Innovating Dispensing Systems:
Bag-and-bag (BAB) Technology and a leap towards Efficiency and Sustainability

Confidential

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Content

- Barrier pack systems
- The Bag-and-bag platform
- Benefits and suitable applications

Barrier pack systems

Barrier pack systems overview

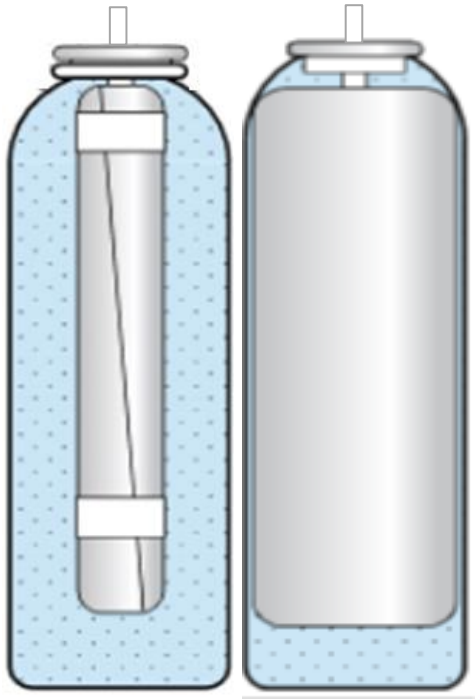
Pressurised / non Presurrised packs and Single / Dual dispensing systems

	Barrier Pack Systems	
	Single Product Dispensing	**Double Product Dispensing**
Non-Pressurised Packs	Bottle Airless bottles Bag in bottle Piston in bottle Tube / Airless tubes Jars / airless Jars	Dual bags in bottles Twin bottles Airless Twin bottles Twin tubes Airless Twin tubes
Pressurised Packs	Bag-on-valves (BOV) Bag-on collar (BOC) Piston in can Bag in can Bag in bottle	**Bag-and-bag (BAB)** Others

BOV as foundation for dual dispensing

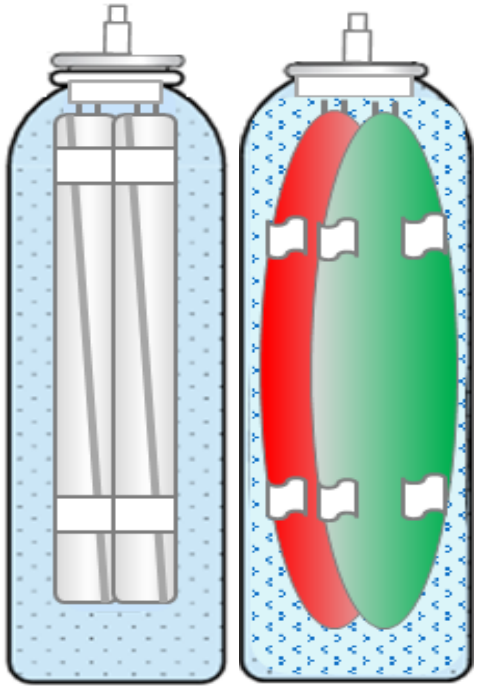
BAB is an extension of BOV systems to dispense 2 products stored in the same pressurised pack

BOV



- **BOV** is a pressurised packaging system that allows product stored in a bag to be separated from the propellant in the can of an aerosol dispensing system.
- **BOV** is one bag which is connected to valve in a standard aerosol cans.

BAB



- **BAB** is an extended version of the **BOV** that allows products stored in two bags to be separated from the propellant in the can of an aerosol dispensing system.
- **BAB** is two bags which are connected to a specific valve (**Bi-Power Valve)** in a standard aerosol cans.
- Products that **cannot be stored in mixed condition** can be packaged in this Dispensing System and **mixed at the time of use.**

