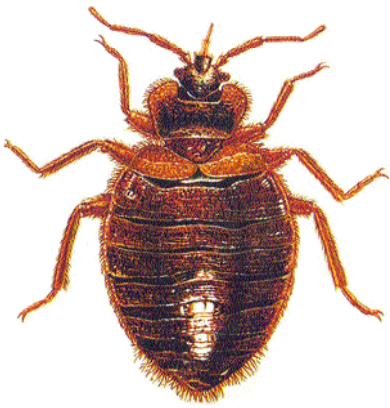


## Introduction

Years after they were thought to have been eradicated in the United States, bedbugs appear to be making a major comeback. High-end hotels, movie theaters, cruise ships, universities, libraries, upscale condo buildings, and many other types of facilities across the country have been hit with serious infestations.

On top of dealing with the bedbug infestations, many of these facilities have also faced negative publicity and have suffered a loss of business as a result. The legal community has also taken note, and the number of related lawsuits is growing daily. Currently, in the hope of avoiding negative publicity, most building owners are settling cases out of court; even so, the seriousness and costs of infestations shouldn't be minimized. For example, in Australia, where major bedbug outbreaks have occurred, it has been reported that bedbugs are costing the tourism industry alone approximately \$75 million per year.

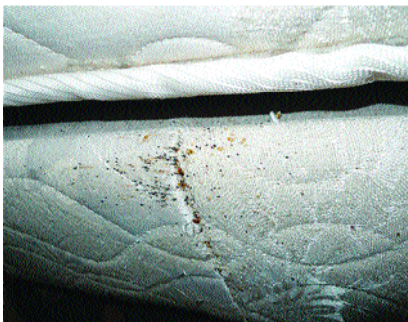
Historically, bedbugs were thought to be a sign that cleanliness was lacking, and there was a social stigma associated with infestations as a result. That, however, is not necessarily the case today, and the bugs can be found in even the cleanest environments. Regardless of how well maintained a building is, bedbugs can be inadvertently brought into a facility via luggage, in shipments, or even on the clothes of guests. Once introduced into a building they can quickly become established and will often spread beyond the original room or area, which is another reason they can be difficult to eradicate.



**Adult bed bug**

## What to Look For

Bedbugs are small, flattened, brownish insects and like to feed on the blood of humans and animals, which is the reason they are often found in bedding, mattresses, and fabric chairs. A bedbug bite usually produces swelling around the bite, much as a mosquito or flea bite might. Unlike mosquito bites, however, bedbug bites often appear in groups or clusters.



**Signs of active infestations**

## Use of Pesticides

Bedbugs can survive for almost a year without feeding, which is one of the reasons irradiating them in an infested area can be such a challenge. Historically, there have not been many options available when it comes to ridding facilities of bedbugs, and those that were effective, such as the pesticide DDT, were proven to have harmful environmental consequences. Relatively common prior to World War II, DDT made bedbugs all but vanish in the United States by the late 1950s. However, DDT was banned in this country in the 1970s, and that along with a number of other factors — increases in immigration, globalization, and international travel and shipments, among others — have contributed to their dramatic resurgence.

### **TIPS:**

*An inexpensive magnifying glass will make you a better bed bug hunter. The better the lens quality the better you will be able to see so go for higher-quality glass if possible.*

*A good flashlight will optimize your hunt for bed bugs. An LED-type flashlight will serve you better than a normal bulb-type flashlight.*

The problem we have today is that although there are now less-toxic pesticides available, they have proved to be far less effective in killing bedbugs. It is also quite difficult to get new pesticides approved by the federal government, particularly any pesticide that could come in direct contact with humans. Fortunately, there are options that are proving to be both effective and safer for the user and the environment. One is the use of professional steam cleaners.



