

Chapter- 9 :

Introduction to Twill Weaves

Twill weaves can easily be identified by its general characteristic of more or less pronounced diagonal lines in either warp or weft direction. The most commonly known twill is the Denim fabric.

9.1 CHARACTERISTIC OF TWILL WEAVES

Twill weaves can easily be identified by its general characteristic with its series of more or less pronounced diagonal lines in either warp or weft direction, or in equal or quantities on both sides of the cloth. Twill with 3 ends and 3 picks with lifting of 1 / 2 twill or 2 / 1 twill **figure-13** is the smallest twill weave repeats. The twill lines can be made continuously either from left to right in / direction as shown in **figure 14** and is called **Right Hand Twill** or **Z Twill** and a twill which runs from right to left in \ direction as shown in **figure 15** and is called **Left Hand Twill** or **S Twill**.



Figure - 13

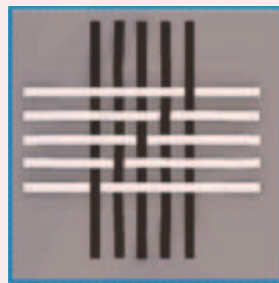


Figure-14: Right Hand Twill

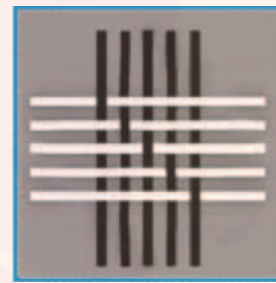


Figure-15: Left Hand Twill

These weaves can be again sub-divided as follows.

9.2 BALANCED TWILLS AND UN-BALANCED TWILLS

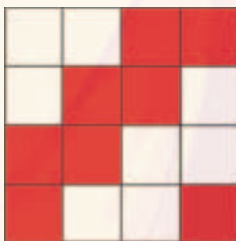


Figure-16

In a **Balanced twill (figure 16)** the number, size and distribution of the warp or the weft floats are similar, and whereas in **Un-balanced (figure 17)** twill either warp or the weft floats may be very prominent.

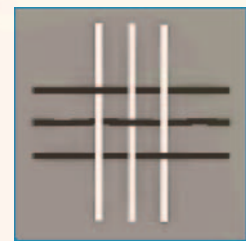
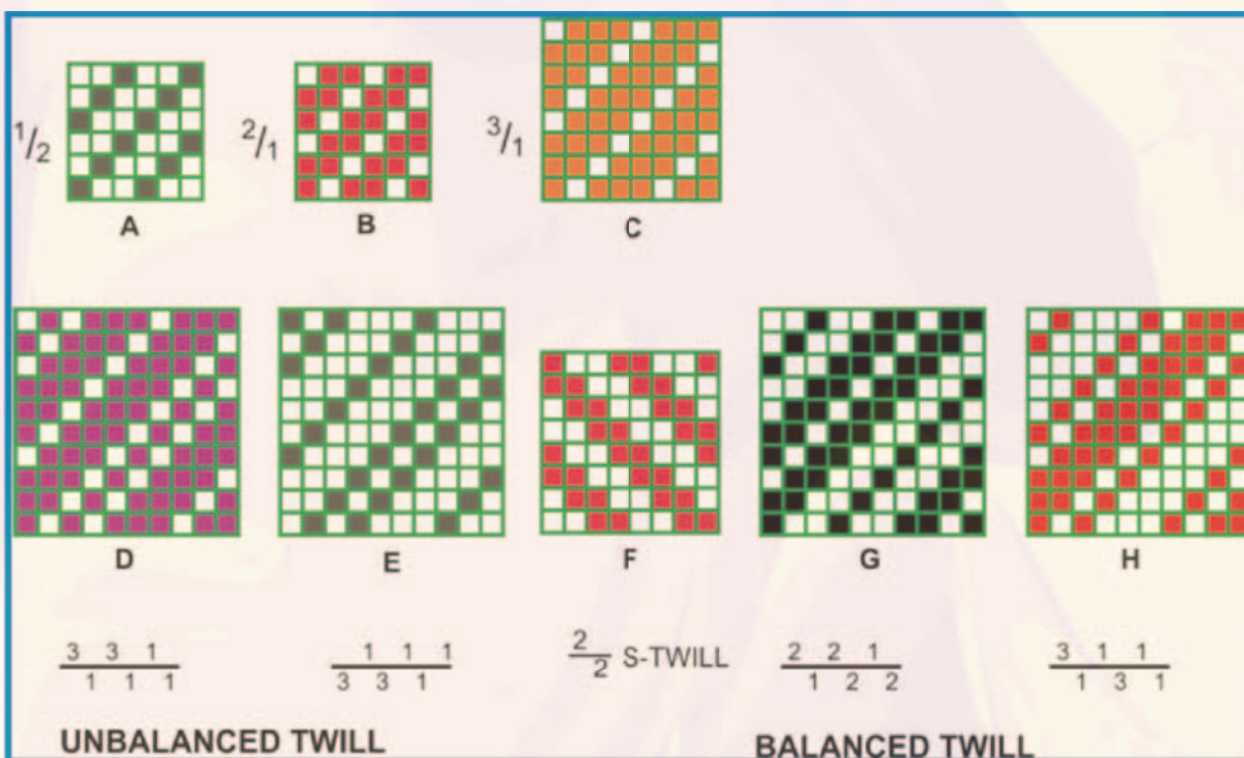


