Total Quality Management of Youngone High tech Sportswear Industries Ltd.

Submitted to

Md. Tamzidul Islam

Assistant Professor

BRAC Business School

Submitted By

Md.Mizanur Rahman

Id-14164039

BRAC Business School(MBA)

Letter of Transmittal

Md.Tamzidul Islam
Assistant Professor
BRAC Business School (BBS)
BRAC University
66 Mohakhali, Dhaka-1212, Bangladesh

Subject: Letter of Transmittal

Dear Sir,
Here the internship report that I prepared as a partial fulfillment of completion of my MBA program. It is great achievement to work under your active supervision. I am assigned to prepare under your direct supervision on the topic entitled **"Total Quality Management of Youngone High tech Sportswear Industries Ltd".** I am fortunate enough that I have got an experience and efficient professional team in the company. I have got the opportunity to work at Youngone High tech Sports wear Industries Ltd in Lab department under Quality department & I was assigned for Lab testing.

I tried my best to show my skill, which is achieved by three (03) months, practical experience through this report. Finally, I would like to assure that I will remain standby for any clarification, explanation as and when required.

Thank you in advance for your kind assistance.

Sincerely yours,

Md.Mizanur Rahman
ID: 14164039
BRAC Business School
BRAC University

Acknowledgement

All praise to the almighty, and the merciful. Without his blessing and endorsement this report would not have been accomplished. The successful completion of this report might never be possible in time without the help some person whose inspiration and suggestion made it happen. First of all I want to thank my faculty advisor **Md.Tamzidul Islam** who has provided me with suggestions for making this Final Internship Report and also provided me with the format for preparing this report. Then I also thank my team members of Youngone at Lab department. I would also like to thank Mr.Halim Uddin ,my organizational supervisor of Youngone High Tech Sports wear Industries Ltd., and all my colleagues who helped me by providing informative instructions. I was closely attached with them during my internship tenure.
Without them this project would have been very difficult.

Executive Summary

Youngone began manufacturing sportswear and down jackets in Seongnam, South Korea and has since grown to become the premier manufacturer of outdoor apparel, footwear and gear. Today, we own and operate production facilities in Bangladesh, Vietnam, China and El Salvador. More importantly, through the more than 70,000 people we directly employ, we touch the families and communities that have supported our growth for over 40 years. This integrated support system has enabled us to play an important role in the socio-economic development of the countries we work in. Our broad product and service portfolio depends on continuous investment in our people and has contributed to Youngone's exceptionally diversified group.

To further enhance our quality and to encourage and support quality manufacturing, the Lab was launched. We produce both woven and knit garments as well as a variety of insulations that are vertically integrated into the manufacturing process. This allows us to meet the ever changing needs of our customers by shortening lead times and improving quality control. It also helps us to reduce nonconformity of products, which has an important value to our company and our customers.

Table of Content:

1.1 Introduction:

"Quality management" ensures superior quality products and services. Quality of a product can be measured in terms of performance, reliability and durability. Quality is a crucial parameter which differentiates an organization from its competitors. Quality management tools ensure changes in the systems and processes which eventually result in superior quality products and services. Quality management methods such as Total Quality management have a definite goal - to deliver a high quality product. Quality management is essential to create superior quality products which not only meet but also exceed customer satisfaction. Customers need to be satisfied with your brand. Business marketers are successful only when they emphasize on quality rather than quantity. Quality products ensure that you survive the cut throat competition with a smile. Bangladesh ranked number two in RMG sector following china. So it is essential for Bangladesh to fulfill total quality for its ready made garment.

1.2 Origin of the Report:

As a part of the Internship Program of Master of Business Administration course requirement, I am assigned for preparing a report on the activities that I am currently working at Youngone Hightech Sportswear Industries Ltd for the period of 04 months starting from May 20, 2017 to till now. I am assigned as an Assistant Chemist Lab department.

1.3 Objectives:

Broad Objective:
Analyze the total quality of finished garment.

Specific Objective:
To ensure 100% quality to export in foreign countries.

1.4 Scope:

The report has two parts. First part is the organization part where I covered brief about the organization. Second part is the job part where I covered what I did in the office. Though I worked in a project of Lab department. In this part I covered how Youngone is doing their lab operations to ensure total quality and export its finished goods to foreign countries.

1.5 Limitation:

The study has suffered from a number of barriers –

- Data from Youngone is highly confidential
- Time is also a big constraint for this research. The topic of this report is vast in compare to time.

- It was difficult to communicate with the consumers, as many of them were unable to give time for interview

1.6 Methodology

The study was totally based on Total quality management and Lab operations. As the report has two parts, the organization part and job part data was collected from lab operations, official web site of Youngone High tech Sports wear Industries Ltd.. Moreover I have been doing lab test for the last three months since May20 2017.

1.7 Youngone Hightech Sportswear Industries in Bangladesh:

The globally renowned name of Youngone Corporation was originally created in 1974 in Korea by Kihak Sung, the current Chairman of the group. An economist by training, Sung has successfully expanded his modest operations to the present colossal status; Youngone today is a world-class and the largest supplier of outdoor clothing and sportswear, such as athletic, active and casual sports apparel including sports shoes, backpacks etc. Annual turnover of the group is to the tune of $600 mln.

Youngone's decision to enter Bangladesh was not a consciously planned one one of the partners, while visiting the country in 1979, inadvertently committed to investment here. The corporation later honored this commitment and established its first overseas operation in Chittagong in 1980 as a joint venture company. Through quick learning of local business environment and adoption of effective business approach, Youngone grew rapidly in Bangladesh. The company eventually did set up production bases in other emerging countries like China, Vietnam, and El-Salvador to diversify its country risks and reduce lead time. But Bangladesh remains its preferred country of investment due to its efficient labour force, effective management team, and preferential treatment in overseas markets of US and EU. Consequently, Youngone has invested heavily in Bangladesh; starting with only 250 local employees, today it employs a 36,000 strong local workforce in its 16 factories to generate a turnover of Tk 18 billion. World famous buyers like Nike, Eddie Bauer, LL Beans, Sears, The North Face, Intersports, Polo Ralph Lauren, and Puma source their products from Youngone in Bangladesh as approximately 50% of the group's sales is produced in Bangladesh.Younone is providing total quality management through lab test for Scott, G-Star, Nike, Aigleetc buyer.

2.1 Lab testing:

Textile fabrics are manufactured for many different end uses, each of which has different performance requirements to fulfill total quality.

