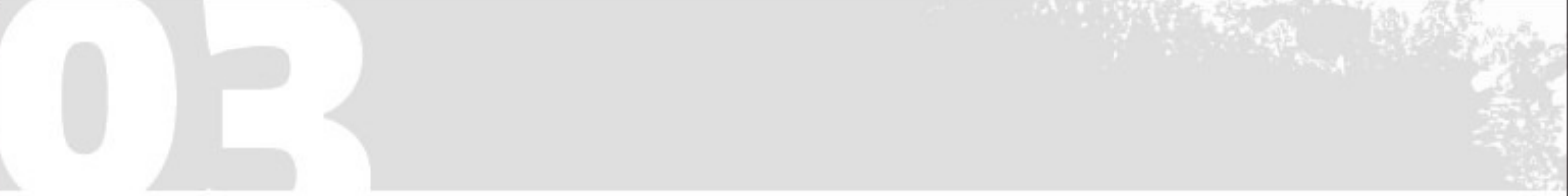


Weaving

Textile Fibres are filiform elements characterised by the flexibility, fineness and large length in relation to the maximum transverse dimension, that's why they are appropriate to textile applications.



Manufacturing Process

The manufacturing cycle of the company starts in the preparation and weaving sections. The woven fabric formation is performed during the weaving. It's an operation that consists in the square crossing of two parallel threads systems, the warp and the weft, which go through preliminary preparation operations.

Manufacturing Process:



The weaving operations can be systematised as the following:

- **Reeling of thread**
- **Warp preparation**
- **Weft preparation**

During the reeling, the thread is unreeled from the primary bobbin and, going through special devices, the thread is reeled on the new bobbin. This operation is valuable to the realisation of a depuration function, that is, the removal of all faulty points in the thread.

Warping



Warping consists in creating a system of parallel threads, rigorously personalised with the same length and with an equal tension. This system is reeled in an axle (the “beam”) that is assembled in the back of the loom.

Sizing



Once wove, the warps are sized. Sizing consists in the impregnating or coating of the warp threads with a film-forming adhesive colloidal substance, in order to increase the threads resistance against mechanical actions during weaving process. Thus, it is possible to reduce the ruptures and the consequent stops of the loom, increase the weaving efficiency and improve the woven fabric quality.

Assembly on the loom

Once the warping and sizing are completed, the assembly on the loom takes place and consists in a string of operations, allowing the weaving execution. To draw-in or to loom consists in threading each thread of the warp into the knit hole of the respective heddle. The order to execute this operation is defined by a system called “Drawing-in”.

Afterwards, threads are woven on Rapier Looms and Air-jet Looms.

Weaving



Finally, in the weaving section, we proceed to the metres review and counting. Later, we will start the finishes, where our aim is to prepare clothing from the weaving and confer the touch and strength characteristics, in order to make them woven fabrics prompt to be used.

Weave

The **weave** of a fabric is the term used to indicate, in a technical sight, how the weft threads are interlacing with the warp threads, to produce the woven fabric. The crossings, where both weft and warp threads combine, are unlimited.

The graphic representation of a fabric is drawn on squared paper – **Paper Weaving Pattern** – where are represented the warp threads by the space between the vertical lines, and the weft threads by the space between the horizontal lines. Each square in the paper represents the intersection between a warp thread – **End** – and a weft thread – **Pick**.

Each painted square indicates that in the fabric, the warp yarn goes above the weft yarn – **warp binding point**.

Each white square indicates that in the fabric, the weft yarn goes above the warp yarn – **weft binding point**.

