

## **MODERN MATERIALS AND TECHNOLOGIES IN ECO-FRIENDLY INTERIOR DESIGN**

Ecological interior design is an important component of global sustainable development goals. With the development of industrialization and the increase in the number of people living in cities, the understanding of sustainable use of natural resources has grown. People began to realize the need to minimize waste and harmful emissions into the environment. Ecological design is an expression of a new worldview of humanity that seeks a way out of the broken relationships with the natural environment [1, p. 151]. In view of this, modern interior design emphasizes the use of environmentally friendly materials and technologies that help to maintain the natural balance and provide comfortable and healthy living conditions.

New technologies are emerging to reduce the carbon footprint of construction and energy consumption. Let's take a look at the main modern materials used in eco-friendly interior design, as well as technologies that contribute to energy efficiency and sustainability.

It should be noted that ecological design is not limited to the choice of materials, but also covers a whole range of approaches that contribute to sustainable development. Ecological design takes inspiration from nature and rethinks the way people relate to it. A modern person can minimize damage by choosing this style. After all, eco design allows you to try to find a 'green' alternative to many interior items [3].

The main principles of eco-design include the rational use of natural resources, reduction of energy consumption, recycling and reuse of raw materials, safety and health. The materials used in modern interior design should not only be natural, but also used efficiently to minimize environmental pollution.

Energy-efficient materials and technologies should be used to ensure energy savings. For example, electrochromic glass is becoming popular in modern design, as it has the ability to change its transparency depending on light or temperature and reduces the need for air conditioning. Thermal insulation panels made of hemp, cellulose or recycled paper effectively retain heat; this, accordingly, reduces heating costs. LED lighting consumes up to 80% less energy than traditional lamps and has a much longer lifespan. Smart home systems in Ukraine are not available to a wide range of consumers, but they allow you to optimize energy consumption and control heating, lighting and ventilation independently.

Instead of developing new materials, more and more attention is being paid to the use of secondary resources or materials that can be recycled. For example, recycled wood and plastic are widely used in the manufacture of furniture, metal cladding and flooring. Recycled glass is used as a raw material for windows, decorative partitions and tiles. Recycled metals such as aluminum and steel are used to make furniture frames, lamps and various decorative items.

The choice of materials that are not harmful to human health is one of the main criteria in eco-design. The modern market for eco-friendly materials offers a wide range of components that comply with the principles of sustainable development. The most popular

interior materials include wood from certified forests, bamboo, natural clay, linen, recycled materials, as well as environmentally friendly coatings and paints.

Wood is a material that comes from forests that are managed sustainably. It is fully biodegradable and has a low carbon footprint.

Bamboo is a fast-growing material that is highly resistant and durable, and is also fully renewable.

Clay used to produce building materials is free of toxic elements and is considered one of the most environmentally friendly materials. Flax and other natural fibers are used to make fabrics and cladding materials.

Materials made from recycled glass, plastic, textiles or metals can significantly reduce the need for primary resources and reduce waste. For example, tiles made from recycled glass or countertops made from recycled plastic bottles are not only environmentally friendly but also aesthetically pleasing.

Conventional paints and varnishes can contain harmful volatile organic compounds (VOCs) that have a negative impact on health. Therefore, environmentally friendly design prefers natural water-based paints, lime and clay coatings, as well as oils and waxes for wood processing [4].

An interesting material that has found wide application in construction and interior decoration is corten, or stainless rust. A hundred years ago, it was used to make containers, tanks and wagons. Today, corten is actively used for building cladding, creating paradoxical 'rusty' objects that do not actually corrode. Some of the most striking examples include the Leeds Metropolitan University in the north of England, designed by Feilden Clegg Bradley Studios, the headquarters of Audenasa in Spain, designed by Vaillo + Irigaray, and the reconstruction of the Palazzo di Vagonovo by 3ndy Studio in Italy [5].

Ecological interior design not only contributes to the preservation of nature, but also has an important impact on the psycho-emotional state of a person. Studies show that people who live in an environmentally friendly environment experience less stress, sleep better and have a higher level of life satisfaction. Natural materials, live plants in the interior and natural light play an important role in this. In addition, ecological design supports social initiatives by promoting environmental awareness among a wide audience.

Eco-design and indoor climate improvement methods include the use of Phyto design and aqua design elements. These objects regulate the humidity and chemical composition of the air, enrich it with oxygen, purify it from carbon dioxide, toxic substances and dust, as well as ionize and humidify it. In addition, they provide additional sound insulation and noise absorption, and by releasing phytoncides, they have a negative effect on pathogens. This allows to comprehensively solve sanitary, hygienic, psychological and aesthetic problems. [2, p. 218].

There are many examples of the successful use of eco-friendly materials in interior design around the world. One such example is Google's office in London, which uses energy-efficient lighting, recycled furniture and live plants to create a healthy working environment.

In Ukraine, there are also examples of eco-design in public spaces, such as coffee shops and restaurants, where recycled wood materials, organic textiles and even structures made of natural stone and clay are used.

In conclusion, ecological interior design is an important element of sustainable development that helps to preserve natural resources and improve the quality of life. The use of environmentally friendly materials and modern technologies not only reduces the

negative impact on the environment, but also creates a comfortable environment for people. The implementation of such solutions in everyday life contributes to the formation of a new environmental awareness and raising the level of environmental culture among the population.

## REFERENCES

1. Близнюк М. Екологічний дизайн: теоретичні основи, принципи, освітня складова / М. Близнюк // Вісник Львівської національної академії мистецтв. — 2020. — Вип. 33. — С. 141–153.
2. Запорожченко О. Ю., Осадча М. М. Провідні тенденції формування екологічного дизайну інтер'єрів сучасних торговельно-розважальних комплексів / О. Ю. Запорожченко, М. М. Осадча // Архітектурний вісник КНУБА. — 2023. — № 25. — С. 100–107. — Режим доступу: <https://www.irbis-nbuv.gov.ua>.
3. Що таке екодизайн: принципи, якими не можна нехтувати // NVB Architects. — Режим доступу: <https://nvb-architects.com.ua/blog/shho-take-ekodizajn-principi-qkimi-ne-mozhna-nehtuwati/>.
4. Sustainable interior design: головне про екологічний інтер'єр // Amaz Interiors. — 28.01.2025. — Режим доступу: <https://amazinteriors.com/uk/2025/01/28/sustainable-interior-design/>.
5. Modern Trends in the Development of Science / ed. S. B. Zep. — Riga : Izdevniecība “Baltija Publishing”, 2023. — Р. 33. — Режим доступу: [https://www.google.com.ua/books/edition/Modern\\_Trends\\_in\\_the\\_Development\\_of\\_SCI\\_E/PrAlEQAAQBAJ](https://www.google.com.ua/books/edition/Modern_Trends_in_the_Development_of_SCI_E/PrAlEQAAQBAJ).