PRODUCT CATALOG

DESIGN
TANKS

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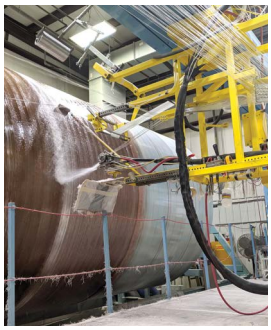
CENTRIFUGALLY CAST FIBERGLASS TANKS

CHOP-HOOP FILAMENT WINDING



BRINEMAKER TANKS

ACCESSORIES

INTRODUCTION

Design Tanks, located in Sioux Falls, South Dakota, has been manufacturing fiberglass tanks for over fifty years in the Midwest.

Although the name has changed, the faces have not. Through streamlining the manufacturing and administrative process, we are able to deliver our product to the customer quicker than ever; whether you need it in CA, TX, MN, NY, the Philippines, or any point in between.

Our in-house design staff can take care of your most difficult design specifications and provide you with the answers you require.

RESIN SELECTION PROCESS:

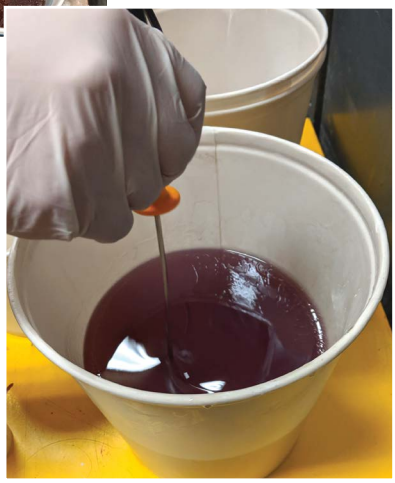
- Design Tanks will work with the customer to determine the proper resin selection based on the chemical content of the tank as well as the environment the tank will be in.

- Key pieces of information for resin selection include chemical composition of contents including concentrations, operating temperature of the contents, and special requirements (ex. food grade or fire retardant).

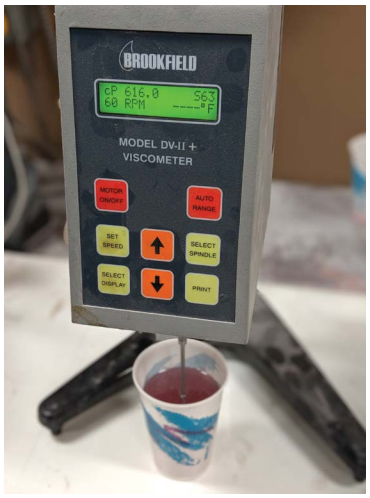
- Design Tanks uses two bulk resin systems, an isophthalic polyester, and a vinyl ester. The isophthalic polyester is cost effective and covers a broad range of chemical environments while the vinyl ester can be used for an even broader range of chemicals at higher temperatures and more severe concentrations.

- When one of DT's two bulk resin systems doesn't work with the chemical environment, we will utilize special-order resin systems.

- Design Tanks works closely with the resin manufacturers to choose the most suitable resin which will result in the longest service life for the tank. This includes using Design Tank long history of experience and the resin manufacturers knowledge in order to know how to work with the specific resin system to finish with the highest quality product.



- Whichever resin system is chosen, it will be used for all fiberglass parts in the tank including the tank wall, flanges, and all fiberglass parts inside the tank.



CENTRIFUGAL CASTING – THE PROCESS

Originally pioneered more than **five decades** ago as a method to construct high performance gondolas for atmospheric test balloons, the centrifugally cast process developed into and remains one of the most versatile and economical methods of producing high-quality fiberglass tanks. It provides all of the mechanical strength necessary for liquid storage plus the superior chemical resistance capability of a high resin-to-glass ratio wall construction.

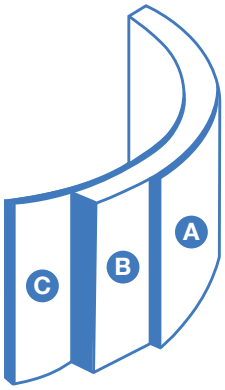
By utilizing centrifugal force to combine resin and glass, the process provides tanks with a dense uniform wall laminate capable of a 70% resin content. For all practical purposes, the entire wall becomes a resin-rich, chemical-resistant barrier that can be custom designed for specific requirements ranging from the storage of corrosive chemicals such as hydrochloric acid and sodium hydroxide to food grade applications.

The spin cast tank is produced inside a smooth metal cylinder. First the end section, which is sprayed up in a separate mold, is inserted into the cylinder at a point determined by tank capacity. This flexibility allows us to manufacture a variety of sizes without changing tooling. For example a 32" diameter tank can be made to hold any capacity between 100 and 300 gallons by adjusting the distance that the head is placed into the mold.

After the end section has been located, sidewall construction begins by applying a 10 to 15 mil layer of resin coat or gel coat to the spinning mold. This provides the tank with its desired color and the distinctive exterior finish.

The backbone of the tank, the structural wall and corrosion barrier, is constructed next by combining chemical resistant resin with chopped strand "E" glass for strength. Chopped glass has been selected to minimize potential wicking problems sometimes associated with other reinforcements. The resin saturated chopped strand reinforcement is sprayed into the mold in layers and then rolled to remove trapped air bubbles to insure a dense uniform laminate. This process is then repeated with each additional resin/glass layer to meet the design wall thickness.

- **A** A 10-15 mil layer of pure or pigmented resin is applied to the mold surface.
- **B** Chopped "E" glass is added to meet design thickness.
- **C** 7-10 mils of pure resin is applied to the inside surface.



End section is inserted into position determined by desired capacity.

Color is applied by spraying gel coat into the mold.

CENTRIFUGAL CASTING – THE PROCESS

SPECIFICATIONS:

Centrifugally cast tanks manufactured by Design Tanks are designed to meet or exceed the strength requirements of ASTM D4097-01.

Standard catalog tanks are built to hold liquid with a specific gravity of 1.3 at a safety factor of not less than 10:1. Tanks designed to hold heavier materials are available upon request. Contact the factory for specific requirements.

Centrifugally cast tanks can be manufactured for food grade applications depending upon resin selection.

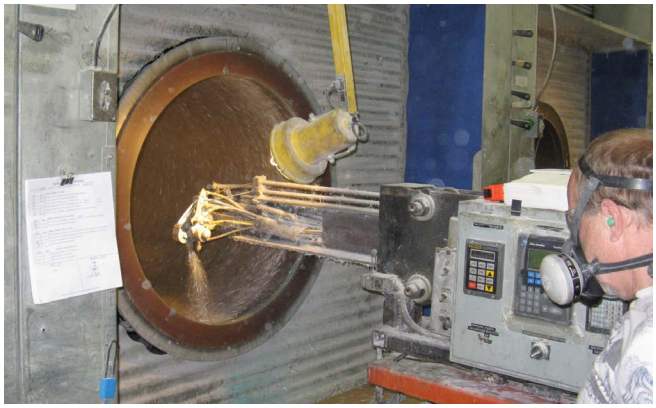
In tanks 24” through 48” diameter, the entire wall is constructed from a single resin system throughout. Larger diameter tanks (60” through 90” diameter) feature the additional flexibility of manufacturing with a dual resin system to achieve a high quality tank at an economical price.

Upon completion of the wall, the inside surface is coated with 7 to 10 mils of pure resin to give the interior of the tank a smooth corrosion-resistant barrier. In highly corrosive applications, such as the storage of caustic materials, a layer of synthetic veil is added before the final resin coat to provide further resistance to chemical attack.

After curing in the mold, the tank is removed by air pressure, checked for quality and sent to the final assembly area for the installation of accessories. Centrifugally cast tanks are available in several sizes and styles. Each can be constructed from a number of resin systems to meet specific chemical and temperature requirements. Refer to resin selection guide to determine material compatibility.

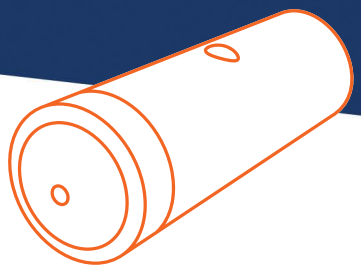
PROPERTIES (MINIMUM)

Tensile strength (PSI)	14,000 ASTM D638-96
Tensile modulus (PSI)	800,000 ASTM D638-96
Compressive strength (PSI)	18,000 ASTM D695-96
Coefficient of thermal expansion (in./in./°F x 10–6)	12 ASTM D-696-91
Flexural modulus (PSI)	600,000 ASTM D790-96a
Flexural strength (PSI)	19,000 ASTM D790-96a

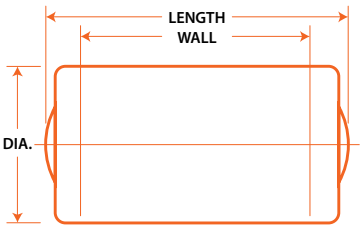


Resin and chopped glass is sprayed into the revolving mold.

Once cured, the finished product is removed from mold.



CENTRIFUGALLY CAST HORIZONTAL FIBERGLASS TANKS



Horizontal fiberglass tanks can be designed for either stationary storage or non/D.O.T. regulated mobile applications. Tanks must be properly supported during use.

- **Baffles are recommended for mobile applications whenever the tank length to diameter ratio exceeds 1.5.**

NOTES:

1) Tanks are designed for atmospheric pressure only and must be vented! Follow vent specifications.
2) Centrifugal cast tanks provide the superior chemical resistance capability of a high resin-to-glass ratio wall construction, and the most aesthetically pleasing exterior appearance in the industry.

TOTAL CAPACITY (GAL.)	DIAMETER X LENGTH (IN.)	APPROX. WALL LENGTH (IN.)	APPROX. WALL THK. (IN.)	APPROX. WEIGHT (LBS).	NO. OF SADDLES REQUIRED
55	24 x 32	20	1/8	28	2
65	24 x 37	25	1/8	30	2
85	24 x 47	36	1/8	34	2
110	24 x 60	49	1/8	40	2
130	24 x 71	59	5/32	56	3
110	30 x 43	30	1/8	46	2
150	30 x 57	44	1/8	51	2
200	30 x 75	63	5/32	74	3
150	32 x 49	32	1/8	53	2
200	32 x 65	48	5/32	74	2
250	32 x 79	64	5/32	86	3
300	32 x 93	78	5/32	109	3
150	38 x 38	17	1/8	68	2
200	38 x 48	27	5/32	73	2
250	38 x 58	38	5/32	82	2
300	38 x 69	50	5/32	105	2
350	38 x 79	60	5/32	115	2
400	38 x 89	70	3/16	147	3
425	38 x 94	75	3/16	156	3
350	42 x 66	46	5/32	117	2
400	42 x 75	55	5/32	127	2
500	42 x 91	70	3/16	170	3
530	42 x 97	76	3/16	181	3
500	48 x 73	50	3/16	186	2
600	48 x 86	63	3/16	206	2
700	48 x 100	77	7/32	266	3
800	48 x 112	90	7/32	291	3
900	48 x 126	104	7/32	317	4
1000	48 x 139	117	9/32	391	4
1000	60 x 97	60	3/16	393	2
1100	60 x 105	68	7/32	452	3
1200	60 x 113	77	7/32	476	3
1300	60 x 122	86	7/32	498	3
1400	60 x 130	94	7/32	517	3
1500	60 x 138	102	9/32	590	3
2000	60 x 180	145	9/32	718	4
1500	72 x 102	61	7/32	661	2
2000	72 x 131	90	7/32	756	3
2500	72 x 160	120	5/16	990	3
3000	72 x 189	149	3/8	1211	4
1000	90 x 54	16	7/32	603	2
2000	90 x 91	53	7/32	735	2
3000	90 x 128	90	1/4	945	2
4000	90 x 165	127	11/32	1418	2
5000	90 x 202	164	13/32	1995	2
6000	90 x 239	200	1/2	2649	2

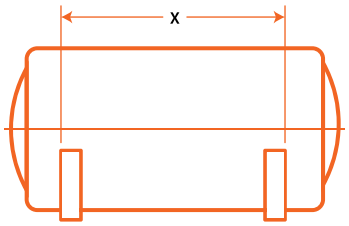
HORIZONTAL TANK ACCESSORIES

SADDLE ASSEMBLY REQUIREMENTS

SADDLE SPACING "X" IN INCHES	
MIN.	MAX.
18	21
23	26
34	37
46	50
56	60
29	31
42	45
60	64
31	33
46	49
61	65
74	79
17	19
26	28
37	39
48	51
57	61
67	71
71	76
41	45
50	54
67	71
71	76
47	51
60	64
73	78
86	91
99	105
111	118
58	61
65	69
72	78
81	87
89	95
96	103
139	146
58	62
87	91
116	121
144	150
16	17
51	54
85	91
122	128
58	165
195	202

All horizontal tanks must be properly supported either by Design Tank saddles or customer supplied saddles that have been approved by engineering. To insure adequate support, follow guidelines for saddle spacing that are provided on this page.

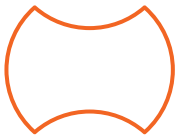
NOTE: Failure to comply with support requirements may void warranty.



X = measurement from outside edges of saddles. Additional saddles must be equally spaced between outside pair.

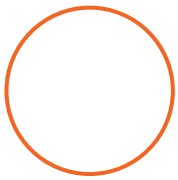
BAFFLES AND BULKHEADS FOR HORIZONTAL FIBERGLASS TANKS

Baffles and bulkheads are con-structed of chemical-resistant FRP resin and bonded permanently to the interior of the tank wall. Baffles and bulkhead are available in tank diameters 24" through 90".



BAFFLES

Partial flow-through baffles eliminate excessive shifting of liquid in mobile applications.



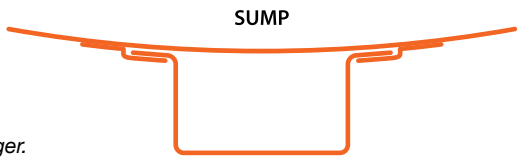
BULKHEADS

Bulkheads divide horizontal tanks into compartments allowing the storage of more than one chemical.

FRP SUMPS FOR COMPLETE DRAINAGE OF HORIZONTAL TANKS

Baffles and bulkheads are con-structed of chemical-resistant FRP resin and bonded permanently to the interior of the tank wall. Baffles and bulkhead are available in tank diameters 24" through 90".

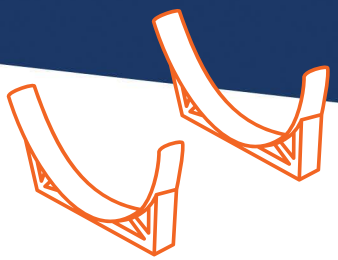
SUMP SIZE (IN.)
10 x 10 x 6
4 x 4 x 2



***For tanks 42" diameter & larger.*

Sumps will accept either bulkhead fittings or fiberglass couplings.

FRP sumps can be factory installed on any horizontal fiberglass tank to provide nearly complete drainage.

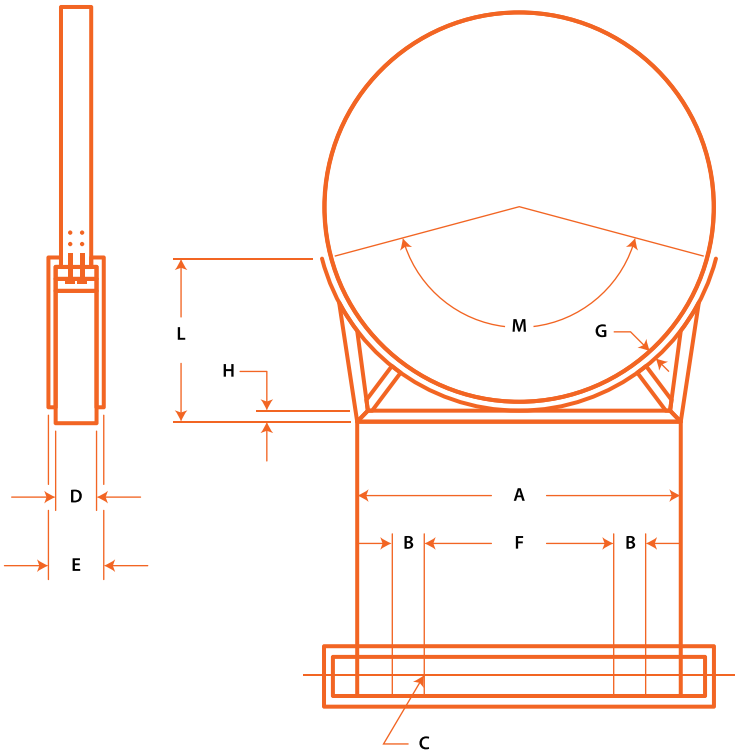


SADDLES

STANDARD SADDLE ASSEMBLIES

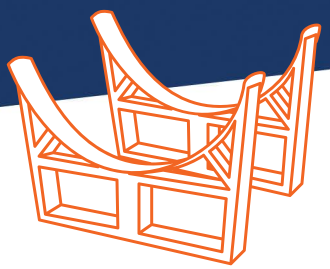
Standard steel saddles provide complete support for horizontal fiberglass tanks when guidelines are followed.

