

Calculating Gypsum Underlayment Mix Designs

A mix design describes the amount of sand used per 80 lb bag, and is named by the number of cubic feet of sand per 80 lb bag.

Example: 1.8 mix design = 1.8 cubic feet of sand per 80 lb bag.

As a general rule of thumb, dry sand weighs 100 lb per cubic foot, so to achieve a 1.8 mix design, you have to use 180 lb of sand per 80 lb bag.

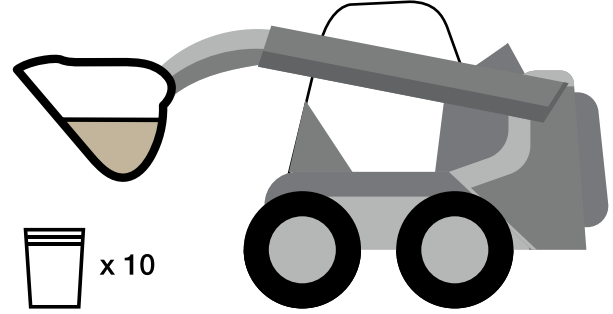
Calibrating a skid-steer bucket using gallons:

- 11 gallons = 1.4 cubic feet
- 14 gallons = 1.8 cubic feet
- 16 gallons = 2.1 cubic feet
- (figures per 80 lb bag)

Using a 5 gallon bucket filled to the top ring, measure the amount of sand required to put the correct cubic feet of sand in a skid-steer bucket.

Example: 4 bag batch at a 1.8 mix design

$$14 \text{ gallons} \times 4 = 56 \text{ gallons of sand}$$



How Much Water Do I Use?

Use the table below as a general rule per bag of material:

Product	Mix Design	Water Range
Treadstone FR25	1.4	4.5-5.25 gal
	1.8	5-6 gal
	2.1	5.5-6.5 gal
Treadstone FR30	1.4	4.5-5.5 gal
	1.8	5-6 gal
Treadstone Sitemix	1.0	4.5-5 gal
	1.4	4.5-5.5 gal
Treadstone Sitemix SL	No Sand Required	3-4 gal
Treadstone Sitemix Ultra	1.0	3-3.75
	1.4	3.5-4.25 gal

$$(\text{Desired Gallons} \times \# \text{ bags} \times 8.34 \text{ (Weight of 1 gallon)}) = \text{lbs water}$$

For example, using Treadstone™ FR25

4 bags in current batch
 $4 \times 80 \text{ lbs} = 320 \text{ lbs cement}$
 $4 (\text{bags}) \times 1.8 (\text{mix design}) \times 100 \text{ lbs (weight of sand)} = 720 \text{ lbs}$
 $720 \text{ lbs} \times 1.05 (\text{moisture correction}) = 756 \text{ lb sand}$
 $5 (\text{gallons per bag}) \times 8.34 (\text{lbs per gallon}) \times 4 (\# \text{ of bags in batch}) = 166 \text{ lbs water}$

To achieve a typical 2000 psi mix:

4 - 80 lb bags of Treadstone™ FR25
 $4 \times 80 \text{ lbs} = 320 \text{ lbs cement}$
 $4 (\text{bags}) \times 1.8 (\text{Mix Design}) \times 100 \text{ lbs (Weight of Sand)} = 720 \text{ lbs}$
 $5 \text{ Gallons Water per Bag} \times 8.34 (\text{lbs per gallon of water}) \times 4 (\text{Bags per Batch}) = 167 \text{ lbs water per batch to achieve 2000 psi mix}$

Mix Designs in Smart Batch Pumps

The Smart Batch pump works by weight of each ingredient, sequentially weighing the water, cement, and sand for each batch.

Important Conversions
1 Gallon Water = 8.34 lb
1 Cubic Foot Sand = 100 lb
1 Bag Gypsum = 80 lb

Example Typical 4 Bag Batch
Desired Mix Design = 1.8
Sand: $1.8 \times 4 \times 100 = 720$
Gypsum: $80 \times 4 = 320$

Smart Batch provides the flexibility to make batches that don't equal an exact number of bags bags.

Example:

3.8 Bags = 305 Lb Cement

To Use A 1.8 Mix Design With A 305 Lb Batch:

$3.8 (\text{Bags}) \times 1.8 (\text{Cubic Feet}) \times 100 (\text{Lb Sand/Ft}) = 684 \text{ Lb(Sand)}$
 $5 \text{ Gallons Water Per Bag} \times 8.34 (\text{Lbs Per Gallon}) \times 3.8 (\text{Bags Per Batch}) = 156 \text{ Lbs Of Water}$

In reality, sand is damp and already has some water weight.

Typical sand moisture is 5%.

To improve yield, add 5% to the sand weight to account for water weight:

$$1.05 \times 720 = 756$$