

Levamelt also suitable for blown film process

Working in perfect harmony

Leverkusen – Removable adhesive films made with the ethylene vinyl acetate (EVM) polymer Levamelt from LANXESS – one of the global market leaders in synthetic rubbers – can also be produced cost-effectively using high-throughput blown film extrusion technology. This has been demonstrated by a procedure for the production of a three-layer film with a Levamelt functional layer. The process was developed by staff at the Leverkusen-based specialty chemicals group in conjunction with extrusion system manufacturer Kuhne GmbH in Sankt Augustin.

"In just a short space of time, Levamelt has cornered a considerable share of the market in adhesive films," says Michael Herrmann, a rubber expert in the Technical Rubber Products business unit of LANXESS. "One of the reasons for this is the fact that due to the rubber's variable polarity, the adhesive film – which is, incidentally, plasticizer-free – can be applied very easily to a wide range of substrates such as glass, polyethylene and coated steel. The adaptability of Levamelt films means they can be removed from many different surfaces without leaving any residue." Until now, these types of films were generally manufactured using coating processes. "Coated films have exceptional optical properties and display very homogeneous thickness," explains Herrmann. "But coating systems call for a major investment. What's more, they take up a lot of space and involve a high logistical outlay. Film co-extrusion, of course, offers an economical alternative. From a technical perspective, it's also an advantage if the films undergo biaxial stretching during the manufacturing process. In coating processes, they're only stretched in one direction."

In film extrusion, the support layer (usually a polyolefin such as polyethylene (LDPE) or polypropylene), the tie-layer and the

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adhesive film have to exhibit similar viscosities in terms of shear rate. However, there is a considerable difference between the melt flow indices (MFI) of Levamelt and LDPE. "The MFIs of polymer materials are only measured at comparatively low shear rates – but that doesn't tell us much about how they will behave during blown film extrusion," says Herrmann. "We were able to show that LDPE and Levamelt work extremely well together at high, process-relevant shear rates of between 11 and 8,000 s⁻¹. And that's not just in the laboratory environment, but also in practice under typical process conditions with a high throughput."

Just how well blown film extrusion works with films coated with Levamelt is demonstrated by the manufacture of a typical three-layer film consisting of an LDPE substrate, an intermediate EVA layer five micrometers thick and a 15 µm Levamelt functional layer. This is carried out on a blown film system from Kuhne. The process can be seen live at Kuhne's in-house trade fair in Sankt Augustin, held parallel to "K" 2010. A video will give visitors to the mechanical engineering company's stand a better insight into the technology, while LANXESS will display samples of the extruded films.

"Naturally, there were a few technical details that had to be cleared up in terms of manufacturing blown films," adds Herrmann. Manufacturing a film with an external adhesive layer, for example, requires cylinders the adhesive won't stick to – not too tough a challenge for a raw material with customized adhesive properties. Recommended temperatures for extruder and blow head also had to be established in order to ensure the optimal viscosity of the relevant raw materials. This revealed that, due to lower molar mass, the flowability of the LDPE substrate was – as expected – much more dependent on temperature than that of the Levamelt grades tested. That makes the elastomers from LANXESS very well suited to processes of this type. "This is all part of the technical advice we offer to each and every customer," remarks Herrmann.

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News Release

LANXESS is a leading specialty chemicals company with sales of EUR 5.06 billion in 2009 and currently around 14,300 employees in 23 countries. The company is represented at 42 production sites worldwide. The core business of LANXESS is the development, manufacturing and marketing of plastics, rubber, intermediates and specialty chemicals.

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