04.29 FREE-FALL CORER

Introduction

The free-fall corer is designed for undisturbed sampling from the top soil layer (1.0 m) of submerged sediments either or not consolidated. The apparatus is lowered in free fall causing it to penetrate by its own weight and velocity into the submerged soil. The sampling depth depends on the cable length.

Description

The free-fall corer consists of a frame (1) with strengthening ribs (2), falling weight (8) and sampler (see fig. 1). The apparatus is fastened by means of a lifting eye (3) to an hoistening unit with free-fall facility. The tube holder (7) contains the sampler (4) with

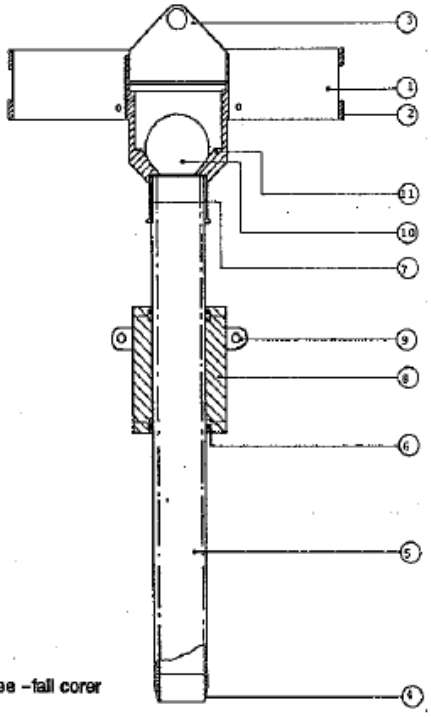

Fig. 1 Free -fall corer

transparent sampling tube (5). The falling weight (8) hangs on the frame with chains through ears (9); a rubber bush (6) secures correct leading. A rubber ball valve (10) in the valve house (11) keeps the sample in the tube through vacuum.

Use of the free-fall corer

Sampling:
Sampling of submerged soils is usually done in pre-elected places. As a rule the layer's thickness is also known in advance. Mark the transparent tube before sampling; the mark corresponding with the known thickness off the layer. Pre-requisites for a correct investigation of submerged layers are:
- a precise description of the origin of samples;
- a localisation of layers and a registration of waterdepth.

The penetration depth of the sampler depends on the soil composition; in soils rich in mud, penetration will reach to about 80 cm, in more sandy soils this will be about 30 cm.

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With a crane (with free-fall facility) on board of a ship the free-fall corer is lowered and after sampling hoisted on deck (see fig. 2). If necessary keep a hand under the tube to avoid loss of sample.
It is advised to siphon water from the sample; allow the toplayer to deposit when sampling loose sediments. The transparent tube allows for direct global description of layers of the submerged soil and to measure the penetration depth.
The sample is removed from the tube by lifting the ball valve a little. The sample is caught in a polyethylene reservoir or a stainless steel bucket. Now the sample can be further described as regards composition, colour, smell and particulars if any.
Before the sample is stored in the reservoir, the soil is homogenized by intensive stirring, by hand or with a soil mixer (cat.no.: 98.20 Soil stirrer and cat.no 98.21 Soil mixer). It is recommended to store the sample in a cooling box at a temperature of 4 to 10 C.

The ship:
It is advised for a large number of sampling (>10) to equip the ship with a crane and free fall winch; hoisting by manpower being time consuming.
For precise location and depth a location system and depth meter are required.

