

PART ONE

FABRIC SELECTION

SECTION I

THE FUNDAMENTAL PROCESSES OF PROFESSIONAL DRYCLEANING

THREE METHODS are used to clean fabrics when they become spotted, stained, and soiled:

1. Drycleaning
2. Wetcleaning
3. Laundering, either by hand or home machine methods, or by commercial laundering.

We shall limit this discussion to commercial drycleaning and wetcleaning of fabrics, since there are many sources of good information on laundering.

When garments or household items are received for drycleaning, they are marked for identification, and carefully inspected. Notation is made of any rips, tears, unusual stains, as well as recognition of fabrics or garment construction that require special handling in drycleaning. Breakable articles such as buckles, buttons and ornaments are removed and sent to the sewing department where they are replaced on the cleaned and finished garment.

The garments are then sorted according to types. The woolen and worsted garments are separated from the silks and synthetics. Then they are further classified according to white, light, and dark colors. Items that require special handling are separated from those cleaned by regular procedures.

Pockets, cuffs, and seams are brushed to remove loose soil and lint. This operation makes for better finishing by eliminating the possibility of shine or seam impressions. It is one more step toward perfection in drycleaning.

The items are placed in a hamper. This is known as a load. The weight of the load depends on the type and size of the drycleaning washer used in cleaning them.

Any soil, spots or stains that have water as an integral part must be removed by either a prespotting or pre-brushing treatment, or spotting after cleaning. Some stains are set more tenaciously if they are not removed before they are drycleaned. For example, grass stains, gutter splash, paint stains are removed before drycleaning.

There are two methods of drycleaning

The drycleaning of modern day fabrics and intricate garment design has become quite complicated. The sequence and method of processing depends on the many classifications of items to be cleaned. The fundamental process for all items involves the immersion and agitation of the garment in solvent.

There are two general classifications of drycleaning solvent:

1. Petroleum (Stoddard, 140F).
2. Synthetic (perchloroethylene, trichloro trifluoro ethane.

Drycleaning of high quality may be done in any of the solvents.

Specialized equipment is necessary

Drycleaning equipment has been scientifically engineered. To remove soil and dirt from fabrics, there must be a certain amount of action. For this reason, the washing cylinder of a drycleaning machine is built to supply a certain amount of mechanical action. In some types of equipment this may be supplied through reverse action of the washing cylinder. The cylinder may be perforated with a given number of holes to allow the proper amount of

solvent to flow through it. Ribs may be built inside the cylinder to aid in picking the garments up and then dropping them down gently, thus providing the action necessary for soil removal.

Soaps and detergents are used

Soaps and detergents are used to get the dirt and soil from clothes. These soaps and detergents are different from those used at home. But they perform the same function when used with drycleaning solvents—they help to emulsify all loose soil and dissolve all oily and greasy soil.

When you wash a fabric that has oil or grease on it, you usually are not successful in removing the grease unless you have previously treated the stained area, because water and oil do not mix. But the reverse is true in drycleaning fabrics, and soil or stains that have water as an integral part of them are not removed by drycleaning solvents. Until recent years, there was a limitation on the removal of water-soluble soil during the drycleaning cycle because of the procedures used. Modern research has now made it possible to use methods that facilitate the removal of many of the water-soluble soils during the drycleaning operation proper.

Filtration and distillation keeps the solvents clean

Dirty solvent must be drawn from the washer continuously and replaced with clean solvent in order to prevent loose soil from re-depositing on the cleaned garments. That is why a filter is so important. The drycleaning solvent is continuously pumped out of the washer, through the filter, and then back into the washer, through the filter, and then back into the washer again. Depending on the size of the filter, solvent may be circulated at the rate of two to ten thousand gallons an hour. In addition, various filtering aids, such as diatomaceous earths, clays, and absorbent powders are used to keep the solvent in excellent condition.

Water is relatively inexpensive and so it can be discarded after laundering—but drycleaning solvents are rather expensive, hence they cannot be discarded. In addition to filtration, the process of distillation is used. You have no doubt noticed steam that comes from a tea kettle forming water again on a cool sur-

face. This is the same principle used in the distillation of solvent. With the use of the still (quite a complicated piece of equipment) your cleaner can keep a continuous supply of clean solvent, so necessary for cleaning garments and household items.

Deodorizing removes the last traces of solvent

After cleaning and rinsing, excessive solvent is removed from the garments by extraction. Extraction is the term used to describe the removal of solvent from the garments by centrifugal force. The last traces of solvent are removed in a special type of equipment called a tumbler. Here a carefully controlled current of warm, fresh air is circulated through the garments.

Some items, because of their construction, bulk, or size are more effectively dried in a cabinet than in a tumbler. Here warm, fresh air is circulated through the fabric, thus removing any traces of solvent odor.

Up to this point, if a garment is not a specialty item, it has been processed together with a number of other garments. From now on it is handled individually. It goes to the spotting department where it is examined for spots and stains that require skill and technique to effect removal. The spotter must have a thorough knowledge of textile fibers, fabric construction, dyestuffs, and chemicals, as well as special skills and techniques.

Spot and stain removal

A spotter has the responsibility of selecting the proper solvent, whether it be dry, wet, or semi-wet; the proper lubricant; the correct chemical for the particular fabric and stain involved. The main problem in spot and stain removal is not that of finding the chemical reagent that will remove the stain, but rather, the selection of a reagent that will remove the stain without resulting in damage to the fabric or dyestuff. You may get the identical stain on two different garments made of two different fabrics. In one case the spotter may be able to remove the stain; in the other he may not be able to do so without running the risk of damaging the fabric. In that case, you may get your garment back with the spot or stain! A good spotter knows when to stop!

Finishing

When garments are thoroughly clean and free from spots and stains, they are sent to the proper finishing department. The term "finishing" is used rather than "pressing," because often no mechanical pressure is used. Only steam and air are applied. Pressure is not applied in the same manner as it is applied in home pressing. Presses have been built to accommodate every type of fabric. For example, men's and women's coats and suits are finished in the wool finishing department, women's dresses and blouses are finished in the silk finishing department.

The modern drycleaning plant uses a variety of equipment to accommodate every size and shape of garment. Some garments lend themselves readily to steam-air finishing so that an entire garment may be finished on a garment form that is inflated with air. On this form the fabric is softened with steam to remove the wrinkles, then it is cooled to its original shape. Some portions of the garment may require touching up by hand pressing, as for instance the lining of a coat.

With fashion dictating all types of complicated drapings in sleeves and bodices of garments, the industry had to find some way to finish all these intricate designs. So the "puff iron" came into being. Puff irons consist of perforated metal forms, padded and covered, and made into various sizes and shapes. One is called a "mushroom"; another an "egg"; still another a "heart." These odd-shaped puff irons make it possible to finish all the narrow frills, shirring, tucks, gathers, and darts of the most complicated bodice or waist of a garment.

It takes judgment on the part of an employee to determine the best method of finishing garments. They are trained to recognize what must be finished on the wool press in the wool finishing department, as against what must be finished on the type of presses found in the silk finishing department. Decisions are made on the basis of fabric and garment construction. For example, a press with a smooth polished head surface is used for finishing such smooth lustrous fabrics as satins and taffetas, whereas a press with a perforated head surface is used for such dull finished fabrics as crepes.

In spite of all the modern inventions of equipment designed to do a specific job, hand

skill is still needed. Many garments are so designed that they require the old skills and techniques of hand finishing.

After the garment is finished, buttons, ornaments, and trimming which were removed prior to drycleaning, are replaced. Minor rips, tears, broken seams, broken hemlines are repaired.

After a garment is cleaned and finished, it goes through a rigid final inspection before it is bagged or boxed for delivery.

What is wetcleaning?

When garments get so badly soiled that drycleaning does not remove all the soil, general grime and dirt, they must be further cleaned by a process known as wetcleaning. Garments that may need bleaching, or garments that are so stained that they may require the digestive action of enzymes, can be cleaned by wet processing. The garments are drycleaned first to remove all solvent-soluble soil.

Garment measurements are recorded before wetcleaning. Dyes are tested to determine if the garment can be wetcleaned successfully, as some dyes bleed and run when wet with water.

Wetcleaning is not washing—rather, it is a hand brushing operation. Quick drying is essential in wetcleaning. To accomplish this, a special piece of equipment called a "Windwhip" is used. The unit is heated to hasten quick drying, and thus helps to eliminate possibility of bleeding and streaking of the dye.

SELECTION AND CARE OF FABRICS

The selection and care of modern day fabrics has become quite complicated for the consumer. Fabric properties can be determined by laboratory tests and many times test results are used by manufacturers to prepare the labels, hang tags, advertising and promotional material on fabrics and garments.

There are many individual properties that combine to make a fabric or garment or household item perform satisfactorily in wear and in cleaning, whether it be laundering, wetcleaning, or drycleaning. These qualities are:

1. *Fiber Content*: A fabric made of 100% composition of any one given fiber may be expected to have different qualities than a fabric

having one or more fibers blended together. For example, a 100% silk fabric would not have the same qualities as a 20% silk and 80% wool fabric.

2. *Yarn Construction*: A fabric may be made from a filament yarn or a spun yarn; a woolen yarn or a worsted yarn; a relatively simple yarn to a complex novelty yarn. Each type of yarn construction contributes certain qualities to the fabric.

3. *Fabric Construction*: Fabric construction may be simple or complex. There are a variety of standard fabric weaves and knits that we have become acquainted with over the years. But every year, the ingenious fabric designer may produce new and attractive fabric constructions.

4. *Dyeing or Printing*: Dyeing or printing of a fabric offers a wide selection of colors and designs from which to choose. Dye chemistry and the proper application of dyes to fabrics play an important part in the satisfaction received from dyed and printed materials.

5. *Finish*: There are many different physical and chemical finishes applied to fabrics to give them many added and desirable properties. But in some instances, a particular finish may also cause limitations in use and care.

6. *Decorative Designs*: Decorative designs may be applied to a fabric surface or woven into the basic weave construction, to add interest and variety. Many of these designs give very satisfactory performance in wear and in

cleaning. In some cases, however, a design may limit the wear life of the fabric.

7. *Garment Construction*: The manner in which fabrics are combined in garment design is a very important consideration. An improperly cut garment, or a poorly sewn garment can result in disappointment.

8. *Garment Findings and Trim*: Findings and trim are just as important as the fabric itself in garment design. If the stitching thread shrinks or bleeds, the bias or stay tape, ribbon or embroidery trim do not perform satisfactorily in cleaning, the value of the entire garment is lost.

THE FIBERS USED IN FABRICS

Today many different fibers are used in fabrics for wearing apparel and household items. When a fabric is made of one particular fiber, the fiber properties generally carry over into the fabric. When two or more fibers are combined into a fabric, some individual fiber properties may be lost. On the following pages we show fabric examples made of 100% composition of each textile fiber manufactured today. Specific terms related to a particular classification of fibers are explained under the heading "Definition of Terms." The major qualities expressed in advantages and disadvantages of a particular fiber may be helpful in the selection of fabrics of similar fiber content.

SECTION II

SELECTION AND CARE OF FABRICS

A. NATURAL FIBERS

1. Cellulosic



COTTON

Tarpoon, 100% Cotton—Galey and Lord

COTTON

Definition: Cotton is a natural vegetable fiber (cellulosic). It is obtained from the seed of the cotton plant.

