Recommended Standard Specification
For
Synthetic Web Slings

WSTDA-WS-1

$25.00

This Recommended Standard Specification has been formulated as a guide to users, industry and government to ensure the proper use, maintenance and inspection of synthetic web slings. The existence of this Recommended Standard Specification does not prevent members of the Web Sling & Tie Down Association or others from manufacturing or selling products beyond the scope of this Recommended Standard Specification.

FOREWORD

This Recommended Standard Specification applies to web slings made of nylon or polyester fibers used for applications which may include lifting, suspending, transporting, lowering and other load handling under known conditions. It recommends construction, identification and marking of web slings. In addition, it provides sling capacity information and important practical advice on the use, maintenance and inspection of web slings.

The exclusion from this Recommended Standard Specification of web slings of different synthetic materials and capacities is not intended to preclude their use and shall not be interpreted in this manner.

Web slings made from materials or construction other than those detailed in this Recommended Standard Specification shall be used in accordance with the recommendations of the web sling manufacturer or qualified person. The specifications contained in this Recommended Standard Specification for Synthetic Web Slings were formulated under the auspices of the Web Sling & Tie Down Association, Inc. The Recommended Standard Specification is intended to assist users in specifying the proper web sling for their particular needs; to serve as a guide to industry in the construction and use of web slings; and to serve as a guide to governmental and other regulatory bodies responsible for the proper use and inspection of web slings. For information not contained in this Recommended Standard Specification, consult the web sling manufacturer.

Safety is the paramount consideration involved in the use of any web sling. The appropriate web sling shall be selected for the specific use. Users of web slings shall have knowledge and training on the proper method of using slings and how to adjust rigging methods as usage situations change. Also, users shall be knowledgeable about industry, local, state, federal and provincial regulations applicable to the use of slings. Figures shown in this standard are for illustration only and are not intended to represent usage, design or manufacturing processes.

MANDATORY AND ADVISORY RULES

Mandatory rules of this standard are characterized by the word "shall." If a rule is of the advisory nature, it is indicated by the word "should" or is stated as a recommendation.

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First Published and Copyright 1978
First Revision 1983
Second Revision 1988
Third Revision 1994
Fourth Revision 2004
Fifth Revision 2013

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CHAPTER 1.0 TERMINOLOGY AND DEFINITIONS

Section 1.1 PURPOSE

1.1.1 This chapter provides a description of synthetic web sling types and definitions which apply to such slings.

Section 1.2 DESCRIPTION

1.2.1 A synthetic web sling is fabricated by sewing woven synthetic webbing of nylon or polyester type yarns into basic sling types with or without fittings.

Section 1.3 BASIC SLING TYPES

1.3.1 TYPE I - Web sling made with a triangular fitting on one end and a slotted triangle choker fitting on the other end. It can be used in a vertical, basket or choker hitch. (See Figure 1-1).

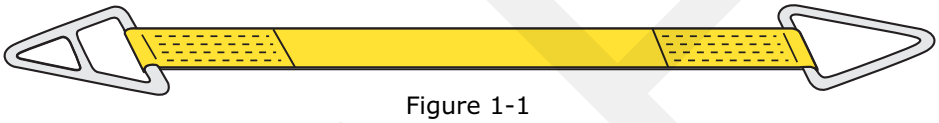


Figure 1-1

1.3.2 TYPE II - Web sling made with a triangle fitting on both ends. It can be used in a vertical or basket hitch only. (See Figure 1-2).

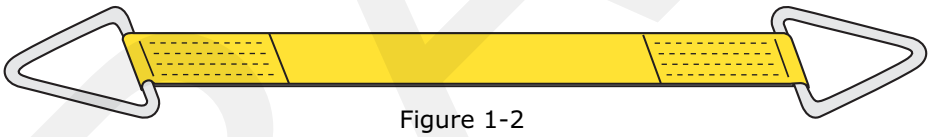


Figure 1-2

1.3.3 TYPE III - Web sling made with a flat loop eye on each end with the loop eye opening in the same plane as the sling body. This type of sling is sometimes called a flat eye sling, eye and eye sling or double eye sling. (See Figure 1-3).

Figure 1-3

1.3.4 TYPE IV - Web sling made with both loop eyes formed as in Type III, except that the loop eyes are turned at a right angle to the plane of the sling body. This type of sling is commonly referred to as a twisted eye sling. (See Figure 1-4).

Figure 1-4

1.3.5 TYPE V - Endless web sling, sometimes referred to as a grommet. It is a continuous loop formed by joining the ends of the webbing together with a load bearing splice. (See Figure 1-5).

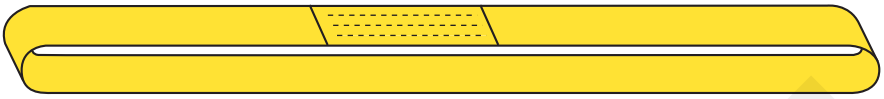


Figure 1-5

1.3.6 TYPE VI - Return eye (Reversed eye) web slings are formed by using multiple widths of webbing held edge to edge by abrasion resistant webbing attached on one or both sides of the web sling body and on one or both sides of the loop eyes to form a loop eye at each end, which are at a right angle to the plane of the web sling body. (See Figure 1-6).

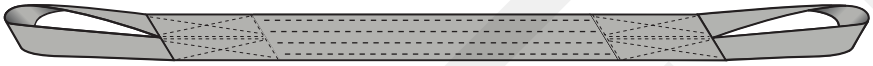


Figure 1-6

1.3.7 TYPE VIII - Wide Body Cargo: Wide Body Cargo slings basket the load. Loads are distributed over a wide surface area, protecting load surfaces from damage. For use in basket hitch only. (See Figure 1-7).

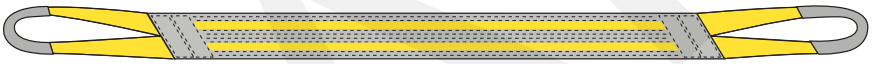


Figure 1-7

1.3.8 TYPE IX - Attached Eye Cargo: A lighter duty, cargo sling, which is more economical than Wide Body Cargo slings. Attached Eye Cargo slings feature narrower eye widths to fit smaller hooks. For use in basket hitch only. (See Figure 1-8).

Figure 1-8

1.3.9 TYPE X - BRIDLE ASSEMBLY: A sling assembly featuring a single top connection point with web sling leg(s) and may feature connection hardware at the bottom of the leg(s). (See Figure 1-9).

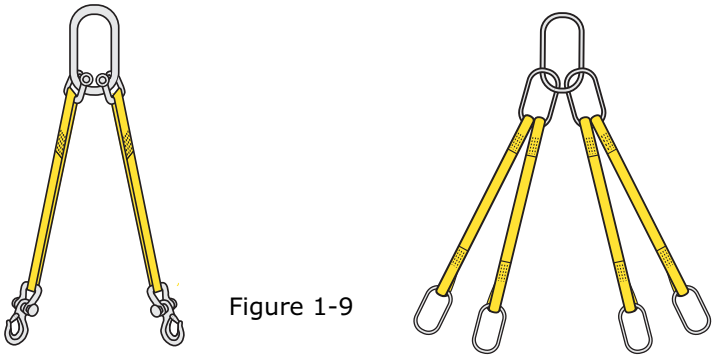


Figure 1-9

1.3.10 OTHER SLING TYPES: Other sling types are available and shall be used in accordance with the web sling manufacturer or qualified person's recommendation.

Section 1.4 DEFINITIONS OF TERMS

Abrasion - The mechanical wearing or scuffing of a surface, resulting from frictional movement between two materials or objects.

Body - That part of a web sling which is between the end fittings or loop eyes. (See Figure 1-10).

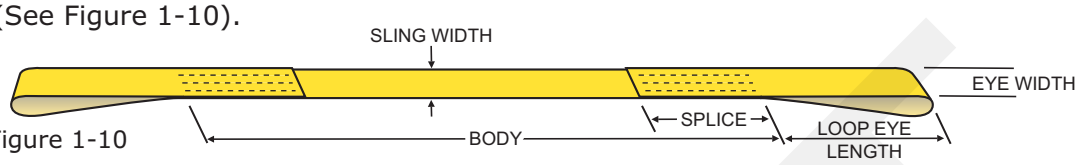


Figure 1-10

Breaking Strength - That force in pounds or kilograms at which point any load bearing part of the web sling fails.

Coating - A finish applied to the webbing for a special purpose.

Design Factor - The ratio of the breaking strength to the rated capacity for each new web sling.

Designated Person - Selected or assigned by the employer or employer's representative as being a competent person who is knowledgeable of regulations, standards, capable of assessing risk, identifying predictable hazards and is authorized to take corrective action.

Elongation - The measurement of stretch, at a given load, expressed as a percentage of the original unloaded length.

Fabrication Efficiency - The ratio of a web sling assembly breaking strength to the webbing strength prior to fabrication, expressed as a percentage.

Fitting - A load bearing device that is attached to the web sling.

Hitch/Vertical - A method of rigging in which the load is attached to one end of the web sling and the other end of the web sling is attached to the handling or lifting device. (See Figure 1-11).

Hitch/Choker - A method of rigging in which the web sling is passed around the load, fed back through itself, and then attached to the handling or lifting device. (See Figure 1-11).

Hitch/Double Wrapped Choker - A method of rigging similar to Hitch/Choker except that the web sling is passed around the load twice. (See Figure 1-11).

Hitch/Basket - A method of rigging in which the web sling is passed around the load and both ends are attached to the handling or lifting device(s). (See Figure 1-11).

Hitch/Double Wrapped Basket - A method of rigging similar to Hitch/Basket except that the web sling is passed around the load twice. (See Figure 1-11).

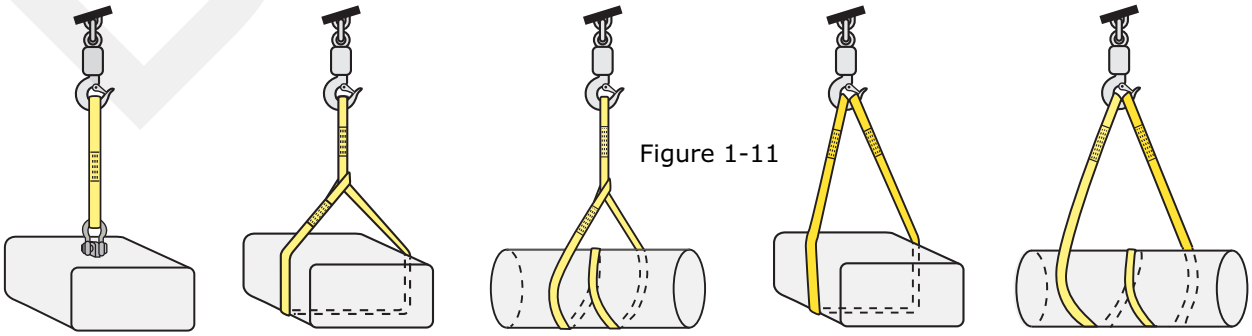


Figure 1-11

Hitch/Adjusting - A method of rigging that is similar to a choker hitch, but where the choked section of the sling is also passed around the handling or lifting device. The bottom portion of the sling is either attached to the load or is passed around the load. The adjusting hitch can be used to effectively adjust the length of the web sling, which is accomplished by repositioning the choke point. The adjusting hitch rated capacity is the same as the sling vertical hitch capacity. **The Adjusting Hitch is not recommended for sling widths over 2 inches.** (See Figure 1-12).

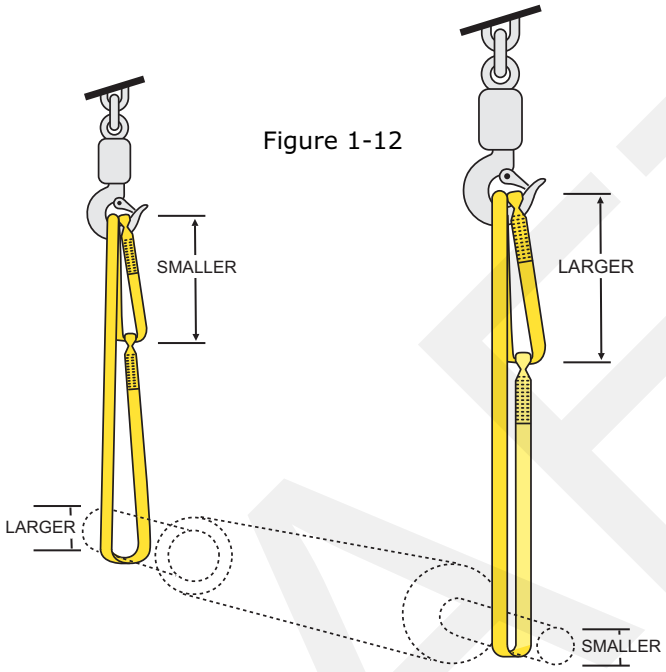


Figure 1-12

Length (Reach) - The distance between the extreme end bearing points of the web sling, including fittings if applicable. (See Figure 1-13).

