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New flammability regulation for mattresses, renewed concerns about chemicals

By Karen Klages
Tribune staff reporter

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For all intents and purposes, they look the same and feel the same. But starting today, all mattresses manufactured for sale in the U.S. (meaning: imports included) are different.

They are impressively fire-resistant.

Not that they won't burn or there wouldn't be flames should you or your child or your cat knock a candle over on the bed, but the level of flames and the degree of heat will be considerably lessened at the onset and for the first 30 minutes of fire, allowing people time to escape.

And they may or may not burn a hole in your pocket. Mattress manufacturers report everything from no increase in price to an up-charge of as much as \$200 for these new mattresses.

It's all the result of a new federal flammability standard issued by the U.S. Consumer Product Safety Commission (CPSC) and aimed specifically at mattresses and mattress sets (with foundations). The standard applies to crib and youth mattresses, futons and refurbished mattresses as well.

"Once fully implemented, as many as 270 lives will be saved each year, [preventing about] 78 percent of the deaths" associated with mattress fires, says Julie Vallese, senior spokeswoman for the Washington D.C.-based CPSC.

Where there is fire, though, there is haze.

The development is not without debate.

Some doctors, scientists and at least one mattress manufacturer see red flags in introducing to the home front yet another usage of flame-retardant chemicals, which already are in a range of consumer products, from electronics to paint and furniture.

Some of them believe it could be the tipping point for people who are chemically sensitive. Others think it's unfair to expose all Americans to these chemicals and materials when a small percentage of people actually die in fires that start with a mattress.

For its part, the mattress industry (which didn't fight the regulation; many manufacturers view the new flame retardancy as a major product improvement -- and as a significant bit of protection for themselves from liability suits) believes it has found safer and greener flame-retardant technologies than those used in the past.

Risk analysis

Some troublesome FR chemicals have been identified as bioaccumulators, which means they persist in the environment. Or: suspected developmental toxicants, which means they could harm developing fetuses. And even: suspected carcinogens.

The CPSC did its own risk analysis before it approved the new standard on the potential health effects from six fire-retardant chemicals and determined that risk to be low, if any.

The commission believes the fire-safety issue is compelling enough to warrant this new regulation, which will affect all Americans buying mattresses, except those who get a doctor's prescription. With that, a consumer can have a one-of-a-kind mattress made, minus the flame retardants.

Citing data from the U.S. Fire Administration, the CPSC says mattresses and bedding were the first items to ignite in 15,300 residential fires to which firefighters were called, annually, from 1999 to 2002. Those fires resulted annually in 350 deaths and 1,750 injuries along with property loss totaling \$295 million. The CPSC believes \$281.5 million of that property loss is "addressable" annually by the new standard, which is officially called 16 CFR (Code of Federal Regulations) Part 1633.

Unlike the federal smoldering regulation that went into effect more than 30 years ago and addressed slow, insidious fires from cigarettes, this new regulation speaks to fast flaming fires started by an open flame such as a candle or lighter.

The emphasis here is on the word "fast."

Because of its size and weight, a mattress is "one of the largest fuel sources in your home," says Tom Chapin, director of research and development for Northbrook-based Underwriters Laboratories, which is one of about 10 labs testing mattresses for compliance with the new standard.

Within 3 to 10 minutes after ignition, an "entire mattress [one without the new flame retardants] would be involved [in fire], with flames probably exceeding 4 to 5 feet above the top of the mattress," Chapin says.

Within 5 to 10 minutes, with so much energy and heat building, "you reach a point where many of the other objects in a room will spontaneously catch on fire," a phenomenon known as flashover, Chapin explains. "You can't save a life at that point."

Slowing things down

With mattresses that comply with the new standard, it's a different story.

The standard limits the "peak rate of heat release" for a mattress that has been ignited to 200 kilowatts for 30 minutes, which was the duration of the test that the CPSC engaged.

