Faculty of Engineering

Department of Textile Engineering

Project report on

Various Type of Knit Fabrics Export in Bangladesh

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A thesis submitted in partial fulfillment of the requirements for the degree of **Bachelor of Science in Textile Engineering**

Advance in Fabric Manufacturing Technology

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DECLARATION

We hereby declare that this thesis has been performed by way of us underneath the supervision of Md. Mahbubul Haque professor Department of Textile Engineering
Faculty of Engineering, Daffodil International University. We additionally declare that neither this challenge nor any phase of this thesis has been submitted someplace else for the award of any diploma.

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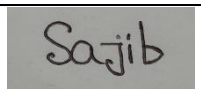
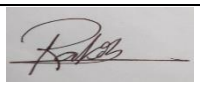
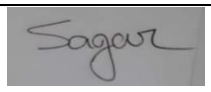
Sajib Kumar Chanda	**183-23-534**	
Rakibul Hasan	**183-23-537**	
Sagor Sarkar	**183-23-548**	

LETTER OF APPROVAL

This thesis document is organized by way of Sajib Kumar Chanda ID: 182-23-534 Rakibul Hasan ID: 183-23-537 and Sagor Sarkar ID: 183-23-548 is accepted in Partial Fulfillment of the Requirement for the Degree of BACHELOR OF SCIENCE IN TEXTILE ENGINEERING. The Stated college students have carried out their challenge work underneath my supervision. During the research time, I determined them sincere, hardworking, and enthusiastic.

Yours Sincerely

……..

Prof. Md. Mahbubul Haque

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Firstly, we specific our gratefulness to Almighty Allah for his divine blessing makes us feasible to entire this report successfully. We are grateful to our supervisor **Prof. Md. Mahbubul Haque**, Department of Textile Engineering, Faculty of Engineering, Daffodil International University. Deep understanding and keen interests of our supervisor in the discipline of fabric dyeing and ending influenced us to elevate out the undertaking work. His countless patience, scholarly guidance, persistent encouragement, energetic supervision, positive criticism, precious advice, analyzing many inferior drafts and correcting these at all degrees have made it viable to complete this project.

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Finally, we'd like to express our heartfelt appreciation to our beloved mother and father, as well as our friends, for their intellectual support, strength, and assistance throughout the drafting of the report.

DEDICATION

From the outset, WE choose to commit this contemporary report to all mighty Allah for allowing this chance to substantiate it. Without God-like's help, nothing would be conceivable. At that point, we choose to devote my report to my folks. We adore them besides the question, for completing my examination they assume an essential job to finish. It is an extraordinary a delight for me. Without their help, it is noticeably outlandish for me to quit this connection so I am grateful to them. My humans had been precious to put collectively this connection. Furthermore, we likewise choose to commit this file to my trustworthy educator and scholastic administrator, **Prof.Md. Mahbubul Haque**, Department of Textile, Daffodil International University, who grant us with the optimistic regulations to arrange this connection. We commit this file to my cherished guardians. Devoted to the articles of garb laborer, who works morning to night, make a contribution walking the wheel of the nation's monetary device by using diligent work. Thank you very much for such a large number of, go ahead, we're with you.

ABSTRACT

The main objective of this study is to investigate the overall effectiveness of different types of knit fabrics using different GSM and specific diameters. This lookup often does not focus on adjusting the specific parameters (GSM, CPI, WPI, SL, compression and diameter) of the exceptional knit fabric after the stenting process. The goal of this study is to measure GSM, CPI, WPI, SL, and diameter and before and after stenting by measuring GSM, CPI, WPI, SL, diameter, and compression before and after stenting to find out how much has changed between compression and before stenting. Collected

various type of information about the knit fabrics exported from Bangladesh. We visit the mondol Fabrics Ltd and gather the various types of information.

Table of Contents

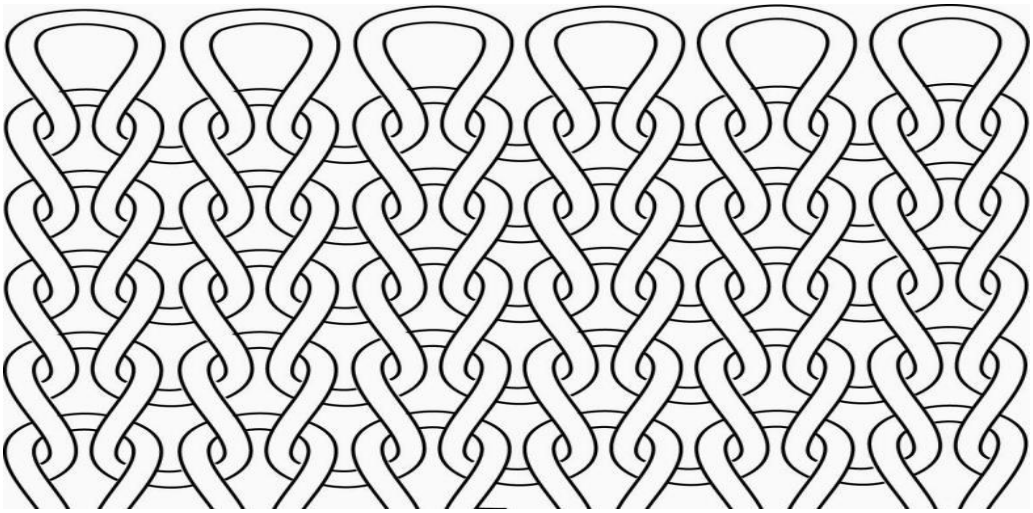
CHAPTER-1
INTRODUCTION

Introduction

Knitting is one of the earliest ways of clothing production; Egyptian knitted objects dating back to the 5th century AD have been discovered. Hand-knitting may be done with simply needles and yarn, and it does not require heavy machinery such as looms, therefore it was and continues to be a practical and accessible art. To manufacture knitted materials more rapidly and mechanically, a range of knitting machines are now available. Knitting is said to have begun in the Middle East in the 5th century and spread throughout Europe with the arrival of wool traders. Interestingly, the early Egyptian knitting samples are constructed of cotton fibers rather than wool. Many of them include Arabic blessings or symbols to stave against ill luck woven into them. Fishermen utilized knitted textiles to produce warm, woolen, waterproof garments for excursions to sea in the 14th century. Knitting machines were employed to create hosiery for the upper classes by the 16th century. Knitting developed a local business in the Highlands and Scotland, with factories employing men to make stockings for sale throughout Europe. Hats, shawls, purses, sweaters, and other knitwear items were soon available on the market. In 1816, the first knitting loom was constructed, and woolen mills were established to produce luxury clothes. In 1853, Eugene Rodier founded the first woollen textile plant. Knitwear became fashionable in the twentieth century. Knitwear became a practical, trendy, and modern alternative for men and women as fashion companies like Chanel introduced jersey dresses, cardigans, and jumpers.

1.1HOW IS KNITTING DONE?

Knitting is the practice of continually interlinking or knotting a succession of yarn loops with Needles. These loops are linked with the preceding loop structure. As a consequence, by latching the previously hanging threads, the new stitch secures the loop structure, eventually producing a sheet of material. This material sheet is a two-dimensional textile, similar to what you'd see in weaving. The difference is that the threads in woven fabric run straight or parallel, but the yarns in knit fabric follow a meandering path. The symmetric looping of yarn produces a fabric that is elastic and stretchy, a desirable trait that makes knitwear a must-have winter wardrobe item. Knitting may be done both by hand and with the help of a machine. Hand knitting techniques such as flat knitting and circular knitting are used to create fabric. Circular knitting is done using circular needles or sets of double-pointed needles, whereas flat knitting is done with two straight needles. Flat knitting generates two-dimensional flat fabric. Circular knitting, on the other hand, makes tubular-shaped cloth. The first stage in the procedure is to cast on, or make stitches on the needle. Distinct casting techniques provide different effects in the finished fabric. Different sorts of stitches may be made, and desired patterns in the material can be created by varying the needle's entrance into the previous thread.



Knitted fabric structures are all based on a knotted thread pattern.

