

Dry-Filling: A New Process Approach for Metered Dose Inhalers (MDIs)

- Innovative process concept that separates API dosing from propellant filling in MDI manufacturing
- Simplifies propellant handling and reduces the need for ATEX zones
- Eliminates key bottlenecks found in conventional processes, resulting in higher overall equipment effectiveness (OEE)
- Dry-Filling can be applied at lab scale and is fully scalable to industrial production lines

Allmersbach im Tal, September 22, 2026 - The metered dose inhaler (MDI) market is undergoing significant change. New propellants with lower global warming potential, partly highly flammable, are reshaping safety requirements and production concepts for MDIs. In response to these evolving conditions, Harro Höfliger now presents a new process approach for MDI manufacturing: Dry-Filling. Complementing established filling methods such as Single-Stage Pressure Filling, Two-Stage Filling and Dual Filling, Dry-Filling expands Harro Höfliger's portfolio of available process options for MDI production. The concept was developed in collaboration with Pharmatec Solutions Ltd.

Conventional MDI production typically requires preparing a combined API-propellant mixture. By contrast, the Dry-Filling process separates API dosing and propellant filling into two independent operations, resulting in a clear sequence of three core steps:

1. Dosing the active ingredient into the open can
2. Closing the can with a metering valve by crimping
3. Filling the liquefied propellant through the valve into the sealed can

This approach eliminates the need to handle propellants during the initial process steps, significantly reducing the requirements for ATEX safety zones.

Eliminating Key Bottlenecks

Beyond these safety benefits, the process also offers advantages irrespective of whether flammable or non-flammable propellants are used. Traditional processes rely heavily on large mixing vessels, extensive cleaning cycles, and the associated downtime. By eliminating the need for upstream weighing and mixing, Dry-Filling removes constraints such as the batch size being dictated by mixing vessel capacity.

Through decoupling the process and filling pure propellant instead of a suspension, batch size can be increased without adding technical complexity. At the same time, cleaning the mixing vessel becomes unnecessary, substantially increasing line availability.

From process evaluation to industrial production

Dry-Filling is designed to offer a safe and economically viable path for incorporating new propellants into existing production environments. Harro Höfliger provides the core process at lab scale, utilising dedicated small-scale systems for API dosing, vacuum crimping, and propellant filling. Data generated at this stage forms the basis for scaling the process to commercial production equipment. Several high-performance line concepts are already available. While the underlying process logic remains the same, system designs can be flexibly adapted to different product and facility requirements.

“The industry is currently facing the major challenge of integrating new propellants into established production environments. Dry-Filling addresses this by reshaping the process architecture: we clearly separate the critical steps, reduce propellant handling on the floor, and significantly increase equipment effectiveness,” says Kris Brosig, Inhalation Specialist at Harro Höfliger.



Production line: Commercial MDI filling line designed for outputs of 100 to 250 cans per minute.

(Image: Harro Höfliger)

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ABOUT HARRO HÖFLIGER

Harro Höfliger specializes in customer-oriented process and production solutions for pharmaceutical and medical applications as well as consumer products. Its core competencies include customized dosing and inhalation technology, solutions for product assembly, and the processing of web materials. The company also offers comprehensive services for process development and throughout the entire product life cycle. For further information, please visit www.hoefliger.com.