TANKS

SECTION UIP 11

DEFINITIONS AND COMMENTS

API refers to the standard specifications of the American Petroleum Institute.

ASME refers to the standard specifications for pressure tank design of the American Society of Mechanical Engineers.

WATER TANKS are normally measured in gallons.

OIL TANKS are normally measured in barrels of 42 gallons each.

STEEL RING CURB is a steel ring used to hold the foundation sand or gravel in place. The tank bottom is then placed on the sand. All tanks do not have curb rings.

HORTON SPHERE, HEMISPHEROID, DEWAR, etc., are types of large liquid- and gas-pressure vessels.

Many special tanks found in use cannot be included here, such as those for storage of exotic fuels, or those used in food or beverage processing which are in the nature of industrial processing equipment.

The costs of the tanks listed in this section are averages of total costs in place at the site including necessary foundations and tank fittings, but not pilings, pipe, fencing, site roads, etc.

The tanks included in this section are those used primarily for liquid and industrial storage.

The tank costs listed do not include an allowance for cathodic protection. Add 2% – 5% of the tank cost when found.

WEIGHTS AND MEASURES

1 gallon (water)	weighs	8.34 pounds
1 gallon	equals	.1337 cubic foot
1 gallon	equals	.1074 bushel
1 gallon	equals	.8327 Imperial gallon
1 gallon	equals	3.7853 liters
1 acre foot	equals	325,900 gallons
1 cubic foot	equals	.8032 bushel
1 barrel (oil)	equals	42 gallons
1 barrel (water)	equals	31.5 gallons

Pressure in pounds per square inch of column of water equals .434 times the height of the column in feet.

Circumference of a circle	=	3.1416 x the diameter
Area of a circle	=	.7854 x square of the diameter
Area of an ellipse	=	.7854 x product of both diameters
Volume of a sphere	=	.5236 x cube of the diameter
Volume of a cone	=	area of base x 1/3 of the altitude

Capacity in barrels (oil) = D^2 x .1399 x height
(diameter and height in feet)

Capacity in gallons = D^2 x 5.8748 x height
(diameter and height in feet)

Capacity in bushels = D^2 x .6308 x height
(diameter and height in feet)

CAPACITY OF CYLINDRICAL TANKS OR RESERVOIRS

(Per foot of depth or height.)

DIA. (feet)	U.S. (gallons)	BARRELS (42 gal.)	DIA. (feet)	U.S. (gallons)	BARRELS (42 gal.)
1	5.87	.14	32	6,016.2	143.2
2	23.50	.56	33	6,398.1	152.3
3	52.88	1.26	34	6,790.7	161.6
4	94.00	2.24	35	7,196.0	171.3
5	146.88	3.5	36	7,613.3	181.3
6	211.51	5.0	37	8,041.9	191.5
7	287.88	6.8	38	8,482.4	202.0
8	376.01	9.0	39	8,934.9	212.7
9	475.89	11.3	40	9,398.7	223.8
10	587.52	14.0	41	9,875.8	235.1
11	710.90	16.9	42	10,362.0	246.7
12	846.03	20.2	43	10,861.6	258.6
13	992.91	23.7	44	11,374.0	270.8
14	1,151.5	27.4	45	11,895.3	283.2
15	1,321.9	31.5	46	12,430.1	296.0
16	1,504.1	35.8	47	12,976.1	309.0
17	1,697.9	40.4	48	13,534.8	322.3
18	1,903.6	45.3	49	14,104.0	335.8
19	2,120.9	50.5	50	14,685.9	349.7
20	2,350.1	56.0	60	21,149.3	503.6
21	2,591.0	61.7	70	28,786.5	685.5
22	2,843.6	67.7	80	37,598.7	895.3
23	3,108.0	74.0	90	47,585.9	1,133.1
24	3,384.1	80.6	100	58,748.0	1,399.0
25	3,672.0	87.4	120	84,597.1	2,014.5
26	3,971.6	94.6	140	115,146.1	2,742.0
27	4,283.0	102.0	160	150,394.9	3,581.4
28	4,606.2	109.7	180	190,343.5	4,532.7
29	4,941.0	117.6	200	234,992.0	5,596.0
30	5,287.7	125.8	220	284,340.3	6,771.2
31	5,646.1	134.4	240	338,388.5	8,056.9

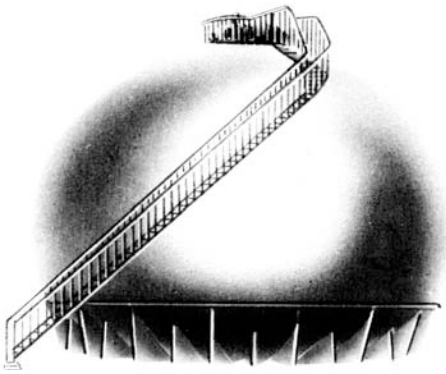
TYPICAL TANK LIVES

Tank lives can vary widely depending on the storage loads and conditions placed on the individual tank, the method of installation and appropriate maintenance and warranties. The typical lives listed below represent averages under standard applications. Lives may be shortened under severe requirements, such as extremely corrosive materials and/or atmospheric conditions or lengthened under very mild circumstances, by special coatings, double walls, etc.

