DEPARTMENT OF **LICENSING AND REGULATORY AFFAIRS** ~~CONSUMER AND INDUSTRY SERVICES~~

DIRECTOR'S OFFICE ~~BUREAU OF SAFETY AND REGULATION~~

GENERAL INDUSTRY SAFETY STANDARDS ~~COMMISSION~~

Filed with the Secretary of State on January 10, 2014

These rules become effective immediately upon filing with the Secretary of State unless adopted under section 33, 44, or 45a(6) of 1969 PA 306. Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the **director of the department of licensing and regulatory affairs** ~~general industry safety standards commission~~ by sections 16 and 21 of **1974 PA** ~~Act No.~~ 154 ~~of the Public Acts of 1974, as amended, being §§408.1016 and 408.1021 of the Michigan Compiled Laws)~~ **and Executive Reorganization Order Nos. 1996-2, 2003-1, 2008-4, and 2011-4, MCL 445.2001, 445.2011, 445.2025, and 445.2030)**

R 408.14904, R 408.14905, R 408.14906, R 408.14908, R 408.14911, R 408.14921, R 408.14922, R 408.14923, R 408.14924, R 408.14925, R 408.14926, R 408.14931, R 408.14932, R 408.14933, R 408.14934, R 408.14935, R 408.14941, R 408.14942, R 408.14943, R 408.14944, R 408.14945, R 408.14951, R 408.14952, R 408.14953, R 408.14954, R 408.14961, R 408.14962, R 408.14963, R 408.14964, and R 408.14965 of the Michigan Administrative Code, are amended, and R 408.14902 is added, as follows:

PART 49. SLINGS

R 408.14902 Adoption of standard.

Rule 4902. (1) The following standard is adopted by reference in these rules, American Society of Mechanical Engineers Standard ASME B-30.9 "Slings," 1990 edition. This standard may be purchased from IHS Global, 15 Inverness Way East, Englewood, Colorado, 80112, USA, telephone number: 1-800-854-7179 or via the internet at web-site: http://global.ihs.com at a cost as of the time of adoption of these amendments of $93.00.

(2) The standard adopted in subrule (1) of this rule is also available for inspection at the Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143.

(3) Copies of the standard adopted in subrule (1) of this rule may be obtained from the publisher or may also be obtained from the Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143, at the cost charged in this rule, plus $20.00 for shipping and handling.

R 408.14904 Definitions; C.

Rule 4904. (1) "Cable laid endless sling-mechanical joint" means a wire rope sling made endless by joining the ends of a single length of cable laid rope with 1 or more metallic fittings.

(2) "Cable laid grommet-hand tucked" means an endless wire rope sling made from 1 length of rope wrapped 6 times around a core formed by hand, tucking the ends of the rope inside the 6 wraps.

(3) "Cable laid rope" means a wire rope composed of 6 wire ropes wrapped around a fiber or wire rope core.

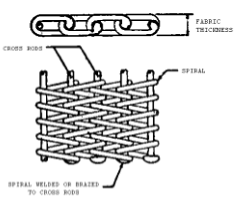
(4) "Cable laid rope sling-mechanical joint" means a wire rope sling made from a cable laid rope, with eyes fabricated by pressing or swaging 1 or more metal sleeves over the rope junction.

(5) "Choker hitch" means a sling configuration with 1 end of the sling passing under the load and through an end attachment, handle, or eye on the other end of the sling.

(6) "Coating" means an elastomer, or other suitable material, applied to a sling or to a sling component to impart desirable properties.

(7) "Cross rod" means a wire used to join spirals of metal mesh to form a complete fabric. (See figure 2 **"Metal Mesh Construction"**)

FIGURE 2
METAL MESH CONSTRUCTION



R 408.14905 Definitions; D to H.

Rule 4905. (1) "Designated" means to be selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

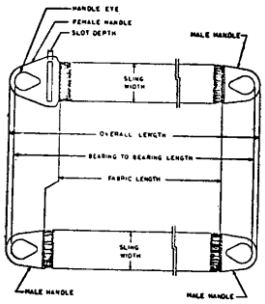
(2) "Female handle of a choker sling" means a handle with a handle eye and a slot of such dimension as to permit passage of a male handle, thereby allowing the use of a metal mesh sling in a choker hitch. (See figure 1 **"Metal Mesh Sling"**)

(3) "Handle" means a terminal fitting to which metal mesh fabric is attached. (See figure 1 **"Metal Mesh Sling"**)

(4) "Handle eye" means an opening in a handle of a metal mesh sling shaped to accept a hook, shackle, or other lifting device. (See figure 1 **"Metal Mesh Sling"**)

(5) "Hitch" means a sling configuration whereby the sling is fastened to an object or load, either directly to it or around it.

FIGURE 1
METAL MESH SLING (Typical)



R 408.14906 Definitions; L, M.

Rule 4906. (1) "Link" means a single ring of a chain.

(2) "Male handle~~,~~" **or** ~~sometimes called a~~ "triangle~~,~~" means a handle with a handle eye.

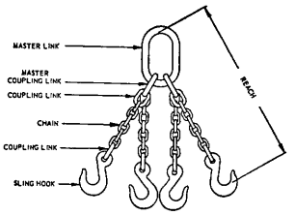
(3) "Master coupling link" means an alloy steel welded coupling link used as an intermediate link to join alloy steel chain to master links. (See figure 3 **"Major Components of a Guadruple Sling"**)

(4) "Master link~~,~~" **or** ~~sometimes called a~~ "gathering ring" means a forged or welded steel link used to support all members (legs) of an alloy steel chain sling or wire rope sling. (See figure 3 **"Major Components of a Guadruple Sling"**)

(5) "Mechanical coupling link" means a nonwelded, mechanically closed steel link used to attach master links and hooks to alloy steel chain.

(6) "Metal mesh~~,~~" **or** ~~sometimes called~~ "fabric~~,~~" means the flexible portion of a metal mesh sling, consisting of a series of transverse coils and cross rods.

FIGURE 3
MAJOR COMPONENTS OF A GUADRUPLE SLING



R 408.14908 Definitions; S to V.

Rule 4908. (1) "Selvage edge" means the finished edge of synthetic webbing designed to prevent unraveling.

(2) "Sling" means an assembly which connects the load to the material handling equipment for the purpose of lifting or hoisting.

(3) "Sling manufacturer" means a person or organization that assembles sling components into their final form for sale to users.

(4) "Spiral" means a single transverse coil that is the basic element from which metal mesh is fabricated. (See figure 2 **"Metal Mesh Construction"**)

(5) "Strand laid endless sling-mechanical joint" means a wire rope sling made endless from 1 length of rope, with the ends joined by 1 or more metallic fittings.

(6) "Strand laid grommet-hand tucked" means an endless wire rope sling made from 1 length of strand wrapped 6 times around a core formed by hand tucking the ends of the strand inside the 6 wraps.

(7) "Strand laid rope" means a wire rope made with strands, usually 6 or 8, wrapped around a fiber core, wire strand core, or independent wire rope core.

(8) "Vertical hitch" means a method of supporting a load by a single, vertical part or leg of the sling. (See figure 4 “**Basic Sling Configurations with Vertical Legs”**)

FIGURE 4
BASIC SLING CONFIGURATIONS WITH VERTICAL LEGS

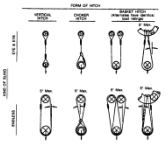
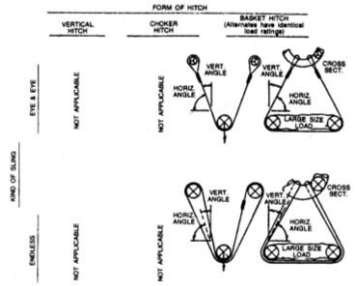


FIGURE 5
BLING CONFIGURATIONS WITH ANGLED LEGS



Notes: Angles 5 degrees or less from the vertical may be considered vertical angles. For slings with legs more than 5 degrees off vertical, the actual angle as shown in Figure 5 must be considered.

EXPLANATION OF SYMBOLS: MINIMUM DIAMETER OF CURVATURE

Represents a contact surface which shall have a diameter of curvature at least double the diameter of the rope from which the sling is made

Represents a contact surface which shall have a diameter of curvature at least 8 times the diameter of the rope.

Represents a load in a choker hitch and illustrates the rotary force on the load and/or the slippage of the rope in contact with the load. Diameter of curvature of lead surface shall be at least double the diameter of the rope.

R 408.14911 General operating practices.
Rule 4911. **(1)** Whenever a sling is used, the following practices shall be followed:
(a) A damaged or defective sling, as described in this standard, shall not be used.
(b) A sling shall not be shortened with bolts, knots, or other makeshift devices.
(c) Sling legs shall not be kinked.
(d) A sling shall not be loaded in excess of its rated capacity.
(e) A sling used in a basket hitch shall have the load balanced to prevent slipping.
(f) A sling shall be securely attached to its load.
(g) A sling, other than an alloy steel chain, shall be padded or protected from the sharp corners of its load.
(h) A suspended load shall be kept clear of all obstructions.
(i) An employee shall be kept clear of a suspended load and a load about to be lifted.

(j) An employee's hand or finger shall not be placed between the load and sling while the sling is being tightened.
(k) Slack in a sling shall be removed gradually.
(l) A sling shall not be pulled from under a load when the load is resting on the sling.

(2) Employers shall not load a sling in excess of its recommended safe working load as prescribed by the sling manufacturer on the identification markings permanently affixed to the sling.

(3) Employers shall not use slings without affixed and legible identification markings.

ALLOY STEEL CHAIN SLINGS

R 408.14921 ~~Alloy steel chain slings;~~ **Sling** identification.

Rule 4921. An alloy steel chain sling shall have a permanently affixed, durable identification, stating the size, grade, rated capacity, and reach.

R 408.14922 ~~Alloy steel chain slings; rated~~ **Rated** capacity of attachments.

Rule 4922. (1) A hook, ring, oblong link, pear-shaped link, welded or mechanical coupling link, or other attachment shall have a rated capacity at least equal to that of the alloy steel chain with which they are used, or the sling shall not be used in excess of the rated capacity of the weakest component.

(2) A makeshift link or fastener formed from bolts or rods, or other such attachments, shall not be used.

R 408.14923 ~~Alloy steel chain slings; inspections;~~ **Inspections;** records; removal from service; proof testing.

Rule 4923. (1) In addition to the inspection prescribed by R 408.14912, an employer shall designate an employee to make a thorough periodic inspection of an alloy steel chain sling in use on a regular basis. An employer shall determine the regularity of inspection based on all of the following factors:

(a) Frequency of sling use.
(b) Severity of service conditions.
(c) Nature of lifts being made.
(d) Experience gained on the service life of slings used in similar circumstances.