- Standard saddles feature minimum clearance between the tank bottom and floor.
- Saddles are supplied epoxy white.
- SS straps hold tank to saddle.
- Standard saddles are intended for mobile applications.
- Custom saddles for large tanks are also available upon request.



TANK DIA. (IN.)	APPROX. WT. (LBS.)	DIM. (INCHES) A	B	C	D	E	F
24	9	19	2 1/2	1 7/32	2 1/2	3	9 1/2
30 32	13 13	25 26 3/4	2 1/2 2 1/2	1 7/32 1 7/32	3 3	4 4	14 1/2 14 1/2
38 42	15 20	31 33	2 1/2 2 1/2	1 7/32 1 7/32	3 3 3/8	4 5	17 19 1/2
48 60	30 64	39 43 1/2	2 1/2 N/A	1 7/32 5/8	4 3/8 6 3/8	5 8	24 1/2 36

TANK .DIA. (IN.)	APPROX. WT. (LBS)	G DIM. (GA.)	DIM. (INCHES) H	L	M DIM. ANGLE (°)	M BAND LENGTH (IN.)
24	9	14	2.5	11	160	34
30 32	13 13	13 10	2.5 2.5	13 3/4 14 3/8	165 161	43 45
38 42	15 20	12 12	2.5 2.5	13 1/2 15 5/8	140 145	47 54
48 60	30 64	11 10	2.5 2.5	16 17 1/8	135 120	58 64

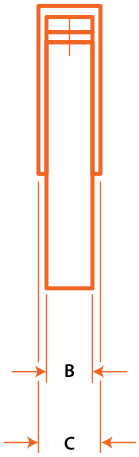


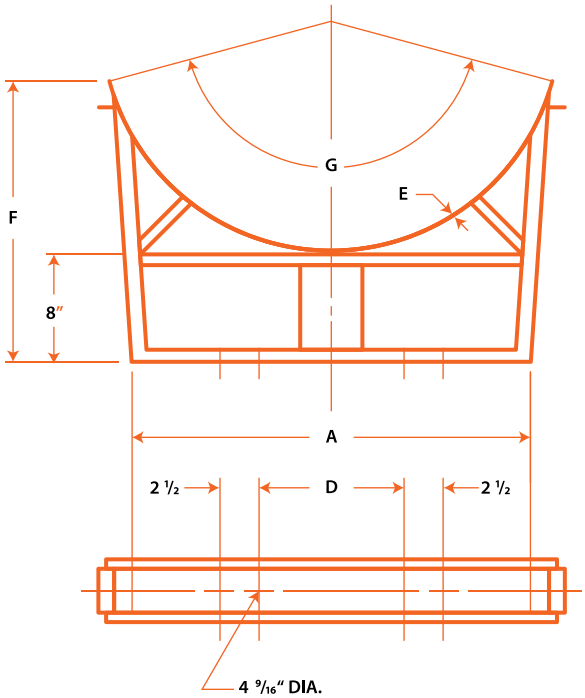
SADDLES

INDUSTRIAL SADDLE ASSEMBLIES

Industrial saddle assemblies feature an 8” clearance between the bottom of the tank and the floor and are recommended for support of horizontal tanks when plumbing access to a bottom drain fitting is required. When ordering, please specify either standard or industrial saddles. If no part number is called out, standard saddles will be shipped.

- Industrial saddles are epoxy white.
- Stainless steel straps and bolts are provided. Epoxy white straps on 72”.
- Heavy duty foam rubber pad is included with the saddle.
- Industrial saddles are not intended for mobile applications.





TANK DIA. (IN.)	APPROX WT. (LBS.)	DIM. (INCHES) A	B	C	D
24	22	19 1/4	3	4	9 1/2
30	27	26	3	4	14 1/2
32	28	26 3/4	3	4	14 1/2
38	40	31	4	5	17
42	44	35 3/4	4	5	19
48	48	40 1/2	4	5	24 1/2
60	114	46 1/4	6 1/2	8	27
72	190	58 1/2	8	10	31

TANK DIA. (IN.)	APPROX. WT. (LBS.)	E DIM. (GA.)	F DIM. (IN.)	G DIM. ANGLE (°)	G BAND LENGTH (IN.)
24	22	10	17 1/16	150	32 1/4
30	27	10	19 1/8	150	39 3/8
32	28	10	20	150	42 3/4
38	40	10	21 11/16	146	49 1/4
42	44	10	23 11/16	150	55 3/4
48	48	10	24 5/16	142	60 1/4
60	114	7	30 7/16	150	79 3/8
72	190	7	34 5/8	150	95 1/16

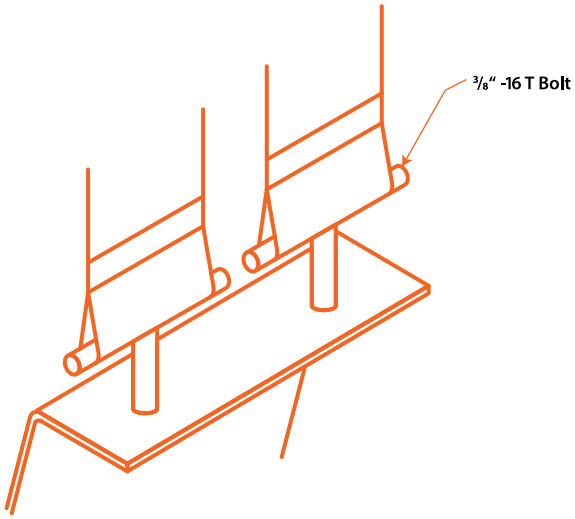
SADDLES

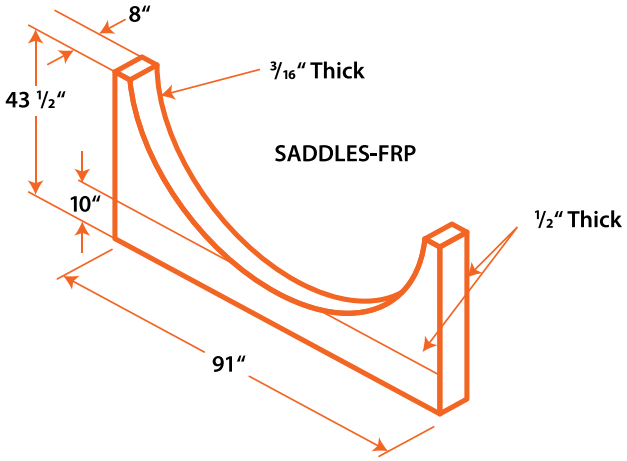
SADDLES – 90” DIAMETER TANKS

Epoxy white heavy duty steel saddles for 90” diameter horizontal tanks feature 10” of clearance from bottom of tank to ground.

- 90” diameter horizontal tanks are designed to be supported by no more than 2 saddles.
- Saddle assembly provides contact with 120 degrees of tank sidewall to insure proper support.
- Customer must provide adequate concrete pad footings for saddle.
- Engineering recommendations are available for specific applications.

NUMBER OF SADDLES REQUIRED	WT. (LBS.) EACH
2	315

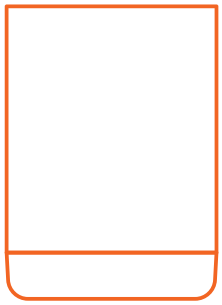




FLAT BOTTOM OPEN TOP

CENTRIFUGALLY CAST FLAT BOTTOM, OPEN TOP FIBERGLASS TANKS

Available in capacities to 6000 gallons, flat bottom open top tanks provide economical storage for a wide range of chemicals depending upon resin selection.



- Covers are not included.
  See chart on next page for options.

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
68	24 x 36	1/8	30
79	24 x 42	1/8	33
91	24 x 48	1/8	36
103	24 x 54	1/8	40
114	24 x 60	1/8	44
126	24 x 66	5/32	47
150	24 x 79	5/32	54
100	30 x 36	5/32	45
116	30 x 42	5/32	51
133	30 x 48	5/32	56
150	30 x 54	5/32	62
167	30 x 60	5/32	68
184	30 x 66	5/32	72
192	30 x 69	5/32	75
119	32 x 36	5/32	53
139	32 x 42	5/32	59
160	32 x 48	5/32	64
180	32 x 54	5/32	70
200	32 x 60	5/32	76
241	32 x 72	5/32	88
267	32 x 79	5/32	95
167	38 x 36	5/32	74
196	38 x 42	5/32	78
225	38 x 48	5/32	85
254	38 x 54	5/32	93
312	38 x 66	5/32	111
341	38 x 72	5/32	120
377	38 x 79	5/32	130
203	42 x 36	5/32	86
274	42 x 48	5/32	100
310	42 x 54	5/32	109
345	42 x 60	5/32	118
380	42 x 66	5/32	127
416	42 x 72	5/32	136
457	42 x 79	5/32	146

FLAT BOTTOM OPEN TOP

CENTRIFUGALLY CAST FLAT BOTTOM, OPEN TOP FIBERGLASS TANKS

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
265	48 x 36	5/32	112
311	48 x 42	5/32	122
357	48 x 48	5/32	132
403	48 x 54	5/32	143
449	48 x 60	5/32	154
495	48 x 66	5/32	165
541	48 x 72	5/32	176
628	48 x 84	5/32	195
720	48 x 96	5/32	216
812	48 x 108	5/32	236
904	48 x 120	5/32	255
950	48 x 126	5/32	268
530	60 x 48	7/32	219
670	60 x 60	7/32	245
810	60 x 72	7/32	272
955	60 x 84	7/32	298
1090	60 x 96	7/32	324
1240	60 x 108	7/32	350
1380	60 x 120	7/32	377
1500	60 x 130	7/32	399
1000	72 x 61	7/32	300
1500	72 x 90	7/32	378
2000	72 x 119	7/32	447
2500	72 x 148	7/32	536
3000	72 x 177	7/32	628
1000	*90 x 41	3/16	438
1500	*90 x 59	3/16	470
2000	*90 x 78	3/16-1/4	582
2500	*90 x 96	3/16-1/4	638
3000	*90 x 115	3/16-5/16	775
3500	*90 x 133	3/16-5/16	854
4000	*90 x 152	3/16-3/8	1011
4500	*90 x 170	3/16-3/8	1118
5000	*90 x 189	3/16-3/8	1270
5500	*90 x 207	3/16-3/8	1368
6000	*90 x 226	3/16-3/8	1525

OPTIONAL COVERS

DUST COVER - removable non-load bearing cover designed to keep out unwanted debris.

TANK DIAM.
23
24
30
32
38
42
48
60
72
90*

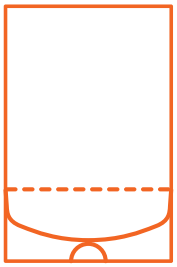
*90" covers bolt down to an external flanged lip. Cover is not designed for loads and must be vented!

***90" diameter tanks include an external flanged lip measuring 2 3/4" wide and 1/2" thick. Actual outside diameter of open top 90" tanks is 95 1/2"**

***90" diameter tanks 2000 gallon and below, have two lifting lugs. All other 90" tanks have three lugs included.**

DISHED BOTTOM OPEN TOP

CENTRIFUGALLY CAST DISHED BOTTOM, OPEN TOP FIBERGLASS TANKS



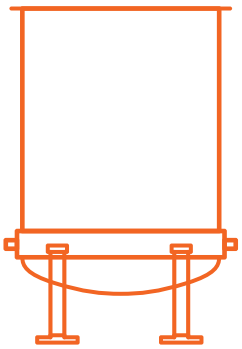
Supported by an extension of the sidewall, our dished bottom tanks allow for complete drainage and easy cleaning. This style features a 6” minimum clearance from bottom of the dish to floor to provide convenient access to plumbing through 5” radius scallop in the sidewall. (Standard clearance on 72” diameter tanks is 12”.)

NOMINAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
50	24 x 35	1/8	25
100	24 x 61	1/8	35
125	24 x 75	5/32	60
50	30 x 28	5/32	39
100	30 x 44	5/32	51
145	30 x 62	5/32	64
50	32 x 26	5/32	39
100	32 x 40	5/32	52
150	32 x 55	5/32	65
200	32 x 69	5/32	78
C220	32 x 75	5/32	85
50	38 x 22	5/32	40
100	38 x 32	5/32	54
150	38 x 42	5/32	68
200	38 x 53	5/32	80
250	38 x 63	5/32	92
300	38 x 73	7/32	135
50	42 x 19	7/32	59
100	42 x 28	7/32	71
150	42 x 36	7/32	83
200	42 x 45	7/32	95
250	42 x 53	7/32	107
300	42 x 62	7/32	119

NOMINAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
350	42 x 70	7/32	131
380	42 x 75	7/32	137
200	48 x 37	7/32	95
250	48 x 44	7/32	108
300	48 x 50	7/32	121
350	48 x 57	7/32	134
400	48 x 64	7/32	147
500	48 x 77	7/32	173
600	48 x 90	7/32	199
700	48 x 103	7/32	225
785	48 x 114	7/32	247
425	60 x 48	5/16	290
570	60 x 60	5/16	328
710	60 x 72	5/16	365
855	60 x 84	7/32	357
1000	60 x 96	7/32	384
1140	60 x 108	7/32	410
1285	60 x 120	7/32	436
1350	60 x 126	7/32	450
1000	72 x 80	7/32	412
1500	72 x 109	7/32	481
2000	72 x 138	7/32	550
2500	72 x 167	7/32	628

DISHED BOTTOM OPEN TOP

90” DIAMETER DISHED BOTTOM, OPEN TOP WITH LEG RING



“90 diameter open top tanks include an external flanged lip and are supported by (4) 4” steel pipe legs threaded into a fiberglass encapsulated leg ring. Legs are not included with the tank and must be ordered separately.

1/2” thick external lip extends 2 3/4” outside tank wall.

Leg length required for 0” clearance is 18 5/8”.

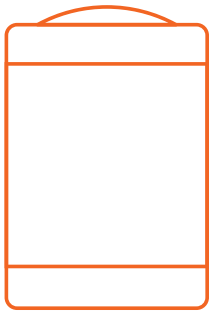
- **Seismic Zone design requires special consideration. Contact Engineering for full assistance.**

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
1000	90 x 47	3/16	895
1500	90 x 65	3/16	955
2000	90 x 84	3/16-1/4	1040
2500	90 x 102	3/16-1/4	1120
3000	90 x 121	3/16-5/16	1280
3500	90 x 139	3/16-5/16	1385
4000	90 x 158	3/16-3/8	1515
4500	90 x 176	3/16-3/8	1640
5000	90 x 195	3/16-3/8	1850
5500	90 x 213	3/16-3/8	1980
6000	90 x 232	3/16-3/8	2090

NOTE: 90” diameter tanks 2000 gallon and below, have two lifting lugs.
All other 90” tanks have three lugs included.

FLAT BOTTOM ANNULAR DOMED TOP

CENTRIFUGALLY CAST FLAT BOTTOM, ANNULAR DOMED TOP FIBERGLASS TANKS



Flat Bottom Annular Dome Top Tanks are totally enclosed and are designed for chemical and water storage applications requiring a dust-free environment.

• Annular head configuration allows for easy fitting installation

NOTES:

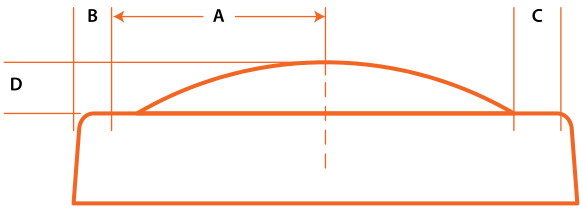
1) **Enclosed tanks are designed for atmospheric pressure only and must be vented!**
2) 90" diameter tanks 2000 gallon and below, have two lifting lugs. All other 90" tanks have three lugs included.

