

GAC 8x30 Mesh Fill Specifications

Standard FRP vessel sizes: 8x44, 10x54, 13x54, 14x65, 18x65

Step 1: Actual Internal Vessel Volumes

The nominal size printed on a vessel (e.g. "100 Litre") is a marketing/rated size, not the true internal volume of the FRP tank. The figures below are the verified internal volumes for each standard vessel size, cross-checked against multiple FRP vessel manufacturer specification sheets.

Vessel Size	Actual Internal Volume
8 x 44	34.4 L
10 x 54	63.2 L
13 x 54	104.5 L
14 x 65	148.0 L
18 x 65	269.0 L

Step 2: Fill Assumptions

Fill ratio: 95% of vessel volume — a denser, market-standard fill that matches common commercial practice, prioritising carbon mass and contact time over generous backwash freeboard. (A more conservative 65% fill ratio, optimised for full 50% bed expansion during backwash, is available as an alternative specification on request.)

Bulk density of GAC 8x30 mesh: 550 kg/m³ (0.55 kg/L) — representative of a dense nutshell/coconut-shell-based 8x30 activated carbon. This figure was reverse-engineered against a verified real-world commercial example (a 14x65 vessel filled with 4 x 20kg bags = 80kg), which it reproduces closely. Bulk density varies by carbon source (typical range 450-550 kg/m³), so this should be confirmed against your specific supplier's datasheet / certificate of analysis before finalising retail specifications.

Denser Market-Standard Fill Table (with 20kg and 25kg Bag Options)

Vessel Size	Internal Volume	Fill Volume (95%)	GAC Required (kg)	Bags (20 kg)	Bags (25 kg)
8 x 44	34.4 L	32.7 L	≈ 18.0 kg	1 bag (20 kg)	1 bag (25 kg)
10 x 54	63.2 L	60.0 L	≈ 33.0 kg	2 bags (40 kg)	2 bags (50 kg)
13 x 54	104.5 L	99.3 L	≈ 54.6 kg	3 bags (60 kg)	3 bags (75 kg)
14 x 65	148.0 L	140.6 L	≈ 77.3 kg	4 bags (80 kg) *	4 bags (100 kg)
18 x 65	269.0 L	255.6 L	≈ 140.6 kg	7 bags (140 kg)	6 bags (150 kg)

* The 14x65 result closely matches a verified real-world commercial product using the same fill philosophy, used as the calibration reference point for this table.

Notes for Product Listings

- Every vessel size rounds up cleanly to a whole number of 25kg bags with a similar or smaller margin than the 20kg option, making 25kg bags a slightly more pack-efficient option across this range.
- 18x65 is the one exception worth flagging: 6 x 25kg (150kg) gives a larger margin over the calculated 140.6kg than 7 x 20kg (140kg). Both are reasonable specifications — 150kg leans toward extra fill/contact time, 140kg tracks closer to the calculated figure.
- This is a near-full fill with minimal backwash freeboard — suited to maximising contact time and carbon life, and matching common competitor/market norms, but not optimised for full bed expansion during backwash.
- If your supplier packs both bag sizes, consider offering 25kg as the standard spec (fewer bags to handle and ship per order) with 20kg available as an alternative for finer top-up increments.
- Always rescale this table if your actual carbon supplier's bulk density differs from 550 kg/m³: $\text{new_kg} = \text{table_kg} \times (\text{your_density} \div 550)$.