Grainline

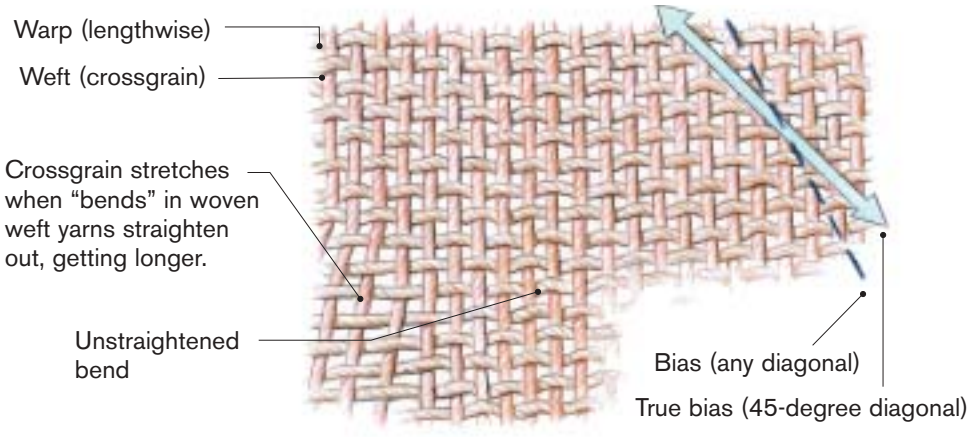
Grain, or grainline, refers to the orientation of the yarns in woven fabric. The warp yarns run from back to front in the weaving loom and form the lengthwise grain—often called the straight grain. The weft yarns are woven from side to side into the warp yarns and form the crosswise grain, or crossgrain. The lengthwise and crosswise grains are perpendicular to one another in the loom. The bias falls along any angle to the lengthwise or crosswise grain, (see the drawing below) and the true bias is at a 45-degree angle to the straight grain. Non-woven fabrics, such as felts, have no grain.

How the Grainlines Behave

Since the warp yarns are tightly stretched during the weaving process, the lengthwise grain has very little, if any, give, or stretch. Most garments are cut with the lengthwise grain oriented vertically, perpendicular to the hem, because the warp yarns hold their shape well and resist bagging and stretching. See the photos on p. 11, which compare the drape of fabric on its different grains. This

Fabric Grain

Grain refers to the orientation of the yarns in a woven fabric. Warp yarns, parallel to the selvage, form the lengthwise grain. Weft yarns, perpendicular to the selvage, form the crossgrain. Bias refers to any line that falls at a diagonal angle to the selvage. True bias falls at a 45-degree angle.



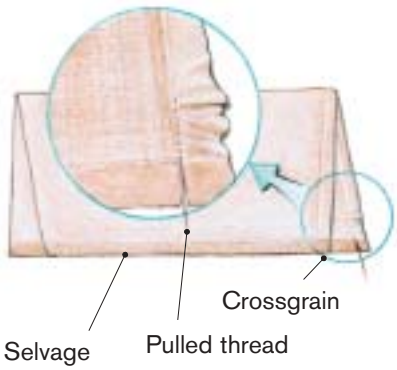
Straightening Grain

STEP 1. Determine crossgrain by pulling crossgrain thread.

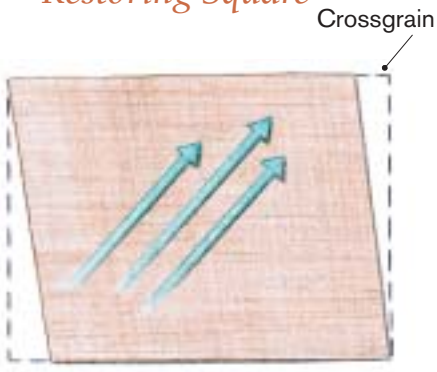
STEP 2. Cut along pulled thread line to mark crossgrain.

STEP 3. Fold fabric lengthwise, smoothing fold and aligning selvages. Fabric is off grain if the layers are not aligned across each end.

Checking for Square



Restoring Square



Hold the fabric at opposite diagonal corners and pull gently. Be sure to hold and pull in the direction opposite to the direction of distortion.

