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### Fabrics for Today's Consumer

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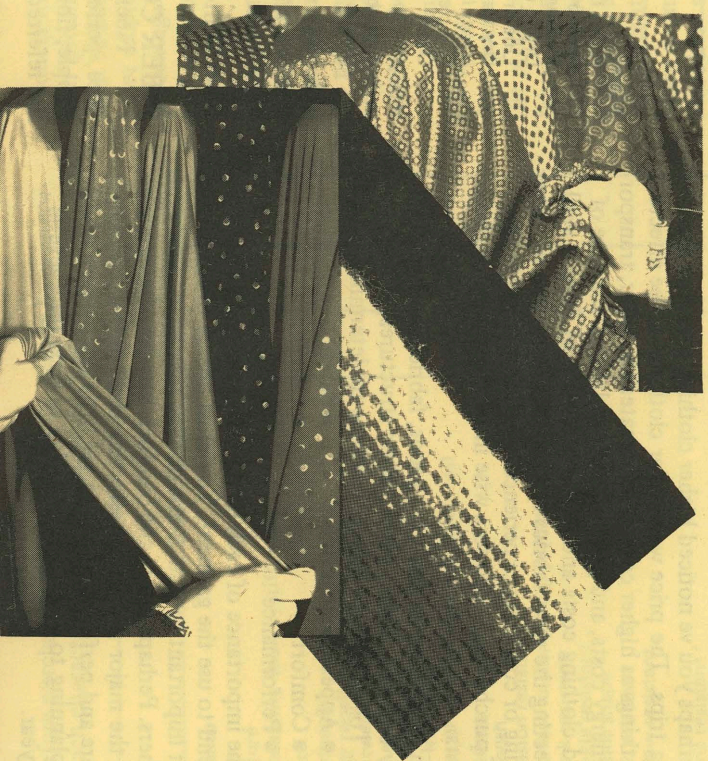
# Fabrics

## for Today's Consumer

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Perhaps you've noticed higher clothing prices on recent shopping trips. The price we pay for clothing can be affected by such things as higher costs of raw materials, labor, transportation, energy costs, and government regulations. Because of increased clothing costs and the wide variety of fabrics available, selecting the right fabrics for your wardrobe can be either an exciting or confusing experience. Careful thinking at the point of purchase can lead to a wise investment of your clothing dollars.

In ready-to-wear and yard goods, fabrics can be found in many textures, fibers, yarns, fabric structures, colors, and finishes. Together these factors combine to determine:

- Appearance
- Comfort
- Performance
- Safety
- Care
- Cost

The importance of each of these will depend upon how you intend to use the garment. You must decide which factors are most important to you. Some choices may be more obvious than others. Perhaps safety and comfort, instead of appearance, may be the major reason for selecting children's sleepwear, while care and performance may have little importance when you're planning to buy a suit you plan to wear only several times a year.

Before purchasing clothing or fabric, decide how important is each characteristic in the following chart.

	Importance		
	Much	Some	Little
● <b>Appearance</b>			
Color			
Texture			
Drapeability (bulky, stiff, soft)			
● <b>Comfort</b>			
Breathable			
Water repellent			
Lightweight			
Anti-static			
Non-allergenic			
Non-Irritating			
Thermal comfort (warmth, coolness)			
● <b>Performance</b>			
Strength			
Abrasion resistant			
Colorfast to laundering, drycleaning, etc.			
Shrink resistant			
Wrinkle resistant			
Retains shape			
Moth resistant			
Mildew resistant			
● <b>Safety</b>			
Flame resistant			

	Importance		
	Much	Some	Little
● <b>Care</b>			
Home launder			
Wash by hand			
Bleachable			
Dry in dryer			
Line dry only			
Dry flat			
Needs little ironing			
Dry clean only			
Other			
● <b>Cost</b>			
Availability/Price			
Maintenance cost			

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After you've decided on your priority needs and wants you're ready to consider the factors that can be of help in judging a fabric's character:

Fiber Content ● Yarn Structure ● Fabric Structure ● Finish

## FIBER CONTENT

Fiber content is just one factor that can affect the appearance, performance, care, comfort, and cost of a fabric. Like people, fibers have individual characteristics or properties and are referred to by generic (family) names. The Textile Fiber

Products Identification Act of 1960 requires that all textile fiber products be labeled according to fiber content. Fibers must be listed on hangtags or labels by their generic names in order of predominance (largest amount listed first), giving the percentage of each fiber present. Once you know the name of a fiber, you can check its characteristics in the chart.

