“Study of woven fabric faults and their remedies”

University of Management and Technology

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DEDICATION

First of all I dedicate my project to the greatest personality in the universe Hazrat Muhammad (S.A.W). Secondly, I dedicate my project to mygreatest blessing: my parents, for every effort they made to make me happy, for every prayer they offered for me, for every second of their lives they dedicated to me!!! What I am today is because of them!!!

Teachers especially to my kind supervisor ***Mr. SAJID HUSSAIN****, Due to their desire, care, affection and our keen interest, I achieved this level of excellence where I am looking for most bright future ahead.*

May Allah bless all of them with everything He has ever created and may give me an opportunity to serve them the best way possible……. (Ameen)

ACKNOWLEDGEMENT

All the praises are for the almighty, Allah who bestowed me with the ability and potential to complete this project.

Words are very few to express enormous humble obligations to my affectionate Parents for their prayers and strong determination to enabling me to achieve this job.

I take this opportunity to record my deep sense of gratitude and appreciation to my project Advisor **Mr. Sajid Hussain, School of Textile&Design, U.M.T Lahore**for her constant encouragement and inspiring guidance with her Wisdom. I also want to thank **Dr. Nabeel Amin**Director School of Textile and Design.

I appreciate the cordial co-operation from all my concern Managers in the different departments of NISHAT Weaving Mills Ltd especially**Mr. Saqib Nisar** General Manager for providing me requisite information and knowledge.Every time Iwas low, his guidance illuminated golden way of success. His continuous availability during the whole project time, and timely delivery of project assisting lectures made possible for me to complete this project.

I am deeply indebted for helping me throughout my stay at his organization in all aspects. It is only because of his kind supervision that I have gained so much knowledge from their organization.

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These persons remained extremely cooperative throughout my stay at their organization and not only helped me in understanding their work responsibilities rather also helped in accommodating me with other employees working at responsible posts. Their friendly & brotherly attitude has really impressed me.

May they all live a happy, healthy and wealthy life always……..

ABSTRACT

This project contains experimental work about the common faults occurring in fabric and their remedies. It also consists of particular weaves prepared on the loom according to customer requirements.

