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EC66-437 Functional Fabric Finishes

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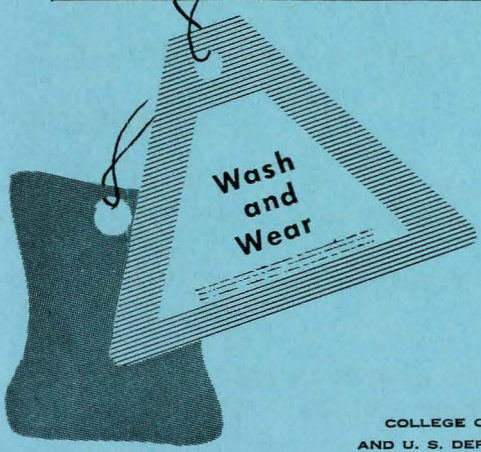
Functional Fabric Finishes



EXTENSION SERVICE
UNIVERSITY OF NEBRASKA
COLLEGE OF AGRICULTURE AND HOME ECONOMICS
AND U. S. DEPARTMENT OF AGRICULTURE COOPERATING
E. F. FROLIK, DEAN J. L. ADAMS, DIRECTOR

FUNCTIONAL FABRIC FINISHES

Gerda Petersen
Clothing Specialist

BUYING TEXTILES

Look for:

1. Sewn-in labels.
2. Hang tags.
3. Printed information on selvedge.
4. Printed information on end of fabric bolt.
5. Seals of certified merchandise.
6. Name of manufacturer who has a reputation for quality products.
7. Name of manufacturer who has a testing laboratory or who has a labeling program.
8. Store that has a testing laboratory.

Remember to:

1. Read label accurately, don't expect anything but what is promised.
2. Follow care instructions carefully for best results.
3. Tell retailer if garment does not perform according to claims made on the labels.

Examine textile carefully and check:

1. Balance of weave.

2. Degree of fraying.

3. Signs of imperfections.

The beauty and quality of a garment depend on the careful execution of every step of the manufacturing process from the raw material (fiber) to the finished garment.

BEAUTY AND QUALITY IN FABRIC

Fiber Yarn Construction Finishes

Fiber - is the raw material from which fabric is made.

Yarn - is made up of one or more strands of fibers of filaments which have been grouped or twisted together. Variety in yarns may be obtained by using blended, twisted, plied or textured yarns.

Construction - is a method of making cloth. Methods include weaving, knitting, felting, fiber bonding and others of less importance.

1. Weaving is an interlacing of yarns that cross at right angles to produce a more or less compact surface. Basic weaves include: plain, twill, satin. Other weaves are pile, Jacquard, leno (gauze) and variations.

2. Knitting is forming a series of loops which hang one upon the other. There are circular and flat knitting machines. Double knits are made by using two sets of needles and yarns at the same time.

3. Felting is an interlocking of wool fibers to form a cloth by means of a combination of mechanical work, chemical action, moisture and heat. (Other fibers may also be added to the web.)

4. Fiber bonding consists of a web of fibers held together with an adhesive or bonding material.

Finishes - are applied to fiber, yarn, or cloth. They contribute to either the aesthetic or functional qualities of the fabric. Finishes may be either mechanical or chemical, or both. General finishes such as bleaching, dyeing, shearing, brushing, pressing, tentering are applied to many kinds of cloth. Others are applied to give a specific function or quality. Functional finishes increase the serviceability of a fabric. Some of these finishes are discussed on the following pages.

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DIMENSIONAL STABILITY

Dimensional stability in a fabric means that it will not stretch or shrink out of shape. Some fabrics shrink because of the nature of the fibers. Fabrics also shrink because fibers are under constant tension when the yarn is spun and the cloth woven or knitted.

In addition to tensions that affect dimensional stability in other fibers, wool fibers swell with moisture. It isn't always desirable to make wool shrink-resistant. In tailoring, its shrinking characteristics are used advantageously to shape the garment to the figure. On the other hand it is convenient and practical to have

a washable wool for socks, undergarments, sweaters, sport shirts, blankets.

To control shrinkage, fabrics must be given a mechanical and/or chemical treatment.

*Mechanical processes may be used on cotton, linen, modified or polynosic rayons (Avril, Zantrel). Trade names of two of these processes are: Rigmel and Sanforized. Garments whose labels bear these names shouldn't shrink more than 1%.

*Some synthetic (thermoplastic) fibers can be heat set, which makes them dimensionally stable.

*Rayons may be treated with a caustic soda which swells fibers and fixes yarns in the weave. The chemicals impregnate the fibers making pre-shrinking permanent.

*A resin finish may also be used on rayons and blends of rayons and acetates. An example is Sanforset. This fabric should not shrink more than 2% in washing. Resin finishes may also be used on cottons and linens.

*Shrink resistant wool finishes include:

Wurlan	Aquawool	Schollerized
Bancora	Harriset	
Dylanize	Lanset	

Knit fabrics may be made dimensionally stable through a mechanical process -- Redmanized -- or a chemical process -- Pak-nit. A trade name for a process used to prevent stretching in tricot knits is Trianizing.

