

FABRIC AND FABRIC MANUFACTURING

Fabric:

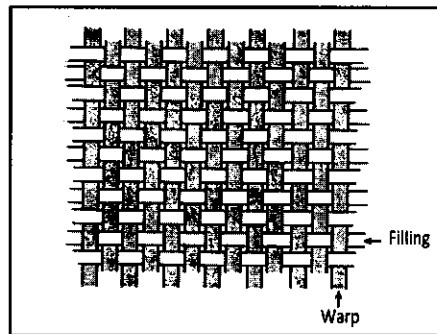
Fabric is a flexible planar substance constructed from solutions, fibres, yarns, or fabrics, in any combination. Textile fabrics can be produced directly from webs of fibres by bonding, fusing or interlocking to make non-woven fabrics and felts, but their physical properties tend to restrict their potential end-usage. The mechanical manipulation of yarn into fabric is the most versatile method of manufacturing textile fabrics for a wide range of end-uses.

Types of Fabric:

There are three principal methods of mechanically manipulating yarn into textile fabrics: interweaving (interlacing or interlacement), interlooping and intertwining. All three methods have evolved from hand-manipulated techniques through their application on primitive frames into sophisticated manufacturing operations on automated machinery.

a. Interweaving:

It is the intersection or interlacement of two sets of straight threads, warp (ends) and weft (picks or filling), which cross and interweave at right angles to each other. Weaving is by far the oldest and most common method of producing continuous lengths of straight-edged fabric.

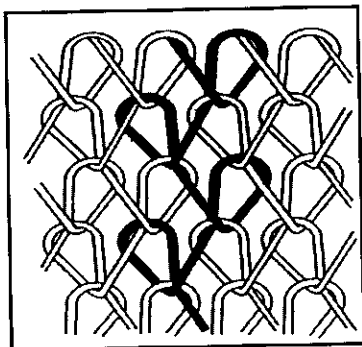


Woven fabric (Interlacing)

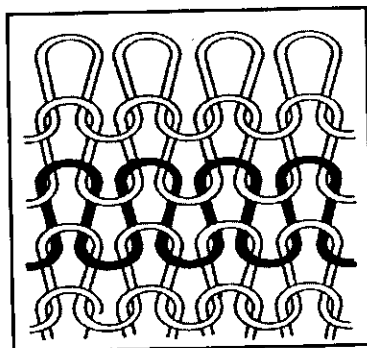
b. Interlooping:

It consists of forming yarn(s) into loops, each of which is typically only released after a succeeding loop has been formed and intermeshed with it so that a secure ground

loop structure is achieved. The loops are also held together by the yarn passing from one to the next. Knitting is the most common method of interloping and is second only to weaving as a method of manufacturing textile products. It is estimated that over seven million tons of knitted goods are produced annually throughout the world. Although the unique capability of knitting to manufacture shaped and form-fitting articles has been utilized for centuries, modern technology has enabled knitted constructions in shaped and unshaped fabric form to expand into a wide range of apparel, domestic and industrial end-uses.



Warp knitted fabric

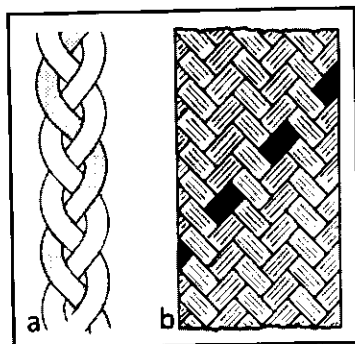


Weft knitted fabric

Knitted fabric (Interlooping / Intermeshing)

C. Intertwining and twisting:

It includes a number of techniques, such as braiding and knotting, where threads are caused to intertwine with each other at right angles or some other angles. These techniques tend to produce special constructions whose uses are limited to very specific purposes.



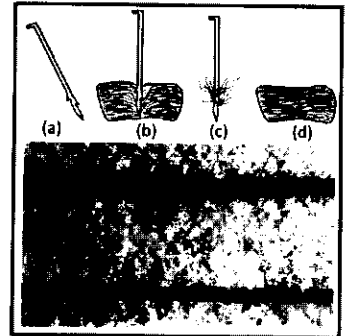
Braid fabric (Intertwining)

There is another method of manipulating directly fibre into textile fabrics is so called nonwoven process. This relatively young branch of the textile industry has expanded enormously after the second world-war because of the high production rates and the resulting cost savings.

Nonwovens are flexible, porous products consisting of one or more fibre layers. The separate fibres may either be preferentially oriented in one direction or may be deposited in a random manner. They are bonded by chemical, thermal or mechanical processes into textile products. Nonwovens are mainly planar structures.



