

# miRoSpark2.0

Combined Device for Polymer type identification – also for black parts, fire retardants and additives

(miRo-part) and a patented sliding spark atomic emission spectrometer (Spark-part) is now combining the benefits of both analysis methods technologies in one portable unit!



characteristic absorption behaviors of different polymer types are used in that spectral region. The polymer sample is radiated with an NIR-light and the reflected light of the measuring place is analyzed using a near infrared detector array.



surface using a train or defined high-current sliding sparks between the electrode gap within ~1sec. The polymer- and additive-components in the spark plasma are vaporized, atomized, ionized and activated to emit spectral characteristic VIS/UV-light radiations.

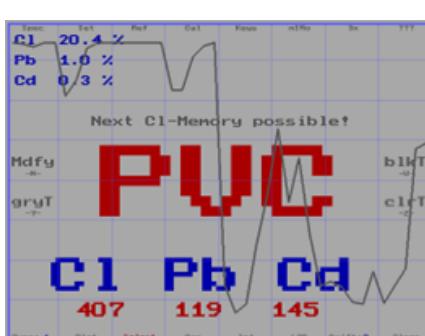


all common types of plastics, regardless of color, size, structure like films, foils, granules, solid, carpets and textiles can be identified with additive elements like fire retardants and heavy metals.



to the sample surface. The analysis begins by pressing the start trigger of 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.

An integrated Mini-Plotter prints out the result.  
An USB-interface allows the data transfer/export.



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

Blends of: PC+ABS \* PC+PET \* PVC+ABS

Foil/Films-Multilayers: PE+PET \* PE+PA \* PP+PET

Textiles/carpets: PA \* PP \* Polyester \* Cotton \* Polycotton \* Acrylic \* Silk \* Wool \* Acetate

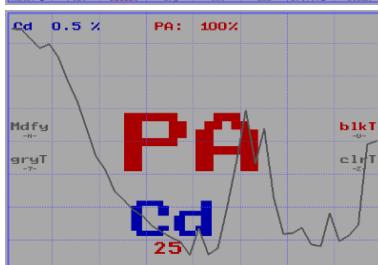
Following significant elements can be detected:

Bromine, Chlorine, Fluorine, Phosphorus, Lead, Cadmium, etc.

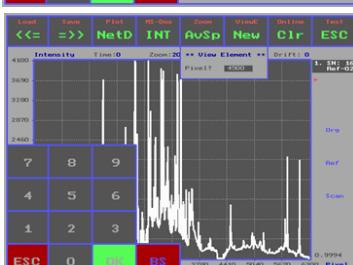




Element	Int	LOD	???
Br	0	5	
Cl	407	300	
Cl'	410	100	
Br'	604	4000	
Br'	0	4000	
S	0	10	
Pb	119	50	
Ca	1937	2500	
Al	134	10	
Al'	134	4000	
F	7	50	
Ti	0	100	
Zn	140	20	
Sn	3	20	
Si	31	100	
Mg	152	500	
Sb	3	5	
P	0	30	
Cd	33	4000	
Cd'	145	15	



Set Cl-LOD for PUC new!									
10	Cl	:	59	1					
Br	Cl	Ba	Cl	Br	S	Pb	Ca		
Al	Pb	F	Ti	Zn	Sn	Si	Mg		
7	8	9	Sb	P	Cd	Cd			
4	5	6						ALL	
1	2	3							
ESD	0	0	BS					Back with ESD	



According to different demands in recycling matters, customers can arrange to have the system calibrated using their own samples. The software allows detailed spectra viewing, loading, saving and comparing. This possibility helps to develop own measuring applications besides the standard ranges.

For the analysis sample preparation using the Spark-part, it is advisable to remove dust and dirt or paintings. The sample surface can be easily cleaned by scratching with a knife.



For easy transportation of the device there is a bar-handle. Both pistols are inserted in side holders and the gray conduit cables are fixed in their clips at the left and at the right side.

The identification of different plastic types for both spectrometers is the result of a trained pattern recognition with a specially developed neural network models inside a database with several counter-checking. The result of the calculation (ai) is a list of the most probable polymer types identified within a probability between 0 and 100%.

Also a trained comparison is used due to gained experiences because plastics have no norms and standardizations compared to metals!

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 preset 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% !

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

#### Technical Data:

- \* Power Supply: 100, 115, 230 VAC, 50/60 Hz
- \* Dimension: 364 x 200 x376 mm
- \* Weight: 14 kg

