

# **Best Practices for Bed Bug Management of Mattresses, Bedding, and Upholstered Furniture**

## **Guidance Document for the Reuse/Resale and Recycling Industries in Connecticut (2011)**

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## Introduction

Bed bug populations have increased in the United States due to an increase in international commerce, recreational travel, and a change in pesticide use practices in buildings. Social stigma and a reactive public response permit many bed bug populations to get out of control, compounding an already difficult situation.

Bed bugs have been a nuisance to humans as blood-sucking temporary ectoparasites for thousands of years. Over 100 scientific studies have shown they cannot transmit disease organisms. Bed bugs do cause a range of anxieties and skin reactions from small slightly itchy red spots to severe blistering and secondary bacterial infections; in severe infestations, anemia. Bed bugs do not like to associate with people other than for food. If they are seen on clothing, which is being worn, it is because they were trapped there or were caught hiding in a fold or pocket in the belief they were “safe”. Because of the habit of seeking a hiding place after feeding, bed bugs can be accidentally picked up and carried to a home or business on articles, personal items, or on the person themselves. Bed bugs cling to materials until perceived motion ceases, when they scurry away to find another hiding place. Bed bugs are often accidentally introduced to a residence or business through no fault of the resident or the employee.

The Connecticut Department of Consumer Protection regulates bedding and upholstered furniture under the “State Bedding and Upholstered Furniture Act, now codified in Connecticut General Statutes, Chapter 420a, entitled “Manufacture of Bedding and Upholstered Furniture” (<http://www.cga.ct.gov/2005/pub/Chap420a.htm>). This law makes it illegal for any storefront/retailer to sell, rent, or renovate any used bedding or upholstered furniture (defined as anything with hidden filling material used for sitting, resting, or reclining) without the proper license and permit, and proper sanitation/sterilization methods. It carried a civil penalty of \$200 per violation. Regulations adopted under the act provide the standards for which covered activities must be conducted. For example, a specific yellow tag is required to show a second hand item and date of sanitization. This law was enacted in the 1930’s to prevent the use and/or sale of dirty, unsanitized filling materials in the renovation or sale of new and used bedding and upholstered furniture; Connecticut General Statutes **Sec. 21a-233d** states “New bedding or new filling material shall not be transported with secondhand bedding or secondhand filling material that has not been sterilized.”

Additionally and more specifically the law states;

**Sec. 21a-232.** (Formerly Sec. 19-420). Prohibited acts; sterilization; sanitation; permits; exception.

(g) No person shall sell any secondhand bedding or filling material unless (1) it has been sterilized or sanitized and has a tag bearing the secondhand dealer’s license number and the permit number of the person performing the sterilization or sanitization, or (2) in the case of secondhand bedding or filling material manufactured at least twenty-five but no more than fifty years prior to the date on which such secondhand bedding or filling material is offered for sale, the secondhand dealer notifies the consumer, in writing, that such secondhand bedding or filling material has not been sterilized or sanitized.

(o) Nothing in this chapter shall apply to automotive upholstery, private sales from the home of the owner direct to a consumer, bedding offered for sale at public auction in the home of the owner, and bedding manufactured at least fifty years prior to the date on which the bedding is offered for sale.

Connecticut's Solid Waste Management Plan outlines a 58% recycling rate by the year 2024. The Plan also defines strategies to implement how to reach that goal which includes developing more opportunities for bulky-waste recycling. Bulky-waste or oversized municipal solid waste (MSW) includes mattresses and furniture. Facilities which process waste materials, including mattresses, require an authorization or permit from the Connecticut Department Energy and Environmental Protection (DEEP).

The purpose of this document is to provide practical industry compatible protocols for the reuse and recycling industries that sell used upholstered furniture and/or dismantle upholstered furniture and bedding materials for refurbishing and/or recycling purposes in Connecticut. This is a best management practices guide designed to eliminate bed bugs from the used mattress/furniture stream, protect workers so bed bugs are not brought home, and provide future users of these articles a pest free product.

