GENERAL OSHA AND MANUFACTURER REQUIREMENTS FOR ALL SLINGS

Safe Operating Practices

1. **Sling users must be trained** in operating practices, including sling selection, use, inspection, rigging practices, cautions to personnel, and effects of environment.

2. **Inspect sling at least daily** and remove from service if damaged.

3. **Protect sling from being cut or damaged** by corners, protrusions, or from contact with edges that are not well rounded.

4. **Use sling properly**. Do not exceed a sling's rated capacities and always consider how the sling angle affects the amount of tension on the sling.

5. **Stand clear of load**. Do not stand on, under or near a load, and be alert to dangers from falling and moving loads, and the potential for snagging.

6. **Maintain and store sling properly**. Sling should be protected from mechanical, chemical and environmental damage.

**Inspection Frequency**

- **Initial Inspection** - Each new sling must be inspected by a designated person to help ensure that the correct sling has been received, is undamaged, and meets applicable requirements for its intended use.

- **Frequent Inspection** - The sling must be inspected by a designated person before each day or shift in Normal service conditions, or before each use in applications where a rapid rate of sling wear or other degradation may exist. (Severe service conditions).

- **Periodic Inspection** - Every sling must be inspected "periodically". The designated person should be someone other than the person performing the frequent inspection.

The frequency of periodic inspections should be based on the sling’s actual or expected use, severity of service, and experience gained during the inspection of other slings used in similar circumstances, but must not exceed a one year interval. General guidelines for the frequency of periodic inspections are:

- Normal service–yearly
- Severe service–monthly to quarterly
- Special service–as recommended

A written record of the most recent periodic inspection must be maintained. (See WSTDA WS-1 for definitions of service conditions.)

2. **Inspections**

   **Inspections. Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service.**

   (OSHA Wording)

- The Safety Bulletin that accompanied each sling must be read and understood by all sling users. See sling abuse illustrations in their respective section of this catalog. Damaged slings should never be used, but in some instances, it is possible to repair slings, proof test and return them to service. Damaged components and sections of chain or wire mesh can be replaced. Hooks, links and other components that are in good condition can be salvaged from a damaged web or round sling, rewelded, proof tested by Lift-All and returned to service.
3. Protect Slings

**WARNING** Read Definition on page 3

Slings shall be padded or protected from the sharp edges of their loads. (OSHA Wording)

The cutting of synthetic slings is the main cause of sling failure; usually caused by a sharp or small diameter load edge against the sling. Proper protection must be used to avoid cutting. (See Sling Protection Section page 14).

Punctures & Abrasions seriously degrade sling strength. Rough load surfaces and dragging slings on the ground will damage all slings, steel or synthetic. Use proper padding between slings and rough loads. Never drag slings on ground or concrete floors.

**Sling Protection**

A qualified person must select materials and methods that adequately protect slings from edges or surfaces. Sleeves, wear pads, corner protectors, or other softeners are examples of materials commonly used as protection devices. However, **No protective device is “cut proof”**.

Some protection devices provide abrasion resistance, but offer virtually no protection against cuts. Several “test” lifts, done in a non-consequence setting, may be necessary to determine the suitability of each protection device. After each “test” lift, inspect all slings and protection devices for damage.

Foreign Matter - Material such as metal chips and heavy grit can damage slings, both internally and externally. Avoid contact with foreign matter whenever possible.

4. Use Slings Properly

- Slings shall not be dragged on floor.

**Improper Loading - Shock Loading, unbalanced loading, overloading and inadequate consideration for the effect of angle factors can adversely affect safety. Make sure the load weight is within the rated capacity of the sling(s) being used for both type of hitch and angle of lift. (OSHA Wording)**

- Do not shock load. Jerking the load could overload the sling and cause it to fail.

- Lift must be stable with respect to the center of gravity - balanced.
GENERAL OSHA AND MANUFACTURER REQUIREMENTS FOR ALL SLINGS

**WARNING** Read Definition on page 3

Slings used in a basket hitch shall have the loads balanced to prevent slippage. (OSHA Wording)

- **Slings shall not be loaded in excess of their rated capacities.** (OSHA Wording)
- Rated capacities (Working Load Limits) must be shown by markings or tags attached to all slings.

Slings shall be securely attached to their loads. (OSHA Wording)

- Do not point load hooks - center load in base of hook.

Temperature - Avoid loads and environments where temperatures exceed the limits of the slings being used. All slings can be damaged by excessive heat, including heat from welding torches and weld spatter.

Chemical Environment - Slings exposed to certain chemicals or the vapors of these chemicals can lose some or all of their strength. When using slings in a chemical environment, contact Lift-All to assure sling compatibility.

