

## Presse Release Sensor Instruments

June 2024

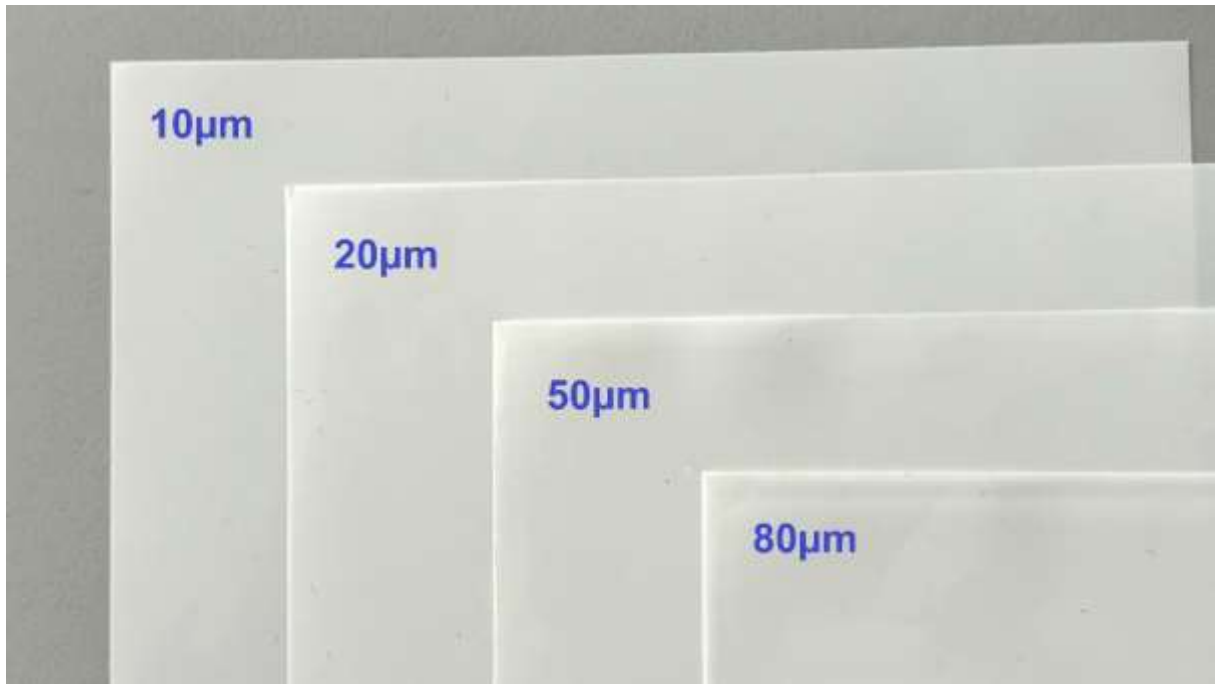
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### Determination of layer thicknesses between and on plastic films

How can the thickness of a coating layer between two PET films actually be determined?

**06/20/2024. Sensor Instruments GmbH:**

For this purpose, four PET film pairs with different pint layer thicknesses between the two PET films (10 $\mu$ m, 20 $\mu$ m, 50 $\mu$ m and 80 $\mu$ m) were examined using the MIR transmitted light method.



PET film pairs with different coating thicknesses (10 $\mu$ m, 20 $\mu$ m, 50 $\mu$ m and 80 $\mu$ m) between the two PET films

On the receiver side, two wavelength ranges with center wavelengths of 2.95 $\mu$ m and 3.90 $\mu$ m (SPECTRO-M-2-2.95/3.90) were available. The distance to the MIR transmitter (SPECTRO-M-15-T) was approximately 20mm.

