



UNITED STATES  
CONSUMER PRODUCT SAFETY COMMISSION  
WASHINGTON, DC 20207

Memorandum

Date: May 26, 2005

TO : Dale Ray, Project Manager, Upholstered Furniture  
Directorate for Economic Analysis

THROUGH: Andrew G. Stadnik, P.E.  
Associate Executive Director, Directorate for Laboratory Sciences  
Edward W. Krawiec, P.E.  
Director, Division of Electrical and Flammability Engineering, Laboratory  
Sciences

FROM : Weiyang Tao, Ph.D. *WT*  
Textile Technologist, Division of Electrical and Flammability Engineering

SUBJECT : Upholstery Fabrics and Interlining Materials used in the Smoldering and Small  
Open Flame Testing\*

The U.S. Consumer Product Safety Commission (CPSC) staff is developing a draft flammability standard for both smoldering and small open flame ignition of upholstered furniture. The staff used more than forty upholstery fabrics to test the flammability of upholstered furniture materials. These fabrics included the California Bureau of Home Furnishings and Thermal Insulation Technical Bulletin 117 (February 2002), Requirements, Test Procedure and Apparatus for testing the Flame and Smolder Resistance of Upholstered Furniture (TB117+) standard upholstery test fabric (100% cotton velvet) (1), the Upholstered Furniture Action Council (UFAC) type I (100% cotton mattress ticking) and type II (100% bright regular rayon) fabrics (2), and others ranging from 100% natural fiber to 100% synthetic fiber (thermoplastic) fabrics and natural-synthetic blends. Also included were flame retardant (FR) treated and FR backcoated fabrics. In addition, more than ten different interlining materials (barrier or batting) were also evaluated. This memorandum gives a brief description of the fabrics (Table 1) and interlining materials (Table 2) used in the testing.

\* This document was prepared by the CPSC staff, and has not been reviewed or approved by, and may not reflect the views of, the Commission.



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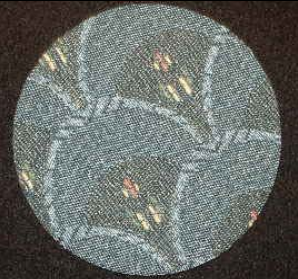
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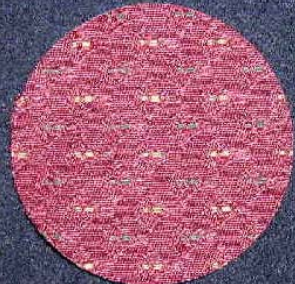


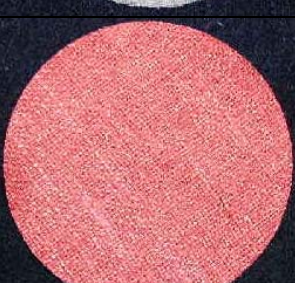
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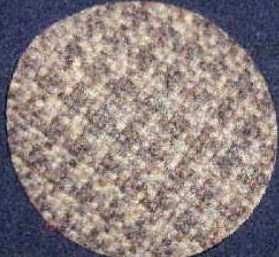
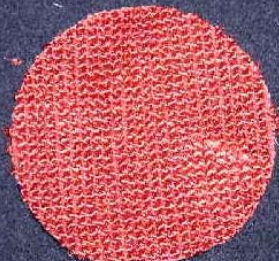


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**Table 1. Upholstery Fabrics used in Testing**





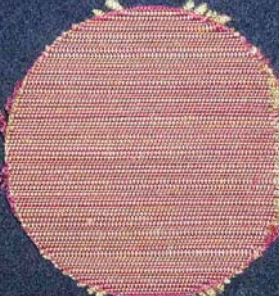
Fabric	Image	Fiber Content	Weight (oz/yd <sup>2</sup> )
1		60% acetate/40% cotton	3.5
2		100% cotton print	6.0
3		57% acrylic/31% polyester/ 12% olefin	8.0
4		100% cotton corduroy	9.0
5		56% rayon/34% polyester/ 10% cotton	10.0

Fabric	Image	Fiber Content	Weight (oz/yd <sup>2</sup> )
6		100% cotton twill	11.5
7		92% cotton/8% rayon chenille	20.0
8		90% cotton/10% rayon chenille (FR backcoated)	24.0
9		100% Cotton twill (FR backcoated)	14.0
10		50% cotton/50% polyester (1/2 FR backcoated)	9.0

