

1. CONCEPTS of GARMENT AND FABRIC SYMMETRY

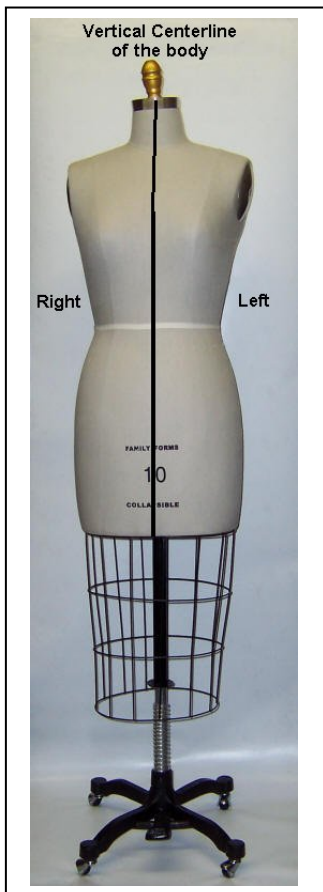
Understanding the modes of marker making and spreading are important concepts. Garment symmetry and fabric symmetry are fundamental concepts of design that define how a garment looks and how it is made. In production, both forms of symmetry affect the marker modes chosen, as well as the methods of spreading and cutting that affect the cost of a fashion item.

For most manufacturers, the price point at which their styles sell will, therefore, partly determine the choices available to the designers in deciding garment styles by symmetry, or in the choice of fabrics. Good designers will understand the concepts of symmetry and work within the constraints of available production methods, and cost. For the purpose of defining marker making and spreading modes, we use specific definitions of garment and fabric symmetry.

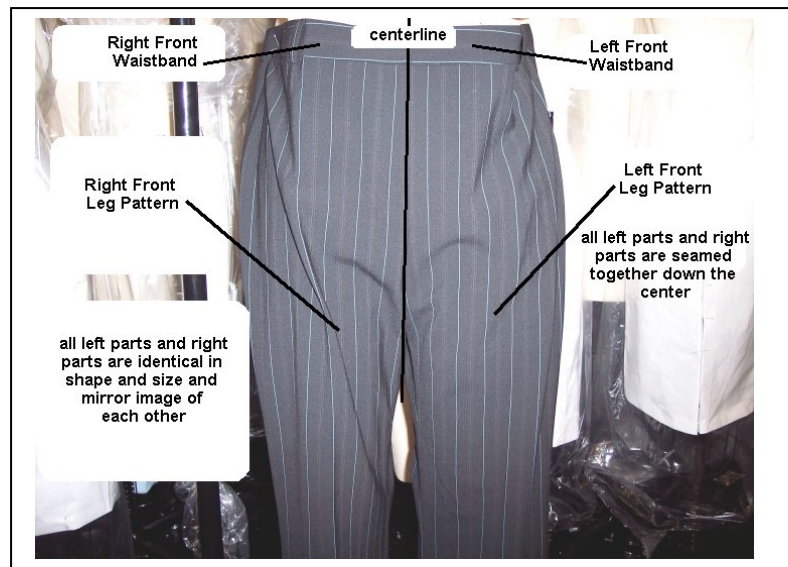
a. **Garments** can either be **Symmetric**, or **Asymmetric**.

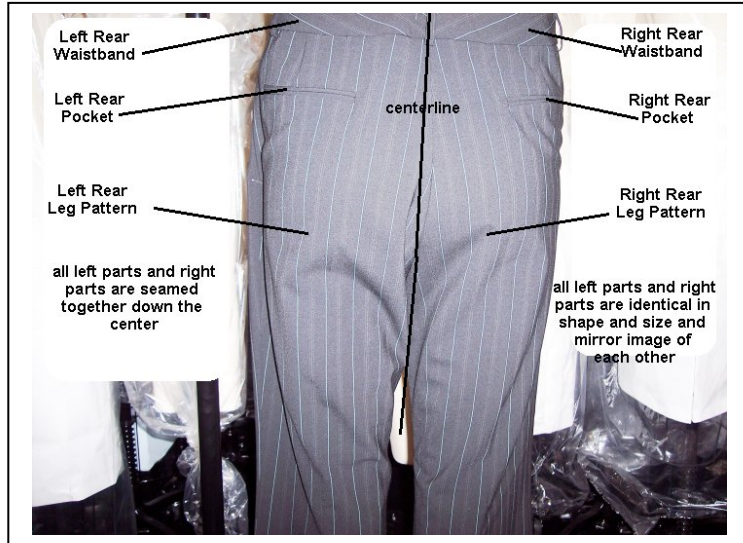
This determination is based on the shapes of the patterns for the garment. As defined, a **Garment is Symmetric** (except for the difference of buttonhole and button-sew) if, when dividing the garment by visualizing an imaginary vertical line drawn from the center of the neck, through the navel (belly button), down to the bottom edge of the garment, (**the Vertical Centerline of the body**) all the patterns on the left side of the body are exactly the same but mirror image to all the patterns on the right side of the body.

