

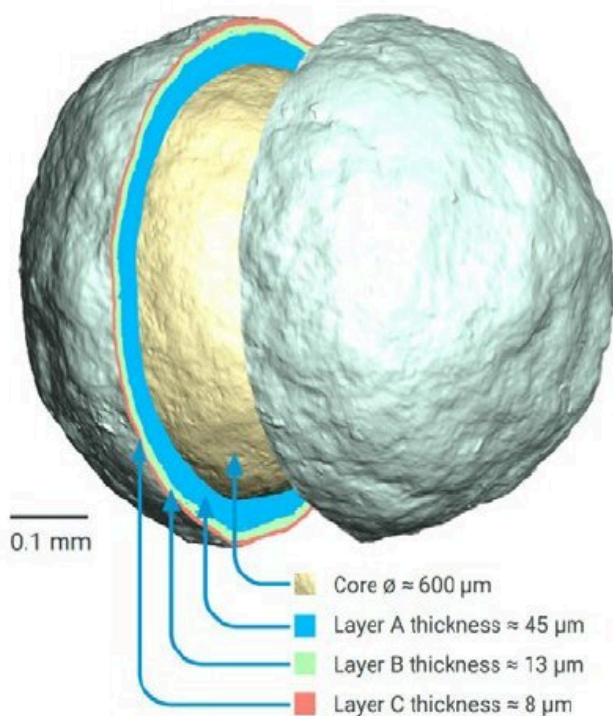
# PHARM016: Analysis of Coating Thickness and Porosity of Functional Particles

## Introduction

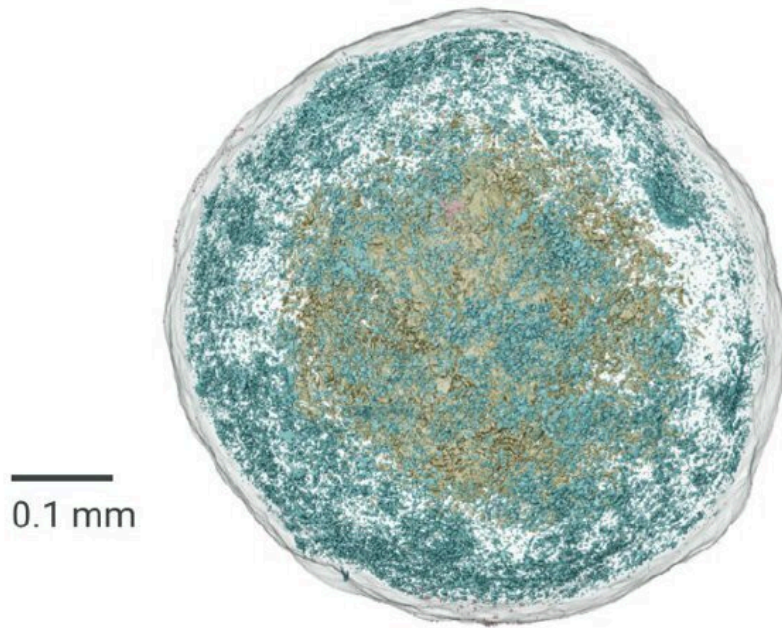
The internal structure and coating of functional particles directly affects tablet performance; controlled release and taste masking. Optical microscopy can only observe a portion of the cross section, and there is concern that the structure may change due to cutting. X-ray microscopy allows non-destructive observation of the three-dimensional structure and numerical evaluation of porosity and coating thickness.

## Non-destructive imaging

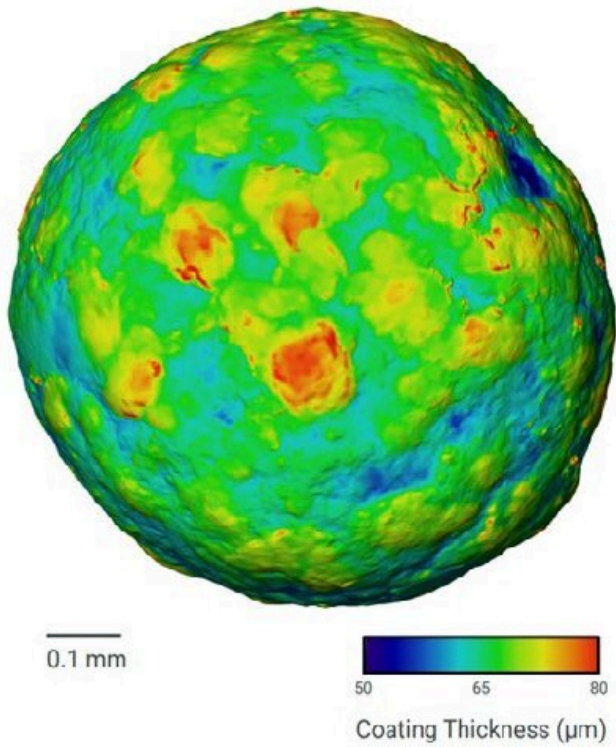
|                            |                           |
|----------------------------|---------------------------|
| <b>Analysis:</b>           | Formulation               |
| <b>Use:</b>                | Formulation (Dosage Form) |
| <b>Analyzed materials:</b> | Functional particles      |
| <b>Analysis software:</b>  | Dragonfly                 |



**Figure 1:** Morphological observation



**Figure 2:** Pore distribution



**Figure 3:** Thickness distribution

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## Conclusion

In Figure 1, a core with a diameter of 600  $\mu\text{m}$  and three layers of coating (A: 45  $\mu\text{m}$ , B: 13  $\mu\text{m}$ , C: 8  $\mu\text{m}$ ) are determined. Figure 2 displays the three-dimensional distribution of pores. The porosity was calculated as 7.43 vol%. In Figure 3, the color distribution shows that the coating thickness varied in the range of 50 to 80  $\mu\text{m}$ . Thus, X-ray microscopy is useful for nondestructive and quantitative understanding of particle structure, and it can be utilized in formulation design and quality evaluation.

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