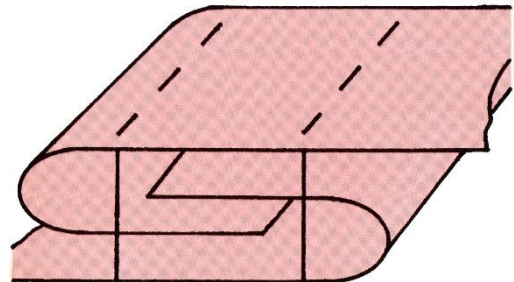


Industry Technologies

This is the feature that was based on an article written by Ken Sandow, who was an instructor and technician at Union Special's Technical Training Center. From 1970 to 1972, Ken served as a sewing engineer in the Union Special's Product Application Department.

Seams and Stitches: International Nomenclature Aids Garment Producers

In the example shown here, a **401-LSc-2** "**401**" indicates a two-thread chainstitch double locked. "**LS**" indicates a lapped seam, while the "**c**" indicates the specific seam configuration. The "**2**" indicates that two independent rows of **401** stitches are used to construct this seam.



401-LSc-2 "401"

Following the first mechanically formed 101 stitches produced in 1825, inventors throughout the world were quick to develop improved machines and more complex stitches. By the turn of the century, most of the stitch types used today had been invented, providing garment manufacturers with a wide selection. Each had its own special attributes of strength, elasticity, coverage, invisibility, and decoration.

With nearly 60 different stitch types available, a degree of confusion was inevitable. Often it was caused by the same stitch being referred to by different names in different parts of the world. Not until 1925 did a committee organized by the Federal Specifications Board classify the many different stitches and seams according to a convenient, and now internationally accepted, system of letters and numbers.

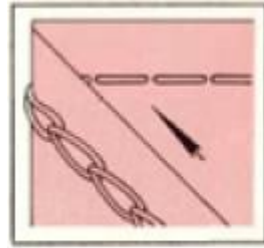
The nomenclature of a stitch/seam type consists of a number to designate the stitch type followed by letters to designate the seam type. Capital letters are used to indicate the general seam classification and are followed by a lowercase letter which indicates the specific seam type within the more general classification. A final number, following the stitch/seam specification, indicates the number of independent rows of stitches used in the seam.

Below are the more popular stitch types available today with a brief description of how they are formed and of their application.

100 STITCH CLASS

represents the oldest form of mechanically produced stitches.

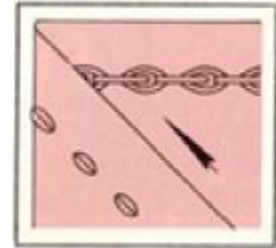
Referred to as single-thread chainstitches, they are formed by a needle thread that is passed through the material and is interlooped with itself using a spreader or a blind looper.



101



103



104

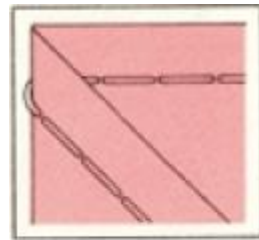
101 is an easily removed stitch used for basting, tacking, button sewing, label setting, and bag closing. It is the simplest of all mechanically formed stitches.

103 is a single-thread blindstitch formed with a curved needle that barely penetrates the bottom ply of material. It is used for blind stitch felling and hemming operations on garments and draperies.

104 is a saddle stitch used to produce a decorative effect on suits, dresses, jackets, etc. It is formed by pulling the needle thread back through the top of the material where it is looped with itself.

300 STITCH CLASS

(lockstitch) is formed by the needle thread passing through the material and interlocking with a bobbin thread using a rotary or oscillating hook.



