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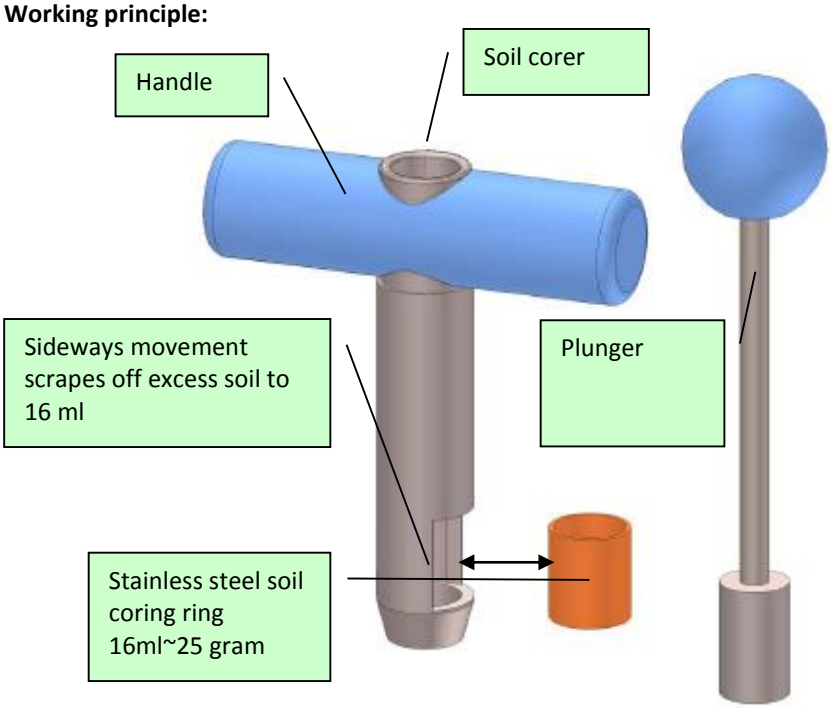
No-loss soil corer for soil with volatile components

User manual

Parts of the set: Soil corer, plunger, stand with push pin, coring rings, bags, stickers and jars (bar-coded stickers optional available via the laboratory)

Working principle:



About this manual

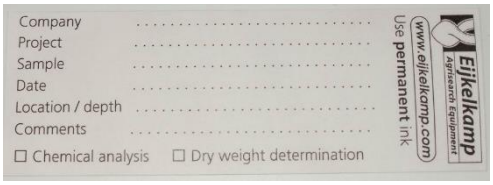
This manual shows:
1. Cooling or freezing method
2. Methanol or sodiumthiosulphate method

Details on these methods can be found in US-EPA 5035A-2002 (very detailed on both methods) or revisions of ISO standards as ISO 22155 (ready spring 2010) and ISO 15009 (end 2010). In ISO 18512 the methanol method is described especially.

This manual does not show safety measure as these may vary according to local laws and site conditions.

Contact the laboratory before taking samples. They can supply you with bar-code stickers.
Consult the lab on how they like to receive the samples for dry weight determination. Dry weight determination can be done on a second (marked) coring ring or on soil in a larger jar. On this larger sample other analysis on non-volatile components may be executed also.

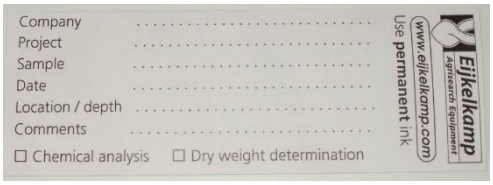
1. Cooling or freezing method

Clean the inside of the soil corer with a tissue. If necessary decontaminate / sterilize sampler with soldering gun flame • The coring ring may be clicked in the sampler before or after the decontamination, provided that the coring ring is clean.	
Fill in sticker(s) provided with the set and/or the stickers from the laboratory • Mark ticket boxes (□) with Chemical Analyses OR with Dry weight (dry weight if applicable) • In some countries it is allowed to report with a default (average) soil moisture percentage, a separate determination of dry weight is not necessary then. • Put the stickers on the bags	
Take a large sample from soil at sufficient depth (e.g. 1 meter) with any sampler (shown here: Dutch auger). • Sampling at insufficient depth results in a sample with a non-representative quantity of volatiles • Remove any smeared soil from outside of main sample	
Push the soil corer into the larger sample. Overfill. Push a second time if the soil is very sticky.	