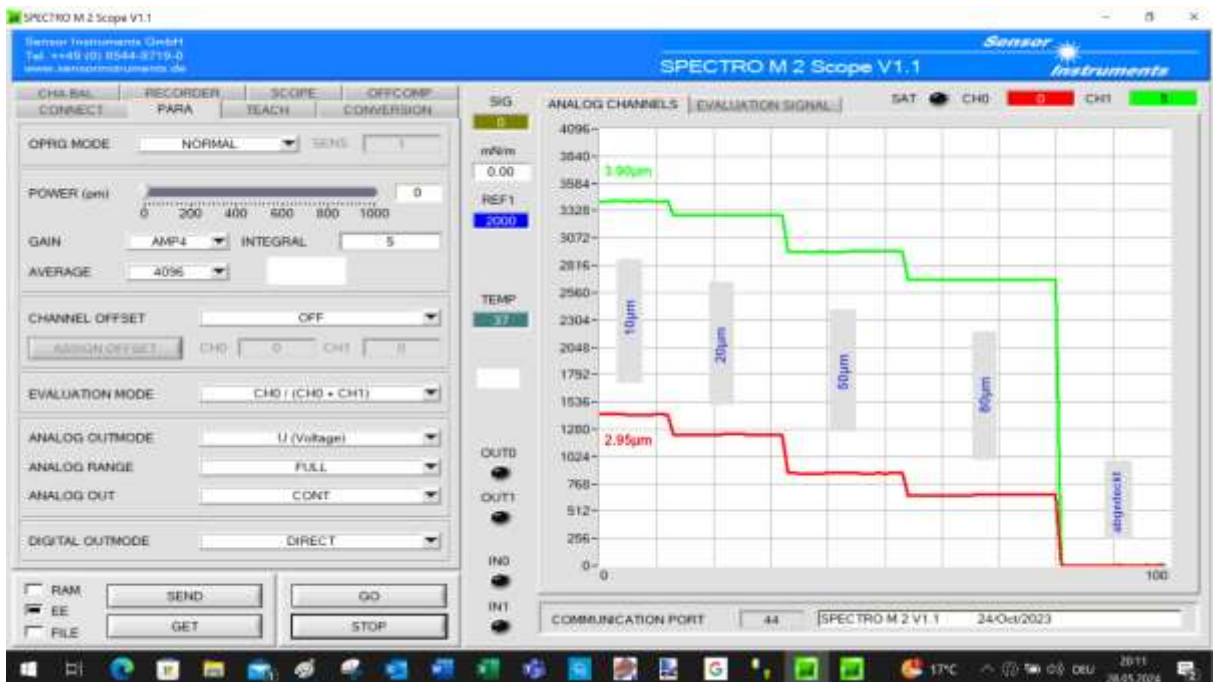


MIR transmitted light measurement of a paint layer thickness with the SPECTRO-M-15-T transmitter (light source) and the SPECTRO-M-2-2.95/3.90 receiver.



Here, the SPECTRO-M-2-2.95/3.90 receiver is directed at a semi-transparent film. (The SPECTRO-M-15-T transmitter is located on the opposite side).

The thickness of the coating layer can be easily determined in both wavelength ranges, as can be seen in the following diagram:

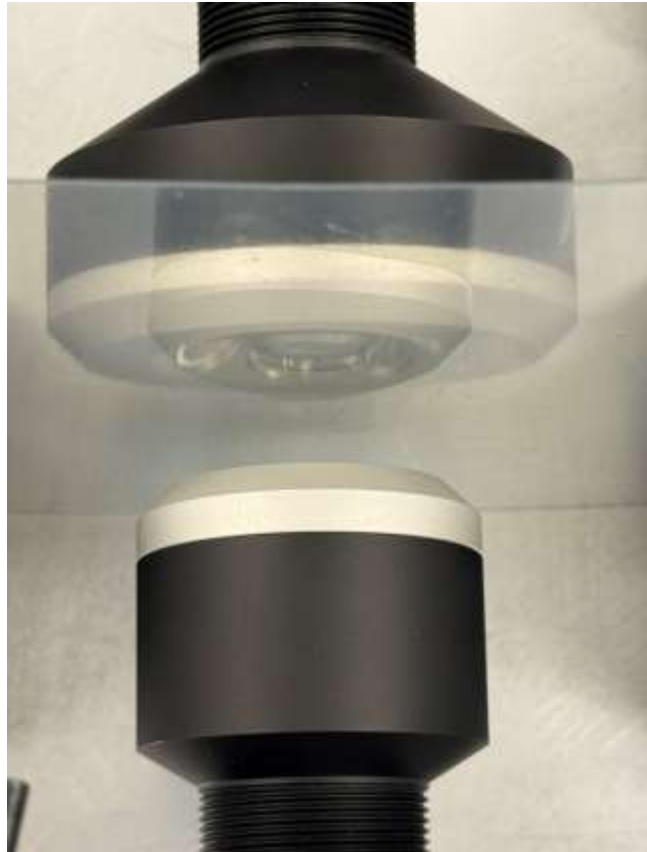


Windows® software SPECTRO M 2 Scope V1.1: Display of the two signals for the 2.95µm and 3.90µm ranges as a function of the coating thickness.