Despite the fact that the devices look to be incredibly complex.

A six-step knitting technique is followed by all knitting machines! Low-carbon steel bearded needles are supported by a needle bar in knitting machines. The process for depressing the beards using a presser bar is described below.

- The needle bar moves forwards, allowing the web to be cleared by the open needles
- On the needles, the warp thread is threaded.
- It's made to float.
- This thread is dragged into the open needles when the needle bar is moved backwards.
- Close the needle loops and draw the weft back through them by lowering the presser bar.
- The needles open and a new row of loops is revealedprotection issues do nolonger encourage the proprietors to install this mixed method.
  And

1.2 PROPERTIES OF KNITWEAR

Two styles of knitting may be distinguished based on the direction in which the yarn flows throughout the knitting process. Weft knitting vs. warp knitting.

1.3 KNITTING TYPE

Yarn loops vertically in the cloth during warp knitting. Only warp knitting machines can accomplish this style of knitting. Weft knitting, on the other hand, moves the yarn horizontally. Knitting in this style can be done by hand or using a weft knitting machine. Whether the fabric is made with warp or weft knitting affects its qualities and structure. Weft knitting produces tubular fabric pieces, whereas warp knitting produces flat or open width shapes. Warp knitting keeps the loop structure stable and prevents runs. Weft-knit textiles, on the other hand, are simple to create but can unravel when cut if not fixed swiftly.

1.4 STITCH TYPE

When using the **basic knit stitch**, each loop is pulled through the loop below it, resulting in a fabric that appears like rows of vertically stacked "V's." **Purl stitches** seem like wavy arches running down the length of the cloth. Knitting patterns that mimic ropes, such as Aran knitting patterns, can be used to produce bulkier textures that absorb heat. Ropes may have been a daily source of inspiration for the ingenious and creative minds that pioneered this approach, since they were named after the Aran Islands off the coast of Ireland. Learn about the natural and environmental qualities of wool from Sue Blacker of Blacker Yarns to better understand why this fibre is mostly used for knitting.

1.5 JERSEY FABRICS AND INDUSTRIALISATION OF KNITTING

Knitting improves a fabric's'stretchability,' which is one of its most striking features. Single knit **fabric** is elastic and lightweight, making it ideal for apparel that is both fitting and comfortable. Jersey was the first commercially produced fabric in the Channel Islands, and it was also known as Jersey!

Jersey is a term used to describe any knitted fabric that does not have a distinct rib. The emergence of industrial knitting technologies led to the creation of jersey fabric from various fibers like as cotton and rayon, despite the fact that it was initially composed of wool.

T-shirts are frequently made of single-knit jersey fabric. It has one smooth side and a purled underneath, and it is soft and malleable. Jerseys come in a variety of styles, including double-knit, Jacquard, interlock, and claque. Jersey textiles are widely used in upholstery and home furnishings, in addition to sports gear, innerwear, and sweaters. It's also been seen in a variety of characteristic clothing styles, such as women's traditional knitted suits, zigzag Mission knitwear, chunky cardigans, and unisex knitwear designs.

So, while knitting originated as a way to manufacture merely functional woolen clothes, it has progressed over time and space, growing into a fashion statement and eventually reaching cult status (note the Nordic knitwear craze). It has become one of the most extensively utilized commercial and personal ways to garment manufacturing, having established itself in our hearts and minds as a leisure and an enterprise. Knitwear is here to stay!

Chapter-2
Literature Review

2.1 Knit Schematics:

Weft or filler knits are made from a single yarn that is passed horizontally through knitting machine needles. When a circular knitting machine makes a tabular cloth, it generates a spiral appearance. Because of this spiral property, matching the wales and courses of the knit fabric at an exact 90-degree angle is typically challenging. Knitted textiles are made using two broad methods: **warp knitting** and **weft knitting**, both of which yield a wide range of knitted fabrics.

2.2 Knitted Fabric

- Weft Knits
- Single Knits
- Single Jersey
- Lacoste
- Double Knits
- Rib Knit
- Purl Knit
- Interlock Knit
- Cable Fabric
- Bird's Eye
- Cardigans
- Milano Ribs
- Pointelle
- Specialized Weft Knits
- Jacquard Jerseys
- Knitted Terry
- Knitted Velour
- Silver Knit
- Fleece
- French Terry
- Warp Knits
- Tricot
- Raschel

Either a circular or a flat-bed knitting machine can be used to make weft knits. Four basic stitches are used in the weft of filling knits.

1. Jersey stitch/plain knits
2. Purl stitch
3. Rib stitch
4. Interlock stitch (both for single and double knits)

2.3 Knitted Fabric Types

2.3.1 Flat or Jersey Knit Fabric

Fabrics with obvious flat vertical lines on the front and dominating horizontal ribs on the back are known as flat or Jersey Knit. The flat or jersey knit stitch is commonly used because it is quick, cheap, and can be altered to create fancy patterned textiles. Regular flat knits have a propensity to "run" if a yarn is split, which is a severe drawback.

END-USE

- T-shirts and tank tops. Most t-shirts are made using a knit fabric, like jersey, as the opaque, stretchy, absorbent fabric is great for comfort and practical use.
- Sweats. ...
- Bed sheets. ...
- Underwear. ...
- Sportswear and athleisure.

2.3.2 Purl Knit Fabric

Knit Purl Fabrics have the same appearance on both sides. The purl stitch may be used to make a variety of appealing patterns and motifs. Bulky sweaters and children's apparel are frequently made using it. Purl knits are known for their sluggish manufacturing pace.

Purl Knit is created by knitting yarn in one wale of the cloth using alternate knit and purl stitches. Knit and purl stitches alternate in the fabric's design. The fabric is reversible and looks the same on both sides. The cloth is flat and does not curl. In the length direction, it is stretchier.

END-USE

- Bulky sweaters,
- Cardigans,
- Pullovers
- Children's clothing.

2.3.3 Rib Stitch Knit Fabric

Embroidery on the Ribs Knits have stitches drawn on both sides of the fabric, producing wales columns on both the front and back. Rib stitch produces fabrics with a high degree of elasticity. Rib knits are used to make the "ribbing" that may be seen on the lower margins of sweaters, sleeve cuffs, and necklines. Rib-knit fabric is made by knitting yarn as alternate knit and purl stitches in one direction of the material. Knit and purl stitches alternate in the wales of the cloth. Because it looks the same on both sides, it is a reversible fabric. These may be made on both flat and circular knitting machines.

END-USE

- Sleeve bands,

- Neck bands,
- Sweater,
- Waistbands.

2.3.4 Cardigans

Cardigans are a Rib Knit variant that comes in half Cardigan and full Cardigan sizes. Tuck stitch designs are unique to the cloth. As a result of the elevated look, cardigans are made of a thicker fabric.

- Half Cardigan

  The Half Cardigan is made up of a first course that is all knit on both needle beds and a second course that is all knit on the front needles and all tucked on the back needles. The fabric's tuck loops limit width-direction stretch. It's not a cloth that can be reversed. They're commonly employed to make pullovers and sweaters, and they're typically coarsely knitted.

- Full Cardigan

  The Full Cardigan is made up of a repetition of one course of all knit on front needles and all tuck on back needles, followed by a second course of all tuck on front needles and all knit on back needles. The Full Cardigan has the same design on both sides.Tuck loops in excess make the cloth heavy and thick. It's commonly knitted in a coarser gauge and used to make sweaters and other fashion items. Wool or acrylic are the most common materials used in cardigans.

2.3.5 Milano Ribs

Milano Ribs are a Rib Knit variation that comes in half and full Milano versions. Knitting and misses designs are shown on the fabric.

Half Milano

Half Milano is made up of one course of all knit on both needle beds and a second course of all knit on only the front needles. Its structure is uneven. It's often knitted in a coarse gauge and is commonly used to make sweaters.

Full Milano

A complete Milano is made up of one course of all knit on both needle beds, a second course of all knit on front needles alone, and a third course of all knit on rear needles only. Full Milano is a gorgeously woven fabric that offers greater covering. The dimensional stability of half Milano rib is lower than that of complete Milano rib. It's a popular suiting fabric.