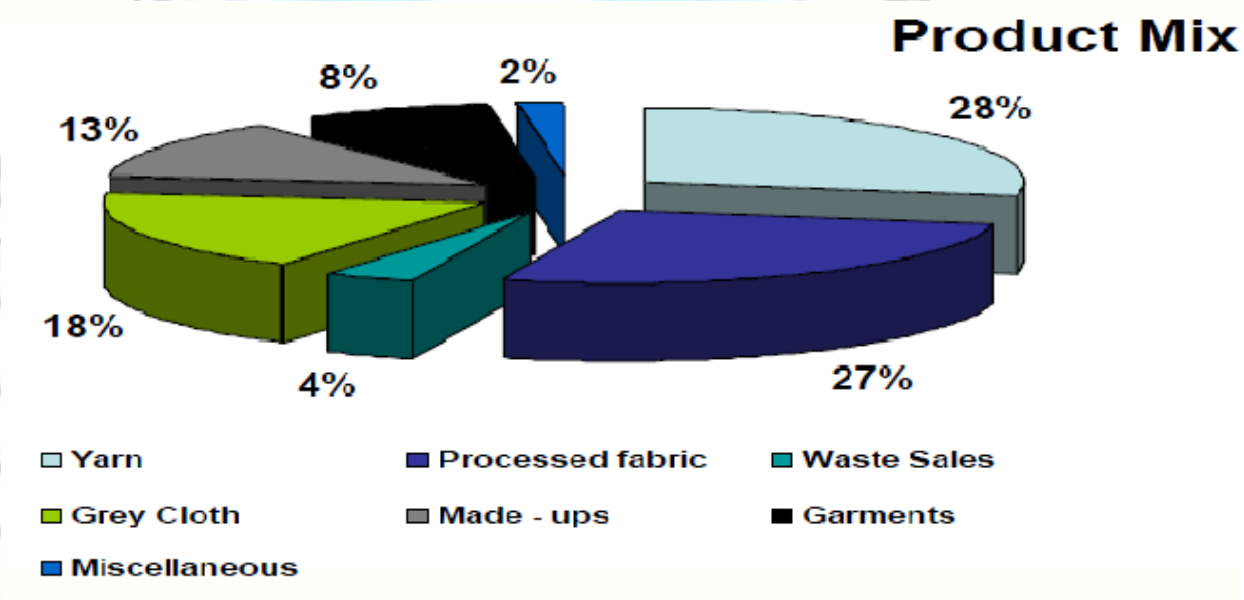
CHAPTER 1

INTRODUCTION

1.1- Mill introduction:

- Nishat Mills Limited ("Nishat"), a flagship company of Nishat Group, ranks amongst the largest and most successful textile exporters of the country.
- It commenced business as a partnership firm in 1951 and was incorporated as a private limited company in 1959. Later it was listed on stock exchange in 1961.
- Initially Nishat started with weaving business and over the years it has become one of the premier composite textile mills in the country with the large production facilities in spinning, weaving, processing, stitching and power generation. It has more than 15,000 employees.
- Overall Nishat has 28 manufacturing units each specializing in a specific product rang allocated at Faisalabad, Sheikhupura, Froze watwan and Lahore.

- Excellent research and development functions are developed with focus on dyeing, finishing and garments businesses. Hence, major focus is on value addition which represents around 50% of total turnover.
- Nishat has a very broad base of customers for its products both in and outside Pakistan. The company has long working relationship with top brands of the world such as J.K.N. International, Levis, Next, Pin croft Dyeing, Ocean Garments, ArnoldKock, Gap, Carreman and Sinha Fashion.
- Nishat has an excellent product mix of sales.



- In recognition of its outstanding performance Nishat has been awarded FPCCI President of Pakistan Trophy for number of years.
- Nishat has established its own power generation facilities at all plant locations that fulfill the internal demand as well as generate surplus for supply to WAPDA. The combined capacity of power generation is 85MWH.
- The strength of the company also includes stop quality and highly competent professional resources to manage the affairs.
- Nishat is a Green Company and has got certificates of ISO-9001, IKO-TEX 100, SA- 8000 and City pad.

- Over the years Nishat has established Nishat USA, Nishat Linen Trading LLC– UAE and Nishat Power Limited as its subsidiary companies to further strengthen its textile business in new markets and diversifying into growing elasticity sector.

1.2-Mills:

- Nishatabad, Faisalabad (Spinning, Processing, Stitching units & Power Plant).
- 12 K.M. Faisalabad Road, (Weaving units & Power Plant) Sheikhupura.
- 21 K.M. Ferozpur Road, Lahore. (Stitching unit).
- 5 K.M. Nishat Avenue (Weaving, Dyeing & Finishing unit Off 22 K.M. Ferozpur Road, Lahore. and Power Plant).
- 20 K.M. Sheikhupura Faisalabad (Spinning unit).

1.3-Mission:

To provide equality products to customers and explore new markets to promote/ expand sales of the Company through good governance and foster a sound and dynamic team, so as to achieve optimum prices of products of the Company for sustainable and equitable growth and prosperity of the Company.

1.4-Vision:

To transform the Company into a modern and dynamic yarn, cloth and processed cloth and finished product manufacturing company that is fully equipped to play a meaningful role on sustainable basis in the economy of Pakistan. Also to transform the Company into a modern and dynamic power generating company that is fully equipped to play a meaningful role on sustainable basis in the economy of Pakistan.

1.5-Business segments:

Nishat has the following five reportable business segments. Each segment has production facilities located at various locations.

