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Fluorination 101

Plastic is the material of choice in the container packaging industry. Plastic is affordable and lightweight. However, the porous nature of plastic sometimes allows product and its essential ingredients to pass through the container. This permeation through the plastic can change the product composition or alter the container.



Common problems include:

- Product weight loss
- Container collapse (distortion/paneling) caused by product permeating through the container
- Loss of active ingredients, fragrances or flavors
- Container discoloration
- Label blistering

A solution is to use a special surface treatment, creating a permanent barrier of protection that can eliminate or greatly reduce the effects of chemicals. The treatment also increases the adhesion of inks, coatings and other bonding materials to the plastic.

Engineers are continually discovering new applications for fluorination:

- Cosmetics
- Food and Beverage
- Fragrances
- Health Care Products
- Pharmaceuticals
- Agricultural
- Automotive
- Fuels, Additives and Lubricants
- Chemicals (Industrial and Household)
- Lawn and Garden
- Pet and Animal Health

Many factors effect container performance; including product formulation and container characteristics such as resin type, resin additives, shape, size and color.

During the fluorination process when the fluorine gas is introduced to the polymer, with the correct parameters of time, temperature, and the amount of fluorine, hydrogen atoms on the exposed surface are permanently replaced with fluorine atoms. Fluorine is chemically bonded to the chain-like

molecules on the outermost surface of the plastic. The reaction is permanent and forms a thin fluorocarbon polymer surface layer with heightened chemical stability.