![LiftAll - PRODUCTS FOR BETTER LIFTING]

## Effect of Angle of Lift on a Sling's Rated Capacity

⚠ WARNING   Read Definition on page 3

Using slings at an angle **can become deadly** if that angle is not taken into consideration when selecting the sling to be used. The tension on each leg of the sling is increased as the angle of lift, from horizontal, decreases. It is most desirable for a sling to have a larger angle of lift, approaching 90°. Lifts with angles of less than 30° from horizontal are not recommended. If you can measure the angle of lift or the length and height of the sling as rigged, you can determine the properly rated sling for your lift.

What would be the rating of each sling rigged at this angle?

1. Calculate the Reduction Factor [RF].

   a. Using the angle from horizontal, read across the Angle Chart to the corresponding number of the Reduction Factor column.
   - OR -
   b. Divide sling height* [H] by sling length* [L].

2. Reduction Factor [RF] x the sling's rated capacity for the type hitch that will be used = Sling's Reduced Rating.

* Measured from a common horizontal plane to the hoisting hook.

Choker Hitch   Vertical Hitch

Vertical Basket Hitch

Angle from Horizontal

90°
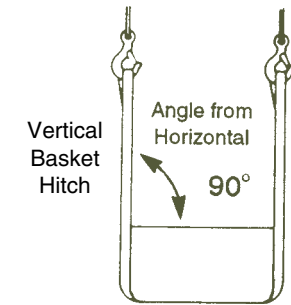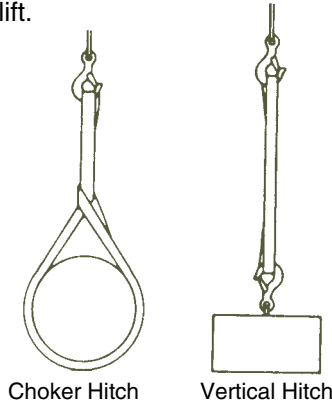
What capacity sling do I need?

1. Determine the weight that the sling will be lifting [LW].

2. Calculate the Tension Factor [TF].

   a. Using the angle from horizontal, read across the angle chart to the corresponding number of Tension Factor column.
   - OR -
   b. Divide sling length* [L] by sling height* [H].

3. Lifting Weight [LW] x the Tension Factor [TF] = Minimum Sling Rating for the type of hitch that will be used.

* Measured from a common horizontal plane to the hoisting hook.

Effect of Angle Chart

Reduced Capacity

Increasing Tension

| Reduction Factor (RF)	Angle From Horizontal	Tension Factor (TF)
1.000	90˚	1.000
0.996	85˚	1.004
0.985	80˚	1.015
0.966	75˚	1.035
0.940	70˚	1.064
0.906	65˚	1.104
0.866	60˚	1.155
0.819	55˚	1.221
0.766	50˚	1.305
0.707	45˚	1.414
0.643	40˚	1.555
0.574	35˚	1.742
0.500	30˚	2.000

Sling capacity decreases as the angle from horizontal decreases. Sling angles of less than 30° are not recommended.

LW = 500 lbs.   LW = 500 lbs.
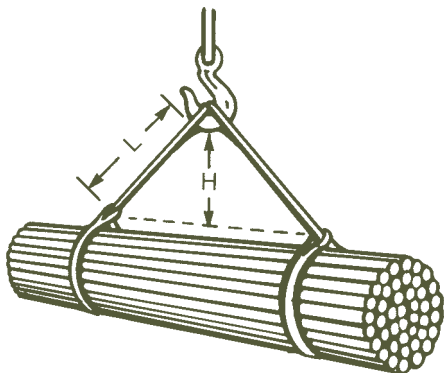
1,000 lbs.

Example:
Vertical Choker rating of each sling = 6,000 lbs.
Measured Length (L) = 6 ft.
Measured Height (H) = 4 ft.
Reduction Factor (RF) = 4 (H) ÷ 6 (L) = .667
Reduced sling rating in this configuration = .667 (RF) x 6,000 lbs. = 4,000 lbs. of lifting capacity per sling
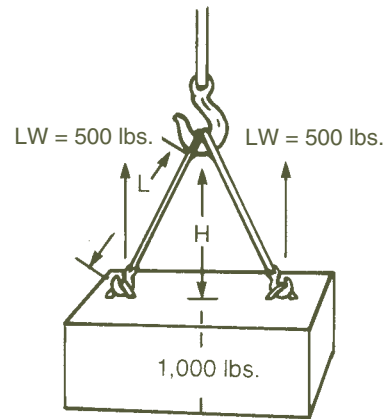
Example:
Load weight = 1,000 lbs.
Rigging - 2 slings in vertical hitch
Lifting Weight (LW) per sling = 500 lbs.
Measured Length (L) = 10 ft.
Measured Height (H) = 5 ft.
Tension Factor (TF) = 10 (L) ÷ 5 (H) = 2.0
Minimum Vertical Rated Capacity required for this lift = 500 (LW) x 2.0 (TF) = 1000 lbs. per sling