



**Department of Textile Engineering
Faculty of Engineering**

Course Title: Industrial Attachment

Course Code: TE 431

INDUSTRIAL ATTACHMENT

AT

KNIT CONCERN GROUP

WATER WORKS ROAD

GODNAIL, NARAYANGONJ

Supervised By

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Daffodil International University

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Advance in Wet Processing

Fall- 2018

LETTER OF APPROVAL

11 September 2018

To
The Head
Department of Textile Engineering
Daffodil International University
102 Sukrabad, Mirpur Road, Dhaka 1207

Subject: Approval of Industrial Attachment Report of B.Sc in TE Program

Dear Sir,

I am just writing to let you know that, this industrial attachment in “**Knit Concern Group**” has been prepared by students bearing Md. Alomgir Hossain (151-23-4273) and Tuhin Sheikh (151-23-4107) is completed for final evaluation. The whole report is prepared based on proper investigation and information “**Knit Concern Group**” with required belongings. The students were directly involved in their report activities and the report becomes vital to spark off many valuable information for the readers.

Therefore, it will highly be appreciated if you kindly accept this industrial attachment and consider it for final evaluation.

Yours Sincerely,

.....
Tanvir Ahmed Chowdhury
Assistant Professor
Department of TE
Daffodil International University

DECLARATION

We hereby declare that, this report has been done by us under the supervision of **Tanvir Ahmed Chowdhury**, Assistant Professor, Department of Textile Engineering, Faculty of Engineering, Daffodil International University. We also declare that, neither this report nor any part of this report has been submitted elsewhere for award of degree of BACHELOR OF SCIENCE IN TEXTILE ENGINEERING.

.....
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Acknowledgement

First of all we express my gratitude to supreme Allah for blessings, approval, protection, mental power and wisdom in all aspects of my life. The applauses to Allah to complete this project work. During our Industrial Attachment, many individuals have unselfishly contributed their time, support to make this project possible. I would like to extend our sincere gratitude to those who have provided guidance in every step along the way.

We would like to express our sincerest gratitude to my respected teacher Tanvir Ahmed Chowdhury, Assistant Professor, Department of Textile Engineering, Faculty of Engineering, Daffodil International University, for his valuable suggestions, encouragement constructive criticism and for providing all necessary support to complete our Industrial Attachment. We also would like to express our thanks to him for his continuous guidance about the industrial training and advise to prepare a report about the training.

We also would like to express our thanks to Prof. Dr. Engr. Mahbub Ul Haque, Head, Dept. of Textile Engineering & Md. Zulhas Uddin, Dean, and BUTEX for give us good suggestion & support about Industrial training.

In Factory, We would also like to thanks Engr. Khaled Masud Ahammed Khan, GM, KC Yarn Dyeing Unit & Engr. Rakib Khan, Manager, KC Yarn Dyeing Unit. I would like to express my thanks to Mr. A.K.M Mohshin, GM, Knit Dyeing & Finishing Unit and Rassel, AGM, Merchandising Department & Mr. Showroar Hossain, Manager, Washing, KNIT CONCERN GROUP for providing necessary information about the factory.

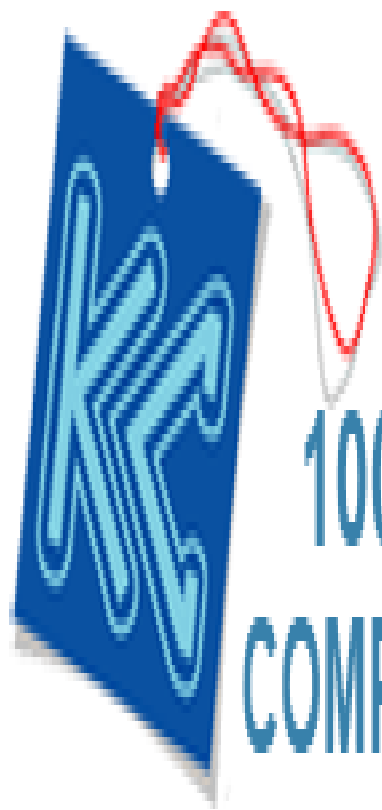
We would like to express our thanks to all Production Officer and Senior Production Officer& all officers of Yarn Dyeing, Knit Dyeing & Finishing and Washing Section, for there valuable technical support during the training period.

Last but not least, thanks go to our precious family for their never ending love and inspire at every stages of our life. Without their continuous support .We realize that We would not be a person We are right now.

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Company profile



**100% EXPORT ORIENTED
COMPOSITE KNITWEAR INDUSTRY**

COMPANY PROFILE

Knit Concern Group is a composite Knitting, Dyeing, Finishing, and Garments factory. It is located at Godnail, Narayanganj, 9-km north side of Dhaka-Chittagong Highway and free from all kinds of pollution, crowd like mid-city. The project was established in 1998. The project is equipped with modern technology machinery and experienced technicians are engaged here to ensure the quality and buyers' satisfaction. They can produce international standard fabric and garments of any quantity and quality. Since its inception, Knit Concern has never stopped growing - in quality, quantity, and everything in between. Over the last couple of years, conceding to its growth requirement, using most contemporary machines and equipment of German, Swiss, USA, Japan, Italy, China and UK origin, it has nearly doubled its capacity.

There are many indicators that may sketch the profile of Knit Concern Group business success but, perhaps, the increase of its export alone, from merely US\$1.03 million in 1992 to about US\$ 60 million in 2010, would show the degree of its exponential growth as a one-stop apparel supplier from Bangladesh.



History of the company

Knit Concern's home base is Narayanganj – a township hosting the largest river port of Bangladesh. Besides, Narayanganj has been one of the largest centers for textiles and garments in this subcontinent ever since the middle age when it was world famous for its ethereal Muslin. This tradition subsequently has ultimately continued to turn Narayanganj into an obvious place for knitwear industry – the country's most vibrant industrial epic today. A busy port, a rich tradition, availability of skilled artisans, and a range of other facilities, amenities and possibilities have made Narayanganj the ideal place for Knit Concern Group.

It launched its very humble journey in 1990 from a rented building at Nayamati. That potential embryo, by virtue of futuristic entrepreneurship, dedication to quality, commitment to excellence, adoption of state-of-the-art technology, and keen focus on customers' satisfaction, could very rapidly metamorphose into a large corporate entity, in its most modern sense, just by 1998.

Since its inception, Knit Concern has never stopped growing – in quality, quantity, and everything in between. Over the last couple of years, conceding to its growth requirement, using most contemporary machines and equipment of German, Swiss, USA, Japan, Italy, China and UK origin, it has nearly doubled its capacity. Highly skilled and dedicated human resource, most contemporary western machinery as well as IT and automation have optimized both of its costing and operational efficiency.

At present, on a single and full-fledged campus at Godnail, Narajanganj, about 12,500 skilled people of Knit Concern are producing about 1,50,000 pieces of very high quality knit garments and 25,000 pieces of lingerie per day. There are many indicators that may sketch the profile of Knit Concern's business success but, perhaps, the increase of its export alone, from merely US\$1.03 million in 1992 to about US\$ 90 million in 2014, would show the degree of its exponential growth.

Vision of the company

The vision of Knit Concern Group is to emerge as a premier manufacturer and exporter of knitwear in the world market.



Mission of the company

The broad mission of Knit Concern Group is to provide its customers the best possible satisfaction and value for their money facilitating them with one-stop knitwear sourcing services



Achievement

At present knit concern 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

This company is also certified by CONTROL UNION.INDIA to manufacture garments using organic cotton yarn under the prestigious coverage of scope CERTIFICATE.

On May 1, 2010, the Ministry of Labor, Government of Bangladesh, has honored Knit Concern with the May Day Award 2010 for the top order ranking as a labor-friendly knit factory in the country.

Besides numerous local and overseas top order business as well as CSR awards and recognitions, many of those - such as the 'Premium Quality Supplier' etc - being offered by its valued buyers and some business and financial publication houses highly noted in the country, the government also has awarded Knit Concern the national trophies several times for performing as the top and the best exporter of knit apparels.

On its way towards success, Knit Concern implemented ISO- 9001:2008 Quality Management System back in 2002.



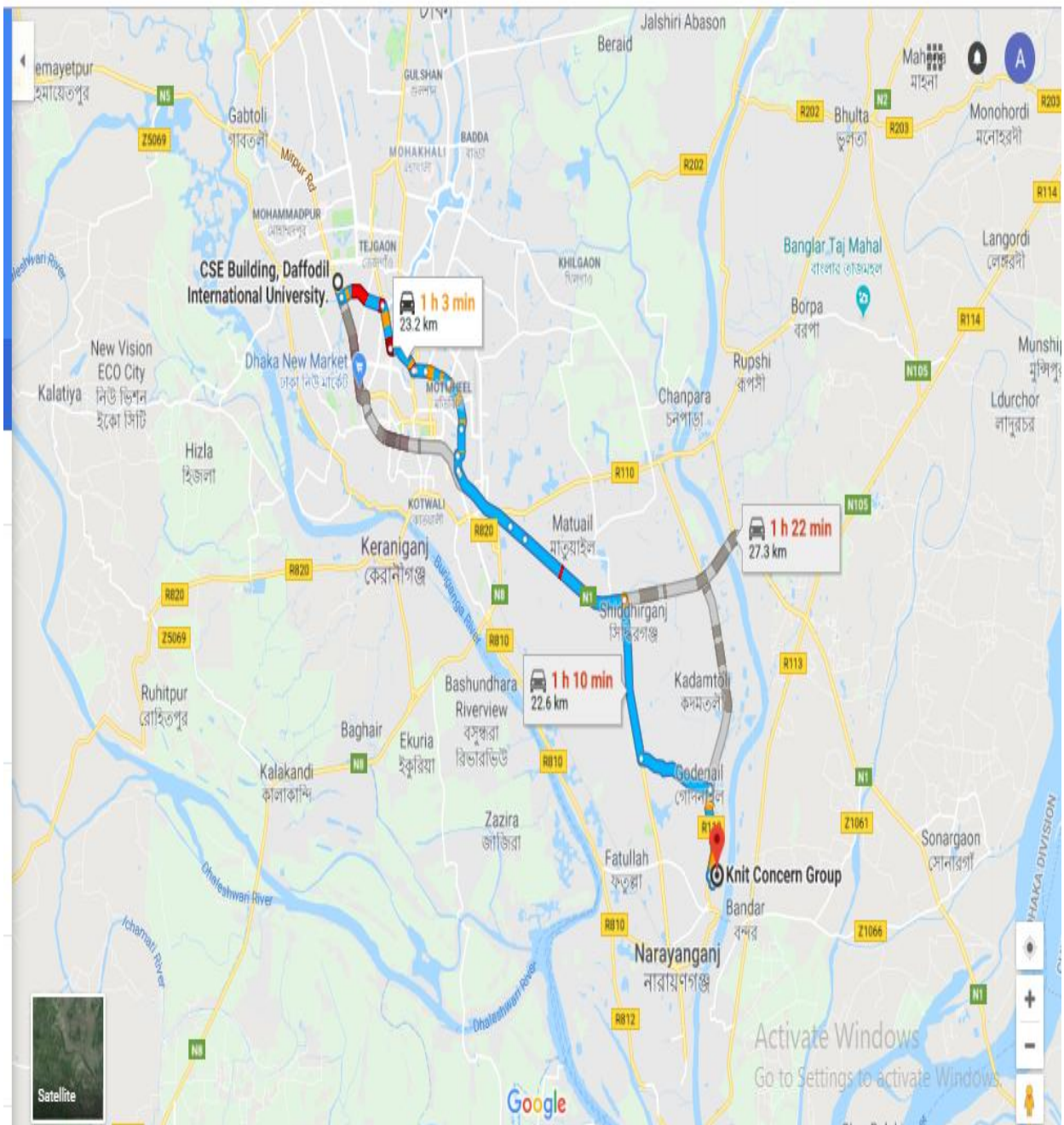


Location of knit concern group



Fig: - White marked area is the area of KCL

Transportation time and distance



Human resources and compliances

Today, over 12,500 people are in the payroll of Knit Concern, whereas the number was only 500 in 1992. Knit Concern offers on campus medical facilities round the clock. Certified medics and nurses attend Knit Concern's people for their necessary medical attentions during working hours. Its medical center is quite capable of attending many emergencies also. To ensure safety commuting, it maintains twelve buses and five microbuses to carry its employees and staff members to and fro.

Knit Concern has a very strong firefighting system. It regularly exercises drills involving all of its workforces to keep them trained so that they can instantly respond to any emergency evacuation situation in a safe manner.

In brief, its work environment encompassing housekeeping, hygiene, safety, security, compensation, benefit, sanitation and Eco-friendly standards etc is maintained in a meticulous way. Recognizing its compliance status, the government has recently awarded Knit Concern as a highly laudable workers' friendly knit factory in the country.



Manpower Management

Section	Total Employee
Knitting	460 +/-
Dyeing	650 +/-
Garments	5000 +/-
Yarn Dyeing	320 +/-
Other	600 +/-

SHIFT CHANGE

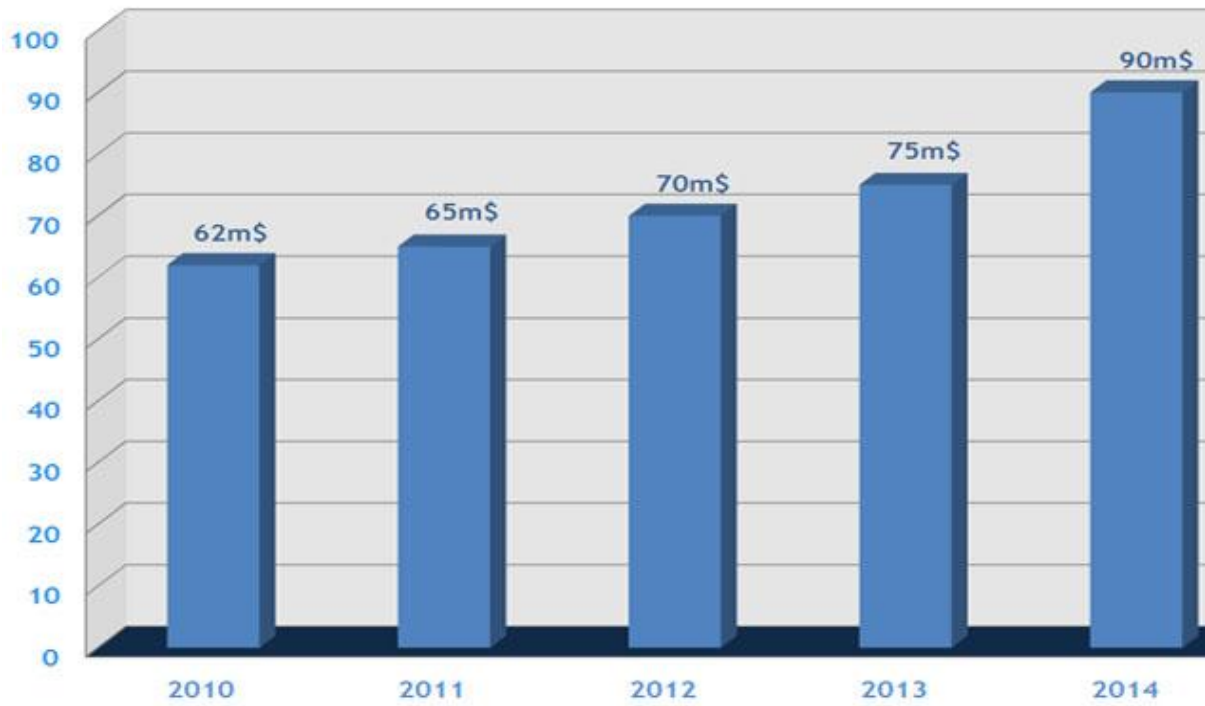
SHIFT	FROM	TO
A	6 AM	2PM
B	2PM	10PM
C	10PM	6AM

CAPACITY

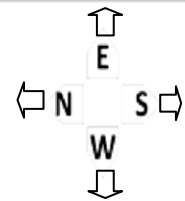
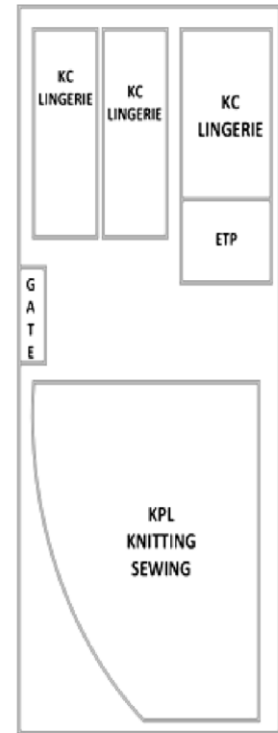
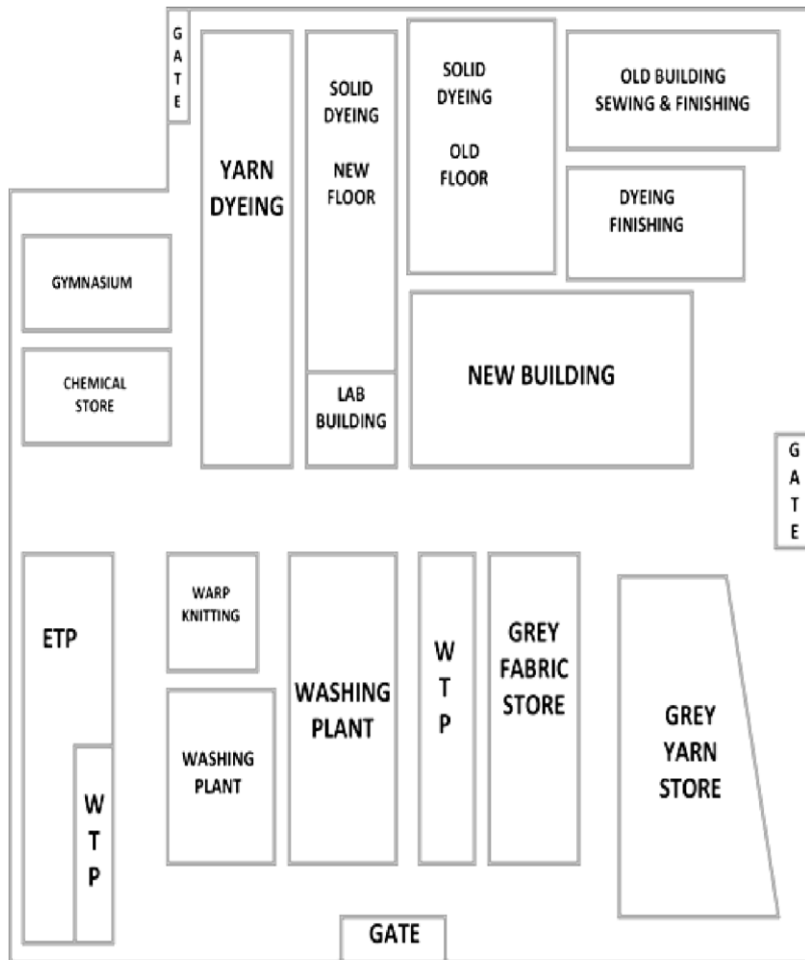
Knitting	30 Tons Per Day
Knit Dyeing	30 Tons Dyed Fabric Per Day
Yarn Dyeing	25 Tons Per Day
Daily Washing	Pigment Dyeing-1,500 Pcs Acid-1,500 Pcs Garments Wash-20,000 Pcs Ready Dye-3,000 Pcs
Garments	T-Shirt-60,000 Pcs Polo Shirt-20,000 Pcs

Export

Annual Turnover: US\$ 90 million (2011)



At a Glance industry Layout

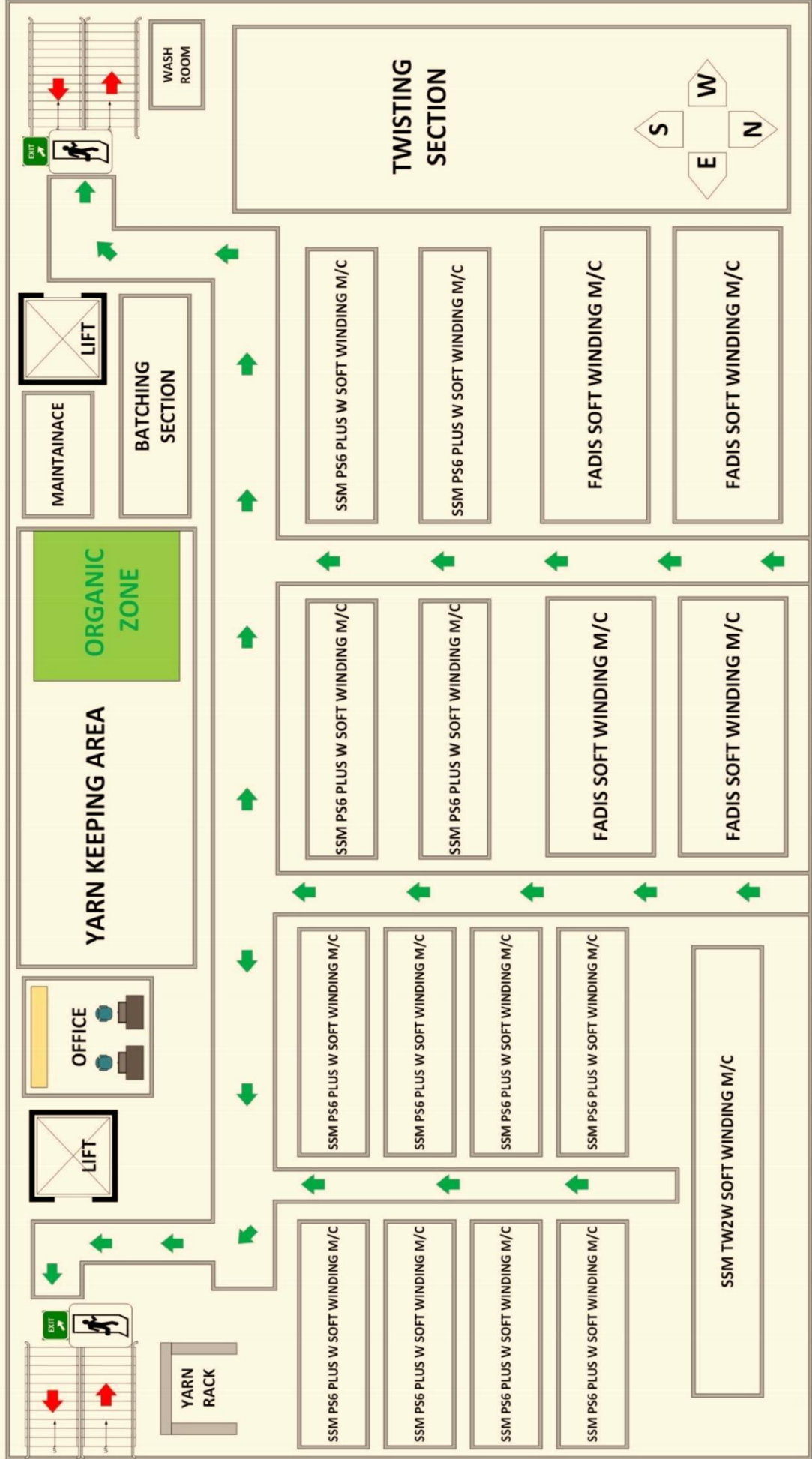


KNIT CONCERN GROUP

Soft winding



SOFT WINDING SECTION



Soft Winding:

Yarn dyeing is the special type of dyeing. Package yarn dyeing is done in package form. For this reason it needs to transfer the yarn from paper cone to steel tube or plastic tube. This function is done in a soft winding section where re-winding is done. Different modern winding machine is used for winding function. Here different parameter is maintained which effect in the dyeing process directly.

