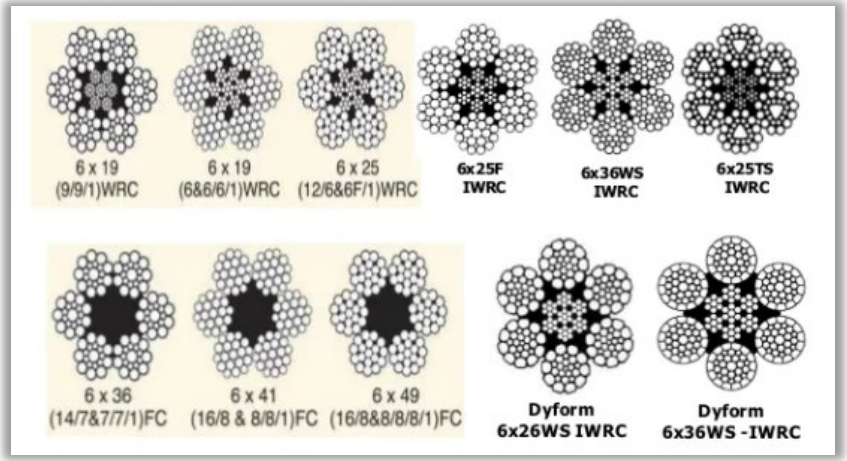
Wire Rope Terminations

Wire Rope Terminations

- Breaking Strength of Wire Rope
- Efficiency of Wire Rope Terminations
- Different types of Wire Rope End Terminations
  - Clips
  - Wedge Sockets
  - Swage Sockets
  - Spelter Socket
  - Button Spelter Socket
- Proper installation of clips
- Proper installation of wedge sockets
- Introduction to Swage Training
- Introduction to Socketing Training



What is Wire Rope

Wire rope is a type of flexible, high-strength rope constructed from multiple strands of wire twisted together around a central core. It is widely used in lifting, rigging, hauling, and structural applications across industries such as construction, mining, marine, and oil and gas.

Key Components of Wire Rope:

- **Strands**: Made up of individual wires twisted together to form a stronger unit. The number and arrangement of strands determine the rope's flexibility and strength.
- **Wires**: The individual steel or alloy wires that make up the strands. They can be galvanized, stainless, or coated for specific purposes.
- **Core**: Provides support to the strands and maintains the rope's shape. Common core types include:
  - **Fiber Core (FC)**: Made of natural or synthetic fibers, offering flexibility and cushioning.
  - **Wire Strand Core (WSC)**: A single strand of wire, providing more strength than fiber cores.
  - **Independent Wire Rope Core (IWRC)**: A small wire rope within the main rope for maximum strength and resistance to crushing.

Characteristics of Wire Rope:

- **Strength**: Designed to handle heavy loads and high tension.
- **Flexibility**: Varies depending on the strand pattern and core type.
- **Durability**: Resistant to wear, abrasion, and corrosion when properly maintained.

Common Applications:

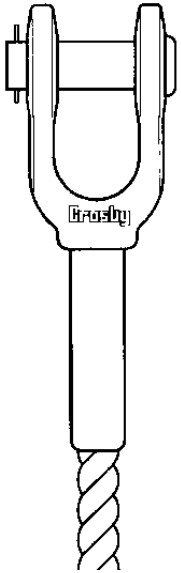
- **Lifting and Hoisting**: In cranes, elevators, and winches.
- **Rigging**: For securing and moving loads.
- **Structural**: As support cables in bridges and buildings.
- **Tensioning Systems**: In guy wires and cable-stayed structures.

Proper selection, inspection, and maintenance are crucial to ensuring the safe and efficient use of wire rope.

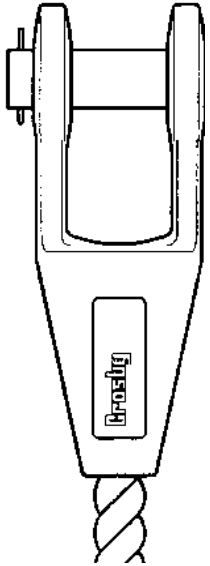
Definition of Efficiency

- The ratio of the catalog breaking strength of the wire rope and the breaking strength as measured with the end termination fitted. (expressed in %)
- To achieve efficiency, proper procedures must be followed.
- Improper procedures will result in lower efficiencies.

