Faculty of Engineering

Department of Textile Engineering

REPORT ON

Defects of woven fabrics and their remedies.

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Advance in Fabric Manufacturing Technology

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Prof. Dr. Md. Mahbubul Haque, Professor & Head, Department of textile engineering, Daffodil International University.** We also declare that neither this project nor any part of this project has been submitted elsewhere for any award.

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Finally we would like to acknowledge that we remain responsible for the inadequacies and errors, which doubtlessly remain.

ABSTRACT

Firstly we collected some defected fabric picture from the weaving floor, Dyeing section, finishing floor and the inspection section of Sim Fabrics Ltd and Shasha Denims Ltd to complete our project work. Then we separate the collected pictures of the faults in different categories so that we can analyze the fabric defects very effectively and establish an acceptable result which will be enough to evaluate the grade of different fabrics and in further time it can help us to carry out further activities depending on the establish form of work.

After evaluation of the grade of the fabric samples we targeted to find out the real causes of these faults in the industrial area . These became possible during our project(Thesis)work.

Then we try to analyze them very effectively to find out the track of the source and tried how to solve those problems.

We have tried our best to give our complete effort on the woven fabric defects which are caused by the different manufacturing process likes spinning ,warping , dyeing, sizing, weaving, finishing etc.

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Chapter – 1

Introduction

Introduction:

The industry of RMG is one of the most potential and revenue earning sector of Bangladesh. The Standing of the RMG market is known worldwide. It was started in the late 1970s.Soon it became one of the major economical strength for Bangladesh. The RMG sector has added very much in earning foreign exchange, balancing export and import, huge unemployment problem for the country and empowerment of women along with given them financial support.

Textiles and clothing will always be essential goods for human beings. Spinning and weaving were the main activities that drove the Industrial Revolution in the 18th century. Since then the textile industry has been a leading industry in the initial phase of industrialization in many countries in different periods of time in the world. Bangladesh is an important producer & exporter of woven RMG product. There are about more than 5,500 woven garment factories, 1,700 knitwear factories and 1,300 spinning, finishing and dyeing factories running in Bangladesh. Growth of garments factories started in Bangladesh around 1980. But now nearly 80% of our foreign currency is earned from RMG export. At present Bangladesh is producing & exporting more than 60 items of garments. Garments are exported to USA, Canada, Japan, Australia, Middle East and many other countries in the world. Cheapest labor cost is the biggest advantage for Bangladeshi garments producers & exporters.

We the men of Bangladesh are inborn weavers. If we turn back near future we can see that the local woven sector was very rich in product mix. But in recent times with the gradual development in knit sector, woven sector is day-by-day lagging behind. A matter of great sorrow that we only produce 30% of export oriented woven fabrics fabric while we import around 70% woven fabrics form abroad.

Textile Sector as a whole plays an important role in the economic life of Bangladesh.

Factors hinder the development of woven sector:

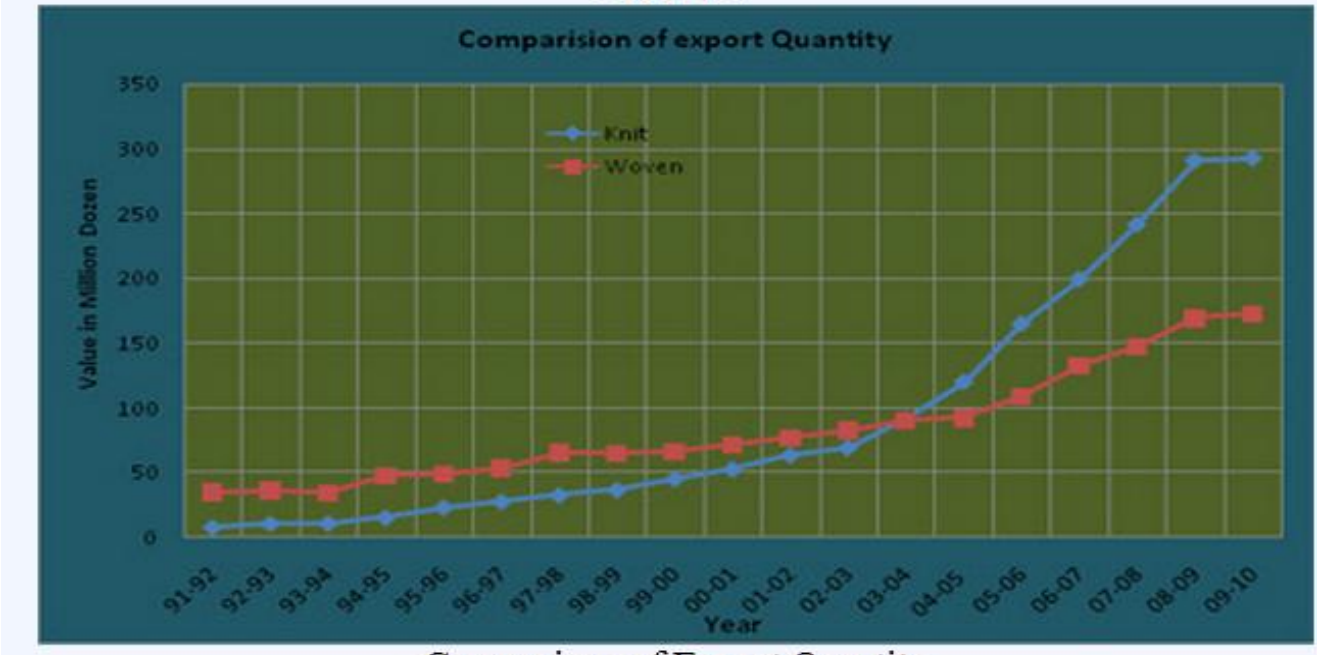
- Must improve our dye-stuff manufacturing capability.
- Our bank interest rate is highest among all competiting countries. So we must have to reduce it.
- Must improve our fabric design and research facilities.
- We may utilize other fibres like Bamboo, Hemp etc.
- Installation of solar power needs financing.
- Must improve woven dyeing as well as finishing capacity.
- Must improve our production capability of synthetic fibres.
- Finally the most important problem is quality of woven fabric should be improved.

Problems found about woven fabric production in Bangladesh:

General problems	Present problems	Psychological problems	Other reasons
Investment Capability	Power Consumption	Lack of confidence	Horizontally Integration
Improper Utilization of Technical Persons	Requirement of Space	High profit achieving tendency	New Fabric Development
Process Difficulty	Buyer Recommendations	Vendor don't want to take risk	Machine Conditions
Environmental Policy	Very less woven dyeing facility		Factory Evaluation
			Lack of Modern Design Machine

Now if we focused on woven sector the case is different in comparison of knit sector. A data to show the increasing rate of woven garments & knit garments exporting rate is given below.

increased to 292.70 million dozens which is 219% higher than the year 2003-04 to 2009-10.



Comparison of Export Quantity

Figure1: Comparison of export quantity.

- If we saw the Figure 1, we can see that in first moment from 1990 to 2002 the woven garments exporting amount is increasing consistently which means consistent growth of woven fabric production locally.
- But after a period of the increasing rate of local woven garments production is very low or can say the growth rate is very slow.
- For producing various types of quality woven fabric, we don't have enough expertise and we can't make enough skilled manpower timely. For this reason the woven projects are not increasing gradually like knit projects in Bangladesh.
- As the woven projects are very few in number and it is very time consuming and difficult to make skilled manpower for woven factory, so we only produce what we produce as usual.
- .As the variation in production number of projects is very less, the textile expertise of Bangladesh lost their interest to be a woven fabric expert and thus the sector is going to the hand of non-tech people.

Description of the major problems:

Investment capability:

- Weak economic condition of Bangladesh
- Limited big investors with less interest to invest in big projects.
- In our country an investment of about 30-50 million is considered as very big investment.
- In CHINA, INDIA, AUSTRALIA, PAKISTAN investment under 100 million is very uncommon.
- In some cases new factory without 1000 looms is strictly prohibited.
- So they have very good scope to setup various types of looms.
- As a result they always get the big orders of bulk production.

Process difficulty :

If we focus on these processes we can easily understand why woven fabric production is difficult and why variations can't be easily brought in woven fabric in comparison with knit fabric.

Environmental policy :

- Buyer evaluates the factory by find out their environmental policies.
- Most of our factories have no any specific environmental policies, even they have no any ETP.
- Factory owner's main argument about ETP is that ETP running is very costly and added extra value to the product.
- Buyers also see where the factory is established, is it in a crowed ful area or outside of the town, they also see how much impact of that factory to the environment.

A Data of Minimum Standard Requirements of factory environment which proposed by an well reputed Buyer is given below:

Minimum Standards Requirement
Untreated effluent must never be discharged
All effluent must be treated in a fully functional effluent treatment plant (ETP) before being discharged
The capacity of on-site effluent treatment plants must be sufficient to process the total factory effluent output
Chemicals must not be allowed to contaminate soil
No chemicals can be washed down surface water drains
Confirm no breaches of consent limits in past 12 months
Confirm no prosecutions in the past 12 months
Mills must be fully compliant with local and national laws and standards
Mills must measure the following parameters: COD/BOD, pH, Temperature, Offensive colour, Suspended solids, Total Dissolved Solids, Specific metals and toxins.
Treated effluent must be tested on a frequent basis in an independent laboratory and records must be available for inspection.
Records of independent test results of effluent must be retained for at least 12 months

Effluent from textile colouration is viewed as the biggest source of pollution and environmental damage in

Figure 2: A Data of Minimum Standard Requirements of factory environment requirements.

Power Consumption:

- No doubt it on off the major problems.
- Lack of resource and investment.
- Lack of maintenance of existing power plants.
- Many capable groups are waiting for power supply in their big projects, those are already established, machines are available….but power supply is nil!
- As we all know that before weaving, WARPING & SIZING is mandatory and it consumes huge power than knit industry.
- A case study showed that a renowned woven factory named NOMAN WEAVING MILL'S per month needed power is 3723 kw(for 128 looms).
- While a renowned knitting factory named Mother Color having 128 circular knitting machines per month power consumption is only 768 kw.
- So it is now clear that a huge power is needed to run a woven factory.

Lack of confidence:

'' WHY WE ARE PRODUCING ONLY SOME COMMON FABRICS, WHY COULD NOT WE PRODUCE OTHER DIFFICULT DESIGN FABRICS? WHERE MOST OF THE CASES ALL FACILITIES ARE AVAILABLE!''

Before answer that question we have to look after some facts:

- 99% of our woven factories have very less amount of technical persons.
- Even those non-tech persons have gained the production manager post.
- When a buyer contact with that production manager and then show his fabric sample, which is very difficult to analyse and more difficult to produce.
- That time he(PM) began to think about his factory pressure, by this time he easily sort out that '' why i have already got enough order of normal bulk fabric production, why should accept that difficult design order, which analysis should be time wasting and the whole process of production should bother my mind a lot!''
- Another fact tells that ''this type of relaxed mentality '' didn't grow in a day ,it is the lack of inspiration to the manager from the superiors. As a result day by day that person loses his attention towards doing some innovative things.
- These lead us to the unsatisfactory development.

High profit achieving tendency:

- This type of tendency has a great impact in our woven sector. A case study tells that our factory owners always try to make minimum 200% profit on every shipment/individual product.
- . To achieve high profit sometimes they apply illegal theory, for example in sizing they use lower quality or lower cost chemical. Suppose a fabric construction is 50*50/140*96=58'' in that case total warp required is 8120 but they do it with 8000 ends. No problem they minimize the problem in the section of finishing. So they saved 120 cones then 120*2.8=336 Dollar saved.
- Here comes the matter of cost, in Bangladesh the cost of fabric is relatively high than other fabric producing countries. Main reason is that we always import raw materials to machines, these added huge value to the products. Here comes another fact that our factory owners are not deep thinkers or having business related intelligence. They can't realize that if they consider the cost of these products they may get more orders, but it is a matter of great sorrow that they can't do this. In another case most of the time they follow the international market price, for example 1 yds fabric price is 2.98 $, India that time cleverly drop the rate in to 2.85$. Then again the Bangladeshi factory owners drop the rate. Again India raises the price but that time Buyers think that India gives us better quality than Bangladesh, then why should we drop the order in Bangladesh!
- The average price of Bangladesh-made shirts was $62.74 per dozen in 1998. This price was the second lowest. The Dominican Republic sold the lowest priced shirts of the same category at $54.79 per dozen. Prices of Indian, Mexican and Sri Lankan shirts were $81.04, $76.26 and $74.77 respectively. Against this, the prices of Hong Kong and Malaysia shirts were $107.34 and $134.08 respectively. Exporters from Bangladesh produce mostly those items on which quotas are available.

