

# Operation Manual for Lifting Slings

Models WSDP, WSESP, WSEDP, and RS



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## 1. Description

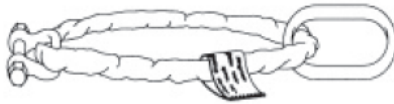
Polyester slings are a smart choice due to their light weight, durability and flexible construction. The sling is dense woven polyester yarn. Web slings provide a degree of protection for loads that require safe and easy handling. The lift weight, flexibility and stretch of synthetic slings reduce fatigue and strain on riggers. Synthetic slings also provide for ease of inspection as well.

There are four slings to choose from:

- Eye-to-Eye Double-Ply
- Endless / Round Single-Ply
- Endless / Round Double-Ply
- Round Sling



Endless-A Polyester round sling in which the load bearing core(s) is wound in a continuous manner and fully enclosed within a protective cover(s)



Eye & Eye-A polyester round sling with a loop eye at catch end typically formed with a sleeve over the body.

Polyester round slings are a great alternative to nylon slings as they have a substantially less stretch value. The pliable body of these synthetic slings will hug the load much better than a nylon lifting sling also which will prevent your synthetic slings from locking up on the load in choker hitches. We currently have the polyester round sling available in an endless round sling and also in eye & eye lift slings. Polyester slings are ideal for applications requiring more strength, less stretch and chemical conditions where a nylon lifting sling would not be appropriate. Round slings are wrapped in a flexible polyester fabric to protect the load bearing yarns from abrasion and damaging UV rays.

One thing to remember when replacing a round lifting sling is how to measure. When measuring the sling, stretch the nylon or polyester sling end to end and measure the sling tip to tip. Do not measure the circumference, or amount of fabric for the entire polyester crane sling as this will give you a sling 2x the size you have intended. Make sure you measure properly to ensure the proper length is ordered

## **Round sling Features**

- High strength to weight ratio
- Low elongation / Extreme flexibility
- Double cover for extra life
- Endless style means that wear points always change with each lift
- Polyester interior fibers do not contact the load, meaning little wear as long as cover is intact
- Long lasting tag indicates working load limits
- Different colors indicate load limits through UR-7

## **Technical Data**

- Maximum working temperatures 90°C (194°F)
- Oil and grease do not normally affect strength
- Resistant to most acids, however is not resistant to concentrations of alkalis
- Does not lose strength in water – will not rot or mildew
- Excellent resistance to ultra-violet rays because outer cover protects inner fibers
- Only 3% elongation

## **Round Sling Applications**

- Boat Handling
- Cargo Handling
- Construction
- Drilling Equipment
- Electrical Equipment
- Heating Units
- Industrial
- Logging
- Machined Parts
- Oilfield – Offshore
- Pipes

-Transformer

## **2. Safety and Technical Information**

### **2.1 The Initial Inspection**

You should have any new or repaired sling inspected by a designated person before putting into use, to ensure that the correct sling is being used, as well as to determine that the sling meets applicable specifications and has not been damaged in shipment.

### **2.2 Frequent Inspection**

This inspection shall be made by the user handling the sling each time it is in use.

-Periodic Inspection

This inspection should only be conducted by designated personnel. Frequency of inspection should be based on:

-Frequency of which round sling is used

-Severity of service conditions

-Experience gained on the service life of slings used in similar applications

-Periodic inspections should be conducted at least annually.

Remove from service when:

-Cuts to sling cover expose red-striped white core yarns

-Snags, holes, tears or abrasions expose red-striped white core yarns.

-End fittings are pitted or corroded, cracked, distorted or broken

-The sling shows signs of melting, chemical damage or charring

-Capacity tag is illegible or missing

-Knots in any part of the sling

-Broken or worn stitching in the cover which exposes the core fibers

-Other visible damage which causes doubt as to the strength of the sling

Note: Do not expose round slings to temperatures exceeding 194°F

Do not exceed rated capacities. Ratings must be reduced when slings are used at angles of less than 90° from horizontal.

The use of any sling with a nylon cover and polyester load-bearing core yarn makes the detection of chemical damage to the core yarn extremely difficult. Use of such slings in chemically active environments, especially those which include strong alkalis, is not recommended. In such chemically active environments slings using covers made from the same fiber as the core yarn is recommended, because the environment will damage the cover either before or at the same time as the core yarn, making inspection and detection much more reliable. If in doubt, return the round sling to ACI Hoist and Crane for inspection and proof testing.

