

Aqueous lacquers: a sustainable alternative

Paramelt, a global producer of wax blends, adhesives and speciality dispersions, provides aqueous alternatives to extrusion-based barrier and heat-seal coatings that offer multiple advantages in terms of resource use, recyclability and formulation flexibility.

Paramelt has developed a range of fully aqueous, polyolefin based lacquers as a more sustainable alternative to extrusion coated paper and paperboard.

Environmental considerations are increasingly influencing the selection of heat seal and barrier packaging structures. Factors such as recyclability, resource use and environmental emissions are leading to a significant reassessment of available technologies.

One particular area of attention concerns the use of extrusion-coated paper and paperboard packaging. Products based on these materials are difficult to recycle because they create quality problems in the re-pulping procedure, where they can disrupt the process and lead to contamination of the finished pulp.

Typically, such polymer-coated packaging materials are discarded in the consumer waste stream, ending up in landfill or at best incinerated. Both options are suboptimal and fail to take full advantage of the recyclable and compostable advantages of paper-based resources.

Heat seal requirements

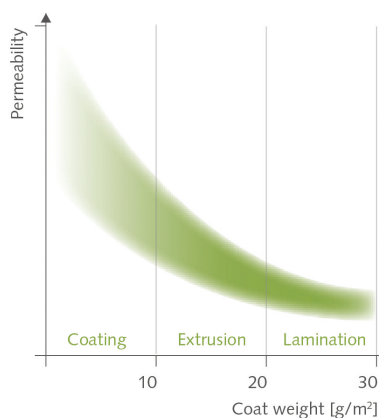
Polyethylene-extrusion-coated paper and board represents around 30% of all paper-based packaging and is found in a diverse range of market segments.

Besides being an excellent barrier against water, moisture and grease, polyethylene extrusion coatings also offer heat-seal functionality. In a number of applications, heat-sealing can be the only requirement. To achieve the desired sealability, a layer of only a few microns thick is needed but such thin coatings are difficult to achieve consistently via extrusion, where thicknesses of more than 10µ are typical.

In addition, extrusion coating is currently limited to full surface coverage. This often results in products that are overdesigned. Where heat sealability is the only requirement, pattern application in the heat-sealing areas leads to significant benefits in reduced material consumption.

Aquaseal water-based coatings

Water-based barrier coatings have existed for many years, though market adoption to date has been relatively limited. The challenge has been to find an effective balance between cost and performance to achieve a sufficient match with extrusion at



Permeation ranges for different polyolefin application technologies.

lower applied coating weights. In addition, the process control and consistency required to achieve effective barrier capabilities at low coating weights is demanding.

Marketed under the brand name Aquaseal, Paramelt has developed a range of water-based polyethylene coatings that match the functionalities of extrusion-coated materials using conventional printing and coating techniques.

This opens up numerous possibilities with respect to sustainability in terms of resource use and recyclability. Water-based coatings also offer more formulation flexibility than extrusion coatings, allowing

the incorporation of sustainable materials such as fillers, vegetable waxes or biopolymers, which by themselves may not be compatible with extrusion processing. This approach leads not only to improved recyclability but, with appropriate product design, can also be used to achieve fully compostable packaging materials.

An acceptable compromise

Packaging specifications are generally established to control the consistency of an existing solution and not always the functional requirements of the application. Many existing materials are over-specified based on the inherent characteristics of extrusion coating. Where high barrier performance is a critical feature, then extrusion coating or lamination will remain an effective solution (see graph above). However, where a lower barrier level is acceptable, or functionality is only required in certain areas of the pack, the coating route can provide a cost-effective and beneficial solution.

Aquaseal: a novel and exciting technology

Paramelt is working with a number of converters to validate and implement this novel and exciting technology. Based on this experience, the company is able to offer a number of new solutions for paper and paperboard coatings based on fully aqueous, heat-sealable, barrier coatings. ■

Further information

Paramelt
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