

# CHARACTERIZATION OF PLASTIC FOILS

Spectral Analysis of Plastic Foils in Real Time

*nlir*

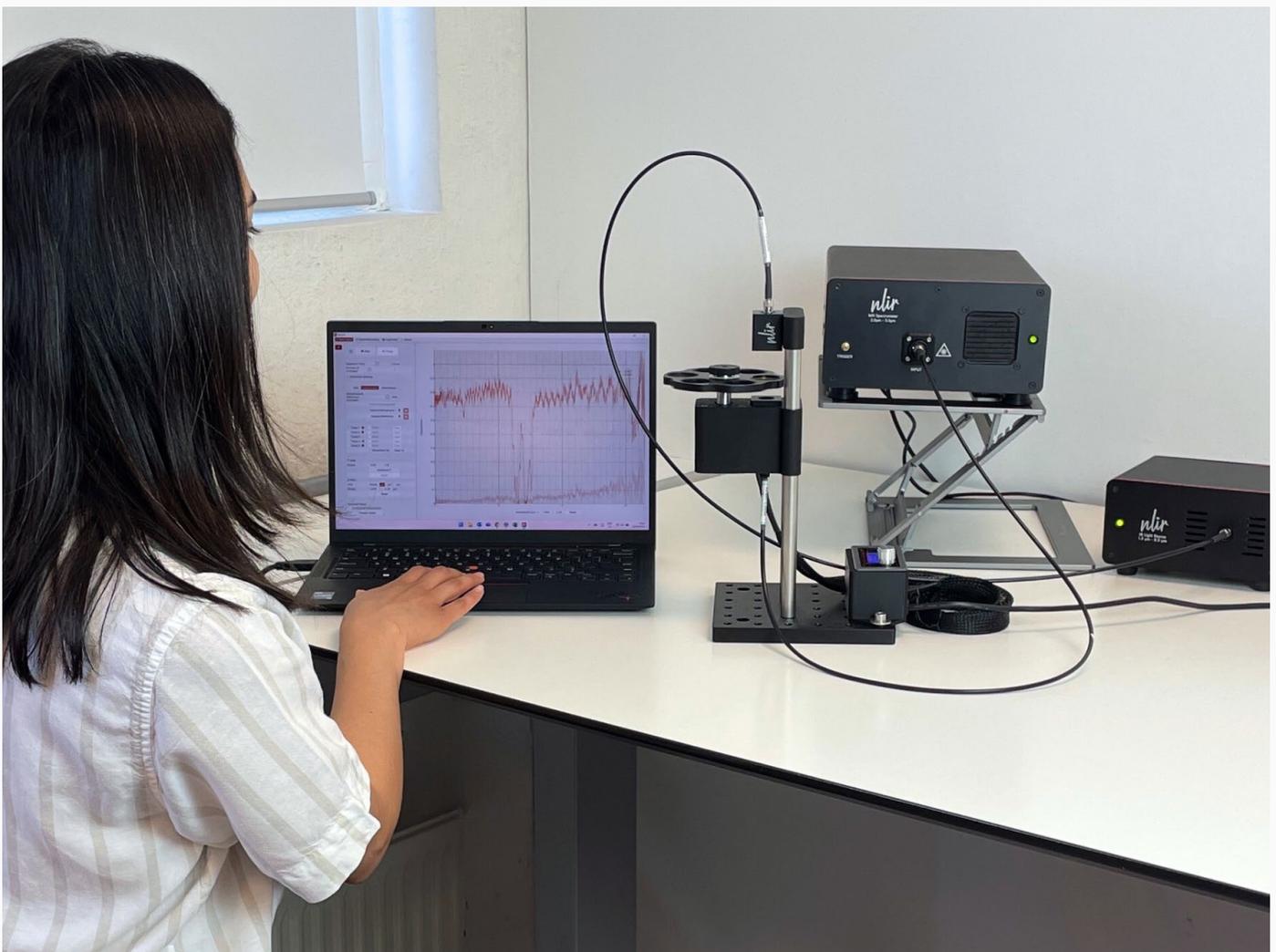
MEMBER OF THE NYNOMIC GROUP

# Mid-Infrared Transmission Measurements of Plastic Foils

NLIR's MIDWAVE spectrometer enables fast acquisitions of spectral information of material under test providing the plastic foil industry with precise control over the specification of the material composition, layer structure of the foils, and in-line real-time monitoring for quality control.

