PROCESS OF WEAVING

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ITUM
WEAVING

Weaving is the action of producing fabric by the interlacing of warp and weft thread. The warp threads are placed along the length of the fabric and the weft threads are placed along the width of the fabric.

FLOW CHART OF WEAVING

Yarn
(In the form of spinner’s package)

Warp Preparation
Winding (cone, cheese)

Warping (Pre beam/ Warper’s beam/ back beam)

Sizing (weavers beam)

Drafting, Drawing, Pinning
Denting, Looming

Weaving (Fabric)

Weft Preparation
Winding (Cop, Pirm, Cone, Cheese)

Weaving (Fabric)
FLOW CHART OF WEAVING

YARN FROM SPINNING
↓
DOUBLING AND TWISTING
↓
WINDING
↓
CREELING
↓
WARPING
↓
SIZING
↓
DRAWING-IN AND DENTING
↓
LOOMING
↓
LTYING-IN
↓
WEAVING

Cone Winding

- Winding is a process of transferring yarns from ring bobbins, hanks, cones etc. into a convenient form of packages containing considerably long length of yarn.

- The main purpose of winding or packaging is to form a single yarn package suitable for the next operation.
Warping

Warping is aimed at preparing the weaver’s beam to be set up on the weaving machine. Warping carries out following operations:

➢ Creation, out of a limited number of warp threads (creel load), of a warp composed of any number of threads with the desired length.

➢ Arrangement of above-mentioned threads according to the desired sequence.

The industrial warping process can be carried out according to two different technologies:

▪ Sectional warping (conical drum or indirect warping).

▪ Beam warping or direct warping (preparatory beam warping).

Sectional warping-

In this case, sections of the warp which may contain up to 1,000 ends are first wound onto a drum tapered with a given cone angle.

So cross wound sections are combined on the drum, and thus each layer of warp contains the same number of ends on the drum.
Direct/ High speed/ Beam warping-

Beam warping is used for long runs of grey fabrics. As an intermediate stage warper’s beams which may contain up to 1,000 ends are produced.

- Then the threads of 6-12 warper’s beam are combined at the slashing (sizing) stage and wound onto a weaver’s beam (loom beam).

Warping Machine-

Warping machine is a simplest machine. It’s have different components and they have own functions which is required to know for better operation. Warping machine components are mainly divided into two types; they are

- Creel
- Head stock
**Sizing**

*The size is usually a starch paste containing softening and other ingredients.*

- Starch sizes are usually not satisfactory for synthetic fiber threads and have to be replaced by special sizes (often containing synthetic polymers) which will adhere better to the threads.

Sizing is most important terms for weaving technology. After winding and warping, sizing of yarn is done during beam preparation. Sizing is done by applying various types of size material on the yarn. During application of size materials steam is needed.

Sizing is a protective process. The process of applying a protective adhesive coating upon the yarn surface is called sizing. This is the most important operation to attain maximum weaving efficiency especially for blended and filament yarns. Sizing is called the heart of weaving.

**Purpose of sizing:** sizing is done during beam preparation for getting some advantage of weaving.

- To improve the weave ability of warp yarn by making it more resistance to action of weaving like absorption, friction, tension etc.
- To maintain good fabric quality by reducing hairiness, weakness and by increasing smoothness and absorbency of yarn.
• Tensile or breaking strength of cellulosic yarn is increased by sizing.
• Elasticity of the yarn is also increased.
• To increase the frictional resistance.
• To reduce electrostatic formation.

Properties of sized yarn:
• Higher elasticity
• Higher yarn strength
• Lower flexibility
• Lower extension
• Lower frictional resistance
• Less weakness
• Increased smoothness

Looming

▪ Before the weaver’s beam is mounted on the loom, each end is threaded through a healed eye and the reed; it also supports a drop wire.

▪ To pass the warp threads through the hole of the drop wire is known as pinning.

▪ If a single warp breaks drop wire will drop. As a result, Machine, will stop instantly to avoid end missing.
Basic motions and essential parts of a loom

- The warp unwound from the weaver’s beam passes round the back rest (back bearer) and comes to the heald frames (harnesses), which are responsible for separating the warp sheet for the purpose of shed formation.

- A drop wire signals the loom to stop immediately after a warp end breaks off.

- It then passes through the reed (swinging frame in front of the heddles), which holds the threads at uniform spacing and is also responsible for beating-up the last inserted pick.

- The cloth then passes over the front rest (breast beam), round the take-up roller, and is wound onto the cloth roller (cloth beam or merchandise beam).

- In conclusion, the warp from the beam is fed to the weaving zone where it is converted into fabric and this fabric is then taken-up on a cloth roll.
Major reference points on a weaving machine

- The front of the machine, where the fabric beam is mounted is also called “weaver’s side.”
- The back of the machine, where the warp beam is placed is called “warp side”.
- Facing the machine from front, the right of the observer indicates the right side of the weaving machine. This is the side where the pick is received (receiving side).
- The left side, where the pick is inserted from, is called the picking side.
- The warp yarns are numbered starting from the left side of the weaving machine.
- The harness frame numbering starts from the front side of the loom.

Essential Motions of a weaving loom

Primary motions of weaving: In order to interlace warp and weft threads to produce a fabric on any type of loom, three operations are necessary:

1. Shedding
2. Picking or filling or weft insertion
3. Beating up

Secondary motions of weaving:

4. Warp let-off
5. Take-up