301



304

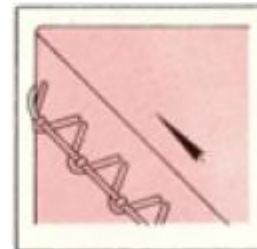


306

301 is a very tight stitch that looks the same on the top and the bottom of the seam. It is used for runstitching and seaming operations on all types of apparel. It produces a secure seam with a



313



314

minimum of "grin". "Seam Grinning" is a term referring to the visibility of the seam on the right side (public side) of the fabric. The ratio of needle thread to bobbin thread is 1 to 1 in a correctly formed stitch where the threads are interlocked in the middle of the material.

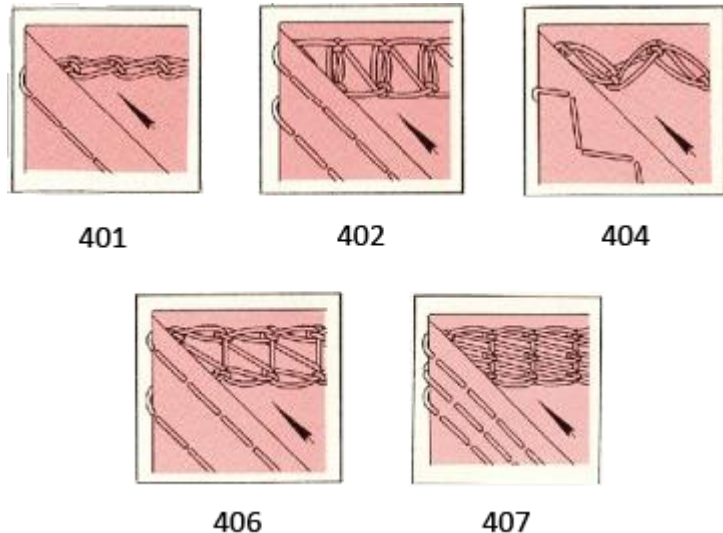
304 is a zigzag lockstitch produced by moving the needle from side to side, thereby putting more thread into the seam for greater elasticity. Used on lingerie, foundation garments, and infants' clothing. It combines comfort with stretch.

306 is a lockstitch blindstitch which is more secure than the single-thread 103 stitch type. It is desirable for its durability and its hand-tailored appearance.

313, a lockstitch blindstitch, is used for felling linings and hems on suit coats. When correctly applied, this stitch is invisible on both the top and the bottom of the seam.

314, another lockstitch blindstitch, provides the quality and the appearance of hand blindstitching and is usually used for felling undercollars and linings at the sleeve on suit coats and tailored garments.

400 STITCH CLASS is comprised of stitch types referred to as multi-thread chainstitches (double-locked stitches). The extra elasticity makes them ideally suited for use on knit and stretch fabrics. This stitch is formed by passing one or more needle threads through the material where they are interlooped with a single looper thread. Because the looper draws its threads from a cone, the need to replace bobbins is eliminated.



401 uses a needle thread and looper thread to produce an elastic stitch which is used on a wide range of main seaming operations on all types of garments.

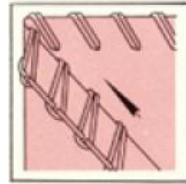
402 uses two needles and one looper to produce a corded or welted effect on the face of the material between the two needle threads. It is used to simulate permanent creases on knit pants and for cording on the backs of gloves.

404 is a zigzag version of the 401 used traditionally for attaching zigzag waistband linings and curtains to pants. Because of the zigzag, the 404 is a more elastic stitch than the 401.

406 uses two needles and one looper. This stitch type was originally used for coverseaming a previously sewn seam. Other applications include making belt loops, binding, and elastic attaching to undergarments. It is also used to hem bathing suits, pajamas, and sportswear.

407 uses three needles and one looper. It is a stitch with even greater elasticity and strength, and better coverage is achieved. It is widely used for attaching elastic to briefs, panties, and similar undergarments.

500 STITCH CLASS includes a group of overedge stitches used for seaming and edge-finishing operations on practically all types and weights of materials. These stitch types are very elastic and offer excellent coverage on the edge of the fabric to prevent unraveling.



