



WARNING To Users of Lift-It® Nylon or Polyester Rope Slings.

 **WARNING** Warning Icons are used to alert users to potentially hazardous conditions and situations, which if not avoided may result in SEVERE INJURY or DEATH.

“Must” denotes a mandatory requirement and is synonymous with the use of the term “shall”.

In this guide, all components used for load handling activities, including but not limited to: slings, fittings, rigging hardware, and/or sling protection may also be referred to as rigging*.

 **WARNING** This guide contains important safety information about the use of Lift-It® Nylon or Polyester Rope Slings. However, it DOES NOT provide you with all the information you need to know in order to be considered trained and knowledgeable in load handling activities. The proper use of Nylon or Polyester Rope Slings is only one part of the many necessary ingredients for proper and safe use for successful load handling activities.

You must be properly trained, and it is your responsibility to consider all risk factors prior to all load handling activities. Improper use and/or lack of proper training may result in SEVERE INJURY or DEATH from Nylon or Polyester Rope Sling failure, the unplanned release of tension, deadly recoil and/or impact force and/or loss of load control.

Thank you for taking the time to read and understand the information detailed in this Nylon or Polyester Rope Sling User Guide that accompanies Lift-It® Nylon or Polyester Rope Slings. Nylon or Polyester Rope Slings can fail if damaged, misused, or overloaded, resulting in SEVERE INJURY or DEATH. Users must be knowledgeable and trained about the selection, use, and inspection of Nylon or Polyester Rope Slings. This Nylon or Polyester Rope Sling User Guide provides some, but not all, of the information a user needs in order to use Nylon or Polyester Rope Slings properly and safely. However, failure to read and follow ALL of the information in this Nylon or Polyester Rope Sling User Guide may result in SEVERE INJURY or DEATH.

The proper use of Nylon or Polyester Rope Slings is only one of the many necessary ingredients of a complete and successful load handling plan. You must be properly trained, and it is your responsibility to consider all risk factors prior to all load handling activities. Improper use and/or lack of proper training may result in SEVERE INJURY or DEATH due to Nylon or Polyester Rope Sling failure, the unplanned release of tension, loss of load control, and/or deadly recoil and/or impact force during load handling activities.

All Lift-It® products are sold with the express understanding that users are thoroughly familiar with safe and proper product usage. A manufacturer does not (and cannot) have complete knowledge or insight into the specific details and potential hazards associated with your particular load handling activity. The user is responsible for proper use as detailed in all applicable standards, regulations and warnings. The improper use of Nylon or Polyester Rope Slings by untrained persons is extremely hazardous and may result in SEVERE INJURY or DEATH. It is also important that Nylon or Polyester Rope Sling users be thoroughly familiar with the manufacturer's recommendations and safety information that accompanies products.

Read and understand all product and warning information provided in the Nylon or Polyester Rope Sling User Guide, available by scanning the QR Code on many of the Lift-It® tags and labels or available at www.lift-it.com and always follow OSHA, ASME, federal, state, provincial, industry, corporate, association, job site specific, insurance, best practice and/or manufacturer warnings and guidelines.

The American Society of Mechanical Engineers in the ASME B30.9 Sling Safety Standard, Section 9-X.1 clearly states the requirement for training. “Sling users shall be trained in the selection, inspection, cautions to personnel, effects of the environment and rigging practices, covered by this chapter.” **Lift-It® Nylon or Polyester Rope Sling users must follow these guidelines for training.**

Occupational Users who use Lift-It® Nylon or Polyester Rope Slings as part of their work must have sufficient training and knowledge of all applicable standards and regulations, as well as employer and/or contractor policies. If you are unsure whether you are properly trained and knowledgeable or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training. If you are a Consumer using Lift-It® Nylon or Polyester Rope Slings, you must also be properly trained and informed in the safe and proper use of Nylon or Polyester Rope Slings. Gravity always works and falling objects injure, kill, and destroy without regard to location. Uncontrolled loads can wreak havoc in a consumer's garage just as easily as they can in the workplace. An important part of becoming properly informed is to read and fully understand the information in all warning/instruction labels, tags, safety bulletins and user manuals that accompany Lift-It® Nylon or Polyester Rope Slings. To increase your level of comprehension, training, and competence, consider completing an accredited rigging course offered by an industry recognized sling and rigging training organization, trade/technical school, union, or industry association. Online courses, instructional videos and publications may also provide valuable information for your specific load handling or load securement activity.

DO NOT use Lift-It® products until you are ABSOLUTELY sure of what you are doing.

Please contact us if you have any questions at 800.377.5438 or email us at info@lift-it.com and NEVER TAKE CHANCES!

The following guidelines cannot possibly cover all the unique variables present in every possible load handling scenario and are certainly NOT all that you need to consider for successful load handling activities. Only the user can possibly have complete knowledge or insight into the specific details and potential hazards associated with a particular load handling activity. Use the following as guidelines, but remember, you are responsible for your decisions, actions and their consequences.

Many dedicated Lift-It® professionals contributed enormous amounts of time, effort, knowledge, experience and financial resources to produce this guide. It demonstrates our commitment to you, your co-workers and your loved ones. We've done our part, now you MUST do yours!

Long before training was in demand, Lift-It® safety professionals traveled at their own expense with a simple message to anyone willing to listen: “Rig right to go home at night”. The “Four Rules of Successful Rigging” were developed over the past four decades as an integral part of the Lift-It® Sling Safety Program. These “Rules” when combined with other necessary considerations based upon your specific application contribute to the successful execution of load handling activities.

Rule One: Stay out of the Danger Zone.
Rule Two: Never use damaged rigging*.

Rule Three: Never overload the rigging*.
Rule Four: You must control the load.

Proper training is necessary to successfully apply the “Four Rules of Successful Rigging”. It is extremely important that you are properly trained in the use and inspection of the slings, rigging hardware and sling protection you use and properly use the equipment in the way you were trained to use it.

Consider the importance of your decisions and actions. The way you do anything is the way you'll do everything. If you rig right, each and every time, your chances of going home, safe and sound to loved ones is dramatically increased. When haste, fatigue, ego and/or production schedules take precedence over safety, lives may be lost, injuries may occur, and property may be destroyed.

Always take the time to make safe and informed decisions or spend the rest of your life regretting poor choices.

Even when you consider all necessary factors, things can still go wrong. One thing is certain.

ALL “Four Rules of Successful Rigging” must be properly applied, simultaneously, “all day long”, “all day strong”.

Leave out and/or improperly apply any one of the “Four Rules of Successful Rigging” in your load handling activities and you relinquish control of your destiny with many profound consequences for your family and co-workers.

Rule One: Stay out of the Danger Zone.

⚠ WARNING Even if you consider all of the factors/issues involved in load handling activities, things can still go wrong. Therefore, all personnel must be alert to potential risks associated with the use of slings, rigging hardware and sling protection.

MAKE SURE ALL PERSONNEL ARE CLEAR OF LOADS AND ALERT TO RISKS, ESPECIALLY IN THE “DANGER ZONE”.

The “Danger Zone” is any area where the load may fall onto or swing into, or anywhere an unplanned release of tension may strike personnel with deadly recoil and/or impact force.

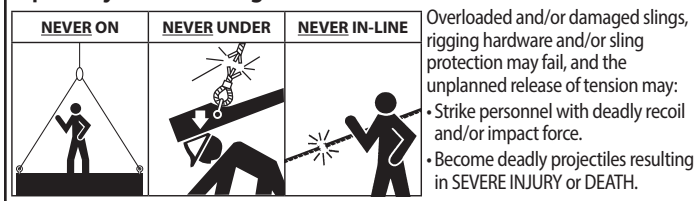
⚠ WARNING Slings, rigging hardware and/or sling protection failure may result in SEVERE INJURY or DEATH. Gravity ALWAYS works and when rigging* failure occurs, personnel on, under, near or next to load handling activities are in grave danger from falling objects. OSHA refers to this area as the “fall zone”. Personnel must never be on, under near or next to suspended loads. Personnel must stand clear of lifted loads and never stand or pass under a suspended load.