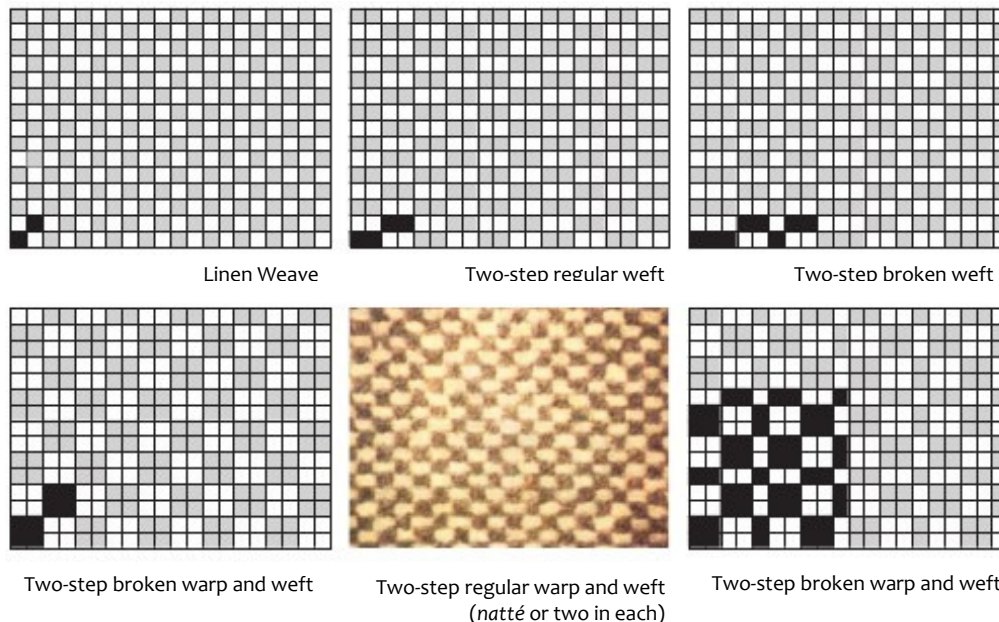


Illustration of a weft binding point (A) and warp binding point (B)

Linen Weave and its derivatives

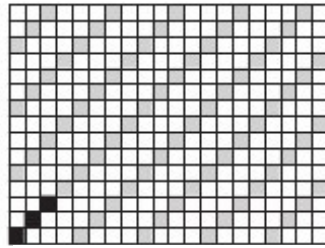
Beyond being the simplest weave, it is also the most common one.

Theoretically, it can be considered as one of the simplest twill.

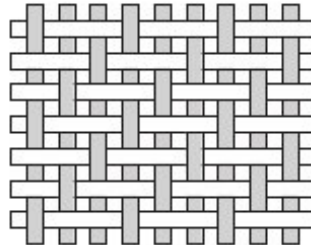


Twill

It is characterised by the one-step in any weaving order.



Three-bond simple twill



Three-bond simple twills

The simple twills can be divided into Weft Twill Weave, Neutral or Circassian and Warp Twill Weave.

If weft threads predominate on the face, relatively to warp threads, we refer to a weft twill weave. On the contrary, if warp threads predominate on the face, we refer to a warp twill weave. Neutral twill has weft binding points as well as warp binding points.

Twills patterns are always squared, i.e., they have ends as well as picks. Twills adopt the name of the pattern's size: three-bond twill, four-bond twill, five-bond twill, etc.



Three-bond twills

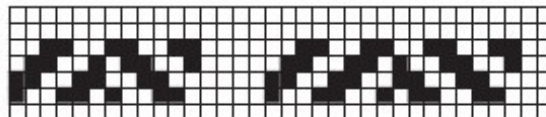


Four-bond twills



Five-bond twills

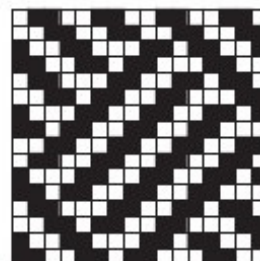
Among the more common twills derivatives, there are included herringbone twills (in the opposite direction or not), check twills and plaiting twills.



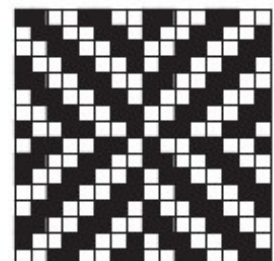
Herringbone twills in the opposite direction



Herringbone twill in the opposite direction
(zig zag effect)



