

What is bamboo fiber? slide 1-3

Bamboo Fibre is a regenerated cellulose fiber, which is produced from raw materials of bamboo pulp. Firstly, bamboo pulp is refined from bamboo through a process of hydrolysis-alkalization and multi-phase bleaching. Bamboo pulp is then processed into bamboo fiber.

The production flow of natural original bamboo fiber.

Two well know processes exist for producing regenerated bamboo fiber:

1) Chemical Processing: Sodium hydroxide (NaOH- also known as caustic soda or lye) is used to 'cook' the fiber into a form of regenerated cellulose fiber carbon disulfide is used for hydrolysis alkalization combined with multi phase bleaching. This process produces a fiber also known as bamboo rayon or modal. Chemical processing is the most popular bamboo fiber regeneration process.

2) Mechanical Processing: In mechanical transformation, machines are used to crush the woody parts of the bamboo plant; natural enzymes are then used to break the bamboo into a mushy mass at which point the individual fibers are combed out and spun into a yarn. This is similar to the process used to make linen. As such, the end product in this process is also known as bamboo linen. This process is much less popular than chemical, primarily because it is much more labor intensive and costly.

Appearances of bamboo fibre: slide-4

Bamboo fiber resembles [cotton](#) in its unspun form, a puffball of light, airy fibers. Many companies use extensive bleaching processes to turn bamboo fiber white, although companies producing organic bamboo fabric leave the bamboo fiber unbleached. To make bamboo fiber, bamboo is heavily pulped until it separates into thin component threads of fiber, which can be spun and dyed for weaving into cloth.

Attributes of bamboo fibre: slide-5

There are many advantages of using bamboo fibre such as:

Bamboo fiber contains anti-bacterial properties, which is effective against bacteria and fungi, eliminating odor naturally. Scientists found that bamboo owns a unique anti-bacteria and bacteriostatic bio-agent named "bamboo kun". This substance gets combined with bamboo cellulose during the process of being manufactured into bamboo fiber. Bamboo fiber has particular and natural functions of anti-bacteria, bacteriostatic and deodorization

The moisture absorbency is twice that of cotton with extraordinary release value. What is notable of bamboo fiber is its unusual ability to breathe and its coolness. Because the cross-section of the bamboo fiber is filled with various micro-gaps and micro-holes, it has much better moisture absorption and ventilation. With this unparalleled micro-structure, bamboo fiber apparel can absorb and evaporate human sweat quickly thus by making it comfortable to wear in summer.

Bamboo fiber is softer in texture than cotton and the smoothness of the fiber ensures that there is no irritation when worn next to the skin. Since bamboo doesn't need anti bacterial chemical treatment garments made out of bamboo doesn't cause allergic conditions of the skin.

Advantages of bamboo over cotton: slide-6-7

These are some of the advantages of bamboo fibre over cotton.

The pesticide problem with cotton has not been a factor with bamboo, and because it grows like a weed, it should not require great amounts of fertilizer.

Bamboo is also drought tolerant and requires minimal rainfall to sustain it, unlike conventional cotton which is water intensive to grow.

Since absorbency of bamboo fibre is better it is easily dyeable and requires less water and chemicals to achieve a particular depth of shade.

How bamboo is an eco friendly material: slide-8-10

Bamboo fights global warming of the earth.

Bamboo takes in nearly 5 times the amount of greenhouse gases and produces 35% more oxygen than an equivalent stand of trees. Through photosynthesis bamboo removes carbon dioxide (CO₂) from the atmosphere thereby using carbon as an energy source and converting it into plant tissue which releases oxygen as a by-product.

Bamboo fights deforestation and pollution : Bamboo helps diminish water pollution due to its high nitrogen consumption. It restores soil by removing toxins due to its high nitrogen consumption.

The bamboo grass renews itself by sending up new shoots after harvesting. It is the fastest growing plant in the world and can be harvested after 4 to 5 years. Traditional hardwoods not only take 25-70 years to mature, but also require replanting.

Bamboo prevents soil erosion.

The complex root system of bamboo plants makes them an excellent choice for planting in high erosion areas such as riverbanks and areas subject to mud slides. They are also suitable for planting in areas which have suffered significant soil degradation and deforestation.

Bamboo fabric is easy to dye and is done so without the use of harsh chemicals and using methods which use less water than conventional dyeing methods.

More important, bamboo fiber is a unique biodegradable textile material. As a natural cellulose fiber it can be 100% biodegraded in soil by microorganisms and sunshine. The decomposition process does not cause any pollution in the environment.

Bamboo fibre is organic: slide-11.

bamboo fibre can be natural dyed, is bio-degradable and bamboo doesn't need pesticides to grow.

Application of bamboo textiles: slides 12-19

Bamboo clothing:

Bamboo's inherent antifungal and anti bacterial property makes it suitable to make underwear, t-shirt and socks.

