2012

Bed-Bugs.co.uk

Useful information and professional treatment solutions.

Bed Bugs Limited

Prepared by

David Cain

Testing report for the electronic dog nose bedbug detection device

Contents

Executive Summary

Once a product goes on sale to the public there is an expectation from customers that it should at least work as described in the sales materials. Failure to ensure that a product performs to specification not only damages a company's reputation but also the reputation of an industry. This is true for lower end of the pest management industry that simply "sprays and preys" as well as the supply of products.

It is a well-known fact that consumers who have had bad experiences with companies or products tell more people than those who have had good experiences. In the case of customer service industries this can lead to a widespread erosion of trust in the sectors ability to resolve issues.

In the case of the product tested, the electronic dog nose it is difficult to see how this product could have be launched onto the market had it been thoroughly tested as it clearly fails to perform to the manufacturers specification and procedures. It is also amazing to see that Popular Science could have given the product an award when clearly it does not work and a real shame that they have decided to "no comment" the issue.

Although the principles of the technology hold some promise for the future the current offerings fails to deliver and quite frankly the lack of professionalism displayed in ordering the unit and getting support does not bode well.

The product design and quality fell well short of the standards portrayed on the website and what I would have expected for a $249 product leaving any customer likely to be feeling dissatisfied from the moment it is unpacked.

We would expect the product to be withdrawn from sale and recalled until the issue can be worked out but at the time of compiling this report this step had not been taken. Should a consumer realise the failings and raise the issue with the press it is highly likely that this fact will become apparent and thus reflect the industry in an even dimmer light.

We again call upon the industry to establish quality independent testing of all bedbug related products free from the undue influences of inventors, manufacturers and academics but because of existing financial relationships and endorsements industry thought leaders seem unwilling to support such a step. The consequence of this stance is that consumers and consumer advocates will continue to test and evaluate products that are commercially available in the same way that any good or service is open to public critique.

We again call upon the global industry to set appropriate standards for quality and efficacy for all products in the bedbug arena before consumer confidence is completely eroded.

We would urge consumers caught up in this scam to address the issue via the Federal Trade Commission (FTC) who are willing to take action on the consumer behalf.

About bedbugs

Bedbugs are blood feeding parasites that preferentially feed on humans. They are a persistent pest and have developed a number of highly evolved abilities to remain close to humans.

They are a pest of exposure and only arrive in your home if you have come into contact with them external to the property or if an adjoining property has a significant infestation.

Close up of an adult bedbug, when fed they become oval in shape but are usually only seen when they are thin and flat.

Close up a juvenile bedbug, the characteristic dark brown colour develops as the bedbug matures and younger samples may appear translucent.

Close up a nesting area showing many of the classic signs of bedbugs, live samples, cast skins and faecal trace signs.

Close up of a bed slat illustrating a build-up of faecal traces and some egg casings close to the joint in the wood.

Bedbugs have been documented as pests since the 17th century although they have been around for much longer and most likely followed man out of the caves millennia ago. Bedbugs were common in the UK prior to World War II, after which time widespread use of synthetic insecticides such as DDT and public education greatly reduced their numbers, at one stage though in the 1930's 30% of all homes in London were infested.

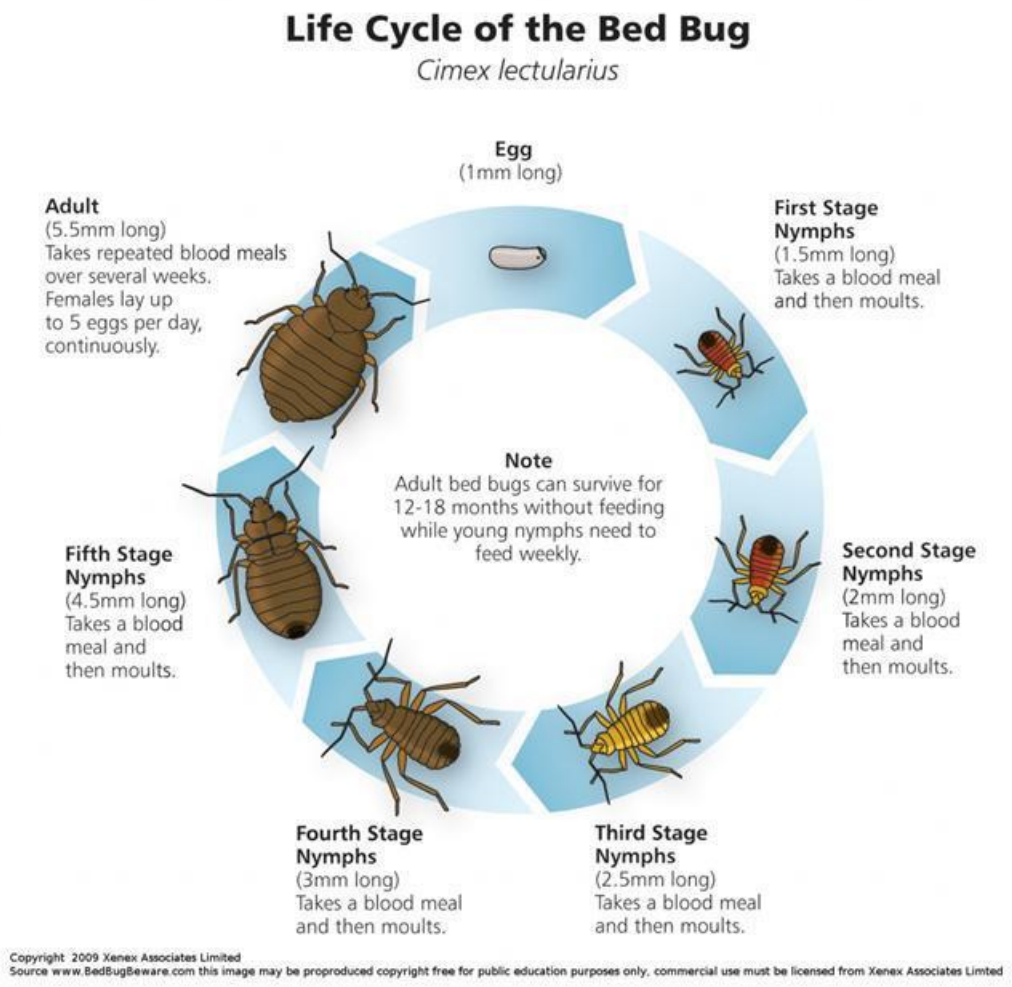
In the past decade, bedbugs have begun making a comeback across the world, although they are not considered to be a major pest or health hazard they can be highly unpleasant to live with and can cause a severe lack of sleep. International travel and commerce are thought to facilitate the spread because eggs, young, and adult bed bugs are readily transported in luggage, clothing, bedding, and furniture. Bedbugs can infest airplanes, ships, trains, and buses, recent cases that we have worked on have been traced back to travel where the source was identified to be the return journey rather than an infested room.

