



# Two-way Stretch Fabrics

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“Stretch” and “holding power” are the words used to describe the spandex class of manmade textile fibers. Lycra® was the first spandex introduced in 1959. It was used in applications where conventional rubber elastic previously had been. The strength, abrasion resistance and flex life of spandex is much greater than the original elastic. It also permits lighter constructions with more “give” and more holding power than were possible before.

No fabrics or garments are made of 100 percent spandex. Smaller percentages provide ample recovery and holding power. The fiber can be used covered (called core-spun yarns). Either a single or double covering of filament or spun yarn is wrapped around the stretchy yarn. On the surface, the yarn has the feel and appearance of the covering yarn. A fabric made from this yarn washes, dries and resists wrinkling with the same ability that a nonstretchable fabric of the covering fiber. The core of spandex (only a small amount is required) hidden within each individual yarn provides stretch and recovery. Core-spun fabrics control the degree of stretch, have durable extension and recovery properties and retain the aesthetic qualities of the covering yarns.

Spandex can also be uncovered (bare) since it can be dyed the same shade as the other fiber in the fabric. As a result, it will not “show through” when the fabric is stretched. Two-way stretch knits are perfect for workout wear with definite stretch capability in both the crosswise and lengthwise directions. Included are swimwear knits and strong, durable knits usually with a lustrous finish. Also available is Lycra spandex and nylon fibers. Dancewear knits are

lightweight, absorbent knits available in Lycra spandex and cotton blends. Common names for leotard knits are cotton/Lycra, poly/cotton/Lycra and Antron nylon/Lycra.

One-way stretch fabric can be used in a two-piece bathing suit or child’s suit. A one-piece bathing suit or tight fitting body suit can only be made from two-way stretch fabric.

## Pattern Selection

A large variety of knit fabrics are on the market, and many patterns are designed for them. On these pattern envelopes, you will find a stretch gauge. Use this to measure the stretch in your knit to see if it is sufficient for that pattern style. Patterns suitable for spandex fabrics will be labeled “for two-way stretch knits.” Be sure to test the stretch of your knit both crosswise and lengthwise. Fold over a 4 inch strip of knit fabric. Fold down about 3 inches. Hold the folded fabric against the chart, and stretch gently from the line to the outer line (the space with the arrow). If the fabric stretches easily without excessive rolling to the outer line or slightly farther, the fabric has the correct amount of

stretch for the pattern. If distortion or curling occurs, your fabric is over stretched, and another knit should be selected.

The amount of stretch available in a pattern varies among the pattern companies. Table 1 shows a comparison of stretch gauges among these companies.

Spandex provides garments with better fit and greater comfort than conventional garments. For example, features include smaller neck openings, higher armholes, closer fit and more tapered seams.

Purchase the same size pattern you would if using a nonstretchable fabric. Stretch is meant to provide comfort and a smooth appearance.

## Elastic Selection

The elastic you choose should be comfortable to wear and suitable to the sewing technique. The stretch and recovery should be what you expect. Being familiar with elastic construction and fiber content will help you make the right choice.

Keep in mind the type of application you will see. Elastic can be sewn directly to the garment or inserted in a casing.

Table 1. Pattern company terminology for stretch gauges.

Amount of stretch	McCall's	Vogue	Butterick	Simplicity	Kwik-Sew
18%	—	—	—	18%	18%
25%	—	—	—	20%	25%
35%	stretch knit	moderate stretch	moderate stretch	35%	35%
50%	one-way stretch two-way stretch	two-way stretch	two-way stretch	50%	50%
70%	—	—	—	70%	70%

**Braided elastic** has lengthwise, parallel ribs. It is lightweight and has good tension or "grip." Because it narrows when stretched, you'll find braided elastic most often used in casings at waistlines, necklines and sleeve and leg edges. Because the rubber in braided elastic is not as well covered as in other types, it is not recommended for direct applications. The action of the sewing machine needle pierces and breaks up the rubber to the point where stretch and recovery is severely affected.

**Woven and knitted elastics** are both softer than braided elastic but just as strong. They are recommended for any application where the elastic will come in direct contact with the skin such as swimwear or lingerie. Both these elastics will retain their width when stretched.