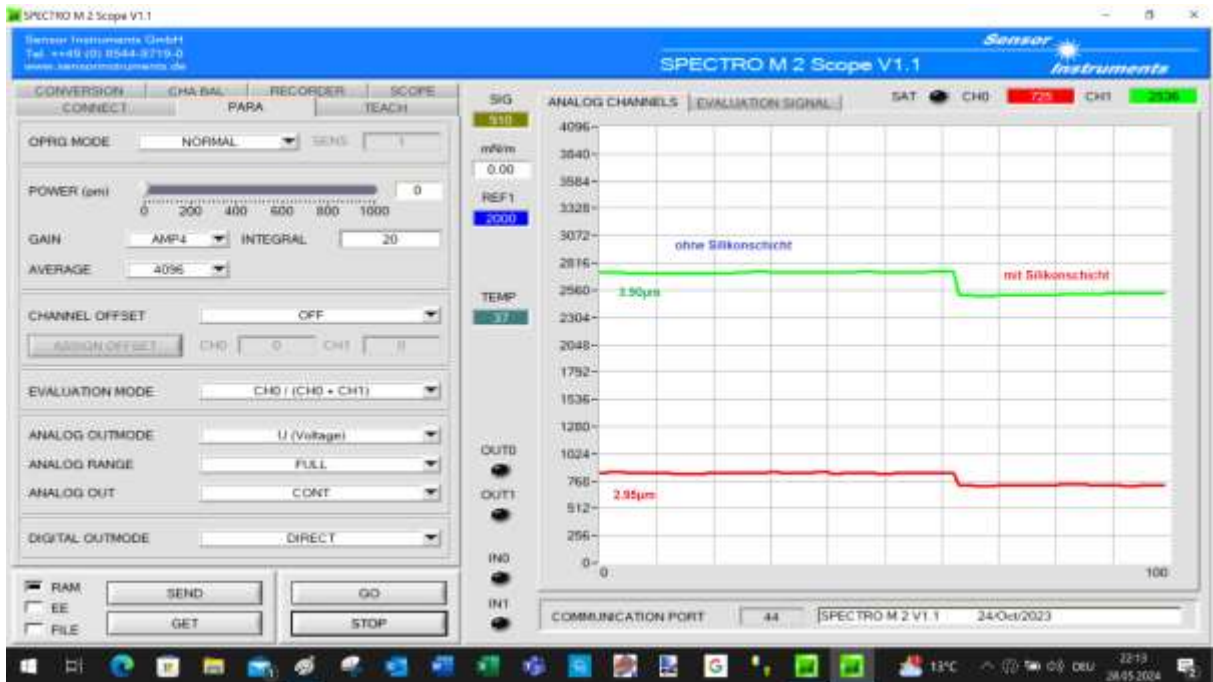
As MIR light is absorbed to varying degrees depending on the films used and the intermediate layer, it is necessary to calibrate the sensor system using the SPECTRO M 2 Scope V1.1 Windows® software for the specific product.

### **Silicone layer on a transparent plastic film**

The presence of a silicone layer on a transparent plastic film was also investigated using this measurement method, with the result that this layer can also be detected quite well. In both wavelength ranges, the presence of a silicone layer leads to an attenuation of the signal level. A product-specific calibration using the SPECTRO M 2 Scope V1.1 Windows® software is also required here. First, the film is measured without coating (corresponds to a silicone layer thickness 0µm). A layer is then applied, the thickness of which is determined, for example, using the basis weight method or another reference measurement method. The calibration can be completed after determining a few reference points.



Detection of a silicone layer on a transparent plastic film with the SPECTRO-M-15-T transmitter (light source) and the SPECTRO-M-2-2.95/3.90 receiver.



Windows®-Software SPECTRO M 2 Scope V1.1: An existing silicone layer leads to an attenuation of the signal level in both wavelength ranges 2.95µm and 3.90µm.

## Conclusion

With the MIR transmitted light method, different layers applied to a plastic film or embedded between two plastic films can be detected and their thickness determined after appropriate calibration. Furthermore, the thickness of a plastic film can also be measured after calibration.

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