Horizontally integration :

Most of the woven factories are horizontally integrated. It seems that they don't have any spinning, dyeing, printing, finishing, garments facilities under one specific shed. Most of them are very much dependent on yarn supply. A matter of great sorrow that our yarn quality is not too good and cost is comparatively higher than international market. As a result the fabric cost is become high.

New fabric development:

- Very less amount of new fabric development according to buyer requirements, also we are not capable of all sort of fabric development.
- Own innovation is almost absent here.
- Thus we can't attract or assure the new buyers, those who want to drop their orders.
- That's why we always got the order of regular or normal fabric production.
- Fabric developers are not interested to build up new fabric concept because there might not have facilities to produce that sort of value added fabric.
- Finally we always having same buyer same production

Machine conditions:

- Most of the machines of our factories are almost 5/10/15 years old. So when buyers come to an audit in that mill they became demoralized.
- Some of the factories are using end life Warping and Sizing machines thus the efficiency became less.
- Most of machine having duplicate parts thus they losing their efficiency gradually.
- Another case study said that in most of the factories the warpers & weavers beams became 'TAL' that's why warping and sizing became faulty.

Factory evaluation:

- Unfair policies of big industries also responsible for this condition. A case study showed that big industries when expand their plants, they easily get extra power because they are renowned while new factories failed to achieve that.
- Buyers mentality is also responsible, they always drop order to the renowned factories. While in many places in our country produce quality fabrics. Another concept is that those less renowned factories failed to prove themselves, they failed to catch buyer. They satisfied themselves by producing only local fabric.

Lack of modern design machine:

Our machines are capable of producing only normal design fabrics. So we can't produce difficult design fabric specially curtain fabric and heavy blankets. In winter major countries a great demand of heavy blanket is seen. The absence of modern JACQUARD machine caused a great misfortune to get those order.

Lack of government patronizations:

- No doubt that woven sector is a promising sector in Bangladesh. It needs huge government patronization, but the real scenario is totally different.
- To import woven machinery and accessories, vendor doesn't get any Tax holiday facilities. If we focus India, China, Honkong, Thailand and other woven fabric producing countries, we found that their producers have got huge facilities provided by their government. Facilities are given below:

Other reasons :

- Their government provided huge research facilities and they have got the independence of making decisions.
- They have got 100% tax free facilities for any kind of woven related import.
- They have got uninterrupted power supply.
- Their bank interest for this sector is almost 0-1%.
- They have got huge technical persons as well as modern machineries.
- They achieved ultra modern technologies by the shake of huge Textile related institutes.

Now if we focus our Textile sector specially woven sector we are facing above discussed laggings.

Now we are standing towards a great opportunity that is technical textiles. Its application is gradually increasing day by day. An important fact is that 90% of Technical textiles are made by woven fabrics. Now if we want to grab that opportunity or catch the market we must have to improve our present condition of woven sector.

Chapter :2

Literature survey

2.1 Weaving:

Weaving is the intersection of two sets of straight yarns, warp and weft, which cross and interlace at right angles to each other. The lengthwise yarns are known as warp yarns and width wise yarns are known as weft or filling yarns and the fabric produced is known as woven fabric. The machine used for weaving fabric is a loom. It is a complex work. A number of faults occur in fabric during weaving process.

2.2Definition of Defect:

An imperfection that impairs worth or utility.
Or, Want or absence of something necessary for completeness or perfection.
Or, A fault that spoils the material.

2.3 Fabric Defect:

A Fabric Defect is any abnormality in the Fabric that hinders its acceptability by the consumer. Fabric faults, or defects, are responsible for nearly 85% of the defects found by the garment industry. An automated defect detection and identification system enhances the product quality and results in improved productivity to meet both customer demands and to reduce the costs associated with off quality. Higher the production speeds make the timely detection of fabric defects more important than ever.

2.4 Defects occurs during manufacturing in different processes:

1. Pre-treatment process			
S. No	Faults	Causes	Remedies
1.	Oil and grease stains	Due to carelessness of the maintenance workers and the machine operatives, oil spills over parts which come in contact with the fabrics and stains are produced.	Emulsifiers are used to remove oil and grease stains.
2.	Singe Marks	Blockage of some of the flame orifices and creases in the fabrics lead to non-uniform singeing and affected areas appear darker after dyeing or printing	Colour should be stripped and the fabrics re-singed and readyed.
3.	Draft Stains	If wet cloth after bleaching is left for relatively longer period of time after bleaching, then after dyeing, printing or finishing it will exhibit stains of deeper colour.	The cloth showing stains is acidified, washed and dried to remove the stains.
4.	Rope Marks	When scouring and bleaching the cloth in rope form under high pressure during mangling, folds develop longitudinally.	In order to remove the folds, cloth is stentered and in case of severe folds it is mercerized.

5.	Tendered Areas	Chemical degradation during bleaching produces tendered areas of faded color in dyed cloth.	Minor tendering is curable by boiling the cloth in caustic soda solution and redyeing. Acute tendering cannot be repaired.

2. Dyeing

S. No	Faults	Causes	Remedies
1.	Dark Selvedges and Bronzing	Dark selvedges are caused by non-uniform winding of cloth during dyeing on jiggers. Bronzing effect also appears during dyeing in open jiggers with vat and sulphur dyes.	The defective cloth colour is stripped and it is redyed. During the process of redyeing beaming of cloth should be perfect.
2.	Dye Stains	Dark selvedges are caused by non-uniform winding of cloth during dyeing on jiggers. Bronzing effect also appears during dyeing in open jiggers with vat and sulphur dyes.	In case of vat and fast colours cloth should be stripped of colour and redyed. Boiling leveling bath should be used for direct dyed cloth. Levelling agents should also be added.
3.	Dye Molting	Erroneous recipe concentrations and dyeing methodology result in unlevel dyeing.	The dye must be stripped, reduced or reoxidised. Adjust the colour by shading method.
4.	Sided Dyeing	Unequal pressure on the dye mangle in continuous dyeing produces differences in colour depth on sides.	The cloth should be stripped of colour and redyed with uniform pressure on the dye mangle.
5.	Specky Dyeing	The use of dyestuff brands of big particle size especially in pigment and vat colour dyeing results in darker dyed spots on the fabric surface.	The cloth should be boiled and stripped of colour. Highly dispersed brands of vat colours should be used for redyeing of cloth.
6.	Colour Migration	Colour intensity on one side of the fabric is different from that on the other side. The main cause is non-uniform drying of both faces of the fabric.	Colour should be stripped and fabric redyed.

3. Printing			
S. No	Faults	Causes	Remedies
1.	Colour Seepage	Unequal feeding of printing paste of low viscosity causes stains in parts of the fabric not to be printed.	Print paste feed must be equal and uniform and its viscosity should be suitable.
2.	Squeeze Marks	Pressure differences of the squeeges variations in colour intensity of printed fabric. Poor quality of thickener and rubber also causes this problem.	Squeegee pressure should be adjusted. Good quality thickener and rubber of suitable shore hardness should be used.
3.	Colour stains on unprinted parts	Colour from a defective preceeding screen is over printed in the main white grounds. This is due to wear of gelatin or ducco of the screen.	The defective screen must be repaired.
4.	White or coloured spots and colour depth difference	Fabric areas differing in the colour depth than the surrounding areas or appearance of unprinted white spots caused by defective printing rollers.	Eccentric printing or engraved rollers must be repaired and engraving depth should be increased.
5.	Doctor Blade Streaks	Scratches in the printing rollers or dullness of the doctor blades can cause white wavery lines in warp direction.	Engraved printing rollers should be repaired. Doctor blades should be cleared and sharpened.
6.	Blanket Marks	Defective woolen or rubber blankets of the printing machine cause color stains on comparable distances of the printed fabric.	Defective blankets should either be repaired or replaced with new blankets.
7.	Misalignment or overlapping of design	Misalignment or overlapping of the printed design is caused by defective fitting of rollers or screens on the printing machine. It may also be due to errors in engraving or photographing of the design.	Screens or rollers should be properly fitted on the printing machine. Errors in engraving or photographing of the design should be rectified.

4. Washing

S. No	Faults	Causes	Remedies
1.	Weaker Colour	Low efficiency of color fixation process causes weaker or pale colour after washing.	Colour of the dyed fabric should be devcloped with correct concentration
2.	Stains on white grounds	Saturation of the washing containers with dye-stuffs or contaminated water cause stain on white portions of the fabric.	Squeezing mangles of the washing machine should be cleaned. Washing liquor should be frequently renewed.
3.	Poor washing fastness	In complete removal of excess colour or low washing process efficiency causes poor washing fastness.	Temperature of the washing basins should be adjusted. Soap or other chemicals which are are added should be removed
4.	Poor washing fastness	Stains on the machine blanket can cause colour stains on the back of the printed cloth.	Blanket as well as the drying oven should be cleaned.

5. Steaming

S. No	Faults	Causes	Remedies
1.	Colour intensity differences on cloth sides.	Non-uniform temperature and steam distribution inside the steamer cause differences in colour intensities between cloth sides.	Uniformity of temperature and steam distribution in the steamer should be perfect.
2.	Water Drops	Improper insulation and heat distribution causes dropping of condensed water on cloth during steaming.	Temperature during steaming should be evenly distributed and insulation of the steamer should be improved.

6. Finishing

6.1. Stentering

S. No	Faults	Causes	Remedies
1.	Startch stains and white lines on finished cloth	Starch stains and white lines on the finished cloth are produced because of incomplete dissolution of the starch in the padding liquour.	Fabric should be desized and restarched.
2.	Longitudinal Creases	Longitudinal creases are produced if the cloth passes on non-uniform cylinders	The cloth should be padded in a solution of

		after starching.	hot water and dried on an even surface.
3.	Wrong and narrow width	Frequent stoppages during mercerization or drying produce cloth with non-uniform width.	Cloth should be passed again through the Stenter to get the required width.

6. 2. Calendering			
S. No	Faults	Causes	Remedies
1.	Non-lustrous spots or lines	Grooves or scratches on the calendar bowls cause non-lustrous spots or lines on the cloth.	Cloth should be padded in hot water and recalendered on a smooth flawless calender.
2.	Poor finish of cloth	If cloth with high starch content and high moisture regain is calendered, the finish of the cloth will be poor.	The cloth should be thoroughly dried and treated with suitable finishing recipe before calendering.
3.	Poor degree whiteness	Residual acidity in bleaching and mercerization processes, incomplete dissolution of the optical brightener and use of poor quality softeners can lead to poor degree of whiteness of the cloth.	Initial scouring and bleaching should be proper. Optical brightener should be properly dissolved. Bleached fabric PH should be adjusted and suitable softening agent should be used.

Table 1: Fabric defects occurs in different processes.

