

KNIT FABRICS

KNITS

Knitted fabrics have been popular for many years. They were especially popular during the 1960s and the early 1970s. Use of knit fabrics for clothing decreased in the late 1970s, but there is evidence that they are regaining popularity. Fiber manufacturers contributed to the growth of the knit industry through research and development of new fibers and new yarns. Technologists successfully created computerized equipment and new knit structures. Other reasons for the increased popularity of knitted fabrics include their ability to resist wrinkling, their greater use by fashion designers, and the fact that knit fabrics can be made rapidly and therefore cost less to produce.

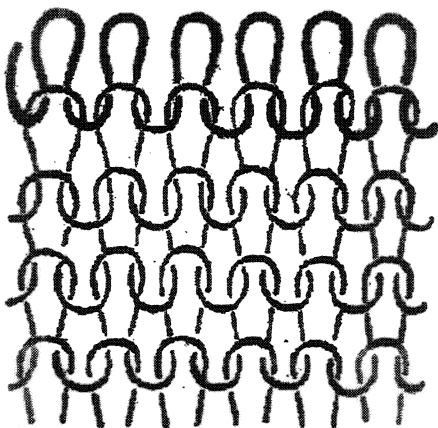
Remember that knitting machines form loops of yarn with many pointed needles or shafts. The needles draw new loops through the previous loops. The vertical rows of loops are called **ribs** or **wales**, and the horizontal rows of loops are called **courses**.

Knits made with more wales per inch will be more stable and rigid in the horizontal direction and will tend to shrink less in that direction. If there are more courses per inch, the knit fabric will be more stable and will shrink less in the lengthwise direction.

A loose knit construction with fewer wale and course yarns per inch will tend to stretch, sag, and bag easily. Use of more wale and course yarns per inch creates a knit that has good recovery from stretch.

The two basic methods of constructing knits are weft (or filling) knits and warp knits. Each method produces a variety of types of knit fabrics.

Weft (or Filling) Knits



Weft or filling knits are constructed from one yarn that is fed into knitting machine needles in a horizontal direction. Either a circular or a flat-bed knitting machine can be used to make weft knits. The circular knitting machine creates a spiral effect as it produces a fabric in tubular form. Because of this spiral characteristic, it is often difficult to have the wales and courses of the knit fabric form a perfect 90 degree angle match. This difficulty may produce an "off-grain" effect in some fabrics, particularly where stripes or other geometric fabric designs are involved.

Four basic stitches are used in manufacturing weft or filling knits. They are the flat or jersey stitch (also sometimes called a plain knit), the purl stitch, the rib stitch, and the interlock stitch, which is also used in double knits.

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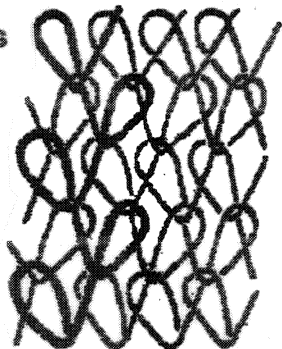
Flat or jersey knit fabrics have visible flat vertical lines on the front and dominant horizontal ribs on the back of the fabric. The flat or jersey knit stitch is used frequently because it is fast, inexpensive, and can be varied to produce fancy patterned fabrics. A major disadvantage of regular flat knits is their tendency to "run" if a yarn is broken. However, a variation of the stitch will create run-resistant flat knits. The flat or jersey stitch can be varied by using different yarns or double-looped stitches of different lengths to make terry, velour, and plus fabrics. This stitch is also used in making nylon hosiery, men's underwear, and T-shirts.

Purl knit fabrics look the same on both sides of the fabric. Many attractive patterns and designs can be created with the purl stitch. It is often used in the manufacture of bulky sweaters and for some children's clothing. A major disadvantage of this method is that production is slow.