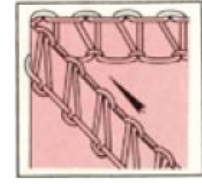
501



502



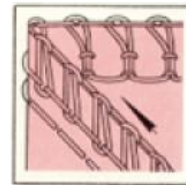
503



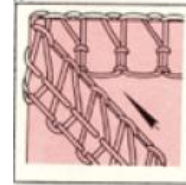
504



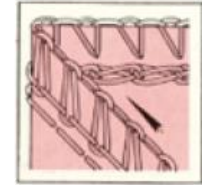
505



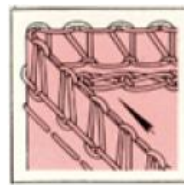
512



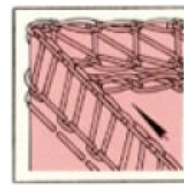
514



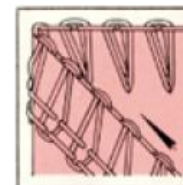
515



516



519



521

501 uses a single thread to produce a break-open seam that is used for bold end seaming applications. When opened, the seam is flat without any overlapping of the material, allowing it to pass easily through dyeing or finishing machinery.

502 is a two-thread stitch formed by drawing the looper thread around the edge of the material. It is primarily used for bag seaming.

503 is a two-thread stitch similar to 502 except that the needle thread interlocks with the looper thread on the edge forming a "pur". The 503 stitch is used for serging or blind hemming operations.

504, the most popular of the 500 Class stitches, uses three threads and applies to a wide range of seaming operations. A tight secure seam is produced with both top and bottom looper threads meeting on the edge.

505, sometimes called the box or square-edge-stitch, produces the best coverage for serging operations. It is also used to break open seams on garments.

512 is a four-thread, mock safety stitch formed by using two loopers and two needles where the right needle only enters the upper loop to give the appearance of a safety stitch. This stitch is both strong and elastic.

514 is similar to the 512 except that both needles enter the upper looper thread. It has the strength and elastic advantages of the mock safety-stitch with the additional advantage of being able to chain off more consistently.

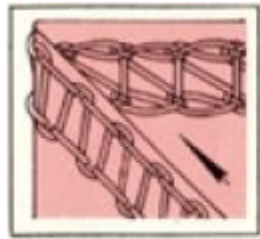
515 is a true safety-stitch formed by simultaneously sewing one row of 401 stitches and one row of 503 stitches. This configuration combines the strength and stretch advantages of both stitch types to produce a durable seam.

516 is another variation of the safety-stitch which uses a row of 504 stitches plus a row of 401 stitches. Although an additional thread is used in the over-edge portion of this stitch, it also is used to make a strong, durable seam.

519 is a six-thread safety-stitch comprised of a 602 stitch on the edge and a 401 stitch. It provides excellent strength and coverage on heavier-weight material.

521 is a three-thread stitch used for break-open seaming on men's and women's hosiery. From 20 to 100 stitches per inch are often used resulting in a strong, yet comfortable hosiery seam.

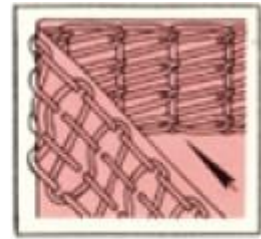
600 STITCH CLASS is referred to as a coverstitch. Stitches in this class are formed similarly to the multi-needle 400 stitch types but with the addition of a top cover or spreader thread. Flatter seams, greater coverage, and excellent elasticity account for the popularity of this stitch class as used on foundation and undergarment operations.



602



605



607

602 is a four-thread stitch type used for binding operations on knit undergarments, athletic shirts, and infants' wear. It provides excellent coverage on both the top and bottom of cut-edge binding.

605 is a five-thread stitch type well suited to lapped seaming and elastic attaching operations, as well as to cut-edge binding operations. It is also used as a decorative stitch.