The designated employee shall inspect an alloy steel chain sling at least once every 12 months.

(2) The employer shall make and maintain a record of the most recent month in which each alloy steel chain sling was thoroughly inspected and shall make the record available for examination.

(3) The employee designated to make the inspection of an alloy steel chain sling shall make a thorough inspection for all of the following:

(a) Wear.
(b) Defective welds.
(c) Deformation.
(d) An increase in length beyond acceptable limits established in this part. If the defects or deteriorations are present, then the designated employee shall immediately remove the sling from service.

(4) The employer shall ensure that, before use, each new, repaired, or reconditioned alloy steel chain sling, including all welded components in the sling assembly, is proof-tested by the sling manufacturer in accordance with ~~ANSI/~~ ASME ~~standard~~ B-30.9 ~~-1990,~~ "Slings," **1990 edition, as adopted in R 408.14902.** ~~The standard is adopted by reference in these rules and may be inspected at the Lansing office of the Michigan Department of Consumer and Industry Services. The standard may be purchased at a cost of $90.00 as of time of adoption of this rule from the American National Standards Institute, 1430 Broadway Avenue, New York, New York 10018, or the Michigan Department of Consumer and Industry Services, State Secondary Complex, 7150 Harris Drive, Box 30643, Lansing, Michigan 48909. The employer shall retain a certificate of the proof test and shall make it available for examination.~~

(5) The employer shall retain a certificate of the proof test and shall make it available for examination.

(6)~~(5)~~ If the chain size at any point of **the** ~~any~~ link is less than that **stated** ~~prescribed~~ in Table 1, ~~then the designated employee shall~~ **the employer shall** remove the **chain** ~~sling~~ from service.

TABLE 1
MINIMUM ALLOWABLE CHAIN SIZE AT ANY POINT OF LINK

Chain size (inches)	Maximum allowable wear
1/4	13/64
3/8	19/64
1/2	25/64
5/8	31/64
3/4	19/32
7/8	45/64
1	13/16
1 1/8	29/32
1 1/4	1
1 3/8	1-3/32
1 1/2	1-3/16
1 3/4	1-13/32

R 408.14924 ~~Alloy steel chain slings; rated capacities,. high temperature limit.~~ **Safe operating temperatures.**

Rule 4924. ~~(1) An alloy steel chain sling shall not be used with a load in excess of the rated capacities prescribed in Table 2. A sling not included in this table shall be used only in accordance with manufacturer's recommendations.~~

~~(2)~~ **Employers shall permanently remove an alloy steel-chain slings from service if it is heated above 1,000 degrees F. When exposed to service temperatures in excess of 600 degrees F, employers shall reduce the maximum working-load limits permitted by the chain manufacturer in accordance with the chain or sling manufacturer's recommendations.** ~~An alloy steel chain sling shall be permanently removed form service if it is heated above 1,000 degrees Fahrenheit. When exposed to a service temperature of more than 600 degrees Fahrenheit, the maximum working load limit permitted in Table 2 shall be reduced in accordance with the manufacturer's recommendations~~.

TABLE 2
RATED CAPACITY (WORKING LOAD LIMIT), FOR ALLOY STEEL CHAIN SLINGS
RATED CAPACITY (WORKING LOAD LIMIT), POUNDS

CHAIN SIZE, INCHES	SINGLE BRANCH SLING- 90 DEGREE LOADING	DOUBLE SLING VERTICLE ANGLE (1)			TRIPLE AND QUADRUPLE SLING(3) VERTICLE ANGLE (1)		
		30 DEGREE	45 DEGREE	60 DEGREE	30 DEGREE	45 DEGREE	60 DEGREE
		HORIZONTAL ANGLE (2)			HORIZONTAL ANGLE (2)		
		60 DEGREE	45 DEGREE	30 DEGREE	60 DEGREE	45 DEGREE	30 DEGREE
¼	3,250	5,550	4,550	3,250	8,400	6,800	4,900
3/8	6,600	11,400	9,300	6,600	17,000	14,000	9,900
½	11,250	19,500	15,900	11,250	29,000	24,000	17,000
5/8	16,500	28,500	23,300	16,500	43,000	35,000	24,500
¾	23,000	39,800	32,500	23,000	59,500	48,500	34,500
7/8	28,750	49,800	40,600	28,750	74,500	61,000	43,000
1	38,750	67,100	54,800	38,750	101,000	82,000	58,000
1-1/8	44,500	77,000	63,000	44,500	115,300	94,500	66,500
1-1/4	57,500	99,500	81,000	57,500	149,000	121,500	86,000
1-3/8	67,000	116,000	94,000	67,000	174,000	141,000	100,500
1-1/2	80,000	138,000	112,500	80,000	207,000	169,000	119,500
1-3/4	100,000	172,000	140,000	100,000	258,000	210,000	150,000

(1) Rating of multileg slings adjusted for angle of loading measured as the included angle between the inclined leg and the vertical.

(2) Rating of multileg slings adjusted for angle of loading between the inclined leg and the horizontal plane of the load.

(3) Quadruple sling rating is same as triple sling because normal lifting practice may not distribute load uniformly to all 4 legs.

R 408.14925 Alloy steel chain slings; repairing, **Repairing;** reconditioning, and proof testing.

Rule 4925. (1) A worn or damaged alloy steel chain sling or attachment shall not be used until repaired.

(2) When welding or heat treating is performed, a sling shall not be used unless repaired, reconditioned, and proof tested by the sling manufacturer.

(3) A mechanical coupling link or low carbon steel repair link shall not be used to repair broken lengths of chain.

R 408.14926 Alloy steel chain slings; cracked **Cracked** or deformed links or hooks; removal from service.

Rule 4926. (1) Alloy steel chain slings with cracked or deformed master links, coupling links, or other components shall be removed from service.

(2) A sling shall be removed from service if the hook is cracked, has been opened more than 15% of the normal throat opening measured at the narrowest point, or twisted more than 10 degrees from the plane of the unbent hook.

WIRE ROPE SLINGS

R 408.14931 Wire rope slings; rated capacity; temperature limits. **Safe operating temperatures; sling use.**

Rule 4931. (1) A wire rope sling shall not be used with loads in excess of the rated capacities. shown in Tables 3 to 14. A sling not included in these tables shall be used only in accordance with the manufacturer's recommendations.

(2) A fiber core wire rope sling of any grade shall be permanently removed from service if it is exposed to a temperature in excess of 200 degrees Fahrenheit.

(3) When a nonfiber core wire rope sling of any grade is used at a temperature above 400 degrees Fahrenheit or below minus 60 degrees Fahrenheit, recommendations of the sling manufacturer regarding use at that temperature shall be followed.

(4) Employers shall use only wire-rope slings that have permanently affixed and legible identification markings as prescribed by the manufacturer and that indicate the recommended safe working load for the type of hitch used, the angle upon which it is based, and the number of legs if more than 1.

TABLE 3
RATED CAPACITIES FOR SINGLE LEG SLINGS

6x19 and 6x37 Classification Improved Plow Steel Grade Rope with Fiber Core (FC)Rope		Rated capacities, tons (2,000 lb.)								
		 Vertical			 Choker			 Vertical basket *		
Diameter (inches)	Construction	HT	MS	S	HT	MS	S	HT	MS	S
¼	6 x 19	0.49	0.51	0.55	0.37	0.38	0.41	0.99	1.0	1.1
5/16	6 x 19	0.76	0.79	0.85	0.57	0.59	0.64	1.5	1.6	1.7
3/8	6 x 19	1.1	1.1	1.2	0.80	0.85	0.91	2.1	2.2	2.4
7/16	6 x 19	1.4	1.5	1.6	1.1	1.1	1.2	2.9	3.0	3.3
½	6 x 19	1.8	2.0	2.1	1.4	1.5	1.6	3.7	3.9	4.3
9/16	6 x 19	2.3	2.5	2.7	1.7	1.9	2.0	4.6	5.0	5.4
5/8	6 x 19	2.8	3.1	3.3	2.1	2.3	2.5	5.6	6.2	6.7
¾	6 x 19	3.9	4.4	4.8	2.9	3.3	3.6	7.8	8.8	9.5
7/8	6 x 19	5.1	5.9	6.4	3.9	4.5	4.8	10.0	12.0	13.0
1	6 x 19	6.7	7.7	8.4	5.0	5.8	6.3	13.0	15.0	17.0
1 1/8	6 x 19	8.4	9.5	10.0	6.3	7.1	7.9	17.0	19.0	21.0
1 ¼	6 x 37	9.8	11.0	12.0	7.4	8.3	9.2	20.0	22.0	25.0
1 3/8	6 x 37	12.0	13.0	15.0	8.9	10.0	11.0	24.0	27.0	30.0
1 ½	6 x 37	14.0	16.0	17.0	10.0	12.0	13.0	28.0	32.0	35.0
1 5/8	6 x 37	16.0	18.0	21.0	12.0	14.0	15.0	33.0	37.0	41.0
1 ¾	6 x 37	19.0	21.0	24.0	14.0	16.0	18.0	38.0	43.0	48.0
2	6 x 37	25.0	28.0	31.0	18.0	21.0	23.0	49.0	55.0	62.0

HT=Hand Tucked Splice and Hidden Tuck Splice. For hidden tuck splice (IWRC) use values in HT columns.

MS=Mechanical Splice.

S=Swaged or Zinc Poured Socket.

* These values only apply when the D/d ratio for HT slings is 10 or greater, and for MS and S Slings is 20 or greater where:

D=Diameter of curvature around which the body of the sling is bent.

d=Diameter of rope.