Function of soft winding:

- To convert yarn from paper cone to perforated plastic or steel tube
- To maintain package density (0.380 to 0.400) gm/cm³
- To reduce the yarn package density
- To reduce unwanted materials from the yarn package
- To facilitate next process

Machine information of soft winding

The two types of soft winding machine in this industry

1. SSM
2. FADIS Machine

SSM machines are two type

1. SSM-PS6 Plus-W
2. SSM-TW2W2

Number of Spindle

1. Brand Name: SSM-PS6plusw , Switzerland
No. of Machines = 12
Each machine has 60 spindles
No. of spindle = 720
F= 50 Hz
2. Brand Name: SSM TW2w2
No. of machine = 1
No. of Spindle = 78
F = 50 Hz
3. Brand Name: FADIS – SINCRO T-FT P30, Italy
No. of machine = 4
Each machine has 96 spindles
No. of spindle = 384
Total machine spindle (SSM+FADIS) = 1182

Machine specification:

<p>Machine No: 01 Brand Name: SSM-TW2W Type: TW2-W No of Spindle: 78 M/c No: 856.0130/06 M/A No: Year 2007 U: 400V I max : 38A f: 50Hz</p>	<p>Machine No: 02 Brand Name: SSM-PS6W Type: PS6-W No of Spindle: 60 M/c No: 883.0427/06 M/A No: Year 2007 U: 400V I max : 32A f: 50Hz</p>
<p>Machine No: 03 Brand Name: SSM-PS6W Type: PS6-W No of Spindle: 60 M/c No: 883.0428/06 M/A No: Year 2007 U: 400V I max : 32A f: 50Hz</p>	<p>Machine No: 04 Brand Name: SSM-PS6W Type: PS6-W No of Spindle: 60 M/c No: 883.04279/06 M/A No: Year 2007 U: 400V I max : 32A f: 50Hz</p>
<p>Machine No: 05 Brand Name: SSM-PS6W Type: PS6-W No of Spindle: 60M/c No: 8830430/06 M/A No: Year 2007 U: 400V I max : 32A f: 50Hz</p>	<p>Machine No: 06 Brand Name: SSM-PS6W Type: PS6W No: 883.0429/06 No of Spindle: 60 Year: 2007 U : 400V I max : 32A f : 50HZ</p>
<p>Machine No: 07 Brand Name : SSM-PS6-W Type: Ps6-W M/C No: 888.1065/10 No of Spindle: 60 Year: 2011 U : 440V F : 50HZ</p>	<p>Machine No: 08 Brand Name: Fadis Type: Sincro T-FT p300 No of Spindle: 96 No: G0022DX M/A No: Year 2007 U: 400V I max : 16A Power : 12 kw</p>

Machine No: 09 Brand Name: SSM-PS6-W Type: PS6-W No of Spindle: 60 No: 883.0430/06 M/A No: Year 2007 U: 400V I max : 32A f: 50Hz	Machine No: 10 Brand Name: SSM-PS6-W Type: PS6-W No of Spindle: 60 No: 883.1062/10 M/A No: Year 2007 U: 400V I max : 32A f: 50Hz
Machine No: 11 Brand Name: SSM-PS6-W Type: PS6-W No of Spindle: 60 No: 883.1063/10 M/A No: Year 2011 U: 400V I max : 25A f: 50Hz	Machine No: 12 Brand Name: Fadis Type: Sincro T-FT P300 No of Spindle: 96 No: G0023SX M/A No: Year 2007 U: 400V I max : 16A Power : 12 kw
Machine No: 13 Brand Name: SSM-PS6-W Type: PS6-W No of Spindle: 60 No: 883.1059/10 M/A No: Year 2011 U: 400V I max : 25A f: 50Hz	Machine No: 14 Brand Name: SSM-PS6-W Type: PS6-W No of Spindle: 60 No: 883.1061/10 M/A No: Year 2011 U: 400V I max : 25A f: 50Hz
Machine No: 15 Brand Name: SSM-PS6-W Type: PS6-W No of Spindle: 60 No: 883.1064/10 M/A No: Year 2011 U: 400V I max : 25A f: 50Hz	Machine No: 16 Brand Name: Fadis Type: Sincro T-FT P300 No of Spindle: 96 No: G0028 M/A No: Year 2007 U: 400V I max : 16A Power : 13.8 kw
Machine No: 17 Brand Name: Fadis Type: Sincro T-FT P300 No of Spindle: 96 No: G00283 M/A No: Year 2016 U: 400V I max : 16A Power : 13.8 kw	

Parts of the machine and their function:

- I. Cone Holder
- II. Thread guide
- III. Yarn tensioner
- IV. Propeller
- V. Feeder
- VI. Display panel
- VII. Sensor
- VIII. Knot catcher
- IX. Back pressure etc.

Function:

Cone holder: The cone package is mounted on the cone holder

Thread guide: The thread guide is provided to guide the yarn to cheese/cone Package during winding

Yarn tension: It provides sufficient tension to the yarn during winding

Propeller: The yarn traversing movement is facilitated by two counter Rotating blades

Display panel: The display operating the various machine parameters such as Count of yarn, speed, production etc.

Cradle/Rod: It helps to hold the cheese/cone on the winding head, it is Mounted on the upper part of the machine

Knot catcher: It clears the yarn defects during winding

Sensor: When the yarn is breakage then it provides the signal during soft Winding

Difference between SSM and FADIS machine

SSM	FADIS
1. One motor with one spindle	1. One motor with two spindle
2. It has propeller	2. It has traverse guide
3. One type of package can be made	3. Any type package can be made
4. Traversing angle 5.678°	4. Traversing angle 12°
5. Precision winding	5. Non precision winding

Actual and theoretical production:

Actual production = 17 to 19 tons/day

Theoretical production = 22 tons/day

Package density:

The package density are important factors which is to be standardized for uniform and trouble free dyeing .The packages may be soft or hard these should conform to the standards, when the soft liquor flowing through it will find the course of least resistance and cause channeling, which may leave some parts of the package relatively undyed or lighter. If the packages are wound too hard, a point can be reached where the flow of liquor is impeded to such an extent that uneven dyeing may occur. The package density depends upon the type of the machine, automation, type and construction of the yarn to be dyed. Package density with standard range (0.380 -0.400) gm/cm³

Package density formula:

$$\rho = (\text{total package wt.} - \text{Bobbin wt.}) / \pi \{ (\text{Pk dia} / 2)^2 - (\text{Bobbin dia} / 2)^2 \} \times h$$

Faults of soft winding:

1. Lot mixing: Lot mixing is commonly occurred in this section. As a result Shade is varied from one package to another package in dyeing Section and also the same package.
2. Density : This problem is occurred due to wrong setting of tension , over feed Of speed, angle of winding etc.
3. Count mixing : Sometimes various count of yarn package mixed with one Another, as a result shade variation is occurred in dyeing Section
4. Cleaning device : This device is used to collect dust or fly which is with the Yarn.
5. Yarn breakage : This problem occurred due to low strength of yarn and more tension of winding machine
6. Hardness or Softness : This problems occurred due to wrong tension or High feed speed.
7. Wrong program setting: Wrong program setting is great problem. Speed , Angle, tension should be adjusted with the yarn Count.
8. Ribbon formation : This problem is occurred due to wrong set up of cam Switch.
9. Fault shape of package : This problem is occurred due to faulty yarn guide, Tension device, drum guide etc.
10. Ring shaped cone: This occurred due to faulty setting of cone holder.

Remedies of soft winding faults:

- Lot mixing: Numbering should be in every package, Lot should not mix With one another and operator should be careful during Winding.
- Density: Package density should be uniform Package density should Work out for every lot package.
- Count mixing: Various count of yarn Should be separately
- Cleaning device: Clean device should keep clean.
- Yarn breakage: High quality yarn should use and tension should uniform.
- Hardness or softness : Tension should be accurately and uniform of each lot Package.
- Wrong program setting: Program should setting properly.
- Fault shape of package: Tension should accurately of each lot package.



SSM-PS6 PLUS W SOFT WINDING MACHINE



SSM-TW-2W SOFT WINDING MACHINE



FADIS SOFT WINDING MACHINE



Yarn keeping area

Yarn package collect from Store for Count Wise:

- 100% Organic Cotton
- 20/1,
- 24/1, 30/1,
- 34/1,
- 40/1
- 30/1, 34/1,
- CVC 10/1,
- 20/1,
- 24/1,
- 26/1,
- 28/1,
- 30/1,
- 34/1
- 40/1,
- 60/1,
- 60/2
- Cotton 10/1,
- 12/1,
- 30/1,
- 34/1,
- 45/1
- PC 45/1
- TC 10/1,
- 24/1,
- Card 16/1,
- 20/1,
- 22/1,
- 24/1,
- 26/1,
- 26/2,
- 28/1,
- 30/1,
- 32/1,
- 34/1,
- 36/1
- 40/1

Batch section: 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.

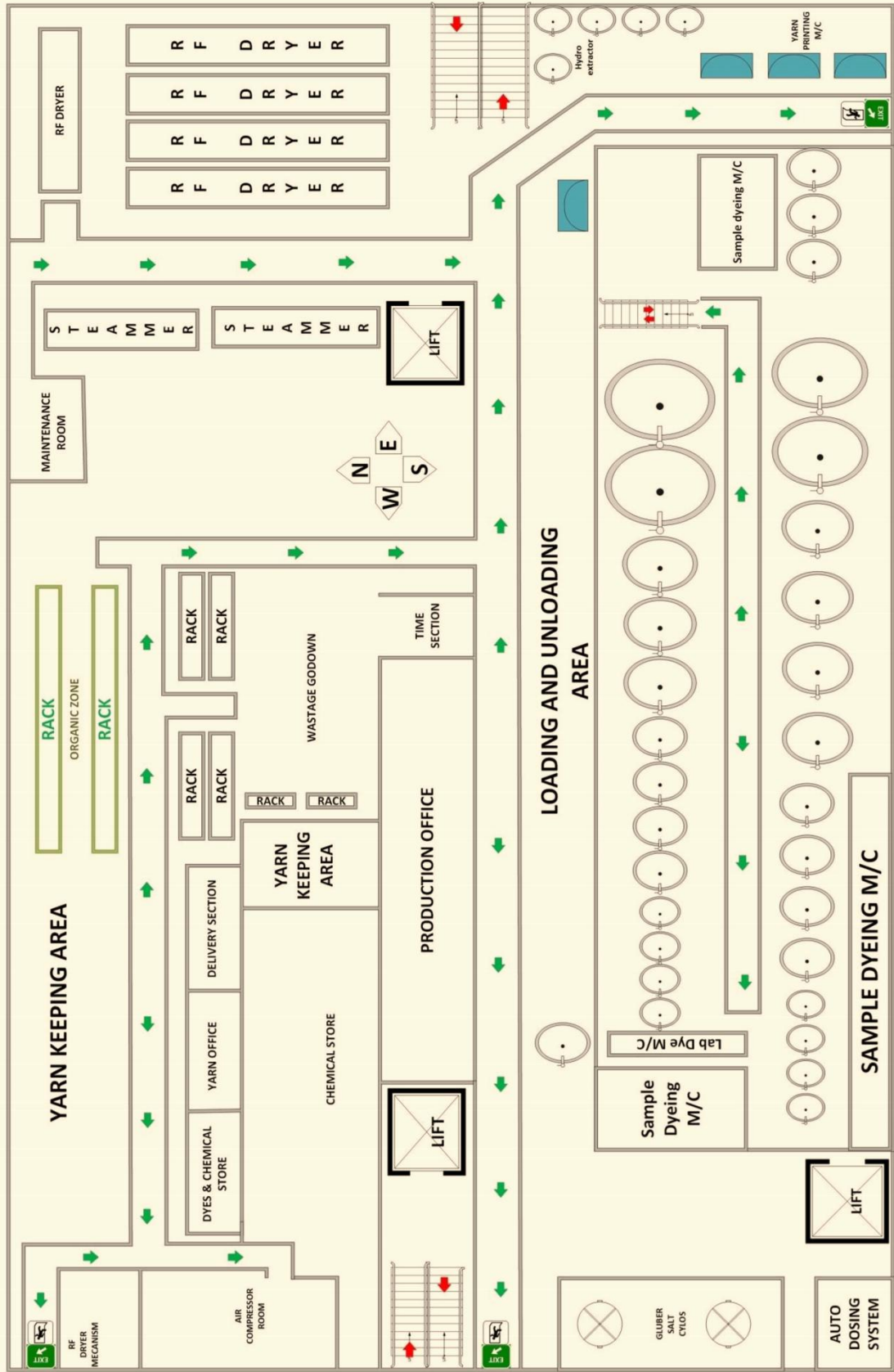
Purpose of Batch Section:

- ✓ To receive the grey Yarn from Soft winding or other source.
- ✓ Turn the grey yarn if require.
- ✓ To prepare the batch of yarn for dyeing according to the following criteria-
 - Order sheet (Received from buyer)
 - Dyeing Shade (Color or white, Light or dark)
 - Yarn Count

Yarn dyeing



YARN DYEING MAIN FLOOR



All yarn dyeing machine description in Knit concern group:

M/C Name	Brand	Origin	Quantity
Yarn dyeing machine	FONG'S	CHINA	30
Yarn dyeing machine	LAIP	ITALI	01
Sample yarn dyeing m/c	FONG'S	CHINA	19
Lab yarn dyeing m/c	FONG'S	CHINA	08
Soft winding machine	SSM, FADIS	SWITZERLAND, ITALY	13, 4
Hard winding machine	SSM, FADIS	SWITZERLAND, ITALY	12,2
Polyester thread winding	SSM	SWITZERLAND	06
Nylon winding machine	SSM	SWITZERLAND	01
Hydro	STALM	ITALI	05
Dryer	STALM	ITALI	02
Dryer	STRAYFIELD	England	03
Yarn printing machine	LAIP	ITALI	04
Steamer	LAIP	ITALI	02
Auto dossing			
Silos-dos	LAWER	ITALI	02
Dos-Chem.	LAWER	ITALI	04
Rotary dyes store	LAWER	ITALI	01

Yarn dyeing: Yarn dyeing is slightly difference from woven or knit dyeing. Dyed yarns are used for making stripe knit or woven fabrics or solid dyed yarn fabric or in sweater manufacturing. Yarns are dyed in package form or hank form by yarn dyeing process.

Yarn dyeing flow chart of KC:

Yarn received from grey store



Soft winding



Batching



Load for dyeing



Hydro-extractor



RF dryer



Hard winding



Packing



Delivery

Package dyeing machines:

Package dyeing machines are the most widely used now a days for dyeing of almost all type of yarns, due to economical, automatic and accurate dyeing results. The package dyeing usually denotes for dyeing of any type yarn wound on the compressible dye springs/perforated solid dyeing tubes or cones. Yarn dyeing in package form is done at high temperature and under high pressure, with the packages mounted on hollow spindles .These spindles are fixed on the dyeing carriers, which is inserted into the dyeing vessel after closing the lid of the machine, the dyeing liquor is forced through the packages in two way pattern (inside to out and outside to in) and goes on circulating throughout the vessel and yarn.



Main parts of the machines:

- Main tier or the main vat in which the actual dyeing is being carried out.
- addition tank
- Stock or preparation tank
- Main pump
- Injector or dosing pump
- Dyeing carrier
- Sampling device
- Back cooler in fully flooded models
- Control panel

Material to Liquor Ratio:

Material to liquor ratio is an important feature of the package dyeing machines, typically machines with M: L from 1:6 to 1:70 are usually used in KCL. However it is always preferred a machine with less possible liquor ratio, without affecting the quality of dyeing. The liquor ratio of the machines is reduced by reducing length the pipelines in the system, by modifying the carrier shape, by modifying and relocating the heat exchangers, air pad system and automatic liquor ratio adjustment, and using internal pumps.

Dosing System:

It is essential for perfect dyeing results and reproducibility of results that run-on of different chemicals, dyes, auxiliaries etc is done in a maintained manner and repeated exactly in a same manner always. The machine which run through programmers can be programmed in such a way those additions can be done in a specified time by following an incremental/progressive curve, a linear curve or a regressive curve etc.

Working principle of package dyeing machine:

The material to be dyed is wound on the dye springs, perforated plastic cheeses or steel cones are loaded in the carrier spindles, which are compressed and bolted at the top to make a uniform and homogeneous dyeing column. The liquor containing dyes, chemical and auxiliaries is forced through with the help of pump, and circulated through the material from inside –out and is move backward periodically so that each and every part of the material get the same and uniform treatment. The dyeing cycle is maintained through a micro-computer and different chemicals may be added through the injector pump or color kitchen at any stage of dyeing.

In case of fully flooded machines, the liquor expands with the rise in temperature (approximately 5% volume increases from 30-130 degree centigrade temperature) is taken back in the expansion tank through a back cooler. This extra water is then again injected to the dyeing vessel through an injector pump. Expanded volume of the dye liquor is thus remains in continuous circulation in the system.

Any type of addition can be done to the machine through the injector pump, the quantity and time of injection can be maintained through the programmer.

Air pad technology is possible in all types of machines such as vertical kier, horizontal kier and tubular dyeing machines.

The material after dyeing is washed and finished properly in the same machine and taken out hydro extracted in the same machine and dried subsequently.

Vertical Kier Dyeing Machines:

In Knit Concern Ltd machines have a vertical cylindrical dyeing kier, in which material loaded into carriers with vertical perforated spindles, is dyed. The machine could be fully flooded or air pad type. These are high pressure machines and suitable up to 135 °C temperature dyeing.

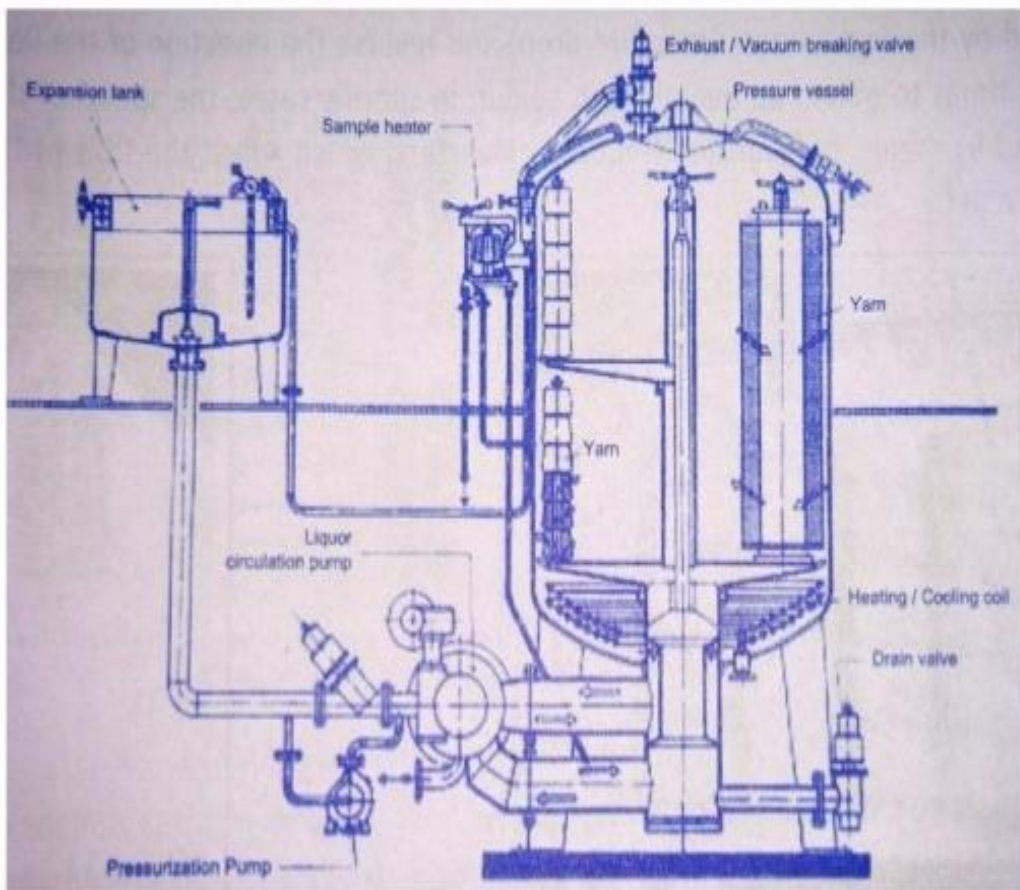
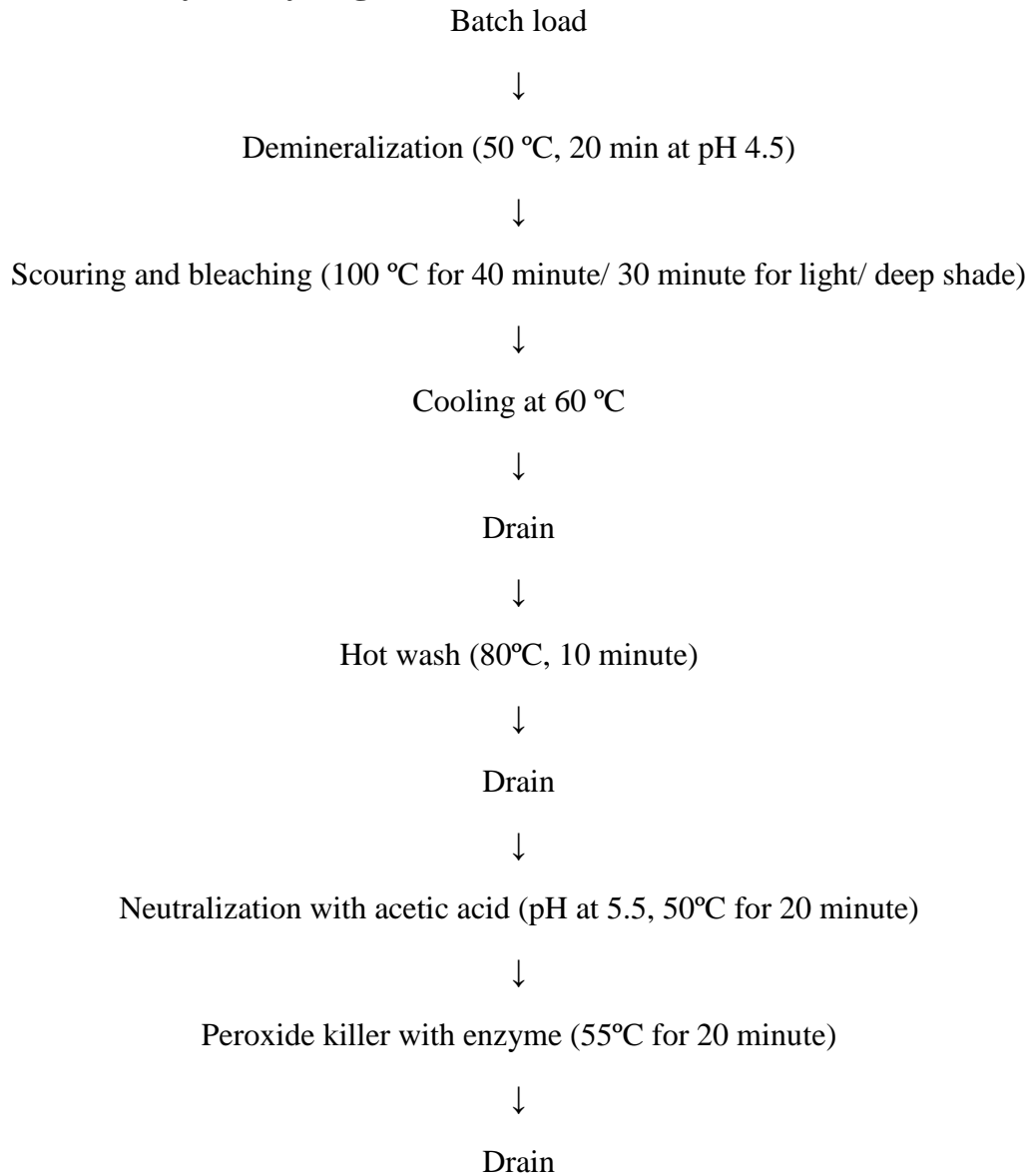


fig: a schematic view of vertical yarn dyeing m/c

Pretreatment of yarn dyeing:



Flow chart of light shade yarn dyeing:

Salt + sequestering agent + leveling agent + de-aerating agent (60°C, 20 minute)



PH check



Color dosing (60°C, 10 minute)



Run time (60°C, 10 minute)



Color migration (80°C, 20 minute)



Cooling (60°C)



Level check



Soda dosing (60°C, 60 minute)



PH check



Dyeing run (60°C for 40 minute)



Dyed sample check



If ok, then delivery

Flow chart of medium shade yarn dyeing:

Salt + sequestering agent + leveling agent + de-aerating agent (60°C, 20 minute)



PH check



Color dosing (60°C, 10 minute)



Run time (60°C, 10 minute)



Color migration (80°C, 20 minute)



Cooling (60°C)



Level check



Soda dosing (60°C, 40 minute)



PH check



Dyeing run (60°C for 40 minute)



Dyed sample check



If ok, then delivery

Flow chart of dark shade yarn dyeing:

Salt + sequestering agent + leveling agent + de-aerating agent (60°C, 20 minute)



PH check



Color dosing (60°C, 20 minute)



Run time (60°C, 10 minute)



Color migration (80°C, 20 minute)



Cooling (60°C)



Level check



Soda dosing (60°C, 30 minute)



Caustic dosing (optional)



PH check



Dyeing run (60°C for 40 minute)