607 is a six-thread stitch type providing more coverage than any of the other stitches in the 600 class. It is used for flat seaming operations on undergarments, sportswear, infants' wear, etc.

The Needle's Eye.

[Industry Technologies](#)

Seams and Stitches (Part 2): Taking A Closer Look at Seams and Stitchings

What is a seam or a stitching?

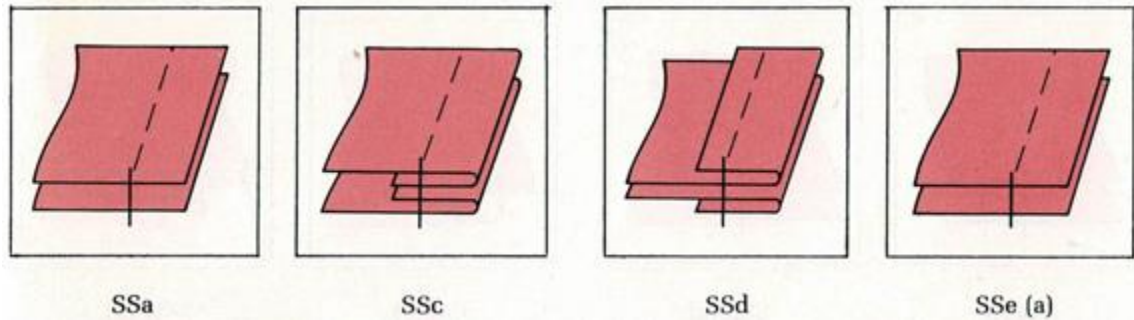
A seam may be defined as a series of stitches used to join two or more plies of material. Most apparel operations are grouped under a seam classification. A stitching, on the other hand, is a series of stitches used to finish the edge or for decorative purposes on a single ply of material. Serging and hemming operations are common examples of stitchings. It is important to remember not to confuse stitchings with stitch type classifications.

The federal specifications booklet divides seams into four classes: Superimposed Seams (SS); Lapped Seams (LS); Bound Seams (BS); and Flat Seams (FS). Stitchings are divided into two

classes: Edge Finish (EF) and Ornamental Stitchings (OS). Within each of these classes are several types which are indicated by lowercase letters, such as SSa or LSb.

SUPERIMPOSED SEAMS.

Superimposed Seams (SS) are produced by sewing together two or more plies of material, with the edges of the materials generally being even. This is accomplished with a simple sewing



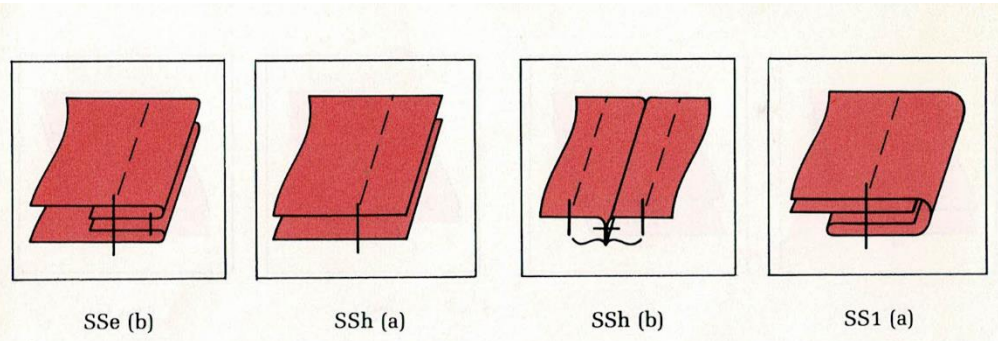
machine edge guide or, occasionally, with a more complex folding device. Sixty superimposed seam types are classified for various operations.

