

IN•TOUCH

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California Technical Bulletin 117-2013 And Residential Furniture Fire Safety

California Technical Bulletin 117-2013 is a flammability standard for upholstered furniture sold in the state of California. It is an update of the original California Technical Bulletin 117 standard that was adopted in 1975. CA TB 117-2013 took effect January 1, 2014.

The standard was developed by the California Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation (BEAR-HFTI). The updated standard is based significantly on what began in 1978 as a voluntary program within the furniture industry, through the Upholstered Furniture Action Council (UFAC). The UFAC test procedure was standardized, with modifications, as *ASTM E1353-08a: Standard Test Method for Cigarette Ignition Resistance of Components of Upholstered Furniture*, and the National Fire Protection Association (NFPA) Standard 260, *Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture*.

The voluntary UFAC program was initially created to address the leading cause of home fires involving upholstered furniture—ignition from smoldering cigarettes. Since the inception of the UFAC voluntary program, research shows that there has been a 79.3% decline in the number of upholstered furniture fires from cigarette ignition.

*TB 117-2013
tests furniture
as a composite
system.*

Smolder Vs. Open Flame Testing

The 2013 standard is significantly different than the original.

The original TB-117 standard included a smolder test and an open flame test for resilient filling materials, including flexible polyurethane foam. Because of the open flame requirement, many filling materials could not meet the original TB 117 standard without the use of flame retardant additives.

Since the home furnishings industry is moving away from flame retardant use, and the original TB 117 standard didn't focus on where most furniture fires actually begin—with the cover fabric, not the filling material—California, working closely with representatives of the



home furnishing industry, made modifications to TB 117.

TB 117-2013 does not prohibit the use of flame retardants in filling materials, but it does provide manufacturers with flexibility to meet the performance requirements of the law without them.

CA TB 117-2013 focuses attention on the interaction of the cover fabric with filling materials, to more effectively test the composite system of the materials used to make upholstered furniture. Since flexible polyurethane foam is almost always used as a component in a composite seating system, TB 117-2013 can provide a better “real-world” determination of how a piece of furniture would respond to a smoldering ignition source. If the upholstered furniture uses cover fabrics that are more prone to ignition from smoldering fire, the test requires a compliant barrier material. This has the benefit of slowing down potential ignition and improving safety.

What CA TB 117-2013 Is Intended To Cover

CA TB 117-2013 covers residential upholstered furniture sold in the state of California. Because California’s testing standards are often stricter than the rest of the nation, and because it is complicated for furniture manufacturers to maintain separate inventories, California standards often become *de facto* standards for furniture sold across the country.

How The CA TB 117-2013 Test Is Conducted

The CA TB 117-2013 test is actually three test methods, depending upon the construction of the finished upholstered composite. The tests are based on ASTM E1353-08a, with some modifications. Here are overviews of each.

Cover Fabric Test

Since the test is based first on the resistance of the cover fabric to ignition from smolder, the fabric is tested in the composite system. (See Figure 1). The composite assembly includes the fabric positioned above a standard polyurethane foam (Density: $1.8 \pm 0.1\text{lb/ft}^3$; Indentation Force Deflection (IFD): 25 to 30; Air permeability: greater than $3.5\text{ft}^3/\text{min}$, with no flame-retardant chemical added in either the manufacturing or post manufacturing processes). For the test, three assemblies of the test fabric are required.

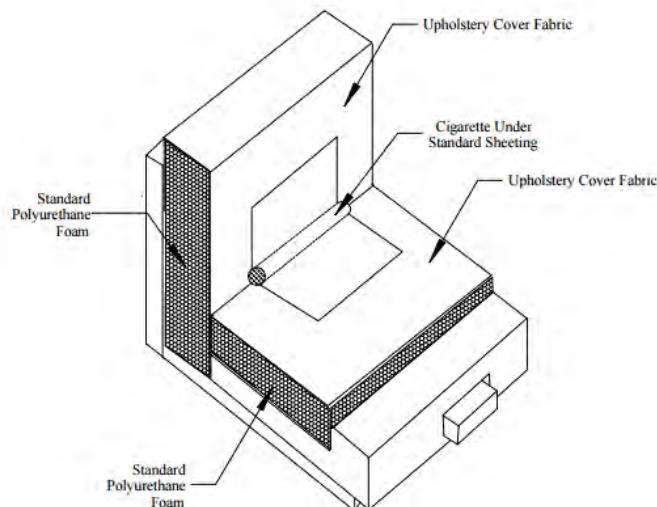


Figure 1: Cover Fabric Test Construction

A lit standard test cigarette is placed on each of the three assemblies in the crevice of the upper and lower sections. The ends of the cigarette are equidistant from the ends of the assembly.

A sheeting material is placed over the cigarette and smoothed down to confirm contact with the cigarette. The cigarettes are allowed to burn their full length, unless ignition of the substrate occurs and the assembly must be extinguished.

If no ignition occurs, the test continues for 45 minutes (it takes approximately 25 minutes for the cigarette to burn from one end to the other).

After the 45 minutes, the remains of the cigarette are carefully removed and the vertical char length of the fabric is measured. The fabric fails the test if:

1. It continues to smolder after the 45 minute test duration.
2. The vertical char length on the cover fabric is measured to be more than 1.5 inches (38 mm).
3. The mockup transitions to open flaming.
4. If more than one of the three test samples fails.

