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Sonargaon University (SU)
সোনারগাঁও ইউনিভার্সিটি (এসইউ)
WE WILL RISE UP WE WILL SHINE

Sonargaon University

Department of Textile Engineering

Report On Industrial Attachment with
Gildan Activeware Bangladesh Limited (GAB)
Palashbari, Ashulia, Savar, Dhaka.
Course Title: Industrial Attachment

Course Code: Tex-442

Group: (A) wet Process

Submitted by:

Name	ID	Batch
Sanjit Kumer Mohanto	**Tex-1803015028**	**15B**
Md. Khairul Islam	**Tex-1803015023**	**15B**
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Supervised by:

Kamrul Hassan Bhuiyan

Academic Supervisor & Lecturer

Sonargaon University

A Report submitted to the department of Textile Engineering in partial fulfillment of the credit requirement for awarding the Bachelor Degree in Textile Engineering by the Sonargaon University.

Advance in Wet Processing Technology

Duration: From 01 October 2021 to 30 November 2021

DECLARATION

We hereby declare that, this project has been done by under supervision of Kamrul Hasan Bhuiyan, Academic Supervisor & Lecturer the Department of textile Engineering, Faculty of engineering, Sonargaon University (SU). We also declare that, neither this project nor any part of this project submitted elsewhere for award of any degree.

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Sanjit Kumer Mohanto
TEX-1803015028

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Md. Khairul Islam
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Submission Date: February, 2022

Letter of Approval

This is to certify that, Sanjit Kumer Mohanto TEX-1803015028, Md. Khairul Islam TEX-1803015023, Md. Al-Amin TEX-180301030, Md. Alomgir Islam TEX- 1803015029, Sanjieda Bhuiayn Toma TEX-1803015063 BSC Engineering Textile program, 12/B Batch have successfully completed their Industrial Internship on Apparel Manufacturing Technology under my supervision. I do hereby approve their report. I also recommend accepting their report for partial fulfillment of Bachelor of Science in Textile Engineering (BSCTE) Degree.

.....

Kamrul Hassan Bhuiyan

Coordinator & Lecturer

Department of Textile Engineering

Sonargaon University (SU), Dhaka

ACKNOWLEDGEMENT

My first gratefulness goes to Almighty Allah to give me the strength and ability to complete the industrial training and this report Who has made our life more beautiful, glorious and honored.

A number of people have made significant contributions to the preparation of this report. Their insights, advice and suggestions helped us a lot. Firstly, I am very much thankful to Prof. Kamrul Hassan Bhuiyan, Academic Supervisor& Lecturer the Department of textile SU, for his encouragement and valuable suggestions for continual improvement of the report. My Internship Supervisor who offered me to do internship in the number one industry in Bangladesh Named **GAB**. I got tremendous support and guidance throughout the internship period. Working with him I have earned not only valuable knowledge but also inspired by innovativeness which helped to enrich my experience to a greater extent. His ideas and way of working is truly remarkable.

I would like to thank the Managing Director, General Manager, Deputy General Manager, Manager, Assistant Manager, Senior Production Officer, Production Officer, Assistant Technical Officer, Technical Officer who gave us scope & helped for doing industrial attachment in the factory as well as for giving scope to work in their respective section.

I would also like to express my gratitude to Md. Sumon Molla (Manager), Gindan Activeware Bangladesh Ltd. (GAB).who helped us and give me his valuable time. Being involved with them we have not only earned valuable knowledge but was also inspired by their innovativeness which helped to enrich our experience to a greater extent. I believe this report could not be finished if they did not help us continuously.

I am also very much grateful to Gindan Activeware Bangladesh Ltd. (GAB).authority for giving us opportunity to do our internship work in their factory.

ABSTRACT

For any technical education, practical experience is almost equal important in association with the theoretical knowledge. By means of practical knowledge it's not possible to apply the theoretical knowledge in the practical field. Industrial attachment is the first step to professional life of student, especially of technical side. It's an indispensable part of study a practically running processing technology of an industrial unit for a student. University education provides us vast theoretical knowledge as well as more practical attachment, in despite of all these industrial attachment helps us to be familiar with technical support of modern machinery and skills about various processing stages. This internship provides me sufficient practical knowledge about production management, efficiency, industrial management, purchasing, inventory control, utility and maintenance of machineries and their operation techniques etc. which cannot be achieved successfully by means of theoretical knowledge only. We have found store section, cutting section, sewing section, finishing section and maintenance section. Here we have also found the sample section but this section isn't fully operational as here only the size set and production samples are produced. All the activities of this factory are performed according to the central orders of the company. This company works for Academy buyer and sometimes works for Pritha which is an own buying house of this group of company. During my internship we got the opportunity to study on some orders, from order receive to the delivery of the order. With the help of my supervisor we have acquired the knowledge of handling an order, the production procedure and the inspection procedure to maintain the quality of these orders. We have also learnt about the office management of this factory.

CONTENTS

Finally I want to give thanks for all the workers, supervisors who have assisted, helped & inspired us to complete this report

INTRODUCTION

The word “textile” originally applied only to woven fabrics, now generally applied to fibers, yarns, or products made of fibers, yarns, or fabrics. The term textile originates from the Latin verb texere, meaning “to weave”. It has, however, come to include fabrics produced by other methods. Thus, threads, cords, ropes, braids, lace, embroidery, nets, and fabrics made by weaving, knitting, bonding, felting, or tufting are textiles. Some definitions of the term textile would also include those products obtained by the papermaking principle that have many of the properties associated with conventional fabrics. In addition to clothing and home furnishings, textiles are used for such industrial products as filters to air conditioners, life rafts, convey or belts, tents, automobile tires, swimming pools, safety helmets and mine ventilators.

At Gindan Activeware Bangladesh Ltd. (GAB), cutting-edge technologies merge seamlessly with human ingenuity and deep seat recommitment to ensure excellence in every stage and are another activities. From fiber to fabric, Gindan Activeware Bangladesh Ltd. (GAB) is truly integrated undertaking. The Gindan Activeware Bangladesh Ltd. (GAB). has the capability to offer a complete product range for the export textile markets. The goal of Gindan Activeware Bangladesh Ltd. (GAB). is to become the preferred partner for sourcing high quality fabrics and clothing from Bangladesh with highly advanced technologyand an emphasis on developing local human resources. Gindan Activeware Bangladesh Ltd. (GAB) has the potential to make an important contribution to the nation's growing ready- made garments export sector

PROJECT DESCRIPTION

Gildan Activeware Bangladesh Limited (GAB)
Palashbari, Ashulia, Savar, Dhaka.

General Information about the Factory:

Name of the Company	Gildan Activeware Bangladesh Ltd. (GAB)
Type	Composite knitwear Industry
Factory Address:	Palashbari, Ashulia, Savar, Dhaka.
Contact No	27788239
E-mail Address	gsam@gildan.com
Person to be contact	Georges Sam Yu Sum (Managing Director)
Year of Establishment	1997
Business	100% export oriented knit fabrics manufacture & readymade knit garments.
Products	Knit Fabrics & Knit Garments
Production capacity	Knitting: 70 tons/day Dyeing & Finishing: 70 tons/day
No. Of employees	155
No. Of workers	6000
Legal Form of Company	Private Limited Company.

VISION OF GAB

In the global marketing, ever-changing fashion world Gindan Activeware Bangladesh Ltd. (GAB).considers its prime mission to suit every new taste, whim and demand of Customers from around the world and all strains of human culture.

Gindan Activeware Bangladesh Ltd. (GAB). Acts on the basic premise that "fashion is an exploration into the images people seek to convey – about themselves and the way they live."

So, in dealing with its target consumers, KCL mainly aims to know their perception about themselves and translates those into garments. Doing that, over the years, KCL designers have acquired an almost telepathic understanding of the consumers‟ needs.

SYL has started manufacture and export garments since late 2014. Its mission is to produce the latest design; quality knit fabrics and apparels for international markets.

SYL is one of the few elite private sector business groups, which contributed wealth as well as welfare to the struggling economy of Bangladesh. As time is essential to space so is taste to its products. The secret is love – which, paired with meticulous efficacy and a keen sensitivity to style, makes SYL an emerging brand destined to light up the horizon of fashion.

SYL has team of skilled and dedicated technocrats backed by adequate number of modern USA and European machinery and equipment's to match international standard of all kinds of knitwear products.

HOW Gildan is Setting the Bar in Bangladesh

Over the past decade, Gildan's vertically integrated facility in Dhaka, Bangladesh has been setting the bar in the region's garment manufacturing industry. After the Company acquired the facility locally, it soon embarked on a journey to bring the facility up to its own industry-leading standards and practices, and thanks to Gildan's ongoing investments and commitment to manufacturing excellence, the facility has been enhanced with state-of-the-art systems and processes over the last number of years. In 2019, Gildan announced an expansion project to develop a large multi-plant manufacturing complex expected to house two new large textile facilities and accompanying sewing operations. The expansion will help service international markets, support growth, and diversify Gildan's manufacturing network. To learn more about the journey that brought Gildan's fully-equipped textiles and sewing facility to where it is today, we sat down with Alquimedes George, Vice President and Country Manager, to hear him share what it was like to help lead the facility's integration while discussing the role played by Gildan's strong environmental, social, and governance (ESG) practices. Read what he has to say:

Can you tell us how you came to lead Gildan's Bangladesh operations?

I joined Gildan 17 years ago as a Quality Assurance Manager for our sewing operations in the Dominican Republic. With the expansion of our Caribbean hub, I was then promoted to Quality Assurance Director. After spending four years in this position, I became Director of Engineering and Maintenance in the Dominican Republic. The exposure I received working in these positions gave me better business insights and equipped me with the core competencies for eventually being transferred to our Bangladesh hub in 2011 as Director of Manufacturing. Today, my responsibility is to lead our fully integrated Bangladesh operations. In addition to overseeing manufacturing, distribution, and the procurement of raw materials, this position requires me to also manage labour processes in accordance with government regulations and Gildan's standards.

Can you explain what the transition process was like when you moved from the Caribbean to our hub in Bangladesh?

Acclimatizing to my host country took some time. At first, it was challenging to get used to a completely new culture and way of life. Even the business environment and mindset in Bangladesh were vastly different from what I was accustomed to. But with the support

of my colleagues at Gildan, alongside my patience, resilience, and willingness to adapt and evolve, I eventually grew to see this place as my second home.

What differentiates Gildan's operations from others operating in the region?

To start, it's important to highlight that most manufacturers in the region are far smaller in scale and primarily operate as contractor facilities hired by international brands to fulfill their orders. Gildan stands out because of our longstanding history and international presence in the industry. In fact, we've been manufacturing clothes for over 35 years in facilities that we directly own and operate, which means that our expertise began far earlier than many other manufacturers. Over the decades, we have refined our craft through our direct supply chain control, and we now have an unprecedented ability to operate with strong oversight under leading international standards – something that sets us apart from other manufacturers in the region. This has also equipped us to take the utmost diligence when it comes to operating responsibly: We have made ongoing investments into sustainability, innovation, and the development of well-

established programs to ensure a higher standard of safety and labour practices. Another thing that makes Gildan stand out is our leading environmental, social, and governance practices and stringent Code of Conduct, which together reinforce our compliance with all local and international labour standards. This is something that may be a challenge for other manufacturers in the region.

What is the perception of Gildan locally?

Gildan is seen as an employer of choice in the region because we are one of few multinational companies operating a garment facility in Bangladesh. In fact, because we are seen as a desirable employer here, we often have long lines of job seekers waiting outside our facility to drop off their applications. Many of these job seekers are motivated to join Gildan because of our reputation of maintaining leading manufacturing practices and operating innovative facilities, as well as applying consistently high social and environmental standards.

What were some of the steps required to align the Bangladesh facility with Gildan's Code of Conduct after the acquisition?

One of the most important things we needed to do was deliver the necessary Code of Conduct training to all our staff and personnel so that we could begin aligning these facilities with our Company standards and the standards set forth by the Fair Labor Association (FLA), International Labour Organization (ILO), and Worldwide

Responsible Accredited Production (WRAP). These trainings began back in 2010 when we started our operations in Bangladesh, and they have been ongoing ever since. We also needed to invest in structural upgrades to ensure that our facility and its manufacturing processes and procedures complied with our Code of Conduct and international standards. For example, we made an investment of more than $1.5 M towards our facility and its fire systems to ensure that our work environment remains as safe and secure as possible.

Beyond that, we've also made it our priority to further reinforce our facility with state-of-the-art features to ensure that it operates sustainably and efficiently. Over the years, we've invested in a wastewater treatment plant, building enhancements, and safety equipment, and to date, these investments have amounted to approximately USD $5 million.

What is an initiative that you have locally to reinforce the importance of health and safety?

Beyond the ongoing investments we make to reinforce health and safety in our facilities, Gildan has also implemented an initiative called the Safety Week Campaign, a special week-long event that invites employees to participate in trainings, contests, and other activities. With this campaign, we aim to spread awareness by teaching and empowering employees on safety and best practices in the workplace. Can you talk about Gildan's expansion project and how your team is preparing to welcome the new workforce?

Gildan's expansion project in Bangladesh is an exciting one that will quadruple the number of people we employ in the region, and significantly expand our production capacity enhancing our ability to service both the European and Asian markets. As we get ready to grow, our priority is to continue developing and promoting internal talent to higher positions. Beyond that, we're also focusing on recruiting new talent to further strengthen our teams. We are currently in the process of implementing several organizational development initiatives to reinforce our position as an employer of choice, where our new workforce will have the ability to work in a highly efficient, state-of-the-art facility with the highest ethical, safety, and labour standards.

How does Gildan contribute to the local community?

Since 2017, Gildan has actively partnered with Room to Read, an organization dedicated to creating positive impacts through supporting literacy and education. Specifically, Gildan has invested in its Girl's Education Program, which seeks to transform the lives of girls in Bangladesh through enhanced education aimed at breaking down gender barriers. In 2019, we were able to help deliver this program to 173 girls, and we are again looking forward to collaborating with Room to Read this to continue supporting gender equality in our communities. Beyond that, we are also in the process of looking for new organizations to partner with so that we can expand on our support of women in the community through investing in their personal and professional development.

We also help our communities by investing in new infrastructure in the surrounding regions. For example, through our new expansion project, we invested approximately $150,000 into creating a new road for the community located just north of our project. What has been the most rewarding thing about working on these projects in Bangladesh? The most rewarding thing for me has been to see this hub grow over the years and how it has allowed us to bring wonderful work environments to the community. It is very fulfilling to see the smiles on the faces of our employees when I walk through our facilities, and I feel proud of Gildan's dedication to operating with excellence and providing workplaces that are safe, healthy, and empowering.

Product Mix:

- 100 % cotton
- CVC (Chief Value Cotton) (60/40)
- Grey melange
- 5 % Viscose & 95% Cotton
- 10 % Viscose & 90% Cotton
- 15 % Viscose & 85 % Cotton
- Ecru melange (2%)
- Camel melange (1%, 2%)
- PC (52/48, 60/40, 65/35, 80/20)
- Sewing thread.

Product Range:

- Men
- Wome n

Knit Dyeing Section:

It has one section of knit dyeing floor. Each contains around 100 thousands square Feet area.

Production Capacity: Approximately 15 ton/day

PRODUCTION: 70 Tons/day (Approximately). It has two lifts, two cranes of capacity = 70 tons. There is a Bas Bar (have no wire) system to facilitate production.

Different Departments: Production Oriented Department:

- Yarn store
- Planning & Control
- Batching
- Chemical store
- Winding section
- Dyeing Section
- Finishing Section
- Dyeing lab section
- Physical lab
- Quality Control
- Maintenance
- Utility
- Water treatment plant
- Effluent treatment plan

Supporting department:

- Procurement
- Merchandising
- Marketing

- IT
- HRD
- Finance & accounting
- Medical
- Personnel Administration - Securit

Other Facilities:

Staff canteen
The canteen is capable to accommodate about 250 persons at a time.

Mosque
The mosque is capable to accommodate about 500 persons at a time.

Medical
Available Facilities with a Air Conditioned Ambulance.

Lighting:
Sufficient lighting arrangement is there with proper lighting shade fixed along with over Academic Supervisor& Lecturer channel

Cleanness:
The factory premise are kept clean, removing the dirt & refuges, cleaners sweep the floor at regular interval effective arrangement are made to dispose off the waste to the nearby dustbin.

Water:
Sufficient water is supplied from in house deep-tube-well to all production lines including toilet. Moreover, each floor provided with tank for portable water.

Toilet:

Sufficient numbers of toilets are available for male & female workers as per requirements. Soaps & towels are also supplied.

Emergency Electricity Supply:

During the electricity failure, available generators can fulfill requirement of the whole complex.

Salary & Wages:

Salary and wages are paid to the staff and workers as per gazette notification of the government of Bangladesh. ○ Payment of salary and

wages are made regularly by 5th - 7th of each month ○ In the salary sheet basic salary, house rent, medical allowance andgross salary are shown separately for each employee.

ACHIEVEMENT

Gildan Active Ware Bangladesh Ltd. (GAB) now is having Oeko Sustainable Textile, i.e., Oeko-Tex Standard 100, which, as you know, entrusts it to produce apparels using organic cottons cultivated and traded conforming to eco-friendly standards all through. Gildan Active Ware Bangladesh Ltd. (GAB) is also certified by CONTROL UNION.INDIA to manufacture garments using organic cotton yarn under the prestigious coverage of scope CERTIFICATE.

