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GREEN DESIGN CONCEPTS AND PRACTICES IN TEXTILE AND CLOTHING: THE CASE OF MARIMEKKO

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As global warming and resource depletion intensify, the textile and apparel industries are increasingly adopting green design. This study explores how brands, such as Marimekko, incorporates sustainability through sustainable materials, naturalistic design, and sustainable production processes. By analyzing its approach, the research offers insights into sustainable practices that help brands reduce environmental impact and meet global demands for responsibility.

Key words: green design, sustainable textiles, eco-friendly materials, sustainable fashion, brand.

INTRODUCTION

The textile and apparel industries are increasingly adopting green design principles in response to 21st-century environmental challenges such as global warming and resource depletion. First introduced in the 1920s, green design aligns with sustainable development, emphasizing resource conservation and a human-centered approach. By the 1990s, it had evolved from modifying design methods to innovating design strategies [1]. Currently, green products account for about 5–10% of the industry, and within the next decade, all textile and apparel products are expected to incorporate green design for environmental sustainability and recyclability. This shift is set to make green design a dominant trend and standardize industrial practices [2]. This study examines how brands, using the example of Finnish brand Marimekko, are integrating sustainable design principles into their design and production strategies, promoting sustainability in the fashion industry and reducing their environmental footprint.

PURPOSE

This study aims to examine how brands integrate green design principles into its textile and apparel product design through a comprehensive strategy. This research aims to understand how textile and apparel design practices can minimize environmental impact while enhancing product appeal through the selection of eco-friendly materials, the adoption of a naturalistic product design style, and the implementation of sustainable production processes.

RESULTS AND DISCUSSION

Brands specializing in clothing, textiles and home furnishings are focusing on the use and development of environmentally friendly materials, particularly for their textiles, to ensure the sustainability of their products. For example, the



Loncell® project, initiated by Marimekko, develops cellulose fibers from birch trees using an eco-friendly ionic liquid solvent. This solvent is reusable, non-flammable, and minimizes environmental impact. Loncell® fibers are biodegradable, free of harmful chemicals, and more durable than traditional cellulose fibers. In 2019, Marimekko partnered with Nature Indigo Finland to produce natural indigo dye from woad plants for industrial applications. Marimekko's Helsinki printing facility tested its quality and color fastness, necessitating innovations in dyeing techniques to adapt natural dyes to textiles. To reduce the water-intensive impact of cotton production, Marimekko collaborates with Spinnova, a Finnish fiber company, to develop wood-based textile fibers. Spinnova's process requires 99% less water than conventional cotton and produces 100% recyclable, chemical-free fibers. In 2020, garments using this technology were introduced to the market. Recognizing its sustainable efforts, Marimekko and Spinnova were shortlisted for Fast Company's 2020 Innovation by Design Awards in the Sustainability category.

Marimekko's design philosophy emphasizes the integration of minimalism with natural aesthetics, which is particularly evident in its nature-inspired prints and its use of bright, organic colors. This approach ensures artistic value while reinforcing the brand's green identity. Naturalism in its designs is reflected in abstract depictions of flora and fauna, evoking spontaneity and a connection to nature. The color palette draws from natural hues such as ocean blue, forest green, and earth tones [3]. Finland's geographic and climatic conditions also contribute to its distinctive color preferences. Located in Northern Europe, with one-third of its territory within the Arctic Circle, Finland experiences cold weather and short spring and autumn seasons. These environmental factors have shaped the Finnish preference for bright and nature-inspired colors. Marimekko's color schemes align with these psychological inclinations, incorporating environmental influences into its design approach.

Marimekko's Unikko pattern, designed by Maija Isola in 1964, remains one of its most iconic prints (Fig. 1). Inspired by nature, it abstractly resembles a flower, symbolizing joy and creativity, while aligning with the brand's green design philosophy, making it popular with consumers around the world (Fig. 2). Beyond Unikko, Marimekko consistently develops nature-inspired patterns, reinforcing its commitment to green design. For instance, the Paju (willow) pattern, influenced by the sound of rustling leaves, offers a poetic interpretation of nature (Fig. 3).

Sustainable production in fashion brands can be structured around three key aspects: energy-saving technologies, green manufacturing, and recycling. The company Marimekko has adopted emission reduction and carbon offsetting strategies across its printing facilities, headquarters, and global retail stores, reducing carbon emissions by approximately 90% over the past decade. An example of its sustainable production approach is the Herkku Pieni Tori dress, made from linen sourced from Belgium and France, spun in China, and woven in Lithuania. Linen requires less water, fertilizer, and pesticides than cotton, making it a more sustainable alternative. A 2019 study found that 82% of Marimekko's direct suppliers use renewable energy, with 16% relying entirely on it. The company has started detailed assessments of supply chain emissions, and currently, 80% of its



suppliers use at least some renewable energy. Additionally, 23% of suppliers still use fossil fuels and plan to transition to renewable energy, reflecting Marimekko's ongoing commitment to sustainability.



Fig. 1. Unikko and its series of patterns, Marimekko [4]



Fig. 2. Fashionistas showcasing the Unikko pattern [5]



Fig. 3. Women's Dress «Anatomia Paju», Marimekko [5]

CONCLUSIONS

This study explores how brands, such as Marimekko, integrates green design into textile and apparel products through sustainable materials, nature-inspired aesthetics, and eco-friendly production. The brand employs innovative materials like Loncell® fibers, natural indigo dye, and Spinnova fibers while incorporating natural elements into its designs. The study suggests that brands can enhance sustainability by adopting eco-friendly materials, refining design aesthetics, and optimizing production. Future research could examine interdisciplinary approaches merging technology with sustainable fashion, offering insights for brands pursuing responsible design and production.

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