

Benefits of Sealed Seam Mattresses in Challenging Environments

*Insight into the root causes of mattress breakdown
and the solutions that facilities should consider.*



WHITE PAPER

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INTRODUCTION

Picking the right furniture product can be a challenge for facility managers, architects, interior designers, purchasing agents and other professionals involved with intensive-use spaces such as healthcare facilities, correctional environments and shelters – places where a steady stream of clients provide extreme wear and tear on furnishings. After all, furniture for residential settings differs greatly from furniture that is intended to be used in spaces where continuous and rigorous use is a constant challenge and considerations beyond comfort and style are a must.

The difference in various grades of furniture can often be clouded due to the fact that many furniture manufacturers claim to produce products that are highly durable. And they may in fact produce durable furniture. But is it the right furniture for your challenging environment? And does the product stand up to all – not just a few – of the demands placed upon it by your facility?

That is the dilemma that many facilities face when choosing products for their environments. Not only do they have to consider the furniture's actual durability and its safeguards against breakdown, but they also must consider the chance that the product may become a risk to those who inhabit the facility while the product is being used.



Mattresses are no exception to this rule. In fact, this product may be at higher risk since they are made of softer materials – nylon, polyurethane and fabrics – that ensure comfort and usability for those in your facility. While wood and steel products may often be considered the products with the highest threat level, inferior mattresses also can create havoc and economic challenges, including:

Bed bug infestation – Mattresses are notorious for housing these pests. Infestation can become so damaging that the product may have to be completely replaced. Additionally, mattresses can provide a habitat from which the bugs can expand their infestations.

Sanitation and Bodily Fluids – Bodily fluids will inevitably come in contact with mattress products especially in healthcare environments where medical procedures occur and bodily functions may be an issue.

Contraband – Mattress cavities are often the preferred hiding place for inmates and residents concealing contraband in facilities where this is an issue.

Breakdown of the product – Inferior mattress products can easily be vandalized and punctured and often show wear after a short time, forcing facilities to purchase new mattresses.

This white paper will provide in depth information from leading resources regarding the hazards mentioned above and how they can create risks in your facility and drain funds from your budget. After we extensively outline the problems you may face, we will give you valuable advice regarding Sealed Seam Mattresses. These products' seams are sealed on the inside of the mattress and provide a continuous material connection around the circumference of the product.

This is a significant improvement over stitched seams which allow for tears, punctures and the entrance of bodily fluids into the mattress core. The most effective of these products are fused together by using Radio Frequency Welding – a method where high frequency waves are used to heat and connect two pieces of material in order to create a completely sealed interior seam that provides consistent strength and intrusion safeguards around the entirety of the mattress.

BED BUGS

Bed bugs have long been a nuisance throughout the world. While they are not known to spread disease, the parasitic pests feed off human blood and can cause skin irritation and other health problems. And while the United States saw a dip in bed bug infestation during the mid-20th century, the pesky bug has made a huge resurgence in recent years, according to the *Joint Statement on Bed Bug Control in the United States from the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Environmental Protection Agency (EPA)*.



The report goes on to say that the “cost of effectively eliminating bed bugs may be significantly more than the cost of eliminating other pests because bed bug control usually requires multiple visits by a licensed pest control operator and diligence on the part of those who are experiencing the infestation.”

And although there is no scientific evidence as to why the resurgence has occurred, the report indicates that the following variables may be to blame:

- Increased resistance of bed bugs to available pesticides
- Greater international and domestic travel
- Lack of knowledge regarding control of bed bugs due to their prolonged absence
- The continuing decline or elimination of effective vector/pest control programs at state and local public health agencies

This presents a particularly alarming problem for facilities that house mattresses for clients who come and go on a regular basis. This is no better illustrated than in a report from the Texas Department of State Health Services that says bed bugs' usual hiding places are in seams of mattresses, box springs, bed frames, and along and/or directly behind headboards.

Lower grade mattress products made with exterior stitched seams not only foster bed bug infestation, but also may provide a launching pad for the bug to infest other parts of facilities.

SANITATION AND BODILY FLUIDS

There is no escaping the fact: prisons, hospitals and shelters are environments where infection control is a constant challenge. Transitional living facilities house people who may be experiencing hygiene obstacles, while healthcare facilities are obviously environments where blood, urine and feces may be exposed. Correctional facilities are no exception either. Day in and day out mattresses in prisons come in contact with bare skin and an exchange in bodily fluid occurs.