For the Symmetric Pant illustrated below, all the garment patterns including the the left leg, waistband and pockets are exactly the same / mirror image to the right leg, waistband and pocket patterns.



Face: Fabric **Face** is the surface of fabric that is intended to be on the outside or visible surface of the completed garment. (In the case of lining, the face is closest to the wearer.)

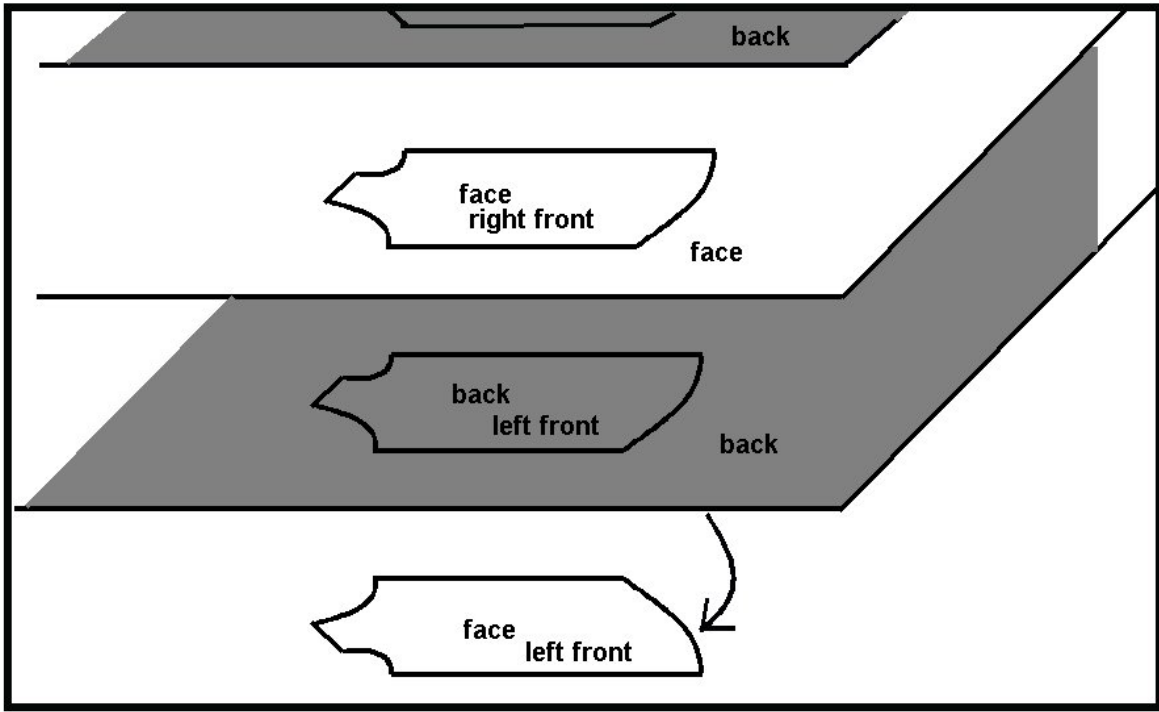




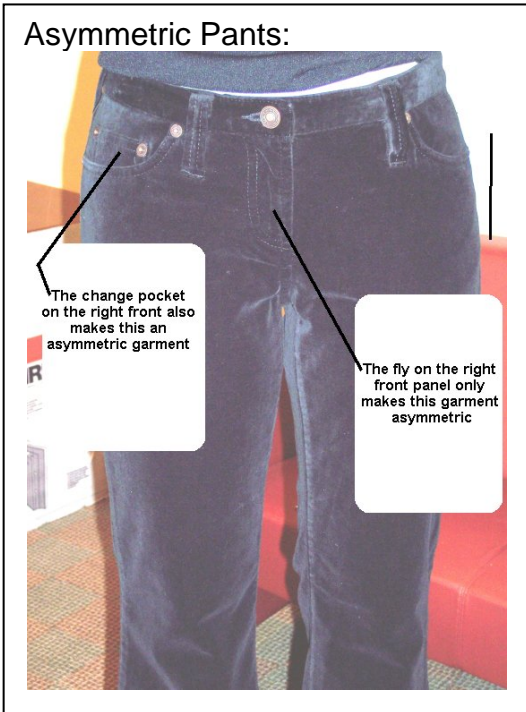
Marker:
 A **Marker** is an organization of the pattern pieces to be cut out of a piece of fabric in such a way as to minimize the fabric wasted between the pattern parts. The patterns are positioned properly on-grain (see definition for grain lines), and within the usable width of the fabric for which the marker is created. Markers are often drafted on wide “dotted” paper with a grid of dots at 1”

Symmetric garments cost half as much to cut since only a half set of patterns need to be cut out of the fabric as long as the fabric is spread on the cutting table where alternating layers of fabric are face up and face down. Then every *pair of plies* laying face-to-face become the left and right pattern for each part of the garment. See below. The marker for a half set of patterns is called a **“Closed Marker”**.