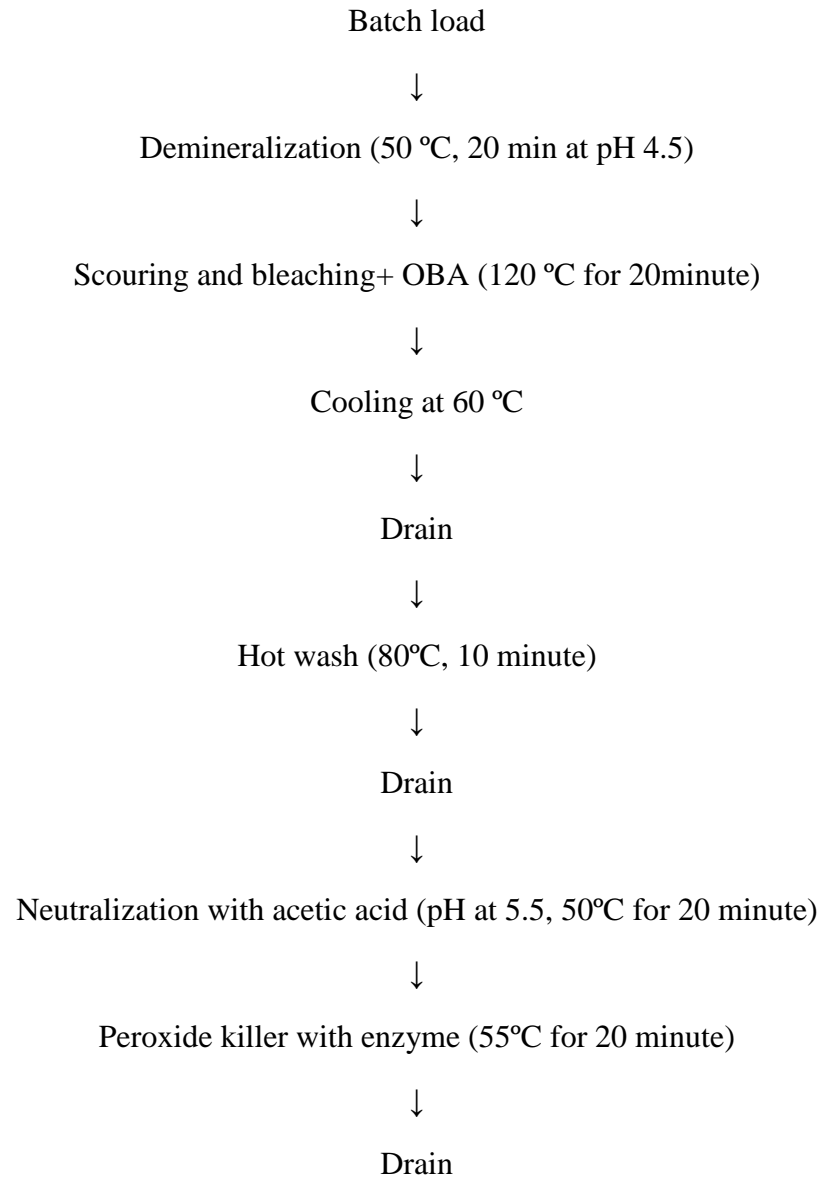


Dyed sample check

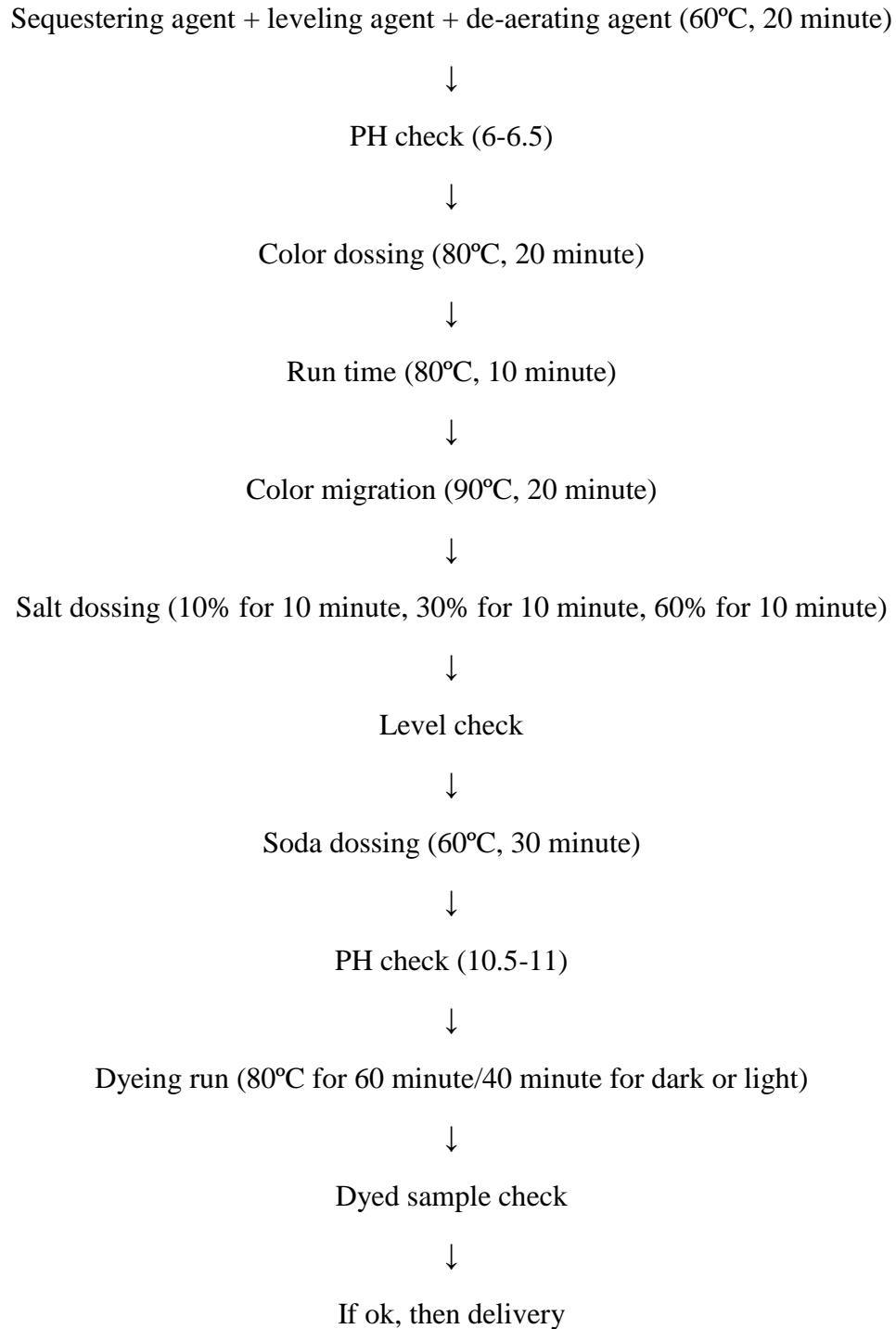


If ok, then delivery

Optical white process:



Flow chart of Turku shade yarn dyeing:



Scouring and bleaching:

Scouring and bleaching are also known as pre-treatment. The main purpose of scouring of cotton fabric is to remove natural color as well as added chemicals of essentially hydrophobic character as completely as possible and leave the fabric in a high absorptive condition without undergoing chemical or physical damage significantly and also the make the goods suitable for removing the natural coloring matter of the cotton during the subsequent process.

Process:

- ✓ At first the yarn package are loaded on to the machine.
- ✓ Required amount of water is taken to the machine.
- ✓ Sequestering agent and de-arreting agent added.
- ✓ Caustic /soda and stabilizer are added by the aid of dossing when the temperature reached at 50°C.
- ✓ H₂O₂ is added by the aid of dossing system for 5 minute.
- ✓ Temperature raised to 98 °C and the process is carried for 60 minute.
- ✓ The liquor is drained at 80 °C after that chemical wash and enzyme wash are done.

Dyeing run:

After scouring and bleaching, it goes for dyeing. There have total 37 dyeing machine and all are ISO certified. Here 19 used as sample dyeing machine and rest of them used for bulk production. Maximum capacity of a dyeing machine is 1821 kg in this factory. Dyeing solutions are made in different tank. According to requirements, these solutions are passed towards the bath.

Finishing:

After rinsing the dyeing carried out with warm water until clear soaping is carried out with a liquor containing and nonionic detergent, washed with hot water, acidified with acetic acid and rinsed.

Dyeing machine description:

Sample dyeing machine

Machine No: 01 Model: Microwin-1 M/c Capacity: 250 gm Package Capacity: 01 Serial No: 32022973T Date/Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Safety Valve Set: 520 KPa	Machine No: 02 Model: Microwin-1 M/c Capacity: 300 gm Package Capacity: 01 Serial No: 330242855T Date/Year Built: 2008 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Safety Valve Set: 520 KPa
Machine No: 03 Model: Labwin-12 M/c Capacity: 14 Kg Package Capacity: 12 Serial No: 31021466T Date/Year Built: 2007 Design Pressure: 700 KPa Design Temperature: 170°C Hydraulic Test Pressure: 1200 KPa Test Date: 2008 Safety Valve Set: 700 KPa Heating/Cooling Medium: Steam Dye Liquid	Machine No: 04 Model: Labwin-12 M/c Capacity: 14 Kg Package Capacity: 12 Serial No: 31021467T Date/Year Built: 2007 Design Pressure: 700 KPa Design Temperature: 170°C Hydraulic Test Pressure: 1200 KPa Test Date: 2008 Safety Valve Set: 700 KPa Heating/Cooling Medium: Steam Dye liquid
Machine No: 05 Model: Labwin-6 M/c Capacity: 7 Kg Package Capacity: 6 Serial No: 31021465T Date/Year Built: 2007 Design Pressure: 700 KPa Design Temperature: 170°C Hydraulic Test Pressure: 1200 KPa Test Date: 2008 Safety Valve Set: 700 KPa Heating/Cooling Medium: Steam Dye Liquid	Machine No: 06 Model: Labwin-6 M/c Capacity: 7 Kg Package Capacity: 6 Serial No: 31020961T Date/Year Built: 2006 Design Pressure: 700 KPa Design Temperature: 170°C Hydraulic Test Pressure: 1200 KPa Test Date: 2008 Safety Valve Set: 700 KPa Heating/Cooling Medium: Steam Dye Liquid

Machine No: 07 Brand name: FONG'S Origin: China Model: LABWIN-12 Machine capacity: 11kg Year: 2011	Machine No: 08 Brand name: FONG'S Origin: China Model: LABWIN-6 Machine capacity: 6kg Year: 2011
Machine No: 09 Brand name: FONG'S Origin: China Model: LABWIN-6 Machine capacity: 6kg Year: 2011	Machine No: 10 Brand name: FONG'S Origin: China Model: LABWIN-12 Machine capacity: 11kg Year: 2011
Machine No: 11 Brand name: FONG'S Origin: China Model: LABWIN-12 Machine capacity: 11kg Year: 2011	Machine No: 12 Brand name: FONG'S Origin: China Model: LABWIN-6 Machine capacity: 6kg Year: 2011
Machine No: 13 Brand name: FONG'S Origin: China Model: LABWIN-6 Machine capacity: 6kg Year: 2011	Machine No: 14 Brand name: FONG'S Origin: China Model: LABWIN-6 Machine capacity: 6kg Year: 2015
Machine No: 15 Brand name: FONG'S Origin: China Model: LABWIN-12 Machine capacity: 11kg Year: 2015	Machine No: 16 Brand name: FONG'S Origin: China Model: LABWIN-12 Machine capacity: 11kg Year: 2015
Machine No: 17 Brand name: FONG'S Origin: China Model: LABWIN-12 Machine capacity: 11kg Year: 2015	Machine No: 18 Brand name: FONG'S Origin: China Model: LABWIN-12 Machine capacity: 11kg Year: 2015
Machine No: 19 Brand name: FONG'S Origin: China Model: LABWIN-6 Machine capacity: 11kg Year: 2015	

Bulk dyeing machine:

<p>Machine No: 01 Brand Name: FONG'S Model: Allwin-43 M/c Capacity: 30 Kg Liquor Ratio Capacity: 180 Liter Package Capacity: 24 No of Spindle: 04 Serial No: 31021468T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>	<p>Machine No: 02 Brand Name: FONG'S Model: Allwin-53 M/c Capacity: 50 Kg Liquor Ratio Capacity: 285 Liter Package Capacity: 36 No of Spindle: 06 Serial No: 31021469T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>
<p>Machine No: 03 Brand Name: FONG'S Model: Allwin-53 M/c Capacity: 60 Kg Liquor Ratio Capacity: 320 Liter Package Capacity: 48 No of Spindle: 06 Serial No: 31021470T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>	<p>Machine No: 04 Brand Name: FONG'S Model: Allwin-70 M/c Capacity: 100 Kg Liquor Ratio Capacity: 580 Liter Package Capacity: 81 No of Spindle: 09 Serial No: 31020960T Year Built: 2006 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2006 Safety Valve Set: 520 KPa</p>
<p>Machine No: 05 Brand Name: FONG'S Model: Allwin-85 M/c Capacity: 200Kg Liquor Ratio Capacity: 1150 Liter Package Capacity: 162 No of Spindle: 18 Serial No: 31021471T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>	<p>Machine No: 06 Brand Name: FONG'S Model: Allwin-85 M/c Capacity: 200 Kg Liquor Ratio Capacity: 1150 Liter Package Capacity: 162 No of Spindle: 18 Serial No: 31021472T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>

<p>Machine No: 07 Brand Name: FONG'S Model: Allwin-120 M/c Capacity: 400 Kg Liquor Ratio Capacity: 2400 Liter Package Capacity: 324 No of Spindle: 36 Serial No: 32022972T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>	<p>Machine No: 08 Brand Name: FONG'S Model: Allwin-120 M/c Capacity: 400 Kg Liquor Ratio Capacity: 2400 Liter Package Capacity: 324 No of Spindle: 36 Serial No: 31021473T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>
<p>Machine No: 09 Brand Name: FONG'S Model: Allwin-145 M/c Capacity: 600 Kg Liquor Ratio Capacity: 3000 Liter Package Capacity: 486 No of Spindle: 54 Serial No: 32023066T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>	<p>Machine No: 10 Brand Name: FONG'S Model: Allwin-145 M/c Capacity: 600 Kg Liquor Ratio Capacity: 3000 Liter Package Capacity: 486 No of Spindle: 54 Serial No: 32023065T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>
<p>Machine No: 11 Brand Name: FONG'S Model: Allwin-145 M/c Capacity: 600 Kg Liquor Ratio Capacity: 3000 Liter Package Capacity: 486 No of Spindle: 54 Serial No: 31021474T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>	<p>Machine No: 12 Brand Name: FONG'S Model: Allwin-145 M/c Capacity: 800 Kg Liquor Ratio Capacity: 4600 Liter Package Capacity: 648 No of Spindle: 54 Serial No: 31021475T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>

<p>Machine No: 13 Brand Name: FONG'S Model: Allwin-166 M/c Capacity: 1000 Kg Liquor Ratio Capacity: 5600 Liter Package Capacity: 788 No of Spindle: 69 Serial No: 31021476T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>	<p>Machine No: 14 Brand Name: FONG'S Model: Allwin-205 M/c Capacity: 1600 Kg Liquor Ratio Capacity: 8600 Liter Package Capacity: 1296 No of Spindle: 108 Serial No: 31021477T Year Built: 2007 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa</p>
<p>Machine No: 15 Brand Name: FONG'S Model: Allwin-205H M/c Capacity: 1821 Kg Package Capacity: 1917 No of Spindle: 213 Serial No: 35027733 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>	<p>Machine No: 16 Brand Name: FONG'S Model: Allwin-186 M/c Capacity: 1026 Kg Package Capacity: 828 No of Spindle: 90 Serial No: 35027736 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>
<p>Machine No: 17 Brand Name: FONG'S Model: Allwin-166 M/c Capacity: 787 Kg Package Capacity: 828 No of Spindle: 69 Serial No: 35027733 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>	<p>Machine No: 18 Brand Name: FONG'S Model: Allwin-166 M/c Capacity: 590 Kg Package Capacity: 621 No of Spindle: 69 Serial No: 35027732 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>

<p>Machine No: 19 Brand Name: FONG'S Model: Allwin-145 M/c Capacity: 642 Kg Package Capacity: 522 No of Spindle: 58 Serial No: 35027731 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>	<p>Machine No: 20 Brand Name: FONG'S Model: Allwin-105 M/c Capacity: 342 Kg Package Capacity: 360 No of Spindle: 24 Serial No: 35027737 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>
<p>Machine No: 21 Brand Name: FONG'S Model: Allwin-90 M/c Capacity: 217 Kg Package Capacity: 228 No of Spindle: 19 Serial No: 35027734 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>	<p>Machine No: 22 Brand Name: FONG'S Model: Allwin-90 M/c Capacity: 217 Kg Package Capacity: 228 No of Spindle: 19 Serial No: 35027623 Year Built: 2010 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2010 Safety Valve Set: 520 KPa</p>
<p>Machine No: 23 Brand Name: FONG'S Model: Allwin-85 M/c Capacity: 103 Kg Package Capacity: 108 No of Spindle: 18 Serial No: 35027630 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>	<p>Machine No: 24 Brand Name: FONG'S Model: Allwin-70 M/c Capacity: 51 Kg Package Capacity: 59 No of Spindle: 09 Serial No: 35027629 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>

<p>Machine No: 25 Brand Name: FONG"S Model: Allwin-53 M/c Capacity: 34 Kg Package Capacity: 36 No of Spindle: 6 Serial No: 35027628 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>	<p>Machine No: 26 Brand Name: FONG"S Model: Allwin-53 M/c Capacity: 103 Kg Package Capacity: 108 No of Spindle: 18 Serial No: 35027627 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>
<p>Machine No: 27 Brand Name: FONG"S Model: Allwin-43 M/c Capacity: 23 Kg Package Capacity: 24 No of Spindle: 4 Serial No: 350276226 Year Built: 2011 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2011 Safety Valve Set: 520 KPa</p>	<p>Machine No: 28 Brand Name: FONG"S Model: Allwin-53 M/c Capacity: 34 Kg Package Capacity: 36 No of Spindle: 6 Serial No: 40033170 Year Built: 2015 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2015 Safety Valve Set: 520 KPa</p>
<p>Machine No: 29 Brand Name: FONG"S Model: Allwin-70 M/c Capacity: 51 Kg Package Capacity: 54 No of Spindle: 09 Serial No: 40033171 Year Built: 2015 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2015 Safety Valve Set: 520 KPa</p>	<p>Machine No: 30 Brand Name: FONG"S Model: Allwin-70 M/c Capacity: 51 Kg Package Capacity: 54 No of Spindle: 09 Serial No: 40033172 Year Built: 2015 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2015 Safety Valve Set: 520 KPa</p>

<p>Machine No: 31 Brand Name: LAIP M/c Capacity: 456 Kg Package Capacity: 480 No of Spindle: 96 Year Built: 2015 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2016 Safety Valve Set: 520 KPa</p>	
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Photo Gallery



Yarn Dyeing Floor



Sample Dyeing Machine



Package Loading on Bulk Machine



Cylos

Chapter 04

Hydro and dryer



HYDRO-EXTRACTOR:

Hydro extraction is a very important process stage of drying process. The main features desired from a good hydro extractor are-

1. To remove the maximum possible unbound moisture.
2. The moisture should be evenly removed within a batch. All the packages have same moisture level%.
3. Uniform removal of moisture from within a package.
4. Minimum or no damage to yarn quality, without deforming the shape of package.
5. Flexibility of the loading of different sizes and types of materials.

This machine is run to a maximum speed of 1400-1500rpm and are available in fully or semi-automatic versions. The machines have a twin basket system, out of which one is under operation while other is ready for unloading and loading.

Radio frequency dryers:

In RF the dielectric energy radiation are used for drying purposes. An RF drier has an electrically charged metal plate or electrode above the material, and another oppositely charged plate or electrode below the material to dry.

The oscillation of the polar molecules generate internal heat due to this very high frequency oscillations and when a sufficient amount of energy is supplied, the water is converted into steam.

Advantage of RF dryer:

The major advantage is that it give consisting drying in less time and also less space .Following advantage are prominent:

1. Faster drying
2. Faster production
3. Energy saving
4. Space saving

Machine information:

Machine name	Brand	Origin	Quantity
RF dryer	Stray field	ENGLAND	03
RF dryer	STALAM	ITALY	02
Hydro extractor	Detin betra	ITALY	05
		TOTAL	10

Machine specification of hydro:

Machine no:01	Machine no:02
Model: Detting Berta 36 TE	Model: Detting Berta 36 TE
TOTAL basket :four	TOTAL basket :four
Per basket package capacity :eight	Per basket package capacity: eight
Total package capacity :sixty four	Total package capacity :sixty four
Basket rotation time: six minutes	Basket rotation time :six minutes
Maximum speed:1400-1500rpm	Maximum speed:1400-1500rpm
Maximum rotation:1470g/l	Maximum rotation:1470g/l
Power: 16 kw	Power:16kw
Alimentation: 400v-500v	Alimentation :400v-500v
Year:2007	Year :2017

Machine no:03	Machine name:04
Model: Detting Berta 36 TE	Model: Detting Berta 36 TE
TOTAL basket :four	TOTAL basket :four
Per basket package capacity :eight	Per basket package capacity: eight
Total package capacity :sixty four	Total package capacity :sixty four
Basket rotation time: six minutes	Basket rotation time :six minutes
Maximum speed:1400-1500rpm	Maximum speed:1400-1500rpm
Maximum rotation:1470g/l	Maximum rotation:1470g/l
Power: 16 kw	Power:16kw
Alimentation : 400v-500v	Alimentation :400v-500v
Year :2016	Year:2016

Machine no:05
Model: Detting Berta 36 TE
TOTAL basket :four
Per basket package capacity :eight
Total package capacity :sixty four
Basket rotation time: six minutes
Maximum speed:1400-1500rpm
Maximum rotation:1470g/l
Power: 16 kw
Alimentation : 400v-500v
Year :2016

Machine specification of RF Dryer:

Machine no :01	Machine no :02
Machine name: strayfield	Machine name :strayfield
Model type SO 100 TE	Model type :SO 100 TE
Per Meter conveyor capacity:30-35	Per Meter conveyor capacity:30-35
Maximum weight:3600kg	Maximum weight:3600kg
Conveyor length:8.75m	Conveyor length:8.75m
Supply volt:380-420	Supply volt:380-420
Supply frequency:50 Hz	Supply frequency:50 Hz
Supply phase:3	Supply phase:3
Supply KVA:230	Supply KVA:230
Supply power factor:0.9	Supply power factor:0.9

Machine no :03	Machine no :04
Machine name: STALAM	Machine name: STALAM
Model type: MC/T-1869/1	Model type :MC/T-1869/1
Per Meter conveyor capacity:30-35	Per Meter conveyor capacity:30-35
Maximum weight:3600kg	Maximum weight:3600kg
Conveyor length:8.75m	Conveyor length:8.75m
Supply volt:400V+/-5	Supply volt:400V+/-5
Supply frequency:50 HZ	Supply frequency:50 HZ
Supply phase:3	Supply phase:3
Supply KVA:230	Supply KVA:230
Supply power factor:0.9	Supply power factor:0.9

Machine no :05
Machine name: strayfield
Model type SO 100 TE
Per Meter conveyer capacity:30-35
Maximum weight:3600kg
Conveyor length:8.75m
Supply volt:380-420
Supply frequency:50 Hz
Supply phase:3
Supply KVA:230
Supply power factor:0.9

Yarn printing



Yarn Printing (Space Dyeing):

Yarn printing is also known as “Space Dyeing”. Although the printing of yarns for true patterned effects proved very difficult to control, the random space-dyed effects that can be more readily attained by a variety of yarn-printing methods have continued to be popular. The patent literature abounds with systems for producing colored flecked effects on yarns but the two most successful methods entail either warp printing or color application to a tubular knitted ‘sock’. The essential process sequence begins with dye liquor application, followed by steam fixation, washing-off and drying.

In KCL Number of yarn printing machine: 04

Machine Name: Bobbin Injection Dyeing Machine (B I D)

Manufacturer: LAIP Dyeing Machinery

Type: Type-R

Code: C1055

Origin: Italy

Color: 1 to 5

Process: Discontinuous Process

Media: Alkali & Acid

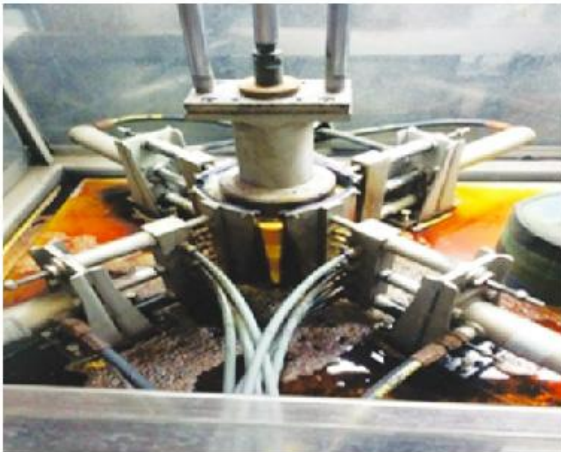
Capacity: 3000 kg per day

Machine Parts: Six parts:

- Dyes Tank
- Dyes Cylinder
- Oil box
- Printing Device
- Panel Board
- Dryer

Working Principle of Yarn Printing Machine:

1. The first work is to clean the drain line of dyes tank
2. Then connection from one part of machine to another part of machine with plastic pipe (oil box & printing unit)
3. Joint with non-return valve(steamer)
4. Joint photo electric cell (sensor) & other pipe line of printing device
5. Joint dyes tank & dyes cylinder with plastic pipe line
6. Joint printing device & printer with needle
7. Work in printing spindle for setting of bobbin
8. Joint printing unit & dye cylinder with plastic pipe
9. Joint water line with machine (dyes tank)
10. Joint steam line with dyes tank
11. Work in drain line of dryer Purchases of Raw Material

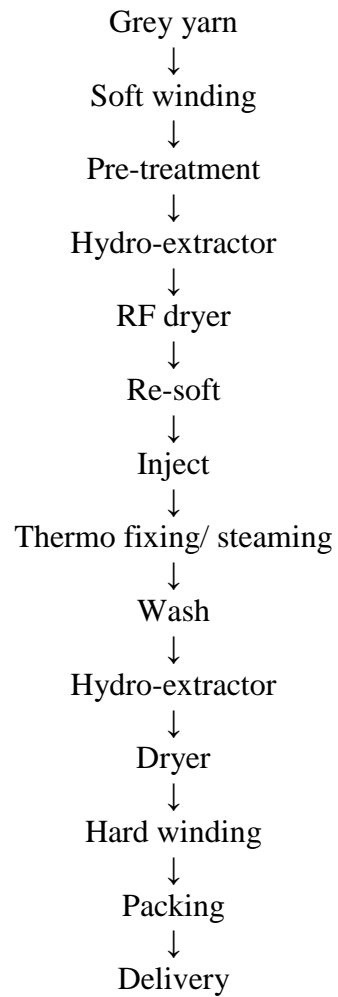


Cone in printing



Cone after printing

Yarn printing flow chart of KCL:



Machine specification:

Y/P Machine

Machine No:01 Brand Name: LAIP Model: BID Machine Type: Type R Code:C1055 Work No:2858 Pressure: ZERO Year:2011	Machine No:02 Brand Name :LAIP Model :BID Machine Type: Type R Code:C1329 Work No:3255 Pressure :ZERO Year:2015
Machine No:03 Brand Name :LAIP Model :BID Machine Type :Type R Code:C1368 Work No:3237 Pressure :ZERO Year:2016	Machine No:04 Brand Name :LAIP Mode l:BID Machine Type :Type R Code:C1349 Work No:2858 Pressure: ZERO Year:2015

Steamer Machine

Machine No:01 Brand Name :LAIP Load⊕52x2=108)PKG Temp:30c Pressure:4-5BAR	Machine No:02 Brand Name: LAIP Load:52x2=108)PKG TEMP:30C Pressure:4-5 BAR
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Yarn printing machine

Hard winding



Hard Winding:

Hard winding also known as the Re-winding process is the last steps of yarn dyeing process. The process which is started by soft winding section, it comes in end by re winding section. After re winding, dyed yarns become ready for packing and delivery to the destination. In yarn dyeing floor hard winding section is also called random section. In this section dried and dyed yarns are transferred from spring or plastic tube to cone form.