- Advantages:**
- Strong, durable and serviceable fabrics may be made from cotton.
 - It can be made into sheer, light-weight luxury-type fabrics.
 - Cotton dyes and prints readily, offering a wide selection of colors and designs. Many of the dyes give good colorfastness to light, perspiration, crocking, washing, wetcleaning, and drycleaning.
 - Cotton is adaptable to many special finishes such as mercerizing, glazing, sanforizing, sanitizing, wrinkle resistance, chlorine resistance, flame resistance, water repellency, and others.
 - It is adaptable to many surface treatments to create beautiful designs, such as moiré, embossed, flocked, and lacquer stencil prints.
 - Mercerizing of cotton gives added strength and luster.
 - Cotton can be spun and woven into a variety of constructions that are comfortable to wear. It absorbs moisture readily; dries quickly.

- Cotton garments can be laundered, wetcleaned or drycleaned, depending on the dye, finish, design of the fabric and the construction of the garment.
- White cotton fabrics can be bleached with the chlorine-type bleaches if there is no resin treatment or if the resin is of the type that resists chlorine type bleaches.
- Cotton is resistant to alkalis.
- It withstands high ironing temperatures. A temperature up to 400-425°F. is safe for cottons.

Disadvantages:

- Untreated cotton lacks elasticity; it creases and wrinkles easily, unless special finishes are used.
- Cotton is easily weakened by mildew and silverfish, unless treated to resist them.
- Cotton is readily attacked by acid reagents or substances.

ACETYLATED AND CYANOETHYLATED COTTONS

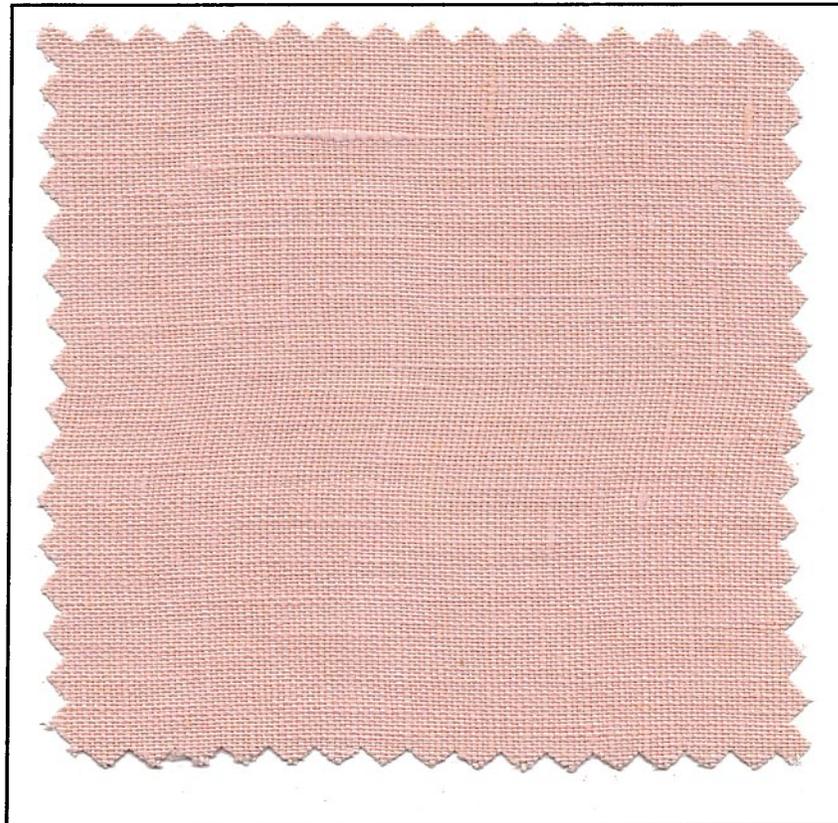
Cotton fibers, yarns or fabrics may be acetylated or cyanoethylated. These fabrics retain the outward appearance of cotton but acquire new, desirable properties, such as permanent resistance to rot, improved resistance to acid, heat, and flat abrasion and improved electrical properties.

LINEN

Definition: Linen is a natural vegetable bast fiber (cellulosic). It is obtained from the stem of the flax plant.

- Advantages:**
- Strong, durable fabrics, stronger than cotton, can be made from linen.
 - Linen can also be made into sheer, light-weight fabrics.
 - Linen absorbs moisture more readily and dries more quickly than cotton. Because of this property linen fabrics are cool and comfortable to wear.
 - Linen does not lint; rarely frays or slips at the seams.
 - Linen dyes well, but it does not take dyes as readily as cotton. Some of the dark colors crock readily.
 - Linen is naturally moth-resistant.
 - It can be laundered, wetcleaned or drycleaned, depending on the dye, finish, design application, and garment construction.
 - It is resistant to alkaline substances and reagents.
 - White linen fabrics can be bleached with chlorine-type bleaches.
 - Linen withstands high ironing temperatures (450-500°F.).

100% Linen



LINEN

- Disadvantages:**
- Linen fabrics are generally more expensive than cotton fabrics.
 - Linen is not very resilient. It wrinkles readily unless it is treated with a wrinkle-resistant finish.
 - Some crush-resistant finishes decrease the comfort in wear; such finishes make some fabrics lose strength more readily; scorch more easily.
 - Linen is easily damaged by acidic substances or reagents.
 - Linen is susceptible to mildew and rot unless treated with a mildew-resistant finish.
 - Pressing along creases and folds weaken linen fabrics.
 - Linen is apt to be weakened by bleaches.

Labeling: According to the Trade Practice Rules issued by the Federal Trade Commission:

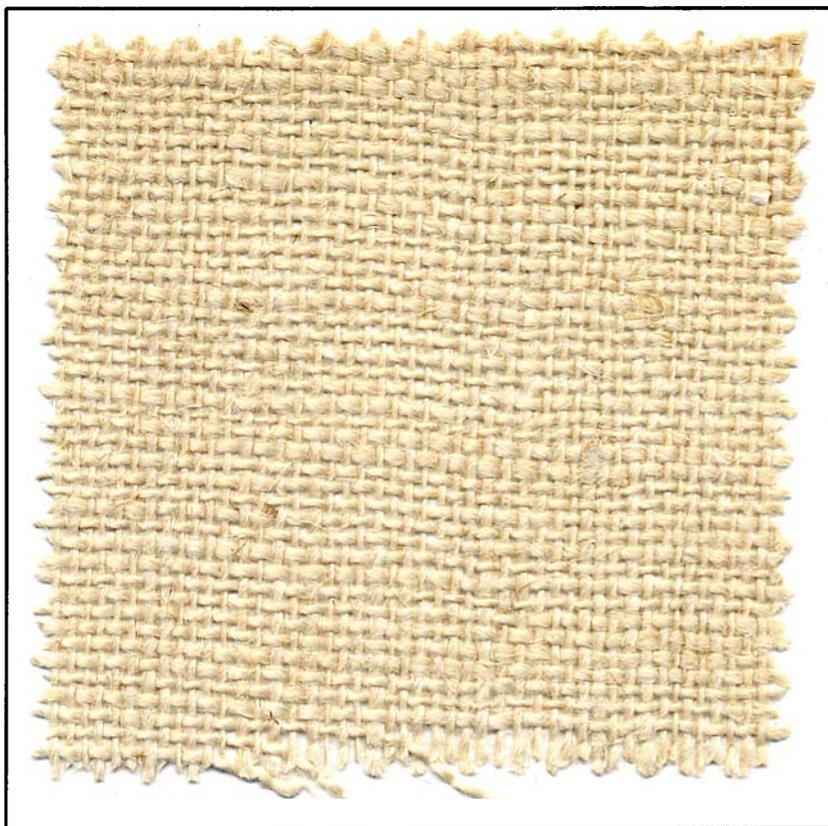
1. No fabric may be labeled "linen," "pure linen," or "pure flax," or carry a name implying that it is linen unless the fabric is made of 100% linen.
2. If a fabric contains linen and another fiber or other fibers, the percentage of each fiber must be stated or the contents disclosed in the order of predominance by weight.
3. Fibers other than linen, but treated or woven into fabrics that resemble linen in appearance may be labeled, "rayon linen," "silk linen," etc.
4. A fabric is mislabeled if the fabric name contains "lin," "lyn" or similar terms.

RAMIE

Definition: Ramie is sometimes called "China Grass." It is a natural vegetable bast fiber (cellulosic), since the fiber is obtained from the stem of the ramie plant.

- Advantages:**
- Ramie is more resistant to light than are linen and cotton.
 - Strong, durable fabrics can be made of ramie because of the natural strength of the fiber.
 - Ramie has a natural luster, comparable to silk and linen.
 - Ramie dyes fairly easily. It is available in a variety of colors.
 - Ramie reacts very much like cotton: It is resistant to alkalis; resistant to mildew.
 - Ramie fabrics can be laundered, wetcleaned or drycleaned, depending on the dyes, finish, design application and garment design.
 - White ramie fabrics may be bleached with chlorine-type bleaches, but precaution should be taken. Ramie fabrics withstand ironing temperatures up to 400 - 450°F.

- Disadvantages:**
- Ramie is more expensive than linen and cotton.
 - The supply or availability is limited.
 - Ramie is damaged easily by acid substances and reagents.
 - Ramie wrinkles easily.



Calcutta Cloth, 100% Jute—Dazian's, Inc.

BURLAP

Definition: Jute is a fiber obtained from the best of various species of *Corchorus* grown primarily in India and East Indian Islands. Burlap, a popular wearing apparel and household decorative fabric, is made of jute.

Advantages:

- The coarseness of jute yarns is an advantage in creating fabrics of rough texture.
- Jute can be bleached but bleaching is accompanied by loss of fabric strength.
- Surface applied or printed designs on jute result in many varieties of decorative and wearing apparel fabrics.
- Jute can be laminated to urethane foam for outerwear fabrics.
- Chemical finishing can improve the drape and hand of jute.
- Chemical finishes may be applied to overcome the natural odor of jute.
- Jute fabrics should be drycleaned.

Disadvantages:

- Jute has a low wet tensile strength. It should not be laundered or wet-cleaned.
- It has very low resistance to light, hence is easily damaged by light resulting in fabric deterioration.
- Unless lined, garments are scratchy, stiff.
- Jute is brittle and breaks or splits easily on folds.
- Jute wrinkles easily; snags readily; lints badly.
- It is difficult to dye and bleach jute. Some dyes have poor penetration, hence poor colorfastness.
- Jute sometimes develops a natural, objectionable odor that cannot be removed in drycleaning or wetcleaning.

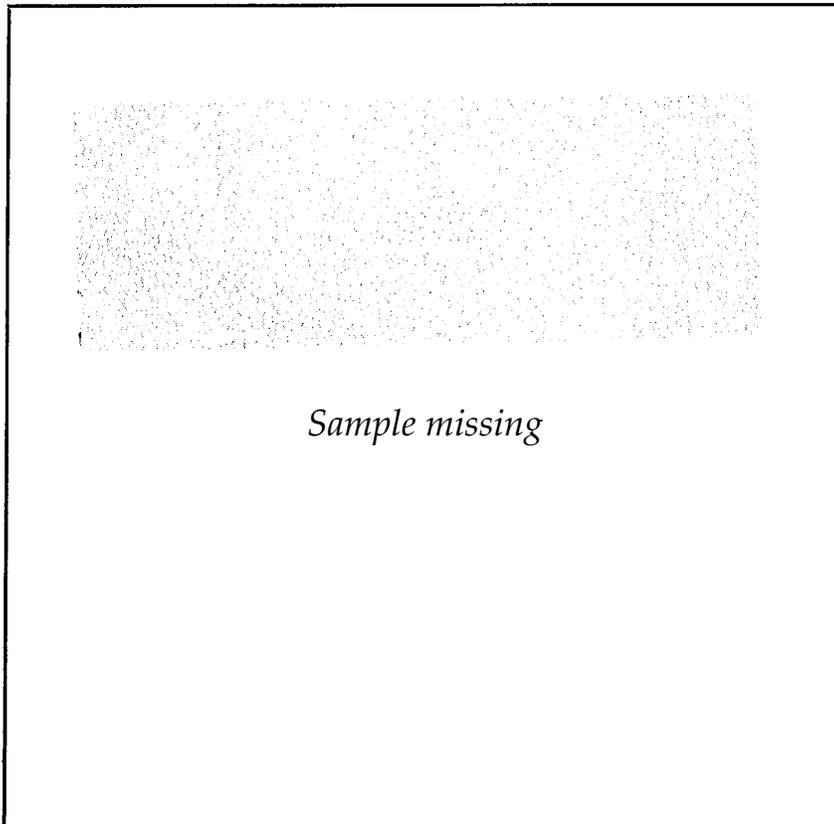
"PURE DYE SILK," "SILK," "ALL SILK"

2. Protein Fibers

Definition: Silk is classed as a natural animal fiber (protein). It is obtained from the cocoons that are spun by cultivated silk worms. The filaments are fine and even in size. They are used to make fine luxurious silk fabrics.