The chemical and physical structures of textile fabric determine how it will perform, and ultimately whether it is acceptable for a particular use. Fabric testing plays a crucial role in gauging product quality, ensuring regulatory compliance and assessing the performance of textile materials. It provides information about the physical or structural, chemical and performance properties of the fabrics.

- Today market becomes more aware and more demanding of products, the number of tests required for textile materials has grown. As a result the testing of upholstery fabrics is increasingly varied, in constant flux and full of the unprecedented challenges of globalization. With the onset of new types of fabrics for the furniture industry for functional applications, and with the increasing number of innovations taking place in the office furniture sector, fabric testing procedures have undergone tremendous change and there is a need to understand all the procedures before a testing system is adapted to investigate the performance of fabrics.

- It is very important to predict the textile fabric's performance by testing. In general, commercial office furniture manufacturer, interior & textile designers who have an understanding of textile properties and testing are equipped to make decisions that will benefit their clients and enhance profits for their businesses.

- Knowledge of fabric testing and its performance analysis can contribute to efficiency in solving consumer problems with textile products, and to the development of products that perform acceptably for consumers.

- As indicated above, buyers and producers of upholstery textiles are among those who use the fabric testing data and results in making decisions about their products. Most textile manufacturers will use either test methods or performance specifications that are published by testing organizations.

- A number of textile research and testing organizations have published data on fabric testing and their procedures. There exists a great variety of textile testing procedures for different fabrics for different end uses.

- Researchers all over the world have been constantly involved in developing newer methods of fabric testing so as to meet the ever-growing globalization and quality requirements. Their researches have resulted in an enormous quantity of data and testing procedures for fabrics.

- These results should be providing the industry, fabric suppliers, furniture manufacturers, exporters, designers, jobbers & dealers with an enormous amount of information about the testing aspects of fabrics to meet the international standards.
- It appears that coverage of the existing literature in textbooks on fabric testing procedures and results is insufficient, although there have been a great number of research achievements by scientists, researchers and industry experts in the areas of upholstery for special applications, nanotechnology applications, medical textiles, etc. Hence, a systematic approach towards integrating the knowledge available in the literature on fabric testing and developments in different aspects of fabric testing and the achievements of researchers and industry experts would help all those who are involved in quality assessment and evaluation of textile products to a great extent.
- Based on the above considerations, it was thought desirable on testing principles and procedures of various aspects of fabrics.
- Hence an effort has been made to include the latest procedures of testing of fabrics for their comfort, appearance, damage analysis, etc. Wide coverage of advanced topics on composition testing, chemical testing, physical and mechanical testing, statistical testing, flammability & Environmental analysis, testing for color and dye analysis, and permeability will help to understand these tests in detail.

Testing & Product quality is very important for RMG sector.

2.2 Appearance after washing test:

This check is used for evaluating the advent of fabric or clothes after washing. evaluation is completed using general lighting and viewing area by rating the advent of specimen in contrast with other reference specimen.

Test Method: As per Home Laundering Consultative Council guideline

APPARATUS
-Wash cator washing machine
-Tumble Dryer
-Detergent: Reference type B IEC test detergent inclusive of 20% Sodium Perborate
-Make weights
-Overlock Machine
-Grey Scales Staining
Colour Assessment Cabinet

Tested Sample (Color shade changed after wash)

Reagents

ECE Reference detergent ‘B’ (without optical brightening agent)

Sodium Perborate Tetrahydrate

Specimen practice

in which feasible take a look at a full garment with all components blanketed.

If the above isn't possible check a composite sample measuring no much less than 30 x 30cm with all componentsincluded so that you can be gift at the very last product.

preserve some other garment/composite pattern from the equal batch for use for exam and evaluation.

If measurements are required to assess dimensional stability, mark the garment consistent with the size suggestions set out in next test technique 12 Dimensional balance to Washing.

check manner

a) Weigh the pattern and make up the weight to 2kg with British preferred Makeweights.

b) choose a wash program that pertains to the care label of the cease product. Set the temperature, water ranges and pull out accurate knobs if using a FOM 71S Wascator.

c) Use the proper quantities of ECE detergent and sodium perborate in line with the wash desk set out in subsequent test method 12 Dimensional balance to Washing.

d) place the makeweights then the test pattern inside the Wascator. Dissolve the powder with a small quantity of warm water in a beaker.

e) start the gadget. while the water is above the bottom degree inside the sight tubes, pour the dissolved powder into the system through manner of lifting the lid on the pinnacle of the gadget. Flush down by rinsing the beaker out with an additional quantity of warm water.

f) After the wash is complete get rid of the specimen and makeweights.

be aware: at the request of the subsequent material Technologist a couple of washes may be required on a few merchandise to evaluate the durability. If this is the case then repeat the

above for the number of washes required.
Drying
a) Dry the specimen and makeweights in line with the commands given on the care label.
assessment OF look AFTER WASHING
the subsequent isn't imagined to be an exhaustive listing, but as an alternative want to be used as a guide most effective. items to word can also include the subsequent: -
1. Differential shrinkage amongst additives i.e. dropped or tight linings, seam pucker, distortion of components.
2. Shrinkage of garment.
three. Seam breakdown i.e. inadequate seams, partial or non-inclusion, faulty thread or sewing, cloth slippage, fraying from seam turnings, stitching damage and so on.
four. Puckering and roping of seams.
5. Detachment of interlinings / fused components that could have delaminated, quantified as:-
-No delamination
-Negligible delamination
-quite brilliant delamination
-entire delamination
6. trade in deal with or look.
7**.** Effect on button,Zip etc.

8. wet aspect abrasion.
nine. immoderate creasing.
10. Spiralling.
11. move staining of interlining.
12. Optical brightening agents (OBA's, FBA's) which occur on positive substrates because of the whitening dealers presence in washing powders. A fluorescent suppressor want to be placed over the washed specimen to evaluate any select up of the whitening agent.
thirteen. Fraying of ribbadd-ons / trims
14. Percolation of wadding.
15. Detachment of trims.
16. Distortion of shape.
17. Matting of cloth surface.
18. Brushing of cloth ground.
19. Pilling of cloth ground.
20. Breakdown of cloth ground.
21. lack of elasticity (stretch and healing) of ribbing.
22. Localized wear.
23.Colourfastness: colour trade, cross staining among components. exercise widespread values as in step with relevant overall performance test stylish.
24. loss of print.