## Definitions

**Bed bug(s):** A secretive insect that is a temporary ectoparasite which feeds on a limited array of warm-blooded vertebrates, primarily bats, birds, and humans. Worldwide, there are approximately 100 species in the family Cimicidae. Two species primarily feed on people; the common bed bug, *Cimex lectularius* L. and the Tropical bed bug *C. hemipterus* (F). A third species of human feeding bed bug is *Leptocimex boueti* Brumpt, currently confined to West Africa. In North America, some other species may occasionally feed on people. These are the pigeon bug *C. columbarius* Jenyns, bat bug *C. adjunctus* Barber, and the swallow bug *Oeciacus vicarius* Horvath.

**Bed bug infestation:** New or established population of live bed bugs in a dwelling or in mattresses, bed frames, bedding and/or other furniture, and/or personal items.

**Canine certified bed bug detection:** Dogs that are trained at an accredited facility and certified by the National Entomology Scent Detection Canine Association (NESDCA) to detect bed bugs. Bed bug infestations, particularly small populations that are not obvious by visual inspection, can often be detected with trained, certified bed bug detection dogs and their handlers. Dogs must remain with the handlers they were trained with. Daily training is expected, to maintain detection sensitivity and focus of the dog. Dogs may not always be 100% accurate due to fatigue, distraction, a difficult environment, or the skill of the handler. Dogs are useful in high volume settings, such as multi-unit housing complexes, hospitality industry spaces, college and university dormitories etc., where a high volume of mattresses/furniture may need inspection during one visit. It is good practice to have either a second dog or a skilled technician check a dog's alerts.

**Control:** The regulation, suppression or elimination of an arthropod deemed as a pest through, chemical, biological, mechanical or other means.

**Integrated Pest Management:** CGS Section 22a-47(dd) means the use of all available pest control techniques including judicious use of pesticides, when warranted, to maintain a pest

population at or below an acceptable level, while decreasing the unnecessary use of pesticides.

**Cryogenic treatment:** The control of an insect, such as a bed bug using cold by exceeding the kill temperature threshold of a specific arthropod species and maintaining this temperature for a set time period. This technique employing CO<sub>2</sub> or refrigeration is used on museum artifacts and items which cannot tolerate heat. Bed bugs can be killed with refrigeration temperatures below 0°F (-19°C) for upward of four days. Some non-cold-hardy populations may be killed at less cold temperatures but still need exposure to freezing for extended periods of time. Pressurized CO<sub>2</sub> from cylinders and applied using a wand can rapidly kill bed bugs by flash freezing. Temperatures may get as low as -108°F (-78°C).

**Heat treatment:** The control of an insect, such as a bed bug using heat by exceeding the kill temperature threshold and maintaining this temperature for a set time period. The human bed bug kill temperature is ~113°F (45°C) for at least 30 minutes. More time is needed when there are many or bulky objects in heat treatment, because the mass of materials often works against temperature levels as heat is absorbed by the articles themselves.

**Pesticide:** CGS Section 22a-47(w) means any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or any substance or mixture of substances intended as a plant growth regulator, defoliant or desiccant.

**Pesticide resistance:** A morphological, behavioral, or metabolic adaptation by an insect as a result of repeated chemical pesticide exposure, so that it can survive treatment and reproduce.

**Recycling:** The processing of solid waste to reclaim material from the waste (CGS Section 22a-207 (7))

**Refuge:** A place where bed bugs hide.

**Remanufacture:** (Connecticut Department of Administrative Services Section 4a-59 (Formerly Section 4-114)) A product “restored to its original function and thereby diverted from the solid waste stream by retaining the bulk of components that have been used at least once and by replacing consumable components”.

**Renovation:** (Connecticut General Assembly, Section 21a-231 (Formerly Section 19-419) Addition of new filling material to bedding. “ Bedding” means any mattress, pillow, cushion, quilt, bed pad, comforter, sleeping bag, upholstered spring bed, box spring, davenport, bedspring metal couch, metal bed, metal cradle, hammock pillow, upholstered furniture or other substantially similar article or part thereof used or intended to be used for sleeping, resting or reclining.

**Reuse:** Using a product or component of municipal solid waste in its original form more than once; e. g., refilling a glass bottle that has been returned or using a coffee can to hold nuts and bolts (EPA Glossary).

