Faculty of Engineering

Department Of Textile Engineering

PROJECT (THESIS) REPORT ON

Impact of Knitted Structure on Physical Properties (Abrasion & Bursting Strength) of Knitted Fabrics.

Course Title: **Project (Thesis)**

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This Report presented in partial fulfillment of the Requirement for the Degree of

Bachelor of Science in Textile Engineering.

Advanced in Fabric Manufacturing Technology

Declaration:

We hereby declare that, this thesis paper has been done under the supervision of **Md. Farhad Hossain**, Lecturer, Department of Textile Engineering, Faculty of Engineering, Daffodil International University. We further declare that no portion of this thesis or any other portion of this paper has ever been submitted elsewhere for the purpose of receiving a degree or diploma.

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LETTER OF APPROVAL

The Project titles "**Impact of Knitted Structure on Physical Properties (Abrasion & Bursting Strength) of Knitted Fabrics"** has been submitted to the following respected members of the Board of Examiners of the Faculty of Engineering by the following students on February 2023 in partial completion of the prerequisites for the degree of Bachelor of Textile Engineering and has been approved as satisfactory.

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We begin by expressing our sincere gratitude and thanks to the Supreme Being for His divine favors, which have enabled us to successfully complete this project.

We are appreciative and owe a debt of gratitude to our supervisor, Md. Farhad Hossain, Lecturer, Department of Textile Engineering, Faculty of Engineering, Daffodil International University, for encouraging us to complete this project successfully with his extensive knowledge and keen interest in the field of enhancing knitted fabrics' physical properties. This project was finally finished thanks to his never-ending patience, astute direction, consistent encouragement, energetic supervision, constructive criticism, and invaluable advice. He also reviewed numerous subpar versions and corrected them at every stage.

Also, we would like to thank Md. Mominur Rahman Sir, Assistant Professor and Department Head (In-Charge) of textile engineering at Daffodil International University, for his ongoing assistance in the preparation of this project report. We thank our fellow students at Daffodil International University who participated in the discussions while completing the course assignments.

Finally, we must respectably thank the ongoing assistance and blessings of our professors, friends, and family.

Dedication

We want to start by thanking Allah for this Industrial Training report.

This report is also dedicated to **Md. Farhad Hossain**, Lecturer, Daffodil International University who greatly assisted us in finishing our industrial training report.

Finally, we want to thank our parents for being our biggest supporters and motivators as we dedicate this industrial report to them.

Statement of Contributions

We all together worked very hard to complete this report. **Shakibul Haque Chayan (191-23-639)** produced the fabrics in the factory. He also brought the fabrics to the university lab and measured the GSM of the fabrics practically. He also determined the WPI of the fabrics. **Sajjad Hosen (191-23-654)** and **Abu Bokkar Pramanik (191-23-695)** measured the CPI and SL of the fabrics. We altogether measured the abrasion and bursting strength of the fabrics in the university lab.

Our supervisor, **Md. Farhad Hossain** always instructed us about this thesis. Lab Assistant, **Md. Alamin Hossain** instructed us to operate the machines of the lab. With everyone's effort, we completed this thesis.

Abstract:

The final usage of knitted fabric is significantly influenced by its physical characteristics, such as bursting strength, gram per square meter (GSM), stitch density, etc. The goal of this study is to examine the physical characteristics of various knit fabrics made from various types of fiber and Material. It has been demonstrated that different knit structures and fiber types, such as cotton, polyester, mélange, spandex, and CVC, have an impact on the fabric's physical characteristics, including bursting strength, pilling, GSM, and stitch density. Every experiment for this study is run on a grey fabric. The findings showed that physical properties of knitted fabric varies due to variation of knitted structure. All fabrics other than Pointel Rib and 3-Thread Fleece have good abrasion resistance. Pointel Rib was made of melange yarn, while 3-Thread Fleece contained a significant percentage of hairy fiber. Except Single Jersey fabric, which has a lot of hairy fiber, all other textiles are reasonably abrasion resistant. As Rib fabrics have the greatest and lowest values in Ball Bursting, Rib fabrics are given top importance. Whereas Flat Back Rib has the lowest Bursting Strength, 1×1 Rib has the highest. Conversely, Flat Back Rib has the lowest extensibility whereas 9×4 Rib has the highest.

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Chapter 1: Introduction

1.1 Introduction

Knitted products are very popular all over the world. Maintaining the physical properties of knitted fabrics such as abrasion and bursting strength is one of the most important challenges. For producing garments, the knit fabrics should be resistant to abrasion as much as possible. Parachutes are made with knitted fabrics. So, while producing knit fabrics, the bursting strength property should be maintained carefully.

1.2 Objectives:

- The main objective in this work to determine the effect of fabric structures on physical properties of knit fabrics.
- Find out how fibers effect on physical properties of knitted fabrics.
- Find out the best fabric having the best physical properties.

1.3 Outcomes:

- Fabrics GSM has a great impact on bursting strength.
- Diagonal fleece fabric shows the best resistance to abrasion.
- Fabrics SL, WPI, CPI has great impacts on fabrics physical properties.
- Fabrics made of Melange shows most weight loss, Cotton shows less than cotton, CVC shows less weight loss than cotton.

1.4 Limitations:

- In this research, we could manage to get only twelve test specimens of Cotton, CVC, Melange and Spandex fiber. More specimen would help to get more accurate results.

Chapter 2: Literature Review

2.1 Knitting Technology

By converting continuous yarn strands into a series of interlocking loops, each loop in the knitting process hangs on the one before it to create fabric. Weft knitted fabrics and warp knitted fabrics are the two primary categories of knitted fabrics.

One thread that runs horizontally can be used to create a row of horizontal loops for a weft knitted construction.

Depending on the fabric type, weft knitting includes:

1. Plain or single jersey knitting
2. Rib knitting
3. Interlock knitting
4. Purl knitting.

Single Jersey fabrics and their derivatives are generally made in S/J Circular Knitting Machines. On the other hand, Double Jersey fabrics derivatives such as Rib and Interlock fabrics are made in D/J Circular Knitting Machines.