Its anti-ultraviolet nature is suitable to make summer clothing.

Its softness, sheen and drapability make it suitable to be made into scarves.

Can be used to make jackets and dresses due to its nice drapability.

Good absorption and breathability makes it ideal for any garments to be worn in contact with the skin.

Since no artificial antimicrobial agent is added to bamboo fiber it doesn't cause any skin allergy when used against the skin.

A blend of 4% lycra with bamboo is used in sportswear. Good absorbency makes bamboo an ideal material.

The softness of bamboo yarn makes it an ideal material to be used in baby clothes.

Bamboo non-woven fabrics made by pure bamboo pulp, which has similar properties as viscose fibers have.

However, bamboo has wide prospects in the field of hygiene materials such as sanitary napkin, masks, mattress, foodpacking bags due to its anti-bacteria nature.

Bamboo textile is also used in hospitals for surgical masks, gowns, drapes and sheets.

Bamboo fibers softness and good absorbency and anti fungal properties makes it suitable for making towels, bath robes and bath mats.

Bamboo yarn can also be used for making home furnishing products such as bed-sheets, quilts, comforters, blankets and throws. Curtains and wall panels can also be made out of bamboo textile.

Bamboo yarn can also be used to make scarves due to its good drape and softness.

Home furnishing

Curtains, bedding and pillows, kitchen textiles. Bamboo fiber is antibiotic, bacteriostasis and UV resistant. Wallpapers and curtains made from bamboo fiber can absorb ultraviolet radiation. Good absorbency and breath ability makes it suitable for bamboo decorating product withstand damp and hence do not produce bad odor.

Commonly used home furnishing bamboo textiles are:

sheet sets
pillows
throws

Other products in which bamboo yarn can be used are:

Curtains and screens.
Upholstery fabrics in bamboo blend

Bathroom textiles:

Bamboo towel and bath robe have soft and comfortable hand feeling and excellent moisture absorption function. Its natural antibiotic function prevents bad odour.

Also suitable for bath mats due to good absorbency.

handloom weaving with bamboo yarn-slides-20

1)Bamboo yarn used in handloom will help to create textile products which are organic and handmade and aimed at the high-end market. Natural dyed bamboo handwoven with indigenous techniques and traditional motifs has immense potential in the domestic as well as export market.

2)Bamboo yarn while weaving can be combined with other natural indigenous fibers such as abaca, maguey and pineapple in the weft to produce exclusive fabrics which cannot be produced by machine.

3)Almost all the indigenous fibers are coarse or stiff and hence unsuitable for daily use. When used in conjunction with soft and supple bamboo yarn fabrics produced will be wearable, functional and easy to care.

4)Bamboo yarn can be used in place of cotton in future when an indigenous technology for bamboo fibre production is developed in Philippines, since there is ample bamboo plantations here.

advantages of handloom prod-slide-21

Flexibility for limited high end production unlike industrial production thus by adding exclusivity to the product.

Combination of unusual novelty yarns with slubs possible in handloom

Possibilities of quick sampling which will provide many designers to experiment and innovate in small batches.

Environment friendly since no consumption of power.

Provides means for livelihood generation and small enterprise building.

handwoven products from india:-slide-21-29

India is known for handwoven textiles and many traditional techniques are available- cotton khadi, ikats, bandhni, banaras brocades, pashmina etc to name a few using yarns such as wool, silk, cotton, linen etc.

Bamboo is relatively a new material and has till now has been introduced in the powerloom sector.

Bamboo yarn though has been used in handloom but very selectively.

On combination with silk yarn the products have varied level of transparency and they make interesting texture combinations.

Various weave combinations are used to create textures.

Traditional Indian textiles provide a rich repertoire of motifs and colours which when suitably modified in a new material such as bamboo with new contemporary colours and textures lead to products for the high-end niche market.

While china has a competitive edge in pricing of machine produced fabrics and garments India has held on to its skills in the handmade sector and still commands a fair share in the handmade market globally as well as in the domestic market.

Thus when it comes to natural dyed hand spun and handwoven or hand-embroidered textiles India has been on the top.

It is hoped that bamboo will increase the earning of the weavers as any organic fibre with natural dyeing fetches a higher price without increasing the price of the raw material. In india few companies have started producing bamboo yarn from bamboo fibre imported from China.

PRODUCT DEVELOPMENT POSSIBILITIES WITH BAMBOO YARN IN HAND-WEAVING slides-30-37

- 1) Scarves
- 2) Throws.
- 3) Fabrics for apparel and home furnishing.
- 4) Cushion covers.
- 5) Table linen.
- 6) Bed linen.
- 7) Lampshade fabric and screens.

the following slides show images of bamboo yarn products in handloom in India.

market potential of bamboo textile: slide-38

overview of home furnishing products in the US and European market:
slides 39-48

The following slides explain the colours that are prevalent in the US and European market and design directions for home furnishing development. However there are deviations depending on the colour forecasts each season. Generally, light and pastel colours are preferred in the spring/summer whereas dark rustic tones are preferred in the autumn/winter.

