



### UV Protective Textile Labeling

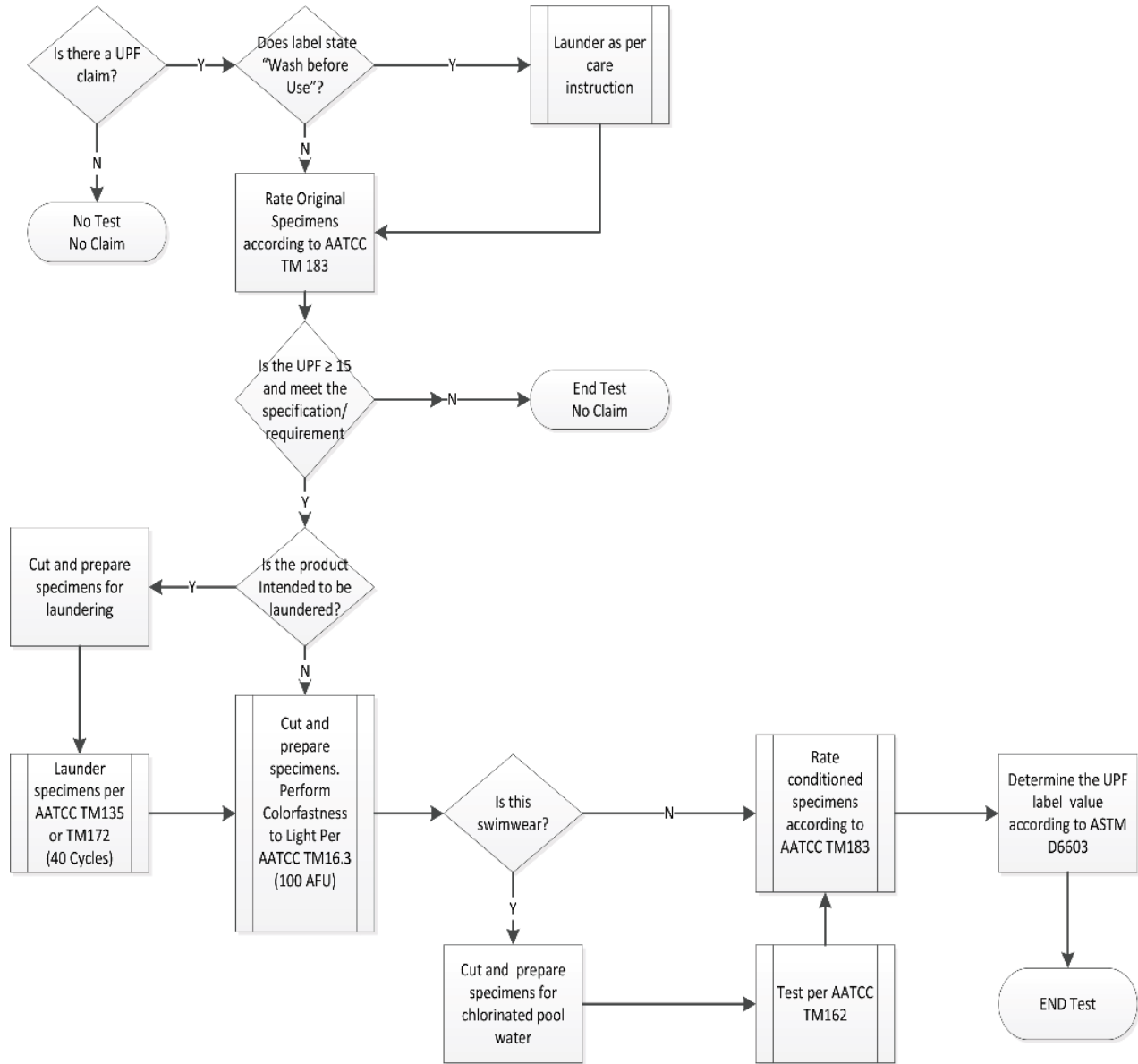
Manufacturers and producers of UV protective textile materials and/or products must be aware of the proper existing standards and test methods to meet published voluntary standards for labeling UV protective clothing for the United States. There are three (3) published voluntary standards that should be used in conjunction with each other for proper labelling. The are as follows:

- AATCC TM183 Test Method for Transmittance or Blocking of Erythemally Weighted Ultraviolet Radiation through Fabrics
- ASTM D6544 Standard Practice for Preparation of Textiles Prior to Ultraviolet(UV) Transmission Testing
- ASTM D6603- Standard Specification for Labeling of UV-Protective Textiles

To summarize at a high level, these standards are used in conjunction with one another to develop the proper UPF values to appropriately label products as “UV Protective.”.

