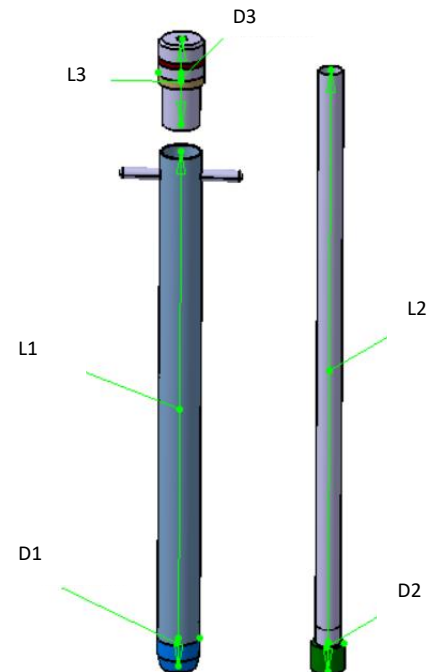


Specifications

- 4 different length x 3 diff. diameter options available
- *Custom dimensions on request (surcharges apply)*

Soil coring tube [SO-XXX.1] with crown [SO-XXX.2] - Overview

Tube length (with crown, total)	[L1] 500, 700, 900, or 1100 mm
Tube, outer diameter	[D1] 80, 68 or 58 mm
Tube, inner diameter	76, 62 or 54 mm
Crown (hardened steel), inner diameter	70, 56 or 48 mm (for smoother emitting the soil core from the larger diameter tube)

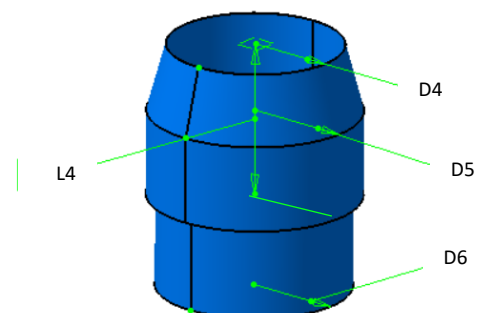


Soil coring tube [SO-XXX.1]

Length	[L1-crown] 450, 650, 850, 1050 mm
Outer diameter	[D1] 80, 68 or 58 mm
Inner diameter	76, 62 or 54 mm
Holes to mount handle bar	2
Holes to mount crown	3 (countersunk)
Material	ST37 (Steel)

Crown [SO-XXX.2]

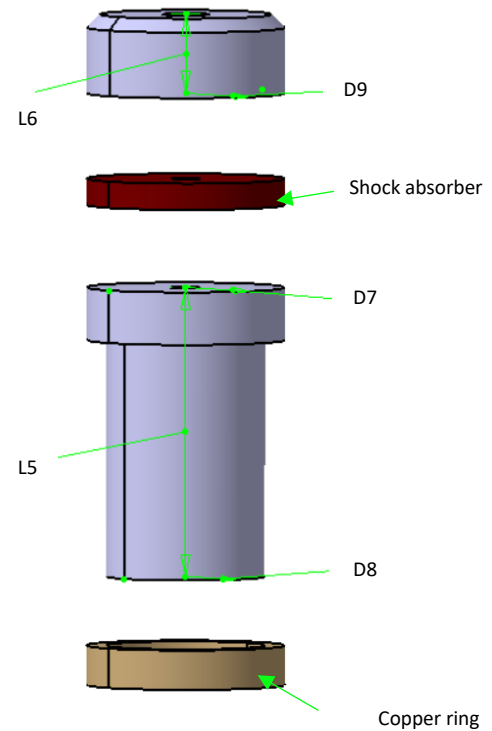
Length	[L4] 50 mm
Inner diameter	[D4] 70, 56 or 48 mm
Outer diameter 1	[D5] 80, 68 or 58 mm
Outer diameter 2	[D6] 76, 62 or 54 mm
Material	CK 45 (Steel), post-treated (hardening)



VSI Soil Corer

Drive head [SO-XXX.3]