2.3.6 Interlock Stitch Knit Fabric

Rib stitch knits have been modified into interlock stitch knits. The front and back of interlocks are identical. These textiles are frequently heavier and thicker than ordinary rib knit materials unless finer yarns are used. Stitch interlocking prevents runs and ensures that garment materials do not ravel or curl around the edges.

END-USE

- Underwear
- pajamas
- baby clothing due to its softness, hoodies due to its warmth,
- t-shirts
- dresses due to its comfort.

2.3.7 Double Knit Fabric

Double knits are made using interlock stitches and their modifications. In the procedure, two sets of needles are employed at an angle to each other. The most popular fibres used in double knits are polyester and wool. Double knits are weft knitted fabrics with two sets of needle beds. The cloth's structure is more stable and compact. The edges of the fabrics do not curl or ravel. They can be textured and created in a number of ways. One or two yarns are used to knit one course in the textile.

END-USE

- Pants,
- Skirts,
- Dresses,
- Sturdy leggings
- Cardigans.

2.3.8 Warp Knitted Fabric

Yarns from the warp beam are used in a specialized knitting machine to create warp knitted fabrics. Unlike weft knits, they are made up of several strands that create loops in neighboring wales. The textile may be identified with a pick glass. The front side of the fabric has slightly slanted vertical knitting loops while the reverse side has inclined horizontal floats. They are not ravenous in the least. Yarn loops are formed in a vertical or warp direction, as is the case with warp knit fabrics. All of the threads required to create the breadth of a warp knit are placed out parallel to one another, similar to how yarns are laid out in weaving. Tricot is often utilized in this procedure to create high-quality fabrics. This process is often used to generate high-quality textiles from tricot and raschel knits.

END-USE

- Producing mosquito netting,
- Tulle fabrics,
- Sportswear,
- Shoe fabric,
- Coating substrates,
- Laminating backgrounds.

2.3.9 Tricot Knit Fabric

Filament yarns are almost exclusively used in tricot knits because the ultra-high-speed tricot knitting machines demand uniform diameter and great quality. Fabrics made with a tricot knitting machine are either plain or feature a basic geometric pattern. The fabric's front surface contains vertical wales that are clearly delineated, whereas the rear surface has crosswise courses.

2.3.10 Raschel Knit Fabric

Raschel knits are made with a variety of weights and kinds of spun or filament yarns. The open-space aspect of crochet or lace, as well as a nearly three-dimensional surface effect design, distinguish most raschel knits.

2.3.11 Cable Knit Fabric

Cable fabric is a double-knit fabric created using a unique loop transfer method. The fabric's wales have a rope-like look, and plaits are formed by passing loops between neighbouring wales. As the loops intersect, the fabric produces a unique surface pattern that looks like braids. It's a common material for sweaters.

END-USE

- Casual dresses,
- Jackets
- Vests.

2.3.12 Bird’s Eye Knit Fabric

Bird’s eye is a double-knit fabric that incorporates both tuck and knitting stitches. The tuck stitch provides an eyelet or hole impression on the cloth surface that resembles a bird's eye pattern. The scrambling effect is mainly created using a fabric consisting of multi-colored threads. Eyelet patterns may be used on the cloth. They are a popular fabric for clothes.

END-USE

especially women’s wear.

2.3.13 Pointelle Knit Fabric

A double-knit cloth known as pointelle. Miss stitches in the cloth are patterned. These transferred stitches created holes in the cloth, making it seem like lace. The fabric's feminine appearance makes it suitable for both women's and children's clothing.

END-USE

- T-shirts,
- pajamas
- Children’s wear.

2.3.14 Intarsia Knit Fabric

A single knit cloth with a pattern called intarsia. Knitting multicolored yarns are used to create it. The fabric is knitted with the same course in several colors and yarns. It contains coloured graphics in the form of blocks that are scattered across a variety of coloured backdrops. On both the front and back of the cloth, the designs appear to be identical. On the backside of the cloth, no floating have been discovered.

END-USE

- Shirts,
- Blouses,
- Sweaters.

2.3.15 Jacquard Knit Fabric

Single jersey textiles created using the Jacquard mechanism on Circular Knitting machines are known as Jacquard Jerseys. They're the most straightforward way to create patterned textiles. They come in a variety of designs, including:

- Stitches mixed together, yarn kinds mixed together in terms of colour and texture, and so on.
- Various coloured loops comprised of different threads are woven into jacquard textiles in the same direction. Single jersey jacquards include floats as a standard feature. In the knitwear business, they're commonly employed.

END-USE

- Clothing,
- Ties,

- Slings,
- Ribbons,
- Upholstery,
- Draperies,
- Curtains,
- Table,
- Bed linen.

2.3.16 Knitted Terry Fabric

Knitted Terry is a pile jersey fabric comparable to woven materials that is knitted using a unique attachment

on conventional circular knitting machines. The surface of the cloth is covered in loops. The pile is made up of one set of yarn, while the foundation fabric is made up of the other.

Knit terry materials are more comfortable than woven terry fabrics because they are softer, more flexible, and more comfy. They aren't as hard or as long-lasting as woven terry, though. Its absorbency and suppleness.

END-USE

- Beachwear,
- Towels,
- Bathrobes etc.

French Terry Fabric

Terry from France It's a sort of Jersey with Weft Insertion. The fabric's piles are not napped, and the technical back is utilized as the facing side. Only one side of French Terry features loops or piles. When compared to regular Terry, the French Terry's mounds are substantially shorter. The fabric stretches well and has a fleece-like handle. These characteristics make the fabric more comfortable, which is why they are commonly used in apparel, particularly for newborns and children. Because of its absorbency and stretch, French Terry is commonly used in sportswear, jogging suits, and exercise clothes.

END-USE

- Sweatpants,
- Hoodies,
- Pullovers,
- Shorts

2.3.17 Knitted Velour Fabric

Pile jersey textiles with soft projecting threads on the fabric surface are known as knitted Velour. They're constructed of an extra set of yarns that make pile loops on the cloth surface, just as knit terry. Velour, on the other hand, shears and brushes the pile loops equally. It may be coloured, and solid colours are commonly available.

END-USE

Luxurious apparels like

- Jackets
- Blouse
- Dresses etc.

2.3.18 Sliver Knit Fabric

Pile jersey fabric is used to make the Sliver Knit. Sliver knit fabric has a longer pile on the fabric surface than Velour fabric. It's manufactured using special circular knitting machines that use knitting sliver along with base yarn to connect surface fibers that look like fur to the cloth. The piles on the surface of sliver knit textiles are longer and heavier than other pile jerseys. Imitation fur textiles made from animal-printed sliver knit fabrics are quite popular. They're more popular than fur since they're lighter, stretchier, and don't require specific storage care.

END-USE

- Jackets
- Coats.

2.3.19 Fleece Knit Fabric

Weft insertion jerseys can in several forms, including fleece. Weft insertion textiles are weft knitted fabrics with an extra yarn put into each course. These extra yarns are kept in place by loops in each course of the fabric, rather than being knit. Decorative or useful yarns, such as stretch yarn, can be introduced. Stability, protection, and comfort are all provided by it. In most cases, the insertion yarn is thicker than the foundation yarn. Fleece refers to the shearing and napping of the insertion yarn that forms heaps. Cotton, Cotton/Polyester, Wool, and Acrylic are the most common materials used to create them.

END-USE

- Jackets,
- Dresses,
- Sportswear,
- Sweaters.

CHAPTER-3
METHODOLOGY

3.1 Materials

To entire this lookup we taken ten sorts of cloth in unique GSM, we use counting type to count number CPI, WPI, we use sodium perforate and detergent to test wash fastness and we used the South Korean EHWHA brand stented machine that was include with seven chambers.