Bedbugs are most frequently found in dwellings with a high rate of occupant turnover, such as hotels, motels, hostels, dormitories, shelters, apartment complexes, tenements, and prisons. Such infestations usually are not a reflection of poor hygiene or bad housekeeping but that a previous occupant had come into contact with them at some stage.

Adult bedbugs are brown to reddish-brown, oval-shaped, flattened, and about 3mm to 5mm long. Their flat shape enables them to readily hide in cracks and crevices. In some cases colonies have been found in places where it is difficult to insert a sheet of paper.

Life Cycle

Female bedbugs lay from one to twelve eggs per day, and the eggs are deposited on rough surfaces or in crack and crevices. The eggs are coated with a sticky substance so they adhere to the substrate. Eggs hatch in around 10 days, and nymphs can immediately begin to feed. They require a blood meal in order to molt and develop into the next stage. Bedbugs reach maturity after five molts. Developmental time (egg to adult) is affected by temperature and takes about 21 days at 30°C to 120 days at 18°C. The nymphal period is greatly prolonged when food is scarce. The adult's lifespan may encompass 12-18 months and they are known to be able to survive for 12 months between feeds although if a source of food is present they will always be active.



Habits

Bedbugs are fast moving insects that tend to be most active at night when we rest; they feed on blood using a piercing mouth part the entry of which is often unnoticed. Nymphs may become engorged with blood within three minutes, whereas a full-grown bedbug usually feeds for ten to fifteen minutes. They then crawl away to a hiding place to digest the meal; a full meal may take 3 or 4 days to digest.

Bedbugs hide during the day in dark protected sites, they prefer fabric, wood, and paper surfaces. They usually occur in fairly close proximity to the host, although they can travel great distances if needed. Bedbugs initially can be found about tufts, seams, and folds of mattresses, later spreading to crevices in the bedstead. In heavier infestations, they also may occupy hiding places further from the bed. They may hide in window and door frames, electrical boxes, floor cracks, baseboards, furniture, and under the tack board of wall-to-wall carpeting. Bedbugs often crawl upward to hide in pictures, wall hangings, drapery pleats, loosened wallpaper, cracks in plaster, and ceiling mouldings.

Injury

The bite is painless at the time but can cause the skin to become irritated and inflamed. Individuals differ greatly in both the extent and timing of their response to a bite. A small, hard, swollen, white welt may develop at the site of each bite which can occur in rows or batches of three or four but also in single reactions. This is often accompanied by severe itching that lasts for several hours to days, in rare cases an allergic reaction may follow, in such cases seek medical attention immediately. The morphology or bites is highly variable and it is almost impossible to diagnose on bites alone.

It is believed that 1 in 10 people show no signs of biting, often leading to the myth that they only attack certain people and about 60% of people do not appear to show signs at the start of an infestation. Cases of extreme reaction seem to be on the increase and affect as many as 2 in 10 people. Given the extent of some of the documented infestation in commercial properties it is clear that waiting for bites to indicate an issue is too unreliable and results in infestations which progress beyond simple and fast control.

Confirming signs

There are only three easily confirmed signs of bedbugs, these are:

- Live samples – although cryptic in nature and small at the nymphal stage they are detectable by those with good eye sight.

- Cast Skins – due to the incomplete metamorphic life cycle of bedbugs they must shed skins between blood meals to develop. This can be a good indication of how long an infestation is present.

- Faecal traces – as bedbugs must defecate after a blood meal and often just before entering a refugia these are the most indicative sign of their presence and can be a good indicator of their locations.

The following are considered to be non-confirming signs:

- Bites – this is because not everyone initially responds to the bites of bedbugs, this fact explains why a hotel can have an undetected infestation for so long and why screening for early detection is such an essential step in an integrated bedbug management systems.

- Blood spots on sheets – an equally variable sign not only due to the different types of blood spots but also due to the fact that no everyone continues to bleed from the puncture wound.

Without confirming the signs of an infestation no treatment should occur as failure to ID the pest issue leaves the controller open to not knowing when eradication is achieved.

Prevention

In the case of domestic settings prevention can only be achieved through avoidance of this pest. As a pest of exposure bedbugs must always be brought into the home through an introduction event or increasingly through adjoining walls from a neighbouring property. Sources of bedbugs in domestic settings have been traced back to:

- Work locations
- Hotel stays
- Hospital stays
- Public transport
- Second hand items
- Delivered with new items

Domestic prevention is only possible through public education and increased awareness of the need for early detection and avoidance. Although this is a slow process in today's fast media culture it was the only solution in the past and remains an extensively untapped opportunity.

In commercial settings prevention is often not possible beyond regulation and monitoring of the supply chain. However the main source will always be guests and staff who may not even be aware of the unwanted problem they leave behind.

It is therefore even more essential to seek solutions to both early detection and efficient treatment with minimal downtime to organisations. Current solutions often have far reaching costs beyond the treatment processes which can have a significant impact on organisations efficiency.

