

**RECOMMENDED STANDARD SPECIFICATION
FOR
SYNTHETIC WEBBING FOR SLINGS**

WSTDA-WB-1



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FOREWORD

This Recommended Standard Specification applies to class 5 and class 7 synthetic webbing used in the manufacturing of synthetic web slings. This standard recommends construction, identification and marking of class 5 and class 7 synthetic webbing.

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

Synthetic sling webbing made from materials or construction other than those detailed in this Recommended Standard Specification shall be used in accordance with the recommendations of the webbing manufacturer, sling fabricator or qualified person. The specifications contained in this Recommended Standard Specification for Synthetic Webbing for Slings were formulated under the auspices of the Web Sling & Tie Down Association, Inc. This Recommended Standard Specification is intended to assist manufacturers of webbing and web slings, to serve as a guide to the industry involved in the manufacture of synthetic sling webbing, and to serve as a guide to governmental and other regulatory bodies responsible for the selection of webbing used in synthetic slings.

Safety is the paramount consideration involved in the use of any synthetic webbing for sling purposes. This standard does not purport to address all safety concerns, if any, associated with the use of synthetic webbing or slings. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of the regulatory limitations prior to use. The appropriate synthetic webbing shall be selected by the user for their specific applications. Users shall be knowledgeable about federal, state, provincial, local, and industry regulations applicable to synthetic web slings constructed of class 5 and class 7 synthetic sling webbing.

MANDATORY AND ADVISORY RULES

**Mandatory rules are characterized by the use of the word “shall”.
If a rule is of an advisory nature, it is indicated by the use of the word
“should”, or it is stated as a recommendation.**

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CHAPTER 1.0

TERMINOLOGY AND DEFINITIONS OF SYNTHETIC SLING WEBBING

SECTION 1.1 PURPOSE

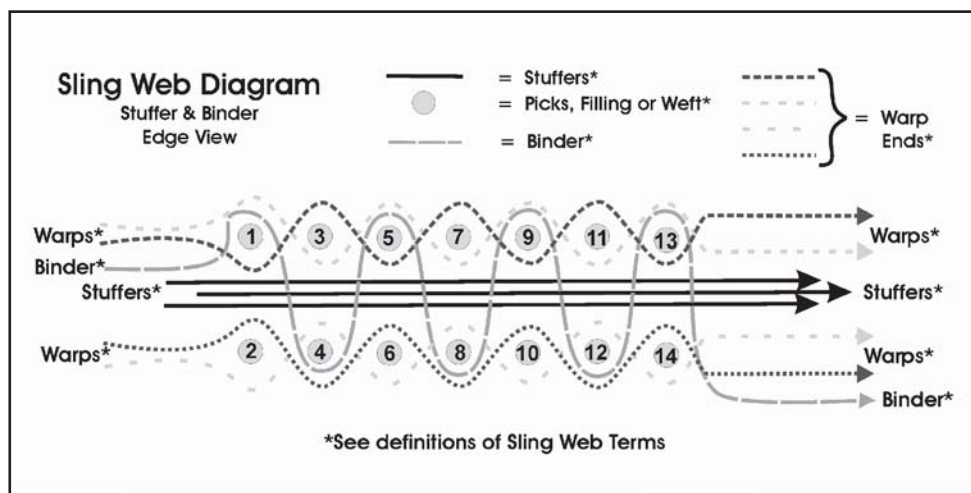
1.1.1 This chapter provides a description and definitions that apply to nylon and polyester synthetic sling webbing used as the primary material for synthetic web slings.

SECTION 1.2 DESCRIPTION

1.2.1 Synthetic sling webbing is a high-tenacity narrow fabric closely woven in a variety of weaves and principally used for slings that have to withstand a tensile stress of:

i Class 5 6800 pounds per inch of width / 121.43 kilograms per millimeter of width

ii Class 7 9800 pounds per inch of width / 175 kilograms per millimeter of width



SECTION 1.3 DEFINITION OF TERMS

BINDER Yarn that is used to hold the two plies together in the sling webbing.