2.3 Dimensional stability to washing:

Scope and Principle

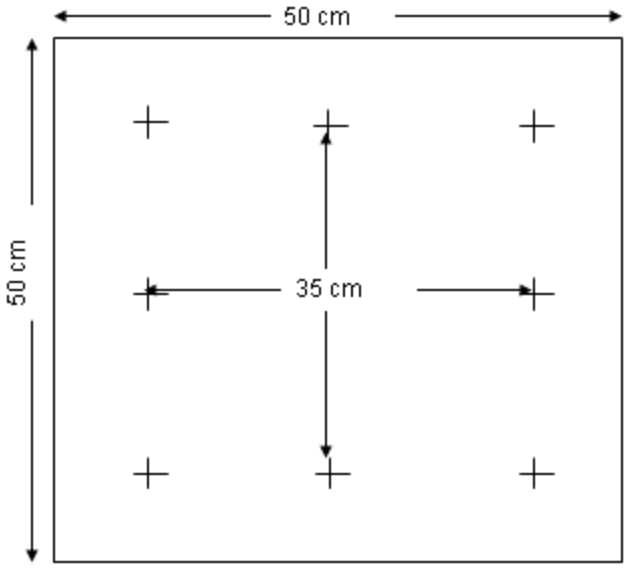
To determine the dimensional change of fabrics / garments when subjected to an appropriate combination of specified washing and drying procedures.

Test Method

ISO 3759/ ISO 6330/ ISO 5077/AATCC 150/AATCC 135

This test method is intended for the determination of dimensional changes in woven & knit fabrics / garments, when subjected to repeated automatic laundering procedures commonly used at home.

The dimensional changes of textile specimen subjected to washing are measured using pair of bench marks applied to the fabric before washing.



Important bench mark locations for different garments

Shirt – Collar, Collar Band, Body Lengths, Sleeve Lengths, Width at chest and Cuffs

Trousers – Front rise, Back rise, Inseams, Outseams, Waist and Seat

Pajama Top – Lengths, Sleeves, Hem and Chest

Pajama Bottom – Inseams, Lengths, Hip and Waist

Uniform/Dress – Bodice lengths, Skirt lengths, Sleeve lengths, Shoulders, Chest, Waist, Hip and Hem

Blouse – Lengths, Sleeve Lengths, Shoulders, Chest and Waist

Skirt – Lengths, Hem, Hip and Waist

Apparatus

Sample Marker

Wash cator FOM 71S and program cards, or

Wash cator FOM 71MP and program cassettes ROM, or

Wash cator FOM 71 MP/Lab Model, or

Wash cator CLS

Domestic tumble dryer, 5kg load ~ with a cool-down facility

Balance capable of weighing 150 ~ 200g and accurate to 0.1g

Balance capable of weighing up to 2.0kg accurate to 1.0g. – 5.0g

British Standard Makeweights

Mesh drying rack and drying line

Stability template and % shrinkage / extension ruler

DALO Marker and / or an indelible marker pen

Front Loading Washing Machine

Specimen Preparation

Fabrics

The minimum size for a stability square is 50 x 50cm. Testing on smaller pieces is not acceptable.

Lay the fabric to relax for 4 hours on a bench in ambient conditions so that it is smooth and tension free.

Do not use the fabric within 5cm of the selvedge.

Place the template on the fabric with the side of the template parallel to the length (warp) direction.

Mark the three width and length marks in pairs 35cm apart, (see additional notes below for different fabric types). Draw around the edge of the template, do not round off the corners.

Draw an arrow outside the measurement area, to denote the length (warp) direction prior to cutting from the main piece.

Woven Fabrics:

Use a single layer of fabric. Use the slots in the template to mark the fabric with an indelible pen.

Warp Knit Fabrics:

Use a single layer of fabric. Use the holes in the template to mark. Use a DALO marker rather than a pen, as this prevents the fabric being dragged.

Weft Knit Fabrics:

Fold the fabric into a double layer, with the fold parallel to the wales. Use the holes in the template. To prevent the fabric being dragged by a pen, use a DALO marker.

Crinkle Effect Fabrics:

Lie the fabric piece on a smooth surface and allow to relax naturally. Without placing the stability template on the fabric remove a specimen approximately 50x50cm.

Place 3 warp and 3 weft measurement points on the specimen using the shrinkage/extension ruler in approximately the same areas of the stability template.

Note: When placing the ruler across the crinkle effect do not allow the ruler to press out the crinkle effect. This may have to be done manually to ensure that the measurement points are 35cm apart.

Trims / Elastics:

Cut three specimens 450mm in length

Using the stability ruler mark one set of gauge marks 350mm apart on each of the three samples, ensuring that they are approximately 5cm in from the end of the sample.

Sew the three test specimens onto a pre shrunk stability square, ensure that the samples are not under any tension and also allowing enough slack for any shrinkage that may occur. Ensure that the sewing line is outside the area of measurement.

Over locking:

Woven Fabrics: Over lock all edges.

Warp Knit Fabrics: Over lock all edges.

Weft Knit Fabrics: Form into a bag by over locking together the two length way directions and one width way direction. The

remaining width is over locked as a single thickness.

Garments:

Refer to the garment measurement guidelines stated in buyer, for any garment/product that is not stated please refer to the buyer Fabric Technologist for guidance.

Test Procedure

Wash Load:

Ensure no more than half of the load are test specimens, the rest of the load being made up of British Standard makeweights.

Powder:

Use ECE detergent and Sodium Perborate.

Wash Program:

a) Select the correct program for the wash required depending on the type of machine being used. Set temperature, water levels and pull out correct knobs if using a FOM 71S Washcator.

b) Place makeweights then the test specimens in the washing machine. Dissolve the powder with a small quantity of warm water in a beaker.

c) Start the machine. When the water is above the base level in the sight tube pour the dissolved powder into the machines by lifting the lid on the top of the machine. Flush down by rinsing the beaker out with an additional quantity of warm water.

d) On completion of the program remove the wash load.

Drying Methods

Line dry – Specimen is hanged by two corners with the fabric length in vertical direction.

Drip dry – Dripping wet specimen is hanged by two corners with the fabric length in vertical direction.

Flat dry – Specimen is dried by spreading on a horizontal screen or perforated surface removing wrinkles without stretching and distorting it.

