FOLLOW THESE TIPS FOR SAFE USE OF SLINGS

SLING USE AND SUGGESTIONS

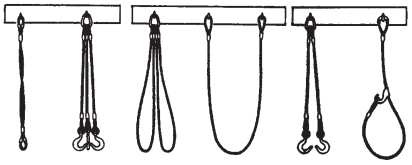
Find Out: Weight of load, shape of load and its balance, how the load is to be lifted, size of the load, overhead room available, environmental conditions.

Suggested Proper Sling Based On: Rated load, sling type, kind of sling (Press-Grip, Cable-Laid, Hand-Braided, etc.), special fittings (Links, hooks, thimbles, protectors, etc.). NOTE: Never exceed 30° angle from horizontal.

Precautions to Take: Use only for rated load, never "Shock" load, protect sling from sharp corners, never use sling if damaged or corroded, avoid dragging sling under or over loads, avoid dropping slings from heights, avoid rolling loads with slings, maintain slings by proper storage and lubrication, avoid extreme heat and corrosive atmospheres.

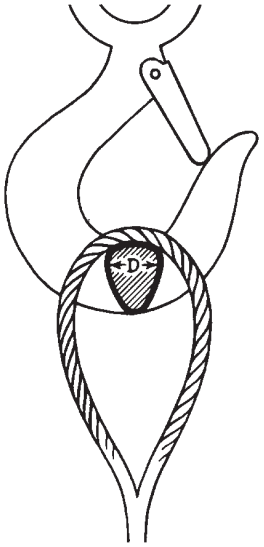
INSPECTION OF SLINGS

Here are some things to look for when inspecting slings: Broken wires, with special attention to ferrules and fittings, condition of the ferrule, corrosion, kinks, abrasion, extreme eye elongation, crushed areas, slippage of strands from ferrule.



STORAGE

Wire rope slings should be stored in an area where they will not be damaged by: Moisture, extreme heat, corrosion (chemical), being run over by vehicular traffic, kinking.



D/d RATIO

Sling eyes are designed to provide what amounts to "small inverted slings" at the ends of the sling body. Therefore, the width of the eye opening will be affected by the same general forces which apply to legs of a sling rigged as a basket.

A sling eye should never be used over a hook or pin with a body diameter larger than the natural width of the eye. Never force an eye onto a hook.

On the other hand, the eye should always be used on a hook or pin with at least the nominal diameter of the rope—since applying the D/d Ratio shows an efficiency loss of approximately 50% when the relationship is less than 1/1.

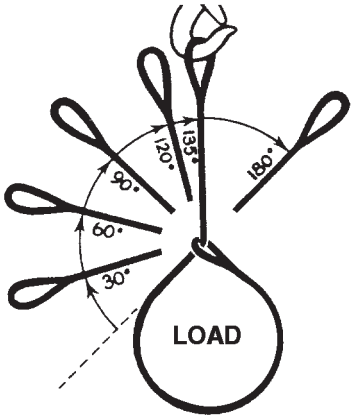
OSHA SAYS

1. Slings and their fittings and fastenings, when in use, shall be inspected daily for evidence of overloading, excessive wear, or damage. Slings found to be defective shall be removed from service.

2. A wire rope sling shall be retired if it develops ten randomly distributed broken wires in one rope lay, or five broken wires in one strand in one rope lay.

3. Fiber core slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200°F. If steel core slings are submitted to temperatures in excess of 400°F or minus 60°F, the manufacturer shall be consulted.

4. Suitable protection shall be provided between the sling and sharp, unyielding surfaces of the load to be lifted.



CHOKER HITCH RATED CAPACITY ADJUSTMENT

For wire rope slings in choker hitch when angle of choke is less than 120°. Percent of sling rated capacity in a choker hitch.

ANGLE OF CHOKE IN DEGREES	RATED CAPACITY PERCENT
OVER 120	100
90 - 120	87
60 - 89	74
30 - 59	62
0 - 29	49

If a load is hanging free, the normal choke angle is approximately 135 degrees. When the angle is less than 135 degrees an adjustment in the sling rated capacity must be made. Choker hitches at angles greater than 135 degrees are not recommended since they are unstable. Extreme care should be taken to determine the angle of choke as accurately as possible.

In controlled tests, where the angle was less than 120 degrees, the sling body always failed at the point of choke when pulled to destruction. Allowance for this phenomenon must be made anytime a choker hitch is used to shift, turn or control a load, or when the pull is against the choke in a multi-leg lift.

LEG ANGLE From Horizontal	LOAD FACTOR
90	1.000
85	1.003
80	1.015
75	1.035
70	1.064
65	1.103
60	1.154
55	1.220
50	1.305
45	1.414
40	1.555
35	1.743
30	2.000

TABLE A

CALCULATING THE LOAD ON EACH LEG OF A SLING

As the included angle between the legs of a sling increases, the load on each leg increases. The effect is the same whether a single sling is used as a basket, or two slings are used with each in a straight pull, as with a 2-legged bridle.

