

DR-50**USING THE PROFILED ELEMENTS TO INCREASE ELECTROCYCLONE EFFECTIVENESS**

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Abstract. Technological advancement implies a continuous increase in the capacities of industrial companies. Industrial enterprises use solid materials for production purposes. Many of the thermal power stations supplying electricity to industrial companies also operate on solid fuels. Increasing volumes of emitted flue gases require high-performance gas-cleaning devices. Aerosols can be purified in various types of devices [1, 2]. It is possible to intensify the operation of electrocyclones by optimising the various parameters and characteristics. The main of this is reduction of re-entrainment [3].

For visual observation and quantification of the effectiveness of the profiled elements, a stand was assembled. A schematic diagram of the experimental stand is shown in Figure 1. The stand is designed as a prototype (in a first approximation) of the annular channel model.

The stand consist of: 1 is the corona electrode, 2 is the external collecting electrode, 3 is the internal collecting electrode, 4 is the body, 5 is the collector, 6 is the inlet pipe, 7 is the exhaust pipe, 8 is the glass plate, 9 is the settling chamber. The walls (smooth aluminum plates) were connected to the positive pole of an external source of high voltage and grounded. The discharge electrodes are connected to the negative pole of the external high-voltage source.

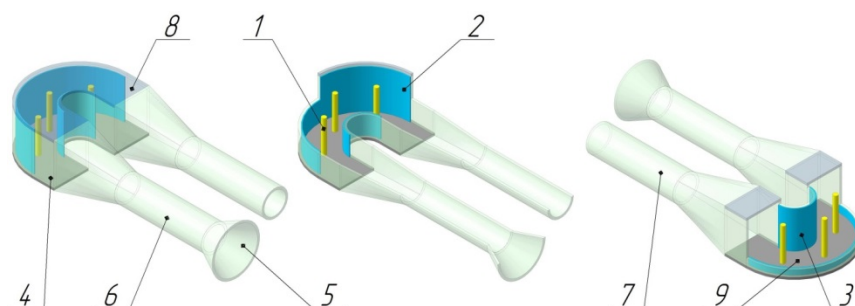


Figure 1. A stand for the re-entrainment process study

4 most common structural elements were selected: C-shaped element, double C-shaped element, rounded C-shaped elements, Z-shaped elements. Evaluated was the amount of material accumulated on the collecting electrodes by passing a sample of 50 g of ash. The most effective (13.8 g per 1 element) are double C-shaped elements; the lowest efficiency is demonstrated by C-shaped elements along the gas (13.0 g). Z-shaped ones catch only 11.3 g and the rounded C-shaped ones catch 5.6 g. This can be explained by the developed parasitic vortices in the radial cavity of the blades and between the blades.

The effectiveness of the profiled elements was demonstrated qualitatively and quantitatively. The most effective are the double C-shaped profiled elements.

References

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