An Alternative Approach for Pressurized Metered Dose Inhalers Manufacturing to Facilitate Propellant Transition

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In consequence of the Kigali Amendment, two next generation propellants have been identified, with HFA 152a reducing the carbon footprint of pressurized metered dose inhalers (pMDIs) by over 90% than HFA 134a 1. However, 152a flammability is forcing manufacturers to implement additional safety measures which makes traditional processes more challenging. By decoupling the filling of individual ingredients and direct dosing them into the canister, these challenges can be mitigated 1. We have initially explored this approach at a bench top scale for a Salbutamol Sulphate (SS) suspension.

SS (30 mg) was dry filled (RSD 1.7-2.1%) employing the Drum TT or a spatula into canisters. These were then crimped using a manual crimper or a Vacuum Crimper X5004 2 and gassed with 152a. Aerodynamic particle size distribution (APSD) and drug delivered (DD) were tested at time zero and after 3 months at 40°C/75% RH.

DD was not affected by either filling or crimping method. APSD showed also comparable results with a slight decrease in respirability during stability with no clear trending differences.

This manufacturing method would significantly de-risk HFA 152a handling, eliminating the need for mixing vessels and enabling pMDI manufacturing no longer dependent on vessel capacity.

1. Sheryl, J., Murray, J., Carr J. et al. (2022). In Drug Delivery to the Lungs, The Aerosol Society 33
2. Stanford, S., Johnson, S., Robinson, I. et al. (2024). In Respiratory Drug Delivery, 1, 304-307