



Web Sling Committee Test Program

FROM: WSTDA Web Sling Committee Date: October 2009 Rev 2
TO: Webbing Sling Manufacturer
SUBJECT: Web Sling Edge Testing Project – Effect of contact with radius edges of varying size

Project Goals:

The goal of the project is to produce and gather test data for the purpose of putting forth operating practice recommendations concerning the use of nylon and polyester web slings when these slings are attached to, or placed around, interfaces with edges which can alter their load carrying capability.

Phase 1: Perform testing to establish the effects of connecting sample web slings to small edge radii. Establish a chart comparing edge size vs. % of retained strength.

Phase 2: Establish recommendations for the smallest size edges that are suitable for direct contact with webbing slings during general use before a need exists to provide a protective device.

Testing Equipment:

Test Fixture: 150,000 lbs. capacity test fixture with removable test edge mandrels.

Test Bed Requirement:

Test Bed Length: 10 ft. min.

Tester Load Capacity: 150,000 lbs. min.

Tester Ram Stroke: 36 inches min.

Test Pin Size: 3" +/- 1"

Frame Opening Spread for Pin: 7-1/16" Min.

The test bed shall be calibrated to ASTM E4 and the approximate ram speed shall be recorded and remain within a range of 4 to 15 in./min.

Test Procedures:

Sling samples - Each web sling manufacturer is requested to submit 2" wide, Class 7 endless, color treated, web sling samples of three different configurations for each nylon and polyester material. For the nylon sling samples, the manufacturer should note whether the nylon webbing is constructed of nylon type 6 yarn, or nylon type 6/6 yarn, or a combination of both yarn types.

Sample No.	Web Sling Type	Number of Plies	Material	Rated Cap.
1	EN1	1	Nylon	6,200
2	EN2	2	Nylon	12,400
3	EN4	4	Nylon	22,000

4	EN1	1	Polyester	6,200
5	EN2	2	Polyester	12,400
6	EN4	4	Polyester	22,000

1. Each participating mfg. in the test for a particular sized sling shall make a quantity of 26 slings, 6-feet long, for each size sling being tested. The 26 slings shall all be made from the same manufacturing lot of product, preferably from the same dye run, and with the slings should be sewn using a single sewing workstation. The tensile test result for the webbing lot shall also be provided. 25 of these slings will be tested and one additional sling is to be made to serve as a backup sample should any problem occur when testing a particular sample. (To fully complete this test program, it is recommended that 5 manufacturers should submit samples for each of the three sling sizes being tested. Of the manufacturers that are willing to submit nylon sling samples, the web sling committee seeks a preference to obtain a quantity of three sets of slings constructed of nylon type 6/6, and two sets of slings constructed of nylon type 6 yarn).
2. Label Sample Number and Manufacturer ID code onto each sling – The testing facility shall label each sling with a sample number. For each sample number, they should make record of the manufacturer name and sling size.
3. Perform Destructive Tensile Testing of all Samples - For each sling size, perform 5 tensile **tests to failure in a vertical hitch** around each of the following, and record the values:
 - o The appropriate WSTDA Test Pin Size
 - o Each test plate containing the noted corner radii (as shown on the following sheet)
 - o The test will start with the largest size radius in each group and the test will stop when the breaking load for any radius is less than 10% of 5 X rated capacity for any 3 of the first 5 tested on that radius.

Notes: The designated WSTDA test pin or test fixture will only be connected to one end of the sling, preferably located on the ram end of the tester. The other end of the sling should be connected to a pin or shackle having a stock diameter larger than the corresponding WSTDA pin size.

4. Gather Test Results – Determine the average test result value for each group of 5 tensile test results per each hardware for each manufacturer. The review the also review the cumulative result for all submitted samples.
5. Determine the percent of retained strength item by dividing the average test value for each hardware item by the average WSTDA test pin result value. Place these result percentages into the attached table.
- 6.

Sling Type	Rated Capacity Vertical Hitch (Lbs.)	Test Pin Diameter (Inches)	Control test Results Nylon	Control Test Results Polyester
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7.

Class 7 2" 1 Ply EN Type 5	6,200	3"		
		Average		

Class 7 2" 2 Ply EN Type 5	12,400	3"		
		Average		

Class 7 2" 4 Ply EN Type 5	22,000	3"		
		Average		



Web Sling Committee Test Program

Submitted By: _____ Date Submitted: _____

Manufacturer: _____

Subject: Edge Radius Testing Project

Table – Edge Test Results

Sling Type	Rated Capacity Vertical Hitch (Lbs.)	Test Pin Diameter (Inches)	Edge Radius Size (Inches)	Percent of retained strength (when compared to the average WSTDA test pin strength value)
.157 Class 7 2" Nylon 1 Ply EN Type 5	6,200	3"	.03	
			.06	
			.12	
			.25	
.313 Class 7 2" Nylon 2 Ply EN Type 5	12,400	3"	.06	
			.12	
			.25	
			.50	
.555 Class 7 2" Nylon 4 Ply EN Type 5	22,000	3"	.12	
			.25	
			.50	
			.62	

NOTE: 1) Always start with the largest radius for each group.

2) If 3 breaks out of the first 5 tests on any radius are less than 10% of 5 x rated capacity

Do not test any more of the slings of that material and ply on that radius.

3) A matrix should be developed to show all the individual tests values.

4) The web splice should always be mid span never on the radius or pin.

Sling Type	Rated Vertical Hitch Value (Lbs.)	Test Pin Diameter (Inches)	Edge Radius Size (Inches)	Percent of retained strength (when compared to the average WSTDA test pin strength value)
.157 Class 7 2" Polyester 1 Ply EN Type 5	6,200	3"	.03	
			.06	
			.12	
			.25	
.313 Class 7 2" Polyester 2 Ply EN Type 5	12,400	3"	.06	
			.12	
			.25	
			.50	
.555 Class 7 2" Polyester 4 Ply EN Type 5	22,000	3"	.12	
			.25	
			.50	
			.62	

Revisions

Rev. No.	Revision Date	Description of Change