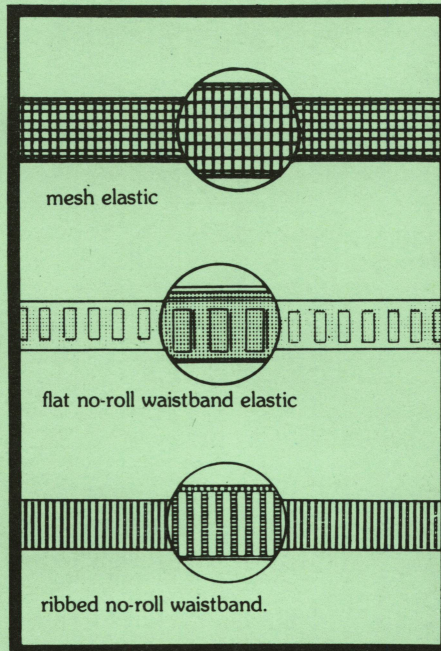
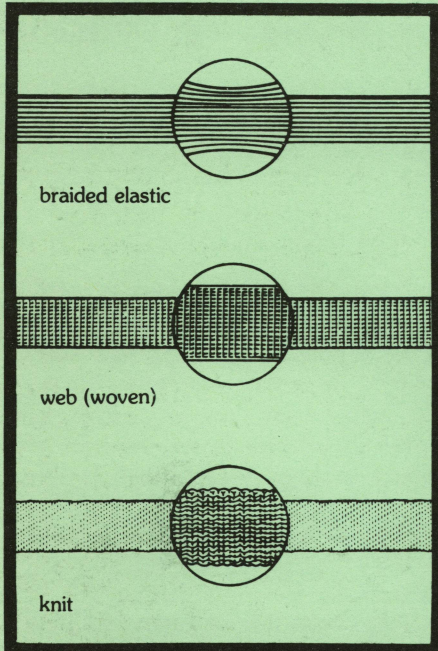
**Mesh elastic** is a knitted construction elastic used for direct applications rather than casings. It is most often used in the waistbands of skirts and pants.

**Nonroll waistband elastic** has lateral ribs that keep the elastic from rolling or twisting. This property makes it a perfect choice for actionwear waistbands. It is used for casings rather than for direct applications. The **flat no-roll waistband elastic** is designed for mediumweight fabrics. The **ribbed no-roll waistband elastic** is perfect for heavier fabrics.

**Elastic thread** is most often used as a decorative aid to create a shirring effect. It can also be used when directly applying other elastics to your actionwear fabric with a straight stitch. It is used only in the bobbin of the sewing machine. Wind it onto the bobbin by hand stretching it slightly as you go. Use polyester or cotton-wrapped polyester in the top of the machine. Because of the different weights of thread, you will probably have to adjust your machine's tension.

Polyester, nylon, rayon, acetate and cotton (either alone or blended) are all combined with rubber in elastic construction. Different fibers will impart different characteristics to your elastic.

**Polyester** is washable, drycleanable, shrink resistant and unaffected by body oils, salt or chlorinated water. It is particularly recommended for swimwear and other actionwear. Whether braid, knit or woven, it is the most useful all-purpose elastic.



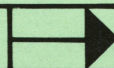
**Fabric with 18% stretch across the grain such as: Single knit, Double knit**

4" (10 cm) of Knit Fabric should stretch to at least here.



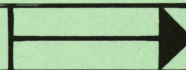
**Fabric with 25% stretch across the grain such as: Nylong tricot, Nylon sheer, Interlock, Velour**

4" (10 cm) of Knit Fabric should stretch to at least here.



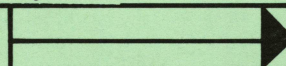
**Fabric with 35% stretch across the grain such as: Sweater fabric, Velour, Terry, Interlock, Fabric with Spandex or Lycra**

4" (10 cm) of Knit Fabric should stretch to at least here.



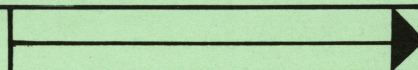
**Fabric with 50% stretch such as: Swimsuit fabric, Fabric with Spandex or Lycra®**

4" (10 cm) of Knit Fabric should stretch to at least here.