- BGMEA

- BKMEA

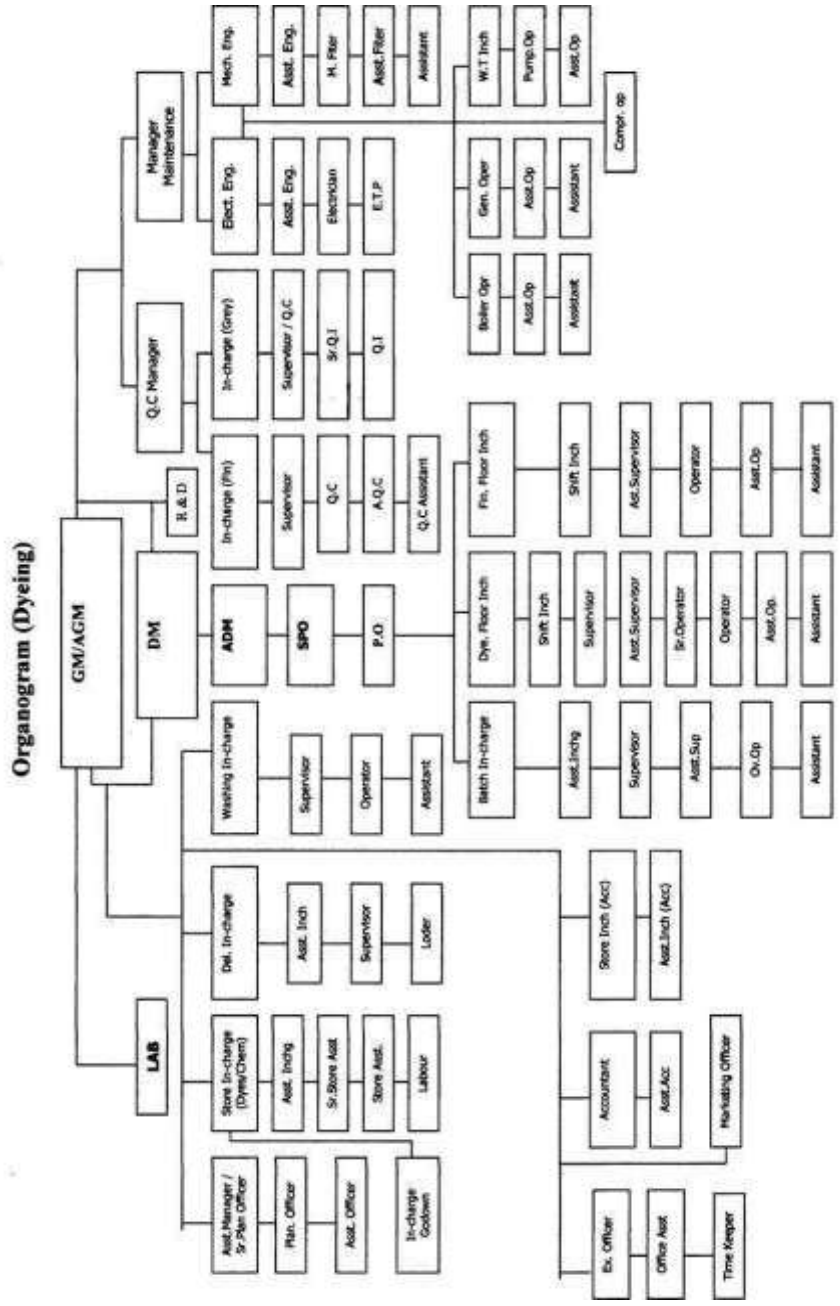
- OEKO-TEX

- **Major Brand**


Our family of brands / Nos marques
GILDAN
GOLDTOE
ANVIL
COMFORT COLORS
SECRET
Silks
POWERSOX
kushyfoot
Therapy Plus
Licensed brands / Marques sous licence
MOSSY OAK
UNDER ARMOUR

HUMAN RESOURCES OF MANAGEMENT

Organogram of man power in Dyeing Section



MANAGEMENT OF SYSTEM

- Buyer sample is send to G.M.
- Matching is done by lab in charge.
- Sample is prepared by asst. dyeing master.
- Sample is send to the buyer for approval.
- Approved sample is returned and taken as standard. Sample for bulk production.
- Asst. dyeing master gives responsibilities to production officer.
- Then production officer, with the supervisors start bulk production.
- On line and off line quality check is done by lab in charge and asst. dyeing master.
- After dyeing finishing in charge controls the finishing process with the supervision of production officer.
- After finishing, the material is checked by asst. dyeing master.
- Finally G.M. checks the result with asst. dyeing master and decision is taken for delivery.

SHIFT CHANGE:

Three shifts:

- Morning (6 Am to 2 Pm)
- Evening (2 Pm to 10 Pm)
- Night (10 Pm To 6 Am)

Responsibility of Production officers:

- To give dyeing program slip.
- To match production sample with target shade.
- To collect production sample lot sample matching next production,
- To observe dyed fabric during finishing running & also after finishing.
- To identity disputed fabrics & report to P.M/G.M. for necessary actions.
- To discuss with P.M about overall production if necessary.
- To sign the store requisition & delivery challan in the absence of P.M.
- Also to execute overall floorworks.
- To maintain loading'/unloading khata. Any

Title : Production Office

Report To : Sr. Production Officer.

Job Summary : To plan, execute & follows up the production activities &. Control the quality production with related activities.

Duties & Responsibilities of SPO:

Overall supervision of dyeing, finishing production. Batch preparation & p^H I check.

Dyes & chemical requisition issue & check. Write Fabrics loading & unloading time from m/c Program making, sample checking, color measurement Control the supervisors, operator, asst. operator and helper of Dyeing m/c. And also any other over work as & when required by the management.

Title : Sr. Production Officer

Report To : Manager

Job Summary: To plan execute & follows up the production activities & control the quality production with related activities.

1. Duties & Responsibilities of GM:

Overall supervision of dyeing, finishing production.

⇩

Checks the sensitive parameters of different machine for smooth dyeing

⇩

Checks the different log books of different areas & report to management

Checks out the plan to control the best out put from supervisors & workers.

⇩

To trained up& motive the subordinates how to improve the quality production.

⇩

Control the supervisor, operator, Asset. Operator & helper of dyeing.

⇩

Maintenance of machine & equipment any other works & when required by the management

Manpower List (Dyeing Department)

No.	Section	Person
01	GM	01
02	DGM	01
03	Manager	01
04	Superintend	03
05	Coordinator	02
06	Supervisor	08
07	Officer/Technician	10
08	QA/Maintenance	25
09	Batch	10
10	Dyeing	80
11	Finishing	120
12	Store	16
13	Delivery	24
14	Washing	08
15	Accounts	10
16	Marketing	04
17	Store (Acc)	04
18	Ex.Of./'Time	04
19	Pion	02
	Total	337

FLOW OF OPERATION

Knitted fabric from Knitting Grey Fabric Ins pectin Section Batch Section

⇩

Dyeing Laboratory Dyeing Floor Finishing Section Quality Checking

⇩

Dispatch/ Delivery Section

Supporting sections:

Planning

⇩

Chemical Store

⇩

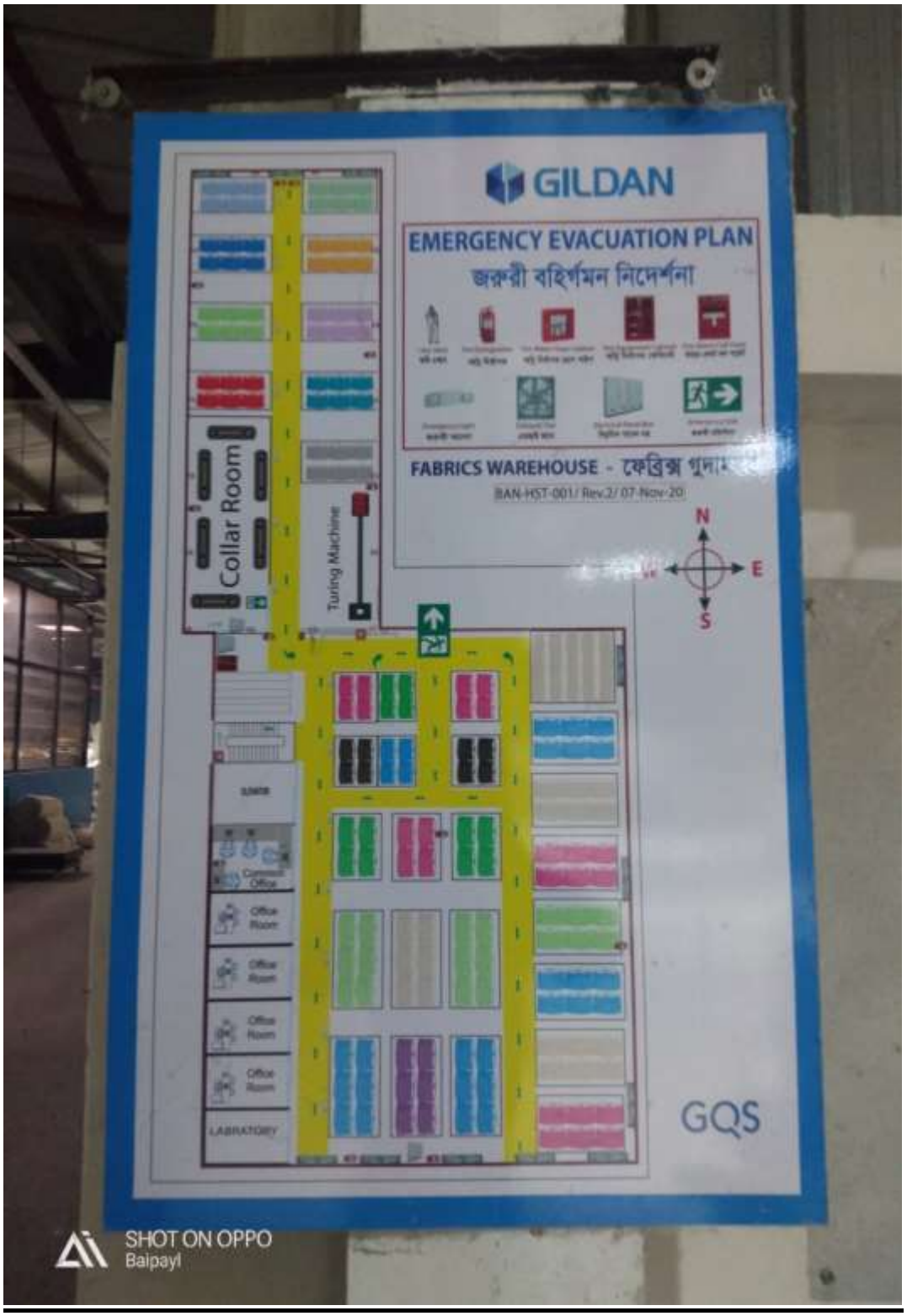
Utilities Sections– water, power, boiler,
Compressor, waste water management system.

⇩

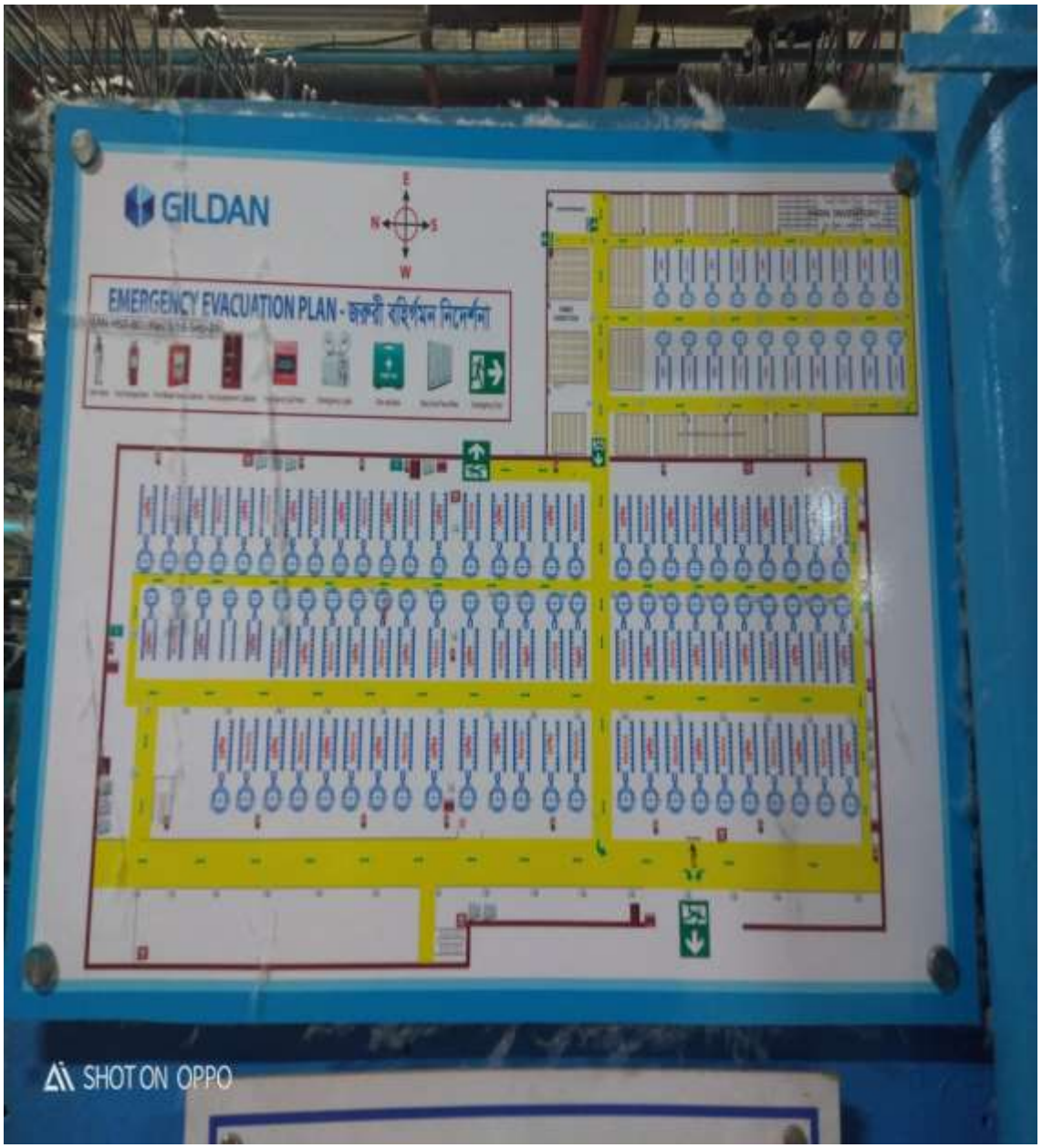
Maintenance Section

Factory layout Picture:

Bleach store Layout Picture:



Knitting Layout picture:

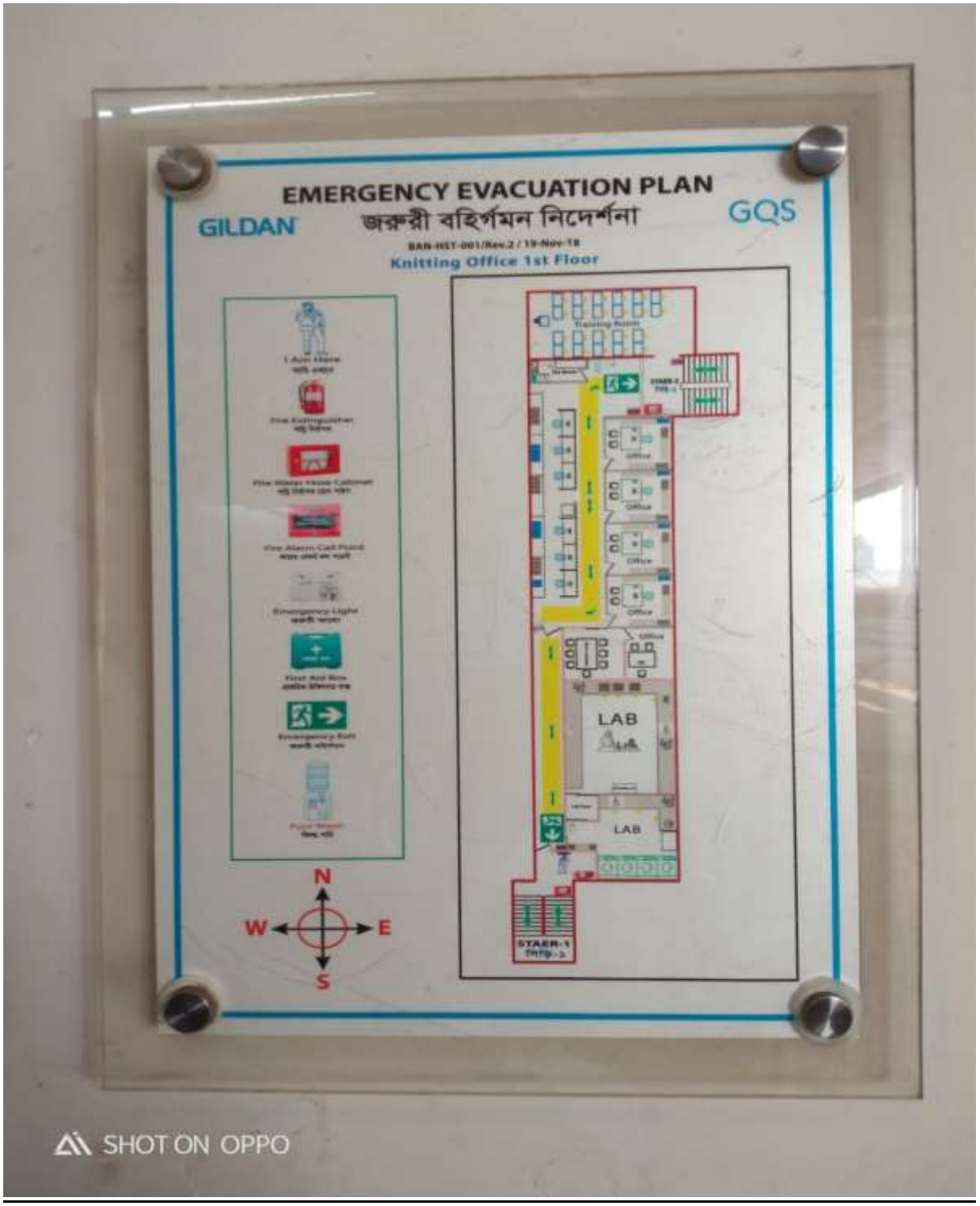


Dyeing Layout Picture:

First Floor:

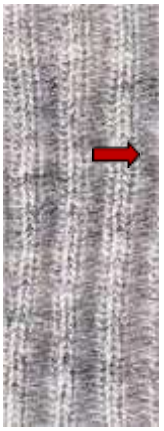
Second Floor:

Lab Layout Picture:



GREY FABRIC INSPECTION

Grey Fabric Inspection Section

Fault name	Causes	Remedies	Image
Hole Mark	#Yarnbreakage or yarn cr # If the yarn count is not correct on regarding structure, gauge course and density. # Badly knot or splicing. #Yarn feeder badly set. # If yarn to high	#Yarn strength must be sufficient to with stand te stretch as well as uniform. #Use propr count of yarn. #Correct ly set of yarn feeder. #Knot should be given properly	
Needle Mark	# When a need breaks # If A needle or needle hook is slightly bends #If needle does not catch yarn	# Needle should be # straight as well as from broken latch.	

Star Mark:	# Yarn tension variation during production. # Bucklin g of the needle latch. #Low G.S.M fabric production	# Maintain same Yarn tension during production. # Use good conditioned needles.	
Bari ness	# Use of irregular yarn having higher long term irregularities . # Using different count	# remove irregular yarn # use proper yarn count #we can use it for	

Lycra out	Cause by If lycra is missed or Lycra attach with the yarn	Check the feeder and attach laycra.	
Seat up (cloth fallout)	# if needle latch is not work properly/ jaum # Causes by hick yarn # Improper/large knot	Make sure all the latches of needle are closed with feeding yarn after a drop stitch.	
Oil mark	# Excessive oil flow in the needle # Leakage of oil line	# Ensure that oil does not pass on the fabrics. #Well maintenance as well as proper oiling.	