The fabric passes the test if **all three mockup assemblies pass**. If only one of the mockups fails in the first attempt, the test may be repeated on three additional samples. If any one fails in the repeat, the fabric fails.

Barrier Materials Test

Should a test fabric fail, it would need to be used in a furniture construction that calls for a smolder resistant barrier material between the outer fabric and filling material. The barrier material must be tested. The barrier material must cover all sides and tops of filling material (exceptions are made for non-detachable or non-reversible cushions).

The barrier materials test is conducted in much the same way as the cover fabric test. A composite assembly of standard Type 2 fabric, barrier material, and standard flexible polyurethane foam is subjected to the cigarette smolder tests. Three assemblies must be tested together.

The standard barrier material assembly passes if all three samples pass. The barrier fabric fails if a single specimen fails to meet the following criteria:

1. The mock-up test specimen continues to smolder after the 45 minute test duration;
2. A char develops more than two inches (50 mm) in any direction from the cigarette on the cover fabric measured from its nearest point.
3. The mock-up test specimen transitions to open flaming.

Resilient Filling Materials Test

The Resilient Filling Material Test, described in Section 3 of TB 117-2013, measures the smolder ignition resistance of filling materials when they are covered with smolder-resistant Class 1 Fabric (100 % cotton mattress ticking conforming to Fed. Spec. CCC-C-436-E) and subjected to a standard non-filter cigarette*. Filling materials include resilient foams, batting of natural and man-made fibers, or resilient pads of natural or man-made fibers.

The test is conducted in much the same way as fabric and barrier materials tests. (See Figure 2.) The filling material is placed in the composite assembly and subjected to the standard smoldering cigarette test. Three specimens are tested.

The filling material fails if:

1. The mock-up specimen continues to smolder beyond 45 minutes and the test must be terminated due to intensifying smoldering.
2. The mock-up specimen transitions to open flaming.

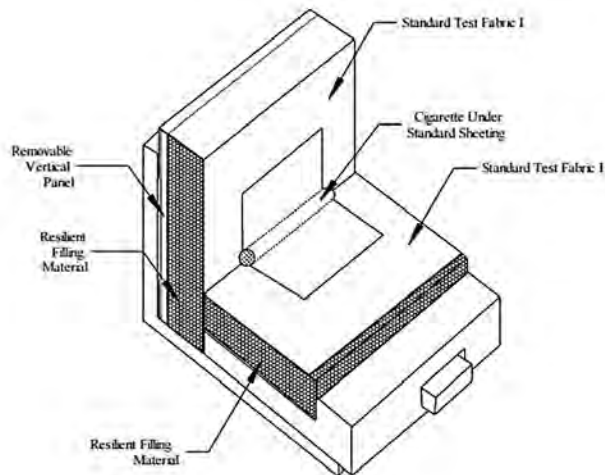


Figure 2: Filling Materials Test Construction

3. The resilient filling material substrate vertical char greater than 1.5 inches 38mm.

In addition to upholstered furniture, slabs, blocks, sheets, and shredded (loose or packaged) resilient flexible polyurethane foam that is sold in California must meet the requirements of the Resilient Filling Material Test contained if they are offered for sale to the general public through retail outlets; are intended for non-commercial or nonmanufacturing purposes; and can be reasonably expected to be used in or as an article of furniture or in or as an uncovered mattress or mattress pad.

For full details of all tests involved in CA TB 117-2013, visit the California Department of Consumer Affairs, Bureau of Electronic Appliance Repair, Home Furnishings and Thermal Insulation at www.bearhfti.ca.gov.

Labeling Requirements

Furniture that meets CA TB 117-2013 is required to have a label stating that it meets the standard. However, to declare whether or not flame retardants are added to the furniture to meet the standard, an additional statement is required. The label is intended to let consumers know the furniture composite contains FRs, as part of a separate California regulation, FRs that require labeling include, but are not limited to, halogenated, phosphorus-based, nitrogen-based, and nano-scale flame retardants, flame retardant chemicals listed as “designated chemicals” according to the California Environmental Contaminant Biomonitoring Program, and any chemical or chemical compound for which “flame retardant” appears on the Safety Data Sheet (SDS).

*NIST SRM 1196 cigarette or cigarette that can burn full length under these test conditions.

Summary

- In 2013, California made major changes to its standard regarding residential upholstered furniture flammability, California Technical Bulletin 117.
- The new bulletin, CA TB 117-2013, replaces the previous TB 117, which had been in place since 1975. The new bulletin requires a testing method based on a cigarette smolder test, without an open flame requirement.
- The updated test method addresses the most common cause of upholstered furniture fires, smoldering ignition. CA TB 117-2013 is based significantly on what began in 1978 as a voluntary program within the furniture industry, through the Upholstered Furniture Action Council (UFAC).
- TB 117-2013 allows upholstered furniture to meet California requirements without the use of flame retardant chemicals. FR chemicals are not prohibited. However, if FRs are used, this must be declared on the furniture label to notify consumers.
- Furniture that meets CA TB 117-2013 is required to have a label stating that it meets the standard. However, to declare whether or not flame retardants are added to the furniture to meet the standard, an additional statement is required.

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