

UWITEC

FREEZECORER



Umwelt und Wissenschaftstechnik

A-5310 Mondsee, Moosbachweg 10, Tel.: +43-6232-3946, Fax: 3946-30
E-Mail: richard.niederreiter@uwitec.at, Home Page: <http://www.uwitec.at>

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Freezecorer for gravel Sediments Typ 1

To take undisturbed samples of coarse sediment from streams and rivers. Waterdepth 0 to maximal 1m.

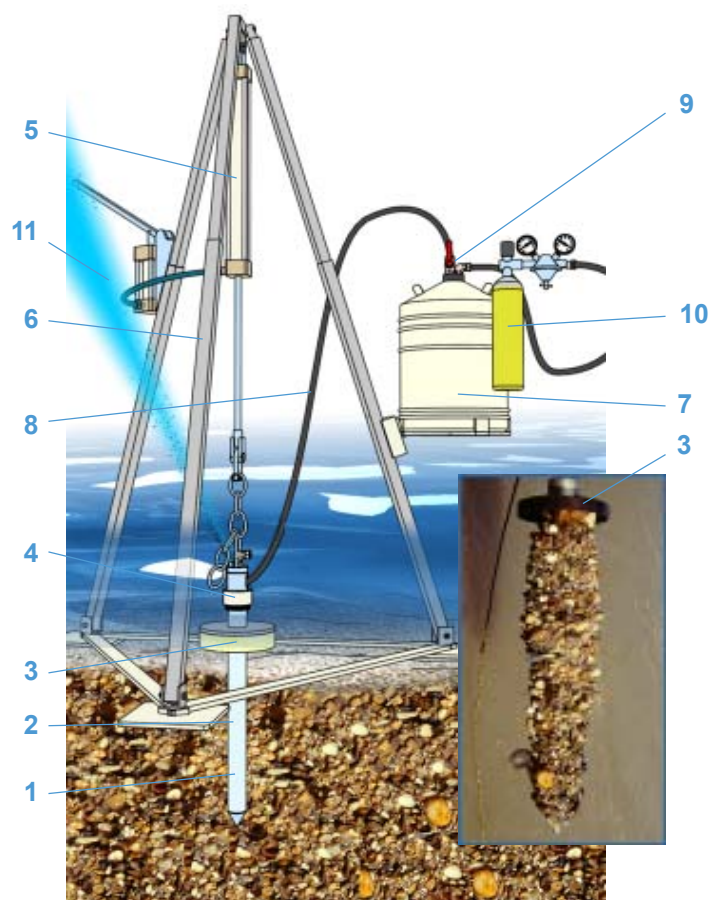
Lowcost steelpipes with watertight protection cap should stay 1 to max. 2 weeks in the riverbed to allow the stream fauna recolonisation. The Corelength is determined from the length of the liquid nitrogen distributor called „freezing finger“ (0,3 m – 1,5 m).

The protection plate with a brim of rubberfoam prevents the sediment surface from current, energie loss and encloses running water animals.

The cooling agent is liquid nitrogen, transported in dewar bottles (35 L, 50 L, 60 L or more).

With compressed air the liquid nitrogen is pushed through dispenser and „freezing finger“.

Consumtion: 15 l to 30 l nitrogen per core. Corediameter up to 30 cm depends on freezing time.



