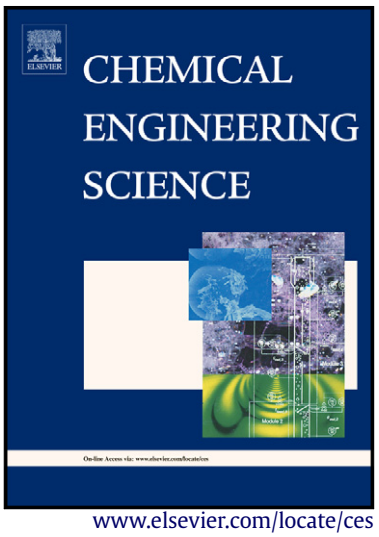


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PII: S0009-2509(14)00705-2
DOI: http://dx.doi.org/10.1016/j.ces.2014.11.051
Reference: CES12015

To appear in: *Chemical Engineering Science*

Received date: 9 July 2014
Revised date: 1 October 2014
Accepted date: 21 November 2014

Cite this article as: Lingai Luo, Min Wei, Yilin Fan, Gilles Flamant, Heuristic Shape Optimization of Baffled Fluid Distributor for Uniform Flow Distribution, *Chemical Engineering Science,* http://dx.doi.org/10.1016/j.ces.2014.11.051

# Heuristic Shape Optimization of Baffled Fluid Distributor for Uniform Flow Distribution

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**Abstract**

This paper presents a CFD-based, heuristic evolutionary algorithm for shape design and optimization of baffled fluid distributor. In this algorithm, the baffle surface is firstly divided with numerous identical control areas (volumes), each control area having an orifice in the middle. Under the constraint of constant global porosity of the baffle, the algorithm adjusts the size distribution of orifices so as to approach identical mass flowrate passing through every control area. An automatic program is processed iteratively so that the baffle configuration evolves toward the optimized shape, providing a uniform flow distribution among parallel outlet channels.

To illustrate the principles and procedure of this algorithm, a 2D example of baffled fluid distributor is introduced and tested. Numerical results show that this algorithm can successfully reach uniform flow distribution with a small pressure drop increase. Sensibility analysis also shows that this algorithm is robust, effective, general and flexible compared to traditional arbitrary or empirical

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