

Design Resource

## Mysore Silk

The making of Silk Textile

by

Prof. Bibhudutta Baral, Mr. J. Antony William and

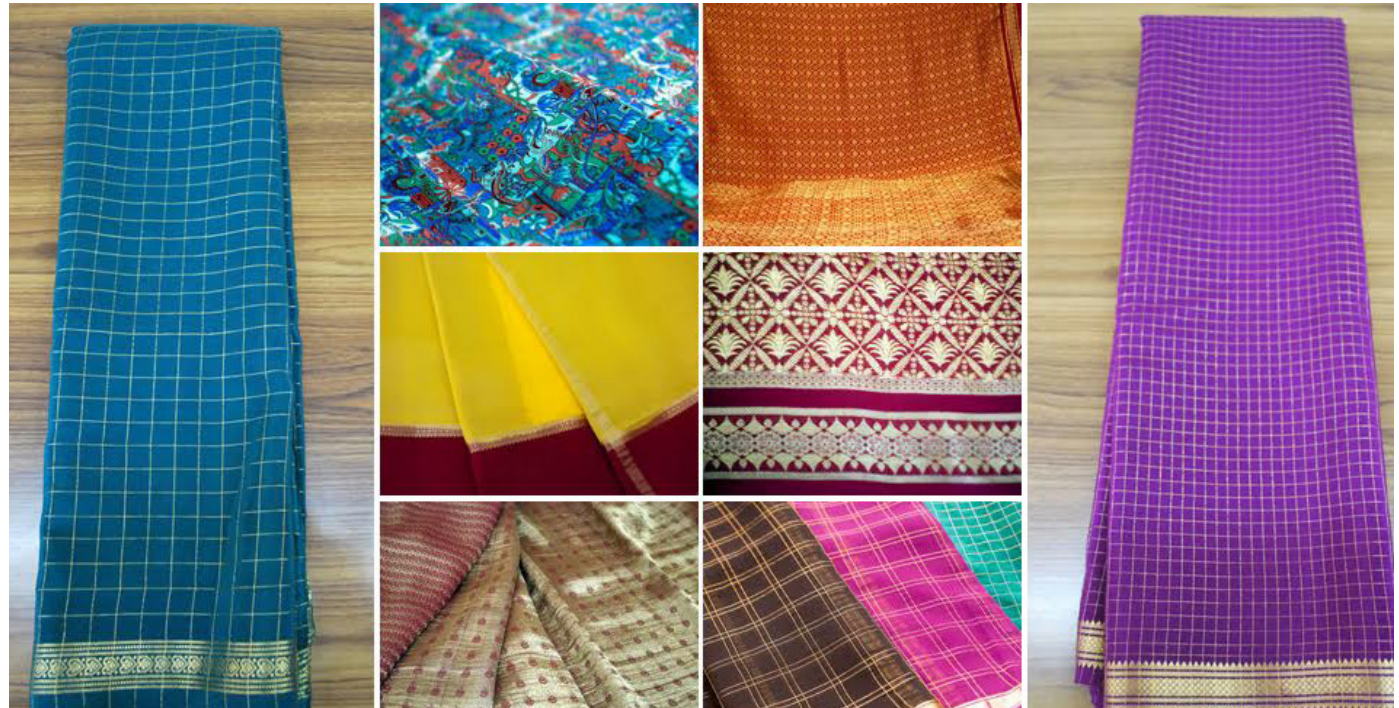
Mr. C. Susanth

NID, Bengaluru

Source:

<http://www.dsource.in/resource/mysore-silk>

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## Introduction

The silk weaving factory in Mysore, presently owned by KSIC, was established in the year 1912 by the Maharaja of Mysore province, Naalwadi Krishnaraj Wadiar. Initially the silk fabrics were manufactured & supplied to meet the requirements of the royal family and ornamental fabrics to their armed forces. In the initial period the looms and preparatory machines were imported from Switzerland. After India gained Independence the Mysore state Sericulture Dept. took control of the silk weaving factory. In 1980 the Silk weaving factory was handed over to Karnataka Silk Industries Corporation Ltd., a Govt. of Karnataka enterprise and is popularly known as KSIC. Under the initiatives of KSIC modernization of silk industry started and still continuing. KSIC is the only organization in the country commanding the entire gamut of silk production right from reeling of cocoons to the weaving of pure silk fabric of various shades and designs, all under one roof. KSIC uses only high quality pure natural silk and 100% pure gold zari. It is located in the heart of the Mysore city and is spread over 17 acres. The raw silk yarn Filatures obtained from T. Narasipura factory and open Market are put through various process and Quality silk products are produced for end user consumption. The factory has an installed capacity of 8,00,000 Mtrs per annum.