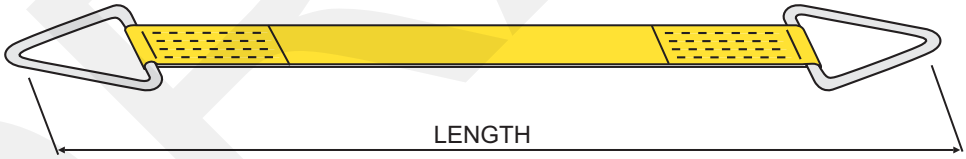


Figure 1-13

Lifting - Raising or lowering an unencumbered load.

Loop Eye - A length of webbing which has been folded back upon itself, forming an opening, and joined to the web sling body to form a bearing surface. (See Figure 1-14).

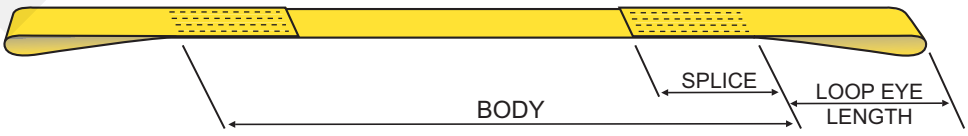


Figure 1-14

Plies - The number of thicknesses of load bearing webbing used in the web sling assembly. (See Figure 1-15).

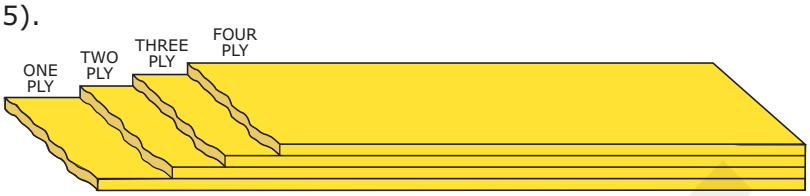


Figure 1-15

Proof Load Test - A non-destructive load test of the web sling to some multiple of the rated capacity of that web sling, including fittings if applicable, usually two (2) times the rated capacity for lifting applications.

Qualified Person - A person who by possession of a recognized degree or certificate of professional standing or who by extensive knowledge, training and experience has successfully demonstrated the ability to solve or resolve problems related to the subject matter and work.

Rated Capacity (Working Load Limit) - The maximum allowable loading force for each web sling assembly for the type of hitch being used.

Selvedge - The woven or knitted (with lockstitch) edge of webbing formed to prevent raveling.

Shock Loading - A condition of rapid lift, sudden shifting of a load or arrest of a falling load that causes the forces in a sling to notably exceed that which would have occurred during normal loading conditions.

Sling Protection - Material of sufficient strength, thickness and construction used to protect the web sling from being damaged by abrasion or cutting.
Some forms of protection will not prevent cutting and provide abrasion protection only.

A. Fixed Pad (See Figure 1-16).

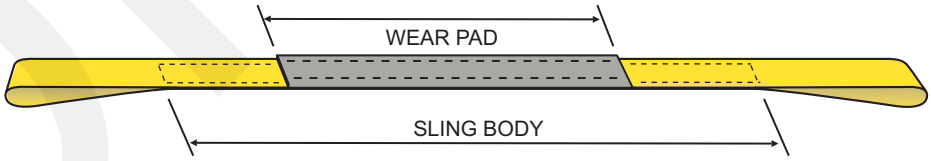


Figure 1-16

B. Sliding Pad (Sleeve) (See Figure 1-17).

Figure 1-17

Sling Service

Normal Service - The use of web slings in typical operating conditions which will not cause a rapid rate of observable degradation in sling materials. This includes the use of slings wherein the rate of sling wear is not accelerated due to the rate of operation, or exposure to highly abrasive surfaces or to edges that generate cutting of any of the sling materials.

Severe Service - The use of slings in conditions that may cause a rapid rate of observable degradation in sling materials. This could include the use of slings at a high rate of operation, direct exposure of the slings to materials in a manner that may generate an elevation of surface temperatures or cause a high rate of abrasive wear or cutting of the sling materials.

Special Service - The use of slings intermittently or in a manner that may result in an inconsistent rate of operation of the slings in a manner that may generate a highly variable rate of surface cutting, abrasive wear or other degradation.

Splice - That part of a web sling which is lapped and secured to become an integral part of the web sling. Types of splices are as follows:

A. Load Bearing Splice - Any splice that carries a portion of the total load applied. (See Figure 1-18).

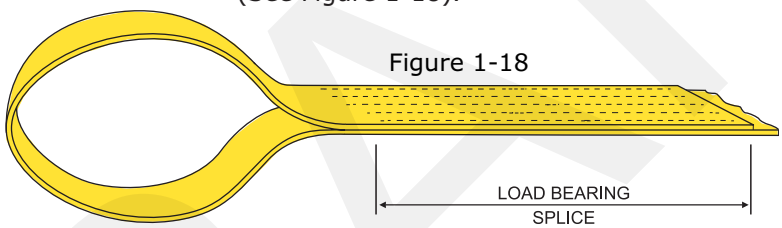


Figure 1-18

B. Assembly Splice - Any splice that joins two or more parts of the sling without bearing any of the applied load. (See Figure 1-19).

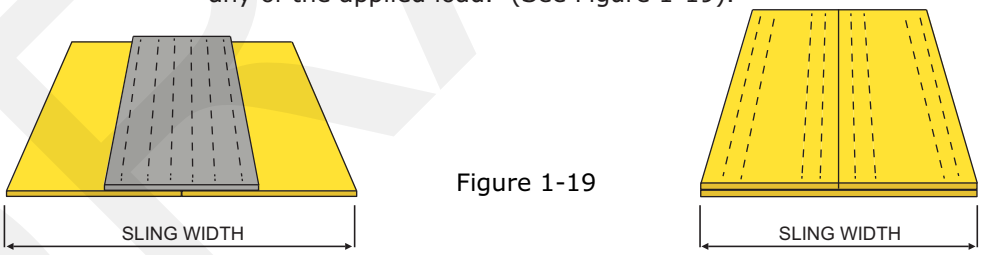


Figure 1-19

(Two or more widths of web joined side by side with a narrower width of web).

(Two or more widths of web joined side by side with a full width of web).

Synthetic Fiber - Man-made fibers.

Tapered Eye - A loop eye which is formed by folding the webbing to a narrower width at its bearing point to accommodate the handling or lifting device. A tapered eye may be either flat (Type III) or twisted (Type IV). (See Figure 1-20).

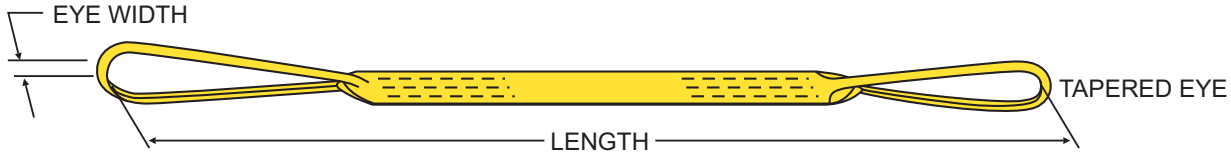
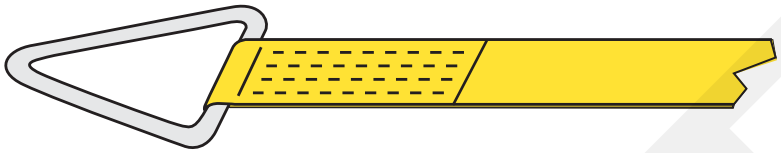


Figure 1-20

Thread - The synthetic yarn used to sew the web sling together.

Triangle Fitting - An end attachment which is used for connecting the web sling to the handling or lifting devices. (See Figure 1-21).

Figure 1-21



Triangle Choker Fitting - Similar to the triangle fitting except that it also has a slot through which the triangle fitting can be passed through in order to permit a choker hitch on the load. (See Figure 1-22).

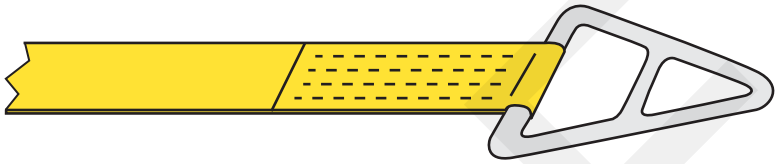


Figure 1-22

Webbing - A fabric woven of high tenacity synthetic yarns offering suitable characteristics for use in the manufacture of web slings.

Webbing Strength - The minimum strength of webbing, expressed in pounds per inch (or kilograms per millimeter) of webbing width.

Width - The distance across the web sling body from outer selvedge to outer selvedge. (See Figure 1-23).

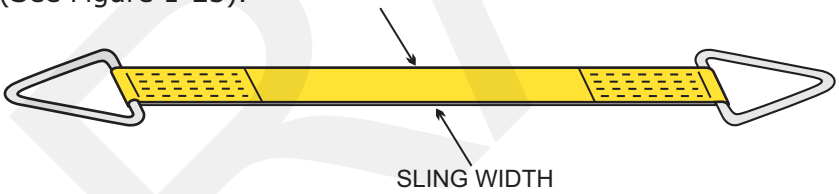


Figure 1-23

Working Load Limit - See rated capacity.

Yarn - The synthetic fibers used to make the webbing and thread.

CHAPTER 2.0 MATERIALS & CONSTRUCTION

Section 2.1 PURPOSE

2.1.1 This chapter provides an outline of materials and construction characteristics of web slings.

Section 2.2 WEBBING

2.2.1 Webbing used for synthetic web slings shall be manufactured and tested in accordance with WSTDA Recommended Standard Specification, Webbing for Synthetic Web Slings, WSTDA-WB-1.

2.2.2 The webbing shall be certifiable to tensile strength, have uniform thickness and width, and have selvedges.

2.2.3 Webbing shall be woven from a synthetic yarn that is heat and light resistant.

2.2.4 All webbing ends shall be sealed by heat or other suitable means to prevent raveling.

2.2.5 Class 5 webbing shall have a minimum breaking strength of 6,800 lbs per inch of width. (121.43 kilograms per millimeter of width).

Class 7 webbing shall have a minimum breaking strength of 9,800 lbs per inch of width. (175 kilograms per millimeter of width).

Section 2.3 THREAD

2.3.1 The thread used in the manufacture of synthetic web slings shall be of the same type synthetic yarn as the sling webbing.

2.3.2 For additional information about thread refer to Recommended Standard Specification: Sewing Threads for Slings and Tie Downs, WSTDA-TH-1.

Section 2.4 STITCHING

2.4.1 Stitching shall be the method for fabricating synthetic webbing slings. The stitch pattern and length of stitching shall be in accordance with the manufacturer's standard practice.

2.4.2 The stitching in all load-bearing splices of new web slings shall be of sufficient strength to achieve a minimum design factor of five (5) for new web slings.

2.4.3 All stitching shall be lock-stitched and preferably continuous. When not continuous, they shall be backstitched at the ends to prevent raveling.

Section 2.5 FITTINGS

This section relates to fittings of metal or other suitable materials which may be attached to the web sling for the purpose of engaging a lifting or handling device. The fittings may be a permanent or detachable part of the web sling.

2.5.1 **Material -** The material selected shall be compatible with the mechanical and environmental requirements imposed on the fitting.

2.5.2 **Design Criteria -** Fitting(s) shall have a minimum design factor of five (5) and have sufficient strength to sustain a proof load of twice the rated capacity without causing any permanent deformation.

2.5.3 **Finish -** All surfaces shall be cleanly finished and edges shall have sufficient radii to prevent cutting or other forms of damage to the web sling.

2.5.4 **Reuse of Fittings -** Fittings shall be inspected prior to reuse. Fittings shall not be used if excessive wear, pitting, corrosion, cracks, distortion or breaks are visible.