TABLE H-4
RATED CAPACITIES FOR SINGLE LEG SLINGS
6x19 and 6x37 Classification Improved Plow Steel Grade Rope
with Independent Wire Core (IWRC)

Rope		Rated capacities, tons (2,000 lb.)								
		 Vertical			 Choker			 Vertical basket [1]		
Diameter (inches)	Construction	HT	MS	S	HT	MS	S	HT	MS	S
¼	6 x 19	0.53	0.56	0.59	0.40	0.42	0.44	1.0	1.1	1.2
5/16	6 x 19	0.81	0.87	0.92	0.61	0.65	0.69	1.6	1.7	1.8
3/8	6 x 19	1.1	1.2	1.3	0.86	0.93	0.98	2.3	2.5	2.6
7/16	6 x 19	1.5	1.7	1.8	1.2	1.3	1.3	3.1	3.4	3.5
½	6 x 19	2.0	2.2	2.3	1.5	1.6	1.7	3.9	4.4	4.6
9/16	6 x 19	2.5	2.7	2.9	1.8	2.1	2.2	4.9	5.5	5.8
5/8	6 x 19	3.0	3.4	3.6	2.2	2.5	2.7	6.0	6.8	7.2
¾	6 x 19	4.2	4.9	5.1	3.1	3.6	3.8	8.4	9.7	10.0
7/8	6 x 19	5.5	6.6	6.9	4.1	4.9	5.2	11.0	13.0	14.0
1	6 x 19	7.2	8.5	9.0	5.4	6.4	6.7	14.0	17.0	18.0
1 1/8	6 x 19	9.0	10.0	11.0	6.8	7.8	8.5	18.0	21.0	23.0
1 ¼	6 x 37	10.0	12.0	13.0	7.9	9.2	9.9	21.0	24.0	26.0
1 3/8	6 x 37	13.0	15.0	16.0	9.6	11.0	12.0	25.0	29.0	32.0
1 ½	6 x 37	15.0	17.0	19.0	11.0	13.0	14.0	30.0	35.0	38.0
1 5/8	6 x 37	18.0	20.0	22.0	13.0	15.0	17.0	35.0	41.0	44.0
1 ¾	6 x 37	20.0	24.0	26.0	15.0	18.0	19.0	41.0	47.0	51.0
2	6 x 37	26.0	30.0	33.0	20.0	23.0	25.0	53.0	61.0	66.0

1 These values only apply when the D/d ratio for HT slings is 10 or greater, and for MS and S Slings is 20 or greater where:

D=Diameter of curvature around which the body of the sling is bent.

d=Diameter of rope.

HT=Hand Tucked Splice: For hidden tuck splice (IWRC) use Table H-3 values in HT column.

MS=Mechanical Splice.

S=Swaged or Zinc Poured Socket.

TABLE H-5
RATED CAPACITIES FOR SINGLE LEG SLINGS
Cable Laid Rope—Mechanical Splice Only
7x7x7 and 7x7x19 Classification Galvanized Aircraft Grade Rope
7x6x19 IWRC Construction Improved Plow Steel Grade Rope

Rope		Rated capacities, tons (2,000 lb.)		
Diameter (inches)	Construction	 Vertical	 Choker	 Vertical basket [1]
¼	7x7x7	0.50	0.38	1.0
3/8	7x7x7	1.1	0.81	2.2
½	7x7x7	1.8	1.4	3.7
5/8	7x7x7	2.8	2.1	5.5
¾	7x7x7	3.8	2.9	7.6
5/8	7x7x19	2.9	2.2	5.8
¾	7x7x19	4.1	3.0	8.1
7/8	7x7x19	5.4	4.0	11.0
1	7x7x19	6.9	5.1	14.0
1 1/8	7x7x19	8.2	6.2	16.0
1 ¼	7x7x19	9.9	7.4	20.0
¾	[2]7x6x19	3.8	2.8	7.6
7/8	[2]7x6x19	5.0	3.8	10.0
1	[2]7x6x19	6.4	4.8	13.0
1 1/8	[2]7x6x19	7.7	5.8	15.0
1 ¼	[2]7x6x19	9.2	6.9	18.0
1 5/16	[2]7x6x19	10.0	7.5	20.0
1 3/8	[2]7x6x19	11.0	8.2	22.0
1 ½	[2]7x6x19	13.0	9.6	26.0

1 These values only apply when the D/d ratio in 10 or greater where:

D=Diameter of curvature around which the body of the sling is bent.

d=Diameter of rope.

2 IWRC.

TABLE H-6
RATED CAPACITIES FOR SINGLE LEG SLINGS
8-Part and 6-Part Braided Rope
6x7 and 6x19 Classification Improved Plow Steel Grade Rope
7x7 Construction Galvanized Aircraft Grade Rope

Component Ropes		Rated capacities, tons (2,000 lb.)					
Diameter (inches)	Construction	 Vertical		 Choker		 Basket Vertical to 30° [1]	
		8-Part	6-Part	8-Part	6-Part	8-Part	6-Part
3/32	6x7	0.42	0.32	0.32	0.24	0.74	0.55
1/8	6x7	0.76	0.57	0.57	0.42	1.3	0.96
3/16	6x7	1.7	1.3	1.3	0.94	2.9	2.2
3/32	7x7	0.51	0.39	0.38	0.29	0.89	0.67
1/8	7x7	0.95	0.71	0.71	0.53	1.6	1.2
3/16	7x7	2.1	1.5	1.5	1.2	3.6	2.7
3/16	6x19	1.7	1.3	1.3	0.98	3.0	2.2
1/4	6x19	3.1	2.3	2.3	1.7	5.3	4.0
5/16	6x19	4.8	3.6	3.6	2.7	8.3	6.2
3/8	6x19	6.8	5.1	5.1	3.8	12.0	8.9
7/16	6x19	9.3	6.9	6.9	5.2	16.0	12.0
1/2	6x19	12.0	9.0	9.0	6.7	21.0	15.0
9/16	6x19	15.0	11.0	11.0	8.5	26.0	20.0
5/8	6x19	19.0	14.0	14.0	10.0	32.0	24.0
3/4	6x19	27.0	20.0	20.0	15.0	46.0	35.0
7/8	6x19	36.0	27.0	27.0	20.0	62.0	47.0
1	6x19	47.0	35.0	35.0	26.0	81.0	61.0

1 These values only apply when the D/d ratio in 20 or greater where:
D=Diameter of curvature around which the body of the sling is bent.
d=Diameter of component rope

TABLE H-7

RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS

6x19 and 6x37 Classification Improved Plow Steel Grade Rope With Fiber Core (FC)

Rope		Rated Capacities, Tons (2,000 pounds)											
Diameter (inches)	Construction	2-leg Bridle Slings						3-leg Bridle Slings					
		30°[1] (60°)[2]		45° angle		60°[1] (30°)[2]		30°[1] (60°)[2]		45° angle		60°[1] (30°)[2]	
		HT	MS	HT	MS	HT	MS	HT	MS	HT	MS	HT	MS
1/4	6x19	0.85	0.88	0.70	0.72	0.49	0.51	1.3	1.3	1.0	1.1	0.74	0.76
5/16	6x19	1.3	1.4	1.1	1.1	0.76	0.79	2.0	2.0	1.6	1.7	1.1	1.2
3/8	6x19	1.8	1.9	1.5	1.6	1.1	1.1	2.8	2.9	2.3	2.4	1.6	1.7
7/16	6x19	2.5	2.6	2.0	2.2	1.4	1.5	3.7	4.0	3.0	3.2	2.1	2.3
1/2	6x19	3.2	3.4	2.6	2.8	1.8	2.0	4.8	5.1	3.9	4.2	2.8	3.0
9/16	6x19	4.0	4.3	3.2	3.5	2.3	2.5	6.0	6.5	4.9	5.3	3.4	3.7
5/8	6x19	4.8	5.3	4.0	4.4	2.8	3.1	7.3	8.0	5.9	6.5	4.2	4.6
3/4	6x19	6.8	7.6	5.5	6.2	3.9	4.4	10.0	11.0	8.3	9.3	5.8	6.6
7/8	6x19	8.9	10.0	7.3	8.4	5.1	5.9	13.0	15.0	11.0	13.0	7.7	8.9
1	6x19	11.0	13.0	9.4	11.0	6.7	7.7	17.0	20.0	14.0	16.0	10.0	11.0
1 1/8	6x19	14.0	16.0	12.0	13.0	8.4	9.5	22.0	24.0	18.0	20.0	13.0	14.0
1 1/4	6x37	17.0	19.0	14.0	16.0	9.8	11.0	25.0	29.0	21.0	23.0	15.0	17.0
1 3/8	6x37	20.0	23.0	17.0	19.0	12.0	13.0	31.0	35.0	25.0	28.0	18.0	20.0
1 1/2	6x37	24.0	27.0	20.0	22.0	14.0	16.0	36.0	41.0	30.0	33.0	21.0	24.0
1 5/8	6x37	28.0	32.0	23.0	26.0	16.0	18.0	43.0	48.0	35.0	39.0	25.0	28.0
1 3/4	6x37	33.0	37.0	27.0	30.0	19.0	21.0	49.0	56.0	40.0	45.0	28.0	32.0
2	6x37	43.0	48.0	35.0	39.0	25.0	28.0	64.0	72.0	52.0	59.0	37.0	41.0

HT=Hand Tucked Splice.

MS=Mechanical Splice.

[1] Vertical Angles.

[2] Horizontal Angles.

TABLE H-8

RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS

6x19 and 6x37 Classification Improved Plow Steel Grade Rope With Independent Wire Rope Core (IWRC)

Rope		Rated Capacities, Tons (2,000 pounds)											
Diameter (inches)	Construction	2-leg Bridle Slings						3-leg Bridle Slings					
		30°[1] (60°)[2]		45° angle		60°[1] (30°)[2]		30°[1] (60°)[2]		45° angle		60°[1] (30°)[2]	
		HT	MS	HT	MS	HT	MS	HT	MS	HT	MS	HT	MS
1/4	6x19	0.92	0.97	0.75	0.79	0.53	0.56	1.4	1.4	1.1	1.2	0.79	0.84
5/16	6x19	1.4	1.5	1.1	1.2	0.81	0.87	2.1	2.3	1.7	1.8	1.2	1.3
3/8	6x19	2.0	2.1	1.6	1.8	1.1	1.2	3.0	3.2	2.4	2.6	1.7	1.9
7/16	6x19	2.7	2.9	2.2	2.4	1.5	1.7	4.0	4.4	3.3	3.6	2.3	2.5
1/2	6x19	3.4	3.8	2.8	3.1	2.0	2.2	5.1	5.7	4.2	4.6	3.0	3.3
9/16	6x19	4.3	4.8	3.5	3.9	2.5	2.7	6.4	7.1	5.2	5.8	3.7	4.1
5/8	6x19	5.2	5.9	4.2	4.8	3.0	3.4	7.8	8.8	6.4	7.2	4.5	5.1
3/4	6x19	7.3	8.4	5.9	6.9	4.2	4.9	11.0	13.0	8.9	10.0	6.3	7.3
7/8	6x19	9.6	11.0	7.8	9.3	5.5	6.6	14.0	17.0	12.0	14.0	8.3	9.9
1	6x19	12.0	15.0	10.0	12.0	7.2	8.5	19.0	22.0	15.0	18.0	11.0	13.0
1 1/8	6x19	16.0	18.0	13.0	15.0	9.0	10.0	23.0	27.0	19.0	22.0	13.0	16.0
1 1/4	6x37	18.0	21.0	15.0	17.0	10.0	12.0	27.0	32.0	22.0	26.0	16.0	18.0
1 3/8	6x37	22.0	25.0	18.0	21.0	13.0	15.0	33.0	38.0	27.0	31.0	19.0	22.0
1 1/2	6x37	26.0	30.0	21.0	25.0	15.0	17.0	39.0	45.0	32.0	37.0	23.0	26.0
1 5/8	6x37	31.0	35.0	25.0	29.0	18.0	20.0	46.0	53.0	38.0	43.0	27.0	31.0
1 3/4	6x37	35.0	41.0	29.0	33.0	20.0	24.0	53.0	61.0	43.0	50.0	31.0	35.0
2	6x37	46.0	53.0	37.0	43.0	26.0	30.0	68.0	79.0	56.0	65.0	40.0	46.0

HT=Hand Tucked Splice.