⚠ WARNING Personnel must not stand in-line with or next to rigging* under tension. An unplanned release of tension may strike personnel with deadly recoil and/or impact force. Sling users must know and understand the potential danger from the unplanned release of tension and deadly recoil and/or impact force that may result in SEVERE INJURY or DEATH.

The “Danger Zone” is sometimes referred to as “working in the bite”, “working in the line of fire” or “working in the strike zone”.

⚠ WARNING Never use slings and/or rigging* for pulling against stuck, snagged or restrained objects IF LOADING CANNOT BE DETERMINED.

Make Sure All Personnel are Clear of Loads and Alert to Risks, Especially in the “Danger Zone”.



Load measuring devices and/or methods must be used to ensure that OVERLOADING DOES NOT OCCUR.

Personnel must be alert to the potential for the sling and/or load to become snagged or hung up during load handling activities. When these conditions occur, the rigging* may be overloaded.

⚠ WARNING Overloaded rigging* may fail and the unplanned release of tension and deadly recoil and/or impact force may result in SEVERE INJURY or DEATH.

Once load handling activities begin, sling users must never place any part of the body between the sling and the load and/or between slings, shackles, hooks and/or other connection points.

Personnel shall never ride the sling, rigging* or load.

Nylon or Polyester Rope Slings shall never be used as suspended personnel platform bridles.

Nylon or Polyester Rope Slings must NEVER be used for any fall prevention application. Only approved fall prevention products which are specifically rated and labeled for fall prevention shall be used for fall arrest and/or fall prevention.

Rule Two: Never Use Damaged Rigging* or Allow Damage to Occur.

Make Rule Two a reality by inspecting and protecting slings and rigging* from damage.

⚠ WARNING The use of damaged slings, damaged rigging hardware and/or damaged sling protection may result in SEVERE INJURY or DEATH.

The strength and performance of all slings, rigging hardware and/or sling protection is affected by wear and damage. It is critically important that sling users employ a three-stage, inspection procedure: Initial, Frequent and Periodic, performed by a Qualified Person** and/or Properly Informed and Trained Consumer. Any deficiency shall be examined, and a determination made by a Qualified Person** as to whether it constitutes a hazard. If damage is identified, the damaged item must be **immediately** removed from service and must not be returned to service until evaluated and a determination made by a Qualified Person** and/or Properly Informed and Trained Consumer as to whether it constitutes a hazard.

OSHA and ASME removal criteria for synthetic rope slings allows continued use if wear and/or damage does not exceed a specific limit. These quantifiable limits are established on a reduction in the material diameter, based on a maximum percentage of the original diameter.

Quantifying a specific limit for wear and/or damage based on a percentage of the original material diameter may be difficult to determine for flexible synthetic rope slings. Damage such as abrasion and/or the absorption of fluids or foreign materials may boost or exaggerate the rope diameter being examined, resulting in a false assessment. Always consider the cost of failure and then determine if the use of any item with an “acceptable” level of wear and/or damage is worth the risk, given the potentially catastrophic and/or deadly consequences. †

No visual inspection can accurately determine the residual strength of slings, rigging hardware and/or sling protection.

Initial Inspection

Prior to use all new, altered, modified or repaired slings, rigging hardware and/or sling protection must be inspected by a Qualified Person** and/or Properly Informed and Trained Consumer to ensure compliance with the manufacturer’s specifications, and the recommended standards and guidelines issued by consensus, industry, association and/or regulatory authorities. Written records are not required for the Initial Inspection of Nylon or Polyester Rope Slings. The initial inspection must also verify that damage did not occur during transit and that defects in materials and/or workmanship are not present. The identification (sling) tag information must also be examined to ensure it matches the manufacturer’s published specifications.

Frequent Inspection (PRE-USE)

OSHA and ASME specify minimum requirements for frequent inspections. ASME B30.9 states, “Each shift, before the sling is used, a visual inspection for damage shall be performed. Slings used in severe or special service should be inspected before each use.” The Web Sling and Tie Down Association and many manufacturers, including Lift-It® specify that slings, rigging hardware and/or sling protection must be inspected before each use. Users will be held accountable to the highest applicable standard of care and must follow the manufacturer’s recommendations. Slings, rigging hardware and sling protection found with damage shall be **immediately** removed from service and shall not be used for any purpose. Items removed from service, must not be returned to service until approved by a Qualified Person** and/or Properly Informed and Trained Consumer. Any hazardous condition detected during inspection shall require further investigation, and/or corrective action by a Qualified Person** and/or Properly Informed and Trained Consumer. Temporary repairs of slings, rigging hardware and/or sling protection are not permitted. ASME and OSHA do not require written inspection records for frequent inspections.

Nylon or Polyester Rope Sling Inspection

Periodic Inspection

Periodic inspections must be performed by a Qualified Person** and/or Properly Informed and Trained Consumer who have been specifically trained. Persons performing periodic inspections must be knowledgeable in regulatory, consensus, industry and/or association standards, as well as: design factors, repair, proof testing and identification (marking or tagging) requirements, removal criteria, material components, configurations and fabrication techniques. Time served in a tool room does not establish competency or qualification. Training and experience are necessary for persons performing periodic inspections.

Periodic inspections are more meticulous than frequent inspections as the entire sling length, splices, fittings and all exposed surfaces are thoroughly examined. It is recommended that periodic inspections be performed by a Qualified Person** and/or Properly Informed and Trained Consumer other than the person performing the frequent inspections. An independent, fresh set of eyes is advantageous in this and in many other situations.

OSHA and ASME have specific definitions for service conditions which dictate the frequency of periodic inspections. The periodic inspection frequency for slings used in normal service must never exceed one year. This frequency is subject to change based upon the rate of use, severity of the service conditions and the nature of the load handling activity. Periodic inspectors also evaluate and compare the service life of slings, rigging hardware and/or sling protection used in similar conditions to determine, and if necessary, shorten the frequency for periodic inspections of slings used in normal service conditions.

Normal Service: Annual periodic inspections must be performed.

Severe Service: Monthly or quarterly periodic inspections must be performed.

Special Service: As recommended by a Qualified Person** and/or Properly Informed and Trained Consumer.

Periodic inspections are not required for slings that are in storage or idle. If slings have been idle or in storage for more than one year since the last periodic inspection, before use the sling must be thoroughly inspected on a periodic inspection basis by a Qualified Person** and/or Properly Informed and Trained Consumer.

OSHA and ASME do not require that inspection records be maintained for individual Nylon or Polyester Rope Slings. What is required is that a written record of the most recent periodic inspection shall be maintained. In other words, evidence documenting that the periodic inspection was performed must be maintained, not a record of the condition of individual Nylon or Polyester Rope Slings.

Periodic inspections should provide some means of identifying items that have been inspected. Paint, tape, or other potentially damaging identification methods must never be used on rigging. Contact the Lift-It® sales professionals for details of post-periodic inspection identification options that not only provide a visual verification of the periodic inspection but are non-damaging and cost effective.

Removal Criteria

ASME and Cordage Institute require that synthetic rope slings shall be immediately removed from service if any of the following conditions are present.

(a) Missing or illegible sling identification.

The sling must be identified or labeled with the following information:

- (1) name or trademark of manufacturer, or if repaired, the entity performing repairs
- (2) manufacturer's code or stock number
- (3) rated load for at least one hitch type and the angle upon which it is based
- (4) type of fiber material
- (5) number of legs, if more than one

(b) Cuts, gouges, areas of extensive fiber breakage along the length and abraded areas on the rope.