2.5 List of Major problems/faults/defects of weaving are pointed out below:

- Warp streaks
- Reediness
- Weft bar
- Weft crack
- Thick and thin places
- Weft loops
- Box marks
- High incidence of warp breaks
- Weft breaks
- Shuttle traps
- Shuttle flying
- Smashes
- Bad selvedge
- Broken picks
- Bullet
- Half pick
- Broken end
- Coarse end
- Coarse pick
- Slough off
- Thick end and thick picks
- Double end
- End out
- Fine end
- Jerk-in
- Knot
- Loom bar
- Loom barre’
- Misdraw (Colour)
- Mispick
- Reed mark
- Reed streak
- Set mark
- Shade bar
- Stop mark
- Tight end
- Pilling
- Float
- Pin marks
- Contamination of fluff

2.6 Causes and Remedies of different fabric Defects:

Warp streaks: Warp streaks are narrow, barre and dense stripes running along the warp direction. Main reasons are the variation in density of adjacent group of warp ends due to non-uniform dent spacing, wrong drawing-in, or count variations. Also, the variations in lustre, reflectance of dye pick-up of adjacent groups arising out of differences in raw materials, blend composition or yarn constructions contribute for streaks.

Reediness: These are very fine cracks or lines between groups of warp threads, caused due to excessive warp tension, late shedding, use of coarse reed with more number of ends per dent, bent reed wires, improper spacing of reed wires, wrong drawing, and insufficient troughing of shed, i.e. tension difference between top and bottom shed lines during beat up.

Weft bar: It is a band running weft-wise across the full width of the cloth. The normal reasons are the periodic medium to long term irregularity in the weft yarn, count difference in weft, excessive tension in the weft feed package, especially in filaments, variability in pick density and difference in twist, colour or shade of adjacent group of picks, difference in blend composition or in the cottons used.
Weft crack: It is a thin place or missing weft across the body of the fabric. The main causes are improper setting of anti crack motion, loose fitting of reed, loose or worn out crank, worn out crank arm, worn out crank shaft bearings, loose belt, worn out duck bills and beaters, weft fork not functioning properly, faulty take up, brake motion not acting instantaneously, shuttle striking on the weft fork due to weak picking, swing rail worn out, weaver not adjusting the fell of cloth properly at the time of starting a loom, and gripper not holding the weft firmly.

Thick and thin places: These are similar to weft bar, but unlike weft bars, it repeats at intervals. They are mainly due to irregular let-off, incorrect setting of holding and releasing pawls on the ratchet wheel of take-up motion, gears of take-up motion not meshing properly, and gear wheel teeth worn out or broken.

Weft loops: Loops project from the surface of cloth either on one or both sides of a cloth because of a small portion of weft getting caught by the warp threads. The main reasons are late shedding, low warp tension and use of bad temples.

Box marks: Box marks are due to something bruising or staining the weft while it is in or near the box. Main causes are dirty boxes, shuttle riding over the weft, oil from shuttle tongue, dirty shuttles, weft flying about too freely, oil splashes from loose cranks, oily spindles and buffers and dirty picking stick for under pick.

High incidence of warp breaks: Excessive warp tension, blunt or loose shuttle tip, rough shuttles, too small or too big shed formation, bottom shed line beating down on slay race, jerky movement of healds, too early or too late shedding, race board badly worn out, healds catching each other, sharp or rigid reed wires, warp size accumulation on reed, pirns projecting above or below shuttle, improper sizing, improper humidity in the loom shed, a weaker warp yarn, a higher speed of loom, more number of ends per inch for the count being used, less air space in

reed are the main causes for excessive warp breaks.

Weft breaks: High weft tension, improper build of pirn, knots at the nose or chase of pirns, back stitches in cones fed as weft in shuttleless looms, rough and damaged surface of pirns, shuttle tongue not in level, rough places inside the shuttle, damaged nylon loops, sloughing off or loosely built weft package, shuttle eye chipped or broken, weft trapped in the box, selvedge ends cutting the weft, weft fork too far through the grate, rough box fronts or shuttle guides, improper alignment of cone in weft feeder, lower twist in weft resulting in weft opening out in air-jet looms, grippers missing the picks, improper knotting of tail ends, and rough handling of cones are the main reasons for higher weft breaks.

Shuttle traps: Entangled warp ends due to fluff falling on the warp, broken warp end entangled to adjacent end, knot with a long tail resulting in entanglement, snarls in yarn getting entangled, too much hairiness in yarns, weak picking, faulty shuttle checking, gear wheels slipping due to broken teeth, loose stop rod finger, and uneven joint of flat belt are the normal reasons for shuttle trap.

Shuttle flying: Fibrous yarns, knots with long tail ends, slack warp, uneven race board, small sheds, bottom line too high, worn pickers, swells giving twist to the shuttle as it leaves the box, early picking, late shedding, unbalanced shuttle, box spindle not set properly, box front not set properly and missing shuttle guard are the main reasons for shuttle flying.

Smashes: Daggers not working, frog spring ineffective, bad shuttle, improper boxing of shuttle, worn out picker, worn out transfer hammer, damaged pirn and entanglements are main causes of smashes.

Bad selvedge: Improper shuttle wire tension, bent shuttle jaw, shuttle crack, more tension on selvedge yarns, late shedding resulting in rubbing of shuttle to the selvedge and improper selection of selvedge weave for the fabric being woven are the main reasons for bad selvedge.

Broken picks: A filling yarn that is broken in the weaving of a fabric appears as a defect. Improper functioning of weft stop motion results in broken picks undetected and going in to the fabric.

Bullet: Bullets are low twisted double yarn seen weft wise in fabrics. Those are generally zero twisted parallel yarns. Practical causes of faults are improper functioning of bunch motion, incorrect yarn path through spindle, loose tensioners, capsule and spring working, insufficient yarn as bunch and knot is not applied after removing bunch yarn

Half pick: In case of rapier looms, if the second rapier does not collect the weft, it shall stop in between, and we get half pick.

Broken end: A defect in fabric caused by a warp yarn that was broken during weaving or finishing.

Coarse end: Warp yarn that has a diameter too large, too irregular or that contains too much

foreign material to make an even, smooth fabric.

Coarse pick: Filling yarn that is too large and imperfect to appear to advantage in the final cloth.

Slough off: Weft yarn has slipped from the pirn. Proper monitoring of strength and chase in pirn winding can solve this problem.

Thick end and thick pick: Higher diameter in yarn for a short distance can be due to improper piecing s at spinning preparatory or drop in pressure on the drafting rollers for a short time. This also can happen due to not removing of spinners double, not piecing the end properly by removing the lapped materials, accumulation of fluff in condensers, cradles and in the necks of the top rollers.

Double end: Two ends that weave as one. This happens because of migration of a broken end to the adjacent reed space along with the neighbouring end.

End out: A warp yarn that was broken or missing during weaving.

Fine end: A defect in silk warp yarn consisting of thin places that occur when some of the filaments that should be in the warp yarn are absent, generally caused by improper reeling. Warp end of abnormally small diameter, i.e. long thin places of class I1 and I2 also is referred as fine end.

Jerk-in: An extra piece of filling yarn jerked by the shuttle into the fabric along with a regular pick of filling.

Knot: Knot is defined as a knob or lump formed by interlacing portions of one or more flexible strands or a quantity of yarn, or thread, which varies with the fibre; it consists of a set of coils. Control in pirn winding, the winding to binding coils ratio can solve this problem.

Loom bar: A change in shade across the width of a fabric, resulting from a build up of tension in the shuttle before a filling change.

Loom barre: Repetitive selvedge-to-selvedge unevenness in woven fabric usually attributed to a mechanical defect in the let-off or the take-up motion.

Misdraw (Colour): In woven fabrics the drawing of coloured yarns through the loom harness contrary to the colour pattern and/or design weave is termed as misdraw. In case of warp knits misdraw is the drawing of coloured yarns through the guide bars contrary to the pattern design.

Mispick: A defect in woven fabric caused by a missing or out-of sequence yarn.

Reed mark: A crack between groups of warp ends, either continuous or at intervals, which can happen due to damaged reed or improper spacing of dents.

Reed streak: A warp wise defect attributable to a bad reed like uneven reed space, bent reed wire, slant wire, damaged reed wire etc.

Set mark: Defect in woven fabric resulting from prolonged loom stoppage. Because of the humid weather and the fine dust present in the atmosphere, the cloth exposed shall get slightly different colour and also some relaxation takes place. A combined effect gives a line in weft direction.

Shade bar: A distinct shade change of short duration across the width of the fabric. This is normally due to a mix up of weft with different property.

Stop mark: Narrow band of different weave density, across the width of a woven fabric, caused by improper warp tension adjustment after a loom stop. A well trained weaver can reduce this type of defects.

Tight end: Warp yarn in a woven fabric that was under excessive tension during weaving or shrank more than the normal amount.

Pilling: Fibre filaments that break in yarn due to friction leaving small clumps of loose fibres on the surface

Float: Slack warp and Faulty Pattern Card are the main reasons for a float in a woven fabric.

Pin marks: Poorly adjusted temple pins or damaged pins can lead to pin marks.

Contamination of fluff: Different fibres or foreign materials get mixed during spinning, winding or in weaving preparation stage, causing visual objection in fabric. The causes are improper cleanliness, not properly cleaning the machines after each doff and lot changes, improper suction of drafting zones of gill boxes and roving, improper cleaning of scrapper and scrapper plate after every lot change of doff, not using of curtains for partition of machines running on different colours, overhead cleaners of ply winding and ring frames blowing dust on running spindles or drums, material not covered to avoid fly and fluff accumulation, use of compressed air for cleaning machines while in working or while adjacent machine is working and use of common return air ducts and running different coloured fibres in the shed.

2.7 Fabric inspection system:

2.7.1Definition of inspection:

Activities such as Measuring, Examining, Testing, one or more characteristics of a product or source comparing these with specific requirements to determine conformity .
The fabric roll is removed from loom and then sent to an inspection frame.

2.7.2Object of fabric inspection:

The word of Inspection in textile engineering mainly identifies to the visual examination or review/scrutinize of materials (like fabric, accessories, trims etc). It is an imperative process in any woven industry to keep away from rejects due to low fabric quality and precautions to remove unexpected loss/defects of finished goods.

The quality of a finished item in woven industry mostly be controlled on the quality of fabric when it is produced as a roll from. Even it occupies 60/70 percent of total cost. Apparel industry should take some defensive actions to ensure quality full fabric is being used in their items and set up fabric inspection department with modern equipment and skilled manpower.
An optimal solution would be to automatically inspect fabric as it is being produced and to encourage maintenance personnel to prevent production of defects or to change process parameters automatically and consequently improve product quality.

Fabric mills and garments industry, both parties quality team should give their highest effort to erase any unexpected circumstances. Even the most exceptional/excellence manufacturing methods cannot compensate for defective materials.

- Garments producer: Have to inspect minimum 10% per color or more of any consignment when they got and assess them based on a four-point system. By this process, they can minimize fabric related quality troubles before it moved to production.

- Fabric mill: Have to inspect 100% of finished goods; defects must be recorded for each roll.

2.7.3 Inspection Instruments/Tools:

The assessment may be carried out usually or by

- Pick glass.
- Measurement by tape.
- Visual.
- UV lamp.
- Streak analyzer.
- Spotting with Shirley stain or similar staining agents.

2.7.4 Methods followed for fabric inspection process:

1) Graniteville "78" system.
2) Dallas system.
3) 4 point system
4) 10 point system

But, above all 4 point system is most popular and broadly used as it is very simple to applicable, educate and learn. Let's find a tiny description of 4 point inspection system below.

2.7.5 To use this system someone have to know following procedure:

- Vast idea on nature of fabric defects (how a defect looks and its appearance).
- Fabric inspection method or preparation.
- Criteria of giving penalty points based on defects and defect length.
- Calculation method of total penalty points for total defects found in a fabric roll or consignment.
- A Check sheet or format for keeping data.

2.7.6 Four Point System:

Most of the apparel/woven industry prefers Four Point rating system for determining fabric quality and it is certified by the American Society of Quality Control (ASQC) as well as the American Apparel Manufacturers (AAMA).

The 4-Point System assigns 1, 2, 3 and 4 penalty points according to the size, quality and significance of the defect. No more than 4 penalty points is assigned for any single defect. Defect can be measured either length or width direction, the system remains the same. Only major defects are considered. No penalty points are assigned to minor defects.