<b>Chemical Resistance Chart</b>		
Chemical	Polyester	Nylon
Acid	*	No
Alcohols	OK	OK
Aldehydes	No	OK
Strong Alkalis	**	OK
Bleaching Agents	OK	No
Dry Cleaning Agents	OK	No
Ethers	No	OK
Halogenated Hydrocarbons	OK	OK
Hydrocarbons	OK	OK
Ketones	OK	OK
Oils, Crude	OK	OK
Oils, Lubricating	OK	OK
Soap and Detergents	OK	OK
Water and Seawater	OK	OK
Weak Alkalis	OK	OK

**THIS IS A GENERAL GUIDLINE ONLY**

**\*Disintegrated by concentrated sulfuric acid**

**\*\*Degraded by strong alkalis at elevated temperatures**

## WARNING

The capacity of a sling to lift weight Decreases as the angle of the sling moves away from being vertical. If the angle of the sling is not taken into consideration before selecting a sling to lift a load, serious injury or death could result from the load being dropped.

### Sling Angle Capacities

If you know the lifting angle of the sling being used, you can apply the Capacity Reduction Factor or the Load Multiplier in the Sling Angle Chart. If you don't know the angle:

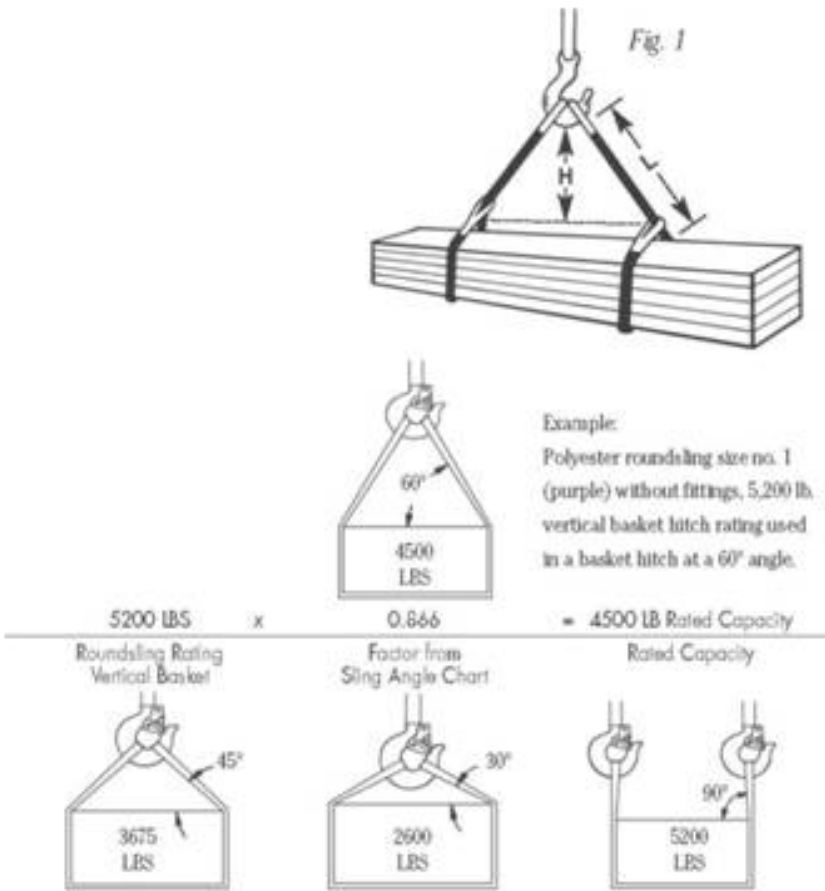
-Attach the sling(s)

-Apply lift until the slings are taut and the load is almost ready to leave the ground (but do not lift the load off the ground!)

-Measure the length of the sling between the lift point and the load.

-Measure the height between the lift point and the load (See Fig. 1)

\*Do not exceed rated capacities. Ratings must be reduced when slings are used at angles of less than 90° from horizontal.



**Situation 1: Capacity Reduction Factor**

When you know the appropriate rated capacity of the sling, and you need to calculate its actual capacity (Based on the sling angle), follow the instructions below:

(The example uses a measured length of 12 feet and a measured height of 8 feet)

Measured Length (L): 12 feet

Measured Height (H): 8 feet

Reduction Factor (RF)=H/L=8/12=0.667

Rated Capacity\* of sling=1,000 lbs

Actual Capacity of sling=Rated Capacity x RF = 1,000 x 0.667=667 lbs

## Situation 2: Load Multiplier

When you know the actual weight of the load, and you need to calculate the appropriate rated capacity (based on the sling angle) of the sling to lift the load, follow the instructions below:

(The example uses a measured length of 12 feet and a measured height of 8 feet.)

Measured Length (L): 12 feet

Measured Height (H): 8 feet

Load Multiplier (LM)=L/H=12/8=1.5 Load Weight: 1,000 lbs.

Necessary Rated Capacity\*

Of sling= Load Weight x LM=1,000 x 1.5=1,500 lbs.

