MODERN TECHNOLOGIES FOR MARKING PHARMACEUTICAL PACKAGING

***Labetska M.**, Senior Lecturer, Ukrainian Academy of Printing*
***Kotmalova O.**, Docent, Ukrainian Academy of Printing*

Marking of packaging of medicinal products is the text, symbols or drawings on the packaging and (or) goods, as well as other aids designed to identify the product or its individual properties, bring to the consumer information about manufacturers, quantitative and qualitative characteristics of the product.

Modern standards for the design of products of the pharmaceutical industry place high demands on the quality of labeling. All over the world, significant funds are spent on the creation and implementation of ever more advanced systems for product quality control, product identification, and logistics. Mandatory labeling is also necessary to control trade and identify counterfeit goods. This is especially important in the field of drug trade, because low-quality drugs harm people's health.

A reliable "packaging-labeling" system prevents the possibility of counterfeiting medicines, provides batch tracking information, improves the visibility of key information and provides legibility of the name or strength of the drug on the blister pack, ensures durability of ink inscriptions, attracts the attention of buyers to important information about the drug.

Marking pharmaceuticals and pharmaceutical packaging is affected by many factors, such as batch data, lot sizes, and information system integration; traceability requirements; line speeds; packaging and label material; character sizes and fonts.

In accordance with Article 12 of the Law of Ukraine "On Medicinal Products" the label applied to the outer and inner packaging of the medicinal product must contain the following information:

- name of the medicinal product;
- name and address of its manufacturer;
- registration number;
- series number;
- expiration date;
- methods of application;
- dose of active substance in each unit and their quantity in the package;
- storage conditions;
- precautionary measures.

To date, the most common methods of labeling the packaging of medicines are:

a) *Contact coders* (application of inscriptions on glass ampoules with intaglio printing ink; sticking self-adhesive labels on the primary packaging of

pharmaceuticals; embossing of polymer containers, which guarantees a high degree of protection of drug packaging from possible counterfeiting);

b) *Ink-jet or continious ink-jet technology* provides high quality, speed, efficiency and versatility of labeling pharmaceutical packaging of various shapes and almost any material (paper, cardboard, plastic, glass, film, metals) at a low cost of consumables and operation of the equipment;

c) *Laser marking* also ensures the quality, speed and flexibility of the labeling process, but is also characterized by the absence of consumables and environmental friendliness;

d) *Thermal and thermal transfer printing* is one of the best ways to apply a barcode on different materials (paper, polymer film, etc.), however, it provides, if possible, a flat surface;

e) *Braille marking.* According to European Union standards, medicines must be marked in Braille for the safe use of medicines by visually impaired patients. In 2010, a law came into force in Ukraine requiring manufacturers to apply Braille marking to the secondary packaging of medicinal products. The name of the drug, the dose of the active substance and the dosage form are indicated in Braille on the consumer package.

The main ways to apply Braille characters on the pharmaceutical packaging are:

- embossing on secondary and primary packaging (on plastic containers);
- screen printing;
- inkjet printing with UV and thermal varnishes;
- use of self-adhesive labels (stickers).

At the stage of group packaging, the manufacturer needs a marking that allows him to identify this product in a certain volume. In this case, either thermal labels or DOD printers are used.

Therefore, it is obvious that pharmaceutical labeling is a very complex and regulated process that is an integral part of quality for any manufacturer or business owner.

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