2.5.5 **Proof Load Test -** Permanently attached fittings that are reused or welded fittings shall be proof tested to a minimum of two (2) times the rated capacity.

Section 2.6 LOOP EYES

2.6.1 Recommended minimum loop eye length for Types III and IV web slings are listed in Table 2-1. See Section 1.3, Basic Sling Types.

Table 2-1 Loop Eyes

	One and Two Ply Slings	Three and Four Ply Slings
Sling Web Width	Typical Eye Length	Typical Eye Length
1" (25 mm.)	9"	12"
1-1/2" (38 mm.)	9"	12"
1-3/4" (44 mm.)	9"	12"
2" (51 mm.)	12"	12"
3" (76 mm.)	12"	18"
4" (102 mm.)	14"	18"
5" (127 mm.)	18"	24"
6" (152 mm.)	24"	24"
8" (204 mm.)	24"	24"
10" (254 mm.)	24"	30"
12" (304 mm.)	30"	36"

Section 2.7 COATINGS

2.7.1 Web slings may be coated with suitable materials that will impart desirable characteristics, such as:

A. Abrasion resistance.
B. Sealing to prevent penetration of foreign particles and matter.
C. Increased coefficient of friction.
D. Ultraviolet light resistance.

Section 2.8 DESIGN FACTOR FOR NEW WEB SLINGS

⚠ WARNING

The sling design factor is based on destructive, laboratory controlled testing conditions, which will not be exactly duplicated during actual loading conditions. Never load any sling in excess of its rated capacity.

2.8.1 The design factor for new synthetic web slings with or without fittings shall be a minimum of five (5) when tested in accordance with Section 3 for lifting and controlled load handling purposes. Please consult the manufacturer for other applications.

Section 2.9 IDENTIFICATION/MARKING REQUIREMENTS

2.9.1 **Identification Requirements -** Each web sling shall be durably marked or labeled by the manufacturer to show:

A. Rated capacity values for:
- The three basic hitches (Vertical, Choker, Vertical Basket) for single leg slings.
- At least one angle from the horizontal for multi-leg bridle slings such as 60, 45 and/or 30 degrees.
- The designated hitch of intended use for special applications.

B. Length (Reach): Bearing point to bearing point.
C. Type of fiber.
D. Name or trademark of manufacturer.
E. Manufacturer's code or stock number.
F. Number of legs, if more than one.

2.9.2 **Additional Identification Information**

A. Identification of fiber types
- Identification Marker - Marker shall be a color sealed or dyed yarn.
- Location of Marker - Marker shall be located in the center of the webbing on at least one face.
- Codes:

Fiber	Color Code
Nylon	No Marker
Polyester	Blue Marker

B. Identification of Synthetic Webbing Class - Class 5 nylon or polyester webbing shall contain an external black I.D. marker clearly visible and woven in at least one edge to indicate material as Class 5 tensile strength.

C. Each web sling manufacturer should internally identify their product with their name or trademark for traceability. The identification marker should be located inside a splice.

D. Each web sling manufacturer shall include warnings for use and inspection with each new web sling.

E. If a sling is made for a non-lifting application, it shall be marked "Not for Lifting".

F. If a sling in service is used for a non-lifting application where the load is unknown (i.e. pulling against UNKNOWN restraint, etc.) it shall then be marked "Not for Lifting" and not be returned to lifting service.

G. If a sling is used for non-lifting applications under known loading circumstances and within the rated sling capacity, it may be returned to lifting service.

2.9.3 **Maintenance of Sling Identification -** Sling identification should be maintained by the user so as to be legible during the life of the sling.

2.9.4 **Replacement of Sling Identification -** Replacement of the sling identification shall be considered as a repair as specified in section 4.8. Proof testing is not required for this repair.

Section 2.10 RATED CAPACITIES

2.10.1 A web sling shall not be loaded in excess of the identified rated capacity shown on its identification tag. Rated Capacities shown in this section are for reference only and may vary among manufacturers. Other sling types are available and shall be used in accordance with the manufacturer's recommendations.

2.10.2 Each manufacturer shall retain the test data used to validate the web sling minimum breaking strength. Destructive tests shall be conducted periodically, according to the test procedure outlined in Chapter 3.

2.10.3 **Rated Capacity Determination** - The formula for determining the rated capacity of a new web sling is as follows: $RC = \frac{CTS \times FE}{5}$

Where: RC = Rated Capacity
CTS = Certified Tensile Strength of Webbing
FE = Fabrication Efficiency *
5 = Design Factor of 5

* Fabrication efficiency is determined by the manufacturer's testing results.

2.10.4 The choker hitch capacity shall be rated at a maximum of 80% of the vertical capacity.

2.10.5 The vertical basket hitch capacity shall be rated at a maximum of two (2) times the vertical capacity.

RATED CAPACITY FOR SYNTHETIC WEB SLINGS

TABLE 2-2
U.S.S. Inch-Pound Units - Class 5 - 1 Ply Slings
Types I, II, III, IV

	SINGLE LEG			2 LEG OR SINGLE BASKET			
	HITCH TYPES			HORIZONTAL ANGLES			
Sling Width	Vertical	Choker	Vertical Basket	90°	60°	45°	30°
							
1 in.	1,100 lb.	880 lb.	2,200 lb.	2,200 lb.	1,905 lb.	1,555 lb.	1,100 lb.
1½ in.	1,600 lb.	1,280 lb.	3,200 lb.	3,200 lb.	2,771 lb.	2,262 lb.	1,600 lb.
1¾ in.	1,900 lb.	1,520 lb.	3,800 lb.	3,800 lb.	3,291 lb.	2,687 lb.	1,900 lb.
2 in.	2,200 lb.	1,760 lb.	4,400 lb.	4,400 lb.	3,810 lb.	3,111 lb.	2,200 lb.
3 in.	3,300 lb.	2,640 lb.	6,600 lb.	6,600 lb.	5,716 lb.	4,666 lb.	3,300 lb.
4 in.	4,400 lb.	3,520 lb.	8,800 lb.	8,800 lb.	7,621 lb.	6,222 lb.	4,400 lb.
5 in.	5,500 lb.	4,400 lb.	11,000 lb.	11,000 lb.	9,526 lb.	7,777 lb.	5,500 lb.
6 in.	6,600 lb.	5,280 lb.	13,200 lb.	13,200 lb.	11,431 lb.	9,332 lb.	6,600 lb.

TABLE 2-3
U.S.S. Inch-Pound Units - Class 5 - 1 Ply Slings
Type V

	ENDLESS			2 LEG OR SINGLE BASKET		
	HITCH TYPES			HORIZONTAL ANGLES		
Sling Width	Vertical	Choker	Vertical Basket	60°	45°	30°
						
1 in.	2,200 lb.	1,760 lb.	4,400 lb.	3,810 lb.	3,111 lb.	2,200 lb.
1½ in.	3,200 lb.	2,560 lb.	6,400 lb.	5,542 lb.	4,525 lb.	3,200 lb.
1¾ in.	3,800 lb.	3,040 lb.	7,600 lb.	6,582 lb.	5,373 lb.	3,800 lb.
2 in.	4,400 lb.	3,520 lb.	8,800 lb.	7,621 lb.	6,222 lb.	4,400 lb.
3 in.	6,600 lb.	5,280 lb.	13,200 lb.	11,431 lb.	9,332 lb.	6,600 lb.
4 in.	8,800 lb.	7,040 lb.	17,600 lb.	15,242 lb.	12,443 lb.	8,800 lb.
5 in.	11,000 lb.	8,800 lb.	22,000 lb.	19,052 lb.	15,554 lb.	11,000 lb.
6 in.	13,200 lb.	10,560 lb.	26,400 lb.	22,862 lb.	18,665 lb.	13,200 lb.

Notes:

1) The rated capacities are based on stuffer weave construction webbing with a minimum certified tensile strength of 6,800 pounds per inch of webbing width.
2) Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing.
3) For Type VI slings and for other sling types, consult the manufacturer for rated capacities.

ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE IF THE WEB SLING RATED CAPACITY IS APPROPRIATE FOR THE LIFT.

RATED CAPACITY FOR SYNTHETIC WEB SLINGS

TABLE 2-4
SI-Units - Class 5 - 1 Ply Slings
Types I, II, III, IV

	SINGLE LEG			2 LEG OR SINGLE BASKET			
	HITCH TYPES			HORIZONTAL ANGLES			
Sling Width	Vertical	Choker	Vertical Basket	90°	60°	45°	30°
							
25 mm	500 kg.	400 kg.	1,000 kg.	1,000 kg.	866 kg.	707 kg.	500 kg.
38 mm	725 kg.	580 kg.	1,450 kg.	1,450 kg.	1,256 kg.	1,025 kg.	725 kg.
44 mm	850 kg.	680 kg.	1,700 kg.	1,700 kg.	1,472 kg.	1,202 kg.	850 kg.
51 mm	1,000 kg.	800 kg.	2,000 kg.	2,000 kg.	1,732 kg.	1,414 kg.	1,000 kg.
76 mm	1,500 kg.	1,200 kg.	3,000 kg.	3,000 kg.	2,598 kg.	2,121 kg.	1,500 kg.
102 mm	2,000 kg.	1,600 kg.	4,000 kg.	4,000 kg.	3,464 kg.	2,828 kg.	2,000 kg.
127 mm	2,500 kg.	2,000 kg.	5,000 kg.	5,000 kg.	4,330 kg.	3,535 kg.	2,500 kg.
152 mm	3,000 kg.	2,400 kg.	6,000 kg.	6,000 kg.	5,196 kg.	4,242 kg.	3,000 kg.

TABLE 2-5
SI-Units - Class 5 - 1 Ply Slings
Type V

	ENDLESS			2 LEG OR SINGLE BASKET		
	HITCH TYPES			HORIZONTAL ANGLES		
Sling Width	Vertical	Choker	Vertical Basket	60°	45°	30°
						
25 mm	1,000 kg.	800 kg.	2,000 kg.	1,732 kg.	1,414 kg.	1,000 kg.
38 mm	1,450 kg.	1,160 kg.	2,900 kg.	2,511 kg.	2,050 kg.	1,450 kg.
44 mm	1,700 kg.	1,360 kg.	3,400 kg.	2,944 kg.	2,404 kg.	1,700 kg.
51 mm	2,000 kg.	1,600 kg.	4,000 kg.	3,464 kg.	2,828 kg.	2,000 kg.
76 mm	3,000 kg.	2,400 kg.	6,000 kg.	5,196 kg.	4,242 kg.	3,000 kg.
102 mm	4,000 kg.	3,200 kg.	8,000 kg.	6,928 kg.	5,656 kg.	4,000 kg.
127 mm	5,000 kg.	4,000 kg.	10,000 kg.	8,660 kg.	7,070 kg.	5,000 kg.
152 mm	6,000 kg.	4,800 kg.	12,000 kg.	10,392 kg.	8,484 kg.	6,000 kg.

Notes:

1) The rated capacities are based on stuffer weave construction webbing with a minimum certified tensile strength of 121.43 kilograms per millimeter of webbing width.
2) Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing.
3) For Type VI slings and for other sling types, consult the manufacturer for rated capacities.

ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE IF THE WEB SLING RATED CAPACITY IS APPROPRIATE FOR THE LIFT.

RATED CAPACITY FOR SYNTHETIC WEB SLINGS

TABLE 2-6
U.S.S. Inch-Pound Units - Class 5 - 2 Ply Slings
Types I, II, III, IV

	SINGLE LEG			2 LEG OR SINGLE BASKET			
	HITCH TYPES			HORIZONTAL ANGLES			
Sling Width	Vertical	Choker	Vertical Basket	90°	60°	45°	30°
							
1 in.	2,200 lb.	1,760 lb.	4,400 lb.	4,400 lb.	3,810 lb.	3,111 lb.	2,200 lb.
1½ in.	3,300 lb.	2,640 lb.	6,600 lb.	6,600 lb.	5,716 lb.	4,666 lb.	3,300 lb.
1¾ in.	3,800 lb.	3,040 lb.	7,600 lb.	7,600 lb.	6,582 lb.	5,373 lb.	3,800 lb.
2 in.	4,400 lb.	3,520 lb.	8,800 lb.	8,800 lb.	7,621 lb.	6,222 lb.	4,400 lb.
3 in.	6,600 lb.	5,280 lb.	13,200 lb.	13,200 lb.	11,431 lb.	9,332 lb.	6,600 lb.
4 in.	8,200 lb.	6,560 lb.	16,400 lb.	16,400 lb.	14,402 lb.	11,595 lb.	8,200 lb.
5 in.	10,200 lb.	8,160 lb.	20,400 lb.	20,400 lb.	17,666 lb.	14,423 lb.	10,200 lb.
6 in.	12,300 lb.	9,840 lb.	24,600 lb.	24,600 lb.	21,304 lb.	17,392 lb.	12,300 lb.

