⚠ WARNING TO THE USERS OF SYNTHETIC PRODUCTS

The ⚠ WARNING icon, used in our product information is done to alert sling users to potentially hazardous conditions and situations.

⚠ WARNING It is your explicit responsibility to consider all risk factors prior to using any tiedown device or product. Read and understand the information contained in this bulletin, in our catalog, on our web site www.lift-it.com and follow federal, state, provincial, local and industry regulations and guidelines. Use by untrained persons is hazardous.

⚠ WARNING All Products supplied and manufactured by Lift-It® Manufacturing are sold with express understanding that the purchaser and user are thoroughly familiar with the safe and proper use and application of the product. The qualified person and tiedown user has the responsibility for use and application, and should have sufficient training and knowledge of all applicable standards to responsibly use our products.

⚠ WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. Synthetic tiedowns will fail if damaged, abused, misused, overused, or improperly maintained.

WHEN ORDERING OR USING, *ALWAYS CONSIDER:*

- Static and Dynamic Load Requirements
- Chemical Exposure
- Load Angle Factor
- Adequate Wear Protection
- Ultraviolet Light Degradation

Chemical Considerations

It is important to select a tiedown that has the proper chemical characteristics, making the tiedown compatible with its environment.

PERFORMANCE CHARACTERISTICS OF SYNTHETIC FIBERS

NYLON

Nylon is popular and general purpose synthetic fiber which is unaffected by common grease and oil. Nylon products have good resistance to aldehydes, hydrocarbons, ethers and some alkalis, while degradation ranging from none to moderate occurs with exposure to certain alkalis. Nylon slings are not suitable for use with acids and bleaching agents. Exposure can result in degradation from none to total. Dilute acids, such as, hydrochloric and sulfuric in 10% concentrations at room temperature cause a significant loss in strength in 10 hours.

Solvents for nylon include:

- Concentrated formic acid
- Phenolic compounds at room temperature
- Calcium chloride in methanol at room temperature
- Hot solutions of zinc chloride in methanol
- Benzyl alcohol at the boil

Hot solutions of calcium chloride in:

- Glacial acetic acid
- Ethylene Chlorohydrin
- Ethylene Glycol

Nylon is also not significantly affected by compounds of the following classes: alcohols, dry cleaning solvents, halogenated hydrocarbons, ketones, soaps and synthetic detergents or water (including sea water).
Nylon products lose 15% of their work load when wet. The acceptable temperature exposure range is -40°F (-40°C) to a maximum of 194°F (90°C). Stretch at work load limit is approximately 6-8%.
All webbing will become shorter, over time. Nylon webbing placed on a table, with no use, will shrink up to 5% in length after six months, as a result of the weave configuration. Dense webbing shrinks less than a loose weave. Nylon will shrink more than polyester webbing. Other factors that affect shrinkage are humidity, temperature and usage.

POLYESTER

Polyester is not significantly affected by most compounds of the following classes: alcohols, dry cleaning solvents, halogenated hydrocarbons, ketones, soaps and synthetic detergents or water (including sea water). Polyester also has good to excellent resistance to aqueous solutions of most weak acids at the boil and to most acids at room temperature, but is disintegrated by concentrated sulfuric acid (95%) at room temperature. Polyester products also have good resistance to most aqueous solutions or strong alkalis at room temperature, but are degraded by the same solution at the boil. Oxidizing agents and bleaching treatments ordinarily used by the textile industry also do not degrade polyester fiber. Stretch at work load limit is approximately 3-4% and polyester does not lose strength as a result of moisture absorption. The acceptable temperature exposure range is -40°F (-40°C) to a maximum of 194°F (90°C).

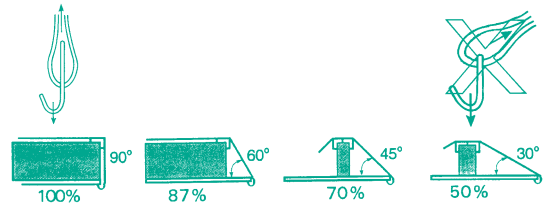
⚠ WARNING Our Products may contain chemicals known to cause cancer, birth defects and/or other reproductive harm.

