

Chapter- 8:.....

Introduction to Plain Weave

8.1 PLAIN WEAVE

❖ Characteristics of Plain weave

It is the most economical and easy to produce weave. In a plain weave, each warp yarn passes alternatively over one weft and then under the second weft yarn. They require only two heald shafts or harnesses because the weave repeats every two ends and two picks. When one heald shaft is raised the other is lowered, and then the sequence is reversed for the next pick. **Please refer figure 4 and 5.**

INTERLACMENT OF WARP & WEFT

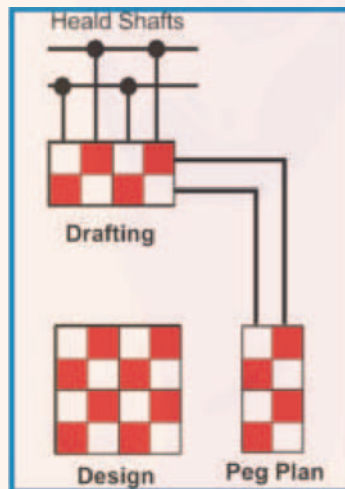


Figure 4



Figure 5

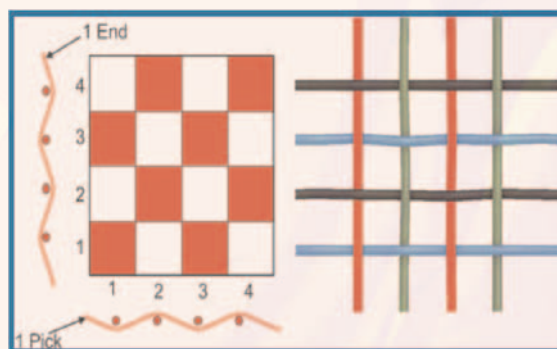


Figure 6

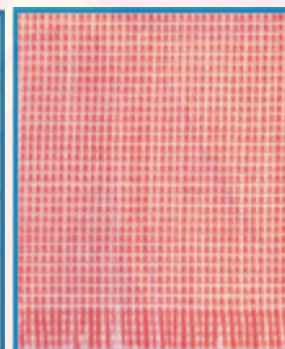


Figure 7



The simplest and most elementary combination of two series of threads employed in the construction of textile fabrics is the **plain** weave or also termed as **calico weave** (refer figure 6 and 7). In figure 6 the fabrics depicts two colors warp series and weft series in 1:1 order.

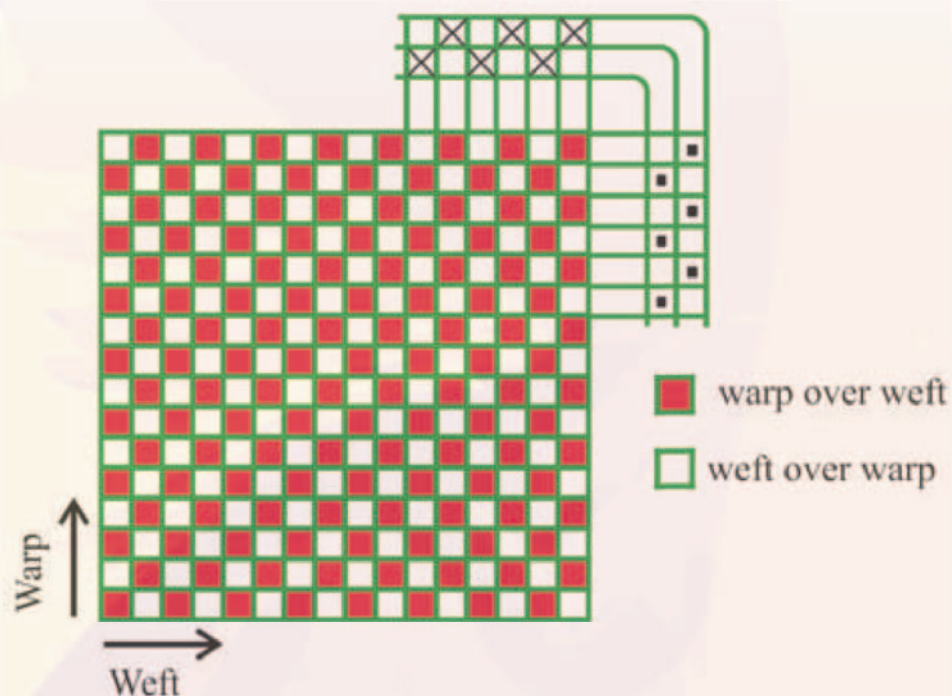


Figure - 9

Illustration shows Warp up (over weft) and weft up (over the warp) the manner in which it can be represented on a graph paper.

