



RATED CAPACITY		MADE IN USA	
8880	LBS VERTICAL	Part No:	EE3-902P
7104	LBS CHOKER	Serial No:	248002-1-2
17760	LBS V. BASKET	Width:	2 IN
		Length:	20 FT 00 IN
		10/10/22	

WWW.OLSENCHAIN.COM
800-328-1906
TYPE 1055
DATE: 24

SLING MANUAL



RATED CAPACITY		MADE IN USA	
	VERTICAL	Part No:	EE3-902P
		Serial No:	102-1-3

VOLUME 11



SLING MANUAL

VOLUME 11

DELANO, MN

1070 McKinley Parkway
Delano, MN 55328

TF 800.328.1906
FX 952.944.3899

MOORHEAD, MN

4133 32nd Ave. S.
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All overhead lifting slings manufactured by Olsen Chain & Cable are governed by OSHA 1910.184 and ASME B30.9. Olsen Chain & Cable's overhead lifting slings are manufactured to meet or exceed these requirements.

SALES@OLSENCHAIN.COM

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HOISTS & CRANES



CRANES

To lift, rotate, and transport the heaviest of equipment and loads.

Gantry and Mobile Gantry Cranes

Put in place over and around equipment so that you can get maximum leverage and load-bearing capacity.

Monorail Cranes

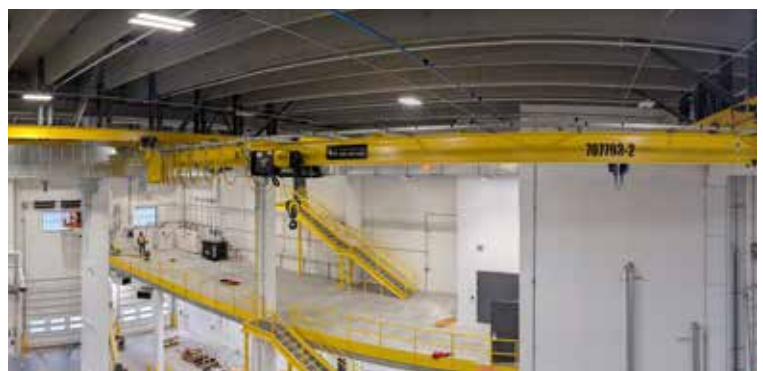
Ideal for movement of heavy items within restricted spaces. Some move in a straight line; others can be engineered to move items in various patterns.

Jib Cranes

Jib Cranes can move materials up to 360 degrees, depending on their installation, around their central support structure.

Workstation Cranes

Designed to meet the varied and demanding requirements of your workstation and your production line.





WE'LL OUTFIT YOUR WORKSPACE WITH THE MOST RELIABLE HEAVY LIFTING EQUIPMENT AVAILABLE ON THE MARKET.



HOISTS

We manufacture, sell, and service reliable hoists that stand up to even the most difficult tests of strength and durability.

Electric Chain Hoists

Compatible with most any workstation and adjustable to your specific needs because of compact headroom, hook suspension, variable speeds and features.

Manual Chain Hoists

For when electricity is either unavailable or impractical, but you need a lifting solution.

Wire Rope Hoists

Olsen Chain & Cable Wire Rope Hoists can lift varying weights and load types.

Lever Chain Hoists

Giving you the ability to lift equipment safely in a variety of workstation layouts and scenarios.



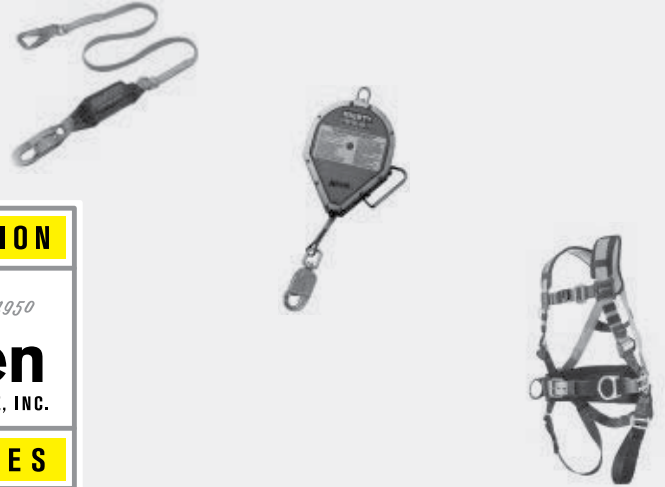
Visit [olsenchain.com/hoists-cranes](https://www.olsenchain.com/hoists-cranes) or call **800.328.1906** to learn more about Hoists & Cranes, Inspection Services & Refurbishment

INSPECT / SERVICE / REFURBISH



FALL PROTECTION GEAR

Olsen Chain & Cable has many fall arrest solution options available. Call our sales staff for assistance ordering your fall protection needs or to schedule a training seminar.



WE'LL TAKE CARE OF ALL YOUR MATERIAL HANDLING EQUIPMENT – FROM NEW, TO END OF SERVICE, AND EVERYTHING IN BETWEEN.



Pre-Operation Inspections

Required before the first use of the hoist each shift of every day. All functional operating mechanisms must be checked daily by the hoist operator prior to each shift. Olsen can assist Employers with the development of safety checklists and training.



Monthly 'Frequent' Inspections

Wire rope, chain and hooks are required to have a documented, monthly inspection.



Annual Inspections

Complete hoist system inspection that complies with OSHA 1910.179 requirements.



Hoist & Crane Services

Olsen Chain & Cable can provide you with service, inspection, and refurbishment of many hoist and crane makes and models. Our technicians are required to complete a minimum of 20 hours of continuing education credits annually. Components are based on Customer's requirements and we are your single point of contact for systems to ensure that your crane installation goes smoothly from beginning to end.



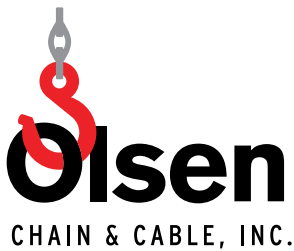
Annual Nylon, Polyester, Cable, and Chain Sling Inspections

Refurbishment or quoted replacement options are available. Per requirement: OSHA 1910.184 and ASME B30.9, Olsen Chain & Cable can assist you with this service and provide you with the OSHA-required reports.



Fall Protection Equipment Inspections

OSHA 1926.502 Regulations for Construction and OSHA 1910.66 Standards, in addition to OSHA the ANSI A10.32-2012 Standard and ANSI Z359 Fall Protection Code are used when Olsen Chain & Cable provides inspection services with documentation on your fall protection equipment and systems.



At Olsen Chain & Cable Co., Inc., we are continually striving to serve your needs. Our commitment to training reflects our belief that safety is the most important job on any work site.

COMPETENT PERSON

OSHA defines a competent person as one “who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.” OSHA 1926.32(f)

QUALIFIED PERSON

A qualified person “means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.” OSHA 1926.32(m)

DESIGNATED/AUTHORIZED PERSON

A designated or authorized person is defined as “a person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the jobsite.” OSHA 1926.32(d) & (i). OSHA 1910.184(b) states that “designated” means “selected or assigned by the employer or the employer’s representative as being qualified to perform specific duties.”

PLEASE NOTE

In addition to its own rules, OSHA may also enforce other regulations under an authority called Incorporation By Reference. This power, found in OSHA 1926.31 states “the standards of agencies of the U.S. Government, and organizations which are not agencies of the U.S. Government which are incorporated by reference in this part, have the same force and effect as other standards in this part.

Only the mandatory provisions (i.e., provisions containing the word “shall” or other mandatory language) of standards incorporated by reference are adopted as standards under the Occupational Safety and Health Act.”

Finally, OSHA Chapter 5 contains what is commonly referred to as the General Duty Clause. It states:

“(a) Each employer -

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that

are causing or likely to cause death or serious physical harm to employees;

(2) shall comply with occupational safety and health standards promulgated under this act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.”

Olsen Chain & Cable Co., Inc. shall not be liable for any loss caused by or resulting from the failure to disseminate instructions and/or warnings. This booklet is intended as a general guide to rigging and is not meant to be comprehensive. Each rigging circumstance is different and should be carefully considered. **If you have any questions, please contact us.**

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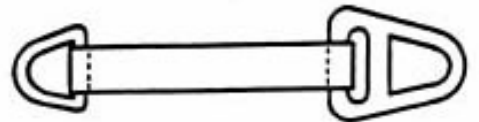




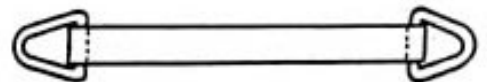
SYNTHETIC WEB SLINGS

TYPES OF SYNTHETIC WEB SLINGS

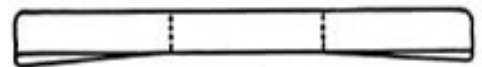
TYPE I Sling is made with triangle fitting on one end and slotted triangle choker fitting on the other end. Sling can be used in vertical, basket or choker hitches. Specify aluminum or steel fittings. Steel fittings must be used for 2-ply ratings. Aluminum fittings develop only single-ply ratings.



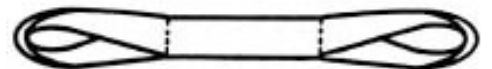
TYPE II Sling is made with triangle fitting on each end. Sling can be used in vertical or basket hitch only. Specify aluminum or steel fittings. Steel fittings must be used for 2-ply ratings. Aluminum fittings will only have single-ply ratings.



TYPE III Sling is made with a flat loop on each end with loop eye opening on the same plane as the sling body. This type of sling is sometimes called a flat eye and eye, eye and eye, or double eye sling.



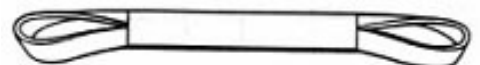
TYPE IV Sling is made with both loop eyes formed as in Type III, except that the loop eyes are turned to form a loop eye which is at a right angle to the plane of the sling body. This type of sling is commonly referred to as a twisted eye sling.



TYPE V Endless sling, sometimes referred to as a grommet sling. It is a continuous loop formed by joining the ends of the fabric together with a load bearing splice.



TYPE VI Return eye (or reversed eye) sling is formed by using multiple widths of webbing held edge to edge. A wear pad is attached on one or both sides of the sling body and on one or both sides of the loop eyes to form a loop eye at each end which is at a right angle to the plane of the sling body.



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TYPE I SLING

Specify aluminum or steel fittings.

WEB WIDTH	PART NUMBER	WORKING LOAD LIMIT IN POUNDS		
		VERTICAL	CHOKE	BASKET
SINGLE PLY				
2	TC1-902	3,200	2,560	6,400
3	TC1-903	4,800	3,840	9,600
4	TC1-904	6,400	5,120	12,800
5	TC1-905	8,000	6,400	16,000
6	TC1-906	9,600	7,680	19,200
8	TC1-908	12,800	10,240	25,600
10	TC1-910	16,000	12,800	32,000
12	TC1-912	19,200	15,360	38,400
DOUBLE PLY				
2	TC2-902	6,400	5,120	12,800
3	TC2-903	8,800	7,104	17,760
4	TC2-904	11,520	9,216	23,040
5	TC2-905	14,000	11,200	28,000
6	TC2-906	16,320	13,056	32,640

TYPE II SLING

Specify aluminum or steel fittings.

WEB WIDTH	PART NUMBER	WORKING LOAD LIMIT IN POUNDS		
		VERTICAL	CHOKE	BASKET
SINGLE PLY				
2	TT1-902	3,200	-----	6,400
3	TT1-903	4,800	-----	9,600
4	TT1-904	6,400	-----	12,800
5	TT1-905	8,000	-----	16,000
6	TT1-906	9,600	-----	19,200
8	TT1-908	12,800	-----	25,600
10	TT1-910	16,000	-----	32,000
12	TT1-912	19,200	-----	38,400
DOUBLE PLY				
2	TT2-902	6,400	-----	12,800
3	TT2-903	8,800	-----	17,760
4	TT2-904	11,520	-----	23,040
5	TT2-905	14,000	-----	28,000
6	TT2-906	16,320	-----	32,640

TYPE III SLING / TYPE IV SLING

WEB WIDTH	PART NUMBER	WORKING LOAD LIMIT IN POUNDS		
		VERTICAL	CHOKE	BASKET
SINGLE PLY				
1	EE1-901	1,600	1,280	3,200
2	EE1-902	3,200	2,560	6,400
3	EE1-903	4,800	3,840	9,600
4	EE1-904	6,400	5,120	12,800
5	EE1-905	8,000	6,400	16,000
6	EE1-906	9,600	7,680	19,200
DOUBLE PLY				
1	EE2-901	3,200	2,560	6,400
2	EE2-902	6,400	5,120	12,800
3	EE2-903	8,880	7,104	17,760
4	EE2-904	11,520	9,216	23,040
6	EE2-906	16,320	13,056	32,640
8	EE2-908	20,480	16,384	40,960
10	EE2-910	24,000	19,200	48,000
12	EE2-912	26,880	21,504	53,760

TYPE V SLING

WEB WIDTH	PART NUMBER	WORKING LOAD LIMIT IN POUNDS		
		VERTICAL	CHOKE	BASKET
SINGLE PLY				
1	EN1-901	3,200	2,560	6,400
2	EN1-902	6,400	5,120	12,800
3	EN1-903	9,600	7,680	19,200
4	EN1-904	12,800	10,240	25,600
5	EN1-905	16,000	12,800	32,000
6	EN1-906	19,200	15,360	38,400
8	EN1-908	25,600	20,480	51,200
10	EN1-910	32,000	25,600	64,000
12	EN1-912	38,400	30,720	76,800
DOUBLE PLY				
1	EN2-901	6,400	5,120	12,800
2	EN2-902	12,800	10,240	25,600
3	EN2-903	17,760	14,208	35,520
4	EN2-904	23,040	18,432	46,080
6	EN2-906	32,640	26,112	65,280

LARGER CAPACITIES AND SIZES AVAILABLE, AS WELL AS 3 AND 4 PLY OPTIONS. PLEASE CALL OR EMAIL FOR DETAILS.

FLAT POLY
SLINGS & BRIDLES

SYNTHETIC POLYESTER WEBBING SLINGS

MULTI-LEG BRIDLE SLINGS | 2, 3 AND 4-LEG SLINGS

WEB WIDTH	HOOK SIZE	MASTER LINK DATA	SHORTEST POSSIBLE LEG LENGTH	LEG PART NUMBER	2-LEG BRIDLE WORKING LOAD LIMIT IN POUNDS		
					60°	45°	30°
SINGLE PLY							
1	1T	3/4"	2'6"	EE1-901-X	2,770	2,260	1,600
2	2T	3/4"	2'8"	EE1-902-X	5,540	4,520	3,200
3	3T	1"	3'3"	EE1-903-X	8,310	6,780	4,800
4	5T	1"	3'9"	EE1-904-X	11,080	9,050	6,400
DOUBLE PLY							
1	2T	3/4"	1'6"	EE2-901-X	5,540	4,520	3,200
2	5T	3/4"	1'9"	EE2-902-X	11,080	9,050	6,400
3	5T	1"	2'3"	EE2-903-X	15,380	12,560	8,880
4	7T	1-1/4"	2'9"	EE2-904-X	19,950	16,290	11,520



FLAT POLY SLINGS & BRIDLES

WEB WIDTH	HOOK SIZE	MASTER LINK DATA	SHORTEST POSSIBLE LEG LENGTH	LEG PART NUMBER	3-LEG BRIDLE WORKING LOAD LIMIT IN POUNDS		
					60°	45°	30°
SINGLE PLY							
1	1T	3/4"	2'6"	EE1-901-X	4,150	3,390	2,400
2	2T	3/4"	2'8"	EE1-902-X	8,310	6,790	4,800
3	3T	1"	3'3"	EE1-903-X	12,470	10,180	7,200
4	5T	1"	3'9"	EE1-904-X	16,620	13,580	9,600
DOUBLE PLY							
1	2T	3/4"	1'6"	EE2-901-X	8,310	6,790	4,800
2	5T	1"	1'9"	EE2-902-X	16,620	13,580	9,600
3	5T	1"	2'3"	EE2-903-X	23,070	18,840	13,320
4	7T	1-1/4"	2'9"	EE2-904-X	29,930	24,440	17,280



WEB WIDTH	HOOK SIZE	MASTER LINK DATA	SHORTEST POSSIBLE LEG LENGTH	LEG PART NUMBER	4-LEG BRIDLE WORKING LOAD LIMIT IN POUNDS		
					60°	45°	30°
SINGLE PLY							
1	1T	3/4"	2'6"	EE1-901-X	5,540	4,520	3,200
2	2T	3/4"	2'8"	EE1-902-X	11,080	9,050	6,400
3	3T	1"	3'3"	EE1-903-X	16,630	13,580	9,600
4	5T	1"	3'9"	EE1-904-X	22,170	18,100	12,800
DOUBLE PLY							
1	2T	3/4"	1'6"	EE2-901-X	11,080	9,050	6,400
2	5T	1"	1'9"	EE2-902-X	22,170	18,100	12,800
3	5T	1-1/4"	2'3"	EE2-903-X	30,760	25,120	17,760
4	7T	1-1/2"	2'9"	EE2-904-X	39,900	32,590	23,040



SYNTHETIC WEB SLING SAFETY REQUIREMENTS

WARNING: Consult industry recommendations and OSHA standards for proper application.

DO NOT exceed rated capacity of sling. Rated capacity of sling applies to a new and unused sling.

DO inspect sling before each use. Tensile strength of a sling may decrease with each use.

DO NOT allow sling to rotate at either end. Sling may fail if damaged, abused, misused, overused, or improperly maintained.

ALWAYS FOLLOW THESE GUIDELINES:

- Determine weight of load.
- Select a sling of suitable capacity.
- When in doubt, use a larger capacity sling.
- **DO NOT** run a sling around sharp corners without corner guards.
- **DO NOT** attach sling to fittings with sharp edges or corners.
- Avoid formation of knots or twists in the legs or sling body.
- Examine sling for damage and worn areas.
- Take up slack slowly to avoid shock loading the sling.
- Use a tag line on the load if necessary to prevent sling and load rotation
- **DO NOT** shorten sling using knots, or join two slings together using knots.
- Store in a cool, dark place. **DO NOT** expose to UV light or sunlight.
- Chemicals, such as acids and alkalis, and ultra-violet light can affect the strength of synthetic web slings in varying degrees ranging from none to total degradation.

CARE OF SYNTHETIC WEB SLINGS

Synthetic web slings should be stored in a cool, dry, and dark place and should not be exposed to sunlight to prevent mechanical or chemical damage when not in use.

Never drop a sling which is equipped with metal fittings.

Nylon and polyester slings shall not be used at temperatures in excess of 180° F. They may be used in temperatures as low as -40° F.

Chemicals, such as acids and alkalis, and ultra-violet light can affect the strength of synthetic web slings in varying degrees ranging from none to total degradation.



INSPECTION OF SYNTHETIC WEB SLINGS

Before any new or repaired sling is placed in service, it shall be inspected to ensure that the correct sling is being used, as well as to determine that the sling meets the requirements of this specification. Frequent inspections should also be made by the person handling the sling, as well as periodic inspection by designated personnel to watch for possible damage and wear, based on frequency of sling use, severity of service conditions, and experience gained on the service life of slings used in similar applications.

Written inspection records should be kept on file for all slings. These records should show a description of the new sling and its condition on each subsequent inspection.

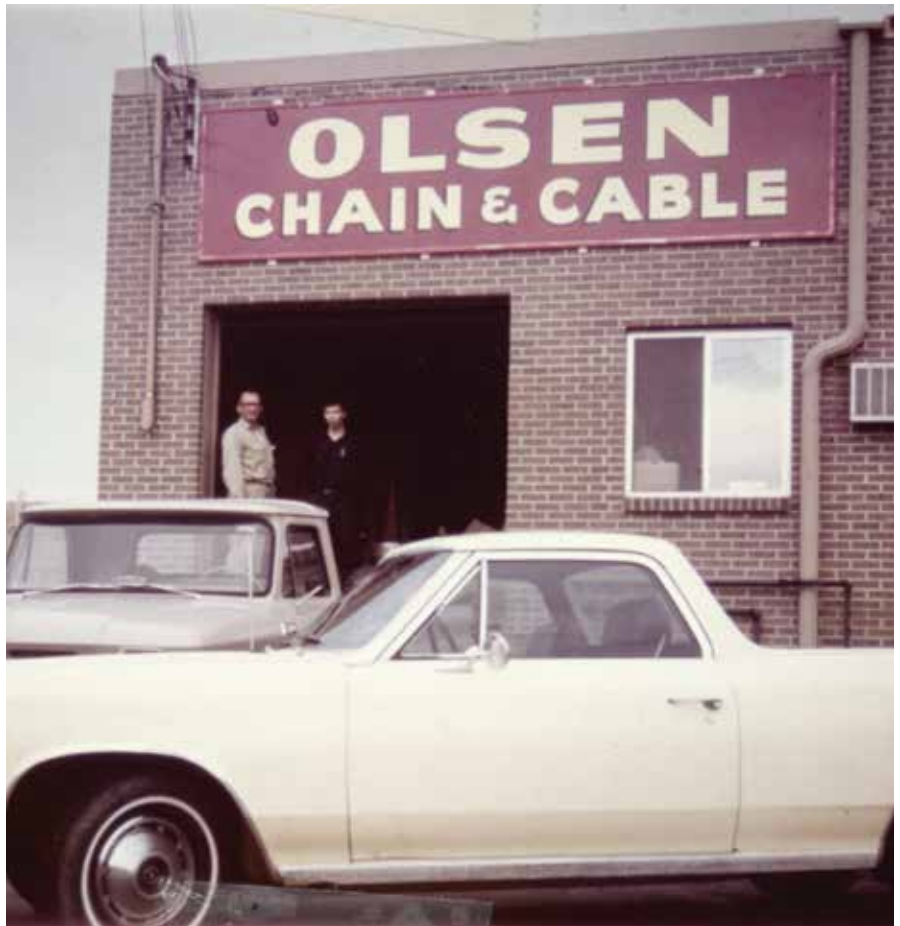
Always consult current OSHA laws and ASME regulations regarding inspection of slings.



