BRÜCKNER MASCHINENBAU

A Member of Brückner Group

Brückner Maschinenbau teams up along the value chain

Cooperations for a sustainable future – BOPE is at the head of the list

From bilateral teamwork with raw material suppliers, masterbatch specialists and film producers to more complex cooperations along the value chain: Brückner is involved at many levels.

DOW and Brückner are jointly developing BOPE-LLD and BOPE-HD resins and films as well as barrier solutions for BOPE. All three fields of applications have been tested at Brückner in the lab-scale using the laboratory stretcher KARO 5.0 as platform for film developments as well as the pilot line and successfully transferred to a production line.

Brückner and **SABIC** have collaborated for quite some time to create sustainable materials for the packaging industry, e.g. BOPE films. The successful outcome is a BOPE-LLD material which has been presented jointly at the K-Show 2019. Same procedure is now ongoing for BOPE-HD resins. During the latest cooperation Brückner tested SABIC's certified circular BOPP material (which incorporates recycled content) in their own technology center as a drop-in solution for biax-film applications.

NOVA Chemicals has been working with Brückner to accelerate the development and commercialization of a new high-density resin technology for the BOPE market. BOPE is a transformative technology that enables the manufacture of all-polyethylene, recyclable multilayer film structures with significantly improved physical performance. The technology is seen as ideal for use in food packaging, heavy duty sacks, e-commerce and other demanding applications. Besides BOPE-HD, Nova offers also BOPE-LLD grades. In a common project with NOVA, the film producer Polivouga and Brückner a full BOPE-pouch consisting of BOPE-HD for the stiff base film and BOPE-LLD as sealing web will be presented to the market.

The optimization of polymers, masterbatches and process parameters necessary for innovative BOPE films was carried out by **CONSTAB** engineers on a Brückner pilot plant. One example is white opaque BOPE film: By combining two innovative additive masterbatches, excellent density values of 0.5 g/cm³ to 0.7 g/cm³ were achieved, while at the same time providing very good stiffness.

In the "**Circular Alliance**" six companies teamed up to produce new high barrier mono material flexible packaging solutions designed for recyclability. The partners include **Dow**, a resin supplier, for the first step in the production chain, **Brückner** Maschinenbau for the production of the biaxial stretched polypropylene and polyolefin-based films, **Hosokawa Alpine** for the production of MDO LDPE, **ELBA** to convert the finished film rolls into pouches, **Constantia** Flexibles to produce

metallized high barrier stand-up pouches and finally **Bobst** with their high barrier, printing & lamination competence.

The project has involved using different high barrier mono-material structures, each one thoroughly tested to guarantee that all industry requirements were met in terms of processability, barrier, safety and optical quality. The different types of mono-material stand-up pouches (MDO PE, BOPE, BOPP and CPP) are the outcome of considerable investment and intense research by each of the partners.

In March 2019 a value chain project initiative was launched by a group of companies under the acronym **PRINTCYC** (**Prin**ted PP films for mechanical re**cyc**ling) to research and test ways to create circular economy solutions basing on post-industrial waste. Members of PRINTCYC: The machine suppliers Brückner Maschinenbau, Kiefel and PackSys Global, the film producer Profol, the ink manufacturers Huber Group and Siegwerk, the converters Constantia Flexibles and Wipak as well as the recycling specialist Erema. The initiative is coordinated by akk innovation, an independent start-up company for sustainable innovation management in the plastics packaging industry. The specific target of the first two project phases was to understand the impact of different ink formulations on the mechanical PP and PE recycling process. Furthermore, the re-usability of PP and PE recyclates (rPP / rPE) made from printed post-industrial film waste was evaluated in cast film, blown film, compression moulding and thermoforming technologies as well as the biaxial stretching process. Now the team is contacting new, prospective value chain partners and other recycling initiatives for designing the next working package to contribute to a circular economy of printed PP and PE films.

R-Cycle is the open and globally usable tracing standard along the life cycle of plastic packaging. The overall goal is to implement a practical solution, ensuring recyclability by seamless documentation of all recycling-relevant packaging properties based on established technologies. In the recycling process, packaging can thus be precisely identified in order to process the resulting recyclate into diverse and high-quality plastic products. In collaboration with packaging manufacturers, brand owners, wholesalers, and retailers global identification numbers should be introduced and IoT gateways, the necessary server infrastructure and standardized formats for secure data exchange will be developed. Partners in this project are: **Arburg**, **Kautex Maschinenbau**, **Reifenhäuser**, **Brückner Maschinenbau**, the **Institute for Plastics Processing (IKV)** and **GS1 Germany**.

Additionally, Brückner cooperates in various partnerships that have already existed for many years. Some examples: One of the most long-standing cooperations is with the **VDMA** (German Engineering Federation). The association is the largest network organization and an important mouthpiece of mechanical engineering in Germany and Europe. We also work with more than 20 **universities** in Germany and five more in Europe, two in the US and two in China. In addition, we

frequently cooperate with **Fraunhofer Institutes** and participate in various support projects. Other associations & organisations we work with are

- **CEFLEX** (Circular Economy Flexible Packaging), a joint project of various European companies and associations that represents the entire value chain of flexible packaging
- **EUROMAP**, the umbrella organization of the European plastics and rubber machinery industry
- **BOPET Films Europe**, representing BOPET film producers in the European market, aiming to boost the circularity of flexible packaging

Last but not least and quite up-to-date, Brückner Maschinenbau researched and developed extensively in close collaboration with two long-standing customers in the direction of biaxially oriented polyethylene films (BOPE):

With **Plastchim-T**, one of Europe's top manufacturers of high-quality films and flexible packaging and the Italy based Ticinoplast, Brückner has been cooperating for two years on a means to make BOPE films with the highest possible recycling capabilities. The results of the numerous joint trials at Brückner's technology center in Germany and Plastchim's production site in Bulgaria are trend-setting and Plastchim-T now consequently took the next step: They ordered a 6.6m wide, ultra-flexible BOPP/BOPE hybrid line for an extended range of films. This line will be in operation by the second half of the year 2021 and will be a new benchmark in BOPE film production.

The family owned **Polivouga** Group has developed in a short time into one of the fastest growing film producers in Europe. Already at K 2019 it became apparent that Polivouga was considering the promising BOPE business as a possible investment scenario. Subsequent development work with many joint trials have so far impressively proven that Brückner's upscaling process, i.e. the transfer of test results from laboratory scale to production plants, is working very well for new film development projects. Thus, Polivouga recently ordered the first 8.7m wide BOPP/BOPE hybrid line worldwide.

Brückner Maschinenbau, the world market leader for film stretching lines, is a member of the Brückner Group, Germany, a worldwide leading supplier of tailor-made engineering solutions and services for the plastics and packaging industry, with more than 2,600 employees. Other members of the group include Brückner Servtec, offering service & upgrading solutions for film stretching lines, Kiefel, specializing in machines for forming and joining plastic materials for a variety of industries, and PackSys Global, one of the world's leading packaging equipment manufacturers.

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