Tumble dry

- ISO dryer: Auto reversing action

Re-Measuring Procedure

Woven and Knitted Fabrics:

Re-measure after 4 hours relaxation.

Transfer the specimen onto a work surface in the same location. Do not move the specimen about whilst re-measuring.

Use one of the following methods for re measuring:

Using the % shrinkage/extension ruler and holding it at a 45° angle, read off the % change in dimensions for the three length (warp) and three width (weft) dimensions.

Or

For measurements taken with a metal ruler, use the following formula:

% Dimensional Change= {(Original length 350mm – Tested length mm) x 100}/Original length

Crinkle Effect Fabrics:

To re-measure untie the specimen and allow to naturally relax and lie flat on a smooth surface. Do not stretch the specimen.

Place the shrinkage/extension ruler lightly on the surface of the crinkle garment and record the dimensional change in both directions.

Trims / Elastics:

Remove each of the three specimens from the stability square by cutting along the sewing line.

Allow to relax for a minimum of 4 hours. Do not stretch the specimen.

Place the shrinkage/extension ruler lightly on the surface of the specimen and record the dimensional change.

Garments:

Re-measure original measurement points and calculate the dimensional change using the following formula:

% Dimensional Change= {(Original length 350mm – Tested length mm) x 100}/Original length

Knitwear ~ Rib Recovery

After measuring the above measurement points stretch the rib manually to its original measurement to see if the rib is recoverable. This can be done by placing a metal ruler on a smooth surface and placing the rib over the ruler. Then manually grab the rib by hand at the side seams and pull steadily to see if the rib recovers to its original measurement. Report as Satisfactory or Unsatisfactory (with comments).

Spirality

For Weft Knitted Garments calculate the % Spirality using the formula stated in buyer Test Method

Note: When recording the length measurement this must be taken for the underarm to the hem of the garment.

Appearance Assessment

As a guideline comment on the general appearance of the tested specimen with respect to colour change, surface appearance etc. Report as Satisfactory or Unsatisfactory (with comments)

Garments:

Report the garment measurement points and % dimensional change as indicated on the tables below the garment diagrams .

Where applicable report the % spirality.

Knitwear:

Report the Rib Recovery in addition to the above.

Calculation

-Wash and dry the sample 3 times for AATCC and once for ISO as per the procedure explained earlier.

-Condition the sample. After conditioning lay each test specimen without tension on a flat smooth horizontal surface. Measure and record distance between each pair of benchmarks.

-Calculate the difference between the before wash and after wash measures and report in %.

DC % = 100 (B – A) / A

DC = Dimensional Change

A = Original Dimension

B = Dimension after Laundering

Shrinkage is denoted as '-' which is decrease in dimensions

Elongation is

denoted as '+' which is increase in dimensions.

Test Report

Report the test method number and title.

Fabrics:

Report the average change in dimension of the length and width directions. Use a positive sign to indicate an increase in length and a negative sign to indicate a decrease in length. Quote the results to nearest 0.1%.

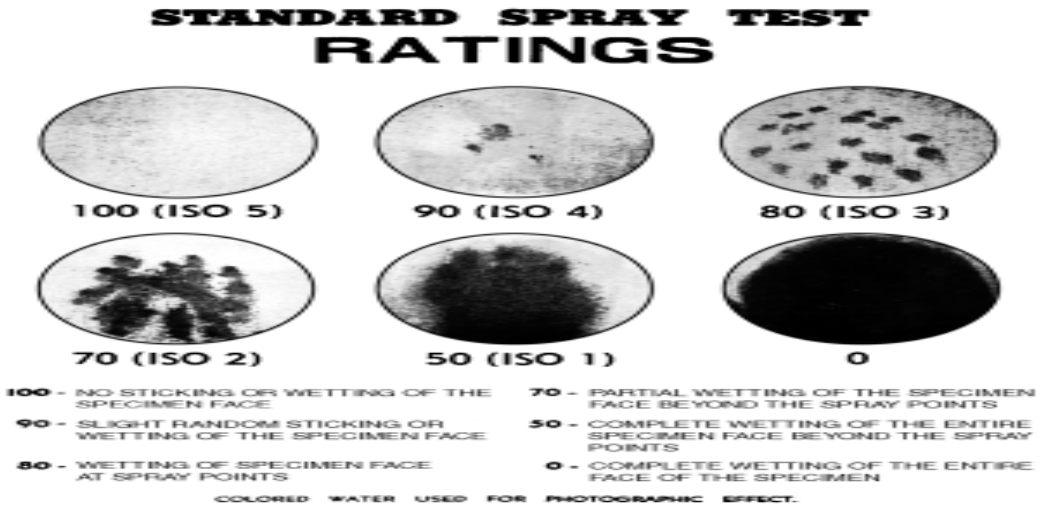
2.4 Water Repellency Test:

- To measure water repellency of a given fabric.

Theory:
This test method is applicable toany textile fabric, which may or may nothave been given a water-repellent finish.It measures the resistance of fabrics towetting by water. It is especially suitablefor measuring the water-repellent efficacyof finishes applied to fabrics.The results obtained with this testmethod depend on the resistance to wettingor water repellency of the fibers,yarns and finishes on the fabric, and uponthe construction of the fabric.

2. Principle
Water sprayed against the taut surfaceof a test specimen under controlledconditions produces a wetted pattern whose size depends on the repellency ofthe fabric. Evaluation is accomplished bycomparing the wetted pattern with pictures on a standard chart.

The ratings are as follows:



1.Spray Tester
2. Graduated cylinder, 250 mL.
3. Water, distilled.
4. Stopwatch

Sample:
100% cotton, polyester, umbrella, parachute cloth.

7. Test Specimens

1 Three test specimens 180.0 × 180.0mm (7.0 × 7.0 in.) are needed and shouldbe conditioned at 65 ± 2% relative humidityand 21 ± 1°C (70 ± 2°F) for a minimumof 4 h before testing.

2 Where possible, each specimenshould contain different groups of lengthwiseand widthwise yarns.

M/c specification:

- Name: Spray tester
- Brand: HANWON HS 045.
- Template: 50 cm circumference.