REPLACEMENT OF SYNTHETIC WEB SLINGS

Synthetic web slings shall be immediately removed from service if any of the following conditions are present:

- Acid or alkali burns.
- Melting, charring, or weld spatter on any part of the sling.
- Holes, tears, cuts, snags, or embedded particles.
- ANY cut or abrasion in the yarns.
- Broken or worn stitching in load bearing splices.
- Excessive wear or elongation exceeding the amount recommended by the manufacturer of the sling.
- Distortion, excessive pitting, corrosion, or breakage of fittings.
- Other apparent defects which cause doubt as to the strength of the sling.



USE OF SYNTHETIC WEB SLINGS

SAFE OPERATING PRACTICES

Whenever any sling is used, the following practices shall be observed:

- Slings that are damaged or defective shall be immediately removed from service and not used.
- Eyes in synthetic web slings shall not be formed by using knots or tying.
- Slings shall not be shortened with knots or tying.
- Sling legs shall not be knotted or twisted.
- Slings shall not be loaded in excess of their rated capacities.
- Slings used in a basket hitch shall have the loads balanced to prevent slippage.
- Slings shall be securely attached to their loads.
- Slings shall be padded, protected, or 'cribbed' from the sharp edges of their loads.

SYNTHETIC WEB SLING TERMINOLOGY

- Design Factor is the ratio between the sling's minimum breaking strength and the sling's rated working load limit.
- Elongation is the measurement of stretch, expressed as a percentage of the original unloaded length. Nylon slings stretch approximately 5-7% at rated working load limits.
- Plies are the number of layers of load-bearing webbing used in the sling assembly.
- Rated Capacity (or Working Load Limit) is the maximum allowable working load for each sling for the type of hitch used.
- Selvage Edge is the woven, or knitted, edge of a webbing formed to prevent raveling.
- Synthetic Fibers are man-made, UV-stabilized fibers consisting of either nylon, polyester, or other polymer types which may be developed in the future.

- Suspended loads shall be kept clear of all obstructions.
- All employees shall be kept clear of loads about to be lifted and of suspended loads.
- Hands or fingers shall be kept clear of loads about to be lifted and of suspended loads.
- **SHOCK LOADING IS PROHIBITED.**
- A sling shall not be pulled from under a load when the load is resting on the sling.

Welded end attachments shall not be used unless proof tested by the manufacturer or equivalent entity at twice their rated capacity prior to initial use. The employer shall retain a certificate of the proof test and make it available for examination. Welding of end attachments, except covers to thimbles, shall be performed prior to the assembly of the sling.





POLYESTER ROUND SLINGS

CODE	COLOR	RATED CAPACITY IN POUNDS			APPROX WIDTH (IN)	APPROX. WEIGHT POUNDS/FOOT
		VERTICAL	CHOKER	BASKET		
SP300	PURPLE	3,000	2,400	6,000	2"	0.3
SP450	BLACK	4,500	3,600	9,000	2"	0.45
SP600	GREEN	6,000	4,800	12,000	2"	0.48
SP900	YELLOW	9,000	7,200	18,000	2"	0.7
SP1200	GREY	12,000	9,600	24,000	3"	0.9
SP1400	RED	14,000	11,200	28,000	3"	0.95
SP1700	BROWN	17,000	13,600	34,000	3"	1.2
SP2200	BLUE	22,000	17,600	44,000	3"	1.4
SP2600	ORANGE	26,000	20,800	52,000	4"	1.7
SP3200	ORANGE	32,000	25,600	64,000	4"	1.9
SP4000	ORANGE	40,000	32,000	80,000	5"	2.4
SP5000	ORANGE	50,000	40,000	100,000	5"	2.7
SP6000	ORANGE	60,000	48,000	120,000	5"	3
SP7000	BLACK	70,000	56,000	140,000	6"	3.5
SP8000	BLACK	80,000	64,000	160,000	6"	4
SP9000	BLACK	90,000	72,000	180,000	6"	4.5
SP10000	BLACK	100,000	80,000	200,000	6"	5

POLY ROUND SLINGS

HIGH PERFORMANCE ROUND SLINGS

CODE	COLOR	RATED CAPACITY IN POUNDS			APPROX WIDTH AT LOAD (IN)	APPROX. WEIGHT POUNDS/FOOT
		VERTICAL	CHOKER	BASKET		
SP12500	BLACK	125,000	100,000	250,000	5"	2.22
SP15000	BLACK	150,000	120,000	300,000	5.5"	2.61
SP17500	BLACK	175,000	140,000	350,000	6"	3.07
SP20000	BLACK	200,000	160,000	400,000	6.5"	3.47
SP22500	ORANGE	225,000	180,000	450,000	7"	4.8
SP25000	ORANGE	250,000	200,000	500,000	7.5"	5.45
SP27500	ORANGE	275,000	220,000	550,000	8"	5.95
SP30000	ORANGE	300,000	240,000	600,000	8.5"	6.85

POLYESTER ROUND SLINGS

SELECTION OF PROPER LIFTING HARDWARE

All connection hardware for polyester round slings shall be sized and selected so that size requirements meet those values in Table RS-1 below, or the bearing stress value at the point of connection does not exceed 7,000 pounds per square inch (PSI) during sling loading. Olsen Chain & Cable recommends that polyester round sling users read and familiarize themselves with the information in the Web Sling and Tie Down Association Recommended Standard Specification for Synthetic Polyester Round slings in publication WSTDA-RS-1.

To calculate load bearing stress requires two calculations. First, the user must calculate the load bearing area at the hardware connection. This is accomplished by multiplying the hardware thickness or stock diameter by the effective contact width. A flat bearing surface such as a pin or trunnion has 100% of the inside connection point. A curved bearing surface

such as a shackle bow has 75% of the inside connection point.

Next, the user must calculate the load bearing stress. This is accomplished by dividing the applied force on the lifting sling by the load bearing area value calculated above.

Example: Calculate the load bearing stress on a SP600 sling with 6,000 pounds of force applied used in the bow of a 5/8" shackle and verify that it does not exceed 7,000 PSI during sling loading.

STEP 1: Effective contact width = 2" X 0.75 = 1.5 inches

STEP 2: Load bearing area = 1.5" inches X 5/8 inch = 0.9375 square inches

STEP 3: Load bearing stress = 6,000 pounds / 0.9375 square inches = 6,400 PSI

ROUND SLING		HARDWARE SIZE			
SIZE	CAPACITY IN POUNDS	MIN STOCK DIAMETER	MIN DIAMETER IN INCHES	MIN EFFECTIVE CONTACT WIDTH	MIN EFFECTIVE CONTACT WIDTH IN INCHES
SP300	3,000	.39	7/16	.97	1
SP600	6,000	.59	5/8	1.29	1-3/8
SP900	9,000	.72	3/4	1.66	1-3/4
SP1200	12,000	.85	7/8	1.78	1-7/8
SP1400	14,000	.95	1	2.00	2
SP1700	17,000	1.12	1-1/8	2.13	2-1/8
SP2200	22,000	1.15	1-3/16	2.62	2-5/8
SP2600	26,000	1.25	1-1/4	2.85	2-7/8
SP3200	32,000	1.41	1-1/2	3.15	3-1/4
SP5000	50,000	1.60	1-5/8	3.57	3-5/8
SP6000	60,000	1.90	2	4.00	4
SP7000	70,000	2.05	2-1/8	4.60	4-5/8
SP10000	100,000	2.46	2-1/2	5.22	5-1/4

TWIN-PATH® SLINGS

TWIN-PATH® EXTRA SLING WITH COVERMAX® AND K-SPEC® CORE YARN



US Patent #4,850,629 & 5,651,572 CN #1,280,458 & #2,195,393
Italy #97300367.6 Japan #2929431 Australia #707924

TPXC This is the world's first truly ergonomic sling. It has a bulked nylon outer cover for superior abrasion resistance. These are made in sizes up to 500,00 lbs. vertical rated capacity. Larger capacity slings are available on special order. Extra Heavy Duty Covermax® is standard on 40,000 lb. vertical capacity and higher. These slings have overload tell-tails, inner red cover, and are used worldwide in place of wire rope slings for heavy lifts. They are about 10% of the weight of a steel sling. These products are repairable. The Twin-Path® patented design provides the rigger with two connections between the hook and the load for redundant back-up protection. These slings have 1% stretch at rated capacity compared to braided polyester round slings which can stretch up to 9%. If ergonomics, productivity and safety are important, then these slings are the only choice. This is the lightest and strongest sling on the market today with K-Spec®, the longest lasting load bearing core yarn, backed by independent testing. All slings have fiber optic internal inspection system.

TWIN-PATH® EXTRA COVERMAX® SPECIFICATIONS

Please note: Capacities shown include both paths and are for one complete sling. Sling ratings based on fittings of equal or greater capacity. Conforms to ANSI/ASME B30.9 chapter 6, NAVFAC P-307 section 14.6.4.3, and the Cordage Institute Roundsling Standard.

	RATED CAPACITIES IN POUNDS • 5:1 DESIGN FACTOR					APPROXIMATE WEIGHT POUNDS/FOOT BEARING-BEARING OF SLING LENGTH	NOMINAL BODY WIDTH IN INCHES
	VERTICAL	CHOKER	90° BASKET	60° BASKET	45° BASKET		
TPXCF8500	85,000	68,000	170,000	147,220	120,190	1.65	3 - 6
TPXCF10000	100,000	80,000	200,000	173,200	141,400	1.84	3 - 6
TPXCF12500	125,000	100,000	250,000	216,500	176,750	2.35	4 - 8
TPXCF15000	150,000	120,000	300,000	259,800	212,100	2.66	4 - 8
TPXCF17500	175,000	140,000	350,000	303,100	247,450	3.14	5 - 10
TPXCF20000	200,000	160,000	400,000	346,400	282,800	3.45	5 - 10
TPXCF25000	250,000	200,000	500,000	433,000	353,500	4.07	5 - 10
TPXCF27500	275,000	220,000	550,000	476,300	388,850	4.61	6 - 12
TPXCF30000	300,000	240,000	600,000	519,600	424,200	4.92	6 - 12
TPXCF40000	400,000	320,000	800,000	692,800	565,600	6.54	7 - 14
TPXCF50000	500,000	400,000	1,000,000	866,000	707,000	8.15	8 - 16

INSPECTION OF TWIN-PATH® PRODUCTS

- Tell-Tails should extend past the tag area of each sling. If both Tell-Tails are not visible, remove the sling from service. If any part of the sling shows evidence of chemical degradation, remove it from service. Re- turn the sling to Olsen Chain and Cable for evaluation and possible repair.
- Slings should be inspected for evidence of cutting or tearing of the outer cover. Slings with cuts should be removed from service and sent back to Olsen Chain and Cable for repair evaluation. Damage to the cover may indicate core damage.
- Inspect the slings for evidence of heat damage. Aramid Sparkeater Slings should not be exposed to temperatures over 149°C / 300°F. K-Spec® and Polyester Core Slings should not be exposed to temperatures above 82°C / 180°F. Cold temperature exposure down to -40°C / -40°F does not effect the strength of these products. Other temperatures should be referred to Olsen Chain and Cable for evaluation.

- Slings using aluminum fittings shall not be used where fumes, vapors, sprays, or mists of alkalis or acids are present.
- Twin-Path® Lifting Slings and any fittings attached should be the subject of frequent and regular inspections. In addition to the initial inspection by a competent person and frequent written inspections, the slings should be visually inspected before each use.
- Written inspections should be performed as required and documents of such inspection by a competent person shall be kept on file in the safety department of the plant or site where used. Inspections may be done more often based on frequency of use, severity of conditions, and experience of past service life.
- Slings should be examined throughout their length for abrasion, cuts, heat damage, fitting distortion or damage, tag legibility, and if any doubts are held by the inspector, the sling should be removed from service. Core integrity is determined by fiber optic light transfer if this type of Tell-Tail is installed in the sling. If a deterioration is found, the sling must be removed from service and returned to Olsen Chain and Cable for evaluation.
- Slings removed from service that are not capable of repair should be destroyed and rendered completely unfit for future use.
- Abrasion, heat damage, or cuts to the cover may indicate a loss of strength to the load core and these slings should not be used until evaluated by Olsen Chain and Cable. At area of damage, cover should be opened and the core yarns counted and visually inspected.

WHOOPIE SLINGS

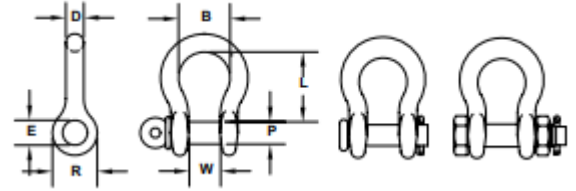
Whoopie (or whoopee) slings are an adjustable length lifting sling made from hollow core polyester rope. They are popular for arborists as well as for contractors in multiple other industries. They can be used to secure hardware around trees or posts, and as lifting slings for electrical transformers, motors and other loads where a snug fit and finite length adjustability are ideal. They are quick and easy to adjust and have one adjustable eye where the tail end runs through the sling body, and one fixed eye on the opposite end. To adjust the length of the sling, simply just pull the “tail” of the adjustable eye through the body to achieve the desired length. When you set the load the outer sling body tightens on itself like a Chinese finger giving you a secure pick or anchor point. Size and working load limit differentiated by color. Custom lengths and configurations available.



COLOR	SIZE	WORKING LOAD LIMIT (lbs.)		
		VERTICAL	CHOKER	BASKET
Blue	1/2"	2,200	1,760	4,400
Orange	3/4"	4,200	3,380	8,400
Red	5/8"	3,200	2,560	6,400

SHACKLES

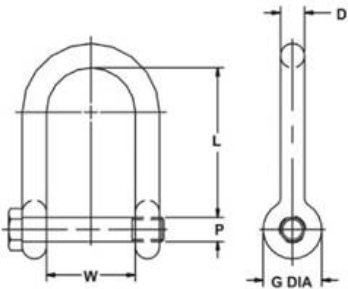
Olsen Chain proudly stocks American made CM Super Strong Anchor Shackles, in screw pin, Bolt/Nut/Cotter and Round Pin options. See the table below for dimensions and working loads. Painted and galvanized options available.



SIZE D (IN.)	WORKING LOAD LIMIT (TON)	STD. PKG.	WEIGHT (LBS)	DIMENSIONS					
				P	E	W	R	L	B (MIN.)
3/16	1/2	50	0.06	0.25	0.29	0.38	0.57	0.88	0.58
1/4	3/4	50	0.12	0.31	0.36	0.47	0.75	1.13	0.75
5/16	1	50	0.20	0.38	0.45	0.53	0.84	1.25	0.81
3/8	1-1/2	50	0.30	0.44	0.52	0.66	1.00	1.40	1.00
7/16	2	50	0.50	0.50	0.58	0.72	1.15	1.69	1.19
1/2	3	50	0.75	0.63	0.70	0.84	1.34	1.94	1.38
5/8	4-1/2	25	1.30	0.75	0.83	1.06	1.66	2.41	1.63
3/4	6-1/2	10	2.30	0.88	0.95	1.28	1.94	2.84	1.89
7/8	8-1/2	10	3.50	1.00	1.09	1.44	2.14	3.31	2.06
1	10	5	5.00	1.13	1.22	1.72	2.44	3.75	2.52
1-1/8	12	Bulk	7.00	1.25	1.36	1.84	2.66	4.02	2.69
1-1/4	14	Bulk	9.50	1.38	1.52	2.03	3.15	4.63	2.88
1-3/8	17	Bulk	12.50	1.50	1.65	2.25	3.25	5.19	3.25
1-1/2	20	Bulk	17.20	1.63	1.77	2.41	3.50	5.63	3.50
1-5/8	24	Bulk	23.50	1.75	1.88	2.66	3.91	6.13	4.13
1-3/4	30	Bulk	27.70	2.00	2.13	2.94	4.06	6.97	4.75
2	35	Bulk	39.00	2.25	2.38	3.28	4.51	7.44	5.50
2-1/2	55	Bulk	90.50	2.75	2.91	4.13	6.25	10.48	6.75

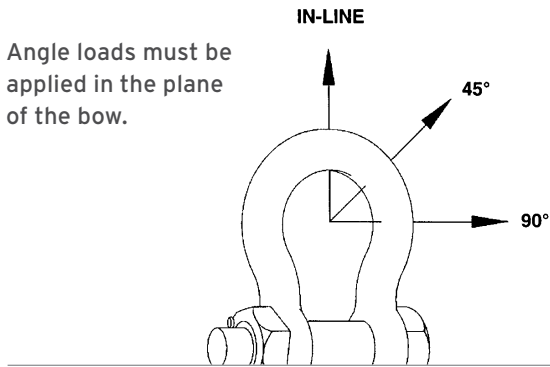
SHACKLES

LONG REACH SHACKLE



SIZE (IN.)	WLL (lbs.)	DIMENSIONS (in.)				
		P	D	L	W	G
5/8	7000	0.75	0.63	4.00	2.25	1.57
3/4	10000	0.88	0.75	5.00	2.75	1.81
1	19000	1.00	1	5.50	3.25	2.38
1 1/4	28000	1.38	1.25	6.19	3.88	3.06
1 1/2	34000	1.50	1.50	7.00	4.50	3.50
1 3/4	50000	2.00	1.75	8.00	5.25	4.00

SHACKLES

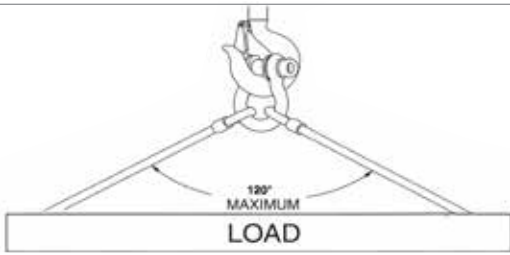


Side Loading Reduction Chart for Screw Pin and Bolt Type Shackles Only**

Angle of Side Load from Vertical In-Line of Shackle	Adjusted Working Load Limit
0° In-Line*	100% of Rated Working Load Limit
45° In-Line*	70% of Rated Working Load Limit
90° In-Line*	50% of Rated Working Load Limit

*In-Line load is applied perpendicular to pin.
****DO NOT SIDE LOAD ROUND PIN SHACKLES**

NEVER EXCEED 120° INCLUDED ANGLE
 Use Bolt Type and Screw Pin Shackles ONLY.



Shackles symmetrically loaded with two leg slings having a maximum included angle of 120° can be utilized to full Working Load Limit.

GREEN PIN STANDARD SCREW PIN ANCHOR AND BOLT/NUT/COTTER SHACKLES

WORKING LOAD LIMIT (TON)	SIZE (in.)
1/3	3/16
1/2	1/4
3/4	5/16
1	3/8
1.5	7/16
2	1/2
3.25	5/8
4.75	3/4
6.5	7/8
8.5	1
9.5	1 1/8
12	1 1/4
13.5	1 3/8
17	1 1/2
25	1 3/4
35	2
42.5	2 1/4
55	2 1/2

GREEN PIN SUPER SHACKLE SCREW PIN AND BOLT/NUT/COTTER

WORKING LOAD LIMIT (TON)	SIZE (in.)
3.3	1/2
5	5/8
7	3/4
9.5	7/8
12.5	1
15	1 1/8
18	1 1/4
21	1 3/8
30	1 1/2
40	1 3/4
55	2
85	2 3/4

GREEN PIN LONG REACH BOLT NUT COTTER

WORKING LOAD LIMIT (TON)	SIZE (in.)
4.6	3/4
8.6	1 1/8
15.5	1 1/2

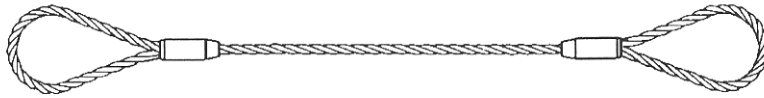


COLUMBUS MCKINNON LONG REACH SHACKLES

SIZE (in.)	WORKING LOAD LIMIT (lbs.)	SCREW PIN WEIGHT (lbs.)	BOLT, NUT, COTTER WEIGHT (lbs.)
5/8	7,000	1.80	1.95
3/4	10,000	2.72	3.21
1	19,000	5.86	6.31
1 1/4	28,000	11.90	12.90
1 1/2	34,000	19.60	20.70
1 3/4	50,000	30.70	33.30

SHACKLES

MECHANICAL SPLICE WIRE ROPE SLINGS



Standard eyes are formed using the Flemish Eye splice. Ends are secured with a pressed carbon steel sleeve. Pull is directly along the centerline of wire rope body and eye. This sling gives the most efficient use of rope capacity and is the most economical. Also commonly known as swedge slings.

