# AN INDUSTRIAL TRAINING REPORT

Submitted by

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in partial fulfillment for the award of the degree

of

**BACHELOR OF TECHNOLOGY** 

in

**TEXTILE TECHNOLOGY** 



# DEPARTMENT OF TEXTILE TECHNOLOGY ANNA UNIVERSITY CHENNAI 600 025 SEPTEMBER 2023

# **BONAFIDE CERTIFICATE**

Certified that this internship report on INDUSTRIAL TRAINING REPORT is the bonafide work of SENTHAMIZH K (2021309038) who carried out the Industrial Training under my supervision.

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# **ACKNOWLEDGEMENT**

I express my gratefulness to **Dr. NEELAKANDAN**, Professor and Head, Department of Textile Technology, Anna University who gave me the permission to Undergo Industrial training in this organization.

I express my deep sense of gratitude towards **Mr M.MURUGESAN.**,
Faculty Advisor, Teaching Fellow, Department of Textile Technology, Anna
University for his guidance.

I extend my thanks to **Mr.EESHWARA MOORTHY**, Vijayakumar Spintex Private Limited for his guidance and successful completion of Training.

SENTHAMIZH K

# SREE VIJAYKUMAR SPINTEXS PRIVATE LIMITED

REGD. OFF. : 53 B-4, P.N. PALAYAM ROAD @ K.R. PURAM, GANAPATHY & COIMBATORE - 641 006.

CIN: U17111TZ2004PTC011165 GST NO: 33AAICS7270F1ZB



REF :

DATE: 04 08 2023

To Whom it May Concern

This is to Certify that Miss.K.Senthamizh (Rollno: 2021309038) A Second year B.Tech Textile Technology at Anna University, Chennai has successfully completed Internship in the field of Spinning Division from 26.06.2023 to 26.07.2023.

During her Training period performance was satisfactory and was found sincere honest and energetic.

We wish her every success in her life and career.

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#### **ABSTRACT**

The trace of textile industry india is traced as early as from ancient history even during the times of Indus valley civilization itself. Many of the terrocotta figures found in IVS resembles spinning parts like Spindle wharves etc..., The spinning and weaving industries were once widespread after independence, its one of the major labour intensive sector next to agriculture sector. During the Industrial Revolution, spinners, doffers, and sweepers were employed in spinning mills from the 18th to 20th Centuries.

Herein I discussed about my Industrial Training experience on Spinning of Polyester fibres in VIJAYAKUMAR SPINTEX PRIVATE LIMITED, ANNUR. This is 19 years successfully established industry with a wide range of experience in spun yarn manufacturing. Apart from this they are also focusing on environmental and social responsibilities. Their yarns are of higher quality and is well established in the marketing of yarn.

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#### **INTRODUCTION**

#### 1.1 INTRODUCTION

We have more interest in knowing about the manufacturing of yarn from fiber we approached spinning mills for our 4<sup>th</sup> semester internship/inplant training program. For this training we approached the following spinning mill.

# 1. Vijayakmar Spintex, Annur.

The Milll provided us permission to undergo industrial training in their Spinning mill. So that after completion of 4<sup>th</sup> Semester Exams, we started our training under their guidance.

We have undergone the inplant training from 26.06.2023 to 26.07.2023 (31 days). We learned about sequence of machines which are involved in the manufacturing of yarn. Also We learned about the functions and operating procedures of various machines involved in spinning. We have gained lots of information about spinning which will be very useful for us in our future career. We have presented all the information that are collected from the industry during our training period.