Translation: It's a slow fire.

"Only a very small flickering flame occurs that may or may not spread across the top of the mattress" over the course of 30 minutes, Chapin says. And "these flames are typically only about a few inches high."

Bottom line: There's time for people to escape.

How mattress manufacturers achieve this feat of fire performance is largely left up to them.

Most manufacturers are reengineering their mattresses and using fire barriers (made of fabric) within the mattress, according to Ryan Trainer, executive vice president and general counsel of the International Sleep Products Association, the industry's trade group.

The fire barrier encapsulates the foam core of the mattress, separating it from the fire. The barrier can be made from woven, knitted or non-woven fabrics, Trainer says.

But that's all a consumer will ever know.

Secret recipe

The new regulation does not require mattress-makers to identify what means and/or chemicals they or their suppliers are using to make their mattresses and/or those fire barriers fire resistant. And most manufacturers are guarding that information as intellectual property.

"I know the mattress manufacturers are probably very concerned about health [issues]. They know people are sleeping on these things and are breathing them," says Lauren Heine, a Washington-based environmental engineer and a member of a U.S.

Environmental Protection Agency steering committee looking into furniture flame retardancy.

But, Heine goes on, "Nobody can really find out what's in their mattress. That's one of the big issues." For someone who is chemically sensitive, this is critical information, Heine says.

Trainer says the mattress industry stopped using polybrominated diphenyl ethers (PBDEs) as a flame retardant in its foam a few years ago and never used decabromodiphenyl oxide/ethers ("deca"). Both are flame retardants that have proven to have adverse health effects.

(PBDEs are identified as bioaccumulators and as suspected endocrine toxicants and gastrointestinal or liver toxicants. In addition to foam, they are typically used in rigid plastics, including the casing of home electronics products. PBDEs have shown up in women's breast milk and in the bodies of polar bears in Canada and the Arctic. Deca is a type of PBDE. It's classified as a suspected developmental toxicant and suspected carcinogen and has been banned or is being banned -- with some restrictions -- in Washington and Maine. The Illinois EPA has done two studies looking into the phasing out of deca, as well.)

Trainer said some mattress-makers may be using antimony trioxide in their fire barriers -- albeit in a very small quantity and embedded, not loose, in the fibers. (Antimony trioxide has been identified as a probable carcinogen.)

Representatives from Sealy, Serta, Simmons and Spring Air -- four of the five largest bedding makers in the country -- are tight-lipped about the exact nature of their fire barriers. (Tempur-Pedic, rounding out the Top 5, would not reveal any information about its flame-retardant program. Those five manufacturers represent about 60 percent of all mattresses sold in the U.S.)

But all four bedding giants say that their barriers do not contain PBDEs, deca or antimony trioxide. Instead, Sealy, Serta and Spring Air (Simmons would not offer specifics) all are using one (or more) of three fire barrier technologies or some variation of them.

They involve: barriers made from mainly cotton that has been bonded with boric acid; barriers made of rayon that has been extruded with silica (tiny fragments of glass or clay); and barriers made from rayon that has been treated with ammonium polyphosphate.

'An improvement'

"I don't think you would want to live in a room with a burning mattress [using the fire barriers mentioned above]. But this is a step in the right direction," says John Laseter, president, CEO and lab director of Texas-based Accu-Chem Laboratories, an independent

crime and clinical toxicology laboratory, which means it tests people and cadavers for substances and toxins. Laseter has testified in a number of cases related to environmental toxins.

Laseter has not performed investigations related to the new flame-retardant mattresses, but says the chemicals identified by Sealy, Serta and Spring Air sound like a "toxological improvement" over some of the flame retardants used in the past, including PBDEs.

Improvement is good, but it may be missing the point with chemically sensitive people. According to Dr. William Rea, a Dallas-based surgeon-turned-environmental medicine doctor, the concept of "total load" is key.