Do not bring infested items into the home. It is important to carefully inspect clothing and baggage of travellers, being on the lookout for bedbugs and their tell-tale faecal spots. Also, inspect all second-hand beds, bedding, and furniture. Identifying the source is one of the key aspects to controlling an infestation. Unless the source is excluded from the property the stock of bed bugs will be continually replenished and the life cycle will continue.

If adjoining neighbours are suspected then communication of the issue sooner rather than later is essential so that the source of the infestation can be dealt with.

Early detection

If avoidance is not feasible the next viable line of defence in combating bedbugs is early detection. The author of this report has had multiyear success in using simple Passive Monitors to facilitate early detection whereby treatment efficiency can be dramatically increased to as low as complete eradication in as little as an hour using both chemical or nonchemical treatment options.

Summary of transaction

Order placed 1st March 2012

First unit arrived 1st June 2012 – failed initial testing on 500 bedbugs in a jar from 2 inches

Second unit arrived 31st July 2012 – also failed to detect bedbugs

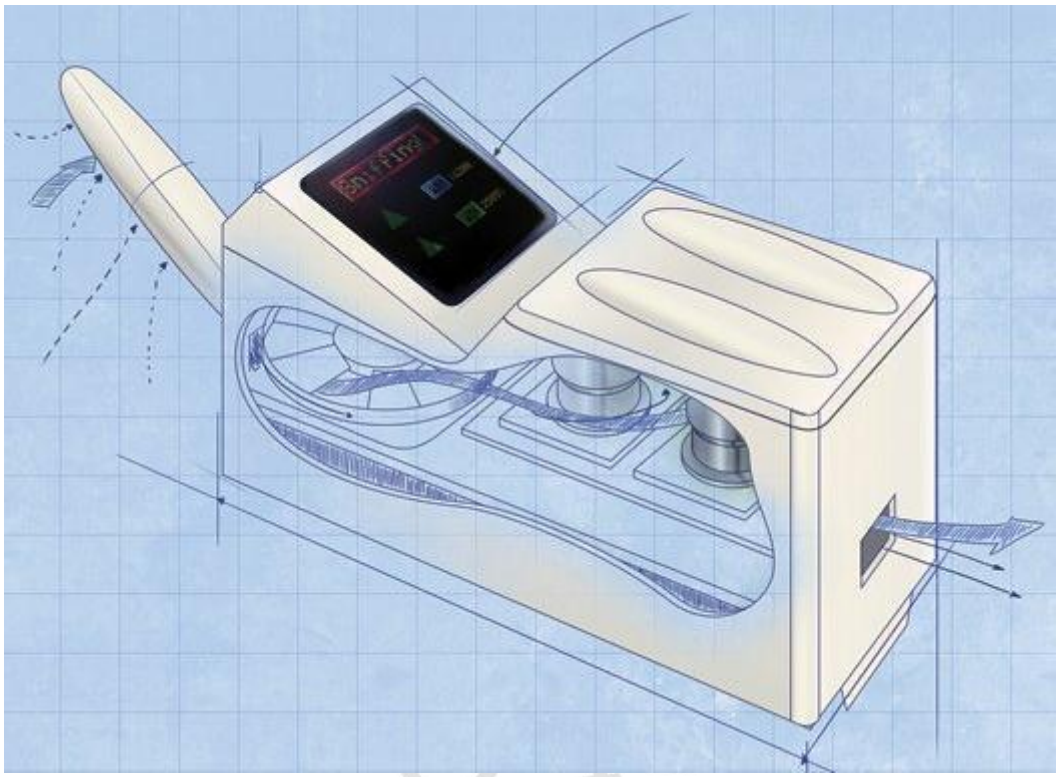
Second unit returned 12th September – no communication since that date beyond broken promises

About The electronic dog nose

Source: www.theelectronicdognose.com

How It Works

A fan sucks air in through seven small holes in the wand. The air comes into contact with three sensors capable of detecting a bed bug's unique aromatic signature, a combination of pheromones, CO2 and methane. Software monitors and adjusts the system, and a color display shows when the user is getting closer or farther from the source.



The device replicates the way dogs pick up scents, enabling it to sniff out bedbug pheromones, chemicals that insects use to communicate with one another. Dogs' olfactory system allows them to recognize even the faintest of scents. In recent years, well-trained bedbug-detecting pups have proven their ability to recognize bedbug pheromones with 98 percent accuracy in a controlled study. Goggin's cocker spaniel, Nina, acted as a model by lending the device her unique "sniff cadence," the rhythm dogs use to breathe in an odor. The snuffling pulls a scent into the smaller of a dog's two olfactory chambers; over time, faint aromas build up in the chamber and become recognizable to the animal. The notorious insects, which reemerged in the U.S. about 10 years ago after a 50-year hiatus are extremely difficult to find. They can hide in the folds or cracks of nearly any object. Unlike cockroaches and mice, bedbugs don't respond to poison-laced baits or bombs. Exterminators must deliver poisons more directly, so pinpointing the insects' exact location is vital in stamping out an

infestation. During a typical inspection, an exterminator may spend up to an hour per room seeking bedbugs out. Goggin's Bed Bug Detective does the same job in 15 minutes.

Lab data

Independent Lab Tested/Verified Results

Below are actual lab results, verifying what the Electronic Dog Nose already knows. That bed bugs can be detected quickly and effectively through analysis of unique aromatic organic compounds...