BREAKING STRENGTH That load in pounds or kilograms at which point the webbing fails.

CATCH CORD Yarn used to lock and prevent raveling of the weft yarn on shuttle-less weaving machinery.

DENIER A numbering system which expresses the weight in grams of a multi filament yarn that is 9000 meters in length. Lower numbers represent finer sizes of filament yarn, and higher numbers represent coarser sizes of filament yarn.

FILLING The yarn running from selvedge to selvedge at right angles to the warp. Also referred to as weft and picks.

HIGH TENACITY Higher than normal tensile strength with a range of 6.0 to 9.5 grams per denier as compared to regular tenacity of lower than 6.0 grams per denier.

MULTIFILAMENT A yarn consisting of many continuous filaments or strands, as opposed to a monofilament, which is one strand.

SECTION 1.3 DEFINITION OF TERMS (con't)

NARROW FABRIC Any non-elastic woven fabric, 12 inches or less in width, having a Selvedge on either side, except ribbon and seam binding.

PICKS The yarn running from selvedge to selvedge at right angles to the warp. Also referred to as weft and/or filling.

RAVELING The process of undoing or separating the weave or knit of a fabric.

SELVEDGE The narrow edge of woven fabric that runs parallel to the warp.

SHUTTLE LOOM A weaving apparatus having a boat-shaped device usually made of wood with a metal tip that carries filling yarns through the shed in the weaving process.

SHUTTLE-LESS LOOM A weaving apparatus also known as a needle loom in which some device, commonly a needle rather than a shuttle is used for weft insertion.

STUFFER A longitudinal load bearing yarn in webbing. Also, extra yarns running in the warp direction through a woven fabric to increase the fabric's strength and weight.

SURFACE PLYS Exterior or outside plies of a plied weave, sometimes referred to as face or back ply of the weave.

SYNTHETIC FIBER Man-made fibers.

TENSILE STRENGTH In general, the strength shown by a specimen subjected to tension as distinct from torsion, compression or shear.

TREATED Webbing with a chemical coating applied which offers some degree of protection against environmental or mechanical hazards.

UNTREATED Webbing without any additional applied chemical coating.

WARP The set of yarn in all woven fabrics that run lengthwise and parallel to the selvedge and is interwoven with the filling.

WEBBING Fabric that is closely woven in a variety of weaves.

WEFT The yarn running from selvedge to selvedge at right angles to the warp. Also referred to as picks and/or filling.

YARN The synthetic fibers used to make the webbing.

CHAPTER 2.0

CONSTRUCTION OF SYNTHETIC SLING WEBBING

SECTION 2.1 PURPOSE

2.1.1 This chapter provides an outline of materials and construction characteristics of nylon and polyester class 5 and class 7 synthetic sling webbing.

SECTION 2.2 MATERIALS

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

2.2.2 Yarns may be twisted or flat (not twisted) and composed of commercially available deniers.

2.2.3 Nylon yarn used in the manufacturing of sling webbing shall be high tenacity, continuous multifilament nylon. Yarns may include both Nylon 6 with a minimum melting point of 428°F (220°C) and Nylon 6.6 with a minimum melting point of 489°F (254°C).

2.2.4 Polyester yarn used in the manufacturing of sling webbing shall be high tenacity, continuous multifilament polyester with a minimum melting point of 489°F (254°C)

SECTION 2.3 CONSTRUCTION

2.3.1 Webbing shall be certifiable to tensile strength, have uniform thickness and width, and have selvages.

2.3.2 Webbing shall be woven using a stuffer weave construction technique.

2.3.3 Webbing may be woven on a shuttle or shuttle-less loom.

2.3.4 When shuttle less-loom construction is utilized the filling yarn shall traverse the full width of the webbing and shall be held at the knitted edge by a catch cord interlacing with filling yarn. Webbing may be woven with the system 3 catch cord on the latch needle edge or the system 5 catch and lock cord on the latch needle edge.