- Temperature and chemical environment must be considered (see specific sling types for data).

Right Way

Wrong Way

- Angle of lift must be considered in all lifts. See page 12.
- Temperature and chemical environment must be considered in all lifts.
GENERAL OSHA AND MANUFACTURER REQUIREMENTS FOR ALL

WARNING

Read Definition on page 3

Sling legs shall not be kinked.
(OSHA Wording)

Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
(OSHA Wording)

A sling shall not be pulled from under a load when the load is resting on the sling.
(OSHA Wording)

Suspended loads shall be kept clear of all obstructions. All employees shall be kept clear of loads about to be lifted and of suspended loads.
(OSHA Wording)

• Before a load is lifted, a place should be prepared where it is to be put down. Lumber can be used to allow space to remove the sling and prevent shifting of the load.

• After lifting, the load should not be pushed or guided by employees hands directly on the load. Ropes or “tag lines” should be attached for this purpose.

Right Way

Wrong Way

Right Way

Wrong Way
6. Maintain and Store Sling Properly

Attempt to keep slings clean and free of dirt, grime and foreign materials.

When not in use, slings should be stored in an area free from environmental or mechanical sources of damage, such as: weld spatter, splinters from grinding or machining, or sources of UV, heat, or chemical exposure, etc.

Additional Factors to consider when handling loads

- Integrity of the attachment points
- Structural stability of the load
- Loose parts that could fall from load
- Power lines in the area

**Slings shall be stored in cool, dark, dry areas, preferably on racks.**

**Choker Hitch Angles**

When a choke hitch is used, and the angle of choke is less than 120 degrees, the sling choker hitch capacity decreases. To determine the actual sling capacity at a given angle of choke, multiply the sling capacity rating (for a choker hitch) by the appropriate reduction factor determined from the tables below.

Reduction in rated capacity as a function of angle of choke

<table>
<thead>
<tr>
<th>Angle of Choke</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; or = 120</td>
<td>1.00</td>
</tr>
<tr>
<td>105</td>
<td>.82</td>
</tr>
<tr>
<td>90</td>
<td>.71</td>
</tr>
<tr>
<td>60</td>
<td>.58</td>
</tr>
<tr>
<td>0</td>
<td>.50</td>
</tr>
</tbody>
</table>

Sling capacity decreases as choke angle decreases.

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**Synthetic Slings**

<table>
<thead>
<tr>
<th>Angle of Choke</th>
<th>Factor</th>
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</thead>
<tbody>
<tr>
<td>&gt; or = 120</td>
<td>1.00</td>
</tr>
<tr>
<td>105</td>
<td>.82</td>
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<td>90</td>
<td>.71</td>
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<tr>
<td>60</td>
<td>.58</td>
</tr>
<tr>
<td>0</td>
<td>.50</td>
</tr>
</tbody>
</table>

**Wire Rope Slings**

<table>
<thead>
<tr>
<th>Angle of Choke</th>
<th>Factor</th>
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</thead>
<tbody>
<tr>
<td>&gt; or = 120</td>
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</tr>
<tr>
<td>90</td>
<td>.87</td>
</tr>
<tr>
<td>60</td>
<td>.74</td>
</tr>
<tr>
<td>30</td>
<td>.62</td>
</tr>
<tr>
<td>0</td>
<td>.49</td>
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</tbody>
</table>

**Lift-All** is dedicated to manufacturing and developing products for material handling that meet or exceed current industry and government requirements (OSHA and ASME B30.9). Ultimately, the life and strength of any sling depends on those who inspect, use and maintain it.
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.

**Effect of Angle of Lift on a Sling’s Rated Capacity**

**WARNING**
Read Definition on page 3

What capacity sling do I need?
1. Determine the weight that the sling will be lifting [LW].

2. Calculate the Tension Factor [TF].
   - OR -
   a. Using the angle from horizontal, read across the angle chart to the corresponding number of Tension Factor column.
   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**

<table>
<thead>
<tr>
<th>Tension Factor (TF)</th>
<th>Angle From Horizontal</th>
<th>Reduction Factor (RF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>90°</td>
<td>1.000</td>
</tr>
<tr>
<td>1.004</td>
<td>85°</td>
<td>0.996</td>
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<td>1.155</td>
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</tr>
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<td>1.742</td>
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<td>0.574</td>
</tr>
<tr>
<td>2.000</td>
<td>30°</td>
<td>0.500</td>
</tr>
</tbody>
</table>

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

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.

**Reduced Capacity**

| Vertical Basket Hitch 90° |

**Example:**
Load weight = 1,000 lbs.
Rigging - 2 slings in vertical hitch
Lifting Weight (LW) per sling = 500 lbs.
Measured Length (L) = 5 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