2.2 Single Jersey Fabric

Weft knitted single jersey is created using just one set of needles. The most common fabric used to make T-shirts is single jersey. With a single jersey, the front and back have various appearances. This fabric has gained appeal since it is very warm, flexible, stretchy, and comfortable to wear.

2.2.1 Some derivatives of Single Jersey Fabric

- Plain S/J
- Single Lacoste
- Double Lacoste
- Single Pique
- Double Pique
- Fleece etc.

2.2.2 Derivatives of Fleece:

- 2-Thread Fleece
- 3-Thread Fleece (Normal & Diagonal)

2.3 Double Jersey Fabric

Weft knitted double jersey is created using two sets of needles. Although the appearance of the face and back of a double jersey is the same as that of a single jersey, they are practically identical.

2.3.1 Derivatives of Double Jersey Fabric:

- Rib (1×1 Rib, 2×1 Rib, 8×4 Rib, Flat Back Rib, Pointel Rib etc.)
- Interlock
- Waffel
- Thermal etc.

2.4 Importance of yarn for Knitting

One of the most common methods for producing cloth is knitting. Yarns are blended together in this method to create a thick, elastic fabric that is still flexible. In order to knit the highest-quality fabric or defect-free fabric, we must select the best yarn or ideal yarn. So, we must be careful to choose yarn with the right characteristics.

As an ideal yarn, yarns should have the following characteristics:

1. The yarn is consistent in length and has a circular cross section.
2. Yarn is made up of radial layers that are concentric.
3. Each fiber maintains a consistent distance from the yarn axis by rotating uniformly around one of the concentric cylinders.
4. A fiber near the center will travel along the axis in a straight line.
5. The yarn-based axis of the coir sides of circular cylinders.
6. The density of packing, or the number of filaments or fibers across the unit area, is constant. The yarn's fibers remain the same throughout the model.
7. The yarn will have the same amount of twist per unit length for each filament.
8. There are a huge number of filaments in the yarn.

Any yarn should not be permitted to be used in knitting to create fabric if any of the aforementioned yarn qualities are missing. Although maintaining the yarn's parameter is necessary for excellent knitting, it cannot provide that for you.

2.5 Knit Fabric GSM:

GSM is short for grams per square meter. GSM is a unit of fabric weight. It has no restrictions but does influence several fabric qualities. In order to prevent financial loss throughout the manufacturing process, fabric weight must be regulated. For instance, ordering heavier fabric than is required for the product being created. GSM is a significant knitted fabric metric that is crucial for a textile engineer to comprehend and produce fabric. Engineers must manage fabric GSM in order to meet consumer quality expectations. The yarn count is a highly important component for GSM variation. This allows us to examine which textiles are heavier and lighter per unit area.

$$GSM = (CPI \times WPI \times 0.9158)/Ne$$

2.6 Stitch Length

Stitch length or loop length is the amount of yarn needed to create a finished knitted loop. A stitch length is the length of yarn that includes the needle loop and each side's half of the sinker loop.

2.7 WPI (Wales Per Inch)

Wales are the rows of loops that run the length of the cloth. The term "wales per inch" refers to the number of wales in each inch of knit fabric (WPI).

2.8 CPI (Course Per Inch)

The term "Course Per Inch" refers to the number of stitches in each inch of knit fabric (CPI).

2.9 Abrasion Resistant Fabric:

A fabric's capacity to withstand surface wear brought on by flat rubbing contact with another material is known as abrasion resistance. Wyzenbeek and Martindale are two separate test procedures frequently used by the textile industry to evaluate abrasion resistance. Due to the fact that both of these test procedures are only capable of assessing a textile's flat abrasion resistance, they are unable to account for edge abrasion or other types of surface wear that might be present in actual upholstered applications.

2.10 Bursting Strength of Knit Fabric

When a fabric is compressed, it immediately starts to expand simultaneously in every direction. When the pressure is gradually increased, the cloth eventually reaches a pressure limit and bursts. Burst strength refers to the upper limit of pressure. As a result, we may state that "the bursting strength of the fabric is defined as the pressure necessary to rupture the fabric surface." Ball Bursting is a special type of bursting test. Ball Bursting is the required amount of force (N) to break the fabric. The most crucial feature for parachute cloth is its bursting strength. The bursting strength of the fabric is significantly influenced by the type of yarn and material used, the count, and the construction of the fabric.

Chapter 3: Methodology

3.1 Materials:

3.1.1 Yarns:

- Different Count Cotton
- Different Count CVC
- Different Count Grey Melange
- Different Count Polyester
- 140 Den Spandex

3.1.2 Fabrics:

- Plain Interlock
- 1×1 Rib
- Single Jersey
- Flat Back Rib
- Thermal
- 3-Thread Fleece
- Pointel Rib
- 9×4 Rib
- 2-Thread Fleece
- Double Pique
- Single Lacoste
- 3-Thread Diagonal Fleece

3.1.2.1 Construction of Fabrics

SL No	Fabric Name	Yarn Count	Sample Fabric (Front Side)	Sample Fabric (Back Side)
01	Plain Interlock	32/1 Melange 5%		
02	1×1 Rib	30/1 COM 100% Cotton & 140D Half Feeder Spandex (5%)		
03	Single Jersey	28/1 KH 100% Cotton		
04	Flat Back Rib	30/1 COM 100% Cotton		

05	Thermal	30/1 COM 100% Cotton		
06	3-Thread Fleece	28/1 Melange 5% & 16/1 COM 100% Cotton		
07	Pointel Rib	26/1 KH 100% Cotton & 140D Full Feeder Spandex (5%)		
08	9×4 Rib	26/1 Comb 100% Cotton & 140D Full Feeder Spandex (5%)		