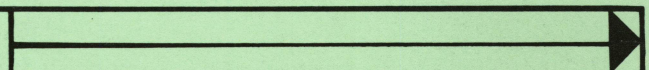
**Fabric with 70% stretch such as: Swimsuit Fabric, Power net (Girdle fabric)**

4" (10 cm) of Knit Fabric should stretch to at least here.



**Fabric with 100% stretch across the grain such as: Ribbing**

4" (10 cm) of Knit Fabric should stretch to at least here.



**Nylon elastic** shares many of the same characteristics as polyester elastic. It can, however, turn yellow when exposed to the chlorine in swimming pools.

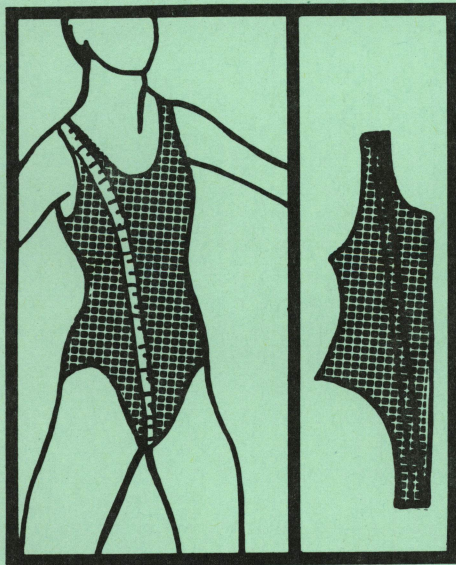
**Rayon and acetate elastics** are economical elastics suitable for a variety of garments. Because they stretch when wet and do not recover until dry, rayon and acetate elastics are not recommended for swimwear or for any activity where the wearer might perspire heavily.

**Cotton elastic** is soft and absorbent, recovers well and will withstand repeated launderings. It's perfect for sleepwear and lingerie.

## Cutting and Marking

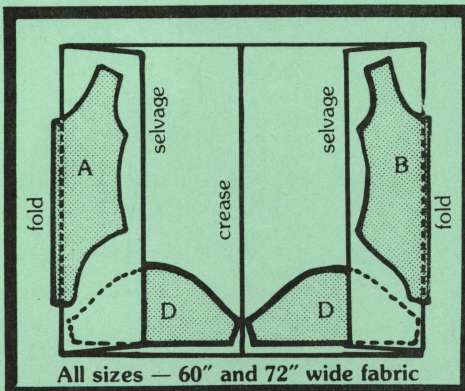
Preshrink fabrics including interfacings, zippers, elastic, trims and notions. This will prevent any shrinkage that might take place and will also remove any undesirable finish on the fabric. Spandex fabrics can be dried in a clothes dryer on a cool setting. Allow 24 hours for the fabric to relax before you begin cutting.

Before laying out the pattern, you may have to adjust it for a good fit. Take the shoulder-to-crotch measurement of your body and the pattern pieces, both front and back.



using the lines printed on the pattern pieces.

Cotton/Lycra generally has a crease at the fold that cannot be removed. Lay out pattern pieces so that the permanent crease falls at an inconspicuous place on the garment, or avoid the crease altogether. Usually easier is to avoid by refolding the fabric, bringing selvage edges toward the center.

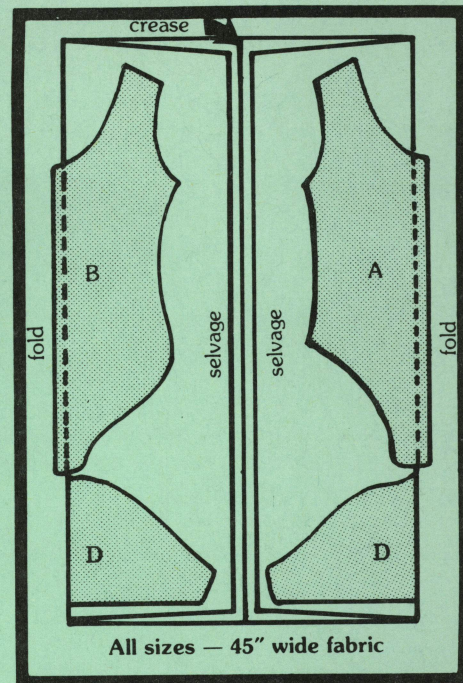


- The pattern should be at least 1 inch shorter than your body and more if your knit has a great amount of stretch. For very stretchy knits, the pattern pieces can measure up to 6 inches shorter.
- Adjust your pattern pieces if necessary. Shorten or lengthen them,

Lay out pattern pieces with the greater amount of stretch going around the body.