- Advantages:**
- Silk is luxurious in appearance and feel.
 - Silk is a very strong fiber in relation to its filament fineness.
 - Silk is very elastic, therefore very wrinkle resistant.
 - Silk is comfortable to wear because it is so absorbent. It dries quickly.
 - Silk gives up soil readily.
 - It dyes and prints readily to beautiful, brilliant shades.
 - Silk is adaptable to a variety of fabric constructions, from the very sheer drapable fabrics to the heavy, stiff, bouffant fabrics.
 - Silk can be laundered, wetcleaned or drycleaned, depending on dye, finish, design, and garment construction.
 - White silk fabrics may be bleached with hydrogen peroxide or sodium perborate-type bleaches.

Willow Crepe, 100% silk



"PURE DYE SILK," "SILK," "ALL SILK"

- Disadvantages:**
- Sunlight and perspiration weaken silk fabrics.
 - Many dyes used on silk are affected by sunlight and perspiration.
 - Silk may be damaged by acidic and alkaline substances and reagents.
 - In some constructions, silk is very susceptible to abrasion.
 - In some constructions, silk yarns have low strength and have a tendency to split or break.
 - Silk can be attacked by insects.
 - Strong soaps and high ironing temperatures over 340°F. tend to weaken and yellow silk fabrics. Some silks may yellow with age.
- Labeling:**
- By a ruling of the Federal Trade Commission, “silk,” “all silk,” “pure dye,” “pure dye silk,” must not contain any metallic weighting, loading or adulterating materials other than the dyeing and finishing materials necessary to produce the desired color or finish. These materials cannot exceed 10%, except in black silk, in which a tolerance of 15% is allowed.

Weighted silk is no longer available in the American Market, nor is any being imported into the United States from Foreign sources.

Imported Silk Taffeta, 45% weighting

WEIGHTED SILK

Definition: Weighted silk is a silk fabric that has metallic weighting, usually tin salts, loading, or an adulterating material in the fabric.

- Advantages:**
- In some cases weighted silk may have more drapability than a pure dye silk of comparable construction.
 - Weighted silk fabrics are less expensive in most cases than comparable constructions of pure dye silk fabrics.
 - Weighted silk can be laundered, wetcleaned or drycleaned, depending on the dye, amount and kind of weighting, design application, and garment construction.

- Disadvantages:**
- Weighted silk is not as serviceable as pure dye silk. The greater the degree of weighting, the less is the degree of serviceability.
 - Weighted silk may crack and split with very little use or wear. Perspiration and sunlight quickly weaken it. It may also crack or split when it is drycleaned.
 - Spot and stain removal is more difficult than in pure dye silk because some of the spotting reagents used to remove spots and stains may react with the weighting material, causing fabric damage.

Labeling: By a ruling of the Federal Trade Commission, silk fabrics that have more than 10% weighting (except for black silk that may have 15%) must be labeled and sold as weighted silk. The amount of weighting must be stated on the label.

WOOL

Definition: Wool is a natural animal fiber (protein). It is obtained by sheering sheep or lambs. Technically, wool also includes the so-called specialty fibers—cashmere, camel’s hair, mohair, llama, vicuna, and rabbit’s hair.

- Advantages:**
- Wool is warm and comfortable. It absorbs moisture readily and without making the wearer feel cold.
 - Wool is very resilient; it resists wrinkling.
 - Wool fabrics hold creases and shape very well.
 - Many wool fabrics are naturally somewhat water-repellent, and flame-resistant.
 - Wool has the ability to hold deep nap without matting; retains warmth.
 - Wool tailors very well because of its ability to be shaped.
 - Wool dyes easily, permitting a wide range of colors.
 - Wool is fairly resistant to acidic substances.
 - Wool may be laundered, wetcleaned or drycleaned, depending on the dyes, finish and garment design.
 - White wool fabrics may be bleached with hydrogen peroxide or sodium perborate bleaches.

100% Wool



WOOL

- Disadvantages:**
- Wool is very sensitive to alkaline substances.
 - Chlorine-type bleaches cause wool to yellow and may even dissolve it.
 - Wool is readily attacked by moths and carpet beetles unless treated to resist them.
 - Wool requires special handling in laundering, wetcleaning and dry-cleaning to prevent felting shrinkage. Some special finishes help to reduce this hazard.
 - Wool becomes harsh at 212°F. ; scorches at 400°F.

Labeling: The Wool Product's Labeling law provides that all wool products, except upholsteries and floor coverings, must be labeled as to the amount of wool and other fibers present. It requires that the kind of wool used must also be stated, and defines them as follows:

“Virgin” or “New” Wool: These terms may be applied only to wool fibers taken directly from the fleece of sheep.

“Reprocessed” Wool: This term is used to cover wool fibers reclaimed or recovered from woven or felted wool products which have never been worn or used in any way by the consumer.

“Re-used” Wool: This term is used to cover wool fibers reclaimed or recovered from any wool product that has been worn or used by the consumer.

The law also requires that the manufacturer's name or registered number appear on the label.

SPECIALTY HAIR FIBERS

Specialty hair fibers are obtained from a related species of animals. They are used with wool to produce special effects or to give additional beauty, color, softness, or luster.

How are they classified?

1. *Fur-Bearing Animals*: Fabrics are being sold currently that combine beaver, mink, seal, angora (rabbit) in a variety of woven and knit items.

2. *The Camel Family*

Camel's Hair—known as camel's hair wool. Genuine camel's hair coats are very expensive. They should not be confused with the woolen fabrics that are made to resemble genuine camel's hair. The characteristic tan color can be deceiving, since many fabrics are dyed to match or look like genuine camel's hair.

Guanaco—sometimes called "Fibers of the Wild." Fabrics using this fiber are soft, luxurious, and expensive.

Vicuna—Coats made of vicuna sell in the same price range as genuine fur coats. A very limited amount is available, because the fiber is controlled by the Peruvian government.

Alpaca—gray and fawn colored fabrics predominate, but available in white, black, coffee color.

Llama—True brown fabrics predominate. A few light biege.

A New Luxury Fiber—A new top quality woolen fiber combining the soft, silken luxury of Vicuna with the durability of Alpaca has been developed through the cross-breeding of the two Andean animals. It was a joint venture of the U. S. and Bolivian governments. The new animal is expected to produce a wool that has all the fine silky warmth of Vicuna, with the strength and durability of Alpaca, at a price that will make garments of this fiber available to the average American consumer.

3. *The Goat Family*

Angora goat, better known as mohair. This should not be confused with angora rabbit hair. Mohair is used in fabrics ranging from

heavy drapery and upholstery fabrics to very sheer dress fabrics.

Cashmere goat is a natural fiber obtained from the fine underdown of the Kashmir goat found in the high plateaus of inner Asia. A small amount of the fiber comes from Kashmir, India, but China and Outer Mongolia produce the greatest amount. The natural color of cashmere is white, gray, or tan. It can be dyed from very light pastel colors to dark colors, blue, brown and black.

Unfortunately, the word "cashmere" is often used indiscriminately as many products are called cashmere which actually contain little or no cashmere fiber at all. The word "Kashmir" generally refers to a lower grade of cashmere. Over the years, however, the word "Kashmir" and "Cashmere" have been used interchangeably.

To produce sufficient yardage for an overcoat requires the entire annual yield of approximately 30 Kashmir goats. The annual clip of the Kashmir goat is very small in relation to the demand. The inaccessibility of the areas where it is grown and the primitive methods of transportation contribute to its cost.

Some of the limitations of Cashmere are:

(a) *Abrasion in wear*: Cashmere fabrics are very susceptible to abrasion in wear. Effects of wear usually occur first at neckline, cuffs, front opening, and edge of pockets. The seat may show abrasion too.

(b) *Small dark hairs*: Small dark hairs many times appear throughout pastel colored cashmere fabrics. This is sometimes very noticeable because of the color contrast, the dark color against the light pastel shade. These are the guard hairs that were not removed from the fine down fibers before the fibers were spun into a yarn.

(c) *Pilling*: Pilling is a term used to describe the bunching together of surface fibers into a ball. This is usually more noticeable in knit goods than in woven goods. It occurs most frequently in the underarm area where the sleeve rubs against the body.

4. *Reindeer*

Many luxury suiting and coating fabrics contain reindeer hair. Reindeers are found in northern and arctic regions. They are often domesticated.

The tan to brown stiff reindeer hair is added to give surface interest to a fabric. If not secured in the basic weave, it may shed or abrade off in wear and be partially removed in drycleaning.

Labeling:

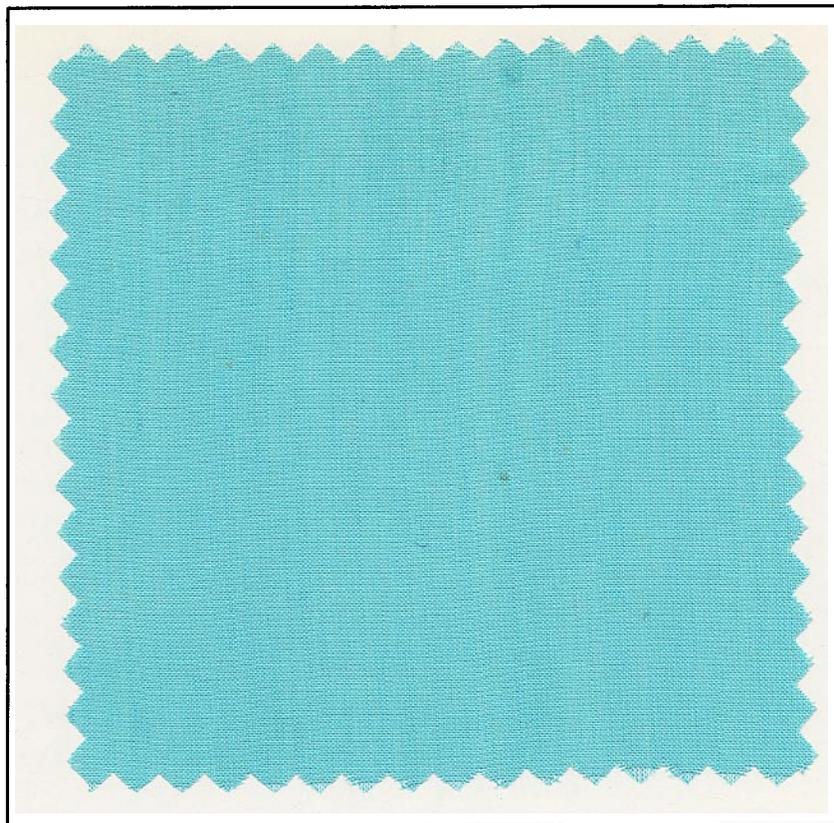
The Federal Trade Commission ruling states that when a fabric is made of one of the specialty fibers classed as wool, or a blend of the fibers and wool, the name of the fiber may be used on the label, providing the percentage of each fiber is given. If the specialty fibers fall within the classification of reprocessed or reused wool (see page 18), such information must also be stated on the label.

