

High Gas Barrier Coating for Polyester Film

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ABSTRACT

Improved oxygen barrier in a multi-layer flexible food pouch, sachet or bag translates to prolonged product freshness and extended shelf life. This presentation describes a new aqueous coating which, when applied in line during the polyester (BOPET) film production process, can have a high impact on oxygen transmission rate. Metalizing the coated substrate further improves gas barrier.

SUMMARY OF PRESENTATION

We set out to develop a functional coating intended to act as a barrier to oxygen and be suitable for food packaging. The formulation was to be free from chlorinated materials and nanoparticulate additives. The result of this work was a transparent, single component, aqueous resin dispersion with good shelf life and pan stability. Laboratory and commercial scale machine trials demonstrated a very thin layer of coating on film can have a high impact on barrier.

The concept calls for applying the coating during the film production process. The coating is applied after the machine direction (MD) and before the transverse direction (TD) stretching phases in the tentering process. The coating on the film exhibits excellent water resistance.

Coat weights below 0.1 dry g/m² improve oxygen transmission rate (OTR) on transparent BOPET film by a factor of 100x. Subsequent metallization of coated substrates improve barrier an additional 10x. The gas barrier was only slightly influenced by high relative humidity exposure.

LOOKING AHEAD

Tests are under way to evaluate printability, vacuum metal adhesion and adhesive receptivity of the coated film, with the goal of making prototype pouches and bags for food packaging. Additional work will screen converted structures for sterilization and retortability.