MS=Mechanical Splice.

[1] Vertical Angles.

[2] Horizontal Angles.

TABLE H-9
RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS
Cable Laid Rope---Mechanical Splice Only
7x7x7 and 7x7x19 Construction Galvanized Aircraft Grade Rope
7x6x19 IWRC Construction Improved Plow Steel Grade Rope

Rope		Rated Capacities, Tons (2,000 pounds)					
Diameter (inches)	Construction	2-leg Bridle Slings			3-leg Bridle Slings		
		30° (60°)	45° angle	60° (30°)	30° (60°)	45° angle	60° (30°)
1/4	7x7x7	0.87	0.71	0.50	1.3	1.1	0.75
3/8	7x7x7	1.9	1.5	1.1	2.8	2.3	1.6
1/2	7x7x7	3.2	2.6	1.8	4.8	3.9	2.8
5/8	7x7x7	4.8	3.9	2.8	7.2	5.9	4.2
3/4	7x7x7	6.6	5.4	3.8	9.9	8.1	5.7
5/8	7x7x19	5.0	4.1	2.9	7.5	6.1	4.3
3/4	7x7x19	7.0	5.7	4.1	10.0	8.6	6.1
7/8	7x7x19	9.3	7.6	5.4	14.0	11.0	8.1
1	7x7x19	12.0	9.7	6.9	18.0	14.0	10.0
1 1/8	7x7x19	14.0	12.0	8.2	21.0	17.0	12.0
1 1/4	7x7x19	17.0	14.0	9.9	26.0	21.0	15.0
3/4	7x6x19 IWRC	6.6	5.4	3.8	9.9	8.0	5.7
7/8	7x6x19 IWRC	8.7	7.1	5.0	13.0	11.0	7.5
1	7x6x19 IWRC	11.0	9.0	6.4	17.0	13.0	9.6
1 1/8	7x6x19 IWRC	13.0	11.0	7.7	20.0	16.0	11.0
1 1/4	7x6x19 IWRC	16.0	13.0	9.2	24.0	20.0	14.0
1 5/16	7x6x19 IWRC	17.0	14.0	10.0	26.0	21.0	15.0
1 3/8	7x6x19 IWRC	19.0	15.0	11.0	28.0	23.0	16.0
1 1/2	7x6x19 IWRC	22.0	18.0	13.0	33.0	27.0	19.0

TABLE H-10
RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS
8-Part and 6-Part Braided Rope
6x7 and 6x19 Construction Improved Plow Steel Grade Rope
7x7 Construction Galvanized Aircraft Grade Rope

Rope		Rated Capacities, tons (2,000 pounds)											
Diameter (inches)	Construction	2-leg Bridle Slings						3-leg Bridle Slings					
		30°[1] (60°)[2]		45° Angle		60°[1] (30°)[2]		30°[1] (60°)[2]		45° Angle		60°[1] (30°)[2]	
		8 - Part	6 - Part	8 - Part	6 - Part	8 - Part	6 - Part	8 - Part	6 - Part	8 - Part	6 - Part	8 - Part	6 - Part
3/32	6x7	0.74	0.55	0.60	0.45	0.42	0.32	1.1	0.83	0.90	0.68	0.64	0.48
1/8	6x7	1.3	0.98	1.1	0.80	0.76	0.57	2.0	1.5	1.6	1.2	1.1	0.85
3/16	6x7	2.9	2.2	2.4	1.8	1.7	1.3	4.4	3.3	3.6	2.7	2.5	1.9
3/32	7x7	0.89	0.67	0.72	0.55	0.51	0.39	1.3	1.0	1.1	0.82	0.77	0.58
1/8	7x7	1.6	1.2	1.3	1.0	0.95	0.71	2.5	1.8	2.0	1.5	1.4	1.1
3/16	7x7	3.6	2.7	2.9	2.2	2.1	1.5	5.4	4.0	4.4	3.3	3.1	2.3
3/16	6x19	3.0	2.2	2.4	1.8	1.7	1.3	4.5	3.4	3.7	2.8	2.6	1.9
1/4	6x19	5.3	4.0	4.3	3.2	3.1	2.3	8.0	6.0	6.5	4.9	4.6	3.4
5/16	6x19	8.3	6.2	6.7	5.0	4.8	3.6	12.0	9.3	10.0	7.6	7.1	5.4
3/8	6x19	12.0	8.9	9.7	7.2	6.8	5.1	18.0	13.0	14.0	11.0	10.0	7.7
7/16	6x19	16.0	12.0	13.0	9.8	9.3	6.9	24.0	18.0	20.0	15.0	14.0	10.0
1/2	6x19	21.0	15.0	17.0	13.0	12.0	9.0	31.0	23.0	25.0	19.0	18.0	13.0
9/16	6x19	26.0	20.0	21.0	16.0	15.0	11.0	39.0	29.0	32.0	24.0	23.0	17.0
5/8	6x19	32.0	24.0	26.0	20.0	19.0	14.0	48.0	36.0	40.0	30.0	28.0	21.0
3/4	6x19	46.0	35.0	38.0	28.0	27.0	20.0	69.0	52.0	56.0	42.0	40.0	30.0
7/8	6x19	62.0	47.0	51.0	38.0	36.0	27.0	94.0	70.0	76.0	57.0	54.0	40.0
1	6x19	81.0	61.0	66.0	50.0	47.0	35.0	22.0	91.0	99.0	74.0	70.0	53.0

TABLE H-11
RATED CAPACITIES FOR STRAND LAID GROMMET---HAND TUCKED
Improved Plow Steel Grade Rope

Rope Body		Rated Capacities, tons (2,000 pounds)		
Diameter (inches)	Construction	 Vertical	 Choker	 Vertical Basket[1]
¼	7x19	0.85	0.64	1.7
5/16	7x19	1.3	1.0	2.6
3/8	7x19	1.9	1.4	3.8
7/16	7x19	2.6	1.9	5.2
½	7x19	3.3	2.5	6.7
9/16	7x19	4.2	3.1	8.4
5/8	7x19	5.2	3.9	10.0
¾	7x19	7.4	5.6	15.0
7/8	7x19	10.0	7.5	20.0
1	7x19	13.0	9.7	26.0
1 1/8	7x19	16.0	12.0	32.0
1 ¼	7x37	18.0	14.0	37.0
1 3/8	7x37	22.0	16.0	44.0
1 ½	7x37	26.0	19.0	52.0

[1] These values only apply when the D/d ratio is 5 or greater where:

D=Diameter of curvature around which rope is bent.

D=Diameter of rope body.

TABLE H-12
RATED CAPACITIES FOR CABLE LAID GROMMET---HAND TUCKED
7x6x7 and 7x6x19 Construction Improved Plow Steel Grade Rope
7x7x7 Construction Galvanized Aircraft Grade Rope

Cable Body		Rated Capacities, tons (2,000 pounds)		
Diameter (inches)	Construction	 Vertical	 Choker	 Vertical Basket[1]
3/8	7x6x7	1.3	0.95	2.5
9/16	7x6x7	2.8	2.1	5.6
5/8	7x6x7	3.8	2.8	7.6
3/8	7x7x7	1.6	1.2	3.2
9/16	7x7x7	3.5	2.6	6.9
5/8	7x7x7	4.5	3.4	9.0
5/8	7x6x19	3.9	3.0	7.9
¾	7x6x19	5.1	3.8	10.0
15/16	7x6x19	7.9	5.9	16.0
1 1/8	7x6x19	11.0	8.4	22.0
1 5/16	7x6x19	15.0	11.0	30.0
1 ½	7x9x19	19.0	14.0	39.0
1 11/16	7x6x19	24.0	18.0	49.0
1 7/8	7x6x19	30.0	22.0	60.0
2 ¼	7x6x19	42.0	31.0	84.0
2 5/8	7x6x19	56.0	42.0	112.0

[1] These values only apply when the D/d ratio is 5 or greater where:

D=Diameter of curvature around which rope is bent.

D=Diameter of rope body.

TABLE H-13
RATED CAPACITIES FOR STRAND LAID ENDLESS SLINGS-MECHANICAL JOINT
Improved Plow Steel Grade Rope

Rope Body		Rated Capacities, tons (2,000 pounds)		
Diameter (inches)	Construction	Vertical	Choker	Vertical Basket[1]
¼	6x19 IWRC	0.92	0.69	1.8
3/8	6x19 IWRC	2.0	1.5	4.1
½	6x19 IWRC	3.6	2.7	7.2
5/8	6x19 IWRC	5.6	4.2	11.0
¾	6x19 IWRC	8.0	6.0	16.0
7/8	6x19 IWRC	11.0	8.1	21.0
1	6x19 IWRC	14.0	10.0	28.0
1 1/8	6x19 IWRC	18.0	13.0	35.0
1 ¼	6x37 IWRC	21.0	15.0	41.0
1 3/8	6x37 IWRC	25.0	19.0	50.0
1 ½	6x37 IWRC	29.0	22.0	59.0

[1] These values only apply when the D/d ratio is 5 or greater where:

D=Diameter of curvature around which rope is bent.

D=Diameter of rope body.