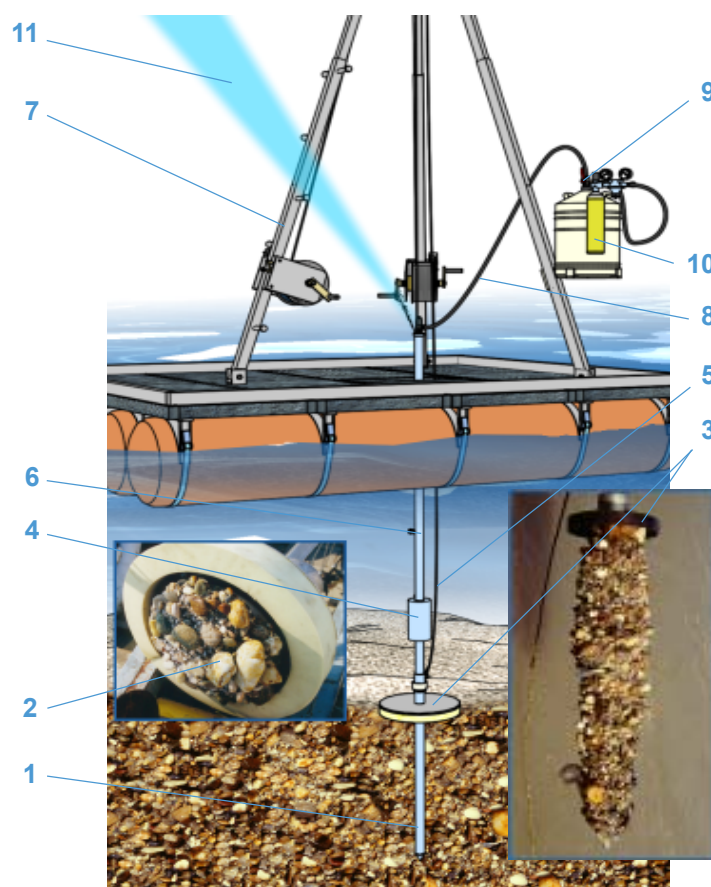
- 1 Steelpipe 42 mm diameter. Length 1 – 2 m, Corediameter max. 30 cm, Corelength 0,3 m – 1,5 m
- 2 Liquid nitrogen distributor called „freezing finger“
- 3 Surface protection plate 45 cm diameter with a brim of rubberfoam 8 x 10 cm
- 4 Steelpice to push and pull
- 5 Hydraulic Handpump and Zylinder pulls up to 5 tons or Chainpuller pulls up to 3 tons
- 6 Tripod from aluminium with steelplates on each leg
- 7 Dewar bottle (z.b. 35 L)
- 8 Flexible isolated tube with connectors
- 9 Nitrogendispenser with closing- and safety valve
- 10 Pressed air bottle with pressure reducer
- 11 After cooling the nitrogengas comes out through lengthening rod and sledge pice

Freezecorer for gravel Sediments Typ 2

To take undisturbed samples of coarse sediment from streams and rivers.

Waterdepth 1 m up to 15 m. Freezecorer (Stainless steeltube 45mm diameter, length 0,5 m up to 1,5 m) with special liquid nitrogen distributor inside. The Freezecorer with protection plate is lowered down from a boat or platform. With a sledgeweight the Freezecorer is hammered into the sediment until the protection plate arrives the sediment survice. With the „Freeze Plate Sampler“ it is possible to get realy undisturbed surface samples with a diameter of 40 cm down to a sedimentdepth of 20 cm.

After lowering „Freezecorer“ or „Freeze Plate Sampler“ cooling starts immediately! The cooling agent is liquid nitrogen, transported in dewar bottles (35 L, 50 L, 60 L or more). Compressed air (1 to max. 3 bar) presses the liquid nitrogen through dispenser, lengthening rods (steelpipes with a coaxial, neoprenisolated tube for the liquid nitrogen) to the „Freezecorer“ or Freezeplate Sampler“. Freezingtime 30 to 45 min., consumption up to 40 L nitrogen per core. Corediameter up to 30 cm depends on freezing time. With a diamond saw cores can be cutted in horizontal layers or lengthwise in two halves.