- A. Evaluate UV transmission of original specimen (“unprepared”) or (“laundered once”) specimen using AATCC TM183. The value reported is the mean TM183 UPF value.
- B. Refer to ASTM D6544 to determine the exposure conditions depending on the product end use. After subjecting the specimens to the specified exposure conditions of ASTM D6544, evaluate UV transmission using AATCC TM183. The specimen is referred to as the “prepared-for-testing” specimen.
- C. Refer to ASTM D6603 for additional calculations. Classifications for labeling UPF value are also outlined in ASTM D6603.

The following flowchart outlines the proper use of the three standards.



## Historical Background

During the mid-20th century, cultural values emphasized tanned skin as healthy and beautiful. Consumer products companies developed lotions and sprays to promote tanning in the sun and eventually those companies introduced sunscreen lotions with claims of their ability to allow longer sun exposure before sunburns occurred. Generally, people were uninformed about the possibility of permanent and long-term skin damage and associated health risks caused by ultraviolet (UV) radiation from the sun. Higher incidents of skin cancer were occurring in places with long, sunny seasons such as Australia, the southwestern United States, and for those vacationing or with summer homes in sunny climates. By the early 1990s, increased skin cancer rates drew the attention of health professionals, researchers, consumer products companies and standards-developing organizations.

The companies making tanning and sunscreen products had developed a system for rating sun protection for marketing purposes and to provide consumers with information about product expectations and performance claims that became widely used. Sun Protection Factor, or SPF, ratings are intended to provide consumers with a way to judge sun protection when using sunscreen products. For example, a sunscreen lotion with a SPF 30 rating claims to provide a person with the blocking of UV-R radiation (280-400 nm wavelengths) for 30 times longer than a person not using the sunscreen lotion.

As the textile industry became interested in providing UV protection, extensive and intensive discussions ensued. In the United States, these discussions occurred within MTCC Committee RA106 UV Protective Textiles Test Methods and ASTM Subcommittee D13.65 UV Protective Fabrics and Clothing. Interested parties in the discussions were manufacturers of spectrophotometers and spectroradiometers, standards-developing organizations, fabric manufacturers and consumer product companies. The challenges were focused not only on how to measure the transmission or blocking effectiveness of materials and finishes applied to fabrics but also what data were necessary to correlate instrumental measurements to human exposure results. A further complexity was how to prepare textiles for testing, such as laundering, as it is related to the durability of UV protective finishes. However, the key issue was, should fabrics use the same rating system as the one already in use by sunscreen products.

AATCC Test Method 183 Transmittance or Blocking of Erythemally Weighted Ultraviolet Radiation through Fabrics has been reaffirmed and revised several times since it was first published in 1998. It serves as the standard methodology for the measurement of UV transmission and is the basis for textile UV labelling. As AATCC does not develop performance specifications or labelling standards, ASTM Committee D13 on Textiles and Subcommittee 013.65 for UV Protective Fabrics and Clothing worked for many years to develop two companion UV standards. ASTM 06544 Standard Practice for Preparation of Textiles Prior to Ultraviolet (UV) Transmission Testing and ASTM D06603 Standard Specification for Labelling of UV-Protective Textiles were both published in the mid-2000s.

Consensus was reached by the experts, many of whom participated in both AATCC and ASTM committee activities, to create a different rating system for UV protective fabric and apparel. The collective wisdom was that a rating system for fabrics and clothing manufactured for meeting UV protection claims should be different than the one used for skin products, to help consumers avoid the confusion of a rating system that applied to both. For this reason, the rating system of Ultraviolet Protection Factor (UPF) was created.