

## Sewing Stretch Knit Fabrics

Most stretch knit garments are seamed with overedge and/or coverstitch seam constructions because these stitches offer the best seam elasticity and coverage of the raw edge of the fabric. A quality problem that is common with stretch knits is excessive “broken stitches” or “stitch cracking” when the seam is stretch excessively. Generally the greater the elasticity of the fabric, i.e., higher Lycra® or Spandex® content, the more likely you are to have broken stitches if you do not understand how to optimize elasticity in the seam.



### WHAT CAN BE DONE TO MINIMIZE BROKEN STITCHES?

Most broken stitches are the result of one of the following:

- Not using the correct thread type & size
- Not having enough stitches per inch
- Not sewing with the correct stitch balance or machine thread tensions set incorrectly
- Not using the correct seam margin or needle spacing for the application

### WHAT THREAD TYPE & SIZE ARE COMMONLY USED TO SEW STRETCH KNIT FABRICS?

The most common threads used to sew stretch knit fabrics are textured polyester or textured nylon threads like A&E's *Wildcat® Plus* or *Best Stretch®*. Textured threads are ideal for overedge and coverstitch seams because they offer excellent seam coverage and seam elasticity. In cases where performance garments will be subjected to harsh end-use applications and wash cycles, many manufacturers prefer to use *Perma Core®* threads in the needles and textured threads in the looper positions. Spun polyester threads such as A&E's *Perma Spun®* and *Excell®* are also used to reduce thread cost.

### Recommended Threads for Stretch Knit Fabrics

Fabric Weight	Needle Thread	Looper & Spreader Threads
Light Wt. Stretch Knits	T-18 or T-24 <i>Perma Core®</i> <i>Alternative:</i> T-21 <i>Perma Spun®</i> and <i>Excell®</i>	<i>T-18 Wildcat® Plus</i> or <i>Best Stretch®</i>
Medium Wt. Stretch Knits	T-24 <i>Perma Core®</i> <i>Alternative:</i> T-27 <i>Perma Spun®</i> and <i>Excell®</i>	<i>T-24 Wildcat® Plus</i> or <i>Best Stretch®</i>
Heavy Wt. Stretch Knits	T-40, T-60 <i>Perma Core®</i> <i>Alternative:</i> T-40, T-60 <i>Perma Spun®</i> and <i>Excell®</i>	<i>T-35 Wildcat® Plus</i> or <i>Best Stretch®</i>

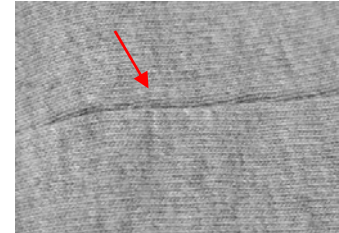
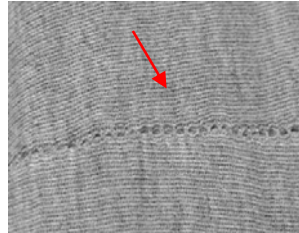
Seams should be sewn at 14 to 18 spi with the proper stitch balance.

Since many performance garments are very tight fitting, sometimes there are complaints that the seam is 'rough' to the touch and not soft like they should be. This appears to be more of a problem with the thread on the inside than on the outside of the sewn product. When sewing with a coverstitch or bottom coverstitch, the thread that you feel on the inside is actually the needle thread loops rather than the looper thread. To minimize this roughness, use the smallest needle thread possible and make sure the

needle loop is pulled up to the bottom side of the fabric. Then you will primarily feel the looper thread which if sewn with a textured thread, will have a nice and soft feel. Another solution is to sewn the garments with the looper thread side to the outside of the garment.

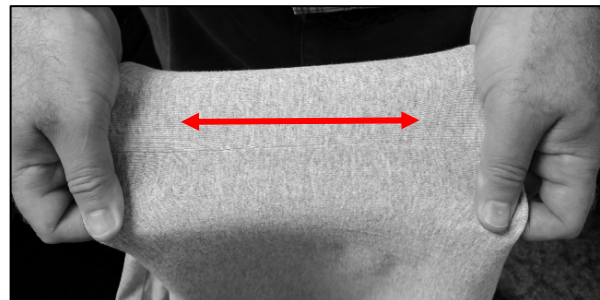
### WHY IS IT IMPORTANT TO HAVE THE PROPER NUMBER OF STITCHES PER INCH & STITCH BALANCE?

