sIRoPlus

Stationary online unit for greater measuring distances – nearly "no limits"

Technology by **IoSys** – Europe's Leading Specialist for Plastic Detection

GUT
Environmental Technologies

With the near infrared spectrometry (NIR) of the IoSys units it is possible to identify plastics of the household-, enginee-ring electronics and automotive application field. It allows direct analysis of non-dark-colored plastic parts (films, foils, granules, solid, foamed) and other materials like carpets and textiles.

The measuring principle is the diffuse near infra-red reflection spectroscopy where the characteristic absorption patterns of different polymer types in a typical spectral region are used. The polymer sample is radiated with infrared light and the reflected light of the measuring place is analyzed by a near infrared detector array. To measure transparent materials a white ceramic must be placed behind the sample as a reflection mirror.

For plastic identification the samples are quickly pas-sing by below the optical focus lens, for instance using a conveyor belt. The light foci (ca. 10 cm) of the mo-vable NIR light sources can be adjusted for a distance up to 1-1,5 m. By the integrated relay-interface board the identification result is also generated as output sig-nal for sorting systems. Polymer types and their corre-sponding relay positions can be set individually. After the measurement the result is shown on the built-in LCD-Touchscreen or an external VGA monitor.

The device includes the optical NIR-system and the computer, which controls and evaluates the identifi-cation process. Control and parameter settings like model selection can be set by the integrated LCD-touchscreen, by an external keyboard or by an external optional colour touchscreen. Additional connections like an USB-interface enables external data transfer.

An LED array visualizing the identification result is available as an option as well as an external touch-screen. The sIRoCube design enables to set up seve-ral units in parallel to measure the whole width of a conveyor belt.

The identification of different plastic types is the result of a trained pattern recognition with a specially deve-loped neural network inside a database with several counterchecking. The result of the calculation is a list of the most probable polymer types identified within a probability between 0 and 100%. This comparison is necessary, since – contrary to metals – plastics have no norms and no standardizations!

Furthermore up to 7 pre-set polymer types can be programmed with corresponding external signal gene-ration.

The software allows detailed spectra viewing, loading, saving and comparing. This possibility helps to deve-lop own measuring applications besides the standard ranges.
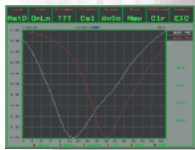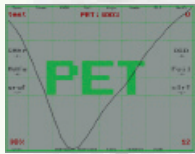
Depending on the spectral resolution of the NIR-spectrometer(16 or 32 Pixel) it is possible to identify relevant plastics as following independently of surface structure and contaminations:

PA6/PA66	PS	PC+ABS	ABS+PVC	PLA
PA12	PPO	PBT	PVC	Cellulose
PE	SAN	PET	PE+PA	
PP	PC+PET	PMMA	PE+PET	
ABS	PC	POM	PP+PET	

Technical Data:

- Dimensions:	360 x 270 x 700 mm
- Weight:	5 kg (with external power supply)
- Power Supply:	110 - 230 VAC, 50/60 Hz

Optional Accessories:

- External VGA-Screen for the display of results
- External touchscreen for display and operation
- External printer for result documentation
- LED-Array for the visual indication of the measuring results

Specifics of this unit:

- Identification of plastics from household-, packaging and engineering/electronics waste
- Contactless and non-destroying measurements
- Measuring time within few milliseconds
- Sample distance up to 150 cm
- Online setup for conveyer belt application
- Detailed spectra overview for easy comparison
- 7 individually programmable outputs for signal generation
- 8 additional materials/spectra can be added