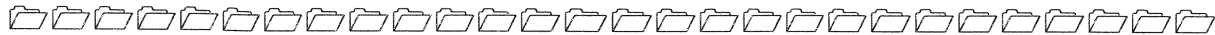
Rib stitch knits have stitches drawn to both sides of the fabric, which produces columns of wales on both the front and back of the fabric. Rib stitch produces fabrics that have excellent elasticity. Rib knits are used for the "ribbing" which is usually found at the lower edges of sweaters, on sleeve cuffs, and at necklines. They are also used for a variety of different kinds of garments.

Interlock stitch knits are variations of rib stitch knits. The front and back of interlocks are the same. These fabrics are usually heavier and thicker than regular rib knit fabrics. However, fine yarns can be used to produce lightweight interlock knits. The interlocking of stitches prevents runs and produces apparel fabrics that do not ravel or curl at the edges.

Double knits are made from the interlock stitch and variations of that stitch. The process involves the use of two pairs of needles set at an angle to each other. A variety of attachments can be added to the knitting machine to create beautiful patterns. The development of highly sophisticated electronic controls and the use of computers in design make it possible to reproduce intricate art work or other detailed designs in minutes. The front and back surfaces of the double knits have a rib-like appearance. These fabrics are generally firm, less apt to stretch, more resilient, and heavier than single knits. They are also run resistant and do not ravel. Two fibers that are often used to make double knits are polyester and wool.

Warp Knits

Warp knit fabrics are constructed with yarn loops formed in a vertical or warp direction. All the yarns used for a width of a warp knit are placed parallel to each other in a manner similar to the placement of yarns in weaving. These fabrics can be made rapidly and in great quantity. Two common types of warp knits are tricot and raschel.

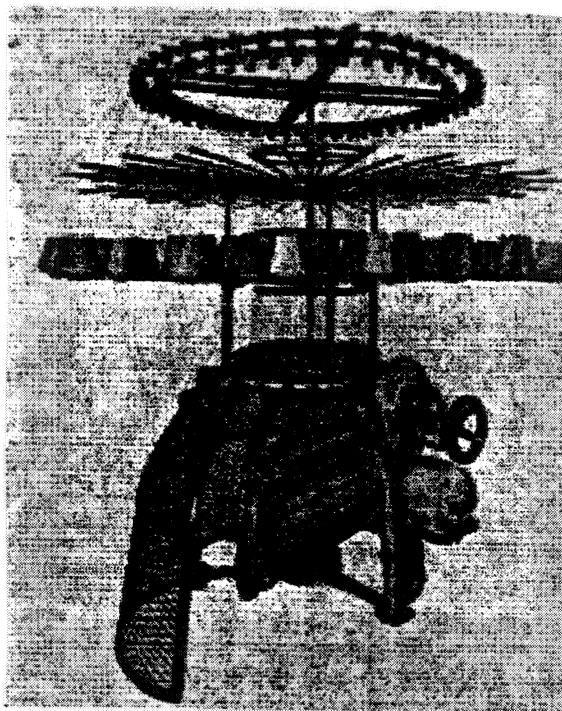


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Tricot knits are made almost exclusively from filament yarns because uniform diameter and high quality are essential yarn characteristics for use with the very high speed tricot knitting machines. Fabrics constructed by the tricot knitting machine are usually plain or have a simple geometric design. The front surface of the fabric has clearly defined vertical wales, and the back surface has crosswise courses.

General characteristics of tricot knits include softness, good drapability, crease resistance, non-raveling, and elasticity. The wide range of textile products made from tricot knits include lingerie, sleepwear, robes, men's shirts, blouses, dresses, waitresses' and nurses' uniforms, backing for bonded fabrics, and automobile upholstery. Tricot knits are made predominantly from nylon, acetate, and polyester fibers.

Raschel knits are produced from spun or filament yarns of different weights and types. Most raschel knits can be identified by their intricate designs, the open-space look of crochet or lace, and an almost three-dimensional surface effect design. Raschel knits are used for a diverse group of products, including lace and lace trims, sweaters, thermal underwear, swimsuits, blankets, and tennis nets.



Circular knitting frame for filling knits.
Circa 1940s.