"Total load means that the body has a capacity to hold [only] so many incitants -- any substance that can cause disease," says Rea, who notes that the number of chemically sensitive people not just in the U.S., but around the world, is growing and attributes that to the rise of toxic chemicals in our air, food and water. "More and more people are getting overloaded."

He goes on: "Picture a barrel. Each person is a barrel. Once the barrel gets full, that's the essence of total load. One more drop [one more chemical exposure], and it spills over into trouble."

That trouble could be problems with the immune system, the non-immune enzyme detoxification system and the autonomic nervous system, says Rea, noting that he has not studied the new flame-retardant mattresses or what's in them.

But, Rea calls the home "probably the most contaminated of any place in our environment." He notes "gas stoves, pesticides, synthetic carpets, synthetic mattresses and cleaning products" -- and the fact that many homes are made to be so airtight that they don't breathe.

Rea sees several thousand patients from around the world annually at his Environmental Health Center in Dallas, where he puts chemically overloaded patients through a detox program that includes exercise, sauna, a special nutrition program and sleeping in "environmentally less polluted" rooms, which have ceramic tile floors and (sometimes) walls, organic cotton mattresses and organic cotton bed linens.

Chemically sensitive people aren't the only ones at risk from chemical overload, according to Dr. Doris Rapp, a pediatrician, allergist and environmental medicine doctor based in Arizona. Children, pregnant women and the elderly are other high-risk groups -- and product testing is rarely done on them, Rapp says.

What else can you do?

Consumers who want to purchase a mattress without the new flame retardants are left with few choices.

Mark Strobel, a small mattress-maker in southern Indiana who has launched an Internet campaign (www.peopleforcleanbeds.org) against the new federal regulation also has launched a new Internet-based business, www.prescriptionbeds.com. He will make consumers a bed without the new flame retardants, with a doctor's prescription, as the regulation allows. Consumers can purchase online or through a network of furniture and bedding stores around the country, as well as through chiropractors.

And at least one manufacturer of all-natural wool and cotton beds (natural materials tend to burn more slowly), says it's not using a synthetic fire barrier at all.

According to Scott Carwile, one of the owners of California-based Vivetique (www.vivetique.com), his company has burned more than \$100,000 worth of cotton/wool mattresses and figured out how to reach compliance with the new standard by merely "changing the ratio of wool and cotton."

Heine believes mattresses may be only the beginning of a trend toward more flame-retardant regulation. Furniture may be next. In fact, a similar open-flame standard for upholstered furniture is currently working its way through the CPSC.

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How to know if it's a fire-resistant mattress

Not all mattresses for sale now are the new fire-resistant ones.

Mattresses made before July 1 still can be sold -- and they may or may not comply with the new open-flame standard issued by the U.S. Consumer Product Safety Commission.

(Some manufacturers didn't wait until the July 1 deadline and have been onboard with the new standard for quite some time.)

To know what you're getting, look for the mandatory label stitched to the mattress. If a mattress meets the new standard it will include (among other things) the date of manufacture and the words: "This mattress meets the requirements of 16 CFR Part 1633 (federal flammability (open flame) standard ...)"

Some compliant mattresses will have the UL mark. It means that that mattress-maker hired Underwriters Laboratories to perform the compliance testing -- and its mattresses passed muster. UL is one of about 10 labs that are qualified to do the testing.

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The score on chemicals

A helpful Web site for those wanting to know more about the potential hazards of various chemicals is www.scorecard.org.

Under the "Chemical Profiles" link, people can search for detailed information on more than 11,200 chemicals, including chemicals used in large amounts in the U.S. and those regulated under major environmental laws.

Scorecard was launched in 1998 by Environmental Defense, a non-profit environmental advocacy group, and now is owned by Green Media Toolshed, a non-profit that provides media/communications tools and training to a network of 180 environmental non-profit organizations around the country.

-- Karen Klages

kklages@tribune.com

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