TABLE 2-7
U.S.S. Inch-Pound Units - Class 5 - 2 Ply Slings
Type V

	ENDLESS			2 LEG OR SINGLE BASKET		
	HITCH TYPES			HORIZONTAL ANGLES		
Sling Width	Vertical	Choker	Vertical Basket	60°	45°	30°
						
1 in.	4,400 lb.	3,520 lb.	8,800 lb.	7,621 lb.	6,222 lb.	4,400 lb.
1½ in.	6,600 lb.	5,280 lb.	13,200 lb.	11,431 lb.	9,332 lb.	6,600 lb.
1¾ in.	7,600 lb.	6,080 lb.	15,200 lb.	13,163 lb.	10,746 lb.	7,600 lb.
2 in.	8,800 lb.	7,040 lb.	17,600 lb.	15,242 lb.	12,443 lb.	8,800 lb.
3 in.	13,200 lb.	10,560 lb.	26,400 lb.	22,862 lb.	18,665 lb.	13,200 lb.
4 in.	16,400 lb.	13,120 lb.	32,800 lb.	28,405 lb.	23,190 lb.	16,400 lb.
5 in.	20,400 lb.	16,320 lb.	40,800 lb.	35,333 lb.	28,846 lb.	20,400 lb.
6 in.	24,600 lb.	19,680 lb.	49,200 lb.	42,607 lb.	34,784 lb.	24,600 lb.

Notes:

1) The rated capacities are based on stuffer weave construction webbing with a minimum certified tensile strength of 6,800 pounds per inch of webbing width.
2) Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing.
3) For Type VI slings and for other sling types, consult the manufacturer for rated capacities.

ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE IF THE WEB SLING RATED CAPACITY IS APPROPRIATE FOR THE LIFT.

RATED CAPACITY FOR SYNTHETIC WEB SLINGS

TABLE 2-8
SI-Units - Class 5 - 2 Ply Slings
Types I, II, III, IV

	SINGLE LEG			2 LEG OR SINGLE BASKET			
	HITCH TYPES			HORIZONTAL ANGLES			
Sling Width	Vertical	Choker	Vertical Basket	90°	60°	45°	30°
							
25 mm	1,000 kg.	800 kg.	2,000 kg.	2,000 kg.	1,732 kg.	1,414 kg.	1,000 kg.
38 mm	1,500 kg.	1,200 kg.	3,000 kg.	3,000 kg.	2,598 kg.	2,121 kg.	1,500 kg.
44 mm	1,700 kg.	1,360 kg.	3,400 kg.	3,400 kg.	2,944 kg.	2,404 kg.	1,700 kg.
51 mm	2,000 kg.	1,600 kg.	4,000 kg.	4,000 kg.	3,464 kg.	2,828 kg.	2,000 kg.
76 mm	3,000 kg.	2,400 kg.	6,000 kg.	6,000 kg.	5,196 kg.	4,242 kg.	3,000 kg.
102 mm	3,700 kg.	2,960 kg.	7,400 kg.	7,400 kg.	6,408 kg.	5,232 kg.	3,700 kg.
127 mm	4,650 kg.	3,720 kg.	9,300 kg.	9,300 kg.	8,054 kg.	6,575 kg.	4,650 kg.
152 mm	5,600 kg.	4,480 kg.	11,200 kg.	11,200 kg.	9,699 kg.	7,918 kg.	5,600 kg.

TABLE 2-9
SI-Units - Class 5 - 2 Ply Slings
Type V

	ENDLESS			2 LEG OR SINGLE BASKET		
	HITCH TYPES			HORIZONTAL ANGLES		
Sling Width	Vertical	Choker	Vertical Basket	60°	45°	30°
						
25 mm	2,000 kg.	1,600 kg.	4,000 kg.	3,464 kg.	2,828 kg.	2,000 kg.
38 mm	3,000 kg.	2,400 kg.	6,000 kg.	5,196 kg.	4,242 kg.	3,000 kg.
44 mm	3,450 kg.	2,760 kg.	6,900 kg.	5,975 kg.	4,878 kg.	3,450 kg.
51 mm	4,000 kg.	3,200 kg.	8,000 kg.	6,928 kg.	5,656 kg.	4,000 kg.
76 mm	6,000 kg.	4,800 kg.	12,000 kg.	10,392 kg.	8,484 kg.	6,000 kg.
102 mm	7,450 kg.	5,960 kg.	14,900 kg.	12,903 kg.	10,534 kg.	7,450 kg.
127 mm	9,250 kg.	7,400 kg.	18,500 kg.	16,021 kg.	13,080 kg.	9,250 kg.
152 mm	11,150 kg.	8,920 kg.	22,300 kg.	19,312 kg.	15,766 kg.	11,150 kg.

Notes:

1) The rated capacities are based on stuffer weave construction webbing with a minimum certified tensile strength of 121.43 kilograms per millimeter of webbing width.
2) Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing.
3) For Type VI slings and for other sling types, consult the manufacturer for rated capacities.

ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE IF THE WEB SLING RATED CAPACITY IS APPROPRIATE FOR THE LIFT.

RATED CAPACITY FOR SYNTHETIC WEB SLINGS

TABLE 2-10
U.S.S. Inch-Pound Units - Class 7 - 1 Ply Slings
Types I, II, III, IV

Sling Width	SINGLE LEG HITCH TYPES			2 LEG OR SINGLE BASKET HORIZONTAL ANGLES			
	Vertical	Choker	Vertical Basket	90°	60°	45°	30°
							
1 in.	1,600 lb.	1,280 lb.	3,200 lb.	3,200 lb.	2,771 lb.	2,262 lb.	1,600 lb.
1½ in.	2,300 lb.	1,840 lb.	4,600 lb.	4,600 lb.	3,984 lb.	3,252 lb.	2,300 lb.
1¾ in.	2,700 lb.	2,160 lb.	5,400 lb.	5,400 lb.	4,676 lb.	3,818 lb.	2,700 lb.
2 in.	3,100 lb.	2,480 lb.	6,200 lb.	6,200 lb.	5,369 lb.	4,383 lb.	3,100 lb.
3 in.	4,700 lb.	3,760 lb.	9,400 lb.	9,400 lb.	8,140 lb.	6,646 lb.	4,700 lb.
4 in.	6,200 lb.	4,960 lb.	12,400 lb.	12,400 lb.	10,738 lb.	8,767 lb.	6,200 lb.
5 in.	7,800 lb.	6,240 lb.	15,600 lb.	15,600 lb.	13,510 lb.	11,029 lb.	7,800 lb.
6 in.	9,300 lb.	7,440 lb.	18,600 lb.	18,600 lb.	16,108 lb.	13,150 lb.	9,300 lb.
8 in.	11,800 lb.	9,440 lb.	23,600 lb.	23,600 lb.	20,438 lb.	16,685 lb.	11,800 lb.
10 in.	14,700 lb.	11,760 lb.	29,400 lb.	29,400 lb.	25,460 lb.	20,786 lb.	14,700 lb.
12 in.	17,600 lb.	14,080 lb.	35,200 lb.	35,200 lb.	30,483 lb.	24,886 lb.	17,600 lb.

TABLE 2-11
U.S.S. Inch-Pound Units - Class 7 - 1 Ply Slings
Type V

Sling Width	ENDLESS HITCH TYPES			2 LEG OR SINGLE BASKET HORIZONTAL ANGLES		
	Vertical	Choker	Vertical Basket	60°	45°	30°
						
1 in.	3,200 lb.	2,560 lb.	6,400 lb.	5,542 lb.	4,525 lb.	3,200 lb.
1½ in.	4,600 lb.	3,680 lb.	9,200 lb.	7,967 lb.	6,504 lb.	4,600 lb.
1¾ in.	5,400 lb.	4,320 lb.	10,800 lb.	9,353 lb.	7,636 lb.	5,400 lb.
2 in.	6,200 lb.	4,960 lb.	12,400 lb.	10,738 lb.	8,767 lb.	6,200 lb.
3 in.	9,400 lb.	7,520 lb.	18,800 lb.	16,281 lb.	13,292 lb.	9,400 lb.
4 in.	12,400 lb.	9,920 lb.	24,800 lb.	21,477 lb.	17,534 lb.	12,400 lb.
5 in.	15,600 lb.	12,480 lb.	31,200 lb.	27,019 lb.	22,058 lb.	15,600 lb.
6 in.	18,600 lb.	14,880 lb.	37,200 lb.	32,215 lb.	26,300 lb.	18,600 lb.
8 in.	21,200 lb.	16,960 lb.	42,400 lb.	36,718 lb.	29,977 lb.	21,200 lb.
10 in.	26,500 lb.	21,200 lb.	53,000 lb.	45,898 lb.	37,471 lb.	26,500 lb.
12 in.	31,800 lb.	25,440 lb.	63,600 lb.	55,078 lb.	44,965 lb.	31,800 lb.

Notes:

1) The rated capacities are based on stuffer weave construction webbing with a minimum certified tensile strength of 9,800 pounds per inch of webbing width.
2) Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing.
3) For Type VI slings and for other sling types, consult the manufacturer for rated capacities.

ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE IF THE WEB SLING RATED CAPACITY IS APPROPRIATE FOR THE LIFT.

RATED CAPACITY FOR SYNTHETIC WEB SLINGS

TABLE 2-12
SI-Units - Class 7 - 1 Ply Slings

Types I, II, III, IV

Sling Width	SINGLE LEG HITCH TYPES			2 LEG OR SINGLE BASKET HORIZONTAL ANGLES			
	Vertical	Choker	Vertical Basket	90°	60°	45°	30°
							
25 mm	725 kg.	580 kg.	1,450 kg.	1,450 kg.	1,256 kg.	1,025 kg.	725 kg.
38 mm	1,025 kg.	820 kg.	2,050 kg.	2,050 kg.	1,775 kg.	1,449 kg.	1,025 kg.
44 mm	1,225 kg.	980 kg.	2,450 kg.	2,450 kg.	2,122 kg.	1,732 kg.	1,225 kg.
51 mm	1,400 kg.	1,120 kg.	2,800 kg.	2,800 kg.	2,425 kg.	1,980 kg.	1,400 kg.
76 mm	2,125 kg.	1,700 kg.	4,250 kg.	4,250 kg.	3,681 kg.	3,005 kg.	2,125 kg.
102 mm	2,800 kg.	2,240 kg.	5,600 kg.	5,600 kg.	4,850 kg.	3,959 kg.	2,800 kg.
127 mm	3,500 kg.	2,800 kg.	7,000 kg.	7,000 kg.	6,062 kg.	4,949 kg.	3,500 kg.
152 mm	4,200 kg.	3,360 kg.	8,400 kg.	8,400 kg.	7,274 kg.	5,939 kg.	4,200 kg.
203 mm	5,350 kg.	4,280 kg.	10,700 kg.	10,700 kg.	9,266 kg.	7,565 kg.	5,350 kg.
254 mm	6,650 kg.	5,320 kg.	13,300 kg.	13,300 kg.	11,518 kg.	9,403 kg.	6,650 kg.
305 mm	8,000 kg.	6,400 kg.	16,000 kg.	16,000 kg.	13,856 kg.	11,312 kg.	8,000 kg.