	Years
Concrete tanks	30 – 55
Galvanized steel	15 – 20
Steel oil storage	25 – 30
Steel surface water storage	30 – 40
Elevated steel tanks	30 – 40
Underground steel, single wall	10 – 20
double walled	25 – 35
fiber coated	25 – 35
Galvanized steel chemical storage	3 – 17
Stainless steel chemical storage	15 – 30
Polyethylene chemical storage	15 – 20
Fiberglass chemical storage	15 – 20
Underground fiberglass	30 – 35
Wood	20 – 25
Steel pressure tanks	20 – 25

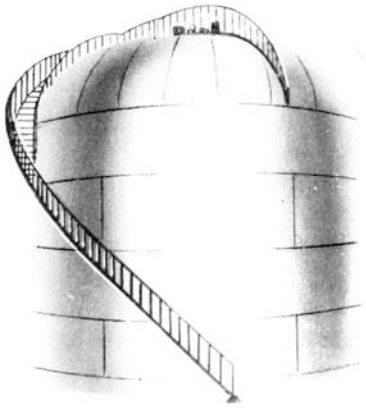
TANKS

SECTION UIP 11

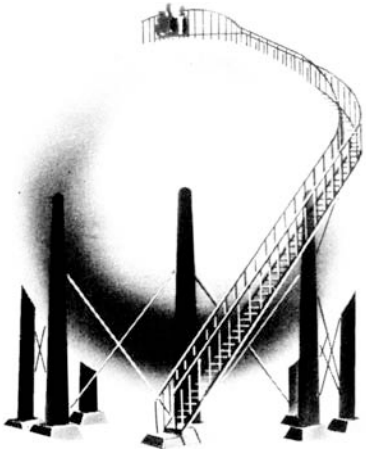


SPHEROID

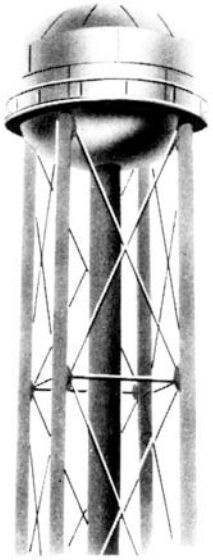
WOOD TANK ON TOWER



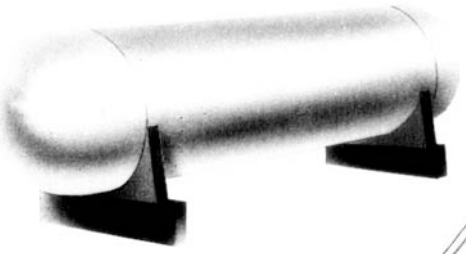
HEMISPHEROID



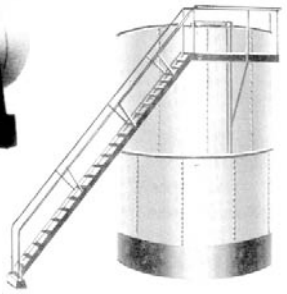
SPHERE FOR LIQUID STORAGE



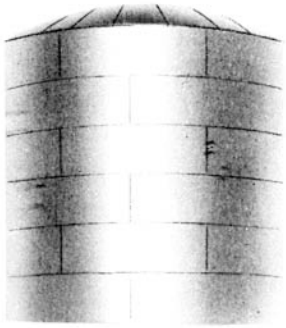
ELEVATED WATER TANK



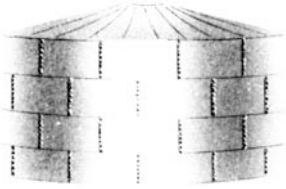
HORIZONTAL PRESSURE TANK



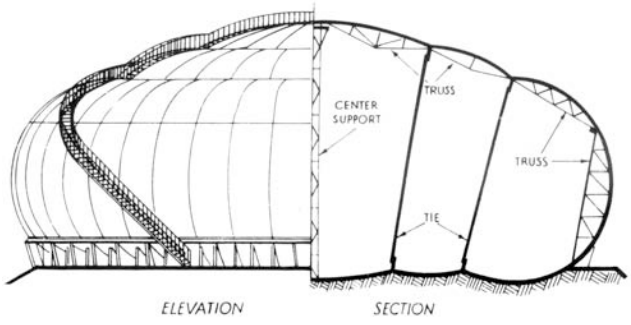
BOLTED STEEL – API



WELDED STEEL WATER TANK



GALVANIZED BULK STORAGE



HORTON SPHEROID

HEMISPHERICAL BOTTOM TANKS

CAPACITY (GALLONS)	DIAM. D	SIDE S	DEPTH T
3,000	8'	5' – 5"	9' – 5"
5,000	8'	10' – 10"	14' – 10"
10,000	10'	13' – 9"	18' – 9"
15,000	12'	13' – 9"	19' – 9"
20,000	14'	12' – 9"	19' – 9"
25,000	14'	17' – 1"	24' – 1"
30,000	16'	14' – 9"	22' – 9"
35,000	16'	18' – 1"	26' – 1"
40,000	16'	21' – 7"	29' – 7"
50,000	18'	20' – 3"	29' – 3"
60,000	20'	18' – 11"	28' – 11"
75,000	20'	25' – 5"	35' – 5"
100,000	24'	21' – 7"	33' – 7"
125,000	24'	29' – 0"	41' – 0"
150,000	26'	29' – 2"	42' – 2"
175,000	28'	28' – 9"	42' – 9"
200,000	28'	34' – 2"	48' – 2"
250,000	32'	30' – 11"	46' – 11"
300,000	34'	32' – 11"	49' – 11"
500,000	40'	40' – 0"	60' – 0"

ELLIPSOIDAL BOTTOM TANKS

CAPACITY (GALLONS)	DIAM. D	SIDE S	TOTAL T
20,000	16'	10' – 9"	14' – 9"
25,000	18'	10' – 3"	14' – 9"
30,000	18'	12' – 11"	17' – 5"
35,000	20'	11' – 9"	16' – 9"
40,000	20'	13' – 11"	18' – 11"
50,000	22'	13' – 11"	19' – 5"
60,000	24'	13' – 11"	19' – 11"
75,000	26'	14' – 9"	21' – 3"
100,000	30'	13' – 11"	21' – 5"
125,000	30'	13' – 9"	26' – 3"
150,000	34'	16' – 7"	25' – 1"
175,000	36'	17' – 1"	26' – 1"
200,000	38'	17' – 5"	26' – 11"
250,000	40'	20' – 1"	30' – 1"
300,000	40'	25' – 5"	35' – 5"
400,000	47'	23' – 1"	34' – 10"
500,000	51'	24' – 5"	37' – 2"
600,000	54'	26' – 1"	39' – 7"
750,000	58'	28' – 5"	42' – 11"
1,000,000	66'	28' – 3"	44' – 9"

TANKS

SECTION UIP 11

ELEVATED STEEL TANKS

