

The following guide was created to simplify highly technical testing information so that it can be understood and useful when selecting and specifying fabrics for particular applications. For complete details about the individual tests, please refer to the specific tests as published by the issuing agencies.

## Flammability



The measurement of a fabric's performance when it is exposed to specific sources of ignition.

*Note: ACT guidelines specify different flammability tests dictated by the intended end use for the fabric.*

### ACT GUIDELINES

#### Upholstery

California Technical Bulletin #117 Section E – Class 1 (Pass)

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#### Direct Glue Wallcoverings

ASTM E 84-03 (Adhered Mounting Method) – Class A or Class 1

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#### Wrapped Panels and Upholstered Walls

ASTM E 84-03 (Unadhered Mounting Method) – Class A or Class 1

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#### Drapery

NFPA 701-89 (Small Scale)\* – Pass

\*NFPA 701-99 Test #1 is being phased in at this time, but is not yet cited in all relevant codes. Therefore, the small-scale test remains the ACT standard until further notice.

### TEST METHODS

#### California Technical Bulletin #117 Section E\* – Class 1 (Pass)

The California TB #117 Section E is a test method of the California Bureau of Home Furnishings and Thermal Insulation. It is a vertical flame test measuring the ease of ignition and the burning rate when a small open flame hits the surface of the test fabric for 1 second. A Class 1 (Pass) rating is assigned if:

1. A 5.0" section of the fabric is consumed in 3.5 or more seconds (less than 3.5 seconds is a failure). For raised surface fabric, the minimum burn time is increased to 4.0 seconds.
2. The fabric does not ignite.

\* For complete technical details about California Bulletin #117 Section E: <http://www.bhfti.ca.gov/techbulletin/117.pdf>

#### ASTM E 84-03\* Tunnel Test

The ASTM E-84 test is a test method of the American Society for Testing and Materials (ASTM). Commonly called the Tunnel Test, this test can be performed under two different methods "adhered" or "non adhered" where the only difference is in specimen preparation:

*Adhered:* The fabric is bonded to either a CA board substitute or gypsum board. This is the prescribed method for wall coverings whose actual use will be "adhered".

*Non adhered:* If the fabric is a panel fabric or upholstered walls, it is tested in a frame without being bonded to any other material.

In each instance (adhered and non adhered), the fabric is placed in the ceiling of the test tunnel and subjected at one end to a high intensity flame which spreads over the first 4.5 feet of the 24 foot test specimen.

The distance of flame front progression and total burning time are used to calculate a "flame spread index". Smoke monitors are used to calculate a "smoke developed" value. The flame spread index and smoke developed value are calculated from the results of the test fabric compared to the characteristics of cement board and red oak materials resulting in the indexes.

Typically, the code classes are as follows:

- Class A: Flame Spread Index of 25 or less and Smoke Developed value of 450 or less
- Class B: Flame Spread Index of 26 to 75 and Smoke Developed value of 450 or less
- Class C: Flame Spread Index of 76 to 200 and Smoke Developed value of 450 or less

**Caution:** The ASTM E 84 test is only valid if the textile or vinyl wall covering is used in a sprinklered occupancy. If not, the Room Corner Test (NFPA 265 for textiles; and NFPA 286 for vinyl) is mandated in many jurisdictions.

\* For complete technical details about ASTM E 84-03: <http://www.astm.org>

**NFPA 701-89 (Small Scale)\***

The NFPA 701-89 (Small Scale) is a test method of the National Fire Protection Agency. It measures the ignition resistance of a fabric after it is exposed to a flame for 12 seconds. The flame, char length and flaming residue are recorded. The fabric will pass the test if all samples meet the following criteria (if one sample fails the fabric fails):

- 1) an after flame of less than 2.0 seconds
- 2) an average char length of less than 6.5" or an individual specimen over 7.5"
- 3) the specimen does not continue to flame after reaching the floor of the test chamber

Note: NFPA 701-99 Test #1 is being phased in at this time, but is not yet cited in all relevant codes. Therefore, the small-scale test remains the ACT standard until further notice.

\* For complete technical details about NFPA 701: <http://www.nfpa.org>

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## Abrasion

The surface wear of a fabric caused by rubbing and contact with another fabric.