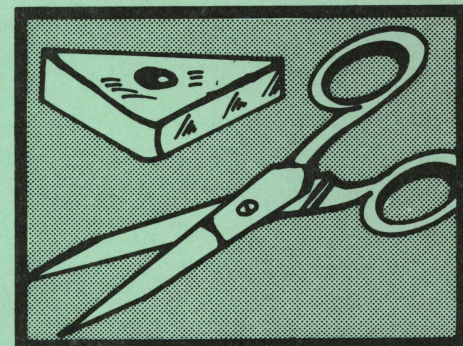
Spandex fabrics can appear shiny or dull depending on the direction you look at them. Decide how you want your garment to look, and then lay out all pattern pieces in the same direction. (Follow the layout for nap fabric on the pattern instructions.) Whether you cut on the crosswise or lengthwise grain, all pattern pieces should be placed in the same direction. Otherwise, your garment sections will appear to have different shades.

To prevent stretching and distortion when preparing fabric for cutting, work on a flat surface. Do not let the fabric hang off the table.



Instead of pinning pattern pieces to the fabric, which is quite slippery, weight them down.

If you choose to use pins, make sure they are very fine or ball point. Do not stretch when cutting. Use very sharp shears to avoid snagging or "chewing" the fabric.



Pattern markings may be transferred by using tailor tacks, dressmaker's carbon or ballpoint pins. If using carbon, always test on a scrap of fabric to be sure the markings do not show through or discolor the fabric. Testing is important because tracing wheels damage some spandex knits. Fabric markers are excellent for marking these fabrics. Test on a scrap to make sure marks can easily be removed. Do not clip into seam allowances to mark.

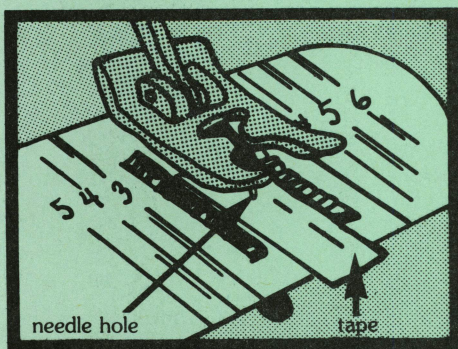
## Construction Techniques

The more that cut out pattern pieces are handled, and the longer they are left unsewn, the more twisted, curled and distorted they become. This can create problems in constructing the garment.

Some pattern designs require interfacing and/or lining. Interfacing is required for a little extra shaping and reinforcement. For areas like shirtbands and collars, choose one that is stable lengthwise and stretches crosswise. Lining fabric should have the same degree of stretch as the fashion fabric. If you plan to line an entire swim suit or leotard design, you may want to baste it to the fabric and treat it as an underlining.

Try on your partially assembled garment once or twice as you sew. You may find you want to stitch slightly deeper side seams or shoulder seams. This is because the flexibility of spandex permits a trimmer fit in some garments. But, this will vary from style to style and according to your own personal taste.

Use polyester or cotton-wrapped polyester core thread. It will "give" along with your fabric. Do not use nylon monofilament because it has no stretch. A thread lubricant such as Sewers Aid® will help by reducing thread cutting. To avoid snagging spandex fabrics, use a size 9 or 10 ballpoint machine needle. Larger needles may cause runs in fabric resulting from broken yarns. They may also cause unsightly needle holes when the garment is stretched. Skipped stitches can sometimes be prevented by using a throat plate with a small needle hole. If you don't have this type of throat plate, you can cover the needle hole with a piece of tape.

