PROPERTIES AND USES OF SYNTHETICS ON THE MARKET THAT MIGHT BE DESIRED BY THE HIGH SCHOOL STUDENTS FOR CLOTHING CONSTRUCTION CLASSES

by

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PURPOSE AND SCOPE

In the past few years nylon, the first true synthetic, has grown in importance until it is widely desired, accepted, and used by the public. Other synthetics are rapidly gaining importance on the market. Therefore, it is increasingly necessary for the consumer to know the advantages and limitations of these fibers as well as the care of them. Since these fibers are also offered in yard goods in growing amounts, it is wise for the woman who sews to know how to handle the fabrics during the construction of garments or household furnishings.

It is the purpose of this paper to give specific information on properties and characteristics of synthetic fibers which require care and handling during construction, as well as laundering and care during the use. It is also the aim of the writer to present the information at the level of understanding of the high school student.

The paper is limited to a discussion of the four synthetics now on the market in greatest quantity -- Nylon, Orlon, Dacron, and Dynel.

INTRODUCTION

As compared with the slow and steady development in the manufacture of nautral fibers, the manufacture of man-made fibers has mushroomed into gigantic proportions within half a century. Consider the fact, for example, that nylon, one of our most important textile fibers was practically unknown until 1938, while it had become one of the foremost textile fibers just a few years later. Synthetics in some cases have a price advantage over natural fibers as well as being more dependable in supply and quality. And synthetics give textile manufacturers great flexibility in styling. With these selling points to work on synthetic producers think they still have unlimited markets to open up.

Being face to face with so many new synthetics in fabrics for clothing construction and in ready-made garments, it is wise for consumers to know the advantages and the limitations of these new man-made fibers.

Nylon, Orlon, Dacron, and Dynel are the four synthetics found in the greatest amounts on the market today, that is, excluding rayon. Nylon, Orlon, and Dacron may be considered members of a class of fibers possessing properties in common which are not possessed by the earlier synthetic or natural fibers. These are:

High strength
Easy launderability
Quick drying

Dimensional stability in wearing and washing
Essentially equivalent wet-dry properties
Ability to be heat stabilized
Resistance to mildew and insects
Excellent durability
Retension to pressing in creases and pleats

Nylon, Orlon and Dacron are different with respect to flexibility, resilience, and stiffness. A discussion of these fibers individually will best describe their advantages and limitations.

PROPERTIES AND USES OF SYNTHETICS ON THE MARKET THAT MIGHT BE DESIRED BY THE HIGH SCHOOL STUDENTS FOR CLOTHING CONSTRUCTION CLASSES.

Nylon

Nylon was the first of the truly synthetic fibers. It was first offered for sale just before World War II. The combination of durability, sheerness, strength, and ease of care accounted for the success of nylon from the start. Like most other important materials, Nylon "went to war", which, of course, delayed somewhat its expansion into other logical uses. We might truthfully say that nylon started a revolution in the textile industry which is still in progress. Since the war, nylon has been employed in a variety of new applications. The criterion of its adoption in new uses has continued to be one of functional performance per dollar cost. The major properties responsible for its outstanding success are enumerated below:[1]

Excellent abrasion resistance
High tear resistance
High elastic recovery
High flex life
High tensile strength
Resistance to alkali
Low resistance to bending
Soft hand
Drape
Flame resistance.

Dyeing is a difficult process with all synthetics. Because of the low affinity of nylon for water, it is not easy to obtain good penetration of the fibers, or even fabric. It is difficult to obtain good dark colors in synthetics and where a dark color is used there is fading with washings. Some dyes are being put into the dope before it is spun into the yarn to gain better and more lasting results. There are improvements being made, however, in the dyeing of nylon. In the case of blends, it is difficult to get a solid shade because the natural fiber has a different affinity for dyes than the nylon.

Following nylon continous filament yarn came nylon staple for use in spun structure, both knitted and woven. Essentially the same properties apply to the staple form with durability, ease of care and dimensional stability being paramount. Major uses for nylon are: hosiery, tricot knitted underwear and lingerie woven underwear and lingerie, woven underwear, woven dress fabrics, woven shirtings, combination fabrics with rayon, synthetics, and natural fibers.[2]

Nylon knitted and woven garments can be washed in the washing machine. They must be washed thoroughly if they are to stay white or bright. If they are hung to dry while dripping wet, they will not be wrinkled or require ironing. However, during construction of a nylon garment, or when pressing is necessary, the iron should be placed on "rayon".