Function of Hard winding

- To increase the yarn package density
- To wax the yarn during hard winding
- To increase the yarn strength
- To reduce the yarn faults

No. of machine and specification with spindle

1. Brand name: SSM-CW8W, Switzerland

$$\text{No. M/C} = 8$$

$$\text{No. of spindle for each M/C} = 128$$

$$\text{Total No. of spindle} = 1028$$

$$U = 400 \text{ V}$$

2. Brand Name: SSM-CW2-W, Switzerland

$$\text{No. of M/C} = 4$$

$$\text{No. of spindle for each M/C} = 96$$

$$\text{Total No. of spindle} = 384$$

$$U = 400 \text{ V}$$

3. Brand Name: FADIS-SINCRO T-FT P300

$$\text{No. of M/C} = 4$$

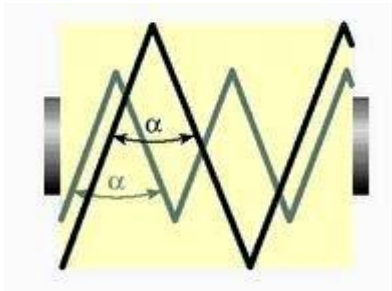
$$\text{No. of spindle for each M/C} = 48$$

$$\text{Total No. of spindle} = 192$$

$$\text{Total M/C spindle in hard winding section} = 1600$$

HARD WINDING OR RANDOM WINDING

Random soft package winding machines are conventional winding machines, in which a grooved drum acts as both the driving as well as the traversing element. The winding is done through indirect drive to the package, which we call the friction drive. The yarn lay formed is random, that's why is called random winding. The main characteristics of random windings are-



Winding angle:-Since grooved drum is used for winding the winding angle remains the same.

Winding ratio:-The number of coils per turn of the package decreases as the diameter of the package increases, so the package is softer at the outer layers.



Parts of the hard winding M/C

- i. Cone Holder
- ii. Thread guide
- iii. Yarn tensioner
- iv. Feeder
- v. Display pane
- vi. Sensor
- vii. Knot catcher
- viii. Back pressure etc.

Function of m/c the parts:

1. Cone holder: The cone package is mounted on the cone holder
2. Thread guide: The thread guide is provided to guide the yarn to cheese/cone Package during winding
3. Yarn tensioner: It provides sufficient tension to the yarn during winding
4. Signal lamps: The signal lamps are indicate the reason for stoppage the Drums during winding
5. Display panel: The display operating the various machine parameters such as Count of yarn, speed , production etc.
 5. Cradle/Rod: It helps to hold the cheese/cone on the winding head It is Mounted on the upper part of the machine
7. Knot catcher: It clears the yarn defects during winding
8. Sensor: When the yarn is breakage then it provides the signal during hard winding

Faults of hard winding:

11. Lot mixing: Lot mixing is commonly occurred in this section. As a result Shade is varied from one package to another package in dyeing Section and also the same package.
12. Density : This problem is occurred due to wrong setting of tension , over feed Of speed, angle of winding etc.
13. Count mixing : Sometimes various count of yarn package mixed with one another.
14. Cleaning device : This device is used to collect dust or fly which is with the Yarn.
15. Yarn breakage : This problem occurred due to low strength of yarn and more Tension of winding machine
16. Hardness or Softness : This problems occurred due to wrong tension or High feed speed.
17. Wrong program setting: Wrong program setting is a great problem. Speed , Angle, tension should be adjusted with the count
18. Ribbon formation : This problem is occurred due to wrong set up of cam switch
19. Fault shape of package : This problem is occurred due to faulty yarn guide , Tension device, drum guide etc.
20. Ring shaped cone: This occurred due to faulty setting of cone holder.

Remedies of hard winding faults:

- Lot mixing: Numbering should be in every package. Lot should not mix With one another and operator should be careful during winding
- Density: Package density should be uniform. Package density should Work out for every lot package.
- Count mixing : Various count of yarn Should be separately
- Cleaning device: Clean device should keep clean.
- Yarn breakage: High quality yarn should use and tension should uniform.
- Hardness or softness : Tension should be accurately and uniform of each lot package
- Wrong program setting: Program should setting properly.
- Fault shape of package: Tension should accurately of each lot package.

Machine description of hard winding:

<p>Machine No:01 Brand Name: SSM Type: CW2-W No of Spindle: 90 M/C No: 863.0029/07 U: 400V I(max): 28A F: 50Hz</p>	<p>Machine No:02 Brand Name: SSM Type: CW2-W No of spindle: 90 M/C No: 863.0029/07 M/A No: Year 2007 U: 400V I(max): 28A F: 50HZ</p>
<p>Machine No:03 Brand Name: SSM Type: CW2-W No of spindle: 90 M/C No: 863.0029/07 M/A No: Year 2007 U: 400V I(max): 28A F: 50HZ</p>	<p>Machine No:04 Brand Name: SSM Type: CW2-W No of spindle: 90 M/C No: 863.0029/07 M/A No: Year 2007 U: 400V I(max): 28A F: 50HZ</p>
<p>Machine No:05 Brand Name: FADIS Type: Sincor T-FT/RTP300 No of spindle: 96 M/C No: G0024DX M/A No: Year 2008 U: 400V Amp: 16 Power kw: 12</p>	<p>Machine No: 06 Brand Name: SSM Type: CW8-W No of spindle: 128 M/C No: 836.1029/11 M/A No: Year 2011 U: 400V I(max): 7A F: 50HZ</p>
<p>Machine No:07 Brand Name: SSM Type: CW8-W No of spindle: 128 M/C No: 836.1032/11 M/A No: Year 2011 U: 400V I(max): 7A F: 50-Hz</p>	<p>Machine No:08 Brand Name: SSM Type: CW8-W No of spindle: 128 M/C No: 836.1030/11 M/A No: Year 2011 U: 400V I(max): 7A F: 50Hz</p>
<p>Machine No:09 Brand Name: FADIS Type: Sincro T-FT/RTP300 No of spindle: 96 M/C No: G0025SX M/A No: Year 2008 U: 400V Amp: 16 Power: 12</p>	<p>Machine No:10 Brand Name: SSM Type: CW8-W No of spindle: 128 M/C No: 836.1032/11 M/A No: Year 2011 U: 400V I(max): 7A F: 50HZ</p>

Raw Material used in different section



Raw Material for Yarn Dyeing

- Yarn
- Dyestuff
- Chemical and Auxiliaries

Name and Source of Raw Material:

Yarn Store for Count Wise:

100% Organic Cotton

20/1, 24/1, 30/1, 34/1, 40/1 GM

50, 75 D

30/1, 34/1, CVC

10/1, 20/1, 24/1, 26/1, 28/1, 30/1, 34/1 40/1, 60/1, and 60/2 Cotton

10/1, 12/1, 30/1, 34/1, 45/1 PC

45/1 TC

10/1, 24/1, 26/1, 30/1, Card

16/1, 20/1, 22/1, 24/1, 26/1, 26/2, 28/1, 30/1, 32/1, 34/1, 36/1 and 40/1

Comb

Using Dyes and Chemicals:

Basic chemicals

No of Chemical	Name of chemical	Function
01	Hydrogen Peroxide H ₂ O ₂	Bleaching
02	Soda Ash	Color Fixing
03	Chemtech ALF	Color Fixing
04	Acetic Acid	Neutralize
05	Formic Acid	Neutralizer
06	Bleaching	Reducing
07	Caustic Soda	Scouring
08	Hydroses	Stripping
09	Kappatex R-98	Stripping

Axillaries

No of chemical	Name of chemical	Function
01	Cibatex Ab-45	Buffering
02	Parmagen NF	DE aerating
03	Heptol EMG	Demineralizing
04	Felosan NOF	Detergent
05	Kappawet BOSS	Detergent
06	BiopolishC	Enzyme
07	Retrocell PLX Ultra	Enzyme
08	Lavacell BAC	Enzyme
09	Albafix ECO	Fixing
10	Albatex FRD	Fixing
11	Parmafix RD	Fixing
12	Fixer F-100	Fixing
13	Irgasol DAM	Fixing remover
14	Univadine DIF	Dispersing
15	Sarabid OL	Levelling
16	Cibacel DBC	Leveling
17	Seragal C-FTR	Levelling
18	Dyclosure S	Leveling
19	Intensol AME 6	M/C Wash
20	Uvitex EBF	Optical Brightener
21	Uvitex BHV	Optical Brightener
22	Finoscav V6	Peroxide killer
23	Invatex Pc	Peroxide killer
24	Chromalase PQ	Peroxide killer
25	Zymbiosan PHL	Peroxide killer
26	Erioponos	Reducing agent
27	Sirrix 2UD	Sequestering agent
28	Kappaquest FE	Sequestering agent
29	Seraquest QE	Sequestering agent
30	Kappaquest A41	Soaping
31	Cottoblanc NSR	Soaping

34	Epalin –PE	Softener
35	Kataminbw	Softener
36	Perifil-210	Softener
37	Rucofinsiq new	Softener
38	Kataminuni Liq	Softener for pes
39	Sapamine kl	Softener for pes
40	Silicon oil	Softener for st
41	Uvlitex NFWLIQ	Optical brightener
44	Perisol NU	Optical brightener
43	Uvitex BHV LIQ	Optical brightener
43	Argaphor 4bk	Optical brightener
44	Brightener HQ 4BQ	Optical brightener
45	Maxbrite ER –II	Optical brightener

DYES

No of chemical	Name of chemical	Function
01	Dorasyne Yellow XLR	Acid dyes
02	Dorasyne Br. Yellow XLG	Acid dyes
03	Dorasyne Br. RED XLNG	Acid dyes
04	Dorasyne Br. blue XLBR	Acid dye
05	Dorasyne green XLBS	Acid dye
06	Dorasyne orange XLP	Acid dye
07	Dorasyne Turq. C3GN	Acid dye
08	Erionyle yellow A3 G	Acid dye
09	Erionyle yellow AR	Acid dye
10	Erionyle RED A3G	Acid dye
11	Erionyle A3BN	Acid dye
12	Erionyle Rodamine FF	Acid dye
13	Erionyle Flvine FF	Acid dye
14	Erionyle orange BGSN	Acid dye
15	Erionyle TURQ AG	Acid dye
16	Eriofast yellow 5G	Acid dye
17	Eriofast Red 2B	Acid dye
18	Eriofast blue 3R	Acid dye
19	Eriofast blue 3R	Acid dye
20	Eriofast Blue 3G	Acid dye
21	Eriofast Navy M	Acid dye
25	Eriofast Black M	Acid dye
23	Lanaset Navy R	Acid dye
24	Lanaset Blue 2R	Acid dye
25	Lanaset red 2B	Acid dye

25	Lasnaset red 2B	Acid dye
26	Avitera Yellow	Reactive dye
27	Avitera Red SE	Reactive dye
28	Avitera Blue SE	Reactive dye
29	Avitera orange SE	Reactive dye
30	Avitera Brill SE	Reactive dye
31	Avitera GOLD SE	Reactive dye
32	Avitera deep SE	Reactive dye
33	Avitera cardinal SE	Reactive dye
34	Bicklative blue KBR	Reactive dye
35	Bicklative blue SGLD	Reactive dye
36	Blicklative REDK3SB	Reactive dye
37	Bicklative yellow SE	Reactive dye
38	Bicklative blue SE	Reactive dye
39	Bezaktiv blue S-FR	Reactive dye
40	Bezaktiv blue SGLD	Reactive dye
41	Bezaktiv turquoise H-A	Reactive dye
42	Bezaktiv violet Vsr	Reactive dye
43	Bezaktiv cosmos RED	Reactive dye
44	Bezaktiv yellow	Reactive dye
45	Bezaktive Red GO	Reactive dye
46	Bezaktive Red GO	Reactive dye
47	Bezaktiv blackGO	Reactive dye
48	Bezaktiv navy GO	Reactive dye
49	Coraflix yellow XRFT	Reactive dye
50	Coraflix Red XRFT	Reactive dye
51	Corazol Red RFT	Reactive dye
52	Corazol Navy XRFT	Reactive dye

53	Corazol orangeME2RN	Reactive dye
54	Corafix brill sky blue	Reactive dye
55	Imcozin bri yellow v4GL	Reactive dye
56	Imoczin orange E2R	Reactive dye
57	Levafix yellow CA	Reactive dye
58	Levafix Ambor yellow	Reactive dye
59	Leafix RED CA	Reactive dye
60	Dianix Turquoise XF	Reactive dye
61	Novacron super black M	Reactive dye
62	Novacron Turquoise HGN	Reactive dye
63	Novacron yellow S3R	Reactive dye
64	Novacron dark Blue WR	Reactive dye
65	Novacron ocean SR	Reactive dye
66	Novac Scarlet FNGG	Reactive dye
67	Novac sclet FNGG	Reactive dye
68	Remazol blue RGB	Reactive dye

69	Remazol NavyRGB	Reactive dye
70	Remazol ultra N blue	Reactive dye
71	Remazol royl RGB	Reactive dye
72	Remazol Ultra Red RGB	Reactive dye
73	Remzol Ultra yellow RGB	Reactive dye
74	Remzol G yellow RGB	Reactive dye
75	Suffix Navy blue SPD	Reactive dye
76	Suffix Navy B	Reactive dye
77	Suffix Red SS	Reactive dye
78	Suffix yellow SS	Reactive dye
79	Suffix yellow S4GL	Reactive dye
80	Sunzol violet 5R	Reactive dye
81	Terasil Blue WBS	Disperse dye
82	Terasil Blue BGE	Disperse dye
83	Terasil Blue 3RL -02 150%	Disperse dye
84	Terasil Black WW-KSN	Disperse dye
85	Terasil Black WNS	Disperse dye
85	Terasil Black SR	Disperse dye
86	Terasil Black BFE	Disperse dye
87	Terasil Navy WRS	Disperse dye
88	Terasil Navy GRLC	Disperse dye
89	Terasil Red R	Disperse dye
90	Terasil Red WRS	Disperse dye
91	Terasil Red WFS	Disperse dye
92	Terasil Red W4BS	Disperse dye
93	Terasil Red FBN	Disperse dye
94	Terasil G Yellow W3R	Disperse dye
95	Terasil Yellow W4G	Disperse dye
96	Terasil Yellow W6GS	Disperse dye
97	Terasil Violet BL	Disperse dye

Yarn dyeing lab

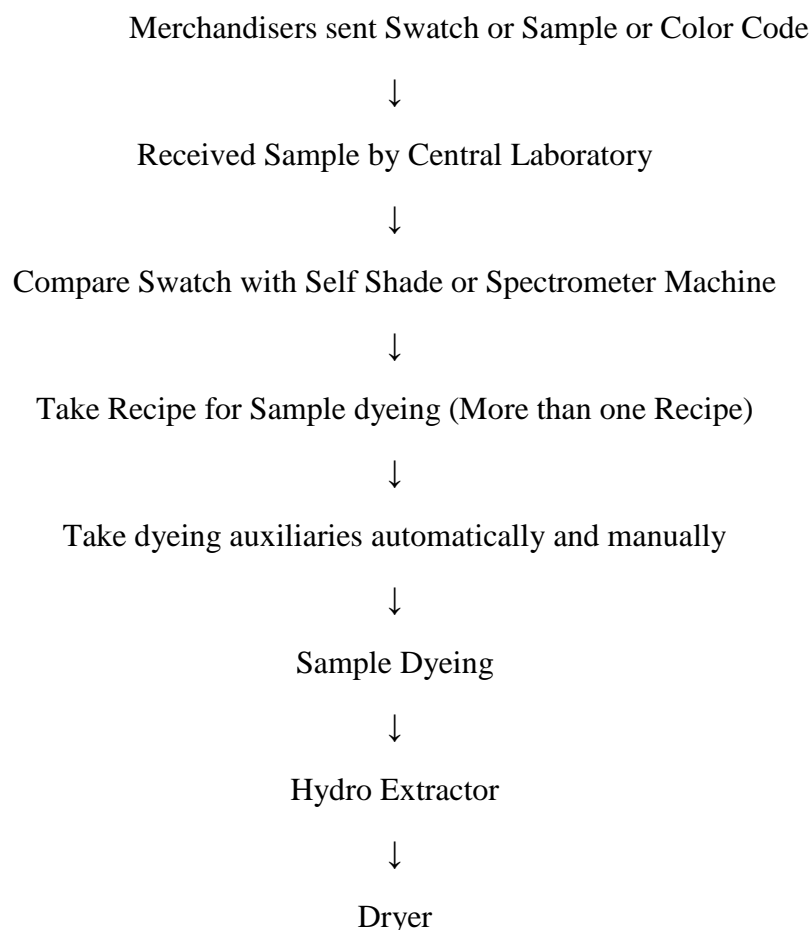


Laboratory: Lab is the heart of the textile industry Higher precision lab can aid easily to achieve the goal of the organization Before bulk production a sample for the approval from industry is sent to the buyer As per the requirement of the buyer the shade is prepared in a lab considering the economic aspects .

Lab Dip Development:

- I. Lab Dip Development means the sample which is dyed according to buyer's requirements (similar shade and so on). Depending on lab dip development sample dyeing and bulk production dyeing planning done. The following sequence need to produce a Lab Dip.

Process flow chart OF lab:



Compare Dyeing Sample with Light Box and spectrophotometer machine
If need Take correction for required shade manually and automatically Sample dyeing
compare Dyeing sample with Swatch

Specification with function:

01. Dryer:

M/C Specification:
SDL ATLAS Textile
Testing solutions
U.K.

Functions: To dries the fabric

02. Hydro Extractor:

M/C Specification: Lab Extractor SDL U.K.
Function: To remove extra water from fabrics

03. Sample Dyeing Machine:

Machine Specification:
Co power Technology co .Ltd.
Model: Super mat
Weight: 135 kg
U.S.A

04. Machine name: AUTO LAB

Model No: TD-LAB V34

Manufacturer: LAWER

Origin: ITALY

Software version: V 3.9.

Serial no: 2709

Year: 2011

Capacity: 172 bottles



DIFFERENT TYPE OF TEST WITH DETAILS:

01. Washing M/C:

M/C Specification:

WASH KATOR

U.K

Objectives:

To wash the fabric according to buyer requirements

Sample: 10 x 4 cm

Multi fiber: 10 x 4 cm

Used: Persil per body 10 gm

Time: 30 min



02. Rubbing Tester: M/S

Specification: KCM-01

CROCKMASTER

JAMES-H.HEAL &CO LTD, HALFIX

ENGLAND

Cycle: 10

03. Perspiration Tester:

M/S Specification:

1:50

Saliva-GB/T-18886



04. Water:

Ratio-1:100 (With multi fiber)

Time: 30 min

Saliva-1:50

Tem: 37°c

Time: 4 hour

05. T.P.I M/C:

Single yarn: Z twist

Double yarn: S twist

Calculi: Reading\20

Specification length-20cm

Accept value: 18

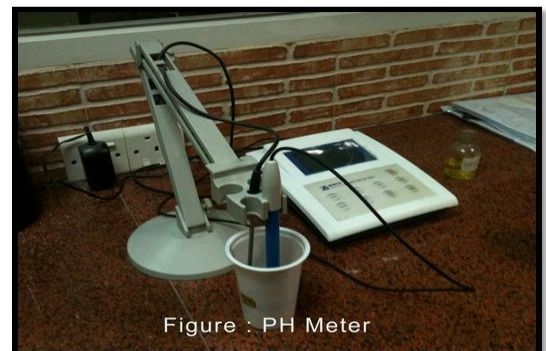
06. pH Test M/C:

Yarn-2gm

General water -100ml

ORBITAL SHAKER

Shake time: 2 hour



Color assessment cabinet:

Accurate color matching and assessment of the finish product are important and essential steps in the production of all colored materials, especially in textile manufacture where luster and texture are also important attributes. It is perhaps no surprising that much work has been carried out in the textile industry together with the associated dye making and dye using sectors to standardize method for color assessment.

Traditionally, all assessments were, of necessity, carried out by visual methods. Natural daylight is highly variable depending on geographical location time of year, time of day and climatic conditions. To overcome the variability of daylight, viewing cabinets or light booths were developed which can incorporate several standard illuminants so that samples can be viewed in various conditions to assess color against the standard together with mesmerism and color constancy. The inside of the cabinet is painted to a standard grey color and illuminant tubes should be replaced every 2000 hours. Light booths are available from a number of suppliers and when equipped with standard illuminants, they offer the observer the three cs' of color assessment:

- .Control of viewing conditions
- .Consistency in the visual method
- .Communication of judgments.

The following factors also impact on the consistency of visual assessment in light cabinets:

- ✓ Level of illumination (light intensity)
- ✓ Spectral quality of the light
- ✓ Sample size
- ✓ The angular size of the light source
- ✓ The incident angle
- ✓ Background and surround
- ✓ Separation and juxtaposition
- ✓ Interference from adjacent colors
- ✓ The color response of the individual observer.

Knitting



Knitting

Excellence in knitting, however, is an inborn aspect of Knit Concern inherited from the family of its Chief Executive, Joynal Abedin Mollah; the Mollah family has been in yarn and knitting business since 1960s.

The knitting facility of Knit Concern is equipped with world's latest and dependable brand machinery like Mayer & cie, Fukuhara Orizio and Stoll. Intensive online inspections at different stages during and after knitting process are carried out invariably to achieve the desired knitting quality.