(c) Damage that is estimated to have reduced the effective diameter of the rope by more than 10%.†

(d) Uniform fiber breakage along the major part of the length of the rope in the sling such that the entire rope appears covered with fuzz or whiskers.

(e) Inside the rope, fiber breakage, fused or melted fiber (observed by prying or twisting to open the strands) involving damage estimated at 10% of the fiber in any strand or the rope as a whole.†

(f) Discoloration, brittle fibers and hard or stiff areas that may indicate chemical damage, ultraviolet damage or heat damage.

(g) Dirt and grit in the interior of the rope structure that is deemed excessive.

(h) Foreign matter that has permeated the rope and makes it difficult to handle and may attract and hold grit.

(i) Kinks or distortion in the rope structure, particularly if caused by forcibly pulling on loops (known as hockles).

(j) Melted, hard, or charred areas that affect more than 10% of the diameter of the rope or affect several adjacent strands along the length that affect more than 10% of strand diameters.†

(k) Poor condition of thimbles or other components manifested by corrosion, cracks, distortion, sharp edges, or localized wear.

(l) For hooks, removal criteria as stated in ASME B30.10.

(m) For rigging hardware, removal criteria as stated in ASME B30.26.

(n) Other conditions including visible damage that cause doubt as to the continued use of the sling.

Additional Removal Criteria for Double Braid and Core-Dependent Double Braid Rope Slings:

⚠ WARNING The condition of the internal load-bearing core of Core-Dependent Double Braid ropes may be difficult to evaluate.†

(o) A single cut greater than 5% of the rope circumference, or three or more cut strands that are near each other, even if the core is not exposed.†

(p) Cut fibers at the leg junction of the eye.

(q) Abrasion through 50% of the cover, even if the core is not exposed.†

(r) Inconsistent diameter and/or volume reduction.

(s) Fused fibers and/or extremely stiff cover, unchanged by flexing the rope.

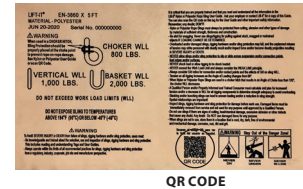
(t) Other conditions including visible damage that cause doubt as to the continued use of the sling.

† Always consider the **cost of failure** when evaluating "acceptable" levels of wear and/or damage.

Inspection Procedures

NEVER handle or inspect rigging with bare hands. Damaged rigging and/or embedded materials may result in injury. A hazard assessment must be performed prior to all tactile inspections to ensure that injury will not occur. For synthetic slings, the inspector employs tactile (touch) inspection by feeling the entire length of the sling as some damage may be more felt than seen.

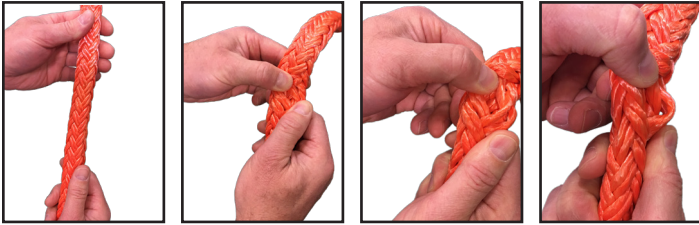
For initial and periodic inspections, the entire sling should be laid out flat on a smooth, clean surface in a well-lit location; these same conditions may not always be a reality for frequent inspections. All inspections must be thorough and when damage is detected, damaged items must be **immediately** removed from service for further evaluation by a Qualified Person** and/or Properly Informed and Trained Consumer. Temporary repairs of slings, rigging hardware and/or sling protection are not permitted. If damaged slings cannot be repaired, tested, and certified by the manufacturer or their agent, they must be destroyed and made unusable for any purpose. If rigging is not safe for use at the job site, it must never be used for any purpose at home, on the farm or ranch, as recovery straps or used as tie backs to secure overhaul balls during mobile crane travel. All inspections must identify damage and areas of concern marked or tagged for further evaluation by a Qualified Person** and/or Properly Informed and Trained Consumer.



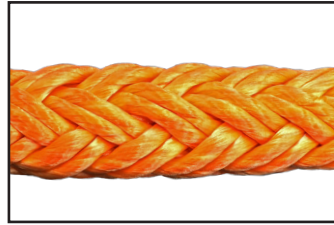
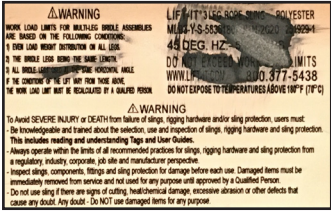
WARNING

If you identify any of the following types of damage, **IMMEDIATELY REMOVE NYLON OR POLYESTER ROPE SLINGS FROM SERVICE**, even if the damage you see is not as extensive as shown in the following pictures. These are extreme examples provided only for illustration purposes. Any damage detected in the sling protection may also indicate potential damage to the sling. **Remember, any doubt, DON'T!**

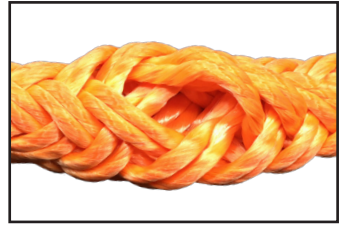
Any hazardous condition detected in slings, rigging hardware, sling protection, and/or sleeves during inspection must lead to further investigation, possible replacement and/or corrective action by a Qualified Person** and/or Properly Informed and Trained Consumer.



Internal abrasion may be determined by pulling one strand away from other strands to inspect for powder, broken filaments or volume reduction.



Like New External



Like New Internal



Excessive External Abrasion



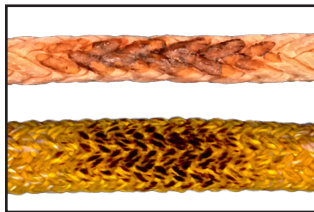
Excessive Internal Abrasion



Illegible Tag



Cuts



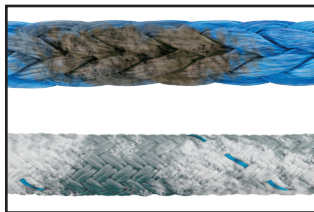
Excessive External Abrasion



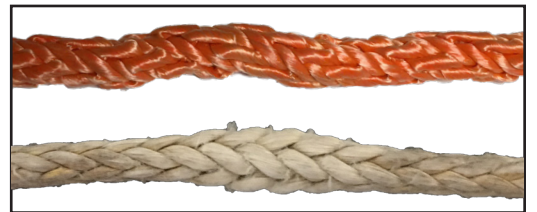
Fiber Breakage



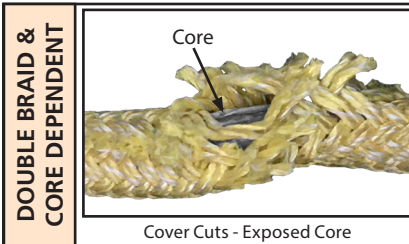
Excessive Dirt/Grit



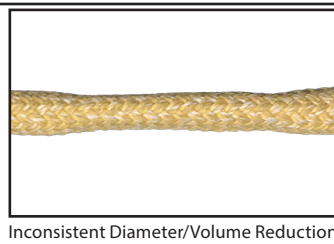
Heat Damage - Melting/Charring



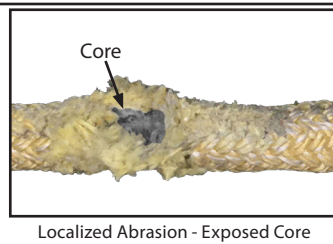
Other Conditions That Cause Doubt.