There are bleaches on the market specifically made for nylon if a bleach is necessary.

Sewing with woven nylon fabric. When cutting nylon fabric, well sharpened shears should be used leaving generous allowances for seams. Needles, for both machine and hand sewing, should small and sharp. Select the finest needle that will accommodate the thread. Sharply pointed pins and sharp, fine needles penetrate tough nylon easier and give better results in basting. Nylon thread is recommended for nylon fabrics. Seams sewn with nylon thread are durable, dry quickly when washed, and will not shrink. Other threads, however, may be used. Nylon thread should be cut with sissors as it is so tough that attempting to break it by hand may cause "pulled seams". It also gives it a clean-cut end that is easier to put through the eye of the needle.

It is very important to test stitching on all nylon fabrices before starting any permanent seams. This will help you determine the proper sewing machine settings. Fewer stitches per inch can be made when sewing nylon. Better seams will generally result when stitches are larger than those used on other fabrics. If you prefer smaller stitches for top stitching, your own experimentation on the fabric itself will help you select the proper machine adjustments. When sewing on tightly woven fabrics

as few as seven stitches to an inch may be used, particularly for inside seams. Nylon's strength allows this large stitch to be possible.

The stitch should be tested on the straight of the goods, lowering tension until a well-formed but loose stitch is made. Because of nylon's great strength and elasticity, sewing with tensions normally used with other threads may cause seams sewn with nylon thread to pucker. When sewing with threads other than nylon, use loose tensions and large stitches, too. The use of tissue or ordinary shelf paper under your material often gives smoother seams when sewing sheer and tightly woven fabrics.

Seams on nylon fabrics, as on all fine fabrics should be carefully made without raw edges. Bound, French, edge stitched, or overcast seams help insure resistance to raveling. Pinking the edges will be sufficient for some tightly woven fabrics. Your decision on finishing should be based on whether or not your particular fabric tends to ravel. Most nylon tricot fabrics will not ravel. Finishing without raw edges is not as necessary on these as it is on some other fabrics. When finishing seams with bindings, be sure they are nylon or of preshrunk material. Well finished seams will help preserve the beauty and durability of nylon articles.

As with other fabrics, each seam should be pressed after stitching. It is important to use a low temperature - the "nylon" or "rayon" setting on automatic irons. Pressing with a damp cloth may give superior results, or if you have a steam iron, it too may be used.[3]

Long and patient research by Du Pont scientist, led to the understanding that certain mechanical properties are required to give fibers resilience properties and a wool-like feel. This has been done very closely with other Orlon and Dacron in staple staple form. Concurrently, it was discovered that the continuous filament forms of each of these new materials also exhibited unique properties.[4]

Orlon

Orlon's chief ingredient comes from limestone, petroleum, natural gas, coal, air, and water. Orlon feels and looks silkier than silk, and silky textiles can be made from it by using the long strands. But by chopping it up into shorter- "staple" fiber and giving it a "permanent wave", it can be twisted into a yarn which, according to its developers is the most wool-like fiber yet made by man.

Hot sunrays have almost no effect on it. It sheds water and refuses to harbor mildew or fungus. It's highly acid-resistant and a lighted cigarette can't set it afire. Moths, carpet beetles and other insects hate the sight of it.

In many ways it's the most rugged fiber going. But despite this, and unlike tough nylon, it has warm, soft texture wet or dry. In all-weather tests sponsored by DuPont engineers, the new fiber lost less than a quarter of its strength, after control samples of nylon, silk, wool and rayon had fallen to shreds.[5] Therefore, the following is a compiled list of the properties of orlon:[6]

Warm - dry - silklike hand
Dimensional stability
Resistance to
Sunlight
Acids
Atmospheric gases
Mold and rot
Moths and mildew
Easy launderability - quick drying
Durability - dry and wet
High friction - fiber to fiber

The following is a list of properties for orlon staple:

Exceptional bulking power
Moderate resilience
Recovery from wrinkling - dry and wet
Texture and appearance for outerwear

