

Capsugel® Zephyr™

Dry-Powder Inhalation Capsule Portfolio

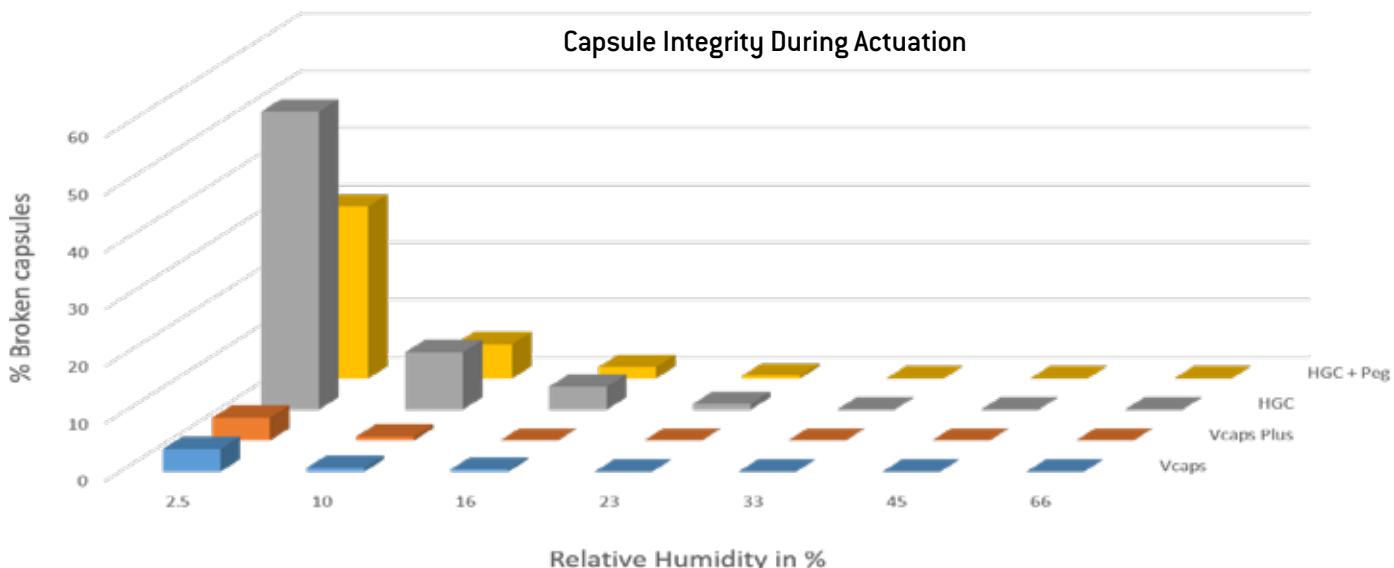
Dry-powder inhalation capsules provide a major drug development opportunity for pulmonary treatments and systemic applications.

- A non-invasive and needle-free delivery system
- Ability to deliver and dose range for inhaled drugs
- Supports patient compliance
- Propellant-free biodegradable capsules
- Supports accurate dosage of API in the capsules
- Customization through moisture and lubricant contents
- Allows flexibility in DPI device choice
- Enables consistent performance for emitted dose

Lonza's Capsugel® Zephyr™ Dry-Powder Inhalation Capsule Portfolio offers the most complete portfolio of DPI capsules with targeted emitted dose that are tailored toward formulation properties and inhalation device. The high-quality customizable capsule solutions based on different polymers and compositions are supported by a wide range of services within Lonza.

Customized dry-powder inhalation capsules designed to meet the unique challenges of pulmonary delivery.

By combining polymer science, engineering and formulation know-how, we are creating breakthroughs in capsules and encapsulation technologies that are changing the functional role of capsules in medical research, drug formulation and drug delivery. This unique capability has been utilized to develop specialized DPI capsules to optimize pulmonary and systemic drug delivery to the lungs. Lonza's Capsugel® Zephyr™ DPI capsules are customized to your specific application, achieving optimal and consistent performance by adjusting key design parameters including the capsule size and design, polymer/gelling agents, moisture content, lubricant levels and weight tolerances.

Capsule interactions with environmental conditions have a decisive influence during actuation phase.**Capsule brittleness in function of Relative Humidity, measured by tube test on 50 capsules****Microbiological Specifications**

Inhalation microbial quality through respecting applicable GMP and Capsugel® standards, without the use of preservatives, ethylene oxide or irradiation treatment.

LOD Customization Capabilities

Often, capsule LOD has to be adapted to specific formulation filling properties and stability requirements. In house water activity measures can be performed in-house to find out the best range. Lonza offers LOD range customization.

Test	Specification
Total Viable Aerobic Count	
Total Aerobic Microbial Count	Less than 100 cfu per gram
Total Yeasts/ Mold Count	Less than 10 cfu per gram
Specified Microrganisms	
Bile-Tolerant Gram-Negative	Absence in 1 gram



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Or contact your Lonza representative.