**Sanitary:** Clean and free from pathogens, pests, filth, and contamination to preserve personal and public health and safety.

**Sanitization:** For this best management practices document sanitization is the use of a material/agent for killing pest insects which contain tracers for the purpose of tracking

treatment. Tracers will glow when illuminated by a black light. Some sanitizers may also kill disease causing pathogens.

**Standardized training:** A process of training personnel to consistently meet a specific level of knowledge and skill through instruction and practice.

**Secondhand:** (Connecticut General Assembly, Section 21a-231 (Formerly Section 19-419) Any filling material or bedding subject to prior use.

**Tracer:** A luminescent dye that allows the detection of a sanitizing agent.

**Unsanitary:** Unclean or infested items and/or areas posing a threat to personal and public health and safety.

**Mattress encasements:** Seamless mattress and box spring covers designed to reduce refuge for bed bugs. They also allow for easier surface detection of bed bugs. The encasements should be the correct size for the mattress and box spring. Zippers should be small toothed with specialized stoppers to prevent bed bug movement; stitched seams should be tight and fabric tough and resilient to prevent bed bug feeding through the fabric.

## Mattress and Box Spring Recycling:

The Connecticut Department of Energy and Environmental Protection (DEEP) requires a General Permit registration for a Single Item Recycling Facility, which includes mattress recycling businesses. The applicant must submit an application for approval and all necessary documents and fees. As part of the permit, businesses must develop an Operations and Management (O & M) plan, which includes everything from record keeping to fire protection. The O & M plan for mattress recycling businesses should include steps on how to prevent bed bugs entering a business, including if a business uses any preventative treatments such as cryogenic or heat treatments, how to ensure employees are not infested, and an action plan if bed bugs are introduced into the recycling facility.

The DEEP **General Permit to Construct and Operate Certain Recycling Facilities** page 32, under the title, Mattresses-section D, states :-

*“The Permittee shall ensure that all mattresses are inspected for human bed bugs and bed bug eggs within forty-eight hours of receipt at the facility and prior to placement at the storage facility. If human bed bugs or bed bug eggs are found to be on any mattress, the mattress and adjacent mattresses shall be segregated and taken off site for proper treatment and handling.”*

[http://www.ct.gov/dep/lib/dep/Permits\\_and\\_Licenses/Waste\\_General\\_Permits/recycle\\_gp.pdf](http://www.ct.gov/dep/lib/dep/Permits_and_Licenses/Waste_General_Permits/recycle_gp.pdf);

### Develop a “Bed Bug Action Plan” and Documentation

An action plan to prevent a bed bug infestation should include educating managers, staff, customers, retail staff, department of public works employees, and hotel and prison staff. At the end of this document are links to resources, including brochures, which can be given to your current and/or prospective business partners.

The action plan should also include procedures for inspection and isolation if materials are found infested with bed bugs, sanitization and/or reprocessing with accurate record keeping, and sign off documentation for mattresses and box springs or their components identifying recipient(s). Standardized training of staff including self-protection should be described as well as schedules for renewal of training and/or continued education.

### Education and Staff Training

Managers and/or owners of recycling related businesses should educate themselves on how to identify bed bugs and their behavior. Informational brochures and posters are available to Connecticut companies and business partners (see end of document). It is important to understand the seriousness of having bed bugs on articles because of moving the insects and difficulties of control once populations have established. Municipal transfer station attendants, recycling or housing staff from universities, facility managers from hotels, prisons, hospitals, and bedding businesses should be knowledgeable about the need to not put bed bug infested mattresses with ‘clean’ non-infested mattresses destined for recycling.

To learn about bed bugs, managers and/or owners should attend classes or a course which includes bed bug management. After training, managers and/or owners should attend at least one class a year to remain current. All training activities should be documented. Basic knowledge

about bed bugs should cover identification including other insects that could be mistaken for bed bugs, different species of bed bugs, life cycle, behavior, human/bed bug interaction, medical aspects, the law, prevention and current management techniques and other resources. Reading material from university and government web address that end in .edu or .gov will provide correct information. This information should also be made available to all employees. The Connecticut Agricultural Experiment Station (CAES) provides standardized training recognized by the Connecticut Department of Energy and Environmental Protection (DEEP), Connecticut Department of Consumer Protection (DCP), and Connecticut Department of Public Health.

