AUBURN UNIVERSITY

Polymer & Fiber Engineering

Physical Testing Laboratory

Polymer and Fiber Characterization

Testing Services
2007/2008
Contact & Shipping Information

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- All testing performed in accordance with ASTM and AATCC test methods, where applicable. The customer may specify the standard method of testing.
- Estimates of charges for testing or services quoted upon request.
- Discounts may apply to large orders, please call for a quote.
- All sample excess and waste become the property of Auburn University unless their return is specifically requested by the customer.
POLYMERS AND COMPOSITS TESTING

Many tests are available for polymers and composites at large, such as:

- Strength of polymers and composites
- Impact test for composites
- Dynamic Mechanical Analysis (DMA)
- Thermal Analysis (DSC and TGA)
- Yarn Heat-set Temperature
- Rheology (Viscosity at various strain rates and temperatures)
- FTIR/Raman
- Atomic Force Microscopy (AFM)
- Air/Gas permeability: FRAZIER, GURLEY, CSI, and LYSSY
- Porosity: PMI Porometer CFP-1200A

Please contact us for more details.

FIBER TESTING

The available tests for materials in fiber, yarn or fabric forms are:

FIBER IDENTIFICATION

ASTM D276: “Identification of Fibers in Textiles”
AATCC20:” Fiber Analysis: Qualitative”
Identifying the fibers from textile materials using microscopy, chemical and/or physical analyses as needed.

FIBER CONTENT

ASTM D629: “Quantitative Analysis of Textiles”
AATCC20A:” Fiber Analysis: Quantitative”
Determining the percentage of a specific fiber in a blend (fiber, yarn, and fabric)
The available tests for fibers only are:

HVI (High Volume Instrument)
Measuring the cotton fiber length, uniformity, strength, elongation, maturity, moisture content, color, and trash and Micronaire using USTER HVI SPECTRUM

AFIS (Advanced Fiber Information System)
ASTM D5866: “Neps in Cotton Fibers (AFIS-N Instrument)”
Determining the average measures of cotton fiber length, fineness in mtex, maturity ratio, neps, dust, and trash content using USTER AFIS

CRIMP FREQUENCY and LENGTH
ASTM D3937: “Crimp Frequency of Man-Made Staple Fibers”
Determining the average length, crimp frequency, and crimp index measured manually on single fibers

FIBER STRENGTH
Measuring the breaking strength, and elongation using the INSTRON or FAFEGRAFH

FIBER DENIER
ASTM D1577: “Linear Density of Textile Fibers”
Measuring the denier and/or diameter of fibers tested on VIBROMATE and/or under microscope

SHIRLEY ANALYZER
ASTM D2812: “Non-Lint Content of Cotton”
Determining the non-lint content of cotton based on the separation of lint and foreign matter for a 100 gram sample

MOISTURE REGAIN/CONTENT
ASTM D2654: “Moisture in Textiles”
Measuring the percentage of moisture reabsorbed by a dried material
YARN TESTING

The available tests for yarns are:

SINGLE END YARN STRENGTH

ASTM D2256: “Tensile Properties of Yarns by the Single-Strand Method”
  Measuring the breaking strength, percent elongation, modulus, and breaking
toughness using the INSTRON or the USTER TENSORAPID3

YARN STRENGTH BY SKEIN METHOD

ASTM D1578: “Breaking Strength of Yarn in Skein Form”
  Determining the yarn count and break factor on 120 yard skeins

EVENNESS

  Measuring the CV%, imperfections, and count defects of yarn, roving, or sliver
  using USTER3 Evenness Tester

YARN ABRASION

  Determining the number of yarn abrasion to failure cycles on ZWEIGLE or on SULZER-
  RÜTI abrasion testers

YARN NUMBER

ASTM D1907: “Linear Density of Yarn (Yarn Number) by the Skein Method”
  Measuring the yarn number on 120 yard skeins

YARN TWIST (Turns per Inch)

ASTM D1422: “Twist in Single Spun Yarns by the Untwist-Retwist Method”
  Measuring the yarn twist using SUTER Twist Tester

YARN HAIRINESS

ASTM D5647: “Measuring Hairiness of Yarns by the Photo-Electric Apparatus”
  Measuring the hairiness distribution from 2 to 25 mm hair long of 100 meters of
  yarn on the ZWEIGLE G565 Hairiness Tester
FABRIC TESTING