WIRE ROPE DIAMETER (INCHES)	SINGLE PART BODY - XIPS - IWRC - RATED CAPACITY IN POUNDS*						EYE DIMENSIONS (APPROXIMATE)	
	VERTICAL	CHOKER**					WIDTH (INCHES)	LENGTH (INCHES)
1/4	1,300	960	2,600	2,200	1,820	1,300	2	4
5/16	2,000	1,480	4,000	3,400	2,800	2,000	2-1/2	5
3/8	2,800	2,200	5,600	5,000	4,000	2,800	3	6
7/16	3,800	2,800	7,600	6,800	5,400	3,800	3-1/2	7
1/2	5,000	3,800	10,000	8,800	7,200	5,000	4	8
9/16	6,400	4,800	12,800	11,000	9,000	6,400	4-1/2	9
5/8	7,800	5,800	15,600	13,600	11,000	7,800	5	10
3/4	11,200	8,200	22,400	19,400	15,800	11,200	6	12
7/8	15,200	11,200	30,400	26,000	22,000	15,200	7	14
1	19,600	14,400	39,200	34,000	28,000	19,600	8	16
1-1/8	24,000	18,200	48,000	42,000	34,000	24,000	9	18
1-1/4	30,000	22,000	60,000	52,000	42,000	30,000	10	20
1-3/8	36,000	26,000	72,000	62,000	50,000	36,000	11	22
1-1/2	42,000	32,000	84,000	74,000	60,000	42,000	12	24
1-5/8	48,000	36,000	96,000	84,000	70,000	48,000	13	26
1-3/4	56,000	42,000	112,000	98,000	80,000	56,000	14	28
2	74,000	56,000	148,000	126,000	104,000	74,000	16	32

WIRE ROPE SLINGS

Larger capacity slings available, please call or email for details

* Rated capacities for unprotected eyes apply only when attachment is made over an object narrower than the natural width of the eye, and apply for basket hitches only when the D/d ratio is 25 or greater, where D=Diameter of the curvature around which the body of the sling is bent, and d=the nominal diameter of the wire rope.





** See the Choker Hitch Rated Capacity Adjustment Chart on page 26.



WIRE ROPE RIGGER SLINGS

An eye is formed from the end of a single wire rope and bent back along the wire rope body. Strands are hand tucked back into the body of the rope on one end. This splice is then tapered and concealed. The other end of the sling uses a mechanical splice to form the eye and has a steel sleeve where the eye meets the body. The hand spliced eye will easily pull through narrow spaces with less chance of damaging material. Rigger slings in diameters above 1" available upon request.



WIRE ROPE DIAMETER (INCHES)	SINGLE PART BODY - XIPS - FC RATED CAPACITY IN POUNDS*						EYE DIMENSIONS (APPROXIMATE)	
	VERTICAL	CHOKER**					WIDTH (INCHES)	REACH (INCHES)
3/8	2,400	1,880	4,800	4,000	3,400	2,400	3	6
7/16	3,200	2,600	6,400	5,400	4,400	3,200	3-1/2	7
1/2	4,000	3,200	8,000	7,000	5,800	4,000	4	8
9/16	5,000	4,200	10,000	8,800	7,200	5,000	4-1/2	9
5/8	6,200	5,200	12,400	10,600	8,800	6,200	5	10
3/4	8,600	7,400	17,200	14,800	12,200	8,600	6	12
7/8	11,400	10,000	22,000	19,600	16,000	11,400	7	14
1	14,800	12,800	30,000	26,000	20,000	14,800	8	16

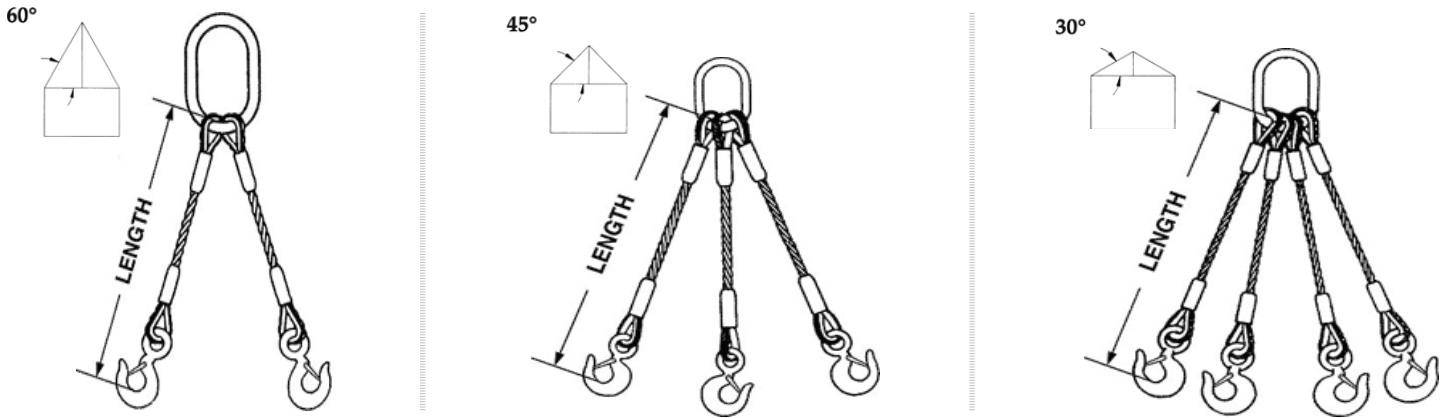
* Rated capacities for unprotected eyes apply only when attachment is made over an object narrower than the natural width of the eye, and apply for basket hitches only when the D/d ratio is 25 or greater, where D=Diameter of the curvature around which the body of the sling is bent, and d=the nominal diameter of the wire rope.

** See the Choker Hitch Rated Capacity Adjustment Chart on page 26.

WIRE ROPE SLINGS

MECHANICAL SPLICE BRIDLE WIRE ROPE SLINGS

Standard eyes are formed using the Flemish Eye splice. Ends are secured with a pressed carbon steel sleeve. Bridle slings can be fabricated with plain eyes or thimble eyes. On request, special hardware can also be used. Oblong master links and latching eye hooks are standard.



WIRE ROPE DIAMETER (INCHES)	SINGLE PART BODY - XIPS - IWRC - RATED CAPACITY IN POUNDS*								
	2-LEG BRIDLE			3-LEG BRIDLE			4-LEG BRIDLE		
	60°	45°	30°	60°	45°	30°	60°	45°	30°
1/4	2,200	1,820	1,300	3,400	2,800	1,940	4,400	3,600	2,600
5/16	3,400	2,800	2,000	5,200	4,200	3,000	7,000	5,600	4,000
3/8	5,000	4,000	2,800	7,400	6,000	4,400	10,000	8,200	5,800
7/16	6,800	5,400	3,800	10,000	8,200	5,800	13,400	11,000	7,800
1/2	8,800	7,200	5,000	13,200	10,800	7,600	17,600	14,200	10,200
9/16	11,000	9,000	6,400	16,600	13,600	9,600	22,000	18,000	12,800
5/8	13,600	11,000	7,800	20,000	16,600	11,800	28,000	22,000	15,600
3/4	19,400	15,800	11,200	30,000	24,000	16,800	38,000	32,000	22,000
7/8	26,000	22,000	15,200	40,000	32,000	22,000	52,000	42,000	30,000
1	34,000	28,000	19,600	52,000	42,000	30,000	68,000	56,000	40,000
1-1/8	42,000	34,000	24,000	62,000	52,000	36,000	84,000	68,000	48,000
1-1/4	52,000	42,000	30,000	76,000	62,000	44,000	102,000	84,000	60,000
1-3/8	62,000	50,000	36,000	92,000	76,000	54,000	124,000	100,000	72,000
1-1/2	74,000	60,000	42,000	110,000	90,000	64,000	146,000	120,000	84,000
1-5/8	84,000	70,000	48,000	126,000	104,000	74,000	170,000	138,000	98,000
1-3/4	98,000	80,000	56,000	148,000	120,000	84,000	196,000	160,000	114,000
2	126,000	104,000	74,000	190,000	156,000	110,000	254,000	208,000	146,000

WIRE ROPE SLINGS



6 AND 8 PART BRAIDED WIRE ROPE SLINGS

High flexibility is achieved by braiding, or plaiting, one or more wire ropes to form a fabric for the sling body. Component ropes run continuously through the body and eyes, ends are hand-tucked into the sling body or secured with sleeves. The 6-part sling has a flat body; the 8-part sling has a round body.

TYPE	SIZE (INCHES)	SLING DIA. (INCHES)	RATED WORKING LOAD LIMIT IN POUNDS						EYE DIMENSIONS (INCHES)	
			VERTICAL	CHOKER**	BASKET HITCH				Width	Length
					Vertical	60°	45°	30°		
6 PART BODY	3/32	7/16	840	740	1,680	1,450	1,190	840	2	4
	1/8	13/16	1,680	1,480	3,400	2,900	2,380	1,680	3	6
	3/16	13/16	2,600	2,200	5,200	4,500	3,680	2,600	4	8
	1/4	1-1/8	4,600	4,000	9,200	7,970	6,500	4,600	5	10
	5/16	1-3/8	7,200	6,400	14,400	12,470	10,180	7,200	6	12
	3/8	1-11/16	10,200	9,000	20,400	17,670	14,420	10,200	7	14
	7/16	2	13,800	12,000	27,600	23,900	19,510	13,800	8	16
	1/2	2-1/4	18,000	15,800	36,000	31,180	25,450	18,000	9	18
	9/16	2-1/2	22,000	19,200	44,000	38,100	31,110	22,000	10	20
	5/8	2-13/16	28,000	24,000	56,000	48,500	39,600	28,000	11	22
	3/4	3-3/8	40,000	36,000	80,000	69,280	56,560	40,000	12	24
	7/8	4	54,000	48,000	108,000	93,530	76,360	54,000	14	28
1	4-1/2	70,000	62,000	140,000	121,240	98,980	70,000	16	32	
8 PART BODY	3/32	7/16	1,120	980	2,240	1,940	1,580	1,120	2	4
	1/8	9/16	2,200	1,920	4,400	3,810	3,110	2,200	3	6
	3/16	13/16	3,400	3,000	6,800	5,890	4,800	3,400	4	8
	1/4	1-1/8	6,200	5,400	12,400	10,740	8,770	6,200	5	10
	5/16	1-3/8	9,600	8,400	19,200	16,630	13,570	9,600	6	12
	3/8	1-11/16	13,600	12,000	27,200	23,560	19,230	13,600	7	14
	7/16	2	18,600	16,200	37,200	32,220	26,300	18,600	8	16
	1/2	2-1/4	24,000	22,000	48,000	41,570	33,940	24,000	9	18
	9/16	2-1/2	30,000	26,000	60,000	51,960	42,420	30,000	10	20
	5/8	2-13/16	38,000	34,000	76,000	65,820	53,730	38,000	11	22
	3/4	3-3/8	54,000	48,000	108,000	93,530	76,360	54,000	12	24
	7/8	4	72,000	64,000	144,000	124,700	101,810	72,000	14	28
1	4-1/2	94,000	82,000	188,000	162,810	132,920	94,000	16	32	

*Rated capacities for unprotected eyes apply only when attachment is made over an object narrower than the natural width of the eye, and apply for basket hitches only when the D/d ratio is 25 or greater, where D=Diameter of the curvature around which the body of the sling is bent, and d=the nominal diameter of the wire rope.

**See the Choker Hitch Rated Capacity Adjustment Chart on page 26.



MECHANICAL SPLICE CONCRETE PIPE/DONKEY SLINGS

Standard eye is formed using the Flemish Eye splice. End is secured with a pressed carbon steel ferrule. Pull is directly along the centerline of wire rope body and eye. This sling gives the most efficient use of rope capacity and is the most economical way to handle concrete water / sewer pipe. Keeper (teacup) holds the sling on the inside of the pipe and is sold separately.

WIRE ROPE DIAMETER (INCHES)	SINGLE PART BODY · XIPS · IWRC · RATED CAPACITY IN POUNDS *	EYE DIAMETER (APPROXIMATE)		KEEPER (TEACUP) PART NUMBER	KEEPER (TEACUP) COLOR	FINISHED FERRULE DIAMETER
		WIDTH (INCHES)	LENGTH (INCHES)			
1/2	5,000	4	8	11575	ORANGE	7/8"
5/8	7,800	5	10	11576	GRAY	1-1/8"
3/4	11,200	6	12	11577	BLUE	1-3/8"
7/8	15,200	7	14	11578	BLACK	1-1/2"
1	19,600	8	16	11579	RED	1-3/4"
1-1/8	24,000	9	18	11580	GREEN	2"
1-1/4	30,000	10	20	11581	YELLOW	2-1/4"
1-3/8	36,000	11	22	11582	WHITE	2-1/2"
1-1/2	42,000	12	24	11583	ORANGE	2-3/4"
1-3/4	56,000	14	28	11783	BROWN	3"



**Rated capacities for unprotected eyes apply only when attachment is made over an object narrower than the natural width of the eye, and apply for basket hitches only when the D/d ratio is 25 or greater, where D=Diameter of the curvature around which the body of the sling is bent, and d=the nominal diameter of the wire rope.*

WIRE ROPE SLINGS

EVERY LIFT USES 1 OF 3 BASIC HITCHES

Vertical, or straight, attachment is simply using a sling to connect a lifting hook to a load. Full rated lifting capacity of the sling may be utilized, but must not be exceeded.

A tagline should be used to prevent load rotation which may damage the sling. When two or more slings are attached to the same lifting hook, the total hitch becomes, in effect, a lifting bridle, and the load is distributed equally among the individual slings.

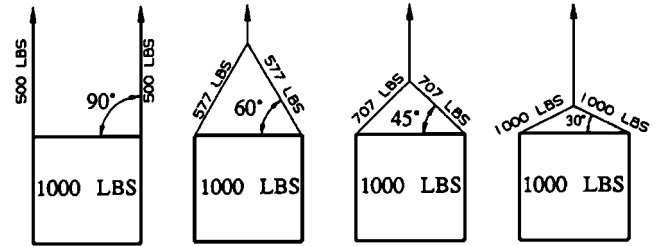
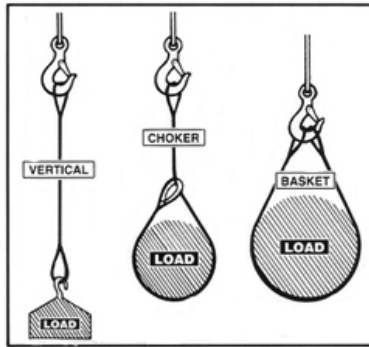
Choker hitches reduce the lifting capability of a sling, since this method of rigging affects the ability of sling components to adjust during the lift. A choker is used when the load will not be seriously damaged by the sling body - or the sling damaged by the load, and when the lift requires the sling to snug up against the load. The diameter of the bend where the sling contacts the load should keep the point of choke against the sling BODY - never against a splice or the base of the sling eye. When a choke is used at an angle of less than 120° the sling rated capacity must be adjusted downward.

Basket hitches distribute a load equally between the two legs of a sling, within limitations described below. Capacity of a sling used in a basket is affected by the bend, or curvature, where the sling body comes into contact with the load, just as any wire rope is affected and limited by bending actions, as over a sheave.

CALCULATING THE LOAD ON EACH LEG OF A SLING

As the horizontal angle between the legs of a sling and the load decreases, the load on each leg increases. The effect is the same whether a single sling is used as a basket, or two slings are used with each in a straight pull, as with a two-leg bridle.

Anytime pull is exerted at an angle on a leg of a sling, the load per leg can be determined by using the data in the example on this page. Proceed as follows to calculate the load and determine the rated capacity required of the sling, or slings, needed for a lift.



HORIZONTAL ANGLE EXAMPLES

In this example, it is assumed the load weight is 1000 pounds and the load is distributed equally between all legs.

1. First, divide the total weight to be lifted by the number of legs to be used. This provides the load per leg if the lift were being made with all legs lifting vertically.
2. Determine the horizontal angle.
3. Then MULTIPLY the load per leg (as computed in Number 1 above) by the proper Load Factor to compute the ACTUAL LOAD on each leg for this lift angle. THE ACTUAL LOAD MUST NOT EXCEED THE RATED SLING CAPACITY.

In the second drawing with a horizontal angle of 60° :

1. Use $1000 \div 2 = 500$ pounds load per leg vertical.
2. The angle is 60° - Load Factor is 1.155.
3. $500 \times 1.155 = 577$ pounds ACTUAL LOAD on each leg at the 60° horizontal angle being used.

In the third drawing with a horizontal angle of 45° :

1. Use $1000 \div 2 = 500$ pounds load per leg vertical.
2. The angle is 45° - Load Factor is 1.414
3. $500 \times 1.414 = 707$ pounds ACTUAL LOAD on each leg at the 45° horizontal angle being used.

In the fourth drawing with a horizontal angle of 30° :

1. Use $1000 \div 2 = 500$ pounds load per leg vertical.
2. The angle is 30° - Load Factor is 2.0
3. $500 \times 2.0 = 1000$ pounds ACTUAL LOAD on each leg at the 30° horizontal angle being used.

As illustrated in the last example, horizontal angle is very important and can have a dramatic effect on the load exerted on a sling. The above examples show that when the horizontal angle DECREASES, the load on each leg INCREASES. This principle applies whether one sling is used with legs at an angle in a basket hitch, or for multi-leg bridle slings. DO NOT use slings in lifting situations with horizontal angles of less than 30 degrees.

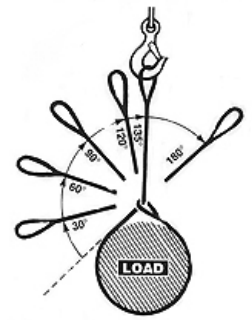
SLING EYE DESIGN

Sling eyes are designed to provide what amounts to “small inverted slings” at the ends of the sling body. Therefore the width of the eye opening will be affected by the same general forces which apply to legs of a sling rigged as a basket. A sling eye should never be used over a hook or pin with a body diameter larger than the natural width of the eye. Never force an eye onto a hook. On the other hand, the eye should always be used on a hook or pin with at least the nominal diameter of the rope - since applying the D/d Ratio shows an efficiency loss of approximately 50% when the relationship is less than 1/1.



CHOKER HITCH RATED CAPACITY ADJUSTMENT

When a choker hitch is drawn tight at an angle of less than 120°, the capacity must be downrated by the percentage indicated in the Rated Capacity table below. In controlled tests, where the angle was less than 120°, the sling body always failed at the point of choke when pulled to destruction. Allowance for this phenomenon must be made anytime a choker hitch is used to shift, turn, or control a load, and also when the pull is against the choker in a multi-leg lift.

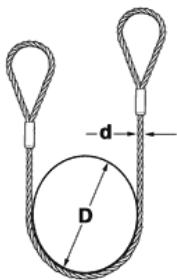


D/d RATIOS APPLIED TO SLINGS



Eye length must NOT be smaller than twice the diameter of the object rigged inside the eye of the sling. NEVER force an object (hook, shackle, etc.) into the eye of a sling.

If the shackle body has AT LEAST the same diameter as the sling (D/d is 1/1) the capacity does not need to be adjusted down.



If the object lifted with a 6-strand wire rope sling in a basket hitch is at least 25 times larger than the sling diameter (D/d is 25/1) the basket capacity does not need to be adjusted down.

When rigged as a basket, the DIAMETER of the bend where a sling contacts the load can be a limiting factor on sling capacity. Standard D/d ratios, where “D” is the diameter of the bend and “d” is the diameter of the wire rope, are applied to determine efficiency of various sling constructions.

ANGLE OF CHOKE IN DEGREES	PERCENT OF RATED CAPACITY IWRC AND FC ROPE
120-180	100
90-119	87
60-89	74
30-59	62
0-29	49

SLING ANGLE AND RATED CAPACITY

The horizontal angle formed by a sling leg and the load surface is the most common sling angle considered in most wire rope sling catalogs. As this angle decreases, the rated capacity of the sling decreases. The sling angle is such a common consideration that most tables show rated capacities for two wire rope slings at 60°, 45°, and 30°. These ratings may be safely applied to other angles having these approximate values, except for angles below 30°.

On these angles, the rated capacity decreases so rapidly that their use should be limited to necessary applications where headroom will not permit a more favorable angle. Such applications should always be computed to insure that large enough lifting slings are used. In general, a design factor of approximately 5:1 is maintained throughout most wire rope sling catalogs. This design factor of 5:1 is normal for new, unused wire rope slings. Certain wire rope sling fittings cannot be assigned a definite numerical design factor. In such cases, suitable rated capacities are listed based on experience and sound engineering practice.

WIRE ROPE SLINGS

SAFETY REQUIREMENTS

WARNING: Consult industry recommendations and OSHA standards for proper application.

DO NOT exceed rated capacity of sling. Rated capacity of sling applies to a new and unused sling.

DO inspect sling before each use. Tensile strength of a sling may decrease with each use.

DO NOT allow sling to rotate at either end. Sling may fail if damaged, abused, misused, overused, or improperly maintained.

ALWAYS FOLLOW THESE GUIDELINES:

- Determine weight of load.
- Select a sling of suitable capacity.
- When in doubt, use a larger capacity sling.
- **DO NOT** run a sling around sharp corners without corner guards.
- **DO NOT** attach sling to fittings with diameters smaller than sling rope diameter.
- Avoid formation of kinks, loops, or twists in the legs or sling body.
- Examine sling for damage and worn areas.
- Take up slack slowly to avoid shock loading the sling.
- Use a tag line on the load if necessary to prevent sling and load rotation
- **DO NOT** use sling with hand tucked splices where rotation will allow unlaying of wire rope and splice.
- **DO NOT** shorten sling using knots, clips, or other means.
- Keep sling well lubricated to resist corrosion.
- **DO NOT** use old or used wire ropes for slings.
- Discard sling if it is damaged, worn, corroded, or exposed to a corrosive environment.



