carbonized bamboo

casein

bamboo

bleached soy

Tencel

Protein-based fibers take acid dyes readily, while cellulose-based fibers stain or remain unchanged.

Firestar (nylon)

cotton

wool

SeaCell

FIBER ROTATION TEST

You will need a microscope for this test; an inexpensive handheld one with 100× magnification will be strong enough. Soak a small amount of fiber in water. Take a few fibers and warm them with a lamp. With the microscope, watch to see whether they move. Cellulose fibers rotate; protein fibers do not. Flax and ramie rotate to the left, cotton and hemp to the right.

BURN TEST

Burn tests are helpful to identify fibers; they also show you how the finished fabric will react if it catches fire. Burn tests are quite simple, but do take a few precautions before you start. I use a candle and place the candlestick in a pan of water to minimize fire risk. Start by burning a few fibers whose content you know so you can compare the results. Move the fiber near

the flame and watch: Does the fiber move? Which way? Move the fiber into the flame. Watch how it catches fire and what the flame looks like. Take it out of the flame and watch: Does it continue to burn? Does it immediately go out? Does it smoke? Smell the burned fiber. Examine the ash. Keep notes. Be cautious; fibers such as flax, bamboo, and acrylic burn instantly and very hot. Fibers that burn when directly exposed to flame but go out when the flame is removed are called "self-extinguishing."

WEAK ACID DYE TEST

Use any dye that works on wool with a simple acid such as vinegar. (If you don't usually use dyes, Kool-aid will work.) Put a small sample in a stainless steel pot, cover it with water, and add 1 tablespoon vinegar and enough dye to color the water. Bring to a boil, remove from the heat, and let cool. Rinse the sample. If it's a protein-based fiber (like wool, silk, angora, cashmere, or soya), it should easily rinse clear, leaving the fiber dyed. Protein fibers, including vegetable-based ones, will accept acid dyes. (Any dye that is heat-set will be difficult to use with corn fiber.) Because nylon is an imitation of keratin, it can also be dyed with acid dyes; it actually takes many dyes better than wool. Cellulose fibers (cotton, flax, ramie, hemp), reconstructed cellulosic fibers (rayon, Tencel, bamboo), and acrylic and polyester won't accept this dye.

Fiber by the Numbers: Fineness and Consistency

Most of the measurements and tests introduced below gauge the fineness and consistency of fibers. Fineness matters for two reasons: it defines the "spinning limit" (or spinning potential) and influences the