

Buoyancy Calculations and Materials Properties sheet

Weight of 1 gallon of fresh water is: 8.345404 pounds.

Weight of 1 cu foot of fresh water is: 62.42718356 pounds

Specific gravity of water is: 1

Weight of 1 gallon of Propane is: 4.2 pounds

The specific gravity of propane liquid is 0.504

Specific Gravity of Concrete, Limestone w/Portland is 2.37

Concrete, Limestone w/Portland weighs 148 lbs per cubic foot.

Each cubic foot of concrete weighing 148 pounds in air contributes 85.57 pounds of ballast when the concrete is submerged in water.

For 500 gallon water capacity Propane tank:

Weight of Empty Propane tank in air is 949 pounds.

Weight of 500 gallons of water is: 4172.702 pounds

Propane tanks are filled to only 80% of their water capacity.

400 gallons of liquid propane weighs 1680 pounds,

500 Gallon Propane Tank (Water Capacity)	Weight range: 2629 pounds (in air, full of product) to Buoyancy of -3224 (submerged, empty of product)
In air tank empty weight:	+949 pounds
In air tank full weight:	+ 2629 pounds
Submerged tank full buoyancy:	-1544 pounds
Submerged tank empty buoyancy:	- 3224 pounds
Concrete for neutral buoyancy:	3224/85.57= 37.68 Cubic Feet
Concrete for Safety Factor of 1.3	37.68 x 1.3= 49.98 Cubic Feet
2 cubic Yards of concrete will provide ballast with a Safety Factor of 1.43	

Find practical dimensions of a rectangular concrete form accommodating 2 cubic yards (93,312 cubic inches) being certain to account for nominal dimensions of lumber:

Lumber Dimensions	
Nominal	Actual
2" x 12"	1- 1/2" x 11- 1/4"
2" x 4"	1-1/2" x 3-1/2"
Combined	1- 1/2" X 14 - 3/4"

Internal Form Dimensions accommodating 2 cubic Yards of concrete		
Form Height	Form Width	Form Length
14.75"	50.21"	126"
14.75 x 50.21 x 126= > 93,312 Cubic Inches (2 Cubic Yards)		