The factory today has more than 159 looms. KSIC silk products are well appreciated in the market due to its 100% pure silk blended with 100% pure gold Zari ( 65% of silver & 0.65% of Gold ). The saris manufactured come in varieties to suit the customer tastes viz: Crepe-de-chine, Georgette, Zari printed crepe silk sarees, semi crepe sarees. The sarees are printed or dyed. The sarees come in over 100 different colors and in many number of design combinations. Some of the design combinations are:

- Embroidery Design saree
- Big Butta Pallu Zari
- Rich Pallu Sari Saree
- Jawar Border Saree
- Small Mango Saree
- Zari Printed Saree
- Saree Tissue Saree
- Traditional Zari Saree
- Checked Zari Saree
- Mango Border Saree
- Sunrise Design saree
- Butta Pallu Saree
- Double Line Checks Saree.

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Other products of silk include soft silks, hankeys, Neck Ties, Stoles, Cravats, dupion fabrics etc.

The current research makes a case study coverage of Karnataka Silk Industry Corporation (KSIC). The factory started in 1930 under the rulers of Mysore royal families. Currently KSIC has 159 looms, Two warping machines, prim machines and many numbers of preparatory machines. KSIC is in the business of manufacturing quality silk products of various designs. The range of products includes silk sarees, salwar kameej, shirts, kurtas, silk dhotis and men's ties.



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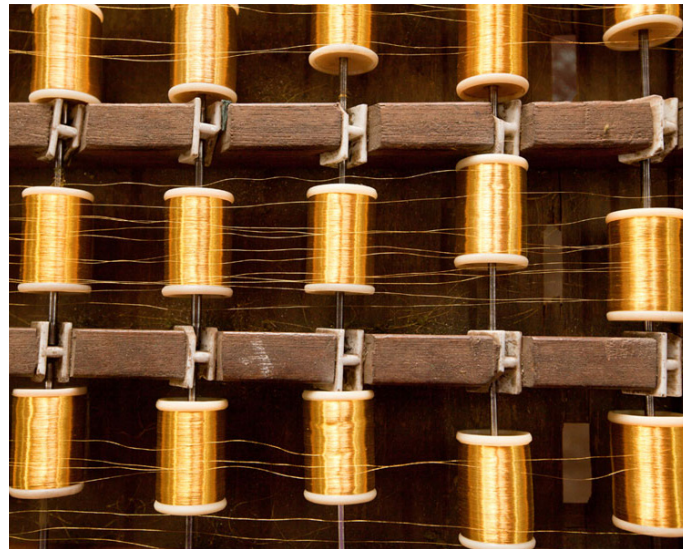
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## Procuring of Raw Materials

Silk filature refers to raw silk manufacturing unit. The raw silk yarn filatures are obtained from the T. Narasipura factory, 25 kms away from the Mysore silk saree making factory. A single cocoon produces 800-900mts. of yarn, but usable yarn is only up to 400-600mts. The remaining yarn is used to produce Kashmiri carpets and is auctioned. The dead pupa remains and from it protein is extracted and used to make dog biscuits and lipsticks. They are sold for as less as 5-10 rupees for a kilogram. The unit manufactures raw silk yarn and transfers it to meet the raw material requirement of silk weaving factory in Mysore. The linear mass density of silk fiber is measured in units called denier. The Mysore silk factory deals with 26-28 denier of the silk thread.



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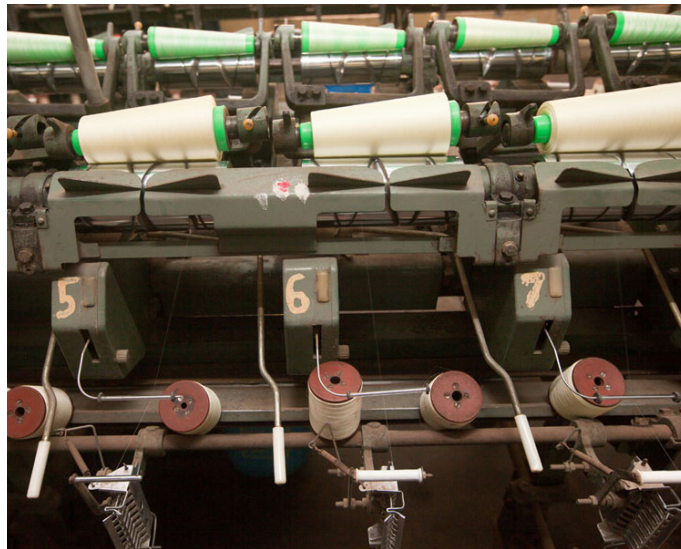
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## Soaking, Twisting, Wefting and Winding

### Soaking:

Coconut oil is used as it makes the fabric soft for temporary coloring. The temporary coloring is done for identifying the warps and the wefts.

### Equipment used:

Steam supplied by Boiler House to Aluminum Tubs.  
Plastic water Container.

