The Pfizer Chair and the real-time monitoring of powders in a tablet press: Proof-of-concept towards implementation

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The Pfizer Chair at the UdeS focuses on projects requiring the development of new knowledge and its integration for the innovative improvement of real industrial production processes. More specifically, the main interests are:

- Fundamental R&D for elucidating the role of cohesion and adhesion forces in flowing powder behavior.
- Applied R&D on analytical techniques for the in-line measurement of physico-chemical properties in processes involving particulates

This seminar will present a list of the ongoing R&D projects and will give a review of our endeavours related with the understanding and successful operation of Tablet presses which are omnipresent in nearly all pharmaceutical production units and not only.

Tablet presses, and more particularly their feed frames, are the last point where pharmaceutical powder mixtures can be found under this form. If something goes wrong, the resulting tablets will fail the final quality control and the entire production has to be discarded. Assuming that the flowing powder mixtures are homogenized in accordance with the required level, component segregation during the process is the most feared phenomenon.

In this work, we will present a review of our endeavors in this direction. 5 PAT, including 3 NIR-based tools, LIF and RGB imaging, have been used to evaluate the possibility of reliable in-line quantitative monitoring of component concentrations in real pharmaceutical formulations. Moreover, particle systems have been used to investigate segregation patterns during the movement of the powder mixtures inside the feed frame.