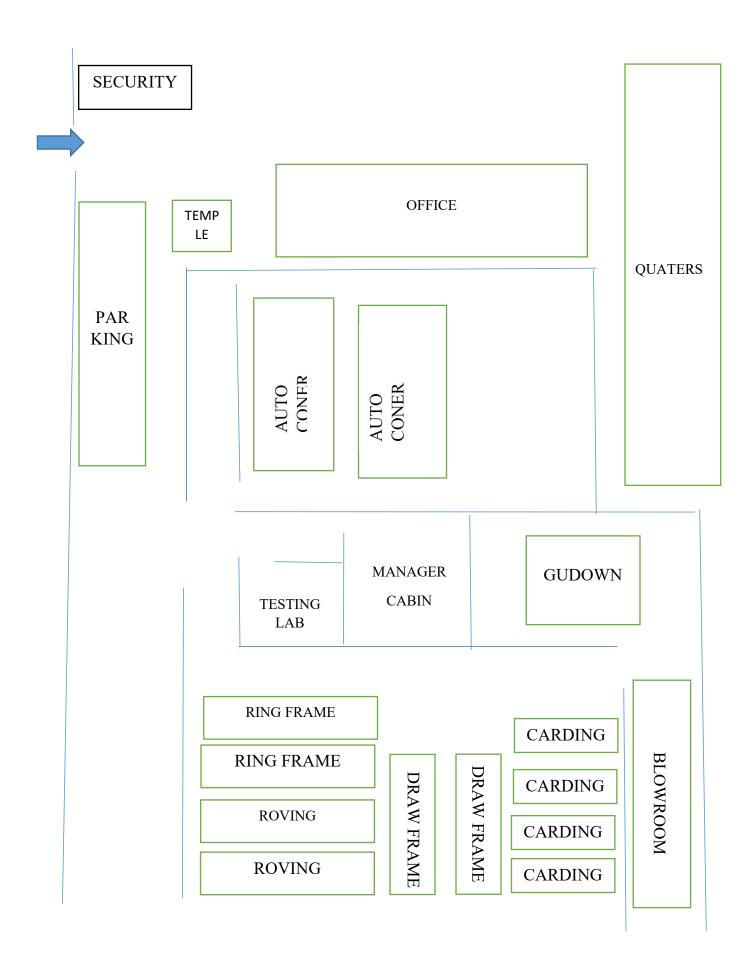
#### 1.2 MILL DETAILS

SHREE VIJAYKUMAR SPINTEX P LTD is a well established spinning mill in the southern Indian state of Tamilnadu. The mill was founded in 2005 by Mr. V.PONNUSAMY, a technocrat with a wide range of experience in spun yarn manufacturing. From a modest 9000 spindles.

The course of time the Company has AIM of gaining not only an ISO 9001 certification but also the status of an export house. In the year 2006-07 the Company had registered a turnover of Rs 7 crore. The Company is well established in the marketing of yarn.

The spinning mill is equipped with the state of art spinning machinery like blowroom & carding from LMW, comber & drawframe, Ring Frame with autodoffer from LMW India.

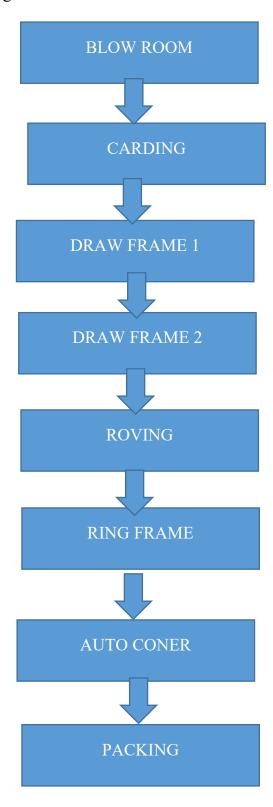
# 1.2.1 Layout of the Mill



# 1.3 SEQUENCE OF PROCESS

The only fibre used in the company is polyester .The sequence of polyester yarn manufacturing is given below:-

POLYESTER



**Fig.1.1 Sequence of Process of Cotton** 

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#### 1.4 WORK ALLOCATION

The workers in this spinning mills are co-ordinated by the Assistant General Manager. There are 2 Supervisors and 40 workers and a lady staff for testing and a staff for accounts maintaining.

The working time of workers are managed by working based on shift change

 $1^{st}$  Shift: 6.00am - 2.00pm

 $2^{nd}\;Shift:2.00pm-10.00pm$ 

 $3^{rd}$  Shift: 10.00pm - 6.00am

#### **MIXING**

# 2.1 OBJECTIVES

Mixing is the first and important process in the spinning process. Mixing is the process where same Properties of fibres are mixed together to form a uniform yarn and to reduce the cost of yarn.

