UV resistance

Technical Bulletin 370904

Ingeo™ Fiber Outperforms Other Synthetics in Resistance to UV Light

Made entirely from annually renewable resources such as corn, Ingeo™ fibers have the performance advantages of both natural and synthetic materials. Additionally, the performance benefits of Ingeo are inherent in the fiber, requiring no treatment or finish. The performance will not diminish or fade after washings or over time.

Test #1, Fabric Exposure

exposure method - AATCC 16E

Xenon light source
Continuous light cycle, no water spray
Black panel temperature (63 ± 1 ° C)
Dry bulb temperature (43 ± 2° C)
Relative humidity (30 ± 5%)

samples

PLA: 1.2 d staple, Ne 20/1 ring spun yarn, 41.6 in/course, single jersey knit tube sleeves

PET: Ne 18/1 open end spun yarn, 41.6 in/course, single jersey knit tube sleeves

Acrylic: Ne 18.7/1, 41.6 in/course, single jersey knit tube sleeves

measurements

Burst strength vs. exposure time (ASTM D3787)

Molecular weight vs. exposure time (GPC)

Color change vs. exposure time (HunterLab Colorimeter)

procedure

Spun yarns knitted on FAK sample knitter

Samples washed in hot water/cold rinse (no detergent)

Samples cut into 6” x 6” specimens

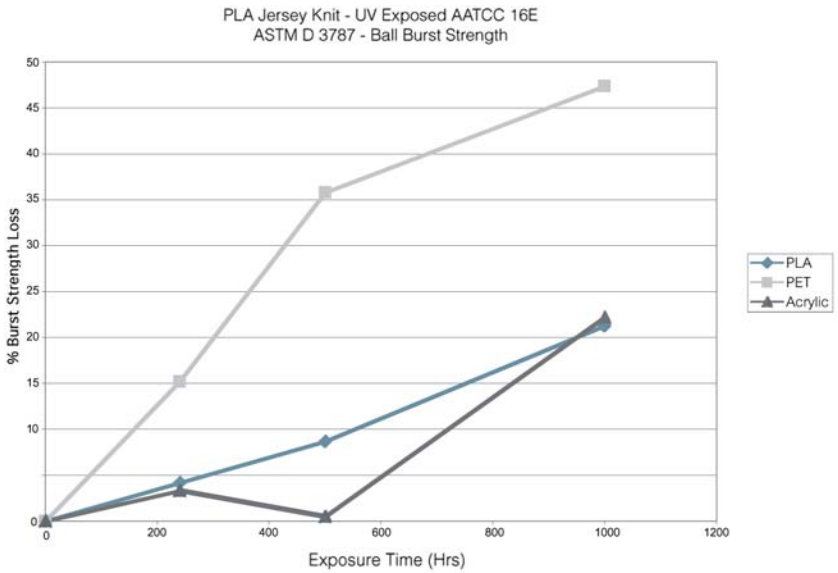
Specimens placed between two black cardboard cutouts

Front exposure window 4” x 4” to UV light, with solid back piece

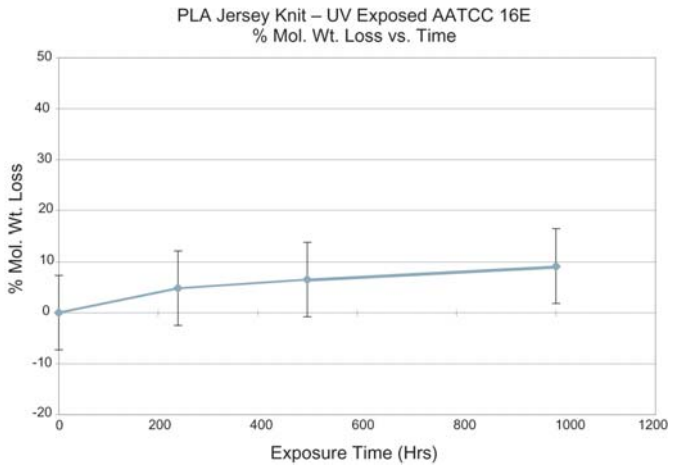
Atlas weatherometer used for UV light exposure