- **S&N Labs**
- **Custom Chemical Analysis & Laboratory Testing**
- *Independent lab and efficacy test*
- 2021 E. Fourth Street, Suite 112
- Santa Ana, CA 92705
- Tel: 714-543-2211
- E-Mail: chemist@snlabs.com

REPORT OF ANALYSIS

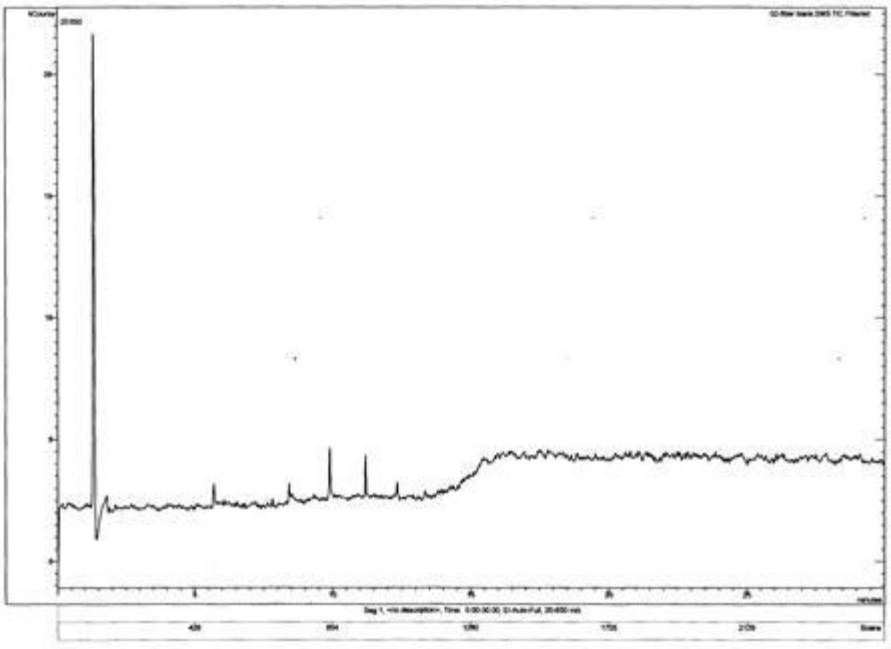
Three small containers were received on 10 February 2012. Two of the samples were bedbugs and the third contained a spider. The vapors trapped in each container were sampled using solid-phase microextraction (SPME) and analyzed using gas chromatography with mass spectroscopy (GC-MS). All three samples showed very similar patterns of peaks. The sample with the most bedbugs (# 1) had some small additional peaks. The main additional peaks were aromatic hydrocarbons (benzene through trimethylbenzene). In addition, a set of C-11 aliphatic hydrocarbons were observed eluting between 9-11 minutes. One other compound tentatively identified in this sample was methylundecanethiol.

The chromatograms, overlays of the total ion chromatograms and an overlay with aromatic component filtering (masses 91 + 105) are enclosed for your reference.

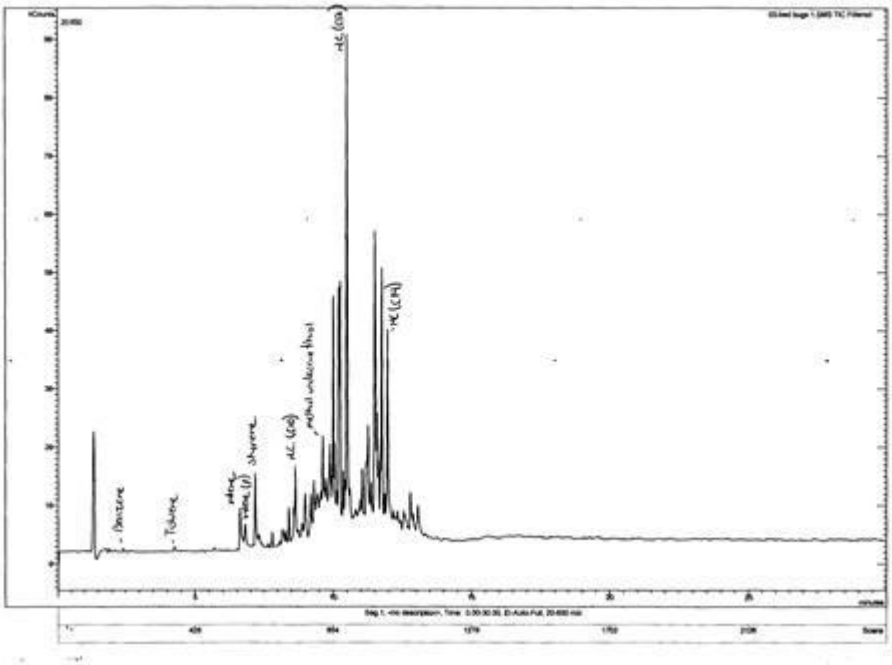
Neil E. Spingarn, Ph.D.
President

Chromatogram Plots

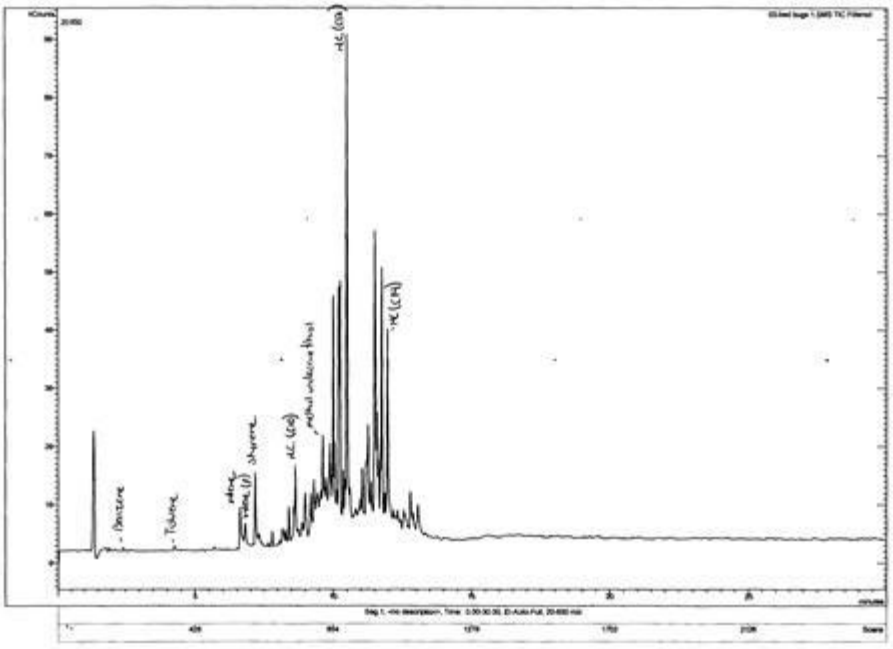
- File: c:data17834 - bed bugs02-fiber blank.sms
- Sample: 02-fiber blank
- Scan Range: 1 - 2552 Time Range: 0.00 - 29.98 min.
- Operator: SN Labs
- Date: 3/512012 12:29 PM