B.

MAN-MADE FIBERS

1. Rayon (Regenerated Cellulose)

As defined by the Federal Trade Commission, rayon is a manufactured fiber composed of regenerated cellulose, as well as manufactured fibers composed of regenerated cellulose in which substituents have replaced not more than 15% of the hydrogens of the hydroxyl groups.



RAYON

Cuprammonium Rayon.

REGULAR RAYON

Definition: There are two methods of production: (1) Viscose rayon—wood pulp or cotton linters dissolved in an alkali, aged and chemically treated before spinning. (2) Cuprammonium—cotton linters dissolved in copper-ammonium hydroxide solution, aged before spinning. (See recent developments on the following pages.)

- Advantages:**
- Rayon can be used to make a wide range of fabrics, from very light-weight luxury type to heavy, strong, durable fabrics.
 - Rayon dyes and prints easily, offering a wide selection of colors and designs.
 - Rayon can be made to look like cotton, linen, silk or wool.
 - Rayon can be given many different finishes, including a finish that reduces the risk of shrinkage.
 - Rayon is absorbent, therefore comfortable to wear.
 - Rayon is resistant to alkalies; moths.
 - Rayon can be laundered, wetcleaned or drycleaned, depending on dye, finish, design application, and garment design.
 - Rayon fabrics can be bleached with chlorine-type bleaches.
 - Rayon should be ironed at 250°F. Rayon is weakened if pressed with iron temperature over 300°F.

- Disadvantages:**
- Rayon loses nearly 50% of its strength when wet.
 - Rayon fabrics shrink considerably unless they are stabilized.
 - Rayon has low resiliency, therefore wrinkles badly unless given a finish to make it wrinkle-resistant.
 - Lengthy exposure to light weakens rayon, especially when the yarns have been highly pigmented to create a dull yarn appearance.
 - Rayon is susceptible to mildew unless treated to resist it.
 - Rayon is easily damaged by strong acids.

Labeling: The Federal Trade Commission's Trade Practice Rules (1951) stated a fiber produced by the viscose and cuprammonium process should be labeled "rayon." If a fabric contains rayon and another fiber, the label should designate the fibers in the order of predominance by weight or the percentage present. The rules were rescinded after the Textile Fiber Products Identification Act became effective, since the new Act covers the provisions of the trade practice rules.

FORTISAN

Definition: Fortisan (saponified acetate) is classified as a rayon—a synthetic cellulose fiber. It is produced only in continuous filament form. Fortisan is a trademark name of the Celanese Corporation of America. The use of Fortisan yarns in curtain and drapery fabrics is on the decline.

- Advantages:**
- Fortisan has a relatively very high tensile strength.
 - It can be spun into very fine filaments, making sheer fabrics that have high strength.
 - Fortisan has very low moisture absorption that can work to an advantage in some fabric constructions. This quality makes the fiber shrink-and-stretch-resistant.
 - Fortisan is resistant to moths; resistant to alkalies.
 - Fortisan can be laundered, wetcleaned or drycleaned, depending on the fiber with which it is combined, the manner in which it is woven, the dye or decorative design.
 - Fortisan itself can be bleached with chlorine-type bleaches. However, the fiber or fibers with which it is combined must be considered in selecting the type of bleach.
 - Fortisan itself can withstand a high ironing temperature but temperature should be set to accommodate the other fiber or fibers combined with Fortisan. It is safest to use an ironing temperature of 250°F. (rayon setting).

- Disadvantages:**
- At the present time, Fortisan yarn is manufactured as pure lustrous white or pigmented black. It is usually used in the warp or lengthwise direction of a fabric, combined with any of the natural or synthetic fibers in the filling or crosswise direction of the fabric.
 - Its application at present is limited to curtain and drapery fabrics.
 - Fortisan has poor resistance to sunlight, but higher than rayon.



Sinhue, 65% Dacron, 35% Avron. Yarn dyed.

AVRON

Definition: Avron is a trade-mark name designating one of the new type high strength rayon yarns. It is made by American Viscose Division, FMC Corporation. It is more than twice as strong as regular rayon.

- Advantages:**
- Avron fabrics may range from 100% types to any percentage blend with other fibers.
 - It is used in both wearing apparel and household fabrics.
 - Its dry strength is 40% greater than regular or conventional rayon.
 - Its wet strength is 60% greater than regular rayon.
 - Avron fabrics have good tear strength, abrasion resistance and crease resistance.
 - Avron imparts a soft, luxurious hand to fabrics.
 - Avron can be drycleaned and wetcleaned.
 - It can be pressed safely with an iron setting of 375°F.

- Disadvantages:**
- Like rayon, Avron is easily damaged by acids.
 - It is susceptible to mildew unless treated to resist it.

LIRELLE

Definition: Lirelle is a term used to designate a new modified high-strength rayon. It is a trade-mark name of Courtaulds North America, Inc.

- Advantages:**
- Lirelle is said to impart a look and feel of luxury to fabrics containing it.
 - It may be blended with cotton, polyesters and other synthetic fibers. Lirelle contributes drapability and versatility in blended fabrics.
 - Lirelle possesses both a high wet and dry strength.
 - Fabrics containing Lirelle may be stabilized for shrinkage control. Fabrics may be treated with a variety of textile finishes.
 - Lirelle may be dyed or printed with colorfast colors.
 - Fabrics made of Lirelle may be drycleaned or wetcleaned, depending on garment construction.

- Disadvantages:**
- Lirelle may be damaged by acids.
 - Lirelle fabrics are susceptible to mildew unless treated to resist it.

Lirrella; 50% Lirelle, 50% cotton—Courtaulds North America, Inc., Stein-Tex, Inc.

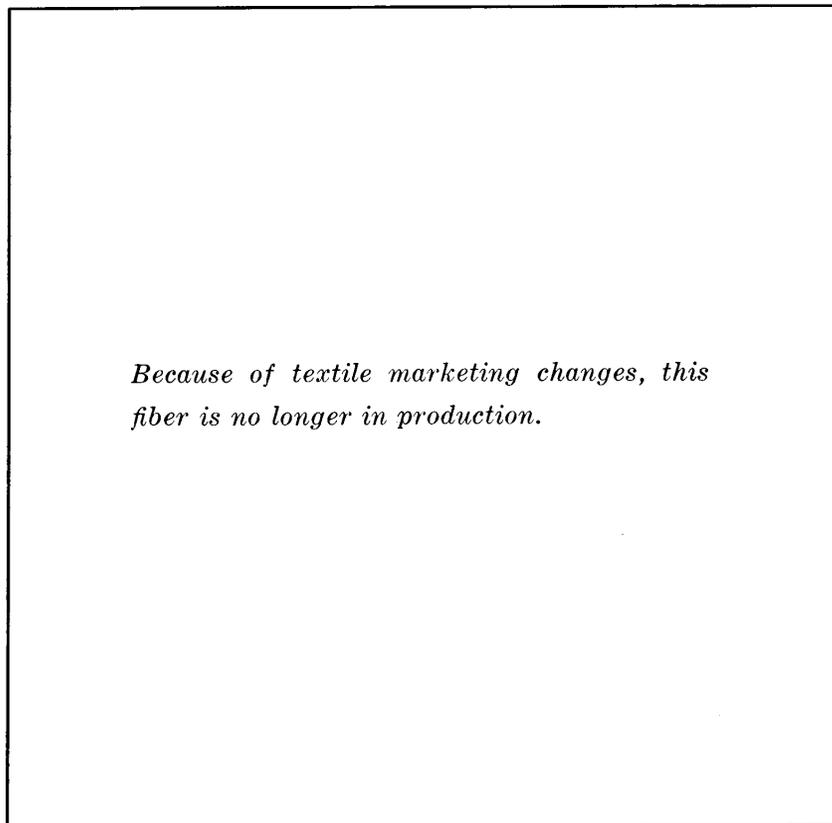
Because of textile marketing changes, this fiber is no longer in production.

CORVAL

Definition: Corval is a fiber made from a derivative of cellulose. The individual molecules have cross-links which bind them together chemically. Corval is a trade-mark name of Courtaulds North America, Inc.

- Advantages:**
- Corval has a wool-like hand. It resists pilling.
 - It can be blended with wool and synthetic fibers.
 - Corval can be dyed with dyestuffs used for cotton.
 - It can be treated with resins to make it wrinkle-resistant.
 - It can withstand the cotton mercerization treatment.
 - Corval can be drycleaned and wetcleaned. It has good stability because the fiber is low swelling and low shrinking.
 - It can be pressed safely with an iron setting of 375°F.

100% Corval—Courtaulds North America, Inc., Rutgers Fabric



CROSS-LINKED FIBERS

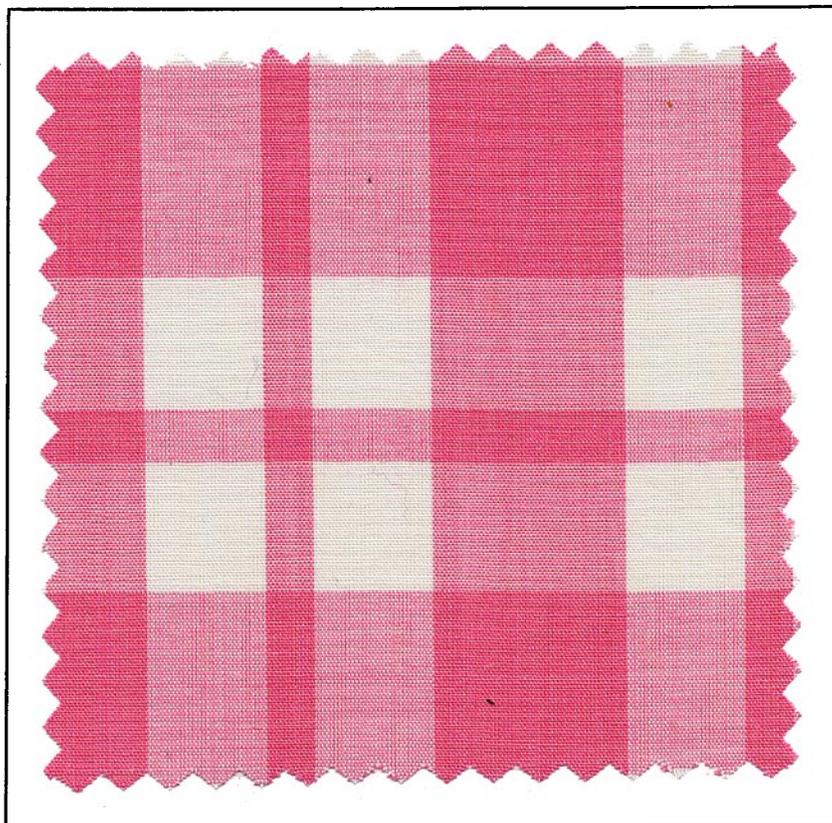
- Disadvantages:**
- Corval has only fair abrasion resistance.
 - It has poor crease retention.
 - Corval has a low tensile strength.
 - It's wrinkle resistance is only fair. It can be improved with a resin treatment.

AVRIL

Definition: Avril is one of the new "polynosic" high-wet modulus rayon yarns. It is made by the American Viscose Division, FMC Corporation. Early rayons were sensitive to water, resulting in plastic elongation, swelling, poor wet strength and poor dimensional stability. Through rearrangement of the internal fiber structure, and increase in the percentage of the external area, the dry and wet strength of rayon has been improved.