Specification of Knitting Machine

Single jersey

M/C NO.	DIA	BRAND	ORIGIN	TYPE	GAUGE	FEEDER	QTY	LYCRAATTC
1	15	ORZIO	ITALY	S/J	24	45	1	NO
2	16	FUKUHARA	JAPAN	S/J	24	48	1	NO
3	17	ORIZIO	ITALY	S/J	24	51	1	NO
4	18	FUKUHARA	JAPAN	S/J	24	54	1	NO
5	19	ORIZIO	JAPAN	S/J	24	57	1	NO
6	20	FUKUHARA	JAPAN	S/J	20/24	60	1	NO
7	21	FUKUHARA	JAPAN	S/J	20/24	63	1	NO
8	22	FUKUHARA	JAPAN	S/J	20/24	64	1	NO
9	23	FUKUHARA	JAPAN	S/J	20/24	69	1	NO
10	24	FUKUHARA	JAPAN	S/J	20/24	72	1	NO
11	26	FUKUHARA	JAPAN	S/	20/24	78	1	NO
12	28	FUKUHARA	JAPAN	S/J	20/24	84	1	YES
13	30	FUKUHARA	JAPAN	S/J	20/24/28	90	1	YES
14	30	FUKUHARA	JAPAN	S/J	20/24/28	90	1	YES
15	30	FUKUHARA	JAPAN	S/J SLITTING	24/28	90	1	YES
16	30	FUKUHARA	JAPAN	S/J SLITTING	24/28	90	1	YES
17	32	FUKUHARA	JAPAN	S/J SLITTING	24/28	96	1	YES
18	32	FUKUHARA	JAPAN	S/J SLITTING	24/28	96	1	YES

19	34	FUKUHARA	JAPAN	S/J SLITTING	24/28	102	1	YES
20	34	FUKUHARA	JAPAN	S/J	20/24/28	102	1	YES
21	36	FUKUHARA	JAPAN	S/J	20/24/28	118/108	1	YES
22	36	FUKUHARA	JAPAN	S/J	20/24/28	118/108	1	YES
23	38	FUKUHARA	JAPAN	S/J	20/24/28	114/122	1	YES
24	38	FUKUHARA	JAPAN	S/J	20/24/28	114/122	1	YES
25	38	FUKUHARA	JAPAN	S/J	20/24/28	114/122	1	YES
26	40	FUKUHARA	JAPAN	S/J	20/24	120	1	YES
27	42	FUKUHARA	JAPAN	S/J	20/24	120	1	YES
28	34	FUKUHARA	JAPAN	S/J SLITTING	24/28	110	1	YES
29	25	FUKUHARA	JAPAN	S/J	20/24	75	1	NO
30	26	FUKUHARA	JAPAN	S/J	20/24	78	1	NO
31	30	MAYER& CIE	GERMANY	S/J SLITTING	20/24/28	96	1	YES

32	30	MAYER& CIE	GERMANY	S/J SLITTING	20/24/28	96	1	YES
33	30	MAYER& CIE	GERMANY	S/J SLITTING	20/24/28	96	1	YES
34	30	MAYER& CIE	GERMANY	S/J SLITTING	20/24/28	96	1	YES
35	30	FUKUHARA	JAPAN	S/J SLITTING	20/24/28	98	1	YES
36	30	FUKUHARA	JAPAN	S/J SLITTING	20/24/28	98	1	YES
37	30	FUKUHARA	JAPAN	S/J SLITTING	20/24/28	98	1	YES
38	30	FUKUHARA	JAPAN	S/J SLITTING	20/24/28	98	1	YES
39	32	MAYER& CIE	GERMANY	S/J SLITTING	24/28	102	1	YES
40	32	MAYER& CIE	GERMANY	S/J SLITTING	24/28	102	1	YES
41	32	FUKUHARA	JAPAN	S/J SLITTING	20/24/28	106	1	YES
42	32	FUKUHARA	JAPAN	S/J SLITTING	20/24/28	106	1	YES
43	34	MAYER& CIE	GERMANY	S/J SLITTING	24/28	108	1	YES
44	34	MAYER& CIE	GERMANY	S/J SLITTING	24/28	108	1	YES

45	34	FUKUHARA	JAPAN	S/J SLITTING	24/28	110	1	YES
46	34	FUKUHARA	JAPAN	S/J SLITTING	24/28	110	1	YES
47	36	MAYER& CIE	GERMANY	S/J SLITTING	20/24/28	114	1	YES
48	36	MAYER& CIE	GERMANY	S/J SLITTING	20/24/28	114	1	YES
49	36	FUKUHARA	JAPAN	S/J SLITTING	24/28	118	1	YES
50	36	FUKUHARA	JAPAN	S/J SLITTING	24/28	118	1	YES
51	46	FUKUHARA	JAPAN	S/J	20/24	138	1	YES
52	46	FUKUHARA	JAPAN	S/J	20/24	138	1	YES
53	48	FUKUHARA	JAPAN	S/J	20/24	144	1	NO
54	48	FUKUHARA	JAPAN	S/J	20/24	144	1	NO
55	44	LISKY	TAIWAN	S/J	20/24	264	1	NO
56	44	LISKY	TAIWAN	S/J	20/24	264	1	NO
57	52	LISKY	TAIWAN	S/J	20/24	312	1	NO
58	52	LISKY	TAIWAN	S/J	20/24	312	1	NO

FLEECE

252/253	28	FUKUHARA	JAPAN	3- THREAD FLEESE	16/20	84	2	YES
254/255	30	FUKUHARA	JAPAN	3- THREAD	16/20	90	2	YES

RIB / INTERLOCK

101	30	WELL	TAIWAN	RIB	18	52	1	YES
102	30	FUKUHARA	JAPAN	RIB/ INTERLOCK	18/22	60	1	YES
103	33	FUKUHARA	JAPAN	RIB/ INTERLOCK	18	60	1	YES
104	33	FUKUHARA	JAPAN	8 LOCK	16/18/22	60	1	YES
105/106	34	FUKUHARA	JAPAN	RIB/ INTERLOCK	18/22	60/62	2	YES
107	36	FUKUHARA	JAPAN	RIB/ INTERLOCK	18/22	60	1	YES
108	36	FUKUHARA	JAPAN	8 LOCK	16/18/22	60	1	YES
109	38	FUKUHARA	JAPAN	8 LOCK	18/22	64	1	YES

110/111	38	FUKUHARA	JAPAN	RIB/ INTERLOCK	18/22	68	2	YES
112/113	40	FUKUHARA	JAPAN	8 LOCK	14/16/18	68	2	YES
114/115	42	FUKUHARA	JAPAN	RIB/ INTERLOCK	14/18/22	72	2	YES

INTERLOCK

151	30	FUKUHARA	JAPAN	INTERLOCK	22	108	1	NO
152/153/154	36	FUKUHARA	JAPAN	INTERLOCK	22	120	3	NO
155 TO 158	38	FUKUHARA	JAPAN	INTERLOCK	22	126	4	NO
159	50	LISKY	TAIWAN	INTERLOCK	18/22	180	1	NO

S/J AUTO STRIPER

201/202/203	30	FUKUHARA	JAPAN	AUTO STRIPER 4 COLOR	16/20	48	3	NO
205	30	FUKUHARA	JAPAN	AUTO STRIPER 6 COLOR	20/24	42	1	YES
204	34	FUKUHARA	JAPAN	AUTO STRIPER 4 COLOR	20	48	1	NO

A/S RIB/ INTERLOCK

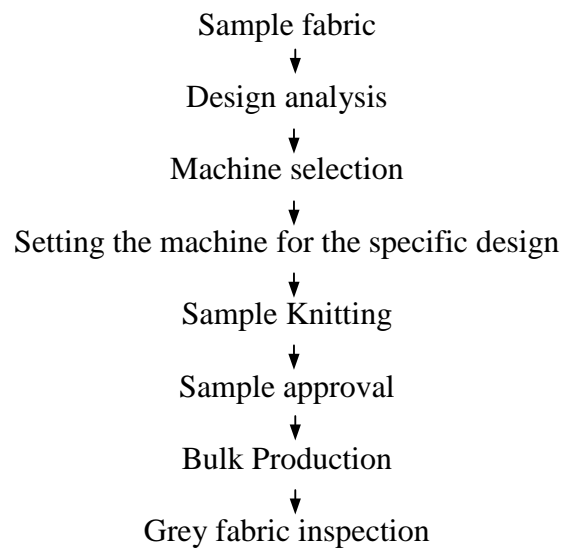
226	33	FUKUHARA	JAPAN	AUTO STRIPER 4 COLOR	18/24	48	1	YES
227	36	FUKUHARA	JAPAN	AUTO STRIPER 4 COLOR	18/24	48	1	YES

FLAT KNIT M/C

SL	Model	BRAND	GAUGE	WIDTH	FEEDER	TYPE	ORIGIN	QTY
1, 9- 11	MC 172SJ	MATSUYA	14"	68"	06	Computerized	China	04

2-3	CMT 211	STOLL	14''	84''	06	Semi- Jacquard	Germany	02
4-8	SFF 152	SHIMA SEIKI	14''	60''	04	Computerized	Japan	05
12-15	PT 222 new	PROTTI	14''	218cm	06	Computerized	Italy	04

Production Flow Chart of Knitting Section:



Production Parameters in Knitting Section:

This section plans for knitting production. Following parameters are important for the planning of knitting the fabric –

- » Order quantity (required amount of fabric to be knitted)
- » Type of fabric to be knitted (S/J, rib, interlock)
- » No of machine to be used
- » Type of yarn used
- » Sources of yarn
- » Fabric GSM, width

The main parameters controlled in knitting section are stitch length, GSM, Fabric diameter etc.

PRODUCTION CALCULATION:

A. Production/shift in kg at 100% efficiency

Width x length x GSM

1000

B. Production/shift in meter *Course/min* .

Course/cm

RPM *No.of Feeder* 60 12 *Efficiency*

Course/cm 100

IIDG X No. of feeder X S.L X Machine Total REV

C. Production per REV =

KG

1000 X 0.9144 X 840 X Count X 2.204

D. Fabric width in meter

*Total
no.of wales*

Wales /cm 100

Total no.of Needles used inknitting

Wales /cm 100

E. Theoretical fabric width

$$\begin{aligned} \text{No. of needle X Wales width} &= \pi \text{DG X Yarn Diameter} \\ &= \pi \text{DG X } 4 \text{ X } \frac{1}{28} \sqrt{\text{count inch.}} \end{aligned}$$

F. Fabric G.S.M:

$$\text{For Single Jersey} = 590.5 \text{ X } 16.1 \text{ /S.L /yarn Count.}$$

$$\text{For Rib} = 590.5 \text{ X } 18.1 \text{ /S.L /yarn Count.}$$

$$\text{For Interlock} = 590.5 \text{ X } 26.1 \text{ /S.L /yarn Count.}$$

Machine Production Calculation:

Say,

$$\text{Feeder} = 90$$

$$\text{Efficiency} = 100\%$$

$$\text{Machine Dia} = 30$$

$$\text{Machine Gauge} = 24$$

$$\text{Yarn Count} =$$

$$30/1 \text{ Stitch}$$

$$\text{Length} =$$

$$2.56\text{mm}$$

$$\text{Machine Total REV} = 1500.$$

$$\pi \text{DG X No. of feeder X S.L X Machine Total REV}$$

$$\text{Production per 1500 REV} = \frac{\text{_____}}{\text{KG}}$$

$$1000 \text{ X } 0.9144 \text{ X } 840 \text{ X Count X } 2.204$$

$$= 15.40 \text{ KG.}$$

Fabric G.S.M Calculation:
Fabric G.S.M (Grey)

$$\begin{aligned} S/J &= 590.5 \times 16.1 / S.L / \text{Yarn Count} \\ &= 590.5 \times 16.1 / 2.56 \\ / 30 &= 124. \end{aligned}$$

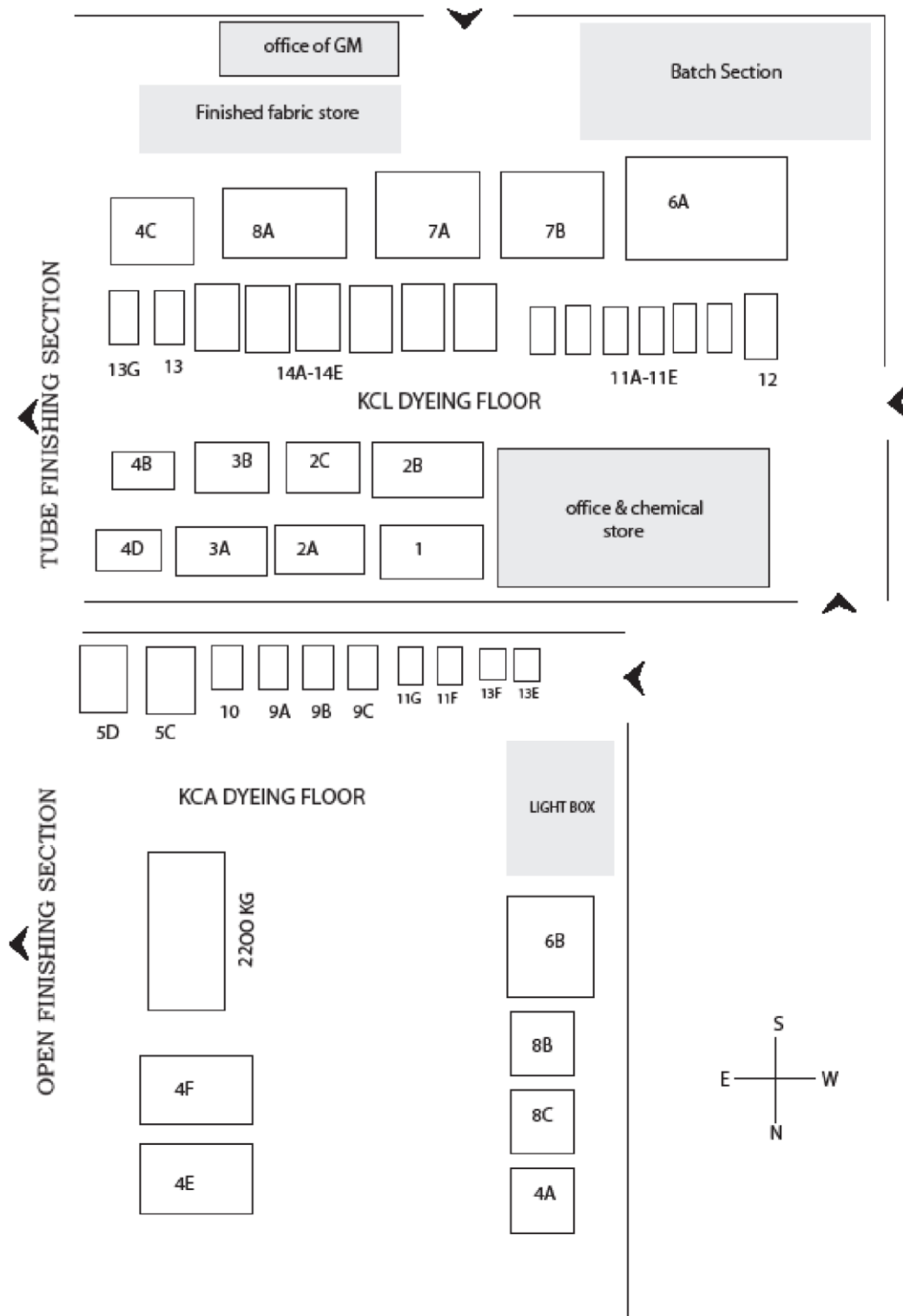
So, Fabric GSM = 124.

Chapter 10

Knit dyeing



Lay out of Knit-Dyeing section:



Batching 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 quality = Total required quantity X Dia Quantity
- ✓ Batch Ratio = Total batch quantity + total parts / Batch quantity
- ✓ Batch distribution:
 - Batch is distributed according to nozzle capacity.
 - During distribution maximum equilibrium of different parts is taken into consideration.
 - Lycra fabrics are slit-cut to heat-set. That's why before dyeing they need to re-sewn. This is done by Bag-sewing m/c.
 - Tubular fabrics are turned into there backside by turning machine.

List of machines in Batch Section:

- **BACK SEWING MACHINE**
 Manufacture: MTG MECCANICA SNC
 Country of origin: Italy

- **TURNING MACHINE**
 Brand Name: HSING CHENG
 Model: HC –TFM-1500mm
 Country of origin: Thailand
 No of motor: 02
 Motor: 210HP
 Power: 220v
 Year of manufacture: 20

- **OVER LOCK MACHINE**
 Brand Name: JUKI
 Model No: 3614
 Country of Origin: Japan

Point to be considered

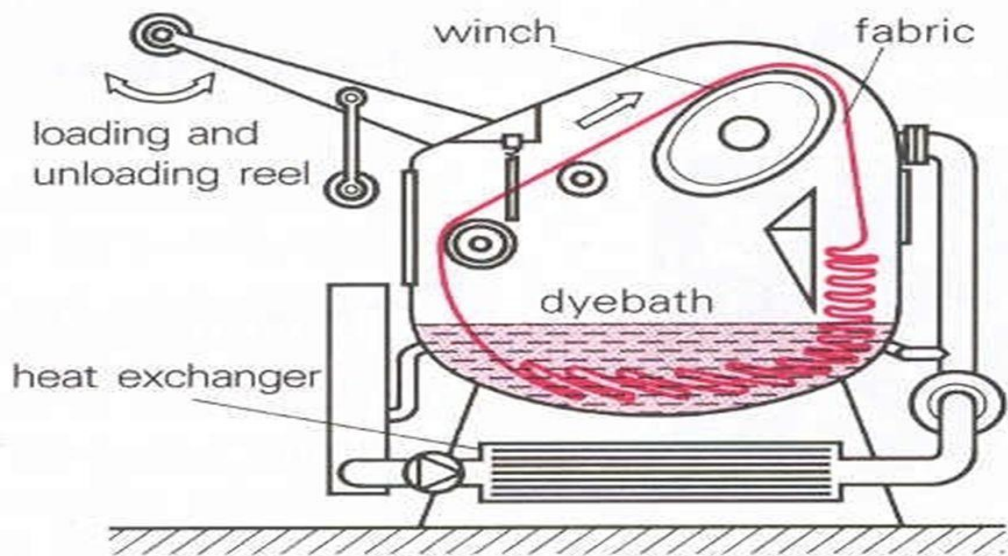
- During batching 11-12% extra fabric should be taken than the ordered fabric
- Fabric should be turned over. I.E. front side of the fabric is turned to the back side
- Fabric should be batched equally for every nozzle.
- Last end of the fabric of the roll is sewn to the first end of the other roll to make required length of the required weight of the fabric.
- If collar & cuff is present they should be batched to each nozzle with body fabric in such a way that each nozzle gets equal no. of collar & cuff.
- When same color but different dia of fabric has to batch in the case, every fabric of different dia of equal quantity of weight should be batched in every single nozzle of the m/c.

Mechanism of dyeing m/c

- Main parts of dyeing m/c:
 - ✓ Main Vessel or Chamber
 - ✓ Winch roller
 - ✓ Heat Exchanger
 - ✓ Nozzle
 - ✓ Reserve Tank
 - ✓ Chemical dosing tank
 - ✓ Utility lines
 - ✓ Controlling unit or Processor
 - ✓ Fabric Plaiter
 - ✓ Different types of motors & Valves

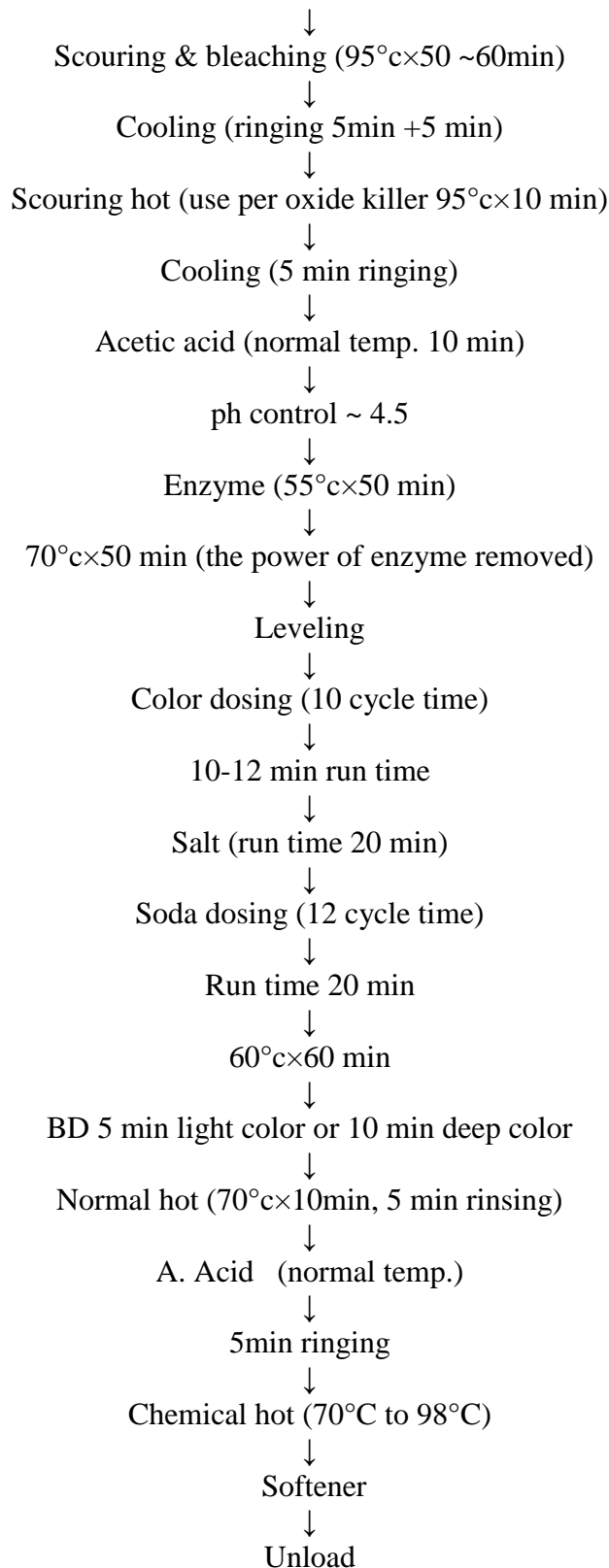
- Working principle of winch dyeing m/c:

Winch Dyeing machines are most suitable for knit fabric dyeing. Here fabric is dyed in tubular form where fabric runs in endless circular path. Inside the machine 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 circulate by a high pressure pump. The main pump draws the liquor from the bottom of the vessel & passes 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.



Dyeing process in knit concern LTD

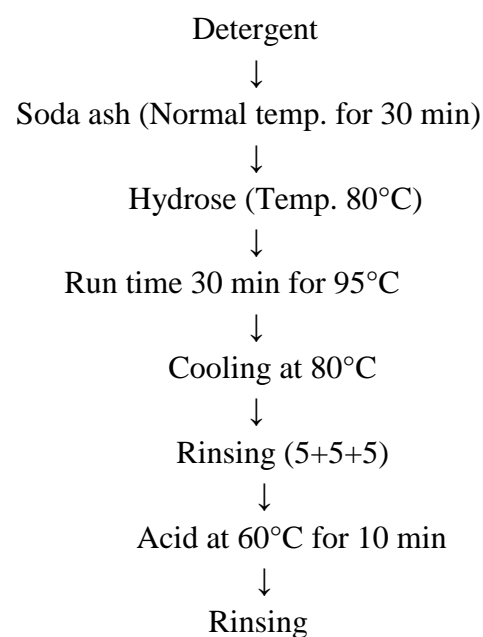
Fabric loading



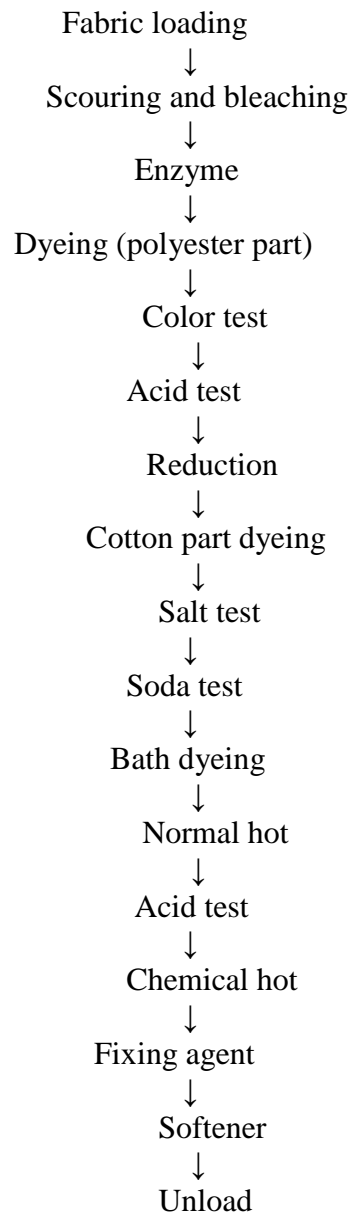
Dark room/matching room:

Dark Room is the major place in dyeing Section where contain four main lights to match the color according to the process sequence for any shade. The main four lights are D 65, TL 83, TI 84 and UV light. In case of white color UV light will be used to match color in various stages since dyeing. D 65 is used maximum. And for others color D 65 light is used. All types of light set on to the light box and under the light box shade will be check. According to the Lab report the buyer gives shade conformation report which includes Std. Swatch, App. Lab dip, Revised Lab and App. Sample. It's important to inform that before come to the bulk dyeing the sample dyeing will be done. Sometimes topping will be done according to the duty stuffs.

