

Accepted Manuscript

Experimental and numerical study of particle deposition on perforated plates
in a hybrid electrostatic filter precipitator

Gongming Tu, Qiang Song, Qiang Yao

PII: S0032-5910(17)30665-4
DOI: doi:[10.1016/j.powtec.2017.08.021](https://doi.org/10.1016/j.powtec.2017.08.021)
Reference: PTEC 12760

To appear in: *Powder Technology*

Received date: 19 May 2017
Revised date: 27 July 2017
Accepted date: 6 August 2017



Please cite this article as: Gongming Tu, Qiang Song, Qiang Yao, Experimental and numerical study of particle deposition on perforated plates in a hybrid electrostatic filter precipitator, *Powder Technology* (2017), doi:[10.1016/j.powtec.2017.08.021](https://doi.org/10.1016/j.powtec.2017.08.021)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Experimental and numerical study of particle deposition on perforated plates in a hybrid electrostatic filter precipitator

Gongming Tu, Qiang Song*, Qiang Yao

KEY LABORATORY OF THERMAL SCIENCE AND POWER ENGINEERING OF MINISTRY OF EDUCATION,
DEPARTMENT OF THERMAL ENGINEERING, TSINGHUA UNIVERSITY, 100084 BEIJING, CHINA

* Corresponding author

Tel: +86-10-62781740

Fax: +86-10-62781740

E-Mail: qsong@tsinghua.edu.cn

Abstract

The advanced hybrid particulate collector (AHPC) is a highly promising and novel hybrid electrostatic filter technology that removes particles from flue gas. Perforated plates are used as collecting electrodes to attain better synergism between the electrostatic and bag zones. A laboratory-scale AHPC was built to investigate the dust collection performance of perforated plates with different percentages of open area (POA) and opening types. Particles were deposited on the front, flank, and back sides of the plate. Differences in cake packing density were observed at different locations. With the increase in POA, the collection efficiency of the front side decreases, whereas the collection efficiencies of the flank and back sides increase. The increase in the collection of the flank and back sides compensates for the decrease in the collection of the front side, which only changes slightly the total efficiency with the POA. The opening type exhibits minimal effect on total efficiency. A numerical method was established to simulate the dust collection process in the electrostatic zone. Simulation results indicate that the openings change the electric field near the plate and facilitate particle deposition on the flank and back sides, which result in the characteristics of collection efficiency. The difference in the cake structure results from the distribution of electric field strength on the plate surface.

Keywords: Particle; AHPC; Electric field; Perforated plate; Deposition

Download English Version:

<https://daneshyari.com/en/article/4914796>

Download Persian Version:

<https://daneshyari.com/article/4914796>

[Daneshyari.com](https://daneshyari.com)