Science of Ultra-Fresh – Bacterial Test

Every article that is marked with the Ultra-Fresh brand has undergone an extensive period of testing to ensure the article is being treated correctly to inhibit bacteria, fungi or both. Some Ultra -Fresh treatments also inhibit the growth of algae, yeast and dust mites.*

All of the tests run in the TRA laboratories use standard international test methods approved by recognized textile organisations. We also perform a range of tests developed by various governments and major international corporations.

When Ultra-Fresh is on the label, you know your product is protected!

Antibacterial Test (AATCC 147)

This is a standard test, approved by regulatory agencies, called AATCC Method 147.

The Ultra-Fresh-treated sample is pure cotton, and the test will measure how effectively it will prevent *Staphylococcus aureus*, bacteria found on the human skin, from growing.

The test is carried out on a Petri plate coated with agar. (Image 1)

The microbiologist prepares the plate by streaking five lines of a liquid solution containing live bacteria across the surface of the agar. At this point the lines look like water. (Image 2)

A small piece of the cotton sample is placed over the live bacteria. (Image 3)

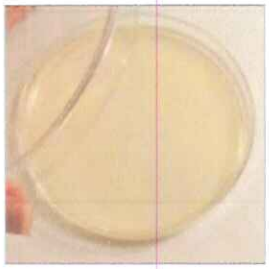

Image 1 - click to enlarge

Image 2 - click to enlarge

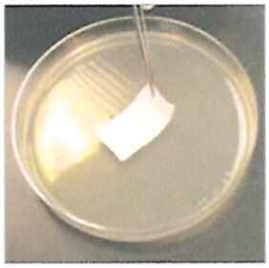

Image 3 - click to enlarge

The Petri plate is placed in an incubator, set at 37ºC, for 24 hours. Agar provides nourishment for the bacteria. Warmth, moisture and food should encourage the bacteria to spread fast.

The following day, the microbiologist removes the Petri plate and checks whether the bacteria beneath the sample has grown or not.

The sample in the right hand plate (Image 5) had been correctly treated with Ultra-Fresh, and for comparison we show you one that had not been treated (Image 4). The yellow streaks are lines of bacteria that have grown so thickly that we can actually see them.

The Ultra-Fresh treated sample has no streaks of bacteria growing beneath it, or even close to it. Unbroken streaks of bacteria can be seen beneath the untreated sample.

Untreated

Image 4 - click to enlarge

Treated

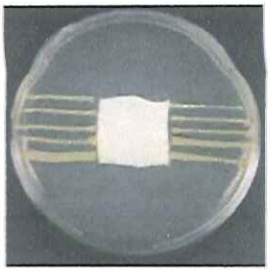

Image 5 - click to enlarge

**Please note that, while the use of Ultra-Fresh products as an aid in the protection of human health is permitted in many countries around the world, the current Ultra-Fresh registrations in some countries only permit antimicrobial product treatment claims which are related to the protection of the treated article and not to human health.*

Ultra-Fresh products are sold globally, but not all the information on this web site may apply in all countries. Local legal requirements may limit which Ultra-Fresh products are available, how they may be used and what claims may be made for our products and for treated articles. If you have questions about requirements in your country or in the countries where your treated articles may be sold please contact Thomson Research Associates for assistance. Ultra-Fresh products should be distributed, sold and used only in accordance with government regulations and the specifications on their labels.

Science of Ultra-Fresh – ISO Test

Quantitative Bacterial Testing

The AATCC Method 147 and AATCC Method 30 tests give either a pass or a fail result, which is often all that is required.

As an example of the many other types of test carried out in the TRA laboratories, here is one that measures the number of bacteria on an Ultra-Fresh treated sample when compared to one that is untreated. This is the ISO 20743:2007 quantitative analysis.

In a quantitative test a known amount of bacteria is put onto both an Ultra-Fresh treated sample and onto an untreated sample. The samples are incubated for 24 hours to allow the bacteria time to grow.

After 24 hours, the samples are shaken in a liquid solution to remove all of the bacteria from the samples. The liquid is then tested to see which sample had the highest bacterial counts. Here is an image of a typical result.

This photo shows a 99% reduction in bacteria.

The Ultra-Fresh treated sample had roughly 2 million fewer bacteria than the untreated.

Science of Ultra-Fresh – Antifungal Test

Antifungal Test AATCC Method 30

A standard antifungal test procedure is used here, *AATCC Method 30*. The material being tested is 100% cotton, treated with Ultra-Fresh. The fungus used to test it is *Aspergillus niger*, commonly found in the environment.

The test for antifungal properties starts out with a Petri plate carrying a layer of agar, containing nutrients that will support fungal growth. The microbiologist places a small piece of the sample on its surface. (Image 1)

A solution containing spores of Aspergillus niger is dropped onto the Petri plate and sample. (Image 2)

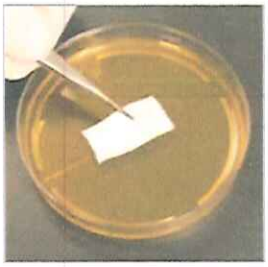

Image 1 - click to enlarge

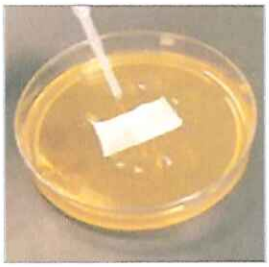

Image 2 - click to enlarge

The plate is placed in an incubator, set at 28ºC, for 7 days. Fungi grow more slowly than bacteria; these conditions encourage optimal growth.

The following week, the microbiologist removes the plate from the incubator and assesses the situation.

In the right picture is an Ultra-Fresh treated sample (Image 4), the other, shown for the sake of comparison, is untreated (Image 3). This particular fungus causes mildew, which shows on the plates as a brown fuzz.

The sample treated with Ultra-Fresh (Image 4) has no fungus growing on it, or even close to it. The untreated sample, however, has done nothing to slow down the growth of the fungus.

Untreated

Image 3 - click to enlarge

Treated

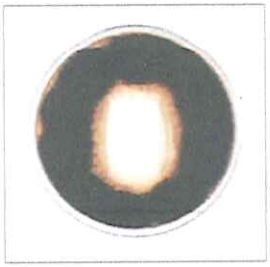

Image 4 - click to enlarge