2.7.7 Inspection Procedure under 4 points systems:

- Decide the quantity to inspect at least 10% of any consignment.
- Even small consignment has to be sure to choose at least one roll of each color way.If more than one role must be chosen, then select the additional roles in proportion to the total number of roles per color received.
- Pick up the rolls to inspect.
- Set the rolls on the inspection device.
- Fabric inspector should have an approved fabric submission form to compare with bulk lot.
- Measure the fabric width and cut off a 6 inch piece across the width of the end of the roll. Mark the right and left side of the strip. After inspect every 50 yards please slow down the inspection process and use the strip to check for any shading problems. Also ensure to check the end of the role.
- Inspect for visual flaws under clear lighting source with slow speed to find out the imperfections.
- Check for biased, bowed and skewed fabric.

- ❖ Mark any imperfections by the colored sticker or chalk so that they can be easily found whenever needed.
- ❖ Make sure the roll exist the accurate yardage as declared by the supplier.
- ❖ Fabric item, length, width, roll no, defect types and other ticket information must be recorded properly.

2.7.8Defect Classification according to 4 point system:

Whenever defects are recognized during fabric inspection under 4 points system and defect must be assigned by a number of points depending on the severity/length.

Inches (″)	(mm)	Points
From 0 > 3" length/width	Up to 75mm	1 point
From 3.1" > 6"length/width	75mm > 150mm	2 points
From 6.1" > 9"length/width	150mm > 230mm	3 points
More than 9"length/width	More than 230mm	4 points

Only major defects are taking into account. A serious defect is any defect that would cause a final garment to be considered a second.

- ❖ Upon the number and the size of the imperfections in the given yard, a maximum of 4 points can be given to one linear yard.
- ❖ Four points can be given for each linear yard, when a defect running continuously along the length of the fabric.
- ❖ Hole point may be evaluated by size.

Holes and openings (largest dimension)	
1" or less	2
Over 1"	4

Acceptability of Roll / Shipment

Fabric shipments can be considered to be second quality and not acceptable upon the following total points. Fabric supplier is responsible for their fabric defect and to compensate for defects, 1 yard for every 8 points.

For below items classified for a point fabric, fabric supplier should compensate for all defective garment cutting panels or pieces.

Synthetic woven	average of 15 points per 100 linear yards
Twill, cotton, linen	average of 20 points per 100 linear yards
Warp.knits	average of 15 points per 100 linear yards
Flat knit rib	average of 0 point per piece
Prints	average of 0 point per 100 repeat
Synthetic/Synthetic blends weft knits	average of 15 points per 100 linear yards
Body mapping, Engineering	average of 0 point per 100 repeat

Defect calculation: total liner yards + total defect points x 100

If total point is greater than 30 per 100 liner yards, no particular roll should be considered first quality.

Total defect points per 100 sq. yards of cloth are computed and therefore the acceptance criteria are usually no more than 40 penalty points. Fabric rolls containing over 40 points are considered "seconds".

The formula to compute penalty points per 100 sq. yards is given by:

= (Total points scored in the roll * 3600) / Fabric width in inches * Total yards inspected

Example: A fabric roll 150 yards long and 56" wide contains following defects.

6 defects up to 3" length 4 defects from 3" to 6" length 2 defects from 6" to 9" length 1 defect over 9" length 1 hole over 1"	6 x 1 4 X 2 2 X 3 1 X 4 1 X 4	6 points 8 points 6 points 4 points 4 points
Total defect points		28 Points
Therefore, Points / sq. yards	= (28 X 3600) / (56 X 150) = 12 points	

2.6.9 Notable points of this system are describing below:

- The process has no stipulation for the probability of minor defects.
- The fabric is graded regardless of the end-product.
- No more than 4 penalty points is appointed for any single defect.

Chapter - 3

Experimental Details/Survey

Experimental Details/Survey:

In order to collect various information about fabric defects, we have visited two woven industries one is Sim Fabrics limited and another one is Shasha denims limited. It may be mentioned that:

SIM Group has been one of the pioneers of the textile industry of Bangladesh. This Group has introduced many new concepts to the commerce and trade industry of Bangladesh. With it's diversification policies, SIM Group has conquered many different arenas along with textile, although textile remains the carter focus of the group activity. New life was injected into the dismantled SIM Fabrics Textile Factory in 2000. Since then this group grew over the years into a full-scale textile factory with SIM Fabrics skilled employees and modern technology. SIM Fabrics will remain an acknowledged leader in providing high quality fabrics for Pants, Skirts, Suites etc to it's customers. SIM Fabrics will continue to provide superior quality of fabrics.

Shasha Denims Ltd is the leading denim fabric producer in Bangladesh since 2000. It is a professionally managed and technically sound organization located at Dhaka Export Processing Zone (DEPZ). The plant is fully integrated with State of the Art technology and machinery from Switzerland, Germany, Belgium, USA and India to give their valued customer the real classical Indigo Denim made with the best and most modern computerized SLASHER DYEING technology. With ever increasing acceptance of their quality fabric and increase in demand the production capacities were expanded at regular intervals. Production capacity of Shasha Denims Ltd is 1.8 million yards per month and deliver the largest quantity from Bangladesh. Shasha Denims Ltd have the widest range of denim fabrics. No one in the country produces as much.

Both Sim Fabrics limited and Shasha denims limited are produces only woven fabrics. During the time of factory visit we found, there are lots of fabric faults occurs during production in different section. The defects are described below:-

3.1 Description of Fabric Defects:

3.1.1 Slub:

Figure 3: slub.

Causes:
If the yarn contain unexpected slub in it, then those slub will be appeared in the fabric as a fault.

Remedy:
The quality controler have to be very carefull about the quality of the yarn.

3.1.2 Hairy fabric:

Figure 4: Hairy fabric .

Cause:

This type of fabric fault comes due to the hairiness of the yarn.

Remedies:

- The yarn have to be checked by during the time of procurement to avoid these faults.
- We need to buy good yarn.

3.1.3 Thick and thin place:

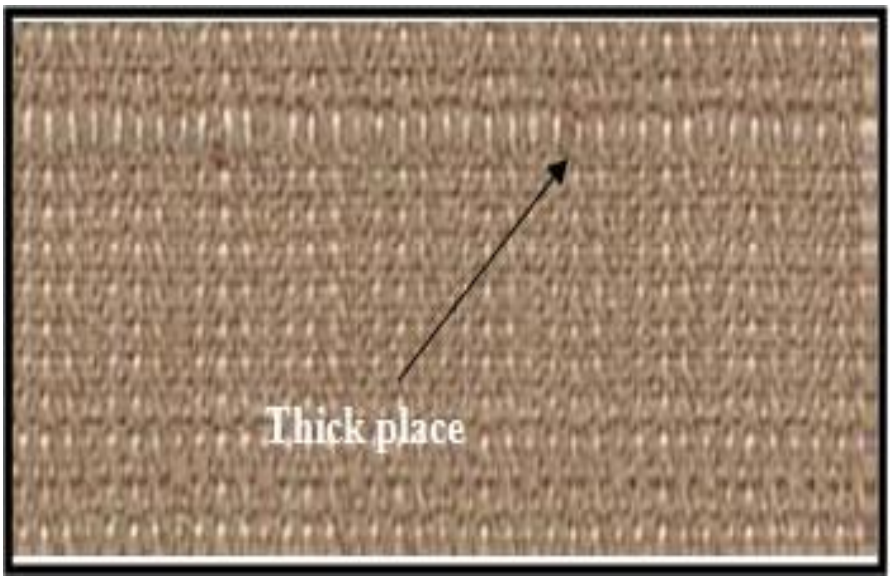


Figure 5: Thick and thin place.

Causes:

This can happen due to not removing of spinners double, not piecing the end properly by removing the lapped materials, accumulation of fluff in condensers, cradles and in the necks of the top rollers.

Remedy:

The yarn have to be checked by QC during the time of procurement to avoid these faults

3.1.4 High twisted yarn:

Figure 6: High twisted yarn.

Causes:

If the TPI of yarn higher, then we will have the given look of the fabric.

Remedy:

Yarn with suitable TPI should be bought.

3.1.5 Oil stained yarn:

Figure 7: Oil stained yarn.

Cause:

If the yarn contain oil stain then these stain will be appeared in the fabric.

Remedy:

To avoid these faults we have to be very careful during the time of procurement of yarn.

3.1.6 knot:

Figure 8: Knot.

Causes:

- If the yarn breakage during winding, warping, sizing and weaving this fault may be occurred.
- Improper loom cleaning.
- Unclean environment.

Remedies:

The extra foreign matter can be pulled out with a plucker. Combing in both direction rectifies the resultant patch.

3.1.7 Starting mark:

Figure 9: Starting mark.

Reason:

- When a loom stops as a result of weft breakage.
- Improper ratio of take up and let off
- Machine stoppage for long time.
- Back rest roller position.
- Drop wire height and position of drop wire.
- Position of reed according to weaving cycle.

Remedies:

- By ensuring the proper ratio between the take up and let off.
- By minimizing the longer machine stoppage time.
- Back rest roller should be positioned properly so that any kind of loom bar or starting mark may be avoided.
- Tension on warp yarn should be maintained properly.
- Drop wire height and position should be maintained properly to avoid starting mark.

3.1.8 Loose warp in fabric:

Figure 10: loose warp in fabric.

Reasons:

- If the warp yarn breakage during winding.
- If the tension of warp yarn is low in warping, then this fault appears.
- If the weavers beam contain broken warp yarn fro sizing.
- During the weaving due to warp breakage this fault may be occurred.

Remidies:

- The warp tension in warping should be equal and uniform.
- We have to motivate the worker to take care of the fabric.

3.1.9 Double end:

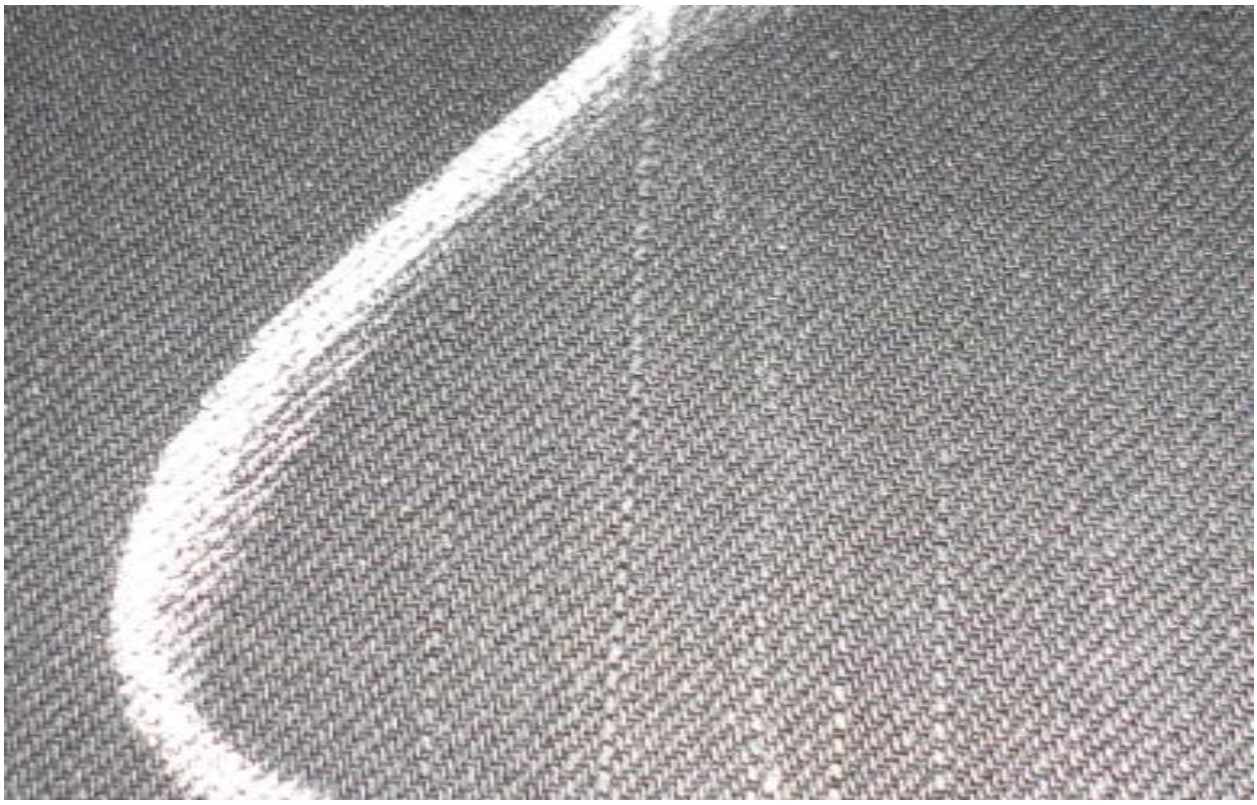


Figure 11: Double warp.

