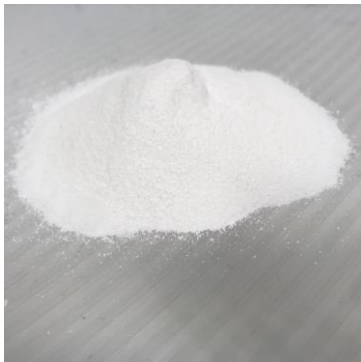


# Case STUDY



Type of product: Near Infrared Chemical Imaging (NIR-CI)  
Product name: HypeReal

**Powder blend  
homogeneity**



Keywords: API concentration,  
hardness, dissolution time,  
coating, cosmetic defect

**Characterization of powder blends to  
improve understanding of the process  
and optimize control**

## ■ Powder characterization in the laboratory

Powder blending is a critical part of pharmaceutical manufacturing. During the production of solid dosage forms, the active pharmaceutical ingredient (API) often needs to be mixed homogeneously with excipients. Precise detection of the active principles' distribution in a blend and a full understanding of the blending process are needed to avoid quality and safety problems in the end-products.

## ■ Goals

To improve understanding of the blending process and optimize control of it, thorough characterization of the distribution of the active ingredients within the overall blend is essential. The combination of digital imaging and optical spectroscopy integrated in a Near Infrared Chemical (NIR-CI) Imaging system enables you to collect and process together all the information provided by the image generated. By moving the hyperspectral camera underneath the powder and processing all the spectral and spatial information thus obtained, the pharmaceutical ingredients can be identified. Their spatial distribution enables you to ensure the blend is homogeneous and free of contaminants.

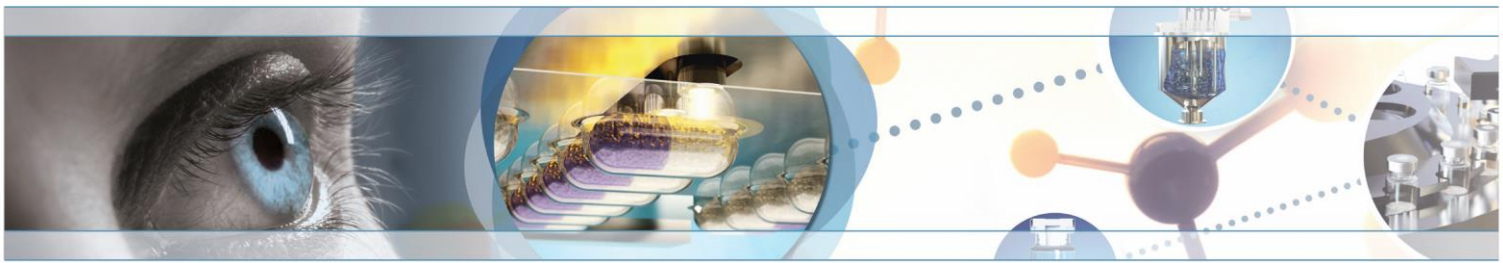
## ■ CA INDATECH's NIR-CI solution: HypeReal

CA INDATECH proposes a unique inspection solution capable of testing a wide variety of solid specimens by means of no-contact measurements beneath the specimen.

HypeReal's technology is the ideal tool for quick, non-destructive analysis of powders in the laboratory.

This spectroscopic equipment can be used to:

- characterize powder blends
- identify the active pharmaceutical ingredients
- detect any contamination
- assess the homogeneity of powder blends



# Case STUDY



## Example of application for characterizing powders and assessing homogeneity:

To demonstrate HypeReal's potential, six specimens were measured: (1) 100% glucose, (2) 100% EMDEX dextrates (a compressible binder composed of glucose monohydrate and various polysaccharides derived from starch), (3) 50% glucose and 50% dextrates unmixed, (4) dextrate contamination in a batch of pure glucose, (5) a non-homogeneous blend of glucose / dextrates and (6) a homogeneous blend of glucose / dextrates.

**Figure 1:** image of the samples of white powder inspected which are indistinguishable to the naked eye.

**Figure 2:** results of a principal components analysis (PCA). The blue color correspond to the spectrum of pure glucose, while the red color represents the dextrates. Samples (1) and (2) show the pure raw materials while the green color in sample (6) indicates a non-homogeneous blend of the two powders. In sample (3), a clear distinction can be made between glucose (blue) and the dextrates (red). The image of sample (4) shows a small spot of dextrates in the batch of pure glucose. Samples (5) and (6) contain equal quantities of glucose and dextrates, but the image shows a difference in the uniformity of the blends. Although the homogeneity of (6) is satisfactory, it is clear that the blending of the glucose and dextrates in (5) is inadequate.

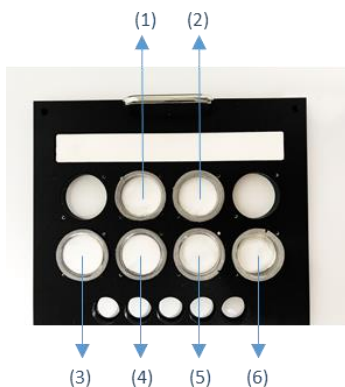


Figure 1 : samples measured

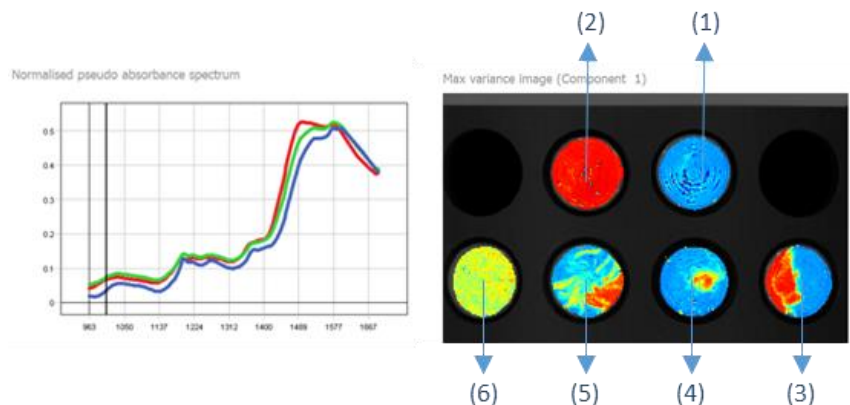


Figure 2 : Principal components analysis (PCA) of the hyperspectral image acquired

## Advantages of HypeReal

- Exceptional measurement configuration due to the camera placed beneath the specimen
- Elimination of any flatness issues with the powders to be inspected
- Extremely rugged and repeatable measurements
- Quick, precise inspections of blends by non-specialized staff
- Provision of plates dedicated to the specimens (white and/or gray references integrated)
- Integration of the Breeze software for acquisition, analysis and reporting of the data in a single software product
- Assessment of API distribution in the blend
- Improved knowledge and understanding of the blending process

HypeReal

Find out more

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