



ecoTech Leaching columns

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Product specifications and quick start guide



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Figure 1: Leaching columns (on the left ID 65 mm; on the right ID 100 mm) with column lid (1), glass tube (2) and column base (3)

All columns consist of a glass tube, column lid and base. Upper and lower locks have a central hole to connect the tubing and a locking mechanism to seal the tube and fix it.

The columns with the inner diameter of 50 mm und 65 mm are sealed by a nut-clamp ring system made of PE. The lower sealing has a wider margin and adjustable feet. This seal system is only suitable for columns with smaller diameter ($\leq \text{ID} \leq 65 \text{ mm}$), so the nut can be tightened manually (Figure 2).



Figure 2: Build-up of column base for tubes with ID = 65 mm und ID = 50 mm. From left to right: Column base with O-ring, clamp ring/collar, fastener-clamp ring system for the large leaching column and ring/union nut.

A fastener-clamp ring system is used to seal the large columns with an inner diameter of 100 mm (Figure 3), higher forces can be exerted with this system when closing the columns. A base plate,



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connected with 10 cm long feet with the column base, gives high stability to these columns and allows easy tube connection.

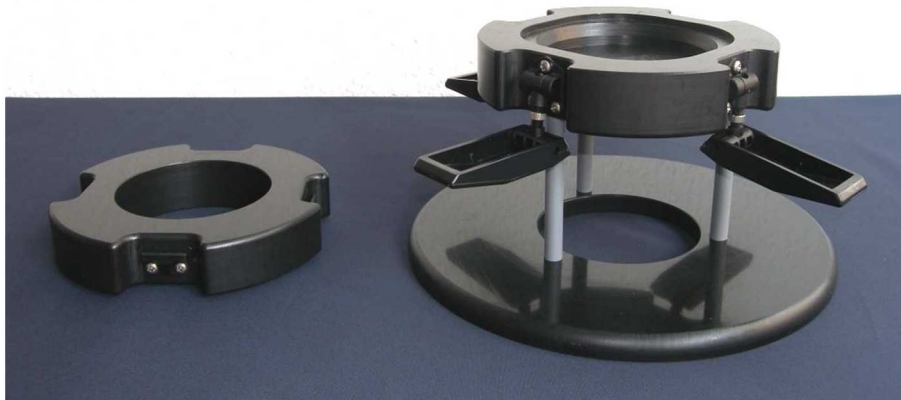


Figure 3: Fastener-clamp ring system

Both described closure types are registered by ecoTech GmbH as utility model. The column packing and tube connection is described in the next chapter.

Quick start guide - Packing and connection of leaching columns

Care must be taken that all elements of the column closures are clean, dry and free from any grease. This is important to ensure the leak tightness of the system. All threads must be clean of any residues before screwing; any remaining particles could damage the components and therefore disturb the whole function of the system.

Before filling the leaching columns with the test material, the inlet tube must be attached to the column. It has to be passed through the borehole in the including grey PVC tube fitting, fitted with a seal ring at the threaded end and finally screwed with the column base together.



ecoTech Leaching columns

Before closing the tube fitting tightly, care must be taken that the tube extends into the column interior space to reach into the later sand filter bed (~0,5 cm). The tube fitting must be closed hand-tightly.

To protect the tube from intrusion of filter sand, some quartz wool is placed over the tube end.

In a next step, the glass tube with an O-ring seal is placed in the column base and the O-ring seal is pushed by hand into its basis.

After mounting the clamping ring the union nut (small columns) is screwed with the basis together and the clamp ring together with its fastener clamp (big column) are pressed against the basis respectively.

With the assembly of the big columns (435.100SC) care must be taken that the opposed fastener clamps are always closed simultaneously. One-sided closure can lead to none equal contact pressure and disturb the leak tightness of the system.

The German DIN 19528 defines how to pack the leaching column with the test material:

At first a 2 cm high filter sand bed is filled into the column, to ensure a regular flow of the eluent over the whole diameter of the column. The grain size of the filter sand should be 0,6-1,2 mm according to DIN 19528.

The leaching column including the lower sand filter has to be tared now. After that the test material is filled in by layers (H = 5cm).

Notice

It is advisable to rotate the column axially during the filling process with the test material several times. Thus an unwanted separation of the material within the column is avoided.

Layering within the test material might provoke preferential flow, an uneven saturation of the material and a different flow rate through the column than expected, in summary causing possible inaccurate or falsified test results.

After filling in each layer of test material into the leaching column, the material must be compacted. The DIN 19528 allows different methods: Drop weight, sieve shaker or by tapping the sides of the leaching column with a rubber mallet.

We recommend compacting the material with a drop weight to archive highest possible reproducibility. According to DIN 19528 – Annex E a drop weight should exert 1,5-2 g/cm² on the surface of the test material.

Supported by the standard specification FprCEN ISO/TS 21268-3:2009 (Soil quality – Leaching procedures for subsequent chemical and ecotoxicological testing of soil and soil materials – Part 3: Up-



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flow percolation test) a drop weight with a density of $6,4 \text{ g/cm}^3$ can be used. For a leaching column diameter of 65 mm it corresponds with a mass of 212 g. This weight is lifted 200 mm guided by a leading rod and dropped from this height. This step has to be repeated twice. After filling the test material into the leaching column, the column has to be tared now a second time, to know the exact mass of sampling material inside the column.

An upper sand filter bed with a height of $20 \pm 5 \text{ mm}$ is introduced than into the column. The column has to be completely full now. Before closing the column with the upper lid, the outlet tube has to be attached to the column lid. It has to be passed through the borehole in the including grey PVC tube fitting, fitted with a seal ring at the threaded end and finally screwed with the column base together. Before closing the tube fitting tightly care must be taken that the tube extends into the column interior space to reach into the later sand filter bed. The tube fitting is now closed hand-tight. To protect the tube from the intrusion of filter sand, some quartz wool is placed over the tube end. Care must be taken before closing the leaching columns; all components must be clean, dry and free from grease. Screw the union nut hand-tight (small columns), and watch an even clamping (big column), respectively.

If not enough test material is available, the lower sand filter bed can compensate the lack of material according to DIN 19528. To do so, the column must be packed upside down and then turned before connecting the tubes.

To increase the pressure resistance of the columns, the additional clamping device should be used.

If questions remain, please contact us directly:

ecoTech Umwelt-Meßsysteme GmbH

eMail: soil@ecotech-bonn.de

Phone: +49 (0) 228/850 44 7700