It is important to educate your clientèle or anyone who may be working with mattresses about bed bugs, so that they know what to do when or if they encounter the insects.

## Images of Human Bed Bugs



**Adult human bed bug**



**Left, female (rounded); right, male (pointed) with pin**



**From left to right: Engorged 3<sup>rd</sup> instar(stage) nymph; adult female; unfed 4<sup>th</sup> instar (stage) nymph**



**Adult bed bug feeding with mouthparts inserted into the skin**



**Shed exoskeletons (skins) and fecal specs both dark and cream colored**



**Bed bug detecting dog working in a cluttered apartment**

## Commonly Misidentified Arthropods and Material thought to be Bed Bugs



**Tick**



**Lice**



**Flea**



**Left: Bed bug. Right: varied carpet beetle abdomen**



**Lint/fluff**



**Varied carpet beetle**



**Spider beetle**



**Bed bug (male)**

## Recycling, Rebuilding, and Reuse

### Collecting Mattresses, Box Springs, and Upholstered Furniture

*Prior to moving a mattress or box spring, a visual inspection should be made for bed bugs and/or black spotting (fecal matter)*

Prior to moving mattress and/or box spring or furniture at a pick-up or collection point, a visual inspection should be made for bed bugs and unsanitary conditions. Because bed bugs hide in cracks and crevices on and off beds and furniture, it is advisable to thoroughly inspect all hard surfaces on furniture, inside and outside with special attention to joints, seams, cracks and laminated surfaces. Close attention should be made to bed frames and mattress seams, tufts, labels, corner protectors, handles, and buttons. With box springs, it may be necessary to remove the bottom dust cover to inspect the interior. If needed, a flash light should be used. Protective gloves should be worn at the discretion of the staff(s) or if conditions are considered unsanitary. Canine bed bug detection may be used, and would be especially appropriate in high volume situations.

If mattresses and/or box springs appear free of bed bug infestation and are sanitary, they may be transported for processing in a delivery vehicle. To keep other mattresses, articles, and/or furniture free of bed bugs, those mattresses and/or box springs that appear unsanitary (e.g., visible blood, urine, feces, and/or other protein-like material. A black light may be used to see cryptic material) and/or bed bug infested, should be put into mattress and box spring encasements or equivalent, sealed, and labeled citing date and location of collection. This alerts staff and other persons of a possible problem, prevents cross contamination of other articles, and prevents possible infestation of cargo area. Encasements if reused should be washed in hot water and dried at a high temperature.

### Responding to a Bed Bug Incident in Your Facility

Upon “point of entry” at the facility if bed bugs are found on any piece of furniture including beds, in any retail store/new or used furniture retail store, rental, or renovation facility, the infested piece should be treated or encased immediately and moved to a secure holding area, preferably away from the building or premises. The area where the infested piece of furniture was found should be carefully inspected either by a trained Pest Management Professional (PMP) technician or certified facility employee. Items put in a dumpster or other disposal area must be rendered unusable through physical damage or defacing to prevent scavenging.

# Used Mattresses, Box Springs, Couches, Chairs and other Upholstered Furniture for Resale, including Furniture Liquidation

## A Plan of Operation

The Connecticut “State Bedding and Upholstered Furniture Act” is specific in the storage of new, used, and sanitized pieces. No used, unsanitized piece may be put in the same area as new or previously sanitized filling materials. The law requires a separate room or some type of divided area for storage of new and used items. If no area is available, it is suggested that the pieces be sanitized on the truck prior to bringing them into the building. The same principles for checking pieces would apply before the merchandise is picked up. A log book or equivalent records should be kept for sanitation of pieces. When a piece is sanitized and tagged with a yellow law tag indicating the piece is second hand, the date of sanitization needs to be marked on the label.