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
60	24 x 34	1/8	32
110	24 x 60	1/8	47
160	24 x 87	1/8	61
70	30 x 28	1/8	40
120	30 x 45	5/32	55
170	30 x 63	5/32	72
200	30 x 75	5/32	85
75	32 x 26	5/32	41
125	32 x 41	5/32	59
175	32 x 55	5/32	72
225	32 x 70	5/32	81
275	32 x 84	5/32	102
290	32 x 89	5/32	106
145	38 x 34	5/32	71
195	38 x 44	5/32	85
245	38 x 55	5/32	98
295	38 x 65	5/32	111
345	38 x 76	5/32	127
395	38 x 86	5/32	143
425	38 x 92	5/32	149
205	42 x 39	5/32	98
255	42 x 48	5/32	110
305	42 x 56	5/32	121
355	42 x 65	5/32	132
405	42 x 73	5/32	143
455	42 x 82	5/32	155
505	42 x 90	5/32	168
275	48 x 41	5/32	134
325	48 x 48	5/32	146
375	48 x 54	5/32	158

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
425	48 x 61	5/32	172
475	48 x 67	5/32	188
575	48 x 80	5/32	207
675	48 x 93	7/32	238
775	48 x 106	7/32	250
875	48 x 120	7/32	272
1025	48 x 139	7/32	306
690	60 x 65	7/32	331
830	60 x 77	7/32	356
990	60 x 91	7/32	380
1115	60 x 101	7/32	405
1250	60 x 112	7/32	429
1540	60 x 139	7/32	478
1660	60 x 147	7/32	499
1000	72 x 66	7/32	488
1500	72 x 96	7/32	560
2000	72 x 124	7/32	641
2500	72 x 153	7/32	720
3000	72 x 182	7/32	806
1000	90 x 47	3/16	557
1500	90 x 66	3/16	613
2000	90 x 84	3/16	693
2500	90 x 103	3/16-1/4	763
3000	90 x 121	3/16-1/4	853
3500	90 x 140	3/16-5/16	947
4000	90 x 158	3/16-5/16	1071
4500	90 x 177	3/16-3/8	1183
5000	90 x 196	3/16-3/8	1339
5500	90 x 214	3/16-3/8	1489
6000	90 x 233	3/16-3/8	1596

FLAT BOTTOM ANNULAR DOMED TOP

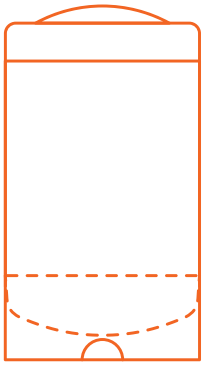
ANNULAR HEAD DIMENSIONS



TANK DIA.	DIM. (INCHES) A	B	C	D
24	7 1/8	4 7/8	5	1
30	10 1/8	4 7/8	5	1 1/2
32	11	5	5	2
38	14	5	5	3
42	16	5	5	3
48	19	5	5	4
60	24 3/4	5 1/4	4 1/2	6
72	30	6	6	7 1/4
90	40	5	5	8 3/4

DISHED BOTTOM ANNULAR DOMED TOP

CENTRIFUGALLY CAST DISHED BOTTOM, ANNULAR DOMED TOP FIBERGLASS TANKS



Totally enclosed tank features a dished bottom for easy cleanout and complete drainage. The 6"clearance (12" on 72" diameter tanks) provides easy access to plumbing through a 5" radius scallop cut in sidewall.

- Annular head configuration allows for easy fitting installation.

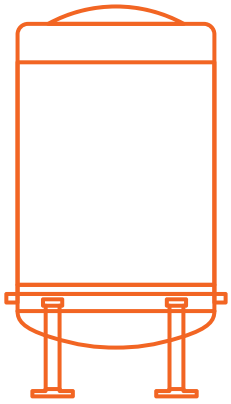
NOTE: Enclosed tanks are designed for atmospheric pressure only and must be vented!

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
60	24 x 44	1/8	32
110	24 x 70	1/8	44
135	24 x 84	5/32	67
70	30 x 37	5/32	49
120	30 x 53	5/32	61
170	30 x 71	5/32	74
75	32 x 36	5/32	50
125	32 x 50	5/32	63
175	32 x 65	5/32	76
225	32 x 79	5/32	89
245	32 x 85	5/32	96
145	38 x 44	5/32	73
195	38 x 54	5/32	87
245	38 x 65	5/32	99
295	38 x 75	5/32	111
345	38 x 85	7/32	154
205	42 x 48	7/32	107
255	42 x 57	7/32	119
305	42 x 65	7/32	131
355	42 x 74	7/32	143
405	42 x 82	7/32	155
435	42 x 87	7/32	161
285	48 x 51	7/32	133
335	48 x 58	7/32	146
385	48 x 64	7/32	154
435	48 x 71	7/32	172

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
485	48 x 78	7/32	185
585	48 x 91	7/32	211
685	48 x 104	7/32	237
785	48 x 117	7/32	263
870	48 x 128	7/32	285
570	60 x 65	7/32	305
715	60 x 77	7/32	330
860	60 x 89	7/32	354
1000	60 x 101	7/32	377
1145	60 x 113	7/32	400
1285	60 x 125	7/32	424
1430	60 x 137	7/32	448
1500	60 x 143	7/32	460
1570	60 x 149	7/32	471
1710	60 x 161	7/32	495
1760	60 x 165	7/32	503
750	72 x 71	7/32	560
1000	72 x 85	7/32	594
1250	72 x 100	7/32	639
1500	72 x 114	7/32	672
1750	72 x 129	7/32	708
2000	72 x 143	7/32	741
2250	72 x 158	7/32	777
2500	72 x 172	7/32	820
2750	72 x 187	7/32	855

DISHED BOTTOM ANNULAR DOMED TOP

90” DIAMETER DISHED BOTTOM, ANNULAR DOMED TOP WITH LEG RING



90” diameter tanks are supported by (4) 4” steel pipe legs threaded into a fiberglass encapsulated steel leg ring. Legs are not included with the tank and must be ordered separately.

Height shown is for tank only.

Leg length required for 0” clearance is 18 5/8”.

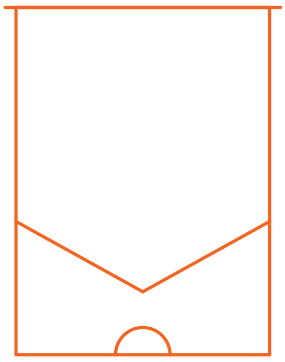
Seismic Zone design requires special consideration. Contact Engineering for full assistance.

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
1000	90 x 58	3/16	1145
1500	90 x 71	3/16	1205
2000	90 x 90	3/16-1/4	1290
2500	90 x 109	3/16-1/4	1370
3000	90 x 127	3/16-5/16	1530
3500	90 x 146	3/16-5/16	1635
4000	90 x 164	3/16-3/8	1765
4500	90 x 183	3/16-3/8	1890
5000	90 x 202	3/16-3/8	2100
5500	90 x 220	3/16-3/8	2230
6000	90 x 239	3/16-3/8	2340

NOTE: 90” diameter tanks 2000 gallon and below, have two lifting lugs. All other 90” tanks have three lugs included.

30° CONE BOTTOM WITH SKIRT

30° CONE BOTTOM W/SKIRT, OPEN TOP



Open top skirted tanks include a flanged lip for tank stability and one scallop for plumbing access to the bottom of the tank. Standard clearance from the bottom of the cone to the floor is 12”.

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
250	48 x 55	7/32	178
450	48 x 81	7/32	227
650	48 x 107	7/32	272
450	60 x 62	7/32	372
650	60 x 79	7/32	421
850	60 x 96	7/32	419
1050	60 x 113	7/32	453
1250	60 x 130	7/32	488
1450	60 x 147	7/32	522
650	72 x 64	7/32	430
850	72 x 76	7/32	458
1050	72 x 88	7/32	487
1250	72 x 100	7/32	516
1450	72 x 112	7/32	545
1650	72 x 124	7/32-1/4	584
1850	72 x 136	7/32-1/4	620
2050	72 x 148	7/32-1/4	656
2250	72 x 160	7/32-1/4	693

CONSTRUCTION NOTES:

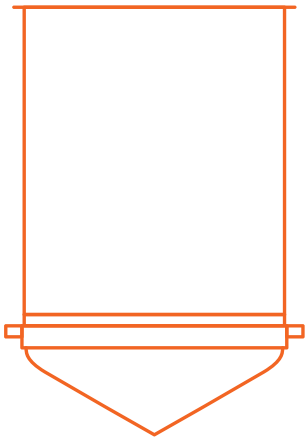
30° Cone bottom skirted tanks are supported by an extension of the sidewall and feature one 5” radius scallop for plumbing access. Larger scallops are available upon request.

Standard clearance from the bottom of the cone to the floor is 12”. Clearances to meet specific customer requirements are available at no additional cost but must be specified at the time of the order.

Tanks are supplied in natural resin color or a pigmented color based on need.

30° CONE BOTTOM WITH LEG RING

30° CONE BOTTOM W/LEG RING, OPEN TOP



Open top leg ring tanks include a flanged lip and FRP encapsulated steel leg ring. Legs are not included and must be ordered separately.

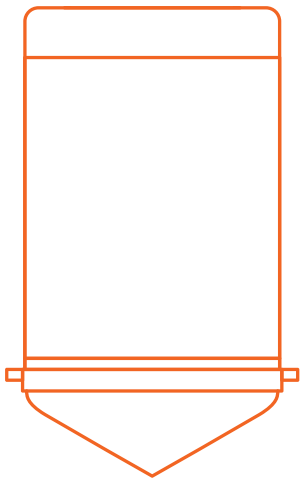
Tanks are supplied in natural resin color. Specific color options are available at additional cost.

- **Seismic Zone design requires special consideration. Contact Engineering for full assistance.**

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)	PIPE SIZE (IN.)	LEG LENGTH FOR 0" CLEARANCE
250	48 x 44	5/32	182	2	19
450	48 x 70	5/32	215	2	19
650	48 x 96	7/32	281	2	19
450	60 x 51	7/32	366	3	26
650	60 x 68	7/32	401	3	26
850	60 x 85	7/32	435	3	26
1050	60 x 102	7/32	477	3	26
1250	60 x 119	7/32	503	3	26
1450	60 x 136	7/32	538	3	26
650	72 x 55	7/32	450	3	29 1/2
850	72 x 67	7/32	479	3	29 1/2
1050	72 x 79	7/32	508	3	29 1/2
1250	72 x 91	7/32	537	3	29 1/2
1450	72 x 103	7/32	566	3	29 1/2
1650	72 x 115	7/32	595	3	29 1/2
1850	72 x 127	7/32	624	3	29 1/2
2050	72 x 139	7/32	653	3	29 1/2
2250	72 x 151	7/32	682	3	29 1/2
1500	90 x 74	3/16	865	4	32
2000	90 x 92	3/16	925	4	32
2500	90 x 111	3/16-1/4	1017	4	32
3000	90 x 129	3/16-1/4	1079	4	32
3500	90 x 148	3/16-1/4	1213	4	32
4000	90 x 166	3/16-5/16	1338	4	32

45° CONE BOTTOM, FLAT TOP

45° CONE BOTTOM, FLAT TOP



Open top leg ring tanks include a flanged lip and FRP encapsulated steel leg ring. Legs are not included and must be ordered separately.

Tanks are supplied in natural resin color. Specific color options are available at additional cost.

- **Seismic Zone design requires special consideration. Contact Engineering for full assistance.**

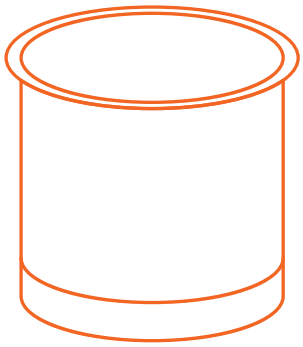
TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)
250	32” x 7’ 3”
250	38” x 5’ 8”
500	32” x 13’ 6”
500	38” x 10’
500	42” x 8’ 6”
500	48” x 6’ 9”
750	32” x 19’ 8”
750	38” x 14’ 4”
750	42” x 12’ 1”
750	48” x 9’ 6”
1000	42” x 15’ 7”
1000	48” x 12’ 3”
1000	60” x 9’
1000	72” x 6’ 11”
2500	60” x 19’ 5”
2500	72” x 14’ 1”
2500	90” x 10’ 2”
5000	60” x 36’ 9”
5000	72” x 26’ 1”
5000	90” x 17’ 9”

MIX TANKS

MIX TANKS

The Mix Tank line was developed to meet the more stringent performance requirements of industrial mixing applications.

Offered in three styles, this series of tanks is a heavy-walled version of the standard line and features an external flanged lip which can accommodate mixers weighing up to 250 pounds.



FLAT BOTTOM

flanged lip included.

Heavy duty flat bottom mix tanks are ideal for applications where complete drainage is not critical.

- Hold down lugs are recommended for mixing applications.
- Vinylester resin tanks are natural in color.

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
50	24 x 29	5/32	45
75	24 x 42	5/32	53
100	30 x 38	7/32	65
125	30 x 47	7/32	78
125	32 x 39	7/32	73
150	32 x 47	7/32	84
175	32 x 54	7/32	105
200	38 x 44	7/32	104
225	38 x 49	7/32	110
250	38 x 54	7/32	117
250	42 x 45	1/4	127
275	42 x 50	1/4	143
300	42 x 54	1/4	148
350	48 x 49	9/32	183
400	48 x 55	9/32	199
450	48 x 62	9/32	216
500	48 x 69	9/32	230
500	60 x 45	9/32	257
600	60 x 54	9/32	283
700	60 x 62	9/32	306
800	60 x 70	9/32	335
750	72 x 46	1/4	345
1000	72 x 60	9/32	406
1250	72 x 75	3/8	526
1500	72 x 89	3/8	589

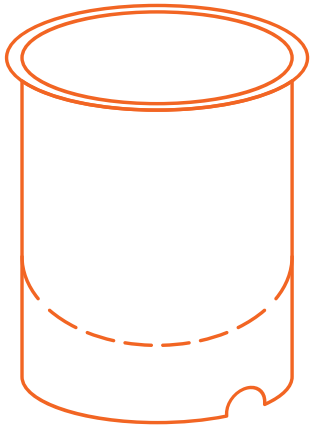
MIX TANKS

DISH BOTTOM W/SKIRT

flanged lip included.

Skirted mix tanks feature a 12” clearance to the floor and are designed to provide complete drainage.

- Hold down lugs are recommended for mixing applications.
- Vinylester resin tanks are natural in color.



TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)
50	24 x 43	5/32	55
75	24 x 56	5/32	63
100	30 x 52	7/32	85
125	30 x 61	7/32	94
125	32 x 53	7/32	95
150	32 x 61	7/32	104
175	32 x 68	7/32	112
200	38 x 59	7/32	130
225	38 x 64	7/32	136
250	38 x 70	7/32	144
250	42 x 59	1/4	167
275	42 x 64	1/4	176
300	42 x 68	1/4	183
350	48 x 64	9/32	237
400	48 x 70	9/32	250
450	48 x 77	9/32	276
500	48 x 84	9/32	292
500	60 x 63	9/32	365
600	60 x 71	9/32	391
700	60 x 80	9/32	414
800	60 x 88	9/32	437
750	72 x 65	9/32	494
1000	72 x 80	5/16	590
1250	72 x 94	13/32	749
1500	72 x 109	15/32	882

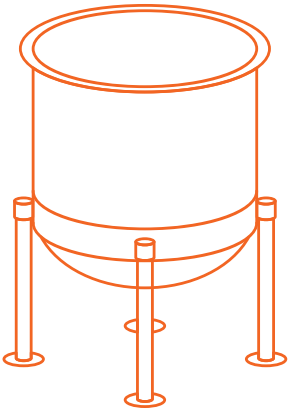
MIX TANKS

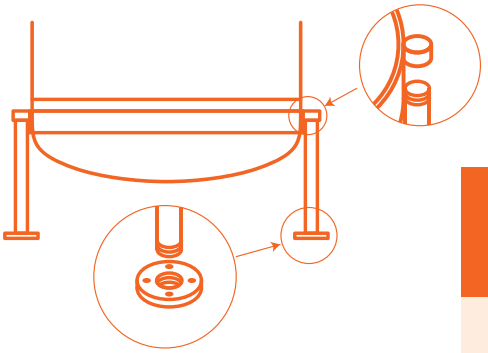
DISH BOTTOM W/LEG RING

flanged lip included.

Dished bottom leg ring tanks are designed to achieve complete bottom access and maximum floor clearance. Legs are not included and must be ordered separately. See below for details.

- For best results, legs should be anchored to the floor. Maximum length = 48”.
- Vinylester resin tanks are natural in color.





Steel coupling is welded to fiberglass encapsulated steel leg ring.

Pipe leg threads into steel flange pad. Pads can be bolted to the floor for stability.

- **Seismic Zone design requires special consideration.**

STEEL PIPE LEGS

Legs must be ordered separately on all leg ring tanks and can either be factory or customer supplied. If legs are to be customer supplied refer to specific tank to determine correct pipe size. All centrifugally cast tanks require four (4) pipe legs.

Legs available are primed steel pipe with NPT threads on both ends and are designed to fit into steel couplings welded onto a fiberglass encapsulated steel leg ring. Lower portion of leg threads into a primed steel flange pad with ASA 150# bolting geometry.

When ordering legs refer to specific tank part number and add the amount shown for 0” clearance to the amount that you require between the bottom of the tank and the floor.

For example to get 12” of clearance on a M7486 (shown above) you would add 12” to a 0” clearance of 12 1/4”. Proper leg length would be 24 1/4”.

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WALL THICKNESS (IN.)	APPROX. WEIGHT (LBS.)	PIPE SIZE (IN.)	LEG LENGTH FOR 0” CLEARANCE
50	24 x 31	5/32	66	1 1/2	6 1/4
75	24 x 44	5/32	74	1 1/2	6 1/4
100	30 x 40	7/32	96	1 1/2	7 1/2
125	30 x 49	7/32	105	1 1/2	7 1/2
125	32 x 41	7/32	105	1 1/2	8 1/2
150	32 x 49	7/32	112	1 1/2	8 1/2
175	32 x 56	7/32	121	1 1/2	8 1/2
200	38 x 47	7/32	144	2	10
225	38 x 52	7/32	150	2	10
250	38 x 58	7/32	158	2	10
250	42 x 47	1/4	181	2	10
275	42 x 52	1/4	189	2	10
300	42 x 56	1/4	196	2	10
350	48 x 52	9/32	239	2	12 1/4
400	48 x 58	9/32	252	2	12 1/4
450	48 x 65	9/32	268	2	12 1/4
500	48 x 72	9/32	285	2	12 1/4
500	60 x 49	9/32	407	3	17 3/4
600	60 x 58	9/32	433	3	17 3/4
M700	60 x 66	9/32	456	3	17 3/4
800	60 x 74	9/32	479	3	17 3/4
750	72 x 51	9/32	552	3	18 3/4
1000	72 x 66	5/16	631	3	18 3/4
1250	72 x 80	13/32	756	3	18 3/4
1500	72 x 95	15/32	873	3	18 3/4

SECTIONALIZED TANKS

CENTRIFUGALLY CAST SECTIONALIZED FIBERGLASS TANKS

Our unique sectionalized fiberglass tank provides an excellent option for retrofit applications such as solar energy storage and domestic fire protection systems.

