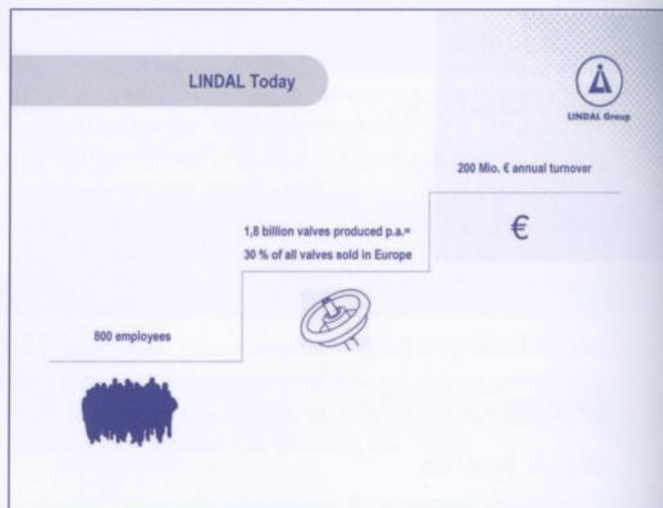


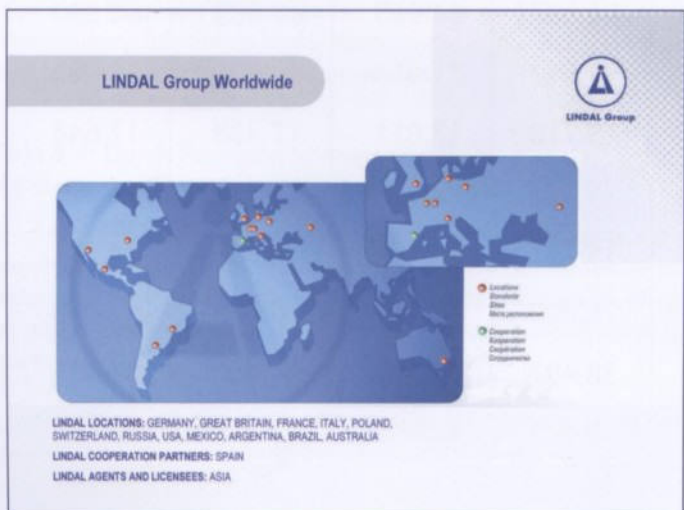
The LINDAL Group

By Philip Brand*

(Lecture Aerosol Forum, March 2009, Paris)



Within the last 10 years the LINDAL-Group has really become one of the important valve suppliers. The group has been growing significantly and healthily.



The Lindal-Group is based throughout the whole world, having its roots in Europe. The development centres are based in Germany and France. Having a strong background in Europe the group is trying more and more to establish itself in the American markets, such as the USA, Mexico, Argentina and Brazil.



Also within the last five years the Group has become an important supplier to multinationals such as Colgate, Beiersdorf, Unilever and Procter & Gamble.

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Bag-On-Valves



- Keeps product bacteria-proof and separated from the propellant.
- For use with all standard or shaped aerosol cans.
- 360° application.

Due to environmental concerns we are keen to work with products such as our Bag on Valves. With this system we are able to use air as a propellant. The system also enables the user to apply 360° and keeps the product protected at all times.

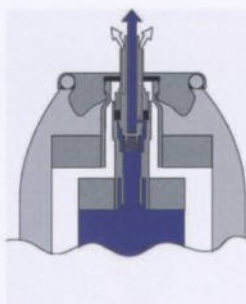
Bag-On-Valve Innovation Bag-In-Bag System



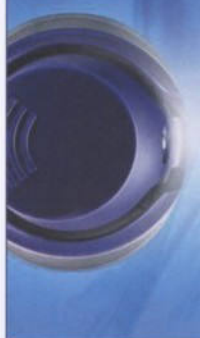
- Two different mediums may be filled separated from each other into a three-chamber-system.
- Mixing is effected while spraying or by the user after application.
- Choice of different actuators.

We were also able to put another bag around the original bag. With this kind of system it becomes possible to dispense or spray two different products at the same time without them mixing in the valve. The flow rate of the two different products is also adjustable, meaning that it is possible to adjust the amount of (in this case) the white product in comparison to the blue product. Also air can be used as a propellant and the two products stay completely protected from each other, against bacteria and the propellant. Possible products are two-component glues, food-products, hair-colourations and pharmaceutical products. Basically any kind of product where two components have to stay separated until application.

Bag-On-Valve Innovation Bag-In-Bag Valve



TRUSPRAY®

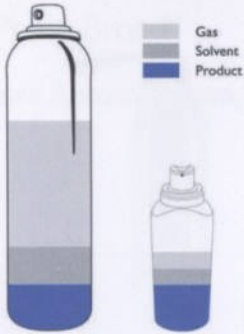


- **Truspray** increases the spectrum of sprayable products: sprays lotions, concentrates, gels and waxes at optimized flow rates.
- Truspray considerably improves the ratio of can size to content: Compared to conventional aerosols it sprays twice as long or is only half the size.
- Truspray is environmentally sound: Better spray performance with less propellants and solvents. (VOC reduction)

www.truspray.com

Another innovation from the LINDAL Group is our TRUSPRAY-system. With this system we were able to reduce the size of an aerosol dramatically. The reduction of the size also has a positive effect on various costs, such as transportation and environmental costs. By using a capillary in the actuator and the diptube it also becomes possible to spray viscous products, which could not be sprayed before.

Performance Comparison:
Standard Aerosol vs. TRUSPRAY®



- Several variations of the gas/liquid ratio are possible
- Product concentration remains the same.

This slide shows the reduced amount of Gas and Solvent. Hence the amount of product stays the same. Therefore the reduction in size can take place.

Bag-On-Valve Innovation
TRUSPRAY® Dispensing



- Actuator with capillary tube: The amount of product dispensed can be controlled by the duration of actuation.
- Bag-On-Valve system keeps product bacteria-proof and separated from the propellant.
- Optional antibacterially treated nozzle.
- May be used with the TRUSPRAY design aluminium can or any other standard or shaped aerosol can.

We were also able to combine the advantages of a Bag-on-Valve system and our TRUSPRAY system. By using a capillary diptube and a capillary in the actuator the system is able to dispense small amounts of creams and lotions. The dosage can be done very accurately and by using a Bag-on-Valve the product stays completely protected against bacteria and light all the time. Possible products here are: Make up, lotions, eyecream, handcream and expensive creams.

LINDAL Product Range
Application Areas



The LINDAL-Group offers valves and actuators for a big variety of products such as pharmaceutical, technical, automotive, veterinary, outdoor, food, household and personal care.



LINDAL Group

Thank you for your attention!

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