Load Angle Factor

The tiedown assembly strength can be affected and radically reduced by more than 50% if the load path is not in a straight line in the fitting area.

The Load Angle Factor must be calculated and applied to determine the reduced tiedown Work Load Limit, when the load path is not in a straight line in the fitting area.

Determine the Load Angle and multiply the Tiedown Work Load Limit by the appropriate percentage. The result is the actual and reduced tiedown assembly Work Load Limit.



ANGLE	%	ANGLE	%	ANGLE	%	ANGLE	%
90°	100	70°	94	50°	77	30°	50
85°	99	65°	91	45°	70	25°	42
80°	98	60°	87	40°	64	20°	34
75°	97	55°	82	35°	57	15°	26

Wear Protection

Synthetic tiedowns can be damaged, abraded or cut as tension and compression between the tiedown and the load develops. Edges and abrasive surfaces in contact with the tiedown must be "padded" with materials of sufficient strength and/or thickness to prevent damage and catastrophic tiedown failure.

The edge of the load need not be "razor" sharp to damage the tiedown. A combination of load contact and inadequate or non-existent wear protection may result in tiedown failure. **⚠ WARNING** Wear protection may not prevent cutting or other forms of tiedown damage.

"Cut proof" wear protection does not exist. Materials must be evaluated and selected based upon the application and type of exposure. Some materials are suitable for abrasion resistance, but offer virtually no protection against the effects of cutting. Certain materials used in the construction of wear protection and protectors have been evaluated for cut resistance. Magnetic corner protectors, Cornermax® and Meshguard® wear protectors have been evaluated and are rated for cut resistance.

⚠ WARNING Materials of sufficient strength and resistance to damage must be employed to prevent injury, death and/or property damage.

SLEEVES

Sleeves cover both sides of the tiedown and can be shifted to a specific location. The sleeve can also be re-positioned for quick and easy inspection of the tiedown.
Available in six different materials: Cordura®, Heavy Duty Nylon, Leather, Neoprene, Felt and Aramid. Available in sewn edge, tubular and quick-sleeve constructions.

MAGNETIC CORNER PROTECTOR

Magnetic corner protectors are fabricated from a durable synthetic material that protects synthetic and wire rope slings from damage. They work on any 90 degree "cornered" load and keep the sling from contacting the load.

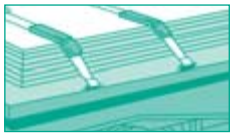
Magnetic corner protectors are "protection rated" at 12,500 PSI. Available in 9, 12 and 18 inches lengths. Application temperatures range from -20°F (-29°C) to 220°F (104°C). Heavy duty protectors, featuring larger diameters are also available.

⚠ WARNING The magnets are designed to keep the protector from falling from metallic loads and are not intended to prevent the protector or sling from sliding. Slings and protectors should be vertical or perpendicular to the load. The farther from vertical that the slings and protectors are, the more likely the protectors and slings will slide to become vertical and result in load instability and uncontrolled load descent. When using magnetic corner protectors always inspect for damage, prior to use. Keep magnets clean and free of debris.

FLEX-O-CLIP

Made of transparent material, Flex-O-Clip is sturdy and provides flexibility to conform to irregular shaped loads. The tiedown can easily be inspected by peeling the Flex-O-Clip from the tiedown; when finished re-install the protector. Available for: 2, 3, 4 inch web widths. Maximum length is 16 ft.

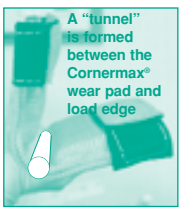
⚠ WARNING Maximum loading is 2500 lbs. per inch of web width.