- Modular design allows for storage up to 800 gallons with a tank capable of passing through a 30” door.
- Factory pre-sanded sections can be assembled on site with no special equipment or training.
- Tanks include adhesive kit and installation instructions.
- Sectionalized tanks are not recommended for the storage of highly aggressive chemicals or for use in food grade applications.
- Available in either isophthalic polyester or vinylester resins.

DIA. X HT. (IN.)	TOTAL CAPACITY (GALS.)	TOTAL SECTIONS	APPROX. WEIGHT (LBS.)	APPROX. THICK. (IN.)
42 x 29	150	1	75	5/32
42 x 55	300	2	107	5/32
42 x 81	450	3	139	5/32
48 x 29	200	1	101	5/32
48 x 55	400	2	137	5/32
48 x 81	600	3	173	5/32
48 x 107	800	4	209	5/32

SECTIONALIZED TANKS

INSTALLATION INSTRUCTIONS

Clean both factory pre-sanded bonding surfaces with MEK or acetone to insure positive seal.

Mix vinylester adhesive per instructions enclosed with kit.

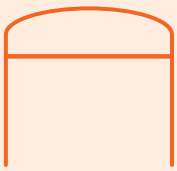
Butter bonding surfaces on spigot joint (base) and bell portion (top) with material, making sure all pre-sanded surfaces are evenly covered.

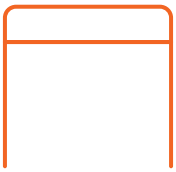
Slip top half of tank smoothly over the base until seams meet.

Strip off excessive adhesive on both outside and inside seams with wooden paddle and wipe off seams with a solvent soaked cloth to produce smooth appearing seams. Tank should be allowed to cure overnight and be water tested before being put into service.

CAPACITY AND DIMENSION CHARTS

CAUTION! The following chart is intended to be used as a guide only. Variations in mold taper and head preparation will affect actual dimensions. For applications requiring strict tolerances contact the factory for details.



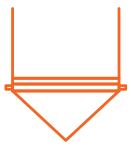


DIAMETER	SIDEWALL GAL/INCH	DOME CAP (GALLONS)	0" CLEARANCE LEG LENGTH	FLAT CAP (GALLONS)	LIP HT. (IN.)
8'	31.3	427	20	248	8*
					8
10'	48.9	833	25	389	8
					9
12'	70.5	1345	28 5/8	630	9
14'	95.9	1793	30 1/2	954	9

NOTE: The 8' is also available in an external flange lip. Height of the external lip is 6". Capacity of the external 8' lip is 235 gallons.

CAPACITY AND DIMENSION CHARTS

CAUTION! The following chart is intended to be used as a guide only. Variations in mold taper and head preparation will affect actual dimensions. For applications requiring strict tolerances contact the factory for details.

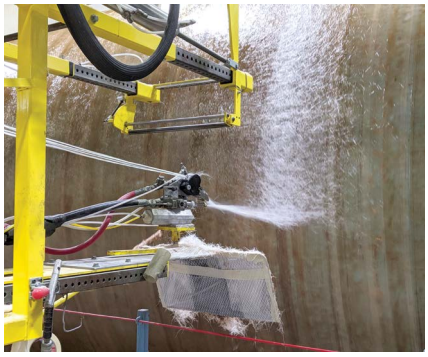

NOMINAL TANK DIA. (IN.)	ACTUAL TANK DIA. (IN.)	GAL.IN. OF SIDEWALL	BOTTOM FLAT HEAD GALS.	BOTTOM FLAT HEAD HT, (IN.)	DISHED HEAD GALS.	DISHED HEAD HT, (IN.)	BOTTOM 30 CONE GALS.	BOTTOM 30 CONE HT, (IN.)	45 CONE GALS.	45 CONE HT, (IN.)	BOTTOM ANNULAR HEAD GALS.	BOTTOM ANNULAR HEAD HT, (IN.)
24	24.25	1.9	11	5.75	14	9	15	12.5	17	16	10	6.75
30	29.25	2.8	16	5.5	22	10	24	14.295	30	19.75	15	7
32	32	3.3	19	6.3125	29	11	32	15.625	38	21	20	8
38	38	4.7	32	8.3125	49	13	54	18.625	63	25	36	10.5
42	42	5.8	33	7.5	47	13	54	17.375	68	24.5	53	12
48	48	7.6	72	9.5	87	15	99	22	118	30.125	73	13
60	60	12.0	112	14	173	20.5	194	27.5	233	39.125	145	17
72	72	17.3	220	13.5	235	19	275	29.75	343	43.375	258	20.8
90	90	27.2	308	11.75	398	21.25	481	34.75	627	52	344	19
96	96	31.3	248	8.25	427	20.25	498	33.5	692	53	NA	NA
108	108	39.6	314	8.5	627	23	723	38.5	1004	60	NA	NA
120	120	48.9	389	8.5	833	25	921	42	1293	65	NA	NA
144	144	70.5	630	9	1345	28.5	NA	NA	2219	78.5	NA	NA
168	168	95.9	954	10.5	1793	31	NA	NA	3627	93.375	NA	NA

CHOP-HOOP FILAMENT WINDING

is a unique blend of two proven fabrication techniques: chopped glass spray-up and continuous filament winding. This combination provides the benefits of maximum corrosion resistance plus the strength required for vertical storage.

The chop-hoop filament wound tank is produced over a smooth male mandrel in four automated steps:

1. The bottom head is produced in a separate spray-up process and affixed to the mandrel. A resin rich inner surface is applied to the mandrel and reinforced either with a glass veil or a synthetic veil (Nexus®) in those applications requiring maximum chemical resistance. This layer is a minimum of 10 mils thick with a glass/resin ratio of approximately 20/80.
2. The interior corrosion barrier is constructed next by combining resin with chopped "E" glass in two 45 mil passes for agriculture and 3 for industrial. Total thickness is a minimum of 90 mils with an approximate glass/resin ratio of 30/70.
3. The structural wall is produced using a process of simultaneous glass chopping, resin spraying, and hoop filament winding. The glass/resin ratio is approximately 50/50 with the glass roving (filament) providing the required hoop strength. The thickness of the structural wall is varied according to tank height, application, and specific gravity of the contents.
4. Finally, a 5 mil resin coat or a 45 mil exterior corrosion barrier is added depending upon projected service. The exterior corrosion barrier consists of a layer of resin and chopped "E" glass strand applied in an approximate resin to glass ratio of 70/30.



SPECIFICATIONS

Using chop-hoop filament wound fabrication, fiberglass reinforced plastic tank walls manufactured by Design Tanks meet or exceed the design criteria of ASTM D 3299-00.

Our standard storage vessels are designed for liquids with a specific gravity of up to 1.3. Tanks designed to hold heavier materials are available upon request.

Chop-hoop filament wound tanks can be manufactured for food grade applications depending on resin selection.

An interior corrosion barrier is fabricated by spraying a chopped roving glass and resin mixture.

Structural wall is constructed by simultaneous glass chopping, resin spraying and hoop filament winding.

TYPICAL PROPERTIES

Hoop Direction	
Tensile Strength PSI	42,000
Tensile Modulus PSI	2,400,000
Flexural Strength PSI	58,000
Flexural Modulus PSI	1,800,000

AXIAL DIRECTION	
Tensile Strength PSI	13,500
Tensile Modulus PSI	1,450,000
Flexural Strength PSI	33,600
Flexural Modulus PSI	1,330,000

Chop-Hoop Filament Winding storage tank.

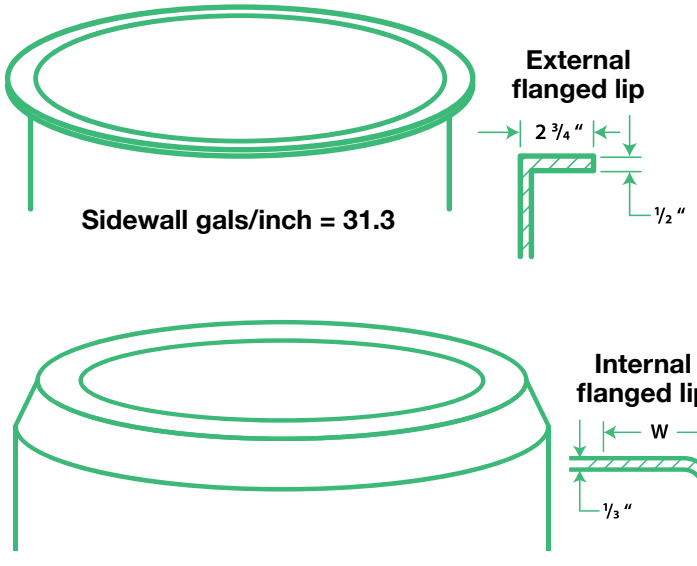
FLAT BOTTOM OPEN TOP

CHOP-HOOP FILAMENT WOUND, FLAT BOTTOM, OPEN TOP FIBERGLASS TANKS

Tank diameter	"W" dimension
9'	6"
10'	7"
12'	9"
14'	10"

- 8' diameter open top tanks include external flanged lips. 9', 10', 12' and 14' dimensions tanks are suppllied with internal flange lips. See drawing below for dimensions.
- Standard tank is designed for 1.3 specific gravity material. 1.8 and 2.1 versions are available upon request.
- All filament wound tanks include lift lugs.

8' diameter – open top



NOTE: Tank bottom must be fully supported and pad must remain level within 1/8" over a ten foot span.

- *Consult a local engineer for specific site requirements.*
- **Seismic Zone design requires special consideration. Contact Engineering for full assistance.**

FLAT BOTTOM OPEN TOP

CHOP-HOOP FILAMENT WOUND, FLAT BOTTOM, OPEN TOP FIBERGLASS TANKS - CONTINUED

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WEIGHT (LBS.)
2000	8' x 5 10"	720
2000	9' x 4' 9"	778
3000	8' x 8' 6"	860
3000	9' x 6' 11"	908
4000	8' x 11' 2"	1000
4000	9' x 9' 0"	1033
4000	10' x 7' 5"	875
5000	8' x 13' 9"	1220
5000	9' x 11' 1"	1157
5000	10' x 9' 1"	1006
6000	8' x 16' 5"	1410
6000	9' x 13' 2"	1327
6000	10' x 10' 9"	1136
6000	12' x 7' 8"	1110
7000	8' x 19' 1"	1610
7000	9' x 15' 4"	1498
7000	10' x 12' 6"	1280
7000	12' x 8' 10"	1230
7000	14' x 6' 5"	1476
8000	8' x 21' 9"	1662
8000	9' x 17' 5"	1830
8000	10' x 14' 2"	1447
8000	12' x 10' 0"	1350
8000	14' x 7' 4"	1550
9000	10' x 15' 11"	1613
9000	12' x 11' 3"	1493
9000	14' x 8' 2"	1655
10000	10' x 17' 7"	1788

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WEIGHT (LBS.)
10000	12' x 12' 5"	1635
10000	14' x 9' 1"	1770
12000	10' X 21' 0"	2190
12000	12' x 14' 9"	1940
12000	14' x 10' 10"	2003
14000	10' x 24' 5"	2620
14000	12' x 17' 2"	2290
14000	14' x 12' 7"	2357
15000	10' x 26' 1"	2900
15000	12' x 18' 4"	2475
15000	14' x 13' 5"	2490
16000	12' x 19' 6"	2660
16000	14' x 14' 3"	2618
18000	12' x 21' 10"	3075
18000	14' x 16' 0"	2775
20000	12' x 24' 3"	3305
20000	14' x 17' 9"	3054
21000	12' x 25' 5"	3525
21000	14' x 18' 7"	3232
22000	12' x 26' 7"	4210
22000	14' x 19' 6"	3430
25000	12' x 30' 2"	5275
25000	14' x 22' 1"	4103
30000	12' x 36' 0"	6675
30000	14' x 26' 5"	5127

FLAT BOTTOM DOMED TOP

CHOP-HOOP FILAMENT WOUND FLAT BOTTOM, DOMED TOP FIBERGLASS TANKS

- Domed top tanks are designed for atmospheric pressure only and must be vented.
- Standard tank designed for 1.3 specific gravity material. 1.8 and 2.1 versions are available upon request.
- All filament wound tanks include lift lugs.
- **Seismic Zone design requires special consideration. Contact Plastics Engineering for full assistance.**

NOTE: Tank bottom must be fully supported and pad must remain level within 1/8” over a ten foot span. Consult a local engineer for specific site requirements.

FLAT BOTTOM DOMED TOP

CHOP-HOOP FILAMENT WOUND, FLAT BOTTOM, DOMED TOP FIBERGLASS TANKS

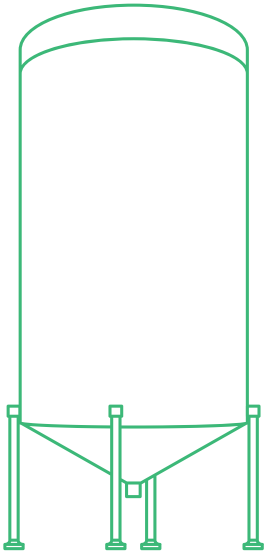
TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WEIGHT (LBS.)
2000 2000	8’ x 6’ 4” 9’ x 5’ 4”	840 850
3000 3000	8’ x 9’ 0” 9’ x 7’ 5”	980 974
4000 4000	8’ x 11’ 8” 9’ x 9’ 6”	1140 1098
4000 5000	10’ x 8’ 0” 8’ x 14’ 3”	1075 1280
5000 5000	9’ x 11’ 7” 10’ x 9’ 9”	1223 1206
6000 6000	8’ x 16’ 11” 9’ x 13’ 9”	1520 1384
6000 6000	10’ x 11’ 5” 12’ x 8’5”	1336 1375
7000 7000	8’ x 19’ 7” 9’ x 15’ 10”	1710 1549
7000 7000	10’ x 13’ 1” 12’ x 9’7”	1480 1500
7000 8000	14’ x 7’ 5” 8’ x 22’ 3”	1767 1900
8000 8000	9’ x 17’ 11” 10’ x 14’ 10”	1715 1647
8000 8000	12’ x 10’ 10” 14’ x 8’ 3”	1625 1876
9000 9000	10’ x 16’ 6” 12’ x 12’ 0”	1813 1768
9000	14’ x 9’ 1”	1983

TOTAL CAPACITY (GAL.)	DIAMETER X HEIGHT (IN.)	APPROX. WEIGHT (LBS.)
10000 10000	10’ x 18’ 3” 12’ x 13’ 1”	1988 1910
10000 12000	14’ x 10’ 0” 10’ X 21’ 8”	2105 2390
12000 12000	12’ x 15’ 6” 14’ x 11’ 9”	2215 2337
14000 14000	10’ x 25’ 1” 12’ x 17’ 11”	2820 2565
14000 15000	14’ x 13’ 6” 10’ x 26’ 9”	2614 3100
15000 15000	12’ x 19’ 1” 14’ x 14’ 4”	2750 2745
16000 16000	12’ x 20’ 3” 14’ x 15’ 3”	2935 2894
18000 18000	12’ x 22’ 7” 14’ x 16’ 11”	3350 3208
20000 20000	12’ x 25’ 0” 14’ x 18’ 8”	3580 3465
21000 21000	12’ x 26’ 2” 14’ x 19’ 10”	3800 3683
22000 22000	12’ x 27’ 4” 14’ x 20’ 5”	4410 3794
25000 25000	12’ x 30’10” 14’ x 23’ 0”	5550 4540
30000 30000	12’ x 36’ 9” 14’ x 27’ 4”	6950 5548

*Wall thickness is stepped.

30° CONE BOTTOM

CHOP-HOOP FILAMENT WOUND 30° CONE BOTTOM FIBERGLASS TANKS



30° CONE - OPEN TOP

TOTAL CAPACITY (GAL.)	WALL DIAMETER X HEIGHT (IN.)	WEIGHT (LBS.)
2000 2000	8’ x 7’2” 9’ x 6’3”	1280 784
3000 3000	8’ x 9’10” 9’ x 8’4”	1430 914
4000 4000	8’ x 12’6” 9’ x 10’6”	1570 1039
4000 5000	10’ x 9’3” 8’ x 15’2”	2230 1710
5000 5000	9’ x 12’7” 10’ x 11’0”	1164 2340
6000 6000	8’ x 17’10” 9’ x 14’8”	1950 1323
6000 7000	10’ x 12’8” 9’ x 16’9”	2450 1489
7000 8000	10’ x 14’5” 9’ x 18’11”	12560 1658
8000 9000	10’ x 16’1” 10’ x 17’9”	2720 2860
10000	10’ x 19’6”	3010

*Wall thickness is stepped.