Quick Tip

If the selvage has been removed, you can identify which grainline is which by grasping the fabric along one grain with both hands and giving it a couple of sharp tugs, listening to the sound it makes. Then grasp along the other grain and tug again. The snapping sound made by the lengthwise grain will be slightly higher in pitch than the sound made by the crossgrain.

places the crossgrain, which has greater stretch, horizontally around the body, allowing the fabric to ease as the yarns flex with the body's movement (see the bottom left section of the drawing on p. 9). The crossgrain is rarely placed vertically in a garment because it will droop as the yarns relax.

Because fabric cut on the bias distorts and stretches (with the maximum stretch along the true bias), it drapes beautifully over the body's contours. Designers often use the characteristic drape of a bias cut to create dramatic clinging effects in their garments. Because of the stretch and distortion of the bias, garment pieces cut on the bias need special handling during cutting and construction. While bias-cut garments require a little extra effort to construct, the rewards are considerable in terms of drape and play of fabric patterns.

Checking for Square

Once a fabric has been woven, it can be pulled out of square, or off grain, during other manufacturing steps, such as when it's folded and rolled onto bolts. When the fabric is off grain, the warp and weft yarns are no longer at right angles to one another. If the grain is not straightened before cutting, the garment will likely fit strangely or hang crookedly.

To determine if fabric is off grain, nick the selvage with scissors near one end of the fabric length. Then grasp one or two crossgrain threads, and pull them gently, as shown in the left-hand drawing above. Cut the end of the fabric along the line created by the pulled thread. Then, with the fabric lying smoothly on your worktable, fold the fabric in half lengthwise, aligning the selvage edges. If the two layers of the cut end (the crossgrain) do not line up, the fabric is off grain. You can also use an L-square to check the alignment; just position the corner of the square at the cut end of the fabric with one leg of the square along the selvage. The cut end of the fabric should align with the other leg of the square.

Squaring the grainlines

If the fabric is off grain, you can often restore the perpendicular alignment of the lengthwise and crosswise yarns; this process is

called squaring or, somewhat illogically, straightening. Some fabric finishes seem to resist squaring. Prewashing a washable fabric will soften the yarns and make them easier to square, as will lightly steaming the fabric.

Square the alignment by holding the fabric at opposite diagonal corners and pulling gently (see the drawing at right on p. 10). Be sure to hold and pull in the direction opposite to the direction of distortion—the idea is to work the yarns back into square, not pull them further out. Then refold the fabric to see if the crossgrain is square with the lengthwise grain. If not, gently pull the fabric on the diagonal again. Continue these steps until the fabric is squared, then press the fabric in the direction of the lengthwise grain only. This method also works for realigning a knit that has been pulled off grain.

Commercial Pattern Grainlines

Because fabric behaves differently along its various grainlines, every commercial pattern piece is marked with the recommended grainline orientation so the garment will fit according to the designer's intentions. The arrow on each pattern piece, which indicates the lengthwise grain, should be placed on the fabric parallel to the selvage. Even small pieces such as collars, cuffs, and facings work best when oriented on the recommended grainline.

But pattern pieces for some garments, such as gored skirts, can be cut with the arrow on the bias in order to increase drape and make interesting use of stripes and other fabric motifs. If you want to do this, mark a new straight grainline on the pattern piece at a 45-degree angle to the printed arrow (use a 45-degree triangle). But plan carefully before cutting to be sure you understand the way the stripes will align from one pattern piece to the next—it's easy to get confused.

Comparing Drape of Different Grains

With the lengthwise grain perpendicular to the floor, this soft, fluid silk crepe maintains some body, with folds beginning toward the top of the dress form.

With the crossgrain perpendicular to the floor, the silk has a similar drape but less body. It will stretch and droop over time.

Silk crepe hung with the bias perpendicular to the floor molds to the dress form, revealing every contour underneath.

Knitted Fabrics

The orientation of the yarn in knitted fabrics is described by "direction" instead of grainline. Direction refers to the lengthwise ribs and crosswise courses. Unlike woven fabrics, knits have the greatest amount of stretch along the crosswise course; thus, a knit's bias direction has less stretch than its crosswise direction. Most often, garments made from knit fabric are cut with the lengthwise direction perpendicular to the hem.