SSa, probably the easiest seam to form, is the most common of all the seam types used for apparel. One ply is placed on top of another with the edges kept parallel by a material trimmer, edge guide, or seam guide. Main seams on slacks, shirts, jackets, coats, vests, and draperies - to name a few - are formed with this seam type. The first operation in making shirt collars or cuffs, pocket flaps, and other runstitching operations are usually done with this seam. Seam type SSa is commonly formed with 101, 301, 401, 502, 504, 512, 514, 515, 516 and 519 stitch types.

SSb is formed by folding both the top and bottom edges toward each other by hand or with the aid of a creasing machine. This seam is used to produce cuffs and flaps on coats, shirts, jackets, etc., in one operation. This seam is usually produced with a 301 lockstitch because it appears the same on the top and bottom sides.

SSd is formed by folding the top and bottom plies in opposite directions. Manufacturers have found that for jute and burlap bags, this seam is virtually leakproof when the bag is turned right side out. Bag manufacturers use a 401 stitch with this seam.

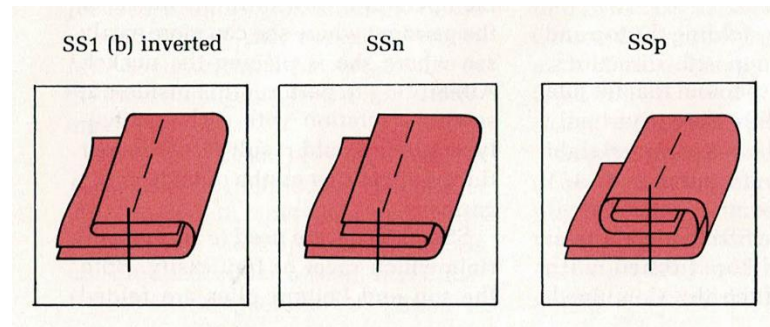
SSe (a & b) consists of an SSa seam (a) that is folded over and topstitched with another row of stitches (b).



Combined, this seam and stitch form the SSe seam, used for runstitching and topstitching collars, cuffs, flaps, pockets, and facings on a wide variety of garments. Because this seam is formed in two operations, the number of rows of stitch indicated after the seam type represents both operations.

SSh (a & b), requiring two operations, is used on knitted garments where the first operation is usually sewn with a 504 overedge stitch (a), and the second operation is produced on a 406 stitch coverseaming machine (b). Combining the excellent elasticity and coverage of these two stitch types, a very durable seam is formed for use on swimwear, sweaters, sportswear, and children's clothing.

SS1 (a & b inverted) is formed by inserting a ply of material into the hem of another ply (a). An inverted construction of this seam is commonly used for setting pockets to jeans (b). One or two rows of 301 lockstitches, with the same, neat appearance on both sides of the material, are used for this operation. This allows the operator to sew from the inside of the garment where she can more easily see where she is placing the pocket. Attempting to perform this inside-out sewing operation with a chainstitch-type stitch would result in the looper thread appearing on the outside of the garment.

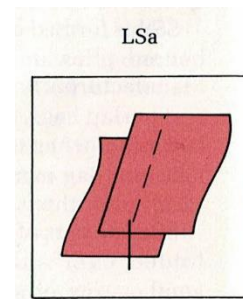


SSn and **SSp** are used to seam materials that ravel or fray easily. Both the top and bottom plies are folded once or twice producing a very secure seam for use on ladies' and children's dresses, pajamas, nightgowns, hosiery, and mesh bags.

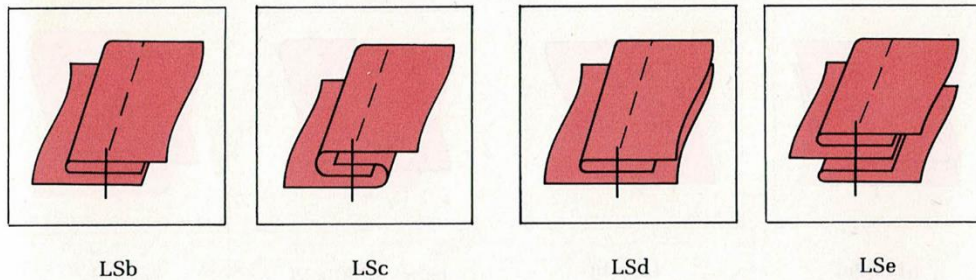
LAPPED SEAMS

Lapped Seams (LS) are formed by joining two or more plies of material that are overlapped at the needle. Most of the seams produced in this class require some type of folder to aid the operator in forming the seam. 108 different lapped seams types make this the largest seam classification.

