

# SOUTHWEST RESEARCH INSTITUTE

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February 7, 1992

Flame Safe Chemical Corporation  
2653 Warfield Avenue  
Fort Worth, Texas 76106

Attn: Mr. Louis Jacobini

Re: SwRI Project No. 01-4510-118-b                                      **FINAL REPORT**  
"Requirements, Test Procedures and Apparatus for Testing the Resistance  
of a Mattress or Mattress Pad to Combustion Which May Result From a  
Smoldering Cigarette - Ticking Substitution Procedure"  
(Technical Bulletin 106; Federal Standard 16 CFR 1632 (FF 4-72);  
California Administrative Code Title 4, Chapter 3, Section 1371)

Gentlemen:

This letter constitutes our final report on your blue/white striped 100% cotton mattress ticking treated with Flame Safe at a spread rate of 300 to 350 sq.ft/gallon, submitted for evaluation by the referenced test method. The fabric was tested as received.

The results apply specifically to the specimens tested, in the manner tested, and not to the entire production of these or similar materials, nor to the performance when used in combination with other materials. All test data are on file and are available for review by authorized persons.

## TEST METHOD AND PROCEDURE

The material was tested in accordance with the Ticking Substitution Procedure of Technical Bulletin 106. This is a test which measures the char length of ticking material when in contact with lighted cigarettes. All materials used for the test, e.g. polyurethane foam, blended cotton felt, cigarettes and sheeting material met the specifications of Section I of this procedure. All materials, including the ticking material undergoing testing, were conditioned for a minimum of 48 hours in a room maintained at 70°F and 50% relative humidity prior to testing.

Prior to the test, 2 lb of cotton felt were placed in the 12 x 12 x 6-in. deep test box, allowing the felt to extend 3 in. above the top of the box. A 12 x 12-in. piece of polyurethane foam was placed over the cotton felt, and the ticking material undergoing testing was stretched over it and fastened to the sides of the box with tape.

A lighted cigarette was placed in direct contact with the ticking material and allowed to burn its full length. In the event that the cigarette self-extinguished prior to having burned its full length, a fresh cigarette placed on another section of the ticking was used to replace it. A total of three cigarettes were burned per specimen. Three specimens were tested.

This report is for the information of the client. It may be used in its entirety for the purpose of securing product acceptance from duly constituted approval authorities. Neither this report nor the name of the Institute shall be used in publicity or advertising.



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After the cigarette self-extinguished, the length of the char was measured and the cotton felt and polyurethane foam were inspected to determine ignition.

If the ticking material passed this test (see next Section for pass/fail criteria) the test was repeated, this time by placing the test specimen directly above the cotton felt (the polyurethane foam was removed). Otherwise, the test was terminated and the results reported.

#### **PASS/FAIL CRITERIA**

Section 10 of the above mentioned document contains the following pass/fail criteria:

Pass: char length less than 1 inch in any direction from cigarette and felt not ignited, for all cigarettes;

Fail: obvious ignition of one or more cigarettes or char length exceeds 1 inch at any point for one or more cigarettes.

#### **CLASSIFICATION CRITERIA**

According to Section 12, ticking materials can be classified based on the results obtained during this test, as follows:

Class A: Three ticking specimens pass the cigarette criteria directly over cotton felt (total of nine cigarettes burned over felt and foam and nine burned over felt only);

Class B: Three ticking specimens pass the cigarette criteria over polyurethane foam above felt (total of nine cigarettes burned);

Class C: One or more cigarettes fail criteria over foam covering cotton felt.

#### **TEST SPECIMEN AND NUMBER OF DETERMINATIONS**

The specimens were described as 100% cotton mattress ticking with Flame Safe flame retardant sprayed at a spread rate of 300 to 350 sq.ft/gallon. Each specimen was 20.0 x 20.0 in. (508 x 508 mm), nominal thickness 0.023 in. (0.584 mm).

**TEST RESULTS**

The test was conducted on December 20 and 30, 1992 with the following results:

Over Polyurethane Foam:

Specimen No.	Cigarette No.	Burned Length, in.*	Cotton Ignition?	Pass/Fail?
1	1	< 1	No	Pass
	2	< 1	No	Pass
	3	< 1	No	Pass
2	1	< 1	No	Pass
	2	< 1	No	Pass
	3	< 1	No	Pass
3	1	< 1	No	Pass
	2	< 1	No	Pass
	3	< 1	No	Pass

Over Cotton Felt:

Specimen No.	Cigarette No.	Burned Length, in.*	Cotton Ignition?	Pass/Fail?
1	1	< 1	No	Pass
	2	< 1	Yes	Fail
	3	1	Yes	Fail
2	1	< 1	No	Pass
	2	< 1	No	Pass
	3	< 1	No	Pass
3	1	< 1	No	Pass
	2	< 1	No	Pass
	3	1.5	Yes	Fail

\* Burned length in each direction.

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Technical Bulletin 106  
Ticking Substitution Procedure

#### CONCLUSIONS

The material, when tested in accordance with the Ticking Substitution Procedure of Technical Bulletin 106, is considered Class B material.

If you should have any questions/comments or if we can be of further assistance, please contact us.

Sincerely,

Approved by:

*Gladys M. Finley*  
Gladys M. Finley  
Project Leader  
Fire Testing Services

*Alex B. Wenzel*  
Alex B. Wenzel  
Director  
Department of Fire Technology

GMF/rr

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