

## Development of new fluorocarbon-free oil and grease resistant barrier coatings for paper and paperboard

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### Abstract

Barrier coatings are used in a variety of applications (food packaging, dry goods, consumer products, etc.) to prevent transport of different compounds either through or into paper and paperboard substrates. These coatings are useful in packaging to contain active ingredients like fragrances or protect contents from substances such as oxygen, water or mineral oil. They are also used to prevent visual changes or mechanical degradation which may occur if the paper becomes saturated by a liquid. Vegetable oil, animal fat and other greasy compounds are present in a broad range of products, posing a significant challenge for packaging and making oil and grease resistance (OGR) a critical attribute for paper and paperboard food packaging. These compounds can quickly saturate untreated paper or paperboard products, negatively impacting a consumer's initial impression and interaction with the product. The most common solution on the market today uses perfluorocarbon treatments which can be easily and economically applied to the fibers or substrate and do not impact the paper structure or properties. However, for a number of reasons, there is a growing interest in perfluorocarbon-free OGR packaging.

The Dow Chemical Company is interested in development of new barrier coatings solutions for the paper and paperboard market and has developed an alternative OGR solution to reduce or replace the use of perfluorocarbons in paper and paperboard. These products are based on aqueous-based polymer dispersions which can offer equivalent or improved barrier performance. These technologies are well suited for all types of OGR applications, including high performance OGR paper coatings where long exposure times, hot oil and folded packaging put additional stresses on the coating. These offerings exhibit exceptional film formation properties which seal off the surface of the paper fiber to prevent oil from wicking through the paper and are compatible with common formulations enabling their use in a wide range of applications with different performance targets. Extensive lab evaluation on various substrates has been carried out and the impact of formulation additives including inorganic pigments and water soluble polymers will be discussed. Lab data will also be complemented with discussion of experience from past pilot coater trials.