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FIBRE TO FABRIC

INTRODUCTION

Any fabric (cloth) is made up of yarns arranged together which are further made up of still thinner strands called fibres. Thread like part in animal and vegetable tissues is called fibres. They are the raw materials that are long, strong and pliable enough to be spun into yarns and woven into fabrics.

CLASSIFICATION OF FIBRES

Natural, semi-synthetic and artificial (synthetic) fibres.

(A) NATURAL FIBRES :

Fibres obtained from plants are called plant fibres and fibres obtained from animals are called animal fibres. Plant and animal fibres together are called natural fibres. For example cotton, jute and silk. The Fibres of some fabrics such as cotton, jute, silk and wool are obtained from plants. Wool and silk fibres are obtained from animals. Wool is obtained from the fleece of sheep or goat. It is also obtained from the hair of rabbits. yak and camels, Silk fibre is drawn from the cocoon of silkworm.



(i) Cotton : It is cultivated where warm and sunny weather stays for at least half of the year. Cotton plants require warm temperature ranging between 21° C to 27°C with sunny and dry weather. By the time of harvesting rainfall between 50 cm to 80 cm is another conducive condition for its growth. Black soil, which has the ability to retain moisture is best suited for cotton cultivation. The fruits of the cotton plant (Cotton bolls) are about the size of a lemon. After maturing, the bolls burst open and the seeds covered with cotton fibres. Cotton is usually picked by hand. Fibres are then separated from the seeds by combining. This process is called ginning of cotton. Ginning was traditionally done by hand. These days Machines are also used for ginning.



(a) Cottaon plants

(b) cotton balls

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(a) Cotton plants

(b) cotton balls

- Cotton is used in the manufacture of fish nets, coffee filters, tents and in book binding.
- The cottonseed, which remains after the cotton is separated from its seeds or ginned, is used to produce cotton seed oil, which after refining can be consumed like any other vegetable oil.
- The cotton seed meal (khal) that is left is generally fed to livestock.
- In India, main cotton producing states are Maharashtra, Haryana, Andhra Pradesh, Punjab and Gujarat. Sourthern United states, China and India are the largest producer of cotton.



Ginning of cotton

(ii) Jute: It is a long, soft, shiny plant and Is one of the cheapest natural fibres. Jute fibres are composed of cellulose and lignin.

Jute is a rainy season crop, grown best in warm, humid climate.Jute plant requires temperature ranging from 17°C to 40°C and rain fall from 120 mm to 150 mm

Almost 85% of the world's jute CUltivation is concentrated in deltas of Ganga

Harvesting of jute plant is done at flowering state. The stalks are cut close to the ground. They are then tied into bundles and soaked in water for 20 days. It softens the tissues and permits the fibres to be separated, The fibres are then stopped from the stalks in long strands and washed in clear, running water. Then they are spread on a that ched roof to dry.

Jute is said to have more than a thousand uses. It is the second most important vegetable fibre after cotton; not only for its wider cultivation. but also for its uses.



Jute plant

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- Jute is used to make cloth for wrapping bales of raw known as Bombyx mori, which feeds on mulberry cotton, and to make sacks and coarse cloth. Jute leaves. Female moth lays eggs, which hatch larvae fibres are also woven into curtains, chair coverings, after 20 days. The larvae make their cocoons by using bags, carpets, hessian cloth, etc.
- In india, jute is produced in West Bengal, Meghalaya, Bihar, Orissa and Assam.

KNNITING:

In knitting, a single yarn is used to make a piece of fabric.

SPINNING:

The Process of making yarn from fibres is called spinning. In this process, fibres from a mass of cotton wool are drawn out and twisted. This brings the fibres together to form a yarn.

WEAVING :

The process of arranged two sets of yarns together to make a fabric is called weaving.

(iii) Wool : It is a fibre obtained from animals like sheep, lambs and goats. It is a form of hair, with a wavy structure characteristic of the breed of sheep comes from sheep, llama, alpaca, guanaco and vicuna. In India, mostly sheep are reared (to bring up) for getting wool. Sheep hair is sheared off from the body, scoured, sorted, dried, dyed, spun and woven to yield wool.

Shearing: The fleece of the sheep along with a thin layer of skin is removed from Its body. This is called shearing.

Scouring :The sheared skin with hair is thoroughly washed In tanks to remove grease, dust and dirt. This is called scouring.

Sorting : Separation of hair of different textures is called sorting.

Fibres can be dyed in various colours, as the natural fleece (hair) of sheep and goats is black brown or white.

The longer fibres are made into wool for sweaters and shorter fibres are spun and woven into woolen clothes.

Wool, spun from the fleece of sheep, is versatile, durable and elastic.

Angora wools Is obtained from angora goats, which are found in hilly areas like Jammu and Kashmir. Yak wool is commonly found in areas like Laddakh and Tibet.

Wool obtained from Kashmir goat is soft and is used to weave fine quality shawls called Pashmina shawls.

Wool is also obtained from fur (hair) on the body of camels. It is used making carpet etc.

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Llama and Alpaca. found in South America, also yield wool.

Wool is used for making coats, suits , shawls, scarves, gloves and carpets. It traps air and so it has insulating properties.

While sorting wool, workers (sorters) get infected by bacterium, anthrax, which causes fatal blood disease called sorter's disease. Such risks faced by workers in any industry are called occupational hazards.

- (iv) Silk: It is a natural fibre consisting mainly of two proteins, fibroin and sericin.
 - Silk fibre is produced from a silkworm or silk moth the wet sticky substance produced by the silk glands. The cocoon is spun using two threads from the two glands, in a figure of eight, around Itself and changes into a pupa. The cocoons are either roasted or dropped in balling water to kill the pupa. This releases the silk threads from the cocoon, which are then spun into a reel.

The science related to silk production is called sericulture.

Silk is considered the queen of fibres. It is used for making dress materials, saris, scarves, jackets. gloves and carpets.

The damaged or waste cocoons are used to produce an inferior quality of silk called spun silk.

Crepe is a kind of silk thread made by twisting individual threads of raw silk, then doubling two or more of these together and twisting them again

Tram is the type of silk thread made by twisting two or more silk threads together in only one direction.

Thrown sIngles is the type of silk, in which individual threads are twisted in only one direction.

Organizing is the type of silk thread made by twisting a thread in one direction bringing two or more such threads together and twisting them in the opposite direction .

Mulberry silk is produced by Bombyx mori worms. These worms are fed on the leaves of mulberry trees.

(B) Semi-synthetic fibres:

These are obtained from naturally occurring fibres oy chemical modifications. For example, cellulose on reaction with acetic anhydride In the presence of concentrated sulphuriC acid gives cellulose dlacetate, which is used for making threads of acetate and other materials like films and glasses.

(C) Synthetic (artificIal) fibres:

Synthetic fibres are manufactured by man in the laboratories. For example: nylon, acrylic and polyester.