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AATCC NEWS



Association of Textile, Apparel & Materials Professionals



March 17, 2015



International Conference

Savannah, GA, USA

March 24-26, 2015



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Engineering Parameters for Aerospace Textiles

Textiles are key engineering components of today's fighter jets, commercial airliners, private planes, rockets, space-shuttles, and helicopters. The engineering parameters for aerospace textiles comprises a vital consideration of dimensional stability, with a specific focus on stiffness to weight ratio and stability under temperature extremes.

[More info...](#)

Selecting a Testing Lab, Part VI Continuing Education

Choosing a textile testing lab is a common challenge. This installment of the series addressing important factors in making a lab selection covers Continuing Education. Previous installments look at [Lab Affiliation](#), [Proficiency](#), [Specialized Services](#), [Calibration](#), and [Test Method Development](#).

[More info...](#)



Reasons to Attend AATCC's IC in Savannah, GA

Not registered for our upcoming International Conference? Here are two reasons why you should attend: [Exceptional Speakers](#) and a [Keynote presentation](#)

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Textile Trivia

Test your wits against other AATCC members in our Textile Trivia game. Answer correctly by March 31 to be entered for a drawing for an Amazon Gift Card.

[More info...](#)



C2C® Merchandising Competition

Reminder: Student Entries for the C2C® Merchandising Competition are due April 29th!
More info...



UPCOMING EVENTS

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

March 24-26, 2015
 2015 International Conference
 Hilton DeSoto, Savannah, GA
[more info..](#)

March 27, 2015
 Northwest Section Meeting
 Portland, OR
[more info..](#)

April 23, 2015
 11:00 AM (EDT)
 Weaving Compliance and Regulatory Requirements into Textile R&D Webinar
[more info...](#)

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
[more info..](#)

September 16-17, 2015
 Antibacterial/Odor Conference
 Research Triangle Park, NC
 Mark Your Calendar!

**If you would like to register for an event please contact our [Education Department](#)

Student Competition Deadlines

April 9, 2015
 C2C® Student Design Competition
 Entries Due
[more info...](#)

April 29, 2015
 C2C® Student Merchandising Competition
 Entries Due
[more info..](#)

Open Enrollment
 Textile Fundamentals Web-Based Training
[more info...](#)

Online AATCC Test Method Training
[more info...](#)

AATCC Recorded Webinars
[more info...](#)

Getting White Right
[more info...](#)

Proficiency Testing Registration

April 4, 2015
 Water Resistance/Repellency
[more info..](#)

May 5, 2015
 Colorfastness
[more info..](#)

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March 17, 2015

Engineering Parameters for Aerospace Textiles

By Nicola Davies

The wings and fuselage of the plane with which the Wright brothers achieved the first *powered* flight used plain woven cotton (muslin), stretched over a wooden frame. Textiles have continued to play a vital—and continually evolving—role in aeronautics since those pioneering efforts over a hundred years ago. In fact, textiles are key engineering components of today's fighter jets, commercial airliners, private planes, rockets, space-shuttles, and helicopters.

There are obvious applications, such as seat covers, parachutes, safety belts, floor coverings, evacuation slides, and space suits. However, bulkheads and other interior structural elements are also often provided by textile reinforced composites. Furthermore, textiles continue to play a key role in core aerospace applications, including: helicopter rotor blades; brake linings; composite fire barriers; engine cowls; gaskets and seals; filament-wound pressurized oxygen tanks; rocket nozzles; and, landing gear doors.