General Contract  
Upholstery

### ACT GUIDELINES

#### General Contract Upholstery

ASTM D4157-02 (ACT approved #10 Cotton Duck)

15,000 double rubs Wyzenbeek method

ASTM D4966-98 (12 KPa pressure)

20,000 cycles Martindale method

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Heavy Duty Upholstery

#### Heavy Duty

ASTM D4157-02 (ACT approved #10 Cotton Duck)

30,000 double rubs Wyzenbeek method

ASTM D4966-98 (12 KPa pressure)

40,000 cycles Martindale method

End use examples of heavy-duty installations where upholstery fabrics rated at 30,000 double rubs should be appropriate are single shift corporate, hotel rooms/suites, conference rooms and dining area usage.

ACT acknowledges that there are extreme wear situations that may require higher levels of abrasion resistance. End use examples that may require higher than 30,000 double rubs include: 24 hours transportation terminals, 24 hour telemarketing, 24 hour healthcare emergency rooms, 24 hour casino gambling areas, and such public gathering places as theatres, stadiums, lecture halls and fast food restaurants.

It is strongly suggested that double rubs exceeding 100,000 are not meaningful in providing additional value in use. Higher abrasion resistance does not necessarily indicate a significant extension of the service life of the fabric.

The Wyzenbeek and Martindale tests are the two methods commonly used to predict wearability. Actual performance is determined by many factors such as fiber content, weaves, finishes, furniture design, maintenance, cleaning, and usage. Durability of an upholstery fabric is a complex interaction (combination) of a number of performance tests that, in addition to abrasion, includes seam slippage, pilling, tensile strength, and usage.

There is no correlation between the Wyzenbeek and Martindale tests so it is not possible to estimate the number of cycles that would be achieved on one test if the results from the other test were known.

**TEST METHODS**

**ASTM D4157-02\*\* Oscillatory Cylinder (Wyzenbeek)**

The ASTM D4157-02 is a test of the American Society of Testing and Materials. A Wyzenbeek machine is used for this test allowing samples of the test fabric to be pulled tight in a frame and held stationary. Individual test specimens cut from the warp and weft direction are then rubbed back and forth using an ACT approved #10 cotton duck fabric\* as the abradant. The number of double rub cycles achieved before two yarn breaks occur or "noticeable wear" is observed is recorded as the fabric's abrasion rating.

\*\* For complete technical details about ASTM D4157-02: <http://www.astm.org>

\* The wire screen abradant is recommended by ACT for use with vinyl and polyurethane coated upholstery and may also be used for testing 100% olefin fabrics.

**ASTM D4966-98\* Martindale**

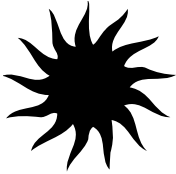
The ASTM D4966-98 is a test method of the American Society of Testing and Materials (ASTM). This is an oscillating test. Fabric samples are mounted flat and rubbed in a figure eight like motion using a piece of worsted wool cloth as the abradant. The number of cycles that the fabric can endure before fabric shows objectionable change in appearance (yarn breaks, pilling, holes) is counted. Number of cycles determines abrasion rating.

\* For complete technical details about ASTM D4966-98: <http://www.astm.org>

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## Colorfastness to Light

A material's degree of resistance to the fading effect of light.



### ACT GUIDELINES

#### Upholstery

AATCC 16 Option 1 or 3-2003	Grade 4 minimum at 40 hours
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#### Direct Glue Wallcoverings

AATCC 16 Option 1 or 3-2003	Grade 4 minimum at 40 hours
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#### Wrapped Panels and Upholstered Walls

AATCC 16 Option 1 or 3-2003	Grade 4 minimum at 40 hours
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#### Drapery

AATCC 16 Option 1 or 3-2003	Grade 4 minimum at 60 hours
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### TEST METHOD

#### AATCC 16 Option 1 or 3 – 2003\*

The AATCC 16 Option 1 and 3 are test methods of the American Association of Textile Chemists and Colorists (AATCC). ACT recognizes both methods where the only difference is the light source being used. In AATCC 16 Option 1 a Carbon-Arc lamp is used as the light source and in AATCC 16 Option 3 a Xenon-Arc lamp is used. Under both methods a strip of fabric (part of which is protected by a special paper card) is placed in a fadometer and exposed to 40 hours of accelerated fading units (AFU). After the exposure the difference in color between the exposed and protected parts of the fabric are compared to the AATCC gray scale and the degree of fading is rated.

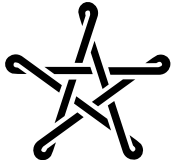
Grade 5 = no fading

Grade 4 = slight fading

Grade 1 = high degree of fading

\* For complete technical details about AATCC 16 Option 1 or 3 – 2003: <http://www.aatcc.org>

## Physical Properties



Physical property tests include: Brush Pill, Breaking Strength and Seam Slippage.