Drive head	
Length (overall)	150 mm
Drive head part 1 [3.1, bottom]	
Length	[L5] 110 mm
Diameter 1	[D7] 90,75 or 65 mm
Diameter 2	[D8] 74,60 or 52 mm
Material	AlCuMgPb
Drive head part 2 [3.2, top]	
Length	[L6] 30 mm
Diameter	[D9] 90,75 or 65 mm
Material	AlCuMgPb
Copper Ring [3.3]	Protective element for the tube, wear part
Shock absorber [3.4]	Durable shock absorber (leather), wear part



Pusher, soil core extraction [SO-XXX.4]

Pusher	
Length (total)	[L2] 650, 850, 1050, 1250 mm
Pusher handle [4.1]	
Length [L2]	600, 800, 1000, 1200 mm
Outer diameter	40 mm
Material	PP
Pusher head [4.2]	
Length	80 mm
Outer diameter [D2]	69, 55 or 47 mm
Material	POM-C

Weight

Weight (Tube, Crown, Pusher, Handle, Drive head)	Approx. 5-10 kg (depending on size)
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Other Parts

Handle [SO-XXX.5]	For tube extraction; two plastic handles on a solid metal rod
Brush [SO-XXX.6]	Cleaning the tubes inside; various models
Extra crown [SO-XXX.2]	Sets include one spare crown
Spare screws for crown [SO-XXX.7]	Sets include 3 spare screws for crown mounting
Soft-head hammer [SO-X80.8]	For hammering on the drive head
Carrying Case [SO-110X.9]	Case, with foam inlay, holds the complete soil corer set for convenient transport and storage

Optional items

Storage box(es)	Storing extracted, undisturbed soil cores in 2 half-shells of the exact outer diameter—for transport and long-term storage; <i>see webpage for details</i>
Alignment frame	Alignment frame to position the soil corer correctly at a certain angle (for MR tube installation); <i>see webpage for details</i>

VSI Part list (Sets)

Part Number	Description of Set
SO-5080S	Set. 50 cm long corer (incl. crown), 80 mm outer tube diameter. For soil sampling. Set consists of 1x Soil Coring Tube, 2x Crowns (1x mounted, 1x extra). 1x Drive Head, 1x Pusher, 1x Handle, 1x Soft-head hammer, 1x Brush (for cleaning), 1 set of spare screws for crown, and 1x Case (black) with foam inlay, lockable. All parts are placed inside the case. Inner tube diameter 76 mm, inner crown diameter 70 mm
SO-7080S	Set. 70 cm long corer (incl. crown), 80 mm outer tube diameter. <i>See above for set content.</i>
SO-9080S	Set. 90 cm long corer (incl. crown), 80 mm outer tube diameter. <i>See above for set content.</i>
SO-11080S	Set. 110 cm long corer (incl. crown), 80 mm outer tube diameter. <i>See above for set content.</i>
SO-5068S	Set. 50cm long corer (incl. crown), 68 mm outer tube diameter. For soil sampling. Set consists of 1x Soil Coring Tube, 2x Crown (1x mounted, 1x extra). 1x Drive Head, 1x Pusher, 1x Handle. 1x Soft-head hammer, 1x Brush (for cleaning), 1 set of spare screws for crown, and 1x Case (black) with foam inlay, lockable. All parts are placed inside the case. Inner tube diameter 62 mm, inner crown diameter 54 mm.
SO-7068S	Set. 70cm long corer (incl. crown), 68 mm outer diameter. <i>See above for set content.</i>
SO-9068S	Set. 90cm long corer (incl. crown), 68 mm outer diameter. <i>See above for set content.</i>
SO-11068S	Set. 110cm long corer (incl. crown), 68 mm outer diameter. <i>See above for set content.</i>
SO-5058S	Set. 50cm long corer (incl. crown), 58 mm outer tube diameter. For soil sampling. Set consists of 1x Soil Coring Tube, 2x Crowns (1x mounted, 1x extra). 1x Drive Head, 1x Pusher, 1x Handle. 1x Soft-head hammer, 1x Brush (for cleaning), 1 set of spare screws for crown, and 1x Case (black) with foam inlay, lockable. All parts are placed inside the case. Inner tube diameter 54 mm, inner crown diameter 48 mm.
SO-7058S	Set. 70cm long corer (incl. crown), 58 mm outer diameter. <i>See above for set content.</i>
SO-9058S	Set. 90cm long corer (incl. crown), 58 mm outer diameter. <i>See above for set content.</i>
SO-11058S	Set. 110cm long corer (incl. crown), 58 mm outer diameter. <i>See above for set content.</i>

