

Ambrose Furey ¹, Mike Griew ² and Ronan Browne ³

¹ Mass Spectrometry Group, Department Physical Sciences, Munster Technological University (MTU), Rossa Avenue, Bishopstown, Cork, T12 P928 Co. Cork, Ireland. (ambrose.furey@mtu.ie)

² HALPIN Centre for Research & Innovation, National Maritime College of Ireland (NMCI), MTU, Ringaskiddy, P43 XV65 Co. Cork. (mike.griew@mtu.ie)

³ STREAM project co-ordinator, Southeast Technological University (SETU), Cork Road, Waterford, X91 K0EK Co. Waterford. (Ronan.Browne@setu.ie)

Introduction

Water samples can be collected using two types of vessels. (i) The Van Dorn (Niskin/Nansen) bottle and (ii) The Kemmerer water sampler¹.

The Van Dorn (Niskin/Nansen) bottle (Figure #1) allows operators to take samples of water from various known discreet depths. It consists of an open-ended, clear plastic cylinder that can be attached to a hydrographic measured line and lowered to the desired depth. A metal weight called a "messenger" is attached to the line. The water sample is taken by dropping a "messenger" down the wire. When the weight hits the catch on the Van Dorn bottle, the catch releases the rubber end covers¹. The two ends snap around and seal off the ends (Figure #2). When the Van Dorn bottle has been tripped, it is hauled back to the surface, and the sampled water is poured into a clean polypropylene wide-neck sampling bottle/ vessel.



Figure #1: van Dorn bottle²



Figure #2: open van Dorn bottle²



Figure #3: Kemmerer water sampler²

The Kemmerer water sampler (Figure #3) can be used for surface water sampling and at specific depths between 3 and 600 m. The messenger activates the unique trip heads that ensure closure in fast flowing-streams or turbulent waters, regardless of line angle. Both bottles also provide a platform to which thermometers can be attached to record the temperature of the water at the location of each Van Dorn bottle. Since only one sample of water can be obtained at a time, the process of acquiring several samples at various depths at the same sampling station can be slow¹.

Procedure for the use of the Van Dorn bottle

1. Open and secure the two ends of the Van Dorn bottle.
2. Using an itemised line with metre depth indicators, deploy the Van Dorn bottle to the chosen depth (e.g. 15 metre depth)
3. Holding the link taut, deploy the metal weight “messenger” down the line to contact the closing device, to trigger both ends of the Van Dorn bottle to close.
4. Slowly pull the filled Van Dorn bottle to the surface.
5. Open one end of the Van Dorn bottle and pour the water sample into a pre-cleaned polystyrene wide neck bottle.

6. Label the bottle with GPS coordinates, relevant information, date, time, depth, water temperature (if available), and sampler name.
7. Transport the samples in a cold box kept at 4 °C or freeze the sample at -20 °C until ready for extraction in the laboratory.
8. Wash the Van Dorn bottle with soapy hot tap water followed by tap water and dry before storage.

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Reference:

1. Website: [Water sampling](#), Grand Valley State University, accessed 2023.
2. Website: [Google images](#), accessed 2023