In this illustration of fabric face-to-face, cutting only a right front yields both a right front and left front from a pair of plies.



- b. Asymmetric garments are defined as having left and right patterns that are different shapes or different parts. Garments are considered Asymmetric for two basic situations. First, if the left side patterns are different than the right side patterns, the garment is asymmetric. In this situation, every pattern must be cut separately. See the illustration of Asymmetric Pants.



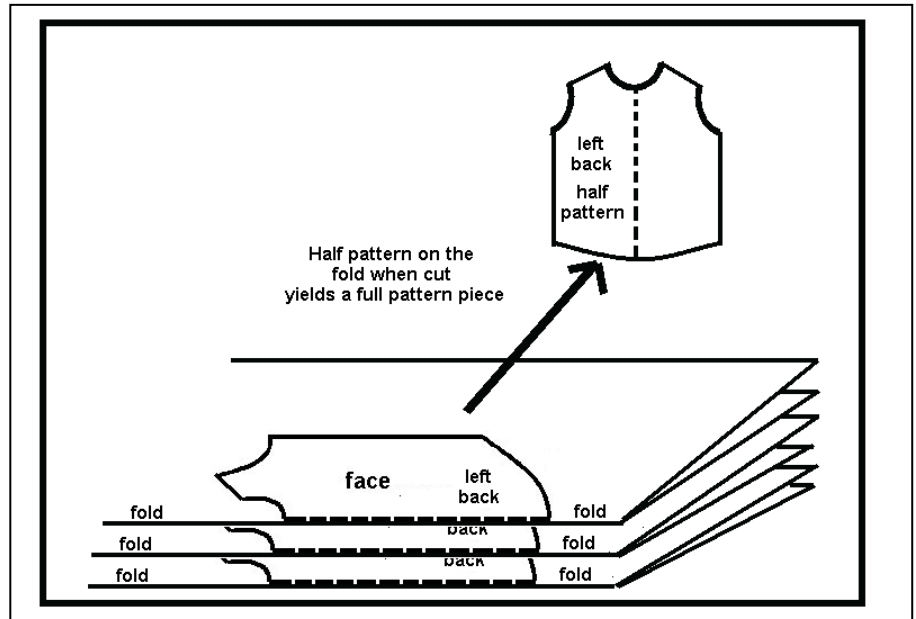
Asymmetric garments require all the patterns, both left and right be cut together as they differ. This means that *all* the patterns must be placed in the marker, and all the patterns must be cut individually, rather than just cutting just a right or just a left as in Symmetric garments. This is known as a “**Open Marker**” for flat, **Open** and rolled fabric. For Asymmetric garments the OPEN marker is generally better quality and better yield.