Cause:

- After sizing if the two ends of warp sticks together. And if the worker don't observe that properly than those ends can go together through the same heald eye and can create this problem.

Remedies:

- The knotting should be done very carefully that, two or more ends can not be knotted with each other.
- Worker have to be very care full during weaving.

3.1.10 Broken warp:

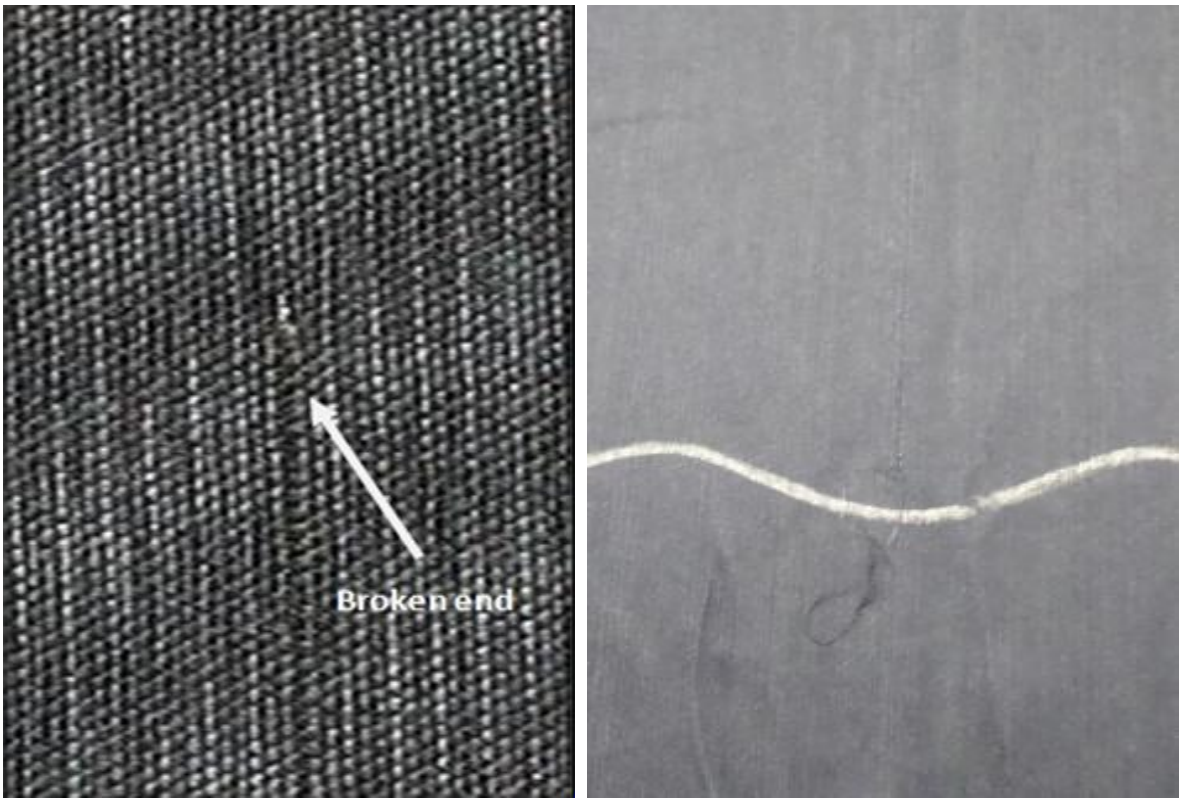


Figure 12: Broken warp.

Causes:

- If the yarn quality is low, breakage may be occurred.
- If a warp yarn breaks and if the dropper don't fall on the dropper bar , then this fault arise.

Remedies:

- Operator should walk around the machine to observe this problem.
- If the problem is in the dropper bar then, we have to change that bar.

3.1.11 Tight end:

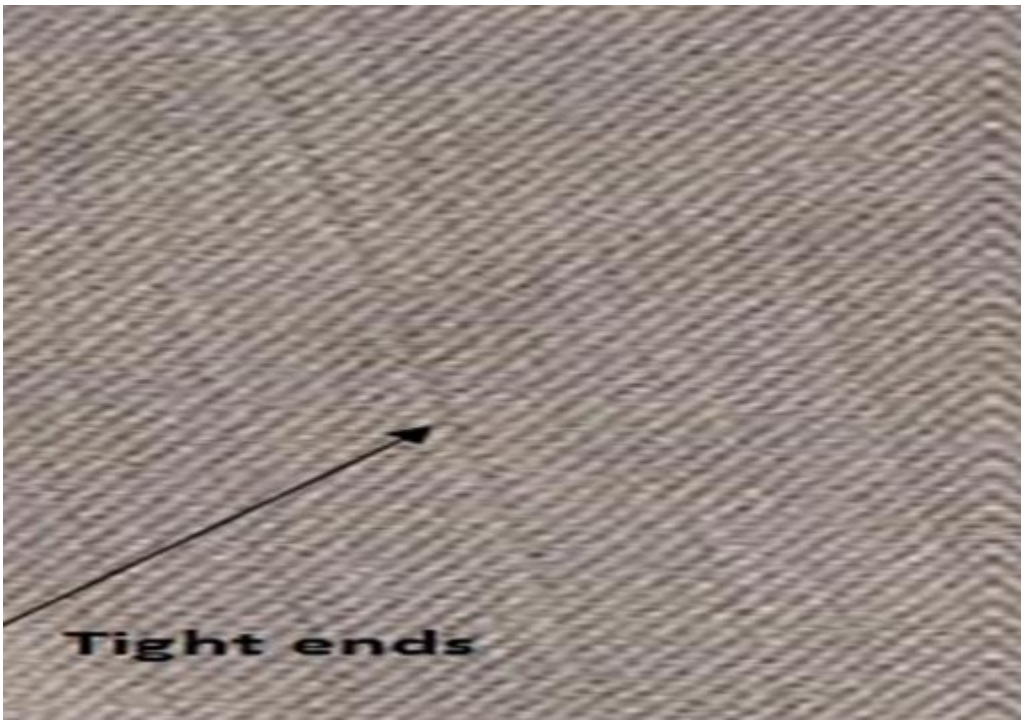


Figure 13: Tight end.

Causes:

- If the tension of a warp yarn is more than the other ends present in the loom then this problem arise.
- This over tension produced on warp during warping and weaving.

Remedy:

To solve this problem we have to find these ends and have to adjust the tension

3.1.12 Pile of warp or loose yarn :

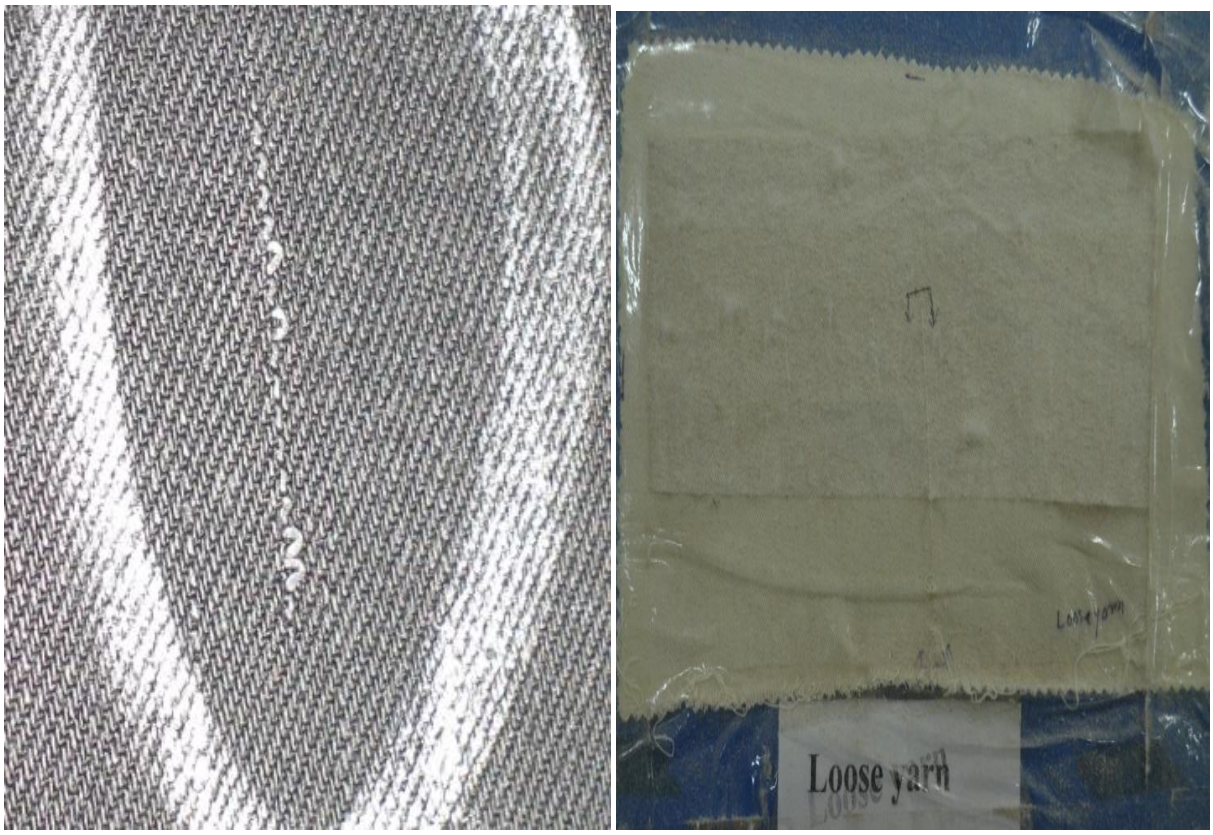


Figure 6 : Pile of warp or loose yarn.

Causes :

- If the beam contains the loose warp yarn this may be occurred this fault.
- If the warp yarn breakage during weaving.

Remedies:

- Loom operator should be very careful to the yarn breakage.
- The floating thread are cut with a clipper.