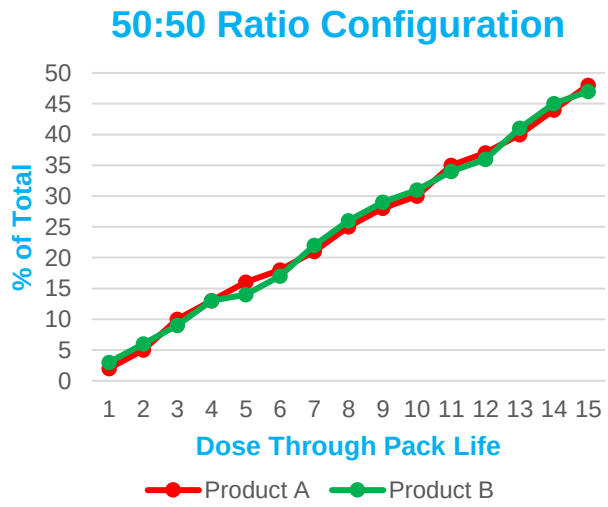
Bag-and-bag (BAB)

Key components of the BAB system

BAB is a Customisable Platform

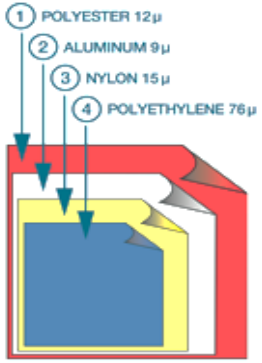
The **BAB** system can be optimised to meet specific technical requirements ranging from pack size to product discharge rates and product ratios.

- **Bag Volumes**
  - Standard configurations from 2x30ml (60ml in total) to 2x100ml (200ml in total) available
  - Depending on formulation requirements custom bag size and configurations available
- **In-Actuator or Post Actuator Mixing**
  - Standard Actuator - Carla
    - Single pre-mixing or separated spray channels
  - Custom Actuators available according to customer requirements
- **Product Ratio control** – Subject to formulation characteristics
  - Standard development 50/50
  - Further product dedicated ratios can be developed on request
    - Subject to formulation characteristics and target ratios

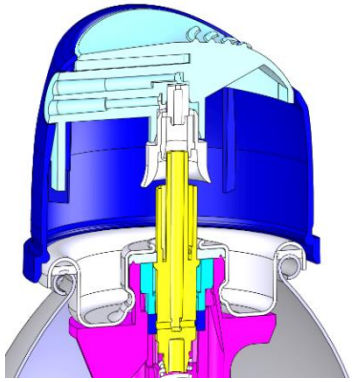


Key components of the BAB system

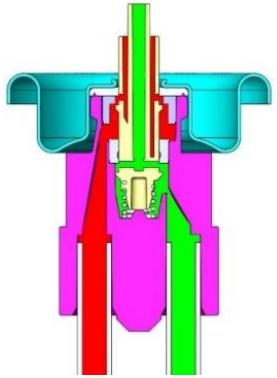
- **The Bags** – As with standard BOVs - 4 layer laminated with PE or PP in contact with product. Other welded types of laminate bag structure are also available.



- **The Actuators** - A Two Channel Actuator with either
  - internal mixing capability or
  - two separate spray channels



- **LINDAL Bi-Power-Valve** – 2 Channel Valve is required to dispenser each product independently



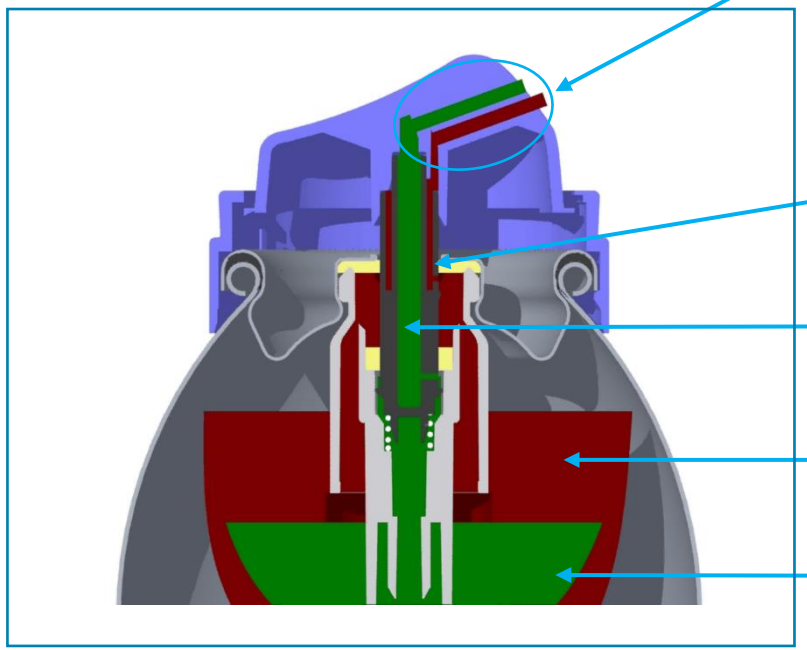
- **The Cans** - Suitable for Monobloc Aluminum, Tinplate or PET cans