- Advantages:**
- The dry strength of Avril exceeds that of cotton.
 - The wet strength of Avril is comparable to that of cotton.
 - Fabrics containing Avril can be knitted or woven; can range from sheer to heavy. It can be blended with any natural or synthetic fiber.
 - Avril can be stabilized for shrinkage control.
 - It can be dyed and printed with dyes that have good colorfastness.
 - Avril fabrics can be drycleaned or wetcleaned satisfactorily.

Supreme, 65% Dacron, 35% Avril



POLYNOSIC

- Disadvantages:**
- Avril fabrics should be treated with a finish to resist wrinkling.
 - Avril will mildew unless treated to resist it.
 - Avril may be damaged by acids.

Labeling: The term polynosic is often used to differentiate the new high-wet modulus rayon yarn from the cross-linked types. Under the Textile Fibers Product Labeling Act, polynosic fibers and cross-linked fibers fall under the generic classification—rayon.

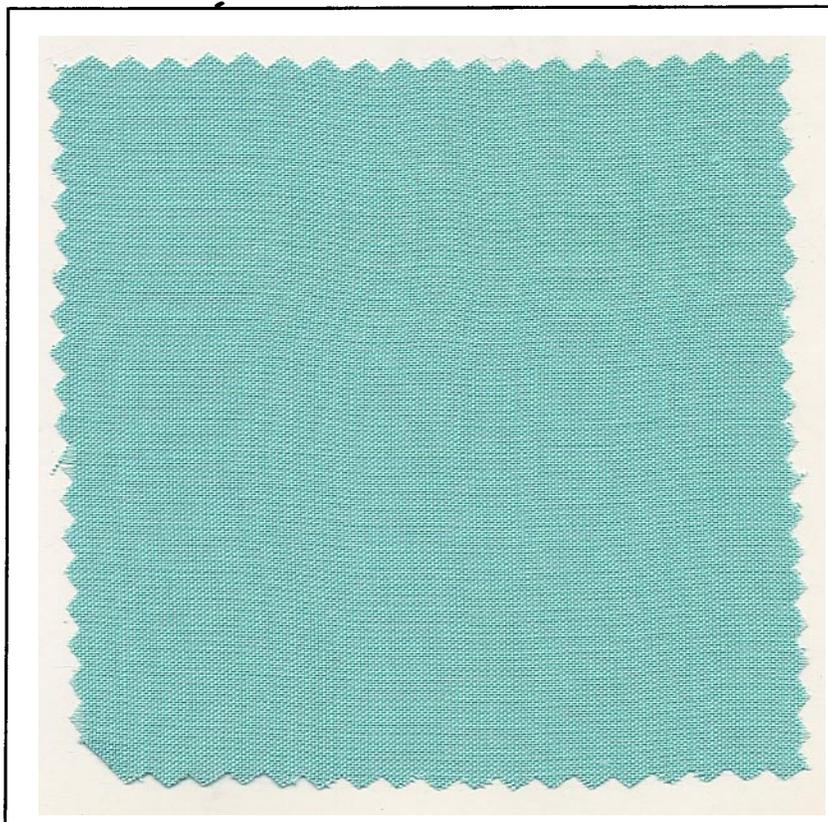
ZANTREL

Definition: Zantrel is a fiber derived from a cellulose base. It differs from rayon in its molecular structure and degree of polymerization. The molecular chain length of the cellulose forming the fiber is about twice as long as in conventional rayon. Zantrel is a trade-mark name of American Enka Corporation.

- Advantages:**
- Zantrel has better dimensional stability and wet wrinkle recovery than regular rayon.
 - It can be mercerized and sanforized like cotton.
 - It has a crisp cotton-like hand. It can be dyed with the same dyestuffs used on cotton and rayon.
 - It can be treated with resins for wrinkle resistance.
 - Zantrel may be drycleaned or wetcleaned.
 - It may be ironed safely with an iron temperature of 375°F.

- Disadvantages:**
- Zantrel has only fair abrasive resistance.

100% Zantrel—American Enka Corp.



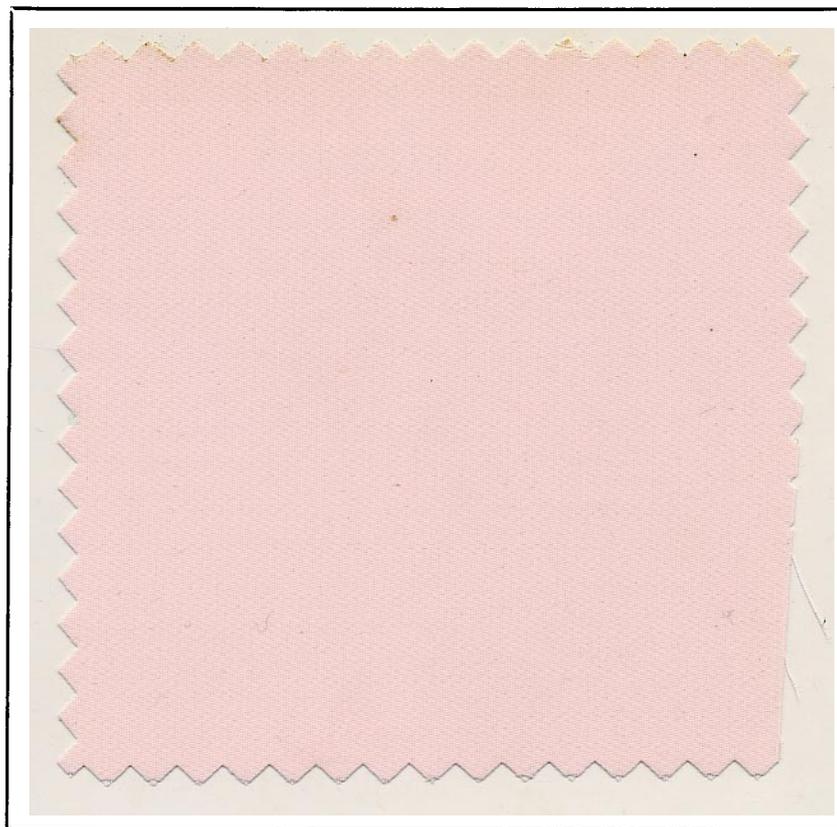
RAYON YARNS

Trade-mark names are used to identify rayon yarns made by different textile producers. These names are used on labels, promotional literature and in advertising copy.

TRADE-MARK NAMES	DESCRIPTION	MANUFACTURERS
Bemberg	Cuprammonium filament	American Bemberg
Cupioni (cupioñi)	Thick-and-thin cuprammonium	American Bemberg
Matesa (mâtesâ)	Dull filament cuprammonium	American Bemberg
Nub-lite	Nubby, thick-and-thin cuprammonium	American Bemberg
Sunspun	Staple cuprammonium	American Bemberg
Englo (en-glow)	Dull luster viscose filament	American Enka
Enka (en-ka)	American Enka name for viscose products	American Enka
Jetspun (jet-spun)	Solution-dyed viscose filament	American Enka
Perlglo (pearlglow)	Semi-dull viscose filament	American Enka
Zantrel or Zantrel Polynosic	Polynosic staple fibre	American Enka
Zantrel 700	High wet strength rayon	American Enka
Fortisan	High tenacity; also regular viscose filament bright and dull, and continuous filament and tow	Celanese
Fortisan 36	High strength regenerated filament rayon	Celanese
Coloray	Solution-dyed viscose staple	Courtaulds
Corval	Cross-linked rayon staple	Courtaulds
Fibro	Viscose staple fiber	Courtaulds
Lirelle	High wet modulus fiber	Courtaulds
Moynel	High wet modulus viscose rayon fiber	Courtaulds
DuPont rayon	Viscose filament; thick-and-thin	DuPont
Civona	Hollow filament viscose yarn	DuPont
Cordura	Strong viscose filament	DuPont
Ondelette	Random slubbed viscose filament	DuPont
Avicolor	Solution-dyed fiber or yarn	FMC Corporation
Avicron (â-vi-krôn)	Latent-crimp filament yarn	FMC Corporation
Avlin (Fiber RD 100)	Multicellular fiber	FMC Corporation
Avril (Fiber 40)	Permanently staple fiber	FMC Corporation
Avron (â-vrôn)	High strength staple fiber	FMC Corporation
Rayflex (ra' fleks)	High strength viscose filament	FMC Corporation
Super L (su'-per-êll)	Smooth staple carpet fiber	FMC Corporation
IRC	Viscose filament and high tenacity yarn	Industrial Rayon
Strawn	Straw-like rayon monofilament, bright and dull; for upholstery and drapery fabrics	Industrial Rayon
Narco	Viscose filament	North American Rayon
Hi-Narco	High tenacity viscose filament yarn	North American Rayon
Super-Narco	Super high tenacity viscose filament yarn	North American Rayon
Skenandoa	Viscose	Skenandoa Rayon
Veri-Dull	Dull filament viscose yarn	Skenandoa Rayon

2. Acetate

As defined by the Federal Trade Commission, acetate is a manufactured fiber in which the fiber-forming substance is cellulose acetate. Where not less than 92% of the hydroxyl groups are acetylated, the term triacetate may be used as a generic description of the fiber.



Piece-dyed Acetate Satin—Eastman Chemical Products, Inc.

ACETATE

Definition: Acetate is a synthetic fiber. It differs from rayon in that it is not a regenerated cellulose, but an acetate ester of cellulose.

- Advantages:**
- Acetate can be made into a large range of fabrics, sheer to heavy weight, that have a luxurious soft feel, silky appearance, with excellent draping qualities.
 - Acetate requires a special class of dyes for dyeing and printing. Because of its different dyeing characteristics from other fibers, many interesting effects can be created by cross-dyeing and in blends.
 - Acetate is resilient and resists wrinkling. It retains creases and pleats fairly well because of its thermoplastic property.
 - Acetate is faster drying than rayon. It is absorbent, therefore it can be warm or cool, depending on fabric construction.
 - Diluted acidic and alkaline substances have little effect on acetate.
 - It is resistant to mildew; moths.
 - Acetate can be solution-dyed, giving excellent color fastness properties to wear agencies such as light, atmospheric gas fading, crocking, perspiration, washing, and drycleaning.

- Acetate fabrics may be laundered, wetcleaned or drycleaned depending on dyes, finishes, decorative design, and garment design.
- To bleach white acetate fabrics, use hydrogen peroxide or sodium perborate-type bleaches or a chlorine-type bleach. Temperature of bath should not exceed 90°F.

Disadvantages:

- Some acetate fabrics generate static electricity and cling to the body. Special finishes may be applied to overcome this disadvantage.
- Acetate loses strength when wet, but not to the degree of rayon.
- Lengthy exposure to light weakens acetate fabrics, especially when they have been highly pigmented to make them dull.
- Acetate is heat sensitive. Ironing temperature should not exceed 275°F. It will glaze at 300°F., stick to the iron at 350°F., and melt at 400°F.
- Some piece-dyed fabrics, unless treated with an inhibitor or anti-fume finish, are subject to atmospheric gas fading. Solution-dyed yarns have served to overcome this problem.
- Acetate is soluble in acetone, acetic acid, alcohol, and other chemicals in this family. Some nail polishes and removers contain acetone.

CRYSTAL ACETATE

Definition: “Crystal acetate” is used to describe a new method of producing a special shaped yarn that provides a reflective surface when woven into a fabric. In making the yarn, the acetate solution is forced through a spinnerette pierced with dashes instead of round holes. Therefore the filament is flat—thus it can reflect a greater degree of light than a round filament.