3.1.13 Wrong end colour:

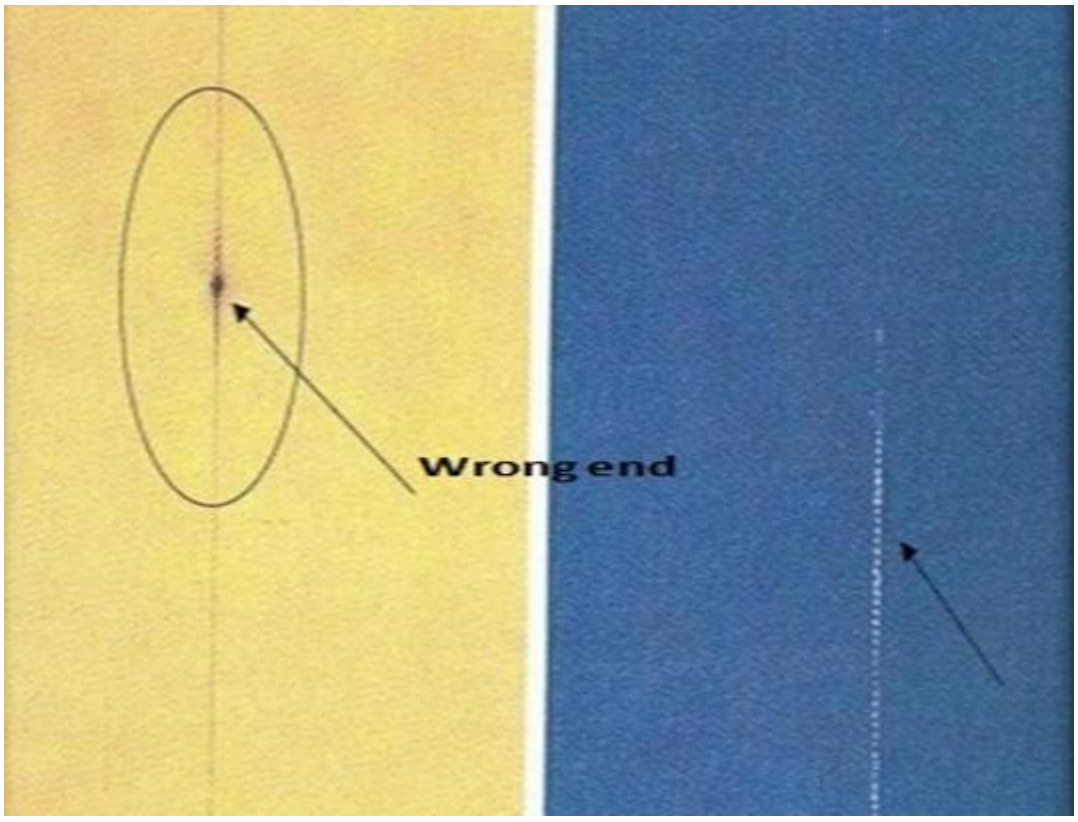


Figure 15: wrong end colour.

Cause:

It happens due to the wrong drawing with wrong coloured yarn.

Remedies:

- Worker have to be very careful during doing the job of drawing.
- After finding the faults we have to remove the faulty colour yarn and place a correct colour yarn.

3.1.14 Broken pick:

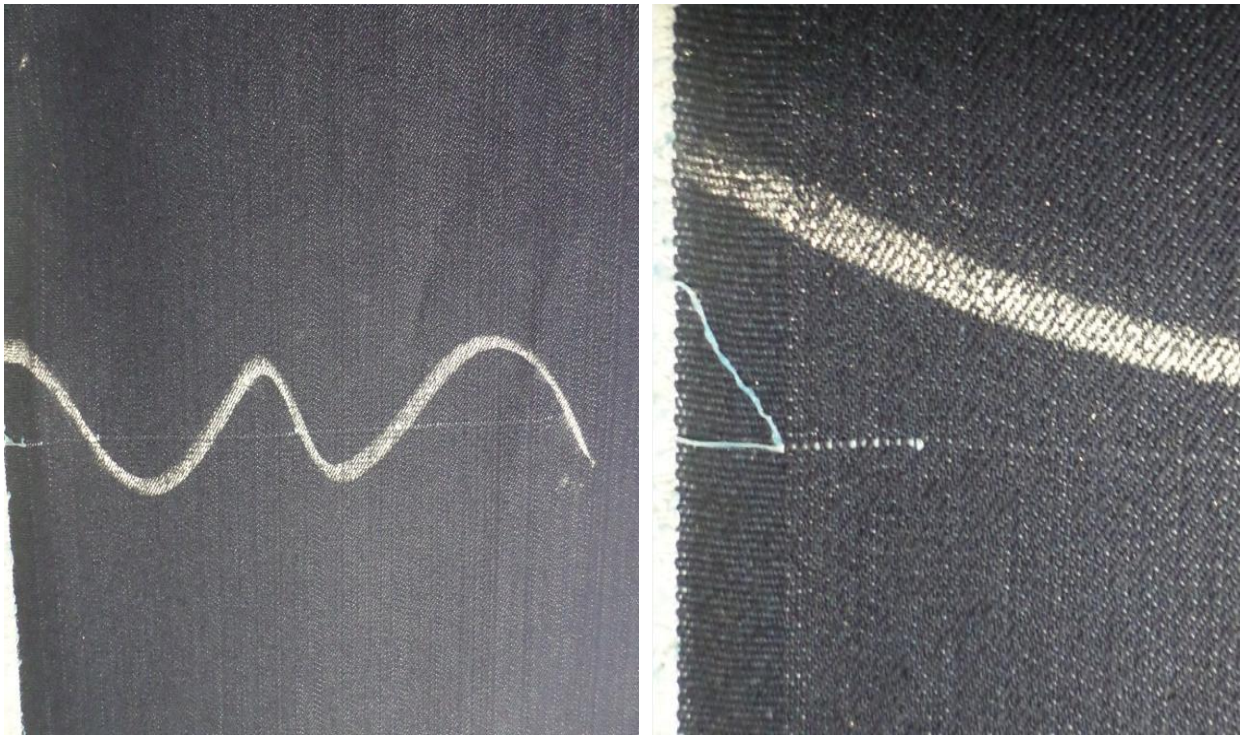


Figure 16: Broken pick.

Causes:

- If the beat up motion is done before insertion of full pick, this type of fault may be occurred.
- If the pressure of the relay nozzle is too low, then this fault may be occured.
- Faulty let off and take up motion.
- Faulty weft stop motion.

Remedies:

- We have to reduce speed of the machine.
- We have to maintain the pressure of relay nozzle is optimum.
- Proper timing of picking and beating should be maintained.

3.1.15 Miss pick:

Figure 17: Miss pick / yarn.

Cause:

If a worker start a stopped machine without picking the broken weft from the shed then this type of fault arise.

Remedy:

We have to motivate the worker to do job properly during time of pick finding.

3.1.16 Double pick:

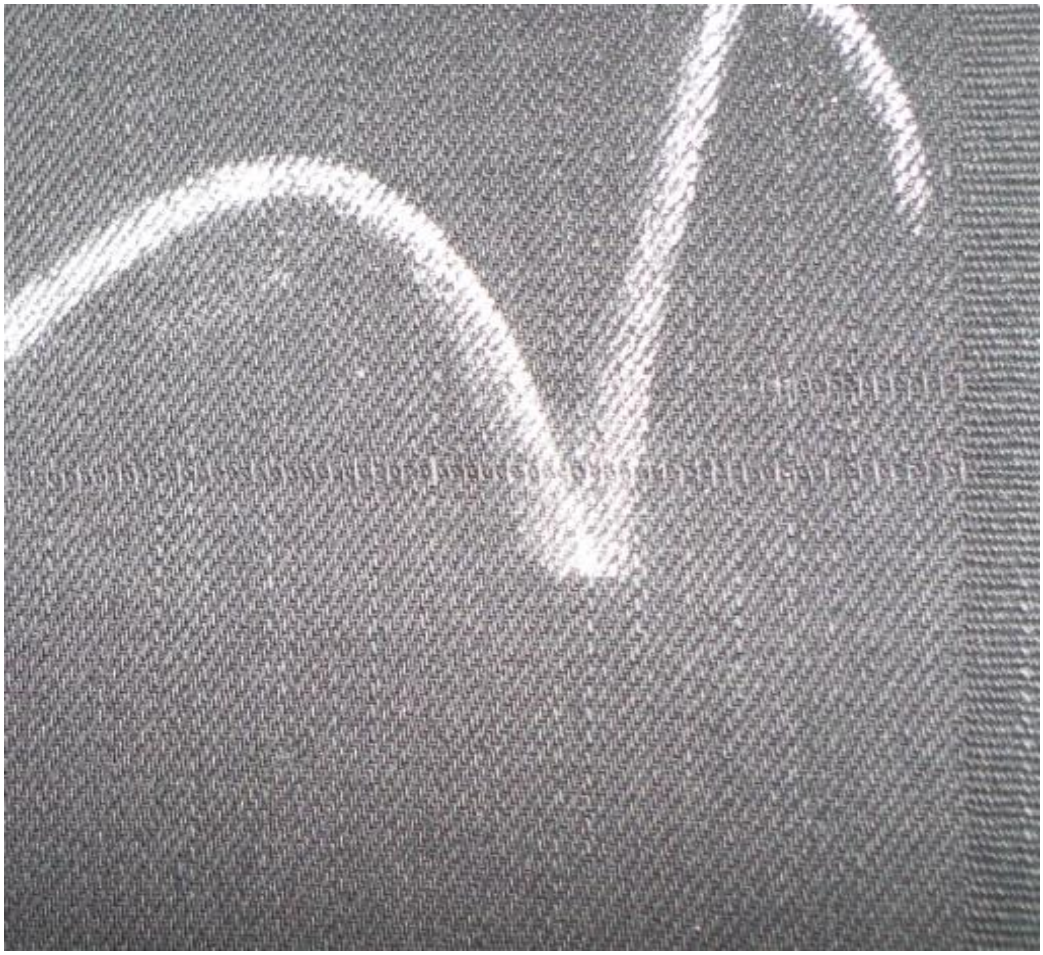


Figure 18: Double pick.

Causes:

- If the receiver receive double yarn instead of single yarn.
- If the spindle don't work properly.
- It may be happens because of migration of a broken end to the adjacent reed space along with the neighbouring end.

Remedies:

- The spindle should be changed.

- Loom should be cleaned.

3.1.17 Snarl or loose weft:

Figure 19: snarl or loose weft.

Causes:

- It happens due to the malfunctioning of the programmable felling tensioner.
- Due to looseness of the filling yarn.
- The wrong alignment of Pre-winder to fixed nozzle.

Remedies:

- The degree of the PFT have to be perfect.
- The pressure of the main valve, relay valve and relay nozzle should be perfect.
- The alignment of the pre-winder should uniform and straight.

3.1.18 Weft bar:

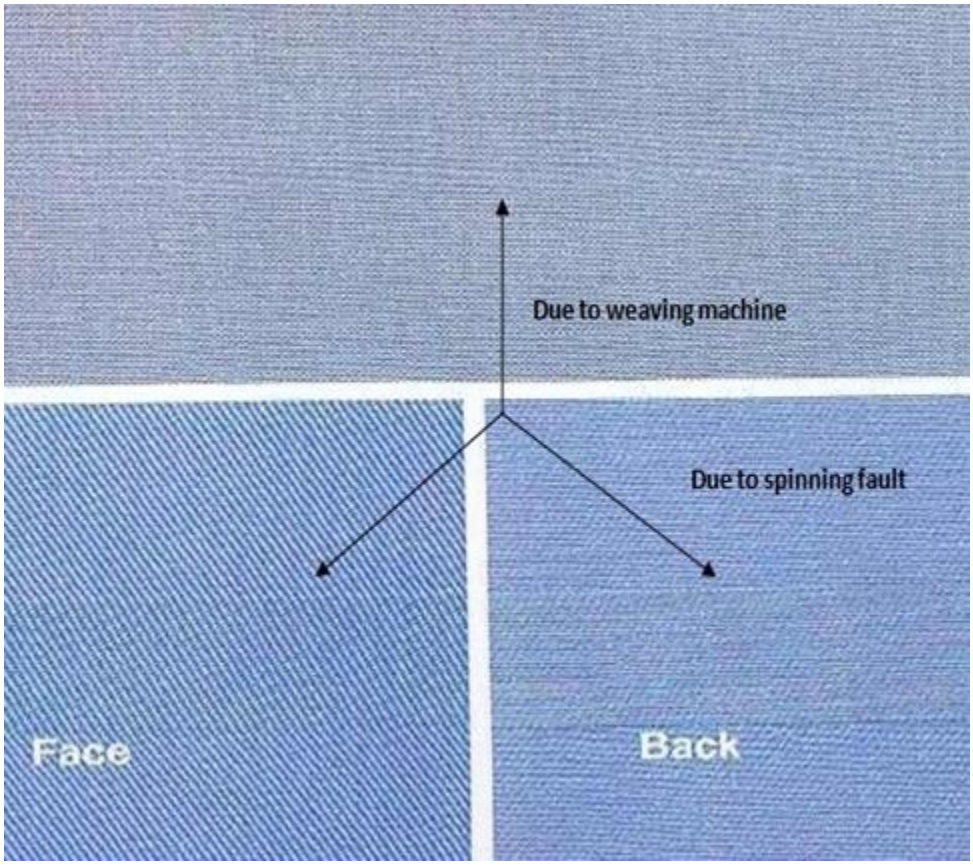


Figure 20: weft bar.