Costs are averages for each of the high-stress and low-stress areas. A check of local building codes will indicate which areas require extra structural strength to resist possible hurricane or seismic forces. Costs include tank, tower, riser pipe, ladder, and other equipment normally installed, completely erected as well as typical foundations and painting.

LOW-STRESS AREAS

Average costs in areas not requiring earthquake-(including zone 1 areas) or hurricane-resistant structures.

CAPACITY	TOWER HEIGHT			
(gallons)	50'	75'	100'	150'
25,000	$ 152,000	$ 169,000	$ 196,000	$ 254,000
50,000	165,000	181,000	208,000	268,000
75,000	195,000	216,000	243,000	301,000
100,000	212,000	232,000	260,000	319,000
150,000	260,000	283,000	310,000	370,000
200,000	348,000	377,000	405,000	463,000
300,000	435,000	475,000	504,000	561,000
400,000	510,000	557,000	582,000	645,000
500,000	569,000	618,000	666,000	736,000
750,000	746,000	806,000	877,000	988,000
1,000,000	943,000	1,018,000	1,109,000	1,243,000
1,500,000	1,312,000	1,411,000	1,544,000	1,748,000
2,000,000	1,678,000	1,803,000	1,978,000	2,257,000

HIGH-STRESS AREAS

Average costs in areas requiring earthquake-(zones 3 and 4) or hurricane-resistant structures.

CAPACITY	TOWER HEIGHT			
(gallons)	50'	75'	100'	150'
25,000	$ 183,000	$ 203,000	$ 235,000	$ 304,000
50,000	197,000	218,000	250,000	321,000
75,000	233,000	259,000	292,000	362,000
100,000	254,000	279,000	312,000	384,000
150,000	311,000	340,000	373,000	444,000
200,000	417,000	452,000	487,000	556,000
300,000	521,000	571,000	604,000	674,000
400,000	612,000	669,000	699,000	775,000
500,000	683,000	743,000	799,000	883,000
750,000	895,000	969,000	1,053,000	1,186,000
1,000,000	1,132,000	1,221,000	1,332,000	1,492,000
1,500,000	1,574,000	1,695,000	1,855,000	2,098,000
2,000,000	2,015,000	2,165,000	2,376,000	2,709,000

RESERVOIRS

Average cost of cut and fill reservoirs with concrete or asphalt linings and metal, wood or concrete roof structures, per unit of rated capacity.

$ .25 to $ .29 per gallon or $80,000 to $94,750 per acre foot

WELDED STEEL WATER TANKS

Costs are average costs of surface reservoirs including typical tank ancillaries such as roofs, ladders, painting, fittings on tank, etc. Steel standpipes (height exceeds diameter) will cost 35% more. Sand and gravel foundations with steel retaining rings are included on those of 1,000,000 gallons capacity, or less, concrete foundations on larger tanks.