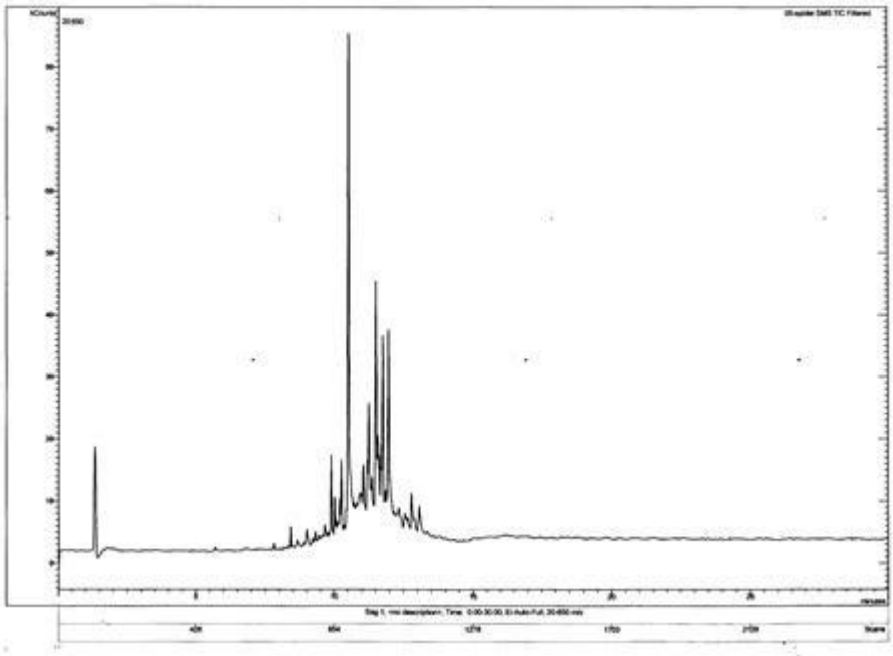
- File: c:data17834 - bed bugs03-bed bugs 1.sms
- Sample: 03-bed bugs 1
- Scan Range: 1 - 2549 Time Range: 0.00 - 29.98 min.
- Operator: **SN Labs**
- Date: 3/5120121:18 PM



- File: c:data17834 - bed bugs04-bed bugs 2.sms
- Sample: 04-bed bugs 2
- Scan Range: 1 - 2549 Time Range: 0.00 - 29.98 min
- Operator: SN Labs
- Date: 3/5/20122:03 PM



- File: c:data17834 - bed bugs05-spider.sms
- Sample: 05-spider
- Scan Range: 1 - 2552 Time Range: 0.00 - 29.99 min.
- Operator: SN Labs
- Date: 3/5120122:55 PM



Testimonials

Chris sent me a beta model (i think) and I played with it for about a week before i got good with it. Here at State Standard Pest Control we treat more bed bug infestations that almost anyone in the area, so from time to time we have a problem with a couch or a room that we get call backs on. I took the Electronic dog nose to an account where the owner was still being bitten on his sectional hide-a-bed couch after we had steamed and treated the couch three times. After about 5 minutes the sensor pick up a hit and went into tracking mode and tracked Three stage four and a egg laying adult female bed bugs to a arm of the couch. We took the couch apart and scanned where the back bolts into the arm and it found them in a pilot hole drilled in the couch that we were not able to get the heat to. The home owner was happy because he is no longest getting bitten. I have another example where the scanner found several adults in a standing lamp where they were coming out and climbing up the electrical cord to feed on the home owner at night. This scanner has saved me several man hrs finding small isolated pockets of bed bugs we would have had to take apart the furniture to find. Thanks Chris Goggins.
Chris Reed

From a traveler using The Electronic Dog Nose Turbo Unit:

We were able to stay at the Turtle Crawl Inn Resort for a week in November. My wife and I loved it! Our condo (#103) was very clean, beautifully dertcaoed *(sic)* and comfortable. We especially enjoyed being able to walk right out onto the beach and watched several amazing sunsets. The staff was very friendly and accommodating. We highly recommend this resort.

FAQ:

How Do I Power My Electronic Dog Nose?

These units are battery powered only with four (4) 9 Volt batteries, the production units will have a low battery indicator and re-chargers; these do not. When the batteries go low the screen display may freeze or drop off, simply re-charge or replace the batteries. To replace remove the four (4) screws on the bottom, remove the cover and replace the batteries.

How Do I Use My Electronic Dog Nose?

To operate the unit it should be closed up, turn the red On/Off switch on (upper position) and the unit will start. The first thing it does is display the Logo and then enters basic sniff mode. You will notice the fans pulsing in and out; at the top is a rubber nose "snout" this should be attached to the front of the unit. It is designed to come off if it should be caught or twisted off, that's ok just push it back into the nostrils under the unit. The unit will momentarily stop sniffing to report what the sensors are seeing. Keep in mind this unit is a nose just like a dog has and in some

ways like yours! It will display three (3) items on the screen each has a number and a colored circle to the right (Red, Yellow, Green). You will notice the numbers constantly changing both between sniffs and during the smell or sense mode. The sensors are telling you what they smell at that moment.

