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AATCC NEWS



Association of Textile, Apparel & Materials Professionals



May 5, 2015



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Flammability Requirements for Military Textiles

While the need for flame resistant (FR) fabrics for military textiles has always been prevalent, with the rise of the use of Improvised Explosive Devices (IEDs), the need for innovative and protective FR fabrics has become more urgent for militaries around the world.

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AATCC Committe Meetings

First timer? Old hand? Some tips to keep in mind when attending AATCC Committee Meetings. AATCC Spring Committee meetings will be held May 5-7, 2015 at the DoubleTree by Hilton Raleigh-Durham Airport at Research Triangle Park.

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Student Chapter Awards

AATCC presents Student Chapter Awards to seniors from our Student Chapters, in recognition of their academic achievement and contributions to the chapter, school, or society.

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Sponsorship Opportunity

AATCC is sponsoring a Sustainability Symposium with Zhejiang Sci-Tech University in Hangzhou, China. Check out opportunities to promote your company's products

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2015 STRC Conference

The Southern Textile Research Conference (STRC) next conference will be in Greenville, SC on May 17-19. The theme is Advanced Materials, Textiles and Fibers.

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AATCC Editorial Survey

We want your input on the topics YOU would prefer to read. What issues haven't we covered? What would you like to learn more about?



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UPCOMING EVENTS

[For complete list and updates, visit the AATCC Events page](#)

May 5-7, 2015
May Committee Meetings
Research Triangle Park, NC
[more info](#)

May 17-19, 2015
STRC 2015 Conference
Greenville, SC
[more info...](#)

June 10-14, 2015
The 13th International Wool Research Conference & AATCC Sustainability Symposium
Zhejiang Sci-Tech University
Hangzhou, Zhejiang, China
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September 16-17, 2015
Antibacterial/Odor Conference
Research Triangle Park, NC
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**If you would like to register for an event please contact our [Education Department](#).

Open Enrollment
Textile Fundamentals Web-Based Training
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Getting White Right
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Proficiency Testing Registration

June 3, 2015
Visual Gray Scale for Color Change Evaluation
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Flammability Requirements for Military Textiles

By Dr Nicola Davies

While the need for flame resistant (FR) fabrics for military textiles has always been prevalent, with the rise of the use of [Improvised Explosive Devices](#) (IEDs), the need for innovative and protective FR fabrics has become more urgent for militaries around the world.

But protection from fire is not the only challenge facing designers of military textiles. One of the other heat-related factors that may be impacted by FR design choices is the effect of the fabric on the wearer's [thermal signature](#), which refers to how targetable the wearer will be through near-infrared detection technologies. Some ways of advancing flame-resistance may simultaneously—positively or negatively—affect infrared detectability.



Heat and flame—as well as ballistics—protection are not the only considerations in designing and specifying military uniforms and fabrics. In an interview, researcher [Aravin Periyasamy](#), of the [Technical University of Liberec](#), emphasized, "Damage resistance, comfort, sweat management . . . and the integration of high-tech materials into uniforms" as some of the key parameters for all military textiles.

Current Status Quo in Military Textiles

Methods of flame-resistance fall into four broad categories:

1. Strategic selection and configuration of natural fibers
2. Chemical treatment of natural fibers
3. Development of synthetics
4. Strategic combinations and configurations of synthetics and natural fibers



Chemical treatment of natural fibers have been prone to failure due to laundering or exposure to chemicals in a soldier's working environment. However, processes have been developed to overcome some of this fragility, and militaries do use some of these treated natural fibers, such as in FR treated cotton undergarments and T-shirts.

"Flame-resistance" in relation to textiles for military use doesn't just mean that the fabric resists catching fire. Some popular synthetics such as nylon and polyester actually resist ignition and aren't that easy to light on fire—but they tend to melt under intense heat, whether a flame is present or not. The severe localized burns that result from the hot, sticky melting substance produced can have grave consequences for a soldier in action.

The current state-of-the-art in FR military textiles includes:

- Cross-linked melamine polymers
- Other polymers
- Modacrylics specialty rayon fibers
- Chemically treated cotton and cotton blends
- Polybenzobisoxazole fibers
- Aramids (aromatic polyamides)
- Meta-aramids and FR viscose
- FR treated cotton
- Polybenzimidazole fibers

FR Testing

For military textiles, many countries may specify [ISO](#) (International Organization for Standardization), [ASTM](#) (American Society for Testing and Materials), or [ANSI](#) (American National Standards Institute) standards for FR testing of their fabrics. For example, ASTM D6413/D6413-13b, a vertical flame test for flame resistance of textiles, is cited in many military specifications.

Future Trends



One laboratory has reported that in a recent set of experiments, a 50/50 blend of wool and aramid outperformed many current FR textiles in terms of strength-to-weight ratio, durability, and comfort. The blend would also easily meet camouflage and anti-infrared-detection standards.

