

How to determine what size Ultracept® unit is required

The Ultracept® system's process is the same regardless of the unit's size. The amount of waste water produced determines whether the 5, 10 or 45 G.P.M. unit is required for a particular application. An easy to follow formula can be used to size the surge pit and the Ultracept® unit that will best meet your needs. The formula consists of the following aspects; surge pit sizing; Ultracept® process chart/ discharge/time chart.

The surge pit is an important factor in the proper operation of the unit. A specially designed cage is placed in the surge pit 12-18" off the bottom. This area below the cage allows solids to settle below the level of the pump. Accumulated solids must be removed before the level reaches the bottom of the cage in order to prevent them from being pumped into the separator.

Exhibit One is "Surge Pit Sizing." This exhibit shows five examples of pit sizes. There are three different capacity figures shown for each pit size; Total Pit Capacity; Sludge Capacity (the area under the cage); Total Water Capacity (the area above and including the cage). To determine the capacity of any existing pit or to design another, figure the cubic feet and multiple by 7.48 (A one cubic foot area can contain 7.48 gallons).

Exhibit Two is the "Ultracept® Process Chart," giving total gallons processed per hour by each unit. Exhibit Three, Table 1, and Exhibit Four, Table 1, are possible applications showing how the surge pit size and Ultracept® unit size and Ultracept® unit size were determined.

Exhibit Five shows the recommended interior design of the surge pit.

L W H			With Overflow Weir
1. 4' x 4' x 4'	= 64 cu. ft. x 7.48 =	479 gal	2.5' x 4' x 3' = 224 gal
Surge: 4' x 4' x 3'	= 48 cu. ft. x 7.48 =	359 gal	
Sludge: 120 gal			
2. 4' x 4' x 6'	= 96 cu. ft. x 7.48 =	718 gal	2.5' x 4' x 5' = 374 gal
Surge: 4' x 4' x 5'	= 80 cu. ft. x 7.48 =	598 gal	
Sludge: 120 gal			
3. 4' x 4' x 8'	= 128 cu. ft. x 7.48 =	957 gal	2.5' x 4' x 7' = 524 gal
Surge: 4' x 4' x 7'	= 112 cu. ft. x 7.48 =	837 gal	
Sludge: 120 gal			
4. 6' x 6' x 6'	= 216 cu. ft. x 7.48 =	1615 gal	4.5' x 6' x 5' = 1009 gal
Surge: 6' x 6' x 5'	= 180 cu. ft. x 7.48 =	1346 gal	
Sludge: 269 gal			
5. 8' x 8' x 6'	= 384 cu. ft. x 7.48 =	2872 gal	6.5' x 8' x 5' = 1945 gal
Surge: 8' x 8' x 5'	= 320 cu. ft. x 7.48 =	2392 gal	
Sludge: 480 gal			

**EXHIBIT ONE
SURGE PIT
SIZING**

Hours of Operation:	8605 (5GPM)	8610 (10GPM)	8645 (45GPM)
1	300	600	2,700
2	600	1,200	5,400
3	900	1,800	8,100
4	1,200	2,400	10,800
5	1,500	3,000	13,500
6	1,800	3,600	16,200
7	2,100	4,200	18,900
8	2,400	4,800	21,600
9	2,700	5,400	24,300
10	3,000	6,000	27,000
11	3,300	6,600	29,700
12	3,600	7,200	32,400
13	3,900	7,800	35,100
14	4,200	8,400	37,800
15	4,500	9,000	40,500
16	4,800	9,600	43,200
17	5,100	10,200	45,900
18	5,400	10,800	48,600
19	5,700	11,400	51,300
20	6,000	12,000	54,000
21	6,300	12,600	56,700
22	6,600	13,200	59,400
23	6,900	13,800	62,100
24	7,200	14,400	64,800

Exhibit Two - Process Chart

Exhibit Three - Application Example

A good example to use is a truck washing facility that uses two pressure washers; one with a 10 G.P.M. output and one with a 3 G.P.M. output. In washing 10 trucks a day, the 10 G.P.M. washer is used for 20 minutes and the 3 G.P.M. washer is used for 10 minutes per truck.

The first step in sizing an Ultracept® is to calculate the total amount of oily water accumulated in a 24-hour day. (Discharge rates of each source)

Source #1	10 G.P.M. x 20 min x 10 trucks	2000
Source #2	3 G.P.M. x 10 min x 10 trucks	300
	Total (a)	2300 GPD

The second step is to calculate the total time (in minutes) each source is used during the washing process. (Total time each source is used)

Source #1	20 min x 10 trucks	200
Source #2	10 min x 10 trucks	100
	Total (b)	300 MPD

The third step in determining which size Ultracept® is best suited for the job is to calculate the excess water that the surge pit will have to hold. To do this, first calculate the amount of water that can be processed by each Ultracept® during the time the trucks are being washed.

8605 (5 GPM)	(b) 300 MPD x 5 G.P.M. = (c) 1500 GPD
8610 (10 GPM)	(b) 300 MPD x 10 G.P.M. = (c) 3000 GPD
8645 (45 GPM)	(b) 300 MPD x 45 G.P.M. = (c) 13500 GPD

Take the total discharge (a)	2300 GPD
Subtract the greatest process amt. w/o exceeding (a)	1500 GPD (8605)
Excess (amount of water the surge pit must hold (d))	800 Gal.

To safeguard against unexpected surges, rainfall or additional usage, we recommend you increase this amount by 20%.

$$1.2 \times 800 \text{ (d)} = 960 \text{ Gal.}$$

This is the amount of water for which the surge pit should be sized. Refer to Exhibit One for capacities of various surge pit sizes.