Part List I (for individual ordering)

Part Number	Description of Part	Wear part*
SO-5080.1	Tube 80 mm , ca. 45 cm long. 80mm outer diameter.	
SO-7080.1	Tube, ca. 65 cm long. 80mm outer diameter.	
SO-9080.1	Tube, ca. 85 cm long. 80mm outer diameter.	
SO-11080.1	Tube, ca. 105 cm long. 80mm outer diameter.	
SO-5068.1	Tube 68 mm , ca. 45 cm long. 68mm outer diameter.	
SO-7068.1	Tube, ca. 65 cm long. 68mm outer diameter.	
SO-9068.1	Tube, ca. 85 cm long. 68mm outer diameter.	
SO-11068.1	Tube, ca. 105 cm long. 68mm outer diameter.	
SO-5058.1	Tube 58 mm , ca. 45 cm long. 58mm outer diameter.	
SO-7058S.1	Tube, ca. 65 cm long. 58mm outer diameter.	
SO-9058.1	Tube, ca. 85cm long. 58mm outer diameter.	
SO-11058.1	Tube, ca. 105cm long. 58mm outer diameter.	
SO-X80.2	Crown , for 80 mm tubes, incl. set of 3 screws	Wear part
SO-X68.2	Crown, for 68 mm tubes, incl. set of 3 screws	Wear part
SO-X58.2	Crown, for 58 mm tubes, incl. set of 3 screws	Wear part
SO-X80.3	Drive Head (complete) , for 80 mm tubes	
SO-X68.3	Drive Head (complete), for 68 mm tubes	
SO-X58.3	Drive Head (complete), for 58 mm tubes	
(SO-XXX.3.1)	Drive Head part 1 (upper part), <i>not available separately</i>	
(SO-XXX.3.2)	Drive Head part 2 (lower part), <i>not available separately</i>	
SO-X80.3.3	Copper ring (Tube protector), for 80 mm tubes	Wear part
SO-X68.3.3	Copper ring (Tube protector), for 68 mm tubes	Wear part
SO-X58.3.3	Copper ring (Tube protector), for 58 mm tubes	Wear part
SO-X80.3.4	Shock absorber (Leather), for 80 mm tubes	Wear part
SO-X68.3.4	Shock absorber (Leather), for 68 mm tubes	Wear part
SO-X58.3.4	Shock absorber (Leather), for 58 mm tubes	Wear part

*wear parts require regular checks and eventually replacement after extensive use / applying excessive force in skeleton-rich soils

Part List II (for individual ordering)

Part Number	Description of Part	Wear part*
SO-5080.4	Pusher (complete) , for 50 cm long, 80 mm tubes	
SO-7080.4	Pusher (complete), for 70 cm long, 80 mm tubes	
SO-9080.4	Pusher (complete), for 90 cm long, 80 mm tubes	
SO-11080.4	Pusher (complete), for 110 cm long, 80 mm tubes	
SO-5068.4	Pusher (complete), for 50 cm long, 68 mm tubes	
SO-7068.4	Pusher (complete), for 70 cm long, 68 mm tubes	
SO-9068.4	Pusher (complete), for 90 cm long, 68 mm tubes	
SO-11068.4	Pusher (complete), for 110 cm long, 68 mm tubes	
SO-5058.4	Pusher (complete), for 50 cm long, 58 mm tubes	
SO-7058.4	Pusher (complete), for 70 cm long, 58 mm tubes	
SO-9068.4	Pusher (complete), for 90 cm long, 58 mm tubes	
SO-11068.4	Pusher (complete), for 110 cm long, 58 mm tubes	
(SO-XXX.4.1)	Pusher tube, <i>not available separately</i>	
(SO-XXX.4.2)	Pusher head, <i>not available separately</i>	
SO-XXX.5	Handle , for all soil coring tubes	
SO-XXX.6	Brush , for all soil coring tubes	Wear part
SO-X80.7	Spare screws (crown mounting), for 80 mm tubes; 3x	Wear part
SO-X68.7	Spare screws (crown mounting), for 68 mm tubes; 3x	Wear part
SO-X58.7	Spare screws (crown mounting), for 58 mm tubes; 3x	Wear part
SO-X80.8	Soft-head hammer , for all soil coring tubes / drive heads	
SO-110X.9	Case with foam inlay , black, lockable; for all corer set types	