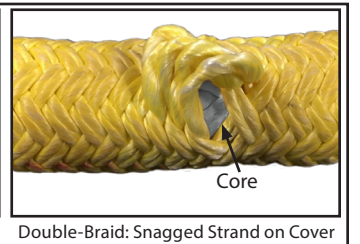
Cover Cuts - Exposed Core



Inconsistent Diameter/Volume Reduction



Localized Abrasion - Exposed Core



Double-Braid: Snagged Strand on Cover

DOUBLE BRAID & CORE DEPENDENT

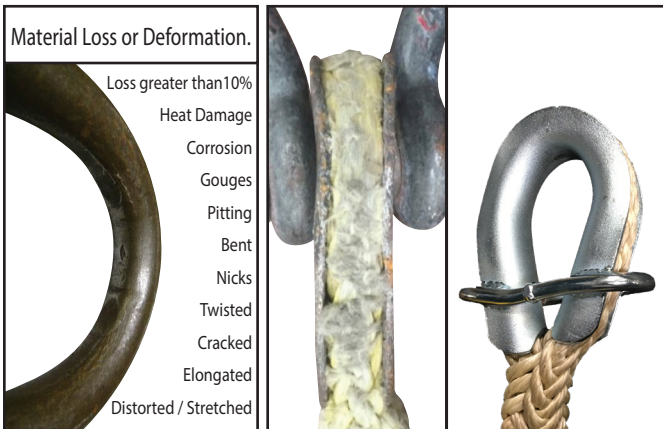
Lock Stitching & Whipping



Broken Lock Stitching

Damaged Whipping

Damaged Fittings / Attached Rigging Hardware Damage



Deformation
Any visibly apparent bend or twist

Throat Opening
Any distortion causing an increase in throat opening of 5% not to exceed 1/4".

Sling Protection

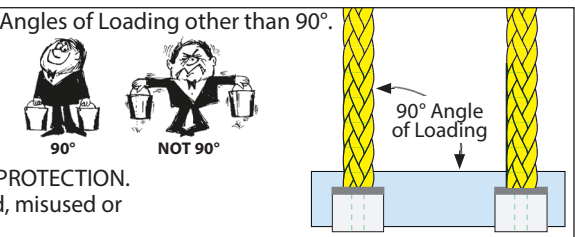
OSHA and ASME require that slings must always be protected from cutting, abrasion and other types of damage by materials of sufficient strength, thickness and construction. This **mandatory requirement** is enforced by OSHA, stated in many consensus sling safety standards and is also mentioned multiple times in the Lift-It® Manufacturing Co., Inc. warnings.

- You must ALWAYS protect slings from ALL POTENTIALLY DAMAGING EDGES and SURFACES.
- There are two basic types of sling protection; protection used specifically for **cut protection** or other devices used for **abrasion protection**.
- Bulked Nylon (Cordura®) may be suitable for abrasion protection but will not prevent damage from cutting.

⚠ WARNING ABRASION PROTECTION WILL NOT PREVENT DAMAGE FROM CUTTING.

- If protection from cutting is necessary, only use sling protection that has been designed, tested, rated and labeled by the sling protection manufacturer.
- “Cut proof” sling protection does not exist, and sling protection MAY NOT prevent cutting or other damage especially if it is not properly used.
- Loads must be rigged properly and a Qualified Person** and/or Properly Informed and Trained Consumer must ensure that the sling protection is the correct type, capacity, shape and size to protect slings from damage.
- Sling protection should not be makeshift (i.e., cardboard, work gloves, rags, carpet, fire hose or other items were not designed to be used as sling protection). Sling protection must be evaluated and selected by a Qualified Person** and/or Properly Informed and Trained Consumer.
- Sling protection and all rigging* must be compatible with the sling.
- Sling protection must not interfere with the sling closing to the full gripping position for secure handling and load control.
- Sling Protection must always be evaluated for suitability and adequacy by a Qualified Person** and/or Properly Informed and Trained Consumer.
- As tension is being applied, **before** load handling activities begin, a Qualified Person** and/or Properly Informed and Trained Consumer must ensure the sling and protection relationship is correct and the sling protection is properly placed to prevent damage to slings and/or sling protection.
- Trial lifts may be extremely valuable in determining and validating sling protection adequacy. Several trial lifts done by a Qualified Person** and/or Properly Informed and Trained Consumer in a set of no consequence circumstances that WILL NOT RESULT IN INJURY or DEATH may be necessary.
- After the trial lift, **but before the actual lift**, an inspection of the slings and sling protection must be performed by a Qualified Person** and/or Properly Informed and Trained Consumer. See page 8 for additional information on trial lifts.
- A Qualified Person** and/or Properly Informed and Trained Consumer must consider and evaluate many factors that may affect sling protection performance. Factors such as, but not limited to: sling elongation, edge type and condition (rough or case hardened), spatial considerations, Angle of Loading, Sling Protection Angle, contact surface (flat or curved), sling protection contact (full or partial), exposure temperature, chemical environment, etc.

- Sling protection ratings DO NOT apply if slings and/or sling protection are used at Angles of Loading other than 90°.
- Tension on all rigging* increases as the Angle of Loading changes from 90°.
(See page 6 for more information on Angle of Loading).
- A Qualified Person** and/or Properly Informed and Trained Consumer must calculate and plan for tension and all rigging* must be evaluated for strength adequacy to prevent overloading.



⚠ WARNING DO NOT OVERLOAD SLINGS, RIGGING HARDWARE AND/OR SLING PROTECTION. Slings, rigging hardware and/or sling protection may fail if damaged, misused or overloaded resulting in SEVERE INJURY or DEATH.

- Damage to sling protection and/or slings may occur as tension and compression combine and cutting forces are increased.
- Always consider the “Weak Link” principle: The maximum WLL for all rigging* is limited by the weakest component.
- Always refer to the Protection Capacity Tag to determine protection ratings and only use sling protection with legible Sling Protection Capacity Tags.

- Magnetic Corner Protectors and CornerMax® Sleeves can be used at an Angle of Loading that is NOT 90°.
- Magnetic Corner Protectors must always make FULL 90° contact with TWO, FLAT surfaces to properly work and for protection ratings to be achieved.


- CornerMax® Sleeves may be used on curved surfaces. Damage can be drastically increased by the shape, i.e., concave, convex and/or by the sling type, elongation, construction, etc.
- When used on curved surfaces you must read and understand the information for CURVED SURFACES in the CornerMax® Sleeve Safety Information Guide.
- Regardless of the sling protection type, load control is affected by the Angle of Loading. As the Angle of Loading deviates from 90° the greater the likelihood that slings and sling protection will slide against the load causing damage that may result in SEVERE INJURY or DEATH.

Slings must be rigged properly for load control.

- NO slipping and sliding – Positive sling to load engagement!**
- NEVER allow slings and/or sling protection to slip or slide over and/or across load edges, load surfaces, suspension points and/or connection points.**
- Slipping and sliding may damage slings and/or sling protection, even if the sling protection is properly placed.**
- Slings and/or sling protection that slip and/or slide may become damaged resulting in SEVERE INJURY or DEATH.**

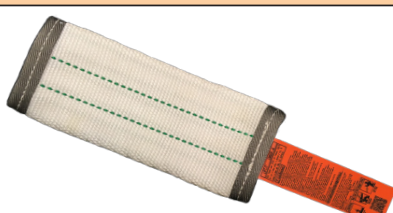
- DO NOT use Lift-It® products until you are ABSOLUTELY sure of what you are doing. Please contact us at 800.377.5438, scan the QR Code on the product and/or warning tag or email us at info@lift-it.com and NEVER TAKE CHANCES!
- Inspect slings, rigging hardware and sling protection before each use and **immediately** remove damaged items from service for evaluation by a Qualified Person** and/or Properly Informed and Trained Consumer. Damaged items shall not be used for any purpose.
- Follow inspection procedures and removal criteria outlined in this guide. See pages 3 & 4 for additional information.

Magnetic Corner Protector



FULL 90° Contact!

