

**THE USE OF SUBLIMATION PRINTING ON FABRIC  
IN THE EDUCATIONAL PROCESS IN THE PREPARATION  
OF SPECIALISTS-DESIGNERS**

**ПРИМЕНЕНИЕ СУБЛИМАЦИОННОЙ ПЕЧАТИ НА ТКАНИ  
В УЧЕБНОМ ПРОЦЕССЕ  
ПРИ ПОДГОТОВКЕ СПЕЦИАЛИСТОВ-ДИЗАЙНЕРОВ**

*E.Yu. PARFENOVA, G.C. SHAIZADANOVA, A.A. ABDULLAYEVA  
Е.Ю. ПАРФЁНОВА, Г.С. ШАЙЗАДАНОВА, А.А. АБДУЛЛАЕВА*

(Almaty Technological University, Republic of Kazakhstan)  
(Алматинский технологический университет, Республика Казахстан)  
E-mail: garwood@mail.ru; gulnar\_11.78@mail.ru; ainur.abdullaecva86@gmail.com

*This article deals with the art of fabrics decoration – sublimation printing. The exposure of the print quality on the composition and type of tissue was investigated.*

*Статья посвящена искусству отделки тканей – сублимационной печати. Исследовано воздействие качества печати на состав и тип ткани.*

**Keywords: sublimation printing, fashion design, designer drawing, decor, print.**

**Ключевые слова: сублимационная печать, дизайн одежды, дизайнерский рисунок, декор, принт.**

Light industry is one of the priority sectors of the world economy. The development of light industry should receive special attention, since this industry has considerable socio-economic importance, ensuring high employment of the able-bodied population. Occupying the second position in terms of consumption, this integrated industry includes more than 20 sub-sectors that can be combined into three main groups: textile, clothing, leather, fur, footwear. The largest share in the structure of light industry is occupied by products of the garment and textile sub-sectors [1].

At present, a great number of scientific achievements in the field of textiles are opened for designers. Textile refers to fabric and other materials produced by weaving threads and fibers.

New, developing part of the assortment consists of the production of relatively short term or newly created fabrics of new fibers, textile yarns, new structures and types of finishing. This part of the assortment develops most dynamically based on the use of modern

technologies. Almost in all classifications of fabrics, the first classification feature is the fibrous composition. It largely determines the purpose of the fabric, the extent of its use, the properties of the fabrics and the structural features of garments depend on them. The equipping of sewing enterprises with equipment, modes of its use are also primarily determined by the fibrous composition of the processed fabrics. During choosing a material, the product clearly articulates the requirements not only to the properties of the fabric, but also to its appearance and characteristics of aesthetic properties. After all, traditionally, the costume performed two basic functions for a person, on the one hand, responding to its utilitarian requests, and on the other hand aesthetic one.

The art of fabrics decoration had been arisen from ancient times. A human being felt the need to make his clothes smart very early. After the advent of the loom machine, the artistic activity of a man began to be directed at fabric surface decoration with an ornamental pattern.

For centuries, production technologies, fabrics decoration and the manufacture of products have been improved. While a costume creating, it was not always possible to achieve a balance between artistic expressiveness and utilitarianism.

Today, the creation of drawings is great art, requiring certain taste of the artist and also imagination, inspiration, knowledge of the basics of decorative and applied art, the laws of color and harmonious color combination, the ability to reflect the requirements of modern fashion in the drawing, to take into account the technological capabilities of the enterprise, letting him reproduce a drawing at tissue without its distortion.

One of such methods is sublimation printing, a special technology that uses the ability of certain substances (dyes) to heat thereby to change from the solid state to the gaseous phase directly, bypassing the liquid phase. The transfer is printed with special sublimation paints, pressed tightly by the press, and heated to the temperature at which the ink is transferred to fabric fibers. The main point of coloration mechanism is that the paint does not lie on the surface of the product, but penetrates deeply between the fibers and settles on them in a thin layer. As a result, the properties of the fabric itself do not change, and the print is super-resistant to washing [2]. During printing by this method, the paint is first placed on a carrier (paper or film), and from it the image is already transferred to the textile web. The print on the fabric is very resistant to burnout, washing off and mechanical influences.