Some of the keys to these results were: (a) coaxing longer staple lengths out of the wool by using a long-staple worsted spinning system, and (b) removing the scales of the wool through the acid "superwash" process. Periyasamy envisions that going forward, "Better results will come from nano-technology-based flame resistance."

With greater accessibility of sophisticated near-infrared detection and targeting—and the many openings for improvements in comfort, durability, and cost—there is a clear need for continued development of heat and flame resistance for military textiles.

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Student Chapter Awards

Part 2

Read Part 1 [here](#)

AATCC presents Student Chapter Awards every year to graduating seniors from our Student Chapters to be recognized for academic achievement and contribution to the chapter, school, or society. AATCC presents each chapter award winner with a certificate and a copy of *Color Vision and Technology*. Winners also receive one year of free Student Membership in AATCC as they start their careers. Be sure to congratulate these outstanding AATCC student members!

NED University

Tahreem Beg is a textile major and maintains a 3.802 GPA. NED University AATCC Student Chapter advisors Muhammad Dawood Husain and Fareha Asim say that Beg has performed well consistently. "She secured the first position in three of eight semesters and an overall second position in her BE Textile Program," says Husain. In her second semester, she was awarded a merit scholarship by the university. "I acted as an advisor of her final year engineering design project," says Husain. "She performed very well in the final presentation, exhibiting excellent ability to understand difficult concepts quickly and be able to explain them. [She] has proved her mettle time and again with her academic excellence alongside the various exposures to the corporate world." Beg participated actively in all of the events organized by the Textile department of NEDUET. She was also Deputy Head of Marketing for the AATCC NED Student Chapter, helping to organize the Career Seminar 2014 and organizing the AATCC Student Chapter's participation at the First NED International Textile Conference (ITC).



Philadelphia University

Rebecca Flax is a textile design major with a 3.699 GPA. She will be continuing her studies at Philadelphia University while pursuing a Master's degree in textile design. Philadelphia University AATCC Student Chapter advisor Janet Brady says "She is a talented student very worthy of this award." Flax worked Open House events on campus, routinely supports other students in the Textile Design Studio by assisting with questions they have regarding computer systems, equipment issues, etc., and tutored for both Dyeing and Finishing and Textile Production I classes for two years. She was selected to represent the TD UG program at The Barnes Foundation, First Sundays "Textiles." Flax exhibited and presented her textile design work to interested museum attendees. She was also selected to exhibit her textile design work at the PHS Philadelphia Flower Show in Spring 2014. A floral designer created an arrangement in response to Flax's textile work. Flax was selected to participate in a WITHIT conference, which is a group of women in the textile and home fashions industries. She also won a scholarship to serve as a student assistant at the HGA international conference Convergence 2014 in Providence RI.



University of California, Davis (UC Davis)



Brenda Zarate majors in textiles and clothing, with an economics and marketing emphasis and maintains a GPA of 3.919. AATCC Student Chapter Advisor You-Lo Hsieh says that Zarate's academic track record includes 14 A-plus grades, "a truly outstanding academic achievement! Her A+ grades are in subjects ranging from economics, cultural anthropology to



textile science. Furthermore, she will graduate with a BS degree in three years!" Zarate will graduate with highest honors from UC Davis this spring. Besides excelling academically, Zarate has been active in organizations in and outside of the university. She has volunteered to help with children's art as well as second hand clothing in the community. She has volunteered in UC Davis' annual Picnic Day Tie Dye event. In addition, Hsieh says Zarate "plans to join a women's cooperative program in Peru to improve the economic viability of women in their textile and apparel work."

University of Rhode Island (URI)

Rachal Mathies is a double major in textiles and Italian, and is also earning a minor in economics, with a 3.75 GPA. She spent a semester in Florence, Italy. According to URI AATCC Student Chapter advisor Martin Bide, "In addition to being a talented student, Rachal is also an excellent practical textile chemist. She has carried out work in the university's textile science laboratory as part of several ongoing projects. Her work is careful and reliable."



Virginia Institute of Technology (Virginia Tech)



Kelsey Smith is a double major in fashion merchandising and design and multimedia journalism with a 3.7 GPA, who has been named to the Dean's List every semester. Smith was chosen for an independent study as AATCC Student Chapter advisor, Jessie Chen-Yu's teaching assistant for Apparel Textiles Lab in Fall 2013. As a Virginia Tech Cheerleader, Smith received the All-Academic Award in 2012 and 2013 for having the highest GPA on the Cheerleading Team. She currently serves as co-captain of the Virginia Tech Cheerleading Team, and has been a part of the program throughout all four years. Smith was also involved in several community service efforts on campus including The Big Event at Virginia Tech and Relay for Life. As a member of Alpha Chi Omega Sorority, Smith served as Intellectual Development Chair for a semester and worked with several philanthropic organizations, including the Women's Resource Center of the New River Valley.

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