Orlon is dyeable with dispersed acetate colors and selected vat colors, but the depth of shades obtainable under normal mill conditions is strickly limited.[7]

The orlon fibers can be woven into any finish from the softest silk or cashmere to the toughest carpet pile. The applications of orlon fabrics are as follows:[8]

<u>Orlon filament</u>
Curtains
Dress fabrics
Sports
Evening wear

Rainwear
Combination fabrics
Viscose rayon
Acetate rayon

Orlon staple
Suitings (especially bulky)
Topcoatings
Overcoatings
Dress fabrics
Woolen-type fabrics
Washable woven sportswear
Knitted wear

More orlon fabrics are being designed for new uses. The new fabrics include twills, taffetas, marquisettes, filters, fancy fabrics, and heavy industrial cloths.

Previous uses of Orlon fiber have included women's dresses where the quick recovery from creasing had special advantages. Women's maid and waitress uniforms have the appearance of silk. The fabrics give men's sport shirts a heavier hand and a feeling of body that is not found in some other fabrics of the same actual weight.

The growth of orlon fabrics fits into a period when yarn shortages are developing for some of the older synthetic yarns. Generally these fabrics have not yet been specified for many military uses, so they are open for civilian use. Their availability for civilian use will probably increase the introduction of these fabrics and at a more rapid pace.[9]

In tests run by the Consumer's Union on orlon shirts, they found that orlon cloth washed as easily as cotton

broadcloth, but no more so. It did dry rapidly, and the collars and cuffs appeared smooth even when not ironed, although the shirt body was wrinkled.[10]

It is suggested by laboratories that you wash orlon in your machine, spin out the water, hang to dry, then steam-iron. Keep the temperature low. None of the new fibers can stand excessive heat.[11] If a steam iron isn't available for pressing during garment construction the temperature regulator should be on "rayon" or "nylon".

Dacron

Dacron is made by melt spinning in a manner similar to that used for nylon. Like orlon, Dacron is made in both continuous filament and staple forms, which differ markedly in their properties and uses.[12]

Distinctive functional properties of Dacron have high wet and dry resilience, dimensional stability under wet or dry conditions, high stretch resistance, and high heat resistance. Market evaluations have demonstrated a wide variety of end uses where this new fiber is ready to improve the functional performance of fabrics and give the ultimate consumer more for his money in ease of care, freshness and neatness of appearance with continued wear, lower maintenance cost and longer life.[13]

The staple version of Dacron is exceptional in its

properties. The resilience properties of woven fabrics, the shape retention properties of knitted fabrics, all coupled with a minimum of maintenance, commend it for many uses now held by wool. Especially is this true in summer suitings where high humidity conditions are encountered and where Dacron is virtually insensitive to moisture.[14]

All of the new fibers seem to have their dyeing headaches, and Dacron is no exception. A good job can and is being done, but the job of dyeing is not easy. Special techniques, such as the use of selected dyeing assistants and dyeing for long periods at the boil, are required. Light fastness of the order required for specific end uses has been obtained. Furthermore, dyestuff and procedure developments now in progress promise very outstanding light fastness in a complete range of colors. Wash fastness of dyes is generally excellent on Dacron. The dye is hard to get on, but once on, it is hard to wash off.[15]

It is fundamental that garments have æsthetic appeal. This means ability to be dyed to a complete range of attractive shades, to have good tailoring qualities, good draping properties and satisfactory fabric texture. Fine tailoring is illustrated not only in a variety of suitings made of staple fiber but in a finely tucked woven blouse, a jacquard weave cocktail dress, and

men's shirts of continuous filament yarn. Good seam appearance without puckering is a feature.

Filament Dacron is being used for dress fabrics such as taffetas, men's shirts, curtains, and sewing thread. The staple Dacron is found in men's and women's suitings - light weight tropicals, especially, dress fabrics, washable woven sportswear, and knitted wear.

Easy care and economy are stressed in all applications. Long wear and retension of a fresh, new look generally characterize Dacron. In consideration of low maintenance cost, it is pointed out that this fiber has a special plus because of its wrinkle resistance when wet. After spots are sponged or scrubbed off, even a suiting fabric will dry out with a pressed look.

