
DEM Modelling of Pin Milling

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Abstract

Milling is commonly used in a wide range of manufacturing operations to tailor desired product specifications and quality attributes. The milling performance of particulates is dictated by the mechanical properties of the material (hardness, fracture toughness and Young's modulus) and, the operating conditions of the chosen mill such as the geometry, process conditions, input energy, etc. However, its determination is currently carried out by trial and error. At the early stages of product and process development, adequate test material is not generally available. Therefore, a methodology is required to predict the milling behaviour based on the properties of the test material. In this work, we focus on analysing the particle dynamics of a crystalline material in a commercially-available pin mill, PicoPlex using the Discrete Element Method (DEM). The particle shape is modelled using polyhedron. The effect of the process conditions such as the feed rate and rotation speed of the pins on the particle dynamics in the pin mill is analysed and will be reported.

Keywords: DEM, Pin milling, Particle Shape

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