Aqueous coating formulations for cupstock to make recyclable hot drink cups

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Abstract

Polyethylene (PE) laminated cupstock is being used for decades to make cold and hot drink cups. PE provides the paper the necessary barrier properties but also the possibility to make it heat sealable. Over the years the technology of making cups has been improved and nowadays cup machines that can make 300 cups a minute are quite common. Though paper has always been considered as one of the most environment-friendly packaging materials, the PE laminated cupstock paper is an exception to this. These cups end up in a land fill or are being burnt to recycle its energy. The PE renders the cups hard to recycle.

Topchim has developed an aqueous coating formulation for cupstock paper that is suitable for hot drink cups. After being used, these cups can be recycled through the common standard waste paper recycling facilities. A major obstacle was to make coating formulations providing heat seal properties that could withstand the high temperatures required when serving tea or hot coffee. The heat sealing conditions (temperature, pressure,…) on the cup machines with the coated cup stock are very similar compared to PE laminated cupstock. The coated cupstock was evaluated positive on classical cup machines at the standard speed as used with the PE laminated cupstock. The resulting cups survive the most stringent leak-testing conditions, they resist for days while filled with coffee.

The aqueous coating formulation delivered by Topchim provides barrier properties and heat sealability in one coating layer. It is possible to substitute a part of the coating formulation by applying a cost-efficient pre-coat on the cupstock. Cup stock paper producing facilities with an on- or off-line coater cannot always apply sufficient coating weight in one layer and therefore a pre-coating can be useful. The applied coating product has a high bio-renewability content and therefore the overall system has a high sustainability profile.