- Do not use an oversized Flex-O-Clip on a tiedown having inadequate width for the pad. Match size to size.
- Remember to allow ample clearance for Flex-O-Clip to work properly.
- Make sure that the length of the wear pad does not interfere with the tiedown closing to the full gripping position on the load.

CORNERMAX®

Cornermax® wear protection is truly remarkable because its design forms a tunnel between the load edge and the wear pad. This "barrier" greatly reduces the possibility of cutting.



CORNERMAX® PART NUMBER	SLING WIDTH (INCHES)	CORNERMAX® WIDTH (INCHES)	PROTECTION RATING (LBS)
CM-6	1 - 2 IN.	6	25,000
CM-8	UP TO 5 IN.	8	60,000
CM-10	UP TO 6 IN.	10	100,000
CM-12	UP TO 8 IN.	12	100,000
CM-14	UP TO 12IN.	14	100,000

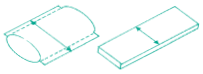
⚠ WARNING No form of wear protection is cut proof.

WEAR PROTECTION INFORMATION

Lift-It® wear protection is constructed from the following materials:

MATERIALS	THICKNESS
Cordura®	3/32"
Nylon/Polyester (9) Heavy	3/16"
Nylon/Polyester (6) Light	1/8"
Leather	3/32" - 1/8"
Neoprene	1/8" - 3/16" - 1/4"
Polyester Felt	1/8" - 1/4" - 3/8"
Aramid Felt	1/8" or 1/4"

WEAR PROTECTION DIMENSIONS



SLEEVE WIDTHS	FOR WEB WIDTHS
3"	1"
3-1/2"	1-1/2", 1-3/4
4"	2"
5"	3"

CHAP SLEEVES

Chap Sleeve Quick-Chap

Lift-It® Chap Sleeves blend two wear protection materials: Polyester Felt, covered by Tubular Cordura®. Chap Sleeves provide protection from abrasion damage, caused by contact with rough surfaces.

Quick Chaps are available with hook and loop tape, making installation and removal, quick and easy.

Please specify sleeve width and length.

CORNER PROTECTORS

Provide protection for both the webbing and the load.

Standard length:
12 inches/18 Thickness

Reinforced Rubber Sheet

WEB WIDTH	ORDER CODE
1-3/4", 2", 3" or 4"	4D

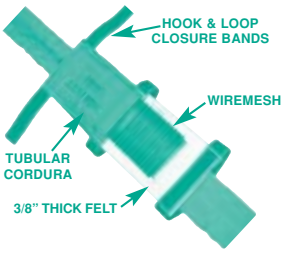
Copolymer Corner Guard
For webbing widths up to 4 inches.

Order Code 4E

MESH GUARD

Lift-It® Mesh guard features a unique combination of wear protection materials. A layer of felt buffers the sling, while carbon steel wire mesh covers the load edge.

Hook and loop closure bands make attachment and removal quick and easy.



Tiedown Inspection

TIEDOWN INSPECTION SYSTEMS

INITIAL INSPECTION - Before any tiedown is placed into service it shall be inspected by a designated person to ensure that the correct tiedown is being used, as well as to determine that the tiedown meets the requirements of the specifications contained in this publication, and all applicable requirements. The tiedown will be inspected to ensure that no damage occurred during transit.

FREQUENT INSPECTION - This inspection shall be made by a qualified person handling the tiedown before each use. Proper tiedown selection, hazard recognition and removal from service shall also be accessed by the tiedown user or competent person.

PERIODIC INSPECTION - This inspection shall be conducted by a designated person, at least monthly. Frequency of inspection should be based on:

1. Frequency of use
2. Severity of the service conditions
3. Experience gained on the service life of tiedowns used in similar applications.

Tiedown assembly inspection records should be established by the user and maintained. The inspection record should include the description and condition of the tiedown, as well as the date of the inspection and identity of the inspector.

