

Surface water monitoring



Improve your surface water sampling- and analysis testing data. Eurofins delivers worldwide the next generation of passive samplers - Sorbisense - right at your doorstep. We offer the full solution from dedicated field sampling systems and know-how to a wide suite of accredited laboratory tests.



Figure 1. Pictures of SorbiCell VOC. Left picture, from left to right: unexposed, as purchased in transportation tube and pre-wetted in de-mineralized water; exposed, fitted with protection caps to prevent drying; exposed Sorbicells with about 50% salt depletion. Picture right shows field mounting units WW-50 (TOP) and GWS-40 (BOTTOM)

Background

The regulation on surface water quality is one of the important corner-stones for protection of aquatic eco-systems as well as production of drinking water. Overlooking periodic run-off events can bring about serious consequences. Also, finding the source of pollutions in surface waters can be a difficult task due to the dynamic nature of natural runoff sources contributing to the various tributaries.

Traditional surface water sampling methods are either based on “spot sampling” or done with the help of expensive water sampling stations. Therefore, monitoring with SorbiCell™ can greatly improve the efficiency of surface water sampling. With documented capital savings up to 80% on field infrastructure investments, there is no need to compromise on data quality, while at the same time major total project cost reductions can be achieved.

Typical problems related to traditional methods are:

- Traditional water samples represent a “snapshot” value, while solute concentrations in rivers and streams may vary strongly over time
- Permanent sampling stations are capital intensive, need electricity and frequent servicing
- Over time, water sample quality may be compromised e.g. due to volatilization of compounds

- Liquid sampling handling with pumps and tubing is tedious, may require filtration steps, and is prone to loss by volatilization or sorption to tubing.
- Fast transport to the laboratory is critical due to poor conservation of bulky water samples

Benefits of Sorbisense method

Sorbisense solves these problems while maintaining high data quality and sample-integrity:

- The sampling process occurs over a longer time period (typically 1-4 weeks), averaging out short time fluctuations
- Easy field procedure, typically under 15 minutes per station
- No electricity, sample tubing, or other infrastructure required
- The method is well-suited for both small streams and channels, as well as rivers and lakes
- No need for liquid sampling handling
- Sorbicell requires very little space and is well conserved for storage and transport

Field sampling procedure

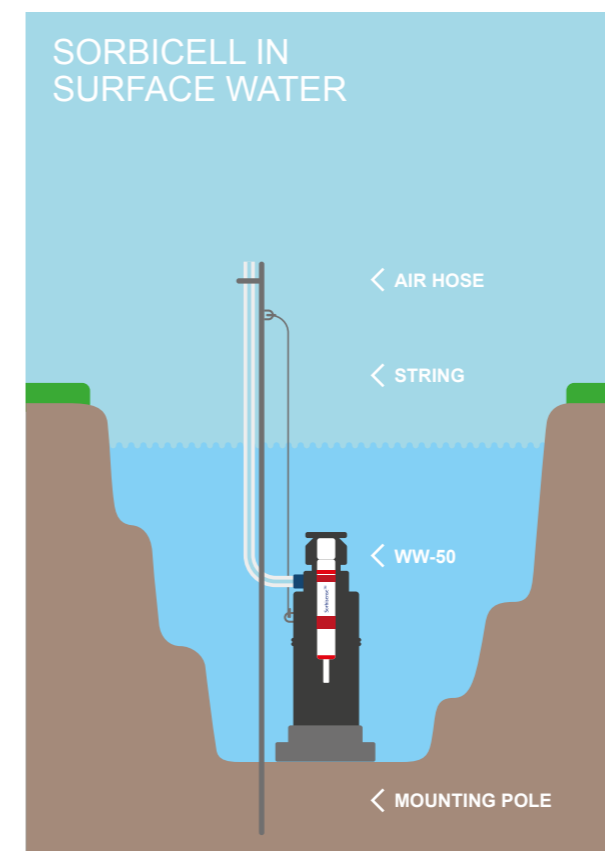
Two basic components together enable monitoring in surface water. SorbiCell™ is a small, 3 ml passive sampling unit for on-site sampling and pre-concentration of organic or inorganic substances. The Sorbicell is clicked onto a surface water sampler (WW-50 Sorbisystem)