LSa, although one of the easiest seams to form, is seldom used in the construction of woven goods because of the raw edges that are vulnerable on both sides of the seam. Its use is confined to joining selvage edges, such as in the construction of awnings and tents. For knit goods, however, this seam is commonly used with a coverstitch to produce very flat and elastic seams. The cover thread on the top and the looper thread on the bottom prevent the edges of the material from raveling. Usually, an edge guide is used to position the bottom ply, and a special presser foot with a yielding section is used to position the top ply.



LSb is formed by turning the edge of the top ply under, thus forming a semi-felled seam. When used for main seams on coats and jackets, the finished edge is on the outside, while the raw edge is concealed on the inside. This seam is produced with either a 301 lockstitch or a 401 chainstitch.

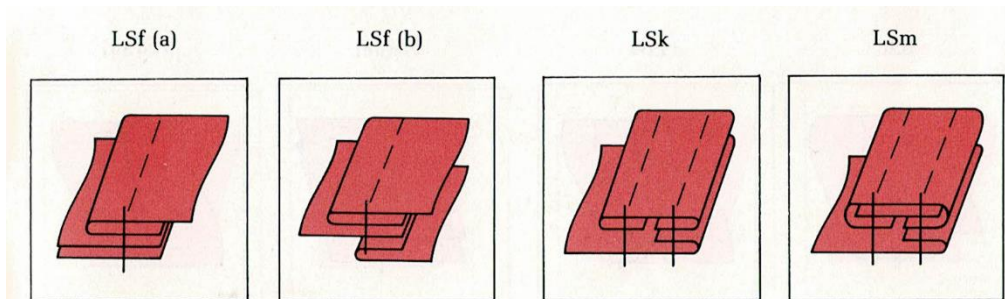


LSc, known as the "felled" seam, is the strongest of all the seam types. Both top and bottom edges are folded in such a way that they interlock, leaving no raw edges. In 1896, Union Special Corporation designed the first adjustable folder for this seam for use on multiple needle machines producing stitch type 401. Today, the LSc seam is used in the construction of jeans, jackets, shirts, pajamas, coveralls, shorts, tents, and parachutes.

LSd, although seldom used for main seaming, is used to set most patch pockets, pocket flaps, pocket facings, and labels. To aid in the handling of the material, the edges of pockets, labels, etc., are occasionally creased prior to the seaming operation, giving greater uniformity and improved appearance.

LSe is formed by inserting a third piece between two folded plies. This seam allows an operator to join the shoulders or set the cuffs of a dress shirt in one operation. A 301 stitch is generally used on this operation since it looks the same on both sides.

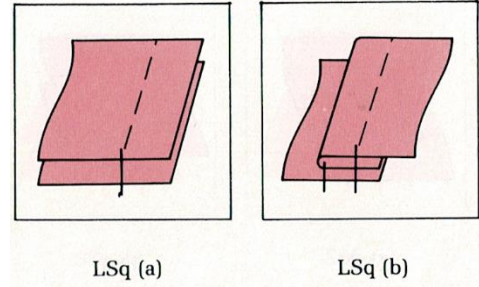
LSf (a & b), used on shirts, dresses, and blouses for yoking operations, is usually joined with a 401 stitch (a) where the looper thread is completely hidden on the inside of the garment (b).