Care characteristics are stated in the chart to be considered along with permanent care labels. These care labels are required by law according to the Permanent Care Labeling Regulation of 1972. It is your responsibility to read and follow the permanent care label attached to the inside of a garment or provided with a fabric purchase according to a bolt-end code number.

Because there is no one perfect fiber, many of today's fabrics are a blend of fibers. The good characteristics of each fiber present are maximized to provide you with a better textile product. For a fiber to influence the characteristics of a fabric, it must make up at least 25 percent of the fabric with several exceptions:

- As little as 15 percent nylon will strengthen a blend
- 2 percent spandex will add elasticity

When caring for a fiber blend, select the care method for the most heat sensitive fiber present in the fabric.

FIBER AND TRADENAME	MAJOR USES	ADVANTAGES	LIMITATIONS	FABRIC CARE First read the permanent care label or bolt end instructions carefully. In addition:
Cotton	Summer wear and other lightweight apparel	Abrasion resistant Good affinity for dyes Strong, even when wet Very absorbent Good durability	Wrinkles unless treated May shrink unless treated Weakened by sunlight and strong acids	Endures frequent hard launderings Withstands high ironing temperatures Avoid risk of mildew.
Linen (flax)	Dresses, skirts, slacks, summer suiting	Excellent strength Very absorbent Stronger when wet Does not lint	Wrinkles unless treated Poor affinity for dyes May shrink or stretch Poor crease retention	Usually dry-cleaned to maintain crispness and avoid shrinkage Withstands high ironing temperatures Avoid risk of mildew
Silk	Lustrous fabrics of many weights used for dresses, suits, blouses, and linings	Strong Very absorbent Moderately wrinkle-resistant Good affinity for dyes, but may bleed	Weakened by sunlight and perspiration May be attacked by insects, especially carpet beetles Fabric may cling due to static electricity	Drycleaning usually preferred If necessary, hand launder in mild suds Strong soaps and high ironing temperatures tend to weaken and yellow fabric May yellow with exposure to chlorine bleach and sunlight
Wool	Outerwear, medium-weight clothing	Has insulating capacity that increases with fabric thickness Very absorbent Wrinkles fall out readily Naturally water-repellent Good affinity for dyes Flame resistant	Attractive to moths and carpet beetles May felt or shrink Tends to stretch during wear and handling when wet Weaker when wet	Usually dry-cleaned If washable, can be done by hand or on gentle cycle of machine using mild soap Avoid chlorine bleach Use steam heat when pressing Never wash in hot water

ACETATE Acele Avisco Celeperm Chromspun Estron	Luxurious fabric used for lingerie, dresses, blouses, linings	Drapes very well Has silky appearance Has luxurious soft feel Resists mildew, shrinking, and moths	Relatively weak Poor abrasion resistance Heat sensitive Loses strength when wet Soluble by nail polish remover Accumulates static electricity Weakens with lengthy exposure to sunlight	Usually drycleaned If washable, can be done by hand or on gentle cycle of machine If tumble dried, use low heat Iron at low temperature only—wrong side of fabric
ACRYLIC Acrilan Creslan Orlon Zefkrome Zefran	Sweaters, dresses, suiting, outerwear, pile fabrics	Resists wrinkling Good bulking properties Resistant to bleaches Good pleat retention Sunlight resistant Good affinity for dyes	Heat sensitive Tends to pill Accumulates static electricity Low absorbency	Remove oily stains before washing Waterborne stains are easily removed Iron at medium temperatures Use fabric softener to reduce static electricity
ARAMID Kevlar	Protective clothing, gloves, tire cords	High strength Stretch resistant		Remove oily stains before washing
Nomex	Protective clothing, insulation in motors, carpets for aircraft	Flame resistant Does not melt		Remove oily stains before washing
GLASS Beta Fiberglas	Used mainly for curtain, draperies, upholstery	Very strong Weather and sun resistant Resistant to moths, mildew Does not absorb moisture Sheds dust and soil	Low abrasion resistance unless treated Low affinity for some dyes	Hand laundering usually recommended <b>DO NOT LAUNDRER IN WASHING MACHINE</b> Chlorine bleach can be used on white fabrics

