

OSHA Training Toolbox Talk: Material Handling and Storage – Sling Rigging Method Affects Capacity

[Reference: 1910.184 / 1926.251]

The method used to attach a single leg sling to a load can significantly affect the sling's lifting capacity. Only a qualified person competent in rigging should determine the proper method to attach a sling to a load, based on the sling manufacturer's data and instructions. But it is also important for others assisting to be cognizant about how various rigging methods affect a sling's capacity.

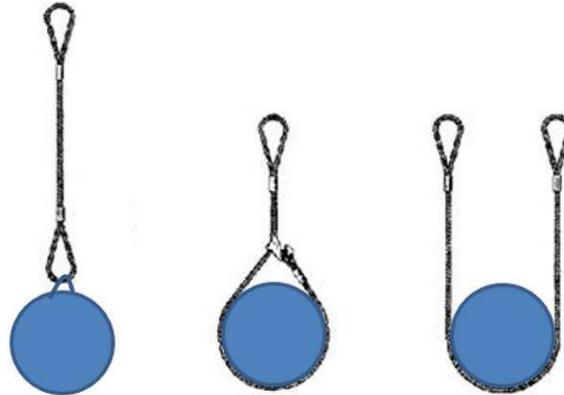
Here is a brief overview of how the rigging method selected can impact the lifting capacity for three common sling hitches: vertical (straight), choker, and basket. Capacities for each method of rigging are typically included on the sling manufacturer's charts, or on the tag attached to a sling. Refer to the handout accompanying this toolbox talk for general examples (*not to be used in actual field conditions*).

- **Vertical (or straight) hitch:** A vertical or straight hitch is described by federal OSHA as a method of supporting a load by a single, vertical leg of the sling. In this configuration, the lifting eye on one end of the single leg sling (such as wire rope, webbing, or chain) is attached directly to the lifting hook on the crane, hoist, or other lifting mechanism, and the other end to the load via an appropriately sized connection device such as a hook or lifting eye and clevis. One pitfall of this method is that a single connection point won't stabilize the load, allowing it to teeter side to side.
- **Choker hitch:** A choker hitch is described by federal OSHA as a sling configuration with one end of the sling passing under the load and then back through an end attachment, loop, or eye on the other end of the sling, forming a "choke" around the load. Then, the lifting eye on the free end of the sling is attached directly to the hook on the hoist or other lifting device. This choker method of rigging results in a lower lifting capacity (approximately 35 percent) than a vertical (straight pull) connection for the same size sling (see chart). However, a choker hitch is able to stabilize the load and provide more support, as long as it is tightened properly and the load is balanced.
- **Basket hitch:** A basket hitch is described by federal OSHA as a sling configuration whereby the sling is passed under the load and has both end attachments, eyes or handles placed on the lifting hook or a single master link. This method provides the greatest lifting capacity; double that of a vertical (straight) sling hitch, and about two and a half times that of a choker configuration. However, it's important to ensure that the load is balanced by centering its weight within the basket, as an uneven weight distribution allows the load to tip to one side and become unstable.

In conclusion, the way that a sling is attached to a load can significantly affect its lifting capacity. It is important to follow instructions for proper rigging techniques as specified by a qualified person, including utilizing the proper attachment method to ensure that the load is lifted safely.

Does anyone have anything to add to today's discussion on how using different type hitches to attach a sling to the load can significantly affect the slings lifting capacity? Please sign the training certification form to ensure you get credit for attending today's OSHA toolbox training session.

GENERAL EXAMPLES OF HOW SLING RIGGING METHODS AFFECT LIFTING CAPACITY



VERTICLE (STRAIGHT) HITCH

CHOKER HITCH

BASKET HITCH



Wire rope sling tag listing capacities measured in tons for various rigging methods. Example not for use in actual lifting applications.

Rope Diameter (inches)	Capacity Rated in Tons		
			
	Vertical	Choker	Vertical Basket
1/4	0.65	0.48	1.3
5/16	1.0	0.74	2.0
3/8	1.4	1.1	2.9
7/16	1.9	1.4	3.9
1/2	2.5	1.9	5.1
9/16	3.2	2.4	6.4

Wire rope sling [wire type not specified] capacity chart showing capacity in tons for various rope sizes and rigging capacities. Provide for example purposes only. Not for use in actual lifting applications.