

Application

RITTER has developed a CO₂ absorption bottle which **reliably absorbs more than 99% of CO₂ from biogas. Guaranteed! Without any indicator liquid for absorption limit!** This absorption bottle combined with the »RITTER Biogas Batch Fermentation System« provides the ideal solution for professional biogas research.

Operating Principle

The biogas generated in the fermentation bottles flows through a dip pipe into the absorption bottle (»bubbler«) containing the absorption solution. The world-wide unique design of the dip pipe with a bell-shaped "absorption chamber" enables previously unachievable high CO₂ absorption rates up to reaching the absorption limit through ...

- ▶ the large wetting surface of the biogas within the absorption liquid and
- ▶ the long holding time of the CO₂ inside of the absorption chamber.

Another outstanding effect is the fact that the RITTER Absorption System can operate without any absorption liquid indicator showing the limit of the absorption capacity. It is a general problem of such indicators that the colour doesn't change abruptly but continuously. Therefore, it is difficult for the user to recognize the true limit of the absorption capacity. In contrast to indicator systems the RITTER System guarantees an absorption rate of at least 99% up to reaching the absorption capacity limit. This capacity limit will be indicated by the MilliGascounter by measuring of the volume of methane remaining in the gas stream after absorbing the CO₂.



Technical Specifications

| | |
|--|---|
| | Volume 250 ml |
| Dimensions absorption bottle (»bubbler«) | Wide mouth GL80 with screw cap Overall dimensions ø D 95 mm x H 145 mm, weight 290 g |
| Material | Borosilicate glass |
| Dip pipe chamber volume | 8,3 ml |
| Holding time of CO ₂ bubble in dip pipe chamber | dependent on gas flow rate |
| Absorption solution | 3-molar caustic potash solution (KOH 3 mol/ltr in aqua dest.) |
| Gas in/outlet ports | PVDF screw-type tube connection for tube ø 4 _i / 6 _o mm |

Absorption Capacity

Definition:

The absorption capacity is that volume of CO₂ which is absorbed until the absorption rate is decreased from 100% (at the beginning) to 99%.

In other words: When the limit of absorption capacity is reached, the gas at the absorption bottle outlet contains 1% of CO₂.

Table of absorption capacities at various gas flow rates:

| | Biogas Input | Flow Rate [ml/h] | | | | | | |
|---|---|------------------|------|------|------|------|------|------|
| | | 50 | 100 | 200 | 300 | 500 | 750 | 1000 |
| CO ₂ absorption capacity, approx. [ltr]* | 60% CH ₄ / 40% CO ₂ | 13,4 | 12,1 | 8,8 | 7,9 | 7,8 | 7,7 | 7,6 |
| | 40% CH ₄ / 60% CO ₂ | 13,5 | 11,8 | 8,9 | 8,5 | 8,3 | 8,0 | 8,1 |
| Absorption capacity limit [ltr]** | 60% CH ₄ / 40% CO ₂ | 20,1 | 18,2 | 13,2 | 11,9 | 11,7 | 11,6 | 11,4 |
| | 40% CH ₄ / 60% CO ₂ | 9,0 | 7,9 | 5,9 | 5,7 | 5,5 | 5,3 | 5,4 |

* Per bottle filling 250 ml, absorption solution KOH 3 mol

** After the CO₂ was absorbed from the biogas, the MilliGascounter displays the volume of the pure methane. The CO₂ absorption capacity limit is reached when the MilliGascounter indicates the values the stated in the table above.

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The most recent version of this data-sheet can be found at <https://www.ritter.de/en/data-sheets/co2-absorption-bottle/>

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