3.1.1 Chemicals used:

- Sodium perforate
- Detergent.
- Softener

At first, we takes the ten knit fabric sample earlier than stentering and after stentering. Then we reduce the GSM earlier than stenter sample and after stenter weight the sample and discover out the earlier than stentering GSM and after stentering GSM then we calculate the changes of GSM. We are counted the CPI,

WPI of each earlier than stentering and after stentering via a counting category then calculate the changes. We wash the earlier than and after stentering sample by using sodium perborate and detergent and then discover out SL, Shrinkages, and diameter changes earlier than and after stentering.

i. To find out fabrics GSM first we take sample then two fabric sample cut by GSM cutter then take weight and average the value and multiple by 100.

ii. Fabric GSM = Average the weight of cutting fabric * 100.

iii. To find out the fabrics diameter we use a measuring tape. To find out the fabric SL length first we take ten wales length then divided by 10.

iv. Fabrics Stitch Length = measured length of ten wales / total no. of wales (10).

v. To find out the fabrics CPI, WPI we used counting glass by counting glass we count WPI and CPI.

vi. To find out the fabrics Shrinkage % first we take before wash fabrics length and after wash fabrics length.

vii. Fabrics shrinkage % = (Length before wash sample – Length after wash sample) * 100 / Length before sample.

3.1.2Table: Specification of 100 EHWHA stenter machine that we were used in our research.

Brand name	EHWHA
Company name	Dangjinsi Chungcheongnambo
Origin	South Korea
Serial No.	72276-0513
Capacity	6 ton/day
Temperature range	110-200 0C
Speed range	15-40 m/min
Maximum fabric width	103”
Minimum fabric width	44”
Use utility	Gas, Electricity, Steam, Compress air
No. of chamber	sevn
Steam pressure	3 kg
Air pressure	10 bar
Application for	Open fabrics
Extra attachment	There have no extra arrangement
M/C parts	Feed roller, overfeed roller, exhaust air fan, motor, chamber, delivery roller.

3.1.3 Different parts name of stenter machine that used in this research

Fabrics feeding Zone: Fabrics feeding zone is used to feed the fabrics uniformly and accurately by use feed roller.

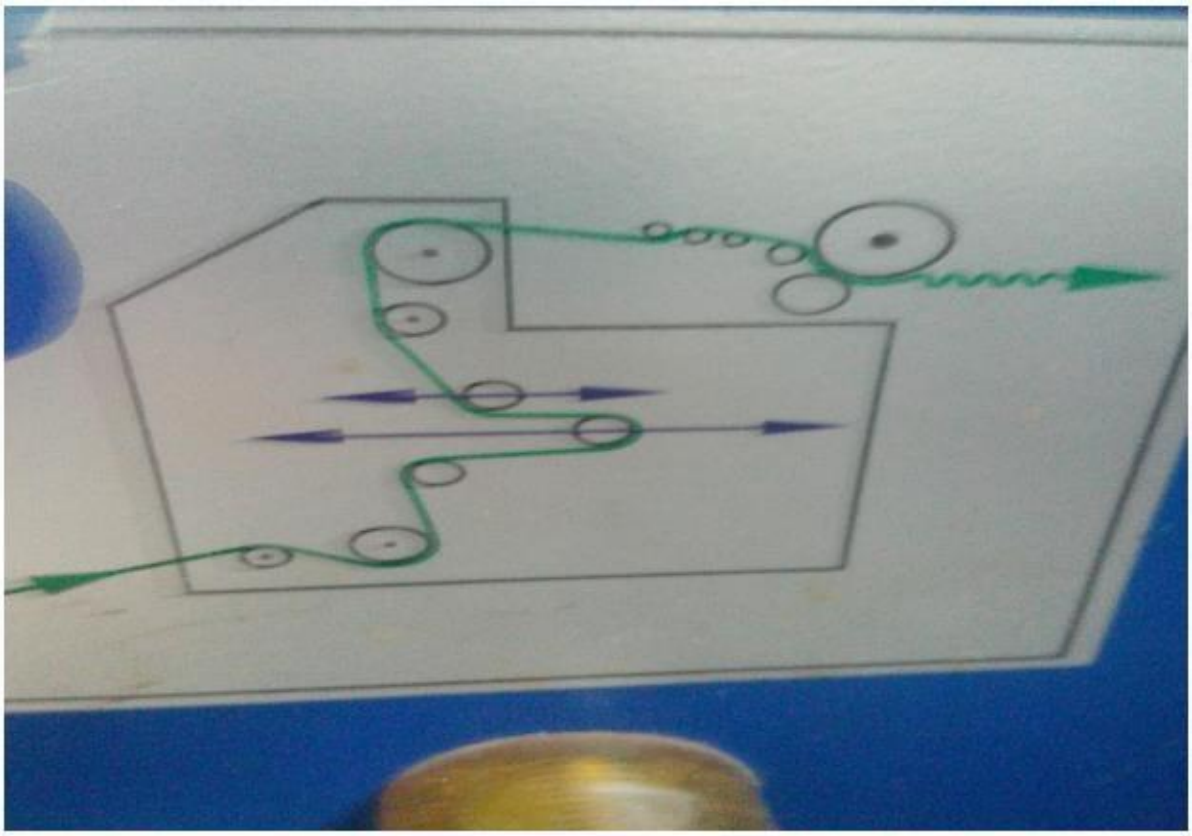


Figure. 3.2.1 Fabrics feed zone

Feed roller: Feed roller feed the fabrics into the machine from batch section or dyeing section.

Fig: 3.2.2 Feed roller

Padder roller: This section includes with squeezing mangle, guide roller and chemicals. Fabrics immerse into the finished chemicals through guide roller then send to squeezing mangle. In this time finished chemicals are applied on the fabrics surface and squeeze for out of extra chemicals

Figure. 3.2.3 Padder roller

Softener tank: In this tank softener is mixed with water for application on the fabrics surface

Figure. 3.2.4 Softener tank

Chain arrangement: This is the mechanical application by this arrangement, fabric shrinkage & width can be control there have pin and clip to grip fabrics automatically.

Figure. 3.2.5 Chain arrangement

Over feed roller: GSM can be controlled by this overfeed system. If fabric width is higher it need to decrease width by increase GSM through increase over feed percentage. If fabrics width is lower need to decrease fabrics width by decrease overfeed percentage.