Working Procedure:

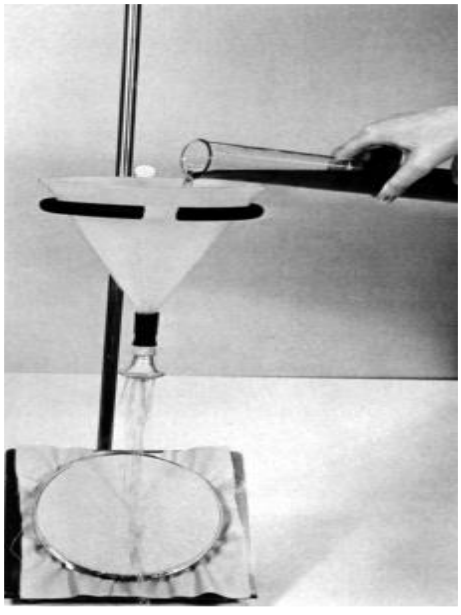
1 Calibrate the apparatus by pouring 250 mL of distilled water at 27 ± 1°C (80 ± 2°F) into the funnel of the tester and
measure the time required for the funnel to empty. The spray time must be between 25-30 s, otherwise the nozzle should be checked to see if the holes are enlarged or blocked.
2 Fasten the test specimen securely in the 152.4 mm (6.0 in.) diameter hoop so that the face of the fabric specimen will be exposed to the water spray. The surface of the specimen should be smooth and without wrinkles.

3 Place the hoop on the stand of the tester with the fabric uppermost in such a position that the center of the spray pattern
coincides with the center of the hoop

In the case of twills, gabardines,piques or fabrics with similar ribbed construction, place the hoop on the stand in such a way that the fabric is oriented in the same direction as it will be used in the end product.

4 Pour 250 mL of distilled water at 27 ± 1°C (80 ± 2°F) into the funnel of the tester and allow it to spray onto the test
specimen for 25-30 s.Avoid touching the funnel with the graduated cylinder while pouring the distilled water. Movement of the funnel will alter the spray disposition on the specimen.
5 Take the hoop by the bottom edge and tap the opposite edge firmly once against a solid object with the fabric facing the object, then rotate the hoop 180° and tap once more on the point

Spray tester



Data:

S/n	Type of fabric	Spray rating
1	100% cotton	0
2	Polyester	0
3	Umbrella	70
4	Parachute	100

Table: Ratings found for different fabrics.

Result:

1. Water repellency of a 100% cotton fabric is 0.
2. Water repellency of a polyester fabric is 0.
3. Water repellency of a umbrella fabric is 70.
4. Water repellency of a parachute fabric is 100.

2.5 Color Fastness to Washing:

Evaluates the colorfastness to Laundering of textiles which are expected to withstand frequent or accelerated laundering.

Test Method:

BS EN ISO 105 C06

Preparation of the samples

• the sample has to be tested in the delivered condition; don't wash and/or tumble it before testing

• it has to be used only multifibre from James Heal

• the washing solution has to be prepared freshly (one litre)

• the current liquor ratio (liquor/sample) is 20:1

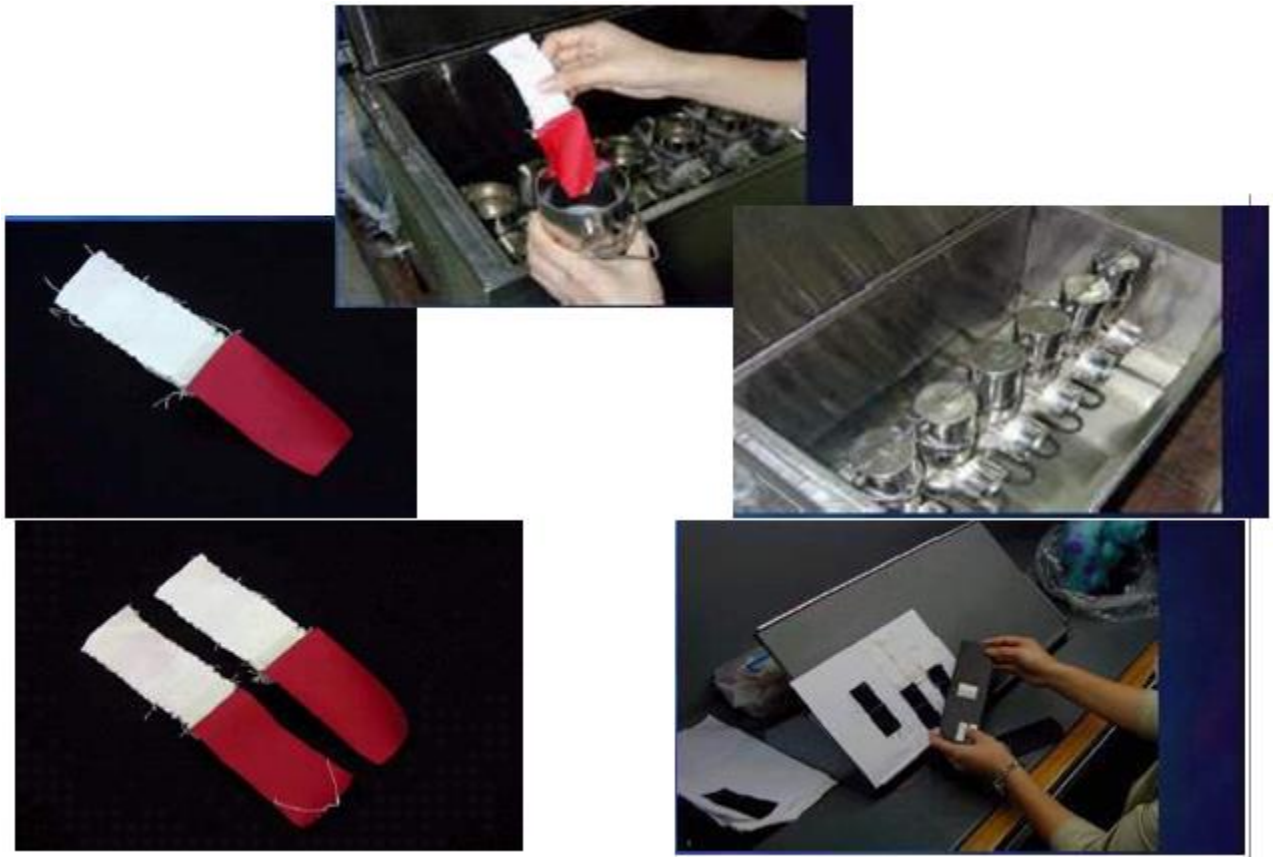
• we do not accept below mentioned specimen prepared in wrong way:

• A) extra stitches (like over lock stitching etc.)