Plain weave is the most widely used of all fabric structures and has the simplest possible pattern of interlacing, the pattern actually repeating itself on every ends and picks (**figure-8**). It also has the maximum possible frequency of interlacing, thereby producing a fabric of firm structure. The yarns in this weave are not easily displaced and are more resistant to slipping.

The interlacement of warp and weft can also be closely examined in the **figure-9** wherein both naturalistic and semi naturalistic form of drawing illustrate the interlacements of warp and weft shown with the selvedge interlacements in a fabric construction.

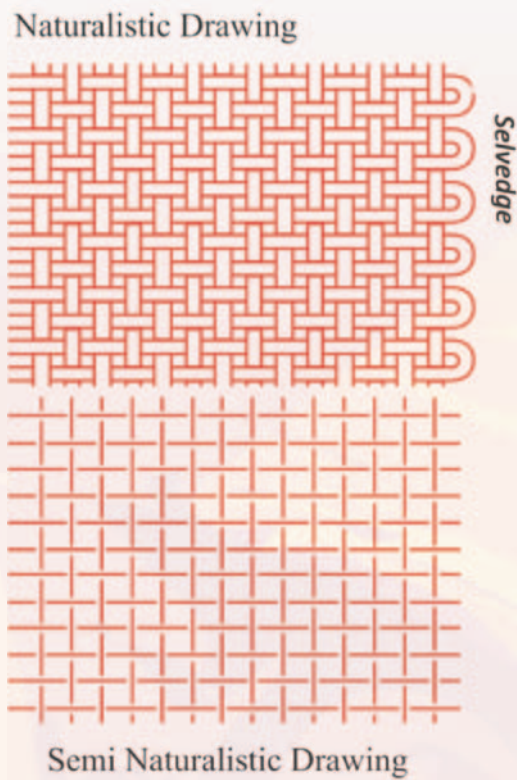
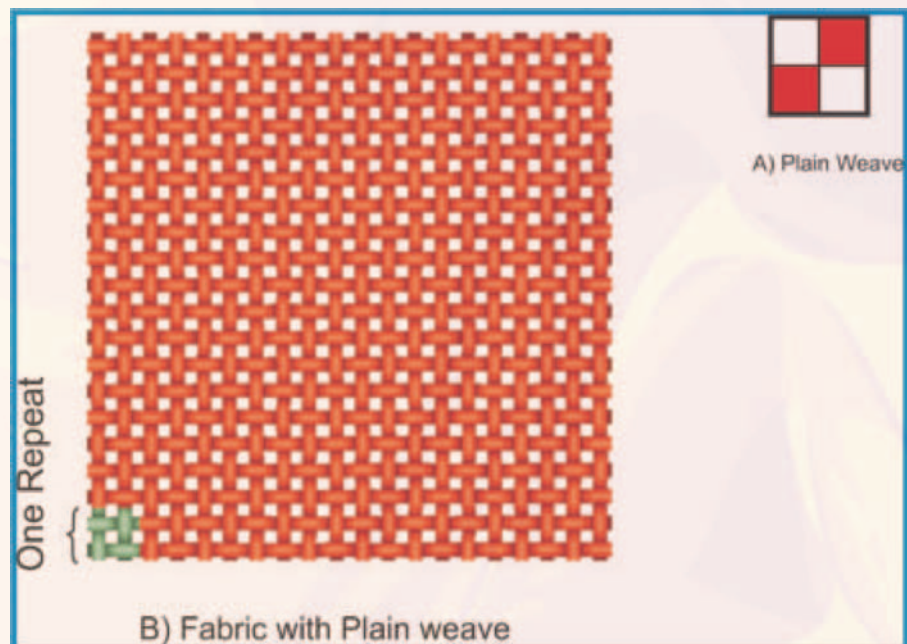


Figure - 9

Illustration above shows the interlacement of warp and weft along with the selvedge at one side of the construction in natural and semi naturalistic way.



