

Influence of the processing conditions of PVOH coatings to achieve high oxygen barrier on paper

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Abstract

KURARAY POVAL™, EXCEVAL™ and, ELVANOL™ are the trademarks for polyvinyl alcohols made by Kuraray.

In the paper industry polyvinyl alcohol plays an important role as a carrier for optical brighteners. In the manufacture of bank notes it guarantees extremely hard-wearing properties and its use as a creping adhesive contributes to high productivity of tissue paper.

Polyvinyl alcohol is also well known as a binder of fine particle inorganic fillers like fumed silica in ink jet papers for high quality photo printing.

There is a pull from the market to develop sustainable, novel and convenient packaging for extended shelf life foods. At the same time there is an industry drive to increase the functionality of the produced paper and board and through that adding commercial value. This is clearly an opportunity for aqueous PVOH and EVOH barrier coatings on paper and board.

Polyvinyl alcohol is a non-ionic water soluble polymer that is well suited for water based coating. Kuraray Poval is a linear and crystalline polymer that is also biodegradable under suitable conditions. The hydrophilic nature of polyvinyl alcohol makes it ideal as a barrier against grease and oil as well as mineral oils. The hydrogen bonds between the polymer chains together with the crystalline structure make polyvinyl alcohol to one of the best available oxygen barrier on the market.

Kuraray is working extensively to develop water based coatings for the packaging sector and our Kuraray Poval and Exceval are already being used where an oxygen and/or a grease barrier is required. Typical applications are for example paper bags for bread and coffee packaging.

Several technical aspects are critical to achieve outstanding barrier properties on paper and board, among these the formation of a pin hole free and closed PVOH film is required. The use of defoamers, as well as the influence of the drying conditions have been optimized to achieve the best barrier level on paper and board.