

MicroPlastic Sediment Separator MPSS

Density Separation of Microplastic Particles from Sediment Samples

ABOUT

Although plastic debris is constantly accumulating in aquatic environments, its impact is not yet fully understood. The establishment of a reliable, verified and standardised method to quantify the amount of

plastic particles in the environment plays a key role to assess the consequences of plastic debris in aquatic ecosystems.

We significantly improved the classic density separation approach by launching the MicroPlastic Sediment Separator MPSS. It enables a reliable separation of different ecologically relevant size classes of plastic particles from sediment samples. A $ZnCl_2$ -solution (1.6-1.7 kg/L) as separation fluid allows for an extraction of plastic particles ranging from large fragments to small microplastic particles (S-MPP, < 1 mm). Subsequent identification and quantification of the particles with a spatial resolution down to 1 μm can be performed using Raman Microspectroscopy.



FEATURES:

- ▶ Standardised method
- ▶ 100% recovery rate for large microplastic particles (L-MPP, 1-5mm)
- ▶ 95.5% recovery rate for small microplastic particles (S-MPP, <1mm)
- ▶ Automatic deadlock release
- ▶ Edgeless hydrodynamic flange geometry
- ▶ Duplex gasket for stirrer axle
- ▶ Volume of sample to be processed:
up to 6 litres

The MicroPlastic Sediment Separator MPSS is divided into three major components which are entirely made of stainless steel, the edgeless hydrodynamic flange geometry enables an undisturbed ascent of the plastic particles:

The stainless steel sediment container is equipped with a rotor, maintaining a constant stirring of the sample to guarantee a perfect excavation of the particles of interest. The combination of servomotor and speed controller allows for individually adjusted rotational speeds of the stirrer from 0 up to 20 rpm.

The conical standpipe smoothly reduces the diameter of the instrument to achieve a high particle concentration in the extracted sample volume.

The sample chamber is equipped with two glass tubes for easy supervision of the separation process. It can be closed by a ball valve and disconnected from the standpipe. The resulting small sample volume of 95 ml allows for an effective vacuum filtration via the integrated 47 mm filter holder.

An additional aluminium base frame with brake rollers cares for mobility and stable standing.

First studies of the MPSS substantiate recovery rates of 100% for large microplastic particles (L-MPP, 1-5 mm) and 95.5% for S-MPP - significantly higher than the values obtained by application of froth floatation (55% for L-MPP) or classic density separation (39.8% for S-MPP).

For more details please refer to: Hannes K. Imhof et al. "A novel, highly efficient method for the separation and quantification of plastic particles in sediments of aquatic environments" (Limnol. Oceanogr.: Methods 10, 2012, 524-537)

TECHNICAL DATA	
Max. sediment volume	6 litres
Volume of concentrate sample	95 ml
Complete volume of container	31 litres
Dimensions	36 x 46 x 140 cm (w x l x h) including base frame
Empty weight	22 kg
Material container	Stainless steel AISI 316 Ti / L, glass, PTFE, EPDM
Material base frame	Aluminium
Rotational speed range	0 ... 20 rpm
Power supply	Mains supply 85-260 V AC, 500 W

ORDERING INFORMATION	
Products	
471 000	MicroPlastic Sediment Separator MPSS for sediment samples of up to 6 litres volume Complete system with base frame Speed controller and power supply (85-260V AC, 500W)