### Precautions:

Checking the Boiler Steam Pressure.

### Preparation:

Dividing the Raw Silk Yarn indented for Warp and Weft as per production plan.

### Activity/Steps:

#### a. Warp:

Boil Water and add soap 2.5 to 3.5% on weight of material and allow the soap to melt completely (About 15 minutes). Add 6% to 8% of coconut oil on weight of material and boil till the coconut oil emulsifies Completely (15-20 minutes). Shift the concentrated solution to plastic container and dilute the solution to required level. Add tinted color (if necessary) and rinse the silk- Hand squeeze and hydro extract. Dress and dry in shade. After completely drying shift the material to soaked silk yarn stores.

#### b. Weft:

Boil water and add 2% to 3.5% Soap on weight of material and allow the soap to melt completely (About 20 minutes). Add 6% to 8% Coconut Oil on weight of material and boil till the coconut oil emulsifies Completely (25-30 Minutes). Divide the solution into two equal parts and add "Blue" color tint For "S" Direction and dilute the solution to required level and steep the silk for approximately 3 to 4 hours. Add "Orange" color tint for Z directions and dilute the solution to the required level and steep the silk for approximately 3 to 4 hours. Rinse and remove the material, hand squeezer and dress and dry in shade. Both orange colored and Blue colored dressed separately on GI pipes. After completely drying, shift the material to soaked silk yarn stores lot wise.

### Dressing:

The semi-dry silk bundles are tied to form a circle and are hung on G.I pipes until they become completely dry.

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Straightening of silk fibers are done manually by jerking them at regular intervals to take away any water content.

### Weft Section:

Winding: The above winding process is common for both the making of the warps and the wefts.

Doubling: Here, the silk thread is doubled by running two threads simultaneously from two different bobbins onto a single bobbin and passed onto twisting.

### 1st Twisting:

This section consists of 4 machines.

The machines consist of rubber roller to provide tension while twisting.

The doubled weft threads are twisted:

Blue tinted thread are given an 'S' Twist in a Clockwise direction.

Orange tinted thread are given an 'Z' Twist in an Anti-clockwise direction.

400 twists are made at this stage.

### 1st Re-winding:

This section consists of 4 machines.

The thread from the bobbins is now wound around a barrel.

These barrels are sent into the Vacuum Heat Shelter.

### Steaming:

The silk threads wound around perforated hollow aluminum pipes are called barrels. The perforations allow the steam to enter on the insides and spread the temporary color equally. Up to 200 barrels from a machine can be accommodated in the steam chamber. Barrels from 3 such machines are placed for a period of 40 minutes for steaming.

### 2nd Twisting:

1800 twists are made at this stage.

Therefore, the total no. of twists amount to 2200.

### Final Re-winding:

They are now transferred to bobbins.

The bobbins now move onto the pirn winding section under the weaving section.

### Pirn Winding:

This section consists of 12 machines of 6 pirns each.

The machines transfer the thread from the bobbins onto the pirns that fit into the shuttles for weaving. This is done only for the wefts.

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### Cone Winding:



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### Double Winding:



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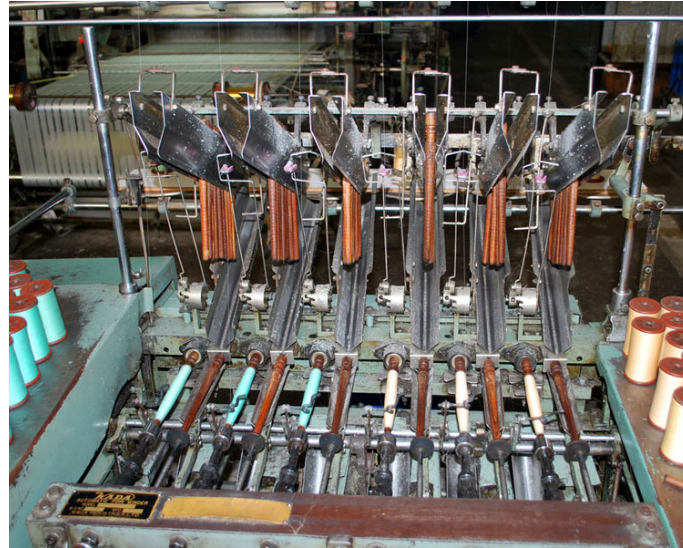
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## Warp Section:

### i) Winding:

The winding process is common for both the making of the warps and the wefts.

### ii) Cone Winding:

This section consists of 12 machines. A single cone consists of silk generated through 80-90 cocoons. It takes 4 hours to wind one cone. Therefore two shifts of four hours each are carried out. The machine threads 162 meters of silk onto one cone in 1 minute so evenly that when it goes to the weaving section there are no gaps found in the sarees. 14,800 silk threads are thus wound around one cone.