CARE OF WIRE ROPE SLINGS

Lubrication – Wire rope slings normally require no additional lubrication other than what may be required for the prevention of corrosion or acid embrittlement when environmental conditions so dictate.

Safe Operating Temperatures – Fiber core wire rope slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200° F. Non-fiber core wire rope slings of any grade are used at temperatures above 400° F or below minus 60° F. Recommendations of the sling manufacturer regarding use at that temperature shall be followed.

Storage – Wire rope slings of all grades should be stored in an area where they will not be damaged by moisture, extreme heat, corrosion, being run-over, or being kinked.

Sling Care – Proper care and usage are essential for maximum service and safety. Wire rope slings should be protected from sharp bends and cutting edges by means of corner saddles, burlap padding, or wood blocking. Heavy or continuous overloading should be avoided as well as sudden jerks which can build up a momentary overload sufficient to break the sling. Slings should be hung up vertically when not in use.

USE OF WIRE ROPE SLINGS

SAFE OPERATING PRACTICES

Whenever any sling is used, the following practices shall be observed:

- Slings that are damaged or defective shall be immediately removed from service and not used.
- Eyes in wire rope slings shall not be formed by using knots or wire rope clips.
- Slings shall not be shortened with knots, bolts, or other makeshift devices.
- Sling legs shall not be kinked.
- Slings shall not be loaded in excess of their rated capacities.
- Slings used in a basket hitch shall have the loads balanced to prevent slippage.
- Slings shall be securely attached to their loads.
- Slings shall be padded, protected, or 'cribbed' from the sharp edges of their loads.
- Suspended loads shall be kept clear of all obstructions.
- All employees shall be kept clear of loads about to be lifted and of suspended loads.
- Hands or fingers shall be kept clear of loads about to be lifted and of suspended loads.
- **SHOCK LOADING IS PROHIBITED.**
- A sling shall not be pulled from under a load when the load is resting on the sling.

Welded end attachments shall not be used unless proof tested by the manufacturer or equivalent entity at twice their rated capacity prior to initial use. The employer shall retain a certificate of the proof test and make it available for examination.

Welding of end attachments, except covers to thimbles, shall be performed prior to the assembly of the sling.



INSPECTION OF WIRE ROPE SLINGS

Each day, before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use, where service conditions warrant (such as overload, accident, severe use, etc.). Damaged or defective slings shall be immediately removed from service.

Written inspection records should be kept on file for all slings. These records should show a description of the new sling and its condition on each subsequent inspection.

Always consult current OSHA laws and ASME regulations regarding inspection of slings.

REPLACEMENT OF WIRE ROPE SLINGS

Wire rope slings shall be immediately removed from service if any of the following conditions are present:

- Ten (10) randomly distributed broken wires in one rope lay, or five (5) broken wires in one strand in one rope lay.
- Wear or scraping of one-third the original diameter of outside individual wires.
- Kinking, crushing, bird caging, or any other damage resulting in distortion of the wire rope structure.
- Evidence of heat damage.
- End attachments that are cracked, deformed, or worn.
- Hooks that have been opened more than 15% of the normal throat opening measured at the narrowest point or twisted more than 10° from the plane of the unbent hook.
- Corrosion of the rope or end attachments.



HOW TO ORDER WIRE ROPE SLINGS

Even though making lifts with slings may become routine, sling selection should not become a casual process, for the whole job depends, literally, on the sling. The following is an accepted procedure for arriving at the proper sling for a lift:

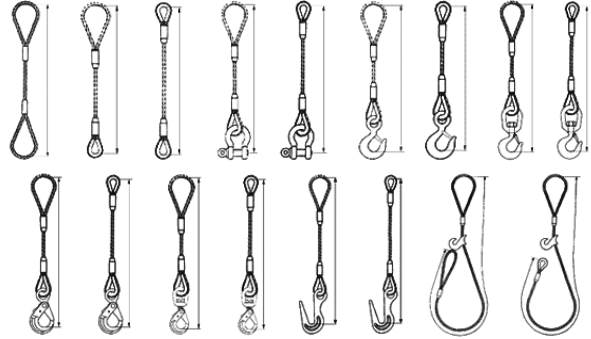
- 1. DETERMINE THE WEIGHT.** The load to be lifted must be known. If it is not, proper steps must be taken to ensure a sling with more than adequate rated capacity is chosen.
- 2. DECIDE ON THE HITCH.** You must accommodate the load's shape and size as well as its weight. Consideration must be given to possible physical damage to the load as well as providing a positive attachment. The hitch you choose may affect your choice of sling construction.
- 3. LIFTING DEVICE.** Obviously the lifting device, whatever it is, must have sufficient capacity and be in proper working condition and provide any maneuverability required once the load is hoisted. The sling must also fit onto this device.
- 4. ROOM TO LIFT.** Be sure the lifting device has sufficient headroom to pick up the load and handle it when the length of the sling is added to the hook.
- 5. SLING LENGTH.** Determine the longest sling possible for completing the lift with this lifting device in this situation. Since the longest sling will provide the largest horizontal angle in most cases, this will account for minimum stress on the sling.
- 6. USE RATED CAPACITY CHART.** Don't guess. Double check that the sling length, type, and diameter you choose, when rigged at the angle you select, will accommodate the load you will be lifting.

THIMBLES

Thimbles are metallic devices offered to protect the sling eyes from abrasion and abuse. Heavy-duty thimbles are standard but other types are available. Please specify at the time of ordering if you require thimbles in your sling eyes.

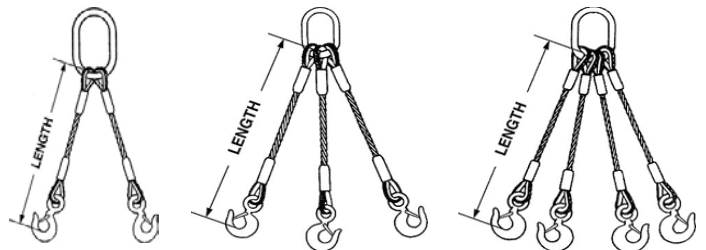
HOW TO MEASURE SLINGS

Specify the length of a sling in feet and inches. This will be understood to be the bearing to bearing length as shown in the following illustrations. Grommet slings (endless slings) should be specified by the bearing to bearing measurement or the circumference.



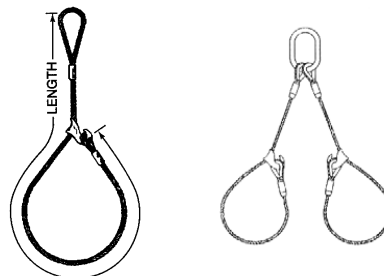
BRIDLE SLINGS

Specify the bearing length of a sling in feet and inches. All bridle slings are supplied with oblong master links, but can be supplied with pear links on request. Thimbles, turnbuckles, and various other attachments can be accommodated.



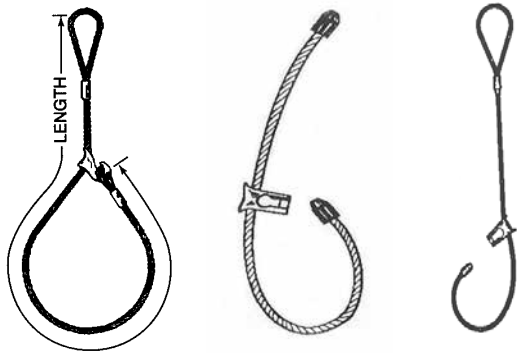
CHOKER SLINGS

Specify the bearing length of a sling in feet and inches. All choker sling bridles are supplied with oblong master links, but can be supplied with pear links on request. Thimbles, buttons, and various other attachments can be accommodated.



ADDITIONAL WIRE ROPE SLINGS

Olsen Chain and Cable also offers a wide variety of custom slings and wire rope assemblies for almost every situation. Please contact our sales staff for technical assistance and capacity rating information.

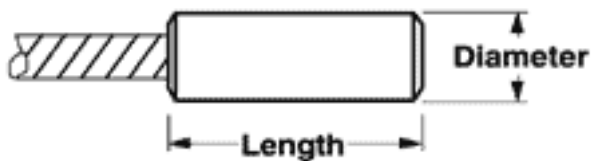
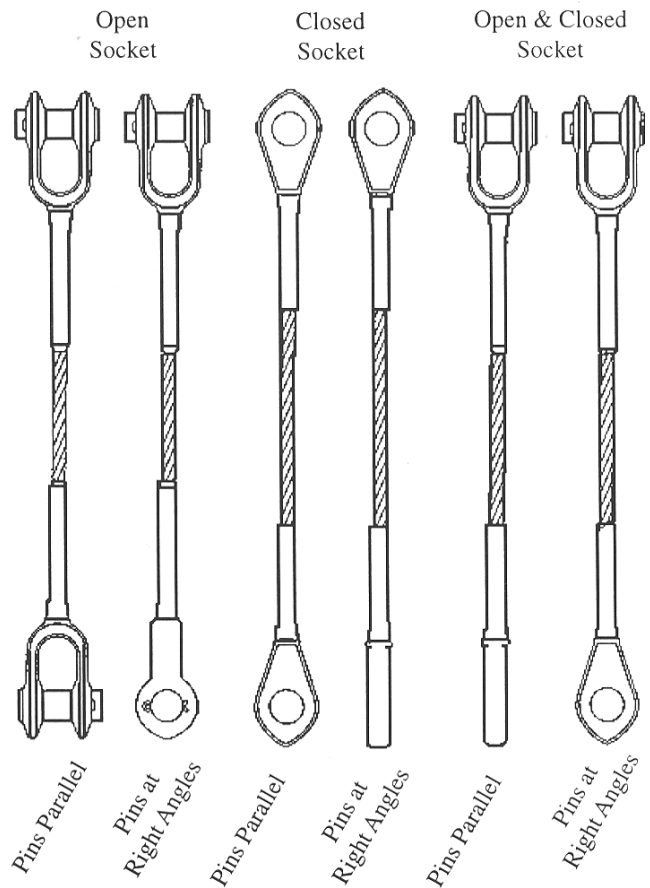


LOGGING I PIPE CHOKER WIRE ROPE SLINGS

These slings are available with a ferrule on each end, a ferrule / eye combination, and an eye / eye sling.

CRANE BOOM PENDANTS

Made per customer specifications and crane manufacturer specifications. Can be made with standard, modified, stainless steel or spelter sockets.



CUSTOM WIRE ROPE TERMINATIONS

Terminations include threaded stud ends, eye terminations, fork end terminations and custom drum ferrules. All custom terminations are manufactured on-site to customer's specifications.



WIRE ROPE

GENERAL PURPOSE CABLE

6 X 19 CLASS

6x19 Class wire ropes provide an excellent balance between fatigue and wear resistance. They give excellent service with sheaves and drums of moderate size. 6x19 Class ropes contain 6 strands with 15 through 26 wires per strand, no more than 12 of which are outside wires.

Dia (in)	Nominal Strength* In Tons (Bright or Drawn Galvanized)†		Approx. Wt/Ft (lbs)	
	XIP		IWRC	FC
	IWRC	FC		
1/4	3.40	3.02	0.116	0.105
5/16	5.27	4.69	0.18	0.164
3/8	7.55	6.71	0.26	0.236
7/16	10.2	9.09	0.35	0.32
1/2	13.3	11.8	0.46	0.42
9/16	16.8	14.9	0.59	0.53
5/8	20.6	18.3	0.72	0.66
3/4	29.4	26.2	1.04	0.95
7/8	39.8	35.4	1.42	1.29
1	51.7	46.0	1.85	1.68
1 - 1/8	65.0	57.9	2.34	2.13
1 - 1/4	79.9	71.0	2.89	2.63
1 - 3/8	96.0	85.4	3.50	3.18
1 - 1/2	114.0	101.0	4.16	3.78
1 - 5/8	132.0	118.0	4.88	4.44
1 - 3/4	153.0	136.0	5.67	5.15
1 - 7/8	174.0	155.0	6.50	5.91
2	198.0	176.0	7.39	6.72
2 - 1/8	221.0	197.0	8.35	7.59
2 - 1/4	247.0	220.0	9.36	8.51
2 - 3/8	274.0	144.0	10.4	9.48
2 - 1/2	302.0	269.0	11.6	10.5
2 - 5/8	331.0	...	12.8	11.6
2 - 3/4	361.0	...	14.0	12.7

*Acceptance strength is not less than 2-1/2% below the nominal strengths listed.

† Galvanizing: For class A wire rope (XIP and IPS grades only), deduct 10% from the nominal strength shown.

Dia (in)	Nominal Strength* In Tons (Bright or Drawn Galvanized)†		Approx. Wt/Ft (lbs)	
	XIP		IWRC	FC
	IWRC	FC		
1/4	3.40	3.02	0.116	0.105
5/16	5.27	4.69	0.18	0.164
3/8	7.55	6.71	0.26	0.236
7/16	10.2	9.09	0.35	0.32
1/2	13.3	11.8	0.46	0.42
9/16	16.8	14.9	0.59	0.53
5/8	20.6	18.3	0.72	0.66
3/4	29.4	26.2	1.04	0.95
7/8	39.8	35.4	1.42	1.29
1	51.7	46.0	1.85	1.68
1 - 1/8	65.0	57.9	2.34	2.13
1 - 1/4	79.9	71.0	2.89	2.63
1 - 3/8	96.0	85.4	3.50	3.18
1 - 1/2	114.0	101.0	4.16	3.78
1 - 5/8	132.0	118.0	4.88	4.44
1 - 3/4	153.0	136.0	5.67	5.15
1 - 7/8	174.0	155.0	6.50	5.91
2	198.0	176.0	7.39	6.72
2 - 1/8	221.0	197.0	8.35	7.59
2 - 1/4	247.0	220.0	9.36	8.51
2 - 3/8	274.0	144.0	10.4	9.48
2 - 1/2	302.0	269.0	11.6	10.5
2 - 5/8	331.0	...	12.8	11.6
2 - 3/4	361.0	...	14.0	12.7
3	425.0	...	16.6	15.1
3 - 1/8	458.0	...	18.0	16.4
3 - 1/4	492.0	...	19.5	17.7
3 - 3/8	529.0	...	21.0	19.1
3 - 1/2	564.0	...	22.7	20.6
3 - 5/8	602.0	...	24.3	...
3 - 3/4	641.0	...	26.0	...
3 - 7/8	680.0	...	27.7	...
4	720.0	...	29.6	...
4 - 1/8	761.0	...	31.4	...
4 - 1/4	803.0	...	33.4	...
4 - 3/8	846.0	...	35.4	...
4 - 1/2	889.0	...	37.4	...
4 - 5/8	934.0	...	39.5	...
4 - 3/4	979.0	...	41.7	...
4 - 7/8	1024.0	...	43.9	...
5	1070.0	...	46.2	...

6 X 37 CLASS

6x37 Class wire ropes are more flexible but less abrasion resistant than the 6x19 classification. Each strand contains numerous small diameter wires. As the number of wires increases, flexibility increases. 6x37 classification ropes contain 6 strands with 27 through 49 wires, no more than 18 of which are outside wires.

*Acceptance strength is not less than 2-1/2% below the nominal strengths listed.

† Galvanizing: For class A wire rope (XIP and IPS grades only), deduct 10% from the nominal strength shown.

ROTATION RESISTANT CABLE

Ropes specially designed for use when rotation must be kept to a minimum. Rotation resistant rope is created by laying inner strands in one direction, outer strands in the opposite direction. This has the effect of counteracting torque by reducing the tendency of the finished rope to rotate. **Strict adherence to breaking-in procedures and proper handling during use are extremely important with these ropes.** Refer to the Wire Rope Users Manual by the American Iron & Steel Institute for assistance in dealing with special design, maintenance, inspection, and removal criteria for this rope. We recommend that rotation resistant ropes be used with a MINIMUM DESIGN FACTOR OF FIVE (5)

19 X 7 ROTATION RESISTANT ROPE

For applications such as mobile cranes where single part hoist rope is used to lift a free load. Not recommended for multiple part lifting.

Dia (in)	Nominal Strength*	Approx. Wt/Ft (lbs)
3/16	1.57	0.064
1/4	2.77	0.113
5/16	4.30	0.177
3/8	6.15	0.25
7/16	8.33	0.35
1/2	10.8	0.45
9/16	13.6	0.58
5/8	16.8	0.71
3/4	24.0	1.02
7/8	32.5	1.39
1	42.2	1.82
1 - 1/8	53.1	2.30
1 - 1/4	65.1	2.80
1 - 3/8	78.4	3.43
1 - 1/2	92.8	4.08
1 - 5/8	108.0	4.80

*Acceptance strength is not less than 2-1/2% below the nominal strengths listed.

Note: These strengths apply only when a test is conducted with both ends fixed. When in use, the strength if these ropes may be reduced if one end is free to rotate.

8 X 19 ROTATION RESISTANT ROPE

Can be used for multiple part lifting. More easily damaged in service than other ropes. Also used for mobile cranes and overhead hoists.

Dia (in)	Nominal Strength*	Approx. Wt/Ft (lbs)
3/8	6.63	0.26
7/16	8.94	0.36
1/2	11.7	0.47
9/16	14.7	0.6
5/8	18.1	0.73
3/4	25.9	1.06
7/8	35.0	1.44
1	45.5	1.88
1 - 1/8	57.3	2.39
1 - 1/4	70.5	2.94
1 - 3/8	84.9	3.56
1 - 1/2	100.0	4.24

*Acceptance strength is not less than 2-1/2% below the nominal strengths listed.

Note: These strengths apply only when a test is conducted with both ends fixed. When in use, the strength if these ropes may be reduced if one end is free to rotate.

DYFORM® 34LR

Very strong. Most rotation resistant of all Bridon rotation resistant ropes. Can be used for the most demanding hoisting applications, primarily on tower cranes.

Diameter		Minimum Breaking Force* • Tons		Approx. Wt/Ft (lbs)
mm	in	1960	2160	
	1/2	15.40	17.42	0.54
13		16.19	18.21	0.57
14		18.88	21.13	0.65
	9/16	19.67	22.03	0.69
15		22.03	24.73	0.77
16	5/8	25.18	28.21	0.87
17	17	27.20	30.46	0.94
18		30.80	34.62	1.07
19	3/4	34.51	38.67	1.20
20		38.33	42.94	1.32
21		43.28	48.45	1.49
22		46.65	52.38	1.61
	7/8	47.21	53.06	1.65
23		50.69	56.88	1.75
24		55.64	62.38	1.92
25		60.59	67.89	2.10
	1	62.38	70.03	2.16
26		66.09	74.19	2.28
28		75.99	85.20	2.63
	1 - 1/8	77.45	86.89	2.70
30		86.44	97.01	2.99
32	1 - 1/4	98.13	110.16	3.39
35	1 - 3/8	116.90	123.65	4.05
38	1 - 1/2	138.26	147.25	4.78

*Listed minimum breaking force is for 1960 and 2160 grade bright (ungalvanized) ropes. Call for minimum breaking force of galvanized ropes.

Please call for sizes and specifications on the 35LS

DYFORM®-18 HSLR

Compacted strand construction with outside strands laid opposite the inside strands. Better rotation resistance and up to 35% greater strength than conventional 19x7 XIP wire rope. Excellent resistance to abrasion; reduced sheave and drum wear.

*Acceptance strength is not less than 2-1/2% below the nominal strengths listed.

Note: These strengths apply only when a test is conducted with both ends fixed. When in use, the strength if these ropes may be reduced if one end is free to rotate.

Dia (in)	Nominal Strength* (tons)	Approx. Wt/Ft (lbs)
3/8	8.3	0.27
7/16	11.2	0.37
1/2	14.6	0.51
9/16	18.5	0.64
5/8	22.7	0.79
3/4	32.4	1.1
7/8	43.8	1.5
1	57.5	2.0
1 - 1/8	71.5	2.5
1 - 1/4	87.9	3.1

STRAND CABLE

Strand is not intended for operation over sheaves or drums. It should be used only where very infrequent flexing will occur.

Diameter (in)	Breaking Strength in Lbs.*	Approx. Wt/Ft per 1000 (lbs)
3/16	3990	73
1/4	6650	121
5/16	11200	205
3/8	15400	273
1/2	26900	517

*Listed for comparison only. Design factors vary between 6:1 and 3:1 depending on application.

Galvanized shown; stainless steel available

1X7 GALVANIZED STEEL STRAND

According to ASTM A 475, class "A" coating, left regular lay, extra high strength.

Diameter (in)	Breaking Strength in Lbs.*	Approx. Wt/Ft per 1000 (lbs)
1/16	500	0.85
3/32	1200	2.0
1/8	2100	3.5
5/32	3300	5.5
3/16	4700	7.7
7/32	6300	10.2
1/4	8200	13.5
9/32	10300	17.0
5/16	12500	21.0
3/8	17500	30.0

Stainless steel shown; galvanized available.

1X19 NON-FLEXIBLE STRAND

One strand of 19 wires. More metallic in area than the 7x7 or 7x19 constructions. This makes it the strongest, but also the least flexible. Aircraft quality grade. 1x19 construction is generally used for bracing purposes. It can, however, be used for controls, especially in the smaller sizes, where very little bending is encountered.

AIRCRAFT CABLE

“Aircraft Cable” has become an accepted industry term for small diameter 7x7 and 7x19 construction wire rope. It is not intended for aircraft use, but designed for industrial and marine applications.

7 X 19 EXTRA FLEXIBLE

7x19 aircraft cable has seven strands of 19 wires each. It is stronger than the 7x7 construction and not as strong as the 1x19, but is the most flexible. Because of its fine wires, the best service is obtained with 7x19 where abrasion is not too severe. These fine wires make it the most flexible to withstand severe bending.

