Angle of Choke - 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 Table 4-2.

Figure 4-3
Adjusted choker hitch capacity = Choker Hitch Capacity x Reduction Factor

Table 4-2. Reduction in rated capacity as a function of angle of choke

<table>
<thead>
<tr>
<th>Angle of Choke</th>
<th>Sling Capacity Reduction Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; or = 120°</td>
<td>1.00</td>
</tr>
<tr>
<td>105°</td>
<td>0.82</td>
</tr>
<tr>
<td>90°</td>
<td>0.71</td>
</tr>
<tr>
<td>60°</td>
<td>0.58</td>
</tr>
<tr>
<td>0°</td>
<td>0.50</td>
</tr>
</tbody>
</table>

5. All Personnel Must Remain Clear of Loads and Alert to Risks
To prevent possible injury when using slings, all personnel must:
- Stand clear of lifted loads and never be under, on or near suspended loads.
- Avoid placing any parts of the body between the sling and load, or between the sling and lifting hook or connections.
- Be alert to the potential for the sling to become snagged during a lift.

6. Maintain and Store Sling Properly
Attempt to keep slings clean and free of dirt, grime and foreign materials. If slings are cleaned, use only mild soap and water, and:
- Do not use bleaching agents.
- Do not machine wash or tumble dry slings, as this can significantly reduce their strength.

4c. Sling hardware and connections
Connections must be smooth to prevent abrading or cutting web slings.

4d. Avoid actions that cause damage to slings, such as:
- Using hooks, shackles or other hardware that have edges or rough surfaces.
- Twisting, kinking or knotting the sling.
- Using slings to pull on stuck or constrained objects.
- Pulling slings from under loads when the load is resting on the sling—place blocks under load if feasible.

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
- Securing a clear load path and avoid any contact with objects that would impede load movement
- Tag lines can often be attached to the load and be used to aid in controlling load positioning

For Additional Information
This bulletin does not contain all of the information that may be necessary to ensure the safe use of web slings. Some additional sources of training information include:
- WSTDA WS-1 Recommended Standard for Synthetic Web slings
- ASME B30.9 Sling Standard
- OSHA 29 CFR 1910.184 Regulations
- Lift-All Catalog and website at www.lift-all.com
- Rigging handbooks

Call for information on Sling Inspections & Safety Seminars
Directed Toll Free (800) 909-1964

Synthetic Web Sling Safety Bulletin

**WARNING**

Failure to Read, Understand and Follow the information in this bulletin may result in severe INJURY or DEATH due to handling, lifting and/or loss of load. This bulletin contains important safety information. It DOES NOT contain all of the information you need to know about handling, lifting and manipulating materials and loads safely. It is your responsibility to consider all risk factors prior to using any rigging device or product.

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 (See Table 4-1).
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.

2a. How to inspect slings
Perform a visual inspection of the entire sling and feel along its entire length for any of the types of conditions listed in Tables 2-1 and 2-2.

2b. Removal from service
Remove sling from service immediately if ANY of the listed types of damage are detected, even if the damage is not as extensive as the relatively extreme examples illustrated in Table 2-2. Never ignore sling damage or attempt to perform temporary repairs of damaged slings (e.g., tie knots in the sling, etc.).

Table 2-1. Removal from service criteria:

- Holes, tears, cuts, snags or embedded materials
- Excessive abrasive wear
- Exposed red core warning yarn if provided
- Broken or worn stitches in the load bearing splices
- Identification tag is missing or not readable
- Sling has been tied into one or more knots
- Signs of ultraviolet (UV) light degradation
- Any heat or chemical damage, i.e. acid or alkali burns, melting or weld spatter
- Fittings with any cracks, excessive wear, or other damage, such as deformation, corrosion, or pitting
- Hooks with throat opened more than 15% or twisted more than 10 degrees out of plane
- Any conditions which cause doubt as to the strength of the sling
2e. Environmental considerations and outdoor use

Exposure to sunlight, and other environmental factors such as dirt or gritty matter and cyclical changes in temperature and humidity, can result in an accelerated deterioration of web slings. The rate of this deterioration varies with the level of exposure and with the thickness of the sling material.

Visible indication of such environmental deterioration can include the following:

- Fading of webbing color
- Uneven or disoriented surface yarn of the webbing
- Shortening of the sling length
- Reduction in elasticity of the sling due to an exposure to sunlight, often evident by an accelerated abrasive damage to the surface yarn of the sling
- Breakage or damage to yarn fibers, often evident by a fuzzy appearance of the web
- Stiffening of the web, evident when web slings are exposed to outdoor conditions

Sunlight / UV Exposure Service Life

Nylon and polyester web slings possess a limited useful outdoor service life due to the degradation caused by exposure to sunlight, or other measurable sources of UV radiation.

Lift-All web slings that are regularly exposed to outdoor conditions should be proof tested to twice its rated capacity every six months. Lift-All nylon and polyester web slings shall be permanently removed from service when the cumulative outdoor exposure has reached the limits shown in Table 2-2.

Table 2-2. Outdoor Exposure Limits

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 years</td>
<td>for 1 ply and 2 ply web slings</td>
</tr>
<tr>
<td>3 years</td>
<td>for 3 ply and 4 ply web slings</td>
</tr>
</tbody>
</table>

3a. Exposure of slings to edges

Exposure of web slings to edges with a radius that is too small can cause sling failure and loss of load. Edges do not need to be "sharp" to cause failure of the sling. Chamfering or cutting off edges is not an acceptable substitute for fully rounding the edges to avoid damage. Slings can also be damaged from contact with edges or burrs at the sling connections.

2d. 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 in Normal service conditions, or before each use in applications where a rapid rate of sling wear or other degradation may occur. 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.)

3b. Sling protection

A qualified person must select materials, and methods that adequately protect slings from damage. 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.

4. Sling Selection and Use

In order to safely lift a load and not exceed the sling’s rated capacity, a qualified person must select slings having suitable characteristics and consider the following:

- Load information including size, shape, weight, composition and center of gravity
- Lifting conditions including overhead clearance, temperature, and chemicals
- Hoisting equipment and attachment options including the number and method of connections to the load

4a. Rigging configuration and load stability

A qualified person must review each lift, create a rigging plan, and select the sling hitch(es) (see Figure 4-1). This process should consider:

- Load Control and Stability – A qualified person must choose the quantity of slings, location of attachments, and the hitch types needed to effectively maintain load control. Resistance to tipping must be maintained if the slings are attached below the center of gravity.

Sling Securement – Each sling must be hitched to prevent slippage, yet not restrict the sling from maintaining uniform tensioning.

Figure 4-1. Common types of sling hitch configurations

4b. Sling capacity and the effect of angles

Do not exceed the sling’s rated capacity or the capacity of any of the components of the rigging system.

Sling Capacity - Determine the load weight, the tension applied to each sling, and verify that the amount of tension applied to the sling does not exceed its capacity for the chosen hitch.

Effect of Sling Angle – The sling angle affects the amount of tension applied to the sling (see Figure 4-2). As the sling angle decreases, the tension on each leg increases. This principle applies when one sling is used to lift at an angle or when a basket hitch or multi-legged bridle sling is used. Table 4-1 provides information on increased tension as a function of sling-to-load angle. The use of slings at angles of less than 30 degrees should be avoided.

Figure 4-2

Multiply the amount of load applied to each leg of the sling by the tension factor (See Table 4-1) to determine the increased tension on each leg.