CAPAC.	COST	CAPAC.	COST	CAPAC.	COST
(gallons)		(gallons)		(gallons)	
10,000	$ 21,750	200,000	$131,250	2,000,000	$ 607,250
20,000	35,000	250,000	148,000	2,500,000	710,000
30,000	46,000	300,000	164,000	3,000,000	812,500
50,000	62,750	400,000	205,250	4,000,000	991,250
75,000	81,750	500,000	240,750	5,000,000	1,159,000
100,000	99,750	750,000	309,000	6,000,000	1,322,000
125,000	107,500	1,000,000	357,250	7,500,000	1,544,000
150,000	116,250	1,500,000	498,750	10,000,000	1,886,000

BOLTED STEEL WATER TANKS

Costs are average costs for factory coated, bolted steel surface reservoirs erected on sand or gravel with a steel ring curb, including typical accessories such as roof, ladders, manways, vents, fittings on tank, and liquid level indicators, etc. Concrete foundations cost an additional $5.00 to $6.75 per cubic foot. Tank and foundation costs depend on seismic zone. For areas requiring earthquake resistant structures add 5% to the tank cost and use $7.75 per cubic foot for a concrete foundation cost. Modular knockdown containment tanks with membrane liner and cover will cost 5% to 15% less.

CAPAC.	DIMEN.	TANK	CAPAC.	DIMEN.	TANK
(gallons)	(d x h)	COST	(gallons)	(d x h)	COST
10,000	15' x 8'	$13,500	300,000	47' x 24'	$ 94,250
30,000	18' x 16'	23,500	400,000	53' x 24'	119,250
100,000	26' x 20'	38,250	500,000	60' x 24'	150,000
125,000	29' x 24'	46,750	600,000	64' x 24'	175,250
150,000	32' x 24'	55,500	900,000	78' x 24'	245,750
200,000	37' x 16'	69,250	1,200,000	91' x 24'	326,500

CONCRETE WATER TANKS

Costs are averages of completely erected surface reservoirs, including foundations, dome roofs, and typical tank ancillaries. Sitework and exterior piping are extra. Small precast modular tanks, up to 30,000 gallons, cost $5,325 to $6,450 per 5,000-gallon module.

CAPAC.	COST	CAPAC.	COST	CAPAC.	COST
(gallons)		(gallons)		(gallons)	
10,000	$ 40,500	200,000	$250,000	2,000,000	$ 865,500
20,000	61,500	250,000	284,000	2,500,000	967,500
30,000	77,750	300,000	346,000	3,000,000	1,120,000
50,000	107,250	400,000	376,500	4,000,000	1,344,000
75,000	134,500	500,000	407,500	5,000,000	1,578,000
100,000	159,000	750,000	509,000	6,000,000	1,832,500
125,000	180,000	1,000,000	585,500	7,500,000	2,138,000
150,000	203,250	1,500,000	718,000	10,000,000	2,749,000

TANKS

SECTION UIP 11

WOOD TANKS

Costs are averages for redwood or fir tanks completely erected on the buyer's foundation. Add 33% for cypress tanks. Sizes given are typical diameters and heights, in feet. Smaller tanks up to 10,000 gallons have 2" staves, larger tanks have 3". For elevated tanks, add tower cost. Add $36 to $41 per foot of diameter for sand and gravel foundation with retaining ring. Concrete slab foundation costs an additional $5.00 to $6.75 per cubic foot. Add wood cover, joists, and ladders to basic tank cost as necessary.

CAPACITY (gallons)	SIZE (d x h)	TANK COST	FLAT COVER	CONICAL COVER	CHIME JOISTS	WOOD LADDER	STEEL LADDER
200	4 x 3	$ 1,250	$ 225	-----	$ 45	-----	-----
300	4 x 4	1,550	225	-----	45	-----	-----
500	5 x 4	2,050	310	$ 600	55	-----	-----
1,000	6 x 6	3,125	450	705	90	$135	$180
1,500	7 x 6	4,000	505	840	125	135	180
2,000	8 x 6	4,800	590	980	150	135	180
3,000	8 x 8	6,025	590	980	150	175	225
4,000	10 x 8	7,175	785	1,315	240	175	225
5,000	11 x 8	8,675	980	1,540	310	175	225
7,500	12 x 10	10,650	1,290	1,735	355	215	270
10,000	14 x 10	13,450	1,485	2,100	530	215	270
15,000	14 x 14	19,150	1,485	2,100	530	290	360
20,000	16 x 14	23,625	1,840	2,855	715	290	360
30,000	18 x 16	30,575	2,085	3,415	905	320	405
50,000	22 x 18	42,325	2,610	4,590	1,125	365	450
75,000	26 x 20	54,500	3,155	5,710	1,350	405	495
100,000	30 x 20	66,250	3,495	7,030	1,725	405	495
150,000	37 x 20	86,400	4,915	9,185	2,525	405	495
200,000	43 x 20	104,325	5,675	11,370	3,100	405	495

GALVANIZED STEEL TANKS

Costs are averages of 13- to 20-gauge, coated, corrugated steel tanks, installed or erected on the buyer's foundation. Prices include conical roof with manhole, freight and typical accessories. Deduct 15% for open tanks. Add $36 to $41 per foot of diameter for sand and gravel foundation with retaining ring. Add an additional $5.00 to $6.75 per cubic foot for concrete slab foundation. For elevated tanks, add tower cost.