8.2 DERIVATIVES OF PLAIN WEAVE:

Plain weave has the simplest form of interlacing and many variations of weaves could be produced from the simple plain weave by extending it either horizontally, vertically or both, they are termed **as derivatives of plain weave**.

The following are the derivatives of the plain weave which could be further modified in terms of the ratios of the warp and weft inserted during the course of weaving. Depending upon it's ratio between warp and weft selected they may be called regular warp or weft rib or irregular warp or weft rib, similarly regular matt or irregular matt weave depending upon the ratios of warp and weft is selected for the construction of the weave.

8.2.1 Warp Rib

The Warp rib weaves are constructed in which each end passes alternately over and under two or more than two picks. Effect of the warp rib can be seen prominently from both the sides of the fabric.



Figure - 10

2 x 1 warp rib, the rib effect is produced in weft direction

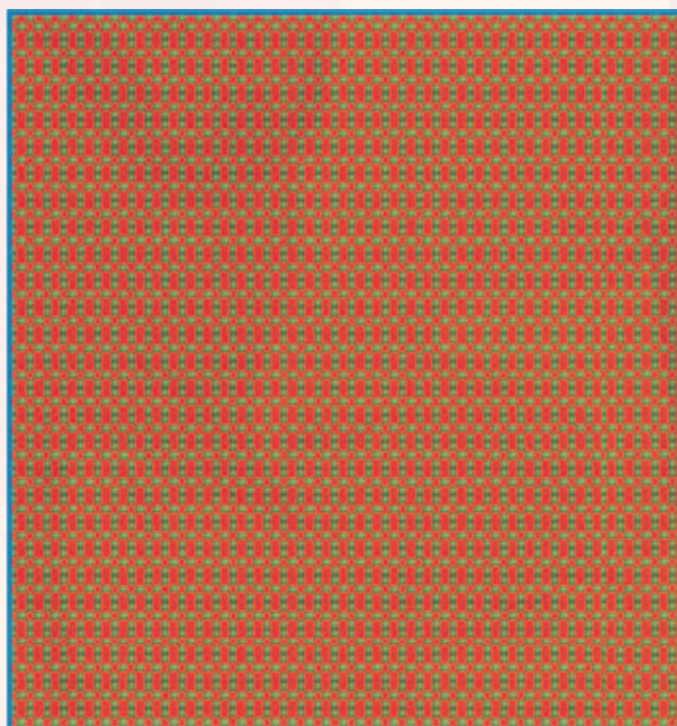
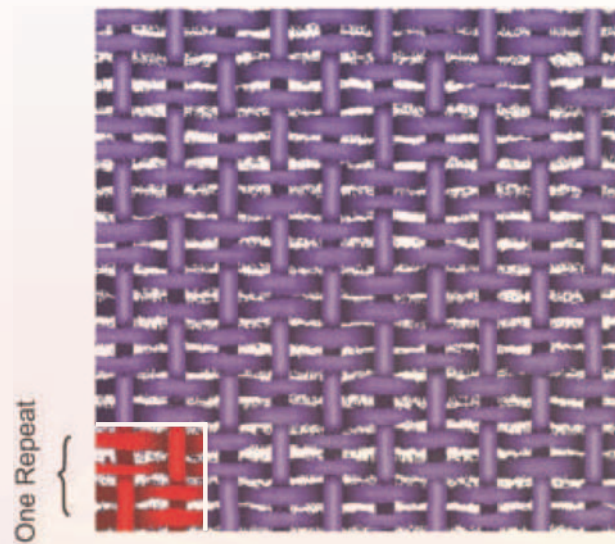




Figure - 10A



Warp Rib Weave

When the two picks are inserted between formations of a shed (with single warp up) then 2 x 2 warp rib is produced (refer the **figure 10A**). Likewise, if 3 picks or 4 picks are inserted in the same shed then 3 x 3 warp rib or 4 x 4 warp rib is formed. The warp rib can be identified by the fact that the formation of the rib is always in weft direct which can be seen very prominently. **Please see figure-10 & 10A.**

8.2.2 Weft Rib

The Weft rib weaves are constructed in which each end passes alternately over and under two or more than two ends. When the 2 ends are lifted alternately the result would be 2 x 2 weft rib. If the lifting is done by 3 ends and 4 ends the resultant weaves would be 3 x 3 and 4 x 4 weft rib respectively. The weft rib can be identified by the fact that the formation of the rib is always in warp direct which can be seen very prominently.