2.3.5 Treated and untreated nylon and polyester webbing, used to fabricate synthetic slings, per class 5 and class 7 rated capacity charts as shown in WSTDA-WS-1, may contain red yarns woven into the core of the webbing to serve only as one of many aids in determining whether and when a sling should be removed from service.

2.3.6 Class 5 nylon and polyester sling webbing, treated or untreated, shall have a minimum breaking strength of 6800 pounds per inch of width / 121.43 kilograms per millimeter of width.

2.3.7 Class 7 nylon and polyester sling webbing, treated or untreated, shall have a minimum breaking strength of 9800 pounds per inch of width / 175 kilograms per millimeter of width.

2.3.8 Both webbing classes and types may be available in natural or dyed, and in treated or untreated types.

SECTION 2.4 COATINGS

- 2.4.1 Synthetic sling webbing 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. Ultra-violet light resistance

CHAPTER 3.0

IDENTIFICATION MARKERS

SECTION 3.1 PURPOSE

3.1.1 This chapter provides for the identification of fiber type, strength class and manufacturer of synthetic sling webbings.

SECTION 3.2 IDENTIFICATION OF FIBER TYPES

- 3.2.1 **Identification Marker** Marker shall be a color sealed or dyed yarn.
- 3.2.2 **Location of Marker** Marker shall be located in the center of the webbing on at least one face.

3.2.3 **Codes:**

Fiber	Color Code
Nylon	No Marker
Polyester	Blue Marker

SECTION 3.3 IDENTIFICATION OF SYNTHETIC WEBBING CLASS

3.3.1 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.

SECTION 3.4 IDENTIFICATION OF SYNTHETIC SLING WEBBING MANUFACTURERS

- 3.4.1 **Identification Marker** The webbing manufacturer identification markers shall be color sealed or dyed yarns.
- 3.4.2 **Location of Marker** All double and multiple layer weaves shall be identified for manufacturer's color code in accordance with the following options:
 - a. Color code markers located in the binder.
 - b. Color code markers located between the surface plies.

SECTION 3.4 IDENTIFICATION OF SYNTHETIC SLING WEBBING MANUFACTURERS (con't)

3.4.3 **Codes** The listing shown was current at the time of publication. For color coding questions or application for color assignment contact WSTDA.

Company Name	City/State/Country	ID Marker / Color Code
American Webbing & Fittings	Winston-Salem, NC	1 blue / 1 yellow
**Burlan Corporation	Gastonia, NC	1 orange / 1 black
*California Webbing		1 black / 1 green
Collingwood Fabrics	Collingwood, CAN	2 black
*Custom Dock Equipment		1 brown / 1 yellow
DSR Corporation	Woodbury, NY	2 violet
Eastern Air Supplies	Canora, SAK, CAN	1 orange / 1 green
*Elizabeth Webbing		1 black / 1 red
*Grace Industries		1 brown / 1 green
Greenhead Industries	Wells, TX	1 black / 1 brown
LaGran Canada	Granby, QUE, CAN	2 brown
Kinedyne	Prattville, AL	1 black / 1 yellow
Murdock Webbing	Central Falls, RI	2 yellow
**Narricot Industries	Tarboro, NC	2 green
Oppermann	Piedmont, SC	1 green / 1 blue
*Phoenix		2 blue
*Precision Weaving		2 orange
Ribbon Webbing Corp.	Chicago, IL	1 green / 1 red
Southern Weaving	Greenville, SC	1 green / 1 yellow
Spanset, Inc.	Sanford, NC	1 black / 1 blue
*Technical Textiles		1 orange / 1 blue
Western Ribbon Ltd.	Calgary, ALB, CAN	1 yellow, 1 red

*Denotes companies no longer in business

**Denotes companies no longer weaving sling webbing

CHAPTER 4.0

STANDARD PROCEDURES FOR TESTING SYNTHETIC SLING WEBBING

SECTION 4.1 PURPOSE

4.1.1 This chapter provides an outline of materials and construction characteristics of nylon and polyester class 5 and class 7 synthetic sling webbing.

