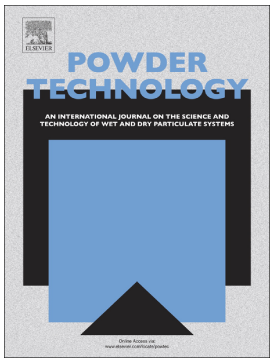

Effects of deswirler position and its centre body shape as well as vortex finder extension downstream on cyclone performance

Dzmitry Misiulia, Sergiy Antonyuk, Anders Gustav Andersson, Tord Staffan Lundström

PII: S0032-5910(18)30399-1
DOI: doi:10.1016/j.powtec.2018.05.034
Reference: PTEC 13407

To appear in: *Powder Technology*

Received date: 18 December 2017
Revised date: 24 April 2018
Accepted date: 16 May 2018

Please cite this article as: Dzmitry Misiulia, Sergiy Antonyuk, Anders Gustav Andersson, Tord Staffan Lundström , Effects of deswirler position and its centre body shape as well as vortex finder extension downstream on cyclone performance. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Ptec(2018), doi:10.1016/j.powtec.2018.05.034

Effects of deswirler position and its centre body shape as well as vortex finder extension downstream on cyclone performance

Dzmitry Misiulia[a,*], Sergiy Antonyuk[b], Anders Gustav Andersson[c], Tord Staffan Lundström[c]

[a]*Department of Machines and Apparatus for Chemical and Silicate Production, Belarusian State Technological University, 13a Sverdlova str., 220006 Minsk, Belarus*
[b]*Institute of Particle Process Engineering, University of Kaiserslautern, D-67653 Kaiserslautern, Germany*
[c]*Division of Fluid and Experimental Mechanics, Department of Engineering Sciences and Mathematics, Luleå University of Technology, SE-971 87 Luleå, Sweden*

Abstract

The performance of a cyclone is studied when changing the position of the deswirler in the vortex finder, its centre body shape and a downstream vortex finder extension. This is done with simulations applying a Reynolds stress model for the turbulence. An extension of the vortex finder (from 2.64 d_{vf} to 6.8 d_{vf}) has almost no effect on cyclone pressure drop or collection efficiency. Moreover, the extension does not affect the pressure losses in the vortex finder. The closer the deswirler is installed to the vortex finder inlet the more significant is its effects on cyclone performance. A streamlined ellipsoidal shape of the deswirler centre body is preferable to a cylindrical

*Corresponding author. Tel.: +375 17 2202694, fax: +375 17 3276217. Postal address: Department of Machines and Apparatus for Chemical and Silicate Production, Belarusian State Technological University, 13a Sverdlova str., 220006 Minsk, Belarus.

Email addresses: dzmitry.misiulia@belstu.by (Dzmitry Misiulia), sergiy.antonyuk@mv.uni-kl.de (Sergiy Antonyuk), anders.g.andersson@ltu.se (Anders Gustav Andersson), staffan.lundstrom@ltu.se (Tord Staffan Lundström)