30° CONE BOTTOM

CHOP-HOOP FILAMENT WOUND 30° CONE BOTTOM FIBERGLASS TANKS

- 30° cone bottom tanks are supported by a fiberglass encapsulated steel leg ring which will accept threaded steel pipe legs.
- 8' diameter open top tanks include an external flanged lip. 9' and 10' diameter tanks include an internal flanged lip.
- Closed top tanks are designed for atmospheric pressure only and must be vented.
- Standard tank designed for 1.3 specific gravity material. 1.8 and 2.1 versions are available upon request.
- **Seismic Zone design requires special consideration. Contact Engineering for full assistance.**

30° CONE - CLOSED TOP

TOTAL CAPACITY (GAL.)	DIMENSIONS DIAMETER X HEIGHT (IN.)	APPROX. WEIGHT (LBS.)
2000 2000	8' x 7'8" 9' x 6'9"	1340 830
3000 3000	8' x 10'4" 9' x 8'10"	1480 955
4000 4000	8' x 13'0" 9' x 11'0"	1620 1086
4000 5000	10' x 9'11" 8' x 15'8"	2350 1760
5000 5000	9' x 13'1" 10' x 11'7"	1209 2460
6000 6000	8' x 18'4" 9' x 15'2"	1980 1334
6000 7000	10' x 13'3" 9' x 17'3"	2570 1514
7000 8000	10' x 15'0" 9' x 19'5"	2680 1686
8000 9000	10' x 16'8" 10' x 18'5"	2830 2970
10000	10' x 20'1"	3120

*Wall thickness is stepped.

30° CONE BOTTOM

CONE BOTTOM

TANK DIAMETER	SIDEWALL GAL./INCH	30° CONE CAP. (GALS.)	CLEARANCE LEG LENGTH (IN.)
8'0"	31.3	498	35"
9'0"	39.6	723	39"
10'0"	48.9	921	42"

STEEL PIPE LEGS

30° cone bottom tanks are supported by steel pipe legs threaded into a fiberglass encapsulated steel leg ring. Legs must be ordered separately.

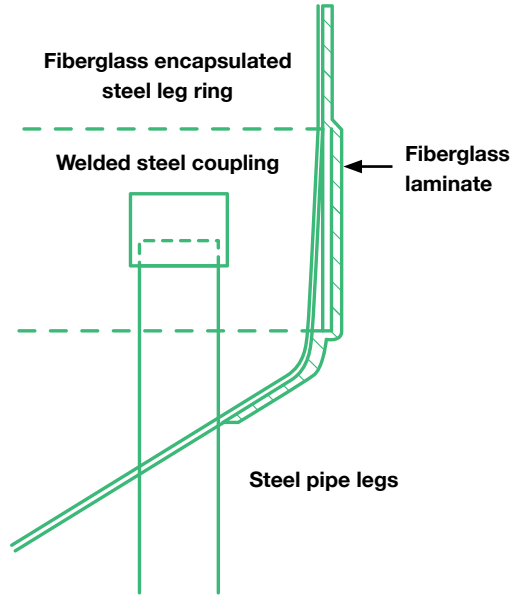
LEG ORDERING INFORMATION

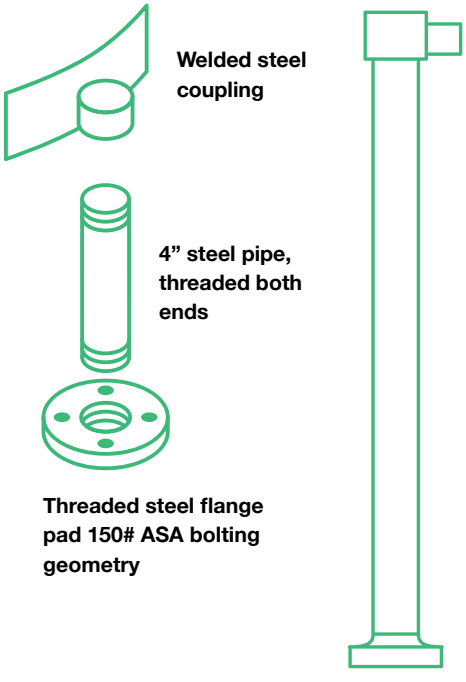
To order legs, specify number required and overall length. Overall length is determined by adding amount of leg for 0" clearance (shown above) to desired clearance between the bottom of the cone and the floor.

(NOTE: Design Tanks recommends that clearance not exceed 24" unless specific application has been reviewed by the factory.)

EXAMPLE: Legs for an 8' diameter 6000 gallon tank with a 24" clearance from bottom of cone to the floor would be ordered as follows:

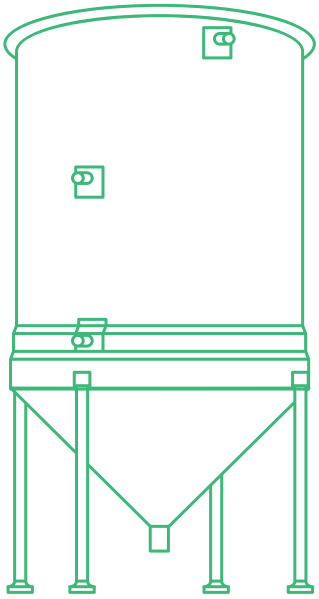
Number of legs required = 4
Leg length = 0" clearance
+ required clearance
34"+24"
Correct order would be (4) 58" tall legs.





45° CONE BOTTOM

CHOP-HOOP FILAMENT WOUND 45° CONE BOTTOM FIBERGLASS TANKS



45° CONE - OPEN TOP

TOTAL CAPACITY (GAL.)	DIMENSIONS DIA. X HEIGHT (IN.)	APPROX. WEIGHT (LBS.)
1500 2000	+90” x 87” +90” x 106”	1050 1130
2000 2000	8’ x 8’4” 9’ x 7’10”	1190 645
2500 3000	+90” x 124” +90” x 143”	1230 1320
3000 3000	8’ x 11’ 9’ x 9’11”	1330 770
3500 4000	+90” x 161” +90” x 180”	1410 1580
4000 4000	8’ x 13’8” 9’ x 12’0”	1478 896
4000 5000	10’ x 10’8” 8’ x 16’4”	2060 1620
5000 5000	9’ x 14’1” 10’ x 12’4”	1019 2170
6000 6000	8’ x 19’0” 9’ x 16’3”	1840 1149
6000 6000	10’ x 14’1” 12’ x 11’8”	2280 2970
7000 7000	9’ x 18’4” 10’ x 15’9”	11331 2390
7000 8000	12’ x 12’10” 9’ x 20’5”	3070 1496
8000 8000	10’ x 17’6” 12’ x 14’0”	2540 3170
9000 9000	10’ x 19’2” 12’ x 15’2”	2680 3370
10000 10000	10’ x 20’10” 12’ x 16’4”	2820 3550
11000 12000	12’ x 17’7” 12’ x 18’9”	3680 3810
13000 14000	12’ x 19’11” 12’ x 21’1”	4050 4210

+ 90” diameter tanks are constructed by centrifugally cast method.

*Wall thickness is stepped.

45° CONE BOTTOM

CHOP-HOOP FILAMENT WOUND 45° CONE BOTTOM FIBERGLASS TANKS - CONTINUED

- 45° cone bottom tanks are supported by a fiberglass encapsulated steel leg ring which will accept threaded steel pipe legs or steel I-beams depending on capacity.
- 8’ diameter open top tanks include external flanged lips. 9’, 10’, 12’ and 14’ diameter tanks include internal lips.
- Closed top tanks are designed for atmospheric pressure only and must be vented.
- Standard tank designed for 1.3 specific gravity material. 1.8 and 2.1 versions are available upon request.
- **Seismic Zone design requires special consideration. Contact Engineering for full assistance.**

45° CONE - CLOSED TOP

TOTAL CAPACITY (GAL.)	DIMENSIONS DIA. X HEIGHT (IN.)	APPROX. WEIGHT (LBS.)
1500 2000	+90” x 93” +90” x 112”	1230 1300
2000 2000	8’ x 8’9” 9’ x 8’4”	1250 711
2500 3000	+90” x 130” +90” x 149”	1400 1490
3000 3000	8’ x 11’5” 9’ x 10’5”	1380 836
3500 4000	+90” x 167” +90” x 186”	1580 1750
4000 4000	8’ x 14’1” 9’ x 12’6”	1530 946
4000 5000	10’ x 11’3” 8’ x 16’9”	2180 1670
5000 5000	9’ x 14’8” 10’ x 13’0”	1090 2290
6000 6000	8’ x 19’5” 9’ x 16’9”	1830 1215
6000 6000	10’ x 14’8” 12’ x 12’5”	2400 3064
7000 7000	9’ x 18’10” 10’ x 16’4”	1384 2510
7000 8000	12’ x 13’7” 9’ x 20’11”	3170 1547
8000 8000	10’ x 18’1” 12’ x 14’9”	2620 3270
9000 9000	10’ x 19’9” 12’ x 15’11”	2780 3360
10000 10000	10’ x 21’6” 12’ x 17’1”	2920 3630
11000 12000	12’ x 18’4” 12’ x 19’6”	3760 3890
13000 14000	12’ x 20’8” 12’ x 21’10”	4020 4270

+ 90” diameter tanks are constructed by centrifugally cast method.

*Wall thickness is stepped.

45° CONE BOTTOM

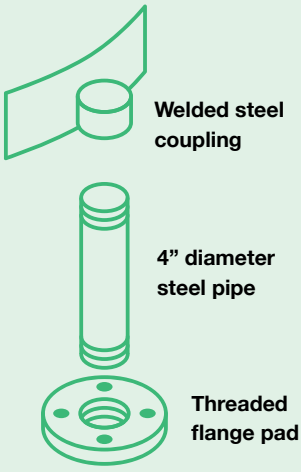
CONE BOTTOM

TANK DIAMETER	SIDEWALL GAL./INCH	45° CONE CAP. (GALS.)	0" CLEARANCE LEG LENGTH PIPE (IN.)	0" CLEARANCE LEG LENGTH "I" BEAM (IN.)
90"	27.2	627	50	48
8'	31.3	692	52	50
9'	39.6	1004	58	56 3/8
10'	48.9	1293	62	61
12'	70.5	2219	75	74.5
14'	95.9	3627	NA	93 3/8

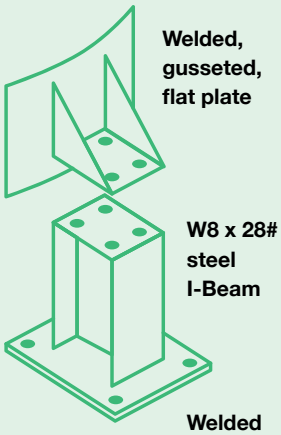
STEEL LEGS

PIPE LEGS

All 8', 9', 10', 12' and 14' tanks up to 10,000 *gallon capacity*.



I-BEAM LEGS



LEG ORDERING INFORMATION

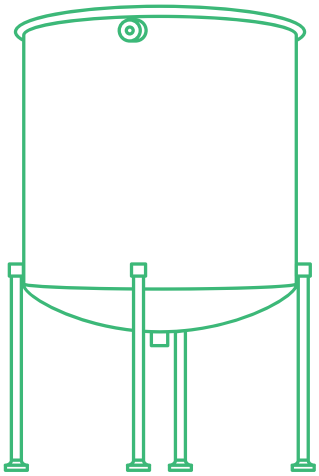
To order legs, specify number required and overall length. Overall length is determined by adding amount of leg for 0" clearance (shown above) to desired clearance between the bottom of the cone and the floor. (**NOTE:** We recommend that clearance not exceed 24" unless specific application has been reviewed by the factory.)

EXAMPLE: Legs for an 10' diameter 10,000 gallon tank with an 18" clearance from bottom of cone to the floor would be ordered as follows:

Number of legs required = 8
Leg length = 0" clearance
+ required clearance
68"+18"
Correct order would be (8) 86" tall legs.

DISHED BOTTOM

CHOP-HOOP FILAMENT WOUND DISHED BOTTOM FIBERGLASS TANKS



DISHED BOTTOM - OPEN TOP

TOTAL CAPACITY (GAL.)	DIMENSIONS DIA. X HEIGHT (IN.)	APPROX. WEIGHT (LBS.)
2000	8’ x 6’3”	1195
2000	9’ x 5’4”	1052
3000	8’ x 8’11”	1350
D3000	9’ x 7’5”	1176
4000	8’ x 11’7”	1495
4000	9’ x 9’6”	1300
4000	10’ x 8’0”	1120
5000	8’ x 14’3”	1650
5000	9’ x 11’7”	1425
5000	10’ x 9’8”	1300
6000	8’ x 16’11”	1900
6000	9’ x 13’9”	1586
6000	10’ x 11’5”	1490
7000	9’ x 15’10”	1751
7000	10’ x13’1”	1670
8000	9’ x 17’11”	1917
8000	10’ x 14’9”	1920
9000	10’ x 16’6”	2150
10000	10’ x 18’2”	2360

*Wall thickness is stepped.

DISHED BOTTOM

CHOP-HOOP FILAMENT WOUND DISHED BOTTOM FIBERGLASS TANKS - CONTINUED

- Dished bottom 8', 9' and 10' diameter tanks are available either open top or closed top in capacities to 10,000 gallons.
- 8' open top tanks include a 1/2" thick x 2 3/4" wide external flanged lip. 9' and 10' tanks have an internal flanged lip.
- Closed top tanks are designed for atmospheric pressure only and must be vented.
- Dished bottom chop-hoop filament wound tanks are supported by a fiberglass encapsulated steel leg ring and 4" diameter steel pipe legs.
- Tanks include lift lugs to facilitate positioning of empty tank on site.
- **Seismic Zone design requires special consideration. Contact Engineering for full assistance.**

DISHED BOTTOM - CLOSED TOP

TOTAL CAPACITY (GAL.)	DIMENSIONS DIA. X HEIGHT (IN.)	APPROX. WEIGHT (LBS.)
2000	8' x 6'8"	1280
2000	9' x 5'10"	1117
3000	8' x 9'4"	1430
3000	9' x 7'11"	1242
4000	8' x 12'	1580
4000	9' x 10'10"	1368
4000	10' x 8'7"	2002
5000	8' x 14'8"	1730
5000	9' x 12'1"	1419
5000	10' x 10'3"	2182
6000	8' x 17'4"	1980
6000	9' x 14'3"	1621
6000	10' x 12'0"	2372
7000	9' x 16'4"	1803
7000	10' x 13'8"	2562
8000	9' x 18'5"	1968
8000	10' x 15'5"	2826
9000	10' x 17'1"	3046
10000	10' x 18'10"	3276

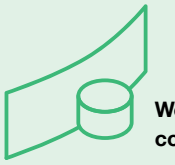
*Wall thickness is stepped.

DISHED BOTTOM

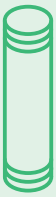
DISH BOTTOM

TANK DIAMETER	SIDEWALL GAL./INCH	DISH CAP. (GALS.)	0" CLEARANCE LEG LENGTH (IN.)
8' 0"	31.3	427	20
9' 0"	39.6	627	23
10' 0"	48.9	883	25
12' 0"	70.5	1345	28 5/8
14' 0"	95.9	1793	30 1/2

STEEL PIPE LEGS



Welded steel coupling



4" steel pipe, threaded both ends

Threaded steel flange pad 150# ASA bolting geometry

LEG ORDERING INFORMATION

To order legs, specify number required and overall length. Overall length is determined by adding amount of leg for 0" clearance (shown above) to desired clearance between the bottom of the dish and the floor.

(NOTE: We recommend that clearance not exceed 24" unless specific application has been reviewed by the factory.)

EXAMPLE: Legs for an 8' diameter 6000 gallon tank with a 24" clearance from bottom of dish to the floor would be ordered as follows:

Number of legs required = 4

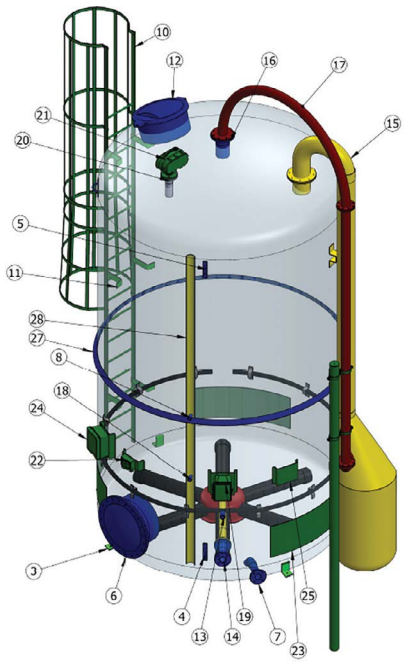
Leg length = 0" clearance
+ required clearance
20"+24"

Correct order would be (4) 44" tall legs.

BRINEMAKER TANKS

BRINEMAKER

Brinemakers allow Companies to leverage the benefits of saturated brine. In addition to obvious bulk salt advantage, consistency of product, and meeting "peak-demand" requirements, companies quickly recognize increased warehouse space and decreased work related injuries due to personnel handling individual salt bags.