# 2.2 FIBRE USED

There fibre used as raw materials in this spinning mill is Polyester.



2.1 Storage

#### 2.2.1 Bale Details

# (i) Polyester

Gross weight of the fibre: 255-260 kg

Net weight of the fibre: 260 kg

Bale Dimension: 1.2D \*38mm\*BB

#### 2.3 MIXING PROCEDURE

The bales are brought from the bale storage room by using load vehicles. Then the bales are opened and the fibres are spread on floor for mixing. The mixing is done by Blendomat and circular bale opener. The blendomat moves across the bales which are placed in parallel line to the motion the fibres are opened up by the machine. The fibres opened by the blendomat are again opened using circular rotary bale opener.

#### **BLOW ROOM**

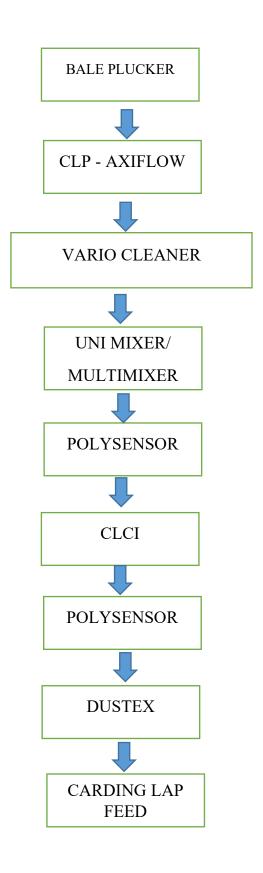
#### 3.1 OBJECTIVES OF BLOWROOM

- > To open the compressed layer of bale of cotton.
- ➤ To extract the impurities like broken seeds, husks, leaves, sand, stone & iron particles, short fibres, immature fibres, dust, dirt and other foreign materials from the cotton by opening and beating.

#### 3.2 BASIC OPERATIONS OF BLOWROOM

- Opening
- > Cleaning
- Dust Removal
- Blending

# 3.3 SEQUENCE OF BLOW ROOM:-



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3.3.1 Bale Plucker

Open the fiber from the bale where fibers are at very compressed and disoriented

state. The opening device has to penetrate into the bale and pick up the tuft of fiber

during releasing from different bales simultaneously.

> Traverse Speed :-10-18 m/min

Speed take off roller:-1400-1800 rpm

Nominal Take of Depth:-1-2 mm

3.3.2 Multimixer

Main function is to blend the raw material of different quality to equalize and even

the mean quality of delivered material. Because natural fiber generally remains in

variation in quality. Material is taken up by rotating rollers evenly from every chamber

and delivered after mixing. Therefore, mixing takes place homogeneously at the inflow

and outflow position.

Storage volume per chamber: 1.4-2.6

Storage capacity per chamber :180-200 kg

Speed of opening roller: 1000-2000 rpm

Pressure of chamber:180 pa

Speed of feed roller :2 m/min

**3.3.3** Unimix

#### **Parts**

- Material input
- > j-shaped chutes
- > Conveyor belt
- > Feed roller
- > Spiked lattice
- Mixing chamber
- > Evener roller
- > Stripper roller

It has 6 chambers

#### 3.3.4 Step Cleaner

- 6 beating cylinders
- Centrifugal force and gravity combine effectively to open the cotton and remove the heavier impurities.
- Beating cylinder takes the tufts upwards & after opening and cleaning, the cotton from the last beating cylinder is conveyed pneumatically to the next machine through outlet pipe.
- The degree of opening and trash extraction can be adjusted for a very wide range of cotton types and grades by changing the speed of beater, (460, 640 and 800 rpm) and the profile of grid to beater.

# 3.3.5 CLC1 (Cleanomat)

- Open the fiber tuft to smallest size and to clean the tuft to the greater extent removing even smallest size of trash and dust which are trapped between fibers.
- The system comprises 3 rotating beaters with carding saw tooth wire projecting from its surface with different gradual point density and a series of grid bars positioned below the beater.

