



OSHA Training Toolbox Talk: Material Handling and Storage – How Sling Angles Affect Capacity

[Reference: 1910.184 / 1926.251]

When using two or more slings to lift a load, there is one primary factor that can alter the rated capacity of the slings; and that is the angle between the sling legs and the horizontal plane across the top of the load. All other things being equal, the flatter, or more severe, the sling angle, the lower the lifting capacity of the sling. Conversely, the greater or less severe the angle, the greater the capacity of the sling.

Sling capacities for various leg angles are typically included on the sling manufacturer's sling capacity reduction charts, or on the tag attached to a Sling.

As the sling angles decrease, the tension in the sling legs increases, resulting in a greater load on each leg of the sling – and that reduces lifting capacity.

Conversely, as the sling angle increases, the tension in the sling legs decreases, resulting in a lower load on each leg of the sling – and that increases capacity. In general, the recommended best practice is to try for a sling angle of 60 degrees or more from the horizontal plane of the load, to help minimize the risk of over-loading the slings.

The angle effect is also important to remember when a sling is attached to a load using a basket hitch. The negative effect is most pronounced when using a short sling, because doing so decreases the angle of the sling relative to the load, significantly lowering the sling's lifting capacity.

The angle effect also reduces sling capacity when using a choker hitch to lift a load.

A **qualified person** competent in rigging must oversee lifting operations. And the sling manufacturer's data and instructions must be followed to ensure that at the angles used, the sling has adequate strength to lift the weight of the load. Likewise, it is important for others assisting with the lift to understand how changing the angle of a sling leg, even slightly, can affect a sling's capacity.

Does anyone have anything to add to today's discussion on how sling leg angle relative to the load can significantly affect the sling's lifting capacity?