

# SlideSpec-S2 - Sliding Spark Spectrometer for Identifying Plastics

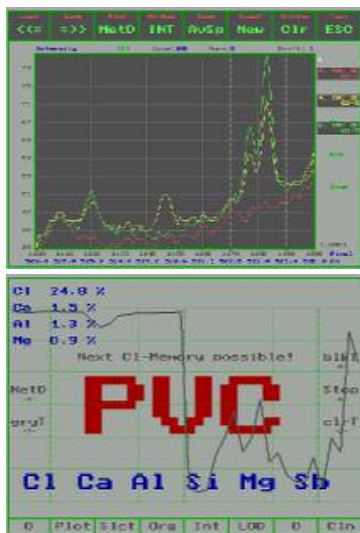
High level material plastic recycling demands that plastic materials must be **sorted** according to **various types** and **free of harmful substances**. IoSys - Dr. Timur Seidel e.K. has taken part in solving the problem. A Sliding spark spectrometer was developed for identifying plastics. It will help to make further amounts of waste polymers available for re-use.



With the newly developed technique "sliding spark spectrometry", an interesting tool for fast plastic identification now exists. It allows **direct analysis of handy, compact, non-conductive plastic parts** from the application field of engineering electronics and automotive waste plastics and other materials. For sample preparation to remove dust and dirt or paintings the sample surface can be easily cleaned by scratching with a knife.



The **basic principle** of the method is the thermal vaporization of a small amount of the plastic surface using a train of defined high-current sliding sparks. The material components in the spark plasma are vaporized, atomized and activated to emit radiation.



**Additive detection** is performed by the characteristic emission for an element of the additive 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.

**Identification of different plastic types** is the result of a trained pattern recognition. After the measurement of the plastic sample, relevant optical and electrical information is processed by a neural network. The result of the calculation is a list of the most probable polymer type identified.

For **plastic identification** the sparking head 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 screen displays the recognized

polymer and possible additives. The hand measuring head is equipped with a metal detector and a 2m cable connected to the instrument. The portable device includes the optical system, the spark generator and a computer, which steers and evaluates the identification process.

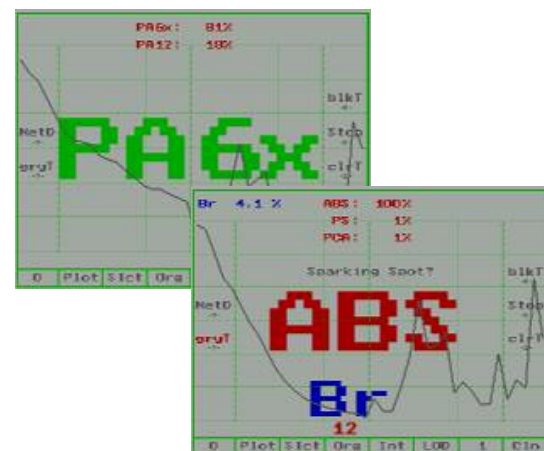


Parameter input, zoomed spectra view, can be set by using an integrated touch panel. Additional connections like an external keyboard and a serial interface allows data transfer. As an optional feature a **Mini-Plotter** printing out the result is available (dimension in mm: 364 x 195 x 316, weight: 10 kg, electric power supply: 100-230 Volt~, 50 Hz).

- ◆ **Fields of application: recycling of engineering electronics and automotive waste plastics**
- ◆ **1 sec. measuring time**
- ◆ **Identification of different polymer types**
- ◆ **Detection fire retardants and heavy metal-containing additives**
- ◆ **On site analysis, e.g. in a dismantling area**
- ◆ **Possibility of developing own application methods for rapid grade identification**

The sliding spark technology allows the following samples to be analyzed **within 1 second** and **independently of color**:

- ◆ Identification of relevant **polymer types** PA6x, PA12, PP, PE, ABS, PS, PPO, PC, PBT, PET, PMMA, POM,PVC, PPS, Teflon, Silicon rubber
- ◆ Identification of **flame-retardants** (e.g. Br-, Cl-, P-, Mg- or Al-containing material)
- ◆ Detection of **heavy metal containing additives** (e.g. Cd or Pb in pigments or stabilizers)
- ◆ Detection of **fillers** (chalk, talcum)
- ◆ Identification of **surface layers** (e.g. Si- or F-contents)



Setting of different sparking conditions as well as the detailed spectra view and evaluation of the out coming atomic emission spectra enables to **develop easily own applications**. Customers can arrange to have the **system calibrated using their own samples**.

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