Portions from chart on pages 4-7 adapted from the *Textiles Handbook*, American Home Economics Association.

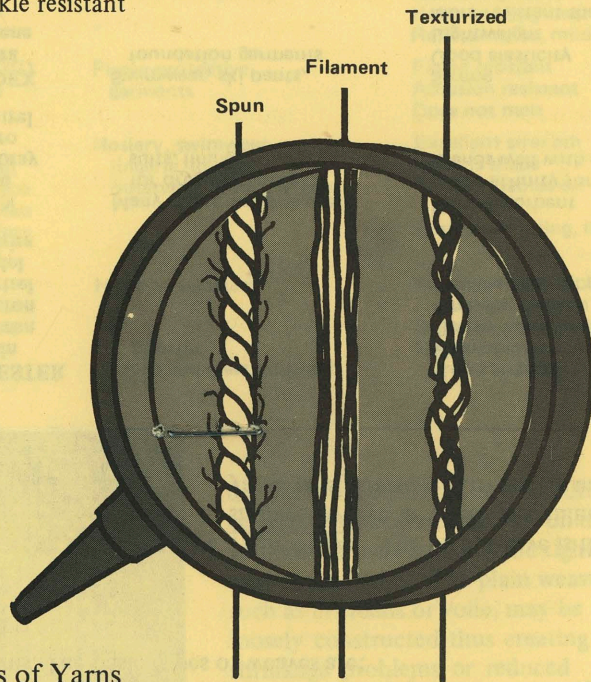
FIBER AND TRADENAME	MAJOR USES	ADVANTAGES	LIMITATIONS	FABRIC CARE First read the permanent care label or bolt end instructions carefully. In addition:
<b>METALLIC</b> Lurex Zefstat	Decorative yarns for apparel fabrics	Provides wide choice of decorative yarns Does not tarnish if coated with plastic covering	Weak Heat sensitive	Follow care instruction attached to garment Do not use high temperature to wash or iron
<b>MODACRYLIC</b> Dynel Verel SEF	Coats, plush toys, children's sleepwear, wigs	Wrinkle resistant Good drapeability Flame resistant Non-allergenic Holds in body heat Resists moths, mildew	Low absorbency Heat sensitive	Deep-pile coats may require drycleaning Follow care instructions for washable fabrics Avoid ironing due to low melting temperatures
<b>NOVOLOID</b> Kynol	Flame-protective garments	Flame resistant Abrasion resistant Does not melt	Fiber is still being tested	Fiber is still being tested
<b>NYLON</b> Antron Cantrece Caprolan Enkalure Qiana	Hosiery, swimwear, lingerie, dresses, outerwear, outdoor gear	Excellent strength Retains shape Excellent abrasion resistance Resists wrinkling, moths	May pill Heat sensitive Accumulates static electricity White nylon picks up dye and soil in laundering	Remove oily stains before washing Cool rinse may reduce wrinkles Use fabric softener to reduce static electricity Use commercial nylon whitener to restore whiteness
<b>OLEFIN</b> Herculon Marvess	Hosiery, sweaters	Strong and abrasion resistant Does not absorb water Retains shape	Has low melting point May shrink when heat applied Light sensitive	Suds with mild detergent and lukewarm water Do not iron 100% olefin fiber Use low temperature to iron blends

