

防油紙 (一)：氟素防油劑應用理論及檢測

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Greaseproof Paper I. Theory and Analyses of Fluorinated Greaseproof Agents in Application

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Summary

Grease barrier containers have the following characteristic property requirements such as oil repellency, and grease resistance. Commercial fluorinated greaseproof agents can be roughly divided into 1) polymeric acrylic copolymers; 2) non-polymeric phosphates; 3) non-polymeric carboxylates; 4) other non-polymeric compounds. Their manufacturing entails mainly electrochemical fluorination and telomerization. In theory, the application theory of greaseproof agent can be explained by contact angle phenomena. Wettability of a solid surface can be evaluated by its critical surface tension force. Wettability through capillary imbibition or penetration of a porous substrate can also help explain the phenomena of liquid (water/oil) repellency. Certification of food additives for sanitary and safety in North America and Asia generally follow the certification model of the US FDA, while in Europe, the BGVV certification system is the main path. There is no absolute analysis standard for the oil repellency of a greaseproof paper product. It is often tested in accordance with the intended purposed of the products or customer demands.

The paper introduces 7 methods for the testing of internally sized paper products and 25 methods for the externally sized products. The methods most often used domestically are the oil kit test and Cobb test. In practice, a kit value of 10 or more is required. The Cobb value depends on the purposes of the products. Test methods for molded paper products still await consensus among the trade practitioners. The packaging paper for fast food must have kit values of 10-12 on the front side and values of 6-12 on the back side. The triple pack for pet food should have inner ply with both sides having kit values of 12 or more; the outer ply shall have kit values of 6-12 on both sides, and the requirements on the mid ply depend on the products. The inside surfaces of carton boxes often require kit values of 6-8. The selection of fluorinated greaseproof agents must ascertain the certification status in FDA and BGVV systems, followed by their barrier indicator and cost, and finally, foaming tendency of the products and compatibility with other chemicals, as well the environmental friendliness of the products need to be assessed.

【Keywords】 : greaseproof papers, paper molding, fluorochemicals, testing methods, oil kit test, Cobb test

一、前言

防油隔離(grease barrier)包裝容器的主要特性需求為：撥除油滴(oil repellency)及阻抗油脂(grease resistance)。在紙與紙板及紙模(paper molding)領域的主要應用有：1) 紙模：紙盤、湯碗、便當盒、速食容器，2) 裱面紙板：比薩餅、肉類、肥皂、零配件、繩子，3) 摺式紙盒：點心、外帶速食、糕餅粉、清潔劑、清新劑，4) 多層袋：點心、糕餅粉、寵物食物、木炭，5) 軟式包裝：速食、糖果、巧克力、人造奶油、奶油、烘焙食物、寵物食物、肥皂，6) 特殊紙：非碳複寫紙、標籤紙、裝飾紙、藝術紙，等六大方面。