*wear parts require regular checks and eventually replacement after extensive use / applying excessive force in skeleton-rich soils

Storage

Dry completely before storing!

Store at dry, temperate place! Do not store plastic parts exposed to the sun or other UV sources!

Long-term storage: rusting/corroding (especially of the crowns) can be reduced by applying a thin oil film on the surface before long-term storage!

Manual

These instructions do not purport to cover all details or variations in the equipment and do not claim to provide for every possible contingency met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to Vienna Scientific Instruments.

General safety



- Ensure all national, provincial, and local safety codes are followed when using this equipment!
- Make sure all operators of this equipment have been trained for safe working practices. Operators must wear safety glasses, safety gloves and any other personal protective equipment necessary!



- Do not use damaged equipment and maintain tools regularly!
- Do not use excessive force on drive head or tube!

Soil core sampling

Preparations

- 1) **Check tight fit of screws** (3, fixating the crown) and **screw nut** (Drive head), tighten if loose, replace if missing; if screws repeatedly become "loose"/unscrew during operation, especially by operating the corer in skeleton rich soils, they might be locked into position by applying a screw adhesive /thread locker (e.g. trademarks are LocTite© or similar; please get in contact if necessary)
- 2) **Check Crown for damages**, replace if edges are bend inside/outside, may continue to be used (for some time) if with sharp, chipped edges
- 3) **Check Copper Ring for damages**, replace if too bend, deformed (preventing a straight alignment of the drive head on the tube brim)
- 4) Potentially mark planned sampling depth on the outside of the tube (e.g. with a dark permanent marker), starting to measure at the cutting edge of the crown or slightly above (if its necessary to scrape some soil from the crown to place the "Pusher")

Coring

- 1) Place **soil corer tube** (with mounted crown) on soil spot, crown towards the soil, +- vertically; potentially remove coarse organic (litter) layers or vegetation before placing the corer
- 2) Place **Drive Head** on top
- 3) Always use a **soft-head hammer**. Using a metal hammer / sledge hammer will inevitable damage the drive head and deform the tube brim!
- 4) Hold tube with one hand, while **carefully using the soft-head hammer** on the **top of the drive head until the tube keeps upright** by itself. If working with two persons, one person might hold the tube while the other one is carefully, gently using the soft-head hammer!

