



Bag-on-Valve: An Attractive Airless Packaging

Airless packaging of liquid products has become a cornerstone in industries where product integrity, longevity, and precise dispensing are critical. Among these packaging options, Bag-on-Valve (BoV) technology stands out as an attractive solution, offering some unique advantages.

Bag-on-Valve is designed to keep the product completely isolated from external air. It uses a flexible, multi-layered laminated bag housed within a standard aerosol can. The product is sealed in the bag, while compressed air or nitrogen occupies the space between the bag and the can. When the actuator is pressed, the pressurised gas squeezes the product out through the valve without any air entering the packaging. This makes BoV a true airless system, ensuring that the product remains free from oxygen, contaminants, and microbial exposure, even after repeated use.

What is Bag-on-Valve Technology?

Bag-on-Valve technology is an advanced aerosol system where the product and propellant are separated. The core components of the system include:

1. **Flexible Laminated Bag:** A multi-layered pouch that contains the product, protecting it from oxygen and contaminants.
2. **Aerosol Can:** A standard aluminum houses the bag and provides structural stability.
3. **Propellant:** Compressed air or nitrogen is used as the propellant, filling the space between the bag and the can.
4. **Actuator and Valve:** These components control how the product is dispensed.

When the actuator is pressed, the propellant exerts pressure on the bag, dispensing the product through the valve without it ever coming into contact with the propellant. This mechanism ensures the product's integrity and in some cases sterility, even with repeated use.

Advantages of Bag-on-Valve

1. Sterility and hygiene

One of the most critical benefits of BoV

is its ability to maintain the product's integrity throughout the product's shelf life. The laminated bag protects the product from exposure to external contaminants, while sterilisation using gamma irradiation can ensure compliance with sterility standards.

2. Long shelf life

The multi-layered bag acts as a barrier against oxygen, preserving the product's efficacy and reducing the need for preservatives. This feature is particularly important for oxygen-sensitive formulations.

- **Product Dispensing:** Achieves up to 99% product evacuation, minimising waste.
- **Ease of Use:** BoV systems allow dispensing at any angle, making them user-friendly for patients and healthcare providers alike.
- **Applications:** Supports a wide range of products, from liquids and gels to foams and creams, making it suitable for medical, pharmaceutical, and cosmetic uses.
- **Environmental Impact:** Uses eco-friendly non-flammable propellants like compressed air or nitrogen and is compatible with recyclable materials such as PCR aluminum cans.

Applications and Market Niches

While both BoV and other airless systems have carved niches in industries like cosmetics and personal care, BoV excels in highly regulated environments such as medical devices. Its ability to maintain sterility makes it ideal for saline sprays, wound care products, and eyewashes.

Nasal sprays are one of the most widespread applications of BoV technology. Products like saline solutions and seawater nasal sprays benefit from BoV's hygienic delivery and ability to maintain sterility. Simply Saline, Sterimar, and Vicks Sinex are well-known brands in this category.

Leading BOV-manufacturers

Aptar is the global leader in BOV systems, offering customisable BoV components tailored to the pharma and medical device market. A similar offering is available from Coster.

As leading BOV packaging manufacturers like Aptar, Coster and PowerContainer (PCC) continue to innovate, the potential for BoV to shape the future of medical liquid packaging is large. The future of BoV technology is bright, with ongoing innovations aimed at addressing current challenges and expanding its applications.

PowerContainer has introduced the Corsair system, an innovative non-VOC (Non Volatile Organic Compounds) delivery solution that combines a bag-on-valve pouch with a rubber sleeve that replaces the propellant. The Corsair combines low-pressure dispensing with compatibility for standard filling processes, making it an interesting and environmentally friendly option for applications such as saline nasal sprays.

Another interesting development is BOV's with metered-dose systems: These systems will allow precise dosing for various products, ensuring consistent quality from the first use to the last. BoV systems with separate chambers for two different liquid components are also available opening up possibilities for complex formulations.

There are several contract manufacturers offering production of medical device and pharma bag-on-valve products. Notable examples include the global CMO group Fareva, Formulated Solutions in the US, and Aurena Laboratories based in Sweden.

Conclusion

Bag-on-Valve (BoV) technology is an innovative airless barrier system that ensures product integrity throughout its entire shelf life while enabling nearly 100% product evacuation. The user-friendly spray packaging is highly valued for its convenience and reliability.



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