Blouses are reported to have a "go-home"appearance as trim as their "come-to work" look, and to be wearable without ironing after being packed two weeks or more. Men's shirts stay similarly neat, it was said, and usually are not ironed after laundering. Extensive consumer tests have been made on both blouses and shirts.

The first commercial suiting fabric from Dacron was made about one year ago. However, there is still a lot of work to be done. For example, more consideration must be given to ways to overcome pilling, the formation of small balls. In one suit of Dacron, pilling was minimized by high twist in the yarn, tight construction of the fabric,

and the use of sanding, shearing, and singeing in the finishing operation.[16] Other problems to be overcome besides pilling are static, melting, and garment-manufacturing procedures.

A suit of Dacron is also susceptable to the melting of holes in the fabric by burning tobacco. Work initiated to minimize this problem has already demonstrated that certain resins greatly retard melting without hurting hand or wrinkle resistance. Also, this problem is reduced significa ntly by blends with other fibers, notably blends with viscose rayon.

Considerable work has been done on blends of Dacron on blends of Dacron with wool and with rayon. The maximum resistance to wrinkling and crease retension under hot, humid conditions is illustrated by a suit of 100% Dacron. Improvement of the wrinkle resistance and dimensional stability of worsted suits under hot humid conditions is represented by a suit made from a blend of 50% Dacron and 50% wool. Also, 100% Dacron builds up a charge of static electricity during dry weather causing it to cling to the skin. This problem is solved somewhat by the wool and Dacron blend.[17] For suits of lower cost that give satisfactory performance a blend of Dacron with rayon or cotton is recommended.[18]

One test customer accidentally tumbled out of a

canoe while wearing his Dacron suit: after hanging the suit up to dry for a few hours, he took it down wrinkle-free and still sharply creased. Another cleaned his by tossing it into a washing machine: it came out in perfect condition. (Actually, the suits should be dry-cleaned to prevent the lining from wrinkling.) The most ordinary spots can be washed off with soap and water. Wool and Dacron, and viscose or acetate rayon and Dacron, are nearly impervious to the effects of moisture as pure Dacron. Like nylon which it closely resembles physically, Dacron requires little or no ironing. The garment should be dried first, then steam-ironed at the steam setting. If the garment is very sheer the iron should be used dry at the "rayon" setting. If a steam iron is not available then it is best to press while there's still a trace of moisture left from washing. Dacron should not be sprinkled -- only a touch-up job is necessary anyway. Washing should be thorough, for, like nylon, Dacron needs complete cleansing to stay white.[19]

Dynel

The characteristics of dynel of major interest to the consumer are sensitivity to heat, resilience, warmth, dimensional stability, rapid drying, good strength, dry and wet, resistance to combustion, mildew-proofness, and

moth-proofness, and chemical resistance.[20] They also claim that dynel causes no allergic reaction.

In its natural form, dynel is honey-colored, but it can be bleached or dyed white or dyed successfully with an extensive range of colors with several different typesof dyestuffs on commercial equipment. The procedures for dyeing dynel are not the same as those employed for cotton, wool, and rayon. Possibly the most important difference in the techniques employed for dynel and those used for some of the other fibers is the requirement that the dye-bath temperature be kept at 205 degrees Fahrenheit or above.[21]

With few exceptions, the washfastness of dyed dynel is very good. The actual degree of fastness, of course, depends on the dyes employed. The acetate-type dyes as a class, while good, are not so fast as the acid dyes. Fastness to crocking is usually excellent.[22] Dyed fabrics are usually satisfactory in regard to perspiration and gas fading, as well as in resistance to many other destructive agents.

Light fastness is a very controversial subject and one about which it is unwise to make positive general statements. However, as a class, dyeings made with the acetate-type dyes have fair light fastness. The exceptions in this class of colors are the yellows, which in

most cases are excellent. In the acid and direct types of dyes, the fastness in general is much better.[23]

At present dynel is available only in staple form (cut to lengths that are processed into yarns). The continuous filament form, which goes by the name of Vinyon N, is still in the experimental stage, with experts trying to improve its manufacturing process. Dynel's development reverses that of nylon, which started out as a filament.

