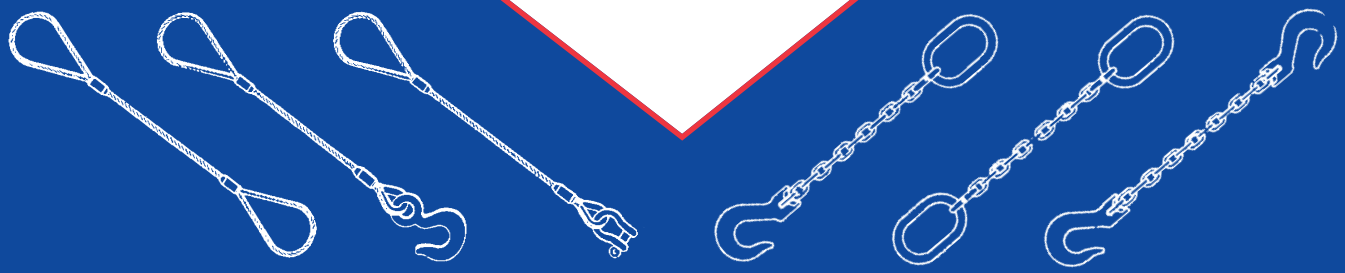
MIDCO COMPANIES



Domestic Wire Rope and Cable™

ASSOCIATED WIRE ROPE FABRICATORS

SLINGS

WIRE ROPE • CHAIN • SYNTHETIC

PRODUCTS
WIRE ROPE • HARDWARE • SLINGS
CHAIN • SYNTHETIC SLINGS • CARGO TIE-DOWNS

BLOCKS
- CRANE
- CUSTOM
- SNATCH
- TAILBOARD
- TONGLINE

CHAIN
- ALLOY
- BOOMER
- HI-TEST
- MAGNET
- PROOF COIL
- TRANSPORT
- TAIL CHAINS

CLIPS
- DROP-FORGED
- FIST-GRIP
- MALLEABLE

EYEBOLTS
- LIFTING
- REGULAR
- SHOULDER
- SWIVEL HOIST RINGS

HOOKS
- BARREL
- CHOKER
- CLEVIS GRAB
- CLEVIS SLIP
- EYE GRAB
- EYE HOIST
- EYE SLIP
- FOUNDRY
- LATCH KITS
- SLING
- SORTING

LINKS
- ALLOY
- MASTER
- OBLONG
- PEAR SHAPE

LOADBINDERS
- LEVER
- RATCHET
- SAFETY
- STANDARD
- WALKING

PENDANTS
- BOOM SUPPORTS
- CRANE
- RAISING LINES
- STRANDED BOOM SUPPORTS
- WIRE ROPE

PLATE CLAMPS

SAFETY EQUIPMENT
- FULL BODY HARNESSES
- LANYARDS
- HARDWARE
- LIFELINES

SHACKLES
- ALLOY
- CARBON
- SAFETY ANCHOR
- SCREW PIN ANCHOR

SHEAVES
- BRONZED BUSHED
- FINISHED BORE
- FORGED
- ROLLER BEARING
- TAPERED BEARING

SLINGS
- CHAIN
- SYNTHETIC
- ROUND
- WIRE MESH
- WIRE ROPE

SOCKETS
- SPELTER
- SWAGE
- WEDGE

SPREADER BEAMS

STAINLESS STEEL
- HARDWARE
- WIRE ROPE

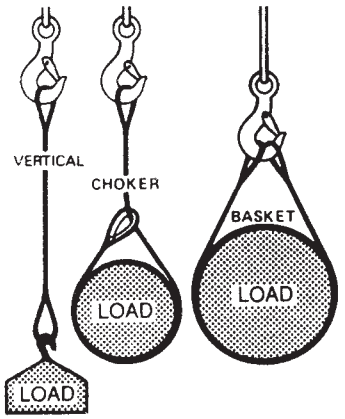
THIMBLES
- HEAVY DUTY
- REGULAR

TURNBUCKLES
- EYE AND EYE
- HOOK AND EYE
- HOOK AND HOOK
- JAW AND EYE
- JAW AND JAW

WELL MEASURING LINES

WIRE ROPE
- GALVANIZED
- GENERAL PURPOSE
- OILFIELD/MINING
- ROTATION RESISTANT
- SPECIALTY

WIRE ROPE SLINGS
* RECOMMENDED OPERATING PRACTICES



Every Lift Uses 1 of 3 Basic Hitches

VERTICAL, or straight, attachment is simply using a sling to connect a lifting hook or other device to a load. Full rated load of the sling may be used but never exceeded. A tagline should be used on such a lift to prevent rotation which can damage the sling. A sling with a hand-tucked splice can unlay and fail if the sling is allowed to rotate.

CHOKER hitches reduce lifting capability of a sling, since this method of rigging affects the ability of the wire rope components to adjust during the lift, places angular loading on the body of the sling, and creates a small diameter bend in the sling body at the choke point.

BASKET hitches distribute a load equally between the two legs of a sling, within limitations imposed by the angles at which legs are rigged to the load.

Basic Factors Concerning Use of Wire Rope Slings

1. RATED LOAD (Rated Capacity) of a wire rope sling is based upon the Nominal, or Catalog, Strength of the wire rope used in the sling, AND FACTORS which affect the overall strength of the sling. These factors include ATTACHMENT or SPLICING EFFICIENCY, the number of parts of rope in the sling, type of hitch (e.g., straight pull, choker hitch, basket hitch), DIAMETER AROUND WHICH THE BODY OF THE SLING IS BENT, and the diameter of pin (or hook) over which the eye of the sling is rigged.

2. RATED LOAD of a sling is different for each of the three basic methods of rigging. (See graphic above) These rated loads are available from your wire rope sling supplier and may be indicated on the tag attached to the sling at the time it is fabricated (if requested by the user).

3. WARNING: A hand-tucked eye splice can unlay (unravel) and fail if the sling is allowed to rotate during use.

4. NEVER “SHOCK LOAD” A SLING. There is no practical way to estimate the actual force applied by shock loading. The rated load of a wire rope sling can easily be exceeded by a sudden application of force, and damage can occur to the sling. The sudden release of a load can also damage a sling.

5. The BODY of a wire rope sling should be PROTECTED with corner protectors, blocking or padding against damage by sharp edges or corners of a load being lifted. Sharp bends that distort the sling body damage the wire rope and reduce its strength.

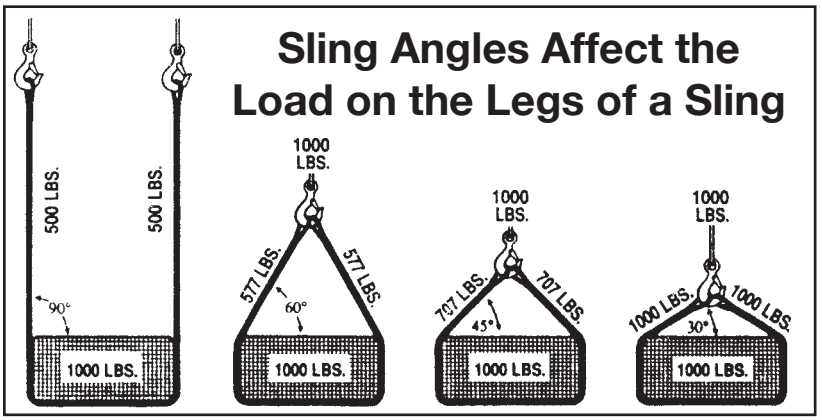
6. ANY ANGLE other than vertical at which a sling is rigged increases the loading on the sling.

7. A sling should be given a VISUAL INSPECTION BEFORE EACH LIFT OR USAGE to determine if it is capable of safely making the intended lift.

   An inspection should include looking for such things as:
   - Broken wires
   - Kinks or distortions of the sling body.
   - Condition of eyes and splices, and any attached hardware
   - Reduction in diameter of the rope
   - Any damage
   - Corrosion

8. Whenever a sling is found to be deficient, the eyes must be cut, or other end attachments or fittings removed, to prevent further use, and the sling body discarded.

9. 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. The eye should always be used on a hook or pin with AT LEAST THE DIAMETER OF THE ROPE.



SLING ANGLE (also called Angle of Loading) is the angle measured between a horizontal line and the sling leg or body. This angle is very important and can have a dramatic effect on the rated load of the sling. As illustrated here, when this 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. Horizontal sling angles of LESS THAN 30 DEGREES SHALL NOT BE USED.

* Courtesy of Wire Rope Technical Board

Some Things Every User Should Know About the Use and Care of Wire Rope and Wire Rope Slings

The following information is NOT a complete discussion of wire rope or wire rope slings. WHAT FOLLOWS IS A BRIEF OUTLINE OF THE BASIC INFORMATION REQUIRED TO SAFELY USE WIRE ROPE AND WIRE ROPE SLINGS.

1. Wire rope WILL FAIL IF WORN OUT, OVERLOADED, MISUSED, DAMAGED or IMPROPERLY MAINTAINED.

2. In service, wire rope loses strength and work capability. Abuse and misuse increase the rate of loss.

3. The MINIMUM BREAKING FORCE, the published (CATALOG) strength, of a wire rope applies ONLY to a NEW, UNUSED rope.

4. The MINIMUM BREAKING FORCE (published catalog strength) of a wire rope SHOULD BE CONSIDERED the straight line pull which will ACTUALLY BREAK a new, UNUSED rope. The published catalog strength of a wire rope should NEVER BE USED AS ITS WORKING LOAD.

5. To determine the working load of a wire rope, the MINIMUM BREAKING FORCE MUST BE REDUCED by a DESIGN FACTOR (formerly called a Safety Factor). The Design Factor will vary depending upon the type of machine and installation, and the work performed. YOU must determine the applicable Design Factor for your use.

   For example, a Design Factor of "5" means that the MINIMUM BREAKING FORCE of the wire rope must be DIVIDED BY FIVE to determine the maximum load that can be applied to the rope system.

   Design Factors have been established by OSHA, ANSI, ASME, and similar government and industrial organizations.

   No wire rope or wire rope sling should ever be installed or used without full knowledge and consideration of the Design Factor for the application.

6. WIRE ROPES WEAR OUT. The strength of a wire rope begins to decrease when the rope is put in use and continues to decrease with each use.

7. NEVER OVERLOAD A WIRE ROPE. This means NEVER USE the rope where the load applied to it is greater than the working load determined by dividing the MINIMUM BREAKING FORCE of the rope by the appropriate Design Factor.

8. NEVER "SHOCK-LOAD" a wire rope. A sudden application of force or load can cause both external damage and internal damage. There is no practical way to estimate the force applied by shock-loading a rope. The sudden release of a load can also damage a wire rope.

9. Lubricant is applied to the wires and strands of a wire rope when it is manufactured. This lubricant is depleted when the rope is in service and should be replaced periodically.

10. Regular, periodic INSPECTIONS of the wire rope, and keeping of PERMANENT RECORDS SIGNED BY A QUALIFIED PERSON, are REQUIRED BY OSHA FOR ALMOST EVERY WIRE ROPE INSTALLATION. The purpose of inspection is to determine whether or not a wire rope or wire rope sling may continue to be safely used on that application. Inspection criteria, including number and location of broken wires, wear and elongation, have been established by OSHA, ANSI, ASME and similar organizations.

    ### IF IN DOUBT, REPLACE THE ROPE.

    An inspection should include verification that none of the specified removal criteria for this usage are met by checking for such things as:

    - Surface wear: normal and unusual
    - Broken wires: number and location
    - Reduction in diameter
    - Rope stretch (elongation)
    - Integrity of end attachments
    - Evidence of abuse or contact with another object
    - Heat damage
    - Corrosion

    In addition, an inspection should include the condition of sheaves, drums and other apparatus with which the rope makes contact.

11. When a wire rope has been removed from service because it is no longer suitable for use, IT MUST NOT BE RE-USED ON ANOTHER APPLICATION.

12. Every wire rope user should be aware of the fact that each type of fitting attached to a wire rope has a specific efficiency rating which can reduce the working load of the rope assembly or rope system, and this must be given due consideration in determining the capacity of a wire rope system.

13. Some conditions that can lead to problems in a wire rope system include:
    - Sheaves that are too small, worn or corrugated cause damage to a wire rope.
    - Broken wires mean a loss of strength.
    - Kinks permanently damage a wire rope and must be avoided.
    - Wire ropes are damaged by knots, and wire ropes with knots must never be used.
    - Environmental factors such as corrosive conditions and heat can damage a wire rope.
    - Lack of lubrication can significantly shorten the useful service life of a wire rope.
    - Contact with electrical wires and the resulting arcing will damage a wire rope.

