

Flammability requirements on the rise

BY Juli Case

Know the codes that will keep your clients and your projects from going up in flames

*I*t's a familiar story. Your client specifies a product and you build it to their direction. Everything is fine until it comes time for installation, when suddenly the local code official throws a curve ball—a flammability requirement that seemingly comes out of left field.

Flammability of fabric products has always been a concern, but many fabricators are finding themselves facing increased restrictions and requirements from local building code officials and fire marshals. The deadly February 2003 nightclub fire in Rhode Island might be partially responsible for the extra attention that some fabric products are garnering, along with the recent tightened restrictions from the Consumer Products Safety Commission on mattress flammability. Both topics have been in the news and have resulted in increased awareness of fire safety, especially where public buildings are involved.

Clearly, end-product manufacturers must obey the mandates of the local building code and related regulations. Not only does the code protect the customer, but it protects your business too, since the codes establish a standard industry practice. How that code is interpreted, however, can vary from code official to code official, causing headaches and delays, which can lead to lost opportunities and revenue.

Your local code officials are very aware that they are the bottom line when it comes to determining public safety. However, you may be more knowledgeable than they are with the specifics of fabric flammability and it's in your best interests to become as savvy on the subject as you can. Complicating matters is the fact that there are few national flammability requirements for specialty fabric products, often leaving you and your code official scrambling to find the best match for the product.

"Some of the biggest problems," says Alan Johnson, MFC, Eide Industries Inc., "are in the documentation and certification of materials. What is accepted in some areas is not accepted in others. Local versus local, state versus state, or United States versus Canada."



Helpful guidelines

A variety of flammability test methods and specifications abound, but there are three that are quoted more often than others and may be the closest that the U.S. has to a national requirement: California State Fire Marshal (CSFM) Title 19, NFPA 701, and ASTM E84. What are the differences among the three?

California State Fire Marshal Title 19. The state of California is a frontrunner in the United States when it comes to flammability, often initiating stricter flammability requirements before the rest of the country. This means that California State Fire Marshal certification is sometimes recognized outside of California, so it's a specification you need to be aware of. Of course, the opposite is also true. When presented with a flame certificate from the CSFM, some local code officials may refuse to accept it. Knowing how it compares to other specifications may be of assistance in that situation. (See chart on page 64.)

In addition to differences in test specifics, such as sample size and exposure to the flame source, the CSFM specification differs from the rest in one other important aspect—documentation. In order to qualify for CSFM certification, a fabric manufacturer not only must have their materials tested by an independent lab approved by the CSFM, but also send the material to the CSFM office to be tested there. The result is extra bureaucracy for the fabric suppliers, but a handy tool for end-product manufacturers. The Fire Engineering Department at the California State Fire Marshal has an online database of fabrics and films that have achieved its certification. Go to <http://osfm.fire.ca.gov/fireengineering.html>.

NFPA 701. Unlike CSFM Title 19, which is a requirement at least in the state of California for many fabric products, NFPA 701 is a voluntary industry specification. The National Fire Protection Association does not keep the detailed records that the CSFM does on which fabrics pass. NFPA 701 is, however, the flammability specification quoted in the International Building Code for such products as canopies. It is perhaps the most widely quoted flammability specification for specialty fabric products in the United States.

As with CSFM Title 19, there are different sections of the test method itself, intended for different categories of products. NFPA 701, Test Method 1 is intended more for interior products such as curtains and draperies, whereas Test Method 2 is designed for outdoor materials such as awnings, tents and tarps. When you are getting a quote from a vendor, it's important to know which certification was obtained for the fabric you're purchasing.

ASTM E84. Unlike CSFM Title 19 and NFPA 701, which were written specifically for fabrics and pliable materials, ASTM E84 is a test method intended to assess the surface burning characteristics of building materials. As such, it is more likely to be quoted in applications such as roofing or fabric structures. This test method compares the burning behavior of the material being tested to a standard reference, such as red oak. If your code official is asking what the flame spread index or smoke developed index for your fabric is, this may very well be the test being referenced.

ASTM International is a voluntary standards development organization. In order to assist users of its test methods and standards, ASTM offers an electronic newsletter that updates subscribers on test methods that are under the revision process or that have recently been approved. For more information on subscribing, go to www.astm.org.