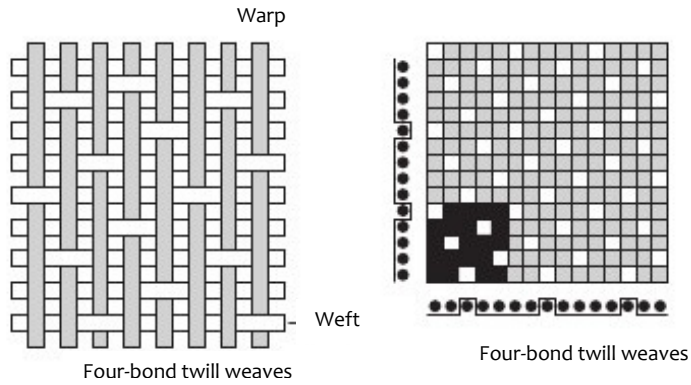
Check twill in the opposite
direction



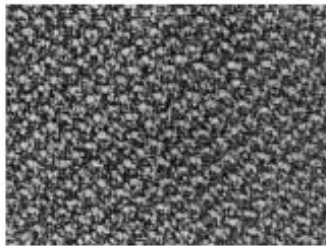
Plaiting twill

Satin

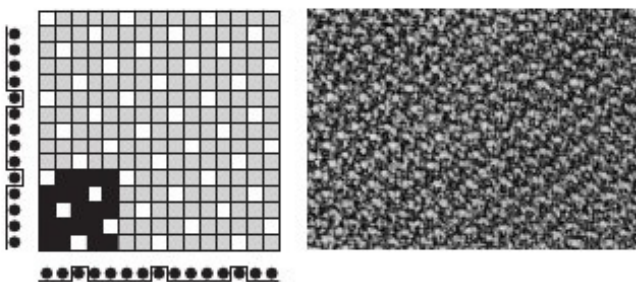
This type of weave produces articles with a smooth and glossy appearance, in which one prevents the diagonal effect thanks to a good partition of the binding points.



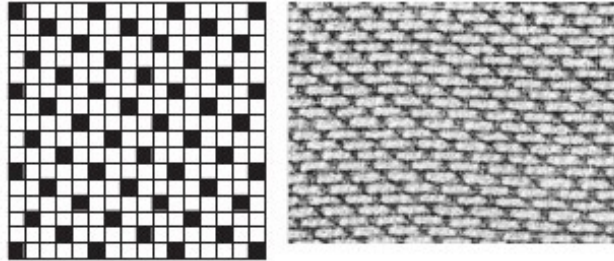
The practical utilisation of this kind of structures prevails over another one, every time we wish an article with a smooth appearance, formed predominantly by the warp and the weft.



Thus, we can classify this type of weaves into **warp satins** as warp weaves.



Weft satins as weft weaves.



The warp satins present a weaving order such as:

$$\frac{N \text{ warp binding points}}{1} A(X)$$

The weft satins present a weaving order such as:

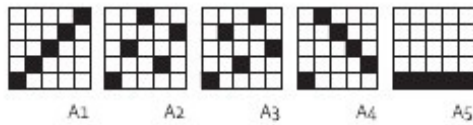
$$\frac{1}{N \text{ weft binding points}} A(X)$$

There are regular and broken satins.

The regular ones comply with the following rules:

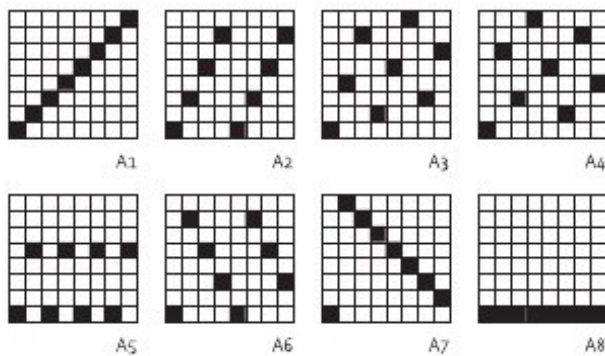
- **Patterns are squared.**
- **In each warp and weft thread, there is only one binding point.**
- **There cannot be binding points in contiguous positions.**
- **The step is constant.**

Five-bond satin



- A1. Twill
- A2. Satin complies with the 4 construction rules
- A3. Satin complies with the 4 construction rules
- A4. Twill with strand in the opposite direction
- A5. It doesn't produce fabric

Eight-bond satin



- A1. Twill
- A2. It doesn't produce weave
- A3. Satin
- A4. It doesn't produce weave
- A5. Satin
- A6. It doesn't produce weave
- A7. Twill with strand in the opposite direction
- A8. It doesn't produce fabric

General Rule

- To find the satin steps, with a certain size, digits are written from an arithmetical order since 1 up to the satin's size, inclusive.
- The one-step produces twill.
- The last step, i.e., the one of the satin size, doesn't produce weave.
- The penultimate step produces reversed twill.
- In the remaining steps, we eliminate every single one that has a common divisor with the pattern's size.

