



“Gheorghe Asachi” Technical University of Iasi, Romania



## VARIETY BEHAVIORS OF DEPTH AND SURFACE FILTER MEDIA WITH THE AGES FOR PLEATED FILTER CARTRIDGES

Yan Cuiping<sup>1,2\*</sup>, Liu Guijian<sup>2</sup>, Chen Haiyan<sup>1</sup>

<sup>1</sup>Key Laboratory of Solid Waste Treatment and Resource Recycle, Ministry of Education, School of Environment and Resources, Southwest University of Science and Technology, Mianyang 621010, China

<sup>2</sup>CAS Key Laboratory of Crust-Mantle Materials and the Environments, School of Earth and Space Sciences, University of Science and Technology of China, Hefei 230026, China

### Abstract

The aim of this study is to investigate variety behaviors of two kinds of media (multiple-layer structures and multiple-layer structures combined with surface treatment, such as finer fibers) with ages using a scanning electron microscope (SEM) and to determine the effect of fabric microstructures on cake formation and pulse cleaning. The results show that fine particles are readily deposited on the surface and inside depth filter medium. The fine fibers with diameters (~0.08 microns, this value is smaller than 0.5 microns) are readily sorption the fine particles on the fibers of surface filter medium. As the filtration progresses, analysis of multiple-layer structure fibers and surface treatment (such as finer fibers) using SEM indicates that dust cake filtration dominates in the end, regardless of what the depth filtration or surface filtration dominant was initially. This phenomenon solves the perplexity of many industry factories that the collection efficiency of surface filtration medium decreases if the polytetrafluoroethylene fibers with ages are born off during pulse cleaning. The experiment shows that the depth filter medium with high dust holding capacity and difficult cleaning is suitable to collect the low dust laden gas in a long time operation. The surface fine fibers have the similar function with the formed dust cakes for surface filter medium. The dust cake formation and pulse cleaning for surface filter medium is different from the depth filter medium. The fine fibers on surface filter medium are similar to the formed cakes on depth filter medium. The surface filter medium is suitable to recover high dust concentration and fine particles from the dust-laden gas in an on-line operational system.

*Key words:* depth filter medium, fine particles, surface filter medium, variety behaviors

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\*Author to whom all correspondence should be addressed: e-mail: cuiping\_2004@163.com; Phone: +86 13795774342