1.5.1-Spinning:

Production of different qualities of yarn (more than 100 different counts) using natural and artificial fibers with production capacity of 64.713 million kg s of yarn per

annum.There is average daily consumption of 138,000 kgs of local cotton and 20,000 kgs of imported cotton. We have an average PC yarn mix of 80% cotton and 20% polyester. Out of total cotton purchases around 90% purchase is from local market and 10% is imported.

1.5.2-Weaving:

Production of different qualities of gray fabric using yarn and having production capacity of 307.971 million square meters of fabric per annum.Out of total yarn requirement approximately 70% of yarn is purchased from external parties and 30% is received from Company's own spinning units.

1.5.3-Processing:

Processing of gray fabric for production of printed and dyed fabric and its further use in manufacturing variety of home textile articles It has processing capacity of 84 million meters of fabric per annum. Approximately 55% of total fabric demand is met from Company's own weaving units and 45% is purchased from external parties.

1.5.4-Garments:

Manufacturing of garments, using processed fabric with capacity of producing 600,000 garments per month. Approximately 25% of total demand of fabric is met from Company's own facilities and 75% is purchased from external suppliers.

1.5.5-Power generation:

Generation and distribution of power using gas, furnace oil, diesel and steam. We have power generation capacity of 85 MW whereas our average consumption is approximately 40MW. In power plants are installed engines from Mak, Jenbacher, Caterpillar, Wartsila, Dai Hatsu and Cummins.

1.6-Energy resources:

In Nishat 3 main energy recourses are used 1st one is furnace oil & diesel, 2nd one is gas and 3rd one is exhaust heat which is coming from boilers sides. Mostly gas is used with exhausted heat when gas is not available than furnace oil is used for producing

electricity for meeting the required consumption Maximum capacity as they want to produce round about 15 MW but there consumption is only 6 MW so three diesel engines are on standby position which is used when they faced gas shortage problem. Also having one turbine having dual function works on gas and also on exhaust heat which is coming out from the boilers & produce approximately 3.5MW electricity.

1.7-Buyers:

- Germany Buyers (Hacking, Moster,Vandelden)
- Spain Buyers Tejidos Roy
- Italy Buyers Lemont
- Canada Buyers Double Tex, Sun Tex

1.8-Certification:

- ISO 9001 and IKO-TEX 100 Certified.
- SA 8000 Certification currently in process

1.9- Introduction of project:

Clothing is one of the three basic needs of human kind, the other two being food and shelter. Therefore, fabric formation is general and weaving in particular is probably as old as human. One of the first necessities of early human was a piece of cloth to cover their body for decency and to protect themselves from the adverse effects of the environment.

Weaving is the mixture of science and art. Despite all the technological advances, weaving is still not a positively controlled process. That is, it is hardly possible to control the individual fiber which is the smallest meaningful building block in a woven structure. This fact is that weaving an interesting technology.

The textile industry, as with any industry today is very concerned with quality. It is desirable to produce the highest quality goods in the shortest amount of time possible fabric faults or defects arc responsible for nearly 85% of the defects found by the garment industry. Manufacturers recover only 45 to 65 % of their profits from seconds or off-quality goods. It is imperative, therefore to detect, to identify, and to prevent these defects

from reoccurring. Currently much of the fabric inspections done manually, and even with the most highly trained inspectors, only about 70% of the defects are being detected There is a grooving realization and need for an automated woven fabric inspection system in the textile industry,

1.9.1-Objective:

Textile industry world over has experienced highly significant and irreversible changes in recent years. These changes have been both on the demand as well as on the supply side. Market demand has altered e.g. in terms of product type's segmentation and particularly in overall volume terms whilst the supply side has countered with a concentration and rapid expansion of the industry in new textile producing countries as well as adaptation of the many new technologies and cost effective equipment's.

We all know that sizing is the heart of weaving process, but finally grey fabric is obtained on the loom. Regarding our project to analyze fabric faults and their Remedies through which we can understand how the quality of the grey fabric is ensured through these settings. The quality of the unfinished fabric depends on the condition of the loom. There may be several other factors which affect directly or indirectly the quality of fabric should be perfect in order to satisfy the need and demand of the customer. Customer requires the product irrespective of the whole process, that's why we have selected that project.