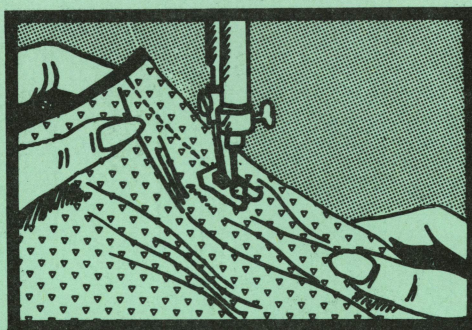


Spandex fabrics dull the needle quickly. You may need to change it often. The tension of your machine should be balanced but loose. The pressure on the pressure foot may have to be increased.

The action of your machine's feed dog, combined with the pressure of the presser foot, may cause one layer of your actionwear knit to creep and stretch more than the other as you sew.

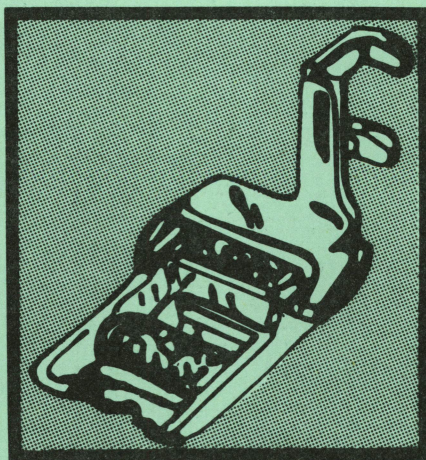
Solve this problem using one or a combination of the following methods:

- Hold the fabric taut as you sew.



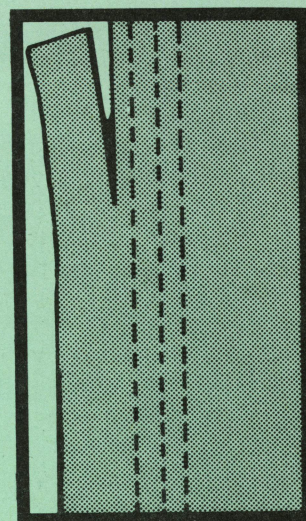
(Note: Taut is different from stretching or pulling that should be avoided since it can cause stitch variation and garment distortion.)

- Pin the fabric at frequent intervals.
- Baste seams together before you sew.
- Use basting tape for seams that do not require a great deal of stretch.
- Stop sewing every 5 to 6 inches; lift the presser foot and "relax" the fabric.
- Use an even feed foot or a roller presser foot.

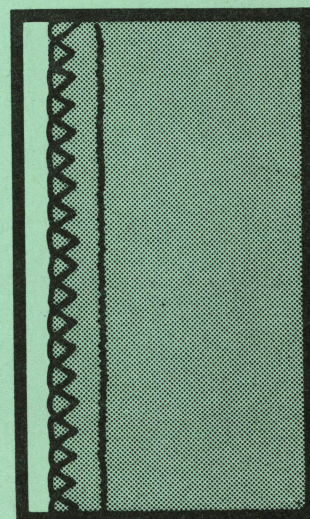


Seams should be narrow, finished and should have some built-in stretch. The type of sewing machine you have will determine the type of seam you choose.

**For a straight stitch machine** stitch along the seamline using a medium length stitch (10 to 12 stitches per inch). Hold taut with a gentle pull. To ensure a strong seam, stitch again right next to the first row of stitching. Make a third row of stitching  $\frac{1}{4}$  inch from the first two. Trim any excess seam allowance.

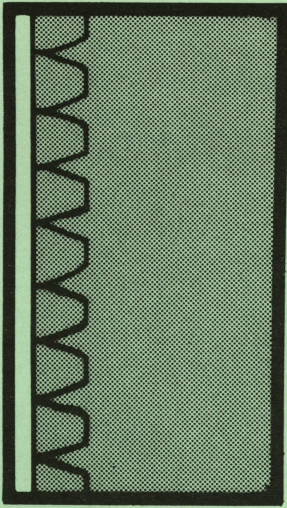


**With a zigzag machine**, stitch along the seamline using a narrow, medium length, zigzag stitch (12 to 16 stitches per inch). Trim the seam allowances to  $\frac{1}{4}$  inch, and sew them together using a large zigzag stitch.