Working principle

How product is dispensed through the valve and actuator

Various dispensing options :

- ❑ Products **mixed in the actuator**
- ❑ Products **dispensed separately**
- ❑ Products **mixed with a static mixer**



Depending on customer need, products can be:
- Either **mixed in the actuator**
- Or **dispensed separately**
- Or **mixed with a static mixer**

Product **A** dispensed through outer-stem orifice

Product **B** dispense through inner stem orifice

Product **A** in one Bag

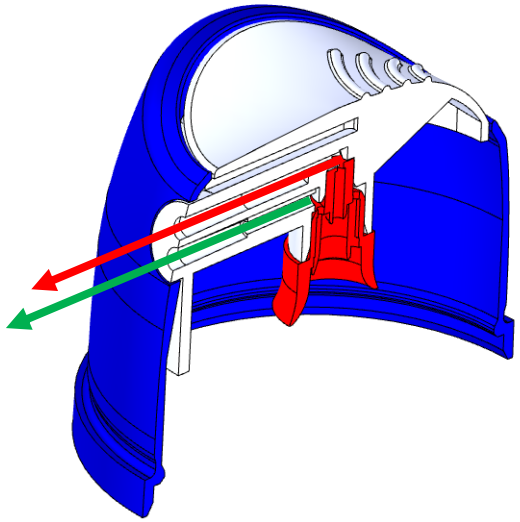
Product **B** in second Bag

Products are **not mixed in the valve** stem

BAB two-channel actuators

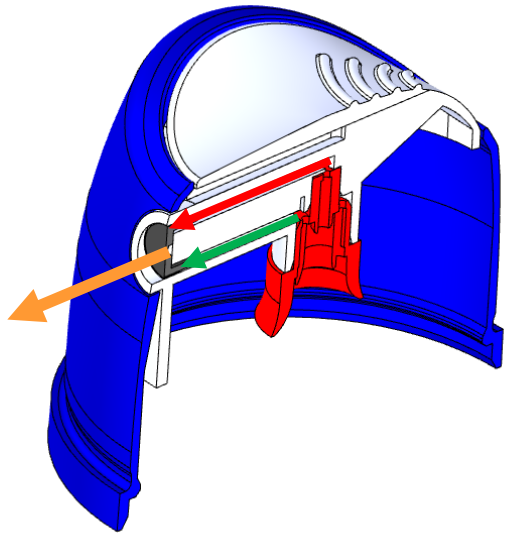