Causes:

If count of yarn vary from cone to cone or within the cone then a bar of weft will appeared in fabric after weaving.

Remedy:

To solve this problem we need to buy yarn with uniform thickness.

3.1.19 Ball:

Figure 21: Ball.

Causes:

If the warp is too much hairy . Then the reed will create ball in warp yarn in- between heald shaft and reed . If the ball is small enough to pass through the dent of reed then they will form the ball in fabric.

Remedy:

To solve this problem we have to change the reed, or reduce the tension of the wrap yarn.

3.1.20 Holes:

Figure 22: Holes.

Causes:

- If we try to cut the balls of the fabric which makes the look of the fabric poor then it will be cut along with the warp. This will create hole in the fabric. This holes become bigger after the finishing process.
- It can be happen due to the clash between fabric and sharp edge of machine parts.

Remedies:

- If we control the ball we can control hole.
- Worker have to carefull during the transportation of fabric from one floor to another to avoid sharp point tingle with fabric.

3.1.21 Oil spot/Drop mark:

Figure 23: Oil spot.

Causes:

- Due to carelessness of the maintenance workers and the machine operatives, oil spills over parts which come in contact with the fabrics and stains are produced.
- Oil spot on the fabrics are caused by too much oiling on loom parts from other sources.

Remedies:

- By applying stain remover
- This stains can be removed by scouring.

3.1.22 Tails out:

Figure 24: Tails out.

Cause:
If the cutter don’t work properly then this kind faults arise.

Remedy:
To solve this problem either we have change the degree of cutter or we have to change the cutter blade.

3.1.23 Temple mark:

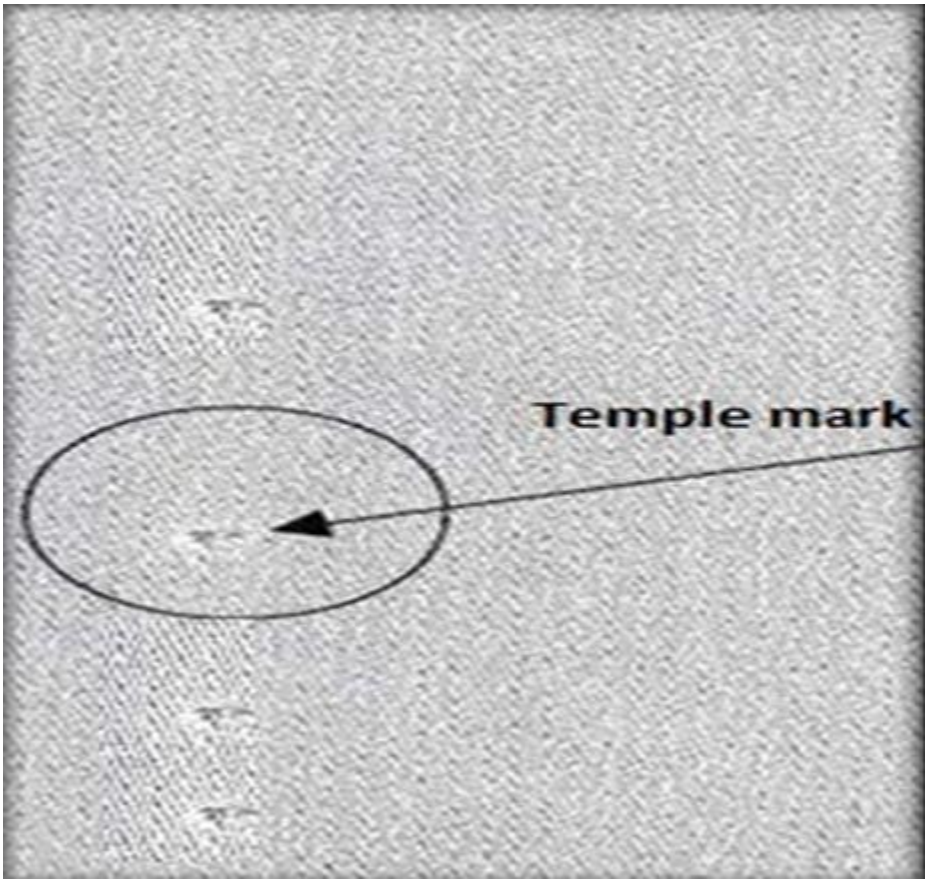


Figure 25: Temple mark.

Cause:

If the placement of ring in the temple bar is wrong or the pressure of temple to the fabric is too high.

Remedy:

The setting of temple should be perfect. And the bristle should be sharp and easy going.

3.1.24 Temple pierced hole:

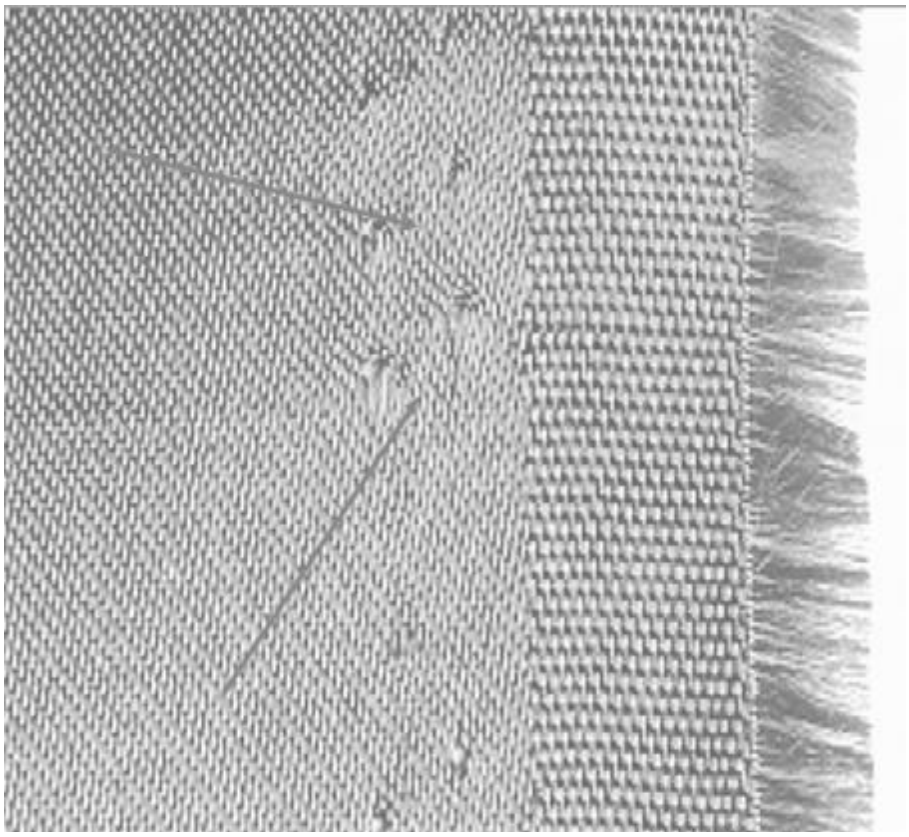


Figure 26: Temple pierced hole.

Cause:
If the ring of the temple is damaged then we will have this fault.

Remedy:
The bristle of the temple should be sharp and easy going.

3.1.25 Cut or torn selvedge:

Figure 27: Cut or torn selvedge.

Cause:

If the cutter don't cut the edge the of the fabric properly or if the weave in the edge of the fabric is not proper. Then we will have this fault.

Remedies:

- We can solve this problem by changing the blade of the cutter.
- By changing the degree of the cutter.
- By applying suitable weave system in the edge of the fabric.

3.1.26 Reed mark:

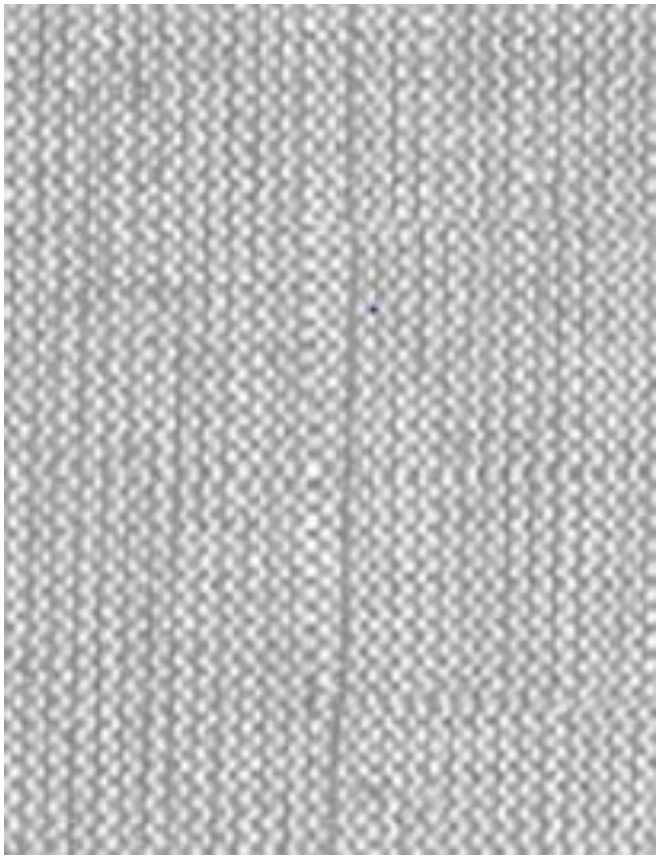


Figure 28: Reed mark.

Causes:

- A crack between groups of warp ends, either continuous or at intervals, which can happen due to improper spacing of dents.
- If the dent of the reed is damaged then we will have this kind of faults.

Remedy:

The reed have to be changed .

3.1.27 Gout:

Figure 29: Gout.

Causes:

- Improper loom cleaning.
- Unclean environment

Remedy:

The extra foreign matter can be pulled out with a plucker. Combing in both direction rectifies the resultant patch.

3.1.28 Crease mark:

Figure 30: Crease mark.

Causes:

- Lack of balance in construction of the fabric
- Pressure of padder roller
- Faulty plaiting device.
- Slack on tight selvedge causes crease at an angle to eh selvedge.
- Variation of heating and cooling rate.
- Improper fabric movement.

Remedies:

- Anti-creasing agents are used to avoid crease mark problem.
- Proper maintenance of the machine

3.1.29 Color Spot:

Figure 31: Colour spot.

Causes:

- Dyes & chemicals factors:
    a. Poor Dispersion or Solubility Properties
    b. Unstable chemicals
    c. Silicones in the dye bath
    d. Presence of iron
- Improper Washing
- Operator negligence
- Dye bath hardness
- Not agitation of dye stuff

Remedies:

- Passing the dissolved dyestuff through a fine stainless steel mesh strainer, as it is added to the addition tank, will ensure that any large undissolved particles are removed.

- Use adequate amount sequestering to lower bath hardness.
- Proper agitation.

3.1.30 Shade variation:

Figure 33: Shade variation.

Causes:

- The fabric has the equal dye affinity and if pretreatment e.g. scouring and bleaching has taken place in different machined.
- Liquor ratio changed
- In each batch, time of the fabric ropes passing through the nozzle is changed.
- Dyeing procedure is different for each batch.
- Temperature and added bulk chemicals changed.
- Low quality water especially PH, hardness and sodium carbonate content.

Remedies:

- Check that the fabric has the same dye affinity and if pretreatment e.g. scouring and bleaching has taken place in different machined
- Ensure that in each batch the fabric rope passes through the nozzle of the machine the same number of time during the actual dyeing process.
- Use the same stand procedure for each batch..

- Standards on your dyes and auxilarities..
- Check your water supply daily, especially the PH, hardness and sodium carbonate content.