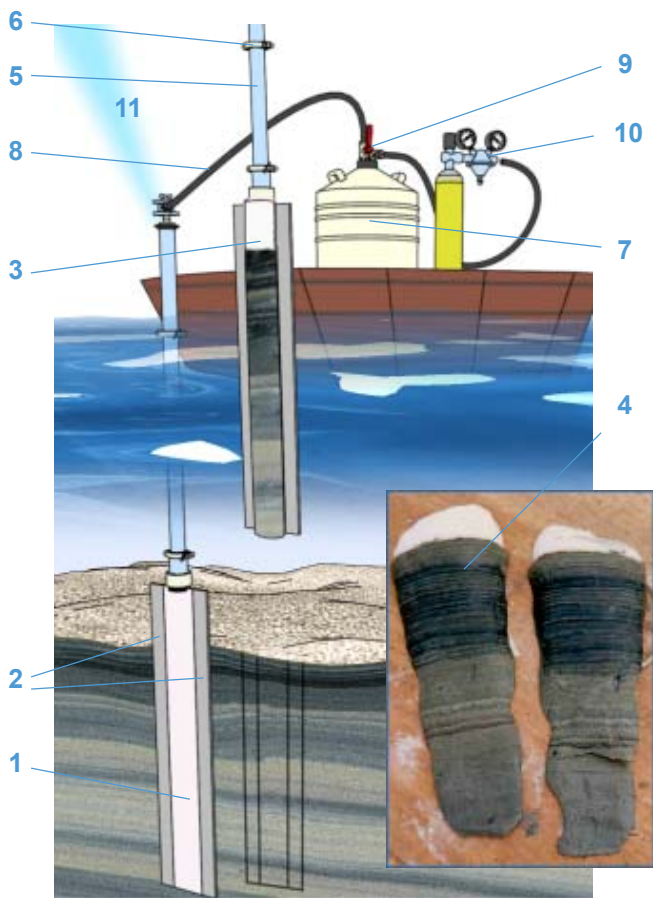
- 1 Freezecorer (Stainless steeltube 45 mm diameter, length 0,5 m up to 1,5 m) with special liquid nitrogen distributor inside. „FCS“
- 2 „Freeze Plate Sampler“ „FPS“ for undisturbed surface samples. Standard Plate diameter 30 cm. Sampleddiameter 40 cm.
- 3 Surface protection plate 60 cm diameter with a brim of rubberfoam 8 x 10 cm.
- 4 Sledgeweight 30 kg, guided on the lengthening rod is lifted and lowered with a rope to hammer the Freezecorer into the Sediment.
- 5 Steelcable (15 mm) to pull the core out of the sediment and on bord.
- 6 Lengthening rod: Steelpipe with a coaxial, neoprenisolated tube for liquid nitrogen inside.
- 7 Boat or platform with strong winch to lift the cores on bord.
- 8 Flexible isolated tube with connector to the liquid nitrogen pipe inside the lengthening rod.
- 9 Nitrogendispenser with closing- and safety valve.
- 10 Pressed air bottle with pressure reducer.
- 11 After cooling the nitrogen gas comes out through the space between isolated liquid nitrogen tube and inside wall of the lengthening rod.

Freezecorer for soft Sediments Typ 3

Flat „Freezingswords“ are lowered down and pressed into the sediment from a boat or platform with lengthening rods by hand.

Waterdepth up to 20 m. „Freezingswords“ are made from Aluminiumplates with channels inside (cross section 55x10 mm or 110x10 mm) length from 0,5 m up to 2,0 m. For sampling from a small boat maximal length 1 m.

The cooling agent is liquid nitrogen, transported in dewar bottles (35 L, 50 L, 60L or more). Compressed air (1 to max. 3 bar) presses the liquid nitrogen through dispenser, lengthening rods (aluminiumpipes with a coaxial, neoprenisolated tube for the liquid nitrogen) to the „Freezingsword“. Freezingtime 3 to 20 min., consumption up to 15 L nitrogen per core. Frozen sediment thickness from 2 cm up to 7 cm depends on freezing time.