CornerMax® Sleeve



May be used at Angle of Loading ≠ 90°

Rule Three: NEVER Overload the Rigging*

Load weight must always be determined and/or verified. Underestimating the load weight may result in SEVERE INJURY or DEATH. The rated capacity (Work Load Limit) of the sling, rigging hardware and/or sling protection must NEVER be exceeded. Check tags and markings, to verify that slings, rigging hardware and/or sling protection are adequately rated for the load weight, the Sling Hitch and the Angle of Loading.

Sling Hitches



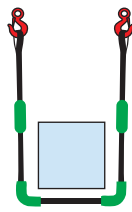
Slings carry loads in one of three primary sling hitches: Choker, Vertical (Straight-Line) and/or Basket. It is important for sling users to know that a sling is rated differently for each specific hitch.

If the “legs” of the sling are not exactly 90° when used in either a vertical or basket hitch, you must calculate for increased tension due to the Angle of Loading. See Table 1 below.

For slings used in a choker hitch, see page 8 Table 2 for reductions due to an Angle of Choke that is less than 120°.

⚠ WARNING

Nylon slings lose 15% of their WLL when wet or saturated.

Choker Hitch Choker WLL is 80% of the Vertical Hitch WLL. (If Angle of Choke > 120°)	Vertical Hitch Vertical WLL is 50% of the Basket Hitch WLL. (AKA Straight-Line Hitch)	Basket Hitch Basket WLL is 200% of the Vertical Hitch WLL. (If Angle of Loading = 90°)
		
< = Less Than > = Greater Than		≠ Does Not Equal WLL = Rated Capacity

Angle of Loading

All slings, rigging hardware and sling protection used in load handling activities are dramatically affected by the Angle of Loading.


The Angle of Loading is the angle between the sling leg and the plane perpendicular to the direction of the applied force.

(See Angle of Loading diagram below). As an example, when a sling is used in a basket hitch, the tension on each “leg” of the sling increases as the Angle of Loading deviates from 90°. This principle applies whether one sling is used at an angle or if slings are used in basket hitches or when multiple slings and/or multi-leg bridle configurations are used.

Always consider the Angle of Loading, which affects rated capacity and calculate changes in the rated capacity of slings, rigging hardware and/or sling protection when used in non-perpendicular vertical, basket or bridle hitches.

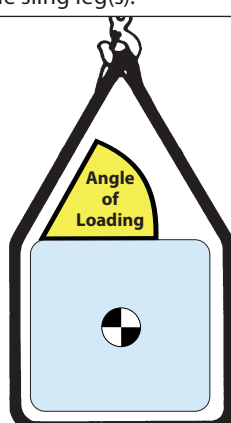
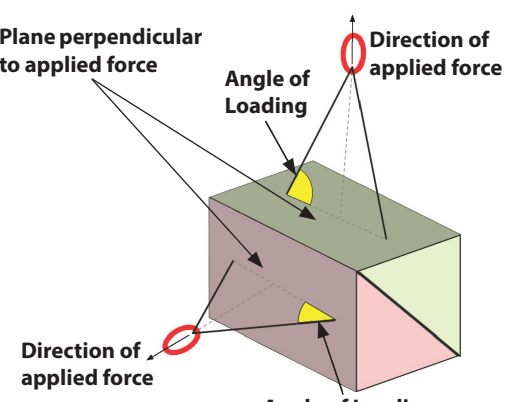
When the Angle of Loading between the sling leg and the plane perpendicular to the direction of the applied force is not exactly 90°, tension increases. The increased tension must be calculated and rigging* capacities must be evaluated for adequacy.

Multiply the load weight (per leg) by the appropriate Tension Multiplier in Table 1 to determine the increased tension on the sling “leg”.

Table 1 provides information about calculating increased tension for Angles of Loading that are not 90°. Calculations apply if: the load is symmetrical (uniform shape or composition and the Center of Gravity  is located exactly in the middle of the load), sling legs are equidistant from the Center of Gravity and are attached at the same level as illustrated below in the Tension Calculation diagram. If conditions are different, such as, but not limited to: asymmetrical loads, attachment points at uneven levels, etc., tension and load control must be determined by a Qualified Person** and/or Properly Informed and Trained Consumer to prevent overloading the rigging* and/or loss of load control. Larger capacity rigging* may be required to compensate for the effects of increased tension for an Angle of Loading that is not 90°. In all instances it is important that no single “leg” be loaded beyond its single “leg” rating and/or that any rigging* component, including sling protection is NEVER overloaded.

Slings shall not be used at an Angle of Loading less than 30° unless approved by the sling manufacturer, Qualified Person** and/or Properly Informed and Trained Consumer.

Increased Tension for Angles of Loading ≠ 90°

TENSION CALCULATION	TABLE 1		ANGLE OF LOADING
Multiply the load weight (per leg) by the tension multiplier to determine the increased tension on the sling leg(s).	Angle of Loading	Tension Multiplier	The acute angle between the sling leg and the plane perpendicular to the direction of the applied force, referred to as the horizontal angle when lifting. <small>[ASME B30.9 Section 9-0.2 Definitions]</small>
	90°	1.000	
	85°	1.004	
	80°	1.015	
	75°	1.035	
	70°	1.064	
	65°	1.104	
	60°	1.155	
	55°	1.221	
	50°	1.305	
	45°	1.414	
40°	1.555		
35°	1.742		
30°	2.000		

⚠ WARNING

DO NOT use slings, rigging hardware and/or sling protection until you are absolutely sure of what you are doing. Remember, failure to follow proper use, care and inspection criteria and/or lack of skill, knowledge and/or training may result in SEVERE INJURY or DEATH. Slings, rigging hardware and/or sling protection may fail if damaged, abused, misused, overloaded or improperly maintained and may result in SEVERE INJURY or DEATH.

Other Important Factors Affecting WLL - D/d & Eye Length

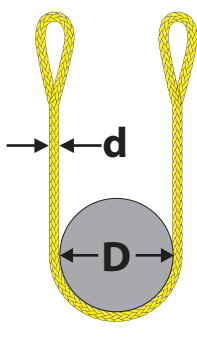
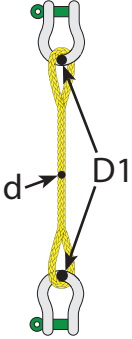
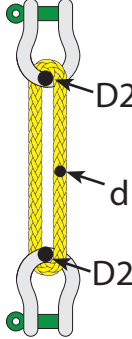
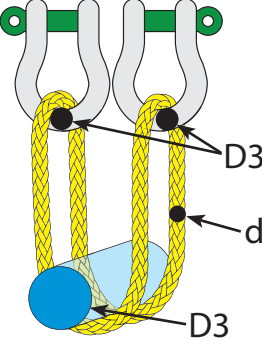
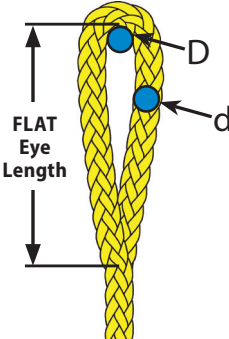
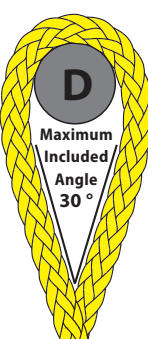
It is important for Nylon or Polyester Rope Sling users to understand that the D/d ratio has a significant effect on the sling capacity when either Nylon or Polyester Rope Slings are placed on a connection point or basketed around the load. **D/d** is defined as the ratio of the **Diameter** around which the sling is bent divided by the **diameter** of the Nylon or Polyester Rope Sling (See Figure 1). When Lift-It® Nylon or Polyester Rope Sling are placed on a connection point or basketed around the load, users must follow the **D/d** recommendations stated in ASME B30.9-Chapter 4, Figure 9-4.5-1.