Some of the fiber's characteristics will broaden, others will limit its use. For example, dynel has what textile men call a good "hand". It feels right. According to Carl A. Sellerstrom, Sales Manager of the Compan's Textile Fibers Department, the properties of dynel make the fiber adaptable to many consumer products which will reach the market in increasing amounts. Now on the market are blankets, crib blankets, and men's hose. Soon there will be draperies, upholstery, pile fabrics, sweaters, bathing suits, suitings and tricot and circular knit goods. The fabrics being shown are apparel fabrics, including work fabric, jersey weave, dynel and cotton plaid, dynel and viscose suiting, knit goods, men's summer hat fabric and fur fabric.

Dynel, even in its present limited production, can be sold at $1.25 a pound. Nylon, now made in millions of pounds a year sells at $1.75 a pound. Wool, which both

both of these fibers can replace pound for pound now brings $3.35 a pound.[24]

Carbide experts will tell you, however, that dynel wasn't developed to compete with wool directly. They say that the synthetic combines the texture and warmth of wool with other characteristics. They believe it will move into fields that wool hasn't touched --work clothes, for example. So far, its commercial inroads have been into fields previously exploited by wool and nylon.

Dynel has one disadvantage which the manufacturers warn about; it is sensitive to heat and must not be dried at a temperature above 170 degrees Fahrenheit as in a tumble dryer. It should not be pressed (most garments made of Dynel don't require pressing anyway) or washed in very hot water. If a blanket of dynel is washed and the binding of the blanket is ironed, the iron should not be allowed to touch the dynel. Moreover, while the body of the blanket could be disinfected, as claimed, with a strong bleach, the binding would most likely be damaged by such treatment.

Dynel sometimes tends to "pill", or form tiny balls, but this will be overcome in time.

When Dynel is blended with rayon for suiting materials, its contribution is fluffiness, bulk, resilience, and warmth. Most of these suitings should be dry-cleaned;[25]

they may be pressed with an iron set at "rayon" as with the other synthetics previously discussed.

SPECIFIC PROBLEMS ENCOUNTERED IN HANDLING DURING CONSTRUCTION

With synthetic textile fibers being used in ever growing quantities for fabric and sewing thread the number of sewing problems is increasing. Many of these problems can be attributed to the natural properties of the synthetic fibers and others are the result of attempts to make natural fiber fabrics simulate the more desirable attributes of the synthetics.

The nature of some of these sewing problems, their probable causes and possible remedies should be of some interest to fabric finishers who play such an important part in the determination of whether a fabric will have satisfactory sewability.

The problems made reference to break down into three major categories:[26] (1) seam puckering, (2) fabric scorching or fusing, and (3) cutting of yarns.

Of these three, puckering has received the most attention by virtue of its current relationship with nylon. So much has been said about this pucker and so little done about it, that people cringe at the mere mention of the word. There have been many remedies designed for the various types of puckering.[27]

Needle heat is a subject that has been receiving

a great deal of attention since the use of synthetic sewing threads and fabrics become of wide spread. Overheated needles produce scorching of cotton and fusing of synthetic thread and fabrics during manufacture. This is also present somewhat in home-sewing. High needle temperature is the result of friction between the needle and the fabric through which it passes during sewing. There are many factors which are obviously a part of this problem of needle heat: (1) speed of the machine, (2) yarn count, weight and construction of the fabric, (3) characteristics of the fiber used in the fabric, (4) fabric finish, (5) number of plies of fabric in the seam being stitched, and (6) needle shape and size.[22]

Unsatisfactory seams may be due to either of two main causes, yarn slippage and yarn breakage. In the former, which is usually associated with fabrics such as satins, the seam fails when strain is put upon it because the threads parallel to the seam and situated between it and the actual edge of the material pulls out of the structure and seam opens in consequence. In less severe cases, the threads slip sideways, leaving a crack down the line of the seam. This is a well-known failing in which warp and filling interlacings are relatively few in number, particularly when, as is

uaually the case, such materials are woven from highly lustrous and slippery yarns.