TABLE 2-13
SI-Units - Class 7 - 1 Ply Slings

Type V

Sling Width	ENDLESS HITCH TYPES			2 LEG OR SINGLE BASKET HORIZONTAL ANGLES		
	Vertical	Choker	Vertical Basket	60°	45°	30°
						
25 mm	1,450 kg.	1,160 kg.	2,900 kg.	2,511 kg.	2,050 kg.	1,450 kg.
38 mm	2,075 kg.	1,660 kg.	4,150 kg.	3,594 kg.	2,934 kg.	2,075 kg.
44 mm	2,450 kg.	1,960 kg.	4,900 kg.	4,243 kg.	3,464 kg.	2,450 kg.
51 mm	2,800 kg.	2,240 kg.	5,600 kg.	4,850 kg.	3,959 kg.	2,800 kg.
76 mm	4,225 kg.	3,380 kg.	8,450 kg.	7,318 kg.	5,974 kg.	4,225 kg.
102 mm	5,600 kg.	4,480 kg.	11,200 kg.	9,699 kg.	7,918 kg.	5,600 kg.
127 mm	7,050 kg.	5,640 kg.	14,100 kg.	12,211 kg.	9,969 kg.	7,050 kg.
152 mm	8,450 kg.	6,760 kg.	16,900 kg.	14,635 kg.	11,948 kg.	8,450 kg.
203 mm	9,600 kg.	7,680 kg.	19,200 kg.	16,627 kg.	13,574 kg.	9,600 kg.
254 mm	12,000 kg.	9,600 kg.	24,000 kg.	20,784 kg.	16,968 kg.	12,000 kg.
305 mm	14,400 kg.	11,520 kg.	28,800 kg.	24,941 kg.	20,362 kg.	14,400 kg.

Notes:

1) The rated capacities are based on stuffer weave construction webbing with a minimum certified tensile strength of 175 kilograms per millimeter of webbing width.
2) Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing.
3) For Type VI slings and for other sling types, consult the manufacturer for rated capacities.

ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE IF THE WEB SLING RATED CAPACITY IS APPROPRIATE FOR THE LIFT.

RATED CAPACITY FOR SYNTHETIC WEB SLINGS

TABLE 2-14
U.S.S. Inch-Pound Units - Class 7 - 2 Ply Slings

Types I, II, III, IV

Sling Width	SINGLE LEG HITCH TYPES			2 LEG OR SINGLE BASKET HORIZONTAL ANGLES			
	Vertical	Choker	Vertical Basket	90°	60°	45°	30°
							
1 in.	3,100 lb.	2,480 lb.	6,200 lb.	6,200 lb.	5,369 lb.	4,383 lb.	3,100 lb.
1½ in.	4,700 lb.	3,760 lb.	9,400 lb.	9,400 lb.	8,140 lb.	6,646 lb.	4,700 lb.
1¾ in.	5,400 lb.	4,320 lb.	10,800 lb.	10,800 lb.	9,353 lb.	7,636 lb.	5,400 lb.
2 in.	6,200 lb.	4,960 lb.	12,400 lb.	12,400 lb.	10,738 lb.	8,767 lb.	6,200 lb.
3 in.	8,800 lb.	7,040 lb.	17,600 lb.	17,600 lb.	15,242 lb.	12,443 lb.	8,800 lb.
4 in.	11,000 lb.	8,800 lb.	22,000 lb.	22,000 lb.	19,052 lb.	15,554 lb.	11,000 lb.
5 in.	13,700 lb.	10,960 lb.	27,400 lb.	27,400 lb.	23,728 lb.	19,372 lb.	13,700 lb.
6 in.	16,500 lb.	13,200 lb.	33,000 lb.	33,000 lb.	28,578 lb.	23,331 lb.	16,500 lb.
8 in.	22,700 lb.	18,160 lb.	45,400 lb.	45,400 lb.	39,316 lb.	32,098 lb.	22,700 lb.
10 in.	28,400 lb.	22,720 lb.	56,800 lb.	56,800 lb.	49,189 lb.	40,158 lb.	28,400 lb.
12 in.	34,100 lb.	27,280 lb.	68,200 lb.	68,200 lb.	59,061 lb.	48,217 lb.	34,100 lb.

TABLE 2-15
U.S.S. Inch-Pound Units - Class 7 - 2 Ply Slings

Type V

Sling Width	ENDLESS HITCH TYPES			2 LEG OR SINGLE BASKET HORIZONTAL ANGLES		
	Vertical	Choker	Vertical Basket	60°	45°	30°
						
1 in.	6,200 lb.	4,960 lb.	12,400 lb.	10,738 lb.	8,767 lb.	6,200 lb.
1½ in.	9,400 lb.	7,520 lb.	18,800 lb.	16,281 lb.	13,292 lb.	9,400 lb.
1¾ in.	10,800 lb.	8,640 lb.	21,600 lb.	18,706 lb.	15,271 lb.	10,800 lb.
2 in.	12,400 lb.	9,920 lb.	24,800 lb.	21,477 lb.	17,534 lb.	12,400 lb.
3 in.	17,600 lb.	14,080 lb.	35,200 lb.	30,483 lb.	24,886 lb.	17,600 lb.
4 in.	22,000 lb.	17,600 lb.	44,000 lb.	38,104 lb.	31,108 lb.	22,000 lb.
5 in.	27,400 lb.	21,920 lb.	54,800 lb.	47,457 lb.	38,744 lb.	27,400 lb.
6 in.	33,000 lb.	26,400 lb.	66,000 lb.	57,156 lb.	46,662 lb.	33,000 lb.
8 in.	42,300 lb.	33,840 lb.	84,600 lb.	73,264 lb.	59,812 lb.	42,300 lb.
10 in.	52,900 lb.	42,320 lb.	105,800 lb.	91,623 lb.	74,801 lb.	52,900 lb.
12 in.	63,500 lb.	50,800 lb.	127,000 lb.	109,982 lb.	89,789 lb.	63,500 lb.

Notes:

1) The rated capacities are based on stuffer weave construction webbing with a minimum certified tensile strength of 9,800 pounds per inch of webbing width.
2) Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing.
3) For Type VI slings and for other sling types, consult the manufacturer for rated capacities.

ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE IF THE WEB SLING RATED CAPACITY IS APPROPRIATE FOR THE LIFT.

RATED CAPACITY FOR SYNTHETIC WEB SLINGS

TABLE 2-16
SI-Units - Class 7 - 2 Ply Slings

Types I, II, III, IV

Sling Width	SINGLE LEG			2 LEG OR SINGLE BASKET			
	HITCH TYPES			HORIZONTAL ANGLES			
	Vertical	Choker	Vertical Basket	90°	60°	45°	30°
							
25 mm	1,400 kg.	1,120 kg.	2,800 kg.	2,800 kg.	2,425 kg.	1,980 kg.	1,400 kg.
38 mm	2,150 kg.	1,720 kg.	4,300 kg.	4,300 kg.	3,724 kg.	3,040 kg.	2,150 kg.
44 mm	2,450 kg.	1,960 kg.	4,900 kg.	4,900 kg.	4,243 kg.	3,464 kg.	2,450 kg.
51 mm	2,800 kg.	2,240 kg.	5,600 kg.	5,600 kg.	4,850 kg.	3,959 kg.	2,800 kg.
76 mm	4,000 kg.	3,200 kg.	8,000 kg.	8,000 kg.	6,928 kg.	5,656 kg.	4,000 kg.
102 mm	5,000 kg.	4,000 kg.	10,000 kg.	10,000 kg.	8,660 kg.	7,070 kg.	5,000 kg.
127 mm	6,200 kg.	4,960 kg.	12,400 kg.	12,400 kg.	10,738 kg.	8,767 kg.	6,200 kg.
152 mm	7,500 kg.	6,000 kg.	15,000 kg.	15,000 kg.	12,990 kg.	10,605 kg.	7,500 kg.
203 mm	10,325 kg.	8,260 kg.	20,650 kg.	20,650 kg.	17,883 kg.	14,600 kg.	10,325 kg.
254 mm	12,900 kg.	10,320 kg.	25,800 kg.	25,800 kg.	22,343 kg.	18,241 kg.	12,900 kg.
305 mm	15,500 kg.	12,400 kg.	31,000 kg.	31,000 kg.	26,846 kg.	21,917 kg.	15,500 kg.

TABLE 2-17
SI-Units - Class 7 - 2 Ply Slings

Type V

Sling Width	ENDLESS			2 LEG OR SINGLE BASKET		
	HITCH TYPES			HORIZONTAL ANGLES		
	Vertical	Choker	Vertical Basket	60°	45°	30°
						
25 mm	2,800 kg.	2,240 kg.	5,600 kg.	4,850 kg.	3,959 kg.	2,800 kg.
38 mm	4,250 kg.	3,400 kg.	8,500 kg.	7,361 kg.	6,010 kg.	4,250 kg.
44 mm	4,900 kg.	3,920 kg.	9,800 kg.	8,487 kg.	6,929 kg.	4,900 kg.
51 mm	5,650 kg.	4,520 kg.	11,300 kg.	9,786 kg.	7,989 kg.	5,650 kg.
76 mm	8,000 kg.	6,400 kg.	16,000 kg.	13,856 kg.	11,312 kg.	8,000 kg.
102 mm	10,000 kg.	8,000 kg.	20,000 kg.	17,320 kg.	14,140 kg.	10,000 kg.
127 mm	12,450 kg.	9,960 kg.	24,900 kg.	21,563 kg.	17,604 kg.	12,450 kg.
152 mm	15,000 kg.	12,000 kg.	30,000 kg.	25,980 kg.	21,210 kg.	15,000 kg.
203 mm	19,250 kg.	15,400 kg.	38,500 kg.	33,341 kg.	27,220 kg.	19,250 kg.
254 mm	24,000 kg.	19,200 kg.	48,000 kg.	41,568 kg.	33,936 kg.	24,000 kg.
305 mm	28,850 kg.	23,080 kg.	57,700 kg.	49,968 kg.	40,794 kg.	28,850 kg.

Notes:

1) The rated capacities are based on stuffer weave construction webbing with a minimum certified tensile strength of 175 kilograms per millimeter of webbing width.
2) Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing.
3) For Type VI slings and for other sling types, consult the manufacturer for rated capacities.

ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE IF THE WEB SLING RATED CAPACITY IS APPROPRIATE FOR THE LIFT.

RATED CAPACITY FOR SYNTHETIC WEB SLINGS

TABLE 2-18
U.S.S. Inch-Pound Units - Class 7 - 4 Ply Slings
Types I, II, III, IV

Sling Width	SINGLE LEG HITCH TYPES			2 LEG OR SINGLE BASKET HORIZONTAL ANGLES			
	Vertical	Choker	Vertical Basket	90°	60°	45°	30°
							
1 in.	5,500 lb.	4,400 lb.	11,000 lb.	11,000 lb.	9,526 lb.	7,777 lb.	5,500 lb.
2 in.	11,000 lb.	8,800 lb.	22,000 lb.	22,000 lb.	19,052 lb.	15,554 lb.	11,000 lb.
3 in.	16,400 lb.	13,120 lb.	32,800 lb.	32,800 lb.	28,405 lb.	23,190 lb.	16,400 lb.
4 in.	20,400 lb.	16,320 lb.	40,800 lb.	40,800 lb.	35,333 lb.	28,846 lb.	20,400 lb.
5 in.	25,500 lb.	20,400 lb.	51,000 lb.	51,000 lb.	44,166 lb.	36,057 lb.	25,500 lb.
6 in.	30,600 lb.	24,480 lb.	61,200 lb.	61,200 lb.	52,999 lb.	43,268 lb.	30,600 lb.

TABLE 2-19
U.S.S. Inch-Pound Units - Class 7 - 4 Ply Slings
Type V

Sling Width	ENDLESS HITCH TYPES			2 LEG OR SINGLE BASKET HORIZONTAL ANGLES		
	Vertical	Choker	Vertical Basket	60°	45°	30°
						
1 in.	11,000 lb.	8,800 lb.	22,000 lb.	19,052 lb.	15,554 lb.	11,000 lb.
2 in.	22,000 lb.	17,600 lb.	44,000 lb.	38,104 lb.	31,108 lb.	22,000 lb.
3 in.	32,900 lb.	26,320 lb.	65,800 lb.	56,983 lb.	46,521 lb.	32,900 lb.
4 in.	40,800 lb.	32,640 lb.	81,600 lb.	70,666 lb.	57,691 lb.	40,800 lb.
5 in.	51,000 lb.	40,800 lb.	102,000 lb.	88,332 lb.	72,114 lb.	51,000 lb.
6 in.	61,200 lb.	48,960 lb.	122,400 lb.	105,998 lb.	86,537 lb.	61,200 lb.

Notes:

1) The rated capacities are based on stuffer weave construction webbing with a minimum certified tensile strength of 9,800 pounds per inch of webbing width.
2) Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing.
3) For Type VI slings and for other sling types, consult the manufacturer for rated capacities.

ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE IF THE WEB SLING RATED CAPACITY IS APPROPRIATE FOR THE LIFT.

RATED CAPACITY FOR SYNTHETIC WEB SLINGS

TABLE 2-20
SI-Units - Class 7 - 4 Ply Slings
Types I, II, III, IV

	SINGLE LEG			2 LEG OR SINGLE BASKET			
	HITCH TYPES			HORIZONTAL ANGLES			
Sling Width	Vertical	Choker	Vertical Basket	90°	60°	45°	30°
							
25 mm	2,500 kg.	2,000 kg.	5,000 kg.	5,000 kg.	4,330 kg.	3,535 kg.	2,500 kg.
51 mm	5,000 kg.	4,000 kg.	10,000 kg.	10,000 kg.	8,660 kg.	7,070 kg.	5,000 kg.
76 mm	7,450 kg.	5,960 kg.	14,900 kg.	14,900 kg.	12,903 kg.	10,534 kg.	7,450 kg.
102 mm	9,250 kg.	7,400 kg.	18,500 kg.	18,500 kg.	16,021 kg.	13,080 kg.	9,250 kg.
127 mm	11,550 kg.	9,240 kg.	23,100 kg.	23,100 kg.	20,005 kg.	16,332 kg.	11,550 kg.
152 mm	13,900 kg.	11,120 kg.	27,800 kg.	27,800 kg.	24,075 kg.	19,655 kg.	13,900 kg.

TABLE 2-21
SI-Units - Class 7 - 4 Ply Slings
Type V

	ENDLESS			2 LEG OR SINGLE BASKET		
	HITCH TYPES			HORIZONTAL ANGLES		
Sling Width	Vertical	Choker	Vertical Basket	60°	45°	30°
						
25 mm	5,000 kg.	4,000 kg.	10,000 kg.	8,660 kg.	7,070 kg.	5,000 kg.
51 mm	10,000 kg.	8,000 kg.	20,000 kg.	17,320 kg.	14,140 kg.	10,000 kg.
76 mm	14,950 kg.	11,960 kg.	29,900 kg.	25,893 kg.	21,139 kg.	14,950 kg.
102 mm	18,525 kg.	14,820 kg.	37,050 kg.	32,085 kg.	26,194 kg.	18,525 kg.
127 mm	21,175 kg.	16,940 kg.	42,350 kg.	36,675 kg.	29,941 kg.	21,175 kg.
152 mm	27,800 kg.	22,240 kg.	55,600 kg.	48,150 kg.	39,309 kg.	27,800 kg.

Notes:

1) The rated capacities are based on stuffer weave construction webbing with a minimum certified tensile strength of 175 kilograms per millimeter of webbing width.
2) Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing.
3) For Type VI slings and for other sling types, consult the manufacturer for rated capacities.

ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE IF THE WEB SLING RATED CAPACITY IS APPROPRIATE FOR THE LIFT.

NOTES FOR TABLES: 2-2 through 2-21

1. The choker capacity for 1 and 2 ply slings shall be rated at a maximum of 80% of the vertical capacity, with an angle of choke ranging from 120 to 180 degrees.

2. Rated capacities for Type III and IV slings apply to both tapered and non-tapered eye constructions. Rated capacities for Type V slings are based on non-tapered webbing. Bunching of both tapered and non-tapered eyes and/or webbing will reduce the rated capacity of the sling. Consult the manufacturer for slings not listed in these tables.

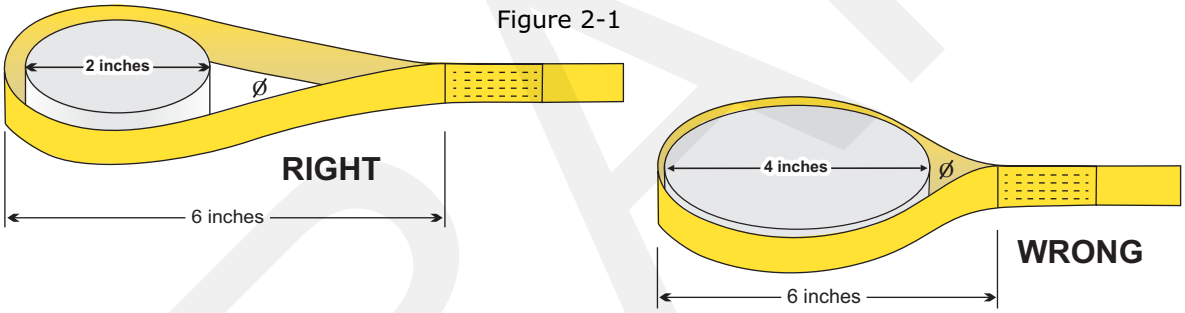
3. When attaching any hardware to a web sling, a sling protection pad should be used between the surface of the hardware and the synthetic web sling.

Section 2.11 CONNECTION POINT CONSIDERATIONS

2.11.1 The ratio of the length of a loop eye to the diameter of the object over which the loop eye is to be placed, should be a minimum of 3-to-1 relationship.

Figure 2-1 illustrates a six inch eye length over a two inch diameter hook or shackle. When using a ratio of 3-to-1, the angle of the two legs of the eye at its throat Ø should not be so severe as to cause a parting or tearing action at this point. (See Figure 2-1).

Figure 2-1



CHAPTER 3.0 STANDARD PROCEDURES FOR TESTING

Section 3.1 PURPOSE

3.1.1 This chapter provides standard procedures for the testing of web slings.

Section 3.2 TYPES OF TESTS

3.2.1 **Destructive Test -** A tensile test of a web sling for the purpose of verifying the minimum breaking strength. The web sling should be rigged in a vertical hitch and shall be pulled until the web sling, including fittings if applicable completely fails.

3.2.2 **Proof Load Test -** A non-destructive load test of a web sling to some multiple of the rated capacity of the web sling, including fittings if applicable, usually two (2) times the rated capacity for lifting applications.

Section 3.3 TEST CHARACTERISTICS

3.3.1 **Sample -** When testing for the purposes of verification of the minimum breaking strength, the web sling test sample shall be made in the same manner used for production slings.

3.3.2 **Web Sling Body Length -** The distance between stitch patterns should be a minimum of twice the stitch pattern length.

3.3.3 **Loop Eye Length -** The loop eye length should be of sufficient length that the ratio of the eye length to diameter of the pin is a minimum of 3 to 1. (See Figure 3-1 and Figure 2-1).

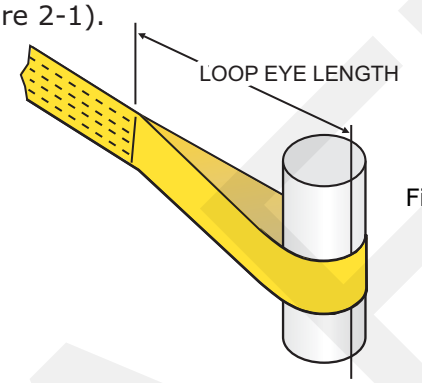


Figure 3-1

3.3.4 Web slings incorporating fittings shall be tested with the fittings attached.

3.3.5 **Hitches** (For Testing Only)

A. Vertical - The web sling shall be rigged in the test machine so that tension is applied in a straight-line pull. (See Figure 3-2).

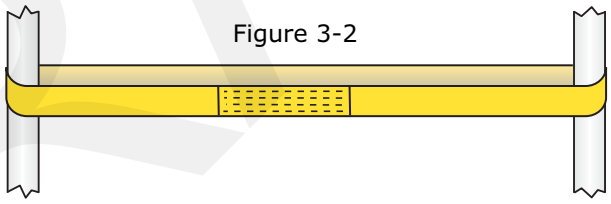


Figure 3-2

B. Choker - The web sling shall be rigged in the test machine so that the minimum angle (a) of choke is 120 degrees (See Figure 3-3).

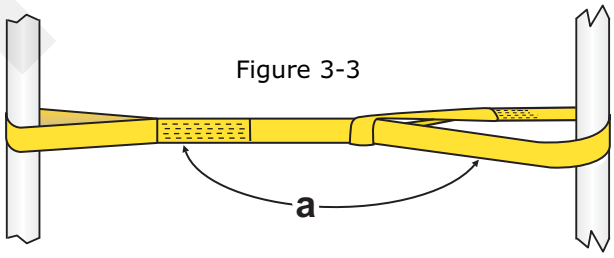


Figure 3-3

C. Basket - Alternately, web slings may be tested in a basket hitch. (See Figure 3-4).

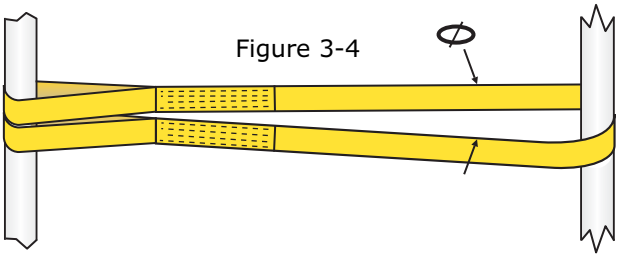


Figure 3-4

Section 3.4 PROOF TESTING REQUIREMENTS

3.4.1 **Proof Testing -** Unless otherwise specified by the purchaser, web slings are not required to be proof tested prior to their initial use if all components are new.

All web slings incorporating previously used fittings at the time of manufacture or welded fittings shall be proof tested by the manufacturer or a qualified person before use.

3.4.2 **Proof Testing Procedures -** When web slings are proof tested, the testing should be conducted using a pin diameter sized in accordance with Table 3-1 and shall be tested in accordance with the following:

A. For single-leg or multiple leg slings and endless slings, legs shall be proof loaded to a minimum of 2 times the single-leg vertical hitch rated load.
B. The proof load for fittings attached to single legs shall be a minimum of 2 times the single-leg vertical hitch rated load.
C. Master links for two-leg bridle slings shall be proof loaded to a minimum of 4 times the single-leg vertical hitch rated load.
D. Master links for three-leg bridle slings shall be proof loaded to a minimum of 6 times the single-leg vertical hitch rated load.
E. Master links for four-leg bridle slings shall be proof loaded to a minimum of 8 times the single-leg vertical hitch rated load.

Table 3-1 Proof Test Pin Sizes

Sling Type Examples	Web Width 1" thru 3"		Web Width Wider than 3"		Number of Web Plies Pulling on Pin at The Connection
	Min. Dia. (Inches)	Max. Dia. (Inches)	Min. Dia. (Inches)	Max. Dia. (Inches)	
EE1, EE2, EN1	1.00	3.00	2.00	5.00	2
EE4, EN2, EN3	2.00	5.00	3.00	6.00	4 to 6
EN4	3.00	6.00	3.00	6.00	8

3.4.3 **Proof Test Certificate -** When a proof test certificate is required, the certificate, issued by the company performing the test, shall show:

- The test date
- A description of the test method
- Product stock and serial number (if applicable)
- The amount of applied load
- Product rated capacity
- Any indicated result

Section 3.5 PROCEDURES FOR DESTRUCTIVE PULL TESTING

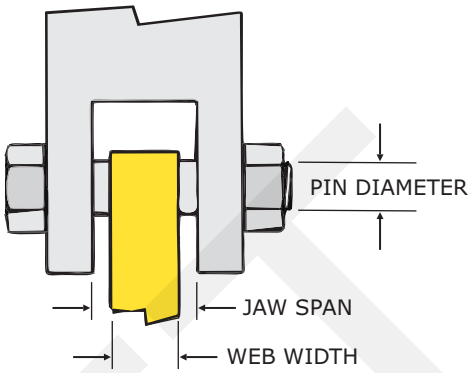
⚠ WARNING

Never use improper test procedures and/or materials when testing slings.

3.5.1 Destructive testing of web slings, excluding slings with fittings, should be tested on the recommended pin diameters shown in Table 3-2. Test pin diameters shall be capable of sustaining the maximum applied load without deformation or failure.