- 5) **Use the soft-head hammer on the drive head** until target depth is reached. Always make sure the surrounding is clear of other persons before using the hammer with greater force!
 - a. Apply the soft-head hammer strokes in a strait fashion on the drive head → inclined “hits” will result in earlier wear and tear of copper rings and tube brims
 - b. Pay close attention to potential sudden resistance, especially in skeleton rich soils → in case the corer does not move downwards, consider relocating the tube to another coring position, you might have hit stones. “Jumping tubes” (i.e. a slight downward movement followed by an upward movement of the corer) are often indicative of hitting larger coarse roots. **Warning!** Applying excessive force will damage the crown and the tube (especially after the copper ring is deformed)
 - c. The hardened crown may cut through coarse roots and light stones, however, pay attention that these objects do not get jammed inside the tube
 - d. In heavy (loamy/clayey) soils, later tube extraction may be eased by turning the soil corer 90°-180° to the left and/or right per every 10-20 cm depth increment (frequently preventing to jam the corer at greater depth)
- 6) Upon target soil depth is reached, **remove the drive head**,
- 7) **Insert the handle** bar from one side and replace the detachable hand grip from the other side
- 8) Carefully **lift the soil corer up**,
 - a. Turning the soil corer left and right (using the handle) and slightly sideward (in a “rocking motion”) while uplifting often helps overcoming friction at the corers’ outside
 - b. Consider to collect soil cores in a step-wise matter (e.g. repeated 10 or 20 cm increments, steps 2-10) if sampling dense soils and/or greater soil depth
 - c. Working in light/sandy, very dry soils: you might need to cover the crown opening with you hand or a plastic bag immediately after corer extraction in order to prevent soil to fall out; sometimes it helps to retrieve undisturbed soil cores in rather sandy soils by compressing the soil “within the crown” to a greater extend—lifting the corer slightly upwards followed by some additional hammering might do the trick
 - d. At own risk: accidentally “jammed” soil corer might be retrieved by 1) pushing the corer repeatedly sideward (if not too deep inside), 2) digging it up with a shovel/pickax, or 3) extracting it with a chain hoist connected to a tri-pod
- 9) **Place the extracted corer horizontally** on the ground;
- 10) **Insert the “pusher” head from the bottom/“crown side”**, gently and uniformly push the core upwards, collect the emerging core in half shells fitting the core diameter (optional, for retrieving most intact soil cores), on plastic sheets, in plastic bags etc.
 - a. To collect most intact soil cores, a second person should pulls the “half shell”/plastic sheets gently backwards in parallel to core emergence
 - b. In case of heavy, “sticky” (e.g. very loamy, wet) soils it might be necessary to remove some (1-2 cm) or all soil from within the crown (e.g. with a putty knife) before placing the pusher head and to reduce friction
 - c. In some cases, soil core extraction can be facilitated by placing the tube “upside down”/vertically into a plastic bag while using the pusher from above; please note that undisturbed cores cannot be retrieved in this case
 - d. In very dense, clayey soils, consider to sample and extract soil cores in a step-wise manner, e.g. 10 or 20 cm increments; make sure not to “contaminate” the corer hole by topsoil/leaves etc. falling down into the hole
 - e. In very dry, sandy soil, lift the soil corer with utmost care to prevent soil to fall out at the bottom accidentally and close the crown opening with your hand/plastic bag as soon possible; consider using a soil corer with smaller inner diameter or the “compression technique” described in 8c

- 11) After core extraction, carefully **clean the tubes** inside with the broom/brush. If using water, make sure the tube is sufficiently dry inside to prevent soil “smearing” and subsequently greater friction. Beside the risk for “cross-contamination”, core extraction from tubes with residual soil on the inside might become significantly more difficult!
- 12) Perform a **visual inspection** of all parts (especially the conditions of the copper ring and crown (screws)) before continuing to core.

Consider to measure soil compaction:

- “Total length of soil core” and “depth of hole” AND/OR “depth of a specific horizon in soil core” and “depth of this specific horizon in the hole” (to determine potential soil compression) with a (folding) rule / yardstick

Happy and safe coring!

VSI Soil Corer

Packing list (soil sampling campaign)

Making no claim to be complete!

- 1x VSI soil corer set
- 2x Pairs of working gloves (leather) and other personal safety equipment as required
- Hex key, for screws of crown
- 1x Putty knife
- 1-2x Permanent markers (black)
- 1x Folding rule, for measurements on core and inside the hole (for potential compaction)
- 1x Serrated Knife (e.g. bread knife), to dissect the core (into horizons, soil depth)
- 1x Half shell or larger plastic sheet, for soil core placement during extraction
- Plastic bags, for soil storage
- Preformatted sample sheets, 2x pencil/pen, plotting pad
- Potentially: Frame backpack (“Kraxer”) or similar to carry the equipment/samples, straps to tie the equipment on

Keep within reach

- Spade/folding spade/pickax, and/or tripod+chain hoist for manual extraction of jammed tubes (“worst case scenario”)
- Wrench, for tightening drive head screws
- Water, paper towels, for throughout cleaning / drying of material