The actual yarns of which the material is woven are ruptured in stitching in many places along the tract of the seam, with the result that, in extreme cases, the garment tears along the seam when a low tension is applied, much as a postage stamp is detached from its neighbor. Any seam that has a larger number of cut yarns will probably be objectionable in appearance, and cut yarns are particularly noticeable in any close-fold seam such as that which is found in the lapels of mens suits. The regular cloth-point or round-point needle that is in general use in the garment industry is designed to produce minimum yarn damage. As the needle enters the cloth, the yarns normally bend out of their normal position, unless, as sometimes happens, the needle hits a yarn in the middle and splits it. When the yarns cannot readily deform around the needle they are cut.

The ability of a fabric to resist yarn severance is determined by many factors, and it would appear that these are the principal ones: stress-strain properties of its fibers, the geometric construction and arrangement of the yarns, the presence or absence of resins and lubricants on or with the fibers.[29]

The only general recommendation that can be made which will reduce seaming damage due to all factors is

the use of the smallest diameter needle. That is the conclusion of two British scientists, C. M. Dorkin and N. H. Chamberlain, who recently completed an extensive study of seam damage for the Textile Institute, Manchester, England.[30] The experimental work showed that seaming damage in woven and knitted fabrics is attributable to a variety of factors. Some of these factors are inherent in the fabric, while others are dependent on the sewing machine.

The addition of some type of dampening attachment to the machine might be of help, the scientists continued. This method has not been tried, they reported, because its application would cause some complications. However, dampening the line of the seam possibly by some type of attachment fitted to the machine, might help. This would serve the double purpose of softening any starch-like finishing agent, and of increasing the extensibility of the fibers, both of which would reduce the damage.[31]

There are now well-recognized methods of overcoming slippage. The seam may be taped or bound or otherwise reinforced, or the material may be made from some thermoplastic material such as Vinyon or cellulose acetate. When the seam has been made with such thread, it is hot-pressed, so that the fusible component of the sewing thread melts and glues together threads of the

immediate vicinity, preventing subsequent slippage in use.[32]

It is further noted that damage is reduced if the materials are stitched at high humidities and that when several layers of fabric are stitched at once the lower layers suffer more damage than the upper ones.

Fabric construction. Stitching on tricot and velvet presents still further considerations. In the constuction of a tricot garment mercerized cotton or fine cotton sewing thread (80-100)or silk size A or finer should be used. The needle should be no coarser than the size designed for 80 - 100 cotton. Coarser needles will cut threads, weaken seams. There should be a slight stretching of tricot as it is stitched to eliminate any drawn or rippled effect in seams, prevent broken threads. This is the real secret of successful sewing with tricot. It is done by gently pulling the fabric between your hands as you stitch, one hand placed in front of the needle, one behind. Be careful to exert the same amount of "pull" with each hand so as not to force the fabric under the needle or to retard its progress. It's a simple trick, not hard.

It is wise to reinforce certain seams. Shoulder seams, where there is appreciable strain, should be reinforced. Also when you have a bias seam, especially in a skirt. Curves for neckline and armholes are easier to

to handle if reinforced. A line of stitching on each of these suspect sections, about 1/8 inch inside the seam allowance will do it. For a 5/8 inch seam, a stay-line about ¼ inch from the edge of the material is made before the seam is stitched. Seam binding may be used but it is more bulky, often not as satisfactory.

Interfacings (cambric, percales, taffeta) are desirable to give strength and body to collars, cuffs, waist bands, front or back facings where button holes occur, etc. Interfacing should, in most cases, be attached to the garment or outside section, then facing applied.

As in all sewing, pressing the tricot garment is important. All seams should be pressed as they are stitched. If an adjustable steam iron is used, it should be set so that it gives only a small amount of steam. A hot iron should never be used. If a steam iron is not available, slight moisture can be applied with a damp cloth and press with a warm iron, on the wrong side. When it is necessary to press from the right side for final pressing, it should be covered with a cloth that has been slightly dampened. When pressing tricot, it should be pressed at all times on the length-wise grain unless you wish to increase the width. If an area needs to be widened, press cross-wise.