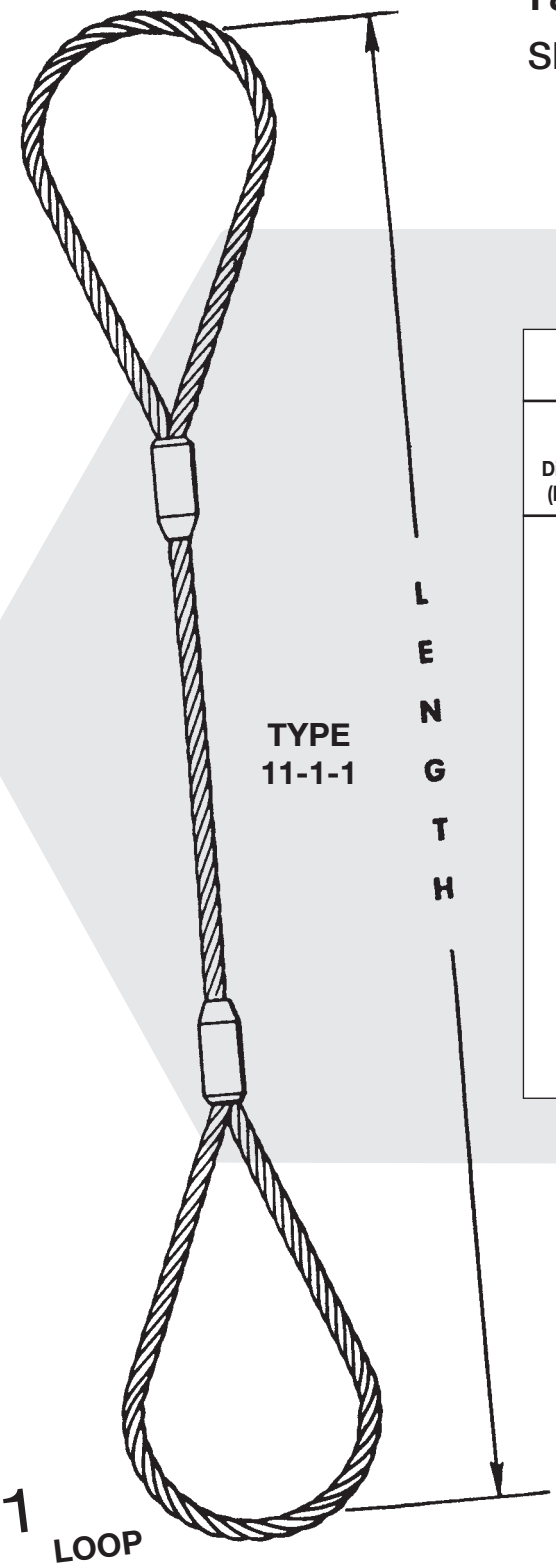
Wire Rope Technical Board – Wire Rope Sling Users Manual, Third Edition

TYPE 11

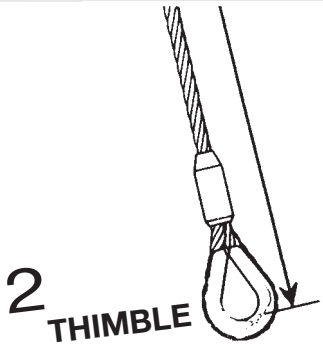
MIDCO *All-Purpose* SLINGS

Tapered Sleeve Attachments

SINGLE LEG



RATED CAPACITIES Tons, 2,000 lbs. D/F 5 TO 1				
Rope Diameter (Inches)	11- 0 Recommended Minimum Length	Vertical	Choker	Vertical Basket
1/4	1′ 6″	0.65	0.48	1.3
5/16	1′ 10″	1.0	0.74	2.0
3/8	1′ 10″	1.4	1.1	2.9
7/16	2′ 4″	1.9	1.4	3.9
1/2	2′ 6″	2.5	1.9	5.1
9/16	2′ 8″	3.2	2.4	6.4
5/8	3′ 2″	3.9	2.9	7.8
3/4	3′ 8″	5.6	4.1	11
7/8	4′ 4″	7.6	5.6	15
1	4′ 10″	9.8	7.2	20
1 1/8	5′ 6″	12	9.1	24
1 1/4	6′ 2″	15	11	30
1 3/8	6′ 10″	18	13	36
1 1/2	7′ 4″	21	16	42
1 3/4	8′ 6″	28	21	57
2	9′ 10″	37	28	73



RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

MIDCO

All-Purpose SLINGS

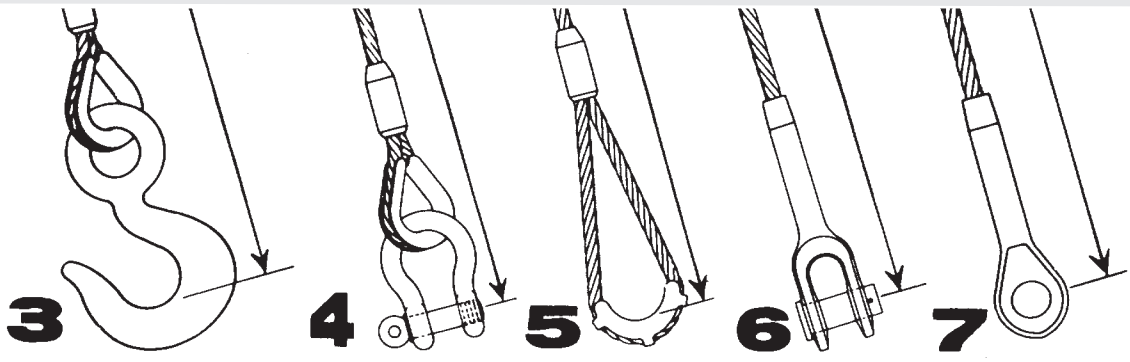
Tapered Sleeve Attachments

Single-leg All-Purpose Slings and Assemblies are for general utility, used singly or in pairs vertically, or in single- and double-basket hitch

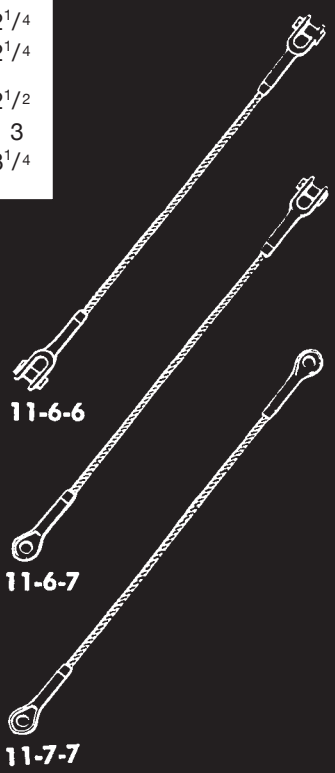
TYPE 11 SLINGS

PERTINENT DIMENSIONS FOR END FITTINGS

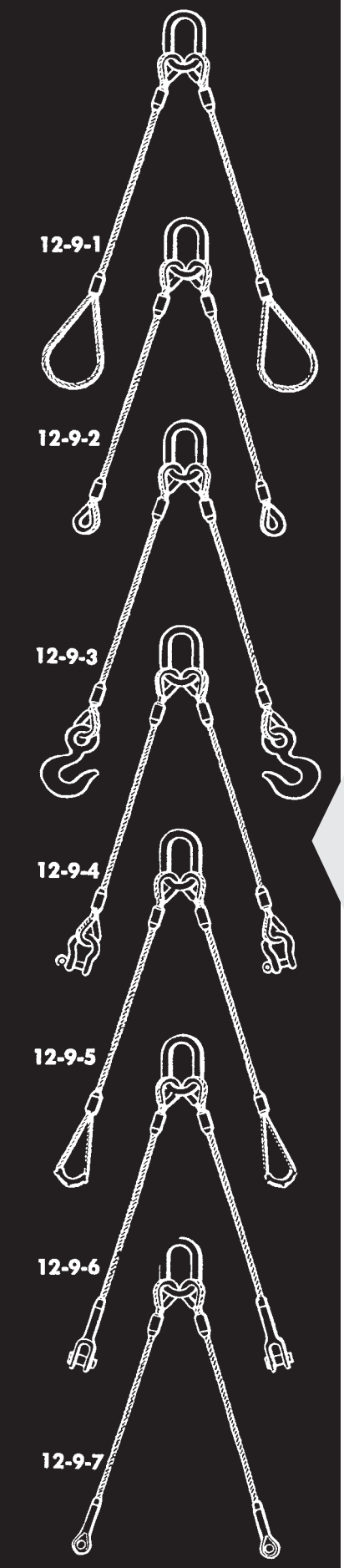
Rope Diam. Inches	1 LOOP INSIDE Width In.	1 LOOP INSIDE Length In.	2 THIMBLE INSIDE Width In.	2 THIMBLE INSIDE Length In.	3 ALLOY HOOK Size Ton	4 SHACKLE with thimble Size In.	5 HALFOPEN THIMBLE INSIDE LOOP Width In.	6 CLOSED SWAGED SOCKET Pin Diam. In.	6 CLOSED SWAGED SOCKET Jaw Opening In.	7 SWAGED SOCKET Hole Diam In.	7 SWAGED SOCKET Head Thickness In.
					6 x 19	E. I. P. S.	I. W. R. C.				
1/4	2	4	7/8	1 5/8	1	5/16		11/16	11/16	3/4	1/2
5/16	2 1/2	5	1 1/16	1 7/8	1 1/2	3/8		13/16	13/16	7/8	11/16
3/8	3	6	1 1/8	2 1/8	2	7/16	2	13/16	13/16	7/8	11/16
7/16	3 1/2	7	1 1/4	2 3/8	3	1/2	2	1	1	1 1/16	7/8
1/2	4	8	1 1/2	2 3/4	3	5/8	2 1/4	1	1	1 1/16	7/8
9/16	4	8	1 1/2	2 3/4	5	5/8	2 1/4	1 3/16	1 1/4	1 1/4	1 1/8
5/8	5	10	1 3/4	3 1/4	5	3/4	2 3/4	1 3/16	1 1/4	1 1/4	1 1/8
3/4	6	12	2	3 3/4	7	7/8	3 1/4	1 3/8	1 1/2	1 7/16	1 5/16
7/8	7	14	2 1/4	4 1/4	11	1	4 1/2	1 5/8	1 3/4	1 11/16	1 1/2
1	8	16	2 1/2	4 1/2	11	1 1/8	4 1/2	2	2	2 1/16	1 3/4
1 1/8	9	18	2 7/8	5 1/8	15	1 1/4	4 7/8	2 1/4	2 1/4	2 5/16	2
					6 x 37	E. I. P. S.	I. W. R. C.				
1 1/4	10	20	3 1/2	6 1/2	15	1 1/2	5 1/2	2 1/2	2 1/2	2 9/16	2 1/4
1 3/8	12	24	3 1/2	6 1/4	22	1 3/4	6	2 1/2	2 1/2	2 9/16	2 1/4
1 1/2	12	24	3 1/2	6 1/4	22	1 3/4	6 1/2	2 3/4	3	2 7/8	2 1/2
1 3/4	15	30	4 1/2	9	37	2	7	3 1/2	3 1/2	3 5/8	3
2	17	34	6	12	45	2 1/2	7	3 3/4	4	3 7/8	3 1/4



HOOK | SHACKLE | HALF THIMBLE | OPEN SWAGED SOCKET | CLOSED SWAGED SOCKET



RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

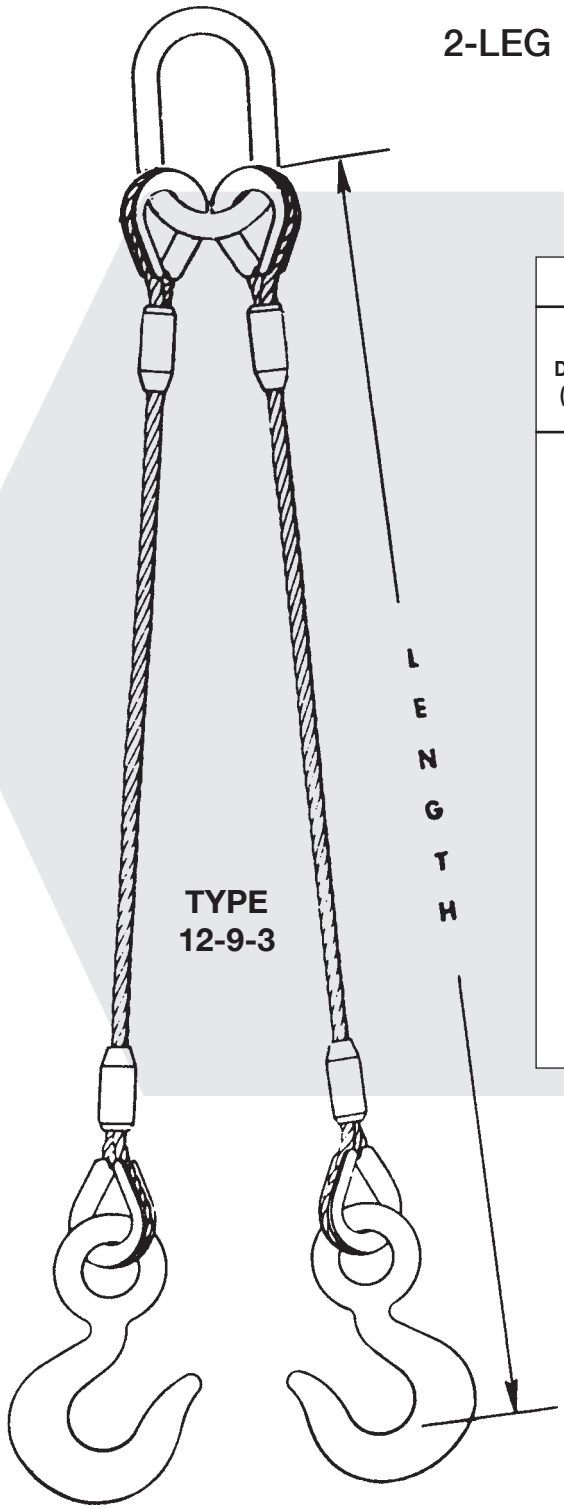


TYPE 12-9

MIDCO *All-Purpose* SLINGS

Tapered Sleeve Attachment

2-LEG BRIDLES



2- LEG BRIDLE			
Rope Diameter (Inches)	12- 9 Minimum Length	45 Degree	60 Degree
1/4	1′ 6″	0..91	1.1
5/16	1′ 8″	1.4	1.7
3/8	1′ 10″	2.0	2.5
7/16	2′ 4″	2.7	3.4
1/2	2′ 6″	3.6	4.4
9/16	2′ 8″	4.5	5.5
5/8	3′ 4″	5.5	6.8
3/4	3′ 8″	7.9	9.7
7/8	4′ 4″	11	13
1	5′	14	17
1 1/8	5′ 10″	17	21
1 1/4	6′ 6″	21	26
1 3/8	7′	25	31
1 1/2	7′ 6″	30	37

RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

MIDCO

All-Purpose SLINGS

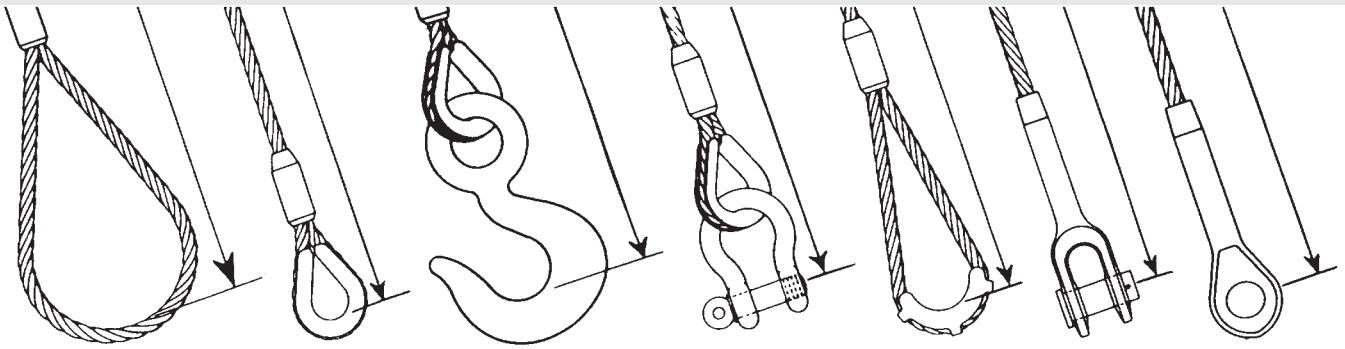
Tapered Sleeve Attachments

TYPE 12-9 SLINGS

Type 12-9 slings are 2-leg All-Purpose bridles, designed for general lifting purposes where attachment may be made directly to the load, such as hooking into lifting eyes or placing loops over lugs.