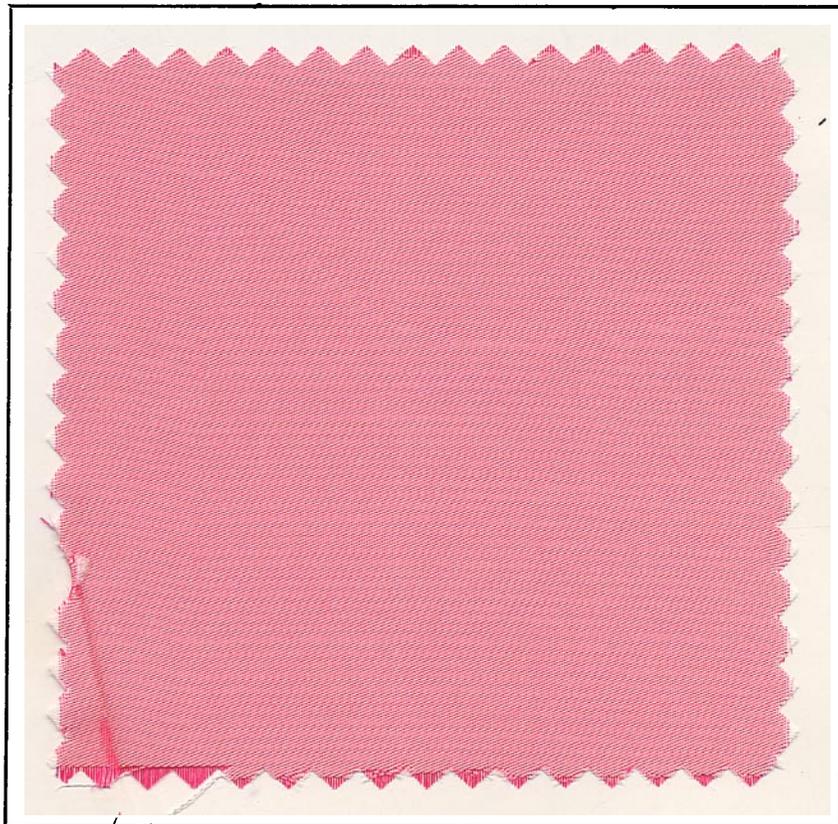
Advantages:

- This type yarn can give a shimmering or glistening effect to a fabric.
- A great many new fabrics have been made possible by the use of this yarn. The fabrics may be solid colored or iridescent.
- Crystal yarns may be combined with regular acetate yarns, silk, wool, nylon in practically every fabric construction.
- Fabrics of crystal acetate dryclean satisfactorily, although some of them require special handling.

Disadvantages:

- The strength of crystal yarns is lower than acetate yarns; hence these fabrics should be considered fragile in comparison with the same fabric construction made of regular yarns.
- Dye problems have been encountered in some of the fabrics.
- Some of the early fabrics using crystal yarns split readily. However, this problem seems to have been overcome in the more recent fabric production.

Nightlite Taffeta-Colorspun acetate warp, crystal acetate filling



CRYSTAL ACETATE



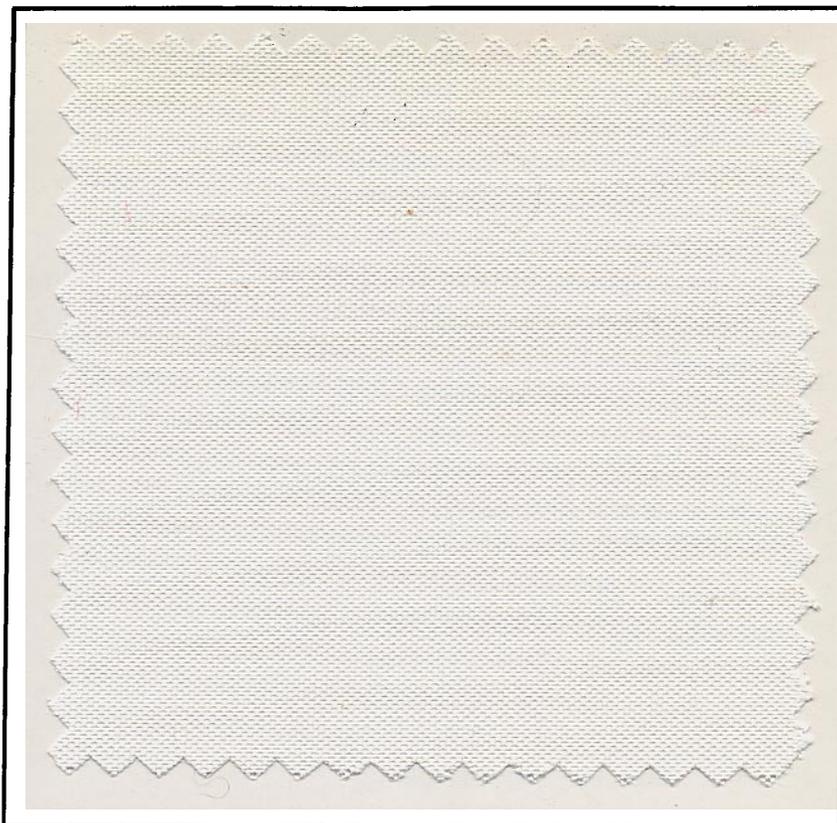
Estron SLR—Eastman Chemical Products, Inc.

ESTRON SLR

Definition: Estron SLR (sunlight resistant) is a new fiber having resistance to ultra-violet degradation not known before in any acetate fiber. Estron SLR is a trade-mark name of Eastman Chemical Products, Inc., a subsidiary of Eastman Kodak Company.

- Advantages:**
- Fabrics can be made with dull acetate yarns having resistance to sunlight tenderization.
 - Estron SLR has higher resistance to sunlight than bright acetate yarns. Bright acetate yarns have higher resistance to sunlight degradation than the regular dull acetate yarns.
 - Estron SLR will extend the service life of many curtain and drapery fabrics.

- Disadvantages:**
- Although the sunlight resistance of Estron SLR is greater than standard dull acetate, the luster, tensile strength and atmospheric discoloration are essentially the same as in standard dull acetate.



*100% Arnel Sharkskin—Celanese Corporation of America,
Goldstein & Leavy, Inc.*

ARNEL

Definition: Arnel is classed as a synthetic fiber consisting of cellulose tri-acetate. It is a trade mark name of the Celanese Corporation of America.

- Advantages:**
- Arnel is made in a large range of fabrics, from very sheer lightweight to heavy-weight fabrics.
 - Arnel has better resistance to abrasion than acetate.
 - It has good stability because it can be heat-set.
 - It takes dye readily, offering a wide selection of colors.
 - Arnel is quick drying; resistant to glazing.
 - Arnel possesses good wrinkle-resistance.
 - Arnel is resistant to moths; mildew.
 - Arnel fabrics may be made to have durable crease and pleat retention.
 - Arnel is not affected by weak acidic or alkaline substances.
 - Arnel can be laundered, wetcleaned or drycleaned, depending on dyes, finishes, decorative design, and garment design.
 - White Arnel fabrics can be bleached with a chlorine-type bleach.
 - It can be ironed at high ironing temperatures, 400 - 425°F. It will discolor at 440°F.; melt at 572°F.

Disadvantages: • Unless properly heat-set or treated with an anti-fume finish the ozone in the air may change the color of some dyes used on Arnel.

ACETATE YARNS

Trade-mark names are used to identify acetate yarns made by different firms. These names are used on labels, promotional literature, and in advertising copy.

TRADE-MARK NAMES	DESCRIPTION	MANUFACTURER
Avicolor	Solution-dyed fiber or yarn	FMC Corporation
Avisco acetate	Acetate filament yarn and staple	FMC Corporation
Celanese acetate	Bright and dull filament yarn; staple; voluminous yarn; thick-and-thin filament; textured filament; crystal	Celanese
Celaperm	Solution-dyed yarn	Celanese
Celaspun	Spun yarn	Celanese
Dupont acetate	Staple, crimpable yarn; type "C," thick-and-thin	DuPont
Acele	Filament yarn, natural and color-sealed	DuPont
Color-sealed acetate	Solution-dyed fiber	DuPont
Estron (ês' tron)	Fiber	Tennessee Eastman
Chromspun (chrómé spûn)	Solution-dyed fiber	Tennessee Eastman
Arnel	Triacetate staple and filament	Celanese
Arnel 60	Triacetate staple with increased strength	Celanese
Celaloft	Bulked filament yarns	Celanese

NYLON YARNS

Trade-mark names are used to identify nylon yarns made by different firms. These names are used on labels, promotional literature and in advertising copy.

TRADE-MARK NAMES	DESCRIPTION	MANUFACTURER
Caprolan—type 6	Heavy-denier filament yarn for industrial fabrics, upholstery, carpets; fine-denier for apparel fabrics	Allied Chemical
Golden Caprolan—type 6	Tire cord; natural gold color	Allied Chemical
Enka—type 6	Staple fiber and filament	American Enka
Cadon	Multilobal yarn	Chemstrand
Chemstrand—type 6,6	Filament	Chemstrand
Antron	Trilobal multifilament yarn	DuPont
DuPont nylon—several types	Filament, staple, crimped staple, textured filament	DuPont
IRC nylon—type 6	Staple	Industrial Rayon

3. Nylon

As defined by the Federal Trade Commission nylon is a manufactured fiber in which the fiber-forming substance is any long chain synthetic polyamide having recurring amide groups as an integral part of the polymer chain.



100% Nylon Taffeta, Norane Finish—Arthur Kahn Co., Inc.

NYLON 6; NYLON 6,6

Definition: Nylon is classed as a synthetic polyamide fiber. It was originally developed by E. I. duPont de Nemours and Company. Now many companies produce it. Nylon 6 is produced from caprolactam; nylon 6,6 from adipic acid. They are basically the same. Nylon 6,6 takes dye more readily and is said to have a good whiteness retention.

- Advantages:**
- Nylon is a very strong fiber.
 - Nylon is a quick-drying fiber. It has a high wet strength which is important in outerwear and swimwear fabrics. It resists non-oily stains.
 - Nylon is resilient.
 - It is a heat-sensitive fiber. It can be heat-set to be dimensionally stable. Durable crease pleat retention can be made by heat-setting the fabric.
 - Nylon blends well with other fibers and adds strength to such blends. (15 to 20% nylon is needed to give additional strength to most fabrics.)
 - It is resistant to mildew and insect damage.
 - Nylon is resistant to alkaline substances.

Disadvantages:

- Nylon fabrics may be laundered, wetcleaned or drycleaned, depending on dyes, finishes, design application, and garment construction.
- White nylon should be bleached with hydrogen peroxide or sodium perborate bleach.
- Nylon is a heat-sensitive fiber. Ironing temperature should not exceed 250°F. It will glaze and turn yellow if temperature gets above 275°F. It sticks to iron at 480-490°F.; it will melt above this temperature.
- In some fabric constructions nylon has low absorption, making the wearer hot in warm surroundings; cold in cold surroundings.
- Nylon has poor resistance to sunlight when compared with cotton, rayon, and Orlon. "Bright" type nylon has better resistance to sunlight than dull type.
- Nylon fabrics, unless treated, have a tendency to accumulate static and cling to the wearer. Special finishes may minimize this.
- Nylon is affected by strong acidic substances.
- Nylon has a tendency to gray and yellow with age. Some nylon fabrics seem to have the power to attract and hold soil in laundering and drycleaning. White nylon picks up dye and soil in laundering or drycleaning. This can be avoided by cleaning and washing separately.
- Nylon is discolored and strength affected by chlorine-type bleaches.
- Some nylon fabrics have the ability to absorb and hold body oils and perspiration.
- Some fabrics made of spun nylon yarns have a tendency toward pilling.
- Nylon is very flammable in sheer and brushed pile fabrics.