<b>Sling Angle Chart</b>		
<b>Angle from Horizontal</b>	<b>A. Capacity Reduction Factor</b>	<b>B. Load Multiplier</b>
90°	1.000	1.000
85°	0.996	1.005
80°	0.985	1.016
75°	0.966	1.036
70°	0.940	1.064
65°	0.906	1.104
60°	0.866	1.155
55°	0.819	1.222
50°	0.766	1.306
45°	0.707	1.415
40°	0.643	1.556
35°	0.574	1.743
30°	0.500	2.000

### 2.3 Recommended Operating Practices for Round slings

Determine weight of the load. The weight of the load shall be within the rated capacity of the polyester round sling(s).

Select a polyester round slings having suitable characteristics for the type of load, hitch and environment.

Polyester round slings shall not be loaded in excess of the rated capacity. Consideration shall be given to the round sling to load angle which affects rated capacities (see page 7).

Polyester round slings with fittings, which are used in a choked hitch shall be of sufficient length to assure that the choking action is on the round sling and never on the fitting.

Polyester round slings used in a basket hitch shall have the load balanced to prevent slippage.

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

Polyester round slings shall always be protected from being cut by sharp corners, sharp edges, protrusions, or abrasive surfaces.

Polyester round slings shall not be dragged on the floor or over an abrasive surface.

Polyester Round slings shall not be twisted, shortened, lengthened, tied into knots, or joined by knotting.

Polyester round slings shall not be pulled from under loads when the load is resting on the polyester round sling.

Do no drop polyester round slings equipped with metal fittings.

Polyester round slings that appear to be damaged shall not be used unless inspected and accepted as usable.

The polyester round sling shall be hitched in a manner providing control of the load.

Personnel, including all portions of the human body, shall be kept from between the polyester round sling and the load, and from between the polyester round sling and the crane hook or hoist hook.

Personnel shall stand clear of the suspended load.

Personnel shall not ride the polyester round sling.

Shock loading shall be avoided.

Twisting the legs (branches ) shall be avoided.

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

During lifting, personnel shall be alert for possible snagging of the polyester round sling.

The polyester round slings legs (branches) shall contain or support the load from the sides above the center of gravity when using a basket hitch.

Polyester round slings shall be long enough so the rated capacity is adequate when the sling to load angle is taken into consideration.

Only polyester round slings with legible identification tags shall be used.




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

Polyester round slings should not be constricted or bunched between the ears of a clevis or shackle, or in a hook. When a polyester round sling is used with a shackle, it is recommended that it be used (rigged) in the bow of the shackle.

Place blocks under load prior to setting down the load., to allow removal of the polyester round slings (if applicable.)

### 3. Capacities and Dimensions

#### 3.1 Sling Capacities

Capacities			
Model			
	Vertical (lbs)	Choked (lbs)	Basket (lbs)
Eye-to-Eye Double Ply Polyester Webbing Slings			
WSDP-020	2,200	1,800	4,400
WSDP-040	4,400	3,500	8,800
WSDP-060	6,600	5,300	13,200
WSDP-080	8,800	7,000	17,600
WSDP-100	11,000	8,800	22,000
Endless / Round Single-Ply Polyester Webbing Slings			
WSESP-020	2,200	1,800	4,400
WSESP-040	4,400	3,500	8,800
WSESP-060	6,600	5,300	13,200
WSESP-080	8,800	7,000	17,600
Endless / Round Double-Ply Polyester Webbing Slings			
WSEDP-040	4,400	3,500	8,800
WSEDP-060	6,600	5,300	13,200
WSEDP-080	8,800	7,000	17,600
Round Slings			
RS-020	2,600	2,080	5,200
RS-050	5,300	4,240	10,600
RS-080	8,400	6,720	16,800
RS-100	10,600	8,480	21,200
RS-130	13,200	10,560	26,400
RS-210	21,200	16,960	42,400
RS-250	25,000	20,000	50,000
RS-900	90,000	72,000	180,000

2.2 Eye-to-Eye Double Ply Polyester Webbing (Table 1 Below)

Model	Capacity (lbs)	L Length (ft)	W Width (in)	Weight (lbs)
WSDP-020	2,200	4	2	1
		6		2
		8		2
		10		2.5
		12		2.5
		14		3
		16		3
		18		3.5
WSDP-040	4,400	4	2.25	1
		6		2
		8		2
		10		3
		12		3.5
		14		3.5
		16		3.5
		18		4
WSDP-060	6,600	4	3	2
		6		3
		8		4
		10		5
		12		6
		14		6
		16		6
		18		7
WSDP-080	8,800	4	4	3
		6		4
		8		5
		10		6
		12		7
		14		7
		16		7
		18		9
WSDP-100	11,000	4	5	4
		6		5
		8		6
		10		8
		12		9
		14		9
		16		9
		18		10