ITEM	DESCRIPTION
1	Design Tanks Adhesive Label
2	FBDT 10'-0" Dia. X 18'-0" Ht. ISO/C-Veil/MEKP
3	Heavy Duty Hold Down 304 SS With Hole
4	Heavy Duty Foam 304 SS Lift Lug
5	Heavy Duty 304 SS Lift Lug
6	24" 15# Side Manway/EPDM/VE/MEKP/C-Veil, White
7	3" Conical Gusset Siphon Flange/VE/MEKP
8	1" Modified Coupling For Tuning Fork Sensor VE/MEKP
9	Contents Label
10	Top Access Ladder (Cage Optional)
11	Epoxy Carbon Steel Ladder Standoff Set (2)/Insulated
12	24" Quick Access Manway With Weighted Cover/VE/MEKP/WHITE
13	1 1/2" Water Inlet Spray Ring Assembly
14	3" Conical Gusset Brine Outlet Double Flange
15	8" Duct Flange U-Salt Dust Vent Assembly
16	6" Conical Gusset Flange VE/MEKP
17	Curved Stainless Steel Salt Fill Pipe Assembly W/ Galvanized In-Ground Support Pipe
18	1" Modified Coupling For Tuning Fork Sensor VE/MEKP
19	Water Level Control Box Assembly W/FRP Mounting Brackets
20	3" Conical Gusset Flange VE/MEKP
21	Smartbob Salt Level Sensor W/PVC Vanstone Flange
22	Salt Level System Display W/FRP Mounting Brackets
23	3 Panel Heat System
24	Heat Panel Control Box W/FRP Mounting Brackets`
25	FRP Name Plate W/FRP Mounting Bracket
26	Dry Heat Post Cure
27	2" Thick Polyurethane Insulation With White Overcoat
28	4" Stilling Well

SALT FACTS:

Southern Rock (44% void volume)

- Maximum brine making rate
  - 10'-0" diameter tank-20GPM
  - 12'-0" diameter tank-25 GPM
- Weight per foot of tank height
  - 10'-0" diameter tank-2.7 ton
  - 12'-0" diameter tank-3.8 ton

Vacuum Granulated (40% void volume)

- Maximum brine making rate
  - 10'-0" diameter tank-40 GPM
  - 12'-0" diameter tank-50 GPM
- Weight per foot of tank height
  - 10'-0" diameter tank-3.0 ton
  - 12'-0" diameter tank-4.2 ton

FACTS/SIZES

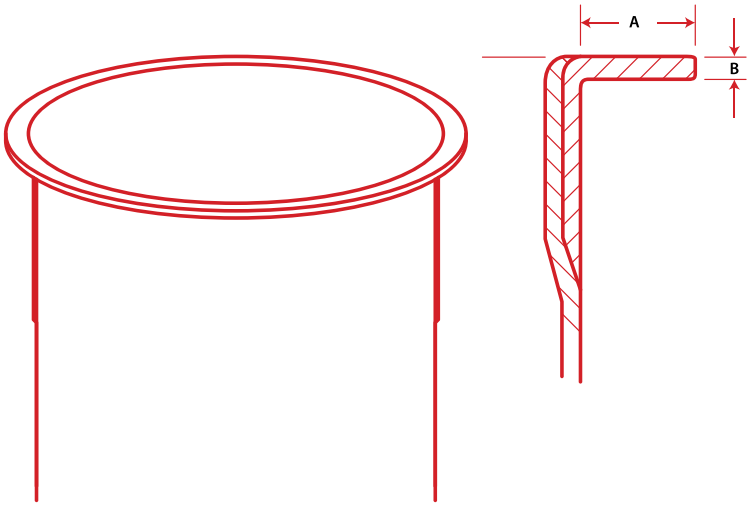
- At 77 °F degrees Fahrenheit one gallon of saturated brine weighs 9.98 pounds and contains 2.642 pounds of salt.
- At 77°F one gallon of water will produce 1.138 gallons of saturated brine and dissolve 3.006 pounds of salt.
- Brinemakers are typically made in diameters ranging from 8' to 12', but can be designed to fit any size required.

ACCESSORIES

FRP FLANGED LIPS

Fiberglass flanged lips are included as standard equipment on all Mix Tanks and are also available as an option on other open top tanks. Constructed from the same resin as the tank corrosion barrier, reinforced lips add rigidity to the top and allow for the use of bolt-down covers.

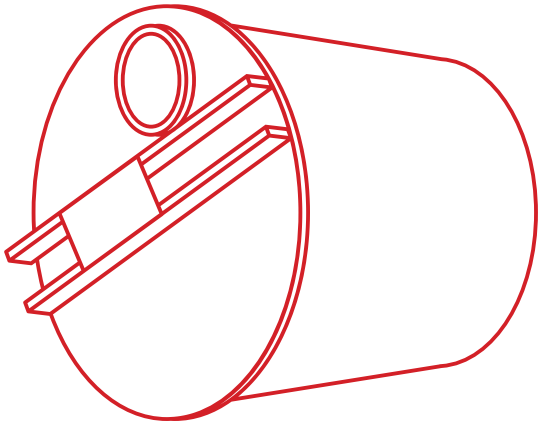
- Lips are constructed as an integral part of the tank wall.
- Lip is supplied without bolting holes unless otherwise specified.



A DIA. (IN.)	B DIM. (IN.)	DIM. (IN.)
24	2	3/8
30	2	3/8
32	2	3/8
38	2	3/8
42	2	3/8
48	2	3/8
60	2	3/8
72	2 1/4	1/2
90	2 3/4	1/2
96	2 1/2	1/2

ACCESSORIES

BOLT DOWN COVERS



Fiberglass bolt-down covers are designed for use with mix tanks or standard open top tanks that have flanged lips. When ordered in conjunction with a tank, cover and flanged lip will be matchdrilled. If ordered as a replacement item, cover will be supplied without holes in order that customer can field drill.

Solid Covers available either plain or with an 8” x 8” mixer shaft cutout.

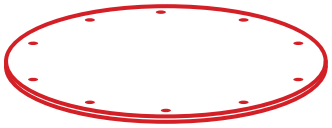
Hinged Covers split with 304 stainless steel hinge to provide easy access to the tank interior. 24” - 72” diameter tanks feature a center split with 1 1/2” wide hinge. 90” & 8’ diameter tanks are split at 1/4 of tank diameter and have a 3” wide stainless hinge. 8’ hinge and solid covers are reinforced to take 350 lb. load.

Hinged covers are available plain, with an 8” x 8” shaft cutout, or with a 1” thick FRP encapsulated pad for mixer mount.

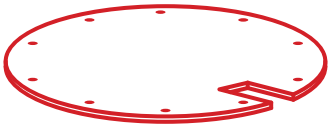
Tank diameters available from 24” to 96”.

***90” solid covers are not designed for loads.**
Hinged 90” & 8’covers are capable of supporting up to 350 lbs.

Solid



Solid w/Shaft Cutout



Hinged

Hinged w/Shaft Cutout

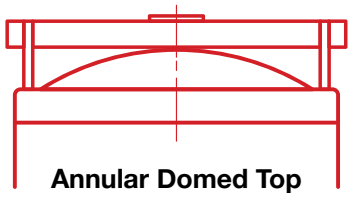
Hinged w/1” Thick Mounting Pad

Stainless steel bolts, nuts and washers are included with installed bolt-down covers.

ACCESSORIES

MIXER BARS

Mixer bars for open top tanks 60” diameter and smaller consist of 2” x 4” rectangular fiberglass tubing with wood cores. Bars are designed to hold mixers weighing up to 125 pounds and are secured to flanged lip with stainless bolts.



Annular Domed Top Support w/Legs

***legs required only on domed top tanks.**

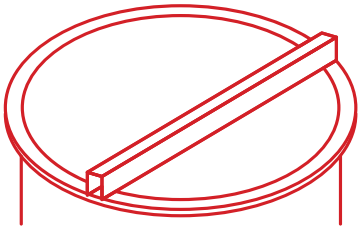
AGITATOR SUPPORTS

90” diameter tanks utilize a primed carbon steel agitator support constructed from two 6” x 8.2 lb./ft. channels and feature a 15” square mounting plate. Agitator supports designed to be used on an annular domed top tank require four (4) steel legs for clearance. When ordering include part numbers for support and legs.

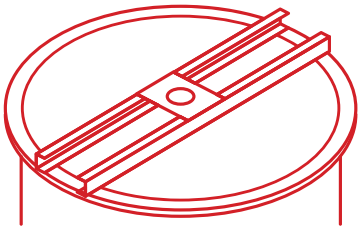
Supports for 72” diameter tanks are constructed from two 4” x 7.25 lb./ft. channels and feature a 12” square mounting plate.

Engineering assistance is available from the factory to meet custom applications and for larger tanks or special installations.

24” - 60” Diameter



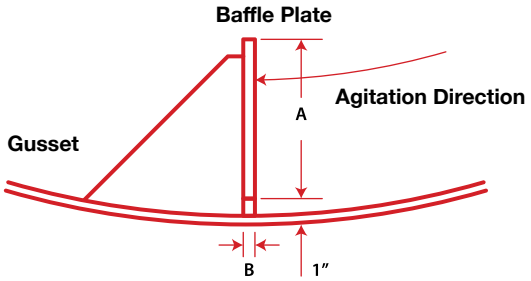
72” and 90” Diameter



ANTI-VORTEX BAFFLES

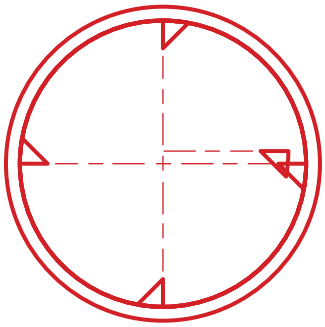
Fiberglass anti-vortex baffles minimize problems associated with vortexing during agitation.

- Flat plate baffles are positioned to oppose agitation direction specified by customer.
- For best results four baffles are recommended per tank.
- Baffles are attached to tank by fiberglass gussets permanently bonded to sidewall.

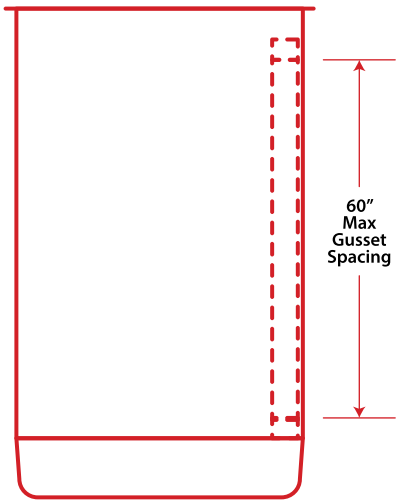


ORDERING GUIDELINES

- When ordering specify number of baffles per tank, length of each baffle, and number of gussets per baffle.
- Typical baffle length will equal sidewall length minus 3" for 32"-72", sidewall length minus 6" for 90" diameter.
- Top and bottom gussets should be located within 3"- 6" of end of baffles. Distance between gussets should not exceed 60".



*Tank Dia.	Baffle Width A	Baffle Thick. B	Baffle Thick. B
32	3	1/4	1/4
38	3	1/4	1/4
42	4	1/4	1/4
48	4	1/4	1/4
60	6	3/8	3/8
72	6	3/8	3/8
90	8	3/8	3/8



FLANGED CONNECTIONS

FLANGED CONNECTIONS

Hand lay-up vinylester flanges with stub pipe are available in sizes from 1” to 24” and are permanently bonded to the tank. Flanges can be located either above or below liquid level and can be ordered in three different styles based upon intended use.

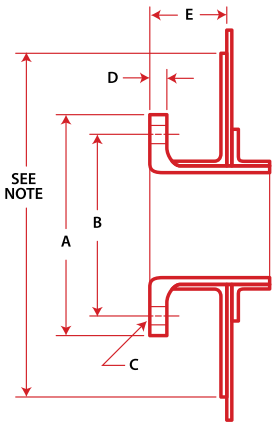
- *Gaskets, bolts, washers, and nuts are not included with flanges. We recommend the use of a 40 to 60 durometer full faced gasket, 1/8” thick, and a maximum bolt take up torque of 30 ft.-lbs.*
- *Flange face is 150 lb. A.S.A. bolting geometry.*
- *Sidewall mounted flanges protrude inside tank a minimum of 1” as shown. Bottom flanges are flush mounted unless otherwise specified.*

NOTE: Bonding area equals three times the nominal pipe size on all pipe through 8”. On 10” through 24”, patch diameter is 16” larger than pipe size.

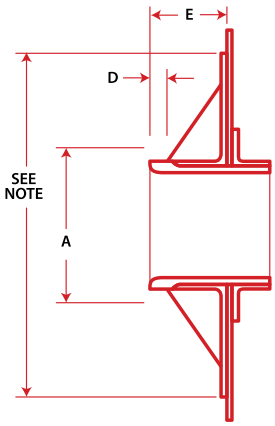
PIPE SIZE (IN.)	A DIM. (IN.)	B DIM. (IN.)	C DIM. (IN.)	D DIM. (IN.)	E DIM. (IN.)	NO. OF HOLES
1	4 1/2	3 1/8	5/8	5/8	6	4
1 1/2	5 1/2	3 7/8	5/8	11/16	6	4
2	6 1/2	4 3/4	3/4	11/16	6	4
3	8	6	3/4	13/16	6	4
4	9 1/2	7 1/2	3/4	15/16	6	8
6	11 1/2	9 1/2	7/8	7/8	6	8
8	14	11 3/4	7/8	1	6	8
10	16 1/2	14 1/4	1	1 3/16	8	12
12	19 1/2	17	1	1 7/16	8	12
14*	21 1/2	18 3/4	1 1/8	1 1/2	8	12
18*	25 1/2	22 3/4	1 1/4	1 3/4	8	16
20*	28	25	1	1	8	20
24*	32 1/2	29 1/2	1	1 1/8	9	20

* Flange must include appropriate blind flange if used as below liquid level access. Larger sizes available upon request.

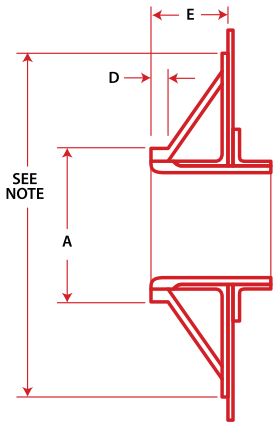
Non-Gusseted Flanges



Blade-Gusseted Flanges



Conically-Gusseted Flanges



FLANGED CONNECTIONS

NON-GUSSETED FLANGES

Non-gusseted flanges through 8” pipe size are designed for light duty, nonweight bearing applications on tanks 72” diameter or smaller. We recommend the use of gusseted flanges on all tanks 90” diameter and larger.

BLADE-GUSSETED FLANGES

Blade gusseted flanges are reinforced by flat fiberglass plates bonded the full length of the flange assembly. They are recommended for heavy-duty applications where ease of access to the back of the flange face is important.

CONICALLY-GUSSETED FLANGES

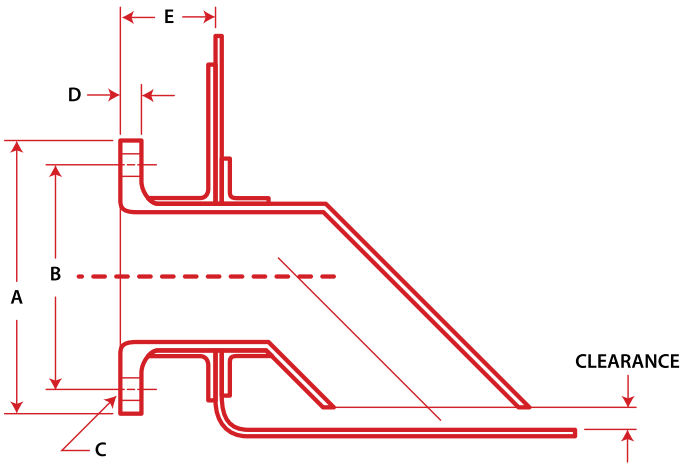
Conically gusseted flanges are reinforced by a fiberglass bonded cone and are recommended for applications where maximum strength is required.

FLANGED CONNECTIONS

SIPHON DRAIN FLANGES

PIPE SIZE (IN.)	A DIM. (IN.)	B DIM. (IN.)	C DIM. (IN.)	D DIM. (IN.)	E DIM. (IN.)	NO. OF HOLES
1 1/2	5 1/2	3 7/8	5/8	11/16	6	4
2	6 1/2	4 3/4	3/4	11/16	4	4
3	8	6	3/4	13/16	4	4
4	9 1/2	7 1/2	3/4	15/16	4	8
6	11 1/2	9 1/2	7/8	7/8	4	8
8	14	11 3/4	7/8	1	6	8

***NOTE:** Bolts are not included with flanges unless a blind flange is also ordered. Column listing number of bolt holes and size refers to maximum size that flange will accommodate and does not necessarily reflect standard installation.