Inspection Machine Specification:

- UZU machine for garments
- Width: 69 & 100 inch
- No of m/c: large – 3 small – 6 – Power supply required: 200 volt 50/60 Hz - Motor- 1 hp.
- Efficiency – 75%
- Brand Name :UZU
- Model: HC-TIM -1500 mm
- Country Of Origin : Thailand
- No of motor: 02
- Motor: 210 HP
- Power : 220 V

Checking Standard:

Varies depending on Brand" requirements - For – 4 point system is followed.

- For others – 10 point system is followed.

Inspected Fabric Storage Section:

- Two storied storage sections with racks of multistoried rails.
- Total capacity – approx. 250 tons

- Storage fabrics are sorted and separated under following parameters---
  - 1. Buyer

- Order no
- Color

- Count
- Brand
- Yarn lot
- Fabric Dia & GSM.

BATCH SECTION

Batching:

Batching means separation of fabric according to specification, Dyeing machine capacity & availability, urgency of the order. Two types of Batching:

1. Solid
2. Assorted

Batch contains body of garments as well as collar-cuffs according to the design.

- Batch Quantity = $\frac{\text{Total required quantity X Dia Quantity}}{\text{Total quantity}}$

- Batch Ratio =

$$\frac{\text{Total batch quantity + total parts Batch Quantity}}{\text{Quantity}}$$

M/C for Batch preparation

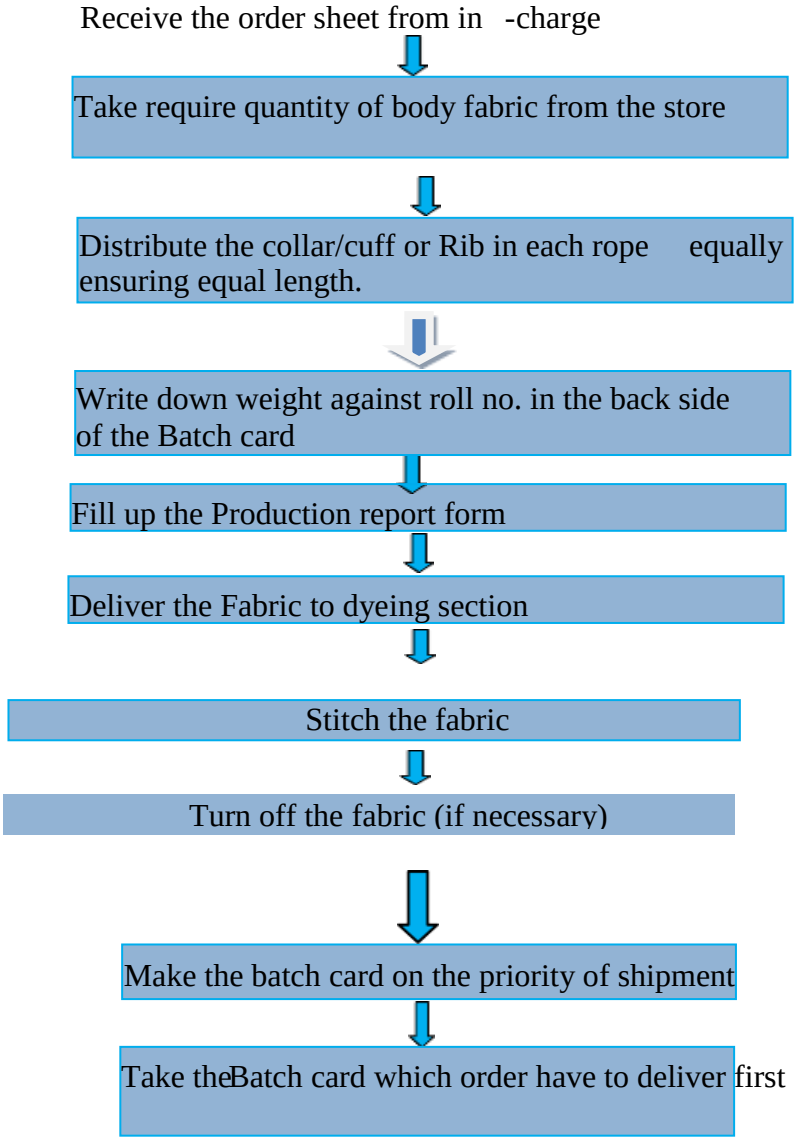
Name : Turning m/c Brand Name : PUJI
Type : REVERSING
No. of m/c 03

Loading Capacity:

In dyeing machine, 250 kgs of fabric can be one nozzle through dyeing machine. Normally, for the fabric with high G.S.M and large width, maximum load can be done.

Nozzle: Each batch is divided into 1-4 stacks, which are termed as nozzle, generally each nozzle weight 250 kgs
Rolls: Each nozzle is further dividedinto1to5, which are termed as rolls. Usually each roll weight about 22-27 kgs(or up)

Process flow chart of Batch preparation:



KNIT DYEING LABORATORY

GAB Knit has a „Central Lab‟ including three major sections– Knit-Dyeing lab & Physical Lab.

Main Responsibility:

- Accepting the „Swatch‟ from the brand and analyze the color & Dyes.
- Preparing the Recipe accurately matching the required color.
- Storing & maintain the dyes to be used for dyeing.
- Producing self-shades & storing it into the computer.
- Record & analysis of chemicals & dyes quality.
- Making plans for bulk dyeing.
- Following the color coding system given by the distinctive Brand & also prepare own color bank.
- Testing the dyed goods.

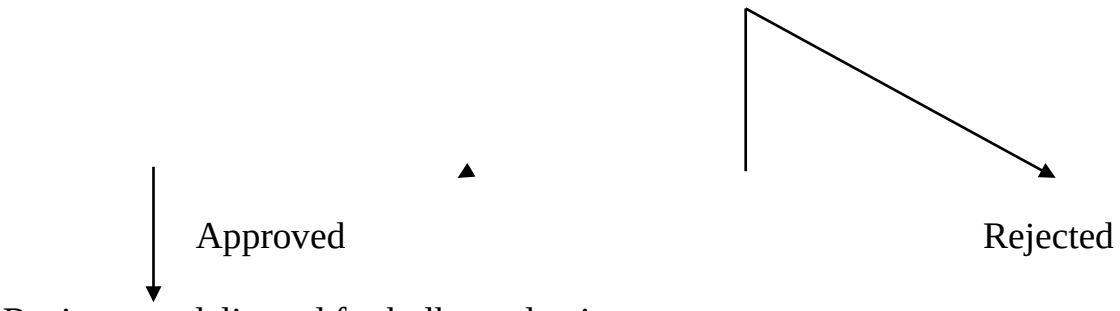
1. Flow of work:

Swatch from buyer/merchandiser

(Contains: fabric construction-gsm-color name-color code-style)

Shade matching by lab works

Shade submission (Sample match A, B, C)



Shade matching system:

Spectrophotometer:

Spectrophotometers designed specifically for the measurement of colored materials, are at center of any modern color formulation, color production, or color quality control system. Although these color spectrophotometers are designed measure samples both accurately & repeatedly, they accomplish these measurements only within a range of applicable tolerances. Spectrophotometers are not perfect measuring devices, & how well they measure often depend on factors under control of system operator. The objective is how to better operate and control color spectrophotometers, so that their measurements are as accurate & repeatable as possible. These tips are intended for those attempting to get the best possible measurement performance from their color measuring spectrophotometer

The Data color high performance bench top spectrophotometers (Data color650™, Data color 600™, Data color 400™) are the newest generation of bench top color measuring instruments, incorporating state-of-the-art CMOS integrated circuit technology in the instrument design. All are intended for use as a device for measuring, specifying and evaluating color inboth laboratoryand production settings.

[Spectrophotometer – Data color model 600]

This high-precision, close-tolerance, reference grade spectrophotometer has special capabilities to handle fluorescent materials.

- Automated zoom lensand specular port
- Exceptional inter-instrument agreement
- Automated UV control
- Multiple viewing apertures with automatic aperture recognition Automatic gloss compensation

Pantone book:

Buyer‟s Swatch: may be piece of fabric or C.I. number of any specified „Pantone book

- There are 4 types of pantone book is available:
- TP-textile paper
- TC-textile cotton
- TPX – textile paper for bright
- TCX -- textile cotton forbright
- TPG
- C Pantone
- U Pantone
- Coloro Panton
- The given swatch is measured by the

- „Spectrophotometer‟, which is prepared by reach memory of different dyestuff self-shades.
- Also the matching may be done by previous working record.

Some self-shade samples:

Sonazol Yellow 3RS

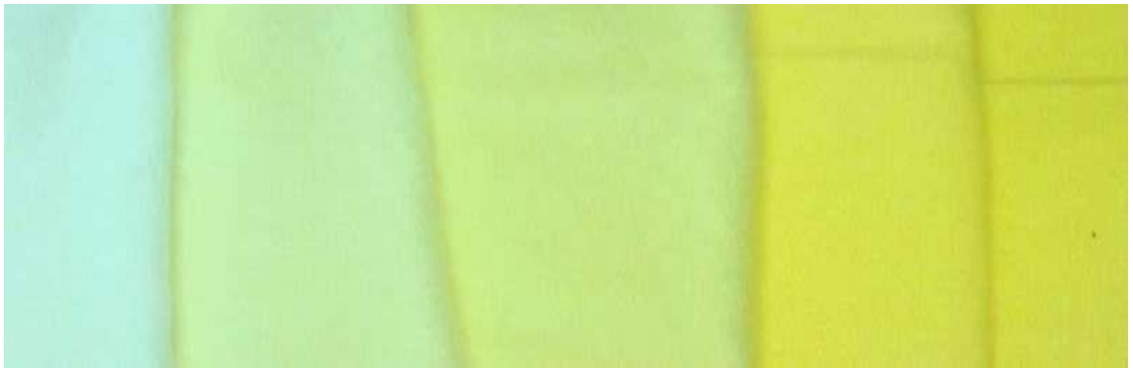
0.01% 0.05% 0.1% 0.5% 1% 2% 3% 4% 5%

Sonazol Red 3BS

0.01% 0.05% 0.1% 0.5% 1% 2% 3% 4% 5% Sonazol Blue RSP

0.1% 0.5% 1% 2% 3%

- Sonazol Yellow 4GL



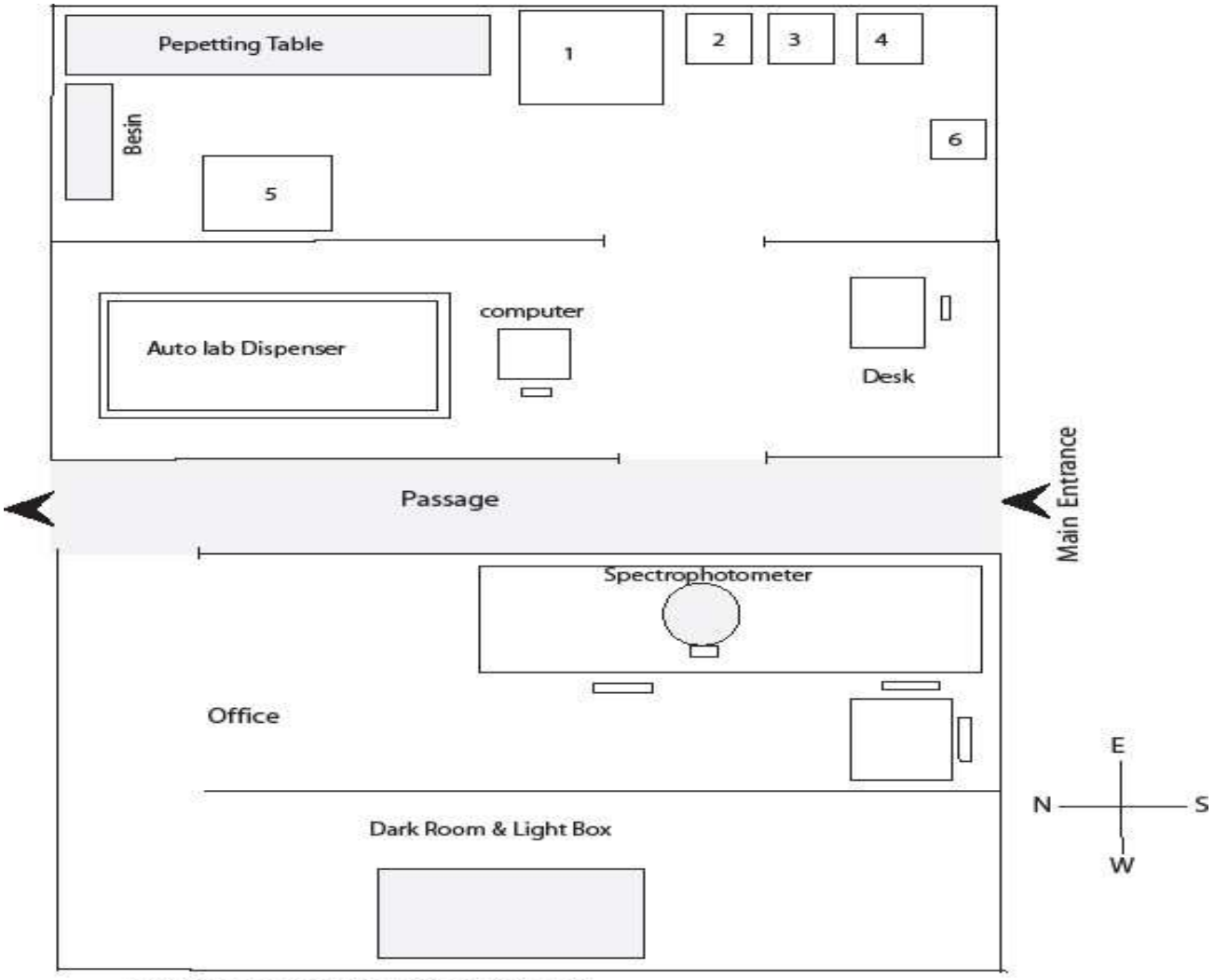
0.1% 0.5% 1.0%
2% 3%

List of machine:

Auto lab Dispenser & Solution maker	01
Ahiba Nuance-(Sample Dyeing m/c)	01
Sand lab sample d/m	04

Lab Extractor	01
Dryer	01
Data color Spectrophotometer SF 600 Plus CT	01

- Layout of Knit Dyeing Lab:



1-5 : Ahiba nuence Sample dyeing m/c
6 :Lab hydro

Lab Dyeing Machine:

AHIBA NUANCE Data color lab dyeing machine

Feature:

- Easyto operate multi-step controller with alpha-numeric program names
- Advanced microprocessor technologycontrols the heatingand coolingsystem
- Dyeingparametersareconstantlymonitoredduringevery step of the dyeingprocess and displayed on the large graphical display
- Memory cards store an unlimited number of processes
- Increased power output ensures reproducible level dyeing
- Suitable for allsubstrate.

AUTO LAB DISPENSER

SPECIFICATION:

Manufacturer:
Data Color Origin: USA

FUNCTION:

- Preparation of stock solution
- Auto dispensing of given recipe

LAB DIP:

Lab dip is a process by which buyers supplied swatch is matched with the varying dyes percentage in the laboratory with The help of "DATACOLOR" or see the previous matching sample or give the recipe by the practical experience, Labdipplays an important role in shade matching & anddetaching the character is tics of the dyes and chemicals are to be used in the large scale of production so this is an important task before bulk production.

Key accessories for Lab:

❖ Data colorcomputer ❖ Lab, receivefile ❖ ElectronicBlench ❖ Plastic/Glassbeakers ❖ Steelstirrer	❖ Scissors ❖ Stainless reference &yeing beakers ❖ Dryer ❖ Variable lightbox ❖ ElectricHeater

DYEING MACHINE

DESCRIPTION AND THEIR MECHANISM OF WORKING

DYEING FLOOR

The Dyeing Machines are all Winch dyeing m/c of both atmospheric &high temperature types.

No. of Machines:

Type	capacity	no. of m/c
Bulk dyeing machine -	150 kg	
	250 kg	
	500kg	
	500 kg	
	750 kg	
	750 kg	
	1000 kg	

Fig. Dyeing Machine

Fig. Dyeing Machine

Fig. Dyeing Machine

1. MECHANISM OF DYEING MACHINE:

Main Parts of Dyeing Machine:

- Main Vessel or Chamber
- Winch roller or Reel
- Heat Exchanger
- Nozzle
- Reserve Tank
- Chemical dosing tank
- Utility lines i.e. water line, drain line, steam inlet etc.
- Controlling unit or Processor
- Fabric Plaiter
- Different types of motors & Valves

Working Principle of Winch dyeing machine:

Winch Dyeing machines are most suitable for knit fabric dyeing. Here fabric is dyed in tubular from where fabric runs in endless circular path. Inside the m/c the upper part of the fabric runs through a nozzle & the lower part is immersed into liquor, in the nozzle the liquor is sprayed onto the fabric. The fabric and liquor both circulated by a hgh pressure pump.

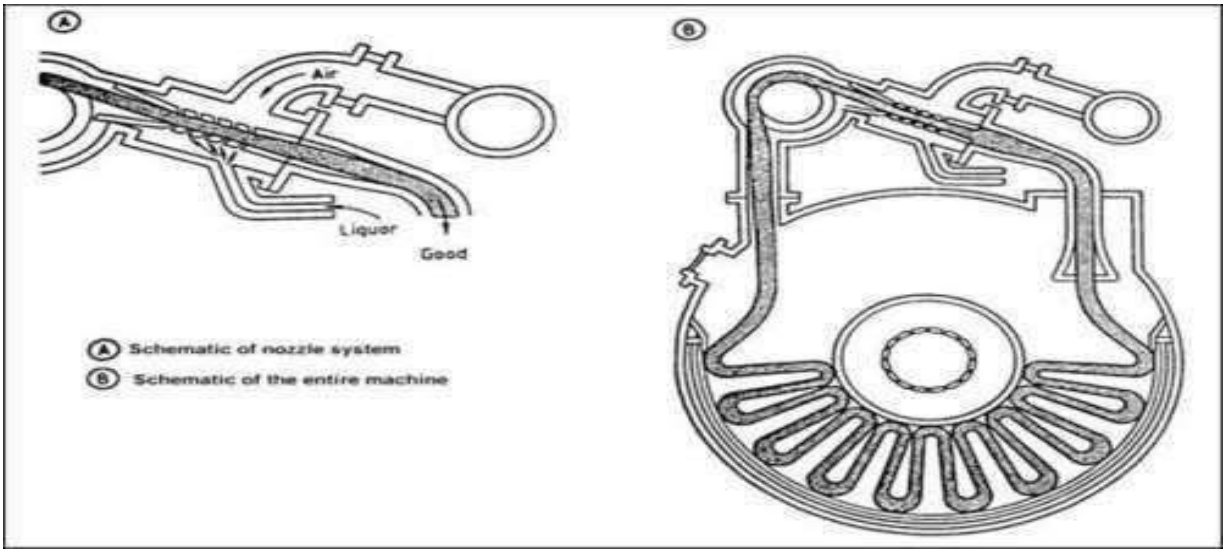


Fig: cross-sectional diagram showing fabric path & nozzle in the high pressure winch d/m

The main pump draws the liquor from the bottom of the vessel & passed this liquor through the heat exchanger to the top of vessel into the Nozzle. The winch roller or the reel also helps running the fabric smoothly. The liquor gets heated or cooled by exchanging temperature in the heat- exchanger.