It is also very important to realize that recommended D/d for Nylon or Polyester **Eye & Eye** Rope Slings (**D1**-Figure 2) are **different** than the recommended D/d for Nylon or Polyester **Endless** Rope Slings, connection point and contact **Diameters** for Nylon or Polyester **Endless** Rope Slings must be at least 8/1 to achieve the basket WLL on the sling tag. See Figures 3A (**D2**) and 3B (**D3**). When connection and/or contact point diameters are different than specified in the current version of ASME B30.9-Chapter 4, a Qualified Person** and/or Properly Informed and Trained Consumer must evaluate and determine the reduced WLL.

To prevent sling damage and ensure proper use, the connection point diameter (**D**) for Lift-It® Eye & Eye Nylon or Polyester Rope Sling eyes **MUST**:

- NOT be smaller than twice (2X) the rope diameter (**d**). (See Figure 4A)
- NOT be larger than 1/3 the FLAT eye length. Maximum D = FLAT eye length/3. (See Figure 4A)
- NOT be so large so that a 30° maximum included angle is exceeded. (See Figure 4B).

When D/d ratios in connection point(s) and/or in the body of Lift-It® Nylon or Polyester Rope Slings are less than the specific requirements listed under Figures 1 thru 4A and in ASME B30.9-Chapter 4, Lift-It® Nylon or Polyester Rope Sling proper use must be evaluated for suitability and the reduced Work Load Limits determined by a Qualified Person** and/or Properly Informed and Trained Consumer.

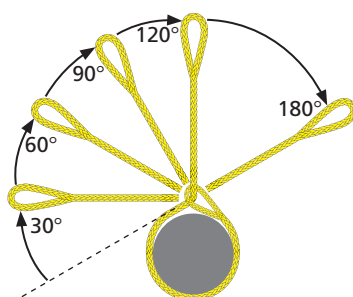
Figure 1	Figure 2	Figure 3A	Figure 3B	Figure 4A	Figure 4B
					
D/d ratios in the body of Nylon or Polyester Rope Slings used in a basket hitch must be at least 8:1 to achieve the basket WLL on the sling tag.	When using Eye & Eye Nylon or Polyester Rope slings in a vertical (straight-line) hitch, the connection points (D1) must be at least twice (2X) the rope diameter. When using Endless Nylon or Polyester Rope Slings in a vertical (straight-line) or basket hitch, the connection points (D2 & D3) must be at least eight times (8X) the rope diameter. Please Note: Illustrations above are not to scale.			The connection point Diameter (D) must NOT be smaller than twice (2X) the rope diameter (d). The connection point Diameter (D) must NOT be larger than 1/3 the FLAT eye length. MAXIMUM (D) = FLAT Eye Length/3	The Diameter (D) for an object in the eye must NOT be so large that a 30° MAXIMUM included angle is exceeded.

Choker Hitch Considerations for Lift-It® Nylon or Polyester Rope Slings

A single sling should never be used to handle unbalanced loads. When using Lift-It® Nylon or Polyester Rope Slings to handle unbalanced, loose, and/or long loads, multiple slings must be used and the load secured to prevent shifting during use. NEVER allow slings to slip or slide. See page 8.

Whenever a sling is used in a choker hitch that results in an Angle of Choke that is less than 120°, the choker WLL decreases.

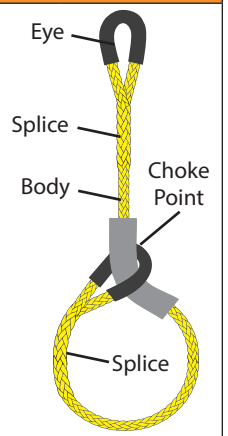
To determine the actual reduced choker WLL, a Qualified Person** and/or Properly Informed and Trained Consumer must multiply the sling's choker WLL by the appropriate Angle of Choke Reduction Factor listed in Table 2.



Angle of Choke (Degrees)	Reduction Factor
over 120	1.00
90 - 120	.87
60 - 89	.74
30 - 59	.62
0 - 29	.49

⚠ WARNING

When Lift-It® Nylon or Polyester Rope Slings are used in a choker hitch, ensure that the choke point is on the body. Never choke a Lift-It® Nylon or Polyester Rope Sling on the sling eyes, fittings, splices, sling tag and/or the Tuck & Bury Region. When Nylon or Polyester Rope Slings are used in a choker hitch, protection should be properly placed at the choke point to reduce friction and prevent rope-on-rope damage. Endless slings will require additional or larger protection devices to cover all rope components at the choke point. The protection must always be of sufficient strength, thickness and construction, such as but not limited to CornerMax® Sleeve (depicted). A Qualified Person** and/or Properly Informed and Trained Consumer must determine protection adequacy.




Rule Four: You Must Control the Load

It is critically important that a Qualified Person** and/or Properly Informed and Trained Consumer select slings, rigging hardware and/or sling protection having suitable characteristics for the load, configuration of lift and environment.

Load control and stability are achieved by always taking into account multiple factors, such as, but not limited to: sling type, sling hitch, coefficient of friction (sling to load), load shape, structural stability, load condition (partially filled and/or shifting contents) and/or environmental conditions (dry, wet, icy, windy conditions, etc.), Angle of Loading, attachment point condition and integrity, placement of the suspension point over the load's Center of Gravity (CG), etc.

Slings must be rigged in a manner providing control of the load for successful load handling activities. Determining the load's CG and placing the suspension point directly over the CG are vital considerations for load control.

The CG  is the point on the load where the load weight is concentrated.

Think of the CG as the load's balance point. Two realities for all load handling activities are:

- 1) Unless restrained, the CG will move directly under the suspension point.
- 2) The CG is like water; it will move to seek the lowest point possible.




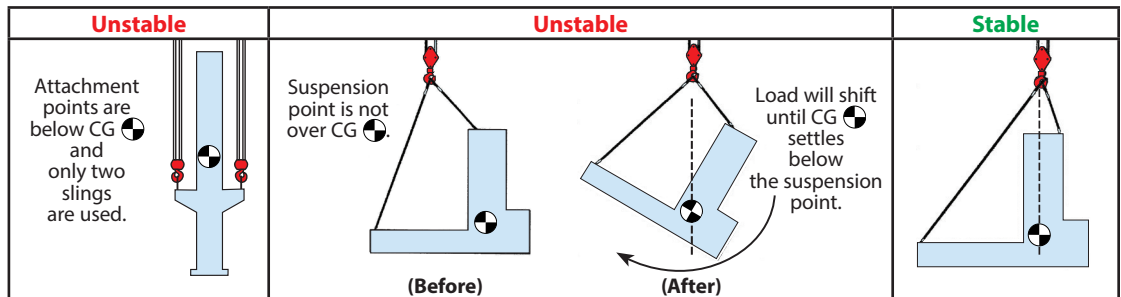
If attachment points are below the CG, it will be necessary to take additional measures to control the load and prevent load rotation. Different methods such as, but not limited to the use of multiple slings (more than 2) and/or "wrapped" hitches, etc. may be useful. A Qualified Person** and/or Properly Informed and Trained Consumer must ensure that all load control techniques are not only safe, based upon the specific situation, but compliant. Some methods may "look good on paper" but in reality, may not ensure load control, further validating the need for trial lifts done by a Qualified Person** and/or Properly Informed and Trained Consumer in a controlled set of no-consequence circumstances whereby INJURY or DEATH will not occur.

See [Trial Lift information](#), (below).

WARNING

Multiple factors must be taken into consideration to ensure that load control and stability are attained.

A load with a "high" Center of Gravity  can rotate in some sling hitches.