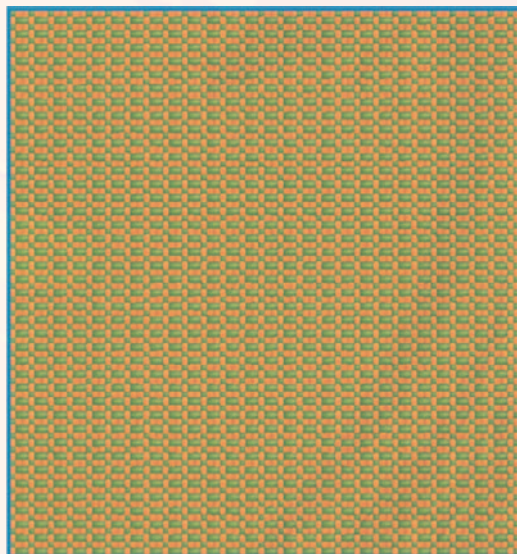
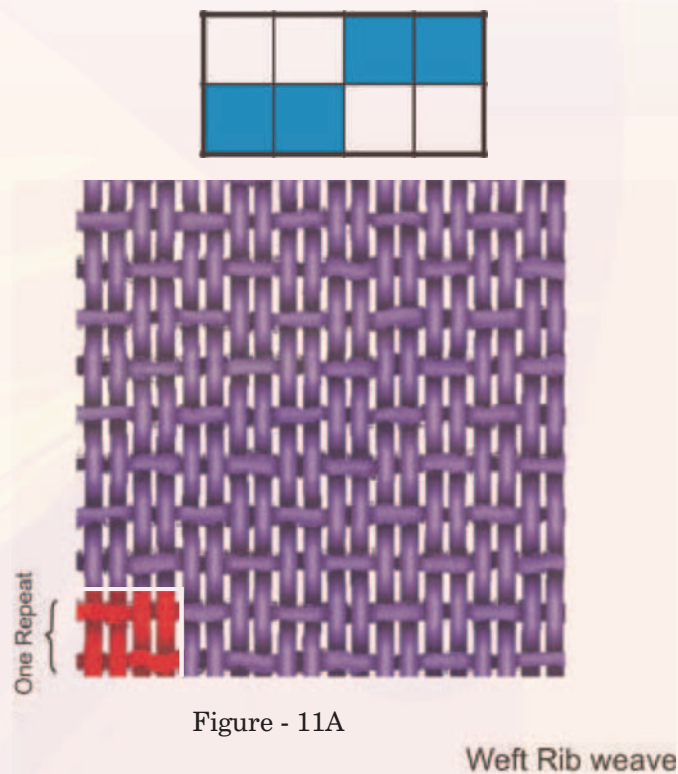


Figure - 11

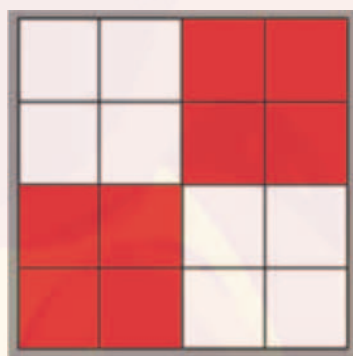
2 x 1 weft rib, the rib effect is warp direction



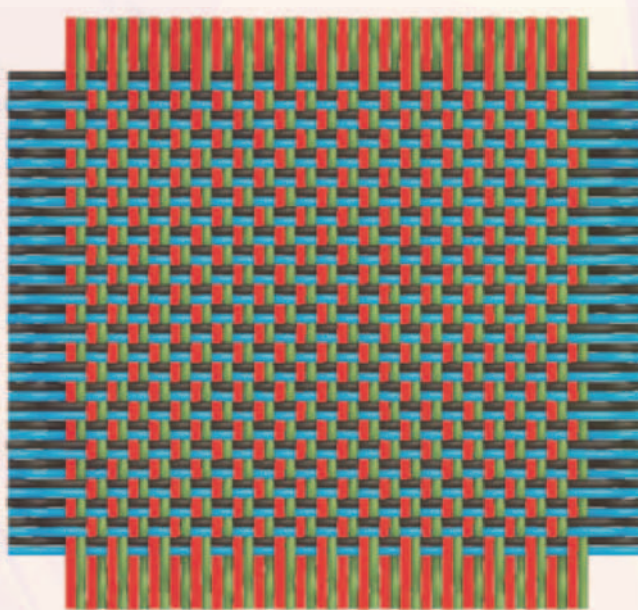
During the weaving, the warp rib or weft rib effect can be obtained by using one thick pick or one coarse end instead of two or more picks in a shed or two ends taken up in single eye of the drafting in the heald shaft during weaving as one respectively. **Please see figure-11 & 11 A.**



