Final Project

Effect of Twill Direction on Grey Fabric Properties

[BS Programme]

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Chapter 1

Introduction

1. Introduction

Our project is Effect of Twill Direction on grey fabric. The textile industry today is concerned with the quality. Due to fast growing technology and methodology, the demand for the quality of the fabric with minimum utilization of resources and production in shortest duration of time has increased. According to an estimate made by ministry of Industries in year 2009 the total share of textiles in exports is about 53% with total share in construction about 40%. The textiles share in employment is about 36% with exports over 5 Billion dollars per annum. By having an overview of these values we came to know about the importance of textiles in Pakistan. To increase these values and to compete with other Asian countries, we have to improve our processes up to great extent. Weaving is one of the major processes of textiles. Weaving is the mixture of science and art. Despite all the technological advances, weaving is still not a positively controlled process. That is, it is hardly possible to control the individual fiber which is the smallest meaningful building block in a woven structure. This fact makes weaving an interesting technology.

1.1 Objectives:

The Objectives of this project are the following:

- Utilization of twills

- To understand the technical problems arising from twill manufacturing

1.2 Weaving Process:

Weaving is defined as the method or process of interlacing two yarns, so they cross each other at right angle to produce a woven fabric. It's a mechanical process carried out on loom. The ends of warp yarn run in length wise direction and pick yarn run from side to side.

- **Warping**
- **Sizing**
- **Drawing in**
- **Weaving**

1.2.1 Primary motion

Shedding:

Shedding is separating the warp ends into two or more layers to form shed.

Picking:

Picking is the passing of weft thread through shed.

Beating up:

Beating-up is pushing the newly inserted weft, known as pick into already woven fabric with the help of reed. Secondary motions are given under.

1.2.2 Secondary motion:

Let-off:

Also called warp control i.e. to deliver the warp sheet at required rate and tension.

Take up:

Also known as cloth control i.e. this motion withdraw fabric from the weaving area at constant rate and wound on cloth roll with the help of two press rollers.

Fabric inspection and folding:

After weaving process the fabric is transferred to the inspection hall .In inspection hall the inspectors inspect the fabric and remove the defects from fabric. The Four-Point System has gained widest acceptance in the textile trades because it is the most lenient, simple and easy to understand cloth grading system.

Chapter2

Literature Review

TWILLS

2. Definition:

Weave (cloth) so as to produce a pattern of diagonal parallel ribs._Designating a weave in which the weft yarns are worked around two or more warp yarns to produce an effect of parallel diagonal lines or ribs. One of the three basic textile weaves (*see* weaving), distinguished by diagonal lines. In the simplest twill, the weft crosses over two warp yarns, then under one, the sequence being repeated in each succeeding shot (row), but stepped over, one warp either to the left or right. In regular twill, the diagonal line is repeated regularly, usually running upward from left to right at 45°. The weave can be varied in many ways for example, by changing the direction of the twill line (as in herringbone twill) or its angle. Twill is much used for men's wear and many other clothing applications because it has stretch on both diagonals, which makes clothes comfortable even if closely fitted. Denim and many tweeds are of twill weave.

2.1 Structure:

In a twill weave, each weft or filling yarn floats across the warp yarns in a progression of interlacing to the right or left, forming a distinct diagonal line. This diagonal line is also known as a

whale. A float is the portion of a yarn that crosses over two or more yarns from the opposite direction.

A twill weave requires three or more harnesses, depending on its complexity. A twill weave is the second most basic weave that can be made on a fairly simple loom.

Twill weave is often designated as a fraction—such as 2/1—in which the numerator indicates the number of harnesses that are raised, in this example, two, and the denominator indicates the number of harnesses that are lowered when a filling yarn is inserted, in this example one. The fraction 2/1 would be read as "two up, one down." The minimum number of harnesses needed to produce twill can be determined by totaling the numbers in the fraction. For the example described, the number of harnesses is three

2.2 Characteristics of Twill:

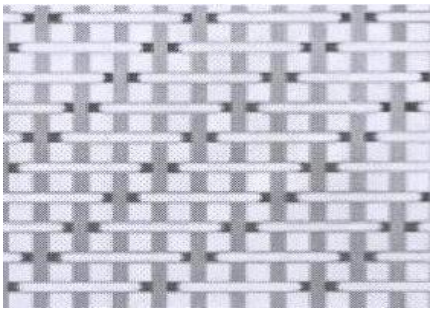
Twill with ribs in both sides, called herringbone

Twill fabrics technically have a front and a back side, unlike plain weave, where the two sides are the same. The front side of the twill is the technical face and the back is called technical back. The technical face side of a twill weave fabric

is the side with the most pronounced wale. It is usually more durable, more attractive, and most often used as the fashion side of the fabric. This side is usually the side visible during weaving. If there are warp floats on the technical face (if the warp crosses over two or more wefts), there will be filling floats (the weft will cross over two or more warps) on the technical back. If the twill wale goes up to the right on one side, it will go up to the left on the other side. Twill fabrics have no up and down as they are woven.