2 separate or 1 combine stream

Double insert : 2 products streams A & B



2 products streams A & B

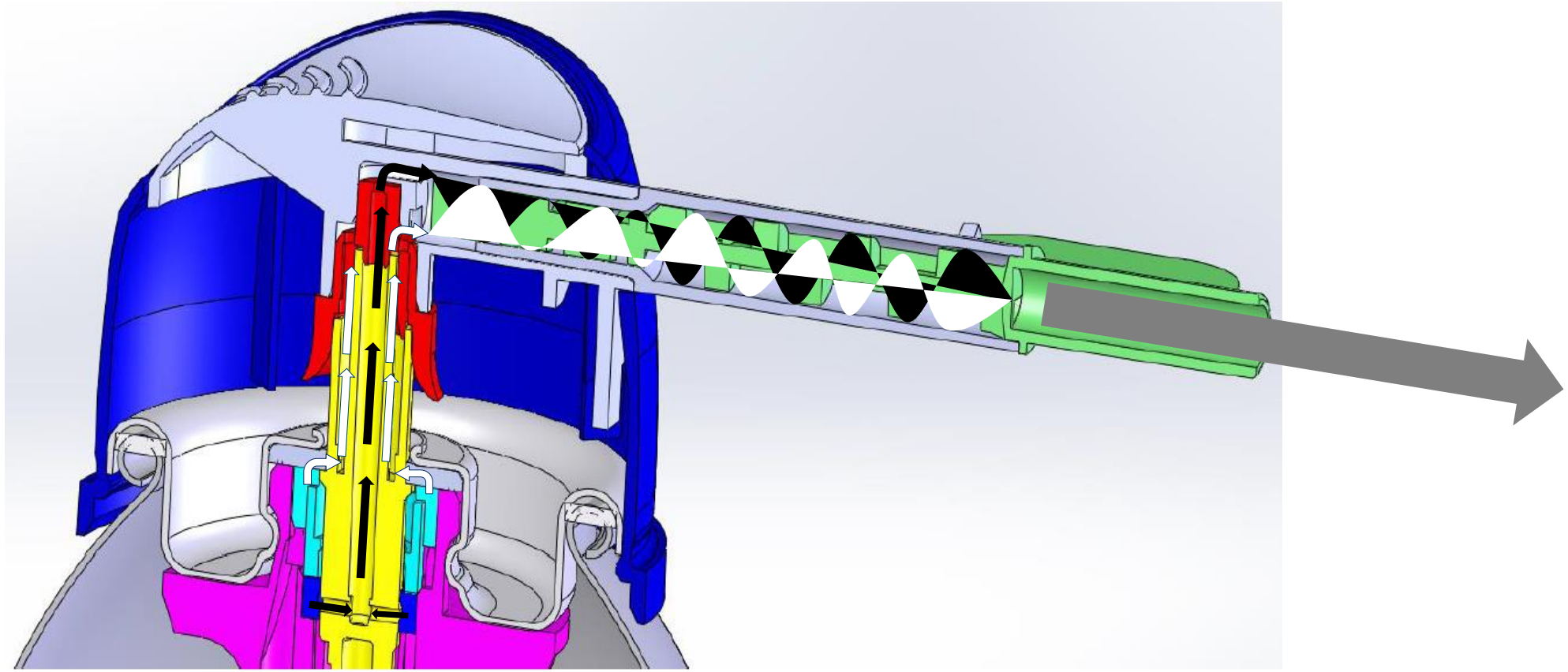
Dual dispensing insert : 1 combined product stream AB



1 combined product stream AB

BAB Static mixer actuator

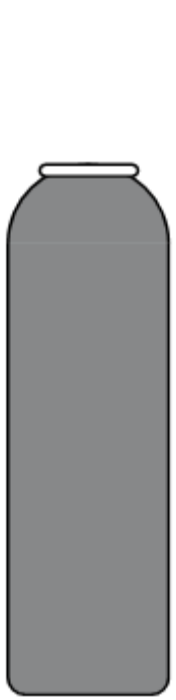
Static Mixer : Dispensing 2 Products that must be mixed at the time of dispensing



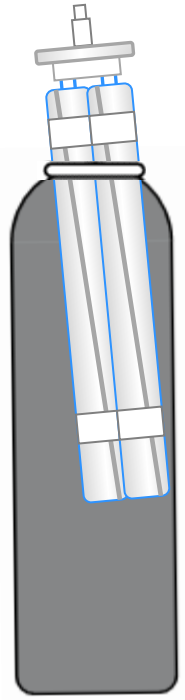
Filling principle

BAB filling can be adapted to existing BOV filling equipment

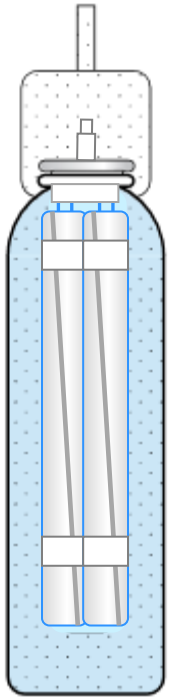
BAB Pre-Pressurising Process is the **same as for standard BOVs**, **with the added step of a second bag fill**.



