AEROSOL VALVES AND ACTUATORS

SATA AEROSOL 101
Conventional and BOV
TYPE OF PROPELLANT

LIQUEFIED PROPELLANT

COMPRESSED GAS

PROPELLANT

VAPOUR

PRODUCT

AND

LIQUID

PROPELLANT

COMPRESSED GAS

PRODUCT

Liquid Propellant Layer
Pressure on the actuator depresses the stem.

This movement interrupts the sealing action of the gasket and exposes the stem orifice to the pressurized flow of the product in the container, thereby opening the valve.

When the actuator is released, the spring returns the stem orifice to the sealed position, closing the valve.
VERTICAL VALVE – Continuous

TOGGLE VALVE – Tilt Action

FEMALE VALVE – Vertical Action

VERTICAL VALVE – Meter Valve

*Shape of actuator and filler capabilities dictates which valve to use*
VERTICAL ACTION

- 1" mounting cups, 20mm ferrule
- Spray anyway feature
- Capillary
- Inverted

Uses:
- Personnel Care
- Household
- Automotive
- Paint and Industrial

AEROSOL VALVES

Delivering solutions, shaping the future.
AEROSOL VALVE AND ACTUATOR SYSTEMS

VERTICAL

VERTICAL ACTION
VERTICAL VALVE - Market Packages
TOGGLE ACTION

- Controlled Directionality
- Reduced Force to Actuate
- Spray anyway feature
- Capillary
- Inverted

Uses:
  - Home Care
  - Personnel Care
  - Food / Pan Sprays
AEROSOL VALVE – Toggle

TOGGLE

TOGGLE ACTION
TOGGLE VALVE - Market Packages
FEMALE VALVE

- Multiple Gasket Options
- Spray anyway feature
- Uses:
  - Paint
  - Industrial / Automotive
  - Institutional / Janitorial
AEROSOL VALVE - Female
FEMALE VALVES - Market Packages
METER VALVE - Market Packages
2 BASIC FILLING METHODS

PRESSURE FILLING (TTV)
- Less propellant loss
- Slower filling speeds
- Regulatory (Emissions)

UNDER THE CUP (UTC)
- Faster filling
- More propellant loss

This is good info to know, but not critical
FACTORS THAT AFFECT SPRAY PATTERN AND PARTICLE SIZE

The Actuator

- Mechanical Break Up
- Non-Mechanical Break Up
- Orifice Shape and Length
ACTUATOR PURPOSE

- Provide Discharge of Product
- Provide Direction
- Provide Flow Control
- Provide Particle Size Control
- Provide Customer Satisfaction
- Spray Pattern Shape & Size
M.B.U. SYSTEMS

Misty
Dyna Mist
Solid Pattern
Gentle Mist

Dual Port
Dyna Mist
Powder Mate
Free Flow
Jet Mist

Personal Care
SOLID PATTERN MBU
Spray Pattern

Coarser particles with a narrow solid round pattern

3” to 5” pattern @ 8”
PROVIDE FLOW CONTROL

- Orifice Size
- Channel Size
- Internal Restrictions
- Baffles & Channels
- Swirl Chambers
<table>
<thead>
<tr>
<th>Regular</th>
<th>Reverse</th>
<th>Straight</th>
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<tbody>
<tr>
<td>Flat Face</td>
<td>One Piece Powder</td>
<td>Extension Tube</td>
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NON-M.B.U. SYSTEMS

- Regular
- Reverse
- Straight

- Flat Face
- One Piece Powder
- Extension Tube
MEDIUM-LARGE BUTTONS
AEROSOL ACCESSORIES

Hoodless
Twist To Lock

Actuators

Aerosol Accessories

Spouts
BOV 101
Aptar

Delivering solutions, shaping the future.

Personal Care
TOPICS FOR THIS DISCUSSION

Technology common to all

Aptar
Formerly EP Spray/Seaquist
Summit
Power Container
Coster
Lindal
BOV Components

- Actuator and overcap
- Standard 1 inch valve
- Product in the bag
- Compressed air / nitrogen Between bag and can
- Typical Aerosol Can
TYPICAL BAG MATERIAL

- PET
- Foil
- Nylon
- PP

No Oxygen or Light Transmission
SIMILAR TO AN AEROSOL PACKAGE

Aluminum or Tin Plate Can
- 2P-160 psi or 2Q-180 psi can ratings required

Proper valve internal gasket must be selected

Valve body, spring seat, spring stem and foil materials must be checked for product compatibility

Spray Ability – Proper Actuator must be selected / developed
WHY USE BAG ON VALVE?

**BETTER DISPENSE**
- Works at any angle
- Continuous dispensing: no pumping required
- More product evacuation

**BETTER PRESERVATION**
- Product held separate from propellant
- Dispenses pure product: no contamination
- Airless pressurized system

**BETTER PROTECTION**
- Safer filling
- Non-VOC propellant: uses compressed air or nitrogen
- Environmentally friendly
**ADVANTAGES**

- Convenient to use – the key to customer satisfaction and repeat business
- >99% evacuation
- Eliminates the interaction between product and propellant
- Will dramatically reduce degradation of the product
- May help you with VOC levels in your product
- Airless pressurized system without propellant
- Safer to produce

Personal Care
THE BOV IS BEST FOR EVERYTHING!

The BOV is not suitable for every application!!!

What is your true motivation?

Do you really need the features offered by a BOV?

Is my formula suitable?
HOW DO I FILL A BOV?

Basic filling process

Can size

Equipment Required
Aerosol Can
Insert Valve
Pressurize Can w/gas
Pressure is checked

Product is filled in Bag through the valve
Can is weighed
Actuator attached
Ready to Spray

EASY AND SAFE TO FILL
SPECIAL EQUIPMENT NEEDED

LPAV – Low Pressure Around the Valve

OR

UTC – Under the Cup

High Pressure Product Filler

Personal Care
WHAT SIZE CAN DO I USE?

Dispensing volume determines the pouch which determines the can size.

Need additional can volume to maintain final dispensing pressure.
SHAPES/SIZES – Consumers have choices

30 ml            500 ml

Aluminum or Steel Cans
FORMULATION CONSIDERATIONS

- No interaction of propellant and formula
- Will the formula spray without a propellant?
- Can I spray my formula with a finger pump?
- Does my formula “spit”?
- Does my formula require shaking before use? Product must be homogeneous.
- Will my formula clog the actuator?
BOV APPLICATION FIELDS

[Images of various personal care products including Dial, Icy Hot, Sensodyne, and others]
Household / Industrial
- Insect Repellent – All Natural
- Insect Sprays – All Natural
- Cleaners
- Air Fresheners
- Non Flammable Sprays
Questions