ANTRON NYLON (DuPont)

Regular nylon has a round cross-section. Antron nylon has a trilobal cross-section. It looks like a clover leaf. The physical and chemical properties of the two types of nylon are the same. This change of shape gives the Antron nylon yarns greater bulk and covering power. The yarns and fabrics have a unique, rich, three-dimension highlight effect. Prints on both woven and knitted fabrics have unusual clarity.

CAPROLAN NYLON (Allied Chemical)

Caprolan is distinguished from regular nylon because the manufacturer uses different materials and chemical processing. The yarns are said to have all the qualities of regular nylon plus some new ones. Most important is the fiber's high strength and unusual affinity for almost any class of dyestuff. It has an improved hand and lasting whiteness. There is no appreciable yellowing in storage. It can be combined with other fibers for durable decorative and wearing apparel fabrics.

FIBERGLAS

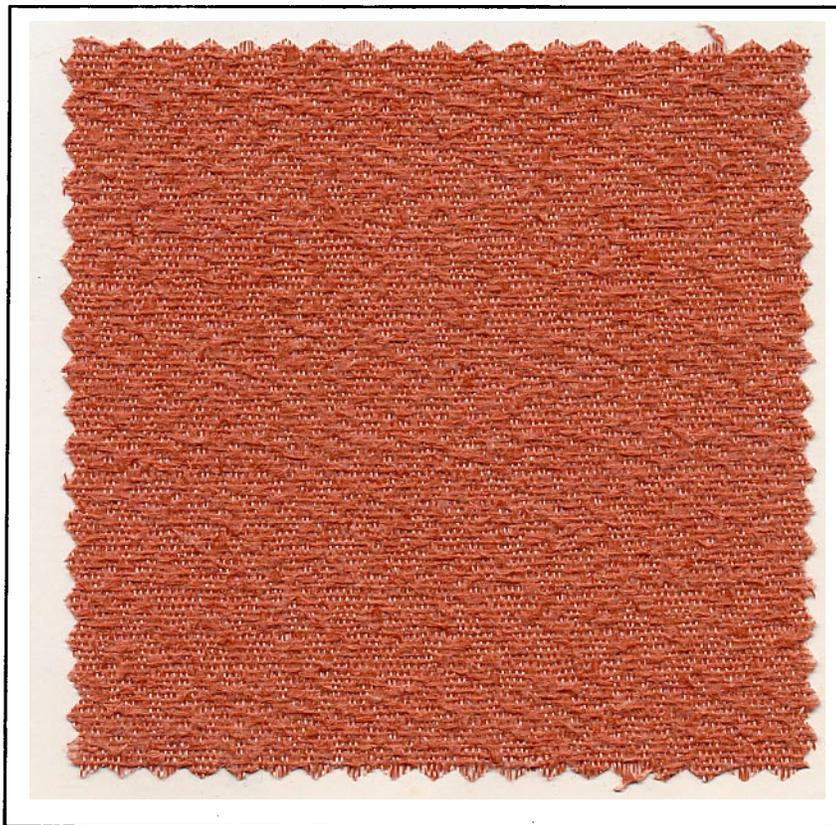
Definition: Fiberglas is classed as an inorganic fiber made from borosilicate glasses. It is a trade-mark name of the Owens-Corning Fiberglas Corporation.

- Advantages:**
- Fiberglas is very strong.
 - Fiberglas is weather-resistant; sun-resistant.
 - It will not support combustion, therefore will not burn.
 - Fiberglas does not absorb moisture—an important quality in curtain and drapery fabrics.
 - It is not damaged by moths, mildew, and many chemical substances.
 - Fiberglas sheds dust and soil; soil is easily removed, unless it is allowed to become ground or embedded in the surface of the fabric.
 - Fiberglas curtains and draperies should be wetcleaned.
 - They should be finished with steam. Temperature should not exceed 500 - 550°F.
 - White Fiberglas may be bleached with chlorine-type bleaches.

Bouclé, Coronized. 100% Glass—Thortel Fireproof Fabrics, Inc.

4. Glass

As defined by the Federal Trade Commission, glass is a manufactured fiber in which the fiber-forming substance is glass.



FIBERGLAS

- Disadvantages:**
- Unless given a special treatment, Fiberglas has very low abrasion resistance.
 - In some constructions, seam and yarn slippage may occur because of the smoothness of the yarns.
 - Fiberglas is attacked by weak alkaline solutions; hydrofluoric acid.
 - Because of its low absorption ability, dyeing and printing of Fiberglas is limited.
 - Fiberglass is easily damaged by excessive mechanical action in use and in cleaning.

A NEW DEVELOPMENT: Glass Yarn for Wearing Apparel and Household Fabrics

There has been a major research break-through in Fiberglas yarns. Owens-Corning Fiberglas Company has announced a new fine yarn called "Beta Yarn." The new Fiberglas filaments are less than one-half the size of any other natural or man-made fiber. The Beta yarn is composed of fibers about 12/10,000 of an inch in diameter. This results in a supple, soft material with improved flex strength. The new yarn opens up the possibility of using Fiberglas for upholstery and bedspread fabrics, for knitted outerwear and coated fabrics. It is stated by the manufacturer that the new yarn will find important uses as a blend fiber to add strength and dimensional stability to the finished fabric (see Marquisette, page 345).

GLASS FIBERS

TRADE-MARK NAMES	MANUFACTURER
A. Yarns for industrial uses:	
Fiberfrax Ceramic Fiber	Carborundum Company
Unifab	Ferro Corporation
Uniformat	Ferro Corporation
Unirove	Ferro Corporation
B. Yarns for household fabrics:	
Fiberglas	Owens-Corning
PPG Fiber Glass	Pittsburgh Plate Glass

5. Acrylic

As defined by the Federal Trade Commission, acrylic is a manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of at least 85% by weight of acrylonitrile units.



100% Orlon Knit—Abaco Fabrics Corp.

ORLON

Definition: Orlon is a synthetic fiber. It is made from a thermoplastic resin made by polymerizing esters of acrylic or methacrylic acid.

- Advantages:**
- Orlon is a very strong fiber. It has good elasticity; high bulking power. These factors are used to advantage in making a great variety of fabric constructions.
 - Orlon can be heat-set for dimensional stability. It has good crease and pleat retention when properly heat-set.
 - Blended with at least 50% wool, fabrics can be given a durable crease or pleat.
 - Orlon has good resistance to sun and weather.
 - Orlon blends well with other fibers, particularly wool and rayon.
 - It is resistant to acidic and alkaline substances.
 - Orlon can be bleached with chlorine-type bleaches.
 - Orlon fabrics can be laundered, wetcleaned or drycleaned, depending on dyes, finishes, design application, and garment construction.
 - White Orlon fabrics may be bleached with a chlorine-type bleach.

- Disadvantages:**
- Some Orlon items pill readily. This is related to yarn and fabric construction.
 - Orlon has very low absorption in some fabric constructions.
 - Wrinkles can become hard set in Orlon fabrics during extraction and drying during the washing or drycleaning cycle.
 - Orlon is very flammable in sheer and brushed pile fabrics.
 - Orlon should be pressed at 250°F. If the temperature goes above 275°F, it will glaze and become yellow. It will stick to the sole of the iron at 480 - 490°F.; it will melt above this temperature.
 - Orlon is very heat-sensitive. In some fabric constructions, it will distort in finishing.
 - The high sheen of Orlon is objectionable in some merchandise.
 - Some finishes are removed in drycleaning and wetcleaning. This results in a harsh hand or feel.

ORLON CANTRECE

Orlon Cantrece is the only filament yarn currently produced by DuPont. It is designed for texturing and is used to make sweaters and high-styled knitwear. It has the look, feel and hand of silk.

“SAYELLE” (sā é!)

“Sayelle” is DuPont’s certification mark for knitwear, socks, fabrics and hand knitting yarns meeting its fiber content specifications. The term is used to denote knitwear, socks, fabrics and yarns containing specified amounts of virgin “Orlon”* acrylic (bi-component), alone or in combination with virgin “Orlon” acrylic and/or other specified fibers. “Sayelle” knitwear, socks, fabrics and yarns are distinguished by unique aesthetic characteristics.

* DuPont registered trade-mark

TYPE 29

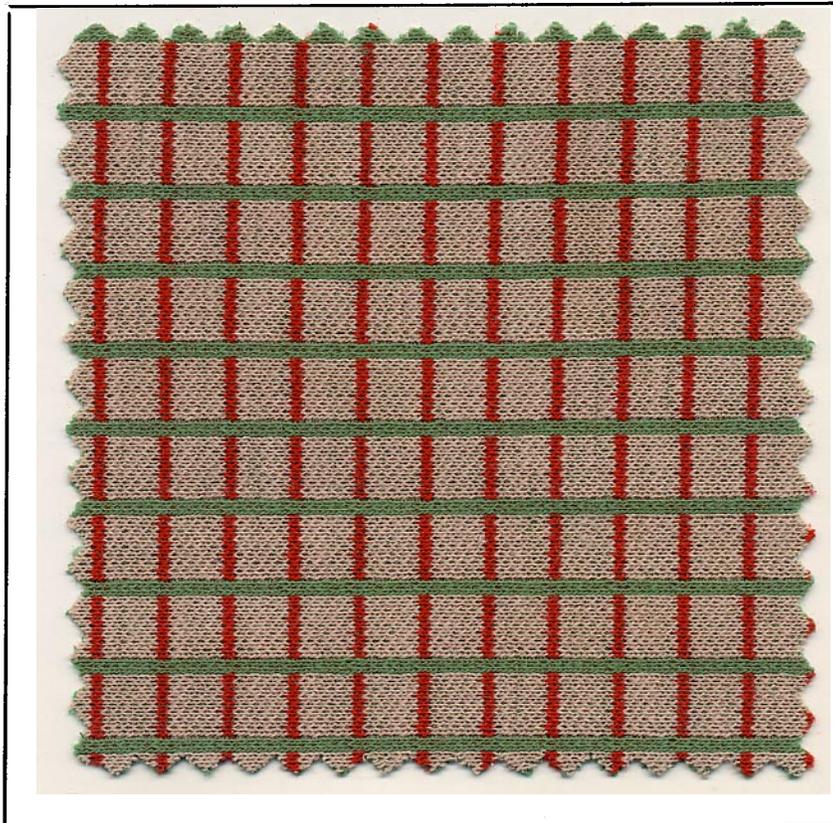
Type 29 is a low crimp, bright luster fiber modified to have a soft luxurious hand comparable to mohair. This new yarn concept causes yarn bulk and loops along the axis of the yarn. This makes the yarn look and feel like mohair. It is currently used to make sweaters.

ACRILAN

Definition: Acrilan is a synthetic fiber. It is made from a thermoplastic resin by polymerizing esters of acrylic and methacrylic acid. It is a trade-mark name of The Chemstrand Corporation.

- Advantages:**
- Acrilan is a strong fiber, hence very strong fabrics may be made from it.
 - Acrilan is resistant to pilling.
 - Acrilan is resistant to acidic and alkaline substances.
 - It is resistant to moths ; mildew.
 - Acrilan, in some constructions, has good wrinkle-resistance.
 - It can be heat-set to have good crease and pleat retention.
 - Acrilan dyes easily, offering a large selection of colors.
 - Acrilan fabrics may be laundered, wetcleaned or drycleaned, depending on dye, finish, design application, and garment construction. It dries rapidly.
 - White Acrilan fabrics may be bleached with a chlorine-type bleach.