Anytime pull is exerted at an angle on a leg or legs of a sling, the load per leg can be determined by using the data in Table A. Proceed as follows to calculate this load and determine the rated capacity required of the sling or slings, needed for a lift.

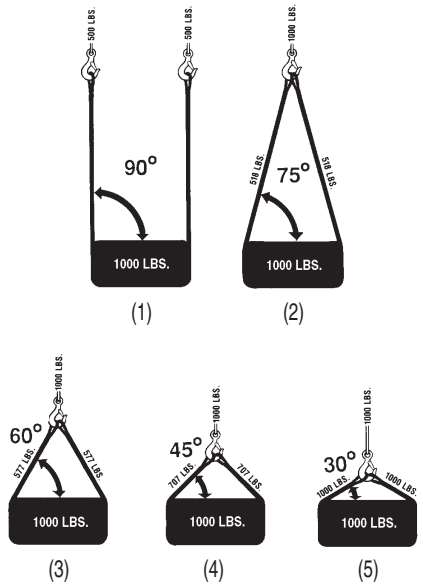
1. First, divide the total load to be lifted by the number of legs to be used. This provides the load per leg if the lift were being made with all legs lifting vertically.

2. Determine the angle between the legs of the sling and the horizontal.

3. Then MULTIPLY the load per leg (as computed in No. 1 above) by the Load Factor for the leg angle being used (from Table A) - to compute the ACTUAL LOAD on each leg for this lift and angle. THE ACTUAL LOAD MUST NOT EXCEED THE RATED SLING CAPACITY.

Thus, in drawing three (sling angle at 60°): 1000 ÷ 2 = 500 (Load Per Leg if a vertical lift) 500 x 1.154 = 577 lbs. = ACTUAL LOAD on each leg at the 60° included angle being used.

In drawing four (sling angle of 45°): 1000 ÷ 2 = 500 (Load Per Leg if a vertical lift) 500 x 1.414 = 707 lbs. = ACTUAL LOAD on each leg at the 45° horizontal angle being used.



DRAWINGS 1-5

ANGLES OF BRIDLES (DRAWING 6)

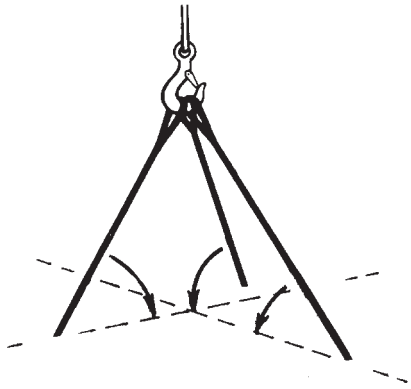
The horizontal angle of bridles with 3 or more legs is measured the same as the horizontal sling angle of 2-legged hitches. In this case where a bridle designed with different leg lengths results in horizontal angles, the leg with the smallest horizontal angle will carry the greatest load. Therefore, the smallest horizontal angle is used in calculating actual leg load and evaluating the rated capacity of the sling proposed.

REPLACEMENT

No precise rules can be given to determine the exact time a sling should be replaced since many variable factors are involved. Safety in this respect depends largely upon the use of good judgment by an experienced person in evaluating remaining strength in a used sling. Proper allowance must be made for deterioration as disclosed by inspection. The safety of an operating sling depends upon this remaining strength.

Conditions such as the following should be sufficient reason for questioning safety of slings and for considering replacement:

a. Ten randomly distributed broken wires in one rope lay or five broken wires in one strand in one rope lay.
b. Wear or scraping of one-third the original diameter of outside individual wires.
c. Kinking, crushing, birdcaging, or other damage resulting in distortion of the rope structure.
d. Evidence of heat damage.
e. End attachments that are cracked, deformed or worn.
f. Hooks that have been open more than 15 percent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook.
g. Corrosion or rope or end attachments.



DRAWINGS 6

RECOMMENDED OPERATING PRACTICES

Whenever any sling is used, it is recommended that the following practices be observed:

a. Slings that are unsafe should be destroyed.
b. Slings should never be exposed to temperatures in excess of manufacturer's recommendations.
c. Use a sling that is long enough to provide the maximum practical horizontal angle.
d. Slings should never be shortened with knots, bolts, or other methods.
e. Care should be taken never to twist or kink the legs of a sling.

ABUSES

It is vitally important to recognize and avoid possible abuses of wire rope slings. By law, the sling user is no longer permitted to use jury-rigged slings and short cuts that were accepted practice for many years. Some of these practices that should be avoided are:

a. Tying knots in wire rope.
b. Using "Home-made" fittings and attachments.
c. Making slings from used operating rope.
d. Use of any sling that is of questionable strength.