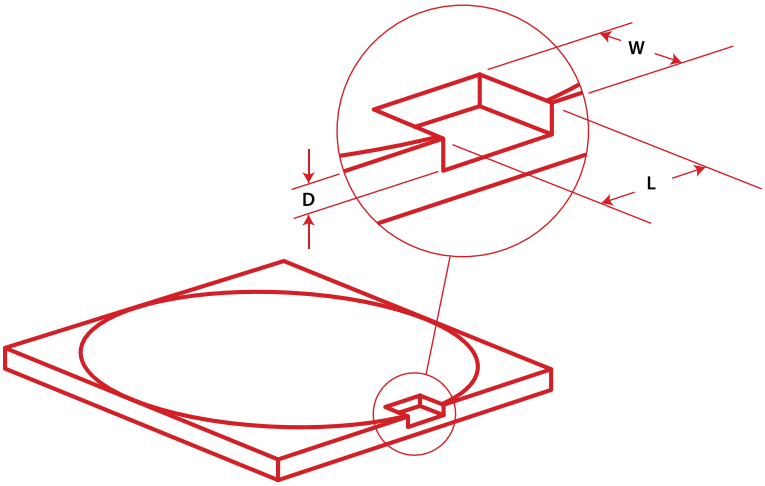


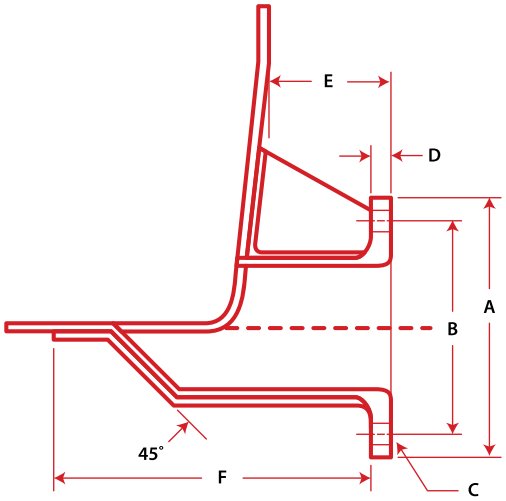
Available either non-gusseted (shown above) or gusseted, siphon drain clearance may vary depending on size and customer needs.

FLANGED CONNECTIONS

SIDE BOTTOM DRAIN FLANGES

Foundation pad must be notched to accommodate flange.
Refer to chart for dimensions. “W” based on tank edge placement.





Side bottom drains extend below the tank bottom to provide nearly complete drainage of flat bottom tanks. Must be gusseted.

FLANGED CONNECTIONS

BLIND FLANGES (LARGER SIZES AVAILABLE UPON REQUEST)

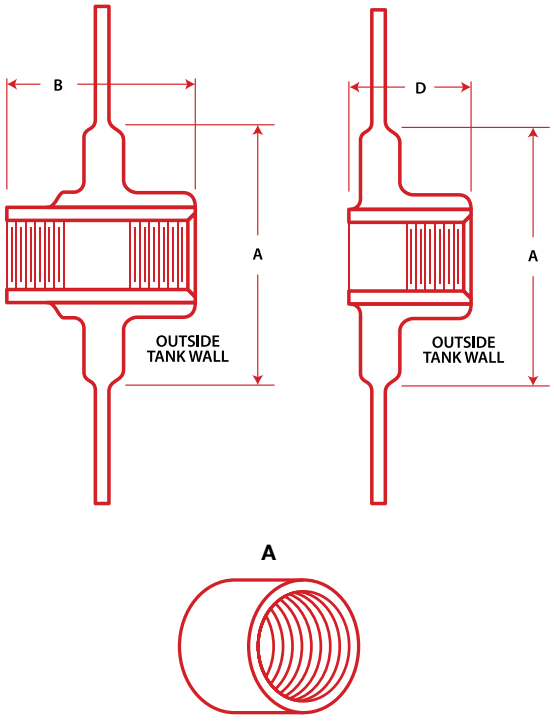
NOTE: All blind flanges are installed with full face gaskets, and stainless steel bolts, nuts, and washers. Bolting hardware supplied for all sizes. Chemical compatability determines gasket material, 1/8" thickness is standard.

Blind flanges provide a sealed cap for flanges that are not currently plumbed to.

COUPLINGS

FULL AND HALF FRP COUPLINGS

PIPE SIZE (IN.)	FULL OR HALF OD (IN.)	FULL OR HALF DIM. A (IN.)	FULL DIM. B (IN.)	HALF DIM. D (IN.)
1/2	1 1/4	4	8	4
3/4	1 5/8	5	8	4
1	1 7/8	6	8	4
1 1/2	2 1/2	8	8	4
2	3	9	8	4
2 1/2	3 3/8	10	8	4
3	4 3/8	13	8	4
4	5	15	8	4
6	7 1/4	20	8	4



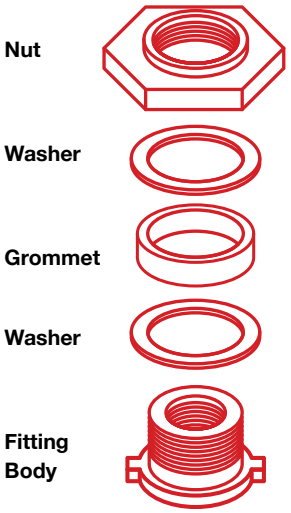
Fiberglass female pipe threaded couplings are bonded permanently into the tank to eliminate potential leak problems. Full and half couplings are available in sizes from 1/2” to 6” and can be located anywhere on the tank except the saddle assembly contact area on horizontal fiberglass tanks.

- Manufactured from corrosion-resistant vinyl ester resin.
- Outside bonding area at the coupling is equal to or greater than tank wall thickness.
- Inside surface is sealed with 2 layers of 2 oz. glass mat and the same resin as the tank wall on all tanks 60” diameter and larger. On smaller diameters inside sealing may not be possible unless tank is equipped with a manway.
- All side wall penetrations protrude as shown unless otherwise specified.
- Bottom fittings are flush mounted for complete drainage.
- Full couplings provide for internal piping. Please specify either full or half when ordering.
- 1 1/2” minimum edge to edge of couplings.
- 2” minimum edge to bottom of tank.

BULKHEAD FITTINGS

FIBERGLASS TANK BULKHEAD FITTINGS

Design Tanks, LLC. bulkhead fittings for fiberglass tanks feature an expanding grommet (Nitrile or Fluorel) which allows for location on most curved surfaces. Available in either PVC or glass filled polypropylene, bulkhead connections provide an economical option for tank penetrations on fiberglass tanks 48" diameter or less. Bonded in couplings are recommended for larger sizes. Before ordering, please consult corrosion guide to determine selection of fitting and grommet material.



INSTALLATION INSTRUCTIONS - FIBERGLASS TANKS

Use a standard hole saw that fits any 1/4" electric drill motor to cut the proper size hole in the fiberglass tank 2 1/8" hole is required for 1/2", 3/4" and 1" threaded fittings. A 3 1/4" hole saw is required for 1 1/4", 1 1/2", and 2" bulkhead fittings.

STEP 1 Place your finger through the fitting and install the body in the hole by placing one lug through the hole first. A slight tap with a hammer will slip the second lug through the hole.

STEP 2 Flex the back-up washer through the hole and over the fitting body.

STEP 3 Slip the grommet over the fitting body but do not slide it all the way down the body at this point.

STEP 4 While holding the fitting body with your finger, work the grommet down the fitting body until it is in the hole in the tank wall. (The grommet will protrude slightly on both the inside and outside of the tank.)

STEP 5 Place the washer on the fitting, then install the nut. Tighten until snug.
(Note that nut is left hand thread!)

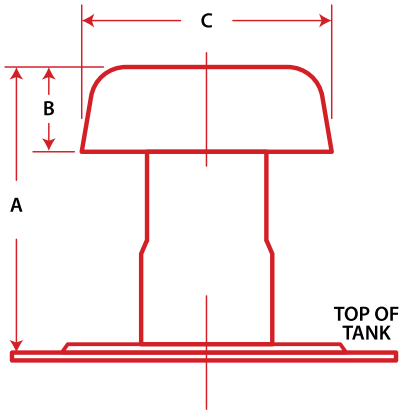
Sealing is accomplished by the grommet expanding against the circumference of the hole you cut in the tank.

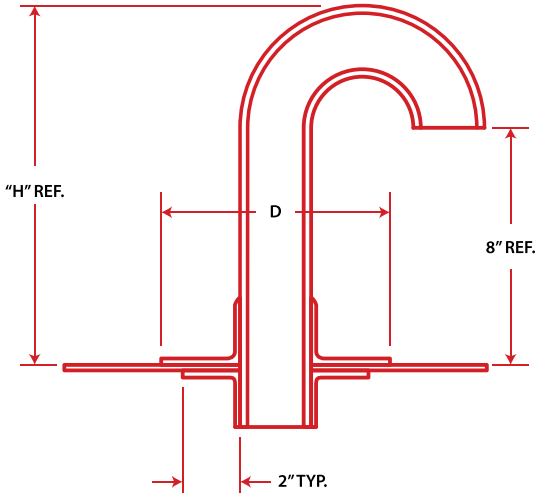
VENTS AND VENTING SPECIFICATIONS

FRP MUSHROOM VENTS

PIPE SIZE (IN.)	A (IN.)	B (IN.)	C (IN.)
2	7 7/8	1 5/8	5
4	9 1/8	2 3/4	8 1/2
8	11 1/8	4 3/4	14

- Mushroom vents are constructed from corrosion-resistant vinylester resin and are permanently bonded directly to the top of the tank.
- Vent screen to keep out birds and bugs is available upon request. Use of a screen reduces vent capacity. Please contact the factory for recommendations and pricing.





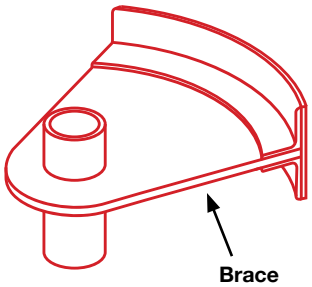
FRP U-VENTS 2", 3", 4"

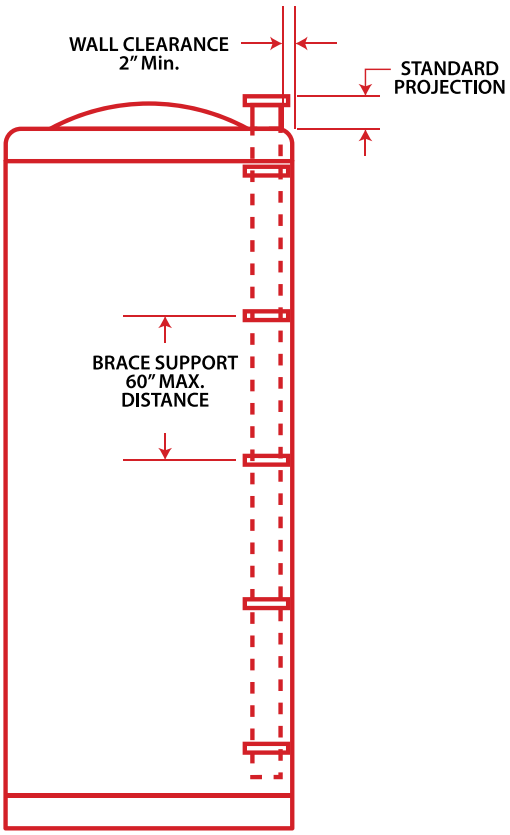
PIPE SIZE (IN.)	D (IN.)	H (IN.)
2	9	12
3	13	14
4	15	16

- 2", 3", and 4" U-vents are permanently bonded to the top of the tank.

DOWN PIPES, BAFFLES, & GUSSETS

FIBERGLASS DOWNPIPES



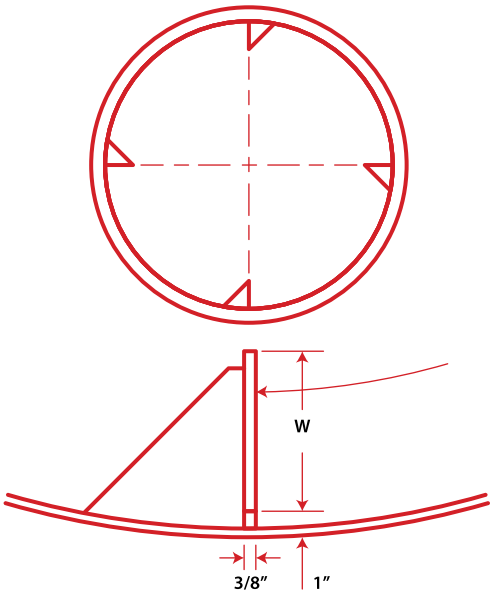


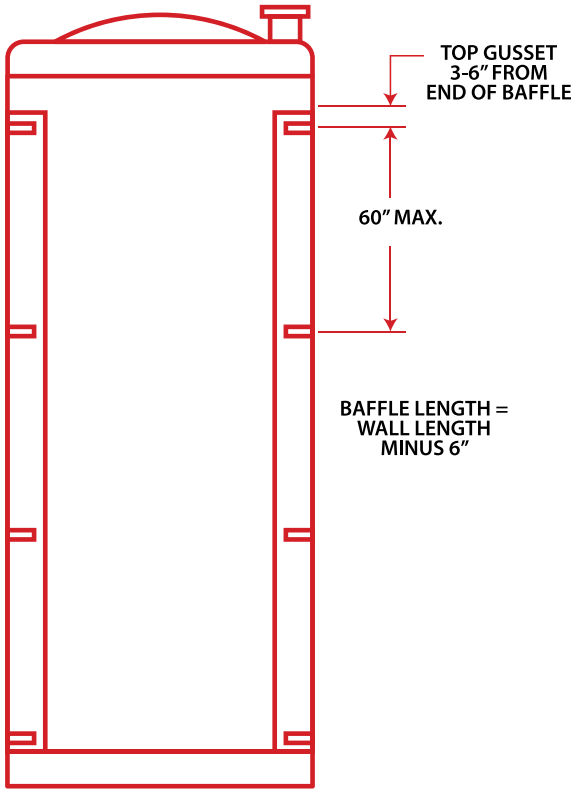
- Fiberglass downpipes are designed for either exterior or interior installation and are used for foam reduction, control of flow, and as a siphon drain.
- Standard installation features pipe permanently bonded to tank wall utilizing fiberglass brace supports. Maximum distance between supports is 60".
- External pipe support is provided using mounting lugs.

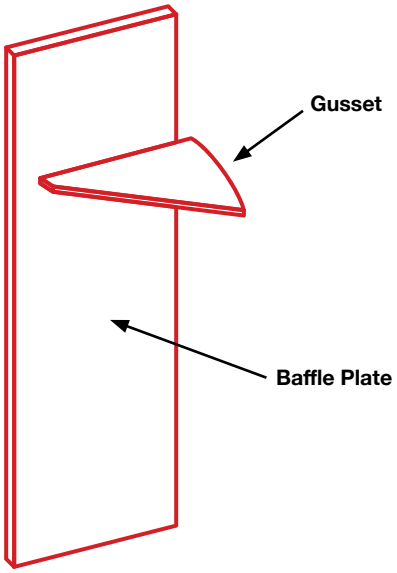
DOWN PIPES, BAFFLES, & GUSSETS

AGITATION BAFFLES

Typical Orientation







- Fiberglass baffles are designed to reduce vortexing in mixing applications.
- Flat plate baffles are bonded to tank wall utilizing fiberglass gussets. See drawing at left for baffle dimensions.
- Top and bottom gussets should be located within 3-6” of end of baffles. Distance between gussets should not exceed 60”.

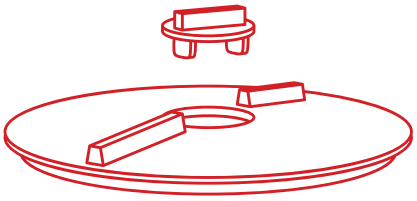
FILLWELLS & MANWAYS

8”, 12”, 16” & 22” FILLWELLS AND COVERS (ABOVE LIQUID LEVEL)

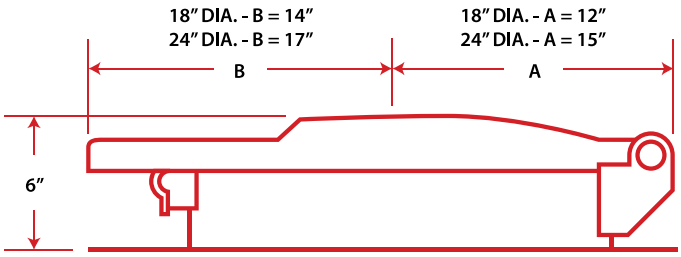
DESCRIPTION
Installed Fillwell
Cover Assembley
Replacement Fillwell
Replacement Center Cap
Pop Rivets (8)

NOTE: Must be installed in flat surface.

Polypropylene threaded fillwells feature large precision threads and are ideal for when inside access is required.



HINGED QUICK ACCESS MANWAYS (ABOVE LIQUID LEVEL) - 18” AND 24”



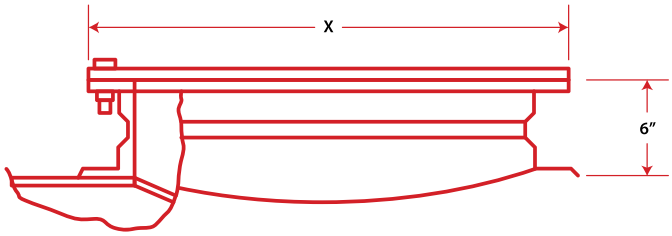
*Additional sizes are available.