Process sequence of dye bath wash:



A full process of a CVC fabric



Production parameters:

➤ PH

- ✓ During scouring & bleaching 10-11
- ✓ During enzyme 4.5
- ✓ During levelling 6.5-7
- ✓ Color steam:
 - reactive dyeing 10.5-11
 - disperse dyeing 4.5-5.5
- ✓ During fixing 4.0-5.5
- ✓ During softening 4.0-5.5

➤ Temperature

- ✓ For cotton scouring & bleaching 90-98
- ✓ For polyester dyeing 100-135
- ✓ For cotton dyeing
 - 80 to 90 (hot brand)
 - 40 to 60 (cold brand)
- ✓ For cotton hot wash 70-80
- ✓ For cotton cold wash 30-40
- ✓ For cotton acid wash 60-70

➤ Time

- ✓ In Cotton Dyeing
 - Scouring & Bleaching 60-90 Min
 - Scouring Hot 10 Min
 - Enzyme 50 Min
 - Levelling 10 Min
 - Softening 20 Min
- ✓ For Color Steam Both Reactive & Disperse 60-90 Min
- ✓ M:L =1:7

Machine specification:

Sample m/c

<p>Machine No: 09 Brand Name: FONGS Model: ALLFIT -60 Serial No: 28015417 Country Of Origin: Honkong Machine Type :HP/HT Machine Capacity: 60 Kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 02 No of motor: 08</p>	<p>Machine No: 10 Brand Name: FONGS Model: ALLFIT -60 Serial No : 26012103 Country Of Origin : Honkong Machine Type :HP/HT Machine Capacity: 100 Kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 02 No of motor: 08</p>
<p>Machine No: 11 A Brand Name: FONGS Model: ALLFIT -30 Serial No :26011959 Country Of Origin: CHINA Machine Type :HP/HT Machine Capacity :30 Kg Cycle time: 03 min No of cycle : 12 Main pump speed :80-150 m/min Winch speed: 250 m/min No of Nozzle : 01 No of motor: 08</p>	<p>Machine No: 11 B Brand Name: FONGS Model: ALLFIT -30 Serial No :29017180 Country Of Origin : Honkong No of Nozzle : 01 No of motor: 08 No of cycle : 12 Main pump speed :80-150 m/min Winch speed: 250 m/min</p>

<p>Machine No: 11 C Brand Name: FONGS Model: ALLFIT -30 SeriNo:29017183 Country Of Origin : Honkong Machine Type :HP/HT Machine Capacity :30 Kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 01 No of motor: 08</p>	<p>Machine No: 11 E Brand Name: FONGS Model: ALLFIT -30 Serial No :29017181 Country Of Origin : Honkong Machine Type :HP/HT Machine Capacity :30 Kg Cycle time: 03 min No of cycle : 12 Main pump speed :80-150 m/min Winch speed :250 m/min</p>
<p>Machine No: 11 D Brand Name: FONGS Model: ALLFIT -30 Serial No :29017182 Country Of Origin : Honkong Machine Type :HP/HT Machine Capacity :30 Kg Cycle time: 03 min No of cycle : 12 Main pump speed :80-150 m/min Winch speed: 250 m/min No of Nozzle: 0 1 No of motor: 08</p>	<p>Machine No: 12 Brand Name: FONGS Model: GN-18 Serial No :24010324 Country Of Origin: CHINA Machine Type :Environmental Machine Capacity: 100 Kg Cycle time: 03 min No of cycle : 12 Main pump speed :80-150 m/min Winch speed :250 m/min No of Nozzle: 0 1 No of motor: 08</p>

Bulk dyeing machine:

Bulk M/C	Bulk M/C
<p>Machine No: 01 Brand Name: FONGS Model: GN 6-SR -6T Serial No :26012102 Country Of Origin : Honkong Machine Type: HP/HT Machine Capacity: 2000 Kg Actual capacity : 1900 kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 06 No of motor: 08 M : L = 1 : 8</p>	<p>Machine No : 2B Brand Name: FONGS Model : GN-18 M-4 T Serial No : 2G011473 Country Of Origin : Honkong Machine Type : Environmental Machine Capacity : 800 Kg Cycle time : 03 min No of cycle 12 Main pump speed : 80-150 m/min Winch speed : 250 m/min No of Nozzle: 04 No of motor: 08</p>
<p>Machine No: 2A Brand Name: FONGS Model: GN 6-SR -4T Serial No :26012101 Country Of Origin : Honkong Machine Type: HP/HT Machine Capacity: 800 Kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 04 No of motor : 08</p>	<p>Machine No: 2C Brand Name: FONGS Model: GN-18 M-4 T Serial No :24010297 Country Of Origin : Honkong Machine Type :Environmental Machine Capacity :800 Kg Cycle time: 03 min No of cycle : 12 Main pump speed :80-150 m/min Winch speed :250 m/min No of Nozzle: 04 No of motor: 08</p>

<p>Machine No: 3A Brand Name: FONGS Model: GN-6 SR-3T Serial No : 26012100 Country Of Origin : Honkong Machine Type: HP/HT Machine Capacity: 800 Kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed :250 m/min No of Nozzle: 03 No of motor: 08</p>	<p>Machine No: 4A Brand Name: FONGS Model: GN-6-2T Serial No :23009446 Country Of Origin : Honkong Machine Type :HP/HT Machine Capacity :400 Kg Cycle time: 03 min No of cycle : 12 Main pump speed :80-150 m/min Winch speed :250 m/min No of Nozzle: 02 No of motor: 08</p>
<p>Machine No: 3B Brand Name: FONGS Model: GN-18 M-3T Serial No :24010325 Country Of Origin : Hong kong Machine Type :Environmental Machine Capacity :600 Kg Cycle time: 03 min No of cycle : 12 Main pump speed :80-150 m/min Winch speed :250 m/min No of Nozzle : 01 No of motor: 08</p>	<p>Machine No: 4B Brand Name: FONGS Model: GN-18 M-2T Serial No :23009199 Country Of Origin : Honkong Machine Type :Environmental Machine Capacity :400 Kg Cycle time: 03 min No of cycle : 12 Main pump speed :80-150 m/min Winch speed :250 m/min No of Nozzle : 01</p>

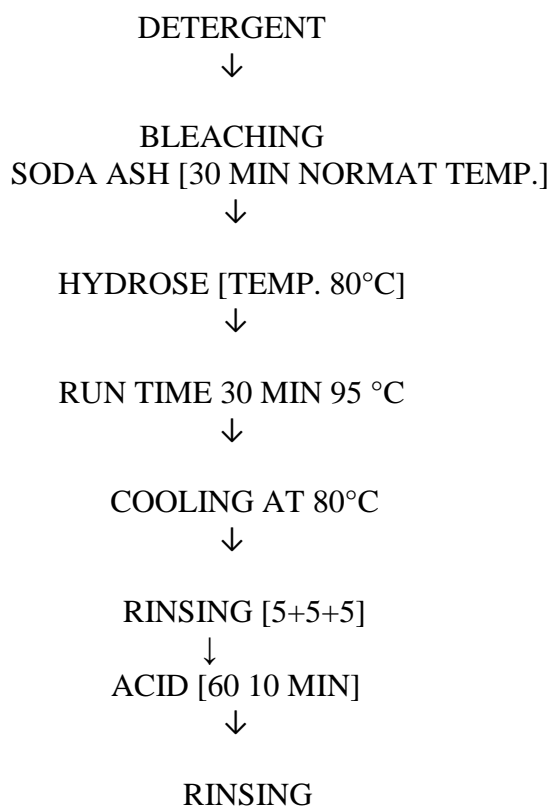
<p>Machine No: 4C Brand Name: FONGS Model: GN-18-2T Serial No : 23009200 Country Of Origin : Honkong Machine Type: Environmental Machine Capacity: 400Kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 02 No of motor: 08</p>	<p>Machine No: 5A Brand Name: FONGS Model: GN-6-1T Serial No :23009447 Country Of Origin : Honkong Machine Type :HP/HT Machine Capacity :200 Kg Cycle time: 03 min No of cycle: 12 Main pump speed :80-150 m/min Winch speed :250 m/min No of Nozzle: 01 No of motor: 08 Power</p>
<p>Machine No: 4D Brand Name: FONGS Model: ECO-6-2T Serial No :28015334 Country Of Origin : Honkong Machine Type: HP/HT Machine Capacity: 400 Kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 02 No of motor: 08</p>	<p>Machine No: 5B Brand Name: FONGS Model: GN-18 M-4 T Serial No :26011472 Country Of Origin : Honkong Machine Type :HP/HT Machine Capacity :200 Kg Cycle time: 03 min No of cycle : 12 Main pump speed :80-150 m/min Winch speed :250 m/min No of Nozzle: 0 1 No of motor: 08</p>
<p>Machine No : 4E Brand Name: FONGS Model: ECO-6-2T Serial No :28015334 Country Of Origin : Honkong Machine Type: HP/HT M/C capacity : 500 kg Loading capacity : 400 kg Minimum water : 2000 L Maximum water : 5000 L M : L = 1: 5 No of Nozzle: 02 No of motor: 08</p>	<p>Machine No : 5C Brand Name: FONGS Model: ECO-6-2T Serial No :28015334 Country Of Origin : Honkong Machine Type: HP/HT M/C capacity : 500 kg Loading capacity : 400 kg Minimum water : 2000 L Maximum water : 5000 L M : L = 1: 5 No of Nozzle: 02 No of motor: 08</p>

<p>Machine No: 6A Brand Name: FONGS Model: ECO-38-6T Serial No : 28014582 Country Of Origin : Honkong Machine Type: Environmental Machine Capacity: 1500Kg Cycle time: 03 min No of cycle: 12 Main pump speed : 80-150 m/min Winch speed: 250 m/min No of Nozzle: 02 No of motor: 08 Power</p>	<p>Machine No: 7B Brand Name: FONGS Model: ECO-38-4T Serial No :28015423 Country Of Origin : Honkong Machine Type: Environmental Machine Capacity: 1000Kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 02 No of motor: 08</p>
<p>Machine No: 6B Brand Name: FONGS Model: ECO-38-6T Serial No :28014581 Country Of Origin : Honkong Machine Type: Environmental Machine Capacity: 1500 Kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 06 No of motor: 08</p>	<p>Machine No: 7E Brand Name: FONGS Model: ECO-38-3T Serial No :28015422 Country Of Origin : Honkong Machine Type: HP/HT Capacity: 1000 Kg Loading capacity : 800-900 kg Cycle time: 03 min No of cycle: 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle : 02 No of motor: 08 M : L = 1:5</p>

<p>Machine No: 7F Brand Name: FONGS Model: ECO-38-3T Serial No :28015422 Country Of Origin: Honkong Capacity: 1000 kg Loading capacity : 800-900 L Minimum water : 3200 L Maximum water : 4000 L Cycle time: 03 min No of cycle: 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min M : L = 1:5</p>	<p>Machine No: 8A Brand Name: FONGS Model: ECO-38-3T Serial No :28015422 Country Of Origin : Honkong Machine Type: Environmental Machine Capacity: 750Kg Cycle time: 03 min No of cycle: 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle : 02 No of motor: 08</p>
<p>Machine No: 8B Brand Name: FONGS Model: GN 6-SR -4T Serial No : 26012101 Country Of Origin: Honkong Machine Type: HP/HT Machine Capacity: 800 Kg Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 04 No of motor : 08</p>	<p>Machine No: 8C Brand Name: FONGS Model: GN 6-SR -4T Serial No : 27012103 Country Of Origin: Honkong Machine Type: HP/HT Machine Capacity: 750 Kg Minimum water : 3000 L Maximum water : 3500 L Cycle time: 03 min No of cycle : 12 Main pump speed: 80-150 m/min Winch speed: 250 m/min No of Nozzle: 04 No of motor : 08 M : L = 1 : 5</p>

Machine Wash:

In dyeing m/c wash is very important activities .Without m/c wash it is quite impossible to go through next dyeing process. In case of m/c wash detergent, bleaching powder soda Hydrose is used. The process for m/c wash is given below.



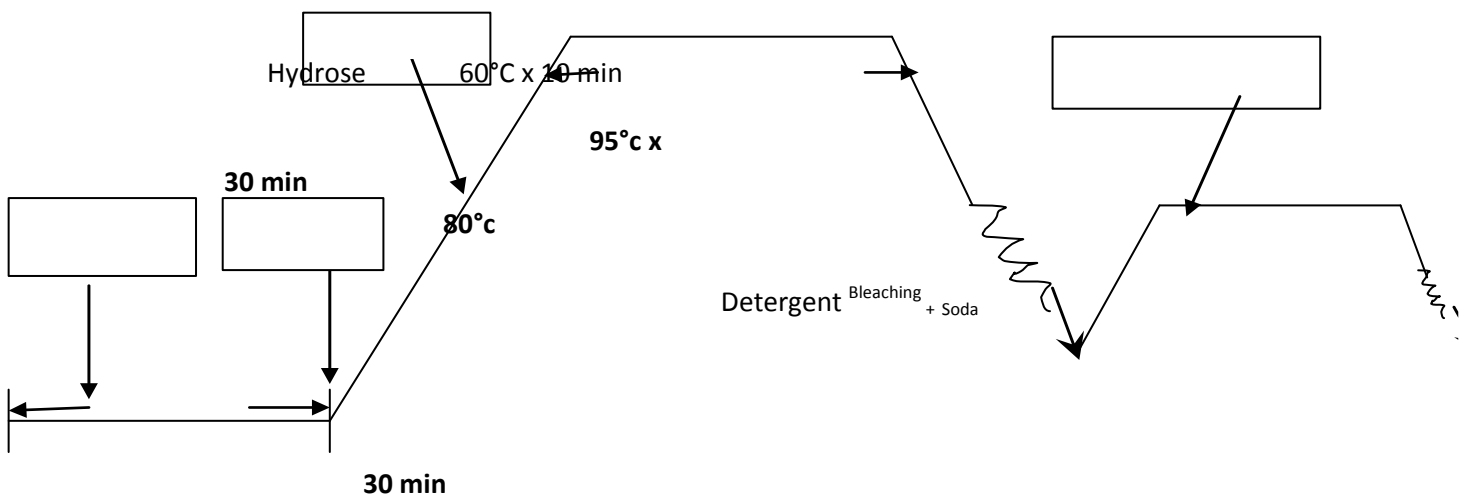


Figure : Curve for M/C Wash

Recipe for Black shade:

PRETREATMENT:

Finocon KRCP	:	0.5 g/l
Kappasol -AF-2000	:	
0.1 g/l Felosan NOF	:	
0.5 g/l		
Kappavon CL	:	0.5 g/l
Kappaquest FE	:	0.3 g/l
Kappazon H53	:	0.35 g/l
Caustic soda	:	2.0 g/l
Soda	:	x g/l
H2O2 (50%)	:	2.0 g/l
A. acid	:	0.3 g/l
Bio EC	:	
0.5 g/l		

DYEING

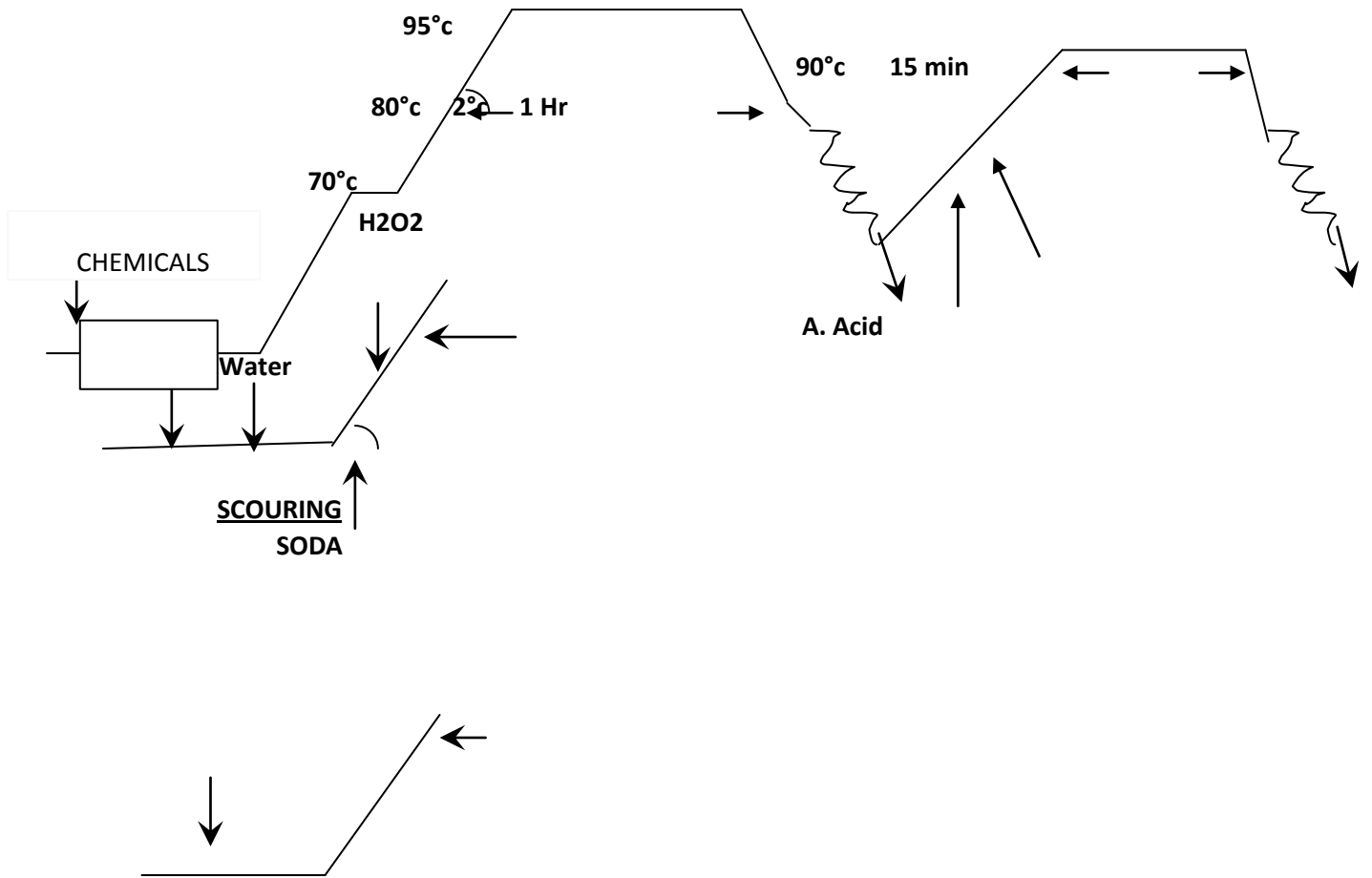
Kappasol AF 2000	:	0.2 g/l
Kappavon CL	:	0.7 g/l
DBC/DPE	:	0.5 g/l
Dyes	:	X %
Salt	:	X g/l
Soda	:	X g/l

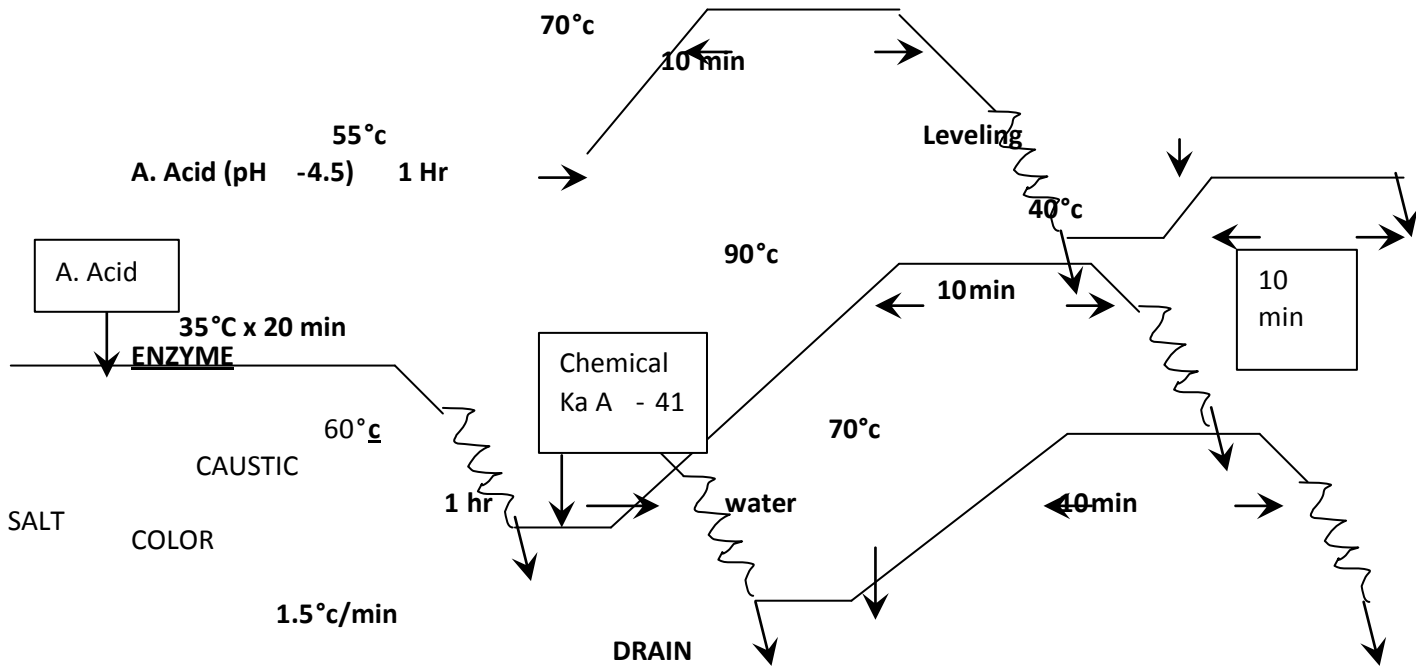
AFTERTREATMENT

A. acid	:	1.0 g/l
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Cibapon R/rwa	1.00 g/l
Fixing	X %
Softener	1 %

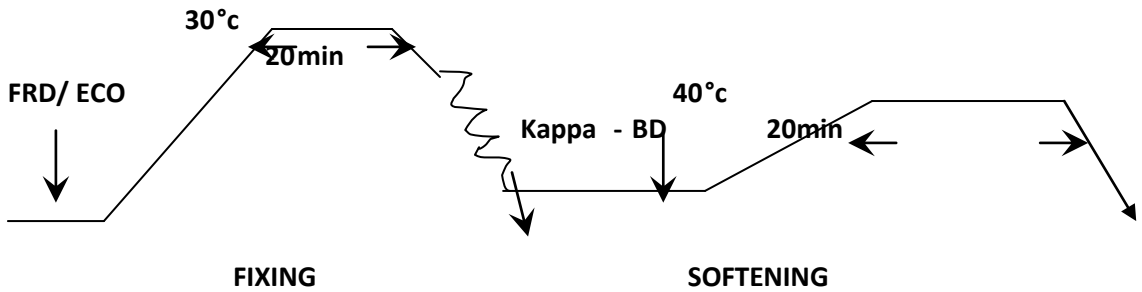
Curve for Black Shade:





COLOR STEAM

NORMAL HOT CHEMICAL HOT



Chapter 11

Finishing section



Finishing Section:

Textile finishing, in a restricted sense, is the term used for a series of processes to all which Bleached, dyed, printed & certain greige fabrics are subjected before they are put to market.

Objectives of finishing:

- Improving the appearance, luster, whiteness etc.

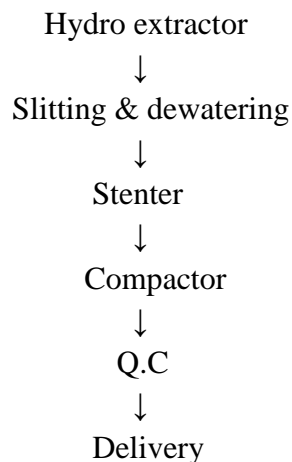
- Improving the feel, which depends on the handle of the material & its softness, suppleness etc
- Wearing qualities, non- soiling, antcrease, antishrink comfort etc.
- Special properties required for particular uses -water -proofing flame proofing etc.
- Covering of the faults in the original cloth.
- 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

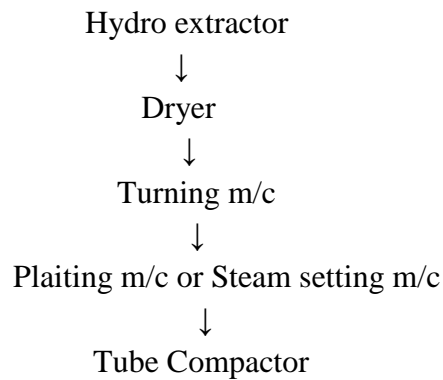
Open-finish section:

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-



Tubular fabric finish section:

Tubular fabrics are generally used for Ladies wear & Baby dress. In KCL huge orders of tubular product are manufactured. The Machines or Finishing Sequence for Tube-Finishing are as following –



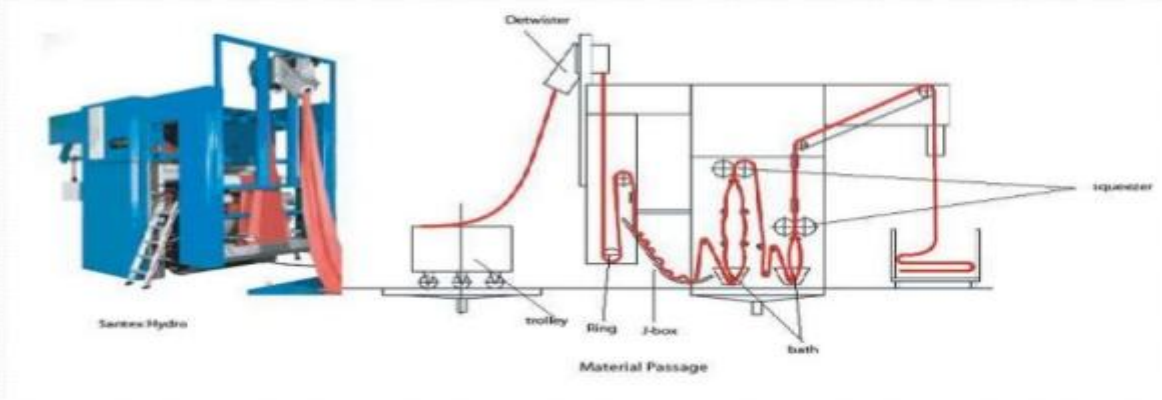
Description of Different Finishing Machines:

- HYDRO-EXTRACTOR-PADDER
Manufacture: 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“.

HYDRO-EXTRACTOR-PADDER



Important Parts & Zones:

- ✓ Detwister: Un-rove the roped form fabric after dyeing by twisting & turning.
- ✓ J-Box: Overfeeding zone, which ensures tension-free movement of fabric.
- ✓ Water & Softener bath: 1st bath is only water, 2nd one is for softener.
- ✓ Padder: 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:

1. Fabric Passing Speed:

Depends on count & gsm.
For low GSM fabric – 60-65 m/min
For Medium – 55- 58 m/min
For High – 50-52 m/min

2. Overfeed regions:

J – box, Before Padder 1 & Padder 2

3. Pressure in Padder: Padder 1 – 4-5 bar
Padder 2 – 3.5- 4 bar

4. Types of Softener used:

Anionic, Cationic & Silicon softeners are used.
pH of bath should be 4.5-5.0
Concentration of softener – 10 g/l
Bath is changed after every 100 kg fabric.

5. Dia of Shaper: Max. 52 inches
Min. 18 inches

6. Water recovery%: 140-150%

7. Power consumed: 400 v. 50 Hz

➤ DRYER

Manufacturer: SANTEX, SWITZERLAND.
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)
 - II. Lower level (3chambers)
- ✓ Heating system associated by STEAM Line & Nozzles.
- ✓ Blower, to spread the steam through-out the chambers.
- ✓ Exhaust air ventilator.