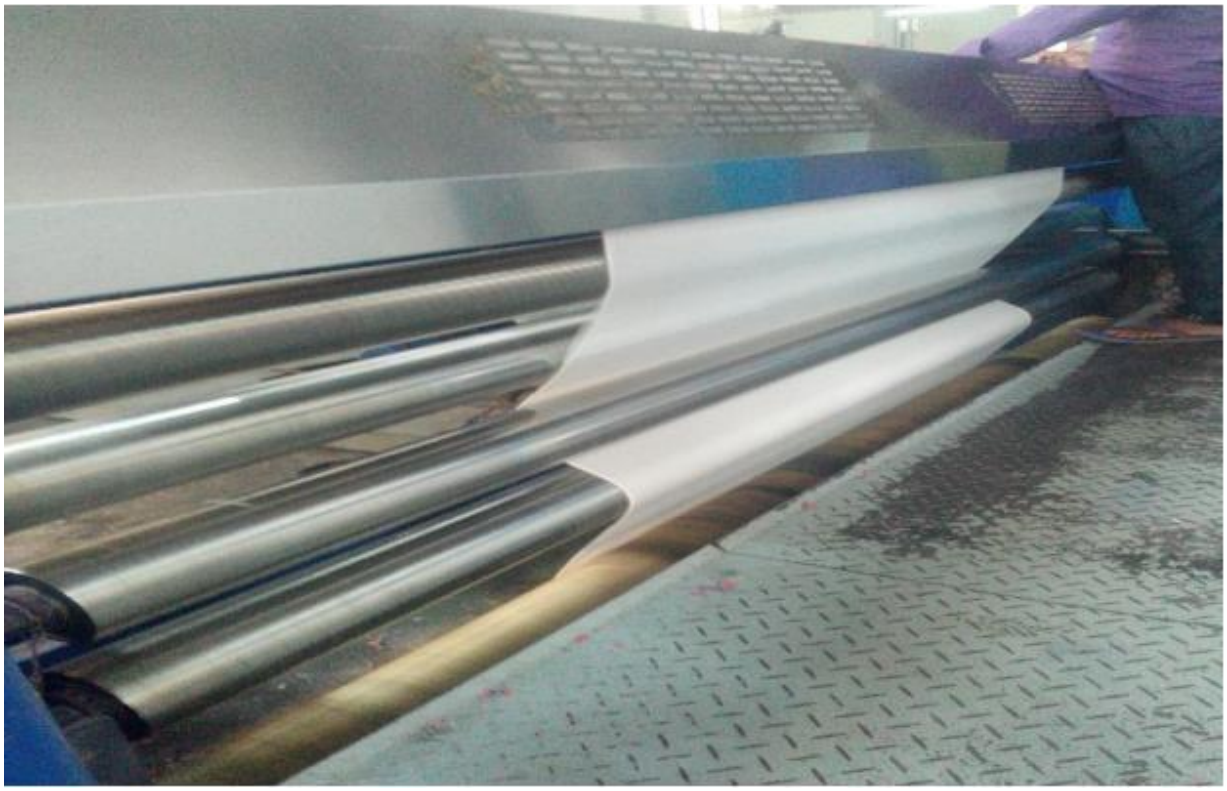


Figure. 3.2.6 Overfeed roller

Chamber: Fabrics dry out in this chamber.

Figure. 3.2.7 Chamber

Delivery roller: This roller delivers the finished fabrics consist of several roller that resist to crease mark on the fabrics.

Figure. 3.2.8 Delivery roller

3.1.4 Sample specification

Details about various types of Fabric exported from Bangladesh in Knitting Industry:

FabricName	GSM	Diameter	CPI	WPI	SL
A. Polyester Single Jersey	165	63”	71	38	2.5mm
B. Rib Fabric	303	53”	56	41	2.62mm
C. Lycra Single Jersey	192	68”	65	43	2.31mm
D. Fleece Terry	240	65”	55	34	2.5mm
E. Single Jersey	165	64”	57	40	1.7mm
F. Waffle fabric	182	70”	47	29	2.66mm
G. Single jersey	170	72”	57	39	1.25mm
H. Single lacost	180	64”	54	32	1.67mm
I. Single jersey	135	72”	52	39	2.8mm
J. Lycra single jersey	290	70”	73	58	2.73mm
K. Spandex Single Jersey	136	71”	52	39	2.7mm
L. Lycra Jersey	290	70”	73	58	2.73mm
M. Lycra Viscos	180	58”	55	34	2.7mm

Table 1.1: various types of Fabric exported from Bangladesh in Knitting

Discussion about various types of Fabric exported from Bangladesh in Knitting:
We are analyzing the data table Maximum GSM 303 of Rib Fabric and Minimum GSM 135 of Single Jersey, Maximum Diameter 72” of Single jersey Fabric and Minimum Diameter 53” of Rib Fabric, Maximum CPI 73 of Single Jersey and Minimum CPI 47 of Waffle. Maximum WPI 58 of Lycra single Jersey and Minimum WPI 32 of Single Lacoste. Maximum SL 2.73mm of Lycra single Jersey and Minimum SL 1.25mm of Single Jersey.

3.1.5 Operating information Stentering of Knit Fabric

SL NO.	Fabric types	Temperature (0C)	M/C Speed (m/min)	Overfeed %
1	Polyester single jersey	110	22	2
2	(1*1) Rib	140	17	55
3	Lycra single jersey	135	20	60
4	Fleece terry	140	15	70
5	Single jersey	120	20	50
6	Waffle	140	19	70
7	Single jersey	130	24	25
8	Single lacost	140	18	70
9	Single jersey 100% cotton	130	27	70
10	Lycra single jersey	195	10	35

Table 1.1: Operating information Stentering of Knit Fabric

Discussion about Operating information Stentering of Knit Fabric

We are analyzing the data table Maximum Temperature 195 of Lycra Single Jersey and Minimum Temperature 110 of Polyester Single Jersey. Maximum Machine Speed 27(m/min) of Single Jersey 100% Cotton and Minimum Machine Speed 10(m/min) of Lycra Single Jersey. Maximum Overfeed

70 of Fleece Terry, Waffle, Single Lacost, Single jersey 100% cotton and Minimum Overfeed 2 of polyester Single jersey .

CHAPTER-4
Discussion of Results/Finding

4.1 Effects of stentering on GSM (gram per square meter) of different knit fabrics.

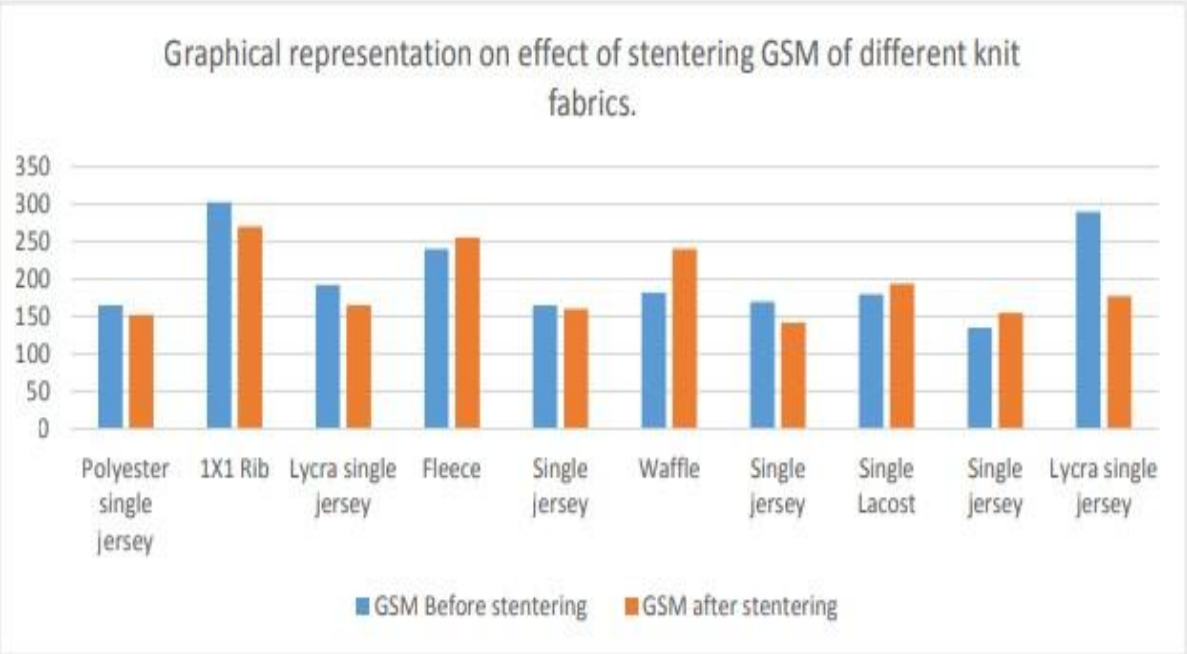


Figure. 4.1 change of different knit fabrics GSM after stentering

In column diagram we can see that change in GSM of different knit fabrics. In the column diagram different knit fabrics sample takes along with X-axis and change in GSM of those fabric takes along Y-axis direction. From the graph we can see that GSM of polyester single jersey fabric decrease the decease percentage is 7.87%, 1*1Rib fabric decrease the decease percentage is 10.89%, Lycra single jersey fabric decrease the decrease percentage is 14.06%, Fleece terry fabric increased the increase percentage is 6.67%, single jersey cotton fabric decrease the decrease percentage is 3.30%, waffle fabric increase the increase percentage is 34.06%, Single jersey decrease the decrease percentage is 18.82%, single lacost increase the increased percentage is 7.77%, lycra single jersey decrease the decrease percentage is 38.96% most of the fabrics GSM decrease because when before stentering process there have many dirt like after enzyme finishing process lot of hairy fiber adhere on the fabric surface for this before GSM is large than after GSM. When fabrics passed through the stentering process, excessive dirt dust removes and and stretched the fabrics for this decrease the fabrics GSM.