CAPAC. (gallons)	DIMEN. (d x h)	TANK COST	CAPAC. (gallons)	DIMEN. (d x h)	TANK COST
500	4 x 5½	$1,000	10,000	12 x 12	$ 7,400
1,000	6 x 5	1,650	15,000	15 x 11	9,200
2,000	7 x 6½	2,650	20,000	18½ x 11	12,775
3,000	8 x 8	3,275	30,000	22 x 11	17,650
4,000	8 x 11	3,975	50,000	24 x 15	25,500
5,000	9 x 10	4,525	75,000	34 x 11	37,800
7,500	10 x 12	6,100	100,000	34 x 15	47,875

TOWERS

Costs are averages of painted towers for flat-bottom tanks, including added cost of erection of tank above ground, footings, piping to ground, valves, balconies, ladders to balconies, and indicator gauges.

CAPAC.	TOWER HEIGHT				
(gallons)	12'	25'	50'	75'	100'
1,000	$ 3,900	$ 4,750	-----	-----	-----
1,500	4,500	5,750	$ 9,400	-----	-----
2,000	5,050	6,350	10,350	$16,350	-----
3,000	5,900	7,300	11,650	18,500	$29,400
5,000	6,900	8,800	13,950	21,300	33,600
10,000	9,250	11,150	17,350	26,300	40,050
20,000	14,350	17,300	26,500	39,250	58,400
30,000	17,000	20,250	30,200	44,800	65,950
40,000	18,850	22,750	33,600	49,350	71,400
50,000	-----	25,050	36,350	52,600	79,000
75,000	-----	-----	42,300	62,000	96,050

In areas subject to earthquakes or hurricanes, a rough estimate of additional cost can be obtained from the following formulas:

12' towers . . . . . $1,000 plus $ .031 per gallon of tank capacity
25' . . . . . 1,475 plus $ .045 per gallon of tank capacity
50' . . . . . 2,275 plus $ .059 per gallon of tank capacity
75' . . . . . 3,875 plus $ .086 per gallon of tank capacity
100' . . . . . 6,550 plus $ .113 per gallon of tank capacity

TANKS

SECTION UIP 11

VAULTED ABOVEGROUND PETROLEUM STORAGE TANKS

Costs are average for UL-listed cylindrical internal steel tanks encased inside a 6" precast concrete vault, providing a 4-hour fire wall and ballistic protection. The protective concrete outer shell is precast in two sections, allowing periodic internal tank inspection. Concrete support legs are cast monolithic with the lower section of the concrete vault. Costs include fittings and installation on the buyer's foundation. For supplemental internal overspill containment tank (7 to 25 gallons), add $900 to $2,250. For steps and platform, add $575 to $2,625.

CAPACITY	SIZE	SINGLE COMPARTMENT		DUAL COMPARTMENT	
(gallons)	(feet)	Single Wall	Double Wall	Single Wall	Double Wall
300	4½ x 7	$ 7,500	$ 9,425	-----	-----
550	5½ x 7	8,475	10,725	-----	-----
1,000	5½ x 12	10,900	13,950	$12,325	$15,675
2,000	7 x 14	16,650	21,550	18,200	23,525
4,000	9½ x 13	26,000	34,000	30,250	39,250
6,000	9½ x 18	33,500	43,750	37,750	49,250
8,000	9½ x 23	44,750	58,250	48,750	63,500
10,000	9½ x 29	48,750	63,500	52,750	68,500
12,000	9½ x 34	58,750	77,000	63,250	82,250

UNDERGROUND FUEL STORAGE

Costs are averages for fiberglass and steel tanks, completely installed, including fittings, access manway, excavation and backfill. For multiple installations, two or more in one hole, deduct 7% for each extra tank, considering the largest tank in the hole as the base. For difficult soil conditions, add for extra cost of excavation and bedding, as necessary. All tanks carry Underwriters' Label. Add $5.00 to $6.75 per cubic foot for concrete pad. Costs do not include piping. Add $3,125 to $4,725 for leakage-monitoring system per tank. Sizes are approximate averages of all tank types. For multi-compartment tanks, add $3,800 to $7,625 per tank.