Diameter	Minimum Breaking Strength in Lbs.		Approx. Wt/Ft per 100' (lbs)
	Galvanized	Stainless	
3/32	1000	920	1.74
1/8	2000	1760	2.90
5/32	2800	2400	4.50
3/16	4200	3700	6.50
7/32	5600	5000	8.60
1/4	7000	6400	11.0
9/32	8000	7800	13.9
5/16	9800	9000	17.3
11/32	12500	-	20.7
3/8	14400	12000	24.3
7/16	17600	16300	35.6
1/2	22800	22800	45.8
9/16	28500	28500	59.0
5/8	35000	35000	71.5
3/4	49600	49600	105.2
7/8	66500	66500	143.0
1	85400	85400	187.0
1 - 1/8	106400	106400	240.0
1 - 1/4	129400	129400	290.0
1 - 3/8	153600	153600	330.0
1 - 1/2	180500	180500	420.0

Sizes 7/16" and larger furnished in 6x19 construction.

7 X 7 FLEXIBLE

7x7 aircraft cable has seven strands of seven wires each. Its greater number of wires which are smaller in size make it much more flexible than 1x19, but not as flexible as 7x19. This construction is used for control purposes where extreme flexibility is not required, but where abrasion is a factor.

Diameter	Minimum Breaking Strength in Lbs.		Approx. Wt/Ft per 100' (lbs)
	Galvanized	Stainless	
1/32	110	110	0.16
1/16	480	480	0.75
5/64	650	650	1.1
3/32	920	920	1.6
7/64	1260	1260	2.2
1/8	1700	1700	2.8
5/32	2400	2400	4.3
3/16	3700	3700	6.2
7/32	4800	4800	8.3
1/4	6100	6100	10.6
9/32	7600	7600	13.4
5/16	9200	9000	16.7
11/32	11100	10500	20.1
3/8	13100	12000	23.6

Sizes 7/16" and larger furnished in 6x19 construction.

BRIDON HIGH PERFORMANCE WIRE ROPES

Constructex®

Made of three different strand constructions (7, 24, and 40-wire strands). The nine strands are closed in one operation and lightly swaged to postform the rope and give the strands a triangular shape. Compacting increases strength and resistance to crushing. The smooth outside surface enhances abrasion and scrubbing resistance. Constructex can provide 1-1/2 to 2 times the service life of other wire ropes in severely abusive applications.

Continued on next page...

High performance cable continued ...

Typical applications include tubing lines; logging lines; winch lines; boom hoists; scrap yard, mobile, and overhead traveling cranes; ore unloaders and ore bridges; hot bed conveyors and car haulage.

Dia (in)	Nominal Strength* (tons)	Approx. Wt/Ft (lbs)
3/4	36.5	1.1
7/8	48.5	1.5
1	62.5	2.0
1 - 1/8	79.5	2.6
1 - 1/4	97.6	3.2
1 - 3/8	118.0	3.8
1 - 1/2	139.0	4.6
1 - 5/8	162.0	5.3

*Acceptance strength is not less than 2-1/2% below the nominal strengths listed.

DYFORM® 6 / FLEX-X

Dyform-6 (also called Flex-X) is a six strand construction with an independent Wire Rope Core. The compact strand construction provides better flexibility, bending life and crush resistance than standard 6-strand ropes. Compacting also produces a smooth surface for reduced bearing pressure, and increases the steel area by 100% for higher abrasion resistance and less sheave wear.

Trade Size (inches)	Nominal Strength* (Tons)		Approx. Wt/Ft (lbs)	
	IWRC	FC	IWRC	FC
3/8	8.8	...	0.31	...
7/16	11.9	...	0.39	...
1/2	15.3	...	0.49	...
9/16	19.3	...	0.63	...
5/8	22.7	20.0	0.78	0.71
3/4	32.4	28.6	1.13	1.03
7/8	43.8	38.6	1.54	1.40
1	57.5	50.0	2.00	1.82
1 - 1/8	71.5	63.0	2.54	2.31
1 - 1/4	87.9	77.5	3.14	2.85
1 - 3/8	106.0	93.0	3.80	3.45
1 - 1/2	125.0	111.0	4.50	4.10

*Acceptance strength is not less than 2-1/2% below the nominal strengths listed.

BRIDON SURFACE MINING AND EXCAVATION ROPE

6-STRAND HOIST AND DRAG ROPE

Bridon American 6-strand Tiger Hoist and Drag Ropes are bright, special grade, IWRC, lang lay wire ropes.

Diameter (in)	Tiger Hoist Rope	Tiger Drag Rope	Approx. Wt/Ft (lbs)
3/4	6 x 25	6x25	1.04
7/8	6 x 25	6x25	1.42
1	6 x 25	6x25	1.85
1 - 1/8	6x26	6x26	2.34
1 - 1/4	6x41 6x49	6x26	2.89
1 - 3/8	6x41 6x49	6x26	3.50
1 - 1/2	6x41 6x49	6x26	4.16
1 - 5/8	6x41 6x49	6x26	4.88
1 - 3/4	6x41 6x49	6x26	5.67
1 - 7/8	6x41 6x49	6x26	6.5
2	6x41 6x49	6x25	7.39
2 - 1/8	6x41 6x49	6x25	8.35
2 - 1/4	6x41 6x49	6x25	9.36
2 - 3/8	6x41 6x49	6x25	10.4
2 - 1/2	6x41 6x49	6x25	11.6
2 - 5/8	6x49	6x25	12.8
2 - 3/4	6x49	6x25	14.0
2 - 7/8	6x49	6x49	15.3
3	6x49	6x49	16.6
3 - 1/8	6x49	6x49	18.0
3 - 1/4	6x49	6x49	19.5
3 - 3/8	6x49	6x49	21.0
3 - 1/2	6x49	6x49	22.7
3 - 5/8	6x49	6x49	24.3
3 - 3/4	6x49	6x49	26.0
3 - 7/8	6x49	6x49	27.7
4	6x49	6x49	29.6
4 - 1/8	6x55	6x55	31.4
4 - 1/4	6x55	6x55	33.4
4 - 3/8	6x55	6x55	35.4
4 - 1/2	6x61	6x55	37.4
4 - 5/8	6x61	6x55	39.5
4 - 3/4	6x61	6x55	41.7
4 - 7/8	6x61	6x55	43.9
5	6x61	6x55	46.2

Nominal strength available on request.

WIRECO/UNION WIRE ROPE CABLES

FLEX-X 19

Ideal for multipart hoist lines wherever you encounter spooling problems, drum crushing, block twisting or have fast line speeds.

- More crushing resistance than standard 19 x 7 rope
- Higher strength-to-diameter resistance to bending fatigue
- Exceptional stability

Diameter (in)	Approx. Wt/Ft (lbs)	Minimum Breaking Force (tons of 2000 lbs)*
7/16	0.43	11.2
1/2	0.49	14.6
9/16	0.65	18.5
5/8	0.78	22.7
3/4	1.16	32.4
7/8	1.58	43.8
1	2.05	56.9
1 1/8	2.57	71.5

*The minimum breaking force applies only when a test is conducted with both ends fixed. When in use, the minimum breaking force of these ropes may be significantly reduced if one end is free to rotate.

FLEX-X 9

Flex-X 9 was specifically designed for boom hoist applications where drum crushing is a challenge.

- Crushing resistant
- Abrasion resistant
- Greater surface area

Diameter (in)	Weight (lb/ft)	Minimum Breaking Force (tons of 2000 lbs)
5/8	0.90	26.2
3/4	1.30	37.4
7/8	1.79	50.6
1	2.33	65.7
1 1/8	2.93	82.7

FLEX-X 6

Flex-X 6 ropes provide greater surface area and more steel per given diameter than conventional 6 strand ropes.

- Superior performance
- Increased service life
- Less sheave and drum wear

Diameter (in)	Approx. Weight (lbs/ft)	Minimum Breaking Force (tons of 2000 lbs)
5/16	0.190	6.38
3/8	0.282	9.13
7/16	0.383	12.3
1/2	0.501	16.1
9/16	0.634	20.4
5/8	0.782	25.0
3/4	1.127	35.6
7/8	1.534	48.2
1	2.003	62.6
1 1/8	2.535	78.7
1 1/4	3.130	96.7
1 3/8	3.787	117
1 1/2	4.507	138
1 3/4	6.134	186
2	8.012	239



PLASTIC COATED CABLE

The coating of cables with vinyl, nylon, or other plastic offers a number of advantages. It lengthens the life of a cable by protecting the wires from abrasion; it seals in cable lubricant and seals out grit, dirt, and moisture. It protects pulleys and drums from abrasion. It also protects hands, clothing, fabrics, or other soft materials which may come in contact with or be used in conjunction with cable.

Nylon is the strongest and toughest coating material. It is available in several grades depending on whether flexibility, toughness, hardness, or outdoor exposure, high or low temperature, or chemical resistance is the primary consideration.

Vinyl coatings offer additional advantages. Generally, compared with nylon, they are more flexible, have better resistance to sunlight, and are less expensive. Mechanically, however, their uses are somewhat more limited.

Clear Vinyl Coated Galvanized Cable – Also available in nylon coated.

7 x 7 construction

Diameter (in)	Coated to (in)	Approx. Wt per 1000 ft. (lbs)	Breaking Strength* (lbs)
1/16	3/32	9.3	480
1/16	1/8	11.8	480
3/32	1/8	18.5	920
3/32	3/16	25.8	920
1/8	3/16	35.2	1700

*Listed for comparison only. Actual operating loads may vary, but should never exceed recommended design factor or 20% of catalog Breaking Strength.

7 x 19 construction

Diameter (in)	Coated to (in)	Approx. Wt per 1000 ft. (lbs)	Breaking Strength* (lbs)
3/32	1/8	19.9	1000
1/8	3/16	36.2	2000
3/16	1/4	77.5	4200
1/4	5/16	123.0	7000
5/16	3/8	197.0	9800
3/8	7/16	270.0	14400

*Listed for comparison only. Actual operating loads may vary, but should never exceed recommended design factor or 20% of catalog Breaking strength.

CLEAR VINYL COATED STAINLESS CABLE

Diameter (in)	Coated to (in)	Breaking Strength* (lbs)	Approx. Wt per 1000 ft. (lbs)	Const.
1/8	3/16	1760	3.62	7x19
3/16	1/4	3700	7.75	7x19
1/4	5/16	6400	12.30	7x19
5/16	3/8	9000	19.70	7x19
3/8	7/16	12000	27.00	7x19

Also available in nylon coated

CABLELAID WIRE ROPE

TO BE USED FOR MECHANICALLY SWAGED SLINGS ONLY. Do not use for hand-spliced assemblies or for general purpose operating rope.

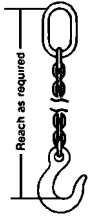
Diameter (in)	Construction	Breaking Strength* (lbs)	Approx. Wt per 1000 ft. (lbs)
3/8	7x7x7	5.70	0.21
1/2	7x7x7	9.75	0.37
5/8	7x7x7	14.6	0.58
3/4	7x7x19	21.4	0.88
7/8	7x7x19	28.4	1.19
1	7x7x19	36.2	1.56
1 - 1/8	7x7x19	44.7	1.94
1 - 1/4	7x7x19	53.7	2.39

*Listed for comparison only. Actual operating loads may vary, but should never exceed recommended design factor or 20% of catalog Breaking strength.

STEEL CHAIN SLINGS

SINGLE LEG ALLOY STEEL CHAIN SLINGS TYPE S

CHAIN SLINGS



SOS



SGS



SOG



SOGB



SOO



SOSB



SSS



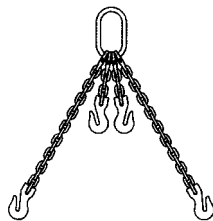
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CHAIN SIZE (IN)	WLL GRADE 80	WLL GRADE 100	WLL GRADE 120
7/32	2500	3200	----
9/32	3500	4300	5200
5/16	4500	5700	----
3/8	7100	8800	10600
1/2	12000	15000	17900
5/8	18100	22600	----
3/4	28300	35300	----
7/8	34200	42700	----
1	47700	59700	----
1-1/4	72300	90400	----

DOUBLE LEG ALLOY STEEL CHAIN SLINGS TYPE D



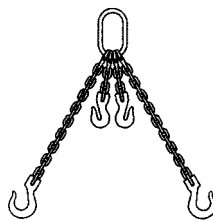
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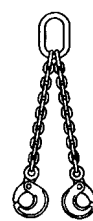
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DOS

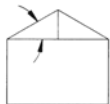


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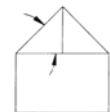


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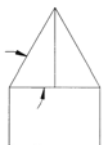
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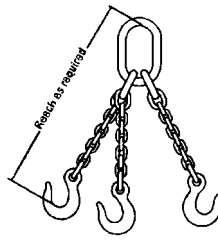
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CHAIN SIZE (IN)	DOUBLE LEG GRADE 80 WLL			DOUBLE LEG GRADE 100 WLL			DOUBLE LEG GRADE 120 WLL		
	60°	45°	30°	60°	45°	30°	60°	45°	30°
7/32	3600	3000	2500	5500	4500	3200	----	----	----
9/32	6100	4900	3500	7400	6100	4300	9000	7400	5200
5/16	7800	6400	4500	9900	8100	5700	----	----	----
3/8	12300	10000	7100	15200	12400	8800	18400	15000	10600
1/2	20800	17000	12000	26000	21200	15000	31000	25300	17900
5/8	31300	25600	18100	39100	32000	22600	----	----	----
3/4	49000	40000	28300	61100	49900	35300	----	----	----
7/8	59200	48400	34200	74000	60400	42700	----	----	----
1	82600	67400	47700	103400	84400	59700	----	----	----
1-1/4	125200	102200	72300	156600	127800	90400	----	----	----

TRIPLE LEG ALLOY STEEL CHAIN SLINGS TYPE T

TYPE T



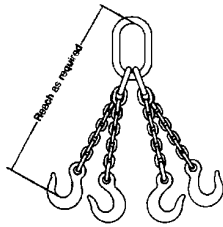
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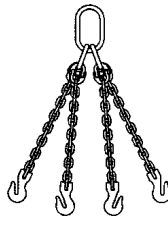
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QUADRUPLE LEG ALLOY STEEL CHAIN SLINGS TYPE Q

TYPE Q



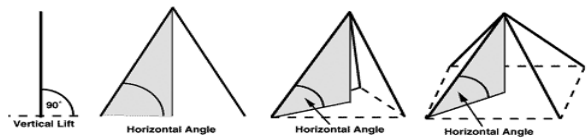
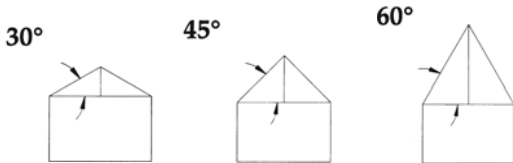
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QOG

SAFETY WARNING

A Quadruple branch alloy chain sling usually does not sustain loads with even distribution to its four branches, especially when loads are of rigid structure. Therefore, maximum working load limits are set at the same values as for triple branch chain slings of equal quality and size and used with branches at the same horizontal angle of inclination.



CHAIN SIZE (IN)	3 AND 4 LEG GRADE 80 WLL			3 AND 4 LEG GRADE 100 WLL			3 AND 4 LEG GRADE 120 WLL		
	60°	45°	30°	60°	45°	30°	60°	45°	30°
7/32A3	6500	5300	3750	8300	6800	4800	----	----	----
9/32	9100	7400	5200	11200	9100	6400	13500	11000	7800
5/16	11700	9500	6800	14800	12100	8500	----	----	----
3/8	18400	15100	10600	22900	18700	13200	27500	22500	15900
1/2	31200	25500	18000	39000	31800	22500	46500	38000	26900
5/8	47000	38400	27100	58700	47900	33900	----	----	----
3/4	73500	60000	42400	91700	74900	52950	----	----	----
7/8	88900	72500	51300	110900	90600	64000	----	----	----
1	123900	101200	71500	155100	126600	89550	----	----	----
1-1/4	187800	153400	108400	234900	191700	135600	----	----	----

CHAIN SLING INSPECTION AND REMOVAL FROM SERVICE CRITERIA

Per OSHA 1910.184 and ASME B30.9

FREQUENT INSPECTION

1. A visual inspection for damage shall be performed by the user or designated person each day the sling is used.
2. Conditions such as those listed in ASME B30.9-1.9.4 "Removal Criteria", or any other condition that may result in a hazard, shall cause the sling to be removed from service. Slings shall not be returned to service until approved by a qualified person.
3. Written records are not required for frequent inspections.

PERIODIC INSPECTION

1. A complete inspection for damage of sling shall be periodically performed by a designated person. Each link and component shall be examined individually; taking care to expose and examine all surfaces including the inner link surface. The sling shall be examined for conditions such as those listed in ASME B30.9-1-9.4. "Removal Criteria", and a determination made as to whether they constitute a hazard.
2. Periodic Inspection Frequency: Periodic inspection intervals shall not exceed one year. The frequency of periodic inspections should be based on:
 - a. Frequency of sling use
 - b. Nature of lifts being made
 - c. Severity of service conditions
 - d. Experience gained on the service life of slings used in similar circumstances.

GUIDELINES FOR THESE INTERVALS ARE:

1. Normal Service - Yearly
2. Severe Service - Monthly to Quarterly
3. Special Service - as recommended by a qualified person. Contact Olsen for assistance.
3. Written records of the most recent periodic inspection shall be maintained and shall include the condition of the sling.

REMOVAL CRITERIA

An alloy steel chain sling shall be removed from service if conditions such as the following are present:

1. Missing or illegible sling identification tag.
2. Cracks or breaks.
3. Excessive wear, nicks, or gouges. Minimum thickness on chain link shall not be below values on page 19.
4. Stretched chain links or components.
5. Bent, twisted, or deformed chain links or components.
6. Evidence of heat damage.
7. Excessive pitting or corrosion.
8. Lack of ability of chain or components to hinge (articulate) freely.
9. Weld spatter.
10. For hooks, removal criteria as stated in ASME B30.10.
11. Other conditions, including visible damage, that cause doubt as to the continued safe use of the sling.

REPAIR

1. Slings shall be repaired only by the sling manufacturer or a qualified person.
2. A repaired sling shall be marked to identify the repairing agency per ASME B30.9 Section 9-1.7.
3. Chain and components used for sling repair shall comply with the provisions of ASME B30.9.
4. Repair of hooks shall comply with ASME B30.9.
5. Cracked, broken, or bent chain links or components other than hooks shall not be repaired.
6. Mechanical coupling links shall not be used within the body of an alloy steel chain sling.
7. Modifications or alterations to the sling or components shall conform to all other provisions of ASME 22B30.9, and all repairs shall comply with proof test requirements of ASMEB30.9 Section 9-1.6.

WEAR ALLOWANCE

Determine chain wear by measuring a cross section at link ends. If chain is worn less than the allowable dimensions shown below, remove from service.

Other issues may exist beyond wear allowances.

MINIMUM ALLOWABLE CHAIN LINK THICKNESS AT ANY POINT			
NOMINAL CHAIN SIZE		MINIMUM THICKNESS	
7/32"	5.5mm	0.189"	4.8mm
9/32"	7mm	0.239"	6.07mm
5/16"	8mm	0.273"	6.93mm
3/8"	10mm	0.342"	8.69mm
1/2"	13mm	0.443"	11.26mm
5/8"	16mm	0.546"	13.87mm
3/4"	20mm	0.687"	17.45mm
7/8"	22mm	0.750"	19.05mm
1"	26mm	0.887"	22.53mm

OPERATING PRACTICES FOR ALLOY STEEL CHAIN SLINGS

- The weight of the load must be known, calculated, estimated, or measured. The loading on the slings will depend on where the center of gravity is located.
- Select sling having suitable characteristics for the type of load, hitch, and environment.
- Slings shall not be loaded in excess of the rated capacity. Consideration shall be given to the sling load angle which affects rated capacity. See Page 25 of this handbook for more information on sling angles.
- Never rig a sling with an angle less than 30° to horizontal.
- Slings in a basket hitch should have the load balanced to prevent slippage.
- The sling shall be hitched in a manner providing control of the load.
- Never side load, back load, or tip load a hook.
- Always make sure the hook supports the load. The latch must never support the load.
- Read and understand all warning and application instructions for the chain sling and fittings.
- For two-legged slings with angles greater than 90°, use an intermediate link such as a master link to collect the legs of the slings. The intermediate link can be placed over the hook to provide an in-line load on the hook. This approach must also be used when using slings with three or more legs.
- When using chain slings in choker applications, the Working Load Limit must be reduced by 20%. Consult Olsen Chain & Cable if the choke angle is less than 120°.
- In shortening applications, a 20% reduction of the Working Load Limit is required except when using cradle grab hooks or chain shortening clutches.
- Slings should always be protected from being damaged by sharp corners.
- Slings should not be dragged on the floor or over abrasive surfaces.
- Chain sling links should not be twisted, kinked, or tied in knots.
- Slings should not be pulled from under loads if the load is resting on the sling.
- Slings that appear to be damaged should not be used unless inspected and accepted by designated personnel.
- Personnel, including portions of the human body, should be kept from going between the sling and the load and from between the sling and the crane hook or hoist hook.
- Personnel shall stand clear of the suspended load.
- Personnel shall not ride the sling.
- Shock loading should be avoided.
- Twisting or kinking the legs (branches) should be avoided.
- During lifting, with or without the load, personnel should be alert for possible snagging.
- When using a basket hitch, the legs of the sling should contain or support the load from the sides, above the center of gravity, so that the load remains under control.
- Slings shall be long enough so that the rated capacity of the sling is adequate when the angle of the legs (branches) is taken into consideration.