REMOVAL FROM SERVICE

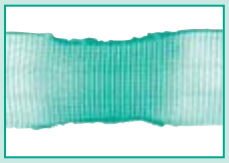
A tiedown assembly shall be removed from service, if any of the following are visible:

1) Tag illegibility - illegible or missing tag.
   Name or trademark of manufacturer
   Working Load Limits is pounds and kilograms
2) Acid or alkali burns
3) Melting, charring, or weld splatter of the webbing
4) Holes, tears, cuts, snags or embedded particles
5) Broken or worn stitching in load bearing stitch patterns
6) Excessive abrasive wear
7) Knots in any part of the webbing
8) Fittings or tension devices that are: broken, bent, twisted, cracked, corroded, pitted, nicked or gouged
9) Crushed webbing
10) Splices, patches or other temporary repairs
11) Damaged loop ends
12) Other apparent defects which cause doubt as to the strength of the tiedown

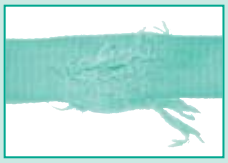
Temporary repairs of assemblies or components shall not be permitted.

WARNING

IF ANY DAMAGE SUCH AS THE FOLLOWING IS VISIBLE, THE TIEDOWN SHALL BE REMOVED FROM SERVICE IMMEDIATELY.


ACID

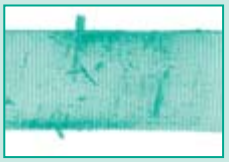
CUTS


PUNCTURES

MELTING OR CHARRING

ABRASIONS

LOOP DAMAGE


EMBEDDED MATERIALS

BROKEN OR WORN STITCHES

MISSING OR ILLEGIBLE TAGS

UV DEGRADATION

TENSILE BREAK

KNOTS

CRUSHED WEBBING

SNAGS

DISTORTED HARDWARE

Mechanical Operations and Considerations

Tiedown assemblies shall be used in accordance with all federal, state, provincial, local and industry regulations and standards.

Select the tiedown that is suitable for the load, environment and application. Inspect the assembly and all hardware, before every use.

Factors to consider in determining the number and location of tiedowns:

1) Article weight and expected dynamic "G" forces
2) Configuration of the load: pipe, coil, equipment, stacking, length, etc.
3) Work load limit, number and placement of tiedowns
4) Need for wear protection
5) Strength of anchorage point(s)
6) Other factors affecting normal and emergency conditions

The aggregate working load limit of the tiedown assemblies used to secure an article against movement in any direction must be at least 1/2 times the weight of the article.

A minimum of three tiedown assemblies is required to secure an article, based only on the weight of the article. It is the responsibility of the user to determine the proper work load limit for the application.

The U.S. Department of Transportation- Federal Highway Administration (FHWA) has published its final rule, Section 393.102(a) for shifting and falling cargo in 49CFR. "Securement must withstand .8 deceleration in the forward direction; .5 deceleration in rearward and lateral direction."

The tiedown work load limit shall be based upon the strength of the completed assembly and not the component parts. The work load is also based upon a straight pull and the tiedown assembly being in a new and unused condition. The tiedown is only as strong as the weakest component, including the point of attachment.

Tiedown work load limits are based upon destruction testing done in controlled, laboratory conditions, that will never be duplicated, exactly, during actual usage.

Users must be knowledgeable in commodity specific rules governing tiedown determination, as stipulated by the Federal Motor Carrier Safety Administration standard.

Tiedown assemblies shall not be loaded in excess of their work load limit. Always consider the angle from the vertical (Load Angle Factor), which affects the work load limit of the assembly.

The load should be securely blocked and stabilized before applying tension to the tiedowns.

Before using any tiedown, the user shall secure their footing to prevent slips and falls, particularly in freezing and icy conditions.

The tiedown shall be attached to provide load control and positioned in accordance with all applicable regulations.

A minimum of two raps of webbing and a maximum of four raps shall be on the ratchet or winch. Additional raps will reduce the work load limit of the winch or ratchet.

The opening in fittings shall have the proper shape and size to fit properly in all attachment or anchorage points.