After using the unit and becoming more familiar with how it works you will become better at using it and tracking down Bed Bug smells. What you are looking for is as many "Green Circles" as possible, the lower two (2) are the most important for Bed Bugs, the more green the stronger the signal and the better Bed Bug signal you have. Yellow means a steady signal and Red is low or smaller smell signals. If you have very strong signals the unit will go into "Tracking" mode, the fan speeds will change and that means you very close or close to tracking down the signals.

How Does The Electronic Dog Nose Work?

The Electronic Dog Nose works very much like a dog's nose, and to some capacity it works much like ours. By "sniffing" a combination of gasses and pheromones unique *only to bedbugs*, it finds bedbugs with a speed and certainty previously unknown...it's even more sensitive and accurate than trained hounds! The Electronic Dog Nose's proprietary, patent-pending technologies allow it to correctly identify the locations of bedbug infestations with speed, safety, and accuracy.

If you have further questions which have not been answered above, take a moment to contact The Electronic Dog Nose. We're happy to field your questions, answer your comments, and help out however we can.

How Long Will It Take For Me To Receive My Electronic Dog Nose?

The Electronic Dog Nose is made and manufactured in the USA, and is built to order - for this reason, shipping may take up to 4 - 6 weeks.

What Sort of Satisfaction Guarantee Do You Offer?

The Electronic Dog Nose offers a 100% Satisfaction Guarantee. All customers have up to 30 days to return their undamaged unit for their choice of a new unit or a full refund. We also have a 1 year warranty which covers full unit replacement in case of manufacturing defect.

Instructions

Welcome to the Electronic Dog Nose, the ultimate in Bed Bug Detection.

You’re unit utilizes the newest technology for Bed Bug Pheromone detection, using both dry and wetted sensors to detect the molecular emissions given off by Bed Bugs.

The unit is simple to operate as follows;

1. Remove the rubber plug on the top and drop in 2-3 drops of wetting solution for each time of use. Replace the rubber plug.
2. Switch the unit on with the main switch, the display will start and show a brief explanation of the indicator colors (14 seconds) and a picture of an adult Bed Bug for reference. The unit is for INDOOR USE ONLY.
3. As the unit runs you will hear the fans running, each sensor cycle has four (4) fan pulses with a "purging" pulse in between each refresh cycle.
4. During the sensor cycles you will see three (3) color indictors and a number value to the left of each, each time an increasing value is detected a Green circle will appear and pause briefly to indicate that an increasing value has been detected.
5. The top value (CH4) is methane; that is given off by healthy and well fed bed bugs, indications in Green of this value means healthy adult Bed Bugs.
6. The lower two (2) values are organic molecules that are common to BedBugs and Green values here mean Male or Female BedBugs and/or eggs are present.
7. Yellow circles indicate no-change in values between readings and Red indicates little or no BedBugs are present.
8. Sweep the unit back and forth and it will begin sensing at 6-8 feet from bed bug sources, as you near the clutch of BedBugs stronger and more frequent Green circles will appear indicating increasing and stronger "Smells" of BedBugs, at 12- 6 inches BedBugs can be positively identified and eradicated with Steam or Chemicals as indicated by each manufacturer or professional Exterminator services.

Maintenance

You're unit requires very little maintenance for trouble free operation'

1. Replacing batteries, the unit uses Four (4) 9 Volt batteries, to replace remove the single screw on the bottom and remove the cover. Replace all batteries at once.
2. The wetting solution should be used each time the unit is turned on, only 2-3 drops is needed to keep the Pheromone sensors hydrated (wetted), additional solution can be purchased on-line at www.theelectronicdognose.com.

The wetting solution is non-toxic, only genuine Electronic Dog Nose wetting solution can be used on the sensors.

Awards

http://www.popsci.com/diy/article/2011-05/2011-invention-awards-sniffing-out-bedbugs

Background information

It has long been known that bedbugs emit odours; this scent profile has been successfully used by some dog trainers to condition animals to detect the presence of bedbugs. This is most reliably done through a developed training program with play rewarding as food rewards can introduce "hungry dog" syndrome which leads on to "inefficient podgy pooch" syndrome.

Although there is some data about the ability of K9's to detect bedbugs being prepared for publication at present the trial design does not appear to have taken into account the fact that one of the main reasons for failure is that to date endorsements have made on the basis of who is willing to make a "marketing support" contribution rather than on the ability of the dogs to detect accurately, thus leaving an industry in disarray and shattering consumer confidence in what should be a valuable tool.

At the same time some industry thought leaders are unwilling to accept that some humans can also develop and perfect the ability to detect down to a single bedbug in a room with little or no air flow preferring to cash "marketing support" cheques rather than encouraging personal development and professional standards.

This has undoubtedly left a nice in the market for the possibility of handheld detection devices, the subject of this report being the second of such products to appear on the market, the first a CO2 only detector (BBD-100) was the subject of a previous report which failed in spectacular fashion and is yet still sold by those who know better.

For detection technology to be of value to professionals and consumers it must be:

- Rhobust
- Reliable
- Accurate (down to a small number of bedbugs in a room)

Without these criteria being met any products or services will ultimately erode consumer confidence in the industries abilities.

Product claims

- Simple
- Accurate – more accurate than a dog
- Long range up to 6 foot

Part of the assessment of this product is against the marketed claims above, effectively is the product fit for purpose and thus fit for sale.

Method

Test 1 – Sampling various environments

The unit was set up as per the manufacturer's instructions and ran for 2 minutes in the following locations:

- Outside (bedbug free)
- Inside warehouse main room (bedbug free)
- Inside warehouse toilet (bedbug free)
- Inside admin office (bedbug free)
- Inside research room (6 mason jars containing 3000+ bedbugs within 6 foot)
- Inside mason jar (containing 500+ bedbugs, well fed at all life stages)

The data was collected on video and transcribed to the table in the results section by frame by frame analysis.

