

*Guide to
Green Fabrics*™

Eco-Friendly Textiles for Fashion and Interior Design

 Kristene Smith

Guide to Green Fabrics™

Introduction

Eco-fabrics have certainly become a major source of curiosity as we all strive to green our planet a little more each day. This guide was designed to teach an understanding of the impact of green fibers and how they deepen our environmental awareness and commitment. It was written with the goal of expanding your overall knowledge of textiles and to help empower fabric decisions in a fresh, new way. Because Guide to Green Fabrics™ is the most comprehensive resource of its kind on the market today, you'll enjoy every detailed chapter and learn many new things.

After reading about each type of fiber, you'll be able to decide which ones work best for you depending upon your design ideals and sustainability integration strategy.

Here's hoping you'll take full advantage of marrying your technical skills with today's green fibers to create exciting, new designs. Remember, it's the relationship you have with the fiber that will determine the outcome of your designs, so knowing the fiber's characteristics and how it performs is especially important to your project's success.

With that, congratulations on joining the green fiber brigade - those dedicated to a clean, green future on a global scale. Be inspired and find new ways to think like an environmentalist, yet with creative, cutting-edge, eco-style!

Warmest and Greenest Regards,

Mikayla Uo

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“Humans interact with the environment constantly. These interactions affect quality of life, years of healthy life lived, and health disparities. Environmental health consists of preventing or controlling disease, injury, and disability related to interactions between people and their environment.”

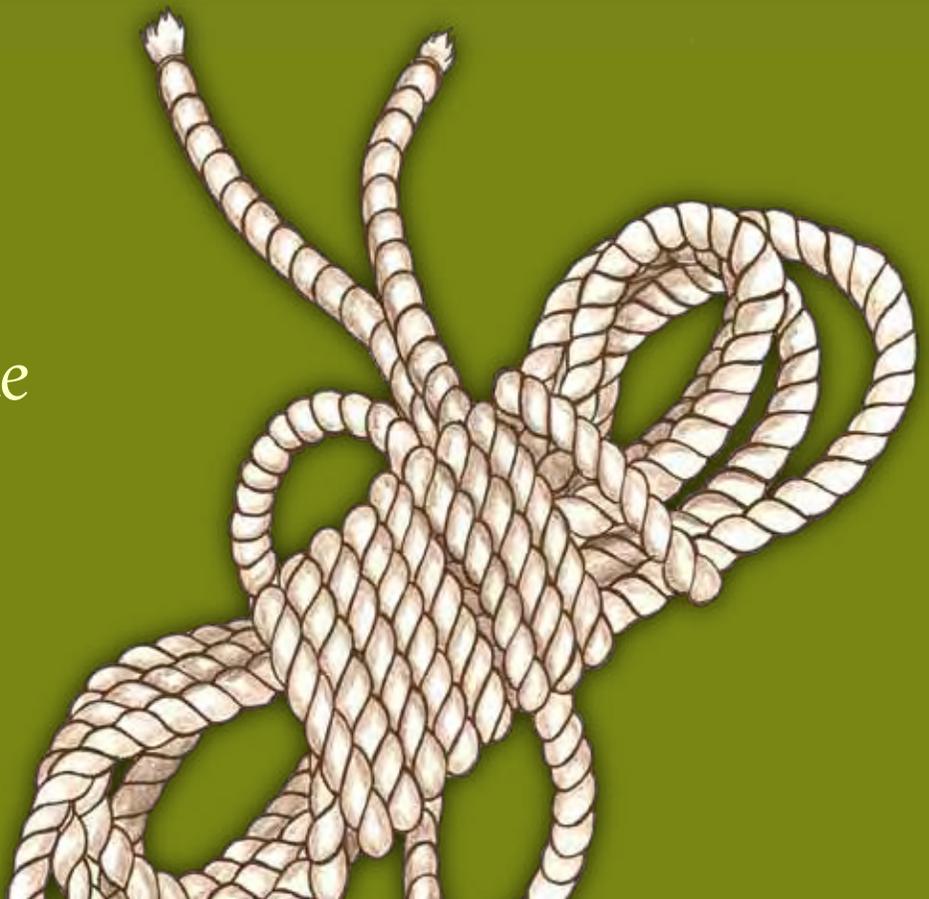
Namita Rautray, Eco-Manufacturer
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Guide to Green Fabrics™

Eco-friendly textiles for fashion and interior design

guidetogreenfabrics.com

Jute



jute produce bags



Jute is a very important geo-textile and is used to make containers that are used in the planting of young trees. Its biodegradability allows for direct planting of the container into the soil and over time jute degrades naturally.