Technical Parameters:

Temperature: For colored fabric – Chamber 1 – 140
Chamber 2 – 150
Chamber 3 – 130
For White (bleached) - all chambers - 120

Working width : 3000 mm
Speed : 8-80 m/min
Nozzle distance : 35-55 mm
Power consumption : 140 kw

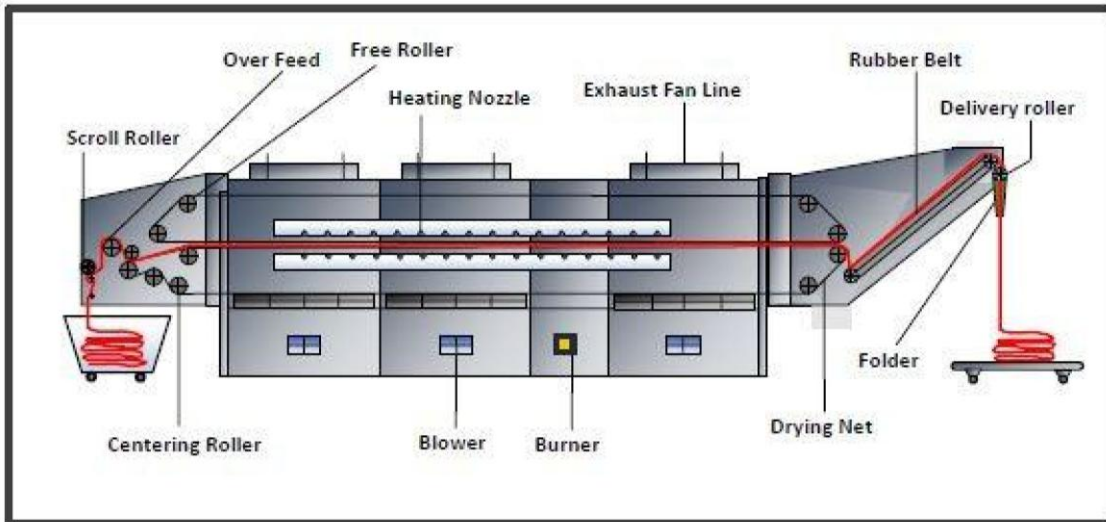


Figure: Dryer

➤ **TUBE COMPACTOR**

Manufacturer:

SANTEX, SWITZERLAND

No. of m/c – 1

TUBETEX, USA

No. of m/c – 2

Function:

- ✓ To control Dimensional stability of fabric.
- ✓ Control GSM of fabric.
- ✓ Make Shiny effect on fabric surface.

Main Parts of Compactor:

- ✓ Feed section – tension control & metal detector.
- ✓ Shape – Set according to the dia of fabric
- ✓ Steam zone.
- ✓ Take out & Plaiter zone
- ✓ Compacting Zone: It's a roller & shoe arrangement & the most important zone which consists of two rollers, the Feed roller (recarter roller) & the Retard roller. They are heated by Shoe, into which hot thermo-oil runs through

Technical Parameters:

1. Speed of passing fabric: 22-40 m/min
2. Shaper length : According to required Dia

3. 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
 Plaiter – 0.80-0.85
4. Compaction% : According to Shrinkage result S/J – 10-15%
 Rib – 10-12%
 Interlock – 8-10%
 Pique – 7-8%
5. Shoe pressure : S/J – large dia – avg. 30 psi
 S/J – smaller dia – 10-15 psi
 Rib – 10-20 psi
 Lycra - <10 psi
6. Power consumed: 80 kw
7. Thermo-Oil temperature: 90

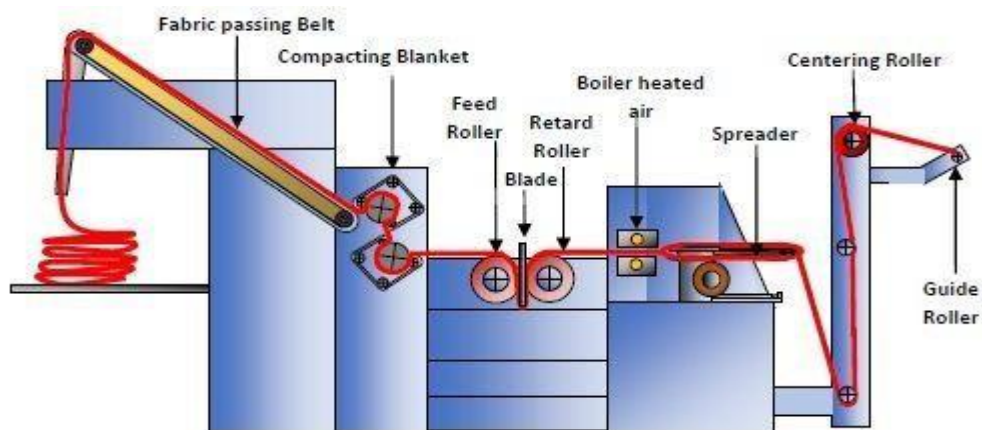


Figure : Tube Compacting machine

➤ 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

➤ Main Parts:

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

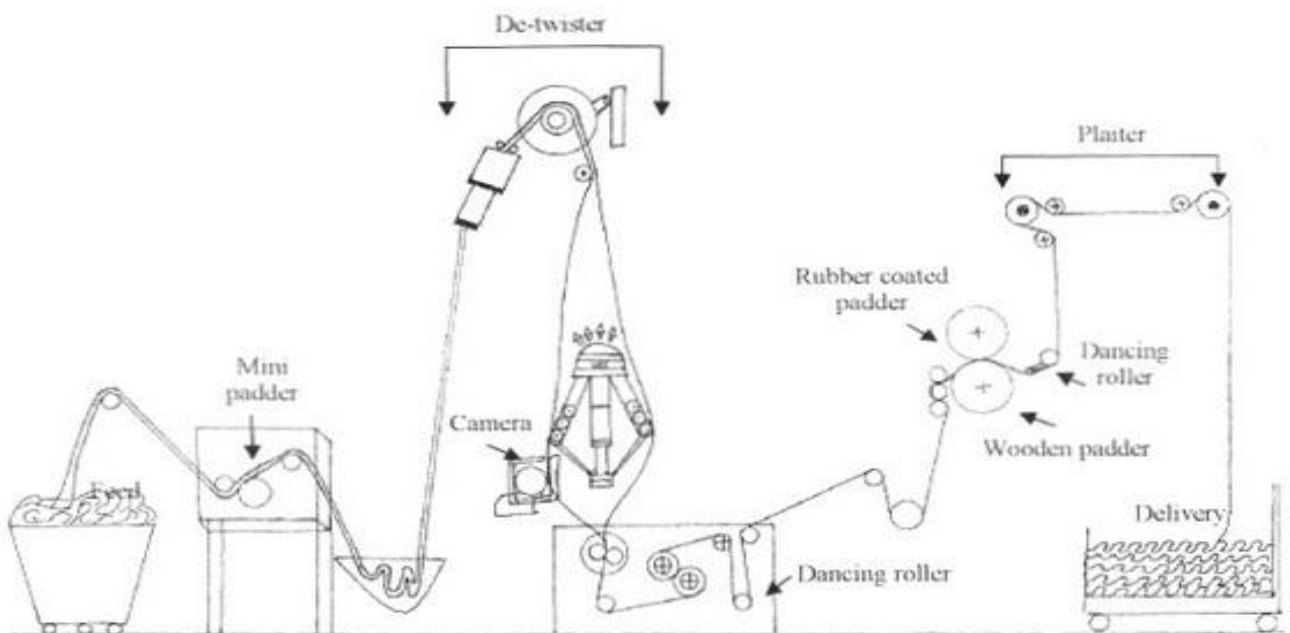


Fig: Passage diagram of slitting m/c

Technical Parameters:

- Speed : Varies with type of fabric
Overfeed : In feed zone, cutting zone, Conveyor belt (20-30%)
Pressure : In Detwister zone-0.5 bar, in Padding – 4-5 bar

STENTER M/C

- 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.

Important Zones & Parts:

- Back Zone - Guider
- Two Baths & Padder or Squeezer
- Auto centering
- Middle Zone - Over feed regions
- Bianco or Mahlo arrangement.
- Chain & clip system
- Chambers (Contains blower, heater, recovery)
- Front Zone - Over feed zone
- Plaiting
- Static electricity remover.

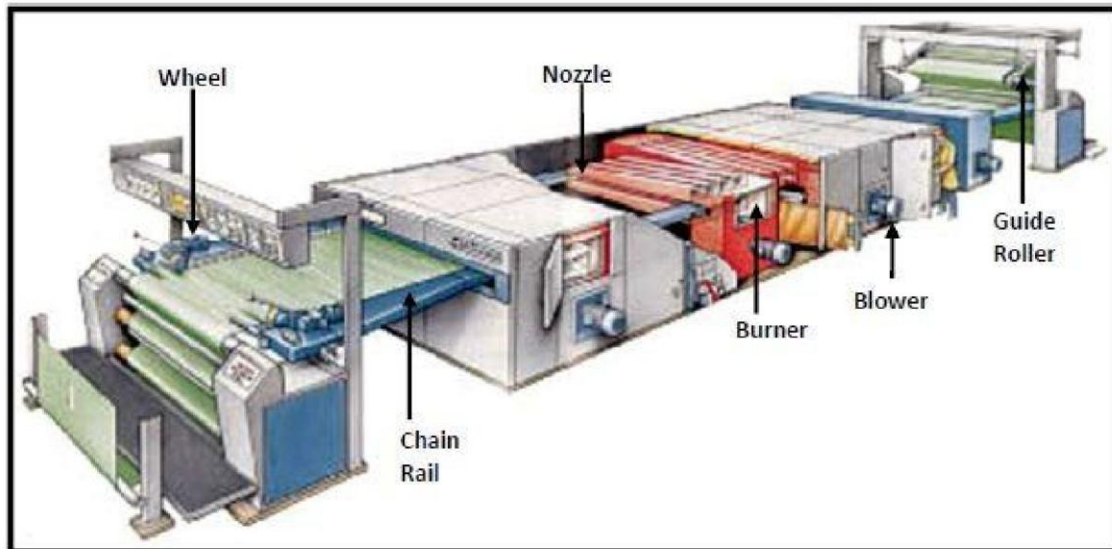


Figure : Stenter Machine.

Technical Parameters:

Fuel used for heating	: Gas (for Gas-Stenter) Thermo-Oil (for Oil-Stenter)
Working Width	: 600-2600 mm
Total Length	: 138 ft.
No. of Chambers	: 8
Chamber length	: 10 ft. each
No of Motors	: 96
Padder Pressure	: Max. air Pressure – 10 bar (avg. 5-7) Max. Steam Pressure – 0.7 bar
Overfeed Ratio	: Back Zone – 0-5 Master overfeed – 80% (in case of heat set 15-20%) Wheel overfeed – 3% Feed overfeed – 3-5% Take-up overfeed – 15-20%
Temperature	: Normal – 130-150 Heat-Set – 180-210
Speed of Passing Fabric	: Normally 35-40 m/min Heat set 18-22 m/min Lycra +8-10%
Padder bath capacity	: 250 lit
Types of Softener used	: White, Color, Silicon Softener

Production:

Capacity: 5 tones/shift

Actual production: 3.5-4.5 tones/shift

Heating Arrangement:

For Gas Stenter : Rotamatic Burner

For oil Stenter : Thermo-oil

Comparative study between two STENTER M/C

KDST-02 Stenter (Gas)	KDST-03Stenter (Thermo oil)
1. Here gas is used to heat the chamber	1. Here thermal oil is used to heat the chamber
2. Heating capacity : 2560 kw	2.Heating capacity : 2640 kw
3.Year of Construction : 2006	3.Year of Construction : 2008
4. Calorific value is not present	4. Calorific value : 9.87 KWH/Nm3
5. Its needs more time to grow heat and also to cool.	5. It can grew heat more quickly and also cool so fastly.
6. It has two take up roller in delivery side.	6. It has one take up roller in deliver side.
7. It has recovery system.	7. It has no recovery system

➤ OPENWIDTH COMPACTOR

M/C quantity : 01

Brand : Brukner, Germany

Maxm line speed : 60 m/min

Useable line speed : 30 m/min

Maxm dia : 95"

Workable dia : 90"

Steam box temp. : 80° C

Feed R/L temp. : 105° C

Over feed (%) : up to 50 %

Shoe pressure : Max-18 Min-5

Sensor Position : - Shoe pressure (One shoe)

- Retard Roller ratio

- Pliater Ratio

- Right-Left roller pressure

Function of the Machine:

1. To compact the fabric
2. To control the shrinkage
3. To maintain proper width and G.S.M

Heating system: Steam

Main parts of the machine:

1. Heating chamber
2. Blower
3. Synthetic blanket as a conveyor,
4. Folder
5. Exhaust fan
6. Unpinning cylinder (-40%+40%)
7. Belt cylinder (-40%+40%)
8. Uncurling device at entry of compacting zone.
9. Sensor
10. Brush roller

Additional attachment:

- i) Selvedge cutting
- ii) Selvedge safety
- iii) Pinning safety
- iv) Selvedge unrolling

Production:

Capacity : 5 tones/shift or 10 tons/day
Actual production : 4 tones/shift.
Utility : Steam Electricity, Compressed air.

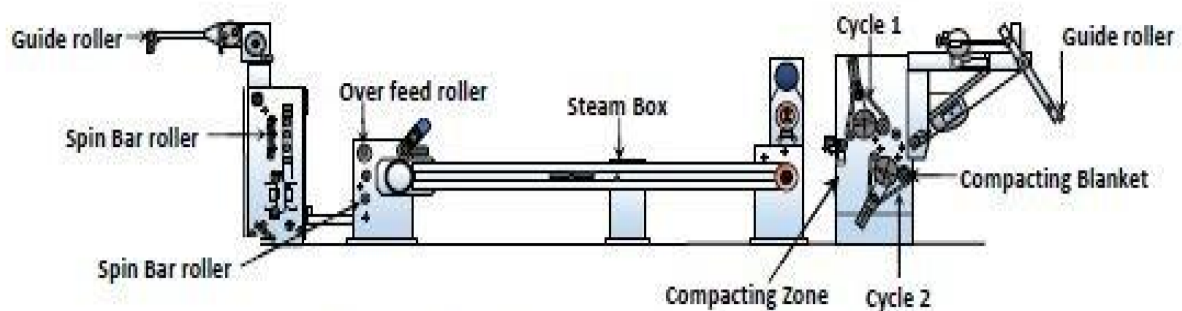


Figure:Open Compacting Machine

Photo Gallery



Open Compacting M/C



Tube Dryer



Tube Compacting M/C



Hydro M/C

Washing unit



Machines in washing unit:

Machine name: Tumble Dryer

- Brand name: TRIVENETA
- Origin: Italy
- Volt. : 400
- Number of tumble dryer: 12

Machine name: Hydro extractor.

- Brand name: Chungmoo.
- Origin: Korea
- Number of Machine: 05

Machine name: Pigment dyeing machine.

- Brand name: TONELLO
- Origin: Italy
- Number of Machine: 02

Machine name: Garments dyeing machine

- Brand name: SUTLICK
- Origin: Hong Kong
- Number of Machine: 10

Machine name: Sample dyeing machine

- Brand name: F&P
- Origin: China
- Number of Machine: 04

Machine name: Sample dyeing machine

- Brand name: F&P
- Origin: China
- Number of Machine: 02

Machine wash:

Machine is washed with hydrous (3g/l), caustic (1g/l), and soda ash (2g/l)
At 98 c for 30 minute to 2.5 hours

↓
Then water is drained

↓
Rinsing

↓
Hot wash at 70-80c

↓
Neutralization with acetic acid (.5-1g/l) at 60-70c for 5 minute

↓
Normal wash

Washing: There are different type of wash that is done in the washing section:

1 .Normal wash:

At normal temperature for 5 minute

2. Garment wash:

At normal temperature with softener for 10 minute

3. Panel wash:

At normal temperature with softener for 30 minute

4 .Enzyme wash:

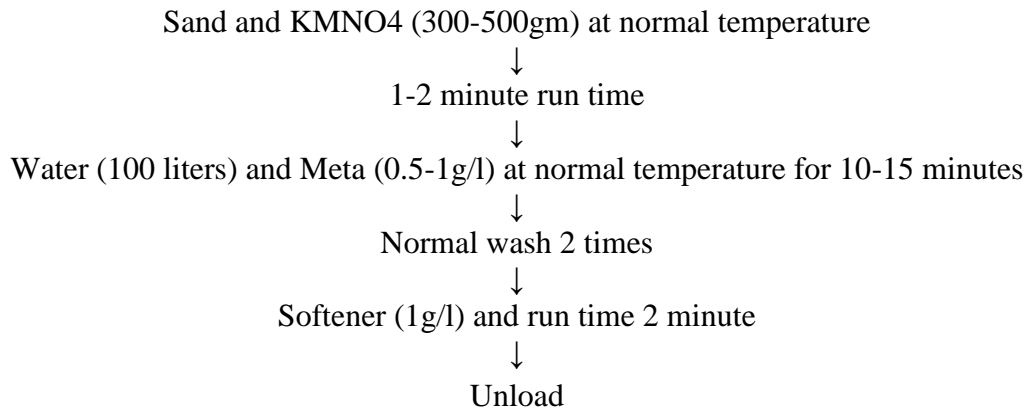
Acetic acid 0.4 -0.5g/l at 55c for 25 minute

5 .Silicon wash:

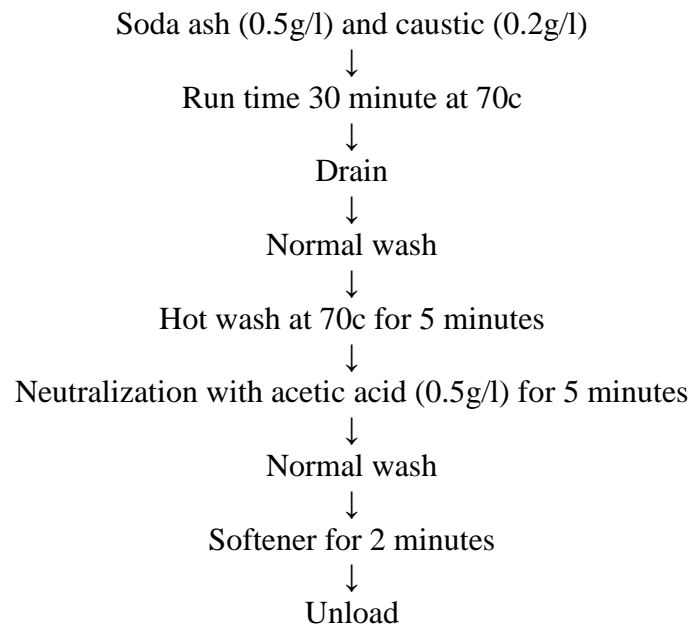
Silicon softener 2g/l and softener 1g/l at normal temperature

For 10 minutes.

6. Acid wash:

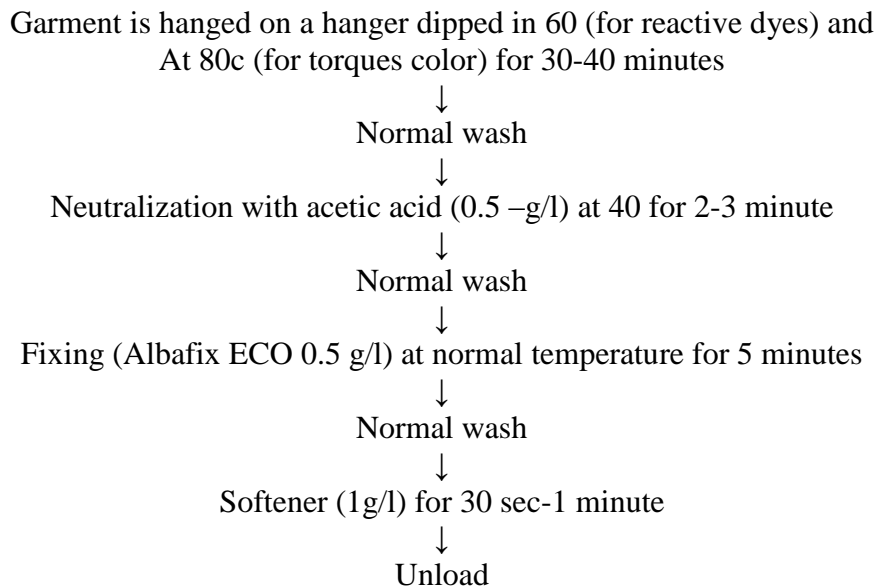


Antic wash (vintage wash):

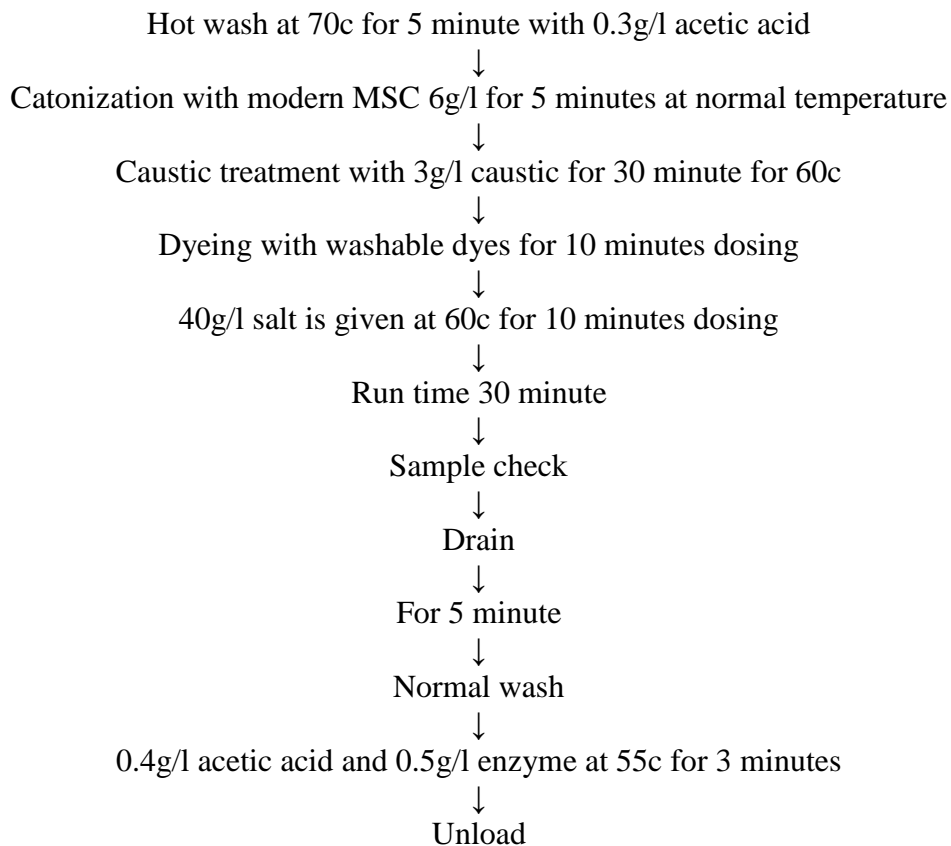


Different types of dyeing in washing:

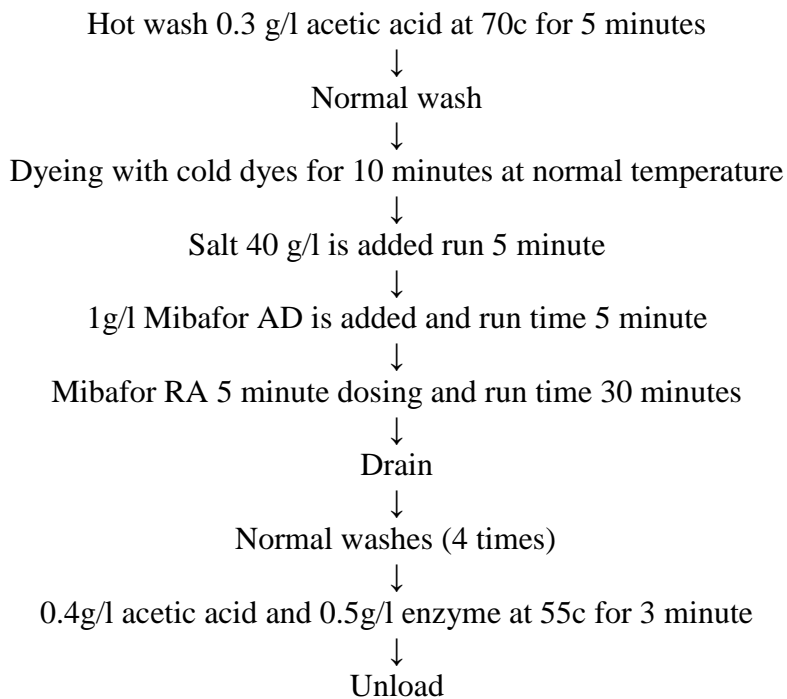
Dip dyeing:



