

SSS3-FR - Sliding Spark Spectrometer for Fire Retardants detection

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 halogen-containing plastics and PVC. 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 household, 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.



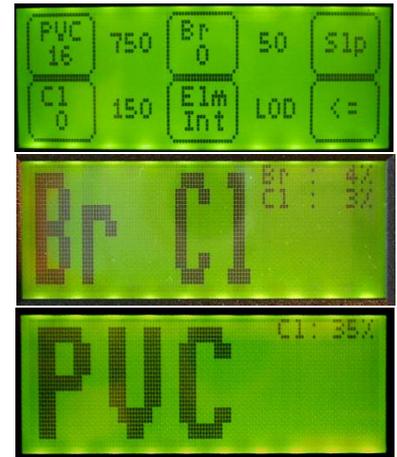
For **plastic identification** the sparking head is simply pressed on to the analysis sample. The measurement begins by pressing the start button on the pistol grip. After one second an integrated LCD displays the result. Furthermore the result can be shown on an external VGA screen

The hand measuring head is equipped with a metal detector and a ca. 80cm cable connected to the instrument. The portable device includes the optical system, the spark generator and a computer, which controls and evaluates the identification process. Parameter input, spectra view, can be set by using an integrated LCD-touchscreen.



Additional connections like an external keyboard and a serial interface allows data transfer. (dimension in mm: 260 x 150 x 160, weight: 4 kg, power supply: 100V, 110V or 230 VAC, 50/60 Hz).

Halogen detection is performed by the characteristic emission of Chlorine and Bromine in the optical spectra. The intensities of these spectral lines are compared with preset threshold values. These element are detected if the pre-set threshold value for PVC, Chlorine and Bromine are exceeded. After calibration with known halogen containing samples, the system enables semi-quantitative in the sub-% concentration range.



Identification of PVC is the result if high intensity of Chlorine is measured.

The portable sliding spark spectrometer allows the following samples to be analyzed **within 1 second** and **independently of colour**:

- ◆ Identification of PVC
- ◆ Detection of halogenated **flame-retardants**
- ◆ Identification of Cl-containing **surface layers**
- ◆ Detection of Cl-containing **multilayers**

- ✓ **For RPF (Refuse Paper and Plastic Fuel)**
- ✓ **Identification of plastics from household- and electronics waste**
- ✓ **On site analysis, e.g. in a dismantling area**
- ✓ **1 sec. measuring time**
- ✓ **Identification of PVC**
- ✓ **Detection of Bromine- and Chlorine containing fire retardants and surface layers**

Customers can arrange to have the **system calibrated using their own samples** or to **detect other significant elements** (e.g. Lead or Fluorine).