4.2 Effects of stentering on CPI (course per inch) of different knit fabrics.

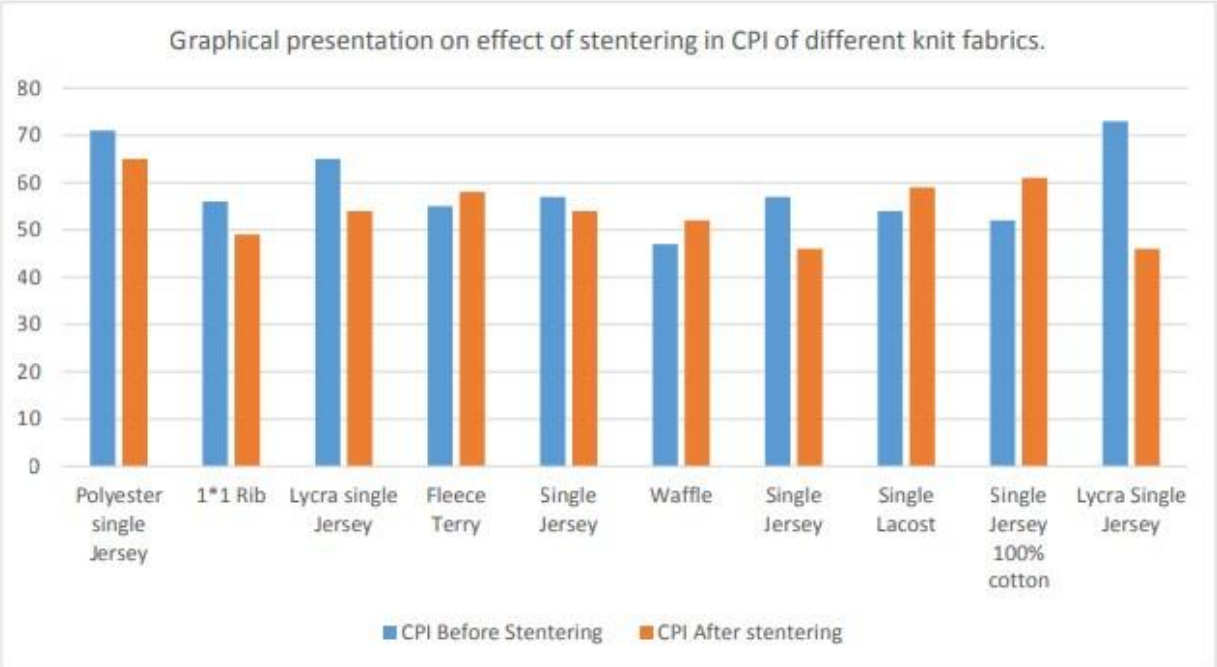


Figure. 4.2 change of different knit fabrics CPI

In this column diagram we can see that change in CPI of different knit fabrics because of stentering. In this column diagram different knit fabrics are taken along with X-axis and the CPI before stentering, afterstentring is taken along with Y-axis. We take the ten different knit fabrics sample from before stentering and after stentering to understand the effects of stentering process. We can see from the graph that the polyester single jersey fabrics CPI decrease 8.45%, (1*1) Rib decrease 12.5%, Lycra single jersey decrease 16.92%, Fleece terry increase 5.26%, Single jersey cotton decrease 5.26%, waffle increase 10.63%, single jersey decrease 19.29%, single lacost increase 9.25%, single jersey increase 17.30%, Lycra single jersey decrease 36.98% after completing stentering process because more overfeed if we set more over feed % then the fabrics GSM increase and CPI also increased after stentering, and some of fabrics CPI decrease because of stretching fabrics if we stretch the fabrics then the fabrics GSM decrease and CPI also decrease.

4.3 Effects of stentering on WPI (course per inch) of different knit fabrics.

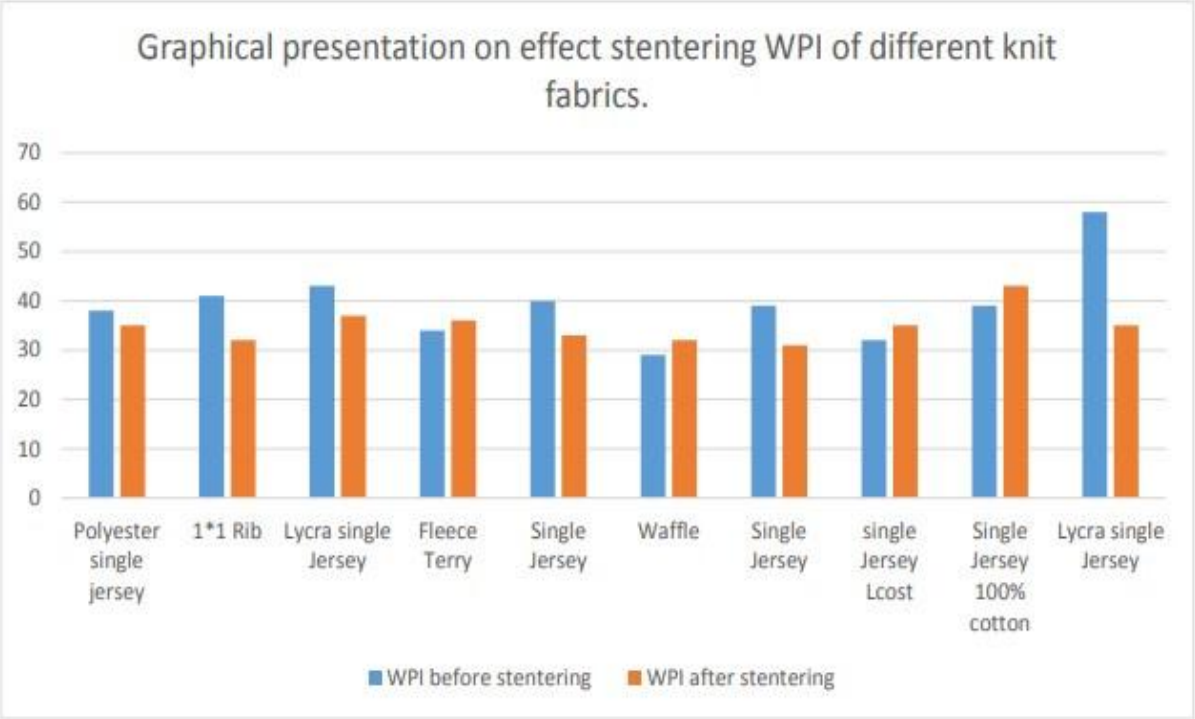


Figure. 4.3 Change of WPI after stentering process in different knit fabrics

In this column diagram, we can see that the WPI changes of different knit fabrics for stentering effects we take ten different knit fabrics sample to understands the changes their WPI. Here different knit fabrics before stentring and after stentering sample taken along to X-axis and their WPI is taken along to Y-axis. At first, we took the before stentering sample then we treated the fabric sample by stenter machine and collect the finished fabrics sample. Then we count the WPI by use counting glass. From this graph we can see that the polyester single jersey fabrics WPI decrease 7.79%, (1*1) Rib decreases 21.95%, Lycra single jersey decrease 13.95%, Fleece terry increase 5.88%, single jersey cotton decreases 17.5%, waffle increase
10.34%, single jersey decreases 20.51%, single lacost increase 9.37%, single jersey increases 10.25%, Lycra single jersey decrease 39.65%, after stentering process. After finishing the fabric for stretching when we stretch the fabrics, GSM is decreased and WPI also decrease, and some fabrics WPI increased for overfeed % when we increase over feed % GSM is increased and WPI also increased.

