

# siRoLine – stationary NIR-Spectrometer for Online Plastic Identification



High level material plastic recycling demands that plastic materials must be **sorted** according to **various types** IoSys - Dr. Timur Seidel e.K. has taken part in solving the problem. A **stationary online measuring Infra-Red optic** was developed by IoSys It will help to make further amounts of waste polymers available for re-use.

With the technique of the so-called near Infrared spectrometry (NIR) it is possible to identify plastics coming from the household-, engineering electronics and automotive application fields. It allows direct analysis of non-dark-colored plastic parts and other materials like **carpets and textiles**.

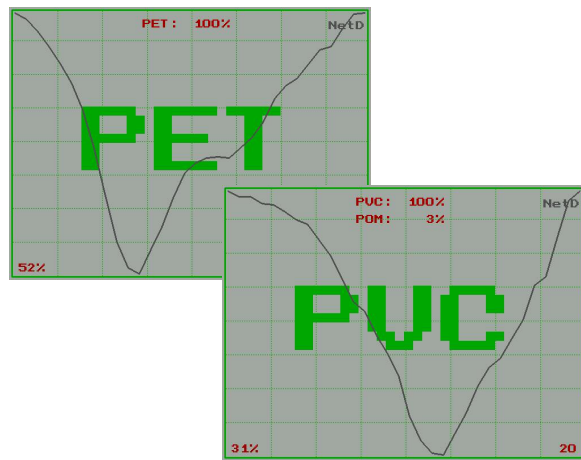
**The basic principle** of the method is the diffuse near infrared reflection spectroscopy whereby characteristic absorption behaviors of different polymer types are used in that spectral region. The polymer sample is radiated with a infrared light and the reflected light of the measuring place is analyzed using a near infrared detector array.

For **plastic identification** the samples are quickly passed by - e.g. using a conveyor belt - below the optical focus lens. The light focus of both movable NIR light sources can be adjusted for a distance from 50 up to 150 cm. The identification result is generated by an integrated **relay-interface board** as an output signals for sorting systems.

Polymer types and the corresponding relay positions can be set individually. Furthermore the result can be shown online on a VGA screen. The portable siRoLine device which can be carried on its handle includes the optical NIR-system and the computer, which controls and evaluates the identification process. Parameter settings like model selection can be set by the LCD-touch display. Additional connections like a serial interface allow external data transfer. As **optional feature** a LED array visualizing the identification result is available. (dimension in mm: 720 x 120 x 150, weight: 4 kg, power supply: 100-230 Volt~, 50/60 Hz).



**Identification of different plastic types** is the result of a trained pattern recognition. After the measurement of the plastic sample the optical information (absorption bands of overtone- and combination vibrations) are processed by a neural network. The result of the calculation is a list of the most probable polymer type identified within a probability of 0 and 100%.



For detailed spectra viewing, loading, saving, editing spectra etc. an external keyboard and a VGA-Display can be connected.

- **Recycling of household-, engineering electronics and automotive waste plastics**
- **Contactless and Non-destructing measurements**
- **Measuring time with few milliseconds**
- **Independent of surface structure, moisture and contamination**
- **7 signal online-outputs for sorting machines**

With the help of the Near Infra-Red optic it is possible **independently of surface structure, moisture and contaminations** to analyze relevant household plastics as following

**PE, PP, PS, PET und PVC**

There is the option to identify further polymer types as following using a NIR-spectrometer with higher spectral resolution:

**PA6x, PA12, ABS, PPO, PCA, PBT, PC, PMMA, POM**



**For further information:**

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