~~TABLE H-14~~
~~RATED CAPACITIES FOR CABLE LAID ENDLESS SLINGS-MECHANICAL JOINT~~
~~7x7x7 and 7x7x19 Construction Galvanized Aircraft Grade Rope~~
~~7x6x19 IWRC Construction Improved Plow Steel Grade Rope~~

~~Cable Body~~		~~Rated Capacities, tons (2,000 pounds)~~		
~~Diameter (inches)~~	~~Construction~~	 ~~Vertical~~	 ~~Choker~~	 ~~Vertical Basket[1]~~
~~¼~~	~~7x7x7~~	~~0.83~~	~~0.62~~	~~1.6~~
~~3/8~~	~~7x7x7~~	~~1.8~~	~~1.3~~	~~3.5~~
~~½~~	~~7x7x7~~	~~3.0~~	~~2.3~~	~~6.1~~
~~5/8~~	~~7x7x7~~	~~4.5~~	~~3.4~~	~~9.1~~
~~¾~~	~~7x7x7~~	~~6.3~~	~~4.7~~	~~12.0~~
~~5/8~~	~~7x7x19~~	~~4.7~~	~~3.5~~	~~9.5~~
~~¾~~	~~7x7x19~~	~~6.7~~	~~5.0~~	~~13.0~~
~~7/8~~	~~7x7x19~~	~~8.9~~	~~6.6~~	~~18.0~~
~~1~~	~~7x7x19~~	~~11.0~~	~~8.5~~	~~22.0~~
~~1 1/8~~	~~7x7x19~~	~~14.0~~	~~10.0~~	~~28.0~~
~~1 ¼~~	~~7x7x19~~	~~17.0~~	~~12.0~~	~~33.0~~
~~¾~~	~~7x7x19 IWRC~~	~~6.2~~	~~4.7~~	~~12.0~~
~~7/8~~	~~7x7x19 IWRC~~	~~8.3~~	~~6.2~~	~~16.0~~
~~1~~	~~7x7x19 IWRC~~	~~10.0~~	~~7.9~~	~~21.0~~
~~1 1/8~~	~~7x7x19 IWRC~~	~~13.0~~	~~9.7~~	~~26.0~~
~~1 ¼~~	~~7x7x19 IWRC~~	~~16.0~~	~~12.0~~	~~31.0~~
~~1 3/8~~	~~7x7x19 IWRC~~	~~18.0~~	~~14.0~~	~~37.0~~
~~1 ½~~	~~7x7x19 IWRC~~	~~22.0~~	~~16.0~~	~~43.0~~

~~[1] These values only apply when the D/d ratio is 5 or greater where:~~

~~D=Diameter of curvature around which rope is bent.~~

~~D=Diameter of rope body.~~

R 408.14932 ~~Wire rope slings; minimum~~ **Minimum sling** lengths.

Rule 4932. (1) Cable laid and a 6 x 19 and 6 x 37 sling shall have a minimum clear length of wire rope 10 times the component rope diameter between splices, sleeves, or end fittings.

(2) A braided sling shall have a minimum clear length of wire rope 40 times the component rope diameter between the loops or end fittings.

(3) A cable laid grommet, strand laid grommet, and endless sling shall have a minimum circumferential length of 96 times their body diameter.

R 408.14933 ~~Wire rope slings; welded~~ **Welded** end attachment; certificate of proof test.

Rule 4933. (1) Welding of an end attachment, except covers to thimbles, shall be performed prior to the assembly of the sling.

(2) All welded end attachments shall not be used unless proof tested by the manufacturer 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.

R 408.14934 ~~Wire rope slings; removal~~ **Removal** from service.

Rule 4934. A wire rope sling shall be removed from service if any of the following conditions are present:

(a) Ten randomly distributed broken wires in 1 rope lay, or 5 broken wires in 1 strand in 1 rope lay.

(b) Wear or scraping of 1/3 the original diameter of outside individual wires.

(c) Kinking, crushing, bird caging, or any other damage resulting in distortion of the wire rope structure.

(d) Evidence of heat damage.

(e) End attachments that are cracked, deformed, or worn.

(f) Hooks that have been opened more than 15% of the normal throat opening measured at the narrowest point, or twisted more than 10 degrees from the plane of the unbent hook.

(g) Corrosion of the rope or end attachments.

R 408.14935 ~~Wire rope slings; forming~~ **Forming** eyes.

Rule 4935. An eye in a wire rope sling shall not be formed by using a knot or a wire rope clip.

METAL MESH SLINGS

R 408.14941 ~~Metal mesh slings;~~ **Sling** marking; rated capacity; coatings.

Rule 4941. (1) Each metal mesh sling shall have permanently affixed to it a durable marking that states the rated capacity for vertical basket hitch and choker hitch loadings.

(2) A handle shall have a rated capacity at least equal to the metal fabric and exhibit no deformation after proof testing.

(3) Coatings which diminish the rated capacity of a sling shall not be applied.

R 408.14942 ~~Metal mesh slings; attachment~~ **Attachment** of handle.

Rule 4942. The fabric and handles shall be joined ~~so that:~~ **to ensure all of the following:**

(a) The rated capacity of the sling is not reduced.

(b) The load is evenly distributed across the width of the fabric.

(c) Sharp edges will not damage the fabric.

R 408.14943 ~~Metal mesh slings;~~ **Sling** testing.

Rule 4943. All new and repaired metal mesh slings, including handles, shall not be used unless proof tested by the manufacturer at a minimum of 1 1/2 times their rated capacity. Elastomer impregnated slings shall be proof tested before coating.

R 408.14944 ~~Metal mesh slings;~~ **Sling** use; **safe operating temperatures.** ~~temperature limits.~~

Rule 4944. (1) A metal mesh sling shall not be used to lift loads in excess of their rated capacities. ~~as prescribed in Table 15.~~

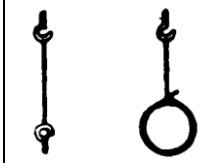
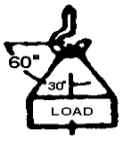
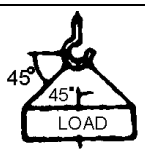
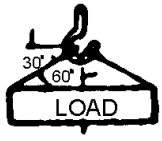
(2) A sling ~~not included in this table~~ shall be used only in accordance with the manufacturer's recommendations.

(3) A metal mesh sling which is not impregnated with elastomers may be used in a temperature range from minus 20 degrees Fahrenheit to plus 550 degrees Fahrenheit without decreasing the working load limit. ~~A metal mesh sling impregnated with polyvinyl chloride or neoprene may be used only in a temperature range from zero degrees to plus 200 degrees Fahrenheit. For operations outside these temperature ranges or for metal mesh slings impregnated with other materials, the sling manufacturer's recommendations shall be followed.~~

(4) A metal mesh sling impregnated with polyvinyl chloride or neoprene may be used only in a temperature range from zero degrees to plus 200 degrees Fahrenheit.

(5) For operations outside these temperature ranges in subrule (3) and (4) of this rule or for metal mesh slings impregnated with other materials, the sling manufacturer's recommendations shall be followed.

~~TABLE H-15~~
~~Rated Capacities~~
~~Carbon Steel & Stainless Steel~~
~~Metal Mesh Slings~~

~~SLING WIDTH IN INCHES~~			~~EFFECT OF ANGLE ON RATED CAPACITIES IN BASKET HITCH~~		
					

~~Heavy Duty-10 Ga 35 Spirals/Ft. of sling width~~

~~2~~	~~1,500~~	~~3,000~~	~~2,600~~	~~2,100~~	~~1,500~~
~~3~~	~~2,700~~	~~5,400~~	~~4,700~~	~~3,800~~	~~2,700~~
~~4~~	~~4,000~~	~~8,000~~	~~6,900~~	~~5,600~~	~~4,000~~
~~6~~	~~6,000~~	~~12,000~~	~~10,400~~	~~8,400~~	~~6,000~~
~~8~~	~~8,000~~	~~16,000~~	~~13,800~~	~~11,300~~	~~8,000~~
~~10~~	~~10,000~~	~~20,000~~	~~17,000~~	~~14,100~~	~~10,000~~
~~12~~	~~12,000~~	~~24,000~~	~~20,700~~	~~16,900~~	~~12,000~~
~~14~~	~~14,000~~	~~28,000~~	~~24,200~~	~~19,700~~	~~14,000~~
~~16~~	~~16,000~~	~~32,000~~	~~27,700~~	~~22,600~~	~~16,000~~
~~18~~	~~18,000~~	~~36,000~~	~~31,100~~	~~25,400~~	~~18,000~~
~~20~~	~~20,000~~	~~40,000~~	~~34,600~~	~~28,200~~	~~20,000~~

~~Medium Duty-12 Ga 43 Spirals/Ft. of sling width~~

~~2~~	~~1,350~~	~~2,700~~	~~2,300~~	~~1,900~~	~~1,400~~
~~3~~	~~2,000~~	~~4,000~~	~~3,500~~	~~2,800~~	~~2,000~~
~~4~~	~~2,700~~	~~5,400~~	~~4,700~~	~~3,800~~	~~2,700~~
~~6~~	~~4,500~~	~~9,000~~	~~7,800~~	~~6,400~~	~~4,500~~
~~8~~	~~6,000~~	~~12,000~~	~~10,400~~	~~8,500~~	~~6,000~~
~~10~~	~~7,500~~	~~15,000~~	~~13,000~~	~~10,600~~	~~7,500~~
~~12~~	~~9,000~~	~~18,000~~	~~15,600~~	~~12,700~~	~~9,000~~
~~14~~	~~10,500~~	~~21,000~~	~~18,200~~	~~14,800~~	~~10,500~~
~~16~~	~~12,000~~	~~24,000~~	~~20,800~~	~~17,000~~	~~12,000~~
~~18~~	~~13,500~~	~~27,000~~	~~23,400~~	~~19,100~~	~~13,500~~
~~20~~	~~15,000~~	~~30,000~~	~~26,000~~	~~21,200~~	~~15,000~~

~~Light Duty-14 Ga 59 Spirals/Ft of sling width~~

~~2~~	~~900~~	~~1,800~~	~~1,600~~	~~1,300~~	~~900~~
~~3~~	~~1,400~~	~~2,800~~	~~2,400~~	~~2,000~~	~~1,400~~
~~4~~	~~2,000~~	~~4,000~~	~~3,500~~	~~2,800~~	~~2,000~~
~~6~~	~~3,000~~	~~6,000~~	~~5,200~~	~~4,200~~	~~3,000~~
~~8~~	~~4,000~~	~~8,000~~	~~6,900~~	~~5,700~~	~~4,000~~
~~10~~	~~5,000~~	~~10,000~~	~~8,600~~	~~7,100~~	~~5,000~~
~~12~~		~~12,000~~	~~10,400~~	~~8,500~~	~~6,000~~
~~14~~	~~6,000~~	~~14,000~~	~~12,100~~	~~9,900~~	~~7,000~~
~~16~~	~~8,000~~	~~16,000~~	~~13,900~~	~~11,300~~	~~8,000~~
~~18~~	~~9,000~~	~~18,000~~	~~15,600~~	~~12,700~~	~~9,000~~
~~20~~	~~10,000~~	~~20,000~~	~~17,300~~	~~14,100~~	~~10,000~~

R 408.14945 ~~Metal mesh slings; removal~~ **Removal** from service; repairs; records.

Rule 4945. (1) A metal mesh sling shall be immediately removed from service if any of the following conditions are present:

(a) A broken weld or broken brazed joint along the sling edge.

(b) Reduction in wire diameter of 25% due to abrasion or 15% due to corrosion.

(c) Lack of flexibility due to distortion of the fabric.