**Bed bug bite**

## Environmentally Preferred Solutions

While chemicals can kill active bugs, most cannot penetrate the egg or the sticky coating that they are incased in as they are laid. That is why the most effective way to deal with bed bugs today, is actually a combination of things, including the use of more environmentally-friendly methods to eradicate insects, vacuuming, and steam-cleaning.

Areas showing active signs of infestations should be vacuumed, using a unit with an enclosed, disposable collection bag. The collection bag should be removed, dropped into a trash bag and sealed, and disposed of immediately after use to avoid spreading the infestation



*Used properly, steam will kill live bed bugs and bed bug eggs. A professional steam cleaning system, such as Tornado's DE 4002, is an excellent tool that may be used for normal cleaning purposes as well as for bed bug control.*

from one area to another. Vacuuming prior to steaming and chemical treatment will not only help remove active bugs, but dirt and soil as well, which will allow the chemicals to penetrate better and improve their residual effect. Incidentally, use of a HEPA equipped vacuum is also advisable, since they control the dispersion of insect allergens as they are being vacuumed, filtering particles as small as .03 micron with 99.97% efficiency. Vacuuming alone cannot be viewed as an effective means of dealing with infestations, however, since bugs in crevices can be missed and eggs themselves can resist the suction force, glued in placed when they are laid.

## The Steam Advantage

Bed bugs are very sensitive to heat, which is where steam cleaning comes into place. Steam cleaning or heat treatment is actually one of the most effective means of dealing with infestations. Studies have shown that temperatures of 40C/104F will kill adult bed bugs and temperatures of 60C/140F is found to be lethal to bed bug eggs. The advantage of using a professional steam cleaner, like the Tornado DE 4002, is that if used properly, the steam can kill all bed bug stages, including eggs, with the unit capable of producing steam up to 248°F.

Another benefit of utilizing a commercial steamer is that doing so can dramatically reduce the amount of pesticide used and/or the number of pesticide treatments required to address an infestation within a building. Since heat is the Achilles heel of bed bugs and steam



**Single spray jets can fling bed bugs from the surface without killing them**



**Tools with multiple steam ports provide even coverage.**



**Direct contact and increased heat when used with a cloth wrap**

treatment provides such an effective kill rate, the primary focus of the use of pesticide essentially changes from the primary means of attack, to that of providing residual kill benefit. Hence, use of a professional-grade, commercial steamer or other forms of heat treatment, is one of the most effective means of addressing a bed bug infestation in a “socially responsible” manner. It really does little good to rid a facility of bed bugs, if in doing so you create another set of problems with respect to toxicity of the area treated. That is why use of a commercial-grade steamer, followed by appropriate chemical treatment is a much more environmentally preferred means of addressing an infestation.

## **Effective Steam Cleaning**

Before discussing the use of steam cleaners to eradicate bedbugs, it is important that we be aware there is a major difference between retail steam cleaners made for the home consumer and high-end systems made for the professional cleaning industry. Most retail or consumer steam cleaners are not appropriate for eliminating bedbugs. They do not allow for the production of low vapor flow and high temperature, both requirements for a steam cleaner to effectively tackle the bedbug problem. The Tornado DE 4002 is easily adjustable and can produce “dry steam”, which allows for quicker drying times. As important, the Tornado DE 4002 has a continual flow feature (can be filled and refilled while remaining operational), which is critical in treating bed bugs. Most retail steamers do not offer this feature, which means the user must stop, refill, and wait for the unit to reheat. During that down period, active bugs can migrate to the area just steamed, escaping direct contact as the operator begins where he or she left off. Additionally, most “retail” steamers don’t allow for control of the nozzle flow and produce a jet of steam that ends up actually blowing the bugs from one area to another on the surface being cleaned.

