MACEAS
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Ultrasonic-Barrier-Measurement-System for EVOH layers

Type: USBT

Background

To reach very low HC-emission from a plastic fuel tank commonly coextrusion technology is used. In this case the wall of the tank consists of 5 or more layers.

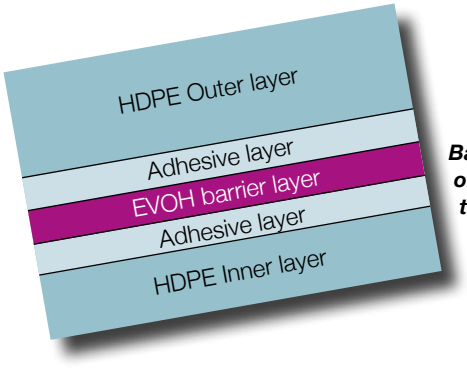
The most important part is taken by the barrier layer. Materials used for this layer are responsible for reducing the HC-emission. In most cases ethylene vinyl alcohol (EVOH) is used as barrier layer. For quality assurance it is necessary and important to measure the thickness of the EVOH layer. Today samples of the tank wall have to be cut out of the tank. Then the samples must be prepared for measurement by microscope. This procedure is a very time consuming and in addition a really destructive method.

Challenge

The ultrasonic measurement of thin layers (< 100 µm) requires the use high frequencies, but plastic (HDPE) has a very high attenuation for such frequencies.

Solution

Together with **Kautex Textron,** Bonn, **MACEAS** succeeded in using new methods in signal processing for the development of an **ultrasonic based measurement system** fitting the requirements for EVOH layer thickness gauging in plastic fuel tank. By means of Finite-Layer-Modelling (FLM) the structure of the plastic fuel tank wall is synthesised and super-posed signals can be separated. The device is able to measure EVOH layers ≥ 40-50 µm.



Basic wall structure of a coex plastic fuel tank

Your advantages

- **Non-destructive measurement of EVOH layer thickness**
- **Fast measurement of many different points**
- **Integrated documentation of measurements**
- **Operator assistant for points to be measured (option)**
- **Interfaces for peripheral devices (barcode scanner)**

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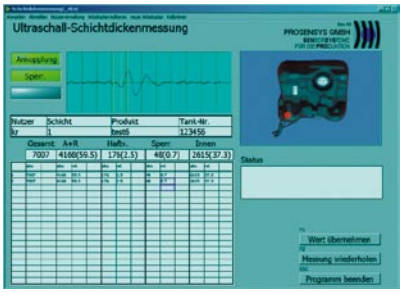
Microtome cutting

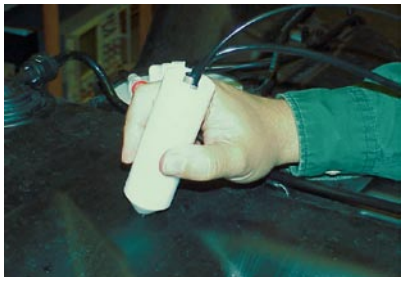
Microtome cutting of a coex plastic fuel tank, EVOH-layer coloured violet, microscope picture.

Screendesign

Example for the design of the user screen.



Technical data



Specifications

Total wall thickness	2-8 mm
EVOH-thickness	50-250 µm
Accuracy	+/-10 µm at 3 % EVOH layer

Appropriate to

- Plastic fuel tank
- Pesticide plastic bottles
- Food packaging
- IBC container
- …

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