(d) Distortion of the female handle so that the depth of the slot is increased more than 10%.
(e) Distortion of either handle so that the width of the eye is decreased more than 10%.
(f) A 15% reduction of the original cross sectional area of metal at any point around the handle eye.
(g) Distortion of either handle out of its plane.
(2) A metal mesh sling which is repaired shall not be used unless repaired by a metal mesh sling manufacturer.
(3) Once repaired, each sling shall be permanently marked or tagged, or a written record maintained, to indicate the date and nature of the repairs and the person or organization that performed the repairs. Records of repairs shall be made available for examination.

NATURAL AND SYNTHETIC FIBER ROPE SLINGS

R 408.14951 ~~Natural and synthetic fiber rope slings; rated~~ **Sling use; rated** capacity; diameter of curvature; ~~temperature limits.~~ **safe operating temperatures.**

Rule 4951. (1) A fiber rope sling made from conventional 3 strand construction fiber rope shall not be used with a load in excess of the rated capacities. ~~prescribed in Tables 16 to 19.~~

(2) A fiber rope sling shall have a diameter of curvature meeting not less than the minimums prescribed in figures 4 and 5.

(3) A sling ~~not included in these tables~~ shall be used only in accordance with the manufacturer's recommendations.

(4) A natural or synthetic fiber rope sling, except for a wet frozen sling, may be used in a temperature range from minus 20 degrees Fahrenheit to plus 180 degrees Fahrenheit without decreasing the working load limit. For operations outside this temperature range and for wet frozen slings, the sling manufacturer's recommendations shall be followed.

(5) Employers shall use natural and synthetic fiber-rope slings that have permanently affixed and legible identification markings stating the rated capacity for the type of hitch used and the angle upon which it is based, type of fiber material, and the number of legs if more than 1.

TABLE 16
MANILA ROPE SLINGS

Rope Diameter Nominal in Inches	Nominal Weight per 100 Feet in Pounds	Capacity is in Pounds											
		Eye and Eye Sling						Endless Sling					
		 Vertical Hitch	 Choker Hitch	Basket Hitch; Angle of Rope to Horizontal				 Vertical Hitch	 Choker Hitch	Basket Hitch; Angle of Rope to Horizontal			
				90°(0°)	60°(30°)	45°(45°)	30°(60°)			90°(0°)	60°(30°)	45°(45°)	30°(60°)
1/2	7.5	480	240	960	830	680	480	865	430	1,730	1,500	1,220	865
9/16	10.4	620	310	1,240	1,070	875	620	1,120	560	2,230	1,930	1,580	1,120
5/8	13.3	790	395	1,580	1,370	1,120	790	1,420	710	2,840	2,460	2,010	1,420
3/4	16.7	970	485	1,940	1,680	1,370	970	1,750	875	3,490	3,020	2,470	1,750
13/16	19.5	1,170	585	2,340	2,030	1,650	1,170	2,110	1,050	4,210	3,650	2,980	2,110
7/8	22.5	1,390	695	2,780	2,410	1,970	1,390	2,500	1,250	5,000	4,330	3,540	2,500
1	27.0	1,620	810	3,240	2,810	2,290	1,620	2,920	1,460	5,830	5,050	4,120	2,920
1 1/16	31.3	1,890	945	3,780	3,270	2,670	1,890	3,400	1,700	6,800	5,890	4,810	3,400
1 1/8	36.0	2,160	1,080	4,320	3,740	3,050	2,160	3,890	1,940	7,780	6,730	5,500	3,890
1 1/4	41.7	2,430	1,220	4,860	4,210	3,440	2,430	4,370	2,190	8,750	7,580	6,190	4,370
1 5/16	47.9	2,700	1,350	5,400	4,680	3,820	2,700	4,860	2,430	9,720	8,420	6,870	4,860
1 1/2	59.9	3,330	1,670	6,660	5,770	4,710	3,330	5,990	3,000	12,000	10,400	8,480	5,990
1 5/8	74.6	4,050	2,030	8,100	7,010	5,730	4,050	7,290	2,650	14,600	12,600	10,300	7,290
1 3/4	89.3	4,770	2,390	9,540	8,260	6,740	4,770	8,590	4,290	17,200	14,900	12,100	8,590
2	107.5	5,580	2,790	11,200	9,660	7,890	5,580	10,000	5,020	20,100	17,400	14,200	10,000
2 1/3	125.0	6,480	3,240	13,000	11,200	9,160	6,480	11,700	5,830	23,300	20,200	16,500	11,700
2 1/4	146.0	7,380	3,690	14,800	12,800	10,400	7,380	13,300	6,640	26,600	23,000	18,800	13,300
2 1/2	166.7	8,370	4,190	16,700	14,500	11,800	8,370	15,100	7,530	30,100	26,100	21,300	15,100
2 5/8	190.8	9,360	4,680	18,700	16,200	13,200	9,360	16,800	8,420	33,700	29,200	23,800	16,800

See figures 4 and 5 for sling configuration descriptions.

~~TABLE 17~~
~~NYLON ROPE SLINGS~~

~~Rope Diameter Nominal in Inches~~	~~Nominal Weight per 100 Feet in Pounds~~	~~Capacity is in Pounds~~											
		~~Eye and Eye Sling~~						~~Endless Sling~~					
		 ~~Vertical Hitch~~	 ~~Choker Hitch~~	~~Basket Hitch; Angle of Rope to Horizontal~~				 ~~Vertical Hitch~~	 ~~Choker Hitch~~	~~Basket Hitch; Angle of Rope to Horizontal~~			
				~~90°(0°)~~	~~60°(30°)~~	~~45°(45°)~~	~~30°(60°)~~			~~90°(0°)~~	~~60°(30°)~~	~~45°(45°)~~	~~30°(60°)~~
~~1/2~~	~~6.5~~	~~635~~	~~320~~	~~1,270~~	~~1,100~~	~~900~~	~~635~~	~~1,140~~	~~570~~	~~2,290~~	~~1,980~~	~~1,620~~	~~1,140~~
~~9/16~~	~~8.3~~	~~790~~	~~395~~	~~1,580~~	~~1,370~~	~~1,120~~	~~790~~	~~1,420~~	~~710~~	~~2,840~~	~~2,460~~	~~2,010~~	~~1,420~~
~~5/8~~	~~10.5~~	~~1,030~~	~~515~~	~~2,060~~	~~1,780~~	~~1,460~~	~~1,030~~	~~1,850~~	~~925~~	~~3,710~~	~~3,210~~	~~2,620~~	~~1,850~~
~~3/4~~	~~14.5~~	~~1,410~~	~~705~~	~~2,820~~	~~2,440~~	~~1,990~~	~~1,410~~	~~2,540~~	~~1,270~~	~~5,080~~	~~4,400~~	~~3,590~~	~~2,540~~
~~13/16~~	~~17.0~~	~~1,680~~	~~840~~	~~3,360~~	~~2,910~~	~~2,380~~	~~1,680~~	~~3,020~~	~~1,510~~	~~6,050~~	~~5,240~~	~~4,280~~	~~3,020~~
~~7/8~~	~~20.0~~	~~1,980~~	~~990~~	~~3,960~~	~~3,430~~	~~2,800~~	~~1,980~~	~~3,560~~	~~1,780~~	~~7,130~~	~~6,170~~	~~5,040~~	~~3,560~~
~~1~~	~~26.0~~	~~2,480~~	~~1,240~~	~~4,960~~	~~4,300~~	~~3,510~~	~~2,480~~	~~4,460~~	~~2,230~~	~~8,930~~	~~7,730~~	~~6,310~~	~~4,460~~
~~1 1/16~~	~~29.0~~	~~2,850~~	~~1,430~~	~~5,700~~	~~4,940~~	~~4,030~~	~~2,850~~	~~5,130~~	~~2,570~~	~~10,300~~	~~8,890~~	~~7,260~~	~~5,130~~
~~1 1/8~~	~~34.0~~	~~3,270~~	~~1,640~~	~~6,540~~	~~5,660~~	~~4,620~~	~~3,270~~	~~5,890~~	~~2,940~~	~~11,800~~	~~10,200~~	~~8,330~~	~~5,890~~
~~1 1/4~~	~~40.0~~	~~3,710~~	~~1,860~~	~~7,420~~	~~6,430~~	~~5,250~~	~~3,710~~	~~6,680~~	~~3,340~~	~~13,400~~	~~11,600~~	~~9,450~~	~~6,680~~
~~1 5/16~~	~~45.0~~	~~4,260~~	~~2,130~~	~~8,520~~	~~7,380~~	~~6,020~~	~~4,260~~	~~7,670~~	~~3,830~~	~~15,300~~	~~13,300~~	~~10,800~~	~~6,770~~
~~1 1/2~~	~~55.0~~	~~5,250~~	~~2,630~~	~~10,500~~	~~9,090~~	~~7,420~~	~~5,250~~	~~9,450~~	~~4,730~~	~~18,900~~	~~16,400~~	~~13,400~~	~~9,450~~
~~1 5/8~~	~~68.0~~	~~6,440~~	~~3,220~~	~~12,900~~	~~11,200~~	~~9,110~~	~~6,440~~	~~11,600~~	~~5,800~~	~~23,200~~	~~20,100~~	~~16,400~~	~~11,600~~
~~1 3/4~~	~~83.0~~	~~7,720~~	~~3,860~~	~~15,400~~	~~13,400~~	~~10,900~~	~~7,720~~	~~13,900~~	~~6,950~~	~~27,800~~	~~24,100~~	~~19,700~~	~~13,900~~
~~2~~	~~95.0~~	~~9,110~~	~~4,560~~	~~18,200~~	~~15,800~~	~~12,900~~	~~9,110~~	~~16,400~~	~~8,200~~	~~32,800~~	~~28,400~~	~~23,200~~	~~16,400~~
~~2 1/8~~	~~109.0~~	~~10,500~~	~~5,250~~	~~21,000~~	~~18,200~~	~~14,800~~	~~10,500~~	~~18,900~~	~~9,450~~	~~37,800~~	~~32,700~~	~~26,700~~	~~18,900~~
~~2 1/4~~	~~129.0~~	~~12,400~~	~~6,200~~	~~24,800~~	~~21,500~~	~~17,500~~	~~12,400~~	~~22,300~~	~~11,200~~	~~44,600~~	~~38,700~~	~~31,600~~	~~22,300~~
~~2 1/2~~	~~149.0~~	~~13,900~~	~~6,950~~	~~27,800~~	~~24,100~~	~~19,700~~	~~13,900~~	~~25,000~~	~~12,500~~	~~50,000~~	~~43,300~~	~~35,400~~	~~25,000~~
~~2 5/8~~	~~168.0~~	~~16,000~~	~~8,000~~	~~32,000~~	~~27,700~~	~~22,600~~	~~16,000~~	~~28,800~~	~~14,400~~	~~57,600~~	~~49,900~~	~~40,700~~	~~28,800~~