<b>POLYESTER</b> Avlin Dacron Encron Fortrel Kodel Trevira	Wash and wear clothing, fiberfill	Good strength High abrasion resistance Resists wrinkling, stretching, moths, mildew Retains heat-set pleats	Holds in body heat Accumulates static electricity Attracts oily stains Sensitive to heat Fabrics made from staple yarns tend to pill	Remove oily stains before washing Cool rinse may reduce wrinkling Fabric softener may prevent static electricity Remove promptly from dryer Needs little or no ironing; use medium temperature if needed
<b>RAYON</b> Avril Coloray Fibro Zantrel	Many fabric weights used for dresses, blouses, suits, linings	Very absorbent Good affinity for dyes Blends well with other fibers	Wrinkles, shrinks, or stretches unless treated Fair abrasion resistance	Generally can be machine washed Iron at moderate setting Chlorine bleach can be used
<b>SPANDEX</b> Lycra Vyrene	Swimwear, ski pants, foundation garments	Strong Good elasticity Lightweight More resistant than rubber to perspiration, body oils, drycleaning damage	May yellow when exposed to sunlight	Wash by hand, or by machine using delicate cycle in lukewarm water Avoid chlorine bleach Drip dry Iron at low temperature
<b>TRI-ACETATE</b> Arnel	Lightweight fabrics, such as sportswear, skirts	Retains heat-set pleats Resists wrinkling and glazing during ironing Takes dye readily Shrink resistant	Poor abrasion resistance Poor resistance to sunlight Soluble in contact with nail polish remover Weaker when wet	Machine or hand wash in warm water; tumble dry Iron at moderate or high temperature
<b>VINAL/ VINYON</b> (combination fiber) Cordelan	Children's sleepwear, work clothes	Has soft pleasing hand Flame resistant Abrasion resistant Will not melt Does not absorb stains		Is easily laundered Do not use chlorine bleach If tumble dried, use low heat

## YARN STRUCTURE

Yarn structure can affect the appearance, performance, comfort, cost, and care of a fabric. Yarns used in a fabric help to determine whether a fabric will be:

- rough, smooth, or crinkled
- light, medium, or heavy in weight
- cool, warm, clammy, or comfortable
- harsh, smooth, or soft
- strong, or resistant to snagging, pilling, or abrasion
- wrinkle resistant



### Types of Yarns

Yarns are either spun or filament.

**SPUN** yarns are made of short fiber lengths (called staple) twisted together in a continuous strand. Spun yarns can be made by using either the natural staple fibers (cotton, linen, or wool) or long synthetic filaments cut into short lengths. They may contain one generic fiber or two or more fibers may be blended during spinning. In garments and yard goods fabrics, spun yarns:

- produce a fuzzy effect on the fabric's surface
- may be used to create bulky fabrics for added warmth
- have a tendency to pill, lint, or become fuzzy with wear
- do not tend to snag
- are usually stronger, the tighter the yarn is twisted

**FILAMENT** yarns are made of long fiber lengths and can be smooth, lustrous, or flat strands which do not need to

be twisted to hold together. They can be made from the silk worm's cocoon or extruded from the chemical solution used in making synthetic fibers. A yarn may be a single strand of fiber (monofilament) as used in sheer fabrics and hosiery, or a bundle of many fiber strands (multifilament) which are usually softer and more opaque. Filament yarns used in fabrics for clothing:

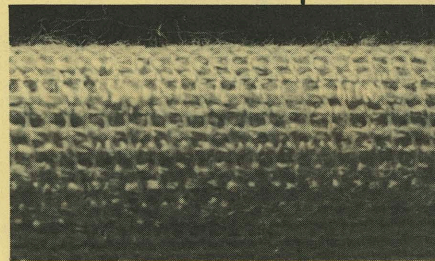
- have a smooth, almost slick feel
- are usually quite soft
- tend to shed soil and lint
- tend to resist pilling
- tend to snag or run easily

