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Quantitative surface topography assessment of directly compressed and roller compacted tablet cores using photometric stereo image analysis - DTU Orbit (09/11/2017)

Quantitative surface topography assessment of directly compressed and roller compacted tablet cores using photometric stereo image analysis

Surface topography, in the context of surface smoothness/roughness, was investigated by the use of an image analysis technique, MultiRay™, related to photometric stereo, on different tablet batches manufactured either by direct compression or roller compaction. In the present study, oblique illumination of the tablet (darkfield) was considered and the area of cracks and pores in the surface was used as a measure of tablet surface topography; the higher a value, the rougher the surface. The investigations demonstrated a high precision of the proposed technique, which was able to rapidly (within milliseconds) and quantitatively measure the obtained surface topography of the produced tablets. Compaction history, in the form of applied roll force and tablet punch pressure, was also reflected in the measured smoothness of the tablet surfaces. Generally it was found that a higher degree of plastic deformation of the microcrystalline cellulose resulted in a smoother tablet surface. This altogether demonstrated that the technique provides the pharmaceutical developer with a reliable, quantitative response parameter for visual appearance of solid dosage forms, which may be used for process and ultimately product optimization.

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