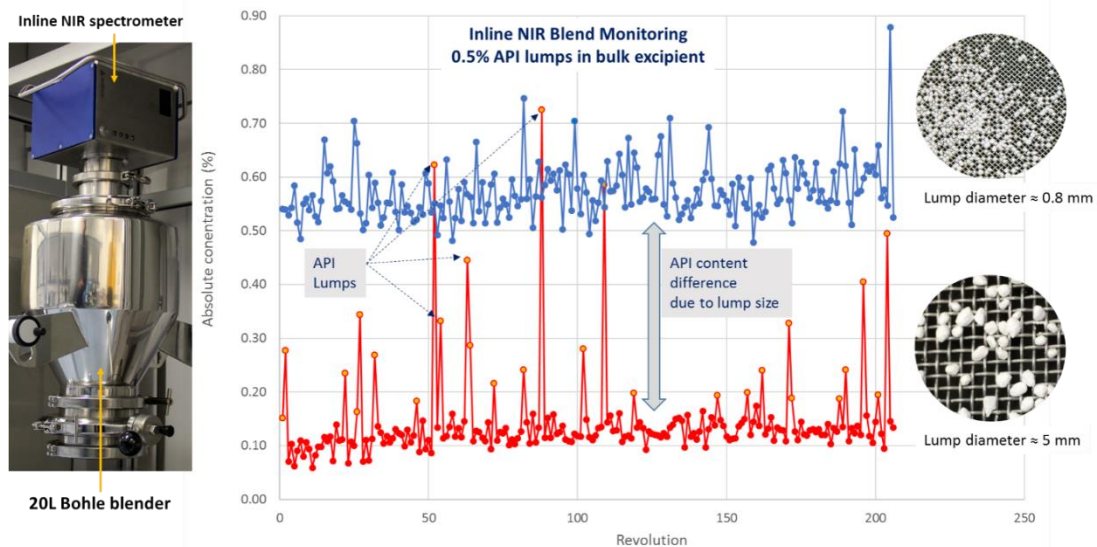


## Lump detection in low dosed powder mixtures by inline NIR

*Ad Gerich (presenting author), Rut Besseling and Michiel Damen, InProcess-LSP, Oss, The Netherlands*

Blend uniformity monitoring and control by NIR is a valuable PAT application in pharma industry either for batch processing or continuous manufacturing. The risk of non-uniform blends specifically exists for low dosed products. For dry blending processes, lumps in API material (or excipients) may cause severe unwanted non-uniformity in the blend, which may cause significant hot-spots in the final product and therefore a major risk for efficacy and patient safety. Besides application of NIR for API content variation, inline NIR can also effectively be applied to detect API lumps or agglomerates in low dosed blends. This work describes how differently sized lumps in a blend can be detected with inline NIR, and how this approach can effectively be used for process monitoring/control, troubleshooting and understanding the behavior of lumps or agglomerates in dynamic blends. An effective application is to study grow or breakdown dynamics of lumps/agglomerates with inline NIR by varying relevant mixing settings and corresponding shear forces.



Lumps in API material will lead to a lower observed overall content and presence of positive spikes in inline NIR blend data. Although the magnitude of observed spikes would be expected to be constant for similar lump size, the authors have investigated that the dominant factor which determines the intensity and frequency of spikes is mainly due to the sampling dimensions of the NIR analyzer and will show that similar sized lumps may show a large variation in NIR intensity, which is of major importance for correct interpretation of obtained inline NIR data in blend processes.