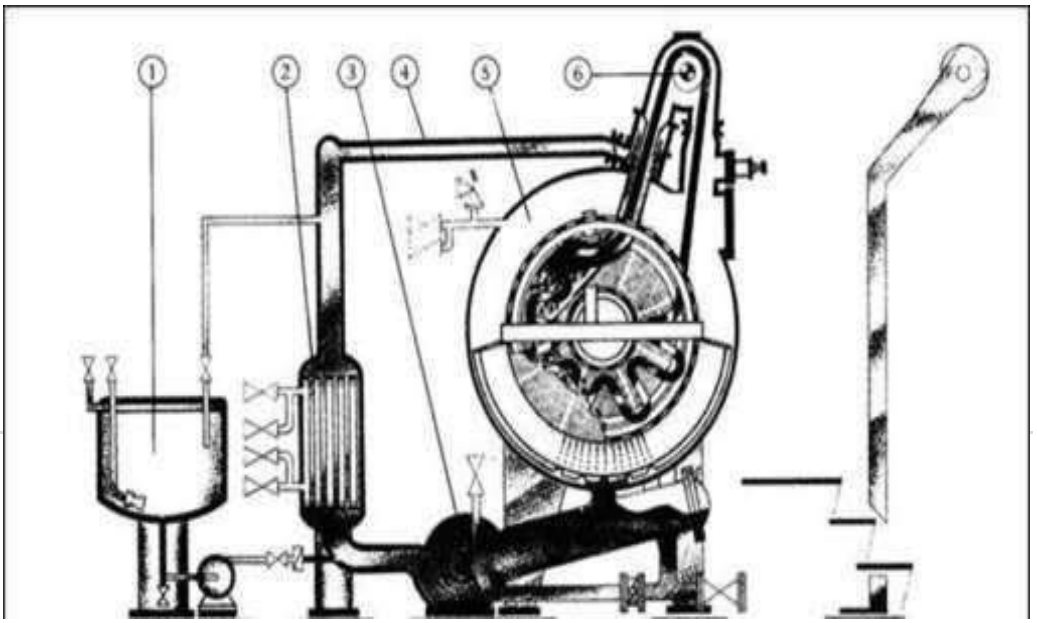


Fig: schematic diagram of the circulation system of liquor in a Dyeing machine

General Parameters of Dyeing machines:

- Capacity per nozzle: theoretically 250 kg but practicallynotmorethan200 kg should be used.
- Nozzle pressure: 4-6psi
- Steam pressure: 7 bar (inlet of heat exchanger) • Cold water temp.
- &pressure: 25 c & 3 bar
- Maximum temp.: 140 for high temp. M/c 100 for atmospheric
- Reel/Winch speed: 150-250 rpm
- Main motor efficiency: 80-85%

FINISHING SECTION

Textile finishing, in are stricted sense, is the term used for a series of processes to which all bleached, dyed, printed & certain greige fabrics are subjected before they are put to market. It‟s one of the most important operation in knit processing.

Objectives of Finishing:

- Improving the appearance, luster, whiteness etc.
- Improving the feel, which depends on the handle of the material & its softness, suppleness, fullness etc.
- Wearing qualities, non- soiling, anti crease, ant shrink comfort etc.
- Special properties required for particular uses -water -proofing flame proofing etc.
- Covering of the faults in the original cloth.
- Increasing the weight of the cloth.

Effects of Finishing

- Easy care.
- Crease recovery.
- Dimensional stability
- Good abrasion resistance
- Improved tear strength
- Good sew ability
- Soft or stiff handle
- Shine or luster

Knit fabrics require finishing process after dyeing. During dyeing all knit fabrics are dyed in tubular form. According to buyers requirement dyed fabrics are finished in either Tubular form or Open-width form.
Depending on which Finishing sections are separated into two sections – OPEN & TUBE section

Open-finish Section:

Those fabrics which are to be cut in open form in garment section as per buyer requirement are finished in open form in this section.
The flow of process is as follows

Hydro extractor slitting & dewatering

↓

Stenter

↓

Compactor Q.C

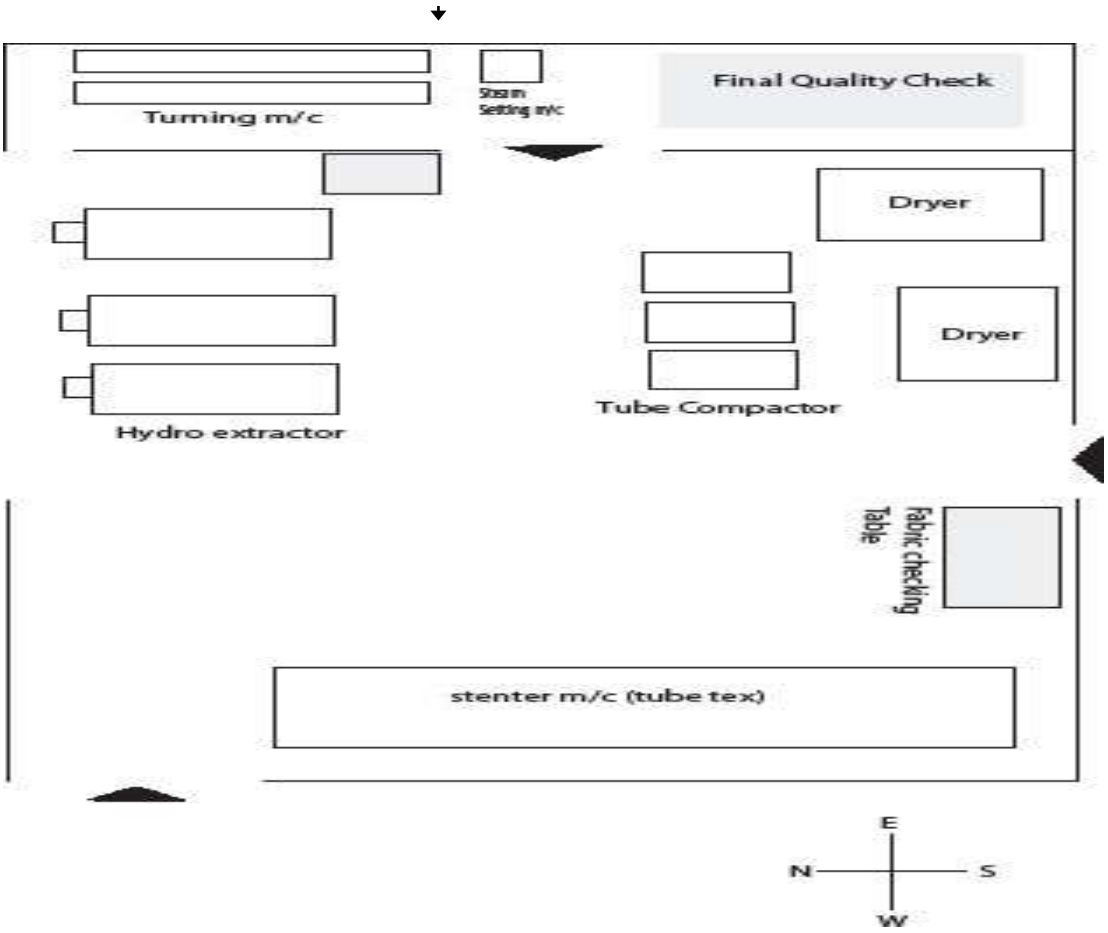
↓

Delivery

Tubular Fabric Finish Section:

Tubularfabricsaregenerallyusedfor Ladieswear& Babydress. In KCL huge orders of tubular product are manufactured.
The Machines or Finishing Sequence for Tube-Finishing are as following – Hydro extractor Dryer Turning m/c

Plaiting m/c or Steam setting m/c Tube Compactor

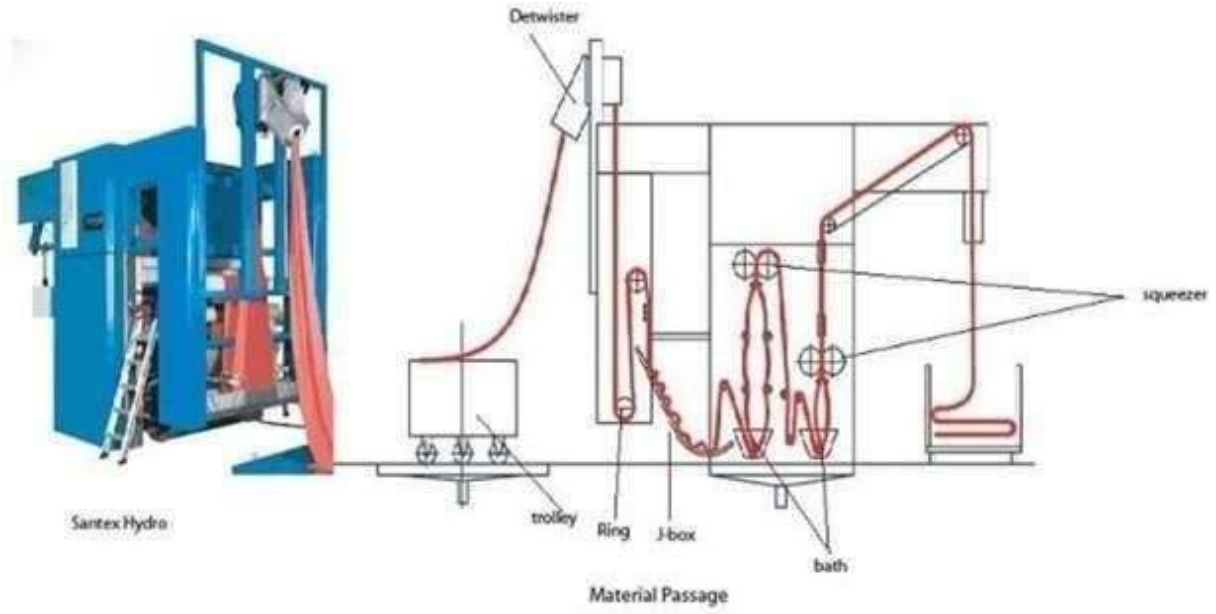


HYDRO-EXTRACTOR-PADDER

Manufacturer	:	SANTEX, SWITZERLAND
No. of m/c	:	2
Manufacturer	:	BIANCO, ITALY
No. of m/c	:	1

Function:

- To remove the excess water inherited by the fabric during Dyeing.
- To clean any unnecessary dirt or hairs of fibers.
- To soften the fabric if required by using softening agent.
- Slight controlling of Dia of tube fabric by using „Shaper".



Important Parts & Zones:

- Detwiste: Un-rove the roped form fabric after dyeing by twisting & turning. movement of fabric.
- Water& Softener bath: 1st bath is onlywater, 2nd one is for softener.
- Pedder: Two pairs of padding rollers set at the top of each bath. They squeeze the excess water from the fabric.

Ring & Ring Pulley: Works as a guide of fabric & maintain required Dia

Technical Parameter

- Fabric Passing Speed: Depends on count & GSM
  - For low GSM fabric–60-65m/min For Medium - 55- 58 m/min
  - For High -50-52m/min
- Over feed regions : J – box, Before Pedder 1 & Pedder 2

- Pressure in Pedder : Pedder 1 4- 5 bar Pedder2–3.5-4bar
- Types of Softener used : Anionic, Cationic & Silicon softeners areused.
- pH of bath should be 4.5-5.0
- Concentration of softener – 10 g/l
- Bath is changed after every 100 kg fabric

Dia of Shaper : Max.52 inches
Min. 18 inches
Waterrecovery% : 140-150%
Powerconsumed : 400 v. 50 Hz.

DRYER:

Manufacturer : SANTEX, SWITZERL AND.
FONG"S, HONGKONG.

Function:

- To dry the wet fabric.
- Control the shade & gsm slightly.

Main Parts:

- Feed unit; contains conveyor belt & number of rollers.
- Two drying sections – i) upper level (3 chambers) Lower level(3chambers Heating system associated by STEAM Line & Nozzles.
- Blower, to spread the steam through-out the chambers.
- Exhaust air ventilator.

Technical Parameters:

- Speed of passing fabric : 22-40 m/min
- Shaper length : according torequired Dia

- Overfeed ratio : Edge drive zone– 1.0-1.5
- Retard roller – 0.80-0.85
- Take-out zone – 0.85-0.90
- Conveyor belt – 1.0-1.05
- Plaited – 0.80-0.85

- Compaction% : according to Shrinkage result

  - S/J – 10-15%
  - Rib –10-12%
  - Interlock – 8-10%
  - Pique – 7-8%

- Shoe pressure : S/J – large

  dia – avg. 30 psi
  S/J – smaller dia – 10-15 psi Rib – 10-20psi Lycra - <10psi

Power consumed :

Thermo-Oil temperature :

SLITTING MACHINE:

No. of machines : 3 Manufacturer :
BIANCO, ITALY.

Function:

→ Slit-cut the tubular fabric through the needle mark.
→ Remove excess water.
→ Prepare the fabric for next ope

Technical Parameters:

→ Speedof passingfabric : 22-40 m/min
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→ Retard roller – 0.80-0.85
→ Take-out zone – 0.85-0.90
→ Conveyor belt – 1.0-1.05
→ Plaiter – 0.80-0.85

→ Compaction% : according to Shrinkage result

S/J – 10-15%
Rib –10-12%
Interlock – 8-10%
Pique – 7-8%

dia – 10-15 psi
Rib – 10-20psi
Lycra - <10psi
: S/J – large dia – avg. 30 psi S/J – smaller

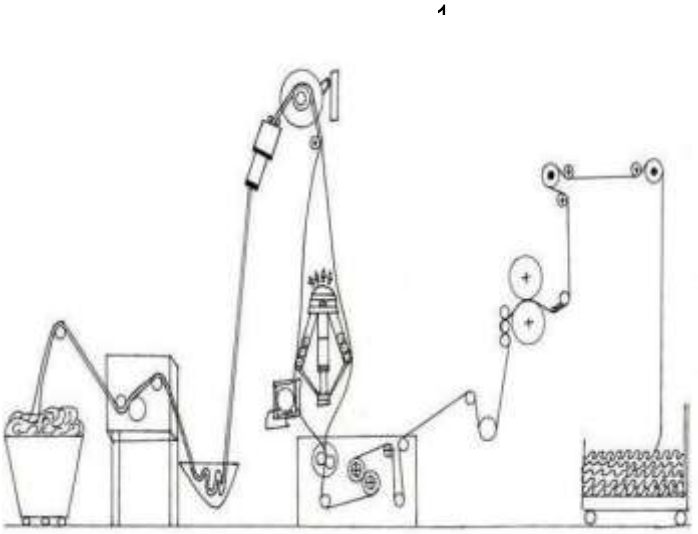
→ Power consumed : 80 kw
→ Thermo-Oil temperature : 90□c

SLITTING MACHINE:

No. of machines : 3
Manufacturer : BIANCO, ITALY.

Function

→ Slit-cut the tubular fabric through the needle mark.
→ Remove excess water.
→ Prepare the fabric for next operation



Slitting Machine Material Passage (Left to Right)

Main Parts:

→ Squeezer
→ J-box
→ Detwister
→ Spreader
→ Rotary cutting blade
→ Auto Centering system
→ Conveyor & Plaiter

Technical Parameters:

→ Speed : Varies with type of fabric
→ Overfeed : In feed zone, cutting zone, Conveyor belt (2030%)
→ Pressure : In Detwister zone-0.5 bar, in Padding – 4-5 Bar.

Main Parts:

→ Squeezer
→ J-box
→ Detwister
→ Spreader
→ Rotary cutting blade
→ Auto Centering system
→ Conveyor & Plaiter

Technical Parameters:

→ Speed : Varies with type of fabric
→ overfeed: In feed zone, cutting zone, Conveyor belt (2030%)
→ Pressure : In DE twister zone-0.5 bar, in Padding – 4-5 bar

STENTER

No. of machine 3
Manufacturer : BRUKNER,GERMANY(2) TUBETEX, USA (1)

Function:

→ To dry the fabric.

→ Heat-set the synthetic fiber fabric.

→ Controlling the width of fabric or maintain dimensional stability.

→ controlling the GSM of fabric.

→ Skew ness & Bowing controlling of stripe fabric.

→ Spirality & Twisting control.

→ Fabric hand-feel modification-like-Softening or Hardening.

→ Shade control.

→ Gumming & Cutting

Stenter m/c (full length view) Stenter m/c (chain & clip system)

Important Zones & Parts:

→ Back Zon

-Guider o Two Baths & Padder or Squeezer

- Auto centering

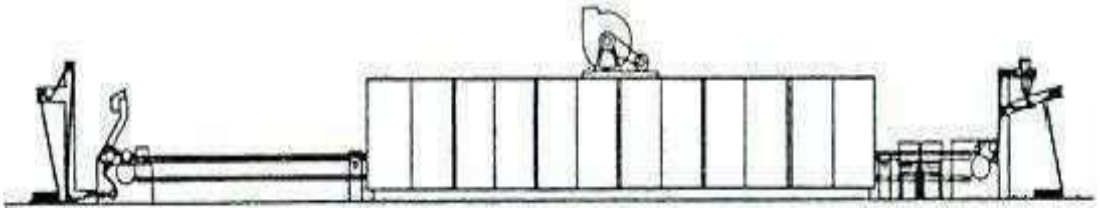
→ Middle Zone

-Over feed regions o Bianco or Mahloarrangement.

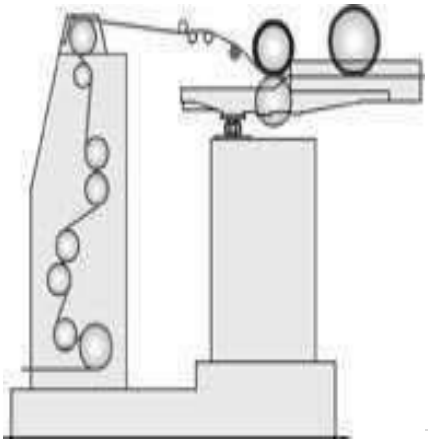
- Chain & clipsystem o Chambers (Contains blower, heater, recovery)

→ Front Zone

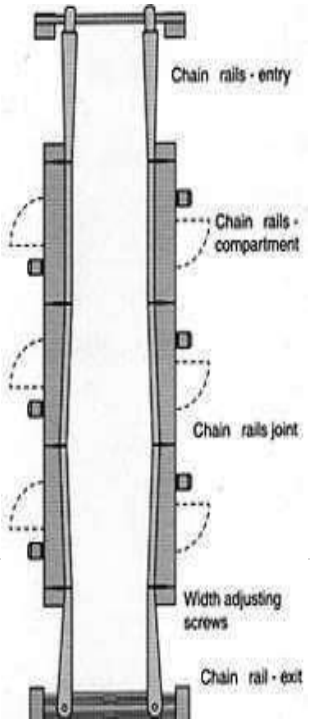
- Over feed zone
- Plaiting
- Static electricityremover.