Use a hammer for filling if the soil is hard or sticky • In stony soils some damage of the cutting edge cannot be excluded. Small damages may be corrected with a file.	
Push cutting ring sideways out of coring device. Soil volume in coring ring will now become 16 ml.	
Clean ring edges to obtain air-tight closure with caps	
Push caps in place. The seals in the caps are diffusion proof because of an aluminium layer. To prevent any corrosion the aluminium is coated with PET at the sample side. PET resists most volatiles.	
Put the capped coring ring in the bag with sticker and store it in the cooler* or freezer. * cooling is sufficient for a storage time of some days (48 hours before extraction in the lab). When freezing, a period of max. 2 weeks is advised. Depending on the standard(s).	
Take a duplicate** sample to allow the lab to express the concentrations measured as based on dry weight ** Duplicate not necessary if concentrations can be reported on an “as received” basis so without moisture correction.	Repeat the procedure above but now mark “dry weight”.

Overview of working site. Samples ready for cooling or freezing	
Push out remaining excess soil with plunger to prepare sampler to hold a new coring ring. • It is advised to have an extra sampler and plunger in the lab in order to keep the field and lab equipment separated • It is also possible to place the entire coring with sample in the jar	
In the lab: Remove the caps by cutting the side of each cap with a utility knife (“Stanley knife”) and place coring ring in the sampler. Sample is pushed in a special 100 ml glass jar with the plunger. Note: The entire filled coring ring can be put in the jar also. This seems attractive for loose soils (that will fall out of the ring easily). There has been no research yet, proving that extraction goes quick enough when a heavy soil is collected in the ring.	  

2. Methanol or sodiumthiosulphate method

• Remove and clean the coring ring (tissue) or take a clean one. • Remove any loose soil out of the soil corer with the plunger and a tissue. Especially clean the rims where the ring is clicked in (clean with screw driver) • Click the coring ring in the sampler • Decontaminate / sterilize sampler with soldering gun flame (shown)	
Put jar ready, pre-filled with 25 grams of methanol or sodiumthiosulphate (for low concentrations). See US-EPA 5035A-2002 guideline or consult the laboratory.	
Fill in sticker(s) as supplied in the set or from the lab: • Mark ticket boxes (□) with Chemical Analyses OR with Dry weight (dry weight if applicable)	
Take a large sample from soil at sufficient depth (e.g. 1 meter) with any sampler (shown here: Dutch auger). • Sampling at insufficient depth results in a sample with a non-representative quantity volatiles • Remove any smeared soil from outside of main sample	
Push the soil corer into the larger sample. Overfill. Push a second time if the soil is very sticky.	

Use a hammer for filling if the soil is hard • In stony soils some damage of the cutting edge cannot be excluded. Small damages may be corrected with a file.	
Push coring ring sideways out of coring device using the stand with push pin. Soil volume in coring ring will now become 16 ml.	
Coring ring removed. Excess soil still in sampler body	
Push out remaining soil from sampler with the plunger. Clean the chamber in which the ring was clicked (with a screw driver). Click the coring ring, filled with 16 ml of soil back in sampler body. It is also possible to put the entire filled coring ring (without the caps!) in the jar with methanol or sodiumthiosulphate. Consult the laboratory on what to do with the rings. Re-using the rings is possible, but may be more expensive based on cleaning and logistics than using new ones.	 

• Use the plunger to push the 16 ml of soil in the jar with methanol or sodiumthiosulphate. • Cap the jar and put it in the bag with sticker(s). Store the jar prior to transport. Be sure it cannot break during transport.	
Take a duplicate** sample to allow the lab to express the concentrations measured as based on dry weight ** Duplicate not necessary if concentrations can be reported on an “as received” basis so without dry weight determination. Dry weight can also be determined on a sample in a larger jar (eg for analysis on non-volatiles). Naturally the soil moisture percentage must be the same as the sample on volatiles.	Take the sample in a coring ring and remove the coring ring from the sampler as shown earlier.
Clean ring edges to obtain air-tight closure with caps	
Push caps in place.	
Stick the filled in sticker(s) marked “dry weight” on the bag, put the capped coring ring in the bag and store for transport.