## Instructions for Rental Return, Commercial Return, Exchanges, Charities, Business, Private Pickup, and Resale

Rental companies should check pieces prior to pick-up to determine if there are bed bugs, using methods described above. Many of the rental companies already require their staff to put the mattress and box spring pieces in encasements prior to transport, regardless of whether any type of insect infestation is found. Connecticut law does not allow the sale of returned bedding and upholstered furniture by a retailer unless they hold a Second Hand Dealer License and Sterilization Permit and have sanitized and tagged the piece. License requirements can be found in the Connecticut States bedding and upholstered regulations Sec. 21a-235-4. It states that “No person shall sell or offer for sale or manufacture for sale, in the state of Connecticut, any article of bedding or upholstered furniture or filling material unless such person is licensed with the department (Department of Consumer Protection) and has been assigned a registry number and such license is valid at the time such article is sold or offered for sale in Connecticut.” Used bedding and upholstered furniture may be sold privately without any licensure requirements, but not at a store front. Connecticut law prohibits the transport of new and used articles together: Sec. 21a-233 states “New bedding or new filling material shall not be transported with secondhand bedding or secondhand filling material that has not been sterilized.”

## Cleaning and Sanitization of Vehicles, Docks, and Work Areas for Reuse, Recycling, and/or Renovation

The initial time period, which includes the activity of picking up/collecting mattresses, box springs, and or other furniture by a vehicle and delivery to a facility, is important for the detection of bed bugs. From there, these articles may enter any number of reuse, recycling, and renovation processes. To maintain a clean, safe working environment, precautions should be taken regarding sanitization.

**Vacuuming** is a step for control, but is not a complete control. The vacuum cleaner should be a canister type with HEPA filter and replaceable bag. The vacuum cleaner bag must be replaced after use on infested bedding, sealed in an air tight plastic bag, and labeled as bed bug infested. The interior of the vacuum hose should be cleaned with hot soapy water, rinsed and soaked in a bath of hot water for 10 minutes. It is suggested that the hose be thoroughly cleaned once each business week if in use.

**Docks and processing areas** where mattresses and box springs are unloaded and processed must be kept in a clutter-free and sanitary condition. This will require daily sweeping or vacuuming and removal of packing material and/or debris at the end of each working day. All debris should be bagged, sealed, and safely disposed of.

**Delivery vehicle.** Inside the cargo area of the delivery vehicle, any seams should be caulked and checked for cracking. These are sites where bed bugs may hide. Vehicles should be cleaned daily by sweeping or vacuuming.

**If there is evidence of bed bug activity.** In any of these locations, a certified facility employee or licensed Pest Management Professional (PMP) experienced in the control and management of bed bugs should be consulted.

**Inspection and Management of Infested Mattresses.** All mattresses must be inspected for bed bugs and bed bug eggs within forty-eight hours of receipt at a permitted Single Item Recycling Facility and prior to placement at a storage facility. If bed bugs or bed bug eggs are found to be on any mattress, box spring, or other furniture adjacent to other mattresses box springs or furniture they shall be segregated and taken to a pre-designated area for proper handling and treatment.

### **Self-protection**

It is suggested that staff wear smooth-soled shoes and tight fitting light colored clothing. Clothing must tolerate hot washing and drying. Tyvek suits may also be worn at “point of entry” locations. A dated sanitization log or equivalent record should be kept detailing inspection, method of cleaning, item(s) cleaned, and other information for review by an inspector (Appendix 1).

### **Treatment of Mattresses and Box Springs for Reuse, Refurbishment, Renovation, and/or Resale**

Integrated pest management (IPM) is a term used to describe a systematic method of managing pests using non-chemical pest management methods and the judicious use of pesticides when pest populations exceed acceptable levels. When pesticide applications are necessary, priority is given to using the least toxic pesticide as first choice. Other factors to be considered when selecting a pesticide for use include the method and frequency of application. In other words, pesticides applied to small precise areas would be more desirable for use than an application of pesticide as a space spray using an aerosol fogger or “bomb.” Following these guidelines will help to minimize the risk of exposure to pesticides for people and pets that occupy the treated area for extended periods of time.

The implementation of integrated pest management is recommended as a common sense approach to pest control in all environments from residential to municipal, commercial and campus settings for both interior and exterior applications.