Test 2 – Sensitivity

The unit was set up as per the manufacturer's instructions and ran for 2 minutes with the tip of the snout secured 2 inches from a well fed mixed population of bedbugs allocated to approximate numbers:

- Bedbug free (control)
- 5 bedbugs
- 20 bedbugs
- 100 bedbugs

The data was collected on video and transcribed to the table in the results section by frame by frame analysis.

Results of testing

Results test 1 – Sampling various environments

Outside			Storage area			Admin			Research			Mason jar		
CH4	PH1	PH2	CH4	PH1	PH2	CH4	PH1	PH2	CH4	PH1	PH2	CH4	PH1	PH2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	05	04	08	07	06	13	02	03	10	01	02	10	05	04
07	57	97	33	05	16	32	11	37	79	94	05	06	74	71
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09	05	04	08	06	02	09	00	03	09	02	01	13	04	04
53	59	49	59	43	81	05	97	88	18	75	44	10	52	67
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
07	03	05	08	02	07	07	03	02	10	01	02	10	06	06
03	57	72	47	74	69	38	09	98	30	82	51	24	03	30
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
07	04	05	07	06	04	08	03	03	09	02	02	10	04	06
03	57	13	50	60	62	87	28	05	78	31	04	45	45	29
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
07	03	05	10	05	04	09	01	02	09	01	01	11	06	05
07	11	99	84	92	14	42	02	99	07	39	67	60	24	41
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09	06	02	08	04	04	08	01	02	09	01	03	10	06	05
43	18	66	60	18	64	36	36	61	71	66	05	51	19	78
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	05	03	07	05	06	07	01	03	09	00	01	11	05	04
59	81	25	18	48	16	05	56	79	69	69	93	35	23	75
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
00	04	05	07	05	06	08	02	02	10	02	03	12	05	06
20	71	40	37	31	13	37	72	20	35	61	11	09	44	82
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	05	04	01	03	05	07	03	03	10	02	02	12	04	06
45	42	97	00	79	48	36	42	96	74	65	99	53	67	12
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09	04	05	07	05	04	09	02	01	11	01	02	11	06	05
64	04	62	75	42	59	40	01	72	84	84	32	07	13	73
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
06	05	05	08	05	06	07	01	03	09	02	01	10	03	04
92	22	26	47	66	44	26	54	52	87	99	84	28	97	57
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
08	05	03	11	06	06	07	02	03	11	02	01	10	04	06
26	48	13	83	88	28	22	38	10	63	54	91	19	93	22
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09	04	05	12	06	06	07	03	03	09	02	03	10	05	05
07	75	50	97	17	06	58	22	35	92	49	30	89	61	03
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09	05	05	09	06	05	07	03	03	09	01	03	09	05	05
60	77	11	32	11	07	27	16	76	39	98	54	01	36	33
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
00	04	05	09	05	02	13	03	02	10	02	04	09	06	04
26	71	89	20	72	81	03	30	66	50	16	05	19	87	76

0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
07	04	05	07	06	06	06	02	01	23	02	03	11	06	04
04	93	31	44	56	37	99	97	95	48	51	72	11	33	31
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
06	02	02	11	05	05	09	03	03	10	02	03	12	06	05
39	70	82	49	42	17	45	49	19	73	28	99	45	13	20
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09	02	04	12	04	05	07	02	04	11	03	04	09	04	04
04	71	98	42	34	91	60	38	12	98	28	74	81	82	74
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	04	04	06	04	05	09	03	03	11	03	04	11	06	04
99	75	07	89	26	89	25	48	64	98	28	74	77	01	40
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
00	04	02	10	05	05	07	02	04	10	01	02	09	06	06
31	75	53	78	59	62	43	56	27	67	77	26	81	14	41
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	05	05	07	06	02	07	01	04	09	02	03	10	05	06
98	28	89	73	49	59	47	69	18	27	21	11	05	78	22
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
00	05	04	13	05	03	07	02	03	10	01	02	11	05	05
47	57	45	30	62	69	89	61	06	22	34	21	98	36	52
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
07	05	04	08	05	03	07	02	01	13	03	02	09	05	02
06	84	57	02	34	32	11	71	71	22	47	99	89	44	98
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
00	05	05	13	06	04	13	02	03	11	02	03	12	05	04
57	00	55	59	38	30	74	37	61	38	70	08	09	62	46
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
08	05	05	07	05	06	07	02	03	12	01	03	13	04	05
53	17	28	11	78	05	61	13	38	32	28	85	40	12	00
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	04	05	12	05	02	06	03	04	11	02	04	08	04	03
12	54	03	99	78	76	98	47	12	71	42	34	50	46	05
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
10	05	05	07	06	05	09	01	02				08	05	05
75	74	56	44	51	51	26	61	76				90	42	13
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
11	05	05	12	05	03	13	02	02				10	02	05
83	91	22	14	95	01	03	04	51				95	71	87
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
10	04	02	01	06	05	09	02	03				10	05	06
40	80	99	30	71	04	98	51	35				11	69	59
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
09	05	05	13	07	06	09	03	02				11	04	05
41	02	22	34	40	93	30	41	27				26	96	63
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
09	03	05	06	03	07	09	03	02						
24	24	46	72	77	05	16	44	54						
						0.0	0.0	0.0						
						08	02	01						
						42	45	62						
0.0	0.0	0.0	0.0	0.0	0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0	0.0	0.0
07	04	04	09	05	05	*08*	*02*	*03*	*11*	*02*	*02*	10	05	05

82	85	77	04	66	11	*80*	*51*	*10*	*14*	*24*	*95*	82	35	27

Table 1 data collected from the various environments

Results test 2 – Sensitivity testing

Test 2 was aborted as the unit did not work and therefore could not be calibrated.