NOMINAL			FIBERGLASS		STEEL (sti-P3)		FIBER COATED STEEL	
CAPACITY	DIAMETER	LENGTH	SINGLE WALL	DOUBLE WALL	SINGLE WALL	DOUBLE WALL	SINGLE WALL	DOUBLE WALL
(gallons)	(feet)	(feet)	TANK COST	TANK COST	TANK COST	TANK COST	TANK COST	TANK COST
300	3	5	-----	-----	$ 2,700	$ 3,975	$ 3,000	-----
550	4	6	$ 4,100	$ 7,175	3,075	4,600	3,975	$ 5,500
1,000	4	11	5,050	9,250	4,025	6,900	4,875	7,275
2,000	6	10	6,375	11,525	5,275	8,250	6,150	8,950
3,000	6	13	7,225	12,900	5,875	9,625	7,000	11,100
4,000	7	15½	8,150	15,025	6,850	10,750	7,900	11,750
5,000	8	13½	9,300	16,250	7,850	13,375	8,925	14,275
6,000	8	18	10,750	18,925	9,300	15,200	10,350	16,175
8,000	8	23	11,975	20,025	10,425	17,075	11,600	18,250
10,000	8	29	14,325	23,250	12,675	20,900	13,900	22,400
12,000	8	34	16,525	26,375	14,275	22,725	15,950	25,525
15,000	10	29	20,150	31,925	17,475	30,350	19,600	31,075
20,000	10	37	26,325	40,050	22,675	35,000	25,475	37,850
25,000	12	33	32,475	48,725	28,275	43,500	31,350	45,925
30,000	12	41	38,925	56,850	33,325	52,350	37,250	53,750
50,000	12	60	64,400	89,600	52,650	81,475	-----	82,600

TANKS

SECTION UIP 11

WELDED STEEL TANKS

(API)

Costs are averages for tanks erected on sand or gravel with steel ring curb, and include cone roofs with supports as needed, outside ladder, roof and shell manholes, threaded and/or flanged openings as needed for operation, roof vents, and paint. Catwalks, stairways, and platforms are not included.

CAPAC. (barrels)	SIZE (feet)	TANK COST	CAPAC. (barrels)	SIZE (feet)	TANK COST
2,000	30 x 16	$ 58,500	75,000	120 x 36	$ 504,000
3,000	30 x 24	66,000	100,000	140 x 37	648,500
4,000	30 x 32	75,000	125,000	160 x 35	788,500
5,000	38 x 24	85,000	150,000	180 x 33	924,000
7,500	38 x 36	98,500	200,000	200 x 36	1,127,750
10,000	55 x 24	124,000	250,000	220 x 36	1,288,000
15,000	55 x 36	155,750	300,000	240 x 37	1,512,000
20,000	60 x 40	189,250	350,000	260 x 37	1,680,000
30,000	80 x 34	252,000	400,000	260 x 42	1,876,000
50,000	90 x 44	360,750	500,000	280 x 46	2,236,750

Add $975 to $1,775 per foot of diameter for pontoon floating roof. Add $1,075 to $1,325 per foot of diameter for double-deck roof.

BOLTED STEEL TANKS

(API)

Costs include roof deck and supports, sand and gravel foundation with retaining ring, painting and typical basic fittings. Sizes are approximate diameter and height of typical tanks.

CAPAC. (barrels)	SIZE (feet)	TANK COST	CAPAC. (barrels)	SIZE (feet)	TANK COST
100	9 x 8	$ 6,250	2,000	30 x 16	$ 58,500
200	9 x 16	9,750	3,000	30 x 24	66,250
500	16 x 16	21,250	5,000	39 x 24	76,750
750	16 x 24	28,250	7,500	39 x 36	94,000
1,000	22 x 16	35,000	10,000	55 x 24	114,000
1,500	22 x 24	47,500	15,000	55 x 36	148,000

For bulk oil loading rack platforms, see Section UIP 14.

HORIZONTAL BULK STORAGE

Costs are averages for completely installed steel tanks, including saddles or legs, and fittings, on owners' foundations. Typical tank dimension is diameter x length.

CAPAC. (gallons)	SIZE (feet)	COST	CAPAC. (gallons)	SIZE (feet)	COST
1,000	4 x 10	$2,175	7,500	7 x 26	$ 6,250
1,500	5 x 9	2,425	10,000	10 x 17	7,775
2,000	5 x 12	2,750	12,500	10 x 21	9,400
3,000	5 x 18	3,425	15,000	10 x 25	10,950
4,000	6 x 19	3,975	20,000	10 x 34	14,100
5,000	6 x 24	4,650	25,000	10½ x 39	17,325
6,000	7 x 21	5,150	30,000	10½ x 46	20,075

VERTICAL BULK STORAGE

Costs are averages of 10- and 12-gauge bolted galvanized tanks, including sand and gravel foundations, fittings and roof. Concrete slab foundations cost an additional $5.25 to $7.00 per cubic foot. Typical tank dimension is diameter x height.

CAPAC. (gallons)	SIZE (feet)	COST	CAPAC. (gallons)	SIZE (feet)	COST
2,000	7 x 8	$4,050	15,000	13 x 16	$13,150
3,000	8 x 8	4,850	20,000	14 x 18	16,375
4,000	8 x 11	5,550	30,000	17 x 19	23,325
5,000	9 x 11	6,250	40,000	19 x 20	30,250
7,500	10 x 13	7,975	50,000	21 x 20	36,600
10,000	11 x 15	9,825	60,000	23 x 20	43,800

HORIZONTAL PLASTIC TANKS

Costs are averages for completely installed fiberglass or polyethylene tanks, including saddles or legs, and fittings, on owners' foundations. Sizes are approximate diameters and length sof typical tanks.