Bed bugs are sensitive to heat. They are immobilized at 106°F (41.1°C) and all stages are killed at 113°F (45° C). Bed bugs are surface insects and do not burrow into materials. They can climb inside objects if there is an opening, thus the underside of a box spring should have its dust cover removed to allow air flow for heat treatment. It is suggested that mattresses and box springs be placed in an insulated space, lifted off the floor (to allow air flow), separated by 4” metal spacers, and heated to a surface temperature of 120°F using fans to move the air, a fire department

approved heating device, and thermometers to monitor temperatures for upward of two hours. This allows time for the space to heat up and maintain a temperature of 120°F for at least one hour. It is important to note that if heating occurs directly against concrete, stone, or tile, these materials excessively absorb heat. Extra time must be allowed for effective treatment. After treatment, these articles should be moved directly to a clean space, away from the delivery area to avoid re-infestation, and processed. Any intact mattresses and box springs should be labeled identifying time, date, and location of heat treatment before shipment. The same control techniques and policies may be also applied to used furniture. Attention should be paid to drawers and/doors etc. which should be opened to allow for a free flow of air.

In the event a business (e. g., rental or secondhand store) lacks access to heat treatment, or insufficient space to have a heat box, steam cleaning using low vapor pressure, high temperature equipment by trained staff may be effective. Once treated, a mattress/box spring should be covered by well-fitted encasements. Bed frames and furniture should also be treated. Modern pesticides currently in use may be ineffective, due to widespread pesticide resistance in bed bugs. Some bed bug populations are resistant, others are not. In the future, a pesticide may be developed which is effective, but current pesticides used on mattresses and box springs should be considered unreliable for the control of bed bugs. Connecticut bedding laws approve the use of chemicals with added tracer for sanitization as it relates to the resale or rental of bedding and upholstered furniture, as long as they meet certain requirements and have a tracer element added so that it can be determined by inspection that the retailer did sanitize.

Cold treat or refrigeration may be considered with heat sensitive articles or where heat treatments cannot be used. Non-cold hardy (adapted) bed bugs can be killed in a freezer if the object they are on is kept frozen for at least 3 to 4 days. Cryonite ® systems use pressurized CO<sub>2</sub>, delivered through a wand attached to cylinders. Temperatures can reach as low as -108°F (-78°C) which produces snow. It flash freezes the insects. There are reports that during treatment non-killed bed bugs may be flushed or blown from their hiding places. Working with CO<sub>2</sub> can be hazardous in enclosed spaces with potential for suffocation and freeze burn.

Vacuuming and steam cleaning are also options. With vacuuming using a crack and crevice tool is suggested. It increases suction and can remove insects and debris from cracks and crevices. It cannot be relied on as an absolute control technique, but part of a more comprehensive IPM program.

Steam is effective if the steam pressure (vapor pressure) is low, and movement of the steam head across a surface is slow. Explosive steam pressure tends to blow insects out of reach, making management less effective. It cannot be relied on as an absolute control technique, but part of a more comprehensive IPM program.

Significant reductions in the volume and toxicity of pesticides applied can be achieved when an IPM program has been implemented properly. The reductions result from the elimination of scheduled pesticide applications that are often made as preventive treatments. Precision applications of low toxicity pesticides rather than typical baseboard applications or treatment of an entire property also have proven to greatly reduce the total volume of pesticides applied.

## Treatment of Mattresses and Box Springs for Recycling

Since the processing of mattresses and box springs in large part is destructive (e.g., mattresses and box springs are broken down and components and materials reprocessed for other functions), it is less likely bed bugs would survive to pose a problem to the recipients of these products. The collection/pick up, delivery, point of entry, and initial processing are all possible places of concern.

**Collection/pick up:** Drivers should be trained in identifying sign of bed bug activity, and those articles which are suspicious should be encased before loading onto a delivery vehicle.

**Delivery:** The cargo area of delivery vehicles (including cargo containers) should have seams caulked and checked for cracking. These are sites where bed bugs may hide. Vehicles should be cleaned daily by sweeping or vacuuming. Empty cargo containers should be cleaned and carefully inspected before leaving a plant. Bed bugs have great difficulty navigating slick hard surfaces, such as smooth metal or glass. Thus, having delivery trucks with smooth metal interiors will impede their ability to move around and climb. Additionally, if the interior of truck cargo area is light colored, it will make it easier to see the insects. There should be no wooden shelving or other rough surfaces which bed bugs could cling to. Bed bugs are resistant to many products, including the active ingredients in foggers and bombs; these products are not advised. If there is a suspicion of bed bug activity in a cargo container, it is suggested the area be steam cleaned using low vapor pressure equipment or heat treated.

