



a.p. van den berg  
*The CPT factory*

# Seabed Sampler XL

for large high-quality seabed samples at water depths up to 4,000 m



## features

- accurate and reliable determination of seabed soil properties
- designed for soft clay layers in the seabed
- recovery ratio >95%
- sample length up to 20 m into the seabed
- sample diameter 110 mm
- water depth up to 4,000 m

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# Seabed Sampler XL, for large high-quality seabed samples at water depths up to 4,000 m



## importance of accuracy and reliability

Soft clay layers in the seabed have long been hard to investigate. Layers are easily disturbed while pushing and it is difficult to preserve samples on the way up to the surface. The increasing activities on the seabed however lead to an ever growing need for an accurate and reliable determination

of the soil properties especially in those clay layers. After all: the more accurate the determination of the soil properties, the lower the risk and cost of structures to be laid down or erected, such as pipelines, oil platforms and suction anchors. The Seabed Sampler XL fulfills this requirement.

## development

The Seabed Sampler XL for taking high-quality samples with a diameter of 110 mm and a length up to 20 m into the seabed, was developed by A.P. van den Berg in cooperation with the Norwegian research institute NGI in the years 2003 to 2006. The scope of the design was to improve the sampling of soft clays in the weak top layer of the seabed in deeper water. However, tests performed in 2008 for a research paper on the Seabed Sampler XL show that the design is also suitable for the shallower water depths. The Seabed Sampler XL is a very accurate and reliable tool for taking samples, with a recovery ratio of at least 95% and deployable at water depths up to 4,000 m.

The high quality of the sample is based on a number of features incorporated in the sampler design:

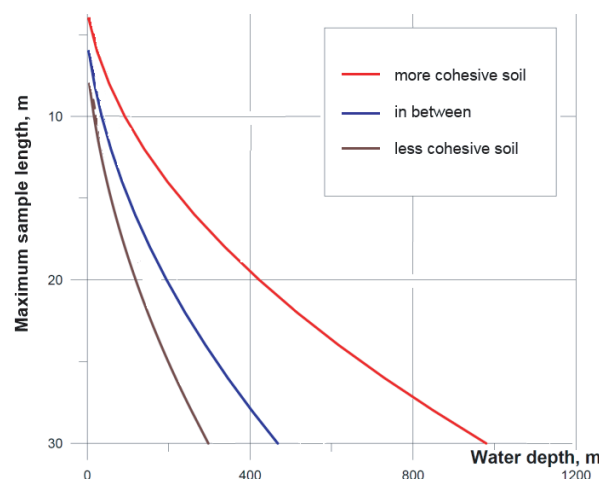
- two types of cutting shoe that perfectly match the type of soil; one with a thinner casing especially designed for soft clays and one with a thicker casing suitable for stiffer soils
- a core retainer that is open during sampling
- a piston that minimizes the forces exerted on the sample
- a positioning system that keeps the piston in place
- a connecting mechanism for the sample tubes, allowing to separate the sample on the spot without damaging it

## results that count

Results of laboratory testing on samples taken with the Seabed Sampler XL make clear that the quality of the sample can be classified as very good to excellent. Especially the quality of the sample in the weak top layer is considerably better than that of samples taken with any other type of sampler.

## maximum sample length

The figure below, which is part of a research paper on the Seabed Sampler XL composed by NGI, Gardline Lankelma and A.P. van den Berg, shows the maximum sample length, before plugging occurs, for different soil types and water depths. It can be seen that samples longer than 10 m are already feasible at water depths below 200 m.



## testing procedure

The Seabed Sampler XL can be pushed into the soil by means of any ROSON seabed CPT unit, a system that has been proven throughout its unrivalled track record of more than 30 years. A pre-assembled string of sample tubes is placed into the ROSON. Then the total assembly is lowered to the seabed and the sampler is pushed into the soil by means of the ROSON wheel drive system. Accurate depth measurement is ensured by the ROSON's depth encoder. ROSON systems can also be used for standard CPT and vane testing at water depths ranging from 0 to 4,000 m and for seismic, magneto and conductivity tests at water depths up to 1,000 m.

### Specifications sample

|                  |            |
|------------------|------------|
| Length           | up to 20 m |
| Diameter         | 110 mm     |
| Max. water depth | 4,000 m    |

### Specifications Seabed Sampler XL

|                    |        |
|--------------------|--------|
| Length outer tube  | 1 m    |
| OD outer tube      | 142 mm |
| Length sample tube | 1 m    |
| OD sample tube     | 114 mm |

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