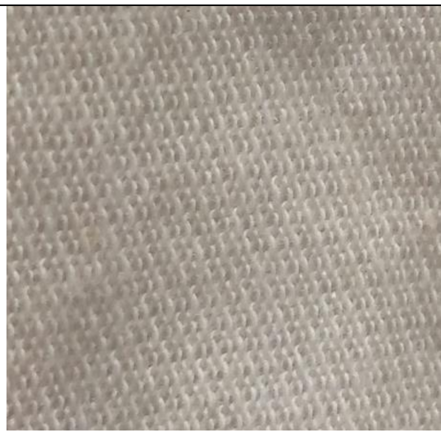
09	2-Thraed Fleece	30/1 & 34/1 COM 100% Cotton 140D Full Feeder Spandex (5%)		
10	Double Pique	32/1 COM 100% Cotton & 75D Polyester		
11	Single Lacoste	32/1 COM 100% Cotton		
12	3-Thread Diagonal Fleece	30/1 CVC (60/40) & 20/1 COM 100% Cotton		

Table 1 (3.1): Sample Fabric Table

3.2 Machine Description

3.2.1 Knitting Machines

3.2.1.1 Single Jersey Circular Knitting Machine

Figure 1 (3.1): Single Jersey Circular Knitting Machine

Brand: PAILUNG

Origin: New Taipei City, Taiwan

Cylinder Diameter: 40

Feeders: 112

GAUGE(NPI): 24

Needles: 3000

3.2.1.2 Fleece Machine

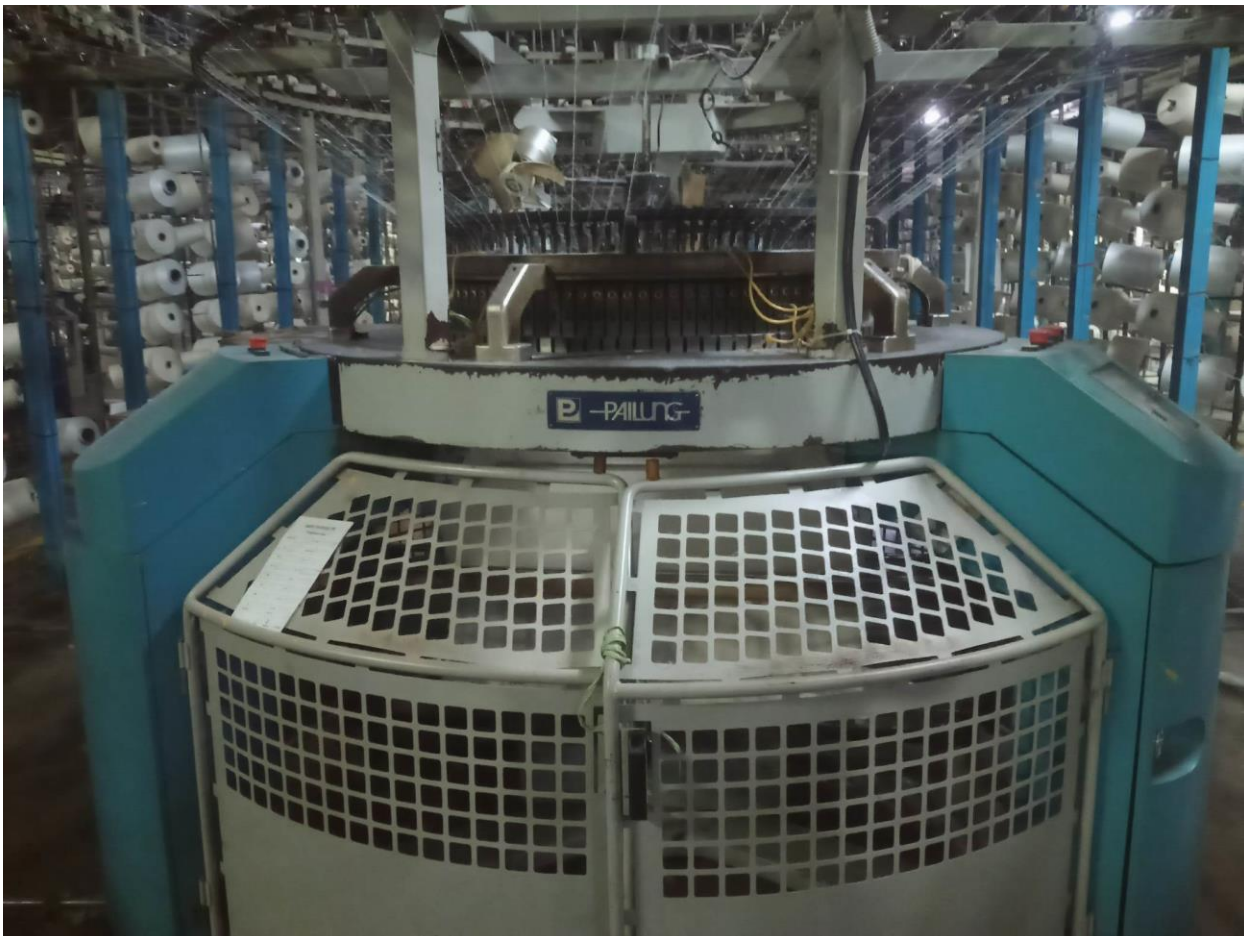


Figure 2 (3.2): Fleece Machine

Brand: PAILUNG

Origin: New Taipei City, Taiwan

Cylinder Diameter: 34

Feeders: 102

GAUGE(NPI): 20

Needles: 2136

3.2.1.3 Rib Machine

Figure 3 (3.3): Rib Machine

Brand: PAILUNG

Origin: New Taipei City, Taiwan

Cylinder Diameter: 40

Feeders: 96

GAUGE(NPI): 18

Needles: 4524

3.2.1.4 Interlock Machine

Figure 4 (3.4): Interlock Machine

Brand: PAILUNG

Origin: New Taipei City, Taiwan

Cylinder Diameter: 40

Feeders: 96

GAUGE(NPI): 24

Needles: 3016

3.3 Test Methods and Testing Machines:

3.3.1 Yarn Test

3.3.1.1 Count Test

Machines: Wrap Reel

Standards: ISO-2060

This International Standard specifies methods for the determination of the mass per unit length, and the mass per unit area.