Double Knit, 100% Acrilan. Laurens. —Chemstrand Company



ACRILAN

- Disadvantages:**
- Acrilan is heat-sensitive. Safe ironing temperature is 250 -260°F. It will fuse and stick if the temperature reaches 450°F.
 - Too high an ironing temperature or exposure to high temperature for long periods will cause Acrilan fabrics to yellow.
 - Some finishes are removed in drycleaning and wetcleaning. This results in a harsh hand or feel.



100% Creslan—American Cyanamid Co., Fibers Division

CRESLAN

Definition: Creslan is a synthetic fiber made primarily from acrylonitrile extruded into a frigid bath. Creslan is a trade-mark name of the American Cyanamid Company.

- Advantages:**
- Creslan absorbs little water yet it can be dyed readily with fast colors.
 - It is resilient and will not crush or mat down in proper fabric constructions.
 - Creslan has a high wet strength. It can be stabilized for shrinkage control.
 - It is wrinkle-resistant; has good pleat retention; holds a crease and retains its shape.
 - Creslan is resistant to moths, mildew and abrasion.
 - Creslan fabrics have warmth without weight; properly constructed fabrics will not fuzz or pill.
 - Creslan is resistant to weak alkalies and acids.

- Creslan can be drycleaned and wetcleaned.
- Creslan should be pressed with an iron at the lowest setting with minimum pressure.

Disadvantages:

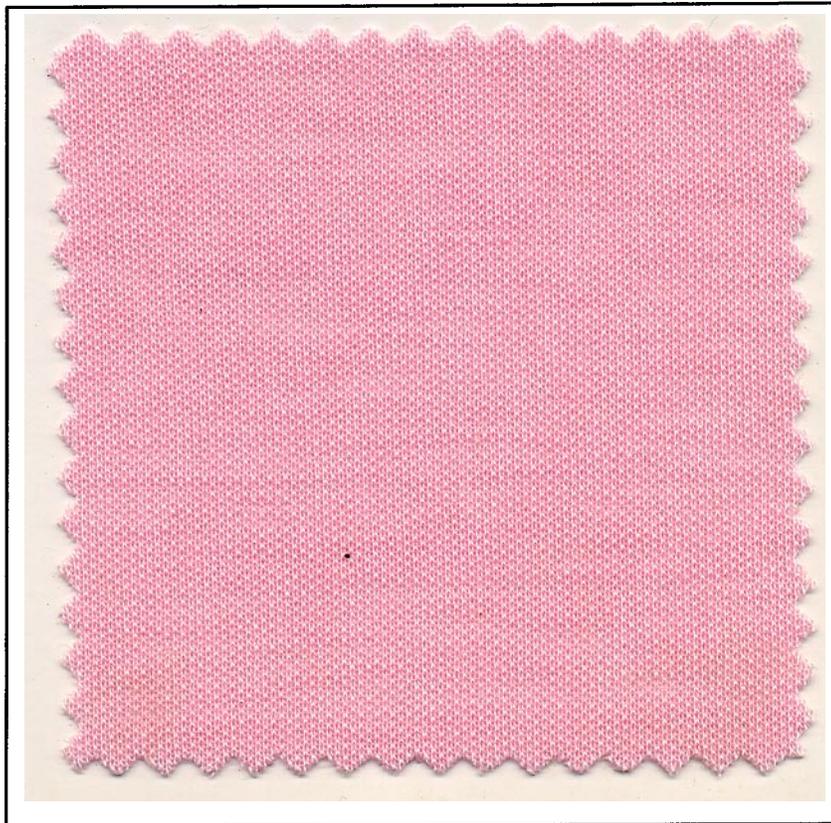
- Creslan fabrics must be pressed with care to prevent shining and glazing, particularly over double thicknesses such as seams, darts, hemlines, pleats and facings.
- The iron temperature must be below 250°F., with low ironing pressure.
- Should be pressed on wrong side; if pressed on right side, press cloth is necessary.
- Fabric must cool before shifting it on the board or press.
- Steaming or blocking to shape requires extreme care.
- Some finishes are removed in drycleaning and wetcleaning. This may result in a change of hand or feel.

ZEFRAN

Definition: Zefran is an acrylic fiber. It is classed as an "acrylic alloy" or a polyacrylonitrile fiber. Zefran is a trade-mark name of Dow Chemical Company.

- Advantages:**
- Zefran is a white fiber in its natural state.
 - The fiber is modified with a dye-receptive component that makes it dye readily with conventional methods of dyeing.
 - Zefran has good bulk and low density. This means fabrics made of it possess good loft and warmth and insulating properties. It does not pill readily.
 - Zefran can be controlled to be dimensionally stable.
 - It is weather-resistant; rot-resistant.
 - Zefran has good abrasion resistance, wrinkle resistance and crease resistance.
 - Zefran can be drycleaned and wetcleaned. White fabrics can be bleached.

Zefchrome, double-knit, 100% Zefran—Dow Chemical Co., Security Mills, Inc.



ZEFRAN

- It is resistant to glazing. It will stick if iron temperature reaches 490°F.

Disadvantages: ● Zefran yellows at high temperatures.

ZEFKROME

The term Zefkrome describes the first "Producer-Colored" acrylic yarn developed exclusively for double-knits. Shades are achieved which are colorfast, uniform and consistent since the colors are incorporated in the fiber. It is also said to have the hand of a worsted with the performance and dimensional stability of an acrylic fiber. Zefkrome fabrics are said to have high tensile strength, resist pilling, good pleat retention and wrinkle-resistance.

6. Modacrylic

As defined by the Federal Trade Commission modacrylic is a manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of less than 85% but at least 35% by weight of acrylonitrile units.



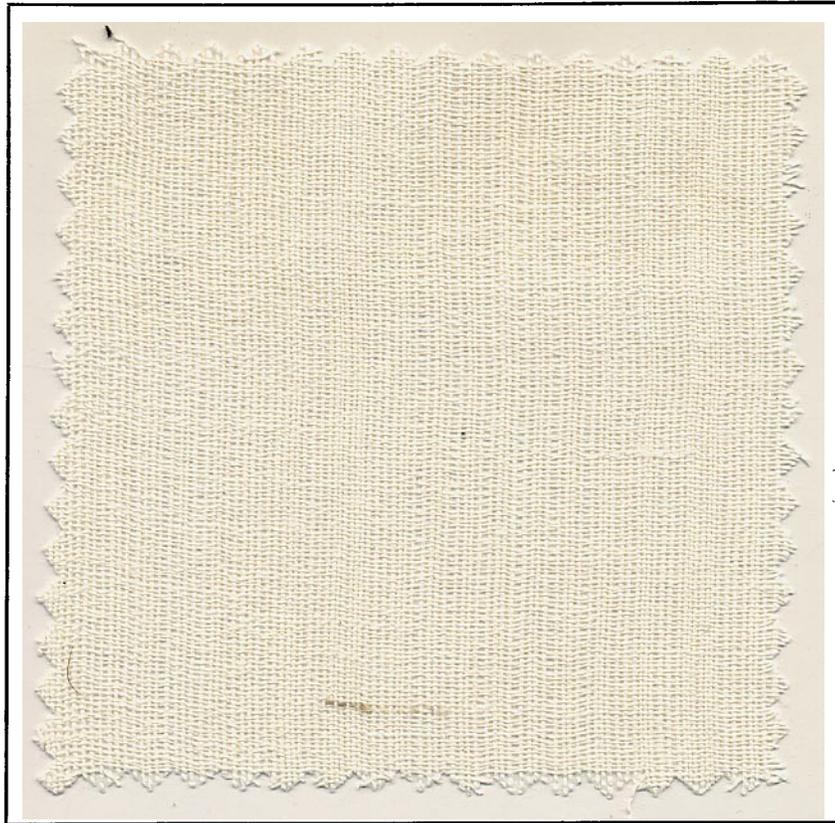
100% Dynel Twill Suiting, Union Carbide & Chemical Co.—Travis Fabrics, Inc.

DYNEL

Definition: Dynel is classed as an acrylic fiber. It is made of a copolymer of acrylonitrile and vinyl chloride dissolved in acetone and spun into a fiber. It is a trade-mark name of Union Carbide and Chemicals Division of Union Carbide Corporation.

- Advantages:**
- Dynel has a wool-like characteristic. It is resilient.
 - It is resistant to moths; mildew; insect damage.
 - It is resistant to alkaline and acidic substances.
 - Dynel is fire-resistant; it will not support combustion.
 - Blended with other fibers (requires at least 35% Dynel) fabrics gain crease and shape retention.
 - It has good bulking powers and blends well with other fibers.
 - Dynel fabrics may be laundered, wetcleaned or drycleaned, depending on dyes, finishes, design application, and garment design.
 - Dynel can be bleached with chlorine-type bleaches.

- Disadvantages:**
- Dynel is very heat-sensitive. It should be ironed at a temperature below 250°F. It fuses at 245°F. and melts above that temperature.
 - Dynel fabrics are susceptible to burn holes from cigarette embers.
 - Static has been a problem in some 100% Dynel fabrics.
 - Dynel has low affinity for dyes.
 - Dynel has very low absorption properties.
 - In some fabric constructions, Dynel has the tendency to pill, mat, shed, and tuft.



100% Verel—Eastman Chemical Products, Inc.,

VEREL

Definition: Verel is a synthetic fiber. It is a modified acrylic fiber. Verel is a trademark name of the Tennessee Eastman Company, a division of Eastman Kodak Co.

- Advantages:**
- Verel is a strong fiber, hence it can be used to make durable fabrics.
 - It is resistant to acidic and alkaline substances.
 - It is resistant to moths; mildew.
 - Verel has good weather resistance.
 - It can be made into fabrics that have good press and shape retention, good wrinkle recovery.
 - Verel has a low tendency to pill. It has good abrasion resistance.
 - Verel will char and melt but it will not support combustion. It possesses excellent protection where flammability is a consideration.
 - It can be laundered, wetcleaned or drycleaned, if dyes, finish, decorative design application, and garment construction permit.

- Disadvantages:**
- Fabrics of 100% Verel should not be exposed to temperatures greater than 300°F.
 - Peroxide and chlorine-type bleaches will discolor Verel.

DACRON

Definition: Dacron is a synthetic fiber. It is composed of a polyester condensation polymer from ethylene glycol and terephthalic acid. It is a trade-mark name of the E. I. duPont de Nemours and Company.

- Advantages:**
- Dacron is a very strong fiber, hence strong fabrics can be made from it.
 - It possesses good elasticity, and it is wrinkle-resistant.
 - Dacron may be heat-set for dimensional stability. Some fabrics have good pleat retention; good crease retention.
 - Dacron blends well with other fibers, contributing to wrinkle resistance. In wool blends, at least 40 to 70% Dacron must be present to impart this quality; at least 25% in rayon blends.
 - It is resistant to moths; mildew.
 - Dacron fabrics can be laundered, wetcleaned or drycleaned, depending on dyes, finishes, design application, and garment construction.
 - White Dacron fabrics may be bleached with a chlorine-type bleach.

100% Dacron Stripe



DACRON

7. Polyester

As defined by the Federal Trade Commission, polyester is a manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of at least 85% by weight of an ester of a dihydric alcohol and terephthalic acid.

- Disadvantages:**
- Dacron has been improved to take many dyes. Some resin-bonded pigment colors possess poor colorfastness.
 - It has low absorption in 100% applications, causing garments to be hot and uncomfortable.
 - Some Dacron outerwear fabrics seem to have a wicking action. Moisture and soil seem to be pulled through the fabric. In the case of moisture, the fabric may feel cool to the wearer.
 - Some knitted Dacron fabrics and Dacron and cotton fabrics have a tendency to pill.
 - Dacron must be ironed at a low temperature (250°F.). It will start to glaze at 275°F.; stick to sole of iron at 400 - 450°F.; and melt above this temperature.