Fabric	Image	Fiber Content	Weight (oz/yd <sup>2</sup> )
11		100% cotton (FR treated)	7.5
12		57% rayon/36% polyester/ 7% cotton (FR backcoated)	12.0
13		88% cotton/12% nylon sateen (FR treated)	10.0
14		100% wool	11.0
15		100% silk	3.7





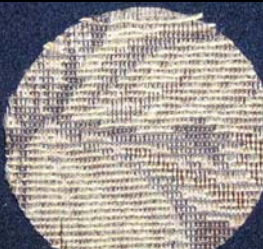

Fabric	Image	Fiber Content	Weight (oz/yd <sup>2</sup> )
16		100% standard FR polyester	6.5
17		100% nylon (FR backcoated)	12.3
18		50% rayon/50% nylon (FR backcoated)	14.5
19		100% cotton	10.0
20		54% acrylic/ 24% polyester/ 22% olefin	8.2

Fabric	Image	Fiber Content	Weight (oz/yd <sup>2</sup> )
21		100% olefin	18.7
22		100% olefin	5.7
23		100% cotton twill	9.5
24		100% cotton velvet (TB117+ test fabric)	10.0
25		100% cotton, UFAC type I	9.0






Fabric	Image	Fiber Content	Weight (oz/yd <sup>2</sup> )
26		100% rayon, UFAC type II	8.0
27		100% cotton	7.5
28		56% rayon/34% polyester/10% cotton	9.7
29		41% olefin/33% acrylic/26% polyester	7.9
30		52% rayon/48% polyester	9.4

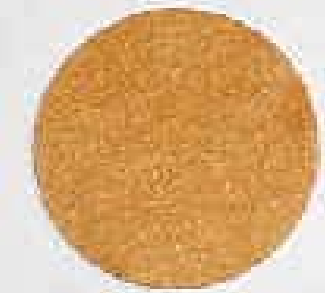









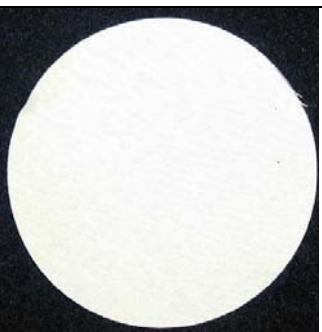
Fabric	Image	Fiber Content	Weight (oz/yd <sup>2</sup> )
31		100% wool	12.5
32		leather 1	7.3
33		leather 2	12.0
34		vinyl	21.5
35		100% olefin	10.0

Fabric	Image	Fiber Content	Weight (oz/yd <sup>2</sup> )
36		100% olefin	10.0
37		100% polypropylene	11.5
38		56% cotton/44% polyester	10.0
39		58% polyester /42% cotton	8.3
40		67% cotton/33% polyester	11.0
41		60% rayon/40% polyester	13.8

**Table 2. Interlining Materials used in Testing**

Interliner	Image	Description	Weight (oz/yd <sup>2</sup> )
1. P		UFAC standard garneted polyester barrier/batting	18.0
2. S		Nonwoven, loft barrier	4.3
3. M		Nonwoven, loft barrier	7.8
4. V		Nonwoven, loft barrier	5.3
5. L		Nonwoven, loft barrier	6.6

<b>Interliner</b>	<b>Image</b>	<b>Description</b>	<b>Weight (oz/yd<sup>2</sup>)</b>
6. O		Nonwoven, sheet barrier	4.2
7. D		Nonwoven, sheet barrier	3.0
8. T		Nonwoven, sheet barrier	3.5
9. C		Organic cotton batting	3.2
10. G		Nonwoven, loft barrier	5.5

Interliner	Image	Description	Weight (oz/yd <sup>2</sup> )
11. W		Nonwoven, loft barrier	4.3
12. \$		Woven, ceramic barrier	18.3
13. ¢		Woven, ceramic barrier	10.0
14. K	Photo not taken due to difficulty in handling this material. Both smoldering and open flame performances of this material are poor. This barrier is not suitable for upholstered furniture.	Nonwoven barrier	Weight not measured due to difficulty in handling this material. Both smoldering and open flame performances of this material are poor. This barrier is not suitable for upholstered furniture.
15. R		Down proof cotton fabric	4.0

## References

1. California Bureau of Home Furnishings and Thermal Insulation, Technical Bulletin 117, Draft, February 2002.
2. UFAC Test Methods, Upholstered Furniture Action Council, 1990.