**Given the speed and sensitivity of MIDWAVE Spectrometer, we facilitate:**

- Rapid material identification
- Optical property analysis
- Moisture content detection
- Barrier layer verification
- In-line defect detection
- Thickness and uniformity analysis



# Measurement Case and Interpretation of the Results



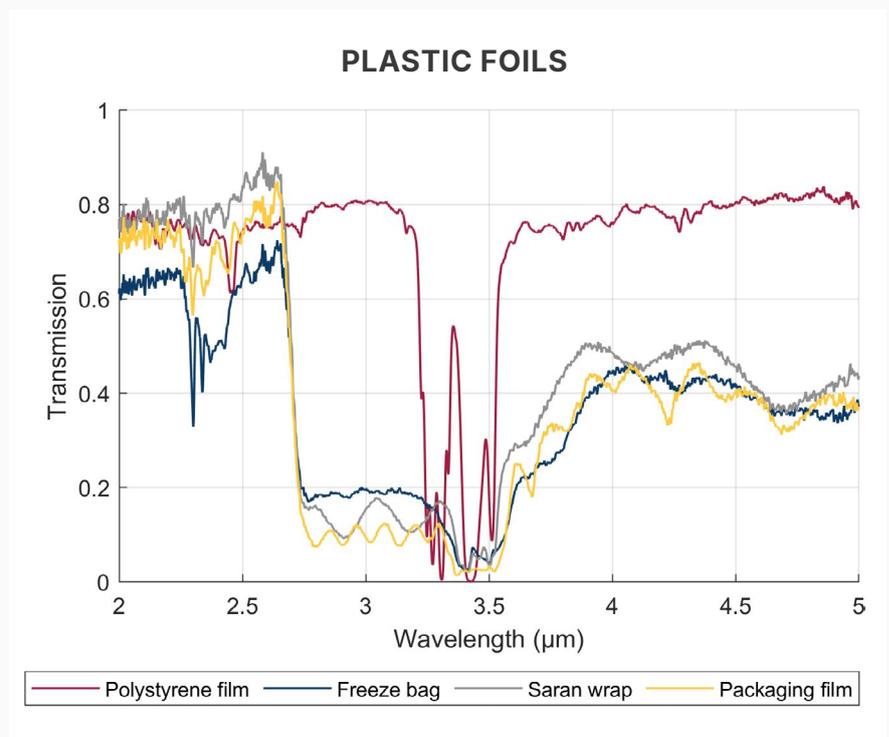
## MEASUREMENT SET-UP

We have performed high-speed mid-infrared transmission spectroscopy on four different types of plastic films using a spinning sample wheel. The samples were measured at a speed of 60 RPM up to 300 RPM. Even with the samples moving at high speed, MIDWAVE Spectrometer is able to capture the spectral signatures of each film efficiently as shown in the graph below.

## KEY OBSERVATIONS

Using the spectra, we are able to easily distinguish different plastic films: polystyrene, freeze bag, saran wrap and packaging film. These plastic foils show strong absorption features in the 3.2 – 3.5  $\mu\text{m}$  range, which correspond to C–H stretching vibrations, with polystyrene showing particularly sharp features.

On the other hand, the freeze bag displays a more complex and broad absorption, indicating blended polymer structure. The sharp absorption around 4.3  $\mu\text{m}$  for the packaging film is consistent with the presence of polyethylene or polypropylene, possibly blended with other materials.