Standard atmosphere for conditioning and testing

The atmosphere for conditioning and testing textiles is that defined in ISO 139. This atmosphere has a relative humidity of 65 ± 2% and a temperature of 20 ± 20 C.

Method- At first 1Lea (120yds) yarn is wound into the wrap reel. Then the wound yarns need to measured its weight in pound in digital balance. Then we need to put the value into the equation below:

Indirect count: $$N = \frac{w \times L}{W \times l}$$

Where, W = The sample's weight.

w = The system's unit weight.

L = The sample’s length

l = The unit length of the system/

In case of Polyester, the 5315 should be divided by the calculated count.

Figure 5 (3.5): Wrap Reel

3.3.1.2 Yarn Quality Test

Yarns quality are tested in the fabric inspection machine and the quality of the fabric is noted. If the yarn fails to achieve the required quality, then the yarns are rejected.

Method: At first fabric is made from the yarn and then the fabric goes through dyeing and finishing process. After finishing, the faults of the yarns are checked in the light source of the fabric inspection machine.

Figure 6 (3.6): Fabric Inspection Machine

3.3.2 Fabric weight (GSM):

The mass per unit length and per unit area of a fabric may be determined in more than one way.

Machine name: GSM Cutter.

Standard: ISO-3801

This International Standard specifies methods for the determination of the mass per unit length, and the mass per unit area.

Standard atmosphere for conditioning and testing

The atmosphere for conditioning and testing textiles is that defined in ISO 139. This atmosphere has a relative humidity of 65 ± 2% and a temperature of 20 ± 20 C.

Method- When the piece or sample length can be condition in the standard testing environment, the length and mass of the fabric are calculated, or the length, width, and mass of the fabric are determined and calculated. as appropriate, the computed mass per unit area

Figure 7 (3.7): GSM Cutter

3.3.3 Stitch Length, WPI & CPI

Stitch length, WPI & CPI is determined with the help of Counting Glass, Scale and Needle.

Method of determining Stitch Length: At first 100 Wales from same yarn are marked. Then then the yarn is untied from the fabric. Then the marked 100 Wales length are measured into the scale. Then the measured length is divided by 100.

Method of determining WPI: The Counting glass is put over the fabric and then the number of vertical lines present inside the counting glass is determined. The vertical lines are wales & in 1inch the lines are determined through counting glass.

Method of determining CPI: The fabric is marked 1inch horizontally through the counting glass. Then the yarns are untied. Then number of yarns are counted inside the marked 1inch fabric. The number of yarns in that marked portion is the number of courses.

Figure 8 (3.8): Thread Counting Glass

3.3.4 Abrasion:

Abrasion Machine: This device is used to test the ability of socks, gloves, carpet, nonwoven materials, leather, and high pressure laminated and printed surfaces to pill and abrasion.

Machine name- Martindale

Standard: ISO-12947-2

Testing Method: A cork-lined box is filled with specimens that are mounted on polyurethane tubes and rotated at a consistent speed. After a predetermined amount of yarn breakage, weight loss, fuzzing and pilling are evaluated visually.

Evaluation: Yarn Breakage is determined visually and weight loss percent is determined by the help of digital balance

$$\text{Weight Loss \%} = \frac{\text{Before Weight} - \text{After Weight}}{\text{Before Weight}} \times 100\%$$

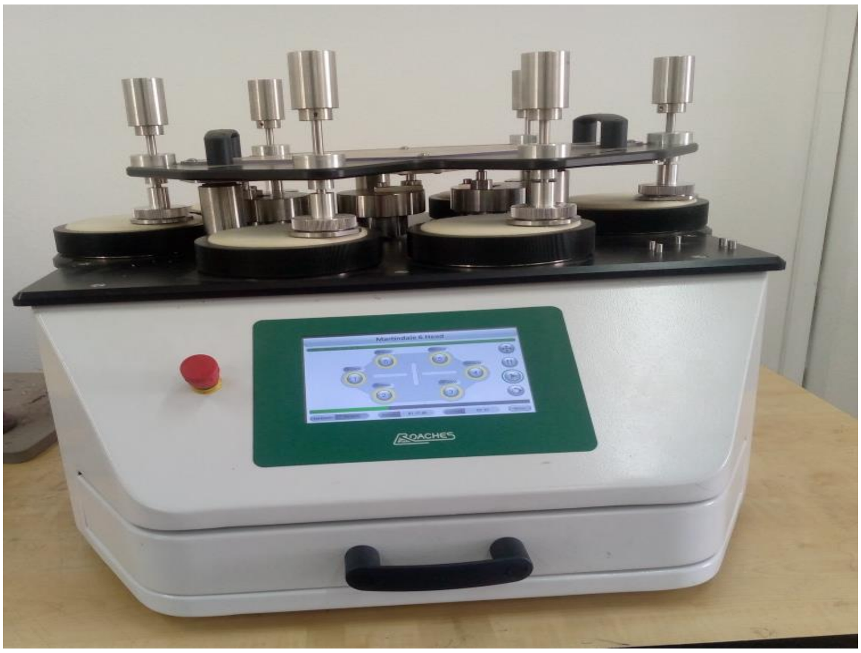


Figure 9 (3.9): Martindale Machine

3.3.5 Ball Bursting:

For knit fabric, nonwoven, plastic bags, tissue paper, and medicinal items, the bursting test is crucial. This test has been completed for both dry and wet fabric. To determine the bursting strength, we have taken dry fabrics.

Machine name: James Heal (Universal Strength Tester)

Standards: ISO 3303-1

Method: There are two versions of the software "Testwise for Truburst" available, however we have only used the Testwise Lite version, which is included by default. We began by setting the specimen on the jaw and continued once the ball was placed over the fabric. We took the reading after the fabric burst.

Figure 10 (3.10): Universal Strength Tester

Chapter 4: Result and Discussion

The test results are shown here following the completion of testing (GSM, SL, WPI, CPI, Abrasion and Bursting) & Yarn Quality in accordance with the previously discussed standards.