Speed of Beater: 580 m/min

Pressure : 165 Pa

Waste Removal: 40%

#### **3.3.6 Dustex**

It effectively removes micro dust particles at the end of cleaning line installation.



**Figure 3.2 Dustex** 

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In this machine, further opening and cleaning of material is achieved by using

krishner beater and grid bar arrangements .The well opened tufts are sucked by cage

surface. The micro dust particles are removed in the cage by perforations in the cage

surface. Then the sucked material is transported to the calender roller and wound on

the lap rod . Piano feed regulating system is used for feeding constant amount of feed

to the krishner beater.

3.4 LAP SPECIFICATIONS

➤ Lap weight : 22 kg

➤ Lap length :53 meters

#### **CARDING**

#### 4.1 OBJECTIVES

- Disentangling of cotton fibres or the separation of the bunches or tufts of fibres into individual fibres and commencement of their parallelization.
- The removal of smaller and lighter impurities.
- Changing the formation of cotton from a lap to a sliver, accompanied by the reduction of the weight per yard of the material.

Fundamentally these are two important actions performed with carding surfaces, carding and stripping. The action which takes place between two closed surface depends upon the inclination of the wire and the direction and note of their motion in rotation to each other. Carding action is accomplished when the wires of two surfaces are inclined in opposite direction. Stripping action is accomplished when the wires of two surface points in the same direction.

#### 4.2 MACHINE PARAMETERS

#### **Carding Machine Paramerts-1**

Make: TRUTZSCHLER

• Type : TC 5

• Hank: 0.140Ne

• Draft :100

• Can filling length: 10000 m

• Cylinder speed: 513 RPM

• Lickerin speed: 1155 RPM

• Flats speed: 320 mm/min

• Efficiency: 90%

• Can change speed: 40m/min

• Delivery speed: 140m/min

• Production: 38.2KG/HOUR

#### 4.3 CHUTE FED CARDS



Fig.4.1 Carding

The delivered tufts from the blowroom line are transported to the carding machines directly by the application of air flow principle. It is essential to use auto levelling in carding machine while feeding the material through the air flow principle

Because the tufts are not transported to the carding machine by the air flow is not uniform. This is one of the disadvantages of the chute fed carding machines. Suppose if a chute fed carding machine breaks down, we have to stop the blowroom and vice versa. For the maintenance of blowroom line or card, we have to stop both the blow room line and carding machine. It is also one of the disadvantage in the chute fed cards.

#### **DRAW FRAME**

#### 5.1 **OBJECTIVES**

The main objectives of drawing process are

- 1) To create a parallel formation of fibers
- 2) To ameliorate the uniformity levels in fibers by doubling and drafting
- 3) To lessen the weight per unit of carded sliver length
- 4) To extract the dust from carded sliver
- 5) To blend the raw material as required
  - a. To straight the ruffled, hooked and curled fibers

#### **FUNCTIONS**

- 1) Equalizing
- 2) Parallelizing
- 3) Blending
- 4) Dust withdrawal

#### 5.2 DRAWFRAME USAGE

The Viscose spinning unit uses breaker drawframe and finisher drawframe but in cotton spinning unit they use only single drawframe as finisher drawframe.

#### 5.3 BREAKER DRAWFRAME

The carded slivers are feed to the breaker draw frame machine. There are 6 sliver cans in organic drawing machines and 5 slivers in inorganic machine. The trailing hook present in the carded sliver are removed in this machine. Due to doubling of several slivers the unevenness in the carded sliver can be reduced. The atmospheric conditions draw frame department is listed below.

.

#### **5.3.1** Machine Parameters

- ✓ Number of Deliveries Double
- ✓ Delivery can diameter 24 inches
- ✓ Delivery Can height 48 inches
- ✓ Can Changer Automatic
- ✓ Creel type Power Creel
- ✓ Drafting Type 3 over 3 drafting arrangement
- ✓ Voltage 380V
- ✓ Frequency 50Hz
- ✓ Type Spring loaded
- ✓ Doubling: upto 12
- ✓ Feed: 6 sliver can

#### 5.4 FINISHER DRAWFRAME

The delivered slivers from the breaker drawframe is feed to the finisher draw frame. The leading hooks present in the carded sliver to removed in this machine and also reduce the unevenness of the sliver by the doubling and levelling. The slivers are run through the pair of scanning rollers. One of these is moving according to the sliver thickness. These movements are transformed by a signal converter into the form of measuring voltage. The measured voltage is transformed to an electronic memory. This memory assures that the draft is changed exactly when the irregular place of sliver is in the main zone. Then the servo drive is used to transmit the additional speed requirements via planetary gear to the middle roller of the drafting system. This assures that the draft is changed accordingly in the main draft zone.

