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INVESTIGATION OF LIGHT FILTERS USED IN CEMENT INDUSTRY

(I.N. Abdullaev)

Abstract: *The cement industry is one of the areas of technogenic pollution of the environment. In this regard, it is important to capture the dust that gets into the air during this process. The article analyzes the methods of regeneration of the structures of vacuum cleaners and filter-filters used at cement plants in the Fergana region. The results of experimental work on the state of synthetic filter filters that purify the air from the dust flow are presented. The method and procedure for regenerating filters without damaging the tissue was studied and a feasibility study was performed to reduce the time required to replace them.*

Key words: *cement industry, dust collectors, light filters, regeneration, synthetic fabrics, ecology.*

According to official data [1-24], currently 22 cement plants in the Republic of Uzbekistan produce about 11 million tons per year. produces cement. Over the past 4 years, the development of construction has sharply increased the demand for cement in both domestic and foreign markets. In this regard, the President of the Republic of Uzbekistan The task is to increase the volume of cement production in the country to 21 million tons. If we take into account the average annual production of existing plants, more than 20 more cement plants will have to be built. Currently, 6 cement plants are producing in Fergana region, 3 are nearing completion, and 2 are under construction. Sophisticated filtration systems have been used since the 1980s to treat emissions from these plants. Their structure, constructions and principles of operation are being improved all over the world. For example, existing vacuum cleaner filters have different configurations and parameters in shape, have different principles of performance, light filters are made of different materials on the fabric, which are constantly being improved[11-34].

In order to evaluate the advantages of using light filters made of fabrics, they are studied based on the results of experiments, depending on each production situation. For example, the differentiated classifications of light filters used in cement production are as follows:

- by the shape of the filter element - **wide;**
- on the presence of their support - **carcass**;
- on the location of the fan relative to the filter - **suction** ;
- on regeneration of filter fabric - **pulsed**;
- on the shape of the case and the location of filters in it - **rectangular** ;
- by the number of sections in the structure - multi- **section** ;
- by the type of fabric used- **synthetic fabric** .

The dimensions of the sleeve filters depend on the structural conditions and the economic approach, ie the higher the sleeves, the larger their diameter, as it is necessary to prevent the fabric from collapsing at the entrance to the sleeves. Table 1 shows the technical classifications of filtration equipment used in "Fagonatsement" LLC.

Fergana Cement MChJ Technical classifications of filters of the type FR (Filter Regenerator) in JV
Table 1

Devices	FR-1	FR-2	FR-3
Number of modules, pcs	1	1	1
Filter surface area , m ^{2}	4550	2060	1310
Overall dimensions , m	8x15x13	7x13x9	6x10x10
Weight , t	71.5	37.5	27.5
Number of sections in the module, pcs	20	22	14
Number of cells in the section, pcs	65	78	78
Length , L mm	7000	3000	3000
Diameter i , d mm	165	135	135
The ratio of the maximum length to the diameter	42-1	22-1	22-1
Filter materials	Polypropylene synthetics k mato		

Number of filters in the complete device: (20x65) + (22x78) + (14x78) = 4108 pieces, the total area of the required fabric is 7920 m ^{2} . In some more powerful plants, this figure goes up to 10,000m ^{2} . There is a need for 200,000 m ^{2} of fabric for one-time refueling of all existing plants . Such equipment is carried out at least twice a year. If by 2025 the volume of

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cement production reaches 21 mln. The number of plants will increase to 40 million tons. m ^{2} of synthetic fabric will be required[19-44]..

The purpose of these figures is that the fabric is not available in Uzbekistan, but is imported entirely from China and Russia. This is the first problem.

From the process of cement clinker saturation, the temperature of gas-dust, which monitors the product at high temperatures (1200 ^{0}) in all technological units, should be reduced to about 250 $^{0\ C.}$ A complex system, extreme excess energy, is required to achieve temperature reduction. This requirement stems from the aforementioned light filter fabric properties, as there is currently no material that can withstand temperatures above 250 ^{0}C -280 $^{0\ C}$ and is cost-effective. This is the second problem.

The light pulse puff filters used are held by wire carcasses with a length of 2 to 12 meters and a diameter of 120-200 mm (in our example L = 3 and 7 m., D = 135 and 160 mm.), Fig.1.

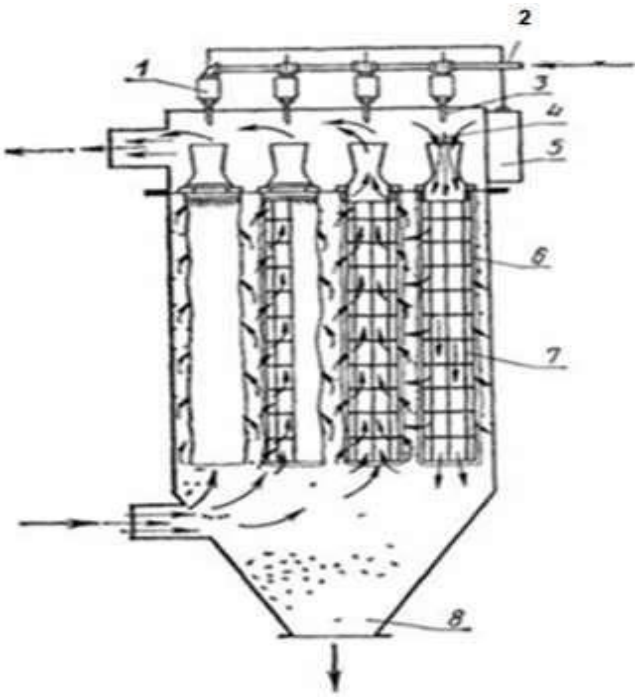

Figure 1. Pulse blower carcass filter

1-solenoid valve;
2 compressed air inlet pipe; 3-nozzle;
4 compressed air flow;
5 automatic regeneration control equipment;
6 eng; 7-carcass; 8-bunker

Carcasses of such lengths must serve in a vertical position without bending, bending, deformation during the regeneration of the fabric, without breaking the gap between the filters. Unfortunately, the technology of making carcasses that meet these requirements is not available in Uzbekistan. This is the third problem.

Based on these three problems, the Institute conducts extensive research at the Department of "Building and Structure Construction" of the Faculty of Civil Engineering in cooperation with "Fergana Research and Invention Technology" LLC. We considered these three problems as "three directions" and set clear goals and objectives in these areas.

The research focuses on:

- study of the physical, chemical and mechanical properties of synthetic fabrics made from local polymer raw materials;
- To study the properties of basalt fiber woven fabrics in order to search for high temperature resistant fabrics;
-Development of technology for the production of wide filter carcasses.

It should be noted that the solution of problems in all three areas will ensure the independence of raw materials in the cement industry of Uzbekistan, the development of import-substituting products, energy-saving technologies.

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