1.9.2-Project objectives:

Our primary objectives of capstone project are:

- To categorize fabric defects.
- To inspection and controlling fabric defects.
- To avoid rejection of fabric, it is necessary to avoid defects.
- Due to increasing demand for quality fabrics, high quality requirements are today grater since customer has become more aware of poor quality problems.

1.9.3-Project outcomes:

After the completion of capstone project, we will be able to:

- Fabric defect categorization easy to understand.
- To understand root causes of fabric defects.
- Able to remove faults.
- To minimize the future reoccurrences of the defect

1.10-The short history of looms:

The process of waving is known since a long time, from BC 8-9, it stands of two distinct sets of yarns or threads to form a fabric or cloth. The threads which run lengthways are called the warp yarns and the ones running across from side to side are the weft yarns or fillings. They passing the weft yarn though the warps in a perpendicular direction, in a way that those are avoiding the warp yarns alternately on top and bottom side. The fiber after passing is pushed to the already woven textile, and the next turn is going the other way creating a kind of mesh, meanwhile the textile

As the woven techniques progressed the cloth was woven on looms, a device that holds the warp threads in place while filling threads are woven through them. It fastened the process a lot, because the warp yarns did not have to be separated every time when crossing the weft, instead they were hold by the so called heddles.

Firstly the yarn was taken from one side to the other by hand, which limited the width of the textile, sometime assistants (mainly children) were sat there to help, later the yarn was put into a capsule called the warp at passing through. At the industrial revolution the flying shuttle was invented by John Key, which is a warp that could be thrown along?

The idea of machine operated looms appeared already in 1678, but was realized only in the18th century. The first water-power supplied device is dated to 1788; later in the 19th century also steam-powered was used in England. The pattern woven technique by punched card machine was invented by Joseph Marie Jacquard already in 1805, and this was also the first step in automation and control technique.

Till the middle of the 20th century the looms with flying shuttle were the most efficient, but had the disadvantage of big noise and high energy consumption because of the weft's weight. The idea of waving without a weft showed up already in the middle of

the 19th century, but it could not be realized that time. Nowadays it is already developed and still improved all the time, but loom with wefts are still used some places.

1.11- Preventive maintenance of loom for reduction of faults:

Today cloth quality standards are rising. Unless the loom is in top condition it is impossible to get consistent high quality of performance.

1.11.1-Cloth quality loss:

In respect of quality, following problems are usually due to poor maintenance of looms:

Broken Picks / Miss Picks

Starting Marks

Let-off Marks

Oil Stains or streak in fabric

1.11.2- Preventive maintenance:

Sulzer documents contain following schedules:

- Oiling
- Monthly Maintenance
- Six-monthly Maintenance

1.11.2.1-Oiling & lubrication:

It is to be carried out by a person given a small briefing by the technical staff. It is essential that oil and grease should reach the part which they are intended to lubricate. The staff should monitor it regularly.

1.11.2.2- Monthly maintenance:

It involves removal, cleaning and % checking of regular parts of the picking and receiving side. Knowledge of machine and understanding of procedure is a must. Worn out parts can be changed.

1.11.2.3-Six-Months maintenance:

It implies to carry out a thorough check as Sulzer recommendations and checklist. It requires proper training & experience of technician as well as monitoring by staff. Good maintenance practices

are easily adaptable and can systematically be practiced. All unit owners should recognize the need for the same & implement with all diligence.

1.12-Improving weave ability:

Improving weave ability means making fabric defect free & looms end breakage free. The Weave ability of the warp yarns produced from same raw material can be improved by changing spinning parameters, spinning technology & to some extent by choice of winding parameters. However the yarn must have a certain minimum quality. Besides this, the weave ability can be substantially improved by making a choice of suitable size materials and size process.