*Pilling* is the formation of fuzzy balls of fiber on the surface of a fabric that remain attached to the fabric. *Breaking strength* is the measurement of stress exerted to pull a fabric apart under tension. *Seam Slippage* is the movement of yarns in a fabric that occurs when it is pulled apart at a seam.

### ACT GUIDELINES

#### Upholstery

Brush pill ASTM D3511-02, Class 3 minimum

Breaking strength ASTM D5034-95 (2001) (Grab Test)  
50 lbs. minimum in warp and weft

Seam slippage ASTM D4034  
25 lbs. minimum in warp and weft

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#### Wrapped Panels and Upholstered Walls

Breaking strength ASTM D5034-95 (2001) (Grab Test)  
35 lbs. minimum in warp and weft

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#### Drapery

Seam slippage ASTM D3597-02-D434-95 for fabrics over 6 oz./sq. yard  
25 lbs. minimum in warp and weft

### TEST METHODS

#### ASTM D3511-02\*

The ASTM D3511-02 is a test method of the American Society of Testing and Materials (ASTM). This test utilizes nylon bristles to rub the surface of the test fabric for a specific amount of time. The number of pill balls are counted and given a 1 – 5 rating.

Class 5 = no pilling  
Class 1 = severe pilling

\* For complete technical details about ASTM D3511: <http://www.astm.org>

**ASTM D5034-95 (2001) (Grab Test)\***

The ASTM D5034-95 (2001) (Grab Test) is a test method of the American Society of Testing and Materials (ASTM). To evaluate, the fabric being tested is put into a machine that grips the fabric with two clamps. One clamp is stationary and the other moves away applying tension until the fabric breaks or ruptures. This test is performed in both the warp and weft directions. The number of pounds required to cause a fabric to break or rupture determines the rating.

\* For complete technical details about ASTM D5034-95 (2001) (Grab Test): <http://www.astm.org>

**ASTM D3597- 02-D434-95\***

The ASTM D3597- 02-D434 is a test method of the American Society of Testing and Materials (ASTM). To measure a fabric's ability to resist seam slippage, a seam is sewn in the test fabric using a standard thread, specific seam allowance and specific number of stitches per inch. The sewn fabric is then clamped at opposing side of the seam. One clamp is moved away from the other applying tension at the sewn seam. This test is performed in both the warp and filling directions. The tension is increased until the seam separates to a specific distance. The number of pounds required to cause separation due to yarn slippage determines the rating.

\* For complete technical details about ASTM D3597-02-D434-95: <http://www.astm.org>

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## Wet & Dry Crocking



Transfer of dye from the surface of a dyed or printed fabric onto another surface by rubbing.

### ACT GUIDELINES

#### Upholstery

AATCC 8-2001	Dry Crocking, Grade 4 minimum Wet Crocking, Grade 3 minimum
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#### Direct Glue Wallcoverings

AATCC 8-2001	Dry Crocking, Grade 3 minimum Wet Crocking, Grade 3 minimum
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#### Wrapped Panels and Upholstered Walls

AATCC 8-2001	Dry Crocking, Grade 3 minimum Wet Crocking, Grade 3 minimum
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#### Drapery

AATCC 8-2001 (Solids)	Dry Crocking, Grade 3 minimum Wet Crocking, Grade 3 minimum
AATCC 116-2001 (Prints)	Dry Crocking, Grade 3 minimum Wet Crocking, Grade 3 minimum

### TEST METHODS

#### AATCC 8-2001\*

The AATCC 8-2001 is a test method of the American Association of Textile Chemists and Colorists (AATCC). This method uses a standard white cotton fabric that is rubbed against the surface of the test fabric. To test for wet crocking the standard fabric is wet before rubbing against the test fabric. After rubbing under controlled pressure for a specific number of times the amount of color transferred to the white test squares is compared to an AATCC color chart and a rating is established.

Grade 5 = no color transfer

Grade 1 = high degree of color transfer

\* For complete technical details about AATCC 8: <http://www.aatcc.org>

#### AATCC 116-2001\*

The AATCC 116-2001 is a test method of the American Association of Textile Chemists and Colorists (AATCC). This test is specifically used for printed fabrics that do not lend themselves to the AATCC 8-2001 method. The test fabric is held at the base of a Rotary Vertical Crockmeter and rubbed with a standard cotton white fabric either dry or wet. After rubbing under controlled pressure for a specific number of times the amount of color transferred to the white test squares is compared to an AATCC color chart and a rating is established.

\* For complete technical details about AATCC 116: <http://www.aatcc.org>