

# Bag-on-Valve Overview

The Bag-on-Valve (BoV) technology is gaining in popularity, especially for cosmetics and healthcare applications. The packaging technology is used in aerosol cans; i.e. Cans containing liquid or viscous products that are sprayed during administration and where the actual dispensing is propelled by a compressed gas.

## CAN

The cans used for aerosol products used with the BoV technology are predominantly made of aluminium, although tinplate is also sometimes used. The aluminium cans are standard aerosol cans which are shaped out of discs and made in one piece, with no welding joints. They can be moulded in a number of shapes that make them easier to grasp/handle. A certain shape may also emphasise the aerosol's brand and/or product content. The choosing an aerosol can for BoV one should also consider the pressure ratings of the can. The applied standard are the US DOT ratings and the European FEA standards.

## BAG AND PRODUCT CONTENT

The actual product content in a BoV aerosol is not filled into the actual can, but into a bag. A typical bag used for this purpose consists of a poly-laminated aluminium

## Bag-on-Valve System



**Step 1.**  
Placing of valve and bag inside the can.

**Step 2.**  
Gassing (air/nitrogen) followed by crimping of the valve onto the can.

**Step 3.**  
Product filling in the bag.

**Step 4.**  
Actuator and cap placement.

bag (three or four layers depending on product requirements). The bag, which is heat-welded to the valve, guarantees impermeability and can be optimal for oxygen sensitive and sterile products. Standard BoV systems covers a broad range of bag sizes ranging from 30 to 500 ml. BoV typically uses standard aerosol aluminium cans with 1 inch can openings. BoV systems

are available with both female and male valves; and there are many different versions of valves available, offering configurations suitable for a specific application.

Almost all fluids and more viscous products can be filled into a BoV-system as long as the product's viscosity is low enough to get it through the valve stem. However, the

#### The Valve

BoV-systems are available with both female and male valves.

#### The Bag

Laminated multilayer bag. Available in a wide range of sizes.

#### The Product

Suitable for liquid as well as visous products, such as gels and creams. Optimised for oxygensensitive and sterile products.

#### The Actuator

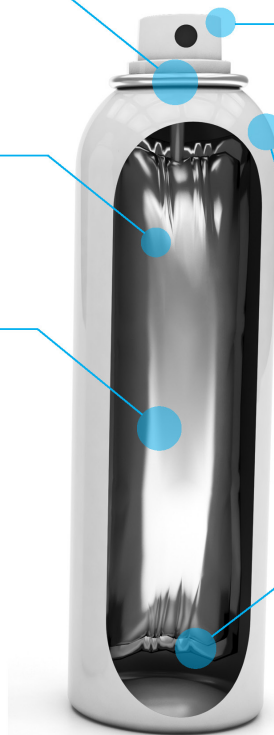
A wide range of standard actuators are available, depending on product demands.

#### The Can

Standard aerosol can. Shaped cans can also be used.

#### The Propellant

Total separation between products and propellant, BoV can be used with compressed air or nitrogen.



## FILLING METHODS

When using compressed air or nitrogen as propellant, the initial or “pre-pressure” is introduced into the can and the valve is simultaneously crimped to the can valve. This is called under-the-cup (UTC) gassing. In a second step, the product content is introduced, through the valve, into the bag itself.

Many spray products in a BoV-system are well-suited for pressurisation with a compressed gas. Since the pressure drops as the product is dispensed it is very important to choose a high enough initial pressure to ensure a good spray pattern over the life of the can.

## ACTUATOR

To dispense the product content from an aerosol can an actuator is used. A variety of actuators meets the requirements of different products, be they sprays, gels or other viscous products. They are also designed to improve handling and come in many shapes and colours. Some actuators can also withstand the gamma irradiation sterilisation that has become common for medical aerosols.

system does not work well with products that need to be shaken before use, since the bag is filled and doesn't improve mixing when shaken.

### PROPELLANT

To squeeze out the content from the bag, a propellant is needed. Usually, a gas of either compressed air or nitrogen is used. The propellant gas is filled

#### Examples of common Bag-on-Valve sizes in Aluminium cans:

Bag fill volume	Aerosol can size
30 ml	35 x 88 mm
50 ml	35 x 105 mm
75 ml	40 x 125 mm
100 ml	45 x 125 mm
125 ml	45 x 150 mm
150 ml	50 x 156 mm
200 ml	53 x 173 mm
250 ml	53 x 205 mm
300 ml	59 x 214 mm

into the area between the aluminium can and the laminated bag containing the product content. The product in the bag encompasses 60 per cent of the can's brim capacity, while the remaining 40 per cent is occupied by the propellant.

BoV is also compatible with liquefied propellants that can provide a more steady dispensing rate over the life of the can.

## Final Product

The final BoV aerosol product can either be regulated as a cosmetic, food or healthcare product, including pharmaceutical or medical device. It depends upon the product contained in the bag and the statements made about the product. As most BoV-systems use non-flammable propellants, like compressed air or nitrogen, they are classified as aerosols (UN 1950) which needs to be taking into consideration for storage and transportation. Local regulations for the handling and recycling may vary in different states or countries.

For more information contact Aurena Laboratories AB: [www.bagonvalve.com](http://www.bagonvalve.com) & [www.aurena.se](http://www.aurena.se)