### iii) Warping Machine:

All the cone bobbins are transferred on a semi-automatic warping machine. The warping machine consists a total of 438 bobbins mounted in 34 sections. The bobbins are mounted on sponge discs to prevent erosion of silk threads with the plastic cones that it is wound around. At intervals of every five columns, iron teeth protruding from the top of the columns are present. The silk threads run over these teeth into a perforated structure before the warp rolling machine.

The silk threads from each bobbin make a net like structure and pass through the perforations.

Before passing through the perforations, the machine indicates an error sometimes caused by a loose or cut thread by a red light. The skilled artisans identify immediately as to which thread becomes loose or is cut and fix it by joining both the cut ends or tighten it. A combination of three threads through the perforations combines to form a single thread. Steel rods manually inserted in between the different levels of sets of threads separate the threads to let them intertwine comfortably and alternately to form a net. These threads then pass through minutely spaced steel structures, under a roller and a knot is made to mark one section of the silk threads.

The roller is divided into 5 sections of 9 protrusions each where it is knotted to mark a defined length. When every 900 meters of silk thread, a cut is made and 5 1/2 meters in length for a saree is made into rolls rolled into newspapers. The waste silk threads that are cut and broken are collected in a cloth under the net structure.

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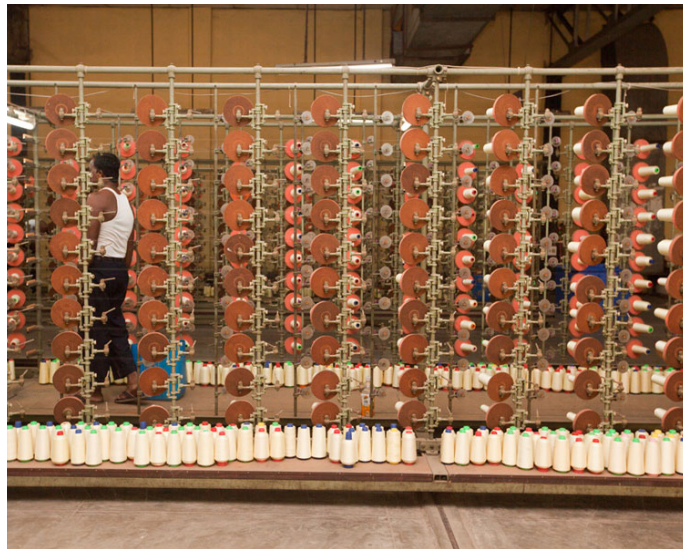
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## Mysore Silk

The making of Silk Textile

by

Prof. Bibhudutta Baral, Mr. J. Antony William and

Mr. C. Susanth

NID, Bengaluru

Source:

<http://www.dsource.in/resource/mysore-silk/warping>



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## Gold Lace Section: Warping for Borders:

The gold, silver and silk is imported from Surat. It consists of 0.65% gold and 65% silver.

### i) Gold Warping:

A smaller version of the warp machine is used in the gold lace section. The gold threads from the bobbins are transferred into rolls for the warp. Small versions of the shuttles are used in the weaving.

### ii) Gold Weft:

All 3 materials are wound into one bobbin which in turn is converted into a pirn to fit into the shuttle for the weft.



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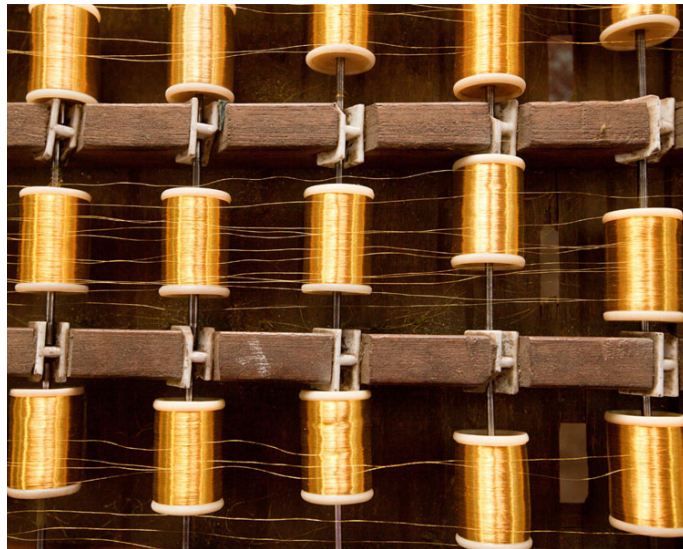
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Source:

<http://www.dsource.in/resource/mysore-silk/weaving>

## Weaving Process:

The company just recently imported machines from Japan. German machines were used before that and were replaced 5 years ago. The power looms are divided into two types:

Jacquard loom

Dobby loom

The looms are supplied with patterns by the design section that are fed into the machine to weave designs onto the sarees.