Since tricot doesn't run or ravel, no special seam finishes are necessary. Loops, bindings and cording should be stretched lightly as stitched. For bound buttonholes, the interfacing must be in place on the underside of the garment, worked buttonholes should be made only on interfaced sections, gathers and shirring may be made by hand or by machine, hems and facings may be finished with seam binding or edge-stitching.[33]

Velvet, like any other fabric, should be cut on a smooth, flat surface. If necessary to work on the floor, first spread a sheet on the rug, stretch and fasten it securely at the four corners. Lay the velvet with the pile up on the sheet or other cutting surface. If the pattern indicates pieces cut on a fold, or cut double, fold the velvet in half lengthwise with the pile on the inside.[34]

Baste seam edges with fabric laying on a flat surface. Pins, preferably brass ones, may be used along seam edges where holes made by them will not show. Basting should be done with a long slender needle and silk thread. Cotton thread may catch into particles of the pile and make slight flaws in the fabric. Pin bottom and top edges of seams together first and ease in fabric gently so that all seam edges are straight and even. Baste with short, not long, running stitches.

Make all fitting adjustments on the garment while it is still basted, machine stitches once made cannot be altered without marring the fabric.

For machine sewing, use silk thread. It is slightly elastic and will help to prevent puckered seams. Adjust the machine with a rather long stitch. If the stitch is too short, the fabric may pucker at the seams. Insofar as possible, avoid any outside stitching on velvet. If necessary to attach pockets, bands, or collars, they are best done by hand, working from the wrong side. The beauty of velvet lies in its smooth unmarred surface; Therefore, inside seams, which are almost completely hidden by the pile of the velvet, are most flattering and satisfactory.

If two bias edges must be joined in sheer velvet, slide paper under the seam and stitch with the straight edge flat next to the teeth of the feeder plate of sewing machines.[25]

Velvet cannot be pressed in the same way as other fabrics because of its pile. There are two practical and satisfactory methods of pressing: one is with a needle board, the other with an iron and thick padding of turkish toweling.

Velvet should be dry-cleaned. However, baby carriage covers, pillow tops, table runners, bed

jackets and other plain articles may be washed if color-fast.

Squeeze velvet gently through warm mild suds and rinse thoroughly in warm water. Do not wring or squeeze but hang while dripping wet on a line to dry. Shake gently during the drying process and brush lightly while still slightly damp. Before velvet becomes completely dry, steam press it to raise and restore the fresh, new appearance.[36]

Sewing with nylon thread. After working with nylon, since its inception in 1938, it has been decided that the seat of most nylon sewing thread problems lies in the tension adjustments. With some of the coarser fabrics, the development of excessive needle heat during the sewing operation sometimes causes disintegration of the thread if the proper precautions are not taken.

As a consequence of the high tension exerted upon the sewing thread, the elongation is taken out of it before it goes into the garment, as in the case of undergarment seams. Later, when the nylon restores itself to its orginal length it is found to have gathered and distorted the material.

Because of this natural tendency of nylon

thread, top and bottom tension should be as loose as possible, while giving good seaming and stitching.[37]

Sewing with Dacron thread. Sewing thread of Dacron is now being offered for the first time to home sewers. It is particularly suitable for sewing fabrics made of man-made fibers, expecially the newer ones: Orlon, nylon, and Dacron. It's important that the thread used on these fabrics will not detract from their inherent qualities such as quick drying, strength, and long wear. Since thread of Dacron possesses these same characteristics, it can be expected to contribute the upmosr in performance when used on fabrics of these newer fibers. The manufacturer also recommends the thread for sewing fabrics of silk and wool.[38]

Sewing thread of Dacron is characterized by high stretch resistance, high strength, dimensional stability in wearing and washing, and good durability. This thread gives good sewing efficiency and performance; it is operated on sewing machines with a minimum of adjustments.[39]

Tests conducted by the manufacturer show that it is as simple to use as mercerized thread. Switching from cotton of equivalent size to thread of Dacron requires no change of needle. The thread is easily threaded into the needle as it cuts clean without fuz-

ziness. Because thread of Dacron resists stretching during sewing, it eliminates puckering and reduces "creeping" at the seam-end. It stitches sheers beautifully and has a soft sheen and is shrink resistant. For hand sewing, it is smooth to work with and does not snarl.

