

Bulk Density Analysis for biochar produced in a Kon-Tiki under the Global Artisan standard.

Version 2 (9/18/23)

Bulk density of the unground sample as delivered must be analyzed following the procedures of DIN EN ISO 17828 or ASTM D291/D291M-20.

The sample has to be analyzed as produced and delivered.

The sample is neither dried nor milled.

NOTE:

Bulk density of biochar may be altered by transport, storage, or handling. Therefore, factors, such as vibrations, shocks, pressure, drying, and humidification, must be avoided when transporting the biochar from the production site to the laboratory.

A) For biochar with a maximum particle size of 50 mm

The minimum sample volume is 30 liters.

90% of the sample material must present a particle size below 50 mm, and no particle must be larger than 100 mm.

Use a measuring box of 300 mm x 300 mm x 350 mm. The measuring box is ideally made from steel or aluminum but can also be made from wood or plastic.

Add an indelible marker (e.g., by paint, adhesive tape) at the insight of the measuring box at the height of 300 mm.

Measure the weight of the measuring box.

Fill the measuring box up to the 300 mm height marker. Be exact!

Weight the measuring box with the biochar.

Dry the open measuring box for 24 h at 80 to 110 °C in a ventilated drying oven.

Measure the weight of the measuring box immediately when removing it from the drying oven.

Calculate the bulk density and water content using the following formula.

$$\text{Bulk density} = \frac{\text{Dry weight (=weight after drying – weight of measuring box)}}{\text{Biochar volume}}$$

$$\text{Water content} = \text{weight before drying} - \text{weight after drying}$$

B) For biochar with a particle size > 50 mm

For samples, where more than 10% of the particles present a particle size larger than 50 mm and/or present particles with a particle size > 100 mm, the necessary sampling volume becomes impracticable large (> 120 l). *Please contact in those cases the Ithaka Institute for further instructions and a practicable solution.*