4.1 Test Results:

4.1.1 Yarn Test

YARN TEST REPORT

	Stripe	Neps	Dead Fiber	Thick & Thin Place	Slub	Contamination	Report
28/1 Melange (5%)	Nill	Minor	Minor	Minor	Minor	Minor	oK
32/1 Melange (5%)	Nill	Minor	Minor	Minor	Minor	Minor	OK
26/1 KH 100% Cotton	Nill	Minor	Minor	Minor	Minor	3pcs	OK
28/1 KH 100% Cotton	Nill	Minor	Minor	Minor	Minor	2pcs	OK
16/1 COM 100% Cotton	Nill	Minor	Minor	Minor	Minor	Yarn Conta-3pcs	OK
20/1 COM 100% Cotton	Nill	Minor	Minor	Minor	Minor	Poly Conta-3pcs	OK
30/1 COM 100% Cotton	Nill	Minor	Minor	Minor	Minor	Poly Conta-4pcs	OK
32/1 COM 100% Cotton	Nill	Minor	Minor	Minor	Minor	Poly Conta-6pcs	OK
34/1 COM 100% Cotton	Minor	Minor	Minor	Minor	Minor	P.P 1pcs	OK
30/1 CVC (60/40)	Nill	Minor	Minor	Minor	Minor	Minor	OK

Table 2 (4.1): Yarn Test Reports

4.1.2 GSM

SL No.	Fabric Name	GSM
01	Plain Interlock	177
02	1×1 Rib	318
03	Single Jersey	152
04	Flat Back Rib	230
05	Thermal	177
06	3-Thread Fleece	239
07	Pointel Rib	221
08	9×4 Rib	238
09	2-Thread Fleece	283
10	Double Pique	168
11	Single Lacoste	159
12	3-Thread Diagonal Fleece	230

Table 3 (4.2): GSM Results

4.1.3 SL, WPI & CPI

SL No.	Fabric Name	SL	WPI	CPI
01	Plain Interlock	2.40	30	97
02	1×1 Rib	5.5	27	49
03	Single Jersey	2.5	32	86
04	Flat Back Rib	2.4 & 1.2 & 4.2	24	105
05	Thermal	2.4 & 1.6	37	95
06	3-Thread Fleece	2.6 & 4.1 & 1.7	24	28
07	Pointel Rib	3 & 3.1	27	35
08	9×4 Rib	5.4	30	47
09	2-Thread Fleece	1.2 & 3	38	61
10	Double Pique	2.3 & 2.5	27	47
11	Single Lacoste	2.3	27	49
12	3-Thread Diagonal Fleece	1.9 & 4.3 & 3.5	26	31

Table 4 (4.3): SL, WPI & CPI Results

4.1.4 Abrasion: No yarn breakage and moderate pilling was found visually to all fabrics.

SL No.	Fabric Name	Weight Loss (%)
01	Plain Interlock	5.08%
02	1×1 Rib	2.83%
03	Single Jersey	7.24%
04	Flat Back Rib	3.91%
05	Thermal	5.08%
06	3-Thread Fleece	7.53%
07	Pointel Rib	8.14%
08	9×4 Rib	3.36%
09	2-Thread Fleece	3.18%
10	Double Pique	5.35%
11	Single Lacoste	5.66%
12	3-Thread Diagonal Fleece	0%