Fabric path of stenter



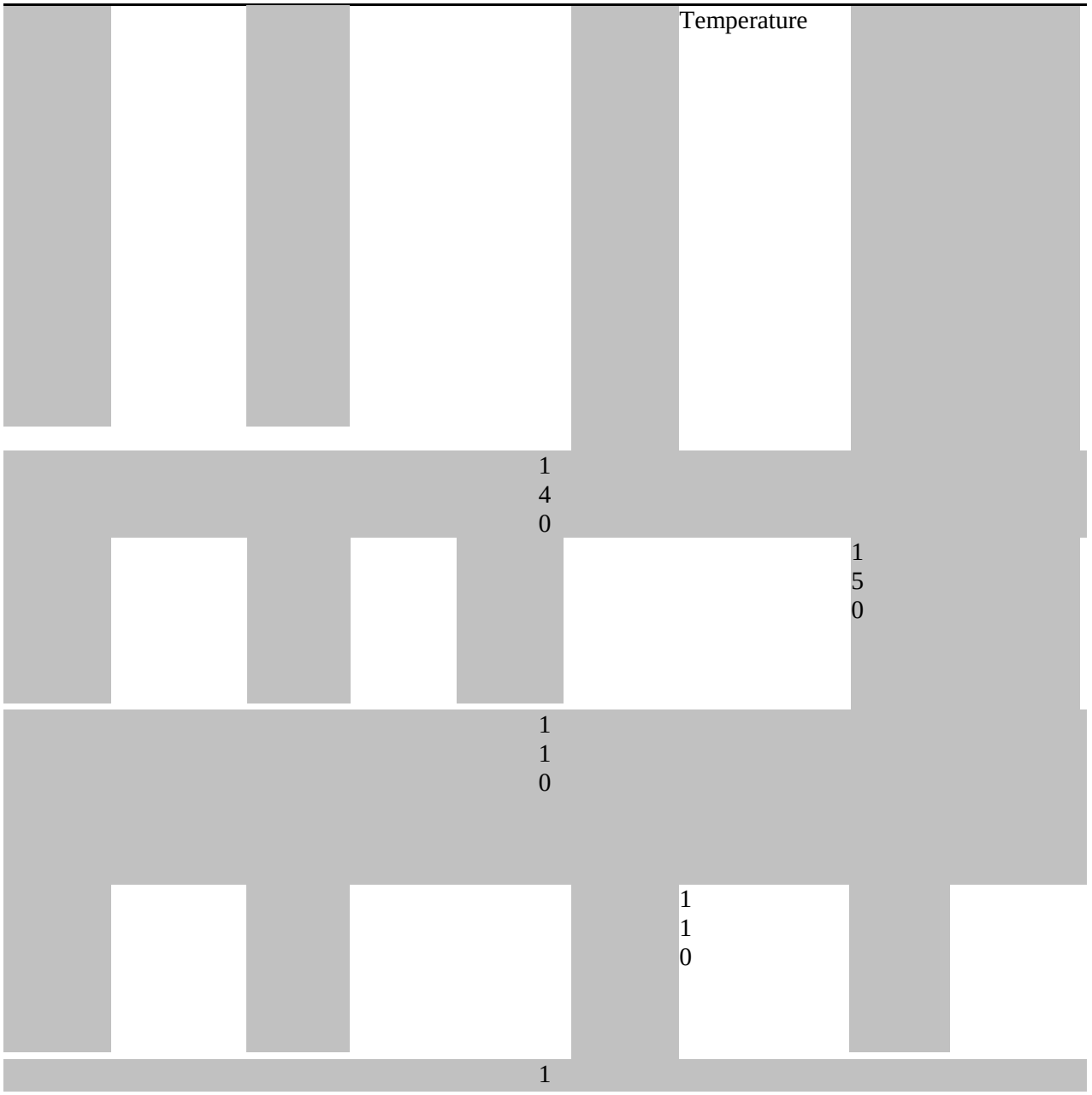
Overfeed & pinning

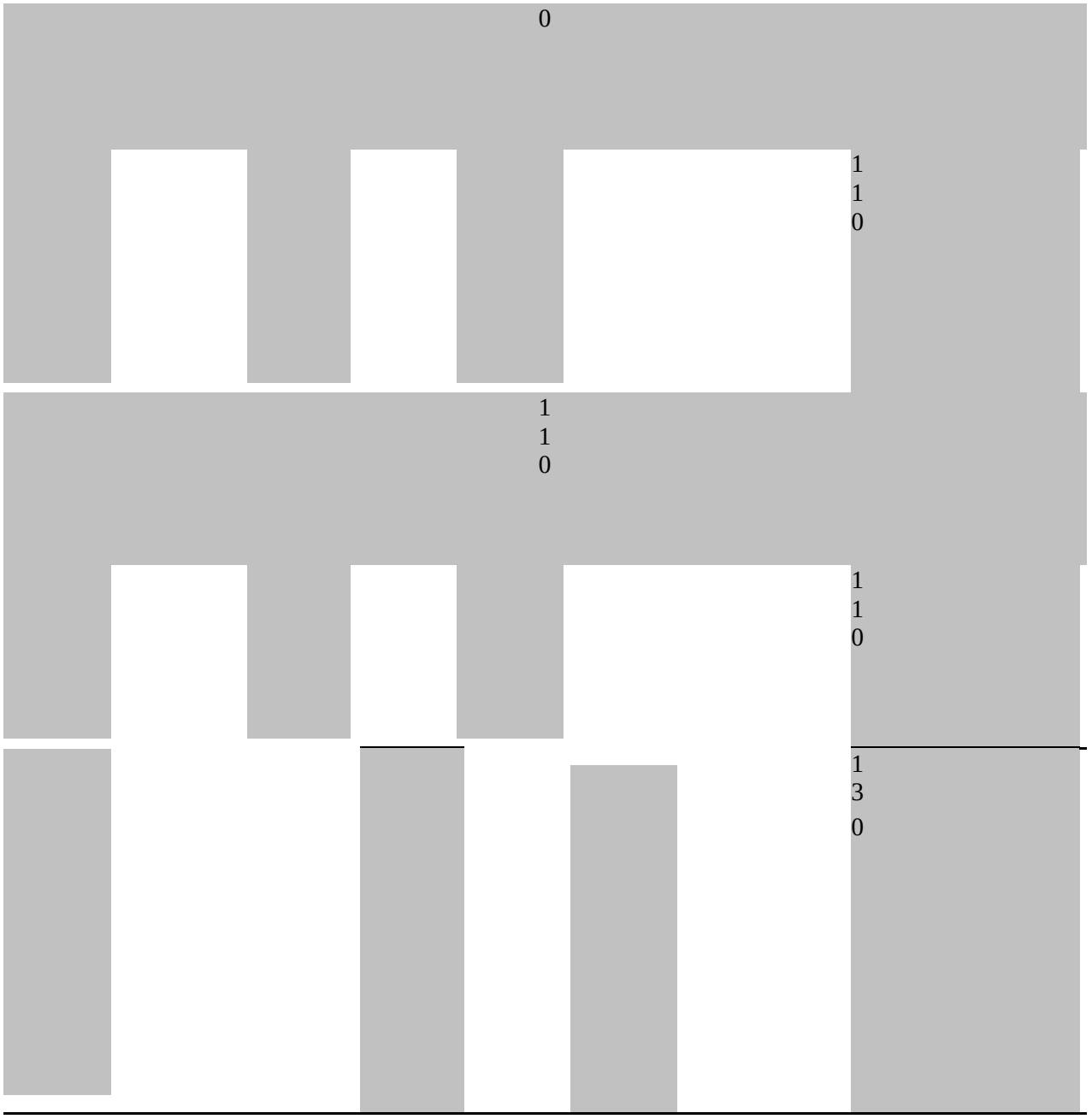


Fabric in the chain

Parameters used for different types of fabric

BRUCKNER




0
1
1
0
1
1
0
1
1
0
1
3
0

OPENWIDTH COMPACTOR: +

M/C quantity	:	01
Brand	:	Bruckner, Germany
Maxim line speed	:	60 m/min
Use ableline speed	:	30 m/min Maxm dia :95 "
Work abledia	:	90"
Steam box temp.	:	80° C
Feed R/L temp.	:	105° C
Overfeed(%)	:	up to 50 %
Shoe pressure	:	Max-18 Min-5
Sensor Position	:	

-Retard Roller ratio

-Shoe pressure(One shoe)

-Plater Ratio

-Right-Left roller pressure

Function of the Machine:

→ To compact the fabric

→ To control the shrinkage

→ To maintain proper width and G.S.M

Heating system: Steam

Main parts of the machine:

- Heating chamber□
- Blower(2, one at the entry chain zone for uncurling and another at the entry of compacting zone)□
- Synthetic blanket as a conveyor,□
- Folder□
- Exhaust fan□
- Unpinning cylinder(- 40%□+40%)
- Belt cylinder(-□ 40%□+40%)
- Uncurling device at entry of compacting zone.□
- sensor□✓ brush roller□

Additional attachment:

- Selvedge cutting
- Selvedge safety
- Pinning safety
- Selvedge unrolling

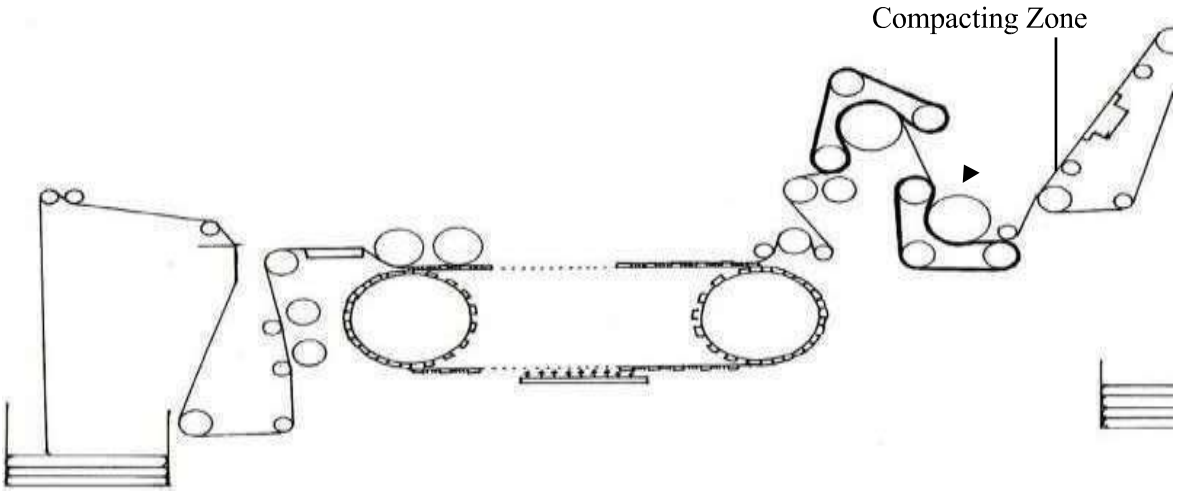


Fig. Material Passage

Production: Capacity:10 tones/shift or 30 tons/day Actual production: 4 tones/shift Utility: Steam Electricity, Compressed air

SPECIAL FINISHING SECTION

Sueding or Carbon Finishing or Pitch Finishing:

No. of m/c : 2
Manufacturer : LAFER, ITALY

Function:

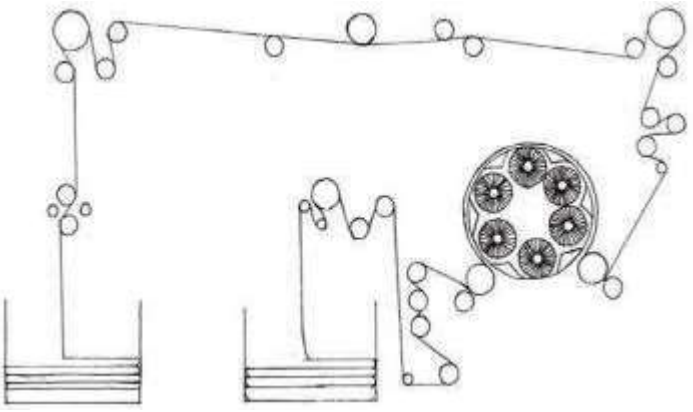
- Make the surface of fabric Smooth
- Improve heat insulation properties.
- Good Hand feel

Technical Parameters:

- Types wires –Carbon
- Fabric speed – S/J : 8-11 rpm
- Rib/Interlock: 9-10rpm
- Terryfleece: 10-11 rpm
- Tension – 10-16kg-wt
    - Drum rpm – 20-25 rpm

Specification:

- No of motor: 08
- Winch speed: 10-30m/min
- Machine speed: 50m/min (max)
- Drum speed: 30-35-50 rpm (Max 70)
- Pile roller no: 06
- Pile made of Plastic
- Plaiter tension: 6kg
- Taker in tension: 20kg
- Fabric return driver Tension: 25kg



Material Passage

- Drum Tension: 50kg
- Speed range: 10-40m/min
- No of cylinder/drum: 2 for double cylinder
- 1 for singlecylinder
- No of pin roller: 24 2 = 48
- 24 1= 24
- Cylinder r.p.m (General): 100
- Tension: 3 kg

Raising or Brushing:

- M/Quantity: 01
- Brand -GEMATEX
- Model: KRM 6725
- Origin-Germany
- Year ofmanufacture-1999
- Voltage - 400V
- Nominal Current -63A
- No of Pile:12
- No of Counter-Pile:12

Function

- To raise or tear-out the extra thread loops on the back-side of fabric
- Increase the warmth of fabric.

Singeing

No. of m/c - 1
Manufacturer- OSTHOFF – SENGE, GERMANY

Function

To remove the hairs form fabric surface by burning in extremely heated flame

Technical parameters

Flame temperature : 100-110°cFabric
speed : max 90 m/

RAW MATERIALS USED IN DYEING

In the industry the raw materials used for production are:

1. Grey fabrics
2. Dyes
3. Chemicals

Grey Fabrics:

Following types of gray fabrics are dyed:

1. Single jersey
2. Single jersey with Lycra
3. Polo pique
4. Single Lacoste
5. Fleece
6. Interlock
7. Interlock with Lycra
8. Rib
9. Rib with Lycra
10. 1X1 rib
11. 2X2 rib
12. Different types of collar & cuff

Dyes:

The Following dyes are used: 11.Reactive

name of Dyes	Origin	Supplier
Sonazol Yellow - 4GL	Taiwan	Xin Wan
Sonazol Yellow 3RS	Taiwan	Xin Wan
Reactive Orange – 2RH	Taiwan	Xin Wan
Sonazol Yellow EDS	Taiwan	Xin Wan
Sonazol Red3BS	Taiwan	Xin Wan
Sonazol Red-EDS	Taiwan	Xin Wan
Sonazol BlueRSP	Taiwan	Xin Wan
Sonazol Black BHC	Taiwan	Xin Wan
Sonazol Black HCR	Taiwan	Xin Wan
Sonazol Black HFG	Taiwan	Xin Wan
Sonazol Turkquise G	Taiwan	Xin Wan
Remazol Yellow RR	Dyster	N.K Trades
Remazol Blue RR	Dyster	N.K Trades
Dychofix Red 2 BXF	Swizerland	N.K Trades

13. Disperses dyes

Mega Fix Yellow YNA	Bangladesh	Apex Color & Chemical
Mega Fix Red RNA	Bangladesh	Apex Color & Chemical
Mega Fix Navy Blue NNA	Bangladesh	Apex Color & Chemical
Mega Fix Blue F2RL	Bangladesh	Apex Color & Chemical
Mega Fix Turquise Blue HXF	Bangladesh	Apex Color & Chemical
Mega Fix Yellow 6GHXF	Bangladesh	Apex Color & Chemical
Disperses Yellow GG	German	NK Trades
Disperses Navy Blue ECON	German	NK Trades
Disperses Black ESNT	German	NK Trades
Disperses Yellow 8GFF	German	NK Trades

Chemical:

Chemicals Name	Supplier	Price (Tk/Kg)	Mode of Action
Kappasol AF 200	Kapp ache m	371	Antifoam
Kappwet BOS	Kapp ache m	350	Wetting (Detergent)
Kappquest FE	Kapp ache m	147	Sequestering
Kappazone H53	Kapp ache m	142	Peroxide stabilizer
Kappasoft BD	Kapp aache m	283	Cationic Softener
Kappasoft SM	Kapp ache m	284	Silicon Softener

Kappatex R98	Kapp ache m	345	Reducing Agent
Invatex PC	CIBA	139	Peroxide Killer
Silvatol FLN	CIBA	467	Anti Oil
Cibecel DBC	CIBA	176	Leveling gent
Anti per R	Gente c	210	Peroxide Killer
Anti per PRB	Gente c	211	Peroxide Killer
Eriopon OS	CIBA	573	Reducing agent
Invatex AC	CIBA	180	Core neutralizing
Cibafix ECO	CIBA	396	Fixing
Tinofix FRD	CIBA	316	Fixing
Irgasol DAM	CIBA	271	Fixing Remover
Cibatex AB45	CIBA	188	High Temp. pH Stabilizer
Univadine DIF	CIBA	468	DisperseLeveli ngAgent

Romapon 173	Dayst ar	88.53	Anticrease
Uni enzyme 1000	Huna n	290	Enzyme
Acetic Acid	Taiw an	89	Acid
Soda Ash	China	26	Alkali
Glaubar Salt	China	16.28	Electrolyte
Caustic Soda	China	52.34	Alkali
Hydrogen peroxide 50%	India	45.4	Bleaching Agent
Oxalic Acid		75	Acid

PRODUCTION SEQUENCES AND OPERATIONS

Sequence of operation

Lab dip approved

▼

Grey fabric inspection

▼

Batching

▼

Scouring & Bleaching

▼

Enzyme (If required)

▼

Dyeing

▼

Bath Drain

▼

Cold Wash

▼

Neutral With Acetic Acid

▼

Soaping

▼

Fixing (If required)

▼

softening

Dyeing Process for Lab

Neutralizing by

acid wash

▼

Soap wash

▼

Drying

Polyester Dyeing in Lab:

Sample

▼

Neutralizing (by acetic at 50° c)