4.4 Effects of stentering on SL (stitch length) of different knit fabrics

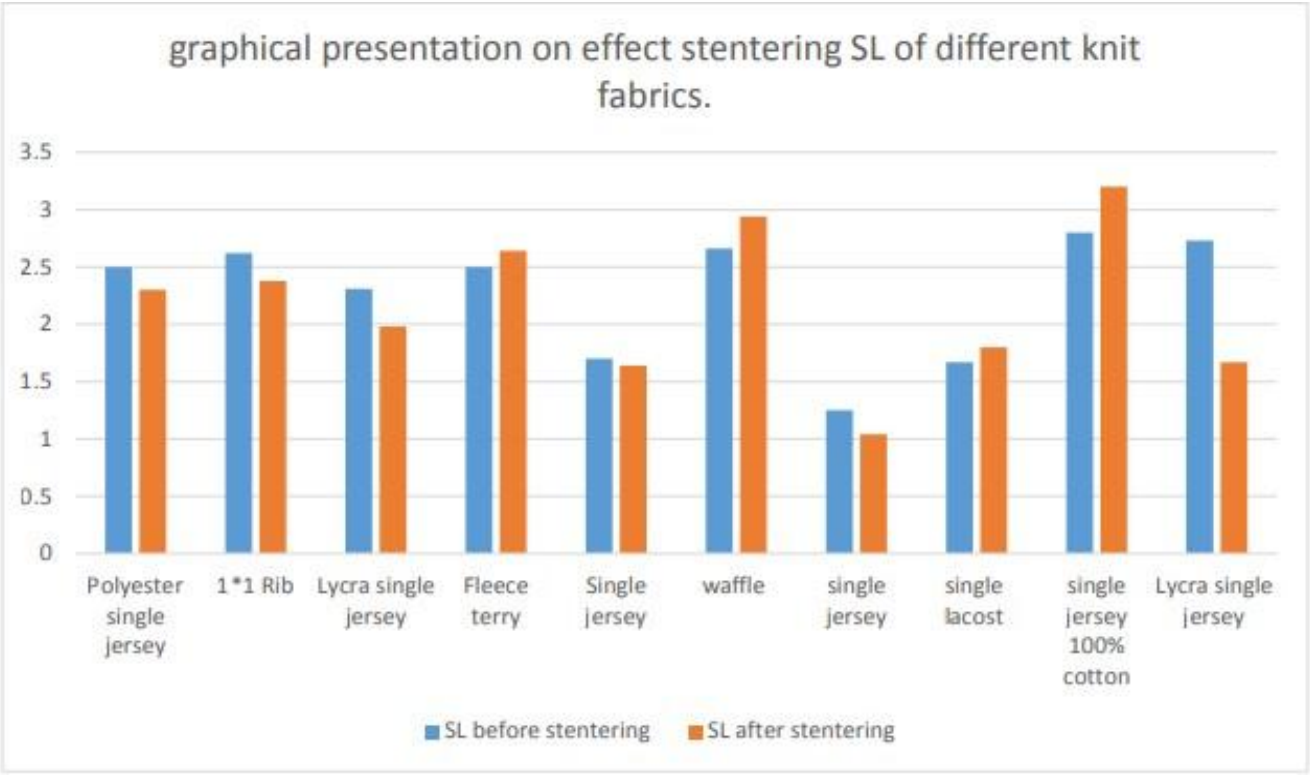


Figure. 4.4 Changes of SL after stentering process in different knit fabrics

In this column diagram, we can see that the changes of SL of different knit fabrics because of stentering effects. Here we take ten types of different knit fabrics sample before stenter and after stenter to understand the changes of SL. We were taken ten types of different knit fabrics sample before stenter and after stenter along to X-axis and their SL is taken along to Y-axis. Here we see that polyester single jersey fabrics SL decrease 8%, (1*1) Rib decreases 9.16%, Lycra single jersey decrease 14.28%, Fleece terry increase 5.56%, single jersey decreases 3.53%, waffle increase 10.52%, single jersey decreases 16.8%, single lacost increase 11.37%, single jersey increase 14.28%, Lycra single jersey decrease 38.82%, after stentering process. In finished fabrics from unfinished fabrics, because unfinished fabrics contains wax, oil, dirt, and dust these impurities are removed by finished fabrics by stenter machine and then knit fabrics loop fill up the gap where oil, wax, dust, and dirt situated so this stage SL is decreased. But we can also see that some fabrics SL is increased after stentering process because of fabrics stretching by stenter machine when we stretch the fabrics by stenter the fabrics loop increases and some gap created then fabrics SL increased.

4.5 Effects of stentering on diameter of different knit fabrics.

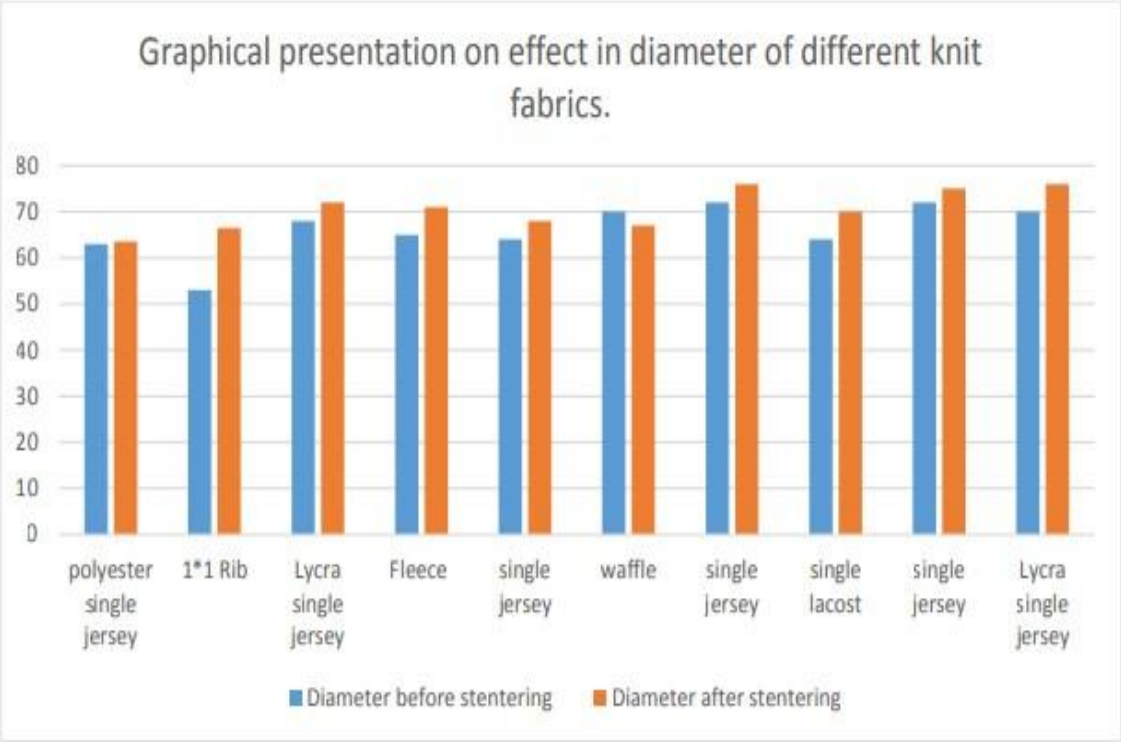


Figure. 4.5 changes of diameter in different knit fabrics after stentering.

From this graphical diagram, we can see that the diameter changes of different knit fabrics after stentering process. Here we take ten kinds of different knit fabrics before stentering process and after stentering process to understand the changes of diameter. We take ten different knit fabrics samples along to X-axis and takes their diameter along to Y-axis. From this graph we can see that polyester single jersey fabrics diameter is increased 0.79%, (1*1) Rib increases 25.47%, Lycra single jersey increase 5.88%, Fleece terry increase 9.23%, single jersey increases 6.25%, waffle decrease 4.48%, single jersey increases 5.5%, single lacost decrease 9.37%, single jersey increases 4.16%, Lycra single jersey increase 8.57% after stentering process, because diameter of fabrics is maintained according to buyer requirement by stretching fabrics. When fabrics is remained unfinished situation generally remain squeeze position for this fabric diameter is remain less but when fabrics is stretching by stenter machine fabrics diameter is increased.