WRINKLE RESISTANT FINISH

"Wash and Wear" Properties -- Durable Press

Wrinkle resistance has been defined as the property of a fabric that causes it to recover from folding and creasing either in wearing or washing. Some fibers such

as wool, silk and polyesters are naturally resistant to wrinkling, whereas cotton, linen and rayon are not.

Wrinkle resistance is imparted to synthetic fibers by heat setting; to rayons, cottons and linens by treating chemically with resin finishes.

Resin finishes may make the fabric:

1. Require a minimum amount of pressing to obtain original neatness.

2. Pucker more in seams.

3. More resistant to pleats and creases in garments that are desirable.

4. Less absorbent, therefore quicker drying. Since it doesn't absorb perspiration it is less comfortable to wear.

5. More resistant to perspiration odors.

6. Smoother, so dirt doesn't penetrate. Thus, shorter wash cycles may be used and clothing receives less wear and tear.

7. Retain color better in laundering.

8. More susceptible to grease spots. Spots are harder to remove.

Some trade names used for wrinkle resistant and "wash and wear" finishes are:

Ban Care	Dri-Smooth	Tebilized
Bates Disciplined	Everglaze Minicare	Unidue
Belfast	Sanforized Plus	Wrinkle-Shed

Durable Press

Durable press (sometimes listed as permanent press) is an advanced development in wash and wear finishing.

The process imparts wash and wear properties, provides permanent creases and pleats where desired, and makes permanent shape possible in a garment.

Present limitations in durable press:

1. Cotton and rayon lose strength during processing but they can be blended with synthetics such as nylon, polyester, and acrylics which provide strength.

2. Creases when once set in a garment can't be removed to allow for alterations.

Some durable press finishes are known by the following trade names:

Burmicrease	Everprest	Sharp-Shape
Cone Press	Koratron	Vanopress
Dan Press	Never-Press	Wat-A-Set

WATER-PROOF AND WATER REPELLENT

Water-proof finish gives complete protection from penetration of water. Fabrics such as cotton and rayon may be coated with rubber or plastic. Air and water do not penetrate a coated fabric. This lack of air penetration may make the garment uncomfortable to wear because body perspiration doesn't evaporate. The finish is permanent but subject to wear. Some plasticized fabrics stiffen in cold weather. Some trade names of water-proof coatings are: Butvar, Resins, Reevair.

Water-repellent finished fabrics are resistent to wetting, but, after continuous exposure, the fabric is penetrated by water. Water repellent fabrics remain pliable, can "breathe" and are comfortable to wear. The finish helps a garment to retain its shape.

Some finishes are durable, others are not. Durable finishes withstand dry cleaning and laundering. Some durable finishes are:

Zelan	Scotchgard	Sylmer
Zepel	Wonderpel	
Aquagard	Cyana finishes	

Non-durable finishes may be renewed in dry cleaning or laundering. Examples are: Aridex, Cravenette, Impregnole.

Other factors that help to make a fabric water repellent:

1. Fiber content - wool fiber has natural water repellency.

2. Construction of cloth - closely woven twill or satin weaves.

3. Construction of garment - double thickness of fabric in shoulder area and a minimum seaming.

Follow instructions on label as to dry cleaning or laundering to get greatest service from water repellent fabrics. Remove every trace of soap by careful rinsing after washing as soap causes the fabric to wet easily.

STAIN AND SPOT RESISTANT FINISHES

Stains and spots are usually either waterborne or oil and grease stains. Both water repellent and crease resistant finishes repel the waterborne stains. The flurochemcials finishes such as Sctochgard, Wonderpel and Zepel also resist oily stains. It is claimed that oily substances roll off, blot off, or may be wiped completely away.

Spots which dry unnoticed can usually be removed with water or a cleaning solvent. However, once an oily stain has penetrated certain fabrics treated with permanent finishes, the spot is difficult to remove. It is important to remove all spots or stains as soon as possible.

Synthetic fibers are naturally resistant to waterborne stains but not to greasy stains. They also require pretreatment before laundering.

Trade names for some spot and stain resistant finishes include:

Cravenette Long Life	Soft-n-dry
Cravenette Super-Silicone	Special Permel Plus
Cyana Permel Plus	Sylmer
Scotchgard	Zepel Fabric Flouridizer

MOTH RESISTANT FINISHES

A moth resistant finish makes wool and other hair fibers unfit food for the moth and carpet beetle. Wool fabrics may be protected from moth damage:

1. By application of chemical substances to the fabric during manufacture. These finishes are usually fast to washing and dry cleaning and last the life of the garment. Some trade names include:

Dieldrin	Mitin	Siromoth
Drewclad	Mothproofer	Sivin S.S.
Eulan	Moth Snub	

2. By the application of chemical substances to the fabric during dry cleaning. Most of these finishes will need to be renewed at next cleaning.

