

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

A combination of a Near Infrared Spectrometer (mIRo) and a specially developed and patented Sliding Spark Spectrometer (SSS2) is now combining the benefits of both technologies in one transportable unit!



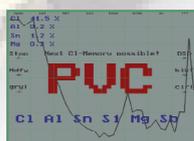
With this technology combination practically all common types of plastics, regardless of color, size, structure (films, foils, granules, solid, foamed, carpets and textiles) can be identified together with their additive elements like fire retardants and heavy metals. For sample preparation to remove dust and dirt or paintings the sample surface can be easily cleaned by scratching with a knife.



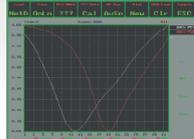
The principle of the NIR technology is the diffuse near infrared reflection spectroscopy where the characteristic absorption patterns of different polymer types in a typical spectral region are used. The polymer sample is radiated with infrared light and the reflected light of the measuring place is analyzed by a near infrared detector array. The basic principle of the Sliding Spark technology is the thermal vaporization of a small amount of the plastic surface using a train of energy-defined high-current sliding sparks. The material components in the spark plasma are vaporized, ionized and activated to emit radiation.



For plastic identification one of the measuring pistols is simply pressed on to the analysis sample. The measurement begins by pressing the start button on the pistol grip. After one second an integrated color TFT-screen displays the recognized polymer. The measuring pistols each are connected to the instrument with a 2 m cable and protective hose. The optical signals are transported via fiber cable to the spectrometer systems. Parameter settings as well as control can be effected by an integrated touchscreen. Additional connections like an USB-interface allow data transfer. An integrated Mini-Plotter prints out the result.



The identification of different plastic types for both spectrometers is the result of a trained pattern recognition with a specially developed 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!



Additive detection is performed by the characteristic atomic emission for an element of the additives in the optical spectra. The intensities of defined spectral lines are compared with preset threshold values. An element is detected if the pre-set threshold value is exceeded. After calibration with known samples, the system enables semi-quantitative analysis of inorganic contents in the sub-% concentration range of down to 0.1%.

The software allows detailed spectra viewing, loading, saving and comparing. This possibility helps to develop own measuring applications besides the standard ranges.



With the **mIRoSpark** it is possible to analyze independently of surface structure, contamination and colours the following relevant plastics, mixtures and additives:

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

Technical Data:

- Dimensions:	364 x 200 x 376 mm
- Weight:	14 kg
- Power Supply:	100, 110 or 230 VAC, 50/60 Hz

Optional Accessories:

- Transmission measurement of transparent hollow bodies like bottles etc. with external light source

Specifics of the unit:

- Identification of plastics from household- and electronics waste as well as carpets and textiles
- On site analysis e.g. in disassembling areas
- Non-destroying measurement with mIRo-part
- Identification of black plastics with SSS2-part
- Less than 1 sec. measuring time
- Measurement of foils and granulates possible
- Detection of significant halogen-containing fire retardants and heavy metal containing additives
- Detailed spectra overview for easy evaluation
- 8 additional materials/spectra can be added
- Printout of the identification result on the built-in mini-plotter

According to different demands in recycling matters, customers can arrange to have the system calibrated using their own samples.