Table 5 (4.4): Abrasion Results

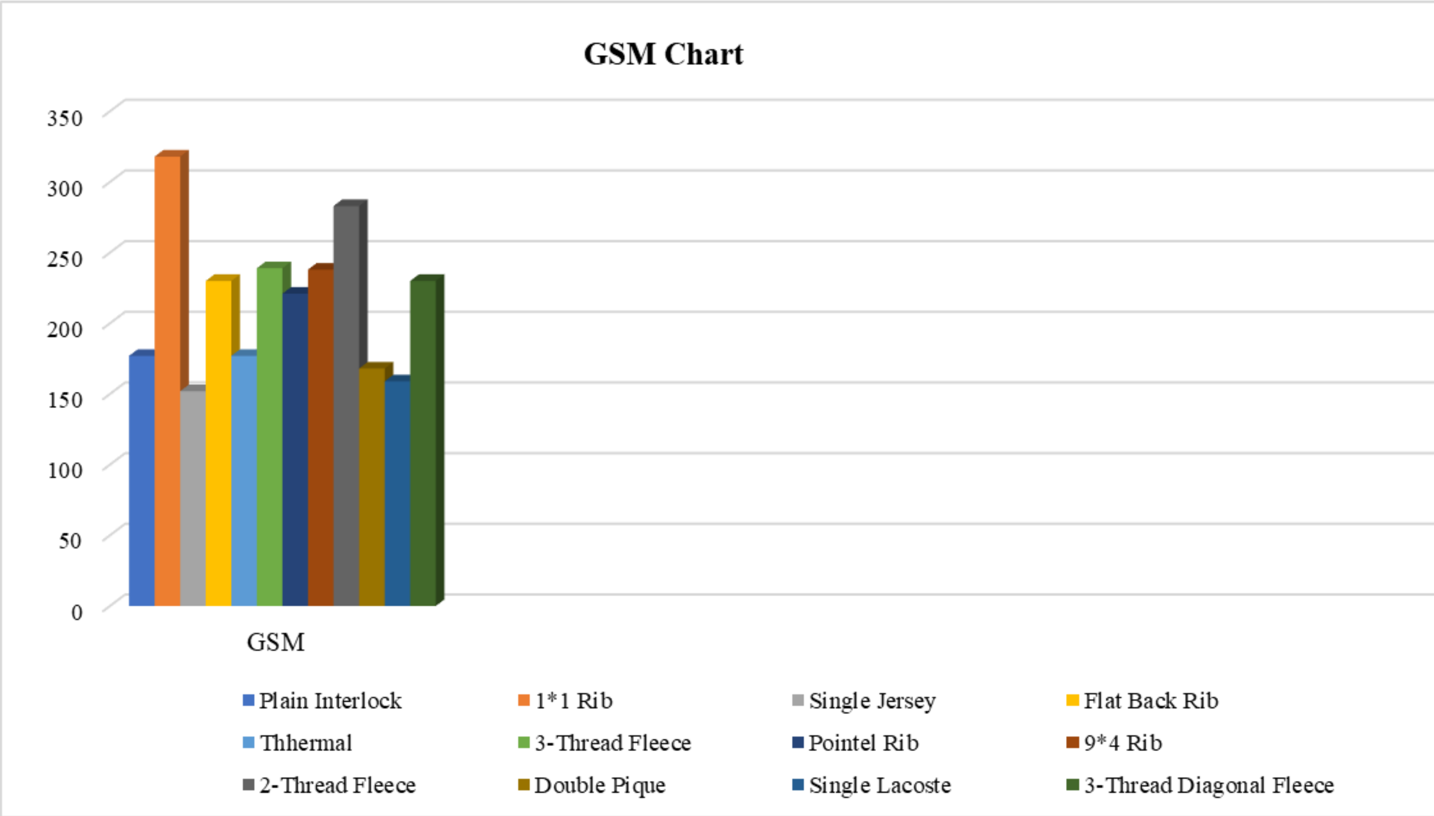
4.1.5 Ball Bursting

SL No.	Fabric Name	Rupturing Force (N)	Extension at Break (mm)
01	Plain Interlock	424.51	122.68
02	1×1 Rib	591.87	132.69
03	Single Jersey	351.62	119.44
04	Flat Back Rib	310.85	116.93
05	Thermal	463.30	120.93
06	3-Thread Fleece	313.77	118.68
07	Pointel Rib	372.50	124.17
08	9×4 Rib	373.06	135.18
09	2-Thread Fleece	408.98	133.43
10	Double Pique	427.99	123.68
11	Single Lacoste	438.62	119.18
12	3-Thread Diagonal Fleece	452.18	118.43

Table 6 (4.5): Ball Bursting Results

4.2 Discussion Based on Test Results

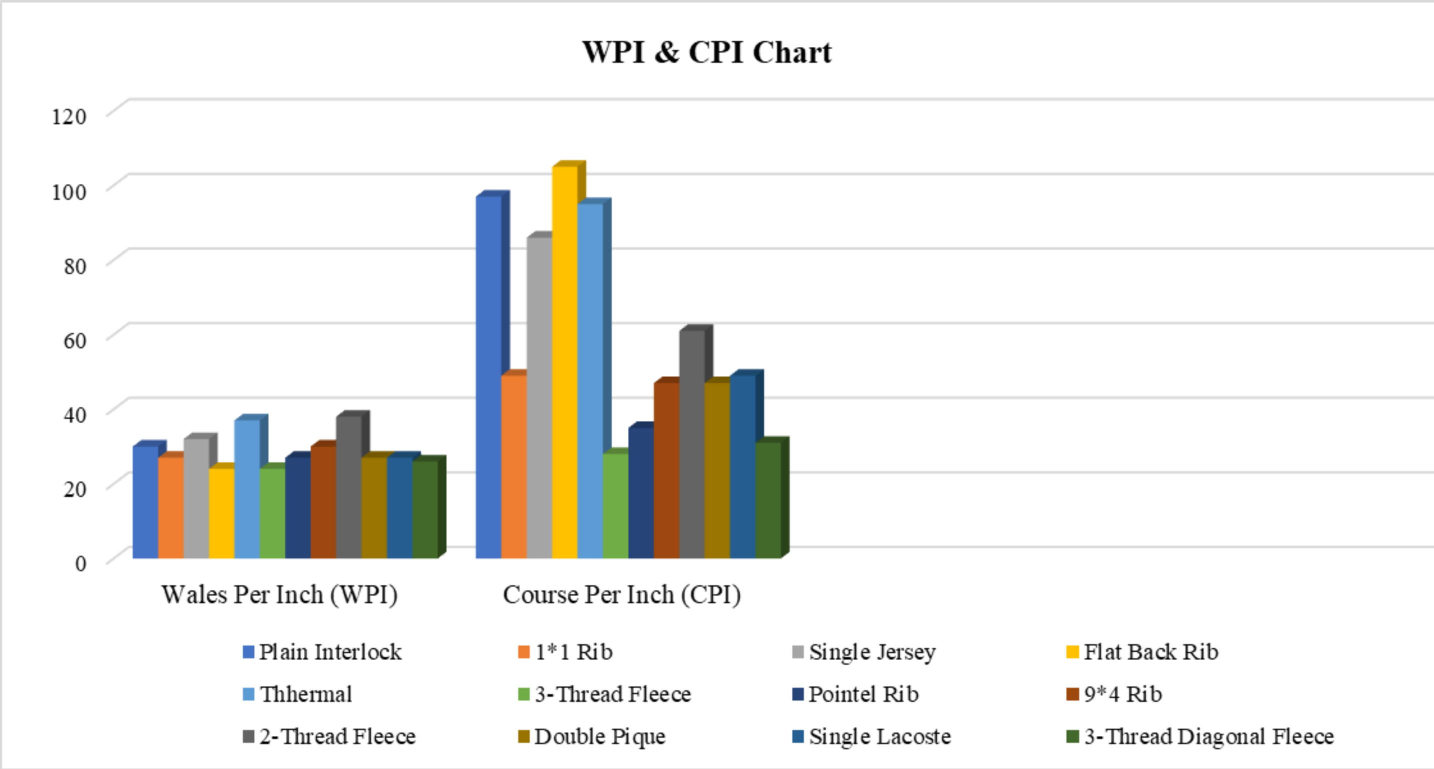
4.2.1 GSM



Discussion on GSM: According to the graph above,

1×1 Rib has the most GSM that is 318. 2-Thread Fleece is just behind it and its GSM is 283. Then 3-Thread Fleece (GSM 239), 8×4 Rib (GSM 238), Flat Back Rib (GSM 230), & 3-Thread Diagonal Fleece (GSM 230), Pointel Rib (GSM 221), Plain Interlock (GSM 177) & Thermal (GSM 177), Double Pique (GSM 168) and Single Lacoste (GSM 159) comes one after another. The Single Jersey fabric has the lowest GSM that is 152.