Overview

Jute, “the golden fiber,” looks all set to capture our hearts and homes alike as the new darling of innovative designers. Its versatility and green qualities have sparked the imagination of that band of designers and accessory makers who have made a pact to wed design with sustainability.

From seed to the expired fiber, there is no part of the plant that can be cast aside as waste material. Jute gives only main products and extremely useful by-products, none of which are wasted. The uses of Jute range from the common rope to designer jute silk that graces the homes of the rich and famous, and of course, the green brigade. Its subtle earthiness makes it the perfect complement to designer homes that are now created around the back-to-nature theme. From drapes to upholstery, from rugs to throws and floor mats to place mats, Jute fulfills all the accessorizing needs of modern homes in keeping with best environmental practices.

In times past, the jute fields of pre-independence India filled the coffers of England and sparked a revival of interest in this plant. Going forward, it promises to bring increased prosperity to those farmers whose livelihood depends upon it. Jute is a predominantly Southeast Asian crop and is cultivated in India, Bangladesh, China, and Thailand.

Properties

Elementary jute fibers are short in length measuring between 0.7 to 6 mm while the longer fibers, 3 to 4 cm long, are the result of the short fibers attaching themselves to each other through lignin. Only about 39.5% of the plant contains fiber while 48% is wood, and the remaining 12.5% is comprised of leaves. Jute is a complex mix of cellulose, hemicelluloses, and lignin. The *hemicelluloses* make it sensitive to alkali while the cellulose makes it sensitive to acid, rendering the chemical processing of the fiber extremely delicate. Jute has good insulation against sound and light as well as being anti-static and a low thermal conductor.

Production

4 to 6 months after sowing, the plant reaches its full maturity and is ready to be harvested. The harvesting process is followed by retting. This process separates the *phloem*, which contains the useful fiber, from the *xylem*, which is the woody core.

Jute is produced in handlooms as well as in modern textile mills using state of the art equipment. The fabric is put through the process of *scouring* to remove all traces of natural and added impurities, and is then bleached to remove coloring matter found in the fiber. The bleaching process has to be well regulated as it is lignin which provides color as well as the cementing material. Over-bleaching leads to weakening of the fabric and reduces its value.

Environmental Concerns

Jute is one of those rare cash crops that are the delight of environmentalists and economists alike. Being a crop grown in mostly developing countries, the methods of farming are still traditional, labor-intensive and old-fashioned, which eliminates high use of chemicals and other pesticides.

In its growing stages, it works as a sponge, absorbing *carbon dioxide* at a greater rate than even trees. Studies show that it absorbs about 15 tons of carbon dioxide and releases 11 tons of *oxygen* in the 100 days of cultivation. Being a rotation crop, after harvesting, it improves the yield of crops planted after it, as large amounts of the leaves and roots are left in the soil leading to natural enrichment. In comparison to trees, which give only about 8 to 10 tons of dry stem per hectare annually, jute gives about 20 to 40 tons.

Jute is a very important geo-textile and is used to make containers that are used in the planting of young trees. Its biodegradability allows for direct planting of the container into the soil and over time the jute degrades naturally. This ensures not only root protection but also reduces labor inputs. In places where soil erosion is a threat, cloth made of jute is draped over the soil preventing erosion while at the same time allowing young plants to breathe and survive. In this application of jute, the ground temperature is also brought down, and the degraded fiber enriches the soil eventually.

Color/Dyeability

Jute takes on dyes that are compatible with cellulose fiber as it is the cellulosic quality that is the active participant in the dyeing process. Jute is best dyed using reactive dyes that are in consonance with its environmentally friendly qualities. The process is simple and cost-effective while at the same time delivering bright colors with high wash-fastness.

The direct method is cheap and simple, but gives only moderately low wash and moderate to high wash fastness. Sulfur dyeing, although cheap, is a complex process and the shades produced, in spite of their depth, have a dull luster. The vat process is used when the brightness of the fabric is of primary concern. It gives high wash and light fastness, but is expensive and complex. All dyes used in the coloring of jute must show substantivity to the fiber and solubility in water apart from the coloring component.

