

siRoLine – Online NIR Spectrometer for Automated Polymer Identification



Efficient recycling of waste polymers requires reliable tools for sorting plastics by type. The siRoLine benchtop spectrometer from IoSys performs automated polymer identification and streamlines screening of plastics for reuse.

The siRoLine is designed for fast, direct testing of virtually any type of plastic object, part or component including household and electronic waste polymers, as well as carpeting, textiles and many other materials. Measurements are mostly independent of sample surface texture, color, moisture content and contamination.

The siRoLine system uses diffuse near infrared (NIR) reflection and transmission spectroscopy to analyze the absorption characteristics of different polymers in a given spectral region. The sample under test is irradiated with a broadband infrared beam, and the light reflected from the sample is analyzed using an NIR detector array.



Polymer identification is achieved by means of trained pattern recognition. Optical data acquired in the test (absorption bands of overtone and combination vibrations) are processed in a neural network. Results of this processing are displayed as percent probabilities of the polymer type contained in the sample.



Tests are performed by passing the test samples under the

siRoLine's built-in light sources and detector. A conveyor belt can be used to facilitate this process. Test results are displayed on an integrated LCD screen. A relay interface board transmits output signals based on the test results to external sorting systems. The siRoLine

can be programmed to communicate specified polymer types to designated relay positions.

The system includes an NIR spectrometer, a computer which controls the analysis functions, and two NIR light sources, each adjustable to a clearance of 19.7 in. to 59 in. Test parameters are selected using the LCD touch screen. An external keyboard and VGA monitor can be connected if desired. 16-bit and 32-bit resolution models are available.

Dimensions: 28.3 x 4.7 x 5.9 in., weight: 9 lbs, power supply: 100-230 Volt~, 50/60 Hz

- **Sixteen-bit resolution model: analyzes PE, PP, PS, PET und PVC**
- **Thirty-two-bit resolution model: analyzes PA6x, PA12, ABS, PPO, PCA, PBT, PC, PMMA, POM**
- **Applications: recycling of household, electronic and other waste polymers; analysis of carpeting, textiles and other materials (optional)**
- **Measurements are non-contact and non-destructive**
- **Measurement time: a few milliseconds**
- **Measurements are mostly unaffected by sample surface texture, color, moisture or contamination**
- **Includes 7 signal outputs to external sorting devices**
- **Works best with samples free of soot-based darkening agents**