4.2.2 WPI & CPI



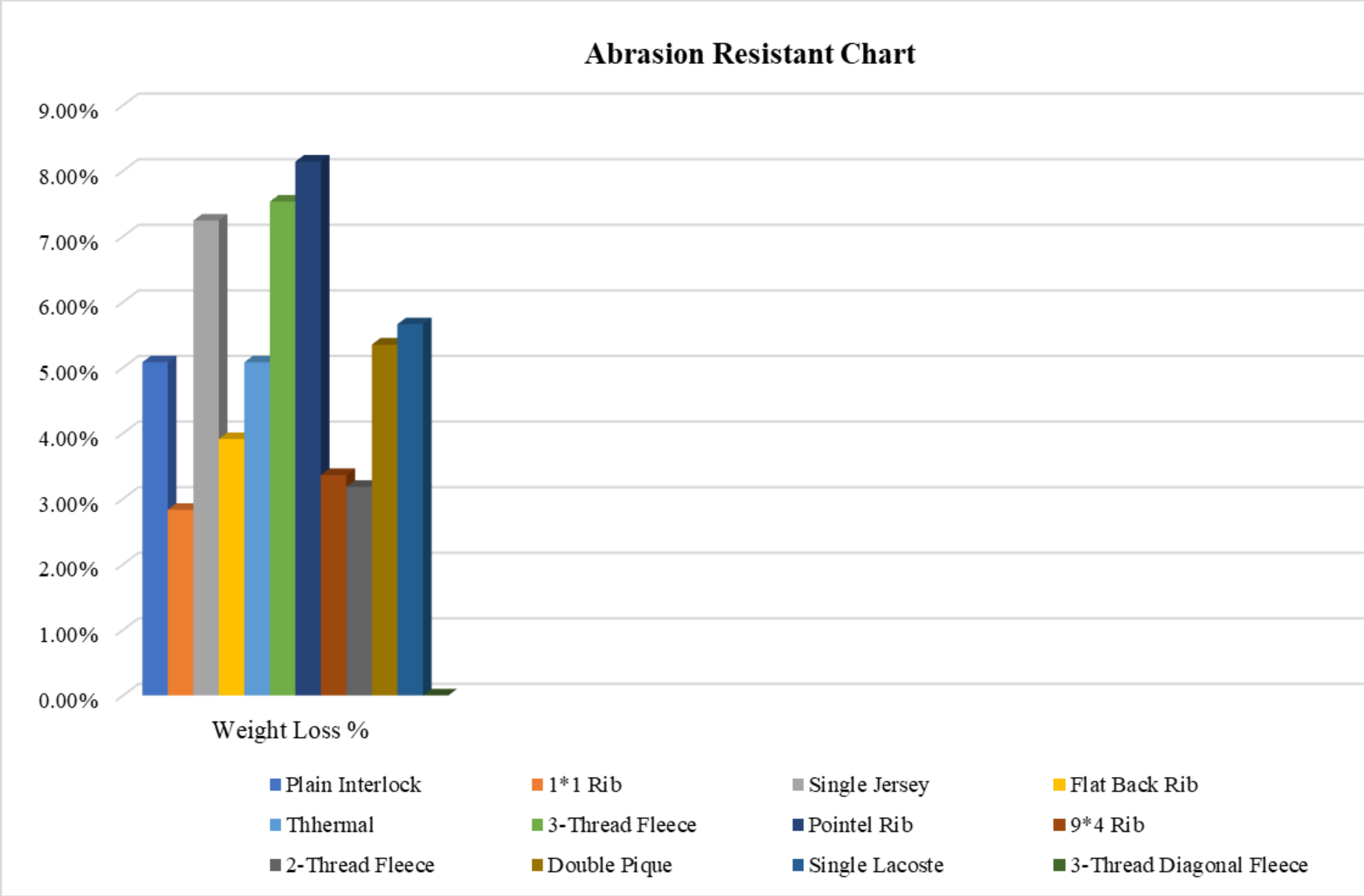
Discussion on WPI & CPI: According to the graph above,

The WPI of the fabric lies between 24 to 38. Flat Back Rib and 3-Thread Fleece has the lowest WPI that is 24 and 2-Thread Fleece has the highest WPI that is 38. The others are: Plain Interlock has 30, 1×1 Rib has 27, Single Jersey has 32, Thermal has 37, Pointel Rib has 27, 8×4 Rib has 30, Double Pique has 27, Single Lacoste has 27 and 3-Thread Diagonal Fleece has 26 WPI accordingly.

On the other hand, Flat Back Rib has the highest CPI that is 105 and 3-Thread Fleece has the lowest CPI that is 28. The others are: Plain Interlock has 97, 1×1 Rib has 49, Single Jersey has 86, Thermal has 95, Pointel Rib has 35, 8×4 Rib has 47, 2-Thread Fleece has 61, Double Pique has 47 and Single Lacoste has 49 CPI accordingly.

So, from the above discussion we can say that Fleece fabric contains very low CPI and Double Jersey derivatives (Plain Interlock, Flat Back Rib & Thermal) has a very high CPI.