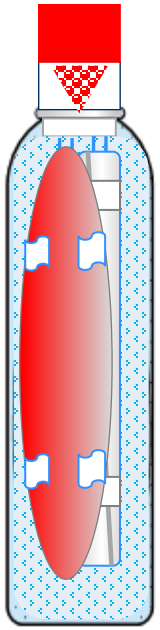
Step 1
Empty can
feed in



Step 2
Bag-and-Bag
Valve insertion

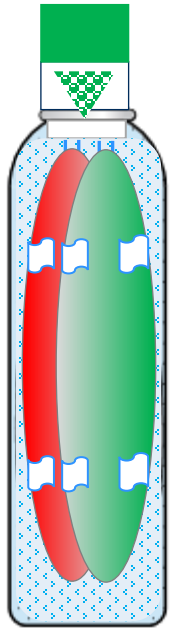


Step 3
Under cup
pre-pressurizing
and clinching (UTC)



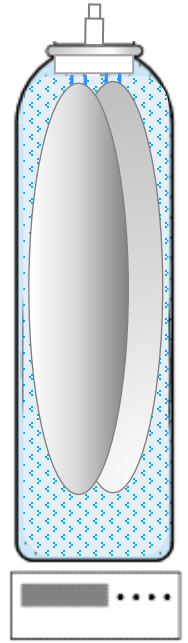
Step 4
Product **A** filling through
the
Outer-Stem orifice
and
cleaning stem

Same process as BOV

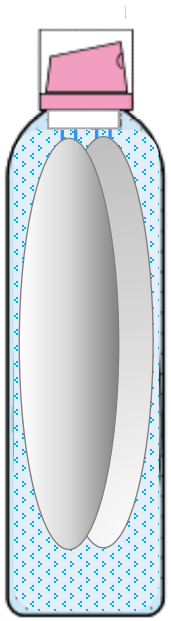


Step 5
Product **B** filling through
the
Inner-Stem orifice
and
cleaning stem

Additional process for BAB



Step 6
Weight check
and
leakage detection
(water bath at 50˚C)



Step 7
Regulator
Actuator
and
Cap Fitting

Same process as BOV

Benefits and Applications

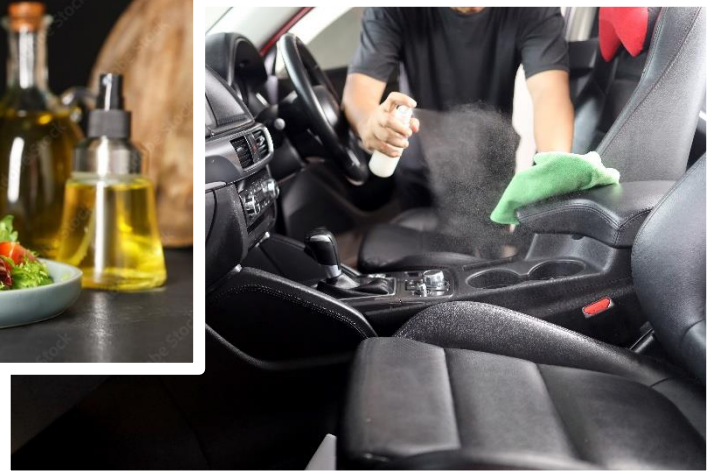
BAB extends the benefits from BOV

Comparison between BOV and BAB

Traditional Benefits of the 2-Chamber System	BOV	BAB	Efficiency	Sustainability
Eliminates incompability risk between product and propellant	✓	✓	✓	✓
Compress gas propellant (No need for Hydrocarbon propellant)	✓	✓		✓
Extend shelf life by isolating the product from external influences	✓	✓	✓	✓
With 96-98% evacuation rate particularly with viscous products	✓	✓	✓	
Versality for a wider range of applications (spray,gel,creams)	✓	✓	✓	
360 degree usability for greater end-user experience	✓	✓	✓	
Additional Benefits				
Provides the possibility to package and dispense 2 incompatible formulations in the same pack	X	✓	✓	✓
Extend shelf life by separating ingredients until end-use by consumer	X	✓	✓	✓
Compatible with various dispensing options (product mixed just before dispensing or product dispensed separately)	X	✓	✓	
Fast filling speed - flow limitation managed in the actuator not in the vavle	X	✓	✓	
Compatible with all cans available on the market (Aluminium,Tin plate,TPE)	✓	✓	✓	
Utilises standard aerosol packaging technologies keeping investment low	✓	✓	✓	
Opportunity to differentiate products and create new consumer features and benefits	✓	✓		
New product type concepts and combinations possible	✓	✓		

Potential applications for BAB

BAB is opening opportunities for new aerosol applications



Thanks for listening