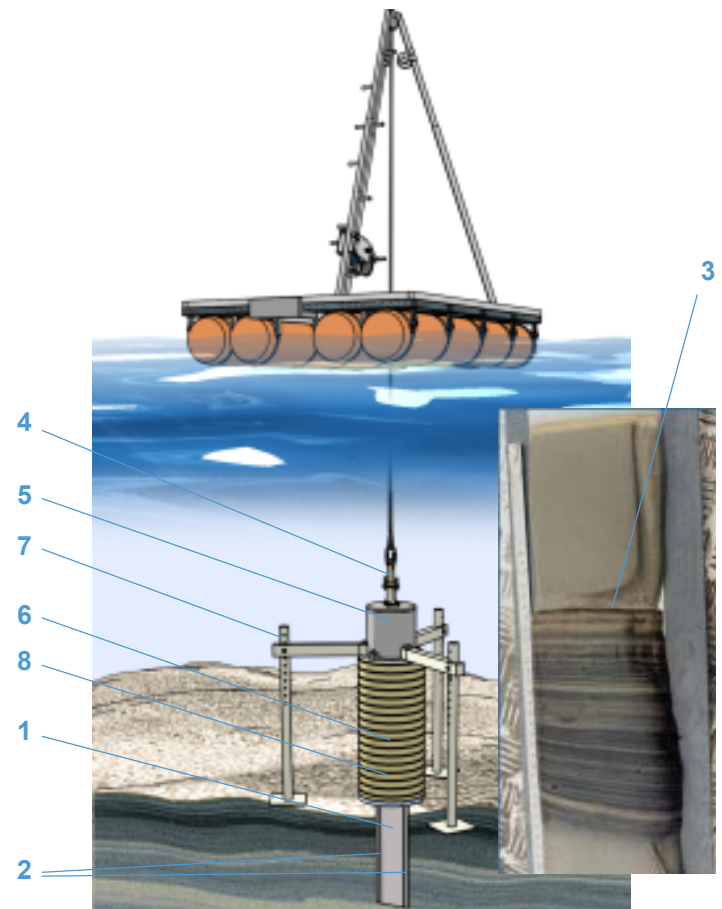
- 1 „Freezingsword“: Aluminiumplate with channels inside cross section 55x10 mm or 110x10 mm, length from 0,5 m up to 2,0 m.
- 2 Plastic plates (PVC 10 mm) screwed to both sides of the „Freezingsword“.
- 3 „Freezingsword“ with frozen- sediment and overlying water.
- 4 2 Plates of frozen sediment can be easily removed from the aluminiumplate after it is warmed up with air, which is pressed through the channels.
- 5 Lengthening rod: Aluminiumpipe with a coaxial, neoprenisolated tube for liquid nitrogen inside.
- 6 Flanges connected with clamps
- 7 Dewar bottle (for example 35 L)
- 8 Flexible isolated tube with connector to the liquid nitrogen pipe inside the lengthening rod.
- 9 Nitrogendispenser with closing- and safety valve.
- 10 Pressed air bottle with pressure reducer.
- 11 After cooling the nitrogen gas comes out through the space between isolated liquid nitrogen tube and inside wall of the lengthening rod

Freezecorer for soft Sediments Typ 4

New developed Freezecorer to take undisturbed samples from unconsolidated surface sediments down to several hundred meter water depth by in situ freezing.

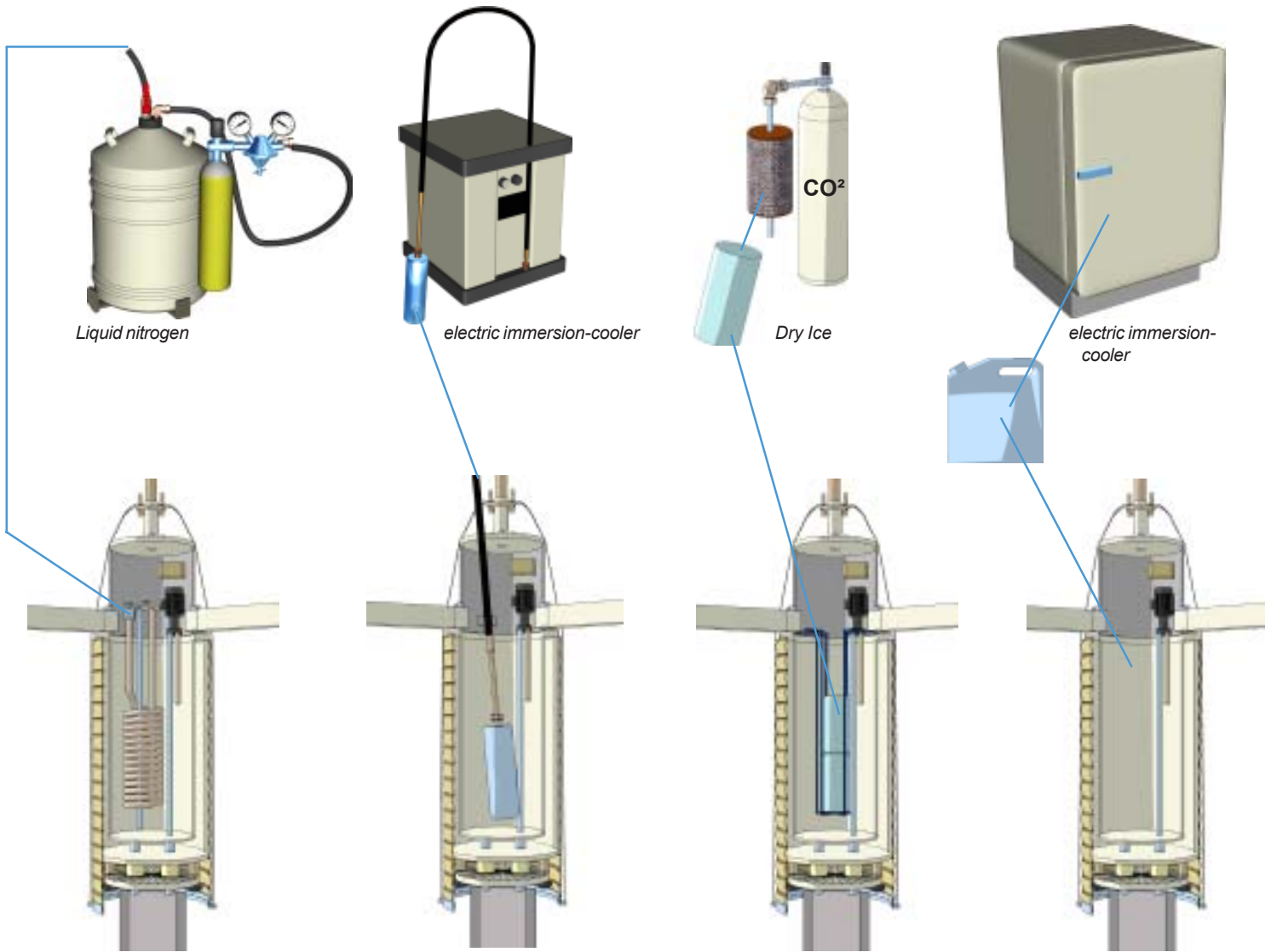
Closed pressure resistant system. Weight in air app. 110 kg, underwater app. 45 kg. Aluminium freeze wedge (110 cm length, 10 cm width and only 1 cm thickness.