Complementary satins

Two satins of which summed steps give the counting of ends and picks from a pattern.

Example:

Seven-bond satin: complementary satins have A2 and A5 or A3 and A4

Broken satins

Satins don't comply with one or more rules of regular satins.

Four-bond broken satin



Six-bond broken satin



Satin Derivatives

- **Obtained from the basic weave (Satin).**
- **The typical characteristics of the Satin remain.**

Satin Derivatives

- Two-step satins: warp, weft, diagonal, oblique ribbing, shaded (warp or weft).
- With motifs: regular derivatives (with only 1 motif, *granité*), broken derivatives with many motifs.
- Composed satins: damasks, *damassé*.

Two-step satin derivatives

- Every single regular satin can be two-step satin.
- In a weft satin, the one-bond warp floats can be increased in two-, three- or four-bond warp floats, according to what we wish.
- The two-step can be realised in the direction of the warp or in the direction of the weft.

Diagonal

- The digital representation is composed by one or more dominant warp floats and these ones have always superior step than one-step, originating fine rows at an angle of more 45°.
- The most common steps are the two- and three-step.

Oblique ribbing

They are characterised by presenting relief oblique bands, formed by the warp and weft floats.

Oblique ribbing with equal strings

- The basic weave is a regular satin with an uneven repeat.
- Either for uneven threads or for even threads, the next step weave should be superior to the previous one.
- In case of being warp strings, in the evolution of each warp thread, the number of warp binding points should be equal to the step and the number of weft binding points should be equal to the step subtracting one unit.
- In case of being weft strings, in the evolution of each weft thread, the number of weft binding points should be equal to the step and the number of warp binding points should be equal to the step subtracting one unit.

Oblique ribbing with two unequal strings

- The basic weave is a rectangular broken satin.
- In case of being warp strings:
 - The step is composed by two numbers, of which sum less one unit is equal to the number of weft threads.
 - In the evolution of the uneven warp threads, the number of warp binding points is equal to the first step.
 - In the evolution of the even warp threads, the number of warp binding points is equal to the second step.
 - In the evolution of both threads, the number of weft binding points is equal to the difference between the number of weft threads and the number of warp binding points.

Oblique ribbing with two unequal strings

- In case of being weft strings:
 - The step is composed by two numbers, of which sum less one unit is equal to the number of warp threads.
 - In the evolution of the uneven weft threads, the number of weft binding points is equal to the second step.
 - In the evolution of the even weft threads, the number of weft binding points is equal to the first step.
 - In the evolution of both threads, the number of warp binding points is equal to the difference between the number of warp threads and the number of weft binding points.

Oblique ribbing with three unequal strings

- The basic weave is a regular satin with a large and uneven pattern.
- The step value should be in such a way that, for uneven and even warp threads, the next step weave should be superior to the previous one.
- The evolution of each warp thread (warp and weft binding points) should be composed by two groups of three values each.
- The sum of three values from the first group should be equal to the step.
- The three values from the second group are obtained through the following way and by the indicated order:

Reduce one unit to the first value from the first group.

Add-up one unit to the second value from the first group.

Reduce one unit to the third value from the first group.

Finishes

Finally, we are in the finishing stage, where the aim is to prepare the clothes for the weaving and confer them the touch and strength characteristics, transforming them into fabrics ready to be use. This activity develops into three fundamental stages:

Manufacturing Process:



1. Preparation of Clothing



2. Dyeing of the Rough Clothing



3. Finishes



Once these processes are concluded, and due to all the transformations endured by the fabric, we can initiate the metres review and counting.