CAPAC. (gallons)	SIZE (feet)	COST	CAPAC. (gallons)	SIZE (feet)	COST
125	2½ x 3½	$ 550	1,000	4 x 11½	$2,250
250	3 x 4	675	1,500	5 x 11	3,575
500	4 x 6	1,250	2,000	8 x 12	5,050
750	4 x 9	1,725	2,500	10 x 12	6,275

VERTICAL PLASTIC TANKS

Costs are averages for fiberglass or polyethylene tanks completely erected on buyers' foundations, including fittings and roof. Add $38 to $44 per foot of diameter for sand and gravel foundation with retaining ring. Concrete slab foundations cost an additional $5.25 to $7.00 per cubic foot. Sizes are approximate diameters and heights of typical tanks.

CAPAC. (gallons)	SIZE (feet)	COST	CAPAC. (gallons)	SIZE (feet)	COST
500	4 x 6	$ 675	4,000	8 x 12	$ 4,825
750	4 x 9	975	5,000	8½ x 12½	5,975
1,000	5 x 7	1,300	6,500	10 x 12	7,675
1,500	5 x 10½	1,925	9,000	12 x 12	10,525
2,000	7 x 7	2,250	12,000	12 x 14½	14,000
2,500	8 x 7½	2,725	16,000	14 x 14	18,200
3,000	8 x 9	3,225	20,000	15 x 15	22,350

VERTICAL WELDED TANKS

Costs are averages for mild steel welded tanks, including sand and gravel foundations, fittings and roof. Concrete slab foundations cost an additional $5.00 to $6.75 per cubic foot. Sizes are approximate diameters and heights of typical tanks.

CAPAC. (gallons)	SIZE (feet)	COST	CAPAC. (gallons)	SIZE (feet)	COST
1,500	7 x 6	$ 3,975	15,000	13 x 16	$13,625
2,000	7 x 8	4,200	20,000	14 x 18	16,900
4,000	8 x 11	5,750	30,000	17 x 19	24,125
5,000	9 x 11	6,475	40,000	19 x 20	31,300
7,500	10 x 13	8,250	50,000	21 x 20	38,275
10,000	11 x 15	10,175	60,000	23 x 20	45,450

NOTE: Plastic tank prices can vary plus or minus 15% depending on the corrosive strength of the material being stored. For fiberglass underground corrosive strength chemical storage tanks see Underground Fuel Storage/Fiberglass and add 15% to 25%.

TANKS

SECTION UIP 11

BOLTED INDUSTRIAL BINS

CYLINDRICAL

The following costs are averages of bolted industrial bins for dry storage, installed without bottoms on buyers' slabs. Add $6.75 to $8.00 per cubic foot of slab.

DIAM.	HEIGHT	CAPAC.	COST		
(feet)	(feet)	(cu. ft.)	to 55#/cu. ft.	to 80#/cu. ft.	to 100#/cu. ft.
9	24	1,614	$ 6,025	$ 6,550	$ 6,950
	32	2,152	7,650	8,150	7,600
	40	2,690	8,850	9,475	10,300
	56	3,776	11,475	12,100	13,225
	72	4,842	13,825	-----	-----
12	24	2,873	9,300	9,775	10,575
	32	3,830	11,025	11,950	12,600
	40	4,750	15,075	15,800	16,850
	56	6,700	18,125	19,300	20,475
	72	8,620	21,150	-----	-----
15	24	4,485	12,500	13,300	14,075
	32	5,980	15,625	16,650	17,550
	48	8,970	21,475	22,725	24,050
	64	11,960	27,025	28,550	30,275
	80	14,966	32,300	-----	-----
18	24	6,456	16,200	16,950	17,875
	40	10,760	24,250	25,625	26,925
	56	15,064	31,725	33,575	35,300
	72	19,389	38,875	40,800	-----
	88	23,716	45,725	-----	-----
21	32	11,725	26,600	27,975	29,400
	40	14,669	31,575	32,900	34,900
	56	20,531	40,775	42,450	44,750
	72	26,424	48,900	51,325	-----
	88	32,315	57,475	-----	-----
26	32	17,284	37,025	38,500	40,450
	48	25,948	48,900	51,000	-----
	64	34,635	60,800	62,825	-----
	72	43,322	67,400	-----	-----
	88	52,009	79,300	-----	-----
32	32	26,378	50,225	-----	-----
	40	33,006	59,800	-----	-----
	56	46,264	76,975	-----	-----
	72	59,521	93,500	-----	-----
	88	72,778	108,350	-----	-----

BOLTED INDUSTRIAL BINS

HOPPERS

The following costs are averages of bolted industrial bins for dry storage, installed with necessary structural members on concrete footings.