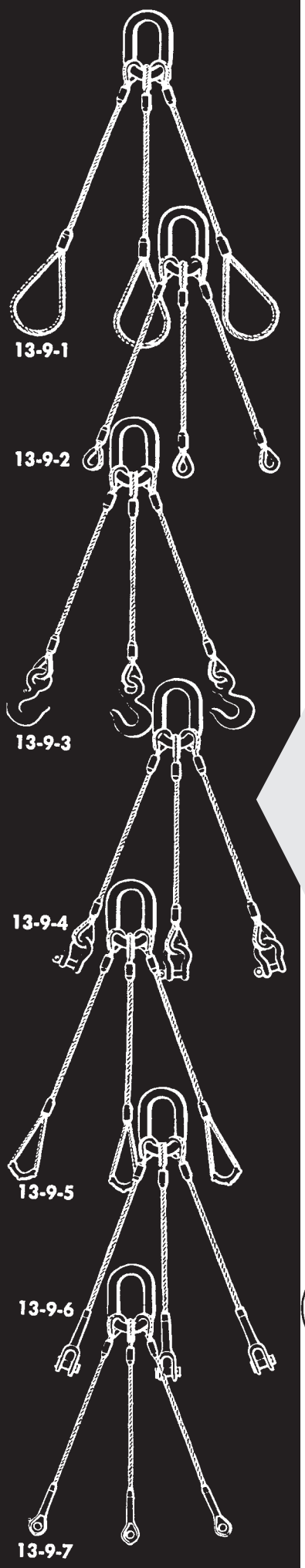
PERTINENT DIMENSIONS FOR END FITTINGS

	1		2		3	4	5	6		7		
	LOOP		THIMBLE		ALLOY HOOK	SHACKLE with thimble	HALF THIMBLE	OPEN SWAGED SOCKET		CLOSED SWAGED SOCKET		MASTER LINK
Rope	INSIDE		INSIDE				INSIDE LOOP	Pin	Jaw	Hole	Head	Stock
Diam. Inches	Width In.	Length In.	Width In.	Length In.	Size Ton	Size In.	Width In.	Diam. In.	Opening In.	Diam. In.	Thickness In.	Diam. In.
6 x 19 E. I. P. S. I. W. R. C.												
1/4	2	4	7/8	1 5/8	1	5/16		11/16	11/16	3/4	1/2	5/8
5/16	2 1/2	5	1 1/16	1 7/8	1 1/2	3/8		13/16	13/16	7/8	11/16	5/8
3/8	3	6	1 1/8	2 1/8	2	7/16	2	13/16	13/16	7/8	11/16	5/8
7/16	3 1/2	7	1 1/4	2 3/8	3	1/2	2	1	1	1 1/16	7/8	5/8
1/2	4	8	1 1/2	2 3/4	3	5/8	2 1/4	1	1	1 1/16	7/8	3/4
9/16	4	8	1 1/2	2 3/4	5	5/8	2 1/4	1 3/16	1 1/4	1 1/4	1 1/8	3/4
5/8	5	10	1 3/4	3 1/4	5	3/4	2 3/4	1 3/16	1 1/4	1 1/4	1 1/8	1
3/4	6	12	2	3 3/4	7	7/8	3 1/4	1 3/8	1 1/2	1 7/16	1 5/16	1 1/4
7/8	7	14	2 1/4	4 1/4	11	1	4 1/2	1 5/8	1 3/4	1 11/16	1 1/2	1 1/4
1	8	16	2 1/2	4 1/2	11	1 1/8	4 1/2	2	2	2 1/16	1 3/4	1 1/2
1 1/8	9	18	2 7/8	5 1/8	15	1 1/4	4 7/8	2 1/4	2 1/4	2 5/16	2	1 1/2
6 x 37 E. I. P. S. I. W. R. C.												
1 1/4	10	20	3 1/2	6 1/2	15	1 1/2	5 1/2	2 1/2	2 1/2	2 9/16	2 1/4	1 3/4
1 3/8	12	24	3 1/2	6 1/4	22	1 3/4	6	2 1/2	2 1/2	2 9/16	2 1/4	1 3/4
1 1/2	12	24	3 1/2	6 1/4	22	1 3/4	6 1/2	2 3/4	3	2 7/8	2 1/2	2



1 LOOP **2** THIMBLE **3** HOOK **4** SHACKLE **5** HALF THIMBLE **6** OPEN SWAGED SOCKET **7** CLOSED SWAGED SOCKET

RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

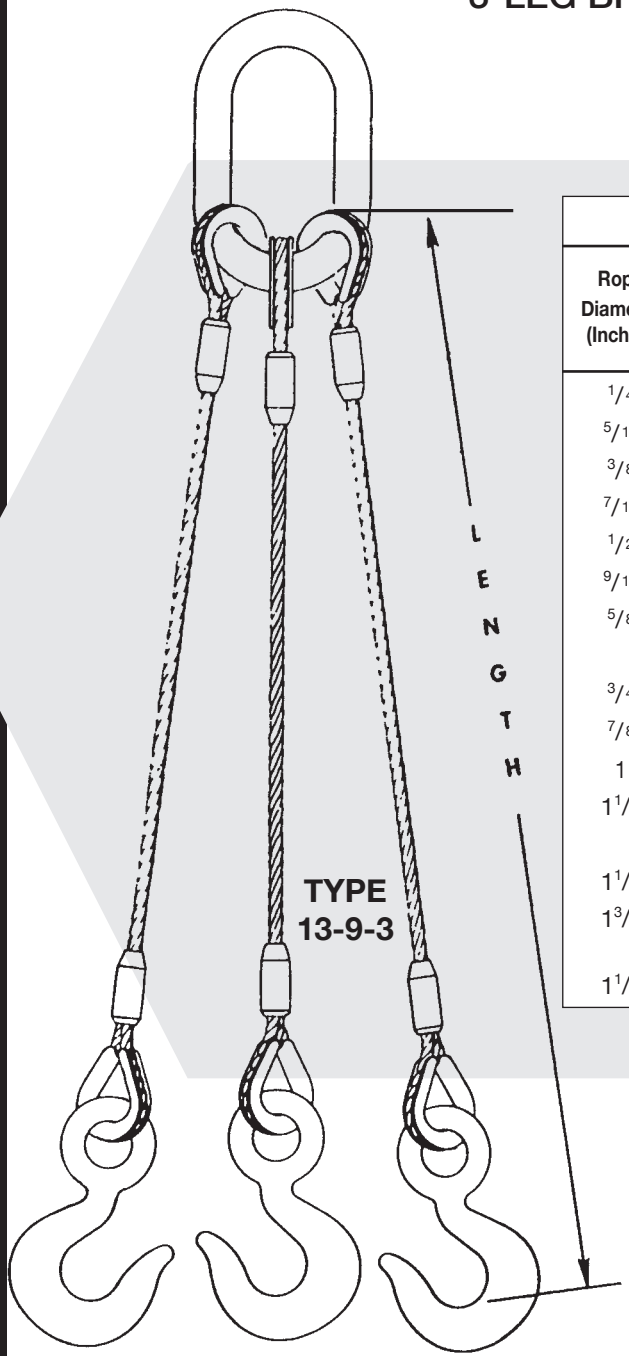


TYPE 13-9

MIDCO *All-Purpose* SLINGS

Tapered Sleeve Attachments

3-LEG BRIDLES



3- LEG BRIDLE			
Rope Diameter (Inches)	13- 9 Minimum Length	45 Degree	60 Degree
1/4	1′ 6″	1.4	1.7
5/16	1′ 8″	2.1	2.6
3/8	1′ 10″	3.0	3.7
7/16	2′ 4″	4.1	5.0
1/2	2′ 6″	5.4	6.6
9/16	2′ 8″	6.8	8.3
5/8	3′ 4″	8.3	10
3/4	3′ 8″	12	15
7/8	4′ 4″	16	20
1	5′	21	26
1 1/8	5′ 10″	26	31
1 1/4	6′ 6″	31	38
1 3/8	7′	38	46
1 1/2	7′ 6″	45	55

RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

MIDCO

All-Purpose SLINGS

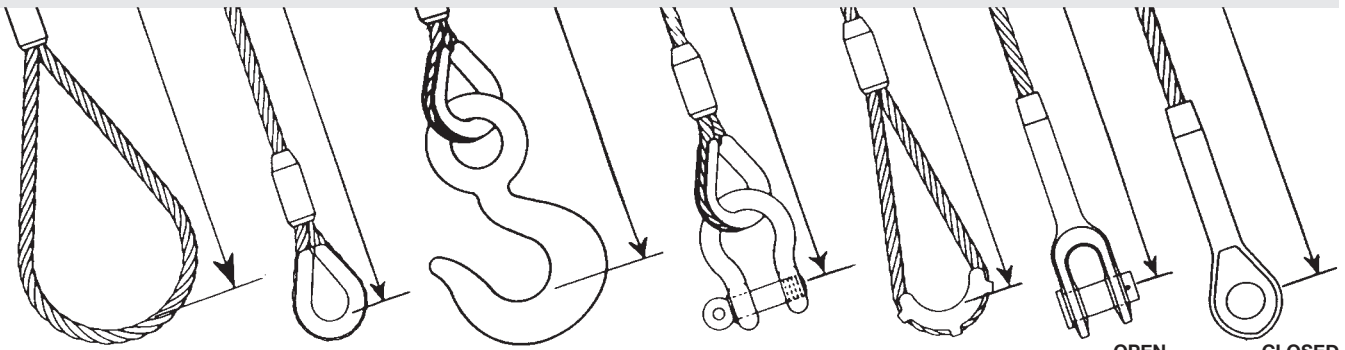
Tapered Sleeve Attachments

TYPE 13-9 SLINGS

Type 13-9 slings are 3-leg All-Purpose bridles, generally recommended for handling unbalanced loads.

PERTINENT DIMENSIONS FOR END FITTINGS

	1 LOOP		2 THIMBLE		3	4	5	6 OPEN SWAGED SOCKET		7 CLOSED SWAGED SOCKET		MASTER LINK
	INSIDE		INSIDE		ALLOY HOOK	SHACKLE with thimble	HALF THIMBLE					
Rope Diam. Inches	Width In.	Length In.	Width In.	Length In.	Size Ton	Size In.	INSIDE LOOP Width In.	Pin Diam. In.	Jaw Opening In.	Hole Diam. In.	Head Thickness In.	Stock Diam. In.
6 x 19 E. I. P. S. I. W. R. C.												
1/4	2	4	7/8	1 5/8	1	5/16		11/16	11/16	3/4	1/2	5/8
5/16	2 1/2	5	1 1/16	1 7/8	1 1/2	3/8		13/16	13/16	7/8	11/16	5/8
3/8	3	6	1 1/8	2 1/8	2	7/16	2	13/16	13/16	7/8	11/16	5/8
7/16	3 1/2	7	1 1/4	2 3/8	3	1/2	2	1	1	1 1/16	7/8	3/4
1/2	4	8	1 1/2	2 3/4	3	5/8	2 1/4	1	1	1 1/16	7/8	1
9/16	4	8	1 1/2	2 3/4	5	5/8	2 1/4	1 3/16	1 1/4	1 1/4	1 1/8	1
5/8	5	10	1 3/4	3 1/4	5	3/4	2 3/4	1 3/16	1 1/4	1 1/4	1 1/8	1
3/4	6	12	2	3 3/4	7	7/8	3 1/4	1 3/8	1 1/2	1 7/16	1 5/16	1 1/4
7/8	7	14	2 1/4	4 1/4	11	1	4 1/2	1 5/8	1 3/4	1 11/16	1 1/2	1 1/2
1	8	16	2 1/2	4 1/2	11	1 1/8	4 1/2	2	2	2 1/16	1 3/4	1 3/4
1 1/8	9	18	2 7/8	5 1/8	15	1 1/4	4 7/8	2 1/4	2 1/4	2 5/16	2	2
6 x 37 E. I. P. S. I. W. R. C.												
1 1/4	10	20	3 1/2	6 1/2	15	1 1/2	5 1/2	2 1/2	2 1/2	2 9/16	2 1/4	2
1 3/8	12	24	3 1/2	6 1/4	22	1 3/4	6	2 1/2	2 1/2	2 9/16	2 1/4	2
1 1/2	12	24	3 1/2	6 1/4	22	1 3/4	6 1/2	2 3/4	3	2 7/8	2 1/2	2 1/4