unit, and then installed in the river or stream. The unit is either placed on the bottom of the stream, or fixed with a wire to a fixed point or floating object (e.g. a buoy). Once submerged under the water table, a small subsample of the passing surface water slowly flows through the Sorbicell at a controlled flow rate until the WW-50 unit is filled (see pictogram BELOW and pictures of non-exposed and exposed Sorbicells LEFT). The required sample volume is 0.1-0.5 L, and once the WW-50 unit is emptied it is ready for re-use. The Sorbicell is removed, placed back in transportation tube and sent to the laboratory in a regular plastic bubble envelope. For deep surface water sampling (>10 m sampling depth) we recommend the pressure rated GWS-40 unit (see picture LEFT).

Laboratory analysis

The SorbiCell cartridge is analysed with standard accredited laboratory methods for quantification of solutes. The accumulated mass of solutes, is thus quantified and likewise, the depletion of salt is measured and related to sample volume. The analysis results are reported as the time-weighted average concentration during the installation period for each contaminant (e.g., 10 µg/L of vinyl chloride).

Figure 2. Schematic of installation in surface water



SorbiCell PFAS;
Per- and polyfluoralkyl substances

Sorbicell NiP
• Nutrients (NO₃-N, PO₄, SO₄)

SorbiCell VOC
• Aromatics (BTEXM)
• Chlorinated solvents and metabolites
• Fuels, Oil
• PAHs
• PCBs
• Phenols
• Pesticides (200)
• Pharmaceuticals (100)

SorbiCell CAN
• Metals (e.g. Cd, Cr, Pb, Hg, Ni)
• NH₄-Nitrogen

Choose the right Sorbicell for your application

Four generic types of SorbiCells are available with different sorbents that are suitable for chemical groups of solutes (see ABOVE). The range of analytes is continuously expanding, please contact us for a quotation for your application.

Get started

First check the local conditions at the monitoring site. The water depth should preferably be >0.5 m and you will need a fixing point for the sampling unit. Then choose the correct Sorbicell sorbent type that corresponds to the solutes to be monitored. Finally choose the correct hydraulic resistance and

mounting unit depending on the sampling depth (we recommend GWS-40/70 for sampling depth >10 m). Now you can choose your correct ordering number (see table below). Please note that SorbiCells are shipped in aluminium sealed bags with 6 pcs. ready for use.

Solute type	SorbiCell Type	Depth under water table	Sorbicell order no.	Sorbisystem
Per- and polyfluoralkyl substances:	SorbiCell PFAS	0,5-10 m >10 m	092-101 (6 pcs) 092-102 (6 pcs)	WW-50 GWS-40/70
Nutrients, SO4:	SorbiCell NiP	0,5-10 m >10 m	012-101 (6 pcs) 012-102 (6 pcs)	WW-50 GWS-40/70
Organics:	SorbiCell VOC	0,5-10 m >10 m	042-101 (6 pcs) 042-102 (6 pcs)	WW-50 GWS-40/70
Metals, NH4-N:	SorbiCell CAN	0,5-10 m >10 m	072-101 (6 pcs) 072-102 (6 pcs)	WW-50 GWS-40/70

Table 1. Products suitable for surface water with minimum depth of 0,5m.

Laboratory analyses

Finally, list your list of solutes and send your project information with the above information as a quotation request to sorbisense@eurofins.dk.

Along with the products we send standard field operating procedures. Further, we offer free on-line services for advice on installations and the optimal choice of analysis packages.



Eurofins A/S
Smedskovvej 38
8464 Galten
Denmark
www.eurofins.dk

About us

Eurofins Scientific is a global market leader in food, environment and pharmaceutical products testing as well as in the fields of agro-science, genomics, and pharmacology. With over 30,000 staff in 400 laboratories across 42 countries, Eurofins offers a portfolio of over 150,000 analytical methods. Sorbisense was founded as a Danish spin-off company from Aarhus University in 2004 by Dr. Hubert de Jonge and Prof. Dr. Gadi Rothenberg. Sorbisense was acquired by Eurofins in 2017, and has its headquarters in Denmark. We offer online and worldwide support for planning your projects and interpretation of the results, as well as advice on a growing number of laboratory tests for SorbiCell.