Exploring the design space for dry powder inhalers, a case study with two types of capsule devices


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Results
The results were analyzed by a surface response design and gave a response plot for both HR and FPF as function of type and amount of fines. Overlap contour plots were constructed of both responses based on above stated borders and these are depicted in Figure 1.

Discussion
For the constraints set, both types of DPI devices do show achievable design spaces. Handihaler has the largest white areas, with the largest at a fair flow constraint, whereas the Cyclohaler shows the largest white area in the passable flow range.

Conclusions
In this study, Handihaler has in general a larger design space than Cyclohaler. At might be advisable to combine the choice for Handihaler with the choice of a piston capsule Filling system and Cyclohaler with tumbling or disc-dosing filling system because this allows for the largest design area.

References