**TEXTURIZED** yarns are filament yarns in which the filaments have been coiled, curled, crimped, looped, stretched, or air fluffed to allow for greater variety and improved performance in fabrics. When compared to regular filament yarns, texturized yarns have:

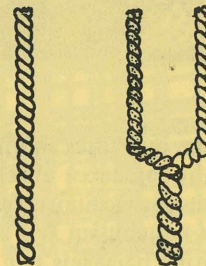
- added comfort stretch
- greater bulk
- greater absorbency
- improved resistance to pilling and creasing
- better shape retention
- lightweight warmth
- added softness

### OVER-THE-COUNTER TESTS

1. To determine if a fabric is made of spun or filament yarns, hold a folded edge of the fabric up to the light. Spun yarns usually have short fuzzy ends that protrude from the fabric's surface. Filament yarns are long silk-like strands that often can be raveled from the fabric's cut edge.



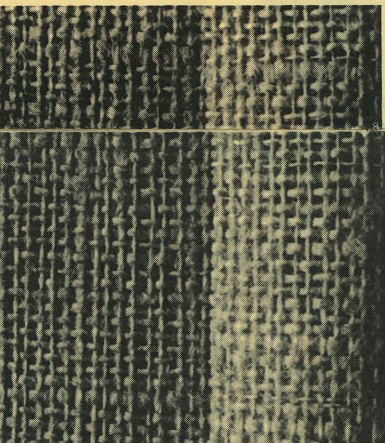
2. To check for strength of spun yarns, ravel several yarns to see if it is a one-ply or two-ply yarn as shown. Up to a point, tightly twisted spun yarns are generally more durable than loosely twisted yarns. Two-ply yarns are generally stronger than one-ply yarns.



Fabrics can be made by weaving, knitting, felting, lace-making, braiding, crocheting, bonding, or laminating. Because most fabrics found in ready-to-wear or yard goods are either knitted or woven, this section focuses on only these fabric constructions. As you shop, keep in mind each of their characteristics.

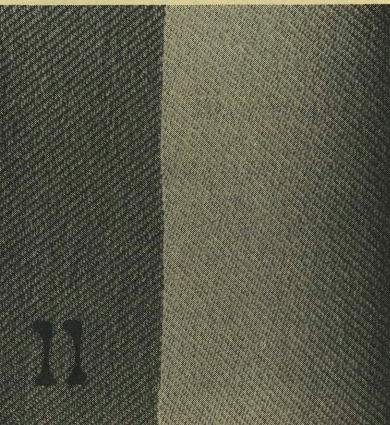
### Types of Fabric

**WOVEN FABRICS** are made by interlacing two or more sets of yarns at right angles. The lengthwise yarn is called the “warp” and the crosswise yarn is called the “filling.” Closely woven fabrics, in general, are durable, firm, wind and water repellent, and usually snag resistant. Loosely woven fabrics, in general, are soft and easy to drape, may ravel or pill, may be less durable than tightly woven fabrics, and may promote shrinkage problems. The basic types of weaves are:



◀ **Plain Weave** The plain weave is the simplest weave in which the filling yarns pass alternately over and un-

der each warp yarn. The durability of plain woven fabric depends on the strength of the yarns and the tightness of the weave. The plain weave, such as in challis or voile, may be loosely constructed thus creating shrinkage problems or reduced strength. The basket weave which is a variation of the plain weave is looser, less stable, and not as durable as the ordinary plain weave.



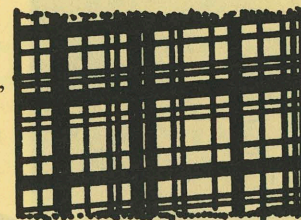
◀ **Twill Weave** The twill weave is a basic weave that can be easily identified by observing the diagonal ridges formed by the yarns. Denim and gabardine are examples of this type of weave. Usually, twill weaves are more closely woven, heavier, and sturdier than ordinary plain weaves. They also tend to show soil less than plain weaves.