• B) additional fabric

• C) incorrect multi fibre

Equipment – Launderometer



Assessment of the specimens

• the assessment has to be done independently of 2 persons; as result take the average

• the assessment (D) has to be done with

• 1) defined grey scale

• 2) grey frame in same grey colour as background

• 3) white paper as background or according to the test method one or more original multifibre to assure no transparent effect coming out of the background

• the edges of the specimen and original multifibre have to be cut straight

• under defined light D65 with defined angle of 45°

Conditions of Viewing

Interpretation of the grades

The end result of any colorfastness test is a grade given to the tested sample.

Grade 5 – NO CHANGE

Grade 4 – SLIGHT CHANGE

Grade 3 – NOTICEABLE CHANGE

Grade 2 – CONSIDERABLE CHANGE

Grade 1 – SEVERE CHANGE

2.6 Color Fastness to Water:

Theory:

Purpose and Scope

This test method is designed to measure the resistance to water of dyed printed, or otherwise colored textile yarns and fabrics.

2 Distilled water or de ionized water is used in this test method because natural (tap) water is variable in composition.

Principle

The specimen, backed by multi fiber test fabric, is immersed in water under specified conditions of temperature

and time, and then placed between glass or plastic plates under specified conditions of pressure, temperature and time.

The change in color of the specimen and the staining of the attached multi fiber test fabric are observed.

Color fastness to water

Apparatus:

1 Perspiration tester (plastic or glassplates are available with the equipment)
2 Drying oven—convection.
3 Multifiber test fabrics (8 mm [0.33in.] filling bands) containing acetate, cotton,nylon, silk, viscose rayon and woolshall be used for specimens containingsilk, or (8 mm [0.33 in.] filling bands)containing acetate, cotton, nylon, polyester,
acrylic and wool shall be used forspecimens with no silk present.
4 AATCC Chromatic TransferenceScale
5 AATCC Gray Scale for ColorChange and Gray Scale for Staining
6 Wringer.

Procedure:

1 Suspend the test specimens and a control specimen in the exposure chamber. The test apparatus should be located in a room in which the ambient air temperature is 18- 28°C (64-82°F) and the relative humidity does not exceed 67%. For reference and inter lab testing, conduct tests in a room or chamber with the standard atmospheric conditions of 21 ± 1°C (70 ± 2°F)and 65 ± 2% RH. Ozone should be present in concentrations which produce one cycle of fading in 1.5-6.0 h of test

2 Examine the control specimen periodically until the resultant color corresponds to that of the standard of fading
when compared in daylight ranging from average to slightly bluish north sky light, or equivalent artificial light. This constitutes one cycle.
3 Remove those specimens which exhibit a color change at the end of one cycle. One cycle will generally produce measureable color change in specimens which are ozone sensitive.
4 Suspend a fresh piece of the control specimen and continue exposure of any remaining specimens for a second cycle.
5 Run additional similar cycles as necessary
6. At last compare the sample with grey scale and measure the result.

2.7 Color Fastness To Rubbing :

Purpose and Scope:

This test method is designed to determine the amount of color transferred from the surface of colored textile materials to other surfaces by rubbing. It is applicable to textiles made from all fibers in the form of yarn or fabric whether dyed printed or otherwise colored. It is not recommended for use for carpets or for prints where the singling out of areas maybe too small using this method

Test procedures employing white test cloth squares, both dry and wet with water, are given.

As washing, dry cleaning, shrinkage, ironing, finishing, etc., may affect the degree of color transfer from a material, the test may be made before, after, or before and after any such treatment.

2. Principle

A colored test specimen is rubbedwith white crock test cloth under controlled conditions.

Color transferred to the white test cloth is assessed by a comparison with the Gray Scale for Staining or the Chromatic
Transference Scale and a grade is assigned.

3.Apparatus:

1 Crock meter
2 Crock meter Test Cloth, cut in 50 mm squares
3 AATCC Chromatic Transference Scale
4 Gray Scale for Staining
5 White AATCC Textile Blotting Paper
6 Specimen Holder for crock meter
7 In-house poor crocking cloth.
8 Crock meter Verification Cloth. This item may be used in lieu of an in-house poor crocking cloth when such poor in-house crocking cloth is not available

Procedure:

1.Dry Crocking Test.

Place a test specimen on the base of the crock meter resting flat on the abrasive cloth with its long dimension in the direction of rubbing

Place specimen holder over specimen as an added means to prevent slippage.

Mount a white test cloth square, the weave parallel with the direction of rubbing, over the end of the finger which

projects downward from the weighted sliding arm. Use the special spiral wire clip to hold the test square in place. Position

the clip with loops upward. If the loops point downward they can drag against the test specimen. Lower the covered finger onto the test specimen. Beginning with the finger positioned at the front end, crank the meter handle 10 complete turns at the rate of one turn per second to slide the covered finger back and forth 20 times. Set and run the motorized tester for 10 complete turns. Refer to individual specifications for any other required number of turns. Remove the white test cloth square, condition (see 8.1) and evaluate as directed in Section 10. In the case of napped, brushed or sanded material when loose fiber might interfere with the rating, remove the extraneous fibrous material

by pressing lightly on the crock circle with the sticky side of cellophane tape before evaluating.

2 Wet Crocking Test.

Establish technique for preparing wet crock cloth squares by weighing a conditioned square, then thoroughly wet out white testing square in distilled water. Prepare only one square at a time. Weigh dry crock square. Using a

syringe tube, graduated pipette or automatic pipette, draw up water in ml to 0.65 times weight of crocking square. If

crocking square weight equals 0.24 gm, the ml used would be 0.24 × 0.65 = 0.16

ml Lay crocking square on white plastic mesh over a dish. Apply water evenly over crocking square and weigh the wet

square. Calculate wet pickup according

to instructions in this method and Colorfastness to Crocking: Rotary Vertical Crock meter Method. If needed, adjust the amount of water used to wet the square and using a new crocking square, repeat steps. When 65 ± 5% wet pickup is achieved, record the amount of water used. Draw up the recorded amount of water into the syringe tube, graduated pipette or automatic pipette for each wet crocking performed during the current day. Repeat this process each day.

Avoid evaporative reduction of the moisture content below the specified level before the actual crock test is run. Continue as directed Air dry the white test square, then condition before evaluating. In the case of napped, brushed or sanded

material when loose fiber might interfere with the rating, remove the extraneous fibrous material by pressing lightly on the

crock circle with the sticky side of cellophanetape before evaluating.