LSk is used for taping operations on brassieres, attaching button facings to shirt fronts, and waistbanding operations. A body folder and a lower or upper strip folder are used to make this seam with two or more rows of stitches.

LSm, called a "Tru-front" or "set-on" centerplait, is used in the production of fronts of shirts, blouses, leisure suits, and pajamas with two or more rows of 401 stitch. The "center plait" seam is similar to the LSk seam, except that an interlining strip is added.

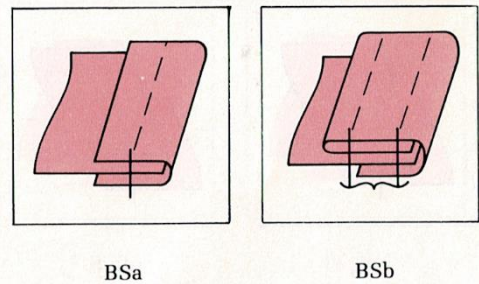
LSq (a & b) consists of an Ssa (a) seam which is folded open and restitched (b), thus combining a strong seam with a neat appearance. This seam is occasionally used on the sides of slacks, to set sleeves on shirts and blouses, and on other operations requiring a flat seam. Because this seam is formed in two operations, the number of rows of stitch indicated after the seam type represents both operations.



BOUND SEAMS

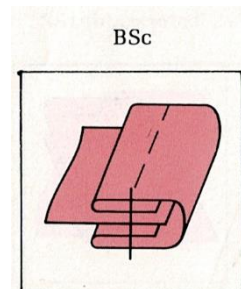
Bound Seams (BS) are one of the best means of finishing the raw edge of an article with a neat and tailored appearance. A bound edge seam is made by folding a piece of material around the edge of another, usually with the aid of a binder. 18 bound seams are classified in the federal specifications, with the type of binding and the seam type directly related to the stitch type being used.

BSa is formed by folding the binding around another ply of material, leaving the raw edges of the binding unfinished. When using a 301 or a 401 stitch with this seam, a selvage edge binding or binding made of paper or plastic is necessary. When this seam is produced with a 602 or a 605 coverstitch, the looper thread on the bottom and the spreader thread on the top cover these raw edges producing a very flat seam. The BSa seam is used to close the tops of bags, to set collarettes to undergarments, and to finish the edges of sheets and pillowcases.



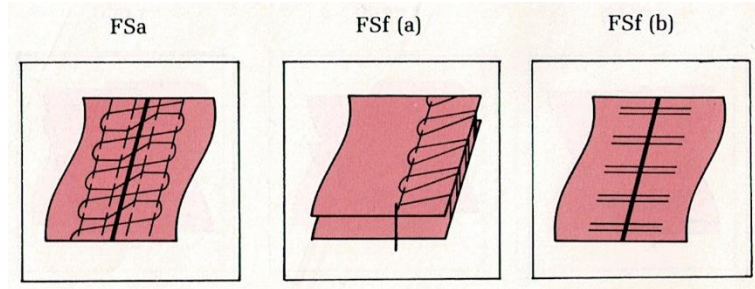
BSb, requiring a less expensive cut-edge binding, combines the neat and tailored appearance of a finished edge on top with a flat, smooth seam on the bottom. Sewn with a 406 stitch, this seam is used to bind the edges of undergarments and similar garments with a ribbed or flat knit binding.

BSc, referred to as "piping" a raw edge, is formed with a cut-edge binding and can be sewn with either a 301 lockstitch or a 401 chainstitch. This seam is used to bind the edges of overcoats, jackets, aprons, dresses, and upholstery. The top and bottom edges of the binding are folded, thus giving a clean, finished appearance on both sides. Today, most jeans manufacturers use this seam to attach the waistband to the body in one operation.



FLAT SEAMS

Flat Seams (FS) are produced by butting two plies of material together, usually with a 606 or 607 coverstitch. Flat seams are used primarily in the construction of undergarments, foundation garments, sportswear, and sleepwear to provide comfort.



