Talking about...Textile Sustainability

Sustainability is a popular topic, and it seems everyone has something to say. A look at blogs that talk about textile sustainability.

More info...

Using AATCC Blue Wool

AATCC Blue Wool Lightfastness Standards are a staple control fabric in many testing labs, but the recent short supply and new lot development has added confusion to an already complicated situation.

More info...

IMPORTANT ANNOUNCEMENT: System Maintenance and Important AATCC Changes

The AATCC Membership database and ordering system will be down December 29-Jan 5 for inventory and maintenance. If you would like to renew or join AATCC during this time, please contact Membership Services. If you have any questions regarding ordering, please contact our ordering department.

**AATCC will also be increasing membership dues beginning Jan, 1, 2015.

More info...
**Buyer’s Guide Survey**

AATCC members, please take the below survey in regards to being a user of AATCC’s Buyer’s guide.

[More info...](#)

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**Registration now open for Wet Processing of Textiles with Spandex Conference**

Join us February 11-12, 2015 to learn more about best processing practices and real world challenges when processing spandex blends.

[More info...](#)

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**Graduating Students**

Please contact AATCC to update us with new emails and mailing addresses so you can continue to receive AATCC Benefits.

[More info...](#)

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### UPCOMING EVENTS

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**Open Enrollment**

Textile Fundamentals Web-Based Training

[more info...](#)

Online AATCC Test Method Training

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AATCC Recorded Webinars

[more info...](#)

Getting White Right

[more info...](#)

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Talking about...Textile Sustainability

From fiber production to fashion design, there's room for increased sustainability all along the textile chain. Let's visit some blogs that are talking about sustainability in the textile industry.

TED
A university-based blog, Textile, Environment, Design (TED) discusses “design strategies for innovative sustainability” and how designers can affect textile sustainability.

BIZ
GreenBiz looks at the business of sustainability. Stories about the textile industry abound, and their Insights section has interesting articles about the broader themes of sustainability.

O
The bloggers at O Ecotextiles aren't afraid to delve deep into tough subjects—with references and citations—and aren't afraid to have strong opinions about textile sustainability. At the same time, their readable style is clear and understandable, so no matter how thorny the topic, the reader can follow along.
Ecouterre is "devoted to the future of sustainable fashion design." This design-focused blog's mission is to "to inform, inspire, and encourage innovation" in fashion design. The blog follows "the evolution of the apparel industry toward a more environmentally sound future, as well as facilitate a conversation about why sustainable fashion matters."

What's Yours?
What's your favorite blog that talks about textile sustainability? Share your links with us and we'll publish them in the next issue!
Using AATCC Blue Wool

What’s the Problem?

If you’re familiar with blue wool and just need a status update, this section should tell you what you need to know. If you’re not really sure what blue wool is all about, or have always had some nagging questions, keep reading for historical context and a full explanation.

One relatively recent development is that most of the AATCC blue wool series, which included standards designated L2 through L9, is no longer readily available. Only the L2 Blue Wool Lightfastness Standard is currently available from AATCC—though some suppliers may still have other standards in stock.

A second development should actually make life a little easier! L2 blue wool has traditionally been used to measure 5 AFU. It can still be used this way, but now L2 blue wool can officially be used to measure 20 AFU as well. A 5 AFU test ends when the color of the L2 Blue Wool Lightfastness Standard specimens match the L2 Blue Wool Standard of Fade for 5 AFU, or exhibit a Gray Scale color change of Step 4. A 20 AFU test ends when the L2 blue wool specimens match the L2 Blue Wool Standard of Fade for 20 AFU, or exhibit a Gray Scale color change of Step 2-3.

Revised versions of AATCC Test Methods 16.1, Colorfastness to Light: Outdoor; 16.2, Colorfastness to Light: Carbon-Arc; and 16.3, Colorfastness to Light: Xenon-Arc clarify the use of L2 blue wool for both 5 AFU and 20 AFU tests and are available for purchase from AATCC as downloadable PDFs.

Understanding AFU
Lightfastness testing involves exposing a material to a specified amount of light, then measuring the change in color or other properties of the material.

Since it is difficult or impossible to control variables such as weather or latitude for outdoor tests, and quality of power source for indoor tests, light exposure is not measured in hours or days. (An hour of exposure on a cloudy day is obviously not the same as an hour of exposure on a sunny day.) Instead, light exposure is measured in AATCC Fading Units (AFU). It is important to remember that AFU are independent of time. Exposure to 20 AFU is NOT the same as exposure for 20 hours.

There is no conversion factor for AFU to clock hours, but AFU can be converted to other units for measuring irradiance. An extensive study established 20 AFU at 85 kJ/(m²nm) when measured at 420 nm and tested according to AATCC TM16.3, Option 3.