Dimensional Stability—Stiffness to Weight Ratio



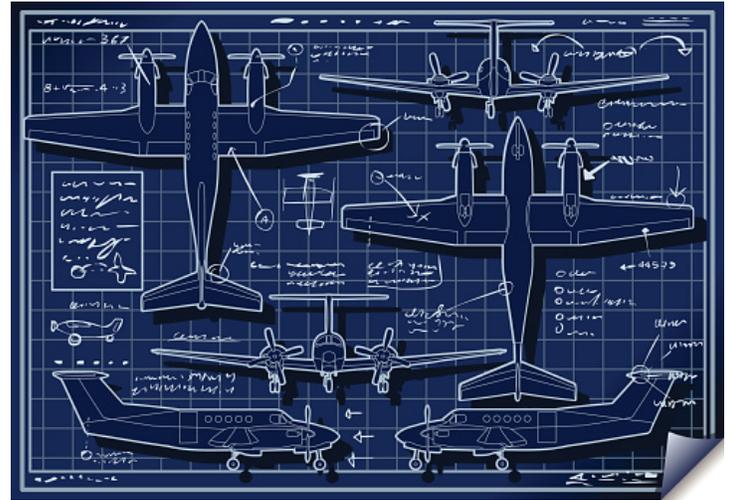
Professor Aravin Periyasamy, textile technologies researcher and scholar, believes the greatest area of need for advancements in aerospace textiles and fabrics is simply the "production of lightweight space vehicles." This is one of the primary objectives of structural textiles—not just for space travel, but for commercial airliners, helicopters and all other aerospace applications—a favorable ratio of stiffness to weight. "Stiffness" must be distinguished from "strength." For example, steel's strength to weight ratio is higher than that of aluminum, but its *stiffness* to weight ratio is lower. Steel is more elastic.

While using thin steel for a stronger and lighter aileron than one made of aluminum would indeed result in an aileron that wouldn't be likely to tear or break, it also has its drawbacks. For one, it would bend under stress more easily than an aluminum aileron of equal weight, defeating some or all of the intended aerodynamic effect, and resulting in poor control of the aircraft.

Composites such as carbon-fiber, glass-fiber, alumina-fiber, boron-fiber, silicon-carbide-fiber, graphite-fiber and aramid-fiber reinforced polymers have higher ratios of stiffness to density than metals and other materials.

Stability Under Temperature Extremes

Fire protection is important for some aerospace textile functions, but dimensional stability in the face of extreme temperatures is particularly crucial. A moving part that changes size or shape with temperature won't continue to function adequately. Textiles are also used for gaskets and other applications where dimensional stability is essential to maintaining a seal.



Textiles used on the exterior of space-faring craft need to accommodate very low temperatures (approaching zero degrees when the craft is in open space), as well as potential extremes of high temperature. Certain parts of airplanes are also subject to wide temperature variations. Resistance to temperature extremes is especially important if the space craft are designed to re-enter the earth's or another planet's atmosphere at a high velocity. Indeed, a textile-based composite, Nomex, is used to protect the entire space craft and occupants from this heat extreme.

Polybenzimidazole and alumina-boria-silica textile composites are among other fiber-reinforced polymers with excellent temperature-related parameters. 3M Nextel Aerospace fabrics, for example, maintain integrity at temperatures up to 2000°F.

Other valuable qualities for aerospace textiles include low electrical conductivity, sound insulation, thermal insulation, and corrosion resistance.

The engineering parameters for aerospace textiles comprises a vital consideration of dimensional stability, with a specific focus on stiffness to weight ratio and stability under temperature extremes. However, the role of textiles within aeronautics continues to evolve and it will be interesting to see how new innovations will contribute to aerospace engineering.

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March 17, 2015

Selecting a Textile Testing Lab, Part VI

There are many options for textile testing and it isn't always easy to find a lab perfectly suited to your needs. This series of articles touches on some of the questions to ask—of yourself and of the lab—before making your choice.

Continuing Education

As new technology emerges—in materials and in testing—a lab with access to current information can be a valuable resource. As with issues of [Proficiency Testing](#) and [Calibration](#), addressed in previous sections of this series, education *must* be ongoing.



As a customer, it can be encouraging to know that a technician has been doing the same type of testing for many years. On the other hand, most training probably occurred in the first weeks or months of working in a particular area. Be sure that in addition to practical experience, technicians at your chosen lab are aware of recent test method updates. Ongoing education also means knowing if and how traditional test methods can be applied to new materials.

The same is true for other lab staff. Whether you deal directly with the technician performing your tests, a customer service representative, or an account manager, continuing education for lab staff means the full benefit of industry advancements for the customer. It may also mean dealing with fewer bad habits and misunderstandings around testing that can accumulate over time.

