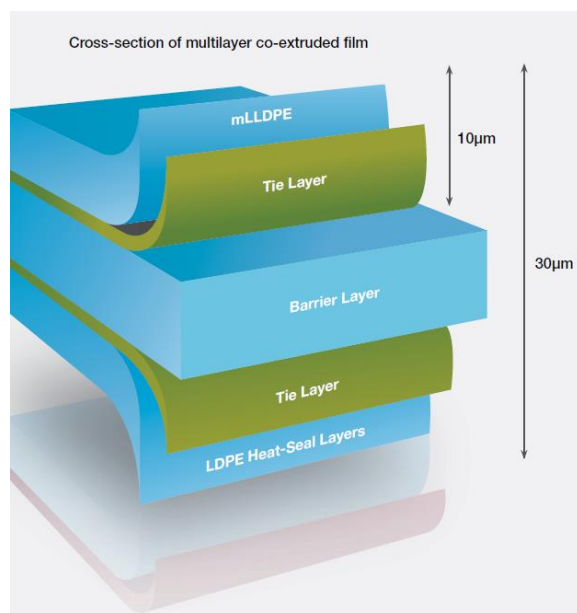


Case Study: Slip in Multilayer Packaging Films

How to achieve medium slip in multi-layer packaging films

The customer problem

A customer was making a five-layer co-extruded packaging film and required a stable CoF between 0.25-0.30 on the outside skin layer of the film structure. The customer had attempted to achieve this by adding 150 ppm erucamide. Although the average CoF achieved was within the specification, there was unacceptable deviation throughout batches, typically between 0.1-0.4 CoF. The other layers consisted of two tie layers and a central barrier layer; the inner skin layer was LDPE.



How did Cargill help?

The variability in slip performance was thought to be caused by the difficulty in dosing such a low level of additive accurately, and the tendency of erucamide to migrate into adjacent layers, especially if they are of high polarity, such as tie layers and adhesives. It was suggested to the customer to replace the erucamide with Optislip™ 203 medium slip additive, and produce a trial batch using 750, 1000, and 1500 ppm of Optislip™ 203 additive. The skin layer also contained 1500 ppm of an inorganic anti-block. The CoF performance of the films produced was measured over 21 days. Within three days of production a stable CoF was achieved at all levels of Optislip 203, with 1000 ppm achieving the required level 0.25-0.3 CoF, with a variability of +/-0.05.

Over the same period erucamide at 500 ppm achieved a CoF of 0.1 within one day, which remained stable for two weeks with a slight upward trend in the third week. Erucamide at 150 ppm achieved the required CoF during the first week but with a larger variability in excess of +/-0.1. After the first week the CoF steadily rose up to 0.5 in the third week.

The solution

The customer selected 950 ppm of Optislip 203 additive for all future production, and over the following year achieved almost 50% reduction in out of spec film, and almost 100% reduction in film considered unsuitable for sale. An added benefit was the ability to formulate differential slip on the inside and outside of the film structure. It was also noted that Optislip™ 203 additive showed less tendency to off-set from one side to the other when the film was wound up on reels. A similar approach was taken when formulating a multilayer laminate film, and in this case Optislip™ 212 additive was found to give the most stable CoF.

If you have further questions do not hesitate to reach out to your local representative.

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