Table 3-2. Recommended Pin Sizes for the Destructive Testing of Web Slings

Web Width	Pin Diameter	Max. Load	Jaw Span
Up to 2" (51 mm)	2" (51mm)	50,000 lb (22,680 kg)	2.25" ± .25" (58 mm ± 7 mm)
Up to 2" (51 mm)	2.5" (64 mm)	110,000 lb (49,896 kg)	2.25" ± .25" (58 mm ± 7 mm)
Up to 6" (152 mm)	3.75" (96 mm)	150,000 lb (68,039 kg)	6.5" ± .5" (166 mm ± 13 mm)
Up to 6" (152 mm)	4.5" (115 mm)	200,000 lb (90,719 kg)	6.5" ± .5" (166 mm ± 13 mm)
Up to 6" (152 mm)	5" (127 mm)	300,000 lb (136,078 kg)	6.5" ± .5" (166 mm ± 13 mm)
Up to 12" (305 mm)	4.5" (115 mm)	160,000 lb (72,575 kg)	13" ± 1" (331 mm ± 26 mm)
Up to 12" (305 mm)	6" (152 mm)	320,000 lb (145,150 kg)	13" ± 1" (331 mm ± 26 mm)



The pin diameters shown in this table are recommended for use in destructive testing web slings. These sizes are not intended to be prescribed for general operational use of these slings. The jaw span shall be of sufficient size to avoid bunching. Care should be taken to see that the expected break strength of the sling being tested does not exceed the strength of the test pin. A heat treated alloy pin is recommended.

Use of pin sizes other than those prescribed above for the purpose of destructive testing may yield artificial test results.

For additional information, see Associated Wire Rope Fabricators (AWRF) "Test Bed Safety Guide".

3.5.2 Web slings with fittings shall be pulled on pins that allow the fittings to be properly seated on the pins.

3.5.3 All web slings should be pulled at a uniform head speed of 4 to 10 inches per minute or a maximum of 3,000 pounds per second / 101.6 millimeters to 254 millimeters per minute or a maximum of 1,361 kilograms per second. For web slings tested by someone other than the manufacturer, consult the sling manufacturer for further test guidelines.

3.5.4 Web slings should be tested at ambient temperatures unless otherwise specified. In the case of disputed or conflicting test results, additional tests should be conducted after the samples have been conditioned for a minimum period of 24 hours at 70 degrees F. +/- 5 degrees and a relative humidity of 65% +/- 5%.

3.5.5 Each pull test machine shall be certified to ASTM E4 standards.

Section 3.6 PROCEDURES FOR SAMPLE DESTRUCTIVE PULL TESTING

3.6.1 **Random Pull Testing to Destruction of Web Slings -** Web sling samples, representative of slings that are produced by each manufacturer, may randomly be tested to destruction in accordance with Section 3.5 of this Standard. Additionally, this testing shall be completed by the manufacturer when any changes are made to the composition of the sling load bearing webbing materials or manufacturing procedures.

3.6.2 **Pass Criteria -** If all tests meet or exceed the required breaking strength value, the sample group meets these test criteria.

3.6.3 **Retest Criteria -** If any single test value falls below the required breaking strength value, two additional samples shall be tested. These two additional samples shall meet or exceed the required breaking strength value or the process is rejected.

3.6.4 **Rejection Criteria -** If the retest of the sample group fails to meet or exceed the required breaking strength value the sample group fails and the process is rejected.

3.6.5 **Corrective Action -** Following a process rejection, the manufacturing practice shall be examined and adjusted as necessary. After corrective action, the product shall be retested to determine compliance with the Pass Criteria prior to any distribution.

CHAPTER 4.0 RECOMMENDED OPERATING PRACTICES

Section 4.1 PURPOSE

4.1.1 The purpose of this chapter is to provide guidelines to the designated person, responsible for sling selection, inspection and usage in accordance with recommended operating practices. This standard does not purport to address all safety concerns associated with sling usage. It is the responsibility of the user of the Standard to establish appropriate safety practices and determine the applicability of all regulatory requirements prior to use.

Section 4.2 TRAINING REQUIREMENTS

⚠ WARNING

Before using slings, users shall be properly trained. The use of slings by untrained personnel is potentially hazardous.

The following seven points briefly summarize some important safety issues. All sling users shall be trained in the following areas:

- **Sling Selection -** Understand the limitations of each sling type and their associated components and materials.
- **Sling Inspection -** Understand how to properly inspect slings, so damaged slings can immediately be removed from service.
- **Prevention of Sling Damage -** Know how to prevent sling damage, including how to properly protect slings from being cut or damaged from direct contact with corners, edges, protrusions or abrasive surfaces.
- **Proper Use of Slings -** Each sling user shall be competent in considering all risk factors prior to using a sling and be able to verify that each sling will not be loaded in excess of its rated capacity.
- **Remaining Alert When Lifting Loads -** Whenever using slings, all personnel shall be trained to remain alert and stand clear of any lifted load or possible path of danger in the event of sling failure.
- **Proper Storage of Slings -** Users should know where to store slings in an environment where they will not become damaged by exposure to heat, chemicals, UV light degradation, environmental and/or mechanical damage.
- Users should read, understand and follow the information contained in this publication, as well as all applicable provincial, state, federal, OSHA regulations and ASME B30 guidelines.

Section 4.3 SLING SELECTION CONSIDERATIONS

Some notable web sling characteristics include the following:

- Web slings are lightweight, flexible and easy to handle and rig.
- Web slings are less damaging on contacting load surfaces than metal slings.
- Web slings may provide a wider surface for load distribution.
- Wear points can be rotated to extend sling life on Type V endless slings.

Some notable web sling limitations:

- Web slings can be cut by contact with damaging edges.
- Web slings have moderate temperature limits.

Section 4.4 SLING INSPECTION

A three stage procedure is recommended to help ensure that slings are inspected with appropriate frequency.

4.4.1 **Initial Inspection -** Prior to use, all new, altered, modified or repaired web slings shall be inspected by a designated person to verify compliance with the applicable provisions of this Chapter.

4.4.2 **Frequent Inspection -** In normal service conditions, a visual inspection for damage shall be performed by the user or other designated person each day or shift before the sling is used. In severe service conditions, a visual inspection for damage shall be performed by the user or other designated person before each use. Manufacturer's recommendations must be followed if a higher rate of inspection frequency, such as before each use, is prescribed. Written records are not required for frequent inspection.

4.4.3 **Periodic Inspection -** A complete inspection for damage shall be performed by a designated person. This inspection should be done by someone other than the individual(s) who most commonly perform the frequent inspection.

A. **Periodic Inspection Frequency -** Periodic inspection intervals shall not exceed one year. The frequency of periodic inspections should be based on:
   1. Frequency of sling use.
   2. Severity of service conditions.
   3. Nature of lifts being made.
   4. Experience gained on service life of slings used in similar circumstances.

B. **Time Interval Guidelines -** The guidelines for time intervals are as follows:
   1. Normal Service - Yearly
   2. Severe Service - Monthly to quarterly
   3. Special Service - As recommended by a qualified person

C. **Written Records -** A written record that the most recent inspection was performed shall be maintained documenting that the event occurred. It is not required that the condition of individual slings be recorded during the periodic inspection. If documentation of the individual slings is maintained, it should be based upon a unique sling serial number, color coding, electronic tracking (RFID) or other means. See Appendix "Web Sling Inspection Form". If individual tracking is not maintained, the inspection process should provide some means of identifying which slings have been inspected at the periodic level of inspection.

4.4.4 **Removal Criteria -** A web sling shall be removed from service if any of the following forms of damage are visible:

A. If web sling identification tag is missing or not readable.
B. Holes, tears, cuts, snags or embedded materials.
C. Broken or worn stitches in the load bearing splice.
D. Knots in any part of the sling webbing.
E. Acid or alkali burns.
F. Melting, charring or weld spatter on any part of the web sling.
G. Excessive abrasive wear or crushed webbing.
H. Signs of Ultraviolet light (UV) degradation.
I. Distortion, excessive pitting, corrosion or other damage to fitting(s).
J. If provided, exposed red core yarn. However, if damage is present and red yarns are not exposed DO NOT USE the sling.
K. Any conditions which cause doubt as to the strength of the web sling.

Section 4.5 SLING TENSION AND ANGLE CONSIDERATIONS

⚠ WARNING

Slings shall not be loaded in excess of rated capacity. Consideration shall be given to the sling angle, which affects sling tension.

4.5.1 **Effect of Angle -** Sling tensions are affected by angle of lift (sling angle), measured from the horizontal, when used with multi-legged web slings or choker/basket hitches. The effect of this angle may be determined by using either of these two methods:

- Increased Tension Method (Recommended Method)
- Reduced Sling Capacity Method (Alternative Method)

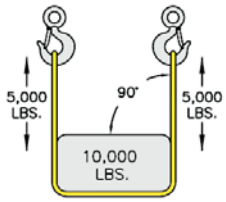
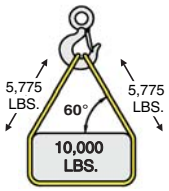
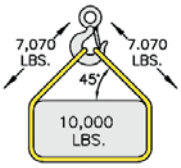
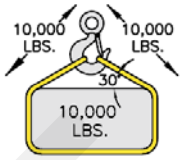
4.5.1.1 **Increased Tension Method** (Recommended Method)
To use this method, the user shall:

1. Determine the sling angle, as measured from the horizontal.
2. Determine the corresponding Tension Factor from Table 4-1.
3. Multiply the load weight by the tension factor to determine the loading on the sling leg(s).
   The result is the INCREASED TENSION or actual loading on the sling leg(s).

Table 4-1 Effect of Sling Angle - Tension Factor Chart

Angle in Degrees from Horizontal	Tension Multiplier	Angle in Degrees from Horizontal	Tension Multiplier
90	1.000	55	1.221
85	1.004	50	1.305
80	1.015	45	1.414
75	1.035	40	1.555
70	1.064	35	1.742
65	1.104	30	2.000
60	1.155		

Table 4-2 Example of the Effect of Sling Angle on Tension

Tension in the Sling Increases as the Sling Angle Decreases				
Sling Angle (from Horizontal)	90°	60°	45°	30°
Tension Multiplier	1.00	1.155	1.414	2.000
Sling Leg Tension (Lbs. Per Leg)	5,000	5,775	7,070	10,000
Required Sling Capacity (Lbs. Basket Hitch)	10,000	11,550	14,140	20,000

4.5.1.2 **Reduced Sling Capacity Method** (Alternative Method) **-** To use this method, the user shall first determine the angle and multiply the sling capacity by the appropriate loss factor for the specific angle. The result is the *Reduced Sling Capacity.*

1. Determine the sling angle, as measured from the horizontal.
2. Determine the corresponding (Sling Capacity) Loss Factor from Table 4-3.
3. Multiply the sling capacity by the loss factor to determine the actual sling capacity at the given angle of lift. The result is the reduced sling capacity. (See Figure 4-1).

Table 4-3 Effect of Sling Angle - (Sling Capacity) Loss Factor Chart

Angle in Degrees from Horizontal	Loss Factor	Angle in Degrees from Horizontal	Loss Factor
90	1.000	55	0.819
85	0.996	50	0.766
80	0.985	45	0.707
75	0.966	40	0.643
70	0.940	35	0.574
65	0.906	30	0.500
60	0.866		

EXAMPLE: A one (1) inch, class 7, Type V endless web sling, rated at 6,400 lbs. in a vertical basket hitch rating, is being used in a basket hitch at a 60 degree angle. What is its lifting capacity at this lifting angle? (See Figure 4-1).

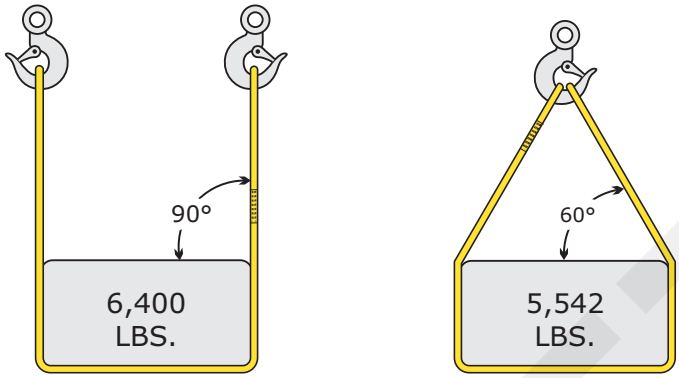


Figure 4-1

ANSWER: Sling lifting capacity at a 60 degree lifting angle equals its basket hitch capacity multiplied by the Loss Factor from Table 4-3, of .866 for a 60 degree angle.

6,400 lbs. X .866 = 5,542 lbs.

4.5.2 **Rated Capacity of Choker Hitch -** When the angle of choke is less than 120 degrees, the sling choker hitch capacity is affected. To determine the actual choker capacity at a given angle of choke, multiply the sling choker rating by the appropriate Choke Reduction Factor found in Table 4-4. (See Figure 4-2).