It's not the nicest imagery, but it is a reality in facilities like these – a reality that must be dealt with in regard to the fight against infection, the exchange of bodily fluids, unsanitary conditions and the breakdown of your mattresses.

The document says that from “January 2011 to January 2013, the FDA received 458 reports associated with medical bed mattress covers failing to prevent blood and body fluids from leaking into the mattress (fluid ingress)” and that one of the reasons that fluid ingress may occur is if the “mattress covers become worn or damaged from small holes or rips in the fabric.”

In fact, a Food and Drug Administration (FDA) report titled *Damaged or Worn Covers for Medical Bed Mattresses Pose Risk of Contamination and Patient Infection* outlines the risks and provides the solutions and guidelines to fight against bodily fluids and unsanitary conditions.

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Additionally, the report says the zipper on the cover may also allow fluid to penetrate the mattress. The same report indicates that if blood and body fluids from one patient penetrate a mattress, they can later leak out from the mattress when another patient is placed on the bed. Patients are at risk for infection if they come into contact with blood and body fluids from other patients.

Bottom line, mattress products that are easily punctured or have obvious penetration points– such as zippers and exposed stitched seams – present hazardous conditions not only in healthcare environments, but in all environments where bodily fluids may be transferred and hygiene issues pose a threat.

CONTRABAND

Keeping illegal or prohibited items – known as contraband – out of the hands of residents has always been a challenge in institutional environments, particularly correctional facilities. It has proved to be inevitable that some members of an inmate population, in particular, will eventually seek out items that they are prohibited.

A document by the U.S. Federal Bureau of Prisons – *Inmate Personal Property* – outlines the recommended rules and regulations regarding what property an inmate may and may not possess while in custody. The purpose of the document is to minimize or eliminate the risks of security breaches, fire hazards and sanitation issues, among other challenges commonly faced in correctional institutions.



The document defines contraband as “material prohibited by law, or by regulation, or material which can reasonably be expected to cause physical injury or adversely affect the security, safety, or good order of the institution.”

Specifically, items that are considered contraband, according to the document, include, but are not limited to:

- Tools which may be used to aid in an escape (e.g., rope)
- Ammunition or explosives
- Combustible or flammable liquids
- Knives or tools not provided in accordance with the Program Statement Correctional Services Manual
- Hazardous or poisonous chemicals and gases
- Narcotics or other controlled substances not dispensed or approved by the institution

Although not mentioned in the document, illegal possession of cell phones also has increasingly become a problem for institutions. Obviously these items are not usually placed in plain sight by inmates.

According to the National Institute of Justice website, contraband is often hidden in an inmate’s clothes, baggage and even inside their bodies. Additionally, contraband can be found on or inside furniture in the inmate’s environment, the document states.

While this report doesn't address them directly, mattresses – especially those that can be easily punctured or that have stitched seams that can be opened – have been well-documented as hiding places for inmate contraband.

BREAKDOWN OF THE PRODUCT

Aside from the obvious risks associated with sanitation, infection, bed bug and contraband issues, facilities also face a financial dilemma. If a mattress is punctured or seam is ripped or if an insufficient cover is worn, that product needs to be replaced.

Take into account puncture attempts in facilities and the normal months and years of continuous use, and those who work in prisons, hospitals and shelters can understand why an inferior mattress product can not only become a security and health risk, but also a financial burden for the facility itself.

As mentioned in the *Joint Statement on Bed Bug Control in the United States from the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Environmental Protection Agency (EPA)*:

Although the exact dollar amount is not known, the economic losses from health care, lost wages, lost revenue and reduced productivity can be substantial.

And according to the FDA's *Damaged or Worn Covers for Medical Bed Mattresses Pose Risk of Contamination and Patient Infection* report, facilities should:

“Remove any damaged, worn or visibly stained medical bed mattress according to the healthcare facility's procedures and manufacturer's instructions,” and “Immediately replace any medical bed mattress cover with visible signs of damage or wear to reduce the risk of infection to patients.”

That is just in regard to bed bugs and infection control. Take into account puncture attempts in facilities and the normal months and years of continuous use, and those who work in prisons, hospitals and shelters can understand why an inferior mattress product can not only become a security and health risk, but also a financial burden for the facility itself.