Home sewers will find this new thread of Dacron nationally available in limited quanities at chain stores, department and variety stores and piece goods shops. Stores have informational leaflets which are available to salespeople and consumers.[40]

SUMMARY

Nylon, Orlon, Dacron, and Dynel are the four synthetics found in the greatest amounts on the market today, that is, excluding rayon. Nylon, Orlon, and Dacron may be considered members of a class of fibers possessing properties in common which are not possessed by the earlier synthetic or natural fibers. These fibers are different with respect to flexibility, resilience, and stiffness.

Dyeing is a difficult process with all synthetics. Because of the low affinity of them for water, it is not easy to obtain good penetration of the fibers, or even the fabric.

All of these fabrics may be washed. The best pressing results if a steam iron is used. However, a regular iron may be used if set on "rayon" or "nylon".

The specific problems encountered in handling these fibers during construction break down into three categories: (1) seam puckering, (2) fabric scorching or fusing, and (3) cutting of yarns. A needle of the smallest possible diameter is the best solution to these problems.

Sewing thread of synthetic fibers is best for sewing on synthetics because it will not distract from their inherent qualities.

CONCLUSIONS

High school students doing clothing construction work should have a full understanding of the synthetic they choose to work with if they are to get the best results during construction and a finished product that will give good wear. How to care for the garment is also an important item for them to know.

It should be pointed out to them that the fabrics of spun yarn will be easier for them to handle than those fabrics of filament yarn. With knowledge of the problems encountered during construction and the best methods of solving these problems, advanced homemaking girls should be able to make satisfactory products from the new synthetic fabrics.

FOOTNOTES

1 Quig, Dr. J. B., "Why Five Fibers?", Rayon and Synthetic Textiles, Volume 32, September 1951, p. 35.

2 Ibid.

3 "As You Sew With Nylon", Nylon Division E. I. DuPont De Nemours & Co., Inc., Wilmington, Delaware.

4 Quig, op. cit., p. 69

5 Day, Michael, "There's a New World In Textiles", Popular Mechanics, Volume 95, June 1951, p. 121.

6 Quig, op. cit., p. 69.

7 "Dyeing of Orlon and Nylon", Rayon and Synthetic Textiles, Volume 32, March 1951, p. 56.

8 Quig, op. cit., p. 69.

9 "More 'Orlon' Fabrics Becoming Available", Rayon and Synthetic Textiles, Volume 32, April 1951, p. 40.

10 "Orlon and Fiber V Shirts", Consumer Reports, Volume 16, April 1951, p. 150.

11 Kendall, Helen W. and Dr. W. E. Coughlin, "Five New Miracle Fibers", Good Housekeeping, Volume 133, September 1951, p. 199.

12 Quig, op. cit., p. 71.

13 Larson, Dr. L. L., "Here's the Dacron Story", Textile World, Volume 101, June 1951, p. 112.

14 Quig, op. cit., p. 71.

15 Larson, op. cit., p. 314.

16 Ibid.

17 "Enter Dacron", Time, Volume 57, May 21, 1951, p. 107.

18 Larson, op. cit., p. 312.

19 Kendall, op. cit., p. 198.

20 "Dynel Showing Highlights Progress of New Fiber", Rayon and Synthetic Textiles, Volume 32, January 1951, p. 73.

21 "Check These Pointers to Help You In Handling Dynel", Textile World, December 1950, p. 127.

22 Ibid., p. 137.

23 Ibid.

24 "New Synthetic Fiber Gets Going", Business Week, December 16, 1950, p. 58.

25 Kendall, op. cit., p. 198.

26 Wedemeyer, H., "Fabric Finishing and Successful Sewing", Textile Age, October 1950, p. 54.

27 Ibid.

28 Ibid.

30 Modern Production, Monday, July 7, 1952, p. 27.

29. Wedemeyer, op. cit., p. 54.

31 Modern Production, op. cit., p. 27.

32 Ibid.

33 "Here's How To Sew On Tricot Jersey", Prepared by: Celanese Corporation of America.

34 Lowrie, Drucella, How to Sew Velvet, p. 6.

35 Ibid., p. 7.

36 Ibid., p. 8.

37 Ellsworth, Robert E., "Successful Sewing With Nylon Thread", Rayon Textile Monthly, May, 1947, p. 60.

38 Chemistry and the Home, p. 6.

39 Larson, op. cit., p. 316.

40 Chemistry and the Home, op. cit., p. 6.

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