Continuing education can take many forms, from advanced university degrees to online webinars. AATCC offers a variety of resources to help individuals stay current on industry issues. Read on for more information about the continuing education opportunities available through AATCC. And ask your lab if staff regularly attend these types of workshops, symposia, webinars, or online training programs to keep current.

Workshops



Testing workshops provide new technicians, or those just looking to refresh their knowledge, an in-depth look at common AATCC and ASTM textile test methods. Most workshops include a hands-on component, as well as background and explanation of the methods. One- to two-day workshops are held at the [AATCC Technical Center](#), at training facilities [around the world](#), or at a [location of your choice](#). On-site training can even be customized to include the specific test methods used most by a particular lab.

Conferences

For more specialized learning, several AATCC [conferences](#) are held each year, on current industry topics. Recent topics have included water resistance and moisture management, and processing fabrics with spandex. At these events, attendees hear about new technologies and current issues from a diverse panel of experts from industry and academia.



The [AATCC International Conference](#) covers a much broader range of topics. This conference includes three days of three simultaneous tracks, with presentations ranging from marketing to novel materials. While every speaker may not address topics relevant to every attendee, everyone gets a good overview of new developments and new perspectives.

Online Training

Textile Fundamentals Demo

THE TEXTILE INSTITUTE
EDUCATION FOR ECONOMIC
DEVELOPMENT CENTER

→ INDEX

- Textile Fibers
- Spun Yarn Manufacturing
- Warp Preparation
- Weaving Fundamentals
- Knitting**
- Removens
- Fabric Preparation
- Color and Color Properties
- Dyestuffs and Dyestuff Applications

Knitting

For those who can't travel to industry events, AATCC offers online training modules on the textile

production process and specific test methods. There are currently 14 modules in the [Textile Fundamentals](#) series, addressing topics from fibers to printing and finishing. Upon successful completion of any module, a certificate is jointly issued by AATCC and the North Carolina State University College of Textiles. There are four [Test Method Training](#) modules, covering 11 test methods and six evaluation procedures. All online courses include video and animation as well as narration.



Webinars

Webinars are a great way to keep up with trends and technology with a minimum investment of time or money. Most webinars are only an hour or two long. In addition to periodic live webinars, anyone can access recorded versions of previous [AATCC webinars](#). Presenters have even agreed to answer questions from participants viewing the recordings well after the original presentation.

Publications

Sometimes the best way to learn is by reading. Books, magazines, journals, and online resources for textile information abound. Large selection is one of the definite advantages to this form of education. Individuals can select the publications focused on the specific information they wish to learn. This can even mean reading only select articles or sections, rather than reading cover to cover. Readers can proceed at their own pace, reviewing sections of particular interest and skimming those of less importance.



AATCC publishes [AATCC Review](#) on a bimonthly basis, with all past articles available in a members-only online searchable archive. This magazine includes industry news as well as articles on a variety of subjects, including new research.



The [AATCC Journal of Research](#) is a peer-reviewed online journal. While the title is relatively new, the journal itself dates back to 1969, when AATCC first published peer reviewed research in *Textile Chemist & Colorist*. Content from all the various titles is included in the searchable archive.

Besides subscription publications, AATCC supplies a number of books and proceedings. Some are available as downloadable files for immediate access and portability. Others are hard-bound books designed to be a lasting reference source. Still others fall somewhere in between—paperback books, ring-bound notebooks, CDs, and more.

With so many educational opportunities available, don't be afraid to ask how lab staff are expanding their knowledge of testing to better support their customers.

Next...Customer Service

Look for more articles in the "Selecting a Textile Lab" series. Read Part I on [Lab Affiliation](#), Part II on [Proficiency](#), Part III on [Specialized Services](#), Part IV on [Calibration](#) and Part V on [Test Method Development](#). The next article will appear in the **April 21** newsletter. If you have questions or comments about this series, please contact AATCC Technical Director, [Diana Wyman](#)