1 LOOP **2** THIMBLE **3** HOOK **4** SHACKLE **5** HALF THIMBLE **6** OPEN SWAGED SOCKET **7** CLOSED SWAGED SOCKET

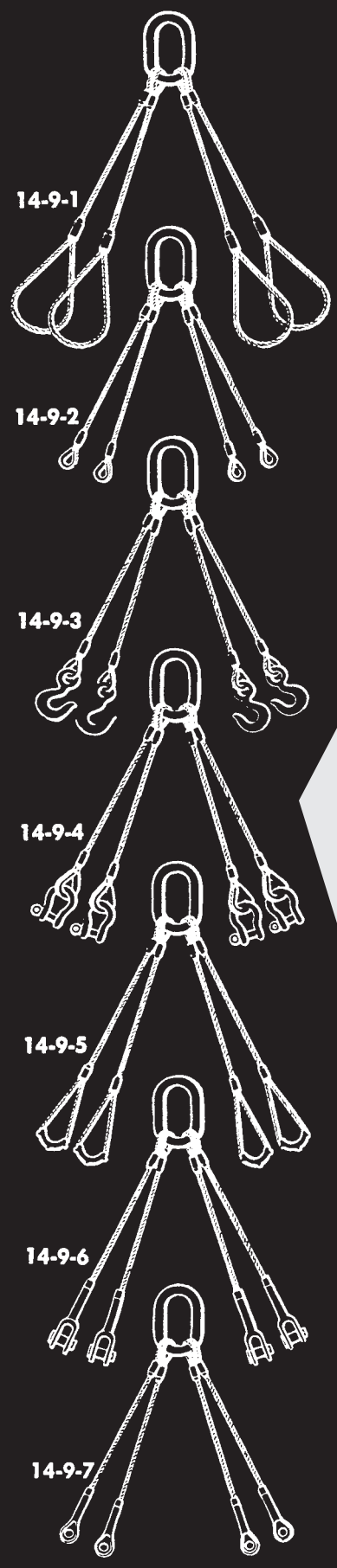
RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

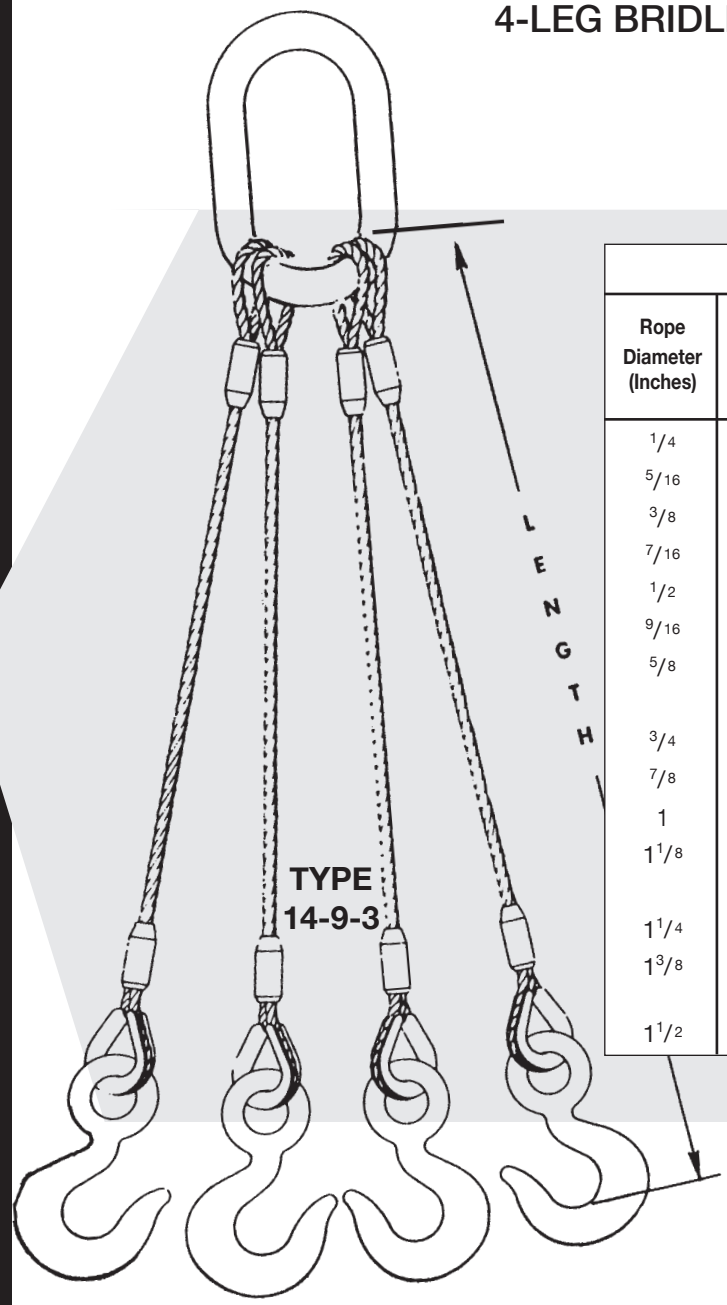
TYPE 14-9

MIDCO *All-Purpose* SLINGS

Tapered Sleeve Attachments

4-LEG BRIDLES





4- LEG BRIDLE			
Rope Diameter (Inches)	14- 9 Minimum Length	45 Degree	60 Degree
1/4	1′ 6″	1.8	2.2
5/16	1′ 8″	2.8	3.5
3/8	1′ 10″	4.1	5.0
7/16	2′ 4″	5.5	6.7
1/2	2′ 6″	7.1	8.8
9/16	2′ 8″	9	11
5/8	3′ 4″	11	14
3/4	3′ 8″	16	19
7/8	4′ 4″	21	26
1	5′	28	34
1 1/8	5′ 10″	34	42
1 1/4	6′ 6″	42	51
1 3/8	7′	50	62
1 1/2	7′ 6″	60	73

RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

MIDCO

All-Purpose SLINGS

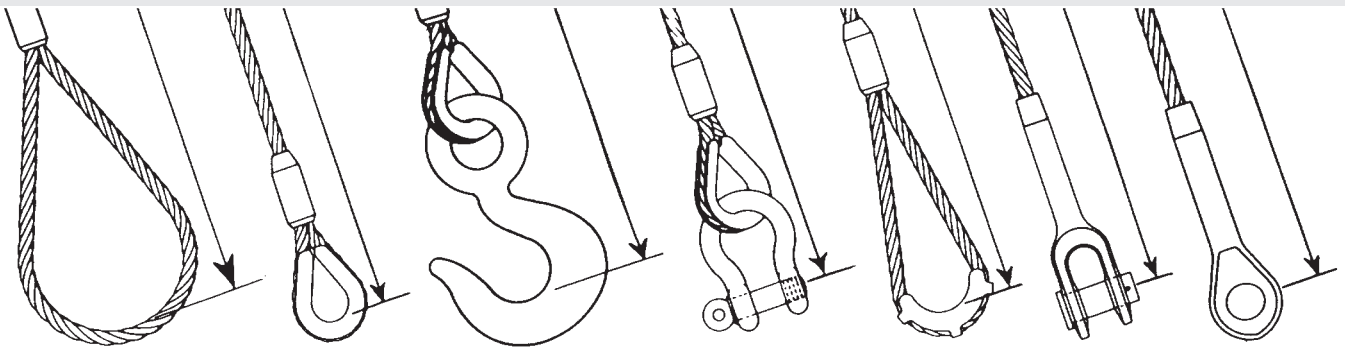
Tapered Sleeve Attachments

TYPE
14-9
SLINGS

Type 14-9 slings are 4-leg All-Purpose bridles, used both for balanced and unbalanced loads and for heavier loads where design calls for more distribution of weight by the use of attachment at four points.

PERTINENT DIMENSIONS FOR END FITTINGS

	1 LOOP		2 THIMBLE		3 ALLOY HOOK	4 SHACKLE with thimble	5 HALF THIMBLE	6 OPEN SWAGED SOCKET		7 CLOSED SWAGED SOCKET		MASTER LINK
Rope	INSIDE		INSIDE				INSIDE LOOP	Pin	Jaw	Hole	Head	Stock
Diam. Inches	Width In.	Length In.	Width In.	Length In.	Size Ton	Size In.	Width In.	Diam. In.	Opening In.	Diam. In.	Thickness In.	Diam. In.
6 x 19 E. I. P. S. I. W. R. C.												
1/4	2	4	7/8	1 5/8	1	5/16		11/16	11/16	3/4	1/2	5/8
5/16	2 1/2	5	1 1/16	1 7/8	1 1/2	3/8		13/16	13/16	7/8	11/16	5/8
3/8	3	6	1 1/8	2 1/8	2	7/16	2	13/16	13/16	7/8	11/16	3/4
7/16	3 1/2	7	1 1/4	2 3/8	3	1/2	2	1	1	1 1/16	7/8	1
1/2	4	8	1 1/2	2 3/4	3	5/8	2 1/4	1	1	1 1/16	7/8	1
9/16	4	8	1 1/2	2 3/4	5	5/8	2 1/4	1 3/16	1 1/4	1 1/4	1 1/8	1
5/8	5	10	1 3/4	3 1/4	5	3/4	2 3/4	1 3/16	1 1/4	1 1/4	1 1/8	1 1/4
3/4	6	12	2	3 3/4	7	7/8	3 1/4	1 3/8	1 1/2	1 7/16	1 5/16	1 1/2
7/8	7	14	2 1/4	4 1/4	11	1	4 1/2	1 5/8	1 3/4	1 11/16	1 1/2	1 3/4
1	8	16	2 1/2	4 1/2	11	1 1/8	4 1/2	2	2	2 1/16	1 3/4	2
1 1/8	9	18	2 7/8	5 1/8	15	1 1/4	4 7/8	2 1/4	2 1/4	2 5/16	2	2
6 x 37 E. I. P. S. I. W. R. C.												
1 1/4	10	20	3 1/2	6 1/2	15	1 1/2	5 1/2	2 1/2	2 1/2	2 9/16	2 1/4	2
1 3/8	12	24	3 1/2	6 1/4	22	1 3/4	6	2 1/2	2 1/2	2 9/16	2 1/4	2 1/4
1 1/2	12	24	3 1/2	6 1/4	22	1 3/4	6 1/2	2 3/4	3	2 7/8	2 1/2	2 1/2



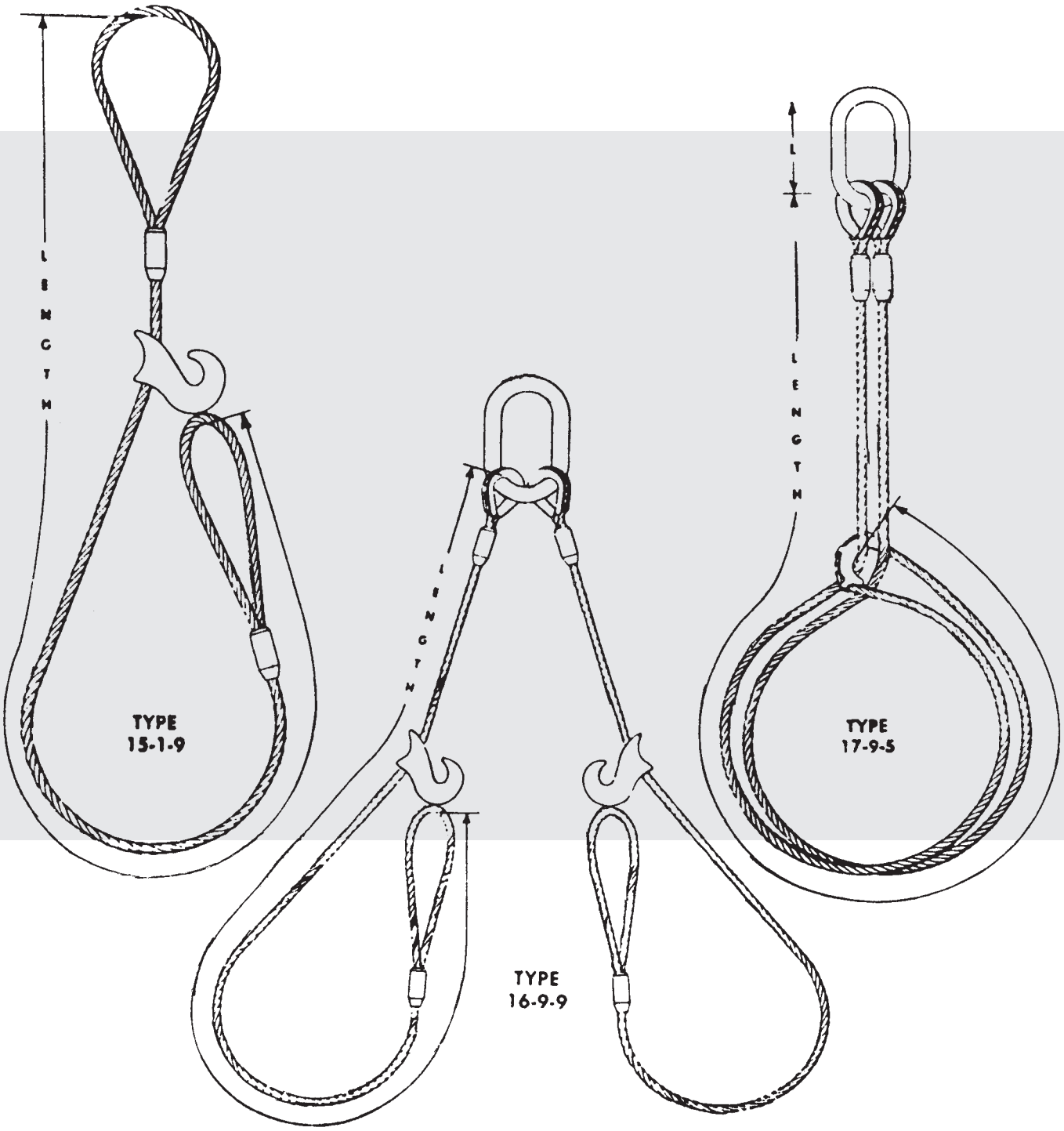
1 LOOP **2** THIMBLE **3** HOOK **4** SHACKLE **5** HALF THIMBLE **6** OPEN SWAGED SOCKET **7** CLOSED SWAGED SOCKET

RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

MIDCO *All-Purpose* SLINGS

Tapered Sleeve Attachments

CHOKER SLINGS



RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

MIDCO

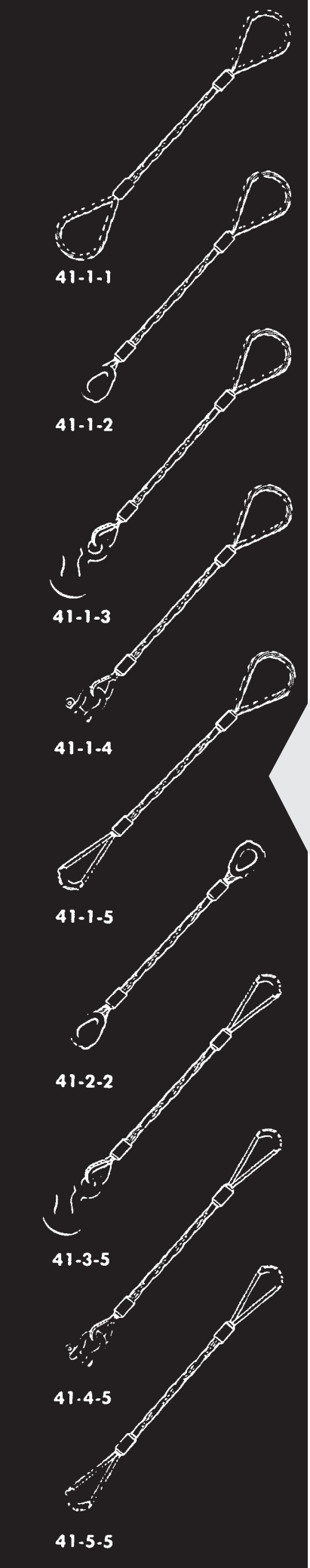
All-Purpose SLINGS

Tapered Sleeve Attachments

These Choker Slings are designed to grip or choke the load. Ideally suited to lifting bar stock, beams, lumber, bundles of pipe and similar material. The tapered sleeve splice, as well as the anchor hitch, Type 17-9-5, allows close snubbing of the load, insuring a positive grip. The use of sliding choker hooks increases sling life and permits faster handling.

Rope Diam. Inches	RATED CAPACITY Tons, 2000 lbs. D/F 5 to 1				LOOP INSIDE		HALF THIMBLE	MASTER LINK
	15-1-9 CHOKER	17-9-5 VERTICAL	2-LEG CHOKER 16-9-9 45 Degree Double Wrapped 	2-LEG CHOKER 16-9-9 60 Degree Double Wrapped 	Width Inches	Length Inches	Inside Width Inches	Stock Diameter Inches
1/4	.48	.95	.67	.82	2	4		5/8
5/16	.74	1.5	1.0	1.3	2 1/2	5		5/8
3/8	1.1	2.1	1.5	1.8	3	6	2	5/8
7/16	1.4	2.9	2.0	2.5	3 1/2	7	2	5/8
1/2	1.9	3.7	2.6	3.2	4	8	2 1/4	5/8
9/16	2.4	4.7	3.3	4.1	4	8	2 1/4	3/4
5/8	2.9	5.8	4.1	5.0	5	10	2 3/4	1
3/4	4.1	8.2	5.8	7.1	6	12	3 1/4	1
7/8	5.6	11	7.9	9.7	7	14	4 1/2	1 1/4
1	7.2	14	10	13	8	16	4 1/2	1 1/2
1 1/8	9.1	18	13	16	9	18	4 7/8	1 1/2
1 1/4	11	22	16	19	11	22	5 1/2	1 3/4
1 3/8	13	27	19	23	12	24	6	1 3/4
1 1/2	16	32	23	28	13	26	6	2

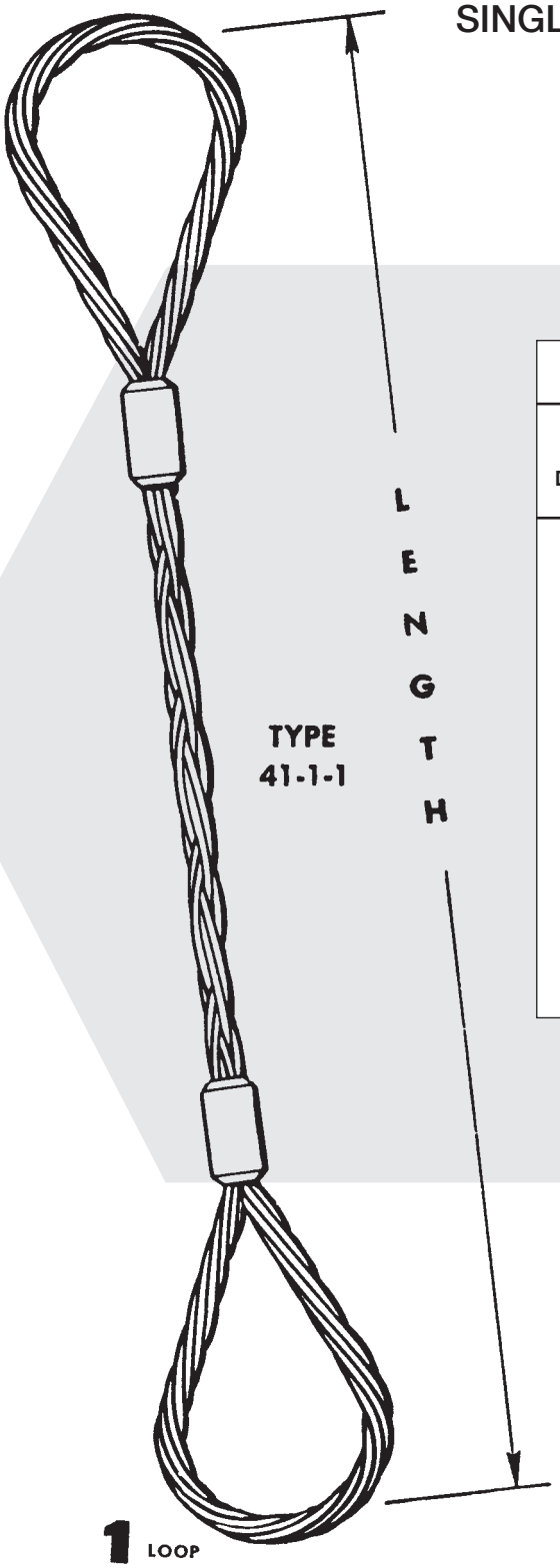
RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.



TYPE 41

MIDCO *8-Part Braided* SLINGS

SINGLE LEG



RATED CAPACITIES Tons, 2000 lbs. D/F 5 TO 1				
Rope Diameter (Inches)	Diameter of Finished Braid (Inches)	Vertical	Choker	Vertical Basket
1/8	9/16	1.1	1.0	2.2
3/16	13/16	1.9	1.6	3.7
1/4	1 1/8	3.3	2.9	6.6
5/16	1 3/8	5.1	4.5	10
3/8	1 11/16	7.3	6.4	15
7/16	2	10	8.7	20
1/2	2 1/4	13	11	26
9/16	2 1/2	16	14	32
5/8	2 13/16	20	18	40
3/4	3 3/8	29	25	57
7/8	4	39	34	78
1	4 1/2	50	44	101

RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

MIDCO

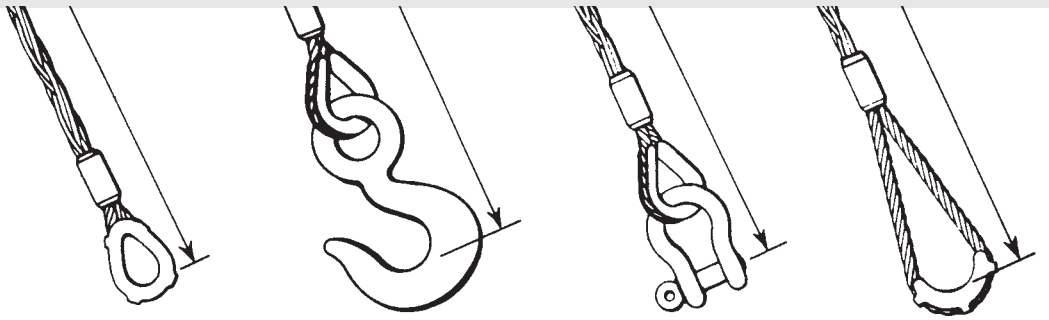
8-Part Braided SLINGS

TYPE 41 SLINGS

Single-leg 8-Part Braided Slings are used where extra flexibility and handling ease are required. They will not spin under load.

PERTINENT DIMENSIONS FOR END FITTINGS

Rope Diam. Inches	1 LOOP INSIDE Width In.	1 LOOP INSIDE Length In.	2 SLIP-THRU THIMBLE INSIDE Width In.	2 SLIP-THRU THIMBLE INSIDE Length In.	3 ALLOY HOOK Size	4 SHACKLE with Thimble Size In.	5 HALF THIMBLE INSIDE LOOP Width In.	5 HALF THIMBLE INSIDE LOOP Length In.
1/8	2	4	2 1/8	4 1/8	1 1/2	7/16	2	1
3/16	3	6	2 3/8	4 3/8	3	1/2	2 1/4	6
1/4	4	8	3 3/8	6 5/8	5	5/8	3 1/4	8
5/16	5	10	3 3/4	7 1/8	7	7/8	4 1/2	10
3/8	6	12	3 3/4	7 1/8	11	1	4 7/8	12
7/16	7	14	4 3/8	8 3/8	11	1 1/4	5 1/2	14
1/2	8	16	5	9 1/2	15	1 3/8	6	18
9/16	9	18	5	9 1/2	22	1 1/2	6 1/2	18
5/8	10	20	6 3/4	11 3/4	30	1 3/4	7	20
3/4	12	24	8	14 1/2	37	2	8 1/2	24
7/8	14	28	8 3/8	17 5/8	45	2 1/2	8 1/2	28
1	16	32	8 3/8	17 5/8	60	2 1/2	10	32

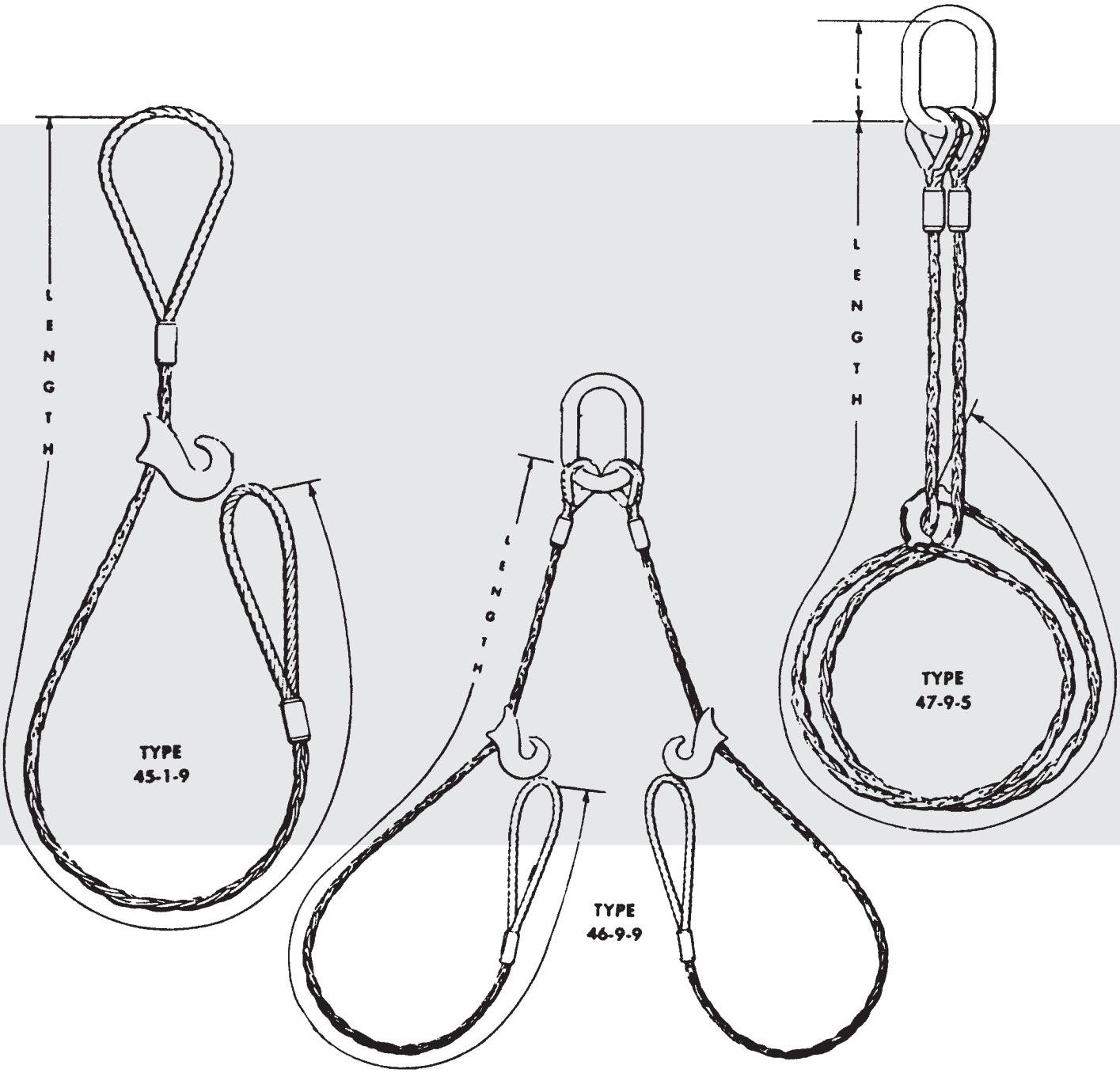


2 SLIP-THRU THIMBLE **3** HOOK **4** SHACKLE **5** HALF THIMBLE

RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

MIDCO *8-Part Braided* SLINGS

CHOKER SLINGS



RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

MIDCO

8-Part Braided SLINGS

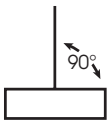
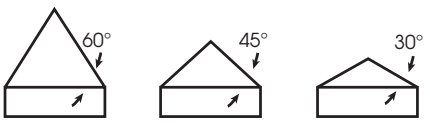
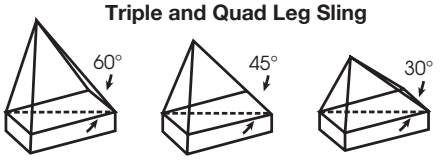
These Choker Slings are used when maximum flexibility and ease of handling are essential for a sling which is to be attached to the load with a choker hitch.
The extra flexibility of this type of sling permits the maximum frictional holding power between the sling and the load.