Review of marketing claims and analysis of lab data

Specific marketing claims have been addressed below:

- Simple
- Accurate – more accurate than a dog
- Long range up to 6 foot

	CH4	PH1	PH2
Outside	0.00782	0.00485	0.00485
Storage	0.00904	0.00566	0.00566
Admin	*0.0088*	*0.00251*	*0.00251*
Research	*0.01114*	*0.00224*	*0.00224*
Mason Jar	0.01082	0.00535	0.00527
Average	0.009524	0.004122	0.004106

Table 2 Average values of readings in different locations

	CH4	PH1	PH2
Outside	0.00782	*0.00485*	*0.00485*
Storage	0.00904	0.00566	0.00566
Admin	0.0088	0.00251	0.00251
Research	0.01114	0.00224	0.00224
Average	0.0092	0.003815	0.003815

Table 3 Average values of readings in bedbug negative locations

By comparison of the averages of the Mason Jar bedbug positive samples with the averages of the other negative samples we can establish that there is no statistically significant difference between the sets of readings.

From our experience we feel that some of the claims are exaggerated at best and complete untruths in some cases. If the product were place on sale in the UK market it is unlikely in its current configuration to pass the Sale of Goods Act 1979 and the requirements of the Advertising Standards Agency.

Communication of concerns with supplier

The following issues have been communicated with the manufacturer:

Build quality – to date the issue remains unresolved

Failure to reach core temperature – to date the issue remains unresolved and several emails remain open without replies or acknowledgements

Maximum run time for heat source – the manufacturer has not been able to provide any confirmation of the maximum safe continuous run time for this product

Unfortunately as so many issues and the fact that the unit actually took over 3 months for the order to be processed and arrive I can only conclude that the manufacturer is not giving this product the support and attention that is required to build a brand with consumer confidence.

We have not had replies despite several requests for updates as to when the working unit will be shipped.

At the time of writing this report we had not been issued a refund.

Conclusions

Clearly from the GC-MS analysis there are off gases and aromatic compounds that can be detected associated with bedbugs but that is clearly beyond the abilities of this device to detect them.

This is not to say that someone will not eventually solve the technical issue surrounding this approach but at present the only reliable way to detect these gases and aromatic compounds is clearly through the use of GC-MS which will never be portable technology.

Given that we would expect that after the first unit was reported as faulty the manufacturer would have done everything in their powers to ensure that the replacement unit worked we have no other choice but to conclude that the system as presented does not work and is unlikely to have ever been quality assurance tested with live bedbugs.

The lack of communication from Mr Goggin's or his legal team is nothing short of shoddy and deeply unprofessional. Although laws do vary between jurisdictions it is certainly true in the UK that law firms have a duty of responsibility not to get involved in situations which may bring the firm's reputation into disrepute and the fairest I can say here is that Morgan Carter Law have a client here which I strongly suspect they would benefit from not having as the association will not be good for long term business.

The incident has effectively stained the reputations of Mr Goggin's , the award ceremony of Popular Science and Mr Goggin's legal team at Morgan Carter Law through association if nothing else.

Recommendations

We have no choice but the recommend the immediate recall of this product until it can reliably detect bedbugs and that proof of live bedbug detection is given.

As the manufacturer has been aware of the issue since 30th July 2012 and the product has remained on sale I would also confer that it is highly unlikely that their insurance providers would honour any claim under public liability.

It is not clear that the industry need to focus on clear testing standards for all bedbug related products and also to have an agreed standard for consumer recalls should such issues happen again. Without these controls and safe guards being put in place there is a significant risk of damage to the industries long term reputation particularly in relation to consumer confidence.

Without addressing these issues as a professional pest industry there is absolutely no differentiation in the consumer's eye between "professional" products and the raft of EPA exempt and "bodge" products that we are starting to see promoted online. In some respects the reputation in the consumers' minds has already been dented through an over reliance on poorly tested chemical based products and the "band wagon" protocol based approaches we have seen to date.

About Bed Bugs Limited

Bed-Bugs.co.uk was established by David Cain in 2005, primarily as an information portal for the exchange of ideas and information about bedbugs. With his scientific background and professional training, David was interested in the increasing spread of bedbugs and what scientific advances were being brought to bear on the problem. Surprisingly, the “scientific” answer was 'not a lot' at the time and although there has been a rush to catch up few people actually study these insects in their natural environments which is how good field biology should always be done.

The sheer volume of enquiries and, more specifically, direct requests for effective help in tackling infestations demonstrated very clearly that existing methods of controlling bedbugs were proving increasingly ineffective. A radical new approach was needed and led David to set up Bed Bugs Limited, a company dedicated solely to the control and eradication of this pest.

From the outset, the company has done things differently, with a firm emphasis on research and investigation in order to develop a treatment process which actually works. A few years down the road, with successful treatment of infestations far higher than general pest controllers, the results show that we are very definitely on the right track and can rightfully claim to be the UK's leading company when it comes to bedbugs.

As bedbugs have become a global issue the company continues to develop new applications, methods and technologies to the extent that in 2012 they launched a green service which is even more effective than the traditional chemical based treatments in gaining immediate control and is based on years of field experience offering rapid detection and control procedures for hotels and hostels.

The author of the first consumer’s guide to bedbugs of modern times David has continued to develop an international reputation for knowing “too much” about bedbugs having personally tackled some of the most extensive infestations in terms of both sheer numbers and dispersal throughout buildings and structures. Known for being an outspoken advocate of technologies that work and a consumer advocate keeps him at the centre of the ever expanding bedbug universe.

Disclaimer

In accordance with the FTC and good business ethics we felt it was important to ensure full disclosure of the fact that the author of this document is also the inventor of the Passive Monitoring technology mentioned as part of this document.

Declaration

This report has been compiled based on the analysis of the raw data provided during testing as well as the experience and commercial understanding of bedbugs. Every effort has been made to ensure that it is as accurate as possible and provides a clear and accurate account of our findings in conducting the test.

The analysis of the data has been free from any undue influence from the supplier or any third parties with interest in the product.

The author is happy to answer any specific questions about this report and stands by its content.

Signed: _____

Date: _____

David Cain BSc (Hons), PgCert, ESQ