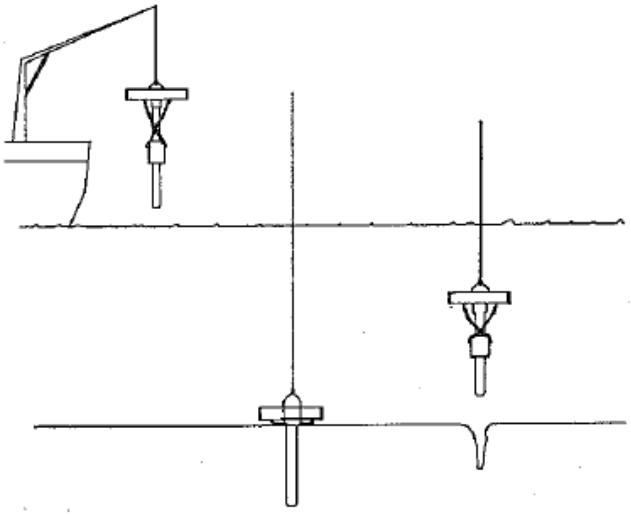


Fig.2 Use of the free-fall corer

Application

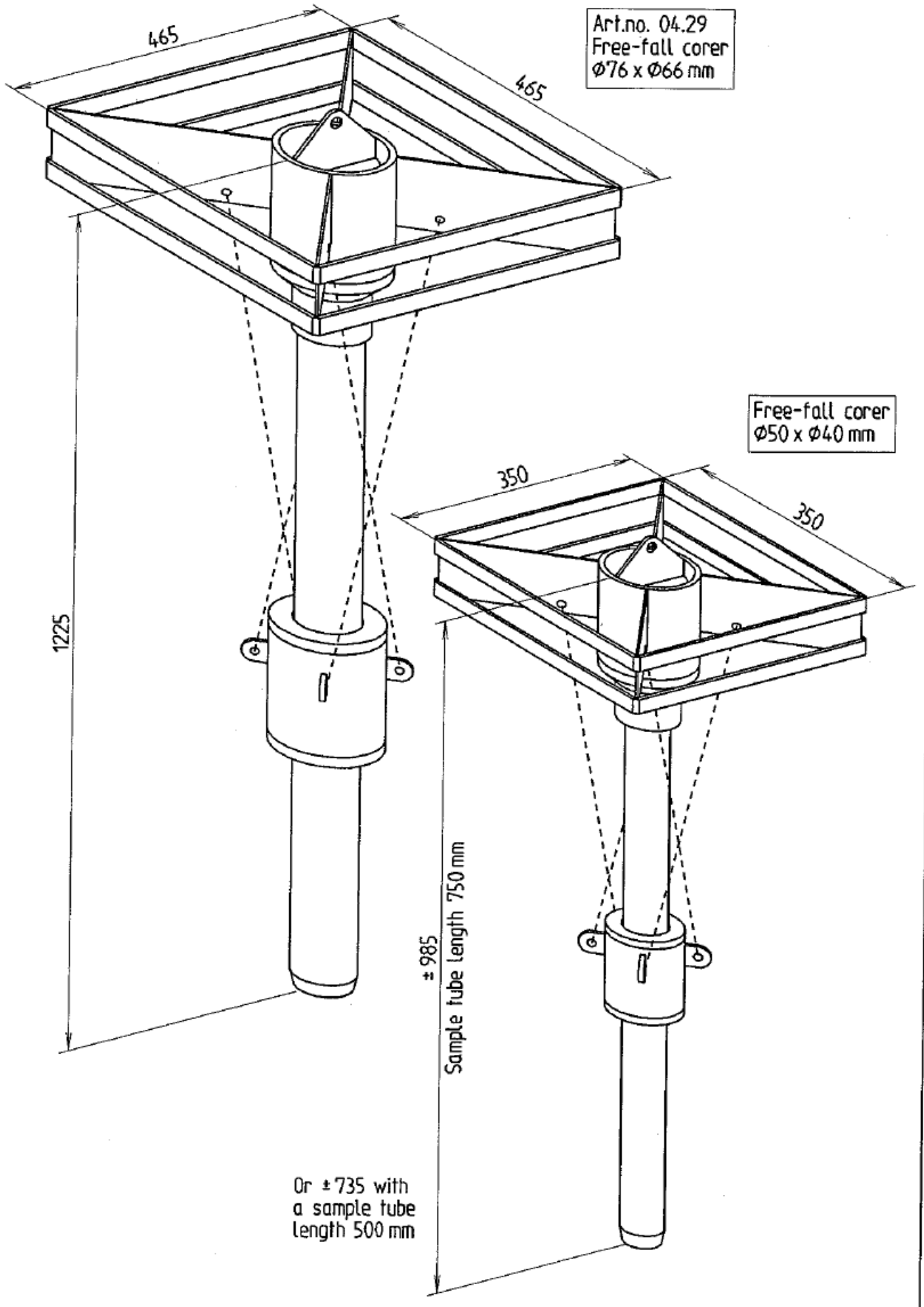
The free-fall corer is applied particularly when sampling with rod serviced apparatuses poses problems because of too great waterdepth, current velocity and wind. The free-fall corer is extremely suitable for submerged soils consisting of sand and mud, silt mixture including organic material. Extremely muddy soil requires careful sampling because of whirling silt. In coarse sandy and stony soils penetration is inadequate.
According to measuring data in the northern Delta area (the Netherlands) it appears that:
- 90 % of harbours and rivers in the lower river area are suitable for sampling with the free-fall corer;
- in the upper river area sampling of the streambed yields poorer results, whereas in harbours and river branches good results are achieved.

Sampling is done on behalf of:
- environmental research;
- soil research;
- geo-hydrological research.

Note: During sampling with the free-fall corer samples are compressed; in some cases this may amount to a factor 2 (Emery & Hülsemann: Shortening of sediment cores collected in open barrel gravity corers, in: Sedimentology, 3 (1964)).
The problem of comprimation can be avoided by using a Beeker sampler (cat. no.: 04.20).

Set specification

Cat.no.	Description	Qty. in set
04.29	**Free-fall corer,** standard set.	
04.29.01	Frame with sample tube guide	1
04.29.11	Acrylic sample tube, with steel cutting shoe, diam.76 x 66 mm, length 100 cm	10



Eijkelkamp
Agrisearch Equipment

BENAMING	FREE-FALL CORER		
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