To work with bamboo yarn for the home furnishing export market products that are prevalent there have to be analyzed and the handloom products developed should fit in the home furnishing trends and preferences in the target market.

In the following slides we get to see some high end home furnishing products in the US market.

As we see the products we will find how motifs, textures and colour together make a complete well designed product. Thus all these elements have to be incorporated in the designs as per the market trends while trying to develop products using bamboo yarn in handloom production.

Apart from that quality is an important aspect and designs should be made so that handloom inconsistencies become a part of design and contribute to the product aesthetics.

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European market home furnishing: slides 49-59

Now we will see the products from high end home furnishing market in UK and Spain.

It may please be noted that the European market prefers soft colours, textures, detailing and delicate floral patterns as compared to the more outright bold nature of the designs in the US market.

Handwoven fabric clothing.-60

The following few slides are of images of high street clothes made of handwoven fabric from India. This is the ideal market segment for exporting handwoven bamboo fabrics. The customers buying these products value the handmade feel, prefer natural dyed fabric made of natural fibers and are willing to pay a higher price to support ethical buying.

slides-61-62

examples handwoven clothing in UK market.

market in Japan: slides-64-74

Japan provides good marketing opportunities for handwoven and natural dyed textiles. Japanese high street companies too stock garments that are made of handwoven textiles which are slightly textured. In the following slides we will find some examples of clothing made from natural-dyed handwoven cotton from India. This is the market which will readily accept products made of natural dyed bamboo yarn.

The colours in this segment are indigos, earthy browns, off-white and shades of blue-black.

Jürgen Lehl and 45 rpm.

Sustenance of handloom weaving: slides-75-77

Handloom weaving in any country has faced stiff competition from the powerloom sector and the plight of handloom weavers are generally not that good.

Stiff competition and inability to match the prices of the machine produced goods has always pushed many weavers to the brink of poverty.

While we all try to help the traditional weaving industry we also feel that with changing technology and market needs most of the handloom fabrics are obsolete. There are very few artisans who have been able to keep a high standard of their work and have changed according to the market demands without compromising on their skills and these are the weavers who have always made their place in the market.

These are the problems faced by the traditional hand-weaving industry:

unwillingness to change as per market needs has led to stagnation.

deterioration of skill and switching over to synthetic materials has led to mass production of goods that compete directly with the machine produced thus by losing out in terms of quality and price.

lack of government policies to support artisans in sustainable way

lack of exposure to the market demands and colour trends

lack of knowledge in product leading to exploitation by traders and middlemen.

suggested actions:

To improve this sector one has to understand that handloom should not compete with the machine made fabrics as it will always lose out on the price. Hence the objective should be to nurture traditional skills and make products that are of high value which will provide enough income to the weavers. Introduction of practical designs blended with the traditional skill is what is required.

Some of the steps that could be taken are:

introduction of eco friendly new organic fibers and high end product development to cater to the high-end eco-conscious customer.

exposure to new design trends and technologies and upgrade to improvised tools

skill up gradation if required or training in design.

exposure to markets through direct interaction with buyers in a buyer seller meet

equip weavers with knowledge of costing and organizational skills to deliver larger orders.

they should be encouraged to develop products that would command a high price because of exclusivity and hand made traditional techniques that cannot be machine produced.

handmade feel in trends and forecasts:

While designing for home furnishing and apparel certain trends and forecasts are to be followed for each approaching season.

Trends and forecasts are directions for design development in each season and are formulated with market research reports after studying the buying pattern in the previous season which includes the colours, textures, materials, silhouettes, along with the upcoming colors, textures and looks based on the previous season.

Color plays a dominant role in deciding the buying preference.

Every retailers and designers in Europe and America tend to follow the trends and colour forecasts each season to minimise the risk of producing something which may be rejected by the market. However in the Indian domestic market the colours, textures and materials are governed by the climatic condition prevalent and religious festivities.

Natural earthy shades, beige and black are always in fashion and hence safe to work with. The season also decides the colours. For example autumn/winter will consist of darker earth colors, black and shades of grey while spring/summer may consist of whites, pastels and brighter shades.

Handwoven textiles always sell at a premium in the Western markets and in Japan.

While in US people mostly buy machine made fabrics in Europe there is a nice blend of consumers preferring machine made products as well as handmade.

Handmade textile has a huge market in Japan. Natural dyed textile also has a huge demand in Japan.

Handcrafted feel and patterns also feature in the forecast for spring/summer 2009.

Well, I would like to present the presentation by pointing out a few disadvantages about bamboo yarn...