### a) Jacquard Loom:

These looms are powerful and require years of experience of the labourers to handle them. They have a 600-700 yarn capacity. The patterns are repeated and need to be monitored to see if any thread gets loose or cut. Each saree takes about 4 hours on the machine and generate big borders of gold on both sides of the saree.

### b) Dobby Loom:

A Dobby Loom is a type of floor loom that controls the whole warp threads using a device called a dobbie. A dobbie loom is an alternative to a treadle loom. Each of them is a floor loom in which every warp thread on the loom is attached to a single shaft using a device called a heddle. A shaft is sometimes known as a harness, but this terminology is used less by weavers. Each shaft controls a set of threads. Raising or lowering several shafts at the same time gives a huge variety of possible gaps or 'sheds' through which the shuttle containing the weft thread can be thrown.

A manual dobbie uses a chain of bars or lags each of which has pegs inserted to select the shafts to be moved. A computer assisted dobbie loom uses a set of solenoids or other electric devices to select the shafts. Dobby looms expand weaver's capabilities and remove some of the tedious work involved in designing and producing fabric. Many newer cloth design techniques such as network drafting can only reach their full potential on a dobbie loom.

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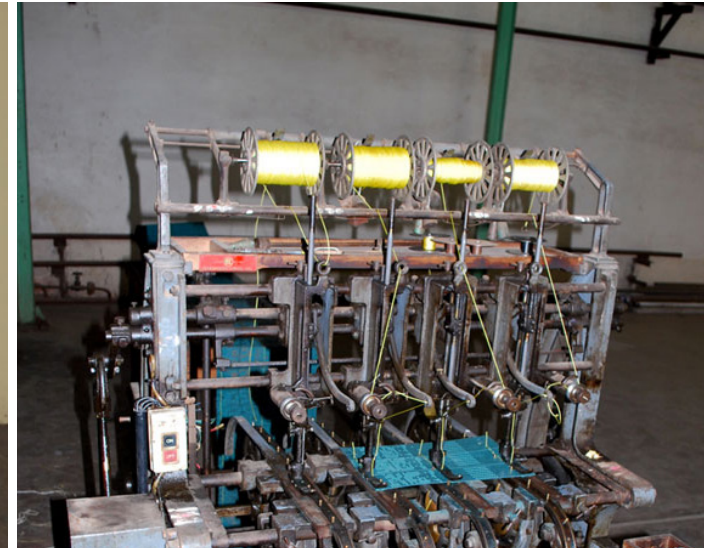
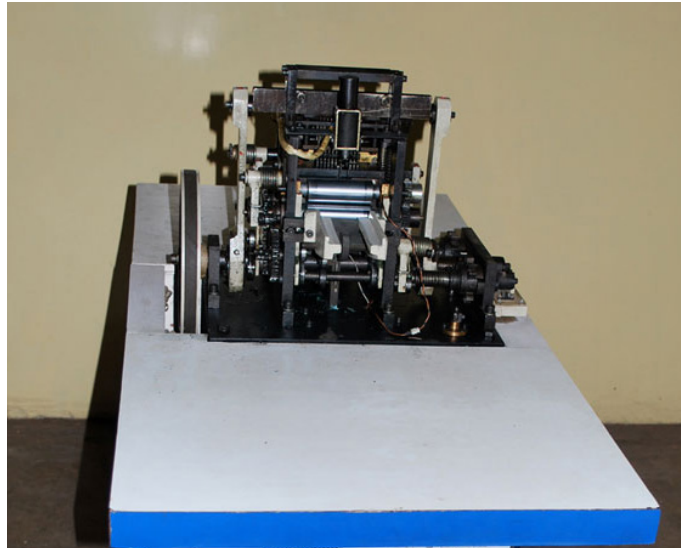
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Design-Automated:



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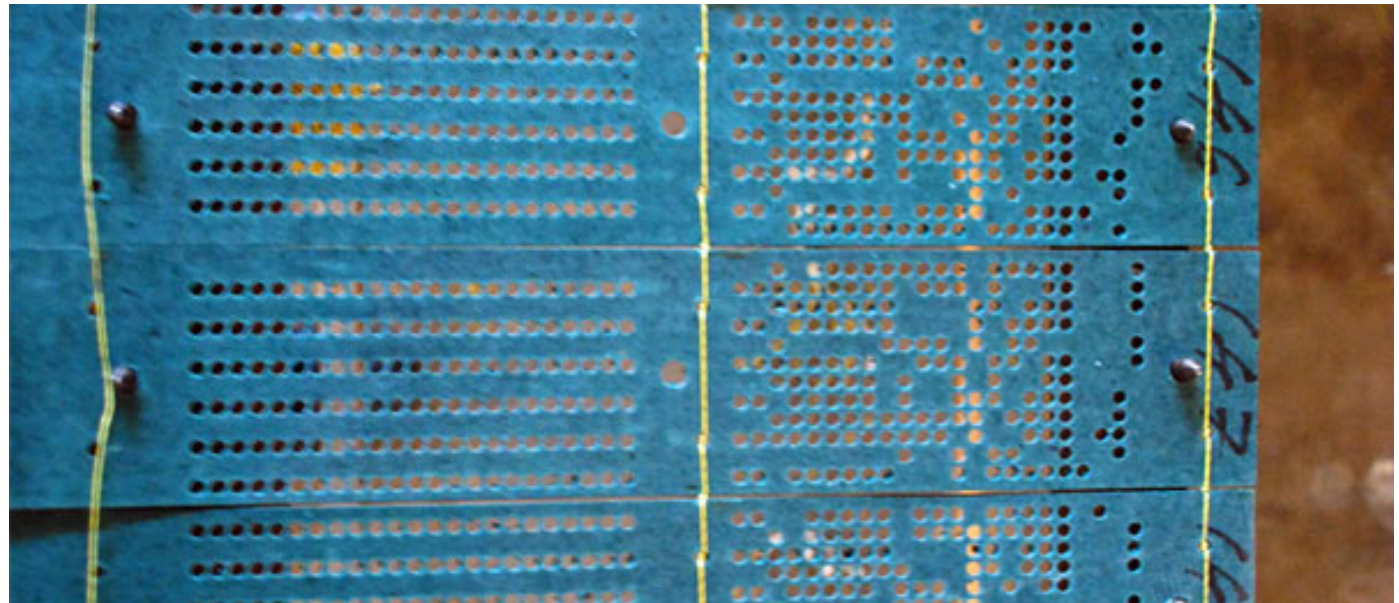
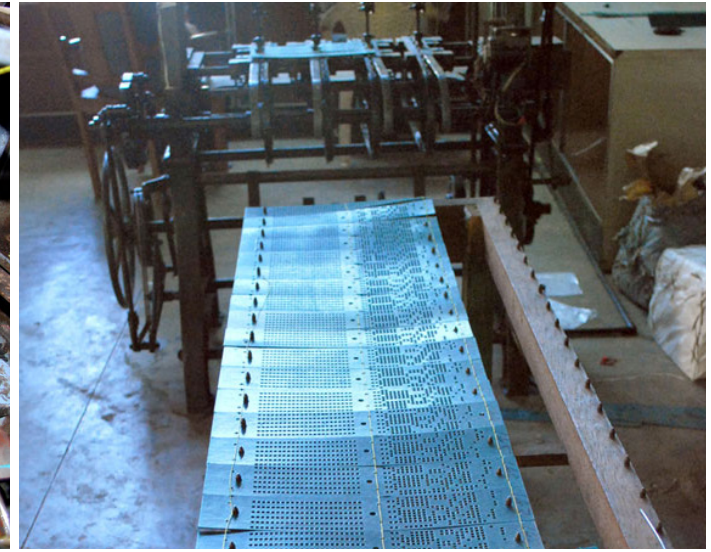
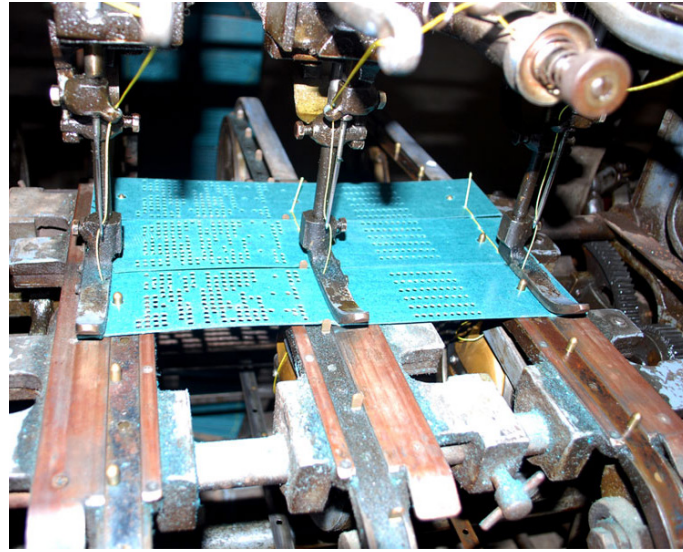
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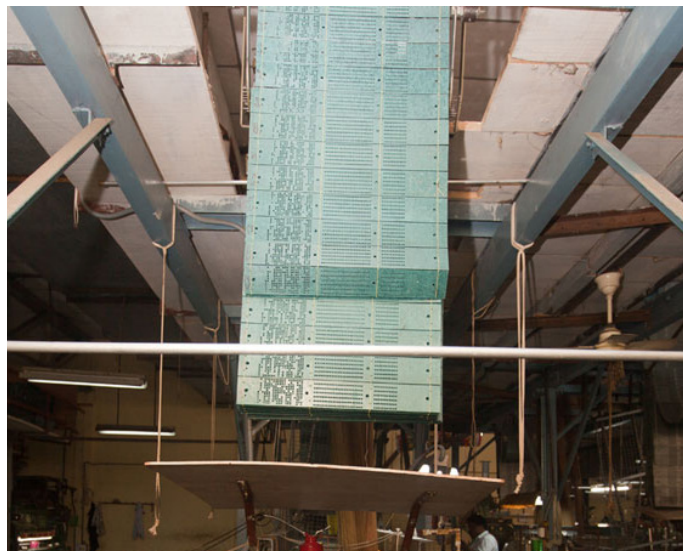
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Source:

<http://www.dsource.in/resource/mysore-silk/degumming>

## Degumming

After weaving, the cloth is generally rough. The degumming process is done to smooth the fabric before dyeing. The Degumming section consists of 4 tanks, Around 230 sarees are clamped by metal springs and soaked in boiling water at 90 degrees. Soap chips and soda ash is added and the sarees are soaked in the solution upto 2 hours. The clamps are tied by rope to Bidder wood logs as they are heat tolerant. This makes the fabric soft. The solution starts frothing and is washed down by water at normal temperature through a hose pipe. The sarees are levered out through a semi-automatic machine and are put in hot water again for 15 minutes to remove excess solution. The machine is controlled remotely by the worker. The sarees are removed from the hot water tank and sent for hydro extraction.

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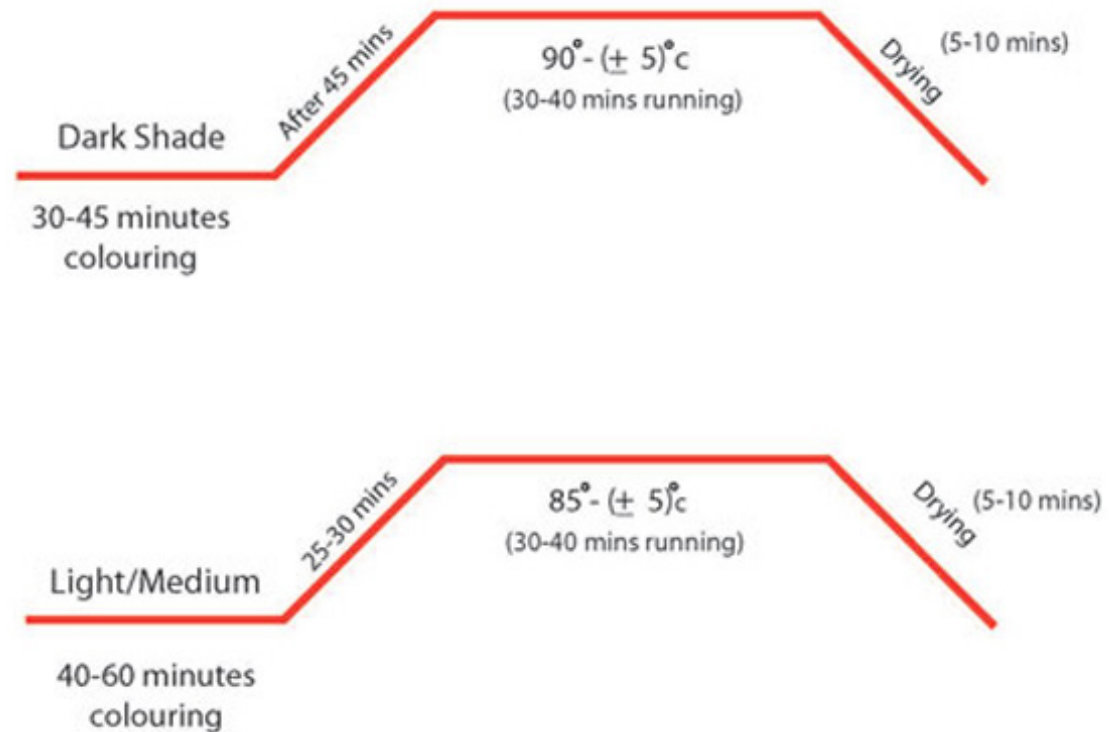
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## Colouring



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Machines called winches help in the colouring of the sarees. The factory has both the big winches that can accommodate 40 sarees and the small winches that accommodate 24 sarees for coloring purpose. The sarees are rotated on a frame on a horizontal axis inside a tank. The tank contains hot water and the tank is connected to a colour tank through a pipe. The colour, is in the form of a liquid and is determined from the shade card that is provided by the marketing team. About 450gms of colour is required for 48 sarees depending on dark shades or light shades. If the colour is not properly applied, then the entire saree is bleached again and the colouring process is repeated again. During the colouring it self the sarees that were stitched together manually are taken out.