3. By laundering, using a wool protecting agent such as EQ 53 in the rinse water. This lasts for about a year.

4. By spraying with various chemical products available for this purpose. Effectiveness depends on the strength of the chemicals and the amount that penetrates the cloth.

MILDEW & MOLD RESISTANT FINISHES

A mildew resistant finish is a chemical applied to a fabric to prevent growth of mildew and mold. These will grow wherever there is available foodstuff and moist, humid conditions. Such growth can affect cotton, linen, rayon, silk, wool, leather, paper. Synthetic fibers are resistant to mildew and mold but if the fabric is soiled

some may grow on the soiled areas. Mildew resistant trade names include:

Arigal C (Cellulose fibers) Fresh-Tex No Mildew

ANTI-BACTERIAL FINISHES

Anti-bacterial (hygienic) finish retards growth of bacteria and fungi. It helps prevent the spread of disease, reduces perspiration odor and arrests mildew attack. Some trade names for these finishes include:

Cyana Guard Eversan Sanitize

Anti-bacterial or disinfectant agents are recommended for use in laundering when sickness is present or when sanitation of laundromats is questionable.

Chlorine bleach is effective but damages some fabrics.

Effective disinfectants for use in laundering include:

Liquid Chlorine	Phenolic	Pine Oil
Clorox	Al Pine	Fyne Phne
Purex	Pine-Sol	Syne Tex
		King Pine
		Pine-O-Pine
		White Cap

Quaternary

CO-OP Sanitizer
Roccal

ANTI-STATIC FINISHES

Static electricity develops when the air is dry and when two fabrics are brought together and then separated. Rubbing of surfaces increases static electricity.

Man-made fibers which absorb little moisture develop static electricity. Wool generates static electricity only under fairly dry conditions. The formation of an electric

spark could be a hazard in certain places such as in chemical plants and operating rooms. Charged material may cause an unpleasant shock to the wearer. Fabrics may cling and may attract soil, dust and lint particles during wear. Anti-static finishes are being perfected to minimize the effects of static electricity.

Fabric softeners, when used in rinse water during laundering, are fairly effective anti-static agents.

FLAME RETARDANT FINISHES

Many textile fabrics are flammable and therefore involve personal safety. Some fibers such as cotton, linen, rayon, acetate, acrylic, and silk are flammable. Wool will smolder. Verel Modacrylic, nylon, polyester, saran are self-extinguishing. Glass and asbestos do not burn.

Tightness or looseness of fabric weaves as well as thickness and weight also determine how fast a fabric burns. Napped fabrics burn along the surface before the base catches fire. After flame resistant finishes have been applied, fabric may char and glow but a flame will not spread. The durable finish reacts chemically with the fiber to add fire resistant finishes. It withstands a number of launderings or dry cleanings without losing its flame retardant qualities. Flame retardant finishes may add some additional qualities to fabric:

Controlled shrinkage during laundering or dry cleaning.

Increased resistance to wear.

Resistance to attack by bacteria, fungi, mildew.

Crease resistance.

The problem at present in making fabrics completely fire resistant is the high cost and in many instances,

change in the hand or feel of the fabric. Some durable fire resistant finishes are:

Permaproof (heavy cotton)
Neva Flame (all fibers except acetate)
Saniflame (all fibers except acetate)
Antiflare
Ban-Flame
Erifon (heavy cotton)

Non-durable or renewable fire resistant finishes are known by these trade names:

Aerotex Anti-Pyros

Fabrics can also be treated with flame-retardant solutions at home.

INSULATING FINISH

An insulating finish of metallic coating on the back of various kinds of lining and drapery fabric is said to provide warmth and coolness. In cold weather, heat is not lost. In hot weather, solar heat is radiated away from the body or room.

The nature of the base fabric and construction of garment or drapery fabric greatly affects the usefulness of this finish. Some of the finish is lost during dry cleaning. Do not wash unless the label suggests washing.

Trade name - Milimum

STARCHLESS FINISH

Starchless finishes are used to impart stiffness or a crisp hand. Resin finishes such as Belfast are used on some fabrics. A chemical finish is used on some collars and cuffs. Multilayer construction in collars may be fused to give a stiff collar. An example is Trubenized.

ABSORBENCY FINISH

Absorbent finishes are used on fibers that do not

absorb moisture and therefore are less comfortable to wear. A chemical finish may be used on nylon to make it more absorbent. Trade name is Nylonizing. This gives an improved appearance and comfort. It may be used on hose and piece goods. Other trade names are: Sorbtex - Hysorb.

If you would like additional information on finishes that may be applied at home, single copies of the following circulars may be obtained from your County Extension Office.

How to Prevent & Remove Mildew (Home Methods)
Home & Garden No. 68 - USDA

Clothes Moths & Carpet Beetles-How to Combat Them
Home & Garden No. 24 - USDA

Making Household Fabrics Flame Resistant
Home & Garden No. 97 - USDA

Copies may also be obtained by writing to:

Superintendent of Documents
Washington 25, D.C.

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