Rope Diam. Inches	RATED CAPACITY Tons, 2000 lbs. D/ F 5 to 1					LOOP INSIDE		HALF THIMBLE	MASTER LINK
	SINGLE-LEG 45-1-9 CHOKER	VERTICAL 2-LEG 47-9-5	2-LEG CHOKER 46-9-9			Width Inches	Length Inches	Inside Width Inches	Stock Diameter Inches
			30 Degree 	45 Degree 	60 Degree 				
1/8	1.0	1.6	0.98	1.4	1.7	2	4	2	3/4
3/16	1.6	3.3	1.6	2.3	2.8	3	6	2 1/4	1
1/4	2.9	5.8	2.9	4.1	5.0	4	8	3 1/4	1
5/16	4.5	9.0	4.5	6.3	7.8	5	10	4 1/2	1 1/4
3/8	6.4	13	6.4	9.1	11	6	12	4 7/8	1 1/2
7/16	8.7	17	8.7	12	15	7	14	5 1/2	1 3/4
1/2	11	23	11	16	20	8	16	6	2

RATED CAPACITIES BASKET HITCH BASED ON D/d RATIO OF 25.
RATED CAPACITIES BASED ON PIN DIAMETER NO LARGER THAN NATURAL EYE WIDTH OR LESS THAN THE NOMINAL SLING DIAMETER.
RATED CAPACITIES BASED ON DESIGN FACTOR OF 5.
HORIZONTAL SLING ANGLES LESS THAN 30 DEGREES SHALL NOT BE USED.

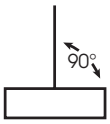
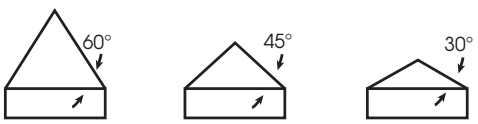
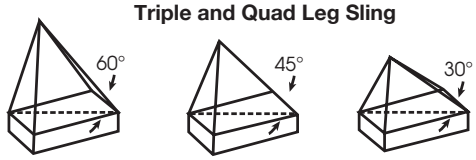
Grade 80 & 100 Alloy Chain Slings

GRADE 80 WORKING LOAD LIMITS 4 TO 1 DESIGN FACTOR

Chain Trade Size, Inches	Single Leg Sling 	Double Leg Sling 			Triple and Quad Leg Sling 		
1/4″ (9/32″)	3,500	6,100	4,900	3,500	9,100	7,400	5,200
5/16″	4,500	7,800	6,400	4,500	11,700	9,500	6,800
3/8″	7,100	12,300	10,000	7,100	18,400	15,100	10,600
1/2″	12,000	20,800	17,000	12,000	31,200	25,500	18,000
5/8″	18,100	31,300	25,600	18,100	47,000	38,400	27,100
3/4″	28,300	49,000	40,000	28,300	73,500	60,000	42,200
7/8″	34,200	59,200	48,400	34,200	88,900	72,500	51,300
1″	47,700	82,600	67,400	47,700	123,900	101,200	71,500
1 1/4″	72,300	125,200	102,200	72,300	187,800	153,400	108,400

The design factor of 4 to 1 on Grade 80 & 100 Alloy Chain agrees with the design factor used by the International Standards Organization (ISO), and ANSI B30.9 is the preferred set of Working Load Limit values to be used.

GRADE 100 WORKING LOAD LIMITS 4 TO 1 DESIGN FACTOR

Chain Trade Size, Inches	Single Leg Sling 	Double Leg Sling 			Triple and Quad Leg Sling 		
9/32″	4,300	7,500	6,100	4,300	11,200	9,100	6.450
5/16″	5,700	9,900	8,100	5,700	14,800	12,100	8,500
3/8″	8,800	15,200	12,400	8,800	22,800	18,600	13,200
1/2″	15,000	26,000	21,200	15,000	39,000	31,800	22,500
5/8″	22,600	39,100	32,000	22,600	58,700	47,900	33,900

USE OF GRADE 80 CHAIN UNDER HEAT CONDITIONS

Effect of Elevated Temperature on the Working Load Limit of Grade 80 Alloy Chain.

Chains should not be used outside of the -40 °F to 400 °F (-40 °C to 204 °C) temperature range without consulting the chain manufacturer. The specific working load limit reductions for Grade 80 chains used at and after exposure to elevated temperatures have been established and are shown below.

Maximum Temperature of Chain	Reduction of Working Load Limit While At Temperature	Reduction of Working Load Limit After Exposure to Temperature
Below 400°	None	None
400°	10%	None
500°	15%	None
600°	20%	5%
700°	30%	10%
800°	40%	15%
900°	50%	20%
1000°	60%	25%
Over 1000°	*(see below)	*(see below)

***OSHA 1910.184 requires all slings exposed to temperatures over 1000 °F to be removed from service.**

USE OF GRADE 100 CHAIN UNDER HEAT CONDITIONS

Effect of Elevated Temperature on the Working Load Limit of Grade 100 Alloy Chain.

Chains should not be used outside of the -40 °F to 400 °F (-40 °C to 204 °C) temperature range without consulting the chain manufacturer. The specific working load limit reductions for Grade 100 chains used at and after exposure to elevated temperatures have been established and are shown below.

Maximum Temperature of Chain	Reduction of Working Load Limit While At Temperature	Reduction of Working Load Limit After Exposure to Temperature
Below 400°	None	None
400°	15%	None
500°	25%	5%
600°	30%	15%
700°	40%	20%
800°	50%	25%
900°	60%	30%
1000°	70%	35%
Over 1000°	*(see below)	*(see below)

***OSHA 1910.184 requires all slings exposed to temperatures over 1000 °F to be removed from service.**

Grade 80 & 100 Alloy Chain Slings

Follow these recommendations for safer chain sling use.

The proper selection, application, care and inspection of chain slings used in moving material by hoisting can produce efficient and economical handling operations with minimum hazard to persons and property.

Midco Recommendations

1. Know your sling manufacturer. **MIDCO WILL INSURE THAT CHAIN SLINGS SUPPLIED TO YOU ARE IN COMPLIANCE WITH OSHA REGULATIONS COVERING INDUSTRIAL SLINGS.**
2. Know your load. Determine the weight, center of gravity and angle of lift; and select the proper size and type of sling.
3. Never overload the sling. Check the working load limit on the identification tag.
4. Visually examine the chain before each use for gouged, bent or damaged links or components.
5. Do not point load hooks. Load should bear on bowl of hook.
6. Make sure chain is not twisted, knotted or kinked before lifting load.
7. Protect chain by padding when lifting sharp-edged loads.
8. Lift and lower loads smoothly. Do not jerk.
9. Protect chain against corrosion during storage.
10. Store chain properly on A-frame.

Inspection

1. Schedule periodic link-by-link inspection of chain slings, based on frequency of sling use, severity of service conditions, nature of lifts being made, and experience gained on service life of slings used in similar circumstances.
2. Clean chain prior to inspection, to make damage or defects more easily seen.
3. Hang chain vertically, if practical, for preliminary inspection. Measure reach accurately (bearing point of master link to bearing point of hook). Check this length against reach shown on tag.
4. Inspect link by link, where the following should be looked for:
   A. Bent, gouged, nicked, worn or elongated links.
   B. Cracks, scoring or marking tend to weaken links. Transverse markings are the most dangerous.
   C. Severe corrosion
   D. Excessive wear. Slings with links having wear exceeding that shown in Table of Wear (below) should be removed from service.
5. Check master links and hooks for all of the above faults. Check hooks especially for excessive throat opening.

It is strongly recommended that chain slings showing faults by the above inspection method be immediately removed from service and returned to manufacturer for repair.

Midco offers chain sling inspection service and proof-testing performed by our own qualified inspectors.

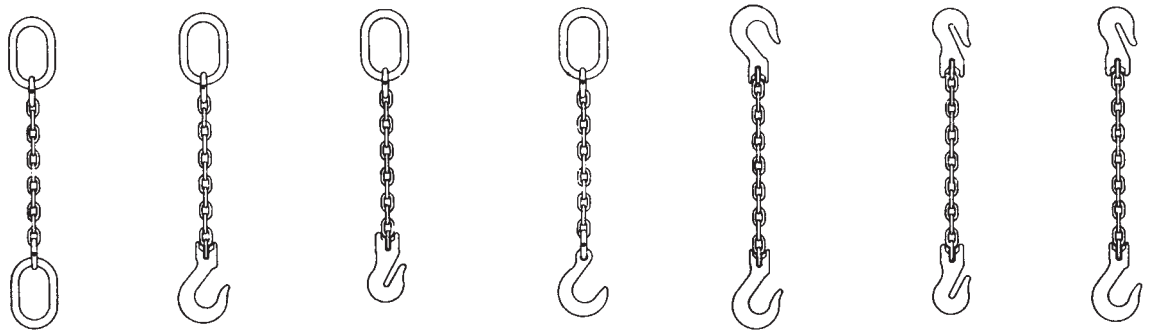
TABLE OF WEAR

Wear Allowance of Grade 80 and Grade 100 Chain

Removal criteria for wear and damage have also been established for the chains covered under this specification, and are listed below. All chain should be removed from service if the material thickness at any location on the link is less than the listed minimum value.

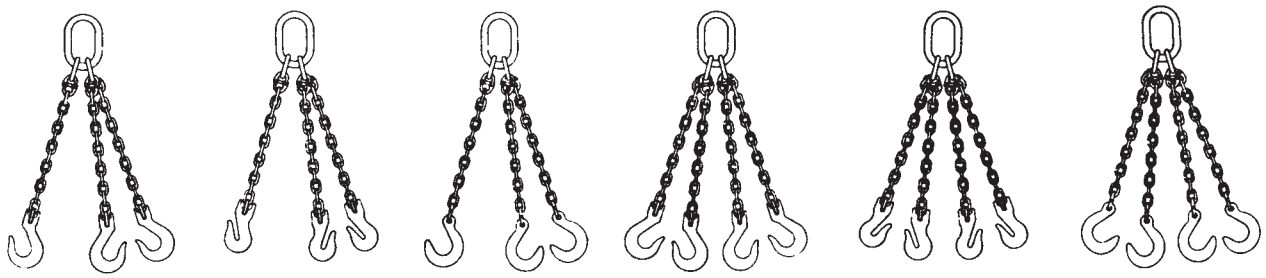
Chain Size	Material Diameter	Minimum Allowable Thickness of Link
9/32″	.281	.239
5/16″	.343	.273
3/8″	.406	.342
1/2″	.531	.443
5/8″	.630	.546
3/4″	.787	.687
7/8″	.881	.750
1″	1.000	.887
1-1/4″	1.250	1.091

CHAIN SLING CONFIGURATIONS



TYPE SOO TYPE SOS TYPE SOG TYPE SOF TYPE SSS TYPE SGG TYPE SGS

TYPE DOS TYPE DOG TYPE DOF TYPE ADOS



TYPE TOS TYPE TOG TYPE TOF TYPE QOS TYPE QOG TYPE QOF

SYNTHETIC SLINGS
Nylon or Polyester

RECOMMENDED OPERATING PRACTICES AND WARNINGS

1. Determine weight of the load.
2. Select sling having suitable characteristics for the type of load, hitch and environment.
3. Slings shall not be loaded in excess of the rated capacity. Consideration should be given to the angle from the vertical (sling-to-load angle) which affect rated capacity. (See sling chart on pages 22 & 23.)
4. Slings with fittings which are used in a choker hitch shall be of sufficient length to assure that the choking action is on the webbing.
5. Slings used in a basket hitch shall have the load balanced to prevent slippage.
6. Slings shall not be dragged on the floor or over an abrasive surface.
7. Slings shall not be twisted or tied into knots, or joined by knotting.
8. Slings shall not be pulled from under loads when the load is resting on the sling.
9. Slings shall always be protected from being cut by corners, sharp edges, protrusions or abrasive surfaces.
10. Do not drop slings equipped with metal fittings.
11. The opening in fittings shall be the proper shape and size to insure that the fitting will seat properly in the hook or other attachments.