ENVIRONMENTAL EFFECTS ON ALLOY STEEL CHAIN SLINGS

- Excessive high or low temperatures or exposure to chemically active environments such as acid or corrosive liquids or fumes can reduce the performance of the chain sling and components.
- Extreme temperature will reduce the performance of alloy steel chain slings. **See chart on the following page.**
- Normal operating temperature is -40° F to 400° F (-40° C to 204° C).
- Reference temperature exposure chart (see page 19) to determine reduction of Working Load Limit due to operating at, and after exposure to, elevated temperatures.
- Chemically active environments can have detrimental effects on the performance of chain. The effects can be both visible loss of material and undetectable material degradation causing significant loss of strength.
- Chain should not be subjected to galvanizing or any plating process. If it is suspected the chain has been exposed to a chemically active environment, remove from service.

ALLOY STEEL CHAIN SLING SAFETY REQUIREMENTS

WARNING: Consult industry recommendations and OSHA standards for proper application.

IMPORTANT SAFETY INFORMATION - PLEASE READ AND FOLLOW

These warnings and instructions are applicable to alloy chain slings manufactured by Olsen Chain & Cable from Grade 80 and Grade 100 alloy steel chain and components.

- Only alloy chain (Grade 80 or Grade 100) should be used in overhead lifting applications.
- Working Load Limit (WLL) is the maximum load in pounds which should ever be applied to chain when the chain is new and when the load is uniformly applied in direct tension to a straight length of chain.
- Working Load Limit (WLL) is the maximum working load for a specific minimum sling angle measured from the horizontal plane. The minimum sling angle and WLL are identified on the sling tag.
- The WLL or Design Factor may be affected by wear, misuse, overloading, corrosion, deformation, intentional alterations, sharp corner cutting action, heat, cold and other use conditions.
- Shock loading and extraordinary conditions must be taken into account when selecting alloy chain slings.
- See OSHA Regulation for Slings 1910.184, ANSI/ASME B30.9 "Slings", ANSI/ASME B30.10 "Hooks", and ANSI/ASME B30.26 "Rigging Hardware" for additional information.

ASME B30.9 requires a designated person inspect each new sling and its attachments prior to initial use, as well as the user or other designated person perform a visual inspection on a sling each day it is used. In addition, a periodic inspection shall be performed by a designated person at least annually, and a record of the last inspection shall be maintained. For further inspection information, see the CHAIN INSPECTION section of this handbook or refer to ASME B30.9-1.9.

REMOVAL FROM SERVICE CRITERIA

A sling shall be removed from service if any of the following are visible on chain or attachments:

- Wear, nicks, cracks, breaks, gouges, stretch, bend, weld splatter, discoloration from excessive temperature, and widened or stretched throat openings of hooks.
- Chain links and attachments that do not hinge freely to adjacent links.
- Latches on hooks that do not hinge freely, seat properly, or show evidence of permanent distortion.
- Excessive pitting or corrosion.
- Missing or illegible sling identification tag.
- Makeshift fasteners, hooks, or links formed from bolts, rods, etc.
- Mechanical coupling links in the body of the chain.
- Other damage that would cause a doubt as to the strength of the chain.

USE OF CHAIN UNDER HEAT CONDITIONS

When the chain itself is heated to temperatures shown here, working load limits shall be reduced as indicated.

USE OF GRADE 80 CHAIN AT ELEVATED TEMPERATURES				USE OF GRADE 100 CHAIN AT ELEVATED TEMPERATURES			
TEMPERATURE OF CHAIN		TEMPORARY REDUCTION	PERMANENT REDUCTION	TEMPERATURE OF CHAIN		TEMPORARY REDUCTION	PERMANENT REDUCTION
°F	°C			°F	°C		
Below 400	Below 204	none	none	Below 400	Below 204	none	none
400	204	10%	none	400	204	15%	none
500	260	15%	none	500	260	25%	5%
600	316	20%	5%	600	316	30%	15%
700	371	30%	10%	700	371	40%	20%
800	427	40%	15%	800	427	50%	25%
900	482	50%	20%	900	482	60%	30%
1000	538	60%	25%	1000	538	70%	35%
Over 1000	Over 538	REMOVE FROM SERVICE		Over 1000	Over 538	REMOVE FROM SERVICE	



CHAINS

CHAIN SAFETY

The chains in this section are designed for general purpose applications and are NOT to be used for lifting or hoisting purposes or where chain failure is likely to cause injury to persons or damage to property. For lifting or hoisting applications, please refer to the MATERIAL HANDLING section of this manual for sling information.

WORKING LOAD LIMIT

The 'Working Load Limit' is the maximum load in pounds which should ever be applied to chain, even when chain is new and when the load is uniformly applied in direct tension to a straight, untwisted length of chain. The term "Working Load Limit" contains no implication of what load the chain will withstand if any of the above factors are changed. Any of the following factors or any abuses will lessen the load that the chain assembly will withstand.

- Tip loading of hooks.
- Twisting of the chain.
- Disfigurement.
- Deterioration of the component by wear, usage, or corrosion.
- Jerking or acceleration in the rate of application of the load.
- Impact is the sudden application of a load. An impact load multiplies the stress on the chain very rapidly and should be avoided.
- Use for a purpose other than that for which the particular type of component was intended.
- Use to carry a load in excess of the published working
- load limit.

CAUTION:

Assemblies of chain and components should be rated according to the working load limit of the weakest component within the assembly.

INSTRUCTIONS REGARDING ATTACHMENTS:

Where attachments, such as hooks or rings are desired for use with chain in sustaining loads, care should be taken to select the attachments of the type, grade, and size recommended for use with the type, grade, and size chain. Misuse or abuse of chain and attachments may result in serious personal injury.

INSPECT CHAIN FREQUENTLY

No product can keep operating at its rated capacity indefinitely. Closely examine each link for deformation, cracks, elongation, corrosion, rust, etc. Take chain out of service even if only one bad link is found. Eliminate twists and kinks in chain before using. Do not attempt to repair damaged or worn links in a chain. Do not attempt to weld, anneal, heat treat, or hot galvanize alloy chain - its capacity will be completely destroyed. Protect chain from corrosion.

DESTROY DEFECTIVE CHAIN

Do not simply discard it. Chain that is not destroyed might be used again by someone not aware of the hazard associated with that use. Destroying chain is best done by cutting it up into short pieces.

PROOF COIL – GRADE 30

A general utility chain for farm, industry, and home applications, such as: pulling stumps, log chain, cargo lashing, pipe line hanging, tailgate, guard rail, tow and switch chain. For applications not requiring high strength-to-weight ratio. Do not use for overhead lifting.

Material – Low Carbon Steel

Finish – Self colored, bright zinc, hot galvanized, and polycoated.

Attachments – Can be supplied in assemblies with any standard chain attachments such as rings, slip hooks, grab hooks, eye bolts, snaps, enlarged links, or S-hooks.

Test Certificate – Proof test certificate is furnished on request.

Trade Size (in)	Wire Diameter		Inside Dimensions (in)		Working Load Limits* (lbs)	Weight Per 100' (lbs)
	mm	inches	length	width		
1/8	4	0.162	0.90	0.29	355	20.39
3/16	5	0.218	0.96	0.40	750	39.35
1/4	7	0.276	1.19	0.50	1250	63.60
5/16	8	0.334	1.12	0.50	1900	100.62
3/8	10	0.394	1.23	0.62	2650	145.63
1/2	13	0.519	1.5	0.81	4500	263.68
5/8	16	0.656	2.12	0.82	6900	382.40
3/4	20	0.781	2.6	1.02	9750	552.10
7/8	22	0.906	2.57	1.26	11375	804.60
1	28	1.023	2.85	1.40	13950	1024.73

***WARNING:** Working Load Limit must not exceeded. Not to be used for lifting or hoisting applications.

HIGH TEST – GRADE 43

Features both high strength and resistance to wear needed by modern hauling and heavy duty trucking, farm, and construction firms. Working load limits exceed those of ordinary low carbon or general utility chain. For applications requiring higher strength-to weight ratios. Do not use for overhead lifting.

Material – Carbon steel.

Finish – Self-colored, bright zinc, and hot galvanized.

Attachments – Can be supplied in assemblies with any standard chain attachments such as rings, slip hooks, grab hooks, eye bolts, snaps, enlarged links.

Test Certificate – Proof test certificate is furnished on request.

Trade Size (in)	Material Diameter (in)	Inside Dimensions (in)		Working Load Limits* (lbs)	Weight Per 100' (lbs)
		length	inches		
1/4	0.281	0.84	0.40	2600	74.89
5/16	0.343	1.03	0.48	3900	109.80
3/8	0.406	1.33	0.57	5400	149.50
7/16	0.468	1.4	0.65	7200	205.60
1/2	0.531	1.59	0.74	9200	264.25
5/8	0.656	2.12	0.82	14000	382.40
3/4	0.781	2.60	1.02	19750	552.10

***WARNING:** Working Load Limit must not exceeded. Not to be used for lifting or hoisting applications.

TRANSPORT - GRADE 70

Extremely strong for its light weight and used primarily for load binding in the transportation industry. Also used extensively on farms, in lumbering, towing and construction. High strength to weight ratio is achieved by special heat treating. It resists wear because of its exceptional hardness properties.

Material – Heat treated carbon steel.

Finish – Zinc electroplate with yellow chromate conversion coating.

Attachments – Can be supplied in assemblies with forged clevis grab hooks on each end and other attachments as required. Approved by the Dept. of Transportation for truck tiedown use. Meets all applicable State requirements.

Test Certificate – Proof test certificate is furnished on request.

Trade Size (in)	Material Diameter (in)	Inside Dimensions (in)		Working Load Limits* (lbs)	Weight Per 100' (lbs)
		length	inches		
1/4	0.31	0.94	0.46	3150	94
5/16	0.34	1.01	0.48	4700	111
3/8	0.39	1.36	0.57	6600	142
7/16	0.47	1.29	0.67	8750	212
1/2	0.51	1.70	0.75	11300	238

***WARNING:** Working Load Limit must not exceeded. Not to be used for lifting or hoisting applications.

STAINLESS STEEL

For food processing, chemical and marine applications, and wherever non-magnetic, electrically welded, corrosion resistant chain is needed. Do not use for overhead lifting.

Material – Type 304 & 316 stainless steel.

Finish – Bright

Trade Size (in)	Working Load Limits* (lbs)	Maximum Length per 100 Links	Minimum Weight Per foot (lbs)
1/8	375	88.8"	0.17
3/16	1150	96.4"	0.38
1/4	1860	124.0"	0.61
5/16	2425	129.1"	0.84
3/8	3800	137.8"	1.40
1/2	6425	179.1"	2.34
5/8	9725	220.5"	3.58
3/4	15175	275.6"	5.51

***WARNING:** Working Load Limit must not exceeded. Not to be used for lifting or hoisting applications.

BINDER CHAINS

Olsen Chain & Cable has a complete line of tie-down chains featuring grab hooks on both ends of the chain. Other hook options are available and can be substituted at the time of order. **Do not use for overhead lifting.**

Size (in x ft.)	Working Load Limit*
5/16 x 16	4700
5/16 x 20	4700
5/16 x 25	4700
3/8 x 16	6600
3/8 x 20	6600

***WARNING:** Working Load Limit must not exceeded. Not to be used for lifting or hoisting applications.

STRAIGHT LINK MACHINE CHAIN

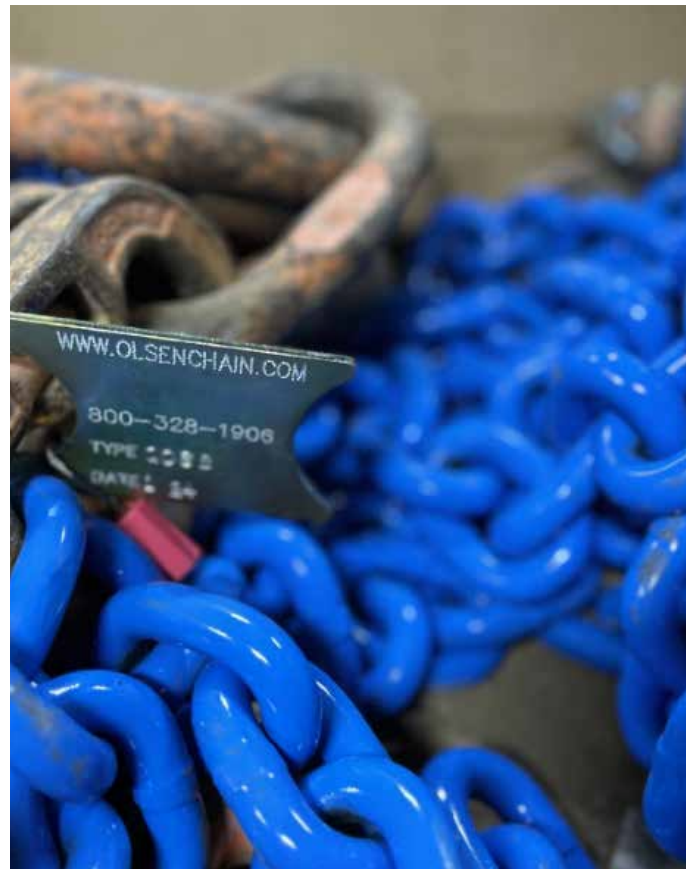
For general utility purposes; farm and animal. Do not use for overhead lifting.

Material – Low carbon steel

Finish – Available in bright, hot galvanized, and zinc plated.

Trade Size (inches)	Material Diameter		Inside Dimensions (inches)		Working Load Limits* (lbs)	Weight Per 100' (lbs)
	in	mm	length	width		
4	0.12	3	0.55	0.21	215	11
3	0.14	3	0.59	0.24	270	15
2	0.15	4	0.61	0.26	325	19
1	0.16	4	0.63	0.28	390	23
1/0	0.18	4	0.74	0.31	465	27
2/0	0.19	5	0.78	0.34	545	33
3/0	0.21	5	1.01	0.36	635	37
4/0	0.23	6	1.03	0.38	700	47
5/0	0.25	6	1.07	0.44	925	52

***WARNING:** Working Load Limit must not exceeded. Not to be used for lifting or hoisting applications.





LOAD SECUREMENT

LOAD SECUREMENT PRODUCTS

Olsen Chain & Cable stocks a wide variety of high-quality load securement products including chains, binders, straps and edge protection. We also have the ability to custom make specific load securement for your application!

Please inquire with one of our sales associates.



transport



strap



corner protector



gloves



ratchet binder



weld on anchor points



binder chain



ratchet binder and chain



binder chain

CARGO SECUREMENT TIPS

- Ensure your tie-downs are properly rated for the load they are meant to secure.
- Inspect all tie-downs for wear and damage, replacing when worn or damaged.
- Make sure that your cargo does not require special precautions or securing.
- A good rule of thumb is one tie-down is used for every ten feet of cargo, using two tie-downs to secure any piece of cargo regardless of length. View our [Tie Down Chain and Load Binder Specifications](#) page for more information.
- Cargo must be firmly immobilized and secured on or within a trailer; this includes tools, equipment, chains, spare tires, etc. Large objects should be tied down directly to the trailer.
- An enclosed trailer may not be sufficient for securing your load, additional securement is likely necessary to prevent shifting during transit.
- Bungee cords and tarp straps must not be used as primary securement for loads or equipment.
- Tie-downs should be secured lower on the trailer, not near the top rails.
- Tie-downs should be attached and secured in a manner that prevents it from becoming loose, unfastening, opening or releasing while in transit.
- Cargo straps can loosen with vibrations of the road, check early in your trip to ensure the attachments are still properly secured and regularly throughout the trip.
- Always make sure your load is properly contained, immobilized and secured so that it cannot leak, spill, blow off, fall from, fall through or otherwise be dislodged from the trailer, or shift upon or within the trailer to so that the trailer's stability or maneuverability is affected. Loads that shift can not only cause crashes but can also damage your trailer and towing vehicle.



LOAD SECUREMENT

 Remember, you are securing the load for sudden stops and trailer sway, not just for normal driving conditions.

TOW KITS

Olsen Chain and Cable tow kits include an eye and eye rope assembly, 2x shackles and a durable, multi-use bag. Our tow ropes are made from industry leading Samson Stable Braid, a double braid rope with high strength, low stretch, and excellent resistance to wear. They also have Cordura tubing in the eyes for extra longevity and wear resistance.

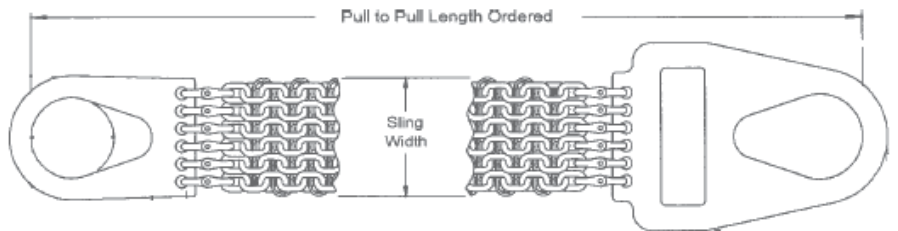


Rope Width (in)	Rope Length (ft)	Breaking Strength (lbs)	Shackle Size (in)	Working Load Limit (tons)
7/8	20	25,400	1	10
7/8	30	25,400	1	10
1	20	33,300	1	10
1	30	33,300	1	10
1 1/4	20	48,700	1 1/8	12
1 1/4	30	48,700	1 1/8	12



HEAVY DUTY CHAIN MESH SLINGS

- Manufactured to exceed all ASME B30.9 and OSHA 1910.184 regulations.
- Durable, heavy-duty construction ideally suited to jobsite or warehouse use - resists abrasion and cutting.
- Each sling permanently stamped with serial number and capacity and load tested - shipped with certification.
- Flexibility and low stretch helps prevent load damage.
- End fittings are plated to resist corrosion.
- Damaged alloy chain body is repairable - return any damaged sling to Olsen Chain & Cable for estimate and repair.
- Shall not be used at temperatures above 400° F.
- Shall not be edge loaded - full width of alloy chain body must contact load.
- **Specify Type 1 for Triangle-Choker or Type 2 for Triangle-Triangle when ordering.**



WIRE MESH SLINGS

SPECIFICATIONS FOR CHAIN MESH ALLOY STEEL TRIANGLES		SLING WIDTH TRIANGLE/ TRIANGLE	SLING WIDTH TRIANGLE/ CHOKER	WLL VERTICAL	WLL CHOKER	WLL BASKET
CHAIN SIZE	CHAIN PARTS					
7/32"	3	3"	7"	5,000	5,000	10,000
	4	3.75"	7"	6,700	6,700	13,400
	5	4.5"	8.5"	8,400	8,400	16,800
	6	5.25"	8.75"	10,800	10,800	21,600
9/32"	3	4.5"	7"	8,400	8,400	16,800
	4	4.5"	7.5"	11,200	11,200	22,400
	5	5.25"	8.5"	14,000	14,000	28,000
	6	5.75"	9"	16,800	16,800	33,600
3/8"	3	4.25"	NA	17,000	-----	34,000
	4	6"	10"	22,700	-----	45,400
	5	6.5"	NA	28,400	-----	56,800
	6	8"	NA	34,000	-----	68,000
1/2"	2	4.88"	NA	19,200	-----	38,400
	3	6.5"	NA	28,800	-----	57,600
	4	8.13"	NA	38,400	-----	76,800

CAUTION! DO NOT EXCEED RATED CAPACITIES!

Design factor of 5:1

RENTALS



HAND CHAINFALL HOISTS			
CAPACITY	DAILY	WEEKLY	MONTHLY
3 Ton	\$84.00	\$252.00	\$756.00
5 Ton	\$110.00	\$330.00	\$990.00
8 Ton	\$150.00	\$450.00	\$1,350.00
10 Ton	\$190.00	\$770.00	\$1,710.00
12 Ton	\$240.00	\$820.00	\$2,200.00
15 Ton	\$260.00	\$910.00	\$2,730.00
20 Ton	\$332.00	\$1,070.00	\$3,190.00

Additional sizes available
 *\$100 fee added to all rentals with lift over 40 feet



LEVER HOISTS			
CAPACITY	DAILY	WEEKLY	MONTHLY
3/4 Ton	\$44.00	\$132.00	\$398.00
1-1/2 Ton	\$70.00	\$210.00	\$630.00
3 Ton	\$76.00	\$284.00	\$854.00
6 Ton	\$96.00	\$360.00	\$1,080.00

*\$100 fee added to all rentals with lift over 40 feet



ELECTRIC HOISTS (110v)			
CAPACITY	DAILY	WEEKLY	MONTHLY
1/2 Ton	\$90.00	\$315.00	\$945.00
1 Ton	\$110.00	\$385.00	\$1,155.00
2 Ton	\$130.00	\$455.00	\$1,250.00
3 Ton	\$180.00	\$540.00	\$1,620.00
5 Ton	\$320.00	\$960.00	\$2,880.00
7 1/2 Ton	\$380.00	\$1,140.00	\$3,420.00
10 Ton	\$450.00	\$1,580.00	\$5,040.00
15 Ton	\$900.00	\$2,160.00	\$6,900.00

*\$100 fee added to all rentals with lift over 40 feet

ELECTRICAL REQUIREMENTS FOR ELECTRIC HOISTS:

- Single phase motors available
- Three phase electric motors available

RENTAL MAGNETIC DRILLS



- 1 1/4" Capacity in Steel
- 3/4" Capacity in Steel

DAILY	WEEKLY	MONTHLY
\$110.00	\$270.00	\$1,000.00

Drill bits and pilots sold separately.

