FACTORS OF THE INFLUENCE OF POLYGRAPHIC PRODUCTION ON THE ENVIRONMENT. METHODS OF SOLVING THE PROBLEM

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Abstract. Polygraphic production is considered as a source of pollution of the environment. The analysis of hazardous toxic elements and compounds contained in raw materials and consumables for printing production is carried out. The factors of environmental risk associated with the use of materials containing polyvinyl chloride have been studied. The ways of ecologization of printing production are offered.

Keywords: printing production, ecology, environment, chemical elements, polyvinyl chloride, recycling, harmful substances, polluting compounds, ecology, legal norms, printing materials.

Анотація. Поліграфічне виробництво розглядається як джерело забруднення навколишнього середовища. Проведено аналіз небезпечних токсичних елементів та сполук, що містяться в сировині та витратних матеріалах для поліграфічного виробництва. Вивчені фактори екологічного ризику, пов'язані з використанням матеріалів, що містять полівінілхлорид. Запропоновано шляхи екологізації поліграфічного виробництва.

Ключові слова: поліграфічне виробництво, екологія, навколишнє середовище, хімічні елементи, полівінілхлорид, переробка, шкідливі речовини, забруднюючі сполуки, екологія, правові норми, поліграфічні матеріали.

Introduction. Organic production is based on the application of environmental strategies management and environmental engineering, environmentally friendly technologies to prevent man-made pollution and to enhance it natural resource efficiency, waste management efficiency production. Preventive strategies, unlike protective ones, require implementation environmental engineering methods and solutions at all stages of product creation and consumption, that is, at all stages of the product life cycle.

Incorporating environmental goals into the economic interests of manufacturers and other entities economic activity should be considered as the basis of the mechanism for rationalization of environmental management and management of environmental safety at all levels of government and regulation.

The driving force in the process of increasing the environmental friendliness of production is to increase the competitiveness of the enterprise, optimize production due to the reduction of defective products and waste. This process is possible through the introduction of innovative approaches such as the implementation of quality management systems (QMS) and production by international standards.

Analysis of the question. The printing industry does not generate much harm to the environment compared with other industries. However, due to the location of most printing companies within cities and the lack of development of their sanitary protection zones, environmental protection is an important and urgent problem today.

Objective. Consider printing production as a source of environmental pollution. Conduct an analysis of the major hazardous elements and compounds contained in raw materials and consumables that affect human vital functions. Consider possible ways of greening.

Materials and results. According to the State Register of Publishers, Manufacturers and Distributors of Publishing Products in Ukraine, more than 3 thousand publishing entities are registered today. The printing industry does not belong to hazardous industries, and small and medium-sized printing industries are often located in residential areas without any sanitary areas. But printing production involves the presence of a large amount of solid waste in all operations. These can be scraps of paper and cardboard, film, containers of paints, glue and solvents. Reducing the volume of solid waste, recycling or reusing it not only increases the level of environmental friendliness of production, but also increases the competitiveness of the enterprise.

The legal framework for printing is outdated and relates mainly to labor protection. Together, these materials serve the products of the woodworking and chemical industries, which are not always safe in processing, especially when using the latest technologies (use of new coatings, ultraviolet radiation for processing, etc.). Often, the manufacturer relies entirely on the supplier of materials, shifting responsibility for the environmental impact of production [1, 2]. In this aspect it is worth mentioning the widespread use of polyvinyl chloride (PVC) materials. There is a widespread anti-PVC campaign in developed countries and the EU due to environmental damage and complexity of disposal. The analysis of the activity of printing companies in Ukraine showed the urgent need to immediately form the legislative and regulatory framework of state environmental regulation, environmental management of enterprises, considering the impact of production on the environment.

Printing materials contain quite a few toxic elements. Typographic paints, varnishes and adhesives contain dangerous chemical elements such as lead and cadmium. Their characteristic feature is that they are quite stable in natural conditions [3]. Here are brief characteristics of the most toxic elements and compounds and their impact on human vital functions.

Pb lead - affects the hematopoietic and nervous systems, the gastrointestinal tract and the kidneys. It causes anemia as well as encephalopathy, decreased mental capacity, hyper kinetic and aggressive conditions, gastrointestinal disorders. Lead is accumulated in soil, contained in air and water in small quantities.

Cadmium Cd - belongs to the most dangerous not only because it is highly toxic, but also because of its widespread use and distribution in modern industry. It enters the body with food and drink. May cause nausea, stomach cramps, headache.

Chromium - is absorbed in the gastrointestinal tract, accumulates in the hair and liver. Chromium is necessary for a stable level of glucose in the body, but in exaggerated doses allergic reactions, various forms of dermatitis, cancer of the upper respiratory tract and lungs are observed.

Zinc - metallic taste in the mouth, salivation, abdominal pain, headache, muscle cramps occur with zinc poisoning. Often found in the atmosphere of densely populated areas.

Polyvinyl chloride (PVC) - often used in production (sheets, self-adhesive films, molding films). When used, vinyl chloride is released - a colorless gas with a faint odor, which is quickly excreted from the body, but with constant contact it can cause mutagenic activity, affect the nervous system, exhibit emotional changes, affect reproductive processes, have an embryo. A major problem is the disposal of PVC, which requires special packing, expensive equipment and prevents the disposal of other plastics. Unfortunately, most PVC waste is simply incinerated in landfills [4].

All the above is reflected in the concept of national information policy, among which the tasks are: promoting scientific and technical development of priority areas of publishing; development of domestic computer and technological support for publishing processes; creation and use of domestic environmentally friendly printing materials; the use of recyclables; introduction of the latest technologies for publishing of publications on paper and electronic media, improvement of the system of state and industry standards.

Improving the ecology of printing production can also occur in the following areas: recycling - the use of waste in other manufacturing operations; reducing the damage to existing technologies for the environment; introduction of environmentally-friendly or completely waste-free innovative technologies; improvement of the industry standards and norms and obligatory observance of them [5,6].

Conclusions. The analysis of hazardous toxic elements and compounds contained in raw materials and consumables for printing production leads to the conclusion that it is necessary to evaluate the environmental characteristics of the raw material base. For this purpose, it is necessary to have all information from suppliers about the presence of harmful and toxic substances that are included in the materials, as well as about possible emissions into the air of the production area and atmospheric air under different modes of treatment of these materials. Depending on this, the manufacturer of printing products must ensure the production of equipment that would not allow hazardous emissions into the air, discharges into the sewer system and ensure the safety requirements of equipment and production processes. In addition, it is necessary to keep a clear record of the composition and quantity of solid waste and to maximize control over its disposal. A possible solution could be to introduce environmental passports in this area.

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