Results which we can achieve in Normal Conditions are

	Dark Shade	**Medium shades**	**Light Shades**
Dry	3-4	4	4-5
Wet	2-2.5	3	3.5-4

2.8 Color Fastness to Saliva:

PURPOSE

To determine the resistance of the colour of textiles to saliva according to GB/T 18886.

EQUIPMENT

- Perspirometer
- 11 acrylic-resin or glass plates
- Flat-bottomed dishes
- Oven, maintained at $(37\pm2)^0C$
- Light box with light source D65
- Grey scale for assessing change in colour (ISO 105-A02)
- Grey scale for assessing staining (ISO 105-A03)
- Multifibre adjacent fabric, type DW (ISO 105-F10)
- Chemicals for the saliva solution (see preparation of solution)
- Distilled water, grade 3
- Scale

PREPARATION OF SOLUTION

Saliva solution, freshly prepared, containing per litre distilled water:
3.0g Lactic acid ($CH_3 \cdot CH(OH) \cdot COOH$)
0.2g Carbamide ($H_2N \cdot CO \cdot NH_2$)
4.5g Sodium Chloride ($NaCl$)
0.3g Potassium Chloride (KCl)
0.3g Sodium Sulphate (Na_2SO_4)
0.4g Ammonium Chloride (NH_4Cl)
No need to bring the saliva solution to specific pH.

TEST SPECIMEN

Two specimens for each colour and material measuring 4 cm x 10 cm.
Details such as labels, badges and drawstrings also need to be tested. If the product is multi-coloured, make sure all colours tested. More test specimens could be required if the product is printed, striped or includes several colours.
If details (including prints) are in contrast colour these need to be tested both against multifibre adjacent fabric and the fabric of which the detail is attached. If not in contrast colour, they need to be tested only against multifibre adjacent fabric.

METHOD

1. Cut specimens measuring 4cm x 10cm.

2. Attach a specimen to multifibre adjacent fabric of the same size, by sewing along one of the shorter (4 cm) sides. The multifibre adjacent fabric should be next to the face side of the fabric.

3. Switch on the oven and preheat pre-heat perspirometer& acrylic plates for 30 min.

4. Place the specimens in individual flat-bottomed dishes and cover with the saliva solution at a liquor ratio of
50:1. *

5. Thoroughly wet the specimens and allow it to remain in the solution at room temperature for 30min. Press

and move the specimen from time to time to ensure good and uniform penetration of the liquor.

6. Pour off the solution.

7. Place each specimen between two glass or acrylic plates and place them in the perspirometer. Each perspirometer can hold maximum 10 samples. If less, all 11 plates still have to be placed in the perspirometer. Put a pressure of 12.5 kPa on the perspirometer using the load, lock it and then remove the load. 12.5 kpa pressures must be evenly distributed on the sample surface. Plates must be parallel to each other, inclination of plates due to thick and thin (uneven sample surface) surface must be avoided.

8. Place the perspirometer in the oven for 4 hours at (37±2)°C in upright position.

9. Take out the specimens from the oven and perspirometer. Open out each specimen and dry them in room temperature, not exceeding 60°C, with the specimen only being in contact at the point of the stitching.

RESULTS

Assess cross staining, change in colour and colour staining. See chapter introduction “Assessment of Colour Fastness”.

NOTE

*****To weigh the specimen and multiply the weight by 50 is an easy way to get correct ratio. E.g. for a specimen which weight 2g, 100ml solution is needed.

2.9 Color Fastness to phenolic Yellowing:

PURPOSE

To assess the potential of white and light coloured fabrics to yellowing due to contamination by sterically hindered phenols. This test is to be carried out on fabric which has not yellowed. Phenolic yellowing is discolouration of textile materials caused by the action of oxides of nitrogen and phenolic compounds (might be present in storage materials, polyurethane foam, fabric finishes etc.), which lead to the production of a yellow colour. This method is not intended to deal with other causes of discolouration such as Optical Brightening Agents deposits, oxidation of fabric lubricants etc.

EQUIPMENT

- Perspirometer
- 7 acrylic-resin or glass plates
- Incubator or oven, to maintain (50±3)°C
- Test papers 75mm x 100mm (see ISO 105-X18 for definition)
- Control fabric 30mm x 100mm (see ISO 105-X18 for definition)
- Butyl hydroxytoluene (BHT)-free polyethylene film
- Light box with light source D65
- Grey scale for assessing change in colour (ISO 105-A02)

TEST SPECIMEN :

Two specimens for each colour and material measuring 3cm x 10cm. For narrow fabrics a single strip of material measuring 10 cm in length is enough. Products that contain polyurethane foam, such as padded bras are especially risky, as they are products packed in plastic bags and/or stored under polluted conditions (e.g. bad ventilation). Products subject to treatment at high temperatures such as heat setting and moulding are also at higher risk.

METHOD

1. Using a ruler and scissors and without marking the fabric, cut two single layers of the fabric to be tested, each measuring 3cm x 10cm.

2. Take one test paper for each sample. Fold it in half along the 10 cm axis and place the sample inside, making a sandwich.

3. Do the same with the control fabric

4. Place each sandwich between two glass plates so that each sandwich is separated.

5. Place all glass plates on top of each other. One perspirometer can hold 5 samples + 1 control fabric (totally 7 glass plates). If less than 5 samples are tested 7 plates should still be in the stack.

6. Wrap the stack firmly in three layers of BHT free polyethylene film and seal with adhesive tape to create an airtight package.

7. Place the package in the perspirometer, apply a pressure of 12.5 kPa (=5 kg), lock it and then remove the load.

8. Place the test device on its side in the oven for 16 hours at (50±3)°C in upright position.

9. Remove the package and allow it to cool before unwrapping.

RESULTS

Assess the test specimens within 30 minutes of unwrapping. Start the assessment with the control fabric and make sure it has yellowed to at least a grade 3 using the grey scale. If not, the test has not been carried out successfully, and needs to be repeated.
Assess colour staining, see chapter introduction “Assessment of Colour Fastness”.

2.10 PH Test:

pH value is to test the acid and alkali contents remained in apparel fabrics. Apparel fabrics which can directly contact with the skin has a relatively higher requirement on PH value. PH value will not make the skin itchy if controlled between weak acid or neutrality.This test method determines the pH of wet processed textiles.
To make a quantitative determination, the chemicals which influence pH must be removed from the textile specimen, collected as a water extract then accurately measured by a pH meter.