Contrast colouring:

The coloured sarees are clamped in wood fixtures in plastic bags and the border is left exposed. A clamp consists of 4 sarees. The border is dipped in water at 120 degrees and colour is added. This process takes about 15 -30 minutes. The workers wear protective gear such as boots, masks and gloves as the colour is extremely toxic. The sarees are then washed with water to remove excess colour and sent for hydro-extraction.

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## Stentering and Packaging:

The semi-dry sarees are steam ironed (heat through steam ) on a massive machine, the Clip Stentering. The entire length of the saree runs on the bed and is ironed as it moves along the horizontal axis. The saree is collected in a roll at one end and moves onto the cutting section.

### Cutting:

Manual cutting of the saree is done according to the pre-decided length from the roll. The sarees are also tagged at this stage where a unique identification number is given to every saree. KSIC is the only organization to give guarantee for its zari saree in the form of embroidered code No. which is unique to each saree.

### Quality Check:

The sarees are sent from the cutting section to check the final finishing. Stains are removed manually by using white petroleum. The threads are trimmed at the ends and are sent for packaging.

### Packaging:

The sarees are packed in waterproof paper or brown paper depending on the climatic conditions. They are then sorted according to type and placed in cartons with cotton and sent to showrooms.

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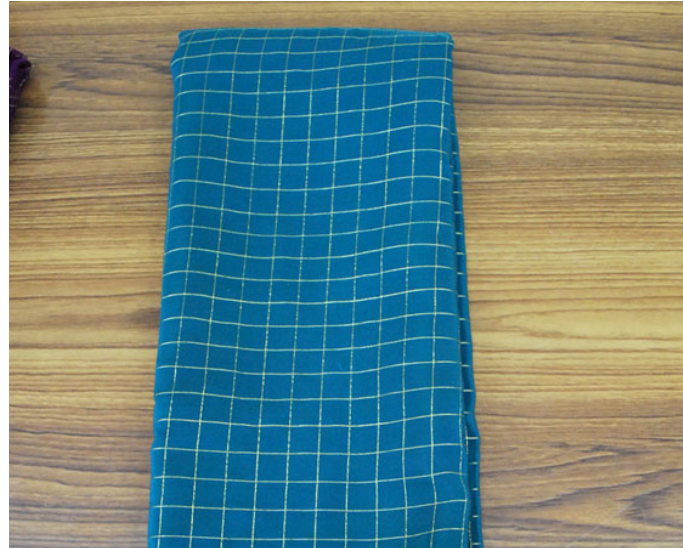
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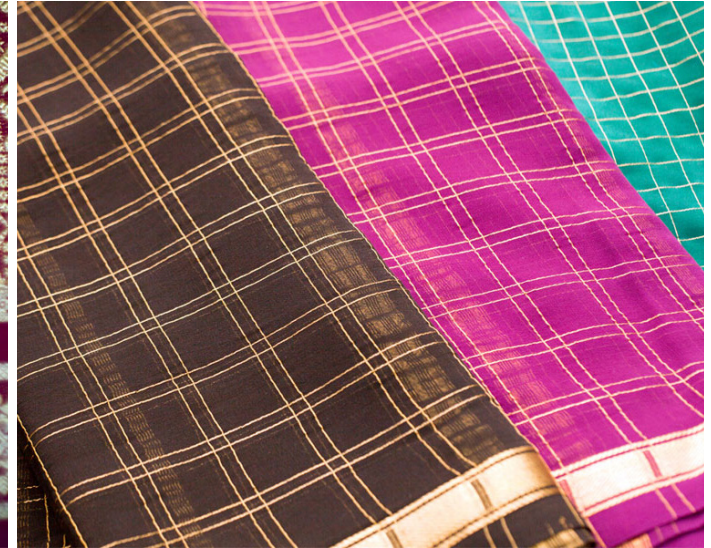
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## Contact Details

This documentation was done by Prof. Bibhudutta Baral, Mr. J. Antony William and Mr. C. Susanth at [NID R&D campus, Bengaluru](#).

You can get in touch with Prof. Bibhudutta Baral at

Email: [bibhudutta\[at\]nid.edu](mailto:bibhudutta[at]nid.edu)

You could write to the following address regarding suggestions and clarifications:

Helpdesk details:

Co-ordinator

Project e-kalpa

R & D Campus

National Institute of Design

#12 HMT Link Road, Off Tumkur Road

Bangalore 560 022

India

Phone:

+91 80 2357 9054

Fax:

+91 80 23373086

Email: [dsource.in\[at\]gmail.com](mailto:dsource.in[at]gmail.com)

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