RENTAL ELECTRIC WINCHES

3,000 POUND ELECTRIC WINCH

- 8 Feet per minute line speed
- Drum capacity : 110 feet of 3/8" diameter cable - cable not included
- Worm gear reduction for positive load holding
- Dynamic braking for instant stopping
- 110 V power
- 6,000 pound dragging capacity



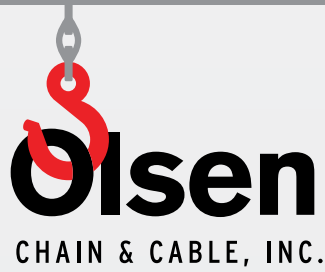
DAILY	WEEKLY	MONTHLY
\$160.00	\$480.00	\$1,440.00

RENTAL LOAD MONITORING EQUIPMENT

PROGRAMMABLE DYNAMOMETERS



CAPACITY	DAILY	WEEKLY	MONTHLY
5,000 pounds	\$50.00	\$150.00	\$450.00
10,000 pounds	\$70.00	\$210.00	\$600.00
25,000 pounds	\$90.00	\$320.00	\$1,100.00
50,000 pounds	\$100.00	\$350.00	\$1,360.00
100,000 pounds	\$270.00	\$700.00	\$2,500.00



ONLINE OR ON-THE-PHONE

RIGGING EQUIPMENT | HOISTS & CRANES | MATERIAL HANDLING



For more than 75 years, Olsen Chain & Cable has manufactured, sold, and sustained lifting equipment for operations of all sizes, setting the standard for performance and safety in our industry.



EQUIPMENT | INSPECTIONS | REPAIR | EXPERTISE

OLSENCHAIN.COM | 800-328-1906

RESOURCES/INFORMATION

POLYESTER ROUND SLINGS

LIFTING FIBERS Endless loops of polyester load bearing yarn.

COVER

Polyester outer cover.
Aramid outer covers also available for heat protection.

LABEL

Laminated tag standard.
Private labeling available on request.

CAPACITIES

3,000 to 100,000 pounds vertical capacities.
5:1 safety factor on all sizes of Polyester Round Slings.

CONFIGURATIONS

Endless loop slings or eye-to-eye slings with cordura covering on the sling body.

APPLICATIONS

Vertical, Basket, and Choker hitches.
Additional hardware (master links, rings, hooks, etc.) available - contact Olsen Chain and Cable's sales personnel for details.

INSPECTION AND REPAIR

Slings shall be examined every lift throughout their length for abrasions, cuts, heat damage, fitting distortion or damage, and tag legibility. Abrasion, heat damage, or cuts to the cover may indicate a loss of strength to the load cores.

If any doubts are held by the inspector, sling should be removed from service and sent to Olsen Chain and Cable for evaluation and possible repair. Slings removed from service shall be destroyed and rendered completely unfit for future use. Inspector and sling user shall follow all applicable OSHA 1910.184 and ASME B30 regulations regarding sling use 30 and inspection.

HIGH PERFORMANCE ROUND SLINGS

LIFTING FIBERS

Endless loops of High Performance load bearing yarn.

COVER

Polyester outer cover.

LABEL

Laminated tag standard. Private labeling available on request.

CAPACITIES

125,000 to 300,000 pounds vertical capacities. 5:1 safety factor on all sizes of High Performance Round Slings.

CONFIGURATIONS

Endless loop slings or eye-to-eye slings with cordura covering on the sling body.

APPLICATIONS

Vertical, Basket, and Choker hitches.
Additional hardware (master links, rings, hooks, etc.) available - contact Olsen Chain and Cable's sales personnel for details.

INSPECTION AND REPAIR

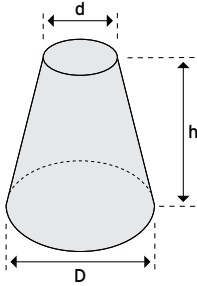
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Inspector and sling user shall follow all applicable OSHA 1910.184 and ASME B30 regulations regarding sling use and inspection.

HOW TO CALCULATE WEIGHT OF MATERIAL

VOLUME: FRUSTUM OF A CONE

- Determine the volume of the object
 $VOLUME = 0.2618 \times h \times (D^2 + D \times d + d^2)$
- Determine the approximate weight of the object
 $WEIGHT = Volume \times Weight \text{ (per Cu)}$



d = OD of small end
 h = overall length
 D = OD of large end

EXAMPLE:

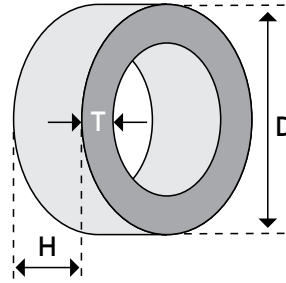
d = 6 inches Material: Steel
 D = 18 inches
 h = 32 inches

- Find the volume:
 $0.2618 \times 32 \times ((18 \times 18) + (18 \times 6) + (6 \times 6)) = 3920.71 \text{ Cu in}$
 also expressed as:
 $0.2618 \times 32 \times (468) = 3920.71 \text{ Cu in}$
- Find the weight:
 $3920.71 \times 0.284 = 1113.48 \text{ lbs}$

Answer: 1113.48 lbs

VOLUME: PIPE

- Determine the volume of the object
 $VOLUME = T \times (D - T) \times 3.141 \times H$
- Determine the approximate weight of the object
 $WEIGHT = Volume \times Weight \text{ (per Cu)}$



D = outside diameter
 H = overall length of pipe
 T = wall thickness

EXAMPLE:

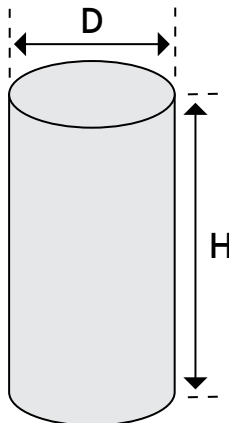
D = 18 inches Material: Steel
 T = 1.5 inches
 H = 48 inches

- Find the volume:
 $1.5 \times (18 - 1.5) \times 3.141 \times 48 = 3731.5 \text{ Cu in}$
- Find the weight:
 $3731.5 \times 0.284 = 1059.7 \text{ lbs}$

Answer: 1060 lbs

VOLUME: SOLID ROUND

- Determine the volume of the object
 $VOLUME = 0.7854 \times D \times D \times H$
- Determine the approximate weight of the object
 $WEIGHT = Volume \times Weight \text{ (per Cu)}$



EXAMPLE:

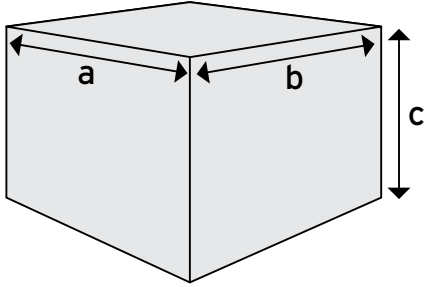
D = 18 inches Material: Steel
 H = 42 inches

- Find the volume:
 $0.7854 \times 18 \times 18 \times 42 = 10687.72 \text{ Cu in}$
- Find the weight:
 $10687 \times 0.284 = 3035 \text{ lbs}$

Answer: 3035 lbs

VOLUME: CUBE (OR RECTANGULAR PRISM)

- Determine the volume of the object
VOLUME = A x B x C
- Determine the approximate weight of the object
WEIGHT = Volume X Weight (per Cu)



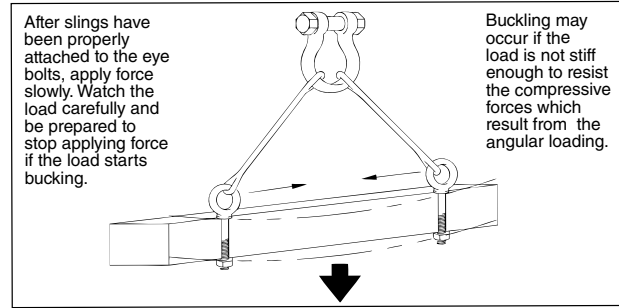
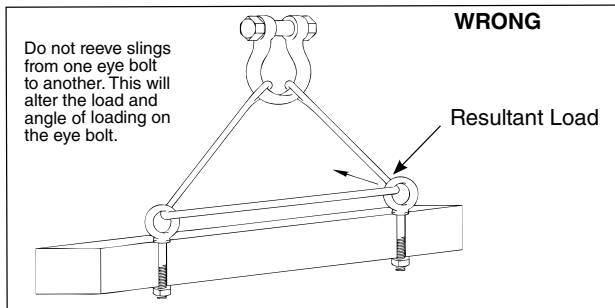
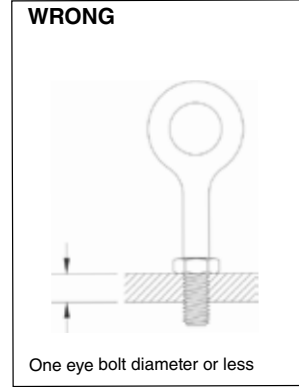
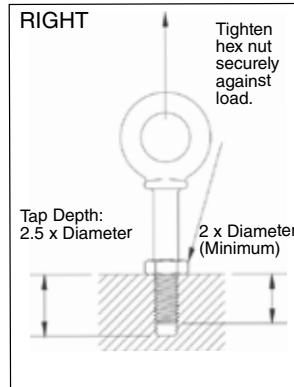
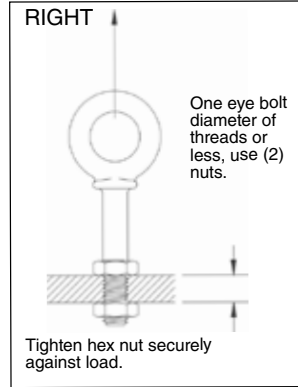
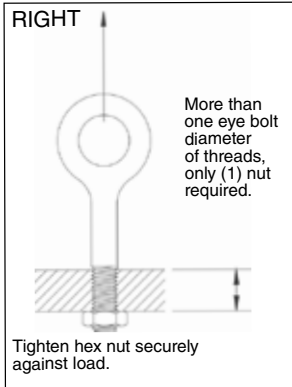
EXAMPLE:

A = 12 inches Material: Steel
 B = 24 inches
 C = 5 inches

- Find the volume:
12 x 24 x 5 = 1440 Cu in
 - Find the weight:
1440 x 0.284 = 408.96 lbs
- Answer: 409 lbs**

WEIGHT OF MATERIALS

MATERIAL	DENSITY OF MATERIALS		
	lbs/cu ft	lbs/cu in	kg/cu m
Aluminum	165	0.095	2643
Brass	534	0.309	8554
Brick, common	120	0.069	1922
Bronze	510	0.295	8169
Cast Iron	480	0.278	7689
Concrete (reinforced)	150	0.087	2403
Clay (compacted)	109	0.063	1746
Copper	560	0.324	8970
Diesel Fuel	52	0.030	833
Earth, dry, excavated	78	0.045	1249
Earth, wet, excavated	100	0.058	1602
Glass	160	0.093	2563
Gold	1254	0.726	19300
Granite, solid	168	0.097	2691
Gravel, w/sand, natural	120	0.069	1922
Gypsum wall board	54	0.031	865
Ice, solid	58	0.034	929
Lead, rolled	711	0.411	11389
Limestone, solid	163	0.094	2611
Marble, solid	160	0.093	2563
Sand, dry	100	0.058	1608
Sand w/Gravel, wet	125	0.072	2002
Snow, freshly fallen	10	0.006	160
Snow, compacted	30	0.017	481
Steel	490	0.284	7849
Tungsten	1224	0.708	19606
Water, pure	62	0.036	993
Water, sea	64	0.037	1025
Wood			
Fir, Douglas	33	0.019	529
Maple, dry	44	0.025	705
Oak, red	44	0.025	705
Pine, White, dry	24	0.015	416
Pine, Yellow, dry	45	0.026	721



MACHINERY EYE BOLT - INSTALLATION FOR IN-LINE AND ANGULAR LOADING

These eye bolts are primarily intended to be installed into tapped holes.

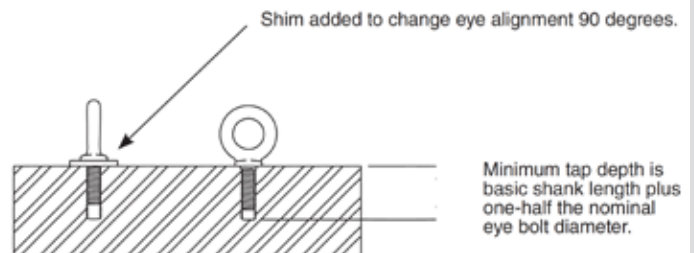
- After the loads on the eye bolts have been calculated, select the proper size eye bolt for the job. For angular lifts, adjust working load as follows:

Direction of Pull	Adjusted Working Load
45 degrees	30% of rated working load
90 degrees	25% of rated working load

- Drill and tap the load to the correct sizes to a minimum depth of 1/2 the eye bolt size beyond the shank length of machinery eye bolt.
- Thread the eye bolt into the load until the shoulder is flush and securely tightened against the load.
- If the plane of the machinery eye bolt is not aligned with the sling line, estimate the amount of unthreading rotation necessary to align the plane of the eye properly.
- Remove the machinery eye bolt from the load and add shims (washers) of proper thickness to adjust the angle of the plane of the eye to match the sling line. Use Table II to estimate the required shim thickness for the amount of unthreading rotation required.

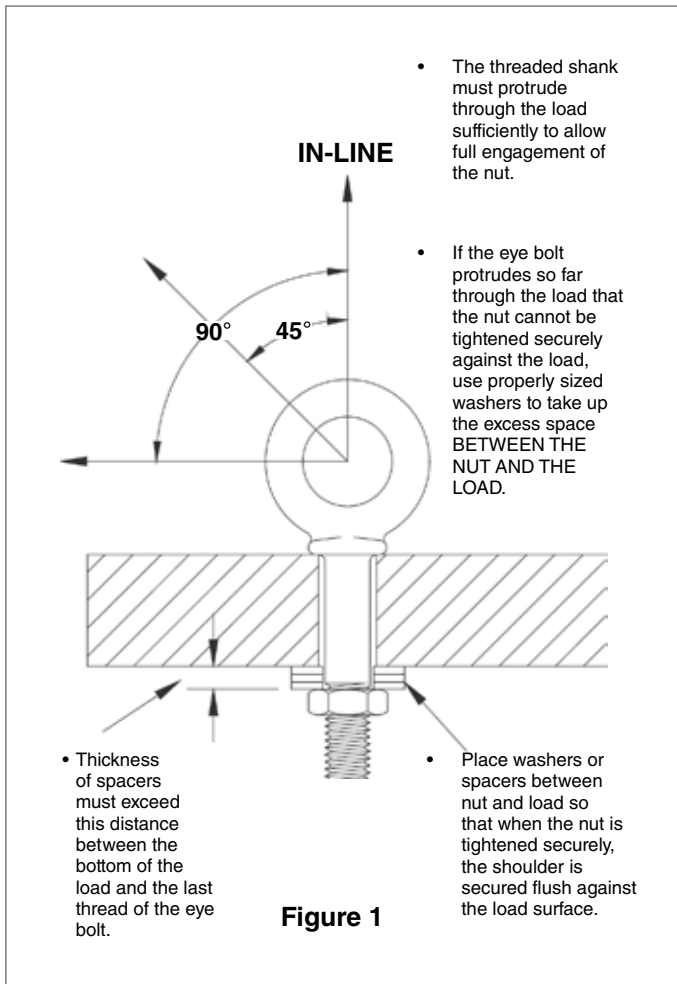
Table II - Crosby®

Eye Bolt Size (in.)	Shim Thickness Required to Change Rotation 90° (in.)
1/4	.0125
5/16	.0139
3/8	.0156
1/2	.0192
5/8	.0227
3/4	.0250
7/8	.0278
1	.0312
1-1/4	.0357
1-1/2	.0417



REFERENCE INFORMATION

SHOULDER NUT EYE BOLT – INSTALLATION FOR ANGULAR LOADING



REGULAR NUT AND SHOULDER NUT EYE BOLT – INSTALLATION FOR IN-LINE LOADING

OPERATING SAFETY:

- Always stand clear of load.
- Always lift load with steady, even pull – do not jerk.
- Always apply load to eye bolt in the plane of the eye – not at an angle.
- Never exceed the capacity of the eye bolt – use working load limit tables.
- When using lifting slings of two or more legs, make sure the loads in the legs are calculated using the angle from the vertical to the leg and properly size the shoulder nut or machinery eye bolt for the angular load.

FORGED EYE BOLT SAFETY INFORMATION

INSPECTION/MAINTENANCE SAFETY:

- Always inspect eye bolt before use.
- Never use eye bolt that shows signs of wear or damage.
- Never use eye bolt if eye or shank is bent or elongated.
- Always be sure threads on shank and receiving holes are clean.
- Never machine, grind, or cut eye bolt.

ASSEMBLE SAFETY:

- Never exceed manufacturer’s working load limits.
- Never use regular nut eye bolts for angular lifts.
- Always use shoulder nut eye bolts (or machinery eye bolts) for angular lifts.
- For angular lifts, adjust working load as follows:

Direction of Pull	Adjusted Working Load
45 degrees	30% of rated working load
90 degrees	25% of rated working load

- Never undercut eye bolt to seat shoulder against the load.
- Always countersink receiving hole or use washers to seat shoulder.
- Always screw eye bolt down completely for proper seating.
- Always tighten nut securely against the load.

Crosby® Load Limits for In-Line Loads	
Size (in.)	Working Load Limit (lbs.)
1/4	650
5/16	1,200
3/8	1,550
1/2	2,600
5/8	5,200
3/4	7,200
7/8	10,600
1	13,300
1-1/4	21,000
1-1/2	24,000

WARNING!

- Loads may slip or fall if proper eye bolt assembly and lifting procedures are not used.
- A falling load can seriously injure or kill.
- Read, understand, and follow all the instructions, safety information, charts, and diagrams presented here before using eye bolts and eye bolt assemblies.

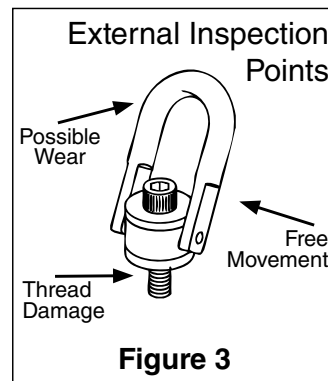
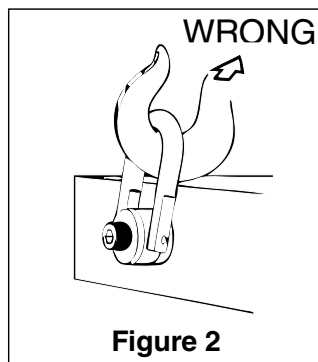
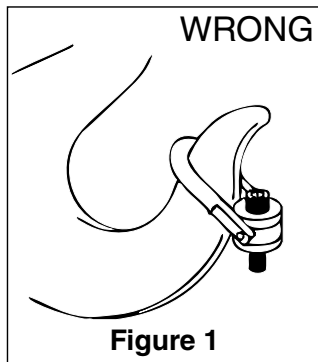
SWIVEL HOIST RINGS

HOIST RING APPLICATION ASSEMBLY SAFETY:

- Use swivel hoist ring only with a ferrous metal (steel, iron) or soft metal (i.e., aluminum) loads (work piece). Do not leave threaded end of hoist ring in aluminum loads for long time periods due to corrosion.
- After determining the loads on each hoist ring, select the proper size hoist ring using the Working Load Limit ratings in Table 1 for UNC threads and Table 2 for Metric threads.
- Drill and tap the work piece to the correct size to a minimum depth of one-half the threaded shank diameter plus the threaded shank length. See rated load limit and bolt torque requirements imprinted on top of the swivel trunnion. (See Table 1 and/or Table 2)
- Install hoist ring to recommended torque with a torque wrench making sure the bushing flange meets the load (work piece) surface.
- Never use spacers between bushing flange and mounting surface
- Always select proper load rated lifting device for use with Swivel Hoist Ring.
- Attach lifting device ensuring free fit to hoist ring bail (lifting ring). (Figure 1)
- Apply partial load and check proper rotation and alignment. There should be no interference between load (work piece) and hoist ring bail. (Figure 2)
- Special Note: When a Hoist Ring is installed with a retention nut, the nut must have full thread engagement and must meet one of the following standards to develop the Working Load Limit (WWL).

