AMI

Market report: BOPE Film

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Background and market status

The latest issue of AMI's Orientate newsletter reviewed the opportunities of the BOPE films market, a market still in its infancy but gaining traction throughout the flexible plastics packaging industry. The BOPE concept has been around for many years but it is only recently, with the progress in material and packaging innovation, that the film is developing into a viable option within the flexible packaging space. Traditionally, consumer goods manufacturers and retailers have focused on weight and material usage improvements to reduce packaging costs, prompting the substitution of rigid formats with multilayer flexible films. The major drawback has been that mixed material laminates are not easy to mechanically recycle. As the sustainability drive gains momentum and retailers and branded goods companies make bold sustainability commitments with particular emphasis on packaging recyclability, there has been a huge push for mono-material packaging - Design for Recycling – and here BOPE film is a strong contender.

Double / triple bubble BOPE has been around for many years, but tenter frame BOPE has only recently become a viable option. One of the main hurdles has been the ability to extrude the resin on a tenter frame due to the higher orientation ratios and the sequential nature of the process, requiring the development of new grades of PE. In 2018, Dow officially launched its TF-BOPE resin at Chinaplas. The product's launch target market was Asia, where it was marketed primarily as a cost-effective alternative to BOPA in abuse layers for packaging, but, whilst originally marketed as a BOPA substitute, the motivation for using BOPE has changed and even in the Asia Pacific there is now a drive towards mono material solutions, including all PE solutions for sustainability. The following year at the K2019 exhibition, Brückner Maschinenbau launched two BOPP/BOPE hybrid lines, designed for full output BOPP and BOPE film production and generating interest throughout the flexible packaging industry.

A focus on all-PE solutions among brand owners and retailers

BOPE is gaining momentum thanks in part to established PE film recycling systems in many countries, with other plastic films less likely to be sorted into separate recycling streams due to a lack of reprocessing routes and lower presence in collected film streams. In Germany and Italy for example, films are sorted into a PE film output grade, and smaller flexible films (including pouches and snack packaging) are included in a mixed plastic output. In the US, UK, France and Spain, the focus is on increasing the use of PE, and thus a significant interest in and development of all-PE flexible packaging solutions.

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Brand owners and retailers have remained committed to their pledges of 100% recyclable packaging, in spite of the many challenges the Covid pandemic has brought about. The growing awareness of the climate emergency combined with increasing regulation and growing public concern has led to the entire packaging value chain exploring and, in some cases, investing substantial amounts into packaging redesigns to improve sustainability and in some cases fundamentally rethinking their delivery chains and adopting circular economy models. As part of this circular economy flexible packaging drive, a strong interest in BOPE as a mono-material option has developed.

It should be noted that all flexible packaging materials have their own mono-material drive: There are developments towards a co-polyester which can offer good sealing for an all-PET pack; BOPP and CPP can be used together as a mono-material; MOPE solutions have been launched for all-PE stand up pouches. Different brand owners are taking different routes depending on the products to be packaged, shelf life and pack design considerations. In many cases, brand-owners will need to be willing to compromise and accepting of different performance parameters when changing to mono-material solutions.

All-PE films produced on biax lines offer a range of physical properties in addition to down-gauging potential. Tenter frame BOPE film has its own unique set of characteristics and can offer certain advantages over current PE films in use. Compared with double / triple bubble BOPE, tenter frame BOPE offers better thickness control and the output rate is considerably higher, which for large volume products could be a distinct advantage. Without the need for barrier requirements, highly specialised or shrinkable films, it is considered a highly economical way of producing large quantities of PE film.

Market development and opportunities

As developments throughout the supply chain gain traction, and the early adopters prove the films' efficacy and advantages, BOPE film will increasingly become an option. There is already a huge market pull from both brand owners and converters but also the possibility of many different application areas to be further explored. Eventually BOPE could be an alternative to other mainstream blown or oriented materials depending on market trends, replacing mixed material film structures made today with BOPP, BOPA or BOPET. Many packaging applications require multiple materials to provide the required performance unless they utilise an all-PE film structure, especially with the strong sealing properties of PE.

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As BOPE becomes a common substrate, more BOPP/BOPE hybrid lines and all BOPE lines will be installed and commissioned. Polyethylene is the most common material for packaging films worldwide and this presents many opportunities. The range of product areas where BOPE film is suitable is wide and includes both food and non-food packaging. The film is now being tested and trialled at several film producers, converters and brand owners, with a small amount of film commercially available. This is expected to ramp up over the next 2-3 years, with advances throughout the supply chain. Overall volumes will remain small in the short term while the material finds its value proposition in the flexible packaging space. The price of the resin remains high and the focus within flexible packaging remains heavily cost driven. Investment is also required as changing to BOPE has capex implications for the entire value chain. The move towards easier to recycle mono-material structures will also require compromise on the part of brand owners and end consumers, and the acceptance of limitations in terms of clarity or haptics.

BOPE is still a future proposition but offers film producers the potential to diversify their business and offer a wider range of solutions to the market. Every world region now possesses BOPE film capability, with investment and development in the material accelerating. As the market pull becomes stronger and lines comes on-stream, the wider flexible packaging industry will develop a better understanding of the material's value proposition.

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