▼

Cooling

▼

Dispersing agent + Buffer + acetic + Dyestuff

▼

45 min Run at 135° c

▼

Reductionc leaning (Hydrose+ ErioponOS+Caustic) At 80° cfor 45 min

▼

Wash

▼

Chemical Wash

▼

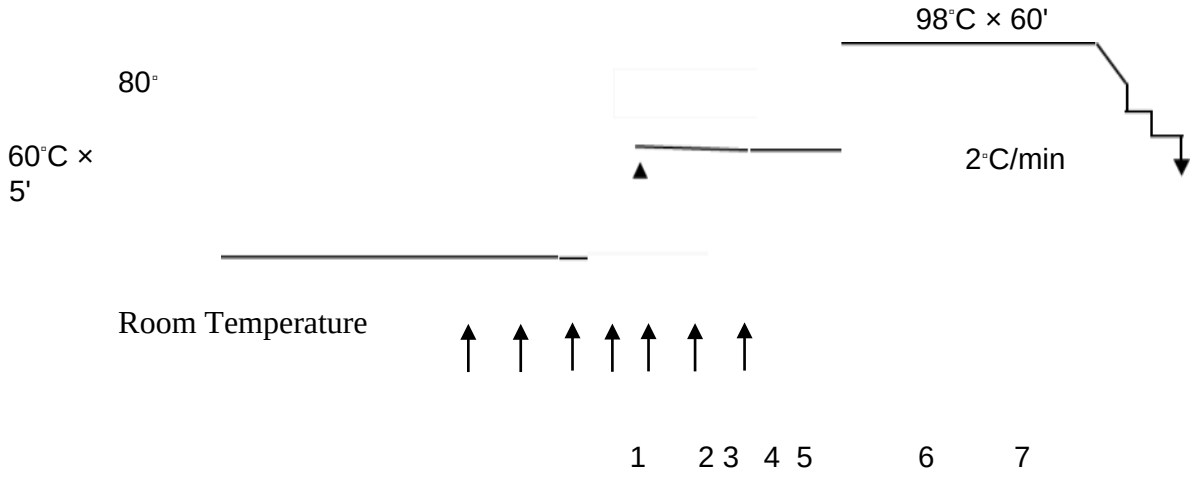
Dry

Dyeing Parameters For Bulk Production:

Process	Temp(˚C)	PH	Time min	M:L ratio
Scouring - Bleaching	98	11.5 -12	60'	1:6 or 1:8
Enzyme WashEnzyme Deactivation	55-70	4.5-5 - -	60' 10 '	1:8
ve Dyeing (Light Shade)	60	10.2 - 10.8		1:8
Reactive Dyeing (Dark Shade)	60	10.9 -12		1:8
White Shade	98	10.5 - 11.5		1:8
Turquoise color dyeing	80-90	10.9 -12		1:8
Polyester dyeing	130	4- 4.5		1:8

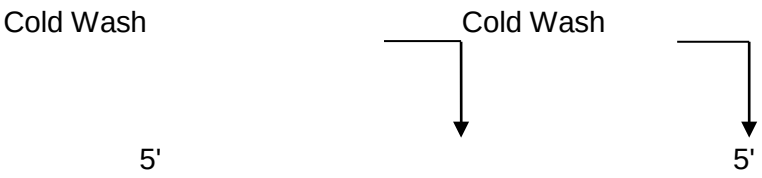
General process for Pre-treatment

Scouring & Bleaching:

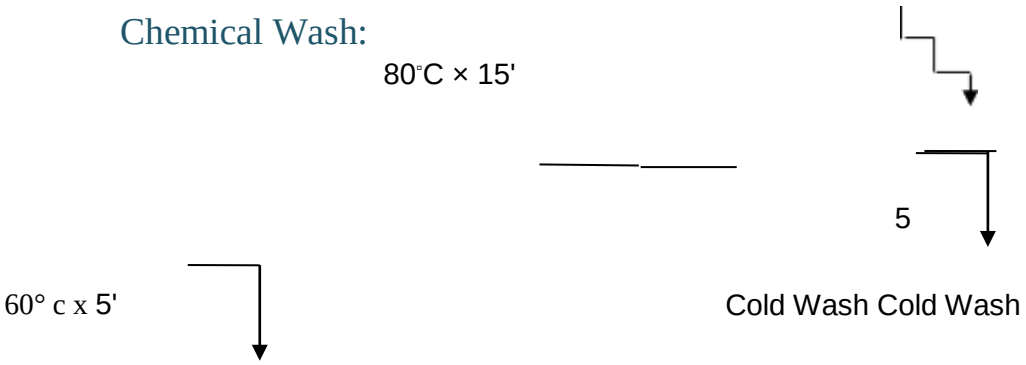


H_2O_2

1) Ant creasing
2) Wetting Agent
3) Sequestering Agent
4) Antifoam
5) Stabilizer
6) Soda
7) Caustic



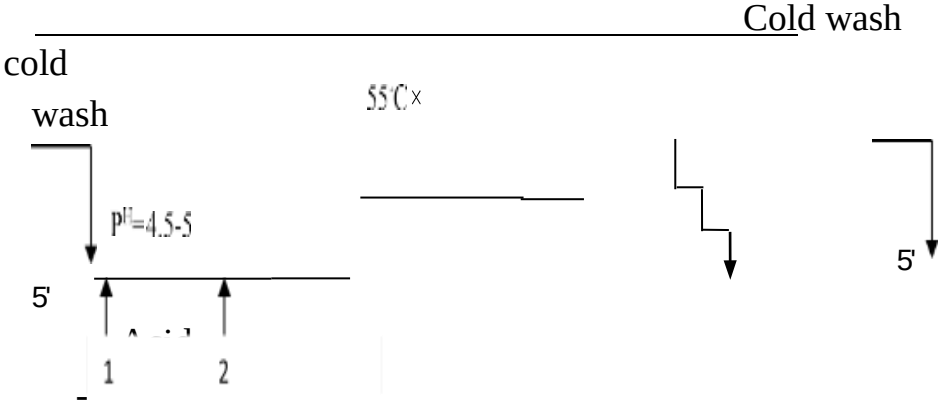
Chemical Wash:



1) Oxalic Acid
2) Peroxide Killer

Bio Polishing/Enzyme Wash:

70° c x 10'



1 Acetic) 2 Bio Polish)

General process for Dyeing

- Auxiliaries are added at 50° C

Salt added by dosing system (time : 10-20')

- pH maintained at6.5-7

-Color dosing at 6O° C for 20'

Exhaustion & Fixation:

-After 30' soda ash added by dosing for 30-35'

-pH checked & maintained at 10.5

-Dye bath is kept at 60° C for 40-60'

-After every 10' the sample is checked fixation occurs during this time.

-Rinse for 10' & the bath is drained.

Neutralization:

-The material should be neutralized to remove alkaline condition at room temperature by acid wash for 15 min & rinsing will be carried on for 10 min.

Soaping:

-Then soaping agent is added & temperature raised to 90°-100°C for 10 min.

-The bath is cooled 7 rinsed for 10 min.

-Dye bath temperature then cooled to 60° C.

Softening:

Softener is applied to soften the fabric as well as it improves the hand feel. The material is treated at 60°C for 20 mins. Then rinsing again & material unload.

Procedure:

At first the bath is set at 50° C & take the right volume of water in the dye bath.

▼

Required amount of wetting agent is added.

▼

Caustic soda is added & second heat command 60°C & stabilizer is added also.

▼

H_20_2 is dosed & 10' runs.

▼

Temperature raised to 100° C & run the material for 30'

▼

Coolingthebathat75°C&bathisdrained.At 90° C the material is run for 15 mins

▼

Cooling the bath to 75°C to Darin

▼

Add Acetic Acid to neutralize the whole bath of fabric & run time is 20'

▼

Rinse the fabric for 5' & bath is drained.

▼

New water from reserver is taken & pH should be 4.5-5 .

▼

Enzyme is injected to the bath. Run time is 60' at 55°C

▼

Temp. Raised to 70° C & run time 10' & then drain

▼

Againnewwateristaken&dosingofglaubarsaltfor20'&pHshouldbecheck (pH =7)

▼

Color dosing for 30' at 50°C

▼

Soda is added by dosing for 40'at 50°C

▼

& run the fabric for 35-60'.At this time after every 10' the sample is checked.

▼

Rinse the material for 10' & bath is drained.

▼

At room temp. acid treatment is done for 20'& rinse the material for 5'

▼

Soaping is done at 90°C for 10 min & bath is drained.

▼

Fixing agent is added at 50° C & run time is 20' & bath is drained

▼

Softening is done at 60° C for 20'& bath is drained.

▼

Finally the fabric is unloaded.

Process for White Shade:

At first Scouring bleaching chemicals are added to the bath & they are treated at 98°C for 60'

▼

Temp. Lowered at 80°C & OBA is added. Run time is 10'.

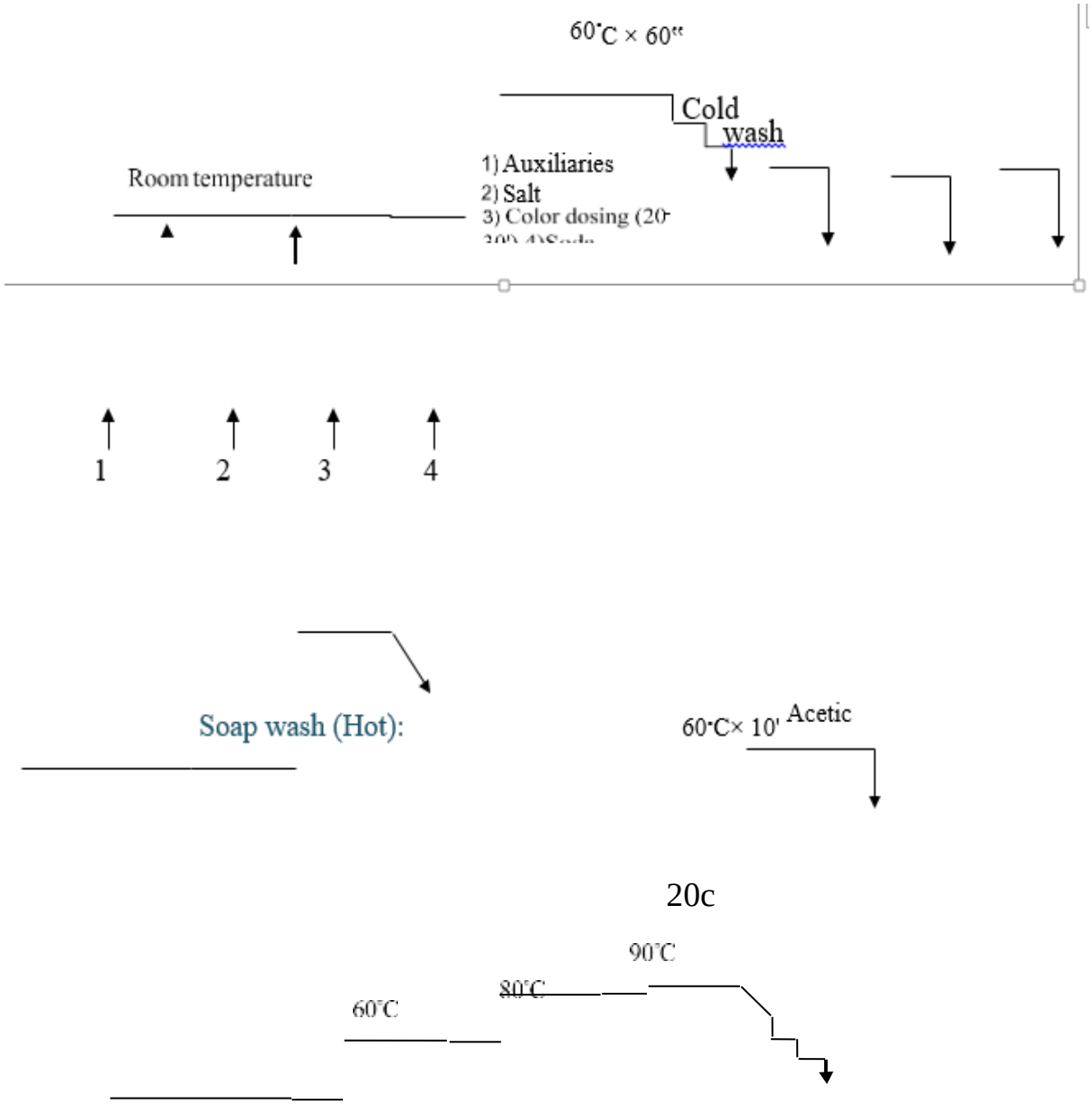
▼

Temp. Raised to 98° C & Run time is 20'.

▼

Then enzyme treatment is applied & then softening occurs

Dyeing Curve:



Soaping chemical

Fixing (if dark shade):

20′

50˚C×20′

Fixing agent Softener

Softening:

40˚C × 20′

Softener &

Some Dyeing Recipe used in Bulk dyeing process:

Knit Dyeing Recipe#1

Color	:	10-100-White
M: L	:	1:8
Material Type	:	100% Cotton

Auxiliaries/Chemicals		
Scouring&Bleaching		
Kappasol AF -2000 (Antifoam)		
Polymer ECO (Ant creasing)		
Tino Wine (MultiFunctional)		
Caustic		

	H_2O_2 (50%)		-
	PHYSICAL BLEACHING		
	Bluton BVB (OBA)		0.23
	NEUTRALIZATION		
	Oxalic Acid		-
	Denquest HYN (Sequestering)		-
	ENZYMATIC CLEANING		
	Acetic Acid		-
	Unizyme 1000L (Enzyme)		-
	FINISHING		
	Softener E-31		10
	Denquest HYN (Sequestering)		-

Knit Dyeing Recipe #2

Color : Navy

M: L : 1:8

Material Type: 100% Cotton

Auxiliaries/Chemicals		
SCOURING & BLEACHING		
Kappasol AF -2000 (Antifoam)		
Kappawet BOSS (Detergent)		
Polymer ECO (Ant creasing)		
Denquest HYN (Sequestering)		
Fistol AWP (Stabilizer)		
Caustic		
Soda		
H_2O_2 (50%)		
NEUTRALIZATION		
Oxalic Acid		

ENZYMATIC CLEANING & PEROXIDE REMOVAL		
Antiper R (Peroxide Killer)		
Acetic Acid		
Enzyme 1000L (Enzyme)		
DYEING BATH		
Kappasol AF -2000 (Antifoam)		
Biavin – 109 (Ant creasing)		
Albatex – DBC (Levelling)		
Remazol Ultra Yellow RGB		
Remazol Ultra Red RGB		
Remazol Navy RGB		
Glauber Salt		
Soda		
NEUTRALIZATION		
Acetic Acid		
SOAPING		
Kappaquest A41 (Soaping)		
AFTER TREATMENT		
Softener SA -1000		
Invatex –AC (Core Neutralizer)		

Knit Dyeing Recipe#4

Color	:	902-Noir (43517) Black
M: L	:	1:8
Material Type	:	100% Cotton

Machine wash

Recipe:

-First of all these two chemical caretaker & treated in normal temperature for30min.

So daash	=	0.5 g/L
Bleachingpowder	=	0.5 g/LThen Direct drain is done.

for white - - -

First of all these two chemicals are taken & treated in normal temperature for 30 min.

Soda ash	=	0.5 g/L

Bleaching powder = 0.5 g/L Then direct drain is done.

-After that these two chemicals are taken & treated with fabric at 98°C for 60 min.

Hydrose	=	1-2 g/L
Caustic Soda	=	1-2 g/L

Add hydrose (6 g/L) & caustic Soda (6 g/L)

▼

Run 20' at 110° C

▼

Run 10' at95° C

▼

Run 10' at80° C

▼

Run 10' at60° C

▼

Run 10' at40° C

▼

Drain

PH Check in different point in dyeing processes:

Name	Range
Bio-Polish	4.5-5.0
Leveling	5.5-6.0
Salt	6.0-6.5
Soda	10.5-11.5
Dye Bath	10.5-11.5
Soaping	6.-6.5
Softener	4.5-5.0
Fixing	5.0-5.5

Quality Testing, Control & Assurance System

The quality assurance department is assigned to maintain consistently uniform quality of the material in process & various stages of its manufacturing.

Objects of quality control

1. Research
2. Selection of raw material
3. Process control
4. Product Testing
5. Specification Test

Quality Assurance Procedure:

Knit Concern Ltd. assures the quality of their products in the following three steps:

In laboratory.
In dyeing section
In finishing section

The quality assurance procedures are described below:

In Laboratory:

Swatch card from buyer according to their requirement is received.
Recipe prediction for sample dyeing using CCMS.
Sample dyeinguntil matching withthe swatchcard. Acceptable color difference is less than 1.
2. If matching is OK, then it is sent to the buyer for approval

In Dyeing section:

After approval from the buyer, sample dyeing is done in dyeing m/c, in dyeing shed & again matched with the approved sample.
If result is OK, then balk production is commenced.
During dyeing process, before he final acid wash, samples are taken and checked for accurate shade matching.
After dyeing sample is collected & matching is done.
Rubbing and wash fastness tests are carried out

In finishing section:

Correctly dyed, after treated & matched fabrics are allowed for finishing.
By using a series of finishing machines correct width, softness
& appearance are maintained according to requirements.
Then sampling is done several times to test GSM, Shrinkage & fastness properties. ✓ Finally fabric is inspected& prepared for delivery

In SYL following flow diagram is followed-

Yarn Processing ▼

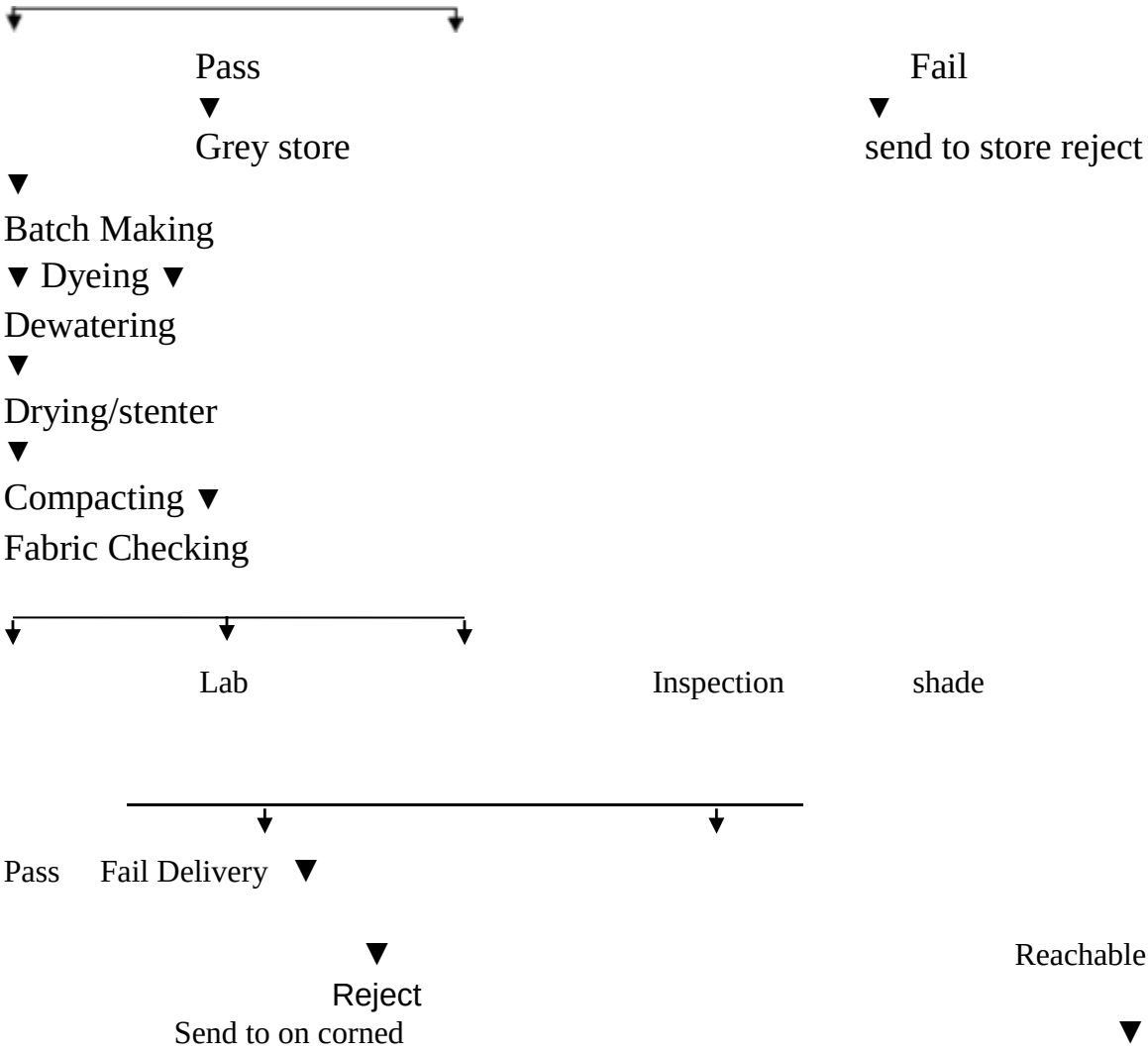
Yarn Test ▼ Pass ⟵

▼ Fail

Knitting ▼

▼ send to spinning mill

Grey fabric inspection



Physical test of fabric:

Fabric weight

-Dimensional Changes in lengthwise

-Dimensional Changes in widthwise

-Seam Slippage

-Spirality test

-Pilling Resistance

-Softness test

-Hairiness test

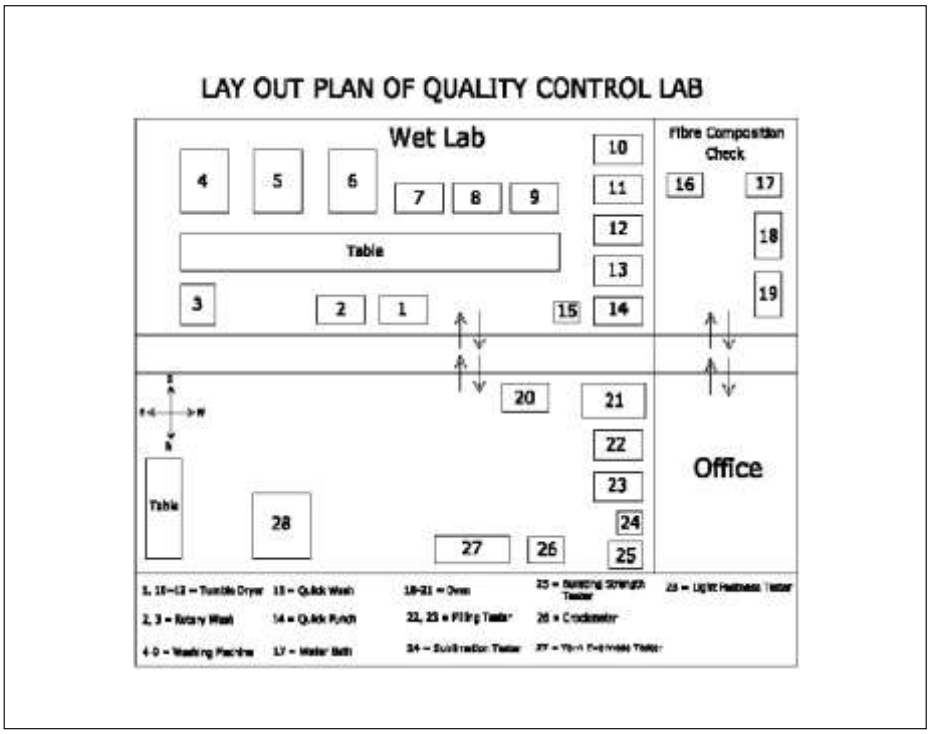
Chemical test of fabric:

- Fastness to rubbing
- Fastness to washing
- Fastness to perspiration

Besides these, for the best qualified production these Chemical Test should be performed-

-Fastness to light
-Fastness to heat
-Fastness to sea water
-Fastness to chlorinated water
-Fastness to actual laundering

Lay out plan of QC Lab:



Problems Encountered in Dyeing Uneven Dyeing

1. It can because due to rapid addition of dyes and chemicals. For this
2. purpose the dosing of soda ash should be maintained properly.
3. Pressure difference.
4. Over loading in the m/c.
5. Yarn lot mixing.
6. Improper control of temperature.
7. Less amount of leveling agent.
8. Improper pretreatment

Rope to Rope Uneven Shade

Improper rope length in each chamber. Improper fabric flow speed in each nozzle.

Off Shade

Improper M: Lratio.
Lower amount ofauxiliaries.
Improper mixing ofdyestuffs.

Dye Spots

Thisismost common fault caused by operator not correctly mixing and thoroughly dissolving dyestuffs in the right amount ofwater

Batch to Batch Shade Variation

If any of parameters of dyeing are changed then it will produce problems in batch to batch consistency. In order to avoid this defect the followingsteps should be followed- 1. Maintain the same liquor ratio.

2. Check that the fabric has the same dye affinity.
3. Use the same standard program procedures for each batch.
4. Make sure that the operators add the right batch of chemicals at the same time & temperature in theprocess.
5. Check the water supplydailyespecially $p^{h.}$, hardness & Na_2CO_3 content.

Crease Mark

Crease marks are produced due to the lower concentration of anti-creasing agent and improper coolingrate (defective coolinggradient). Thisisencounteredbyincreasingthe concentration of anti- creasing agent and proper adjustment of cooling rate.

Running Marks

Running marks are frequently related to the material construction and are caused by poor opening of the fabric rope.

1. Reducing the machine load and running at as light ly higher nozzle pressure, orusingthe next largest available nozzle size, may also help.
2. Either presetting or pre relaxation of the fabric before dyeing can avoid this problem.
3. Running and crack marks can also be are sulto fin correct process procedures. A higher fabric speed, combine with slower rate so frinse and cooling will of ten correct the problem.
4. Care should be taken to check that bath draining temperatures are not very high especially viscose blends are involved.
5. Shock cooling of static material will also cause crack marks.

Intensive Foaming

In case of intensive foaming, which is caused when, the pumps tryto pump a mixture of air and water. This reset sin the loss of nozzle pressure & floating of flake. If the foaming is severe it is better to drop the bath & restart the process, after adding an antifoaming agent to the new bath.

Patchy Dyeing

It is caused, if dye solution is not correct and also scouring is improper.

Miscellaneous Problems

Batchtobatchprocessingmayvaryduetotheimpropercalculationofdyesandchemicals andimproperstrengthofsaltsodaandH_2O_2 etc.Besidehardnessofwaterandcausticmay lead toan improper shade.

Finished fabric Inspection:

The final product should pass against the norms given by the buyer. The following tests are done- -Shade check
-Gem test
-Width or diameter test
-Shrinkage test
-Crocking test
-Pilling resistance test
-Colorfastness to test
-Color fastness to perspiration
-Dimensional stability
For final inspection, Inspection table & Inspection m/c is used . The 4-point

system is given below-

Size of Defect	Penalty point
Less than 3 inches	1
3-6 inches	2
More than 6- 9 inch	3
More than 9 inch	4

Size of holes & openings-

1 inch or less	2
More than 1 inch	4

Some general rules of the inspection are-

1. Not 1 meter of cloth is penalized more than 4 points.
2. Cloth is inspected on face side only unless specified.

If the total defect parts per 100 yards of fabric are 40 or more the fabric will be
rejected. But it may be changed according to buyer‟s requirements

Shade check:

The shade achieved is to be checked several times while in process & at finished state to ensure the customers demand under recommended light source .Generally the shade is checked at the following stage

-Afterdyeing
-After drying
-After trial for finishing

During dyeing period in QC there is a shade matching sequence:

Scouredsample
▼
Enzyme sample
▼
Salt Sample
▼
Sodasample (after 10min)
▼
BDsample(60▫C×20min)
▼
Normal hot sample
▼
Acetic acid sample
▼
Chemical hot sample
▼
Softener sample

For this the following equipment‟s are used:

1. Verivide light box

Manufacturer: Cundy building,frog island Origin: England Light Source:
D-65(artificial daylight) TL-84 (Shop light)
F (florescent light)
UV (Ultraviolet Blue light)

Procedure of GSM measurement by GSM cutter:

1. Cut the fabric with the G.S.M cutter.
2. Weight the fabric with the electric balance.
3. The cut sample is 100 sq.cm. The weight of the cut sample is multiplied by100.
4. TheresultistheG.S.Mofthat particularfabric.Suppose , 5. The weight of the fabric is 2.51 gm. That means the G.S.M of the fabric is 251 gm.

Specification of GSM cutter:

Name: G.S.M CUTTER
Manufacturer:JamesH.Heal&Company limited. Origin: England

Width or diameter test:

After finishing the fabric diameter or width is measured by a measuring tape. If the width is more or less compactor is used to set the required width If width is more, then lengthwise tension is increased Andifwidth is less it isincreased byshape.

Shrinkage test:

Theshrinkagepropertiesisoneofthemostimportantpropertiestobecheckedforthe knitted fabric
For this the equipment used:
Name: Electrolux Washcator Manufacturer: JamesH.Heal &Company limited. Origin: England

There is a water label in m/c .Automatically water entered up to this label Then detergent
(10 gm) is added for per garment The useable program for Washcator are

The washing methods:

Based on ISO 6330, 3759, 5077

Rubbing fastness test

Rubbing fastness is tested by crock meter. Name: Electronic
Crock meter Manufacturer: James Heal & Company limited.
Origin: England Test method: ISO105x12.
Dry& Wet rub is including in this method.

Pilling Resistance Test:

Name: ICI Pilling Test
Manufacturer: James Heal& Company Ltd. Origin: England Test method: EN ISO
12945-2
Description: For wool / wool Blends / Elastane Blends

7200 revolutions
-1 revolution /sec
For other type of fabric
-14400 revolution
-1revolution/sec

Fastness Testing

✞ Color Fastness to Wash:

"ColorFastness"istheresistanceofthecolortofadeorbleedbywashing,light,waterdry- cleaning
chlorine perspiration & ironing. Test method: ISO 6330,3759,5077.
Equipment Used:
Rota Wash M:L=1:50

Multifilament size=10*4 cm Sample Size=10*4 cm Temp.=50c Time=30 min

Chemical Used: Detergent ECE(4g/1),Na-perborate(1g/1) Shad echange i s measured by color change scale & staining scale.

✞ Color Fastness to perspiration :

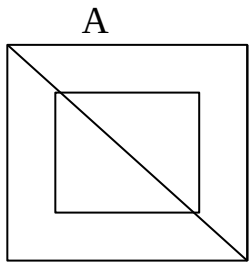
✞

Test Method: ISO- 105E04 Temp = 37 ±2°C
Time: 4 hr.
Dry Temp= 60°C M: L = 1:
50
Wet Time: 30 min Multifilament Size = 10*4 cm
Sample Size = 10*4 cm PH :8-5.5

Chemical Used:		Alkali	Acid
L-histadine mono hydrochloride		0.5	0.5
Sodium Chloride		5	5
Di-sodium Hydrogen		2.5	2.2
pH		8	5.5
Distilled water		1000 ml	1000 ml

Dimensional Stability:

This is checked by spatiality test. Equipment Used:
Quick wash m/c Template Size: -
38 "x 38" - 25"x 25"
Temp.= 50° C
Time = 12 ' (Wash & Dry)



$$\text{Spatiality}(\%) = \frac{2*(AC*BD)}{(AC + BD)} \times 100$$

The standard Spatiality % is 5% after the domestic wash.

REMARK:

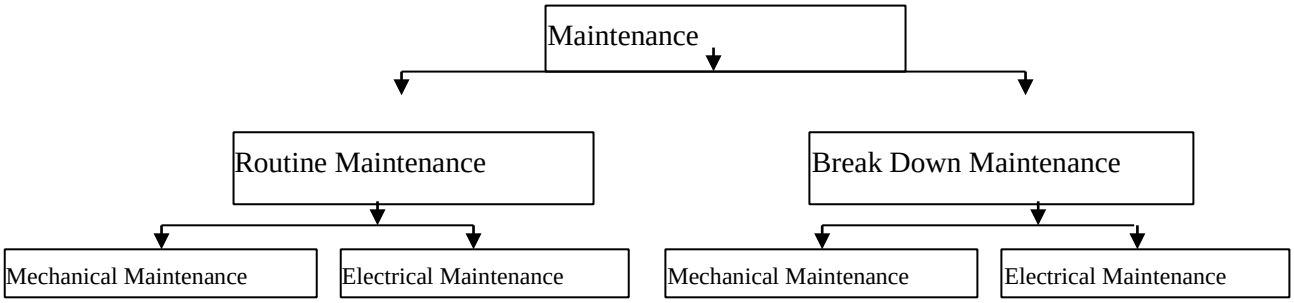
In this modern world the buyer requirement is increasing day by day. And they are conscious about Quality of product more To fulfil this QC department has a lot to do Online. QC also check the following fault- Hole, Fly yarn, Dye stain, Chemical Stain, Uneven shade , Meter to meter Variation, compactor Crease, Patchy dyeing, Yam contamination, Sinker mark, dyeing Crease etc. So QC department is very much important in dyeing section.

Maintenance Section

Maintenance of Machinery:

Maintenance of machinery is very essential mechanical effort for achieving smooth running of different machines. Maintenance is a process by which equipment is looked after in such a way that trouble free services and increased machine life can be ensured and specific product quality required by the customers is sustained. On time maintenance increase m/c lifetime & ensures trouble free services.

2 types of maintenance are done:
1. Break down maintenance Routine maintenance



1. Break down maintenance : Break down maintenance is done instantly when problem
arises in machine. In this case, repairs are made after the equipment is out of order and it cannot perform its normal functions.

2. Routine maintenance: After a particular period of operation, the machines are cleaned & reordered, that is routine or schedule maintenance. The maintenance department does it once in a month. Schedule maintenance varies, time in time & also depends on situation according to types of machines, because maintenance is directly related to production.

Most of the time, all the screws, nuts, bolts & levers are checked, lubrication is also done. Workers inform about the problem areas of the machines. Depending on their information maintenance is done. Maintenance engineer analyze the records and take steps according to requirement.

Routine: Maintenance is a necessary task in any industry. But the degree and interval of maintenance is dependent up on the age of the machineries. Landmark Textile Mills Ltd. has relatively new machineries, which are very modern and state-of-the-art. Due to this reason are latively less amount of maintenance is needed to be carried out in Landmark Textile Mills Ltd. Never-the-less, routine maintenance of the machineries of the dyeing section is carried out once a week.

As the dyeing section remains closed in Friday, the routine maintenance is carried out in Friday. As for break down maintenance (very few break down casesoccur), proper steps are taken to rectify the problem.

Manpower Setup for Maintenance:

Post	Number of Employees
GM Maintance	1
mechanical/Electrical Engineer	5
Mechanical Fitter	1
Electrical Supervisor	3
Asst. Mechanic	10
Electrician	5
Asst. Electrician	10

Maintenance Procedure:
Maintenance: Mechanical
Machine: Dyeing Machines

	Item needed to be checked & Serviced
	Greasing of the winch bearing
	Complete cleaning of machine
	Cleaning of drain valves, replace seals if required
	Checking of air supply filter, regulators, and auto drain seals
	Cleaning of filter elements
	Greasing of unloading roller bearings
	Checking and cleaning (if required) of addition tank level indicator
	Checking the oil level of pump bearing and refill if required
	Checking the function of heat and cool modulating valves
	Checking of all belts and belt tension
	Check circulation, reel and other pumps
	Checking of all door seals

Maintenance: Mechanical Machine: Stentor Machine

	Item needed to be checked & Serviced
	Removal of gas burnt deposits from chains
	Checking of gas burners
	Cleaning of softener application unit
	Checking and cleaning of steam pipe lines
	Checking and cleaning of gas pipe lines
	Grinding of fabric gripping pins
	Cleaning of ventilation duct
	Cleaning of m/c cabinet
	Checking of motors

Maintenance: Mechanical Machine Dewatering Machine

	Item needed to be checked & Serviced
	Cleaning of softener application unit
	Checking of rotating device of rotating trolley unit
	Checking of pneumatic pressure valves
	Checkingandreplacement(ifnecessary)ofrubberpadsofstretchingunit
	Checking of plaiting device
	Checking of speed regulating unit

Maintenance: Mechanical Machine: Tensionless Dryer

	Item needed to be checked & Serviced
	Checking of gas pipe lines
	Checking of gas burners
	Checking of belt conveyor system
	Checking of plaiting device
	Checking of speed regulating unit
	Cleaning of ventilation duct
	Cleaning of m/c cabinet

Maintenance: Mechanical Machine: Compactor Machine

	Item needed to be checked & Serviced
	Checking of Steam pipe lines
	Checking of pneumatic pressure valves
	Checking of belt conveyor system
	Checking of plaiting device
	Checking of speed regulating unit
	Checking and replacement (if necessary) of compacting shoe
	Cleaning of compacting shoe

Maintenance: Mechanical Machine:

Raising Machine

	Item needed to be checked & Serviced
	Checking of Gearing system and replacement of faulty gears
	Cleaning of fiber deposits from the pile and counter pile rollers
	Grinding of pins of pile and counter pile rollers
	Lubrication of gearing system

Maintenance: Mechanical Machine: Boiler

	Item needed to be checked & Serviced
	Checking of gas pressure and gas supply line
	Dosing of softening chemicals to supply water
	Checking of all steam lines
	Cleaning of burner tank (after six month interval)
	Checking and replacement of valves
	Cleaning of feed water tank
	Checking and replacement of filters
	Cleaning of sight glass

Maintenance: Electrical

	Items needs to be checked & serviced
	Check main panels
	Check panel cooling fan & clean its filter
	Clean main pump inverter & its cooling fan
	Check all circuit breaker ,magnetic conductors & relays
	Check current setting of all circuit breaker & motor over load
	Visual checking of all power & control cables
	Check ail motor‟s terminals

	Check & clean fluff & dirt at all motor fan covers
	Check DC drive of kneel motors
	Check all pressure switches
	Check calibration of main vessel & all addition tank
	Check all signal isolators
	Check setting & operation of lid safely switches
	Check setting of tangle sensors
	Check all pneumaticsolenoids

	Check all indicating lamps
	Check calibration of heating/ cooling modulating valve
	Check all on/off switches

Maintenance Tools and Equipment:

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	Maintenance tools/equipment‟s	Functions
	Adjustable wrench	Used for setting nut & bolts
	Pipe Spanner	For pipe fitting
	Spanner	Fixed Spannerfornut& boltsfitting
	Socket spanner	Handle system fornut & bolt fitting
	Hammer	To apply load where required

	Screw driver	To release any screw
	Punch	Used to fit any worn out shaft
	Lock opener	To open the clip of bearing
	Hack saw	metallic thing
	Outside calipers	To measure outside dia
	Inside calipers	To measure inside dia
	Slide calipers	To measure very small dia
	Vernier scale	To measure very small dia
	Chain ton	To lift

		heavy load
	Welding machine	To join metallicp arts
	Grinding machine	To make the smooth fabrics
	Tester	To test electricci rcuit
	Pliers	To grip anything & cut anything
	Avometer/ Voltmeter	To measure voltage

	Steel tape	To measurel ength, width& height
	Chisel	To cut any metal
	File	To smooth the rough surface

Maintenance Schedule

	Parts Description	Check Time
	All pumps(bearing, coupling)	3 month
	All belts (loose/tight)	monthly
	All bearing(grease/sound)	monthly
	All gear box(oil/sound)	monthly
	All valves leak	monthly
	eel rubber	monthly
	Mechanical seal	monthly
	Steam trap	monthly
	Handle of lid	monthly

	LID opening stopper	monthly
	LID glass	monthly
	Safety valve(mainkier &heat exchanger)	monthly
	Pressure gauge	weekly / monthly
	Water leveling scale	monthly

Remarks:

The maintenance department of GAB Limited is well equipped. It has sufficient maintenance manpower including mechanical and electrical engineers. They perform maintenance tasks of the machines during the holidays and vacations. Otherwise, they perform breakdown maintenance, which as stated earlier is very rare in GAB Limited. To increase the lifetime of the machineries and ensure the proper running of the machines, the task of this department is very important

UTILITY SECTION

Major Utilities Used In GAB Limited Dyeing Are:

1. Water
2. Electricity
3. Steam
4. Compressed Air
5. Effluent treatment plant

WATER

The major concern for any kind of wet process industry is „Water" because it is the quality of water which determines the quality of dyeing. Water quality generally vary in different are also depends on the level or height of water level beneath the ground. In Savar water level is around 130- 140 ft. but Gildan activeware Bangladesh limited (GAB) .dyeing water is lifted from about 600 ft deep by submergible pumps.