Some machines have special overlock knit stitches that will stitch and overcast the seam in one operation. The configuration of the stitch will vary with the different brands of machines, but the result is the same — a seam with maximum stretch with minimum effort. Check your sewing machine manual for the stitches appropriate to your machine. Be sure to trim your seam allowance to  $\frac{1}{4}$  inch before you sew your seams. Some sewing machines have knit stitches that cause excess ruffling of the seams. Be sure to sew a test seam on a large scrap of your fabric before using on your garment.

A word of caution. If you use these special overlock stitches, make sure your garment fits. Overlock and stretch



When considerable stress is expected during wear such as in some active sportswear, special effort must be made to lock the spandex yarns firmly into the seams. Oversewing will better anchor yarns in the seam. If you have sufficient seam allowance, it can be folded over and sewn down.

Do not stabilize seams with tape as you normally would for a knit garment. Seams are suppose to stretch.

Hems are easily handled like manufactured clothing. Just turn up a narrow fabric width, and topstitch in place. This hem is much more durable than hand stitching.

### Pressing

Usually spandex fabrics require little or no pressing. Necessary pressing can be done with either dry or steam irons. Test on a fabric scrap to determine temperature required to produce the desired look without causing shrinkage, discoloration or glazing of the fabric. Because spandex is buried in the fabric, you can safely set your iron at the temperature you would normally use for the other fibers in your fabric. Test your iron on a scrap of fabric to make sure it is set at a low enough temperature. If the iron is too hot, then the fabric will have a glazed appearance, melt or pucker. If the iron is not hot enough, then the fabric will not hold a crease.

Light pressure is recommended for best results. A press cloth is helpful to reduce both shine and the tendency of fabric to stretch during pressing. A table covered with a thick terry cloth will give a larger surface and help prevent stretching.



stitches are much more difficult to rip out than a straight or a zigzag stitch.

In two-way stretch garments, all seams are stress seams. You must be sure that they stretch. Test seams on a folded scrap of fabric. The stitches should hold when the seam is stretched to obtain the necessary seam stretch by following this:

- Use a thread with more natural elongation.
- Increase the amount of thread in the seam by increasing the number of stitches per inch. Too few stitches per inch will usually cause the thread to break when the fabric is extended to its maximum. Too many per inch will restrict the fabric stretch.
- Use a different stitch design, if possible. A plain zigzag stitch, a 3-step zigzag stitch or over edge type should be used when more than 35 percent stretch is required.

### Care of Fabric

Spandex fabric is not absorbent and repels body oils, so gentle washing by hand or machine in warm water for about 3 minutes is enough to get it clean. Since chlorine bleach will cause permanent yellowing, use oxygen or sodium perborate bleach. Be sure to rinse the fabric well, and drip dry or tumble dry at a cool setting.

Garments can show early wear signs at the seams because of the tendency of spandex yarns in some fabrics to pull back from the seam. Wear life can be increased somewhat by oversewing these seams.

*Tradenames are used to simplify the information presented. Use of these names neither implies endorsement of products nor criticism of similar products not mentioned.*

Several other publications about clothing are available from the University of Idaho Cooperative Extension Service. Other titles that may interest you are the following:

CIS 591	Interfacing: Selection and Use .....	.25
CIS 592	Hair Canvas Interfacing .....	.25
CIS 593	Fusible Interfacing .....	.25
CIS 594	Underlining a Tailored Garment .....	.25
CIS 595	Bound Buttonholes .....	.35
CIS 596	The Tailored Shoulder .....	.25
CIS 597	Shoulder Pad Construction .....	.25
CIS 598	Lining Selection and Construction .....	.25
CIS 599	Lining a Tailored Garment .....	.25
CIS 600	Topstitching .....	.25
CIS 601	Interlining .....	.25
CIS 602	Machine Buttonholes .....	.35
CIS 739	All About Silk — A Silk Dictionary .....	.35
CIS 740	All About Silk — Silk Fabrics .....	.35
CIS 741	All About Silk — Sewing Silk .....	.35
CIS 742	All About Silk — Caring for Silk .....	.25
EXT 568	Trimming Tailoring Time (Jacket Construction) .....	.50

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