Obround Tank (275/330 Oil Profile) volume formula

tankvolumecalc.com/formulas/obround-tank/

Total volume, exact partial fill, derivation, worked example and a copy-ready fill table.

TOTAL VOLUME

$$V = (\pi R^2 + W \cdot S) \cdot L, \quad R = W/2, \; S = Ht - W$$

PARTIAL FILL AT LIQUID DEPTH H

$h \le R: A = \text{seg}(R,h) \quad | \quad R < h \le R+S: A = \tfrac{1}{2}\pi R^2 + W(h-R) \quad | \quad h > R+S: A = \pi R^2 + WS - \text{seg}(R, Ht-h)$

Derivation

Flat sides with semicircular top and bottom — the real cross-section of standard heating oil tanks. The fill solves piecewise: a circular segment through the bottom dome, linear through the straight-walled middle, and total-minus-top-segment in the upper dome. Continuity at both junctions is enforced by our test suite, and the curve reproduces the Highland Tank gauge book within 2–3%.

Worked example

Take W = 27 in, Ht = 44 in, L = 60 in. Total capacity: 267.9 gal. At a stick reading of 17.6 in (40% of the 44 in maximum depth), the filled volume is 103.1 gal — 38.5% of capacity. Check it live on the calculator.

Fill ratio: % of depth → % of volume (the standard 275/330 profile (27″ × 44″ section))

Depth	Volume
5%	2.1%
10%	5.9%
15%	10.5%
20%	15.7%
25%	21.2%
30%	27%
35%	32.7%
40%	38.5%
45%	44.2%
50%	50%
55%	55.8%
60%	61.5%
65%	67.3%
70%	73%
75%	78.8%
80%	84.3%
85%	89.5%
90%	94.1%
95%	97.9%

Need the full inch-by-inch table for specific dimensions? The dip chart generator prints it as a laminate-ready PDF.

FAQ

Q. What is the formula for a obround tank (275/330 oil profile) volume?

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Total: V = (πR² + W·S)·L, R=W/2, S=Ht–W. Partial fill at depth h: h≤R: A=seg(R,h) | R<h≤R+S: A=½πR²+W(h–R) | h>R+S: A=πR²+WS–seg(R,Ht–h). Derivation and a worked example are above.

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Q. Is the fill-ratio table exact?

Yes — computed by the same engine as our calculators (the standard 275/330 profile (27″ × 44″ section)), verified by the automated test suite described on the methodology page.

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Q. Can I use this in a spreadsheet?

Yes — the formulas are closed-form (acos and sqrt only). Copy the 5%-step table for quick interpolation, or implement the formula directly for exact values.

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