#### **SPEED FRAME**

#### **6.1 OBJECTIVES**

- 1. Attenuation of draw sliver to a suitable size for spinning
- 2.To insert small amount of twist to strengthen the roving
- 3.To wind the twisted strand roving into a bobbin

#### **6.2** SIMPLEX UNIT

In this mill, They are using Roving frame or speed frame only for Viscose spinning unit as it is spun from Ring spinning Process, The roving has a separate set in Viscose unit.

For Cotton Spin Unit, They are not using roving frame as it is spun from rotor spinning method.

As the rotor spinning requires direct feeding of sliver from the draw frame, the roving frame is not present in Rotor Spinning Unit of Cotton



Fig.6.1 Speed frame

#### **6.3** MACHINE DETAILS

Machine Name: Lakshmi LF 1400

Front/Middle/Back: 28/28/28mm Break Draft: 1.10

Main Draft : 6.126 Draft Angle :45°

Feed Hank: 0.121 Delivery Hank: 0.846

Spindle Speed: 1440rpm Delivery Speed: 40m/min

Flyer Speed: 1440 rpm No. of Spindles: 144

Spindle Gauge: 130mm TPI: 0.8

No. Of Machines: 2 Production:5/96.79 (8 hrs)

#### **6.4 MACHINE PARTICULARS**

• Maximum spindles upto 144

• Positive Top and bottom Clearer System

• Effective suction system for both top and bottom clearer waste

• Dual compartment filter box

• Electromagnetic Device for Reliable trough reversal

• Simplified 3 roller and 4 roller spring loaded drafting system

• Creel upto 7 rows for easy accessibility

• Inverter controlled main motor to adjust the spindle speed through display

#### RING FRAME

#### 7.1 OBJECTIVES

- 1. To insert the required amount of twist to the fibres strand to hold the fibres together in the yarn and to prevent the fibres slippage in the yarn too.
- 2. To wind the yarn onto the ring bobbin simultaneously during spinning. To spin the desired count of yarn finally.

#### 7.2 MACHINE DETAILS

Machine Name: 1. Lakshmi LR 60/A

#### 7.3 LAKSHMI LR 60/A - 10

✓ Doffing : Automatic

✓ No. of spindles : 1200

✓ Spindle gauge : 70mm

✓ Bobbin Length: 190mm

✓ Drafting Make : LMW

✓ Drafting type: P3 - 1

✓ Cradle size : 36mm

✓ Top Clearer Roller : Not available

✓ Bottom Clearer Roller : Not available

✓ Bottom Roller Diameter: 27/27/27 mm

✓ Ring Diameter: 38 m

✓ Ring Flange : One

✓ Ring Make : Lakshmi

✓ Spindle type : Plug

✓ Spindle wharve : 18.5mm

✓ Spindle drive : 4 spindle drive

✓ ABC Ring : Not available

✓ No. of Creel rows : 6

✓ OHTC : Available

✓ Motor: 55kW

✓ Inverter : Available

✓ Exhaust air : Downwards

✓ Voltage: 380V

✓ Frequency: 50 Hz

#### 7.4 BREAKAGE STUDY

No. of breaks/100 spindles/ hour : 1.7(for 18Ne)

No. of breaks/100 spindles/hour: 2.2 (for 30Ne)

#### 7.5 SPINDLE TAPE

✓ Abs pulley diameter:- 250.5mm

✓ Wharve diameter:-18.5 mm

✓ Abs pulley contact:- rubber side

✓ Spindle wharve contact:-fabric side



Fig 7.1 Spindle Tape

# 7.5.1 Layers of Tape

- ✓ Top layer:- Rubber
- ✓ Middle layer:- Nylon-Nylon fabric
- ✓ Bottom layer:- Nylon-Cotton fabric

