

# IN•TOUCH

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## California Technical Bulletin 117-2013 Is Now The National Flammability Standard For Upholstered Furniture

In December of 2020, the U.S. Congress directed the Consumer Product Safety Commission (CPSC) to publish a direct final rule codifying California TB-117-2013 as a federal flammability standard for upholstered furniture. CPSC published that rule on April 9, 2021, and it can be found in the Code of Federal Regulations at [16 CFR part 1640](#). As of June 25, 2021, the TB-117-2013 test methods for furniture foam, fabric, batting, barrier material, and decking must be met by furniture sold in any of the 50 states, District of Columbia, and U.S. territories.

CPSC had deliberated for several decades, issuing several draft proposals for a flammability regulation for upholstered furniture, and debating whether it should focus on smoldering ignition from cigarettes, open flame ignition, or both ignition types. The action by Congress effectively settled that question, adopting a set of cigarette ignition tests established in California in 2013 and in force since 2015.

It is important to recognize that TB-117-2013 differs markedly from an earlier version of TB-117 required in California from 1976 until 2013. That version included “small open flame” tests designed to protect furniture against ignition by lighters, candles and matches. California officials amended the earlier version based on limited evidence of its effective-

ness, as well as health and environmental concerns about the flame retardant (FR) chemicals used to meet the law.

The legislation passed by Congress bars CPSC, as well as state and local governments, from pursuing contrary flammability standards for upholstered furniture. This strong “preemption” provision should avoid a confusing patchwork of laws in different localities, and bring greater predictability to this area of product regulation.

*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.

Beginning in the early 2000's, health and environmental advocates began successfully pressing for regulation of flame retardants (FRs) based on human health and environmental concerns. The most prominent FR additive for polyurethane foam, pentabromodiphenyl ether, was withdrawn from the marketplace at the end of 2004 following regulatory actions by U.S. EPA and a number of states. In subsequent years, states banned other halogen (chlorine and bromine) FRs, and this began to deplete the toolbox for complying with CA TB 117. California authorities took note of this trend, along with research that indicated that most fires involving upholstered furniture were begun by smoldering ignition sources, and decided to rework CA TB 117 to allow compliance without the use of FR additives. During the revision process, the state drew upon existing smolder tests for upholstered furniture, including the UFAC standard and ASTM 1353.

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 to increase exit time.

## How The CA TB 117-2013 Test Is Conducted

The CA TB 117-2013 test is actually four 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

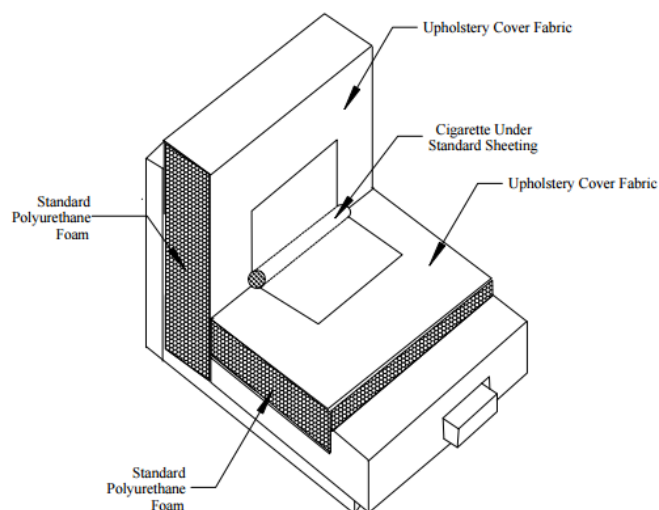


Figure 1: Cover Fabric Test Construction

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 with the following specifications: 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.

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 standard 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 needs 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 meet a required test. In production, 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.