Exhibit Four - Sample Worksheet

The following is a blank worksheet that can be used to determine the optimum size Ultracept® unit as well as the size of surge pit required.

First, calculate the discharge rate of each source.

Source #1 _____ x _____ min x _____ trucks _____
 Source #2 _____ x _____ min x _____ trucks _____
 Total (a) _____ GPD

Second, calculate the total time (in minutes) each source is used.

Source #1 _____ x _____ min x _____ trucks _____
 Source #2 _____ x _____ min x _____ trucks _____
 Total (b) _____ MPD

Third, calculate the excess water the surge pit will have to hold.

8605 (5 GPM) (b) _____ MPD x 5 GPM = (c) _____ GPD
 8610 (10 GPM) (b) _____ MPD x 10 GPM = (c) _____ GPD
 8645 (45 GPM) (b) _____ MPD x 45 GPM = (c) _____ GPD

Take the total discharge (a) _____ GPD
 Subtract the greatest process amt. w/o exceeding (a) _____ GPD
 Excess (amount of water the surge pit must hold) (d) _____ Gal.

To safe guard against unexpected surges, rainfall or additional usage, we recommend you increase this amount by 20%.

1.2 x _____ (d) = _____ Gal.

This is the amount of water for which the surge pit should be sized. Refer to Exhibit One for capacities of various surge pit sizes.

Surge Pit and Cage:

The purpose of the surge pit is to receive the contaminated water and allow solids to settle to the bottom so they will not be pumped into the Ultracept® system. The cage is to be placed in the pit with the bottom of the cage 12” to 18” off the bottom of the pit. See fig. 2.

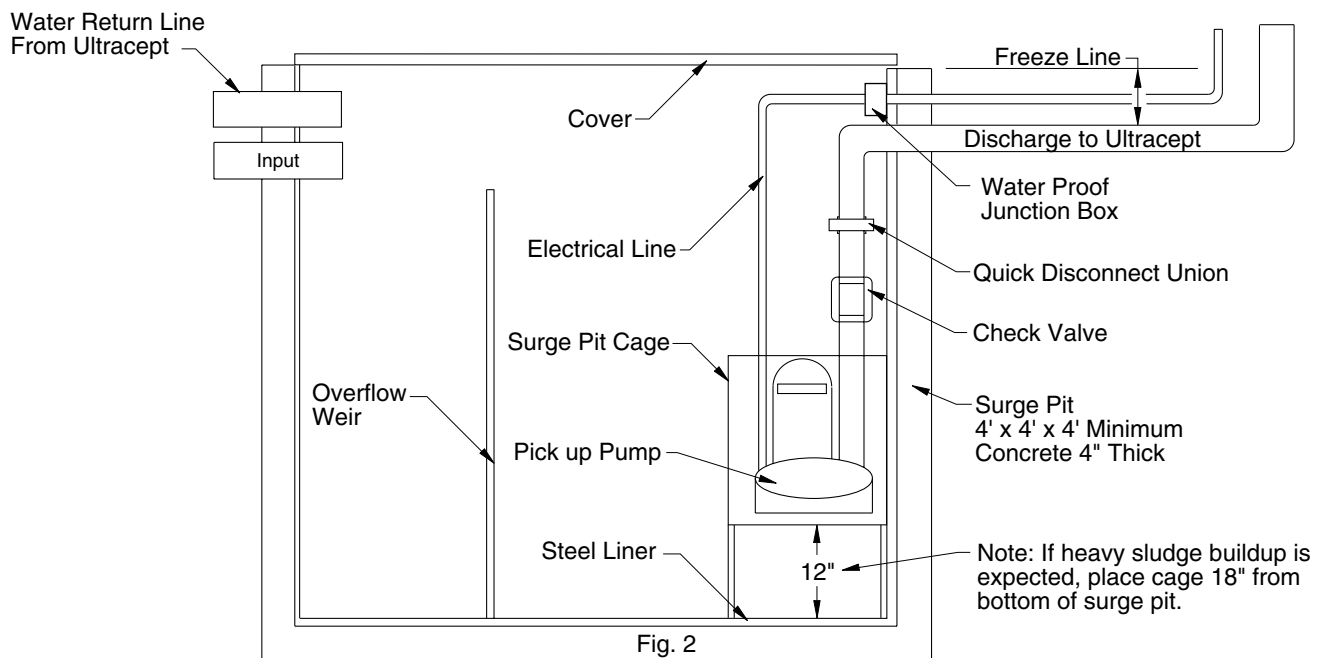
Surge Pit Construction:

The surge pit should be an approved lined concrete pit such as a septic tank, or an approved lined concrete pit (minimum size being 4’ x 4’ x 4’ and 4” thick). If required, local regulations should be checked.

A 1 1/2” discharge pipe should be stubbed into the pit on the side nearest the Ultracept® unit through which contaminated water is pumped from the pit to the unit. This discharge pipe must be located as close to the top of the pit as possible, but not above the freeze line. An overflow weir should be incorporated into the design of the pit on the side closest to the input line. This will allow solids to settle and prevent them from being pumped into the Ultracept® unit. Refer to Exhibit One for the overflow weir location.

In order to provide electricity to the AC surge pit pump, it is necessary for an electrician to run a 120 volt line from the unit to the pit enclosed in conduit. This line also must be stubbed as close to the top of the pit as possible. Note: The surge pit pump is furnished with a 9 ft. UL approved 120 volt cord.

NOTE: Because of the simplicity and versatility of the Ultracept® unit, variations of the system can be made.



Check with your local rep for assistance in meeting your specific needs.