Miscellaneous methods and specifications

- **Underwriters Laboratories (UL):** UL is an independent safety testing and certification organization. It has a number of certifications that apply to the specialty fabrics industry, ranging from UL 94, which applies to the flammability of plastic materials used in devices and appliances to certifications for roofing membranes and sign components. In addition, on the UL Web site you can access a directory of companies and what certifications they have. That site is www.ul.com.
- **CPAI-84:** CPAI-84 is a test method written by the Industrial Fabrics Association International for flame-resistant materials used in camping tents. The definition of camping tent is "any portable temporary shelter or structure designed to protect people from the elements" and includes such products as camping tents, play tents, and ice fishing tents.
- **NF P92-503:** As globalization becomes more common, more fabricators are run-

Textile Specification Comparison				
	CSFM Title 19 Small Scale	CSFM Title 19 Large Scale	NFPA 701 Test Method 1	NFPA 701 Test Method 2
Number of Samples	6	6	10	10
Sample Size	2.5" x 12.5"	5" x 7"	Approx. 6" x 16"	Approx. 5" x 47"
Angel of specimen	Vertical	Vertical	Vertical	Vertical
Ignition Source	Gas Burner	Gas Burner	Gas Burner	Gas Burner
Length of Exposure to Ignition Source	12 Seconds	2 Minutes	45 Seconds	2 Minutes
Accelerated Weathering and/or Leaching?	Yes	Yes	Yes, if claims are made to durability to cleaning or weathering	Yes, if claims are made to durability to cleaning or weathering
Properties Measured	• After Flame • Char Length	• After Flame • Char Length	• % of Weight Loss • Burning Residue	• After Flame • Char Length • Burning Residue

ning into international requirements. A specification that is often quoted in Europe is M1 or M2. Those are actually classifications involved in the French test method NF P92-503. This specification is written by AFNOR and is an electric burner test. The samples are repeatedly exposed to an ignition source and aspects such as duration of flaming, production of burning droplets, and length/width of the damaged section are noted.

- **FED-STD-191A:** The U.S. government is a large user of specialty fabrics and, historically, developed dozens of test methods that were contained within FED-STD-191A. If you see references to such things as Method 5903 ("Flame Resistance of Cloth, Vertical"), it's part of this document. However, these test methods were converted to commercial methods in 1998 and have largely been replaced by methods previously noted.
- **FMVSS 302:** Federal Motor Vehicle Safety Standard 302 is designed for materials used in the occupant compartments of motor vehicles. If your product is an outdoor product or used outside of a motor vehicle, this test method doesn't apply.

What's next?

The bad news is that the issue of flammability is a complex one with no easy answer. The good news is that you're not alone; your vendor is your partner. Most end-product manufacturers rely on the testing done by their fabric supplier. If a company is selling fabric into the awning or banner industry, it's a fair guess that they've already taken steps to assess its flammability.

"We require all of our vendors to send flame certifications with every order," says Johnson. "Don't wait until it's needed. You don't want a job to be complete and then find out you need it."

It's also important to consider if the fabric will be used indoors or outdoors. If the product is something used outside, then the question of permanence comes into play. Will the FR treatment wash out or is it inherent to the material? Keep in mind that specifications such as the CSFM Title 19, NFPA 701 and CPAI-84 take this into consideration already. If your fabric is certified to one of those three specifications, it's already been taken into account.

What happens if your code official or fire marshal is asking for a specification that your fabric isn't certified to? The first step would be to contact your vendor. Even if the specification isn't listed on the product literature, it's possible that they've run the test and have data that they can provide. Having the test run by an independent laboratory is also a possibility.

Increased awareness of flammability issues isn't likely to go away any time soon. California has recently adopted stricter mattress flammability requirements, with the Consumer Products Safety Commission to follow suit in July 2007. Upholstered furniture may be the next product area to see similar changes. In addition, the chemicals that provide flame retardance may also soon be under scrutiny, as there have been reports of finding chemicals in the PBDE family accumulating in the human body.

Fire safety is everyone's concern, from the code official, to the end product manufacturer, to the consumer. There are no easy answers, but with a little knowledge and partnerships with your vendors, you can protect both your projects and your clients.

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