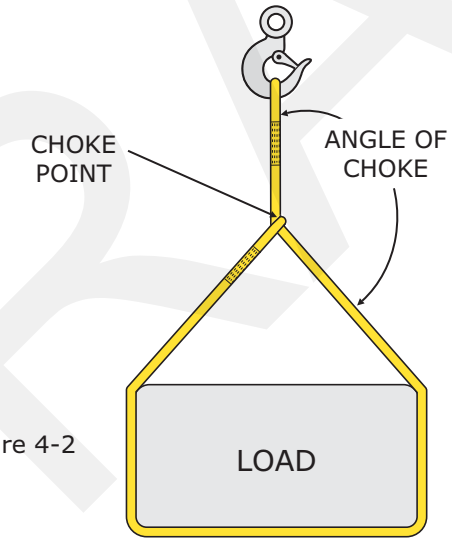


Figure 4-2

Table 4-4 Rated Capacity of Choker Hitch

Angle of Choke (Degrees)		Angle of Choke Reduction Factor
Equal to or greater than	Less than	
120	180	1.00
105	120	0.82
90	105	0.71
60	90	0.58
0	60	0.50

Section 4.6 MECHANICAL CONSIDERATIONS

4.6.1 **Web slings in contact with edges, corners or protrusions SHALL ALWAYS be protected with materials of sufficient strength, thickness and construction to prevent sling damage.**

4.6.2 Web slings should be protected from abrasive surfaces.

4.6.3 Determine the weight of the load. Web slings shall not be loaded in excess of the rated capacity. Consideration shall be given to the sling angle, which affects rated capacity. (See Effect of Sling Angle, Section 4.5).

4.6.4 Select web slings having suitable characteristics for the type of load, hitch and environment.

4.6.5 Web slings that are used in a choker hitch shall be of sufficient length to ensure that the choke point should always be on the sling body—not on the sling eye, fitting, base of the eye or fitting, load bearing splice or tag.

4.6.6 Web slings used in a basket hitch shall have the load balanced to prevent slippage and maintain control of the load.

4.6.7 The openings in fittings shall be the proper shape and size to ensure that the fittings will seat properly on the web sling, crane hook or other attachments.

4.6.8 Web slings should not be dragged on the floor or over an abrasive surface.

4.6.9 Web slings shall not be twisted, shortened, lengthened, tied into knots, or joined by knotting. Web slings shall be shortened, lengthened or adjusted only by methods approved by the manufacturer.

4.6.10 Web slings should not be pulled from under loads when the load is resting on the web sling. Loads resting on web slings could damage the sling.

4.6.11 Web slings shall not be used for pulling against stuck, snagged or restrained objects if loading conditions are unknown.

4.6.12 If a sling is used for non-lifting applications under known loading circumstances and within the rated sling capacity, it may be returned to lifting service.

4.6.13 **Marking Slings for Dedicated Applications -** Slings that are used for pulling against stuck, snagged or restrained objects in loading conditions that are unknown shall not be used for ANY lifting purpose. These Dedicated Application slings shall be marked "**Not For Lifting**".

4.6.14 Do not drop web slings equipped with metal fittings.

4.6.15 Web slings that appear to be damaged shall not be used unless inspected and accepted as usable per Section 4.4 by a qualified person.

4.6.16 Web slings shall be hitched in a manner providing control of the load.

4.6.17 Personnel shall not stand under, on or next to suspended loads or rigging that is under tension.

4.6.18 All portions of the human body shall be kept from being placed between the web sling and the load and from between the web sling and handling or lifting device.

4.6.19 Personnel shall not ride web slings or loads suspended by web slings. Web slings shall not be used as bridles on suspended personnel platforms.

4.6.20 Shock loading shall be avoided.

4.6.21 Excessive twisting of the legs (branches) shall be avoided.

4.6.22 Load applied to a hook shall be centered in the bowl of the hook to prevent point loading.

4.6.23 During use, personnel shall be alert for possible snagging.

4.6.24 The web sling legs (branches) shall contain or support the load from the sides above the center of gravity when using a basket hitch.

4.6.25 Tags and labels should be kept away from the load, hook and point of choke.

4.6.26 Web slings should not be constricted or bunched between the ears of a clevis or shackle or in a hook. When a web sling is used with a shackle, it is recommended that it be used (rigged) in the bow of the shackle. When this is not possible, protect the sling eyes or connection points from damage.

4.6.27 Place blocks under load prior to setting down the load to allow removal of the web sling, if applicable.

4.6.28 For multiple-leg slings used with nonsymmetrical loads, an analysis by a qualified person should be performed to prevent overloading of any leg.

4.6.29 If slings are cleaned, use only mild soap and water. Rinse slings thoroughly and allow to dry completely before storing. **Do not machine wash** slings. Machine washing results in significant loss of strength.

Section 4.7 ENVIRONMENTAL CONSIDERATIONS

Environmental factors such as an exposure to sunlight, dirt or gritty-type matter and cyclical changes in temperature and humidity can result in an accelerated deterioration of web slings. The rate of this deterioration will vary with the level of exposure to these conditions and with the thickness of the sling material. For example, single ply slings will generally degrade more rapidly with this exposure than multiple ply slings. All web sling slings that are exposed to these conditions should be highly scrutinized during their inspections.

4.7.1 Web slings, when not in use, should be stored in a cool, dry and dark place to prevent loss of strength from exposure to sources of ultraviolet light. Web slings shall not be stored in chemically active areas and/or in areas where mechanical and/or environmental damage could occur.

4.7.2 Chemically active environments can affect the strength of web slings in varying degrees ranging from little to total degradation. The web sling manufacturer, or a qualified person, should be consulted before web slings are used in a chemically active environment. In addition, water absorption can decrease the strength of nylon web slings by as much as 10-15%. Sling strength returns when the sling dries completely.

4.7.3 Each chemical application shall be evaluated, taking into consideration the following:

A. Type of acid or alkalis
B. Exposure conditions, i.e., liquid, vapor, mist
C. Concentration
D. Temperature
E. Duration of exposure

4.7.4 **ACIDS**

- Nylon is subject to degradation in acids, ranging from little to total degradation.
- Polyester is resistant to many acids, but is subject to degradation, ranging from little to moderate in some acids.

4.7.5 **ALKALIS**

- Polyester is subject to degradation in alkalis, ranging from little to total degradation.
- Nylon is resistant to many alkalis, but is subject to degradation, ranging from little to moderate in some alkalis.

4.7.6 Nylon and polyester slings shall not be used in contact with objects or used at temperatures in excess of 194°F (90°C) or at temperatures below minus 40°F (40°C).

4.7.7 Web slings incorporating aluminum fittings shall not be used where fumes, vapors, sprays, mists or liquids of alkalis and/or acids are present, unless material compatibility is verified.

4.7.8 Environments in which synthetic web slings are continuously exposed to sources of ultraviolet light can affect the strength of synthetic web slings in varying degrees, ranging from slight to total degradation.

Warning: Slings used in environments where they are subject to continuous exposure to sunlight or ultraviolet light shall be proof tested to twice the rated capacity semi-annually or more frequently depending on severity of exposure.

Web slings that are used outdoors regularly should generally be permanently removed from service within a period of 2 to 4 years.

CAUTION: Degradation can take place without visible indications.

A. Factors which affect the degree of strength loss are:
   1. Length of time of continuous exposure.
   2. Web sling construction and design.
   3. Other environmental factors such as weather conditions and geographic location.

B. Suggested procedures to minimize the effects of sunlight or ultraviolet light:
   1. When not in use, store web slings in a cool, dry, dark location free of mechanical and environmental damage.

C. Some visual indications of environmental degradation are:
   1. Fading of webbing color.
   2. Uneven or disoriented surface yarn of the webbing.
   3. Shortening of the sling length.
   4. Reduction in elasticity and strength of the sling material due to an exposure to sunlight, often evident by an accelerated abrasive damage to the surface yarn of the sling.
   5. Breakage or damage to yarn fibers, often evident by fuzzy appearance of the web.
   6. Stiffening of the web, which can become particularly evident when web slings are exposed to outdoor conditions without being used or cyclically tensioned.

Section 4.8 REPAIRS

4.8.1 There shall be no repairs of sling webbing with structural damage.

4.8.2 Type I and Type II web slings and other web slings utilizing hardware may be re-webbed utilizing existing fittings. It shall be the responsibility of the manufacturer repairing the web sling to determine if the hardware is reusable.

4.8.3 Slings shall be repaired only by the original manufacturer or their appointed agent. When slings are repaired, the sling shall be tagged to identify the repair agent.

4.8.4 All re-webbed Type I and Type II, and other web slings utilizing used or welded fittings shall be proof tested to two (2) times the rated capacity before being placed back into service. Certification of proof test shall be provided.

4.8.5 Only web slings which can be identified from the information on the identification tags shall be repaired.

4.8.6 Temporary repairs of webbing, fittings or stitching shall not be permitted.

Web Sling Inspection Report

Company: _____ **Distributor:** _____
Address: _____ **Address:** _____
City: _____ **State:** _____ **Zip:** _____ **City:** _____ **State:** _____ **Zip:** _____

Insp Date: _____ **Survey by:** _____ **Dist. Contact:** _____

Location	Description	Manufacturer	Serial No.	Length	Inspection Result OK	Scrap	Reweb	Tag Missing / Illegible	Holes, Tears, Cuts, Snags	Imbedded Materials	Stitching in Load Bearing Splice	Knots	Burns- Chemical or Heat	Excessive Wear or Crushing	Other - See Below*	COMMENTS

* Other Removable Criteria: Ultraviolet Light (UV) degradation, damage to fittings, exposed red core yarn (if provided), and any other conditions which cause doubt as to the strength of the sling.

OTHER WEB SLING & TIE DOWN ASSOCIATION PUBLICATIONS

Recommended Standard Specifications:

Printed Books

Synthetic Web Slings	WSTDA-WS-1
Synthetic Polyester Roundslings	WSTDA-RS-1
High Performance Yarn (HPY) Roundslings	WSTDA-RS-1HP
Webbing for Synthetic Web Slings	WSTDA-WB-1
Sewing Threads for Slings & Tie Downs	WSTDA-TH-1
Synthetic Web Tie Downs	WSTDA-T-1
(French) Synthetic Web Tie Downs	WSTDA-T-1
Winches Used With Web Tie Downs	WSTDA-T-3
Synthetic Webbing Used for Tie Downs	WSTDA-T-4
Load Binders Used with Chain Tie Downs	WSTDA-T-6
All Standards In A Three-Ring Binder	WSTDA-ASB

Recommended Standard Specifications:

PDF Files On CD

All Standards CD - (All Standards on CD)	WSTDA-ASCD

Recommended Test Methods:

Strength & Elongation Test Method for Sling & Tie Down Webbing	WSTDA-TM-1

Operating & Inspection Manuals

Synthetic Web Slings	WSTDA-WS-2	Synthetic Web Slings	WSTDA-WS-PS-2 (pocket sized)
Synthetic Polyester Roundslings	WSTDA-RS-2	Synthetic Polyester Roundslings	WSTDA-RS-2-PS (pocket sized)
Synthetic Web Tie Downs	WSTDA-T-2	Synthetic Web Tie Downs	WSTDA-T-2-PS (pocket sized)

Illustrated Wall Chart

Inspection of Web Slings & Roundslings	WSTDA-WSWC-1

UV Degradation Reports

Summary Report UV Degradation	WSTDA-UV-Sling-2003
UV Degradation Mini Manual	WSTDA-UV-MM-2005
UV Degradation Report	WSTDA-UVDR-1981 (Revised 2005)

Training CD-Rom

North America Cargo Securement Standard	WSTDA-CD-TP-2003

Fabric Warning Tags

Web Slings	WSWT-1
Tie Downs	TDWT-1
Roundslings	RSWT-1

Paper Safety Bulletins

Web Slings	WSSB-1
Roundslings	RSSB-1
Tie Downs	TDSB-1

All Fabric Warning Tags and Paper Safety Bulletins are available in three languages; English, Spanish and French

For ordering information and prices, contact the association office or visit our website:

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2105 Laurel Bush Road, Suite 201
Bel Air, Maryland 21015
Phone (443) 640-1070
Fax (443) 640-1031
Email: wstda@stringfellowgroup.net
Web Site: www.wstda.com