

Effect of a screw feeder induced flow in Rolling Compaction: a DEM model

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Abstract

Rolling compaction is a continuous manufacturing process belonging to the field of dry granulation. Here, a fine pharmaceutical powder is compacted into a solid ribbon and subsequently milled to obtain granules. In our work, a Discrete Element Method model is employed to study the first part of the process: from the feeding of the powder by means of a screw feeder, to the compaction yield by two counter-rotating rollers. Despite the simplicity of the setup, it is often hard to retrieve experimental data about the powder in this region, and information about its flow is limited to single particle tracking.

We will use DEM to study the effect of the flow of the particle bed, induced by the periodic screw feeder rotation, and its impact on the compacted ribbon quality. This work is our first approach to DEM modeling of rolling compaction. The ability of DEM to better understand the process will be highlighted, and the framework for future studies of roller compaction by means of DEM will be defined.

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