Seam elasticity can be accomplished by a combination of having the correct number of stitches per inch and having the proper stitch balance. The more stretch the fabric has, the more stitches per inch that are required. Common ranges of stitches per inch for stretch knit fabrics range from 14 to 18 spi. However, even when the correct number of stitches per inch are being used, if the proper stitch balance is not set correctly, you will still experience excessive seam failure. One way of checking the stitch balance is first check the seam for “seam grinning” by pulling perpendicular to the seam. After applying the stress across the seam, remove the stress and check to make sure the seam goes back to a closed seam.



Next pull the seam along the stitch-line to the maximum stretch level that the garment will be subjected to and see if the threads fail.

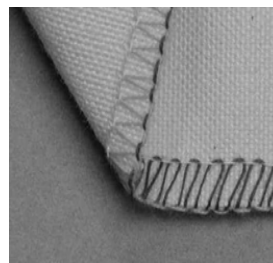
If they do, generally there is not enough needle thread in the stitch. Therefore loosen the needle thread tension and check the seam again.



### WHAT YOU SHOULD KNOW ABOUT SEAM MARGIN

The seam width of overedge or coverstitch seams also has a major impact on seam elasticity. Take a zig-zag stitch for example. The wider the zig-zag and the more stitches per inch that are used, the greater the seam elasticity. A zig-zag stitch will stretch until it becomes a straight line at which time the stitch loses its elasticity.

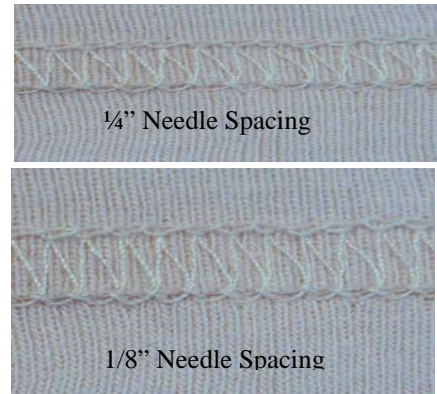
On overedge machines, the “chaining finger” or “stitch tongue” on the needle plate and the adjustment of the overedge machine’s trimming knives determines the seam width. Seams sewn with a wider “bite” or seam margin and more stitches per inch will have greater seam elasticity. The two most common overedge stitch formations used for seaming knit garments today include the single needle 504 stitch and the 514 two needle overedge stitch.



Obviously, a two needle 514 overedge stitch offers greater seam elasticity because this stitch generally is sewn in a wider seam margin. However, many times this wider stitch is not desirable on intimate apparel or knit underwear because it creates a more bulky seam. If a narrow bite 504 stitch is preferred, the seam should be sewn with more stitches per inch and the correct stitch balance.

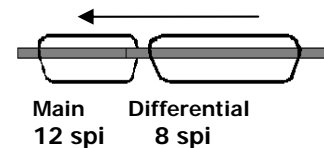
The needle spacing on 406 bottom coverstitch types shown to the right and similar coverstitch types have a tremendous impact on the seam elasticity.

The sample sewn with the wider the needle spacing (1/4") has more elasticity the seam sewn with the narrower needle spacing (1/8") because it has more thread in the stitch. Therefore, when a narrow needle spacing is desired on high-stretch fabrics, the sewing machine should be set for more stitches per inch to minimize thread failure in the seam.



### MAKING SEAMS ON STRETCH KNIT FABRICS WITH A FLAT SEAM APPEARANCE

Most sewing machines designed for sewing stretch knit fabrics have a differential feed system that includes two independently driven feed dogs. Tandem **differential feed** systems have a front differential feed dog and a back main feed dog. If both feeds are feeding at the same stitch length or if a sewing machine is being used with a single feed, then the resulting seam will appear "wavy" like the ocean. To compensate for the stretch in the fabric, the front differential feed is set to feed more fabric in than the back feed is feeding out resulting in a flat seam appearance.



Most binding or border machines are also equipped with an "off-set" differential feed system to optimize seam appearance.

### OPERATOR HANDLING CAN AFFECT SEAM APPEARANCE

When sewing stretch knit fabrics, it is important to train the sewing operators to guide the fabric into the sewing machine without stretching the fabric excessively. Excessive stretch of the fabric when feeding the fabric into the seam can impact seam appearance, seam elasticity, and garment fit.

Whenever knit fabrics are being sewn, needle cutting is always a concern. For more information about how to minimize needle cutting, request a copy of our '*How to Minimize Needle Cutting*' bulletin.

For additional assistance, please contact your local A&E Sales or GRS representative or someone in our Technical Solutions Department.