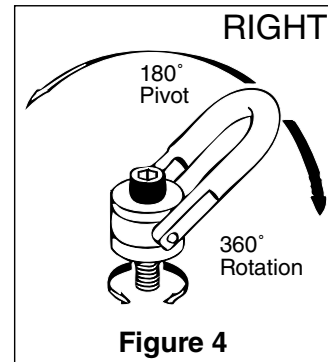
1. ASTM A-563 (A) Grade D Hex Thick
(B) Grade DH Standard Hex

2. SAE Grade 8 – Standard Hex



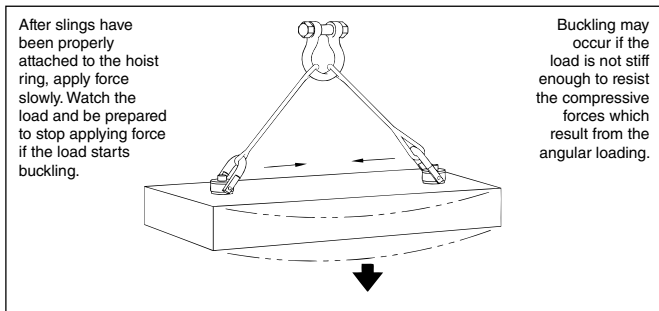
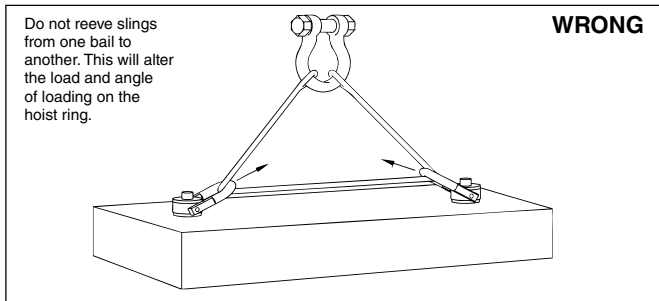
HOIST RING INSPECTION/MAINTENANCE:

- Always inspect before use.
- Regularly inspect hoist ring parts. (Fig. 3)
- Never use hoist ring that shows signs of corrosion, wear, or damage.
- Always be sure threads on shank and receiving holes are clean, not damaged, and fit properly.
- Always check with torque wrench before using an already installed hoist ring.
- Always make sure there are no spacers (washers) used between bushing flange and the mounting surface. Remove any spacers (washers) and retorquer before use.
- Always ensure free movement of bail. The bail should pivot 180° and swivel 360°. (Figure 4)
- Always be sure total work piece surface is in contact with hoist ring bushing mating surface. Drilled and tapped hole must be 90° to load (work piece) surface.



OPERATING SAFETY

- Never exceed the capacity of the swivel hoist ring – see Table 1 for UNC threads and Table 2 for Metric threads.
- When using lifting slings of two or more legs, make sure the forces in the legs are calculated using the angle from the vertical to the leg and select the proper size swivel hoist ring to allow for the angular forces. (Note: Sling angles will de-rate sling members (chain, rope, or webbing) but will not de-rate swivel hoist ring capacity.)



WARNING!

- Loads may slip or fall if proper hoist ring assembly and lifting procedures are not used.
- A falling load may cause serious injury or death.
- Read, understand, and follow all the instructions, safety information, charts, and diagrams presented here before using swivel hoist ring assembly.

*Designed to be used with ferrous work piece only.
 ** The tightening torque values shown are based upon threads being clean, dry, and free of lubrication.
 ^ Individually proof tested to 2-1/2 times the Working Load Limit based on the 4:1 design factor.
 ^^ Bolt specification is a Grade 12.9 Alloy socket head cap screw to DIN 912. All threads are metric (ASME/ANSI B18.3.1m)

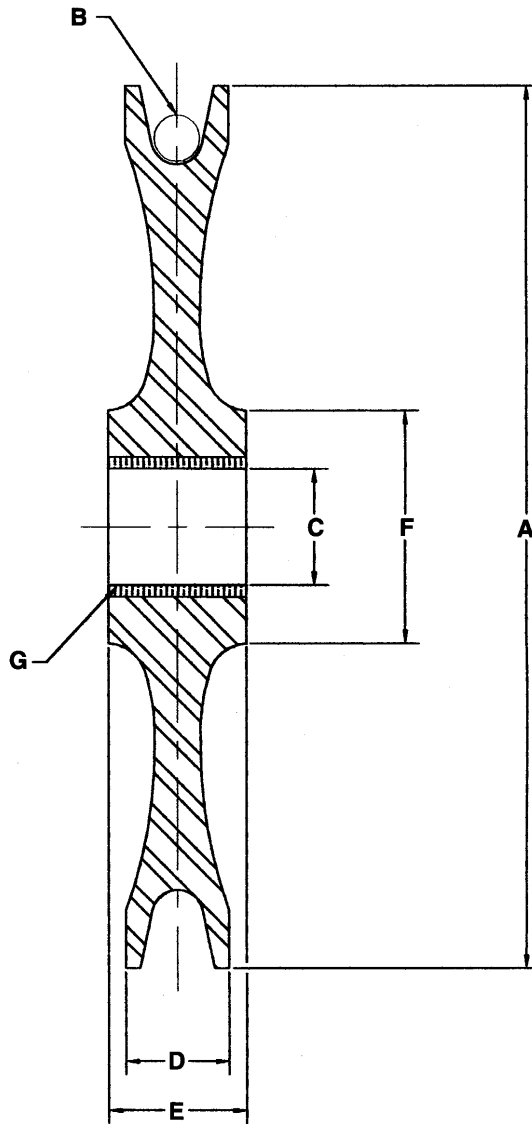
Table 1			
Crosby® HR-125 Swivel Hoist Rings			
Working Load Limit* (lbs)	Torque** in Ft. Lbs.	Bolt Size^^ (in.)	Effective Thread Projection Length (in.)
800^	7	5/16 - 18 x 1.50	.59
1000^	12	3/8 - 16 x 1.50	.59
2500	28	1/2 - 13 x 2.00	.71
2500^	28	1/2 - 13 x 2.50	1.21
4000	60	5/8 - 11 x 2.00	.71
4000^	60	5/8 - 11 x 2.75	1.46
5000	100	3/4 - 10 x 2.25	.96
5000^	100	3/4 - 10 x 2.75	1.46
7000	100	3/4 - 10 x 2.75	.90
7000^	100	3/4 - 10 x 3.50	1.65
8000	160	7/8 - 9 x 2.75	.90
8000^	160	7/8 - 9 x 3.50	1.65
10,000	230	1 - 8 x 3.00	1.15
10,000^	230	1 - 8 x 4.00	2.15
15,000	470	1-1/4 - 7 x 4.50	2.22
24,000	800	1-1/2 - 6 x 4.50	2.98
30,000	1100	2 - 4-1/2 x 6.50	2.98

*Ultimate load is 5 times the Working Load Limit. Individually proof tested to 2-1/2 times the WWL.
 ** The tightening torque values shown are based upon threads being clean, dry, and free of lubrication.
 ^ Long bolts are designed to be used with soft metal (i.e.,aluminum) work piece. While the long bolts may also be used with ferrous metal (i.e. steel & iron) work pieces, short bolts are designed for ferrous work pieces only.
 ^^ Bolt specification is a Grade 8 Alloy socket head cap screw to ASTM A 574. All threads are UNC - 3A.

Table 2				
Crosby® HR-125M Metric Swivel Hoist Rings*				
Working Load Limit (Kg)		Torque** in N-m	Bolt Size^^ (in.)	Effective Thread Projection Length (mm)
At a 5:1 Design Factor^	At a 4:1 Design Factor^			
400	500	10	M8 x 1.25 x 40	16.9
450	550	16	M10 x 1.50 x 40	16.9
1050	1300	38	M12 x 1.75 x 50	17.2
1900	2400	81	M16 x 2.00 x 60	27.2
2150	2700	136	M20 x 2.50 x 65	31.2
3000	3750	136	M20 x 2.50 x 75	28.1
4200	5250	312	M24 x 3.00x x 80	33.1
7000	8750	637	M30 x 3.50 x 100	45.1
11,000	13,750	1005	M36 x 4.00 x 150	60.6
12,500	15,600	1005	M42 x 4.50 x 160	70.6
13,500	16,900	1350	M48 x 5.00 x 160	70.6

CUSTOM WIRE ROPE SHEAVE ORDERING FORM

A	
OUTSIDE DIAMETER	
B	
ROPE DIAMETER	
C	
BORE	
D	
RIM WIDTH	
E	
HUB WIDTH	
F	
HUB DIAMETER	
G	
BRONZE, BUSHING, BEARING OR FINISHED BORE	
H	
QUANTITY	



QUOTATION INFORMATION

Customer Name: _____ Date Required: ____ / ____ / ____

Address: _____

City, State, Zip: _____

Telephone _____ ext. _____

Fax _____

Contact Name: _____

Special Instructions: _____

DECIMAL EQUIVALENTS OF FRACTIONS

1/64	.015625	17/64	.265625	33/64	.515625	49/64	.765625
1/32	.03125	9/32	.28125	17/32	.53125	25/32	.78125
3/64	.046875	19/64	.296875	35/64	.546875	51/64	.796875
1/16	.0625	5/16	.3125	9/16	.5625	13/16	.8125
5/64	.078125	21/64	.328125	37/64	.578125	53/64	.828125
3/32	.09375	11/32	.34375	19/32	.59375	27/32	.84375
7/64	.109375	23/64	.359375	39/64	.609375	55/64	.859375
1/8	.125	3/8	.375	5/8	.625	7/8	.875
9/64	.140625	25/64	.390625	41/64	.640625	57/64	.890625
5/32	.15625	13/32	.40625	21/32	.65625	29/32	.90625
11/64	.171875	27/64	.421875	43/64	.671875	59/64	.921875
3/16	.1875	7/16	.4375	11/16	.6875	15/16	.9375
13/64	.203125	29/64	.453125	45/64	.703125	61/64	.953125
7/32	.21875	15/32	.46875	23/32	.71875	31/32	.96875
15/64	.234375	31/64	.484375	47/64	.734375	63/64	.984375
1/4	.25	1/2	.50	3/4	.75	1	1.00

MISCELLANEOUS CONVERSION FACTORS

ITEM	MULTIPLIED BY	EQUALS
Inches	25.4	Millimeters
Millimeters	.03937	Inches
Cubic Feet	6.22905	Gallons, British Imperial
Cubic Feet	.025	Tons, U.S. Shipping
Degrees, Angular	.0174533	Radians
Degrees, Fahrenheit (less 32°F)	.5556	Degrees, Centigrade
Degrees, Centigrade	1.8	Degrees, Fahrenheit (less 32°F)
Gallons, British Imperial	.160538	Cubic Feet
Gallons, British Imperial	4.54596	Liters
Gallons, U.S.	.13368	Cubic Feet
Gallons, U.S.	3.78543	Liters
Liters	.219975	Gallons, British Imperial
Miles, Statute	.8684	Miles, Nautical
Miles, Nautical	1.1516	Miles, Statute
Radians	57.29578	Degrees, Angular
Tons, Long	1.120	Tons, Short
Tons, Short	.892857	Tons, Long
Tons, British Shipping	42	Cubic Feet
Tons, British Shipping	.95381	Tons, U.S. Shipping
Tons, U.S. Shipping	40	Cubic Feet
Tons, U.S. Shipping	1.050	Tons, British Shipping

CERTIFIED RIGGER COURSES

A Qualified Rigger is responsible for the effective, safe handling of non-routine lifts and is able to:

- Calculate Load Weights
- Determine Load Center-of-Gravity
- Manage Equipment and Material for Operation
- Determine Share-of-Load on Life Points
- Calculate Sling Tensions, Size, & Reach
- Calculate Mechanical Advantage for Snatch Blocking (including line pull and load pull on pulley systems)
- Incorporate Chainfalls & Lever Tools into Sling Systems

ADVANCED RIGGER CERTIFICATION TRAINING

This 2-day course will provide the ASME & OSHA required training and certification* to become a Qualified Rigger (also referred to as a Master Rigger, Professional Rigger, or Advanced Rigger).



THE ADVANCED RIGGER TRAINING COVERS:

- Rigging Gear Inspection
- Sling Inspection
- Below-the-Hook Lifter Inspection
- Hitches
- Knots
- Hand Signals
- Load Chart Interpretation
- Sling Applications Proper Use of Shackles
- Lift Points - Swivel Hoist Rings - Eyebolts
- Sling Tension Calculations
- Load Weight Calculations
- Finding the Center of Gravity Calculations
- Share of Load Calculations
- Load Drifting
- Hoist Compensators (Hoist used to level off loads)
- Tensioning Lever Hoist
- Crane Safety

NRCT (National Rigging and Crane Training) Exam will be given at the end of each day. Students must pass with 70% score.

PRICE
\$1,000

REGISTER AT
store.olsenchain.com/training

* Per ASME B30.9, B30.26 and OSHA 1920.184, riggers shall be trained and qualified for the rigging they are performing

Training will be completed on-site at Olsen's Delano location.

LOAD SECUREMENT

CARGO SECUREMENT TIPS

- Ensure your tie-downs are properly rated for the load they are meant to secure.
- Inspect all tie-downs for wear and damage, replacing when worn or damaged.
- Make sure that your cargo does not require special precautions or securing.
- A good rule of thumb is one tie-down is used for every ten feet of cargo, using two tie-downs to secure any piece of cargo regardless of length. View our [Tie Down Chain and Load Binder Specifications](#) page for more information.
- Cargo must be firmly immobilized and secured on or within a trailer; this includes tools, equipment, chains, spare tires, etc. Large objects should be tied down directly to the trailer.
- An enclosed trailer may not be sufficient for securing your load, additional securement is likely necessary to prevent shifting during transit.
- Bungee cords and tarp straps must not be used as primary securement for loads or equipment.
- Tie-downs should be secured lower on the trailer, not near the top rails.
- Tie-downs should be attached and secured in a manner that prevents it from becoming loose, unfastening, opening or releasing while in transit.
- Cargo straps can loosen with vibrations of the road, check early in your trip to ensure the attachments are still properly secured and regularly throughout the trip.
- Always make sure your load is properly contained, immobilized and secured so that it cannot leak, spill, blow off, fall from, fall through or otherwise be dislodged from the trailer, or shift upon or within the trailer to so that the trailer's stability or maneuverability is affected. Loads that shift can not only cause crashes but can also damage your trailer and towing vehicle.

TOOL BOX TALKS

From equipment to procedures; the ins and outs of rigging, equipment, and safety to protect and equip your entire operation with expertise from rigging and lifting professionals and standards from the leading authorities in safety, compliance, and performance.

ASME

ASME is a not-for-profit membership organization that enables collaboration, knowledge sharing, career enrichment, and skills development across all engineering disciplines, toward a goal of helping the global engineering community develop solutions to benefit lives and livelihoods.

TOPICS MAY INCLUDE:

- Rigging Techniques and Terms
- Synthetic Web Slings & Round Slings - Use, Inspection and Care
- Chain Slings - Use, Inspection and Care
- Wire Rope - Use, Inspection and Care
- We cater the talks to your group and the various rigging applications they use.
- Call us today to Schedule: 800-328-1906

OSHA

OSHA's On-Site Consultation Program offers no-cost and confidential occupational safety and health services to small- and medium-sized businesses in all 50 states, the District of Columbia, and several U.S. territories, with priority given to high-hazard worksites. On-Site Consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice for compliance with OSHA standards, and assist in establishing and improving safety and health programs.

OSHA's Safety & Health Achievement Recognition Program (SHARP) recognizes small business employers who have used OSHA's On-Site Consultation Program services and operate exemplary safety and health programs. Acceptance of your worksite into SHARP from OSHA is an achievement of status that singles you out among your business peers as a model for worksite safety and health.

Tool box talks can be a great way to keep your employees up to date on the various OSHA and ASME standards as they relate to safe rigging.

HOIST PRE-OPERATIONAL INSPECTION CHECK LIST

Refer to manufacturer's operator manual for a complete list of recommended safety checks. Any concerns or questions please call today to schedule an inspection.



- TAGGED CRANE OR HOIST** Check that crane or hoist is not tagged with an out-of-order sign. ASME B30.2-3.3.4 (b) (4) and (5)
- WARNING & SAFETY LABELS** Check that warning and other safety labels are not missing and and safety labels are legible. ASME B30.2-1.1 OSHA 1910.179 (b) (5)
- CONTROL DEVICES** Confirm that hoist motion matches control markings. ASME B30.2-3.3.4 (b) (II)
- HOOK** Check for damage, cracks, nicks, gouges & deformations of the throat opening. If load chain is present check for wear on saddle or load bearing point and any twisting. Refer to manufacturer's operator manual. ASME B30.2-2.1.4 (c) (4) OSHA 1910.179 (j) (2) (ii)
- HOOK LATCH** If a hook latch is required, check for proper operation. ASME B30.2-3.3.4 (b) (15) and (16)
- LIMIT SWITCHES** Check that the upper limit device stops the lifting motion of the hoist load block before striking any part of the hoist or crane. ASME B30.2-2.1.3 (b) (2) OSHA 1910.179 (n) (4) (i)
- UNUSUAL SOUNDS** Check for any unusual sounds from the crane or hoist mechanism during operation. ASME B30.2-2.1.4 (c) (1)
- OIL LEAKAGE** Check for any sign of oil leakage on the crane and on the floor beneath the crane. ASME B30.2-2.1.4 (c) (3) OSHA 1910.179 (j) (2) (ii)
- HOIST CHAIN** Check for cracks, nicks, gouges, wear and stretch. Check that the chain is in the upper and lower sprockets and in the chain guide and that the chain is not twisted. OSHA 1910.179 (j) (2) (iv) OSHA 1910.179 (j) (3) (vii)
- WIRE ROPE** Check for broken wires, broken strands, kinks, and any deformation or damage to the rope structure. ASME B30.2-2.2.2
- REEVING** Check that the wire rope is properly reeved and that rope parts are not twisted around each other. OSHA 1910.179 (j) (2) (vii) ASME B30.2-2.1.4 (c) (6)
- BRAKES** Check that all motions do not have excessive drift and that stopping distance is normal. ASME B30.2-2.1.5 (c) (6) OSHA 1910.179 (j) (3) (v)
- HOUSEKEEPING & LIGHTING** Check area for accumulation of material to prevent tripping or slipping. Check area for poor lighting. ASME B30.2-1.2.1 (b) OSHA 1910.179 (b) (6) (ii)

NAME _____ DATE _____

HOIST SERIAL # _____ TIME _____



Call us today at **800-328-1906** or email **Sales@OlsenChain.com**

Daily, Frequent and Periodic inspections are required. Please refer to OSHA 1910.179 and ASME B30.X to ensure compliance. Any concerns or questions please call today to schedule an inspection.

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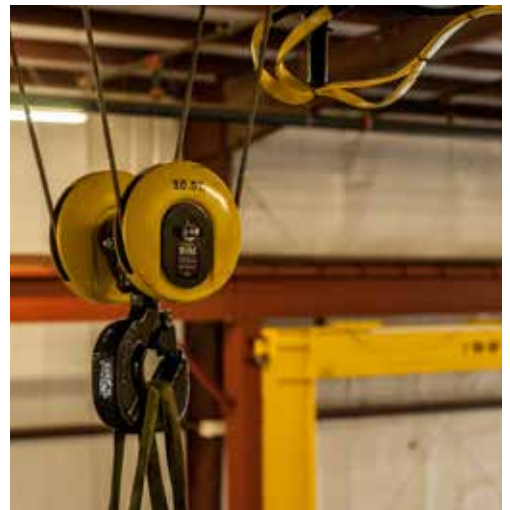


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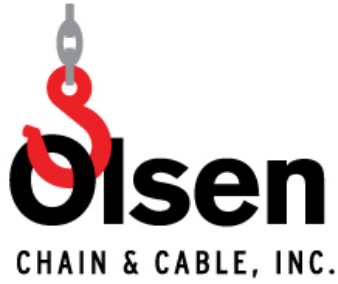
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218-236-7099
800-328-1906
Fax 218-236-7191

Sales@OlsenChain.com

Application for Credit

Date: _____

Name of Company or Individual: _____

Phone: _____ Fax: _____

Street Address: _____

City: _____ State: _____ Zip: _____

Mailing Address (if different than above): _____

City: _____ State: _____ Zip: _____

Please Check One: Proprietorship: _____ Partnership: _____ Corporation: _____

Fed ID#: _____ or SS# _____

SALES TAX RATE: _____ (If exempt, attach certificate)

Length of Ownership: _____

Requested Credit Amount: \$ _____

Accounts Payable Email: _____ @ _____

Should credit availability be granted by Olsen Chain & Cable Co. Inc., all decisions with respect to the extension or continuation shall be in the sole discretion of Olsen Chain & Cable Co. Inc. Olsen Chain & Cable Co. Inc. may terminate any credit availability at any time.

All accounts accepted on terms will be NET 30.

If Partnership or Corporation, please list Partners or Officers:

Authorized Representative Signature: _____ Title: _____

Owner of Business: _____

Home Address: _____

Home Phone: _____ Cell Phone: _____

Business References

Name of Bank: _____

Contact Person: _____

Address: _____

Phone Numbers: _____

Account Type(s): Checking _____ Savings _____ Loan _____

Please list three (3) Business References:

1. Name: _____

Address: _____

Phone: _____ Fax: _____

2. Name: _____

Address: _____

Phone: _____ Fax: _____

3. Name: _____

Address: _____

Phone: _____ Fax: _____

****THE UNDERSIGNED HEREBY PERSONALLY GUARANTEES PAYMENT OF ANY OBLIGATION OF THE ABOVE APPLICANT.**

I/We hereby authorize Olsen Chain & Cable Co. Inc. to whom this application is made, to investigate the references listed pertaining to my/our credit and financial responsibility.

Signed: _____ **Print:** _____

Title: _____ Date: _____

Signed: _____ **Print:** _____

Title: _____ Date: _____

RETURN FORMS TO: AR@OlsenChain.com



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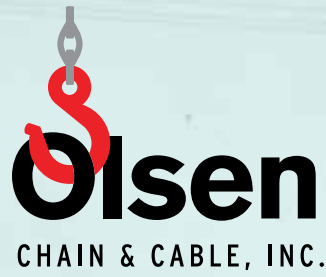
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