

**STAINED GLASS TECHNOLOGY AND MODERN STYLES**

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Kalit so'zlar: vitraj texnologiyasi, uslublar, lazer kesish texnologiyasi, metall ramkalar, raqamli bosib chiqarish texnologiyalari, mehnat, mahorat.

Аннотация: Витражное искусство — сложная и интересная область не только с точки зрения красоты и художественного выражения, но и с точки зрения технологических процессов и материалов. Хотя этот вид искусства сохраняет свои основные принципы на протяжении сотен лет, с каждой эпохой он обогащается новыми техниками и материалами. Это обеспечивает постоянное обновление витража и его приспособляемость к современным требованиям.

Ключевые слова: витражная технология, стили, технология лазерной резки, металлические рамы, технологии цифровой печати, труд, мастерство.

Abstract: Stained glass art is a complex and interesting field not only in terms of beauty and artistic expression, but also in terms of technological processes and materials. Although this art form has preserved its basic principles for hundreds of years, it is enriched with new techniques and materials with each era. This ensures the constant renewal of stained glass and its adaptability to modern requirements.



Keywords: *stained glass technology, styles, laser cutting technology, metal frames, digital printing technologies, labor, skill.*

INTRODUCTION

The stained glass production process consists of many stages. In the traditional method, the design is first drawn, and then the pieces of glass are painted using colorful paints or colored bottles are selected. These bottles are cut to exact sizes and combined using lead or other metal frames. This process requires a lot of work and skill, since each detail must be located precisely and look perfect. Modern technology has greatly simplified the process. For example, laser cutting technology allows glass to be cut accurately and quickly, which increases production efficiency. It also became possible to create complex and colorful designs for stained glass using digital printing technologies.

MATERIALS AND METHODS

The role of new materials in the development of modern stained glass Styles is great. Traditional lead frames are replaced in some cases by aluminum or other light and durable metal alloys. These materials not only increase the strength of the stained glass, but also reduce its weight, which has a positive effect on the architecture of buildings. In addition, in modern stained glass, special types of glass are used, for example, transparent, matte, glass that gives a mirror effect or even has an invariable color. With this type of glass, new artistic and functional features are added to the stained glass. Modern styles of stained glass include many different directions. For example, stained glass windows based on geometry are very popular today. Such works are characterized by clear lines, symmetry and repetitive patterns. The style is close to minimalism and abstract art and is widely used in modern interiors and architecture. Also relevant are stained glass windows based on organic forms and natural motives. They reflect the beauty of nature, flora and fauna, which brings a feeling of warmth and naturalness to the interior.[1]

Another important aspect of stained glass art is its play with light. Colored bottles filter out light and create colorful shade and play of light in the interior. This effect has a positive effect not only on the aesthetic, but also on the mental state.



Modern lighting technologies, especially LED lighting, further enhance this feature of the stained glass. With them, the stained glass colors become more vibrant and changeable and can be played with different times of the day or special effects. Many new technological solutions are being used in the modern styles of stained glass. For example, the technology of creating interactive stained glass is developing, in which sensors are installed on the surface of the stained glass, through which light and colors can be changed. It is a fusion of Modern Art and technology that opens up new possibilities of stained glass art. There are also emerging 3D stained glass technologies, through which it will be possible to create three-dimensional images, giving a deeper and more impressive effect compared to traditional stained glass.[2]

RESULTS AND DISCUSSIONS

Stained glass art has its own symbols and meanings in many cultures. For example, in European countries, stained glass often reflects religious themes, while in Asian countries it serves to express more naturalistic and philosophical ideas. This shows the global cultural richness of stained glass art. Modern styles, on the other hand, combine these cultural differences to create new and unique works of art. The role of stained glass art in architecture and interior design is also very important. In modern buildings, stained glass is used not only as an element of decoration, but also in controlling light, increasing the functionality of the space and ensuring energy efficiency. For example, stained glass windows that filter sunlight will help keep the room cool in summer, and keep warm in winter. This is both environmentally and economically beneficial. Also, with the help of stained glass, a special atmosphere of space is created, which has a positive effect on the mood of people.[3]