## WHAT MAKES OUR TECHNOLOGY STAND OUT?



### Live Monitoring

Get results in seconds.  
Ideal for in-line integration



### High Sensitivity

130 k counts/(ms  $\mu\text{W}$ )  
with non-contact measurements



### OEM Ready

Perfect to be integrated  
thanks to the compact  
and portable size

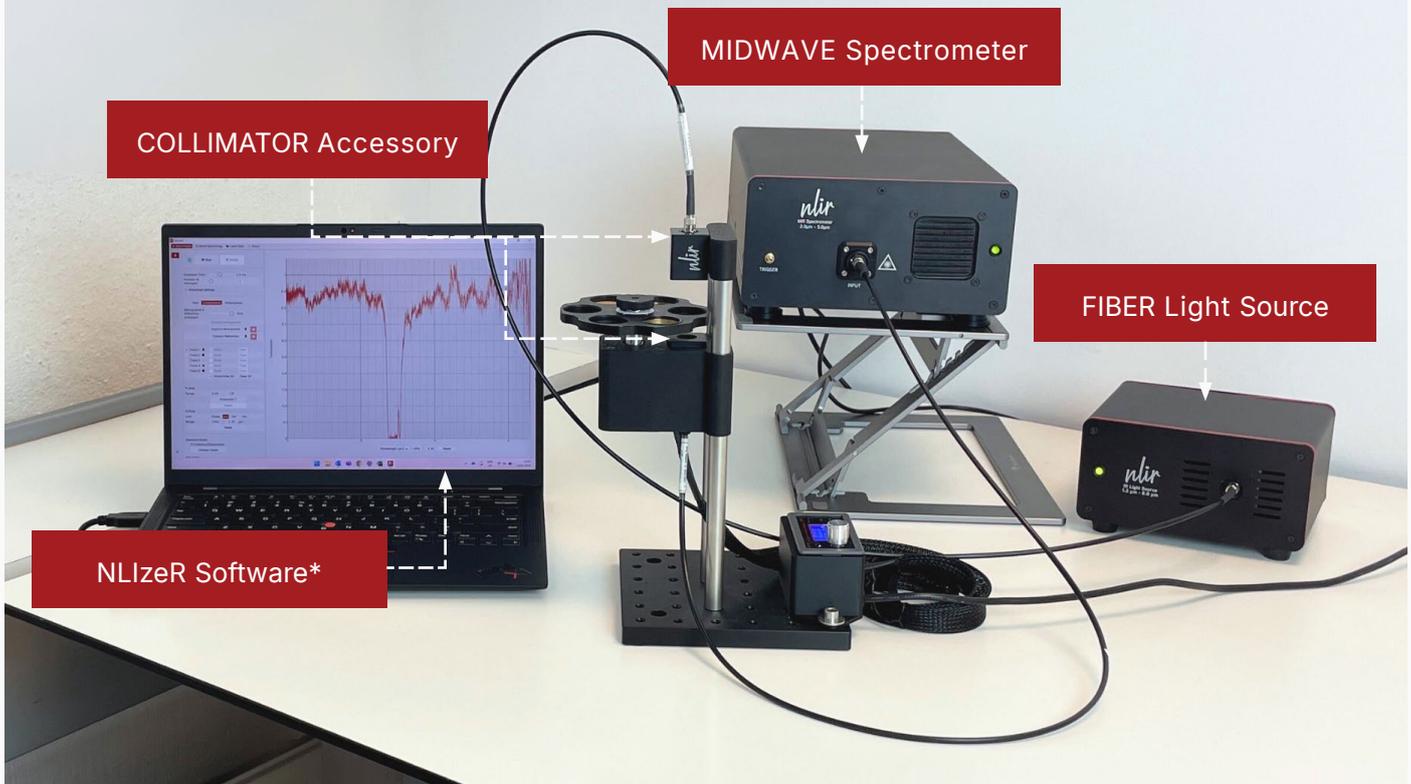


### Excellent Service

Professional advice and  
lifetime support

# Equipment Used to Perform the Measurements

## TRANSMISSION Measurement System



\*Comes free of charge with our MIDWAVE Spectrometer

## Would you like to explore your possibilities in plastic foil measurements?

If you are looking to optimize your plastic foil characterization at an industrial level, our mid-infrared spectroscopy solutions can uplift your production line to new speed. At NLIR, we offer cutting-edge mid-infrared sensing solutions tailored to the needs of plastic foil industry.

Contact us: [info@nlir.com](mailto:info@nlir.com) +45 7174 7870