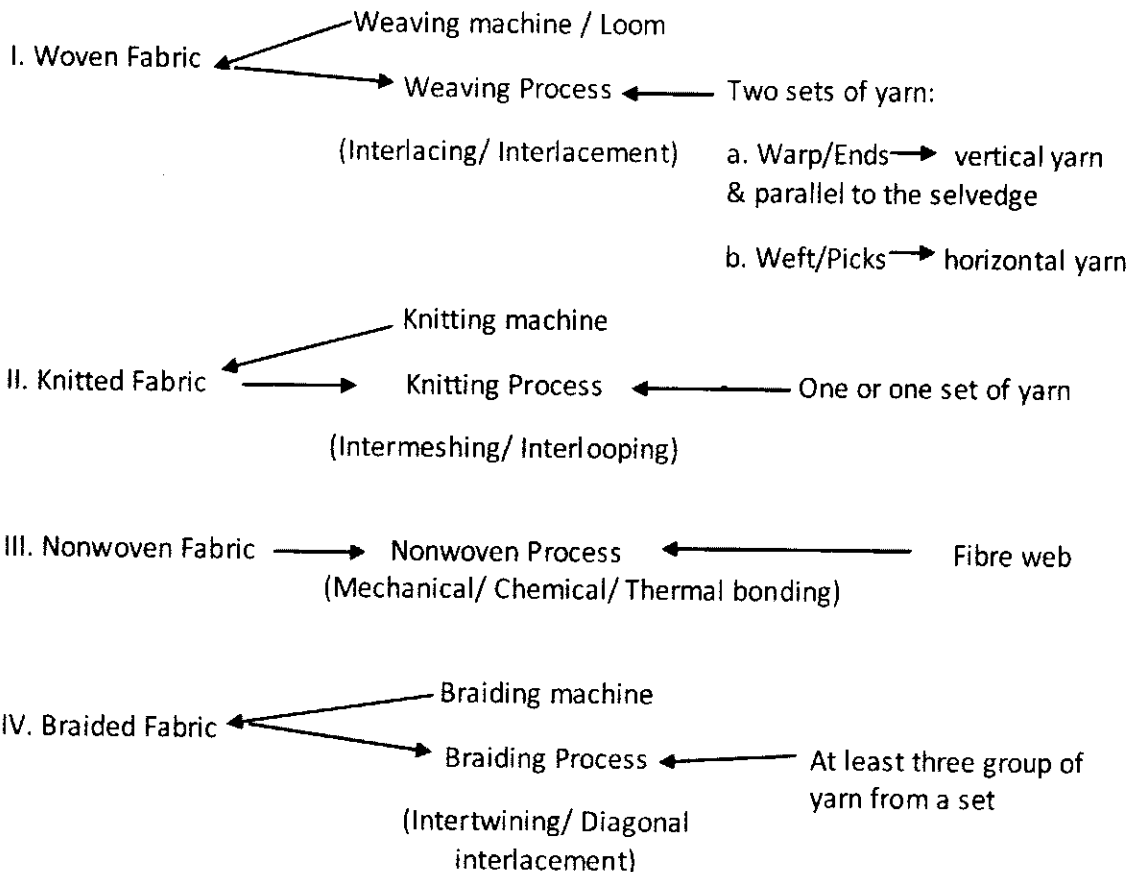
Magnification of a nonwoven fabric

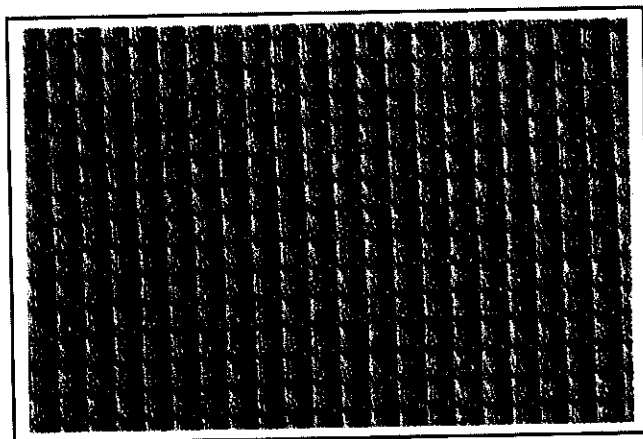


Needle-punched web

Nonwoven fabric (mechanical, chemical or thermal bonding)

Fabric classification at a glance:





WOVEN FABRICS AND WEAVING TECHNOLOGY

A black and white photograph of a traditional handloom. The image shows the vertical threads (warp) and the horizontal beams (weft) used for weaving. The structure is complex, with various parts like the heddles and the reed visible.