*Use of a HEPA Vacuum and Tornado DE 4002 Steamer can dramatically lower the amount of pesticide needed.*



**Tornado's DE 4002 Steam Cleaner**

When using a professional grade steamer, like the Tornado DE 4002:

- Pay particular attention to seams and ribbing on beds, chairs, and other surfaces.
- Avoid “jet” nozzles, because they can blow the bugs away from the area being treated.
- Select steam heads with multiple steam ports or nozzles, including those that allow the entire head to be wrapped with a cloth; these are the most effective tools for treating bedbugs, because they allow for direct contact with the surface being treated.
- To avoid dilution of the chemical and/or vaporization, always do steam treatments prior to chemical treatments.

While professional steamers, like the Tornado DE 4002, are extremely effective in killing all phases of bed bugs, including eggs, the one disadvantage is that they kill on contact and don't have “residual” benefit. Specifically, once the surface cools to below 60 °C/140 °F (the temp where adult bedbugs and eggs are killed), there is no continuing kill benefit. That is the reason why steam treatment should be followed up by use of a residual pesticide to complete the control process. Fighting bedbugs obviously involves direct spraying of chairs, beds, and other surfaces that people and animals have extended contact with, and it is important to note that a pesticide should never be used on those surfaces unless it is specifically labeled for such use. Due to the very nature of bedbugs, monitoring and regular inspection of the area(s) being treated are important to ensure that eradication is successful. It is also worth noting that several treatments are normally necessary to eliminate this persistent bug, and an integrated cleaning approach using both equipment and Environmental Protection Agency (EPA)–registered pesticides will produce the most effective results.





## Resources

### **EPA-Registered Bed Bug Products:**

EPA has developed a search tool that can help you choose an EPA-registered bed bug product that meets your needs.

Click on the link: <http://cfpub.epa.gov/oppref/bedbug/>

### **Centers for Disease Control and Prevention (CDC):**

CDC.gov provides content in several useful ways that facilitate customization, interactivity, collaboration, and customer participation while increasing the impact of CDC science and public health interventions.

Click on the link: [http://www.cdc.gov/nceh/ehs/Publications/Bed\\_Bugs\\_CDC-EPA\\_Statement.htm](http://www.cdc.gov/nceh/ehs/Publications/Bed_Bugs_CDC-EPA_Statement.htm)

### **International Sanitary Supply Association (ISSA):**

The leading resource for information, education, networking, and commercial opportunities as well as the leading voice in government and the community for firms within the cleaning industry worldwide.

Click on the link: <http://www.issa.com/>

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## About Tornado

Tornado Industries, Inc. is dedicated to delivering “Best in Class” commercial and industrial cleaning equipment and after-sale service that meets and exceeds the expectations of our customers. In the industrial cleaning business for over 80 years, Tornado® has a strong entrepreneurial history of partnering with in-house cleaners, contractors and facility managers to provide cleaning solutions that deliver innovation, reliability and competitive pricing. Developed for cleaning professionals, by cleaning professionals, Tornado’s machines are created to maximize cleaning efficiency and speed, minimize the impact of cleaning on indoor environments, and reduce the total cost of cleaning — all factors resulting in greater profitability for your organization. Tornado’s industry-acclaimed products tackle the unique cleaning challenges faced in a variety of markets including, hospitality, food service, health care, building service contractors (BSC), industrial/manufacturing, government, retail, transportation, education, and more.

## Commitment to the Environment

As an organization, we are deeply committed to creating a clean, safe and healthy workplace through the use of innovative cleaning technology developed to minimize the impact of cleaning on indoor and outdoor environments. Tornado® embraces core ecological and corporate values including water conservation, less use of harsh chemicals, improvement of Indoor Air Quality (IAQ) through the use of HEPA filtration and advanced filtration systems, and the use of components that are reusable and recyclable. We proudly support the standards and criteria established by the U.S. Green Building Council, The Carpet and Rug Institute’s (CRI) Green Label Certification program, EPA’s Design for Environment (DfE), among others.



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OR CALL 1.800.VACUUMS

**CORPORATE HEADQUARTERS:**  
Tornado Industries  
333 Charles Ct., Suite 109  
West Chicago, IL 60185

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