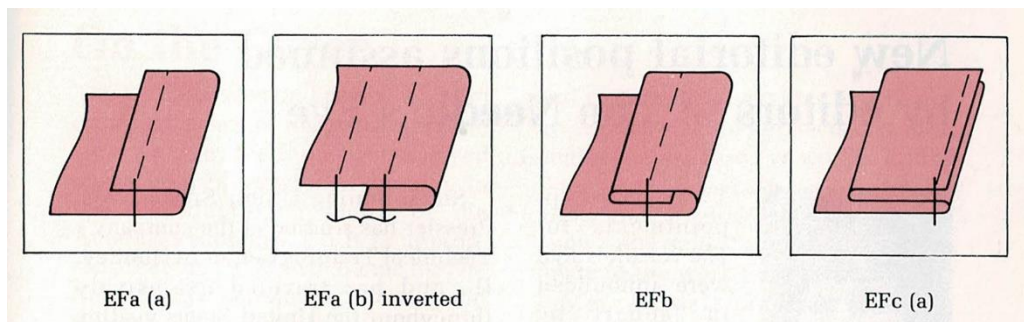
FSa is the simplest of the flat seams and is usually formed on a machine that trims both edges before butting them.

FSf (a & b) is formed in two operations and is used for bolt end seaming large pieces of material. The two plies are sewn together with an overedge stitch forming seam type SSa (a). They are then hinged or folded open forming a flat seam (b) that can easily be fed through dyeing and finishing equipment.

EDGE FINISH STITCHING

Edge Finish Stitching (EF) is used primarily to finish the edge of a single ply of material rather than to join the plies of material. There are 34 stitching types in this class used for serging and hemming.

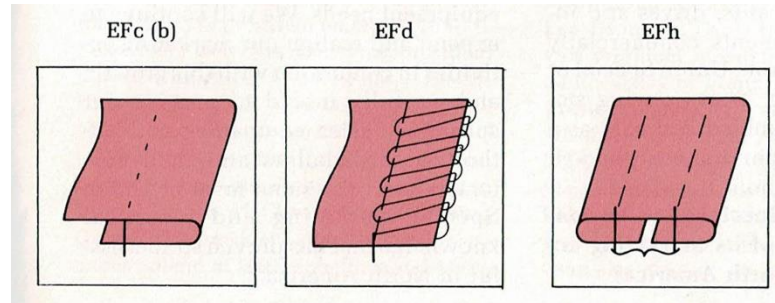
Efa (a & b inverted), formed by turning the edge of a single ply of material, is used to hem a selvage edge or to prepare a



garment piece for a subsequent operation (a). An inverted construction of this stitching is commonly used in knitted robes, sportswear, and undergarments in conjunction with a 406 stitch (b). The looper thread on the bottom covers the raw edge and prevents it from unraveling.

EFb is used to hem the edges of shirts, jeans, and raincoats where the raw edge is locked inside the hem giving a clean, finished appearance. A hemming folder or hemming presser foot is generally used to form the material on a 301 lockstitch or a 401 chainstitch machine.

Efc (a & c) is used to blind hem the sleeves and bottoms on knit garments such as T-shirts. By folding the edge of the material in a certain manner when it is sewn (a), a blind stitch effect is produced (b).



EFd, the simplest edge finish stitching, is formed with a row of 503, 504, or 505 stitches. Referred to as "serging", type EFd is used on slacks, shirts, dresses, jeans, draperies, and upholstery.

EFh is the stitching most commonly used to make belt loops for jeans or work pants. Usually formed with a 406 stitch, the looper thread on the bottom covers the raw edges.

ORNAMENTAL STITCHING

Ornamental Stitching (OS) is used for decorative stitching operations on single plies of material. Quilting operations on upholstery, bedspreads, etc., are usually performed using an OSa stitching sewn with a 301 lockstitch.

Courtesy of Dave Gardner(The Needle's Eye)