Figure-17

The basic principle of the construction of twill weave is that the float of each warp or weft thread may move upward or outward in one or sometimes more than one warp or weft direction that may be lifted up respectively to the right or left depending upon the required direction of twill of the preceding warp direction up or weft direction up. For instance, the 3-ends $\frac{1}{2}$ twill running to the right as shown in **figure-18 A**, the first warp thread is over the first weft thread, and then second warp thread is raised over the second weft thread, the third over the third etc. i.e., each weft float is one warp thread to the right of the float of the preceding pick. In this progressive order of interlacement of the warp and weft, diagonal lines are formed. This type of twill is known as 1 up 2 down ($\frac{1}{2}$ twill) which indicates every pick has to pass under one warp and go over two and so on, thereby making a weft float fabric on the face side. Likewise other twill like $\frac{2}{1}$ & $\frac{3}{1}$ can be constructed, wherein warp will be more prominent on the face of the fabric (**figures-18 B & C**). Prominence of the twill lines can be seen on both the sides of the fabric. Direction of the lines on one side is opposite to that seen on the other when the fabric is turned on the back side. There are other class of twill weaves derived from the basic twills known as Regular twills, Steep Twill, Flat and Elongated twills, Combination of twills, Broken twills, Pointed twill, Wavy or Zigzag twill, Herringbone twill, and Fancy twill weaves. A 3 ends twill with $\frac{2}{1}$ lifting is represented in **Fig 18**-with its naturalistic interlacement for easy identification.



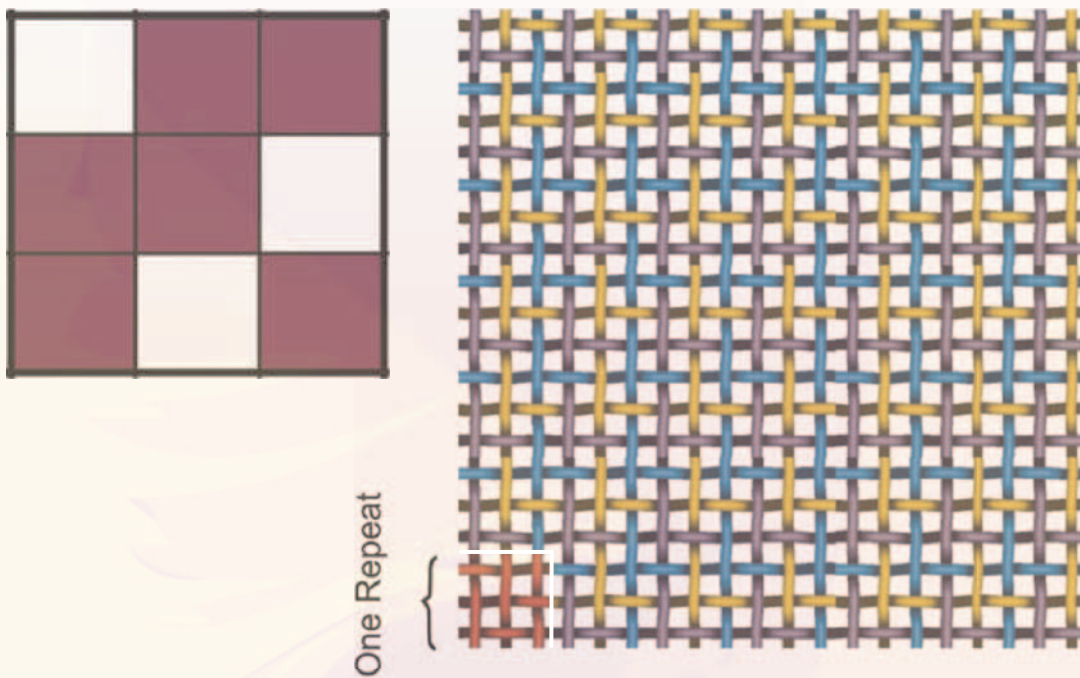


Figure - 18-1

3 Ends Twill weave

9.3 REGULAR TWILLS

Regular twill is the simplest form of twill which can be constructed with equal or unequal diagonal lines of warp and weft arranged alternately. When the diagonal lines are equal, that is, if both ends and picks are lifted under the same number of warp and weft threads uniformly, warp and weft will definitely be in equal quantities on both the face and back of the fabric, but if the lines are unequal, warp and weft may be either in equal or in unequal quantities on the face and back of the fabric. They may be either termed as warp faced or a weft-faced twill fabric depending upon the predominance of the warp or weft floats on the face of the woven fabric.

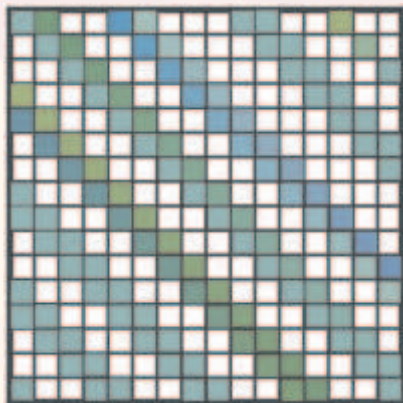


Figure - 19 A, 2/2 Twill

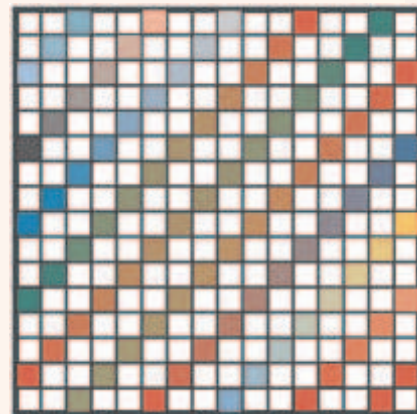


Figure - 19 B, 1/2 Twill