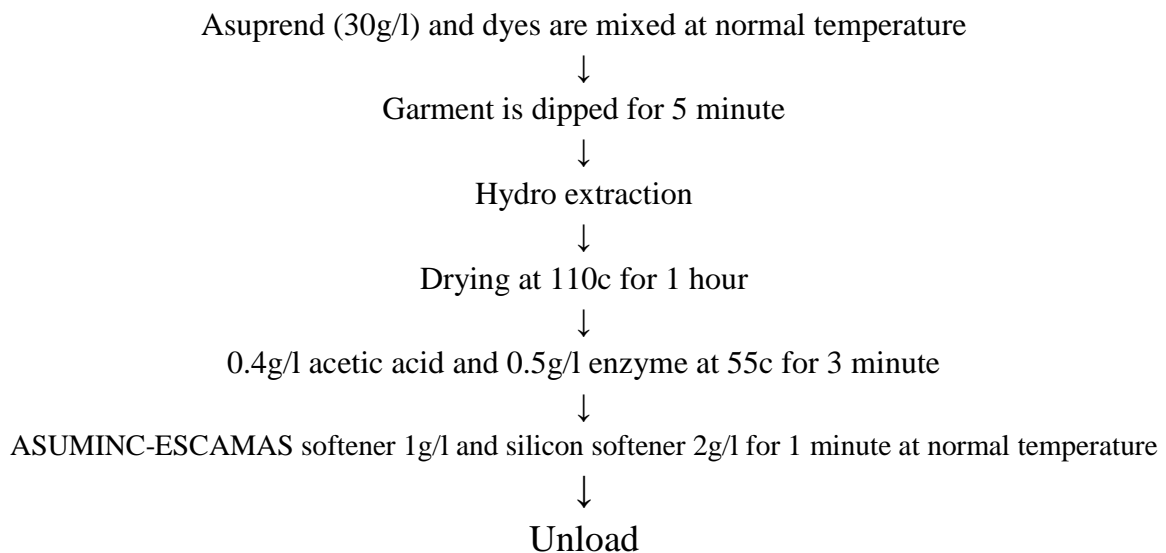
Washable dyeing:



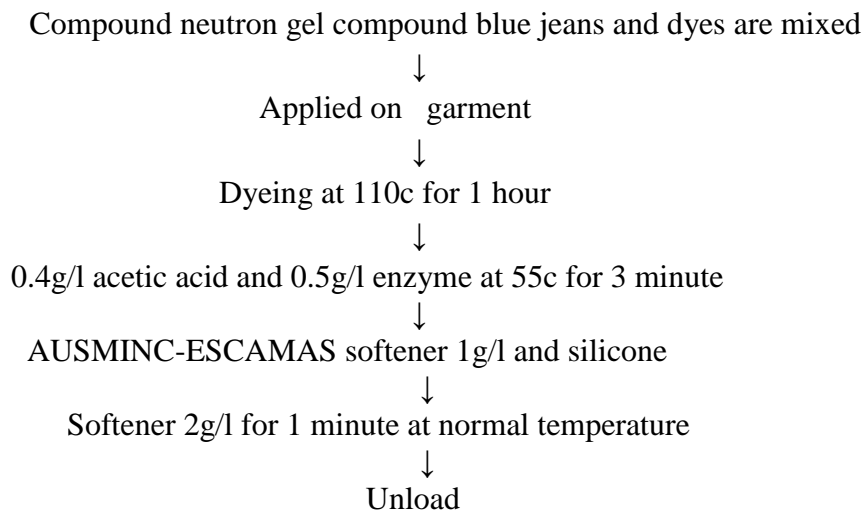
Cold dyeing:



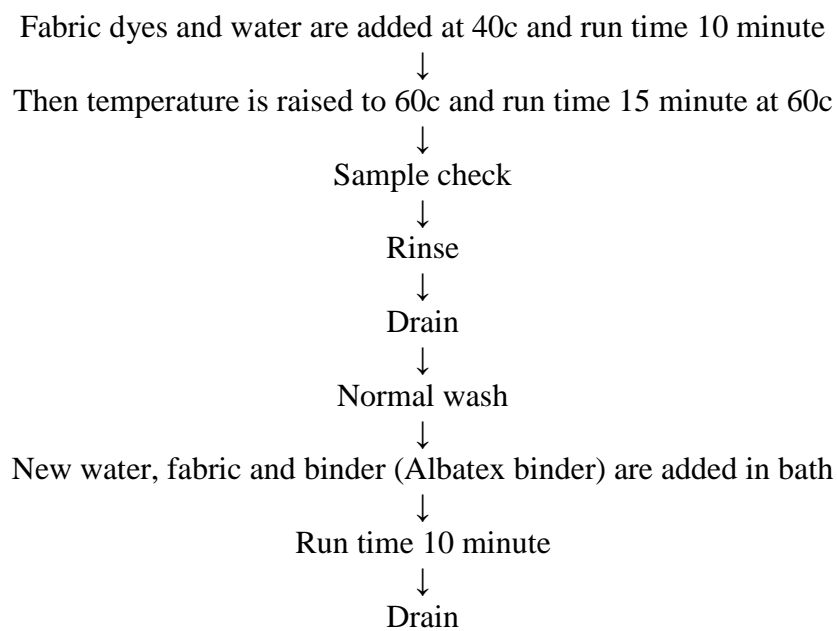
Oil dyeing:



Gel dyeing:



Neon dyeing:



Enzyme wash:

Water, fabric and acetic acid (0.3-0.5g/l) are added at normal temperature

↓
PH (4.5-5.5) is checked

↓
Temperature is raised to 60c and after 5 minutes sample is checked

↓
Then run time 55 minutes at 60c

↓
Rinse

↓
Normal wash

↓
Hydro

↓
Drying

Softener wash:

Softener (1g/l) for 5 minute

↓
Unload

↓
Hydro

↓
Drying

Daily washing capacity:

Type of machine	Quantity
Garment wash	30000-50000 pcs
Pigment dyeing	900-1200kg(5000-7000Pcs)
Oil dye/wave dye	500-600kg(2000-3000pcs)
Gel dye	1200-1500pcs
Reactive dye	5000-7000pcs
Fluorescent/Neon dyeing	900-1200kg(5000-7000pcs)
Washable dyeing and acid wash	1200 -1700pcs
Acid wash	200-500kg(1500-2000pcs)
Tie-dye	800-1000pcs
Deep dye	2500-3000pcs
Burnt out	4000-5000pcs

Photo Gallery



Pigment Dyeing M/C



Hydro Extractor

Utility



UTILITY SECTION

Major Utilities Used In KCL Dyeing Are:

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

Water Treatment Plant:

The water available from different water sources cannot be used directly in boilers and dyeing machines. The objective of water treatment plant is to produce the feed water for boiler and dyeing machines, so that there shall be:

- No scale formation
- No corrosion
- No fouling

The treated water is called 'De-mineralized Water' and the plant where it is treated is called Water Treatment plant

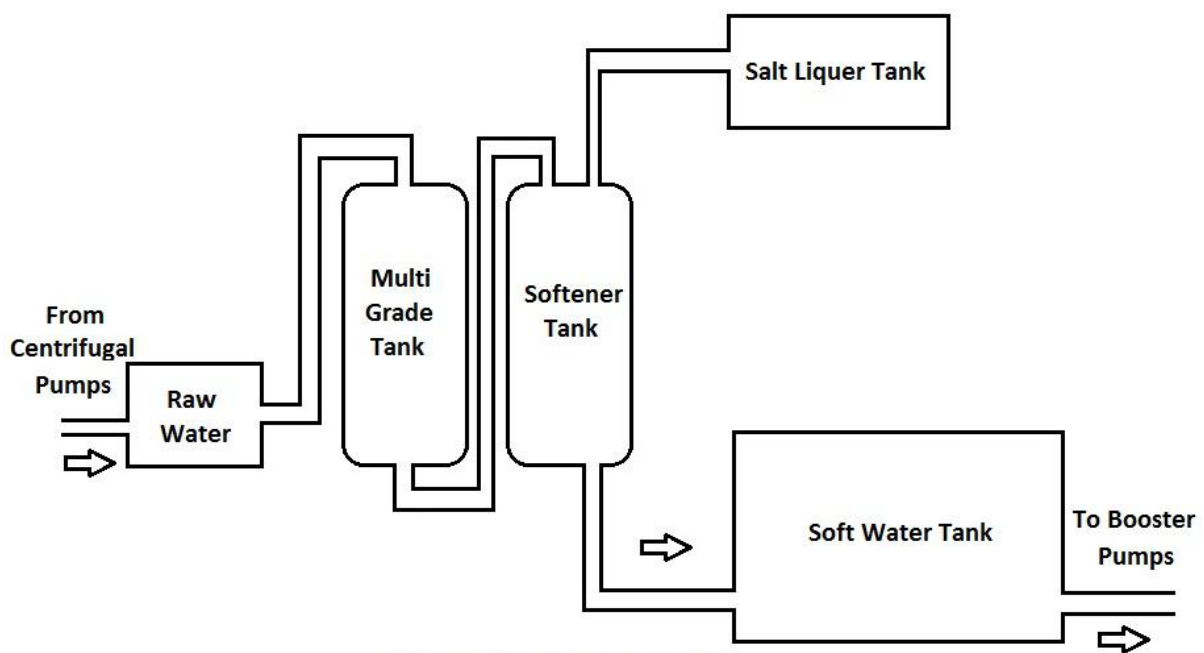
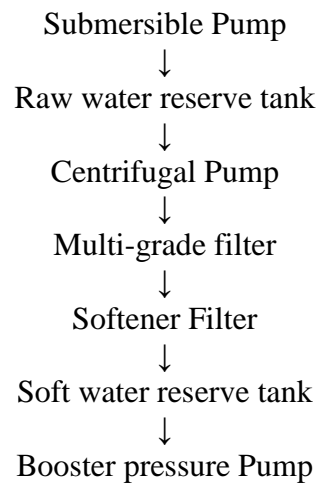


Figure:-Water Treatment Plant

water treatment Plant.

Water Treatment Plant Flow Chart:



Parts of Water treatment system:

Pebbles-I : 850kg Submersible Pump: This Pump pulls water from underground.

Raw water reserve Tank: This tank reserves the raw water which was pulled out by Submersible Pump.

Centrifugal Pump: This Pump supplies the raw water from raw water reserve Tank to Multi-grade filter.

Multi-grade filter: This filter vessel consist: Sand: 4600kg
Gables: 800kg
Pebbles-II: 750kg

Electricity

At KC Yarn dyeing the whole is fully dependent on 2 high power generator. A generator acts as a backup power supply when there is no constant power supply that is available. It has now become a necessity for every household and every company that requires electricity for various things to work. Most of us have been using generators at some point of time. But, have we actually tried to know about what are the different parts present in a Generator? Every part that makes this useful machine has something to do in the entire working of the appliance.

The Generator is made up of 9 main parts;

- Engine
- Alternator
- Fuel System
- Voltage Regulator
- Cooling and Exhaust Systems
- Lubrication System
- Battery Charger
- Control Panel
- Main Assembly / Frame

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
- ✓ Bran: 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 tem : 300°C
- ✓ Chemical Use: For antiscalant, Tandex SD 15
- ✓ Tandex BWS

- ✓ Tandex BWT
- ✓ For Wash, Sulphuric acid+Para sulphates+Caustic+Nelbross+Nalco
- ✓ Feed water Quality: pH – 7-8
- ✓ TDS – 430-530
- ✓ Hardness - <2 ppm Power Consumption

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 KCL
- ✓ 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

Compressor:

- ✓ Natural gas is drawn by pipe through the filter above the compressor & the air is compressed. In such a case the air is slightly hot. Hence cold water is drawn to reduce the temperature of compressed air. Thus the cold water becomes slightly hot & passes through outlet pipe to the overhead 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 & a slight warm compressed air is delivered to require sections of KCL.
- ✓ Source: Natural Air
- ✓ M/C Name: 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

EFFLUENT TREATMENT PLANT (E.T.P.) (Biological E.T.P.):

ETP may refer to effluent treatment water in Indian country industrial this is waste water in recycling process and purify to high TDs water, first stage is sump this is wastage water collection tank next cascade reactor ,trial reactor, dye bath reactor, aeration ,clarifier, PSF, UF, RO, then decant to last stage is evaporate. In fact, water is the heart for dyeing Industry and chemical also an important element for different stage of dyeing. Now, it is quite impossible without chemical continue dyeing. So, which chemical we use in Dyeing that mixed with water and finally drain. If the chemical mixed water goes outside through river it is very harmful for not only our environment but also all alive animals.

Types of E.T.P:

1. There are different types of E.T.P are available .Those are
2. Biological E.T.P.(Best)
3. Chemical E.T.P.
4. Biological & Chemical E.T.P.
5. Physical ETP
6. Biological E.T.P.:
7. The Effluent will be treated according to sequence or stage by stage.
8. Its primary cost or set up cost is very high.
9. Its effluent treatment will be best.

E.T.P

1. Cost of the project is nearly 8, 00, 00,000 BDT.
2. Fully Biological E.T.P.
3. Manufactured by Water Treatment Technology (W.T.T.) of ITALY.
4. 60 lace litre storage capacity □ 30 lace litre processing capacity

Plant Equipment:

- Screen Brush
- Lifting Pump
- Storage and Homogenizing Tank
- Neutralization
- Distributor
- Biological Oxidation
- Sedimentation Feeding Tank
- Sedimentation
- Sludge Return Pump
- Sludge Thickener
- Blowers
- Chemical Reagents
- Flow Meter
- Main Switch Board
- Air Left
- . Filter Press

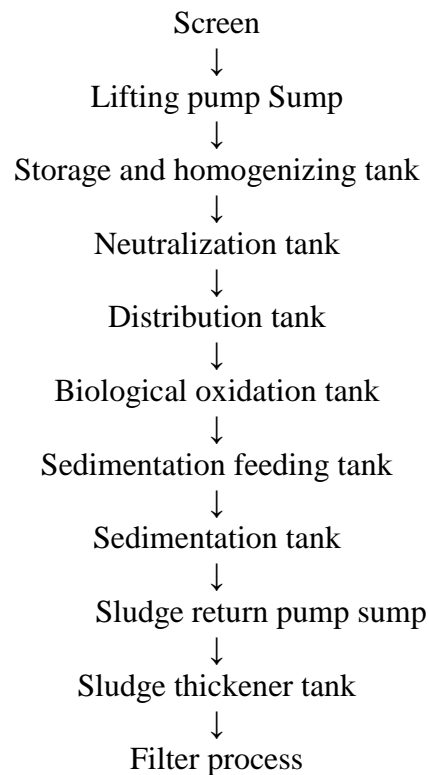
Different chemical used in E.T.P.:

1. Sodium Hypo chloride
2. Sulfuric Acid
3. Polyelectrolyte
4. Nutrient salt
5. De-colorant
6. Anti-foam

Object of ETP:

- To remove coloring matter.
- To control PH.
- To maintain proper value of BOD and COD
- Manufacturer Company Name: Panta ei Srl
- Country of Origin: Italy
- Capacity: 125 m³
- Built Year: 2007

Process Sequence:



Volume of Tank:

- Storage and homogenizing tank: 6000 m
- Biological oxidation tank: 8600 m
- No of Blower:
- Three for Biological oxidation tank
- One for Storage and homogenizing tank

Specification of the Blower:

- R.P.M: 2966
- Volt Required: 400 V
- Required Frequency: 50 Hz
- Power required: 55 kW/hr
- Volume of production airflow: 1415 m/hr

Function of different chemicals

- 98% H₂SO₄-Neutralize the water by controlling pH It is auto dispensed in the neutralization tank
- Polyelectrolyte -Used for sedimentation/sludge coagulation It is used auto/manually in sludge thickener tank
- Deodorant: Used for removing color. It is used auto/manually in sludge thickener tank
- Nutrients -when bacteria become weak it is added to a certain quantity It is added in the oxidation 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

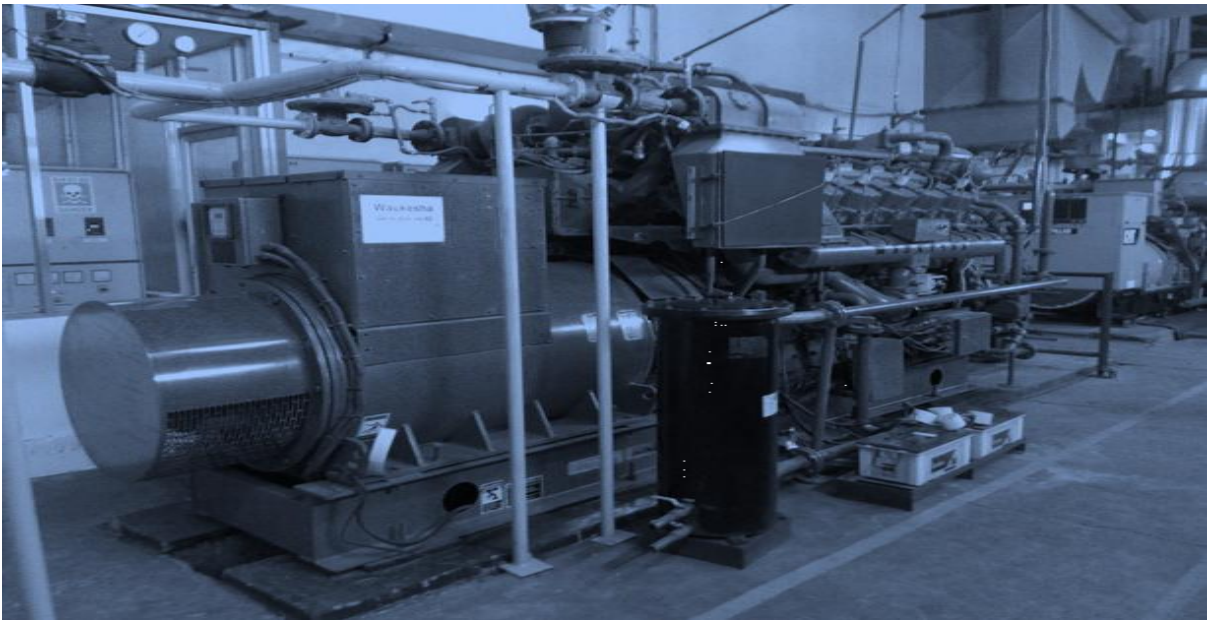
Photo Gallery



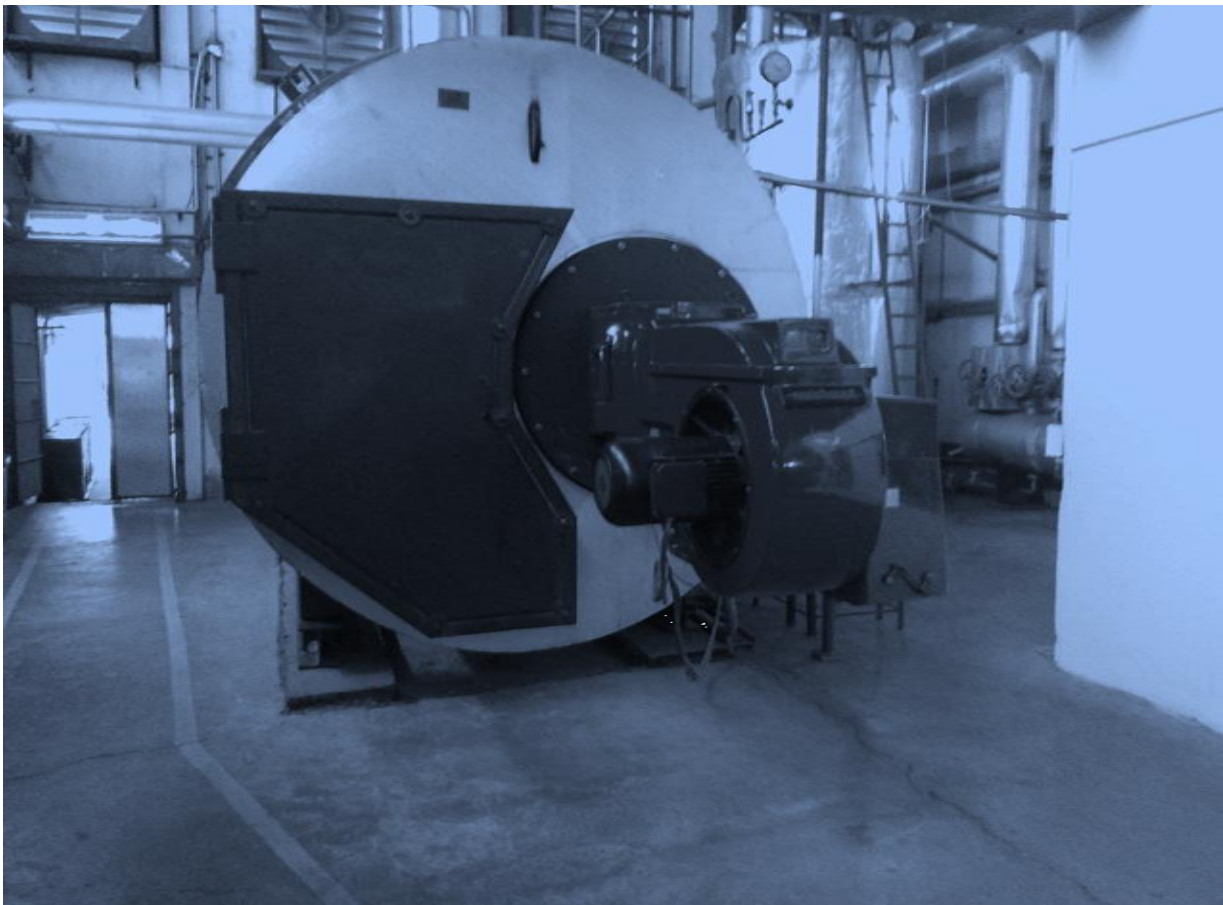
Water Treatment Plant



Booster Pressure Pump



WAUKESHA Electricity Generator



Steam Boiler



Effluent Treatment Plant

Product Quality Control

Quality control

The systems required for programming and coordinating the efforts of the various groups in an organization to maintain the requisite quality. As such quality control is seen as the agent of quality assurance or total quality control.

In the garment industry quality control is practiced right from the initial stage of sourcing raw materials to the stage of final finished garment. For textile and apparel industry product quality is calculated in terms of quality and standard of fibers, yarn, fabric, construction, color fastness, surface designs and the final finished garment product.

Quality assurance system

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

- ✓ Research
- ✓ Specification test
- ✓ Product testing
- ✓ Process development
- ✓ Process control
- ✓ Selection of raw material

Quality assurance procedure

Knit concern ltd, assure the quality of their products in the following three steps:

1. In laboratory
2. In dyeing section.
3. In finishing section.

The quality assurance procedures are described below:

In laboratory:

- ✓ Swatch card from buyer according to their requirement is received.
- ✓ Recipe predication for sample dyeing using CCMS.
- ✓ Sample dyeing until matching with the swatch card. Acceptable color difference is less than 1.
- ✓ 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 machine, in dyeing shed & again matched with the approved sample.
- ✓ If result is ok, then bulk production is commenced.
- ✓ During dyeing process, before the final acid wash, sample are taken and checked for accurate shade matching.
- ✓ After dyeing sample is collected & matching is done

In finishing section:

- ✓ Correctly dyed, after treated & matched yarns are allowed for finishing.
- ✓ By using a series of finishing machines correct shade, softness & appearance are maintained according to requirements.
- ✓ Then sampling is done several times to test strength, shrinkage, fastness properties.
- ✓ Finally yarn is inspected & prepared for delivery.

Physical test of yarn:

- ✓ Yarn weight
- ✓ Dimensional changes in length
- ✓ Softness test
- ✓ Hairiness test

Chemical test of yarn:

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

Besides these, for the best qualified production this chemical test should be performed-

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

Problems encountered in dyeing

Uneven dyeing

- ✓ It can be caused due to rapid addition of dyes and chemicals. For this purpose the dosing of soda ash should be maintained properly.
- ✓ Over loading in the m/c.
- ✓ Pressure difference.
- ✓ Improper pretreatment.
- ✓ Less amount of leveling agent.
- ✓ Improper control of temperature
- ✓ Yarn lot mixing.

Off shade

- ✓ Improper M:L ratio.
- ✓ Lower amount of auxiliaries.
- ✓ Improper mixing of dyestuffs

Intensive foaming

- ✓ In case of intensive foaming, which is caused when, the pumps try to pump a mixture of air and water. This results in 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 anti-foaming agent to the bath,

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 following steps should be followed-

- ✓ Make sure that the operators add the right batch of chemicals at the same time & temperature in the process.
- ✓ Use the same standard program procedures for each batch.
- ✓ Check that the yarn has the same dye affinity.
- ✓ Maintain the same liquor ratio.

Patchy dyeing

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

Miscellaneous problems

- ✓ Batch to batch processing may vary due to the improper calculation of dyes and chemicals and improper strength of salt soda and H₂O₂ etc. Beside hardness of water and caustic may lead to an improper shade.

Finished yarn inspection:

The final product should pass against the norms given by the buyer. The following tests are done:-

- ✓ Dimensional stability.
- ✓ Width or diameter test.
- ✓ Shade check.
- ✓ Shrinkage test.
- ✓ Color fastness to test
- ✓ Color fastness to perspiration.

Chapter 15

Conclusion

Conclusion:

Knit concern has now established in the world as a manufacturer of reputed yarn and capable of producing value added products and executing difficult orders at very short lead time. The Planning, organizing, controlling, designing, creativity, the technical skill and above all the Quality conscious have cemented the base of this leading textile industry. With highly advanced Technology and an emphasis on developing local human resources, its seems to be Clear that knit concern group of textile has the potential to make an important contribution to the Nation growing readymade, garments export sector and makes an example for others.

We have found ourselves fortunate to have our industrial training at Knit concern. It has a huge Production capacity with a very efficient production team. Knit concern. Has very well, Equipped and modern Machineries and producing a wide range Product. During our training Period we have noticed that knit concern is very concern about their quality and they rarely Have any quality complain. The management of knit concern is very organized, pre-active and Co-operative.

At the end of the day we realized that industrial training make our knowledge's application Practically and make us confident to face any problem of our job sector.