

Model 425

Discrete Interval Sampling

Discrete interval sampling can be used to profile an open borehole or screened well, to collect samples from distinct levels or points of inflow, to obtain representative water samples from below floating product layers (LNAPL), and to obtain samples of sinking product layers (DNAPL). There is negligible disturbance, as can be caused by pumping and purging. Mixing of water from different levels in the well is minimized.

Purging and disposal of purged water can be avoided. Sampling directly from a specific depth results in the collection of the most recent water that has flowed into the well at that depth.

The Model 425-T Discrete Interval Sampler offers a zero-headspace sampler that can be transported directly to the laboratory in down-hole condition. It is described overleaf.

Solinst also has a stainless steel Point-Source Bailer with a second check valve at the top of the bailer, to prevent water entering the sampler on the way out of the well (See Model 429 Data Sheet).

Model 425

Discrete Interval Sampler

The Solinst Model 425 is a stainless steel sampler, with LDPE tubing mounted on the convenient Solinst reel. The reel has a pressure attachment for the high pressure hand pump, and a pressure/vent switch to apply and release the pressure on the sampler. A sample release device is also included.

The sampler is pressurized using a high pressure hand pump before being lowered into the well. This prevents water flowing through the sampler on the way down the well. Once the desired depth is reached, the pressure is released and hydrostatic pressure allows the sampler and tubing to fill with water directly from the sampling zone.

When the sampler is filled, it is repressurized and raised to the surface and the sample is decanted using the sample release device provided, to avoid degassing of the sample.

The sampler is ideal for groundwater sampling from below an oil/product layer on the surface of the water, as it allows a sample to be obtained which is untouched by the oil.

The sampler is easily disassembled for decontamination, without the need for tools.



Applications

- Obtaining a representative groundwater sample from below oil/product layers
- Discrete interval sampling
- Chemical profiling of wells
- Sampling at points of inflow to well
- DNAPL sampling

VOC Sampling

Discrete interval samplers are excellent for VOC sampling. There is no mixing with water from different levels in the well. The sample does not travel through a long length of tubing, risking loss of volatile organics. The sample has minimal contact with air.

For the most accurate VOA results the Model 425T Transportable DIS can be used. It retains the volatiles at down-hole conditions with zero headspace during retrieval and transport to the laboratory. (See overleaf)

Advantages

- Sample not pumped through tubing
- No mixing of water from different levels
- Avoids purging and disposal of purged water
- No-tools disassembly for decontamination

Method of Operation

The Discrete Interval Sampler is connected to the tubing. The high pressure hand pump, or a compressed air source, is attached to the reel.

The operating pressure required is determined using the chart at right. For other depths the formulas may be used. Pressure is applied, which closes the check valve in the bottom of the sampler, preventing any water from entering the sampler.

The sampler is then lowered to the chosen sampling depth while pressurized. At the chosen depth, the pressure is released. Hydrostatic pressure fills the sampler and tubing, as the water rises to hydrostatic level.

The sampler is again pressurized to close the lower check valve, and is raised to the surface. It is removed from the borehole and the sample is transferred to a sample bottle using the sample release device for controlled flow.

Recommended Operating Pressure

Depth Feet	Pressure psi	Depth Metres	Pressure kPa
25	20	8	148
50	30	15	217
100	50	30	364
200	95	61	670
300	140	90	952
500	225	150	1,495

$$\text{Operating Pressure} = (\text{Sample depth in feet} \times 0.43) + 10 \text{ psi}$$

$$(\text{Sample depth in m} \times 9.8) + 70 \text{ kPa}$$

Model 425-T Sampler/Transportation Vessel

This model is designed to prevent air contact with the sample, thus retaining volatiles at down-hole conditions during sampling and transport to the laboratory.

The sampler uses special shut-off valves to lock the sample within the sample canister with zero head space.

The Model 425-T sampler operates in a similar manner to the standard Model 425, but when the sampler is brought under pressure to the surface, the special shut-off valves are closed before the sampler is disconnected from the tubing.

Thus air contact with the sample is avoided and the sample is sealed within the sampler with zero headspace, in down-hole condition.

The sampler may then be sent to the laboratory for analysis, without discharging it. The VOCs in the sample will be held in the down-hole state until opened in the laboratory, thus ensuring the highest sample quality at the time of analysis.

Discrete Interval Sampler Capacity

English Units		Metric Units	
Size	Capacity	Size	Capacity
1" x 2'	6 oz	25.4 mm x 610 mm	175 ml
1.5" x 2'	18 oz	38 mm x 610 mm	450 ml
2" x 2'	27 oz	50.8 mm x 610 mm	800 ml
1" x 4'	12 oz	25.4 mm x 1220 mm	365 ml
1.5" x 4'	32 oz	38 mm x 1220 mm	950 ml
2" x 4'	61 oz	50.8 mm x 1220 mm	1800 ml

*Other diameters and lengths available,
on request.*

Materials

The samplers are constructed entirely of stainless steel with Viton® o-rings.

The tubing most commonly used is low density polyethylene (LDPE), however, Teflon® or Teflon-lined polyethylene tubing is also available.

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