SECTION 4.2 TYPES OF TESTS

- 4.2.1 **Verification Test** A test of the webbing to its minimum rated breaking strength and not beyond. If the webbing does not break, it passes the verification test with certification. The webbing shall be tested in a straight-line pull.
- 4.2.2 **Destructive Test** A test of the webbing for the purpose of verifying the breaking strength. The webbing shall be tested in a straight line pull until broken and the results are of the actual breaking strength of the webbing.
- 4.2.3 **Abrasion Test** A test of the webbing to determine resistance to abrasion.
- 4.2.4 **Elongation Test** A test of the webbing to determine the elongation of the webbing under load.
- 4.2.5 **Other Test** If additional test(s) are required, they shall be specified by the purchaser.

SECTION 4.3 TEST PROCEDURES

- 4.3.1 Webbing shall be tested in accordance with the Federal Test Method Standard No. 191A, Method 4108 for verification and destructive strength tests. Webbing shall be tested in accordance with ASTM D 6770-02e1 Standard Test Method for Abrasion Resistance of Textile Webbing (Hex Bar Method) for abrasion tests.
- 4.3.2 Test specimens shall be from each actual production run.
- 4.3.3 The test machine shall be certified annually to ASTM E4 or equivalent.
- 4.3.4 Test results shall be kept on file by the webbing manufacturer.
- 4.3.5 The webbing manufacturer or an independent testing laboratory shall perform the testing of synthetic webbing for slings.

SECTION 4.4 CERTIFICATION

- 4.4.1 When certification is required, the company performing the testing shall issue a certification describing the type, date, and results of tests performed.

This Recommended Standard Specification has been formulated to assist manufacturers of webbing and web slings to serve as a guide to the industry involved in the manufacture of synthetic sling webbing, and to serve as a guide to governmental and other regulatory bodies responsible for the selection of webbing used in synthetic slings. The existence of this recommended standard specification does not, however, prevent members of the Web Sling & Tie Down Association, Inc. and other manufacturers from manufacturing or selling products beyond the scope of this recommended standard specification.

OTHER WEB SLING & TIE DOWN ASSOCIATION PUBLICATIONS

Recommended Standard Specifications:

Recommended Standard Specifications:

Printed Books

Synthetic Web Slings	WSTDA-WS-1
Synthetic Polyester Roundslings	WSTDA-RS-1
Webbing for Synthetic Web Slings	WSTDA-WB-1
Sewing Threads for Slings & Tie Downs	WSTDA-TH-1
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
All Standards In A Three-Ring Binder	WSTDA-ASB-2006

PDF Files On CD

Synthetic Web Slings	WSTDA-SCD-WS-1
Synthetic Polyester Roundslings	WSTDA-SCD-RS-1
Webbing for Synthetic Web Slings	WSTDA-SCD-WB-1
Sewing Threads for Slings & Tie Downs	WSTDA-SCD-TH-1
Synthetic Web Tie Downs	WSTDA-SCD-T-1
Winches Used With Web Tie Downs	WSTDA-SCD-T-3
Synthetic Webbing Used for Tie Downs	WSTDA-SCD-T-4
All Standards CD - (All above on one CD)	WSTDA-ASCD-2006

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

Video

Synthetic Web Sling Care & Inspection	WSTDA-WSV-1-VHS
Synthetic Web Sling Care & Inspection	WSTDA-WSV-1-CD

Illustrated Wall Chart

Inspection of Web Slings & Round Slings	WSTDA-WSWC-1
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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
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Fabric Warning Labels

Nylon Web Slings	WSTDA-SW-02-N
Polyester Web Slings	WSTDA-SW-02-P
Tie Downs	WSTDA-TW-02
Round Slings	WSTDA-RSW-03

Paper Warning Sheets

Synthetic Web Slings	WSTDA-WSWS-02
Polyester Roundslings	WSTDA-RSWS-04
Tie Downs	WSTDA-TWS-97

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

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