- Sling movement over the suspension and/or connections points may occur if the CG is not directly below the suspension point. This "unplanned" movement may damage slings and/or sling protection, which may result in SEVERE INJURY or DEATH.
- **Slings must be rigged properly for load control.**
- **NO slipping and sliding – Positive sling to load engagement!**
- **NEVER allow slings and/or sling protection to slip or slide over and/or across load edges, load surfaces, suspension points and/or connection points.**
- **Slipping and sliding may damage slings and/or sling protection, even if the sling protection is properly placed.**
- **Slings and/or sling protection that slip and/or slide may become damaged resulting in SEVERE INJURY or DEATH.**
- When lifting with a basket hitch, the legs of the sling should contain or support the load from the sides, above the Center of Gravity, so that the load remains balanced and under control to prevent slings from slipping or sliding over and/or across the load.
- When using slings in any configuration of lift, particularly basket hitches, the load must be properly rigged and balanced.
- A single sling hitch must never be used to handle unbalanced, loose and/or long loads.

Trial Lift Information

- Trial lifts (i.e., lifting a minimum height in conditions that WILL NOT RESULT IN INJURY or DEATH) are a critically important part of an evaluation. Even though trial lifts are "static" tests and do not simulate the "dynamic" nature of actual lifts, they may assist in identifying problems before the actual load handling activity begins. Several trial lifts may be necessary to ensure proper use and safety.
- Trial lifts provide a Qualified Person** and/or Properly Informed and Trained Consumer the opportunity to evaluate and take corrective action. Evaluation must include, but is not limited to: ensuring that load is secure and balanced, assumes the intended position and that the sling and protection relationship is correct and that sling protection is properly placed to prevent sling damage.
- Trial lifts are especially important with basket or other "loose" hitches where friction alone between the sling and/or sling protection and the load contributes to load control. Multiple trial lifts, inspections and corrective actions may be necessary to determine the proper combination of factors for successful load handling activities.

Slings of different material types must not be used together during load handling activities. As an example, during use nylon rope slings and polyester rope slings elongate at different rates. Slings from different manufacturers and even slings made by the same manufacturer at different times may not be identical.

A Qualified Person** and/or Properly Informed and Trained Consumer must determine if the use of slings made from the same material which are not identical in length, and/or from different manufacturers is acceptable. If more than one sling is used to handle a load the slings should be identical.

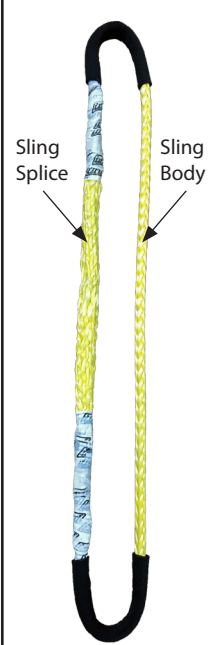
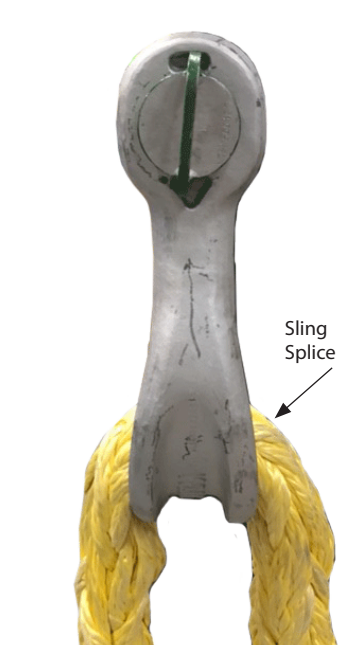
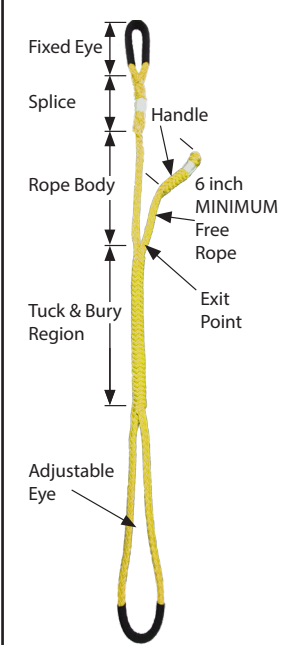
Rigging Practices and Considerations

WARNING Never use slings and/or rigging* for pulling against stuck, snagged or restrained objects IF LOADING CANNOT BE DETERMINED. Load measuring devices and/or methods must be used to ensure that OVERLOADING DOES NOT OCCUR. Personnel must be alert to the potential for the sling and/or load to become snagged or hung up during load handling activities. When these conditions occur, the rigging* may be overloaded.

WARNING Overloaded rigging* may fail and the unplanned release of tension and deadly recoil and/or impact force may result in SEVERE INJURY or DEATH.

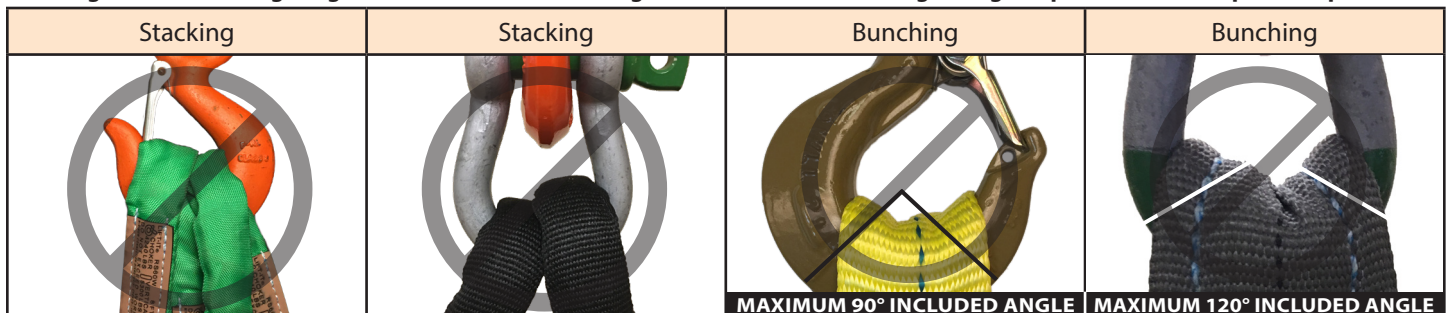
WARNING Work Load Limits are based on a moderate rate of movement. Lifting and/or load handling equipment and load movement should be SLOW and STEADY. NEVER shock load rigging*. Unplanned, instantaneous changes (rapid acceleration or sudden stops) constitute hazardous shock loading which may overload slings, rigging hardware and/or sling protection, resulting in rigging* failure. Rigging* failure and the unplanned release of tension, deadly recoil and/or impact force and/or loss of load control, and may result in SEVERE INJURY or DEATH. As an example, shock loading affects slings with less elongation much more profoundly than slings with a greater rate of elongation. Likewise, a shorter sling is affected to a greater degree by shock loading, than a longer sling.

- When slings are used in a choker hitch, the choke action should occur on the body of the sling, NOT on the sling eyes, fittings, splices, sling tag and/or the Tuck & Bury Region. Sling protection should be used at choke points. See page 7, choker hitch warning.
- Slings shall be shortened, lengthened or adjusted only by methods approved by the sling manufacturer or a Qualified Person** and/or Properly Informed and Trained Consumer.
- Do not use Adjustable Nylon or Polyester Rope Slings in a choker or basket hitch unless approved by a Qualified Person and/or Properly Informed and Trained Consumer.
- During use, NEVER allow the Tuck & Bury Region to contact the load and/or connection/suspension points.
- During use, The Handle must NEVER contact the Exit Point of the Tuck & Bury Region.
- During use, the Free Rope must extend a MINIMUM of 6 inches from the Exit Point.
- Slings shall not be shortened or lengthened by knotting or twisting and/or be joined by knotting.
- During use, Nylon or Polyester Rope Slings, the load and/or load handling device must be prevented from rotating.
- Twisting and kinking MUST be avoided. Twists MUST be removed before applying tension.
- Equipment should not be driven over slings and loads should not be rested on slings.
- Slings should not be pulled from under a load when the load is resting on the sling. When possible, place supports (cribbing) under the load to allow for the removal of slings.
- Slings should not be dragged on the floor and/or over abrasive surfaces. Dirt and foreign material may work into the sling and may cause damage which may seriously affect sling strength and performance.
- If synthetic rope slings incorporate thimbles, they must be installed and maintained so they cannot rotate or fall out. Do not drop slings equipped with metal fittings.
- Slings should not be bunched or pinched between the ears of a shackle or by the load, hook or fitting.

