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RESEARCH ON PARAMETERS CHANGES OF THE TWO-LEVEL MULTICHANNEL CYCLONE

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Abstract

The conducted research has proved the dependence of gas flow rate in the separate channels of the two-level multichannel cyclone at a different inflow velocity and the number of channels. The carried out investigation demonstrates the dependence of changes in velocity in the channels under varying relations between peripheral and transitional flows. The work of a cyclone of the channel is based on centrifugal forces and an additionally occurring filtration process caused by the interaction between the flow coming from the later channel (peripheral) and the other floating towards the axis of the cyclone (transitional). The structure of the two-level cyclone allows reaching higher gas (air) flow efficiency performing similar measurements of the applied equipment. New cyclones are designed upon the establishment of the tangential airflow and using the aerodynamic characteristics of the cyclones that have better efficiency than the ordinary ones. The aim of this research is to investigate changes in airflow rate at different levels of the cylindrical casing and their channels by regulating the half-rings of the multichannel cyclone, and changing relations of peripheral and transitional flows that get into the channels when the speed of the inflow/capacity of the cyclone varies. The maximum aerodynamic resistance is 1562 Pa when flow distribution ratio is 50/50 and inflow velocity is 15.3 m/s. According to the obtained experimental data, the effectiveness of cleaning the air flow polluted with the solid particles of more than 20 microns in diameter is up to 93% when the concentration of such particles in the airflow before cleaning is 5.9 g/m^3.

Key words: channel, concentration, cyclone, efficiency, solid particle

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