~~See figures 4 and 5 for sling configuration descriptions.~~

~~TABLE 18~~
~~POLYESTER ROPE SLINGS~~

~~Rope Diameter Nominal in Inches~~	~~Nominal Weight per 100 Feet in Pounds~~	~~Capacity is in Pounds~~											
		~~Eye and Eye Sling~~						~~Endless Sling~~					
		~~Vertical Hitch~~	~~Choker Hitch~~	~~Basket Hitch; Angle of Rope to Horizontal~~				~~Vertical Hitch~~	~~Choker Hitch~~	~~Basket Hitch; Angle of Rope to Horizontal~~			
				~~90°(0°)~~	~~60°(30°)~~	~~45°(45°)~~	~~30°(60°)~~			~~90°(0°)~~	~~60°(30°)~~	~~45°(45°)~~	~~30°(60°)~~
~~1/2~~	~~8.0~~	~~635~~	~~320~~	~~1,270~~	~~1,100~~	~~900~~	~~635~~	~~1,140~~	~~570~~	~~2,290~~	~~1,980~~	~~1,620~~	~~1,140~~
~~9/16~~	~~10.2~~	~~790~~	~~395~~	~~1,580~~	~~1,370~~	~~1,120~~	~~790~~	~~1,420~~	~~710~~	~~2,840~~	~~2,460~~	~~2,010~~	~~1,420~~
~~5/8~~	~~13.0~~	~~990~~	~~495~~	~~1,980~~	~~1,710~~	~~1,400~~	~~990~~	~~1,780~~	~~890~~	~~3,570~~	~~3,090~~	~~2,520~~	~~1,780~~
~~3/4~~	~~17.5~~	~~1,240~~	~~620~~	~~2,480~~	~~2,150~~	~~1,750~~	~~1,240~~	~~2,230~~	~~1,120~~	~~4,470~~	~~3,870~~	~~3,160~~	~~2,230~~
~~13/16~~	~~21.0~~	~~1,540~~	~~770~~	~~3,080~~	~~2,670~~	~~2,180~~	~~1,540~~	~~2,770~~	~~1,390~~	~~5,540~~	~~4,800~~	~~3,920~~	~~2,770~~
~~7/8~~	~~25.0~~	~~1,780~~	~~890~~	~~3,560~~	~~3,080~~	~~2,520~~	~~1,780~~	~~3,200~~	~~1,600~~	~~6,410~~	~~5,550~~	~~4,530~~	~~3,200~~
~~1~~	~~30.5~~	~~2,180~~	~~1,090~~	~~4,360~~	~~3,780~~	~~3,080~~	~~2,180~~	~~3,920~~	~~1,960~~	~~7,850~~	~~6,800~~	~~5,550~~	~~3,920~~
~~1 1/16~~	~~34.5~~	~~2,530~~	~~1,270~~	~~5,060~~	~~4,380~~	~~3,580~~	~~2,530~~	~~4,550~~	~~2,280~~	~~9,110~~	~~7,990~~	~~6,440~~	~~4,550~~
~~1 1/8~~	~~40.0~~	~~2,920~~	~~1,460~~	~~5,840~~	~~5,060~~	~~4,130~~	~~2,920~~	~~5,260~~	~~2,630~~	~~10,500~~	~~9,100~~	~~7,440~~	~~5,260~~
~~1 1/4~~	~~46.3~~	~~3,290~~	~~1,650~~	~~6,580~~	~~5,700~~	~~4,650~~	~~3,290~~	~~5,920~~	~~2,960~~	~~11,800~~	~~10,300~~	~~8,380~~	~~5,920~~
~~1 5/16~~	~~52.5~~	~~3,710~~	~~1,860~~	~~7,420~~	~~6,430~~	~~5,250~~	~~3,710~~	~~6,680~~	~~3,340~~	~~13,400~~	~~11,600~~	~~9,450~~	~~6,680~~
~~1 1/2~~	~~66.8~~	~~4,630~~	~~2,320~~	~~9,260~~	~~8,020~~	~~6,550~~	~~4,630~~	~~8,330~~	~~4,170~~	~~16,700~~	~~14,400~~	~~11,800~~	~~8,330~~
~~1 5/8~~	~~82.0~~	~~5,640~~	~~2,820~~	~~11,300~~	~~9,770~~	~~7,980~~	~~5,640~~	~~10,200~~	~~5,080~~	~~20,300~~	~~17,600~~	~~14,400~~	~~10,200~~
~~1 3/4~~	~~98.0~~	~~6,710~~	~~3,360~~	~~13,400~~	~~11,600~~	~~9,490~~	~~6,710~~	~~12,100~~	~~6,040~~	~~24,200~~	~~20,900~~	~~17,100~~	~~12,100~~
~~2~~	~~118.0~~	~~7,920~~	~~3,960~~	~~15,800~~	~~13,700~~	~~11,200~~	~~7,920~~	~~14,300~~	~~7,130~~	~~28,500~~	~~24,700~~	~~20,200~~	~~14,300~~
~~2 1/8~~	~~135.0~~	~~9,110~~	~~4,460~~	~~18,200~~	~~15,800~~	~~12,900~~	~~9,110~~	~~16,400~~	~~8,200~~	~~32,800~~	~~28,400~~	~~23,200~~	~~16,400~~
~~2 1/4~~	~~157.0~~	~~10,600~~	~~5,300~~	~~21,200~~	~~18,400~~	~~15,000~~	~~10,600~~	~~19,100~~	~~9,540~~	~~38,200~~	~~33,100~~	~~27,000~~	~~19,100~~
~~2 1/2~~	~~181.0~~	~~12,100~~	~~6,050~~	~~24,200~~	~~21,000~~	~~17,100~~	~~12,100~~	~~21,800~~	~~10,900~~	~~43,600~~	~~37,700~~	~~30,800~~	~~21,800~~
~~2 5/8~~	~~205.0~~	~~13,600~~	~~6,800~~	~~27,200~~	~~23,600~~	~~19,200~~	~~13,600~~	~~24,500~~	~~12,200~~	~~49,000~~	~~42,400~~	~~34,600~~	~~24,500~~

~~See figures 4 and 5 for sling configuration descriptions.~~

TABLE 19
POLYPROPYLENE ROPE SLINGS

Rope Diameter Nominal in Inches	Nominal Weight per 100 Feet in Pounds	Capacity is in Pounds											
		Eye and Eye Sling						Endless Sling					
		 Vertical Hitch	 Choker Hitch	Basket Hitch; Angle of Rope to Horizontal				 Vertical Hitch	 Choker Hitch	Basket Hitch; Angle of Rope to Horizontal			
				90°(0°)	60°(30°)	45°(45°)	30°(60°)			90°(0°)	60°(30°)	45°(45°)	30°(60°)
1/2	4.7	645	325	1,290	1,120	910	645	1,160	580	2,320	2,010	1,640	1,160
9/16	6.1	780	390	1,560	1,350	1,100	780	1,400	700	2,810	2,430	1,990	1,400
5/8	7.5	950	475	1,900	1,650	1,340	950	1,710	855	3,420	2,960	2,420	1,710
3/4	10.7	1,300	650	2,600	2,250	1,840	1,300	2,340	1,170	4,680	4,050	3,310	2,340
13/16	12.7	1,520	760	3,040	2,630	2,150	1,520	2,740	1,370	5,470	4,740	3,870	2,740
7/8	15.0	1,760	880	3,520	3,050	2,490	1,760	3,170	1,580	6,340	5,490	4,480	3,170
1	18.0	2,140	1,070	4,280	3,700	3,030	2,140	3,850	1,930	7,700	6,670	5,450	3,860
1-1/16	20.4	2,450	1,230	4,900	4,240	3,460	2,450	4,410	2,210	8,820	7,640	6,240	4,410
1-1/8	23.7	2,800	1,400	5,600	4,850	3,960	2,800	5,040	2,520	10,100	8,730	7,130	5,040
1-1/4	27.0	3,210	1,610	6,420	5,560	4,540	3,210	5,780	2,890	11,600	10,000	8,170	5,780
1-5/16	30.5	3,600	1,800	7,200	6,240	5,090	3,600	6,480	3,240	13,000	11,200	9,170	6,480
1-1/2	38.5	4,540	2,270	9,080	7,860	6,420	4,540	8,170	4,090	16,300	14,200	11,600	8,170
1-5/8	47.5	5,510	2,760	11,000	9,540	7,790	5,510	9,920	4,960	19,800	17,200	14,000	9,920
1-3/4	57.0	6,580	3,290	13,200	11,400	9,300	6,580	11,800	5,920	23,700	20,500	16,800	11,800
2	69.0	7,960	3,980	15,900	13,800	11,300	7,960	14,300	7,160	28,700	24,800	20,300	14,300
2-1/8	80.0	9,330	4,670	18,700	16,200	13,200	9,330	16,800	8,400	33,600	29,100	23,800	16,800
2-1/4	92.0	10,600	5,300	21,200	18,400	15,000	10,600	19,100	9,540	38,200	33,100	27,000	19,100
2-1/2	107.0	12,200	6,100	24,400	21,100	17,300	12,200	22,000	11,000	43,900	38,000	31,100	22,000
2-5/8	120.0	13,800	6,900	27,600	23,900	19,600	13,800	24,800	12,400	49,700	43,000	35,100	24,800

See figures 4 and 5 for sling configuration descriptions.

TABLE 20

Rated Capacity in Pounds, Synthetic Web Slings, 1,000 lbs. Per Inch of Width, Single Ply

Sling Body Width, Inches	Triangle – Choker Slings, Type I Triangle – Triangle Slings, Type II Eye & Eye with Flat Eye Slings, Type III Eye & Eye with Twisted Eye Slings, Type IV						Endless Slings, Type V						Return Eye Slings, Type VI					
	Vert.	Choker	Vert. Basket	30 Basket	45 Basket	60 Basket	Vert.	Choker	Vert. Basket	30 Basket	45 Basket	60 Basket	Vert.	Choker	Vert. Basket	30 Basket	45 Basket	60 Basket
1	1,000	750	2,000	1,700	1,400	1,000	1,600	1,300	3,200	2,800	2,300	1,600	800	650	1,600	1,400	1,150	800
2	2,000	1,500	4,000	3,500	2,800	2,000	3,200	2,600	6,400	5,500	4,500	3,200	1,600	1,300	3,200	2,800	2,300	1,600
3	3,000	2,200	6,000	5,200	4,200	3,000	4,800	3,800	9,600	8,300	6,800	4,800	2,400	1,950	4,800	4,150	3,400	2,400
4	4,000	3,000	8,000	6,900	5,700	4,000	6,400	5,100	12,800	11,100	9,000	6,400	3,200	2,600	6,400	5,500	4,500	3,200
5	5,000	3,700	10,000	8,700	7,100	5,000	8,000	6,400	16,000	13,900	11,300	8,000	4,000	3,250	8,000	6,900	5,650	4,000
6	6,000	4,500	12,000	10,400	8,500	6,000	9,600	7,700	19,200	16,600	13,600	9,600	4,800	3,800	9,600	8,300	6,800	4,800

Notes: 1. All angles shown are measured from the vertical.