Endless Rope Sling Considerations		Adjustable Nylon or Polyester Rope Sling Anatomy.
The Sling Splice is larger in diameter and elongates differently than the Sling Body.	If possible, center the Sling Splice over the lift and/or connection point to allow for equalized elongation in the Nylon or Polyester Endless Rope Sling body members.	
		

Practices to Avoid

Stacking and/or bunching slings can lead to uneven loading and/or a reduction in sling strength. Spatial relationships are important!



When more than one sling is rigged in a hook, shackle or other device, avoid "crowding" and/or stacking slings on top of one another. If slings are stacked on top of one another, the sling on the top of "the heap" is shorter to the load than the sling on the bottom, which may lead to increased tension on the sling on the top of "the heap". Stacking may also adversely affect load control.

Slings must always be used with compatible fittings, hooks, shackles, etc.

Fittings must be of a shape and size to ensure that they properly seat in the hook, shackle and/or load handling equipment.

Prior to use, shackles, hooks and all fittings must be inspected to identify and evaluate potentially damaging threads, edges and/or surfaces.

All fitting surfaces must be cleanly finished and damaging surfaces and edges removed to prevent sling damage. Contact the manufacturer, Qualified Person** and/or Properly Informed and Trained Consumer before modifying and/or "finishing" any fitting or component.

Slings should be rigged in the bow of the shackle. When this is not possible, protect the sling connection points from potential damage.

Never rig more than one sling on the shackle pin. Always rig multiple slings in the bow of the shackle and never exceed 120° included angle.

The load applied to the hook should be centered in the base (bowl) of the hook to prevent point loading on the hook. When multiple slings are placed in a hook the included angle shall not exceed 90°.

Additional Considerations for Lift-It® Nylon or Polyester Rope Slings.

Lock Stitching and Whipping

Lock Stitching and/or Whipping is installed to secure synthetic rope sling Splices when the synthetic rope sling is not under tension. Whipping may also be installed as a means to secure a thimble to the synthetic rope sling.

Damaged Lock Stitching and/or Whipping may also be an indication of overloading and/or shock loading. If damage to Splice(s), Lock Stitching, and/or Whipping is detected, synthetic rope slings must be **immediately** removed from service.

Do not mishandle synthetic rope slings by pulling against Sling Splices. Splices may be pulled out when Slings are improperly handled and/or positioned by pulling against the Splice. Synthetic Rope Slings should not be handled or moved by grabbing the Splice(s). **Exposure**

Temperatures

Do not use or expose Lift-It® Nylon or Polyester Rope Slings to temperatures above 194°F (90°C) or below -40°F (-40°C). Tensile strengths and Work Load Limits are affected by temperatures outside the recommended exposure limits and may melt and/or cause permanent damage. Sling users must be aware of ambient heat, reflected heat and/or frictional heat from load handling, as well as the proximity of rigging* to localized heat sources such as but not limited to: open flames, hot surfaces, hot objects and/or welding which may damage slings.

Slings that have been exposed to temperatures at or near 300°F (149°C) for Nylon or 350°F (177°C) for Polyester, must be **immediately** removed from service, destroyed and rendered completely unusable for any purpose.

Be aware of ALL heat sources:		
Ambient heat	Reflected heat	Frictional heat
Open flames	Hot surfaces	Hot objects
Welding	Grinding	Heat treating

At low temperatures, when moisture is present, ice formation may occur. Ice crystals may abrade, cut and/or damage slings.

Care and Storage

At the completion of the load handling activity, rigging* should be inspected and returned to a storage location.

Never return damaged slings, damaged rigging hardware and/or damaged sling protection to storage.

Consider storing slings and sling protection in protective containers.

When slings, rigging hardware and sling protection are not in use, store them in a location that is cool, dry, dark, free of environmental and mechanical damage, corrosion, rust, dirt and grit.

Do not store slings in areas where they may become impregnated with rust.

Do not machine wash, hand or pressure wash slings. Washing significantly reduces sling WLL.

Slings exposed to salt water should be thoroughly but gently rinsed with fresh water to prevent mechanical damage from salt crystals. Rinsed slings can either be air dried or used immediately. Wet slings should be allowed to dry before being stored.

Sling strength and elongation may be affected by the fiber type (i.e., UHMPE, aramid, polyester, nylon, etc.) when the sling is saturated with fluids.

Nylon slings lose 15% of their WLL when wet or saturated. Contact a Lift-It® representative for additional information.

Sharp particles such as but not limited to metal shavings can severely damage Nylon or Polyester Rope Slings. DO NOT allow contact with sharp and/or damaging particles.

- If sharp particles or foreign materials are present, gently remove them before use, and ensure damage has not occurred.
- Foreign material, i.e. sand, dirt, pebbles, etc. must be avoided and/or removed if embedded between rope strands/fibers, and ensure damage has not occurred.

Ultraviolet Light

Avoid prolonged exposure to sources of ultraviolet (UV) light; it reduces the strength and performance of all synthetic slings in varying degrees. UV degradation may be indicated by discoloration and/or the presence of splinters or splinters in areas of the sling that do not normally contact the load. UV damage may not always be visually apparent.

Chemical Exposure

Chemically active environments can affect the strength of all rigging* in varying degrees ranging from little to total degradation. Slings, rigging hardware and/or sling protection shall not be used where potentially damaging liquids, solvents, fumes, vapors, sprays, mists of alkalis or acids are present. Exposure time, temperature, concentration and condition must always be considered, prior to exposure by a Qualified Person** and/or Properly Informed and Trained Consumer.

Chemicals which are harmless in liquid form can become sufficiently concentrated by evaporation and may become harmful.

If slings, rigging hardware and/or sling protection will be exposed to potentially damaging chemical environments, contact us prior to use to avoid damaging the slings, rigging hardware and/or sling protection from exposure.

Conductivity

During use, consider all slings, rigging hardware and sling protection conductive, energized or "hot".

Always refer to all applicable and current regulations regarding working in energized environments, such as, but not limited to: 29 CFR 1926.1400, 1926.1408, 29 CFR 1910, state regulations, etc.

Absorbed moisture, impurities and/or other factors will dramatically increase conductivity.

Repairs

Slings shall be repaired only by the original sling manufacturer or their agent. Repaired slings must be marked to identify the repair agent. All repaired slings must be proof tested to two times the rated capacity and certified.

Only slings which can be identified by the information on the sling tag will be considered for repair.

The rope that makes up Lift-It® Nylon or Polyester Rope Slings shall not be respliced or knotted to effect repairs.

Temporary repairs of slings, rigging hardware and/or sling protection are not permitted.

****Qualified Person:** A person, who by possession of a recognized degree or certificate of professional standing in an applicable field, or who, by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.

⚠ WARNING

The information in this guide is current through May 28, 2021. It is the user's responsibility to independently verify the accuracy of the information in this guide and all cited information, standards and regulations if this guide is used or referenced after May 28, 2021.



Michael Gelskey, Jr.
Christopher Shultz
David Shultz

President & General Manager
Technical Sales Manager
QA Manager

M 909.524-9287
M 909.524-9204
O 909.469-2251

E mike@lift-it.com
E chris@lift-it.com
E david@lift-it.com