ENVIRONMENTAL CONSIDERATIONS

1. Slings should be stored in a cool, dry, dark place and should not be exposed to sunlight to prevent mechanical or chemical damage, when not in use.
2. Chemically active environments can affect the strength of synthetic web slings in varying degrees ranging from none to total degradation. The sling manufacturer should be consulted before slings are used in chemically active environments.

ACIDS

1. **Nylon** is subject to degradation in acids, ranging from none to total degradation.
2. **Polyester** is resistant to many acids but is subject to degradation ranging from none to moderate in some acids.
3. Each application shall be evaluated, taking into consideration the following:
   a. Type of Acid
   b. Exposure conditions
   c. Concentration
   d. Temperature

ALKALIS

1. **Polyester** is subject to degradation in alkalis, ranging from none to total degradation.
2. **Nylon** is resistant to many alkalis but is subject to degradation ranging from none to moderate in some alkalis.
3. Each application shall be evaluated, taking into consideration the following:
   a. Type of Alkali
   b. Exposure conditions
   c. Concentration
   d. Temperature

   Nylon and **polyester** slings shall not be used at temperatures in excess of 180° F. (82° C.).

Slings incorporating aluminum fittings shall not be used where fumes, vapors, sprays, mists or liquids of alkalis and/or acids are present.

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

a. Factors which can determine the degree of strength loss are:
   1. Length of time of continuous exposure.
   2. Sling construction and design.
   3. Other environmental factors such as weather conditions and geographic location.

b. Suggested procedures to minimize the effects of ultraviolet light:
   1. Store slings in a cool, dry, dark place when not being used for prolonged periods of time.
   2. Inspect slings weekly or more often, depending on frequency of sling use.

c. Visual indications of ultraviolet degradation are:
   1. Bleaching-out of sling color.
   2. Increased stiffness of sling material.
   3. Surface abrasion in areas not normally in contact with the load.

d. Proof-Testing: Slings used in environments where they are subject to continuous exposure to ultraviolet light should be proof-tested to two times rated capacity annually, or more frequently depending on severity of exposure.

INSPECTION

TYPE OF INSPECTION

a. **Initial Inspection:** Before any new or repaired sling is placed in service, it shall be inspected to insure that the correct sling is being used as well as to determine that the sling meets the requirements of this specification.

b. **Frequent Inspection:** This inspection should be made by the person handling the sling each time the sling is used.

c. **Periodic Inspection:** This inspection shall be conducted by designated personnel. Frequency of inspection should be based on:
   1. Frequency of sling use.
   2. Severity of service conditions.
   3. Experience gained on the service life of slings used in similar applications.
   4. Periodic inspections should be conducted at least annually.

POSSIBLE DEFECTS

A sling shall be removed from service if any defects such as the following are visible:

a. Acid or alkali burns.
b. Melting, charring or weld spatter of any part of the sling.
c. Holes, tears, cuts, snags or embedded particles.
d. Broken or worn stitching in load-bearing splices.
e. Excessive abrasive wear.
f. Knots in any part of the sling.
g. Distorted, excessively pitted, corroded, or broken fittings..
h. Other defects which cause doubt as to the strength of the sling.

INSPECTION RECORDS

Written inspection records, utilizing the identification for each sling as established by the user, 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.

REPAIR OF WEB SLINGS

Slings shall be repaired only by a sling manufacturer. When repaired by other than the original manufacturer, the sling shall be permanently marked to identify the repair agent. All repaired slings shall be proof-tested to two (2) times its newly assigned rated capacity before being put back into service. Certification of proof test should be provided.

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

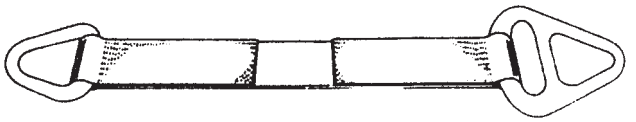
	Acids	Alcohols	Aldehydes	Strong Alkalis	Bleaching Agents	Dry Cleaning Solvents	Ethers	Halo-genated Hydro-Carbons	Hydro-Carbons	Ketones	Oils Crude	Oils Lubricating	Soap & Detergents	Water & Seawater	Weak Alkalis
NYLON	NO	OK	OK	OK	NO	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
POLYESTER	*	OK	NO	**	OK	OK	NO	OK	OK	OK	OK	OK	OK	OK	OK

* Disintegrated by concentrated sulfuric acid

** Degraded by strong alkalis at elevated temperatures.

Synthetic Slings (Larger capacities available upon request)

TYPE ONE – TRIANGLE X CHOKER



VERTICAL RATING = BASKET ÷ 2

9,800-LB. WEBBING

SINGLE PLY				TWO PLY			
		Rated Working Load - Pounds				Rated Working Load	
Width	Catalog Number	Choker	Basket	Width	Catalog Number	Choker	Basket
ALUMINUM HARDWARE							
2″	ATC1-802	2,560	6,400	2″	ATC2-802	3,300	6,700
3″	ATC1-803	3,840	9,600	3″	ATC2-803	5,000	10,000
4″	ATC1-804	5,120	12,800	4″	ATC2-804	6,700	13,400
6″	ATC1-806	7,680	19,200	6″	ATC2-806	9,700	19,400
STEEL HARDWARE							
2″	STC1-802	2,560	6,400	2″	STC2-802	5,120	12,800
3″	STC1-803	3,840	9,600	3″	STC2-803	7,120	17,800
4″	STC1-804	5,120	12,800	4″	STC2-804	9,200	23,000
6″	STC1-806	7,680	19,200	6″	STC2-806	13,200	33,000
8″	STC1-808	10,240	25,600	8″	STC2-808	17,920	44,800
10″	STC1-810	12,800	32,000	10″	STC2-810	22,400	56,000
12″	STC1-812	15,360	34,400	12″	STC2-812	25,600	64,000

The above two-ply ratings are based on the capacity of aluminum hardware. For higher ratings, use those with steel hardware below.

TYPE TWO – TRIANGLE X TRIANGLE

VERTICAL RATING = BASKET ÷ 2

9,800-LB. WEBBING

SINGLE PLY				TWO PLY			
		Rated Working Load - Pounds				Rated Working Load	
Width	Catalog Number	Choker	Basket	Width	Catalog Number	Choker	Basket
ALUMINUM HARDWARE							
2″	ATT1-802	6,400		2″	ATT2-802	6,700	
3″	ATT1-803	9,600		3″	ATT2-803	10,000	
4″	ATT1-804	12,800		4″	ATT2-804	13,400	
6″	ATT1-806	19,200		6″	ATT2-806	19,400	
STEEL HARDWARE							
2″	STT1-802	6,400		2″	STT2-802	12,800	
3″	STT1-803	9,600		3″	STT2-803	17,800	
4″	STT1-804	12,800		4″	STT2-804	23,000	
6″	STT1-806	19,200		6″	STT2-806	33,000	
8″	STT1-808	25,600		8″	STT2-808	44,800	
10″	STT1-810	32,000		10″	STT2-810	56,000	
12″	STT1-812	38,400		12″	STT2-812	64,000	

The above two-ply ratings are based on the capacity of aluminum hardware. For higher ratings, use those with steel hardware below.

Synthetic Slings

TYPE THREE – FLAT EYE X FLAT EYE

TYPE FOUR – TWISTED EYE X TWISTED EYE

9,800-LB. WEBBING

SINGLE PLY					TWO PLY					FOUR PLY				
	Catalog	WLL-POUNDS				Catalog	WLL-POUNDS				Catalog	WLL-POUNDS		
Width	Number	Vertical	Choker	Basket	Width	Number	Vertical	Choker	Basket	Width	Number	Vertical	Choker	Basket
1″	FE1-801	1,600	1,250	3,200	1″	FE2-801	3,200	2,560	6,400	1″	FE4-801	6,200	4,960	12,400
2″	FE1-802	3,200	2,560	6,400	2″	FE2-802	6,400	5,120	12,800	2″	FE4-802	12,400	9,920	24,800
3″	FE1-803	4,800	3,840	9,600	3″	FE2-803	9,300	7,440	18,600	3″	FE4-803	17,000	13,600	34,000
4″	FE1-804	6,400	5,120	12,800	4″	FE2-804	11,500	9,200	23,000	4″	FE4-804	22,000	17,600	44,000
6″	FE1-806	9,600	7,680	19,200	6″	FE2-806	16,500	13,200	33,000	6″	FE4-806	33,000	26,400	66,000
8″	FE1-808	12,800	10,240	25,600	8″	FE2-808	22,750	18,200	44,500	8″	FE4-808	44,000	35,200	88,000
10″	FE1-810	16,000	12,800	32,000	10″	FE2-810	28,400	22,720	56,800	10″	FE4-810	55,000	44,000	110,000
12″	FE1-812	19,200	15,360	38,400	12″	FE2-812	34,100	27,280	68,200	12″	FE4-812	66,000	52,800	132,000

Synthetic Slings

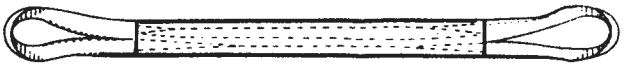
TYPE FIVE – ENDLESS (Grommet)

VERTICAL RATING = BASKET ÷ 2

9,800-LB. WEBBING

SINGLE PLY				TWO PLY			
		Rated Working Load - Pounds				Rated Working Load	
Width	Catalog Number	Choker	Basket	Width	Catalog Number	Choker	Basket
1″	EN1-801	2,500	6,400	1″	EN2-801	4,900	12,400
2″	EN1-802	5,000	12,800	2″	EN2-802	9,800	24,400
3″	EN1-803	6,900	17,200	3″	EN2-803	13,000	32,600
4″	EN1-804	9,200	23,000	4″	EN2-804	16,500	41,400
6″	EN1-806	13,000	32,600	6″	EN2-806	23,000	57,200
8″	EN1-808	15,400	38,400	8“	EN2-808	24,500	61,400
10″	EN1-810	17,900	44,800	10″	EN2-810	26,800	67,200
12″	EN1-812	21,500	53,800	12″	EN2-812	30,000	75,200

TYPE SIX – RETURN EYE



VERTICAL RATING = BASKET ÷ 2

XTRA TUFF

Cordura face pads are sewn to both sides of the sling body and the eyes.

SINGLE PLY				TWO PLY			
		Rated Working Load - Pounds				Rated Working Load	
Width	Catalog Number	Choker	Basket	Width	Catalog Number	Choker	Basket
2″	XT1-802	3,680	9,200	2″	XT2-802	6,160	15,400
4″	XT1-804	6,880	17,200	4″	XT2-804	11,600	29,000
6″	XT1-806	9,600	24,000	6″	XT2-806	13,920	34,800

WARNING! READ THIS NOTICE BEFORE USE!

The Federal Motor Carrier Safety Administration has established rules and regulations for use and inspection of “tie-down” straps and related load-securing devices. Failure to comply with this warning and **FMCSA** regulations may result in Property Damage, Serious Injury or Death.

- Never exceed Working Load Limit.
- Inspect before each use.
- Always protect tie-down material from sharp or abrasive contact points or any other surfaces that may damage the webbing in any way.
- Webbing must not be used if abrasions, cuts, tears, burns, knots, damaged sew patterns or alterations are present.
- Hardware must be pulled in a straight line or failure may occur.
- Do not use tie-down devices if any signs of damage, deformation or alterations are present.
- Tie-down devices are not to be used for lifting, towing or any other purpose for which they are not intended.

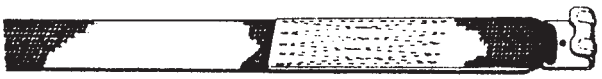
For proper securing of loads to trucks and trailers, strict observance of **FMCSA** regulations is required. Before using these products, consult the FMCSA website for information about your responsibilities.

Tie-Down Straps

RATCHET-BUCKLE BINDERS

Catalog Number	Description	Working Load Limit
527	2″ wide assembly, 27′ long	1,600
557	2″ wide assembly, 27′ long	3,300

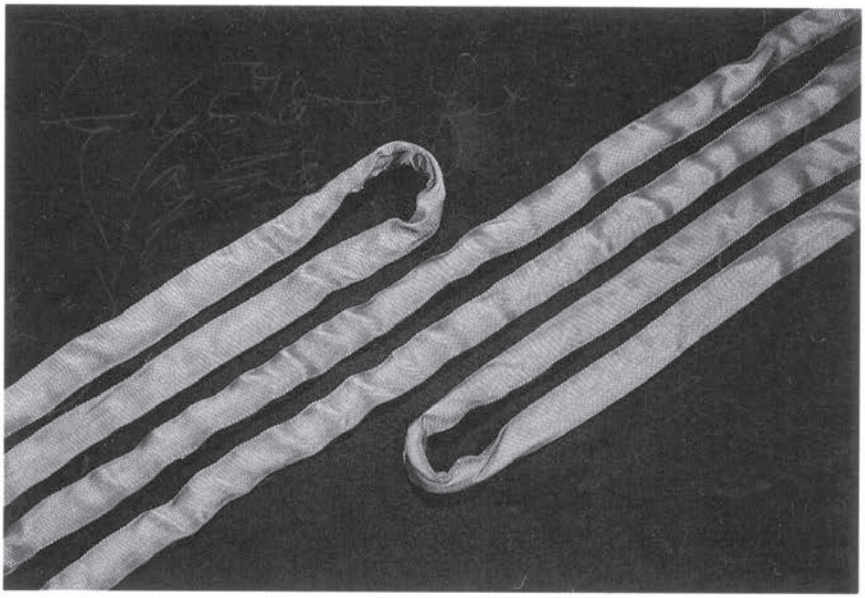
FLAT-HOOK ASSEMBLIES



Catalog Number	Description	Working Load Limit
212-27	2″ wide assembly, 27′ long	1,600
213-27	3″ wide assembly, 27′ long	4,300
214-27	4″ wide assembly, 27′ long	5,000
214-30	4″ wide assembly, 30′ long	5,000

Polyester Roundslings

Polyester roundslings are the most basic roundsling, yet they offer great versatility. Endless roundslings may be used in a vertical, choker or basket-type hitch.