2. Capacities for intermediate widths not shown may be obtained by interpolation.

TABLE 21

Rated Capacity in Pounds, Synthetic Web Slings, 1,200 Lbs. Per Inch of Width, Single Ply

Sling Body Width, Inches	Triangle – Choker Slings, Type I Triangle – Triangle Slings, Type II Eye & Eye with Flat Eye Slings, Type III Eye & Eye with Twisted Eye Slings, Type IV						Endless Slings, Type V						Return Eye Slings, Type VI					
	Vert.	Choker	Vert. Basket	30 Basket	45 Basket	60 Basket	Vert.	Choker	Vert. Basket	30 Basket	45 Basket	60 Basket	Vert.	Choker	Vert. Basket	30 Basket	45 Basket	60 Basket
1	1,200	900	2,400	2,100	1,700	1,200	1,900	1,500	3,800	3,300	2,700	1,900	950	750	1,900	1,650	1,350	950
2	2,400	1,800	4,800	4,200	3,400	2,400	3,800	3,000	7,600	6,600	5,400	3,800	1,900	1,500	3,800	3,300	2,700	1,900
3	3,600	2,700	7,200	6,200	5,100	3,600	5,800	4,600	11,600	10,000	8,200	5,800	2,850	2,250	5,700	4,950	4,050	2,850
4	4,800	3,600	9,600	8,300	6,800	4,800	7,700	6,200	15,400	13,300	10,900	7,700	3,800	3,000	7,600	6,600	5,400	3,800
5	6,000	4,500	12,000	10,400	8,500	6,000	9,600	7,700	19,200	16,600	13,600	9,600	4,750	3,750	9,500	8,250	6,750	4,750
6	7,200	5,400	14,400	12,500	10,200	7,200	11,500	9,200	23,000	19,900	16,300	11,500	5,800	4,600	11,600	10,000	8,200	5,800

Notes: 1. All angles shown are measured from the vertical.

2. Capacities for intermediate widths not shown may be obtained by interpolation.

TABLE 22

Rated Capacity in Pounds, Synthetic Web Slings, 1,600 Lbs. Per Inch of Width, Single Ply

Sling Body Width, Inches	Triangle – Choker Slings, Type I Triangle – Triangle Slings, Type II Eye & Eye with Flat Eye Slings, Type III Eye & Eye with Twisted Eye Slings, Type IV						Endless Slings, Type V						Return Eye Slings, Type VI					
	Vert.	Choker	Vert. Basket	30 Basket	45 Basket	60 Basket	Vert.	Choker	Vert. Basket	30 Basket	45 Basket	60 Basket	Vert.	Choker	Vert. Basket	30 Basket	45 Basket	60 Basket
1	1,600	1,200	3,200	2,800	2,300	1,600	2,600	2,100	5,200	4,500	3,700	2,600	1,050	1,050	2,600	2,250	1,850	1,300
2	3,200	2,400	6,400	5,500	4,500	3,200	9,100	4,100	10,200	8,800	7,200	5,100	2,600	2,100	5,200	4,500	3,700	2,600
3	4,800	3,600	9,600	8,300	6,800	4,800	7,700	6,200	15,400	13,300	10,900	7,700	3,900	3,150	7,800	6,750	5,500	3,900
4	6,400	4,800	12,800	11,100	9,000	6,400	10,200	8,200	20,400	17,700	14,400	10,200	5,100	4,100	10,200	8,800	7,200	5,100
5	8,000	6,000	16,000	13,800	11,300	8,000	12,800	10,200	25,600	22,200	18,100	12,800	6,400	5,150	12,800	11,050	9,050	6,400
6	9,600	7,200	19,200	16,600	13,600	9,600	15,400	12,300	30,800	26,700	21,800	15,400	7,700	6,200	15,400	13,300	10,900	7,700

Notes: 1. All angles shown are measured from the vertical.

2. Capacities for intermediate widths not shown may be obtained by interpolation.

R 408.14952 ~~Natural and synthetic fiber rope slings; splicing.~~ **Splicing.**

Rule 4952. A spliced fiber rope sling shall not be used unless it has been spliced in accordance with the following minimum requirements and in accordance with any additional recommendations of the manufacturer:

(a) In manila rope, an eye splice shall consist of at least 3 full tucks, and short splices shall consist of at least 6 full tucks, 3 on each side of the splice center line.

(b) In synthetic fiber rope, an eye splice shall consist of at least 4 full tucks, and short splices shall consist of at least 8 full tucks, 4 on each side of the center line.

(c) A strand end tail shall not be trimmed flush with the surface of the rope immediately adjacent to the full tucks. This applies to all types of fiber rope and both eye and short splices. For fiber rope under 1 inch in diameter, the tail shall project at least 6 rope diameters beyond the last full tuck. For fiber rope 1 inch in diameter and larger, the tail shall project at least 6 inches beyond the last full tuck. Where a projecting tail interferes with the use of the sling, the tail shall be tapered and spliced into the body of the rope, using at least 2 additional tucks, which will require a tail length of approximately 6 rope diameters beyond the last full tuck.

(d) A fiber rope sling shall have a minimum clear length of rope between eye splices equal to 10 times the rope diameter.

(e) A knot shall not be used in lieu of a splice.

(f) A clamp not designed specifically for fiber ropes shall not be used for splicing.

(g) For any eye splice, the eye shall be of a size to provide an included angle of not greater than 60 degrees at the splice when the eye is placed over the load or support.

R 408.14953 ~~Natural and synthetic fiber rope slings; end~~ **End** attachments.

Rule 4953. A fiber rope sling shall not be used if an end attachment in contact with the rope has a sharp edge or projection.

R 408.14954 ~~Natural and synthetic fiber rope slings; removal~~ **Removal** from service; prohibition.

Rule 4954. (1) A natural and synthetic fiber rope sling shall be immediately removed from service if any of the following conditions are present:

(a) Abnormal wear.

(b) Powdered fiber between strands.

(c) Broken or cut fibers.

(d) Variations in the size or roundness of strands.

(e) Discoloration or rotting.

(f) Distortion of hardware in the sling.

(2) Only a fiber rope sling made from new rope shall be used. Use of a repaired or reconditioned fiber rope sling is **shall not be used.** ~~prohibited.~~

SYNTHETIC WEB SLINGS

R 408.14961 ~~Synthetic web slings; marking~~ **Marking** or coding rated capacities.

Rule 4961. Each sling shall be marked or coded to show the rated capacities for each type of hitch and type of synthetic web material.

R 408.14962 ~~Synthetic web slings; webbing~~ **Webbing** size and edges.

Rule 4962. Synthetic webbing shall be of uniform thickness and width, and selvage edges shall not be split from the webbing's width.

R 408.14963 ~~Synthetic web slings; fittings.~~ **Fittings.**

Rule 4963. (1) Fittings shall be **both of the following**:

(a) Of a minimum breaking strength equal to that of the sling.

(b) Free of all sharp edges that could in any way damage the webbing.

(2) Stitching shall be the only method used to attach end fittings to webbing and to form eyes. The thread shall be in an even pattern and contain a sufficient number of stitches to develop the full breaking strength of the sling.

R 408.14964 ~~Synthetic web slings; rated capacity; use;~~ **Use; safe operating temperatures.** ~~temperature limits.~~

Rule 4964. ~~(1) A synthetic web sling illustrated in Figure 6 shall not be used with loads in excess of the rated capacities specified in Tables 20 to 22. A sling not included in these tables shall be used only in accordance with the manufacturer's recommendations.~~

(1)~~(2)~~ When a synthetic web sling is used, the following precautions shall be taken:

(a) A nylon web sling shall not be used where fumes, vapors, sprays, mists, or liquids of acids or phenolics are present.

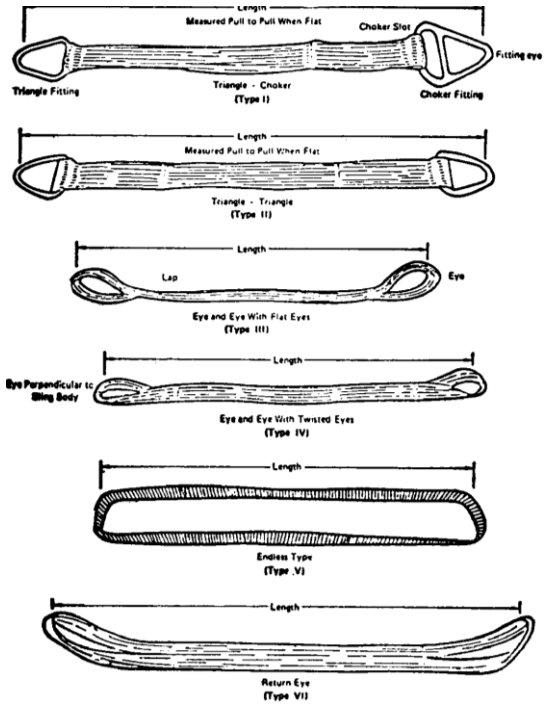
(b) A polyester and polypropylene web sling shall not be used where fumes, vapors, sprays, mists, or liquids of caustics are present.

(c) A web sling with aluminum fittings shall not be used where fumes, vapors, sprays, mists, or liquids of caustics are present.

(2)~~(3)~~ A synthetic web sling of polyester and nylon shall not be used at a temperature in excess of 180 degrees Fahrenheit. ~~A polypropylene web sling shall not be used at a temperature in excess of 200 degrees Fahrenheit.~~

(3) A polypropylene web sling shall not be used at a temperature in excess of 200 degrees Fahrenheit. (See figure 6 "Basic Synthetic Web Sling Constructions.")

FIGURE 6
BASIC SYNTHETIC WEB SLING CONSTRUCTIONS



R 408.14965 ~~Synthetic web slings; removal~~ **Removal** from service; repairs; certificate of proof test; prohibition.

Rule 4965. (1) A synthetic web sling shall be immediately removed from service if any of the following conditions are present:

(a) Acid or caustic burns.

(b) Melting or charring of any part of the sling surface.

(c) Snags, punctures, tears, or cuts.

(d) Broken or worn stitches.

(e) Distortion of fittings.

(2) A synthetic web sling shall be repaired only by a sling manufacturer.

(3) Each repaired sling shall be proof tested by the manufacturer to twice the rated capacity prior to its return to service. The employer shall retain a certificate of the proof test and make it available for examination.

(4) A sling, including webbing and fittings, which has been repaired in a temporary manner shall not be used.