Some garments are considered Asymmetric because they have a single part that spans across the body such as a one-piece back panel. As there is no matching left and right pattern part, these garments would be handled as an asymmetric style. As before, all the pattern pieces must be laid out and cut to make a complete garment.



- c. In a special situation, this type of asymmetric style may be handled as a *symmetric style*. If the fabric that is used is folded in half in the selvedge direction (the length of the goods) during the fabric’s preparation (**folded and rolled fabric put-up, or tubular fabric put-up, known as a “Closed Fabric”**) this garment type can be handled as if

it were a symmetric garment. In this situation known as a “Closed Marker”, the *pattern parts* that span full width across the body are *folded in half* in their length. These half-patterns are situated where the pattern fold is superimposed over the fabric’s folded edge. Then when this pattern is cut, the result is a full body part. See the illustration below.



d. **Fabric** can either be **Symmetric** or **Asymmetric** as well.

A **Symmetric Fabric** is one which has no change in appearance when the fabric is turned 180° in the same plane. Solid color plain weave fabrics are often Symmetric.

Because fabric symmetry is defined, in most cases, when viewing the **face** of the fabric, there is minimal concern for the back of the fabric because it will be inside the garment (and therefore), out of view.

Since there is minimal concern for the back of the fabric because it will be inside the garment, out of view, fabric symmetry is defined, in most cases, when viewing the **face** of the fabric only.

If there is any perceivable nap in the fabric (even a change in the light reflection), changing the view by 180° and thus changing the appearance causes the fabric to be defined as asymmetric. Fabrics that are knit, are naturally asymmetric due to the structure of knitted fabric. Turned 180° knits are perceivably different in direction. In some

cases however, this difference is inconsequential. Otherwise, knits are handled as Asymmetric fabrics.

Goods: A truncated form of the phrase *Piece Goods* which are textile fabrics, either woven or knitted.

Lay: Multiple superimposed layers of fabric on a cutting table.

Spreading: The process of rolling out layer after layer of fabric, smoothly without wrinkles, in such a manner that the selvedge on one side of the cloth is straight, and parallel to that edge of the cutting table.

Selvedge: The natural edge of milled fabric. Sometimes referred to as "self-edge".

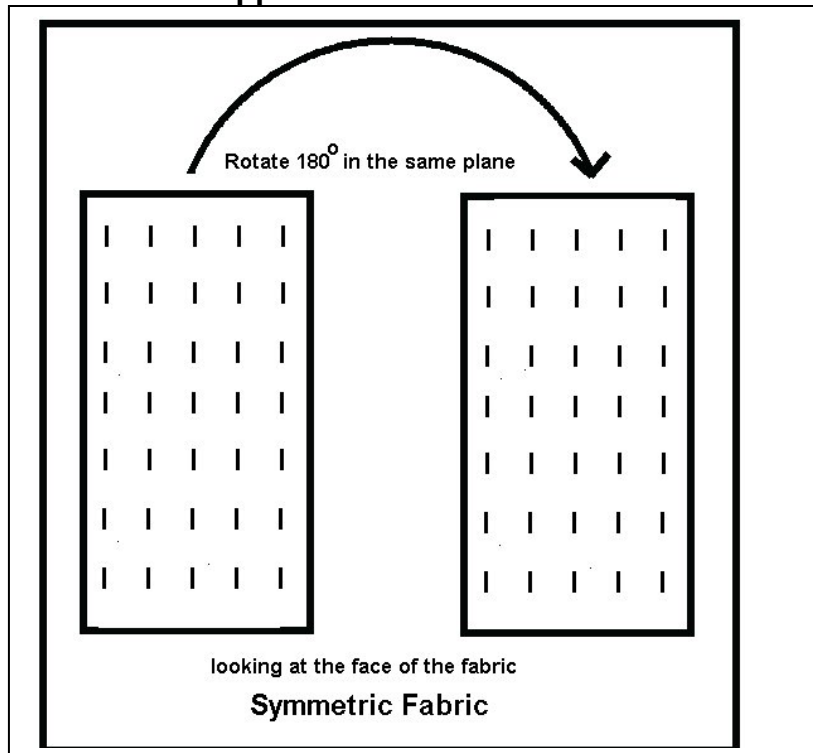
Put up: The preparation of fabric for the spreading process.