8.2.3 Matt or Hopsack or Basket weave:



Matt weave is also the most popular weave as one of the derivatives of plain weave in the textile industry. They are made by extending a plain



weave structure both warp way and weft direction. If the two or more ends working as one single ends and two or more picks in a shed then a Matt weave is produced. The simplest and most commonly used weave is **2 x 2 Matt** also known as **Basket** or **Hopsack** weave as depicted in **figure-12 A & B**. Grouping of the yarns in an irregular manner in warp direction or weft direction will produce the effects that are known as irregular Matt weave. Similarly 3 x 3, 4x 4 or more Matt weaves can be constructed.

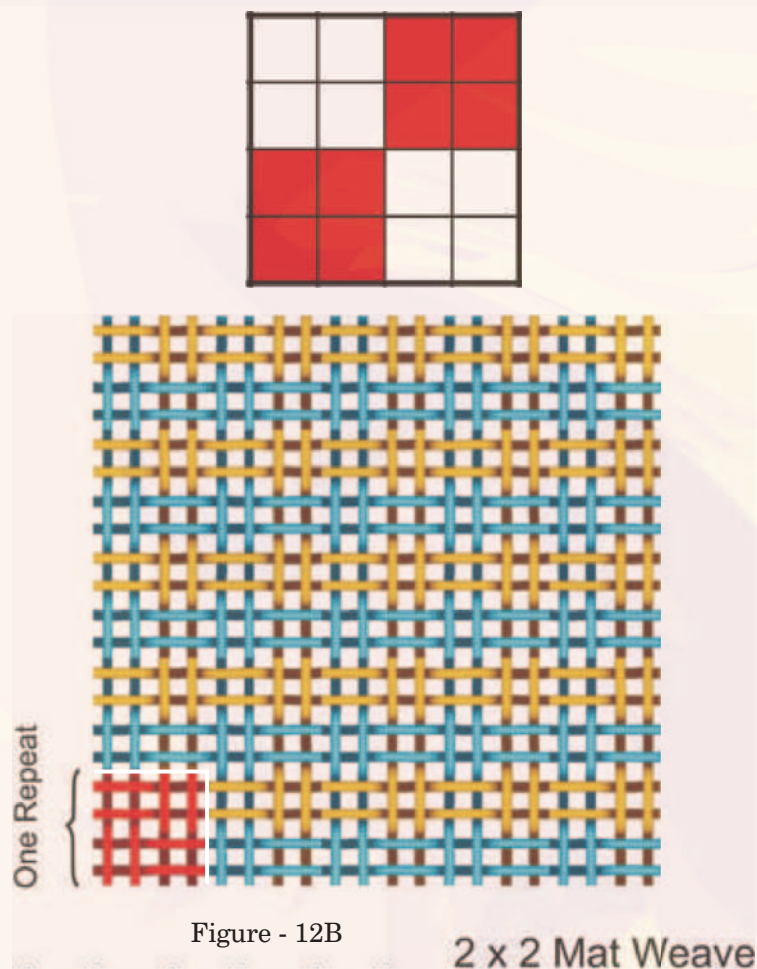


Figure - 12B

2 x 2 Mat Weave

Summary:

This chapter introduces the Plain Weave Design. The plain weave is most economical and easy to produce. Different fabrics are made with plain weave, just by changing the yarn count and varying the construction. Different patterns can also be achieved by using coloured yarn. In this chapter the students will learn the ways of representing the Plain weave on the Design paper. This chapter will also introduce the student to Derivatives of Plain Weave. These can be made by simple modifications in the Plain Weave. At the end of the chapter the student will be ready for weaving the Plain Weave Swatch.