Tiedowns must be protected from cutting, abrasion and other forms of damage by materials of sufficient strength and thickness.

Tiedowns shall be checked and adjusted during use per applicable standards.

Beware of dangers resulting from tossing assemblies over the load.

Tiedown assemblies with fittings shall not be dropped.

Tiedowns shall not be dragged across the floor, ground or over abrasive surfaces.

Tiedowns shall not be pulled from under the load, while the load is resting on the tiedown.

Always maintain a firm grip on winch bars. A slip resistant handle is recommended and only winch bars designed for use with winches shall be used. The tip of the winch bar must engage both holes on the ratchet end cap. Never release the winch bar until the pawl is firmly engaged between the winch teeth. Cheater bars shall not be used and the user must always stand clear (to one side) of the winch bar handle, during operation.

⚠ WARNING Flying winch bars are deadly projectiles that can cause injury, death and/or property damage.

Tiedowns shall not be tied in knots or joined by knotting.

Tiedowns and attached hardware subjected to snow, ice, mud, road salt, dirt, fecal matter and cleaning solutions require inspection, cleaning and lubrication to ensure compliance with acceptable operation procedures.

Do not use tiedown assemblies for lifting, lowering, suspending loads or towing.

In some applications, frictional tiedowns may not be suitable. Always consider dynamic forces and the ability of the article to slide (coefficient of friction).

Environmental Considerations

ULTRAVIOLET (UV) LIGHT

Environments where synthetic webbing tiedowns are continuously exposed to ultraviolet light can affect the strength of synthetic tiedowns in varying degrees ranging from slight to total degradation. Factors which affect the degree of strength loss are the length of continuous exposure time, tiedown construction, design and other environmental factors such as, weather conditions, elevation and geographic location. Initially, nylon webbing loses strength at a slower rate, when compared to polyester webbing, but continued to lose strength as the exposure time is extended. The loss of strength for nylon webbing can be 40 to 60% after exposure for periods ranging from 12 to 36 months. Initially, polyester webbing loses strength at a greater rate, when compared to nylon webbing. Loss in strength for polyester webbing was approximately 30% after 12 months exposure. Polyester webbing strength loss seemed to subside and level off after the initial 12 month period. Visual indicators of ultraviolet degradation are a bleaching out of tiedown color, increased stiffness of the webbing material and the appearance of abrasion in areas not normally in contact with the load.

TEMPERATURE

Synthetic tiedown assemblies should never be used at temperatures in excess of 194°F (90°C). Cold temperature exposure to -40°F/(-40°C) does not affect the strength of the synthetic tiedown. Temperature exposure outside the acceptable range must be considered and evaluated by the user.

STORAGE

When not in use, store tiedowns in a cool, dry, dark location, free of mechanical and environmental damage. The storage location should be ventilated and not exposed to heat sources, weld splatter, or grit.

CHEMICAL

Chemically active environments can affect the strength of synthetic tiedowns in varying degrees ranging from moderate to total degradation. Before tiedowns are used, the chemical compatibility between the tiedown components and the environment must be considered. Consult the sling manufacturer before purchasing to ensure the synthetic tiedowns and their components are chemically compatible with the environment. Synthetic tiedowns shall not be used where liquids, sprays, mists, vapors or fumes of alkalis or acids are present. Contact us before purchase and use.

⚠ WARNING Aluminum fittings shall not be exposed to chlorine environments or be cleaned with chlorine based cleaning solutions.

WATER

When nylon products are "wet", they experience a 15% reduction in strength. Polyester looses no strength when wet.

FOREIGN MATERIAL EXPOSURE

Tiedowns and attached hardware subjected to snow, ice, mud, road salt, salt water, dirt, fecal matter and cleaning solutions require inspection, cleaning and lubrication to ensure compliance with acceptable operation procedures. Exposed tiedowns should be thoroughly rinsed and allowed to dry, preferably out of direct sunlight. Metal chips, weld splatter or heavy grit can damage a tiedown both externally and internally.