Cooling agent: Ethanol to chill by liquid Nitrogen, dry Ice or electric ultralow temperature Freezers.



- 1 Aluminium freeze wedge (standard) of 10 cm length, 10 cm width and only 1cm thickness.
- 2 Plastic plates at both sides of the freezing wedge.
- 3 Freezing wedge with frozen sediment.
- 4 Mounting with gravity trigger
- 5 Cap with space for alcohol pump, battery und electric switches.
- 6 Pressure resistant double-walled housing with a container for max. 33 l alcohol (vakuu-isolated between the walls).
- 7 Adjustable legs with aluminium plates at the lower ends to stabilize the device at the sediment surface and to prevent it from sinking into the sediment.
- 8 Foldable hose to protect the freezecore from melting due to the relatively warm lake water on the long way through the water column.

Cooling agent Freezecorer Typ IV



Technical Data Freezecorer					
	Typ 1	Freezeplatte	Typ 2	Typ 3	Typ 4
Sampling Area	river, brook river	river, brook river	river dam	lake, dam river	lake
Waterdepth	0 - 1 m	0 - 15 m	1 - 15 m	0-20 m	up to 600 m
Sedimentart	gravel	gravel	gravel	soft sediments	soft sediments
Samplesize	length 0,3 - 1,5 m, Ø up to 30 cm	depth up to 30 cm Ø up to 60 cm	length 0,5 up to 1,5 m Ø up to 30 cm	crust thickness up to 5 cm	crust thickness up to 5 cm
Diameter/Cross section	Ø 42 mm	Ø 15-50 mm	Ø 45 mm	10 x 55 mm 10 x 100 mm	10 x 55 mm 10 x 100 mm
Freezecorelength	0,3 - 1,5 m		0,3 - 2,0 m	0,3 - 2,0 m	0,3 - 2,0 m
Material Sword	steel	stainless steel	stainless steel	Aluminium	Aluminium
Cooling agent	liquid Nitrogen	liquid Nitrogen	liquid Nitrogen	liquid Nitrogen	Ethanol cooled down with: liquid Nitrogen dry ice electric immersion-cooler
Material rods	stainless steel	stainless steel, steel	steel	Aluminium	
Material housing		stainless steel			stainless steel, Aluminium
Liquid Nitrogen conduit	neopren isolated stainless steeltube	neopren isolated stainless steeltube	neopren isolated stainless steeltube	neopren isolated stainless steeltube	isolated pressure resistant connectors