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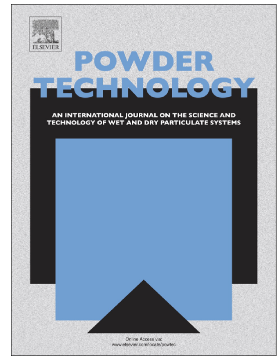

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Evaluation of drag models for particles and powders with non-uniform size and shape

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1 INTRODUCTION

In order to describe the interaction between disperse particles and the flow of a continuous phase, numerous models for the calculation of particle drag coefficients were proposed in literature. The applicability of each model mostly depends on the particle Reynolds number and its shape. This research is restricted to non-spherical particles. Experiments and numerical calculations within this work were carried out for particle Reynolds numbers in the range $Re_P < 1000$.

An evaluation of most commonly used models was performed by Chhabra et al. [1]. They compared the predictions of different drag models at more than 1900 data points and concluded, that the drag model proposed by Ganser [2] provided the most accurate results but still incorporated an average error of 16.3% and a maximum error of almost 181% which seems not acceptable for industrial applications. In general it was noted that the error increased with lower particle sphericity, for example needles and disks, while the results were acceptable for arbitrary shaped, isometric particles. Based on the extensive experimental data of Schulz et al. [3], one of