Specimens pulled at 240, 500 and 1000 hours exposure

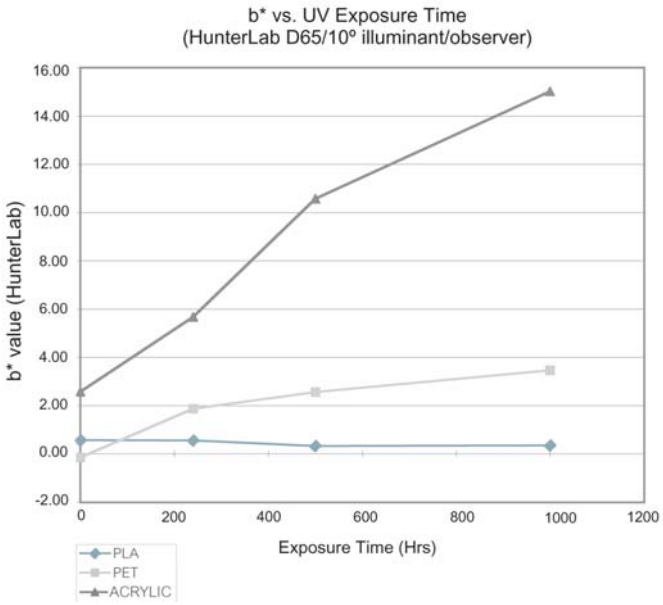
burst strength results

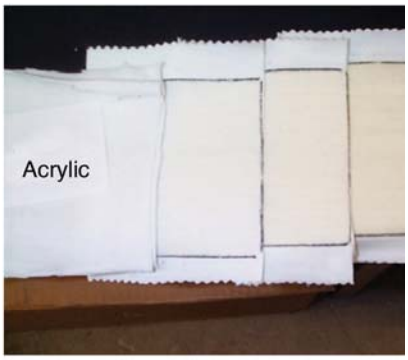


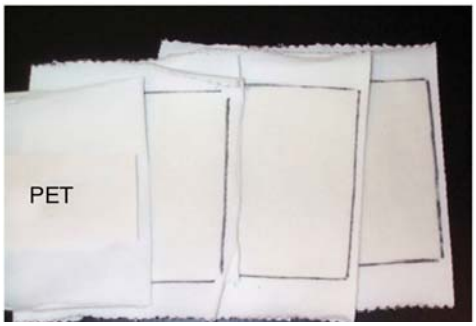
percent molecular weight loss results



HunterLab colorimeter results







conclusions

PLA and acrylic had similar burst strength loss. PET had the worst in the study:

PLA	(-21.3%)
PET	(-47.4%)
Acrylic	(-22.2%)

The PLA sample had about an 8% molecular weight loss over the 1000 hour exposure time period. This is 0.7% outside the error of the instrument.

The acrylic had the greatest change in color, as measured by the HunterLab Colorimeter over the 1000 hours exposed. PLA had the lowest change.

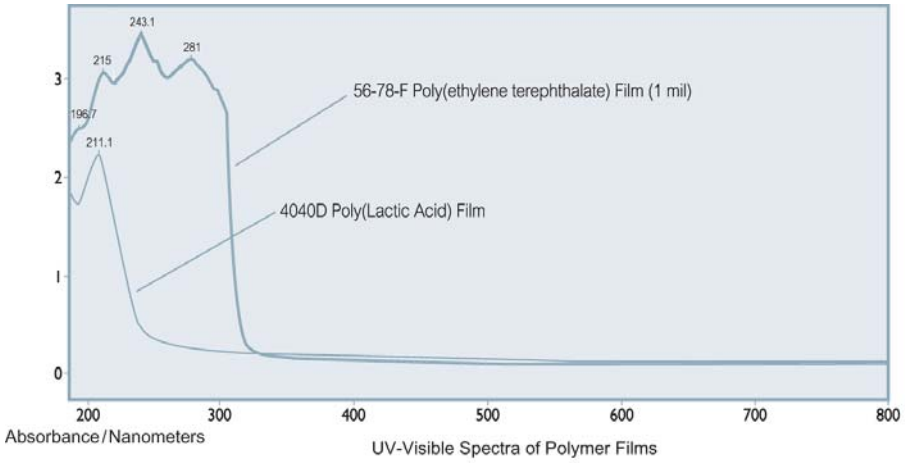
Test #2, PLA Film UV Absorbance

test

Samples of polyester and PLA films were used for the testing. The samples were positioned in an absorbance UV/Visible Spectrophotometer to test the ultraviolet performance. The percentage of absorbancy and transmittance was determined, as a function of wavelength, in the range of 200 to 800 nanometers. The samples were plotted together and compared as a function of wavelength. Comparisons were then made at critical wavelengths that represented typical fluorescent and sunlight.

results

Recent internal testing shows that Ingeo fibers are resistant to ultraviolet light. Ingeo fibers remained unaffected through changing levels of UV light while polyesters have high absorption levels.



UV-Visible Spectra of Polymer Films

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