3.1.31 Bad Selvedge:

Figure 32: Bad Selvedge.

Causes:

- If stretches or looseness is applied on the picks yarn the bad selvedges is occurred.
- If the temple is not properly used during weaving.
- It is mandatory to pull the selvedge's yarn through the Heald Eye and Heald shaft. If it does not complete carefully the selvedges will be poor.
- Loose or Tight selvedge yarn in the Beam.
- If the calendar is cut by the press roller.
- Bad beaming causes the bad selvedges of the fabric.
- If the stanter machine stretches the fabric more.

Remedies:

- During weaving loom operator should be careful on the issues.

- Stretching width should be set very carefully.

3.1.31Uneven printing:

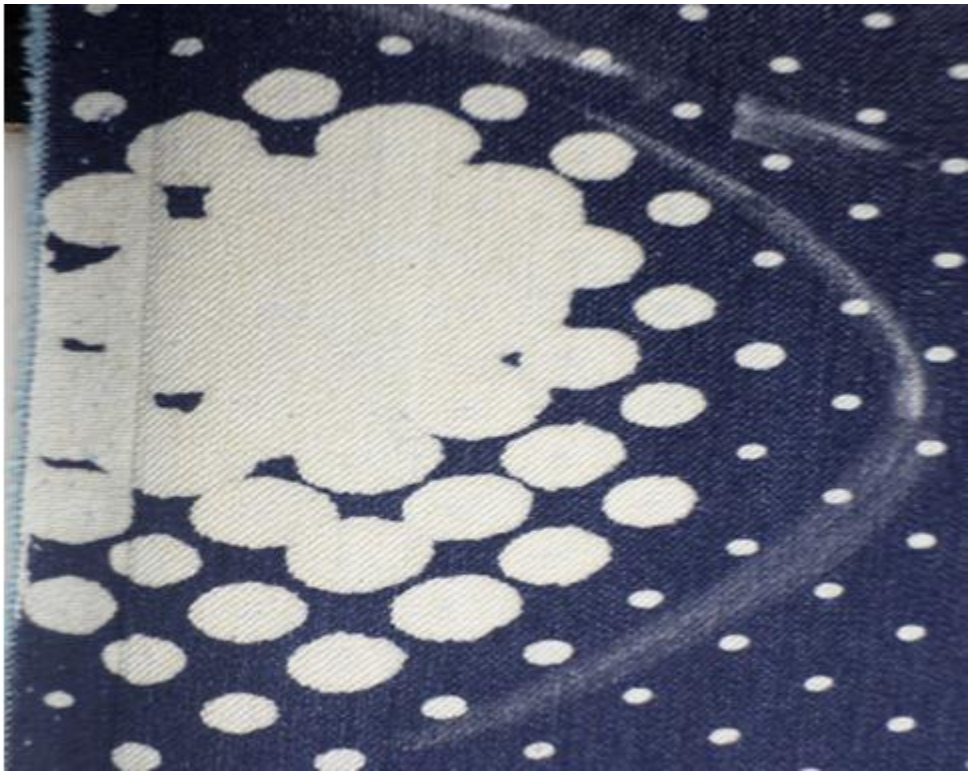


Figure 33: Uneven printing.

Causes:

- Uneven pressure on printing rollers.
- Uneven lapping of central drums in printing machines.
- Diameter of printing rolles is uneven
- Printing paste level not maintained.
- Printing table is not proper cleaned.

Remidies:

- Pressure of printing roller should be optimum.
- If the printing roller have a problem , it should changed.
- Printing table should be cleaned very well.

3.1.32 Foreign yarn:

Figure 34: Foreign yarn:

Causes:

- Improper loom cleaning.
- Unclean environment

Remedy:

The extra foreign yarn can be pulled out with a plucker or sucker. Combing in both direction rectifies the resultant patch..

3.2 Some guide lines for identifying defect in Shasha Denims Ltd:

YARN		DYEING		SIZING		WEAVING		FINISHING		SALES	
DEFECTS	**CODE**	DEFECTS	CODE	DEFECTS	CODE	DEFECTS	CODE	DEFECTS	CODE	DEFECTS	CODE
Slub	101	Shade Vari	201	Slack End	221	Broken Pick	301	Water Stain	401	Short Length	501
Coarser Weft	102	Stains	202	B.F	222	Thick Place	302	E.H. Mark	402	Extra Fents	502
Fluffy Yarn	103	Stop Mark	203	Bad Sel	223	Bad Sel	303	Creases	403	Extra Fags	503
Coarser Warp	104	S.S.V	204	Loose Fin	224	Sel Cut	304	Sleeve Mark	404		
Bad Pieceing	105	Dyeing Petta	205	Tight End	225	Double Pick	305	Hole	405		
Slubby Weft	106			Beam Stain	226	Lashing Pick	306	Un Singed	406		
Oily Warp	107			Size Spot	227	T.R.M	307	Width Vari	407		
Oily Weft	108					Float	308	M/C Stop	408		
Contamination	109					Floating End	309	Stains	409		
Finer Weft	110					F.T.M	310				
Finer Warp	111					Double End	311				
						Long End	312				
						Over Pick	313				
						Reed Mark	314				
						Smash	315				
						Slough Off	316				
						Wrong Drawn	317				
						Pick Cato	318				
						Lees Width	319				
						Foreign Matt	320				
						Distortion	321				
						Missing Pick	322				
						Starting Mark	323				
						Stains	324				
						Snarl	325				
						Knot	326				

Here,

1. SSV= Selvedge to Selvedge Shade Variation
2. B.F= Ball Formation
3. TRM= Temple Roll Mark
4. FTM= Faulty Take Up Motion

A picture of a inspection machine in Shasha Denims Ltd During inspection:

Figure: Fabric inspection machine in Shasha Denims Ltd.

3.3 Classes of fabric defect according to textile process:

Serial	Name of fault	Name of factory	Process responsible for the fault
01	Slub	Both	Spinning
02	Hairy fibre	Shasha Denims Ltd	Spinning
03	Thick and thin place	Sim Fabrics Ltd	Spinning
04	High twisted yarn	Sim Fabrics Ltd	Spinning
05	Knot	Both	Spinning and warping
06	Tight end	Both	warping
07	Ball	Shasha Denims Ltd	Spinning and weaving
08	Broken warp	Both	Spinning and weaving
09	Oil stained yarn	Both	Spinning and weaving
10	Double warp	Both	Sizing and weaving
11	Starting mark	Both	Weaving
12	Float of warp	Both	weaving
13	Broken pick	Both	weaving
14	Miss pick	Both	weaving
15	Double pick	Both	weaving
16	Snarl or loose weft	Both	weaving
17	Weft bar	Shasha Denims Ltd	weaving
18	Tails out	Both	Weaving
19	Temple mark	Both	weaving
20	Temple pierced hole	Sim Fabrics Ltd	Weaving
21	Cut or torn selvedge	Shasha Denims Ltd	Weaving
22	Reed mark	Both	Weaving
23	Gout	Sim Fabrics Ltd	Weaving
24	Loose warp in fabric	Both	Winding, warping,sizing,weaving
25	Shade variation	Shasha Denims Ltd	Dyeing
26	Colour spot	Sim Fabrics Ltd	Dyeing
27	Uneven printing	Shasha Denims Ltd	Printing
28	Oil spot	Both	Dyeing,Weaving and finishing
29	Crease mark	Both	Finishing
30	Holes	Sim Fabrics Ltd	Finishing

Table -2: Classes of fabric defect according to textile process.

Chapter - 4
Discussion Result

4.1Types of Faults:

From our project work we can found that there are some common defects and there are some different defects occurs in Shasha Denims Ltd and Sim Fabrics Ltd.

There are some different defects occurs for Shasha Denims Ltd and Sim Fabrics Ltd according to their different process.

4.2 Faults Common to both factories:

The following faults are occurred in both factories Shasha Denims Ltd and Sim Fabrics Ltd:

- Starting mark
- Loose warp in fabric
- Double warp
- Broken warp
- Tight end
- Float of warp
- Broken pick
- Miss pick
- Double pick
- Snarl or loose weft
- Oil spot
- Tails out
- Reed mark
- Slub
- Oil stained yarn
- Crease mark.

4.3 Faults occurred in Shasha Denims Ltd:

Shasha Denims Ltd is a denim based woven fabric industry. Only different types of export oriented denim fabrics are produced there. The following faults are occurred in Shasha Denims Ltd:

- Weft bar
- Ball
- Cut or torn selvedge
- ,Hairy fibre
- Uneven printing
- Shade variation

Though we have found above fault in Shasha Denims Ltd but this types of fault are not limited in Shasha Denims Ltd. This types of faults may also occurred in case of Sim Fabrics Ltd and other woven factories

4.4 Faults occurred in Sim Fabrics Ltd:

Sim Fabrics Ltd is a satin based woven fabric industry but here twill also be made .Here they produced different types of woven fabric like Shirt, Pants, Trouser etc. The faults occurred in Sim Fabrics Ltd are quietly difference from Shasha Denims Ltd . The following faults are occurred in Sim Fabris Ltd:

- Holes
- Temple pierced hole
- Thick and thin place
- High twisted yarn
- Gout
- Colour spot

During our project work we have found the above faults occurred in Sim Fabrics Ltd. But this types of faults are not fixed for this industry also this types of faults may occurred in Shasha Denims Ltd and other woven Based industry.

4.5 Process responsible for different fabric faults:

Responsible process	Name of fabric faults
Spinning section.	Broken warp
	Ball
	Slub
	Hairy fibre
	Thick and thin place
	High twisted yarn
	Oil stained yarn
	Knot

Table 3: Faults occurred in spinning section

Responsible process	Name of fabric faults
Warping section	Tight end
	Double warp
	Knot
	Loose warp
	Lot mixing of warp yarn

Table 4: Faults occurred in warping section.

Responsible process	Name of fabric faults
Weaving section	Gout
	Reed mark
	Cut or torn selvedge
	Tails out
	Temple mark
	Temple pierced hole
	Starting mark
	Float of warp
	Broken pick
	Miss pick
	Snarl or loose weft
	Ball
	Weft bar
	Oil spot
	Tails out
	Temple mark
	Temple pierced hole
	Double pick
	Knot

Table 5: Faults occurred in weaving section.

Responsible process	Name of fabric faults
Dyeing and printing section	Oil spot
	Shade variation
	Color spot
	Uneven printing

Table 6: Faults occurred in dyeing and printing section

Responsible process	Name of fabric faults
Finishing section	Holes
	oil spot
	crease mark

Table 7: Faults occurred in finishing section

From the discussion we can say that ,to produce a fabric many types of fault may be occurred from different section. From our survey we can clearly say that most of the fabric faults occurred in weaving section. So weaving section is more responsible for fabric faults. To produce excellent quality of fabric the weaving section must be improved.

4.5 Relation between Fabric defect and Fabric quality:

Fabric defect depends on fabric quality should be produced, during our project we have visited two factories one is denim based industry and another is satin based industry. From our project work we can say that if we produced different types of fabric like coarser fabric and finer fabric then without above fault different types of faults may be occurred which we don`t observed during project work.

Chapter: 5

Conclusion

Conclusion :

Though majority of the fabric faults occurred in the weaving section, all the other processes are also very important to get the excellent quality faultless fabric.

If the spinning process contains any fault , we could not expect to get the quality fabric from the healthy dyeing , weaving, finishing and other section.

As a result it has to be sold at lower prices, which creates a huge values loss to the company .To minimizes the value loss due to variety of defect occurring in the fabric , a manufacturer should try to minimize fabric defect from every processing steps.

An automated defect detection and identification system can enhances the product quality and results in improved productivity to meet both customer demands and to reduce the costs associated with off quality.

From our project work we can say that, every processing steps from spinning to finishing are responsible for different kind of fabric defect.

We have done project work is very careful with successfully. We found in the industry every person is very helpful and positive attitude. We also found the fabric faults with its remedies in every division. The project is very essential in our job life.

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