**Satin Weave** The satin weave is a basic weave created by a warp yarn floating over several filling yarns in a staggered pattern. The luster of this fabric is created by the way the floating yarns reflect light. This fabric is generally not as strong because of the low abrasion resistance of the floating yarns. Examples of the satin weave include crepe-back satin, antique satin, and sateen.



### OVER-THE-COUNTER TESTS

1. To determine the degree of wrinkling, crush the fabric in the palm of hand for several seconds. Observe whether or not the fabric recovers quickly from wrinkles.
2. To check for evenness of yarn, weave, and color look carefully for fabric flaws on both the right and wrong sides. Hold the fabric to the light to check density and uniformity of the weave.
3. To check the potential of seam slippage in a fabric, stretch the fabric between thumbs and forefingers in both crosswise and lengthwise directions. Fabric may not be durable if the threads shift apart readily. This is a good test to check for durability in loosely woven fabrics.
4. To check for color or dye penetration, untwist several warp and filling yarns and examine yarns closely.
5. Check to see that geometric or symmetrical prints follow the lengthwise or crosswise yarn direction. If the print is “off grain,” it can’t be matched during construction without distorting the fabric and the hang of the garment.





**KNIT FABRICS** are made by a series of interlocking loops that result in a flexible fabric. Knits most often resist wrinkling, drape easily, and stretch with body movement. They may have poor crease and pleat retention unless properly heat set. Sagging or bagging may be a problem if the knit fabric is not of good, firm quality. Knit fabrics tend to snag easily and those made with staple yarns tend to pill. The two basic types of knit construction are filling knitting (used to make single knits and double knits) and warp knitting (used to make tricot and raschel knits). Their characteristics are:

#### FILLING KNITS

◀ Jersey knits are used in hosiery, sweaters, and sportswear items such as T-shirts. The face of the fabric is smooth with vertical rows of loop structures in the lengthwise direction. Plain jersey knits stretch more in width than in length and may have a tendency to “run” in the vertical direction.

◀ Rib knits are especially beneficial in garments when stretch is desired.

Rib knits are warm and have a great amount of stretch and recovery power in the crosswise direction. This makes them especially suitable for lower edges of sweaters, cuffs, and necklines.

◀ Double knits are commonly used to make a wide variety of sportswear and dress garments. They have good dimensional stability and are resistant to runs. When compared to single knits they are heavier, relatively firm, and less stretchable. A variation of the plain double knit is the interlock double knit. Interlock double knits “run” from one vertical end of the fabric only, much like the same principle as hosiery. This characteristic can be somewhat controlled in home sewing by placing the running edge at the hemline and then staystitch 1/4” from the cut edge.

#### WARP KNITS

Tricot knits are usually made with fine yarns and are frequently used in lingerie, lining, and dress fabrics. Generally they are soft and very drapeable, crease and run resistant, and have good shape retention. Tricot knits can be identified by the vertical ribs on the right side of the fabric and horizontal ribs on the back.

Raschel knits are used to create a wide range of patterned designs in fabric. The most typical raschel knits have an open and lacy appearance. Thus snagging may be a problem.

