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End point detection in fluidized bed granulation and drying technology by various methods

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Abstract: Fluidized bed granulation is a widely applied wet granulation technique in the pharmaceutical industry to produce solid dosage forms. The process involves the spraying of a binder liquid onto fluidizing powder particles, eventually resulting in wet particle which collide with each other and form larger permanent aggregates, known as granules. After spraying the required amount of granulation liquid, the wet granules are quickly dried in the fluid bed granulator. A wide range of analytical process sensors has been used for real-time monitoring and control of fluid bed granulation processes after the Process Analytical Technology initiative was launched by FDA.Various data analysis techniques have been applied to the multitude of data collected from the process analyzers implemented in fluid bed granulators.

This review gives an overview of the end point detection in fluid bed granulation and drying technique. The fundamentals of the mechanisms contributing to wet granule growth and the characteristics of fluid bed granulation processing are briefly discussed. This is followed by a detailed overview of the in-line applied process analyzers, contributing to improved fluid bed granulation understanding, endpoint detection and modeling and control. Analysis and modeling tools enabling the extraction of the relevant information from the complex data collected during granulation and the control of the process are emphasized.

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