#### 7.6 SLIP PERCENTAGE

> CALCULATED SPEED :-

(MOTOR SPEED \* ABS PULLEY DIAMETER)
WHARVE DIAMETER

#### > SLIP PERCENTAGE:-

( CALCULATED SPEED-AVERAGE SPEED ) \*100

CALCULATED RPM

The slip precentage determines the efficient running of Running frame. If the slip percentage is higher it may slip and run along the side edges of the ABS pulley. It may lead to reduction in efficiency of the production and also consumes higher electricity. It will also leads to tape cut.

#### 7.6 SPINNING DOFFER INSTRUCTION

- 1. Once doff is taken, everyone should put the ring with filament of fibre
- 2. Once the roving bobbins are done spinning, the cops should be placed in their respective boxes.
  - 3. During spinning, 10mm should be present for piecing process.
- 4. After taking doff from the machine, the separators should be pushed, then the machine should be turned on
  - 5. Once the doffing is done, the cops should be presented to respective ring frames.

#### **AUTOCONER**

#### 8.1 OBJECTIVES OF AUTOCONER

- ◆ To produce a large package of ring cop.
- ◆ To remove the objectionable faults.

#### 8.2 FEATURES OF AUTOCONER

- ◆ Auto splice without knot
- ◆ Automatically remove the yarn faults
- ◆ Making bigger package
- ♦ Waxing device
- ◆ Pneumatic disc type tensioner
- ◆ Electronic yarn clearer
- ♦ Reserve ring bobbin
- ◆ Automatic doffing

#### 8.3 WINDING MACHINE PARTS

- ◆ Creel
- **♦** Tensioner
- ♦ Yarn Clearer

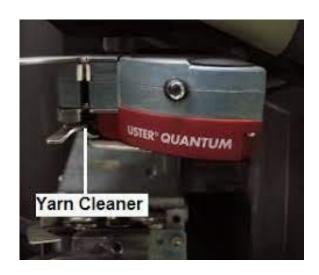


Figure 8.1 Yarn clearer

# **8.4 WAXING AND YARN TENSIONER**



Figure 8.2 Yarn Tensioner

#### **CONCLUSION**

The 30-day internship at Vijayakumar Spintex Mill has been an invaluable experience, providing a comprehensive insight into the operations and intricacies of the textile industry. This opportunity has allowed me to apply theoretical knowledge gained in the classroom to real-world situations, enhancing my understanding of various processes involved in textile production.

During my tenure, I had the privilege to work alongside a dedicated and skilled team, who were instrumental in imparting knowledge and guiding me through the daily operations of the mill. I was exposed to a wide range of tasks, from raw material procurement to the final stages of production and quality control. This hands-on experience has significantly enriched my understanding of the entire production cycle.

Furthermore, the exposure to modern machinery and technologies used in the spinning process has been enlightening. Witnessing the seamless integration of automation and precision engineering in the production line highlighted the critical role of technology in ensuring efficiency and product quality.

Interactions with various departments, including production, quality control, and maintenance, provided valuable insights into the importance of seamless coordination and communication for achieving operational excellence. I also had the chance to witness the meticulous quality checks and measures in place to ensure that only products of the highest caliber reach the market.

Moreover, the emphasis on sustainable practices and adherence to environmental regulations at Vijayakumar Spintex Mill is commendable. Witnessing their commitment to eco-friendly production processes has instilled in me a deeper appreciation for responsible industrial practices.

In conclusion, this internship has been a transformative experience, significantly enhancing my knowledge and skills in the textile industry. The hands-on exposure, coupled with the guidance and mentorship provided by the experienced professionals at Pallava Spinning Mill, has been instrumental in shaping my understanding of the field. I am confident that the insights gained during this internship will prove invaluable in my future academic pursuits and professional endeavors.

I extend my heartfelt gratitude to the entire team at Pallava Spinning Mill for their warm welcome, guidance, and support throughout my internship period. This experience will undoubtedly serve as a cornerstone in my academics