3.2 Endless / Round Single-Ply Polyester Webbing (Table 2 Below)

Model	Capacity	L Length (ft)	W Width (in)	Weight (lbs)
WSESP-020	2,200	4	1	1
		6		1
		8		1
		10		1
		12		1
		14		1
		16		1
		18		1
WSESP-040	4,400	4	2	1
		6		1
		8		1.5
		10		2
		12		2
		14		2
		16		2
		18		3
WSESP-060	6,600	4	3	1.5
		6		2
		8		2
		10		3
		12		4
		14		5
		16		5
		18		6
WSESP-080	8,800	4	4	3
		6		3
		8		4
		10		5
		12		6
		14		7
		16		8
		18		10

3.3 Endless / Round Double-Ply Polyester Webbing (Table 3 Below)

Model	Capacity (lbs)	L Length (ft)	W Width (in)	Weight (lbs)
WSEDP-040	4,400	4	1	1
		6		1
		8		1
		10		1
		12		1
		14		1
		16		1
		18		1
WSEDP-060	6,600	4	2	2
		6		3
		8		4
		10		4.5
		12		5
		14		7
		16		9
		18		11
WSEDP-080	8,800	4	3	3
		6		4
		8		5
		10		6
		12		7
		14		7
		16		7
		18		8

3.4 Round Rope Slings (Table 4 Below)

<b>Model</b>	<b>Capacity (lbs)</b>	<b>L Length (ft)</b>	<b>Weight (lbs)</b>
<b>RS-020</b>	<b>2,200</b>	<b>4</b>	<b>0.8</b>
		<b>6</b>	<b>1.2</b>
		<b>8</b>	<b>1.6</b>
		<b>10</b>	<b>2</b>
		<b>12</b>	<b>2.4</b>
		<b>14</b>	<b>2.8</b>
		<b>16</b>	<b>3.2</b>
		<b>18</b>	<b>3.6</b>
<b>RS-050</b>	<b>5,500</b>	<b>4</b>	<b>1.2</b>
		<b>6</b>	<b>1.8</b>
		<b>8</b>	<b>2.4</b>
		<b>10</b>	<b>3</b>
		<b>12</b>	<b>3.6</b>
		<b>14</b>	<b>4.2</b>
		<b>16</b>	<b>4.8</b>
		<b>18</b>	<b>5.4</b>
<b>RS-080</b>	<b>8,800</b>	<b>4</b>	<b>2</b>
		<b>6</b>	<b>3</b>
		<b>8</b>	<b>4</b>
		<b>10</b>	<b>5</b>
		<b>12</b>	<b>6</b>
		<b>14</b>	<b>7</b>
		<b>16</b>	<b>8</b>
		<b>18</b>	<b>9</b>
<b>RS-100</b>	<b>11,000</b>	<b>4</b>	<b>3</b>
		<b>6</b>	<b>4.5</b>
		<b>8</b>	<b>6</b>
		<b>10</b>	<b>7.5</b>
		<b>12</b>	<b>9</b>
		<b>14</b>	<b>10.5</b>
		<b>16</b>	<b>12</b>
		<b>18</b>	<b>13.5</b>
<b>RS-130</b>	<b>13,000</b>	<b>4</b>	<b>3.4</b>
		<b>6</b>	<b>5.1</b>
		<b>8</b>	<b>6.8</b>
		<b>10</b>	<b>8.5</b>
		<b>12</b>	<b>10.2</b>
		<b>14</b>	<b>11.9</b>
		<b>16</b>	<b>13.6</b>
		<b>18</b>	<b>15.3</b>
		<b>20</b>	<b>17</b>

<b>RS-210</b>	<b>21,000</b>	<b>6</b>	<b>7.5</b>
		<b>8</b>	<b>10</b>
		<b>10</b>	<b>12.5</b>
		<b>12</b>	<b>15</b>
		<b>14</b>	<b>17.5</b>
		<b>16</b>	<b>20</b>
		<b>18</b>	<b>22.5</b>
		<b>20</b>	<b>25</b>
<b>RS-250</b>	<b>25,000</b>	<b>6</b>	<b>8.7</b>
		<b>8</b>	<b>11.6</b>
		<b>10</b>	<b>14.5</b>
		<b>12</b>	<b>17.4</b>
		<b>14</b>	<b>20.3</b>
		<b>16</b>	<b>23.2</b>
		<b>18</b>	<b>26.1</b>
		<b>20</b>	<b>29</b>
<b>RS-900</b>	<b>60,000</b>	<b>10</b>	<b>41</b>
		<b>12</b>	<b>49.2</b>
		<b>14</b>	<b>57.4</b>
		<b>16</b>	<b>65.6</b>
		<b>18</b>	<b>73.8</b>
		<b>20</b>	<b>82</b>