The various chemicals and processes in the textile and garment production, as well as in garment washing and finishing, will effect the final pH-value.

>7,5-rinse the fabric or garment with normal water or acidic water. To make the water become acidic, diluted formic acid or diluted acetic acid can be used.

Garment pH value testing procedure:

Pre-Treatment:
Non-Leather: DIN EN ISO 3071; Extraction in potassium chloride
Leather: DIN EN ISO 4045, Extraction in water

pH = 7 equates pure water and / or neutral solutions
pH < 7 equates a solution with acid impacts pH > 7 equates a solution with basic impacts

Normal Limit: pH value: 4-7.5

Range of pH scale: (0-14), Neutral value: 7

Test method & standards: BS EN 4052 BS EN/DIN EN/ISO 3071 & AATCC 81,EN 1413 (Textile)

3.0 Conclusion:

For this report I have worked in the Youngone Hightech Sportswear Industries Ltd: Lab department. Youngone is a garment manufacturing company.

I know about the different test procedure, according to end use through buyer. Also understand about the different test requirement, which need to fulfill a quality textile product. After lab test we provide test report for Garment shipment clearance. This procedure ensures Total Quality Management.

4.0 References:

1. http://www.youngonecorporation.com/about-us

2.https://www.facebook.com/pg/Youngone-Corporation-Bangladesh-197315713648912/about/?ref=page_internal

3.Following Lab test report:

G-STAR PACKAGE TEST REPORT

YOUNGONE
BANGLADESH

YOUNGONE CENTRAL LABORATORY,
Yougone Hi-Tech Sportswear Ind. Ltd.
PLOT NO: 1-4, 9-12,
Dhaka, Export Processing Zone,
Ganakbari, Savar, Dhaka, Bangladesh.
Tel : 88-02-7788025-27 (Ext: 188)
Fax : 88-02-7788031,

G-STAR RAW

DATE :	04.8.2017
LAB REF :	*REF-2017-09-484*
SEASON :	BULK 16.2N
FABRIC ITEM :	P-210T PRINT
FAB SUPPLIER :	SDF
STYLE :	D02954
INVOICE :	K16-0423(0822)

TEST (S) CONDUCTED:
AS REQUISTED BY THE APPLICANT

						Buyer Requirement
		ASFALT				
DIMENSIONAL STABILITY TEST METHOD: ISO 5077						**SATISFACTORY**
WARP DIRECTION		-(1.4)%				± 3%
WEFT DIRECTION		-(1.1)%				± 3%

FINAL RESULT: PASS

CONTENT TEST (AATCC-20-2001)
(Similar with Directive 97/73/EC & Textile & Wool Act (USA))

BURN TEST:	BLENDS WITH MEJORITY SYNTHETIC FIBER.
ACID TEST:	100% NYLON.

FINAL RESULT: PASS

PILLING TEST (ISO 6330)
(AFTER 3 CYCLES WASH ASSESSMENT @ 40°C)

		SATISFACTORY
		GR-3.5
COMMENTS AFTER WASH	PILLING DIDN'T OBSERVE AND APPEARANCE IS GOOD AFTER WASHING.	

FINAL RESULT: PASS AS PER SCOTT STD.

CHEMICAL PROPERTIES pH TEST:
METHOD: AATCC-81

						G-STAR STD
COMMENTS AFTER TEST		pH-6.78				(6 TO 7.5) pH

COMMENTS AFTER TEST			pH-6.78				(6 TO 7.5) pH
FINEL RESULT: PASS							
SKEWNESS TEST : METHOD: AATCC-179							SATISFACTORY ± 5% MAX
	Before Wash(%)		0.00%				
	After Wash(%)		0.81%				
FINEL RESULT: PASS							

DATE : 04.09.2016
LAB REF : REF-2017-09-484
FABRIC ITEM : P-210T PRINT
STYLE : D02954

FABRIC WEIGHT TEST (ASTM D3776) (Similar with EN 12127)							
Max deviation 5%							SATISFACTORY
AVG-GM/M^2 :			73.00				+5% -5%
REQ GSM:N/A							
FINAL RESULT: N/A							

RESISTANCE TO SLIPAGE & SEAM STRENGTH TEST METHOD : ASTM D-1683 (Similar with ISO 13936-1 3 mm)							
SEAM CONDITION: THREAD: 40 TEX; STITCH/CM	SPI: 4						SATISFACTORY
							WARP: 5 daN
WARP DIRECTION	Seam str(daN)		12.46				
	S.Slippage(daN)		22.41				
	Remark		SEAM BROKEN & YARN SLIPPAGE				
							SATISFACTORY
WEFT DIRECTION	Seam str(daN)		10.13				WEFT: 5 daN
	S.Slippage(daN)		20.75				
	Remark		SEAM BROKEN & YARN SLIPPAGE				
FINAL RESULT: PASS							

TENSILE TEST : TEST METHOD:(ASTM D 5034) (Similar with ISO 13934-2)							SATISFACTORY
WARP DIRECTION							WARP: 14 daN
	Breaking str (daN)		26.98				
WEFT DIRECTION							WEFT: 14 daN
	Breaking str (daN)		23.31				

FINAL RESULT: PASS

TEARING STRENGTH TEST
TEST METHOD : ASTM D1424 (Similar with ISO 13937-1)

SATISFACTORY

BEFORE WASH

WARP DIRECTION Test Reading **(cN)**		2803				**WARP: 800 cN**
WEFT DIRECTION Test Reading **(cN)**		1748				**WEFT: 800 cN**

FINAL RESULT: PASS

AFTER WASH

SATISFACTORY

WARP DIRECTION Test Reading **(cN)**		2645				**WARP: 800 cN**
WEFT DIRECTION Test Reading **(cN)**		1521				**WEFT: 800 cN**

FINAL RESULT: PASS

ABRASION RESISTANCE TEST
Method no: ASTM D3884-92 (YO STD)
Machine name: 5155 Taber Abrasion Tester

Observation no:	**Cycles no:**	**COMMENTS :**	**RESULT**
1	1000	FABRIC DURABILITY IS OKAY	FAIL AS PER YO STD.
2	2000	FABRIC ABRASION STARTED	
3	3000	FABRIC ABRATED	