There are three pump pun its available here–
1. Knit Dyeing – 3 pumps
2. Yarn Dyeing – 2 pumps
3. Printing – 2pumps

Quality of Water found in the raw water here– total Hardness – 250-300 ppm pH – 8-9 TDS – 2000-3000 ppm

Quality of water required for Dyeing:

	Hardness	Iron content	pH
Knit dyeing -	0.02 ppm		
Yarn dyeing-	0.02 ppm		

Water Treatment Plant:

Three Water Treatment Plants in GAB Limited

Sa Knit dyeing –2 Capacity 50000lit/hr

ahaba Yarndyei ng– Capacity 150000 lit/hr

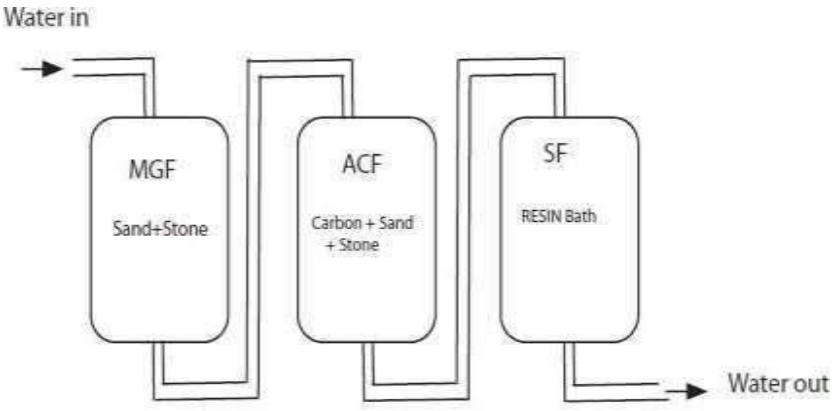
In plant 1&2
Raw water tank capacity-288222 & 660000 lit Treated water reserved tank capacity 960000 lit

Plant Description:

Demineralization by Resin treatment

Three vessels system –

Vessel– 1 – Multi-Grade Filter(MGF)– For Iron Removal Vessel– 2– Activated
Carbon Filter(ACF)– For TDS removal Vessel–3–Softener Filter(SF-Resin)–For Hardness removal



Water Demineralization Treatment Plant

Water distribution system:

By booster pump treated water is supplied to the dyeing m/c pipe line, where, 4 kg pressure is always kept constant by automatic controlling of booster pumps. Total3setsof boosterpumpseachcontain6pumps. Water is drawn by them/c by centrifugal pumps

STEAM BOILER

Steam:

Steam is an important utility for dyeing section. Steam produced by the boiler Supply water is simply treated in the boiler section by the two softener tank Then water reserves to the feed water tank & this feed water tank warms the water Then water passes to the boiler which produces steam & that steam supplies to the factory.

Main parts of the boiler:

Gas Chamber
-Blower
-Gauge glass
-Safety valve
-Burner

No of boiler	:	03
Type of boiler	:	Horizontal, Fire tube boiler

Brand : LOOSE INTERNATIONAL(Germany)

Capacity : 10 ton/hr

Fuel : Natural gas, Diesel. Steam Consumption 2300 kg/hr. for 1200- 1500 products. Steam pressure 7-8 bar.

Water pressure : 3-4 bar

Steam temp : 180°-190°C

Boiler Temp : 300°C

Chemical Used

For an ticipant,Tandex SD15 Tandex BWS Tandex BWT For Wash, Sulphuric acid+Para sulphates+Caustic+Nelbross+Nalco FeedwaterQuality : pH – 7-8

TDS – 430-530

Hardness-<2ppm

Power Consumption : 40

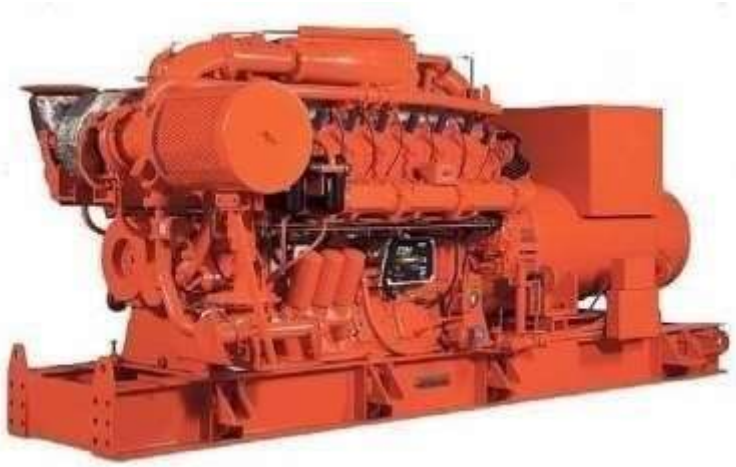
ELECTRICITY/GENERATOR

Total Generator: 4

Types : Diesel Generator – CAT (USA) – capacity– 1710 KW

Gas Generator – WAVKESHA – Capacity – 1100 KW (2) & 900 KW

Gas Generator used in SYL



Total Requirement – 2-2.5 MW/day (3500-4000 kAmp current) Total Output of Three Gas generators – 2100-2500 kw

Pressure required for Gas generators – 222 kpa for 1100 kw & 145 kpa for 900 kw.

Line Pressure – 13 to max 145 kpa

Compressed Air/Compressor

Natural gas is drawn by pipe through the filter above the compressor & the air is compressed. In such a case the air becomes slightly hot. Hence cold water is drawn to reduce the temperature of compressed air. Thus the cold water becomes slightly hot & goes through outlet pipe to the overAcademic Supervisor& Lecturer reservoir. Then the water falls slowly through a compressed air along with some vapors are transferred to the reservoir where the vapors are condensed & outlets drop by drop.The moist compressed air is transferred to the dryer&

Compressor

Brand: BOGGE (Germany) CECATTO (ITALY)

No of m/c : 04

Capacity: 27,0001/hr, 1800 1/hr. Unloading pressure :7.2 bar Loading pressure : 5.6 bar Chemical Used: Grease, Oil AMERIL

Tank/Unit	Function
1. Screen Brush	Big particle & materials remover.
2. Lifting Pump Unit	Automatic flow lifter with level sensored Pumps.
3. Storage & Homogenizing Tank	mixing by air circulation reduce temperature convert dissolved particles into suspension storing for 24hrs. pH 11-12
4. Neutralization tank	To neutralize the lkalinity by dozing sulphuric acid (98%) pH 7-9
5. Distributor tank	Passes & store then eutralized effluent water.Sludge return
6. Biological & Oxidation Tank	Different types of micro-organisms are cultured. Sustentation of effluents Destroy toxic chemicals Separate organic, inorganic & synthesized particles Dye particle sareeaten by micro- organisms pH 7-8.5
7. Sedimentation feeding tank	Deceleration of existing color particles & feed to sedimentation curve.
8. Sedimentation curve	Three section--separator-clarifiers crapping bridge

9. Sludge return pump slump	Sludge is thickened & residue passed into Distributor tank.
10. Sludge thickener	Sludge condensed & made cake.

Effluent Treatment Plant

- Type Of Plant – Biological
- Approximate Area – 20 Katha
- Set up completed by Italian Technology

Project Description:

Chemical used in different Section:

1. Antifoam - Biological tank
2. Decolorant - Sedimentation feeding tank.
3. Nutrient Salt
   (Urea & TSP - Biological Tank
4. Polyelectrolyte - Sludge Thickener
5. Sulphuric acid - Neutralization tank
6. Na(OCl) - Biological tank

Function of different chemicals:

98%H2S04 -Neutralize the water by controlling pH

-It is auto dispensed in the neutralization tank. Polyelectrolyte -Used for sedimentation/sludgecoagulation

- It is used auto/manually in sludge thickener tank. Declarant -Used for removingcolor.

-It is used auto/manually in sludge thickener tank.

Anti-foaming agent -Used for reducing/controlling foam.

-It is used auto/manually in the oxidation tank.

Sodium hypochlorite -It is used to killing harmful bacteria/insect.

-It is used in the Biological Oxidation tank.

Nutrients -when bacteria become weak it is added to a certain quantity

-It is added in the oxidation tank

Parameter	Govt. Tolerance (ppm)	Outlet (ppm)
BOD	50	23
COD	200	200
TDS	2100	1580
TSS	150	36
ELECT RICON DUCTI VITY	1200	3160
DO	4.5-8	4.6
CHLOR IDE	600	>200
PHOSP HATE	8	2.2
NITRITE	50	0.5
pH	6-9	8.1
Temp.	40-45	35

COST ANALYSIS

Introduction:

Costing for a factory which runs for business purposes. And it is also strictly followed in the GAB Limited. Costing of the products considering the raw materials expenditure, salary and wages of officers and workers, distributions and advertisement expenses etc. All direct and indirect expenses is done in this factory. Itis determined by a troop of accountants with advice and consultancy of executive director.

Costing Of the Product:

The following points are considered for costing any dyed product in GAB Limited

1. Total dyes & chemical cost
2. Total utility cost
3. Salary
4. Payment
5. Transport cost
6. Lunch
7. Entertainment cost
8. Miscellaneous cost
9. Government cash incentive

Price of the Product

Generally price of product is determined by the required profit adding to the total expenses. So,

Price of products= (Direct expenses+ Indirect expenses+ Factory Over Academic Supervisor& Lecturer) + Required profit

Price Range of Different Products:

T-Shirt = $0.75 - $4.50 /Pcs Polo Shirt =$2.00 - $6.50 /Pcs Kids Wear ==$0.75- $2.15 /Pcs

Costing of the Product:

Let price of yarn is $ 3.00/ kg.

Process loss of yarn or knitting (10%)= $0.30 Knitting fabric cost = $3.30 Cost of dyes & chemicals = $2.50 Process loss for dyeing (12%)=$0.30 Dyed fabric cost = $ 6.10 Packing cost = $0.05

Production cost of fabric=$6. Fabric price (with25% margin)=$ Fabric consumption/ doz. =

(Body length + Sleeve length) x Chest length x 2 x GSM x12 /10000000

Serial no.	Types of fabric	Charge/kg(Tk)

01	Plain Single jersey	8-12
02	Plain Single jersey with lycra	25
03	1×1 Rib	12
04	6×3 Rib	20-22
05	Interlock	14-16
06	Polo pique	16
07	Single lacoste	16
08	Plain Single jersey yarn dyed feeder stripe	50
09	Plain Single jersey yarn dyed engineering stripe	90
10	Pointed rib	50-60
11	Waffle	30
12	Fleece	18
13	French terry	22-25
14	Interlock engineering stripe	160
15	Plain Single jersey yarndyed engineering stripe with lycra	200
16	Flat back rib	35
17	Engineering stripe flat back rib	180
18	Reversible fabric	50-60

Garments specification:

Serial no	Types of collar & cuff	Charge/set (Tk.)
01	Plain collar & cuff set(1 collar, 2 cuff)	3.50
02	Yarn dyed plain collar & cuff set(1collar, 2 cuff)	5
03	Edge 3 tipping collar & cuff	7
04	V-neck	.85

Body length=78 cm Sleeve length=33 cm Chest length=62 cm GSM=210
Fabric consumption/ doz. = {(78+33) x62x2x210x12}/ 10000000
= 3.469 kg
Fabric consumption/doze (with 10% wastage)= 3.816kg Bodyfabric cost / doz.=$(7.79x 3.816)
= $29.73

Cost of collar& cuff/doze = $ 4.00 Cost of Trims=$ 2.25
Cost of Trims (with 5% Process loss) = $2.36 Production Cost of Garments/ doze=$36.09 Garments Price/doz (with 25% Profit) =$45.12

Knitting charge of different types of fabric

YARN PRICE:

Cotton	
Count (Ne)	Price/kg ($)
16/1	3.25
18/1	3.25
20/1	3.50
24/1	3.60
26/1	3.65
30/1	3.75
34/1	3.80
40/1	4.10
50/1	4.35
Organic cotton	
24/1	3.65
30/1	3.80
34/1	3.95
40/1	4.18
Elastane	
20 Denier Lycra	11.00

Remarks:

Costing is very important for a productive factory. Without proper costing all production curriculums will go to vain. Because a factory cannot reach to its goal without achieving good profit

MARKETING ACTIVITIES

MARKETING

Marketing plays a vital role in the field of displaying/showing the good criteria of the products to the buyer & to communicate with the buyer .there about 30 people in the marketing section of the industry.

Marketing Strategy:

Marketing strategy is a very important factors to sale the products to the buyers If the marketing strategy Is not so developed it will be very hard to reach the goal In case of garments marketing the dealings with the buyer is a very important factor.

Mainly senior marketing officers, merchandisers & higher officials deal with the buyer there are some fixed buyers of the industry. The buyers give their orders continuously all over the year. The Marketing officers & by both side understanding the rate & the order quantity are fixed.

Duties & Responsibilities Of Marketing Officer:

Dealing with the buyer & convince the buyer is the main duty of the marketing officer. A marketing officer has some also other duties The main duties & responsibilities of a marketing officer are given below:

- To prepare cost sheet by dealing with buyer.
- To take different steps by discussing with the high officials & merchandisers.

- To maintain a regular & good relationship between commercial officers & Merchandisers.
- To maintain a regular communication with the buyers & buying houses.
- Communicate with the new buyers.
- Display the better criteria of the products.

Actually the responsibilities & duties of marketing officer begins from getting order of buyer& ends after receiving goods by the buyer So he should be always smart energetic & sincere.

IMPORTING COUNTRIES:

GAB Limited .Is a100%exportorientedindustry. All the goods produce in this industry are exported to various country.

- Europe Countries like UK France Germany etc
- U.S.A.
- Japan

Product Label:

Product label differs from fabric to fabric. The product labels are prepared according to the quality & the buyer requirements.

Local Market:

GAB Limited is a100% export oriented industry. All the goods produced in this industry are exported into various foreign countries. So, goods are not supplied into local market.

Marketing Strategy:

Marketing strategy is a very important factors to sale the products to the buyer. If the marketing strategy is not so developed, it will be very hard to reach the

goal. In case of garments marketing the dealings with the buyer is a very important factor.

In GAB limited. mainly senior marketing officers, m & higher officials deal with the buyer. There are some fixed buyers of the industry. The buyers give their orders continuously all over the year .The marketing officers communicate with the buying houses to collect the orders. By both side understanding the rate & the order quantity are fixed.

BRAND:

GAB limited yarn is 100% export oriented industry. All the goods produced in this industry are exported into various foreign countries. Name of the main buyers of this mill are given below:

REMARKS:

SYL has well-earned marketing team. They always communicate with the brand SYL has some fixed brand The marketing section also looks for the quality & quantity of brand.

CONCLUSION

We have completed our industrial attachment successfully by the grace of Almighty Allah. Industrial attachment will give us our expected destiny of practical life .By the completion of two months of Industrial attachment at Gildan Active ware Bangladesh Limited, we have got the impression that the factory is one of the most modern export Oriented knit composite in Bangladesh. Though it was establish he don lya few years ago ,it has earned " very good reputations "for its best performance over many other export oriented textile mills .

Mill is settled with utility to give all convenient supports to the productions for twenty- four hours GAB Limited. has its own water pre-treatment plant & 26,300 cubic feet water reservoirs in its Savar PDP .The Savar premises has its own power generation plant where 1,900 kw power generators guarantee smooth & uninterrupted power supply to its every operation.
However there are some points to be mentioned:

During the transportation of the fabric on the dyeing floor & also during the loading of the machine, fabrics are soiled by the contact with floor. This makes the fabric/part of the fabric dirty. It may require more scouring/bleaching agent or may create stain making it faulty.

- The- dyeing floor is watery most of the time. It should be kept clean all the time.
- Many time the dosing pipelines are clogged due to the care less dosing of the chemicals. The supervisors should supervise the floor more sincerely.
- The machine stoppage time should be analyzed & minimized. The maintenance should be carried out when the machine is out of action (wherever possible).

OUR APOLOGY :

- The management of SYL were very helpful & our respective seniors gave us time whenever they got.
- Due to secrecy act, all the data on costing & marketing activities has not been supplied & hence this report excludes these chapters.
- Some of the points in different chapter are not described as these were not available.
- The whole process is not possible to bind in such a small frame as this report, hence our effort spent on summarizing them.

But it must be said that SYL Is a best place to get the practical knowledge about the dyeing as they have a lot of production of all quality