The available tests for fabrics are:

FABRIC WEIGHT

ASTM D3776: “Mass per Unit Area (Weight) of Fabric”
Measuring the fabric weight per square yard or square meter using Cutting Die and Balance

FABRIC THICKNESS

ASTM D1777: “Thickness of Textile Materials”
Measuring the fabric thickness on the TMI Precision Micrometers

FABRIC COUNT

ASTM D 3775: “Fabric Count of Woven Fabrics”
ASTM D 3887: “Tolerances for Knitted Fabrics”
Counting the number of ends and picks or courses and wales in one square inch of fabric

YARN NUMBER FROM FABRIC

ASTM D1059: “Yarn Number Based on Short-Length Specimens”
Measuring the yarn number of yarns which have been removed from a fabric sample

AIR PERMEABILITY

ASTM D737: “Air Permeability of Textile Fabrics”
Measuring air flow through the fabric in cubic feet of air passing through square foot of fabric per minute

PILLING (Random Tumble Method)

ASTM D3512: “Pilling Resistance and Other Related Surface Changes of Textile Fabrics: Random Tumble Pilling Tester”
Evaluating the fabric resistance to the formation of pills and other related surface changes compared to standard pictures
FABRIC STRENGTH TESTS

GRAB STRENGTH

ASTM D5034: “Breaking Strength and Elongation of Textile Fabrics (Grab Test)”
Measuring the strength of a 4” x 8” pieces of fabric in both warp and filling directions on the INSTRON using 1 inch wide clamps

STRIP STRENGTH

ASTM D5035: “Breaking Strength and Elongation of Textile Fabrics (Strip Method)”
Measuring the strength of a 1” x 8” raveled pieces of fabric in both warp and filling direction on the INSTRON or TENSORAPID

ELMENDORF TEAR

ASTM D 1424: “Tearing Strength of Fabrics by Falling-Pendulum Type”
Measuring the resistance of fabrics to tearing in both directions on ELMENDORF tear tester

INSTRON TEAR

ASTM D: 2261 “Tearing Strength of Fabrics by the Tongue (Single Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine)”
Measuring the resistance of fabrics to tearing in both directions on the INSTRON

BALL BURST

ASTM D3787: “Bursting Strength of Knitted Goods – Constant-Rate-of-Traversal (CRT) Ball Burst Test”
Measuring the resistance of fabrics to bursting with a ball on the INSTRON

FABRIC STIFFNESS TESTS

BENDING LENGTH

ASTM D1388: “Stiffness of Fabrics”
Measuring the bending length and flexural rigidity of fabric in both directions

CIRCULAR BEND

ASTM D4032: “Stiffness of Fabrics by the Circular Bend Procedure”
Measuring the maximum force required to push the fabric specimen through an orifice on the J.A.KANG Fabric Stiffness Meter
FABRIC ABRASION TESTS

TABER ROTARY ABRASION

ASTM D3884: “Abrasion Resistance of Textile Fabrics (Rotary Platform, Double-Head Method)”
Measuring the resistance of fabrics to rotary rubbing abrasion under controlled conditions. The resistance of abrasion is evaluated by the percentage loss in breaking load or in appearance.

FLEX WEAR TESTER

ASTM D3885: “Abrasion resistance of Textile Fabrics (Flexing and Abrasion Method)”
Measuring the resistance of fabrics to flexing and abrasion under controlled conditions. The resistance is evaluated by the percentage loss in breaking load or in appearance.

SCHIEFER UNIFORM ABRASION

ASTM D4158: “Abrasion resistance of Textile Fabrics (Uniform Abrasion Method)”
Measuring resistance of materials to abrasion using SCHIEFER uniform abrasion testing machine.

WRINKLE RECOVERY

Measuring the recovery angle of woven fabrics after an induced wrinkle.

SHRINKAGE

AATCC135: “Dimensional Changes in Automatic Home Laundering of Woven and Knit Fabrics”
Determining the dimensional changes in woven and knit fabrics when subjected to automatic laundering and drying procedures.

Details of various many other available tests including colorfastness, flammability, Thermal Conductivity Tester “ALAMBETA”, ROTOR-RING, and DYNAFIL-M will be provided on request. Please contact us for more information.