There is no AFU equivalent to "real world" use either. The real world light exposure of a product in the course of a month, a year, or a decade depends on many variables—how often it is exposed, how directly, for how long, to which light sources, etc.

Lightfastness tests, particularly those using a machine, are laboratory tests. They are not meant to replicate the exact conditions of real world use. Lab tests create a consistent set of conditions that provide a relative measure of lightfastness. If two different specimens are exposed to 20 AFU in a standardized lightfastness test, they will not necessarily exhibit the same color changes in real world use, but the one that performed better in the lab test will probably perform better in actual use as well.

Blue Wool Back Story

AATCC Blue Wool Lightfastness Standards are used to measure AFU. In fact, the definition of AFU is based on the L4 Blue Wool Lightfastness Standard. “One AFU is one-twentieth (1/20) of the light-on exposure required to produce a color change equal to Step 4 on the Gray Scale for Color Change or 1.7 ± 0.3 CIELAB units of color difference on AATCC Blue Wool Lightfastness Standard L4.”

So, when L4 blue wool exhibits a Step 4 color change based on the AATCC Gray Scale for Color Change, it has been exposed to 20 AFU. Period. It doesn’t matter whether this takes two hours, 20 hours, or 22 hours. It doesn’t even matter whether the exposure was to natural sunlight, a carbon-arc lamp, or a xenon-arc lamp.

When is it Done?

In most cases, the desired number of AFU is established ahead of time. Reaching that level of exposure may take some trial and error.

When the L2 blue wool specimens match the color of the L2 Blue Wool Standard of Fade for 5 AFU (or exhibit a gray scale color change of Step 4), test specimens have been exposed to 5 AFU. When those same L2 specimens match the color of the L2 Blue Wool Standard of Fade for 20 AFU (or exhibit a gray scale color change of Step 2-3), test specimens have been exposed to 20 AFU.

The only way to know when this happens is to stop the test and check. It is always better to underexpose and then continue at smaller increments, than to overexpose and have to start over with new standards and new test specimens. A calibration cycle (with no test specimens), or experience with a particular machine, provides a good starting point.

Many newer light machines can be set to run until they reach a specified
irradiance. Blue wool is still used to confirm the exposure, but this feature helps minimize the number of times the test is stopped to check the blue wool color change. As noted above, 20 AFU for AATCC TM16.3, Option 3 is reached at 85 kJ/(m²nm) when measured at 420 nm. The relationship is linear; for example, twice as many AFU (40 AFU) requires twice as much irradiance (170 kJ/(m²nm)).

Even with only the L2 Blue Wool Lightfastness Standard, you can measure nearly any level of exposure. For 10 AFU, run one cycle until the standard specimens match the L2 Standard of Fade for 5 AFU. Then replace the blue wool specimens with new ones (leaving the test specimens untouched) and run until those match the L2 Standard of Fade for 5 AFU.

5 + 5 = 10.
20 + 5 + 5 = 30

Any multiple of 5 AFU can be measured by combining consecutive exposures of 5 AFU and 20 AFU.

20 + 20 = 40
20 + 5 + 5 = 30
...

More about Standards of Fade

A Standard of Fade tells you when Blue Wool Lightfastness Standard specimens have been exposed for the specified number of AFU. Using the correct Standard of Fade is key to a proper lightfastness test.

First, the L designation of the Standard and Standard of Fade must match. Use an L4 Standard of Fade only with L4 blue wool; use an L2 Standard of Fade only with L2 blue wool.

Be sure the lot numbers match. Each lot of blue wool is slightly different, and may even contain different dyes. L2, Lot 8 is not the same as L2, Lot 9. For accurate testing, L2, Lot 8 blue wool must be used with an L2, Lot 8 Standard of Fade.

Choose the right end point. L2 blue wool can be used to measure 5 AFU or 20 AFU. When you determine which way you will use it, be sure to select the corresponding Standard of Fade.

Confused Yet?

This article serves as a very general overview of the most common ways to use lightfastness testing and blue wool. There are multiple options within each test method, and special cases that fall outside any standardized method. Always read the entire method or consult with an expert to be sure testing is performed and interpreted correctly.

To order lightfastness testing methods and supplies:

www.aatcc.org/products
orders@aatcc.org
+1.919.549.3526 Telephone
+1.919.549.8933 Fax

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For questions about using blue wool, contact AATCC Technical Director Diana Wyman; diana@aatcc.org; +1.919.549.3532.

Footnotes

1. TM 16.3, 41.1 (also TM 16.1 and 16.2)
2. TM 16.3, 3.2 (also TM 16.1 and 16.2)