**Point of entry:** Where mattresses and box springs are unloaded, the delivery area must be kept in a clutter-free and sanitary condition. This will require daily sweeping or vacuuming and removal of packing material and/or debris at the end of each working day. All debris should be bagged, sealed, and disposed of safely.

**Initial processing prior to breaking down of mattresses and box springs:** At point of entry, any suspicious bed bug infested mattress and/or box springs should immediately be bagged and isolated for treatment. For ease of treating a high volume of mattresses and box springs with possible bed bug activity, heat treatment is advisable. Bed bugs are sensitive to heat. They are immobilized at 106°F (41.1°C) and all stages are killed at ~113°F (45° C). Bed bugs are surface insects and do not burrow into materials. They can climb inside objects if there is an opening, thus the underside of a box spring should have its dust cover removed to allow air flow for heat treatment. It is suggested that mattresses and box springs be placed in an insulated space, lifted off the floor (to allow air flow), separated by 4" metal spacers, and heated to a surface temperature of 120°F using fans to move the air, a fire department approved heating device, and thermometers to monitor temperatures for two hours. This allows time for the space to heat up and maintain a temperature of 120°F for at least one hour. **It is important to note** that if heating occurs directly against concrete, stone, or tile, these materials excessively absorb heat and so extra time must be allowed for effective treatment. After treatment, these articles should be moved directly to a clean space, away from the delivery area to avoid re-infestation and then moved to the breakdown processing areas for recycling.

## **Decision Making on Pesticide Use; Decisions and Choices on Self-use, Integrated Pest Management (IPM), and Hiring of a Pest Management Professional (PMP)**

### **Common Sense Approach to Interior Pest Management**

The DEEP maintains a current list of licensed Pest Management Professionals operating in the State of Connecticut which can be consulted during the decision making process.

### **Things a Business Owner Should Do**

When hiring a Pest Management Professional (PMP) the following should be considered.

1. Verify that the PMP is registered as a commercial pesticide application business with the DEEP Pesticides Management Program. (Use the Kelly Registration System to verify). A business may request that a certified supervisor from a selected PMP company perform inspections.
2. Be sure to communicate with the PMP. Report any pest sightings. Provide samples if possible.
3. Discuss all available pest control options. Ask questions if you do not understand why certain recommendations have been made.
4. Be prepared to perform recommendations that have been made by the PMP (sanitation, caulking, structural maintenance, etc.).
5. Periodically evaluate the success of the IPM program with your PMP. Revise and/or re-implement IPM techniques if appropriate.

### **Things the Pest Management Professional Should Do**

1. Conduct a thorough inspection before providing a quote.
2. Identify the pest(s) present and determine the extent of the infestation.
3. Identify pest points of entry (gaps beneath doors, floor/foundation cracks, damaged screens, etc.).
4. Determine the conditions that are supporting pest activity.
5. Recommend non-chemical pest control options that would effectively reduce the pest population (proactive inspection, sanitation, trapping, methods of exclusion, etc.).
6. Discuss implementation of a monitoring program through glue boards-traps, visual inspection and use of canine scent detection.
7. Explain which pesticides may be used if non-chemical alternatives will not satisfactorily reduce the pest population (least toxic, low-risk products should be first choice). Discuss questions and concerns regarding the use of pesticide products. Provide pesticide label information, including precautionary statements, about the pesticide products which may be used.
8. Explain circumstances which require use of higher toxicity product, if recommended.

### **Abandoned Mattresses and Other Furniture from Litter Cleanups**

If mattresses and/or other furniture appear to be recently abandoned, precautions should be taken since live bed bugs may be present on these articles. Long term abandoned articles may be handled as regular trash/ bulky waste.