Sheer fabrics are seldom made with a twill weave. Because a twill surface has interesting texture and design, printed twills (where a design is printed on the cloth) are much less common than printed plain weaves. When twills are printed, they are most likely to be lightweight fabrics. Soil shows less on the uneven surface of twills than it does on smooth surfaces, such as plain weaves. Thus, twills are often used for sturdy work clothing or durable upholstery because soils and stains are less noticeable on this fabric. Denim, for example, is twill.

The fewer interlacing in twills allow the yarns to move more freely, and thus they are softer and more pliable, and drape better. Twills also recover better from wrinkles than plain-weave fabrics. When there are fewer interlacing, yarns can be packed closer together to produce high-count fabrics. In twills and higher counts, the fabric is more durable and air- and water-resistant.



Structure of a 3/1 twill

There are even-sided twills and warp-faced twills. Even-sided twills include foulard or syrah, serge, twill flannel, sharkskin, herringbone, and hounds tooth. Warp-faced twills include lining twill, denim, jean, drill, covert, chino, gabardine, cavalry twill, and fancy twill.

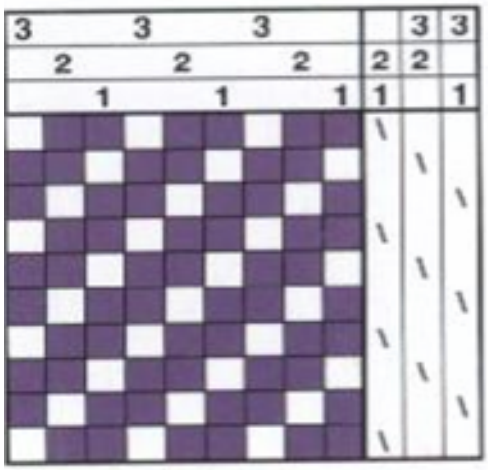
Twill weave is characterized by the effect of parallel diagonal ribs formed left-to-right or right to left. It is created by the interlacing of 2 or 3 warp threads over 1 or 2 filling thread in an alternate rows. The resulting fabric is more pliable and drape able than the plain or basket weave but less pliable than satin. Twill weave which has more warps than the wefts floating on the face of the fabric is called warp faced and those with wefts predominating is known as weft faced.

2.2.1 Characteristics of Twill Weave

- It has fewer interlacing than plain weave.
- It is durable and heavier.
- It is wrinkle resistant.
- It is resistant to showing soil and soiling.
- The twill direction is defined as left or right hand or variation.
- It is more raveling than plain weave.
- It is more pliable drape and hand than plain weave.

2.3 A step to the left or right, or both:

If plain weave has enough possibilities for variation t last a lifetime, then twills surely, could provide several lifetime of study. In plain weave,



2.1 2/1 twill, jeans twill woven on three shafts.

the warp and weft Passover one, undergone inn both direction .both warp and weft may be made up of multiple threads ,as in basket or matt weaves , but they always interlace in the cloth as if they were single threads.

Three end twill may be woven in two ways: warp-faced or weft-faced. The back of a warp-faced twill is a weft-faced twill and vice versa. Imagine how many yards have been woven of this particular twill, also called JEANS TWILL OR DENIM. In classic blue jeans, the warp is indigo blue cotton, and the weft undyed cotton. Many of us live a great deal of our lives in jeans twill. The notation we used for basket weaves is also used for twills. Thus, three-shaft twill may be written (and woven) as either 1/2 or 2/1 twill. The first number shows how many warp ends lie above the weft picks in one repeat and the second, the

number of warp ends below the weft picks in one repeat. The jeans twill of classic dungarees is 2/1 twill, a warp -faced twill.
The warp is dominant because twice as many ends lie over the weft as lie under it; the ratio is 2:1.
In regular twill, adjacent picks never float over or under the same set of warp ends. if the first two ends of a 2/1 twill are lifted for the first pick, then the second and third ends may be lifted for a second pick and the first and third ends lifted for the third pick. Likewise, if the twill is woven as 1/2 twill, the first end is lifted for the first pick, followed by the second and then the third if we maintain the same direction. Twills may progress to the left or to the right; the former is called a LEFT-HAND TWILL, the latter, RIGHT-HAND TWILL. if the direction or the twill movement, the direction of the twill diagonal , remains the same throughout the cloth , it is a simple or a regular twill's think of it as being a straight twill because it progress steadily in the same direction , over and over.

When the number below the line is equal, the twill is said to be even twill. In an even twill, nighters neither the warp nor the weft predominates. Because the number above the line is not equal to the number below it, three shafts twill is said to be uneven twill: the warp shows more on one face and the weft more on the other. The balance of twill fabrics, on the other