James M. Hunt, AIA, President of Behavioral Health Facility Consulting, in Topeka, Kansas, said in an interview for this white paper that in behavioral healthcare facilities, hospital acquired infections are a significant concern and cross contamination between patients and others is a serious problem.

“The integrity of the cover and seams of the mattress are extremely important these days when considering bed bug concerns as well as the usual issues of patients being able to open the seams,” Hunt said.

Hunt said that facilities should purchase mattresses from reputable companies that are specifically designed and manufactured for the environment.

THE MATTRESS SOLUTION

There are many mattress products on the market that claim to be highly durable and suitable for intensive-use environments where continuous wear and tear is a constant challenge. However, if a facility is looking for superior products that will hold up to puncture attempts, sanitation and infection issues and bed bug infestation, look for products with the following attributes:



Level 1

For facilities looking to combat bodily fluids and normal wear and tear, we recommend purchasing polyurethane-coated, fire-retardant mattresses with a radio-frequency welded sealed seam. This grade of mattress should be fluid, crack, peel, abrasion and bed bug resistant, anti-microbial and anti-fungal. Integrated pillows are a wise value choice, as is choosing a mattress with a densified fiber core. For added comfort, select a mattress with a 6" thick polyurethane foam core.

Level 2

For facilities that need extra safeguards, we recommend using a sealed-seam mattress that incorporates an enhanced tear-resistant, rip-stop scrim into the polyurethane-coated cover. Rip-stop technology provides extra security by weaving heavy duty fabric into the cover's material – making it even more secure than your basic sealed seam mattress. It also prevents tearing if a puncture does actually occur. Additionally look for a product with densified fiber or polyurethane foam core and integrated pillow. Products such as these protect against bodily fluids, blood borne pathogens, bed bugs and puncture attempts for enhanced hygiene, security and durability.

Level 3

For maximum security, we recommend mattresses made with a radio-frequency welded sealed seam that is reinforced with internal stitching and that is guaranteed not to break. Look for a heavy weight polyurethane-coated cover that features a reinforcing rip-stop scrim for enhanced hygiene, security and durability. These institutional-grade products provide maximum security against bodily fluids, blood borne pathogens, bed bugs, and puncture attempts. And like the other levels, choose mattresses with a densified fiber or polyurethane foam core.

“The durability of the sealed seam mattress offers a significant return on investment,” said Lt. Josh Carey, Assistant Jail Commander, Hamilton County Jail, IN (500 bed facility - 300 beds jail, 200 beds community corrections). “This has a positive impact to our annual operating budget. Our officers spend less time dealing with replacing, repairing and cleaning mattresses which allows them to focus their time on more critical tasks inside the facility.”

CONCLUSION

Aside from reviewing all of the data supplied here, it’s also important for facilities to ask questions. How do you know it is puncture resistant? What kind of flammability test certifications are available? What kind of seam does the mattress have? What kinds of tests did you put the seam through? Why is this product right for my facility? Why are you the right company to purchase this product from?

If the manufacturer can’t answer these kinds of questions, then you need to look at other mattress options. Because in the end, a mattress is not just a comfortable place for someone to lay their head – it’s a huge safety issue and a prudent investment in facility operations.

RESOURCES

Joint Statement on Bed Bug Control in the United States from the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Environmental Protection Agency

http://www.cdc.gov/nceh/ehs/publications/bed_bugs_cdc-epa_statement.htm

FDA Safety Communication: Damaged or Worn Covers for Medical Bed Mattresses Pose Risk of Contamination and Patient Infection

<http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm348016.htm>

Federal Bureau of Prisons Inmate Personal Property

http://www.bop.gov/locations/institutions/ali/5580_008_%20personalpropinmate.pdf

Norix Furniture Mattress Solutions

<http://www.norix.com/comfortshield>

ABOUT NORIX

For more than 30 years Norix has provided secure furnishings and fixtures for every application. The product line has expanded to include industries and environments such as corrections, behavioral health-care, transportation, educational institutions, fire/police stations, commercial facilities and military installations. We surpass common durability by engineering for the most challenging environments to create robust furniture for every application. The privately held company is headquartered in West Chicago, IL with sales representatives and dealers throughout the U.S. In 2012, Norix launched Safe Environments, a news and information blog serving architects, designers, administrators, and facility managers involved in the design, construction, and operation of challenging environments. For more information, call 800-234-4900 or visit: norix.com.