

Session: Converting and Processing
Presentation by: Hans Martens,
Sabic (KSA/NL)

Title: **New biobased barrier material for flexible packaging**

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Curriculum:

Hans Martens has over 30 years of experience in product development regarding thermoplastic engineering plastics and polyolefins materials, After finalizing his bachelor study in analytical and polymer technology, he has been working approx. 20 years at the R&D dept. of Akzo Nobel in Arnhem (Netherlands) and DSM in Geleen (Netherlands). Hans joined SABIC after the acquisition of all polyolefin and a main part of the chemical business activities of DSM (in 2002) and works as projectleader of several technology and innovation projects especially for the automotive and plastic packaging industry. Since 2013 he is project leader of the technology project to investigate the use of renewable materials (like starch) as functional filler in polyolefin compounds for flexible packaging applications.

Abstract:

SABIC is one of the largest global polyolefin producers. In order to contribute to sustainable development of all the applications our customers are producing we are exploring different aspects of material and application development. The combination of functionality, lightweight, recycling, material reduction and renewable materials has been investigated in order to define solutions to several market segments.

One of the topics we are investigating is the usage of renewable materials in combination with polyolefins.

Our example deals with partially biobased packaging material for improved gas barrier and therefore increased shelf life. Special attention has been given to morphology development during processing of such materials and the role of blend morphology for the steering of oxygen permeability and water vapour transmission rate.

Multi-layer systems are being used in the packaging industry to add various functionalities to the application. Standard in the market is a 5-layer film set up, but the trend is to go to 7 (and more) layer systems. Most commonly used nowadays and benchmark for packaging applications is a 5-layer system. PE/tie/EVOH/tie/PE combinations are commonly used to improve the shelf life of a large variety of food items.

The excellent oxygen barrier performance of this 5-layer EVOH concept can be attributed to the fact that the oxygen molecules are trapped in the free volume by the hydrogen bonds in the EVOH structure. The use of carbohydrates (natural materials consisting of crystalline amylose and branched amylopectin) like starch do have the potential to have similar functionality as EVOH to have excellent oxygen barrier performance.

This performance will be discussed in our presentation.