Regulatory Resources

Web Sling and
Tiedown Association
PH 410.931-8100
FX 410.931-8111
WWW.WSTDA.COM

U.S. Department of
Transportation
Federal Highway
Administration
PH 202.366-4009
FX 202.366-8842
WWW.FHWA.DOT.GOV

Commercial Vehicle
Safety Alliance
PH 301.564-1623
FX 301.564-0588
WWW.CVSA.ORG

California Highway Patrol
PH 800.888-3600
FX 415. 732-8861
WWW.CHP.CA.GOV

Specialized Carriers and
Rigging Association
PH 703.689-0291
FX 703.698-0267
WWW.SCRANET.ORG

How To Operate Ratchet Buckles

Pull webbing through split drum to take up slack.

Operate handle back and forth until webbing is wrapped around the split drum a minimum of 2 and a maximum of 4 wraps.

Close handle fully to lock and hold webbing.

To release, disengage locking latch and rotate handle over center.

WARNING TO THE USER OF SYNTHETIC SLINGS

WARNING It is your explicit responsibility to consider all risk factors prior to using any tiedown device or product. Read and understand the information contained in this bulletin, in our catalog, on our web site www.lift-it.com and follow federal, state, provincial, local and industry regulations and guidelines. Use by untrained persons is hazardous.

WARNING All Products supplied and manufactured by Lift-It® Manufacturing are sold with express understanding that the purchaser and user are thoroughly familiar with the safe and proper use and application of the product. The qualified person and tiedown user has the responsibility for use and application, and should have sufficient training and knowledge of all applicable standards to responsibly use our products.

WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. Synthetic tiedowns will fail if damaged, abused, misused, overused, or improperly maintained.

WARNING Working load requirements should be evaluated by user before selecting appropriate hardware and strap assemblies. All strap assemblies or systems are as strong as the weakest component including the point of attachment. Assemblies must be inspected for worn or damaged parts, before each use. Failure to replace worn or damaged assemblies or components may result in serious personal injury and/or death.

WARNING Use extreme caution when using tarp straps

WARNING Flying winch bars are deadly projectiles that can cause injury, death and/or property damage.

Proper Use, Care, Maintenance and Installation of Cargo Winches

Set screws on portable winches should be snug tightened only. Over tightening of screws may cause bracket to bend, weakening the winch and causing it to fail, resulting in the loss of the tiedown. Portable winches must be removed from the trailer when not in use.

Low Profile winches are for side mount applications only. Low Profile winch models must not be used in undercount applications.

Standard Height winches are for under mount or bottom mount applications only. Standard winch models must not be used in side mount applications.

Combination or cable only winches must be used with the appropriate cable and/or wire rope during application. Selection must be consistent with the cable manufacturer's work load limits.

NOTE: For proper operation, all winches should be installed so the user can readily see the pawl to ensure proper engagement. Additionally, the winch should be positioned so the pawl drops into the ratchet wheel by gravity. Winches should never be installed so the user cannot see the pawl engagement, or in a position where the user must hold the pawl to engage the ratchet tooth. All winches, except portable and slider styles, must be welded to the trailer frame. Minimum welding requirements are 1/4" fillet weld, 4 inches long on both sides of frame, with 1/8" penetration.

Tiedown Assembly Options

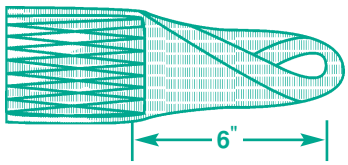
SLEEVES

MATERIALS	ORDER CODE
Webbing	WS
Cordura®	CS
Leather	LS

BUCKLE PROTECTOR PADS

MATERIAL - WEBBING
ORDER CODE - BPP

LOOPS (HALF TWIST & TAPERED)



NOTE: Standard loop length is 6 inches

ORDER CODE - LP

LIFT-IT®

"When Only the Best is Good Enough"

Quality System
Quality Endorsed Company

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