Cutting Table: Work table that is at least six inches wider than the widest fabric to be processed, and two to three feet longer than the longest spread length.

Marker: The tracing of pattern pieces used to guide the cutting process. The marker is usually created on paper and placed over the top layer of a spread (lay). Kept on-grain, the patterns are fitted next to each other in the most efficient manner possible for the marker mode required.

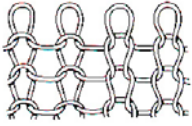
2. FABRIC NAP DIRECTION

- a. **Fabric Nap Direction** is defined as it relates to the direction that the nap (surface) is viewed, or **the direction that the fibers in the surface naturally lay**. For printed fabrics, if the pattern in the fabric all appears to point in one direction in the length of the goods, the fabric has an asymmetric nap direction. In the case of asymmetric fabrics, there is a natural "**Down Direction**" for the nap that would be the best appearance for the print.
- b. Most solid color plain weave fabrics have **no** visible Nap Direction and are therefore **Symmetric**. A Symmetric fabric can turned 180 degrees in the same plane (looking at the face of the fabric) and there is **NO** visible difference in **appearance**.



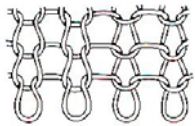
- c. . Printed fabric may also need to be handled as Asymmetric if the print is such that it is visibly different when the fabric is turned 180 degrees in the same plane.

Knits: oriented like



this
rotated 180° to

this look different.

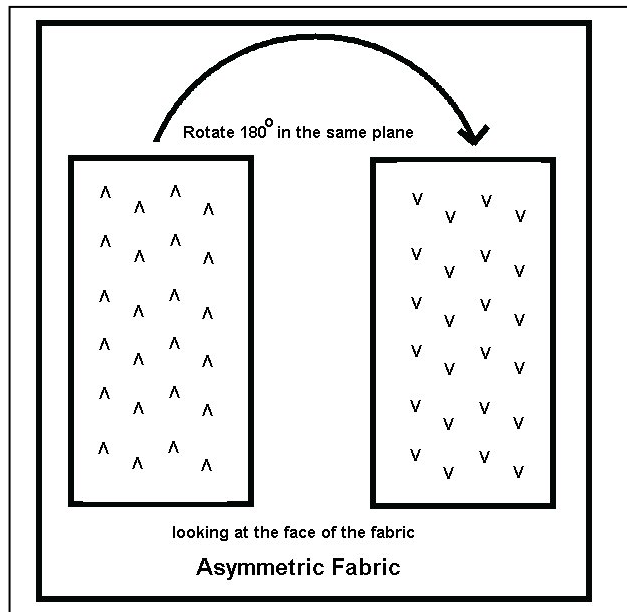


Knits are
Asymmetric

When Knit nap direction does NOT matter: Although knits should be spread in one direction because they are asymmetric fabrics, most are not. Jersey knit has such small loops, and the fabric is smooth which permits an acceptable appearance in either direction. Additionally, the price point is so low, that it is necessary and acceptable to spread the fabric up and down thus causing half of all T Shirts made to technically be **upside down!**

Knit fabrics being a series of loops that point in one direction are technically always Asymmetric.

Example: If fabric is printed with trees where all the tree trunks point in the same direction, the “Down Direction” of the nap is toward the tree trunks. (Naturally, in a garment, these would point toward your toes. One would not usually prefer the trees to be standing on their heads). It is not as easy to decide on which direction “Down” is on some prints. This makes the fabric **Asymmetric**.



- d. For fabric with surface fibers that lay naturally in one direction (in the length of the fabric), the “Down Direction” is the same direction that the open ends of the fibers naturally point. When mills prepare rolled piece goods (fabric), the “Down Direction” is **usually** toward the open end of the roll. Velvet is an example of this type of fabric and has a distinct nap direction and is **Asymmetric**. We often find that designers prefer the “Down Direction” of the nap to point toward the floor as the fabric is made into a garment. In this configuration, the nap lays neatly. Sometimes, to get a more luxurious appearance (darker due to the reduced reflection of light off the fibers of the fabric), a designer will decide to require the nap of the fabric to point toward the wearer’s neck rather than their feet. Often this is done with Velvet for a darker, deeper appearance.