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# Benthos Torch

The unique instrument for quick and easy phytobenthos measurements

- ✓ Fast & simple measurement of microalgae on substrates
- ✓ Direct measurement without preparation





# BenthosTorch

Rapid and simple determination of green algae, cyanobacteria and diatoms on different substrates.

The bbe BenthosTorch is a robust, water proof field instrument for rapid quantification of green algae, cyanobacteria and diatoms on different substrates such as sediments and stone surfaces. A measurement is performed in less than 15 seconds. Just turn it on, place on the substrate and read off the results.



LCD display of the BenthosTorch

## Specifications

DESCRIPTION	VALUE
Measurands	concentration of green algae [ $\mu\text{g chl-a/cm}^2$ ], concentration of cyanobacteria [ $\mu\text{g chl-a/cm}^2$ ], concentration of diatoms [ $\mu\text{g chl-a/cm}^2$ ], GPS co-ordinates
Measuring range	0 – 15 $\mu\text{g chl-a/cm}^2$
Resolution	0.1 $\mu\text{g chl-a/cm}^2$
Weight	1.3 kg
Size (H x Ø)	500 x 60 mm
Power supply	110/230 V – 50/60 Hz – 12V DC
Power input	10 W
Protection class	IP 68
Depth range	10 m
Temperature	Sample: 0 to 35 °C Environment: 0 to 40 °C Storage: 0 to 50 °C
Data capacity	2,000 data sets
Interface	USB data port
Accessories	hard plastic carrying case, mains unit, manual, software, hand loop
Options	telescopic rod, nylon shoulder bag, SDI-12 converter

## QUANTIFICATION OF AUFWUCHS

- ▶ Green algae
- ▶ Cyanobacteria
- ▶ Diatoms

## FEATURES

- ▶ Rapid determination of benthic algae
- ▶ No sample preparation
- ▶ Automatic substrate correction
- ▶ Integrated instrument display
- ▶ GPS sensor
- ▶ Cable-free operation
- ▶ Datalogger function
- ▶ Internal rechargeable batteries
- ▶ USB connection to PC/laptop
- ▶ Wireless measurement





# Benthos Torch

## Why should we measure benthic algae?

Various algal species and cyanobacteria have adapted their nutrient uptake systems enabling them to survive in shallow water close to the shoreline. Here the sunlight still penetrates down to the sea or river bed. This habitat is home to benthic algae, ranging from the microscopic to the gigantic kelp. Especially microphytobenthos attached to the subsurface, play an essential role in primary production.

For the assessment and improvement of surface water the European Water Framework Directive stipulates to determine phytoplankton including benthic algae. As a result, it has become obligatory to study the development and abundance of benthic communities. The collected data are essential for the evaluation of water quality in aquatic ecosystems.

Traditional methods include sampling of benthic algae by scraping surface materials or rapid deep-freezing and subsequent chlorophyll extraction. While incomplete in removal and extraction these methods moreover cannot determine different algal classes. Alternatively, the use of laborious and time-consuming microscopy is limited to accessible objects rarely found in the field.

## Innovative operative concept – fast measurement

Benthic algae measurements have become much easier with the development of the Benthos Torch: different light sources excite the internal pigments of intact algal cells. The amount of re-emitted red light fluorescence gives a quantitative estimate of the algal density. Now *in situ* measurement of different algae classes becomes feasible. No sample preparation is needed. This fluorescence technique enables quick and easy analysis of benthic algae in real time. The Benthos Torch is precalibrated for the most prominent algal classes to be found in the field.

This fluorometric technique has been well-proven for pelagic phytoplankton, by extensive application of the bbe FluoroProbe, and has now been successfully adapted to measure benthic algae concentrations. Background measurement of the substrate matrix enables to compensate and minimize the effect of backward scattering on chlorophyll measurement.



## APPLICATIONS

- ▶ EU Water Framework Directive water quality parameters
- ▶ Restoration and rehabilitation projects
- ▶ Environmental monitoring
- ▶ Limnological work
- ▶ Research and education



*Benthos Torch: For measurement of benthic algae on different substrates*





# BenthosTorch

## Operation

The BenthosTorch is simply switched on either by shaking or by use of a magnetic rod. Four contact keys are well arranged for operating the BenthosTorch. An intelligibly presented menu enables one-step measurement. The illuminated display gives clear readings of results even in bright sunlight. After starting a measurement, all steps are processed automatically: the countdown, the LED tuning and display of the results. A vibration signal informs the user about completion of the measurement.



*BenthosTorch used in the AQUAREHAB project in Denmark and Belgium*



## INSTRUMENT SOFTWARE FUNCTIONS

- ▶ Start and stop of measurement
- ▶ Access to all stored data
- ▶ (Re-)calibration of instrument
- ▶ Settings: measurement duration, measurement interval, GPS on/off



## PC SOFTWARE FUNCTIONS

- ▶ Display of time data as graphic
- ▶ Data retrieval and management
- ▶ Data export to ASCII files
- ▶ GPS data export to e.g. Google Earth

Do you have any questions? Please contact us!

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