

## **SELECTION OF TECHNOLOGY AND EQUIPMENT FOR PRINTING ON PACKAGING AND LABEL MATERIALS**

The printing industry is closely interconnected with the packaging industry, and today printing packaging has gained a leading position in the total volume of world printing services. This is due to the current trend of the modern market, which is that any product should be packaged. Packaging becomes a powerful means of advertising and marketing products, because the demand for goods from consumers depends on its quality.

Packaging is characterized by a wide variety of classes, types and structural and technological features of execution. The material is used to distinguish packaging from paper, cardboard, plastic, metal, glass, ceramics, wood. The most economical and widely used materials are paper and cardboard.

At printing packaging almost any printing and finishing method can be used, therefore, such packaging differs by its excellent appearance and a huge variety of design solutions.

Each of technologies of printing packaging has its advantages and disadvantages.

Flexographic printing is a universal technology that provides high quality high-speed printing of halftone images with medium and low screen ruling. The weak side of flexography is insufficient quality reproduction of halftone images with high screen ruling, small line elements, small-size fonts due to high dot gain and other features of this type of printing. However, a number of innovations, including the introduction of thin photopolymer printing plates with a compression layer and use of UV inks, have significantly improved the quality of flexographic printing. This, along with other advantages of this technology, brings flexography to the first place in the market of printing packaging.

Offset printing produces high quality prints with a fine screen images. The main disadvantage of this type of printing is the high cost of setting up and maintaining the necessary technological modes due to the instability of ink-dampening balance.

Gravure printing allows for very high quality prints with a good tonal graduation. This method has the highest print speed, but the high costs of plate production make it cost-effective only for printing large runs. In particular, gravure printing is widely used in printing packaging for tobacco products and liquids.

Screen printing is characterized by the possibility of obtaining opaque graphic elements through the use of inks with high roofing ability and the possibility to apply ink layer of great thickness. However, high-quality halftone images cannot be reproduced using screen printing at present. Its other disadvantage is quite low printing speed.

Digital printing – a set of methods in which there is no material printing plate. The most common are electrography and inkjet printing. The main advantage of these methods is possibility of operative change of the reproduced information.

Analyzing modern digital printing technologies, we can identify a number of advantages over other technologies.

The main advantage of these methods is the ability to quickly change the reproduced information. It is possible to print the trial versions of the product, to be convinced in the clarity of the image, the brightness of the picture and the correct design. If necessary, it is possible to make timely changes. It was possible to solve the problem of accurate color synchronization between sections – on modern machines there is a special scanner that scans prints and synchronizes the color specified in the sample. This approach allows for absolutely accurate inkability not only between the two printing sections, but also between different machines, which can not be achieved with traditional types of printing.

Lack of prepress, making the process not only cheaper but also faster. Reduces the risk of loss of image clarity. Save time and materials on the adjustment, as other printing methods use a lot of paper and ink. Ability to make corrections to the layout and personalize the data, which can not be done in other ways, since after making the form it is impossible to change it.

Profitability of digital printing for small print runs. Large batches can be produced, or can get limit to one copy of the product.

Increased speed and performance of this type of printing, which used to be significantly inferior to traditional types. Also, new digital technologies have made it possible to print materials that were previously produced exclusively by special types of printing.

One of the latest trends in printing packaging is the spread of the so-called combined technology – the combination of several printing technologies in one process. The purpose of this combination is to expand the possibilities of the printing process by taking advantage of each of the existing methods. Practical realization of combined printing is possible only after solving problems of technological process development, equipment selection and production reorganization.

Packaging carries a marketing function, that is, it should encourage the buyer to purchase from many products exactly the one that it contains.

Thus, packaging manufacturers face the task of somehow highlighting their products, to give them special decorative properties. In addition to this function, with the help of printing and finishing operations, other tasks are solved: protection of prints (from abrasion, from the action of an aggressive environment), giving a print of new consumer properties (blistering and aromatized varnishes), protection of production against counterfeits (holographic labels), etc.

Another important change in the industry is rapid growth in the popularity of interactive printing (QR codes, augmented reality elements, etc.).

#### SOURCES

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### **BASIC PARAMETERS OF PHARMACEUTICAL PACKAGING DESIGN DEVELOPMENT**

The main purpose of developing any design is to attract the consumer's attention with originality and style of packaging. A well-designed drug packaging design can help a pharmacist quickly find it on the shelf. With regard to the requirements for the design of medical products packaging, it is necessary to pay more attention to the readability of the text on the packaging and the material used for its manufacture.

Images, drug names, informative text, color design, and graphic drawings must be harmoniously combined on the drug packaging. In addition to attractiveness, packaging should be reliable, high quality, promote the brand in general, be easy to use.

The packaging of the medicinal product must meet the following key patient-oriented parameters:

– *Informativeness*: the use of graphics and color marking makes the use of the drug more convenient. Excess or lack of information on medical packaging causes negative emotions and frustration. Consumers want to