Available in either 18” or 24” diameter, hinged quick access manways provide quick and easy access to fiberglass tanks for above liquid level service.

FILLWELLS & MANWAYS

BOLT DOWN MANWAYS (ABOVE LIQUID LEVEL) - 24” AND 32”

DIAMETER	NO. BOLTS	X (IN.)
24	8	28 5/16
32	8	36 1/4



Caution: *Tank must be vented to atmosphere when manway is installed.*

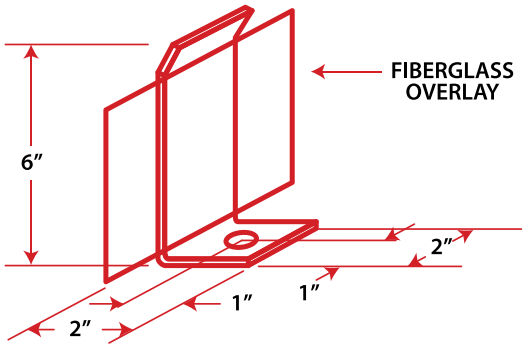
Available in either 24” or 32” size, the bolt down manway features a 3/8” thick FRP cover fastened to a 3/8” flanged lip and can be located anywhere above liquid level that does not interfere with a head seam.

HOLD DOWN LUGS

LIGHT DUTY STEEL HOLD DOWN LUGS

Light duty hold down lugs are designed to provide stability for fiberglass tanks 48” diameter and smaller.

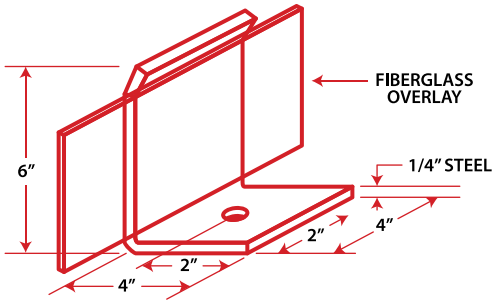
- Available in galvanized steel or in 304 and 316 stainless steel for more corrosive environments.
- Lugs are bonded permantently to tank wall and are intended to be bolted into a concrete mounting pad. Anchor bolts should be located after tank has been placed on pad (bolts not included).



HEAVY DUTY STEEL HOLD DOWN LUGS

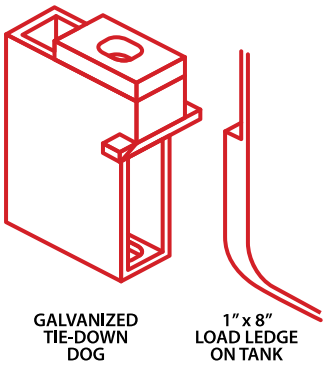
Heavy duty steel hold down lugs are designed for use with tanks 60” diameter or larger where there are seismic, mixing, or wind loading concerns. For specific seismic zone information contact the factory.

- Available in galvanized steel, or in 304 and 316 stainless steel.



EXTRA HEAVY DUTY TIE DOWN

Heavy duty dogs and fiberglass molded load ledge for applications involving high winds or seismic zone 3 or 4. Galvanized carbon steel is standard, for special applications 304 and 316 stainless steel can be purchased.



LIFT LUGS & MOUNTING LUGS

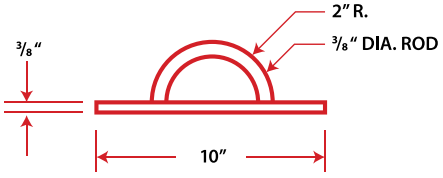
LIFT LUGS

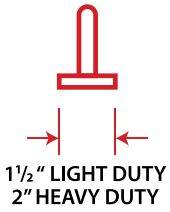
Lift lugs provide a safe, economical means to lift **empty** fiberglass tanks for on-site handling.

- Lift lugs are required on all tanks 90” diameter and larger.
- Lugs are attached to tank wall with hand-layed laminate equal to or greater than the tank wall thickness.
- Lugs are available in 304 or 316 stainless steel.

HEAVY DUTY LIFT LUGS

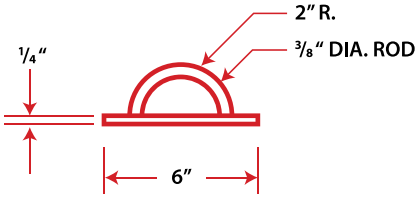
Heavy duty lugs are required on all tanks 90” diameter and larger and are included with the tank. Refer to specific tank size on separate price sheet to determine number of lugs that are included as a standard. Additional lugs are available as an option.





LIGHT DUTY LIFT LUGS

Light duty lugs are designed to be used on fiberglass tanks 72” diameter and less.



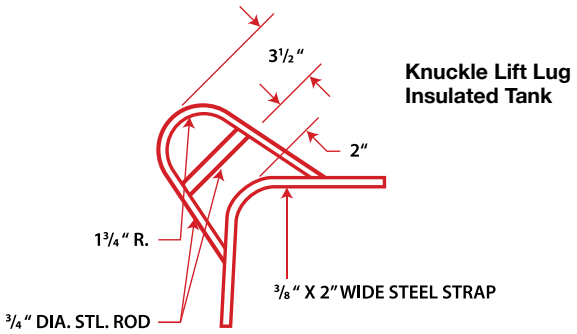
LIFT LUGS & MOUNTING LUGS

FOAMED TANK LIFT LUGS

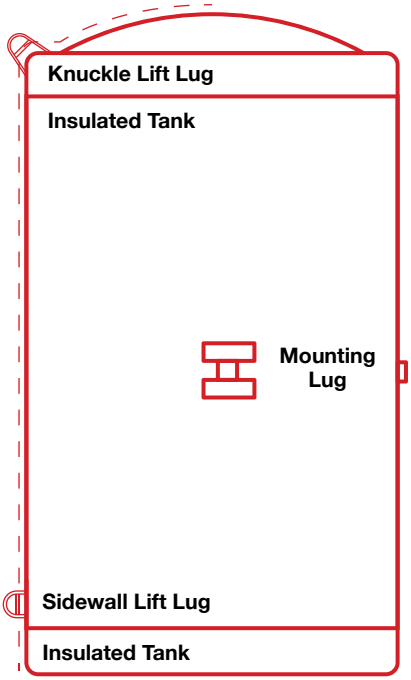
Lift lugs for polyurethane insulated tanks feature additional height to compensate for 2" foam thickness. Typical installation would consist of:

1 SIDEWALL LIFT LUG near the bottom.

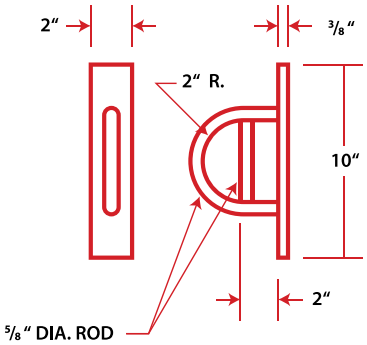
3 KNUCKLE LIFT LUGS at the top. Refer to drawings on this page for detail.

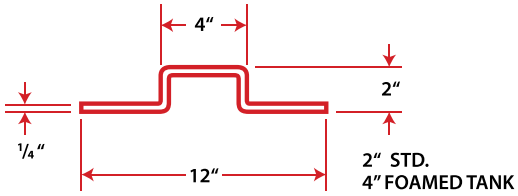


Knuckle Lift Lug
Insulated Tank



Sidewall Lift Lug
Insulated Tank

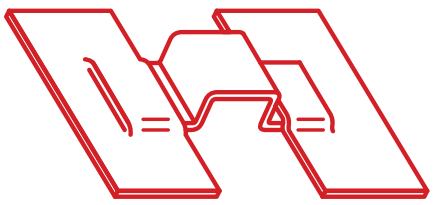




MOUNTING LUGS

Mounting lugs are available in 304 or 316 SS or fiberglass and are designed to bolt accessories (gauges, level indicators, etc.) to the tank wall.

- Attached to wall with hand-layed laminate equal to or greater than wall thickness.
- May be located on any style tank per customer specifications.



LADDERS & CAGES

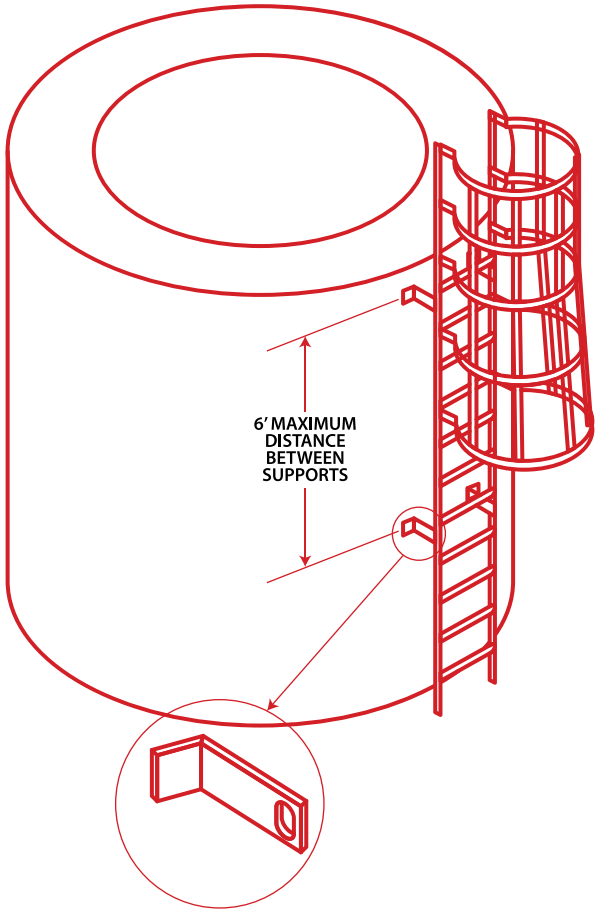
LADDERS & CAGES

Ladder fall restraint system:

- Standard system includes aluminum rigid rail with clamps to ladder rungs, dismount rail extension, shock absorbing shuttle for the rail to stop falls or slips, and a safety harness.
- Also available in galvanized steel and stainless steel.

To order follow the guidelines listed below:

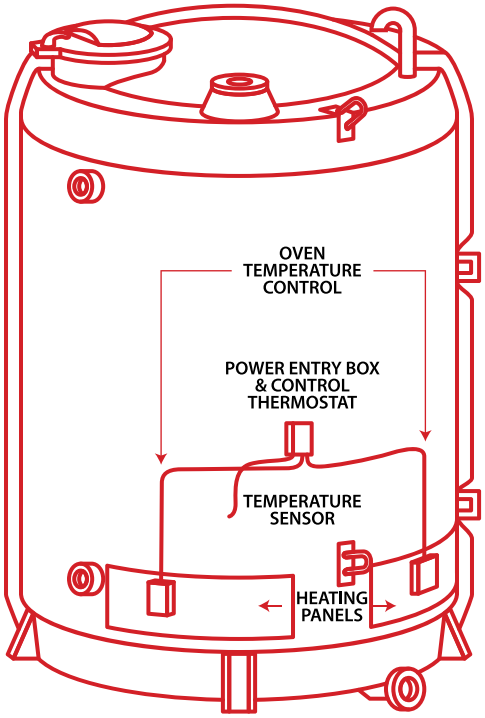
- Total ladder length = tank height + 3’6”.
- Total cage length = ladder length - 7’.
- Maximum center to center distance on mounting lugs is 6’.
- See example on right for assistance.



EXAMPLE		
Calculate ladder length, cage length, and required number of supports for a tank that is 20’ tall.		
Ladder length	=	Tank height + 3’6” 20’ + 3’6” = 23’6”
Cage length	=	Ladder length - 7’0” 23’6” - 7’0” = 16’6”
Lugs Required	=	Tank height/6’ (rounded up to next whole no.) 20’/6’ = 3.33 (round to 4) ladder requires 4 pair of lugs.

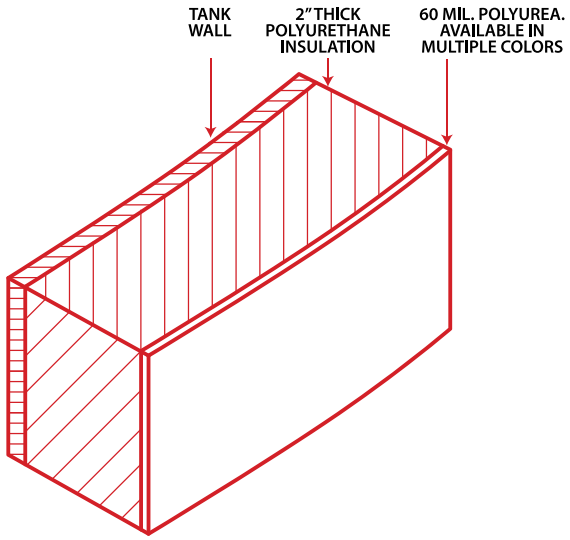
HEATING AND INSULATION

HEATING SYSTEMS



- Heating systems for fiberglass tanks are designed for temperature maintenance only. Sketch above reflects one style of heating system.
- Operate from 120 VAC power source with a low watt/in2 output.
- Enclosed, weatherproof NEMA 4X thermostat operates up to three panels in a parallel circuit.
- To adequately design a system we require tank dimensions, anticipated minimum ambient temperature, wind velocity, and the desired minimum temperature of the contents.
- Alternate heating systems can be designed. In all cases, consult with factory for pricing.

POLYURETHANE INSULATION WITH POLYUREA OVERCOAT



- Spray-on two-part polyurethane foam
- 2.8 pounds per cubic foot density
- R-Value of 6.3 per inch of thickness
- Overcoat consists of a two-part Polyurea material
- Standard top-coat is white or gray and other colors are available upon request
- Materials exhibit excellent weathering characterisitics and great corrosion resistance

FRP OVERWRAP

FRP OVERWRAP SPECS

- Insulation with polyisocyanurate foam
- 2 pounds per cubic foot density
- R-value is 5.4 - 6 per inch of thickness
- Overcoat consists of a FRP laminate material
- Standard top coat color is white or gray and other colors are available upon request
- Materials exhibit excellent weathering characterisitics and great corrosion resistance

GALLONAGE TAPES

GALLONAGE TAPES

Tapes are marked in gallons and liters.

Gallonage tapes are available for cataloged vertical and horizontal fiberglass tanks 24” through 72” diameter and are supplied with black lettering on white adhesive backed tape.

Tapes for 90” diameter tanks are 3 1/2” wide and are supplied with black lettering on white adhesive backed tape.

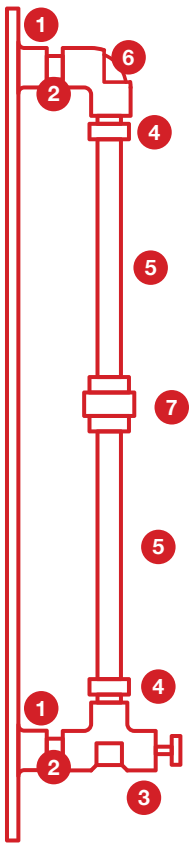
Tapes for 8’ through 14’ diameter tanks are marked in 500 gallon and 2000 liter increments and are supplied with black lettering on white adhesive backed tape 8” wide.

NOTE:
Due to limited translucency of tank wall, liquid level may be difficult to see in low light environments. We recommend the use of a sight tube assembly for those applications where viewing liquid level is critical.

TANK DIAMETER	GALLON RANGE	GALLONAGE INCREMENT
24-38	To capacity	10
42-48	To capacity	20
60	To capacity	50
72	To capacity	100
90	0-2000	200
90	0-4000	200
90	0-6000	200
8’	0-2000	500
8’	0-4000	500
8’	0-6000	500
8’	0-8000	500
9’	0-2500	500
9’	0-5000	500
9’	0-7500	500
9’	0-10000	500
10’	0-3500	500
10’	0-7500	500
10’	0-12000	500
10’	0-15000	500
12’	0-5000	500
12’	0-10000	500
12’	0-15500	500
12’	0-21000	500
12’	0-26000	500
12’	0-30000	500

SIGHT TUBE ASSEMBLIES

PVC SIGHT TUBE ASSEMBLIES



Typical Sight Tube Installation

Rigid PVC sight tube assemblies provide a relatively simple and economical method to positively view liquid level in fiberglass tanks. Direct measurement mechanical systems are also available by factory quotation.

Standard assembly is available in either 3/4” or 1” size and features one bottom angle valve for emergency shut off. If contents are potentially hazardous, we recommend that a top shut off valve be added as a precaution.

An intermediate support is required when overall sight tube length reaches 10’ and one additional support is required for each 6’ length thereafter.

PARTS LIST

ITEM NO.	DESCRIPTION
1	Fiberglass Coupling*
2	PVC Close Nipple
3	PVC Angle Valve
4	PVC Male Adapter
5	PVC Pipe
6	PVC 90° Elbow
7	PVC Union, Socket, Socket

* Coupling bonded into tank. Specify either 3/4” or 1” - 1 valve or 2 valve.

EXAMPLES

SIGHT TUBE LENGTH	NUMBER OF SUPPORTS
< 10’	0
10’ - 17’ 11”	1
18’ - 23’ 11”	2

NOTE: When storing hazardous materials or located (tank) in a high traffic area, an ultrasonic level transmitter is strongly recommended.

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