4.6 Effects of stentering on shrinkage% of different knit fabrics.

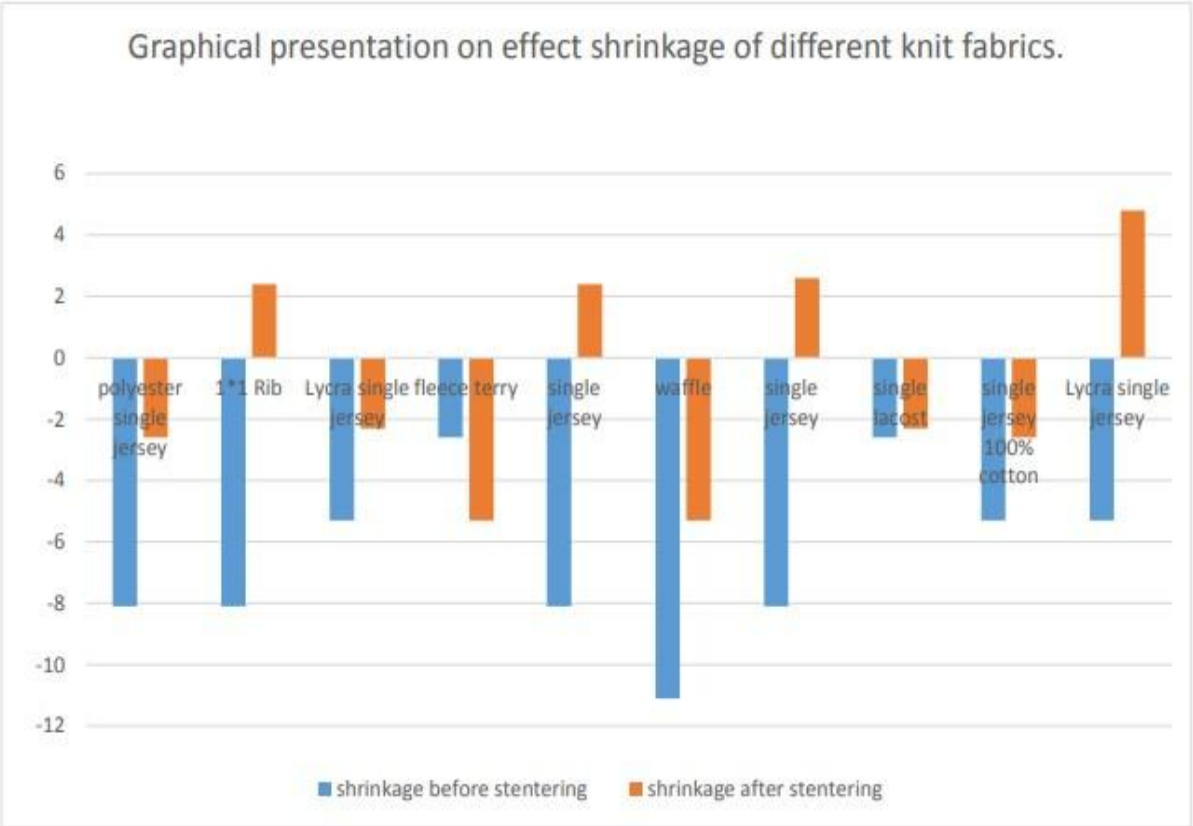


Figure. 4.6 Changes of shrinkage in different knit fabrics after stentering process

This column diagram is drawn for changes fabrics shrinkage before stentering and after stentering process. Here we take ten kinds of knit fabrics samples before stenter and after stenter to understand changes of diameter. Here we take ten knit fabrics sample along to Xaxis and shrinkage before stenter and after stenter is taken along to Y-axis, minus value is taken along to – Y-axis. From this diagram, we can see that maximum fabrics are shrinkages after wash because when fabrics are washed, the fibers release tension that was created during knit fabrics manufactured. The release of tension deforms fabrics after wash. Some fabrics show extension because after wash fabrics decrease the strength and extension is occurred.

Chapter-5
CONCLUSION

5.1 Conclusion:

We know the different types of knit fabrics and their final use after finishing the thesis (project) work. We also learned about the effects of stenting process on different types of knit fabric. Before we started our thesis (project) we didn't know much about knit textiles, and we didn't know much about the effects of stenting method on different knitting materials. Now we can claim that the fabric has increased or decreased following GSM, CPI, WPI, SL, diameter, and compression stenting methods.

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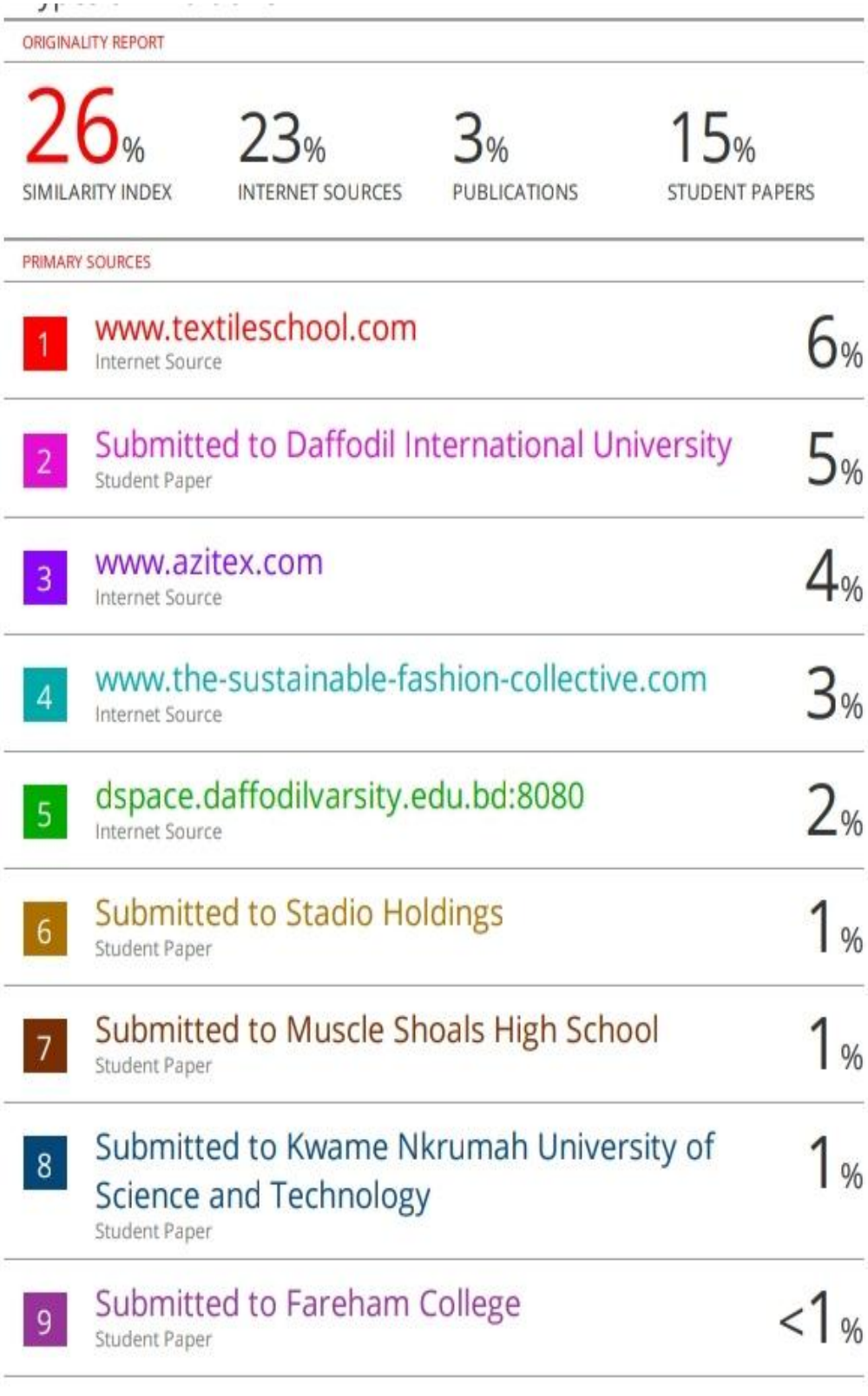

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