Soft water is important to the dyeing process because it carries the dye to the surface of the fabric and then through the enlarged pores to its insides. The dyeing process can be done either by exhaustion or padding, with the former being the preferred choice of most manufacturers. The exhaustion method uses a machine called the Jigger, where bundles of fiber are passed back and forth over tubs of dye until the desired color is achieved.

End Uses

Jute finds myriad uses across all spectrums, from gunny bags used for storing agricultural produce, such as raw cotton, to the finest and most expensive upholstery and draperies. In the carpet making industry, it has been traditionally used as a lining. Jute, being a fancy of designers, also finds a tilt towards exceptional floor coverings in woven, tufted, and piled varieties.

Another great benefit jute offers the environment is through its latest incarnation as a wood fiber, wherein it is used as a non-woven and technical textile. In this form, it is used in the pulp and paper industry, reducing dependence on trees as sources of raw material. This effort directly benefits the environment. In these forms it is also used for underlay, substrate of linoleum, and as fillers in the furniture and bedding industry.



Characteristics

Jute

- Has anti-static qualities
- 100% biodegradable
- Dyes easily
- Important geo-textile
- Provides good insulation
- Intolerant of moisture and humidity
- Grows without need for pesticides
- Provides natural soil enrichment
- Prevents soil erosion
- Low thermal conductor

As new eco-friendly fabrics become available to consumers, knowing what those choices are and how green they claim to be is very important to making informed green fabric decisions. *Guide to Green Fabrics™* was written in an easily readable, consumer-friendly format to help you better understand the many green fabric options and how they perform in fashion and interior design. This guide is easy to reference for technical, academic, and personal use and gives you exclusive insights into the following, not found in any other textiles reference guide:

- Learn how green fabrics impact our environment while contributing to global sustainability and recycling efforts, and our overall health.
- Understand the unique characteristics of sustainable, environmentally friendly, organic, and recycled fibers, and how to use them in your designs.
- Enjoy detailed hand-illustrations depicting the beauty of new, green fibers.
- Learn care methods for bamboo, soy, hemp, organic wool, ramie, organic cotton and other fibers that will keep your fabrics looking clean and green.
- Discover how green fabrics are used in the consumer market for apparel, automotive parts, medical concerns, contract interiors, and home décor.

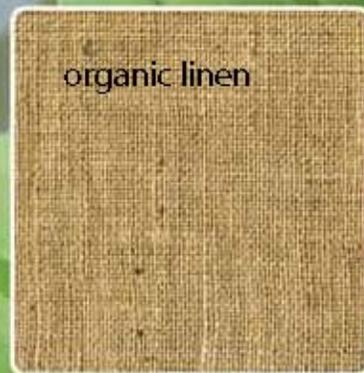
In addition to this guide, our product line offers a full multi-media curriculum for educators including a teaching companion, student workbook, classroom presentations, quizzes, tests, and more. We invite you to delve into the rich world of environmentally friendly fabrics that comprise a diverse array of products from car interiors and home decor products to baby clothes and geo-textiles. You'll benefit from practical information and insights on new eco-fabrics on the market, their origins, properties, characteristics, how they are produced, and what you can do with them. *Guide to Green Fabrics™* will leave you ready to explore your creative side in a new, eco-friendly way!

Meet the Author

Kristene Smith is the author of *Guide to Green Fabrics™*. Initially launched as an educational research project on bamboo, her discovery of the world's leading green fibers blossomed into an educational learning suite now available to educators, students, designers, textiles professionals, and consumers across the globe. A consultant, author, and designer, she holds a degree in Family and Consumer Science and lives with her family in California.

For books and products, please visit guidetogreenfabrics.com.

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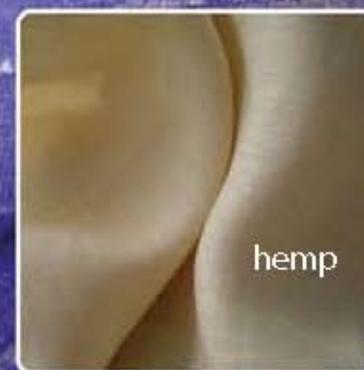
organic linen



soybean protein



bamboo rayon



hemp