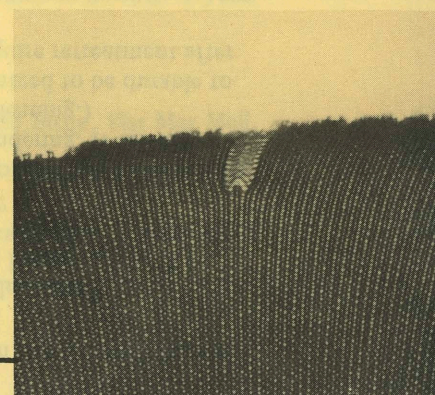
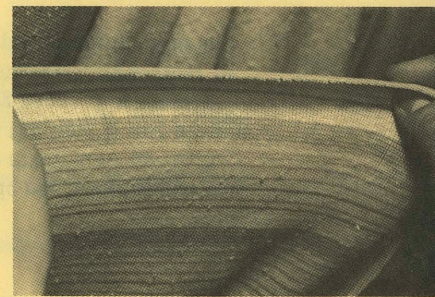
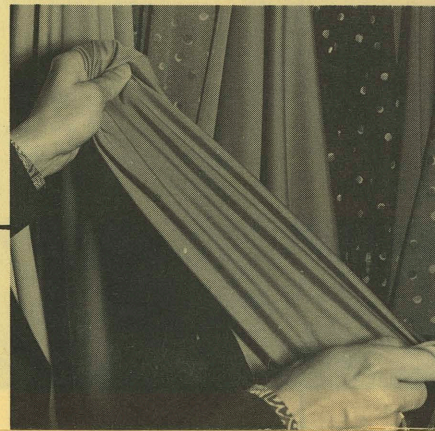
#### OVER-THE-COUNTER TESTS

1. To check for stability of knit fabrics, stretch fabric slightly and observe if fabric returns to ori-

ginal shape. If fabric does not return to its original shape, sagging or bagging of garment may occur.

2. To determine the crosswise direction in single filling knits, pull on the edge of fabric. The lengthwise edge will curl to the back; the crosswise edge will curl to the front.

3. Remember that interlock knits “run” from one cut edge of the fabric only. When purchasing lightweight doubleknit fabrics, pull slightly on the cut edge near the selvage to check for running. In yard goods the running edge could be on the outside or inside of the bolt. When sewing, place the running edge to the bottom of garment and then staystitch.



Finishes are applied to fabrics or garments to provide you with added comfort, ease of care, and pleasing appearance. Finishes are available to prevent your clothing from such things as wrinkling, staining, shrinking, or flaming. Although finishes are used for specific purposes, they may affect the performance of the fabric. For example, a finish used to prevent wrinkling may make ironing difficult if wrinkles are set by heat in the dryer; permanent press finishes may create some abrasion and spot-removal problems.

When purchasing fabric or ready-to-wear, check hand tags and bolt-ends for any information about finish.

### Some Types of Finishes

**Anti-static** keep fabrics from accumulating static electricity, thus avoiding fabric cling.

**Flame-resistant** keep fabrics from actively supporting a flame once the source has been removed.

**Permanent press** (also called durable press) help fabrics shed wrinkles from normal wear and washing. Such finished fabrics may have low abrasion resistance and should be laundered wrong side out for best results.

**Shrink-resistant** will reduce shrinkage to not more than the amount of "residual shrinkage" stated on the label (usually 2 percent shrinkage is considered acceptable in wovens and 5 percent in knits).

**Soil release** make oily stains easier to remove.

**Stain or spot resistant** resist water-based and/or oil-based stains as specified on labels.

**Stretch or sag resistant** are intended for knits. Fabrics keep their original shape throughout normal wear and launderings.

**Waterproof** prevent absorption and penetration of water or air.

**Water repellent** allow fabrics to shed water, while they remain "breathable."

As you consider a particular finish, ask yourself the following questions:

- Will the finish make the fabric more desirable?
- Will the finish require special care in laundering or dry cleaning?
- Is the finish permanent or temporary?
- Is the finish water-soluble or solvent-soluble? (A water-soluble finish will not withstand normal laundering. A solvent-soluble finish will not withstand drycleaning.)
- Is the finish stated on the label guaranteed to be durable to laundering or dry cleaning? Will it require retreatment after laundering or dry cleaning?

### IT'S DECISION TIME

After you've compared your fabric needs and wants to a textile's characteristics, you're ready to make your decision. Perhaps you've discovered that buying the best is not always necessary to meet your family's clothing needs. For greater satisfaction, remember to compare all the facts, from fiber to finish, as you make fabric and clothing purchases for you and your family.

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