4.2.3 Abrasion

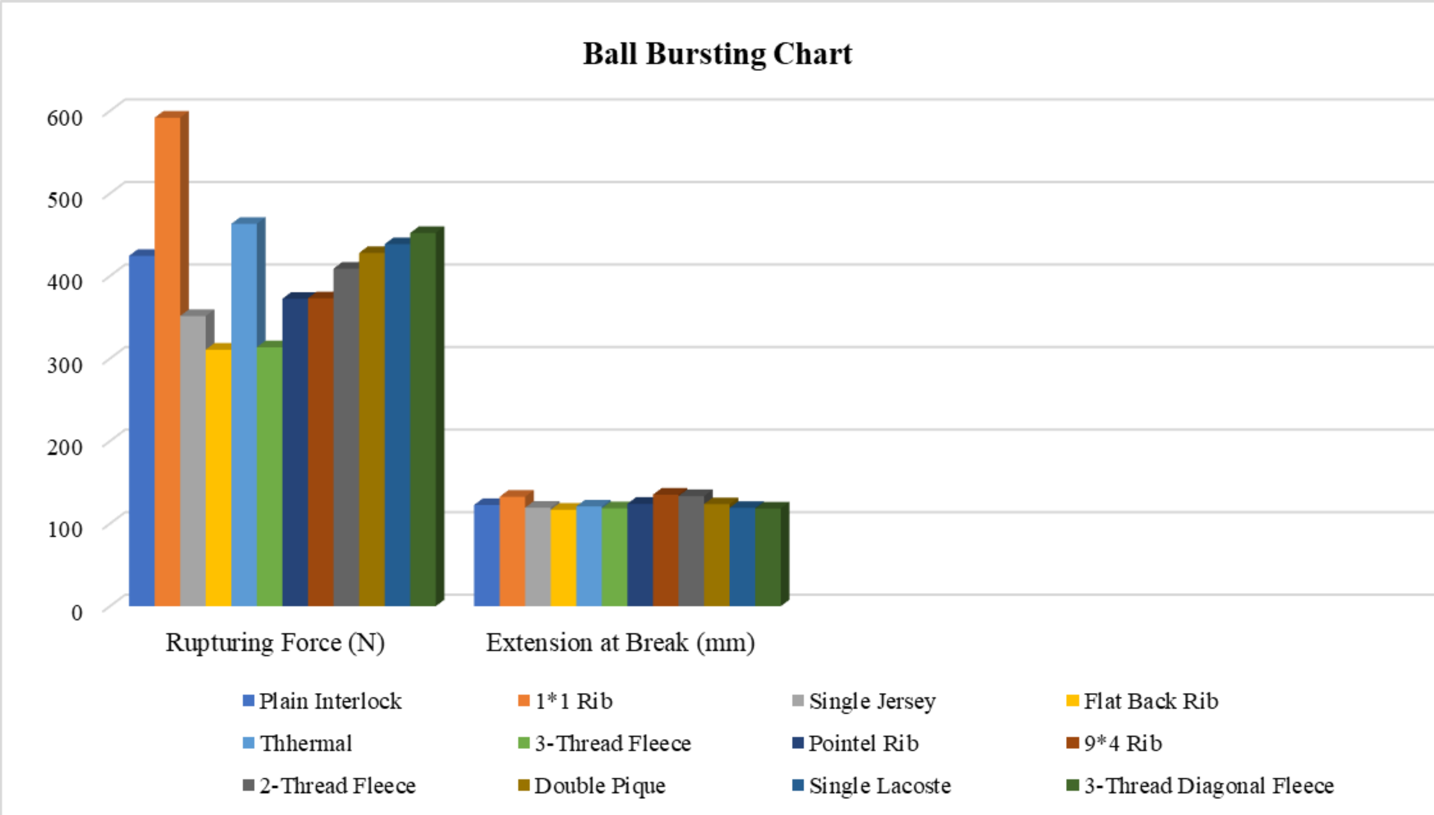


Discussion on abrasion resistance: According to the graph above,

3-Thread Diagonal Fleece is best for abrasion resistant as it shows no weight loss percent. 1×1 Rib, Flat Back Rib, 8×4 Rib, 2-Thread Fleece has satisfactory abrasion resistant. They show 2.83%, 3.91%, 3.36%, 3.18% weight loss accordingly. Plain Interlock shows 5.08%, Thermal also shows 5.08%, Double Pique shows 5.35%, Single Lacoste shows 5.66% weight loss percent. Single Jersey, 3-Thread Fleece and Pointel Rib Fabric has a very poor abrasion resistant property. They show 7.24%, 7.53% and 8.14% weight loss percent accordingly.

So, from the above discussion we can say that, Rib fabric and Fleece fabric has good abrasion resistant property excluding Pointel Rib and 3-Thread Fleece. Pointel Rib was containing a very high amount of hairy fiber and 3-Thread Fleece was composed of Melange yarn. All other fabrics have decent abrasion resistant property just excluding Single Jersey fabric as it was containing a lot of hairy fiber.

4.2.4 Ball Bursting



Discussion on Ball Bursting: According to the graph above,

1×1 Rib has the strongest ball bursting property. It needs 591.87N force to break. On the other hand, Flat Back Rib fabric has the weakest ball bursting property. It needs 310.85N force to break. Plain Interlock, Thermal, 2-Thread Fleece, Double Pique, Single Lacoste and 3-Thread Diagonal Fleece have good Bursting Strength. Single Jersey, 3-Thread Fleece Pointel Rib, 9×4 Rib are comparatively weak fabrics.

9×4 Rib extents most before bursting. It, extents 135.18mm before bursting. On the other hand, Flat Back Rib fabric extents lowest before bursting. It, extents 116.93mm before bursting.

Chapter 5: Conclusion

We have done the thesis successfully. In this study the effect of knitted structure with different yarns on the physical properties of knitted fabrics were investigated. From the investigation it was found that grey Melange and hairy cotton fabric has very poor quality of abrasion. On the other hand, CVC fabrics have better abrasion resistance. Knitted structures do not have major influence on physical properties if the yarns quality remains same.

Rib fabric and Fleece fabric has good abrasion resistant property excluding Pointel Rib and 3-Thread Fleece. Pointel Rib was containing a very high amount of hairy fiber and 3-Thread Fleece was composed of Melange yarn. All other fabrics have decent abrasion resistant property just excluding Single Jersey fabric as it was containing a lot of hairy fiber.
Fleece fabric contains very low CPI and Double Jersey derivatives (Plain Interlock, Flat Back Rib & Thermal) has a very high CPI.

Rib fabric has the most priority in case of Ball Bursting as all highest and lowest values are of Rib Fabrics. 1×1 Rib has the strongest bursting strength and Flat Back Rib has the lowest Bursting Strength. On the other hand, 9×4 Rib has the most extensibility and Flat Back Rib has the lowest extensibility.

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