The method of sublimation printing makes it possible to transfer to the fabric full-color images with an extensive color palette and thin smooth transitions. In particular, it is well suited for printing photos on clothes, flags production, pennants, drawing attributes on gym clothes. This is its main advantage over other technologies of fabric drawing [3]. This method of printing is perfect for making prints in modern design collections.

The promising and rapidly developing direction of sublimation printing is becoming widespread in modern clothing design. Almaty Technological University has created the program of Double-Diploma Education in cooper-

ation with the European Institute of Design (IED, Italy) which specializes in textile design in order to prepare professionals with modern knowledge and practical skills in the field of fashion and design in accordance with European standards.

In addition, the discipline of Decoration Technology also opens the possibility for students to develop their own prints and type using a printer for sublimation printing. Even at the stage of the collection design with printed drawings it is important for a designer to understand the basic laws of chemical and physical processes occurring in tissues, to understand the basic essence of all stages of the technological process of making printed figures, the specificity of changing for fabric properties and ornamental compositions.

Study of tissue behavior during sublimation printing.

The technological process of studying the tissues behavior of during the use of sublimation printing consists of several stages.



Fig. 1

Step 1. Prints are developed through Corel-Draw program (Fig. 1) for application to various types of fabrics.

Step 2. Images of 11x11 size are printed using an inkjet printer JV300-160A on an intermediate medium - dye-sublimation paper. It types the printer, then with the help of special equipment the ink is transferred to a fabric or textile product. The main feature of this material is that it does not absorb ink, allowing at the next technological stage to transfer them to the fabric completely.

Step 3. Further, the print that obtained on the sublimation paper is combined with the front side of the fabric to which the image must be applied. For transfer, depending on the shape and size of this product, a thermo press

is used. This device under the influence of temperature and pressure transfers the image to the fabric, as a result of which the dye penetrates into the structure of the fibers and is securely fixed in them.

In the process of printing on different types of fabrics, the following results were obtained:

Satin - only outline shape of the print appears. The color of the picture becomes monophonic.

Jacquard absorbs the pattern completely.

Taffeta stretch allows to print with loss of color saturation.

Applying the print to the blue chiffon, the picture changes its color combination.

Whereas stretch knitwear with decorative sequins passes through the thermo, its prints are transferred to the sublimation paper.

On the backing silk, the print loses its saturation.

The print application to light beige knitwear allows getting a fairly full-color picture.

Dark satin does not give the opportunity to display the developed print.

The figure shown on the taffeta is almost invisible.

Printing on white stretch cotton fabric allows getting the print of the highest quality.

## CONCLUSION

As a result of the study, the behavior of various types of fabrics during the deposition of sublimation printing, it can be concluded that this method of decoration is better for tissues with a high synthetics content (ideally 100%, but possibly 50%, although in the latter case the color of the image turns out to be less bright). At the same time, the fabric should be light, since the coating ability of paints used in sublimation printing is extremely low.

Working in a digital environment, a designer pays more time for research, experimentation and creativity, gaining more freedom in choosing printing technologies. The development of the digital industry removes the limitations in the textile world, within which textile designers have been for many years: freedom from rapport, color separation, which is very popular with mass consumer. Now designers can work with thousands of colors and a high degree of detail of their ideas, thanks to digital software. For some time, Photoshop, Corel DRAW, Illustrator have become virtually standardized methods of working with textiles, which can equally work with raster and vector images, with drawings and photographs, precise details and graphic effects.

Direct printing on fabric has become a revolution in the textile world, allowing to use inspiration from any sources and creating a new visual language. Designers who work with costume, theatrical, interior and trade themes have acquired a more special way of self-expression. This way of decorating brings together textiles, fashion and interior, allowing them to integrate, mix and influence each other.

## REFERENCES

1. *Tolykbekova A.* State of light industry development in Kazakhstan. <http://kidi.gov.kz>, 15.11.2018.
2. *Pozhidayev N.N., Simonenko D.F., Savchuk N.G.* Materials for clothing. – M.: Light Industry, 1975.
3. Studio of textile printing "Mr. BOB". The pattern on the fabric – a technique and method of application. <http://mrvov.ru/risunok-na-tkani-tehnika-i-metodika-naneseniya/> 16.11.2018.

Рекомендована Ученым советом. Поступила 02.10.18.