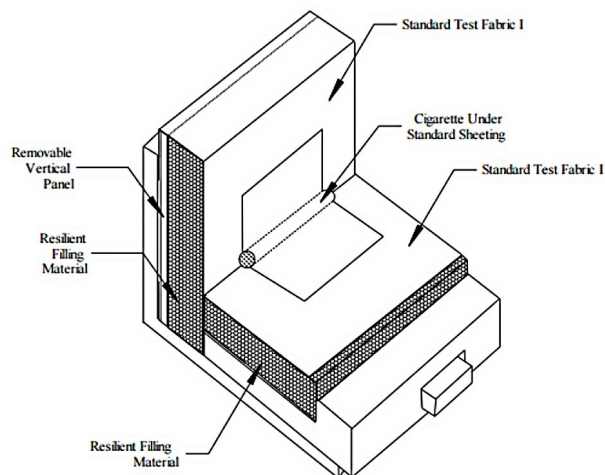
The standard barrier material assembly passes if all three samples pass. The barrier fabric fails if a single specimen fails to meet the following criteria:

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 the standard fabric, smolder-resistant Class 1 Fabric (100 % cotton mattress ticking conforming to Fed. Spec. CCC-C-436-E) and subjected to a standard 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



**Figure 2: Filling Materials Test Construction**

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.
3. The resilient filling material substrate has 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 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.

## Decking Materials Test

The Decking Materials Test measures the tendency of decking materials to smolder and contribute to fire propagation, when subjected to a smoldering ignition source. Decking materials are placed on a fiberglass board and covered with an upholstery fabric. Three test cigarettes under sheeting are lighted and placed on the fabric. The test is timed.

A material is considered to fail if:

A single mock-up test specimen fails to meet the requirements of this test procedure if any of the following criteria occurs:

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

1. A single mock-up test specimen fails to meet the requirements of the test procedure.
2. A mock-up test specimen continues to smolder after the 45 minute test duration;
3. A char length of more than 1.5 inches (38 mm) develops.
4. The mock-up test specimen transitions to open flaming.

The decking material passes the test if three initial mock-up specimens pass the test, i.e., the cigarettes burn their full length and the mock-ups are no longer smoldering.

If more than one initial specimen fails, the decking material fails the test.

If any one of the three initial specimens fails, the test is repeated on an additional three specimens.

If all three additional specimens pass the test, the decking material passes the test. If any one of the additional three specimens fails, the decking material fails the test.

For decking materials that pass this section, the first layer of filling materials located below the decking material shall also meet the test requirements of resilient filling materials test.

*For full details of all tests involved in CA TB 117-2013, visit the California Bureau of Household Goods and Services at [https://bhgs.dca.ca.gov/laws/mod\\_tb117.pdf](https://bhgs.dca.ca.gov/laws/mod_tb117.pdf).*

## Labeling Requirements

Even with the enforcement of 16 CFR 1640 (TB 117-2013) throughout the U.S., furniture sold in California must still carry the required TB 117-2013 flammability label and the additional FR declaration in use since 2015. The national standard has its own label requirement with a single-sentence statement that must appear on all domestically-sold upholstered furniture.

Noting that the majority of furniture sold throughout the U.S. already displays the California/FR label, CPSC has approved the use of a dual label containing both the California and CPSC statements (Figures 3 and 4).



Figure 3: Separate Label



Figure 4: Combination Label



## Summary

- In December of 2020, the U.S. Congress directed the Consumer Product Safety Commission (CPSC) to publish a direct final rule codifying California TB-117-2013 as a federal flammability standard for upholstered furniture.
- The new standard is published in the Code of Federal Regulations at [16 CFR part 1640](#). As of June 25, 2021, the TB-117-2013 test methods for furniture foam, fabric and batting must be met by furniture sold in any of the 50 states, District of Columbia, and U.S. territories.
- CA TB 117-2013 replaced 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 CA TB 117-2013 method addresses the most common cause of upholstered furniture fires, smoldering ignition.
- TB 117-2013 allows upholstered furniture to meet flammability requirements without the use of flame retardant chemicals. FR chemicals are not prohibited. However, if FRs are used, this must be declared on the California furniture label to notify California consumers.
- Furniture that meets CA TB 117-2013 is required to have a label stating that it meets the standard. An additional label statement is now required for the national standard; however, the state and federal disclosures can be combined into one label.
- Labeling and other elements are covered in detail on the [CPSC website](#).

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