DIAM.	HEIGHT	CAPAC.	COST		
(feet)	(feet)	(cu. ft.)	to 55#/cu. ft.	to 80#/cu. ft.	to 100#/cu. ft.
9	16	714	$ 6,675	$ 7,475	$ 7,875
	24	1,250	8,200	8,875	9,375
	32	1,785	9,325	10,100	10,750
	40	2,320	10,425	11,050	11,700
12	16	1,248	9,875	10,500	11,175
	24	2,200	12,225	13,150	14,050
	32	2,160	13,775	14,600	15,725
	40	4,115	15,725	16,900	18,200
	56	6,035	18,625	19,800	21,075
15	24	3,090	16,150	17,050	18,200
	32	4,545	19,350	20,350	21,750
	40	6,040	21,850	23,075	24,775
	48	7,515	24,300	25,575	27,375
	56	8,990	26,325	27,925	29,700
18	24	4,235	20,850	22,150	23,550
	32	6,380	25,150	26,925	28,475
	40	8,535	29,000	30,800	32,850
	48	10,658	32,175	34,500	36,375
	56	12,850	35,225	37,550	39,950
21	24	5,325	25,575	27,100	29,000
	32	8,295	32,050	34,075	36,250
	40	11,220	37,575	40,000	42,600
	48	14,145	42,025	44,800	47,750

TANKS

SECTION UIP 11

WELDED STEEL PRESSURE TANKS

(ASME design pressure, 250 psig)

Costs are for complete standard horizontal installation on legs or saddle pads, including normal fittings on tank but not pipe, valves, or foundation. Bulk storage pressure tank prices can vary plus or minus 10% depending on shell specifications. Individual design can add 50% to 300% to the costs, depending on size. Sizes are typical nominal diameters and lengths for storage of propane, butane or ammonium sulfate, etc.

CAPAC. (gallons)	SIZE (feet)	COST	CAPAC. (gallons)	SIZE (feet)	COST
125	2 x 5½	$ 650	6,500	7 x 26	$ 24,175
250	2½ x 8	875	9,000	7 x 35	29,075
500	3 x 10	1,550	12,000	7 x 45	35,700
1,000	3½ x 15	2,750	15,000	7 x 54	43,750
1,500	5 x 11	4,100	20,000	9 x 49	54,500
2,000	5 x 15	5,375	30,000	11 x 47	76,500
2,500	5 x 19	6,675	45,000	11 x 63	109,250
3,000	5 x 22	7,600	60,000	11 x 90	142,000
4,000	5 x 29	10,025	90,000	11 x 133	208,250

FABRIC PILLOW TANKS

Average costs of rubber- or vinyl-coated fabric pillow tanks, which lay flat when empty and assume a “pillow” configuration when full of liquid. Costs include typical tank ancillaries. Sitework and exterior piping are extra.

CAPACITY (gallons)	SIZE (feet)	POTABLE WATER, FUELS AND OILS	CHEMICALS AND MILD SOLUTIONS
100	6 x 4	$ 1,325	$ 1,175
250	9 x 5	1,675	1,400
500	10 x 7	2,150	1,725
1,000	12 x 9	2,975	2,300
2,000	13 x 12	4,350	3,350
3,000	14 x 14	5,350	4,025
5,000	17 x 16	7,250	5,400
7,500	20 x 19	9,200	6,800
10,000	21 x 22	10,900	8,000
15,000	24 x 25	13,525	9,775
20,000	30 x 25	16,475	11,750
25,000	36 x 25	19,125	13,525
50,000	65 x 25	35,875	25,275
100,000	85 x 35	59,975	44,100

LARGE PRESSURE TANKS

Costs are averages including erection, structural supports, normal foundations and appurtenant equipment. These tanks are all individually designed, and costs vary greatly. Sphere wall thickness will cause costs to vary plus or minus 20%. For areas requiring earthquake- or hurricane-resistant structures, increase costs by 15%.

SPHERES

DIAMETER (feet)	CAPAC. (cu. ft.)	COST	DIAMETER (feet)	CAPAC. (cu. ft.)	COST
20	4,190	$ 96,000	40	33,510	$282,050
25	8,180	135,950	45	47,715	338,400
30	14,135	180,800	50	65,450	397,400
35	22,450	230,000	60	113,095	527,750

HEMISPHEROIDS

CAPACITY	5 LB. W.P.	10 LB. W.P.	25 LB. W.P.
105,000 gallons	$134,000	$154,500	$180,000
210,000 gallons	190,500	225,000	271,000
420,000 gallons	275,000	328,500	409,500
840,000 gallons	393,000	478,000	620,000

DEWAR TANKS (CYROGENIC, 250 LB. W.P.)

VERTICAL

CAPACITY	COST	CAPACITY	COST
500 gallons	$25,250	6,000 gallons	$ 68,150
1,000 gallons	33,900	9,000 gallons	94,000
3,000 gallons	47,050	12,000 gallons	111,550

HORIZONTAL

CAPACITY	COST	CAPACITY	COST
500 gallons	$27,800	6,000 gallons	$ 86,500
1,000 gallons	38,100	9,000 gallons	117,500
3,000 gallons	53,800	12,000 gallons	139,400