- ***Sling life extended through rotation of bearing points***
- ***Soft and Pliable ≈ conforms well to irregularly shaped loads***
- ***Offers tighter choke with easier release***
- ***Double Jacket protects load-bearing fibers***
- ***Tagged for easy identification***
- ***Elongation approximately 3% at Rated Capacity****

Endless (ENR) Roundslings		*Capacity in lbs.					
Part No.	Color Code	Vertical	Choker	Vertical Basket	Min Length	Approx. Diameter (No Load)	Approx. Weight per foot
ENR1	Purple	2600	2100	5200	3'	0.625"	0.3 lb.
ENR2	Green	5300	4200	10600	3'	0.875"	0.4 lb.
ENR3	Yellow	8400	6700	16800	3'	1.125"	0.5 lb.
ENR4	Tan	10600	8500	21200	3'	1.125"	0.6 lb.
ENR5	Red	13200	10600	26400	3'	1.375"	0.8 lb.
ENR6	White	16800	13400	33600	6'	1.375"	0.9 lb.
ENR7	Blue	21200	17000	42400	6'	1.625"	1.3 lb.
ENR8	Orange	25000	20000	50000	6'	1.750"	1.6 lb.
ENR9	Orange	31000	24800	62000	6'	2.125"	2.0 lb.
ENR10	Orange	40000	32000	80000	6'	2.350"	2.6 lb.
ENR11	Orange	53000	42400	106000	8'	3.150"	3.4 lb.
ENR12	Orange	66000	52800	132000	8'	3.950"	4.3 lb.
ENR13	Orange	90000	72000	180000	8'	4.800"	5.9 lb.

⚠ WARNING ***DO NOT EXCEED RATED CAPACITY***

Recommended Operating Practices

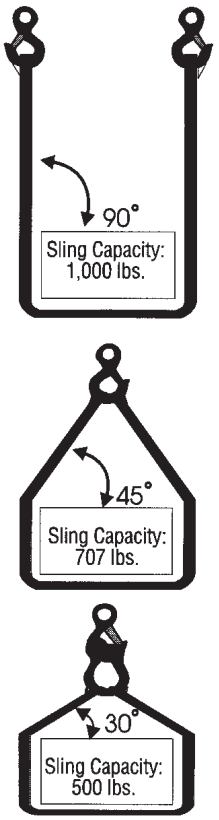
The polyester roundsling is a specialized tool, and it should be treated like any other specialized tool. Proper use and care of your sling can ensure a most effective life for you, your load and your sling.

1. Know the weight of the load.
2. Use a sling with characteristics meant for the type of load, hitch and environment with which you are working.
3. Never load a sling in excess of its rated capacity.
4. Never tie or knot a sling, or use a sling with a knot in it.
5. Protect the sling from being cut by sharp corners, edges, and abrasive surfaces by using wear pads or sleeves.
6. Make sure the sling is securely attached to the load.
7. Do not stand near or under a suspended load, and keep it clear of other obstructions.
8. Do not drag a sling across the floor, over abrasive surfaces, or from under a load.
9. Don't shock (jerk) load when lifting.
10. Take damaged slings out of service immediately.

A roundsling can serve your company well if you take the time and care to use it properly. Store slings on a rack or in the tool room.

Environmental Data		
Substance	**Nylon**	**Polyester**
Acids	NO	*
Alcohols	YES	YES
Aldehydes	YES	NO
Strong Alkalis	YES	**
Bleaching Agents	NO	YES
Dry Cleaning Solvents	YES	YES
Ethers	YES	NO
Halogenated Hydrocarbons	YES	YES
Hydrocarbons	YES	YES
Ketones	YES	YES
Oils, Crude	YES	YES
Oils, Lubricating	YES	YES
Soap and Detergents	YES	YES
Water and Seawater	YES	YES
Weak Alkalis	YES	YES

*This is a general guideline only. *Disintegrated by concentrated Sulfuric Acid. **Degraded by strong Alkalis at elevated temperatures.*



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

WARNING

Failure to comply with this warning may result in sling failure and severe personal injury or death.

Inspection, Care and Use of Synthetic Polyester Roundslings

Removal From Service

A roundsling shall be removed from service if any of the following are visible:

1. Holes, tears, cuts, snags, embedded particles or abrasive wear that expose the core fibers.
2. If roundsling rated capacity tag is missing or not readable.
3. If roundsling has been tied into one or more knots.
4. Melting, charring or weld spatter of any part of the roundsling.
5. Acid or alkali burns of the roundsling.
6. Broken or worn stitching in the cover that exposes the core fibers.
7. Distortion, excessive pitting, corrosion or other damage to fitting(s).
8. Any conditions which cause doubt as to the strength of the roundsling.

Operation Practices

1. ROUNDSLINGS SHALL ALWAYS BE PROTECTED FROM BEING CUT OR DAMAGED BY CORNERS, EDGES OR PROTRUSIONS.
2. Roundslings should be protected from abrasive surfaces.
3. Determine the weight of the load. Roundslings shall not be loaded in excess of the rated capacity. Consideration shall be given to the roundsling angle, which affects rated capacity. (See Sling Angle Chart.)
4. Select roundslings having suitable characteristics for type of load, hitch and environment.
5. Roundslings with fittings which are used in a choker hitch shall be of sufficient length to assure that the choking action is on the roundsling and never on a fitting.
6. Roundslings used in a basket hitch shall have the load balanced to prevent slippage.
7. The opening in fittings shall be the proper shape and size to insure that the fitting will seat properly in the hook or other attachments.
8. Roundslings should not be dragged on the floor or over an abrasive surface.
9. Roundslings shall not be twisted, shortened, lengthened or tied into knots, or joined by knotting.
10. Roundslings should not be pulled from under loads if the load is resting on the roundsling.
11. Roundslings equipped with metal fittings should not be dropped.
12. Roundslings that appear to be damaged shall not be used unless inspected and accepted by a designated person.
13. Roundslings shall be hitched in a manner providing control of the load.
14. Personnel, including portions of the human body, shall be kept from between the roundsling and the load, and from between the roundsling and the crane hook or hoist hook.
15. Personnel shall not stand under and should stand clear of the suspended load.
16. Personnel shall not ride the roundsling.
17. Shock-loading shall be avoided.
18. Twisting and kinking the legs shall be avoided.
19. Load applied to the hook shall be centered in the base (bowl) of hook to prevent point loading on the hook.
20. During lifting, with or without the load, personnel shall be alert for possible snagging of the roundsling.
21. The roundsling's legs shall contain or support the load from the sides above the center of gravity when using a basket hitch.

22. Roundslings shall be long enough so that the rated capacity of the roundsling is adequate when the angle of the legs is taken into consideration. (See Sling Angle Chart.)
23. If applicable, place blocks under load prior to setting down the load to allow removal of the roundsling.
24. Roundslings shall not be used at temperatures above 194 degrees F. (90 degrees C).
25. Roundslings shall not be constricted or bunched between the ears of a clevis or shackle, or in a hook.
26. When a roundsling is used with a shackle, it is recommended that it be used (rigged) in the bow of the shackle.
27. Store roundslings in a cool, dry, dark place when not in use.

Inspection

A. Initial Inspection
Before any new or repaired roundsling is placed in service, it shall be inspected by a designated person to ensure that the correct roundsling is being used, as well as to determine that the roundsling meets applicable specifications and has not been damaged in shipment.

B. Frequent Inspection
This inspection shall be made by the user handling the roundsling each time it is used.

C. Periodic Inspection
This inspection shall be conducted by designated personnel. Frequency of inspection should be based on:
1. Frequency of roundsling use.
2. Severity of service conditions.
3. Experience gained on the service life of roundslings used in similar applications.

Periodic inspections should be conducted at least annually.

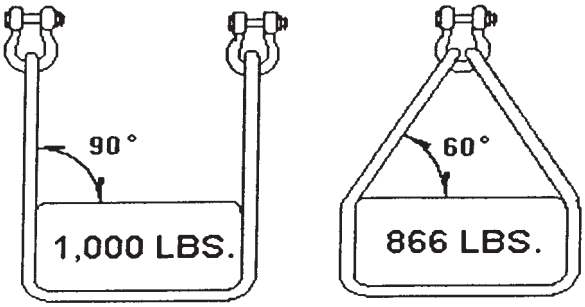
Recommended Minimum Connecting Hardware Diameter

Sling Size Vertical Capacity	Vertical Hitch		Basket Hitch		Sling Size Vertical Capacity	Vertical Hitch		Basket Hitch	
Lbs.	In.	mm.	In.	mm.	Lbs.	In.	mm.	In.	mm.
2,600	.50	13	.62	16	25,000	1.25	32	1.88	48
5,300	.62	16	.88	23	31,000	1.50	39	2.00	51
8.400	.75	19	1.00	26	40,000	1.62	42	2.38	61
10,600	.88	23	1.25	32	53,000	1.88	48	2..75	70
13,200	1.00	26	1.38	35	66,000	2.12	54	3.00	77
16,800	1.12	29	1.62	42	90,000	2.50	64	3.50	89
21,200	1.25	32	1.75	45					

Sling Angle

When slings are used at an angle, sling capacity is reduced. Multiply the Sling Capacity by the Factor below (for the angle used) to determine the reduced rating.

Angle	Factor	Angle	Factor
90º	1.00	55º	.819
85º	.996	50º	.766
80º	.985	45º	.707
75º	.966	40º	.643
70º	.940	35º	.574
65º	.906	30º	.500
60º	.866		



Sling capacity decreases as the angle decreases. A sling capable of lifting 1,000 lbs. in a 90º vertical basket hitch can only lift 866 lbs. at a 60º angle lift.

Additional requirements and safe operating practices may be outlined in the WSTDA-RS-1 Polyester Roundsling Standard, OSHA and ANSI/ASME B30.9, and/or other regulations as applicable.

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WSTDA-RSWS-04

USEFUL CONVERSION FACTORS AND TABLES

1lb.	=	.45359 kg (kilogram)
1 kg	=	2.20462 lbs.
1 kN (kilonewton)	=	101.972 kg = 224.809 lbs.
1 short ton	=	2,000 lbs. = 907.185 kg
1 long ton	=	2,240 lbs. = 1,016.05 kg
1 metric ton	=	2,204.62 lbs. = 1,000 kg
1 ft.	=	.3048 m (meter)
1 m	=	3.28084 ft. = 39.3701 inches
1 inch	=	25.4 mm (millimeter)
1 mm	=	0.03937 inches
1 yard	=	.9144 m
1 m	=	1.0936 yards
1 mile	=	1.60934 km (kilometer)
1 km	=	.62137 mile

1 mile	=	1,760 yards = 5,280 ft.
1 yard	=	3 ft. = 36 inches
1ft.	=	12 inches
1 fathom	=	6 ft.
1 lb.	=	16 ounces

1 kilometer	=	1,000 meters
1 meter	=	100 centimeters
1 centimeter	=	10 millimeters
1 kilogram	=	1,000 grams

Inch	Decimals of an inch	Millimeters
—	.03937	1.0
1/16	.0625	1.587
—	.07874	2.0
3/32	.09375	2.381
—	.11811	3.0
1/8	.125	3.175
5/32	.15625	3.968
—	.15748	4.0
3/16	.187	4.762
—	.19685	5.0
7/32	.21875	5.556
—	.23622	6.0
1/4	.25	6.35
—	.275591	7.0
9/32	.28125	7.143
5/16	.3125	7.937
—	.314961	8.0
—	.354331	9.0
3/8	.375	9.525
—	.393701	10.0
—	.433071	11.0
7/16	.4375	11.112
—	.472441	12.0
1/2	.50	12.70
—	.511811	13.0
—	.551181	14.0
9/16	.5625	14.287
—	.590551	15.0
5/8	.625	15.875
—	.629921	16.0
—	.669291	17.0

Inch	Decimals of an inch	Millimeters
—	.708661	18.0
—	.748031	19.0
3/4	.75	19.05
—	.787402	20.0
—	.826772	21.0
—	.866142	22.0
7/8	.875	22.225
—	.905512	23.0
15/16	.9375	23.812
—	.944882	24.0
—	.984252	25.0
1	1.00	25.4
—	1.023622	26.0
—	1.062992	27.0
—	1.102362	28.0
1.1/8	1.125	28.575
—	1.141732	29.0
—	1.181102	30.0
—	1.220472	31.0
1.1/4	1.25	31.75
—	1.259843	32.0
—	1.299213	33.0
—	1.338583	34.0
1.3/8	1.375	34.925
—	1.377953	35.0
—	1.417323	36.0
—	1.456693	37.0
—	1.496063	38.0
1.1/2	1.50	38.10
—	1.535433	39.0
—	1.574803	40.0

Inch	Decimals of an inch	Millimeters
—	1.614173	41.0
1.5/8	1.625	41.275
—	1.653543	42.0
—	1.692913	43.0
—	1.732283	44.0
1.3/4	1.75	44.45
—	1.771654	45.0
—	1.811024	46.0
—	1.850394	47.0
1.7/8	1.875	47.625
—	1.889764	48.0
—	1.929134	49.0
—	1.968504	50.0
2	2.00	50.80
—	2.007874	51.0
—	2.047244	52.0
—	2.086614	53.0
2.1/8	2.125	53.975
—	2.125984	54.0
—	2.165354	55.0
—	2.204724	56.0
—	2.244094	57.0
2.1/4	2.25	57.15
—	2.283465	58.0
—	2.322835	59.0
—	2.362205	60.0
2.3/8	2.375	60.325
—	2.401575	61.0
—	2.440945	62.0
—	2.480315	63.0
2.1/2	2.50	63.5