

The need for modernization is determined by the fact that the main existing systems of dust cleaning, and, in particular, wet dust collectors, have completely worked out their resources. The efficiency of existing equipment is 92%.

The modernization of the existing gas cleaning equipment is aimed at the reducing technological equipment emissions the on the following indices: particulate matter (dust/aerosol of undifferentiated composition), inorganic dust with $SiO_2 < 70\%$ and wood dust at various manufacturing stages of the foundry.

Technological equipment supplying molding materials with the help of HWS line conveyors and a "Multomatic" automatic line for the subsequent production of molds is installed in the ductile cast iron shop at the molding stage. In this sector the source of inorganic dust emissions, with $SiO_2 < 70\%$, is a conveyor spillage. In the non-ferrous casting shop, the sources of dust and particulate matter emissions are the following: belt conveyors, electric furnaces, jaw crushers, grinding machines and foundry runners. The sources of inorganic dusts with $SiO_2 < 70\%$ in the heat-treating and fettling department are as follows: a grinding machine, an overhead rail conveyor shot blasting machine, and a tumbling barrel.

The principles of operation of newly installed aspiration systems with FVU in these production sectors are the following: dusty air enters the filter inlet, where the distribution and alignment of the air flow occurs. Then the air passes through the filter elements inward. Thus, the dust remains on the surface of the filter cassettes, and the cleaned air enters the clean gas chamber through the fan at the outlet of the unit. The purification efficiency of filter ventilation units of the "HWS" and "Multomatic" lines in the heat-treating and fettling department and in the stripping unit will become 99.9%.

The main sources of wood dust in the wooden models sector of the foundry are machines of various configurations. "Giprodrevprom Ts-1500 cyclone" dust cleaning system with a purification efficiency of 90% will be replaced with more efficient aspiration systems with a recirculating dust collection system and a filter regeneration system. This gas cleaning equipment operation principle is as follows: dust falls into the dust collector and then is transported for processing under the contract. The purification efficiency of such systems is 99.92%.

The calculation of pollutant emissions is presented in Table 1.

Table 1

Substance	Substance emission	
	Before modernization of gas cleaning equipment t/year	After modernization of gas cleaning equipment t/year
Particulate matter (dust/aerosol of undifferentiated composition)	0,241000	0,162190
Inorganic dust with $SiO_2 < 70\%$	13,311	0,595655
Wood dust	0,258	0,0085182
Total:	14,068	0,766363

Table 1 shows that the amount of particulate matter entering the atmosphere, the amount of inorganic dust with $SiO_2 < 70\%$, and wood dust will decrease by 67.29%, 4.47%, and 3.30% respectively. When new gas cleaning equipment is installed, the total amount of pollutants emitted by technological equipment of the "GZLiN" foundry will decrease by 5.44%.

The suggested figures are substantiated by the calculations that show that after the modernization of the dust cleaning systems the ecological situation in the vicinity of the enterprise will meet the regulatory requirements for the ambient air quality for populated areas. At the same time, the amount of dust entering the ambient air will decrease by 13.302 tones per year, and the air quality of the working area will improve.

FUNCTIONAL STRUCTURE OF INFORMATION RETRIEVAL SYSTEM "POLLEN OF WOODY AND SHRUB PLANTS GROWING IN TERRITORY OF THE REPUBLIC OF BELARUS"

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Some characteristics and features of functional structure of information retrieval system "Pollen of woody and shrub plants growing in territory of the Republic of Belarus" are considered, that is being created by order of State Institution "Scientific and Practical Center of the State Forensic Examination Committee of the Republic of

Belarus” and is intended to improve the scientific and methodological foundations of forensic research of plant origin as sources of evidence for solving various identification and diagnostic tasks.

Keywords: functional structure, information retrieval system, pollen of shrub.

The main objectives of the research work on the creation an information retrieval system “Pollen of woody and shrub plants growing in territory of the Republic of Belarus” are:

- identification of specialized tools necessary for the operation of the system and functional requirements for them;
- development of an architecture (generalized functional structure) and algorithms for the functioning of a system that meets known international technical standards and ensures the portability, interoperability and scalability of applications and data;
- development of a subsystem of instrumental and interface tools for users with differentiation of access rights to information and computing resources, the formation of a relational database and testing and approbation of the system.

As a result of performing certain stages in the creation of the system, the following works were performed:

- Microsoft Office Access tools were identified as the best software tools for building and working with the system database;
- an integrated environment for developing software modules for interacting with the system database Microsoft Visual Basic for Applications was described;
- the design and development of the optimal generalized functional structure of the system were carried out;
- specialized algorithms for the functioning of the system, based on the use of controls of a multi-level tree for data manipulation were developed and implemented.

The functional features of the system are determined by the interaction with both the graphical user interface and directly with the database itself through the database management system and are based on the use of 2 roles: “User” and “Administrator”. These roles allow a certain way to distinguish between access rights to the interface part and database objects.

Regarding the structure and content of the system project, it can be noted that it consists of such components as tables, forms and modules. When designing an architecture that implements the possibilities of working with data, as well as their portability and scalability as part of a software application, it was necessary to implement special tables for working with the TreeView element.

A graphical user interface containing various form controls, including for data access, must comply with the functional structure of the system, based on the ability to access (select, add, update and delete) data and database objects with a multi-level tree view. Therefore, the main control element of the graphical form of the designed application was the Microsoft TreeView Control element of the ActiveX type, which provides the possibility of additional program settings.

Thus, developed functional structure of information retrieval system “Pollen of woody and shrub plants growing in territory of the Republic of Belarus” will allow developing a subsystem of tools and interface tools for users, build a database and test and approve the created system in State Institution “Scientific and Practical Center of the State Forensic Examination Committee of the Republic of Belarus”.

REACTION OF PIGMENTAL AND ANTIOXIDANT SYSTEMS OF PLANT ON ENVIRONMENTAL POLLUTION

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The reaction of the pigment and antioxidant systems of agricultural plants has been studied. A high negative correlation between the Cd content in plants and their antioxidant status and a positive correlation between the Cd content and the accumulation of anthocyanins have been revealed.

Keywords: technogenic pollution; cadmium; city phytocenosis; antioxidants; bioindication.

Pollution of soil with cadmium leads to a decrease in the accumulation of photosynthetic pigments and their destruction, a decrease in the rate of accumulation of assimilates and, as a consequence, to a decrease in the con-