## Resources

- **Connecticut Department of Consumer Protection (DCP)**  
165 Capitol Ave, Hartford, CT 06106. Tel: (860) 713-7240  
  
**Licensing and Yellow Law Tags:** [www.ct.gov/dcp](http://www.ct.gov/dcp)  
[http://www.ct.gov/dcp/lib/dcp/pdf/applications\\_october\\_2009/cpbed-01\\_-09oct.pdf](http://www.ct.gov/dcp/lib/dcp/pdf/applications_october_2009/cpbed-01_-09oct.pdf)  
  
**State Bedding and Upholstered Furniture Act**  
<http://www.cga.ct.gov/2005/pub/Chap420a.htm>
  
- **Connecticut Department of Energy and Environmental Protection (DEEP)**  
79 Elm Street, Hartford, CT 06106-5127. Tel: (860) 424-3000  
  
**Permits:** [www.ct.gov/dep](http://www.ct.gov/dep)  
  
**Kelly Registration System:** Connecticut pesticide registration list  
<http://www.kellysolutions.com/CT/>  
  
**Integrated Pest Management (IPM)**  
[www.ct.gov/dep/ipm](http://www.ct.gov/dep/ipm)
  
- **Dogs**  
  
National Entomology Scent Detection Canine Association (NESDCA)  
P.O. Box 3849, Seminole, Fl. 33775  
<http://www.nesdca.com/>  
  
J & K Canine Academy  
P. O. Box 769, High Springs, Fl. 32655. Tel: (386) 454-3647  
<http://www.jkk9.com/scent.html>
  
- **Bed Bug Information and the Connecticut Coalition Against Bed Bugs (CCABB)**  
Connecticut Agricultural Experiment Station, 123 Huntington St. P. O. Box  
1106, New Haven, CT 06504. Tel: (203) 974-8600  
<http://www.ct.gov/caes> and scroll down left blue banner to “bed bugs”.
  
- **Bed Bug Poster**  
<http://www.yorksp Pestcontrol.com/>
  
- **Bed Bugs and Schools**  
[http://www.michigan.gov/documents/emergingdiseases/Bed\\_bugs\\_schools\\_293498\\_7.pdf](http://www.michigan.gov/documents/emergingdiseases/Bed_bugs_schools_293498_7.pdf)

- **Connecticut Department of Public Health**  
410 Capitol Avenue Hartford, CT 06134. Tel: (860) 509-8000  
<http://www.ct.gov/dph/cwp/view.asp?a=3140&q=405378&dphPNavCtr=%7C>
- **Connecticut Local Health Departments**  
<http://www.ct.gov/dph/cwp/view.asp?a=3123&q=397740>
- **Environmental Protection Agency (EPA)**  
Ariel Rios Building, 1200 Pennsylvania Avenue, N.W., Washington, DC 20460.  
Tel: (202) 272-0167  
  
**Integrated Pest Management (IPM)**  
<http://www.epa.gov/opp00001/factsheets/ipm.htm>  
  
**Pesticides**  
<http://www.epa.gov/pesticides/controlling/index.htm>
- **Mattress, Furniture and Other Article Sanitation Training**  
Dr. Gale E. Ridge, Connecticut Agricultural Experiment Station, 123 Huntington St. P. O. Box 1106, New Haven, CT 06504. Tel: (203) 974-8600 [gale.ridge@ct.gov](mailto:gale.ridge@ct.gov)

## Disclaimer

This document was a collaboration of the Connecticut Coalition Against Bed Bugs under the leadership of The Connecticut Agricultural Experiment Station (CAES), Connecticut Department of Energy and Environmental Protection, Office of the Connecticut Chief State's Attorney, Connecticut Department of Consumer Protection, and the Connecticut Department of Public Health. Resources cited in this document are not an endorsement by the group and suggested protocols reflect current peer reviewed information at the time of writing.

## Acknowledgments

Our thanks for editorial reviews by Dr. Kirby C. Stafford III, Vice-Director and Dr. Louis A. Magnarelli Director of The Connecticut Agricultural Experiment Station, and Mr. Terrence R. McDonald Executive Director, St. Vincent de Paul Society.

**Photographs:** Mr. Mike C.Thomas, Mr. Mike P. Vasil, Dr. Gale E. Ridge

Date of publication: May 2011





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