The art of stained glass in education and science also has its place and importance. Many art schools and universities teach stained glass technology and its modern styles. Scientific research is being carried out in this area and new materials and techniques are being developed. For example, work continues on environmentally friendly materials, long-lasting and safe bottles, as well as energy-saving lighting systems. This will serve to further advance the art of stained glass in the future. Stained glass art is an interesting and intimate art form not only for professional



artists, but also for the general public. Many people are learning to create stained glass and show their creative abilities. Also, practicing stained glass art can also help reduce stress, focus, and improve your mental state. This reaffirms his positive impact on human life.[4]

In modern stained glass, technological achievements occupy an important place. New technologies are taking the place of working with traditional lead frames. Advanced techniques such as laser cutting, digital printing, 3D technologies are being used to create stained glass. With the help of these technologies, it will be possible to form complex patterns, clear and clear lines. Also, with the help of interactive sensors and LED lighting, stained glass is becoming not only a static decoration, but also a work of art that creates dynamic, light and Color games. This further enlivenes the interior, making them modern and original. Changes in the choice of materials are also noticeable. Traditional lead frames are replaced by aluminum and other light metal alloys. These materials not only increase the strength, but also lighten the stained glass and facilitate installation. Special types of glass are also widely used. For example, transparent, matte, mirror-effect or colored glass will expand the decorative possibilities of the stained glass. These bottles pass and filter light in different ways, creating Colorful Shading and light effects in the interior. In terms of design, the modern stained glass is very diverse. Geometric shapes, minimalistic styles, elements of abstract art, organic and natural motifs are widely used in modern stained glass. This diversity allows artists to freely express their creativity. The modern stained glass displays everyday life, nature, cityscapes, human emotions instead of traditional religious or historical themes. This brings the stained glass closer to a wider audience and shows its adaptability to modern life. Working with light is an integral part of modern stained glass. Colored bottles filter the light, creating a unique atmosphere in the interior. With the help of light games, the space comes to life, colors change and new images appear in each corner. With the help of LED lighting, the color and lighting effects of the stained glass can be controlled, which opens up new opportunities in interior design. Games of light and color have a



positive effect on a person's mental state, reduce stress and stimulate creative thinking.[5]

Functionality is another important feature of modern stained glass. Stained glass is used not only as an element of decoration, but also as a means of controlling light. When it is installed on a window or door, it monitors the amount and quality of incoming light in the interior. Privacy can also be ensured through stained glass, which is important for offices, homes and public spaces. Stained glass also plays an important role in terms of energy efficiency, as it filters sunlight and helps maintain room temperature stability. Cultural and artistic harmony is also of great importance in modern stained glass art. Symbols of different cultures, traditional and modern elements are harmonized. This makes it possible to create new and unique works of art. Such stained glass is not only decorative, but also works that represent spiritual and cultural heritage. They leave a deep impact on the audience, increasing respect for history and culture. Ecological aspects also occupy an important place in modern stained glass. Today, environmental protection issues are relevant, and artists are also trying to use environmentally friendly materials. Also, energy-saving lighting systems are widely used in stained glass art. This allows artists not only to create beauty, but also to contribute to the preservation of the environment. Creative and therapeutic significance are also an integral part of modern stained glass art. The process of creating stained glass develops a person's creative abilities, improves his mental state. Working with colors and shapes can reduce stress, soothe, and act as meditation. For this reason, stained glass art is not only a decoration, but also a useful activity for human health and mental state.

CONCLUSION

In conclusion, stained glass technology and modern styles are a unique phenomenon that arose as a result of the harmonization of art and technology. This art form, while retaining its historical roots, is constantly being updated and adapted to modern demands and needs. Modern stained glass not only presents Beauty and aesthetics, but is also important in the areas of functionality, ecology and technology. This art form will not lose its place even in the future, but, on the contrary, will



develop and expand further with the help of new technologies and creative approaches. The bright colors, play with light and artistic expression of the stained glass continue to bring warmth and inspiration to the human soul, which makes it a unique and valuable art form even in the modern world.

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