Aerosol 101
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History of Aerosol

The first use for an aerosol package arose during WWII, but the idea of using low-pressure liquefied gas to atomize droplets of liquid in the air was developed in 1924.

1899 Helbling & Pertsch patented aerosols pressurized using methyl and ethyl chloride as propellant.
1929 Erik Rotheim (Norway) invented early cans and valves.
1942 Goodhue & Sullivan developed the first aerosol insecticides.

Canisters filled with insecticide and propellants were used to protect U.S. servicemen (WWII) from insects carrying diseases such as malaria.

What is an aerosol? A very fine particle of liquid or solid substance suspended in air. Fog, for example, is a normal aerosol.

Aerosol-related jobs now employ over 50,000 Americans.
These parts and product all have to be assembled, and this is achieved using automatic filling machinery which can operate at speeds in excess of 400 Cans per minute.

With “impact gassing” using CO2 the Can pressures can reach above 270 psi which may cause the Can to burst and/or become a projectile.

After filling and gassing steps, the Can is immersed in a water bath at 130 degrees F to check for leaks and or high pressures.
In aerosol technology, liquefied propellants are gases that exist as liquids under pressure.

Because the aerosol is under pressure the propellant exists mainly as a liquid, but it will also be in the head space as a gas. As the product is used up (when the valve is opened), some of the liquid propellant turns to gas and keeps the head space full of gas.

In this way the pressure in the can remains essentially constant and the spray performance is maintained throughout the life of the aerosol. The propellant is an essential element in the formulation.

Hydrocarbon Gasses: LPG (Liquefied Petroleum Gas)
Soluble Compressed Gasses: (e.g. Carbon Dioxide)
Refrigerant: (e.g. R134-A)
Non-soluble Gasses: (e.g. Nitrogen, Compressed Air)
1. Start with empty Can; made of tinplate, steel, aluminum... 2-Piece and 3-Piece Cans; Pressure Ratings

2. The capacity of the Can will be greater than that which is declared on the package.

3. The volume of the product is added. This contains all the active ingredients, except for the propellant.

4. The volume of liquid is very carefully controlled to ensure compliance with Weights & Measures. (gram weight)
5. The valve body and valve stem are now inserted into the Can but not crimped to the top of the Can if it is an UTC (Under The Cup) gas filled application.

6. If it is a TTV (Through The Valve) gas filled application the valve cup is crimped prior to gassing.

7. The area above the liquid is called the "head-space".

8. The propellant is now injected under pressure, either UTC or TTV. The propellant may be a hydrocarbon liquefied gas or a compressed gas.

9. If not pre installed; an actuator button is then installed.

10. BOV (Bag-on-Valve) is a third way to assemble an aerosol. A Bag & Valve assembly is inserted into the Can and the Gas is added 1st (UTC), then the Product is added (TTV) to fill up the bag.
UTC: Under the Cup gassing method

The Can is supported in a tool that seals around the top of the Can while the gas is pumped through a (metering cylinder) and through the valve curl and can curl interface.
KP Valve Placer

The valve is placed into each Can
KP UTC Gasser: Rotating Tooling

The Can fits under the tooling that houses the metering cylinder and seals.
Thank you for your time and attention.

We have some samples out on the table and are happy to answer any questions you may have…

Remember, if you are through learning, you’re through…