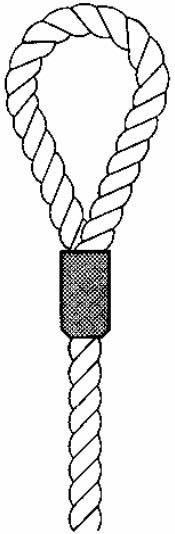
Common Termination Types



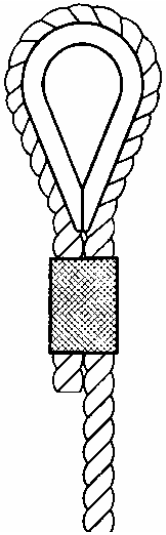
Swage Sockets



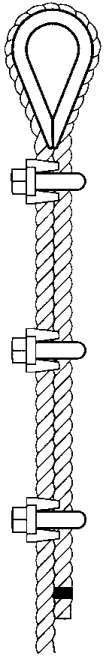
Spelter Sockets



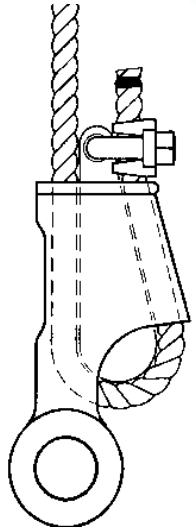
Flemish Eye



Turnback Eye

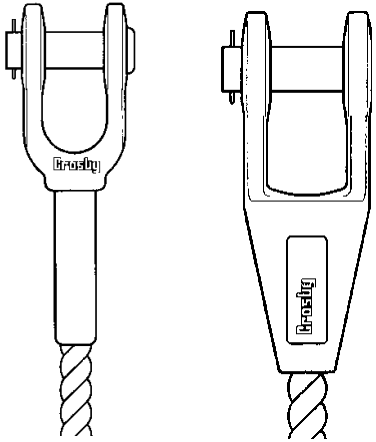


Wire Rope Clips

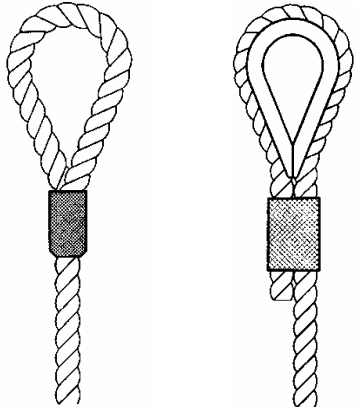


Wedge Sockets

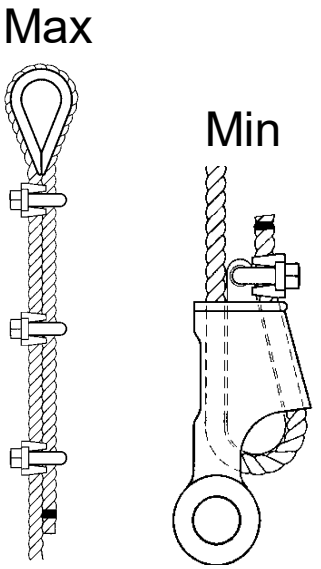
Termination Efficiency



100% can be achieved by Swage and Spelter Sockets



90% or better is achieved by Flemish and turnback eyes

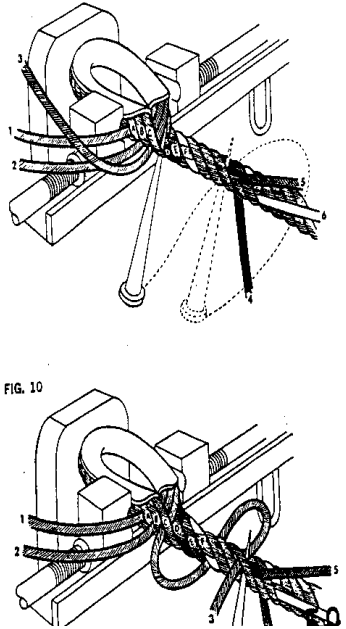


80% is achieved by wire rope clips and wedge sockets

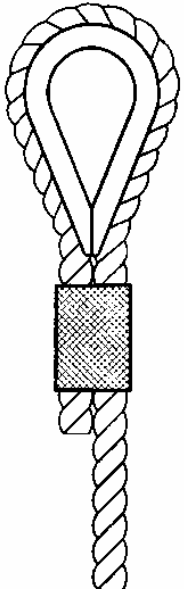
These efficiencies are achieved only if properly terminated.

Fabricated Slings Termination Efficiency

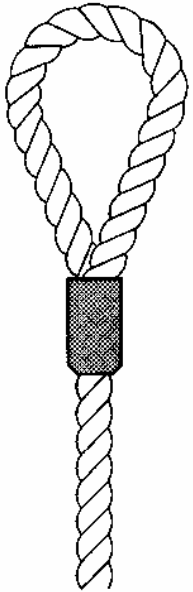
Hand splice
80%



Turnback
94%



Flemish eye
90%-96%



Wire Rope Terminations Manual

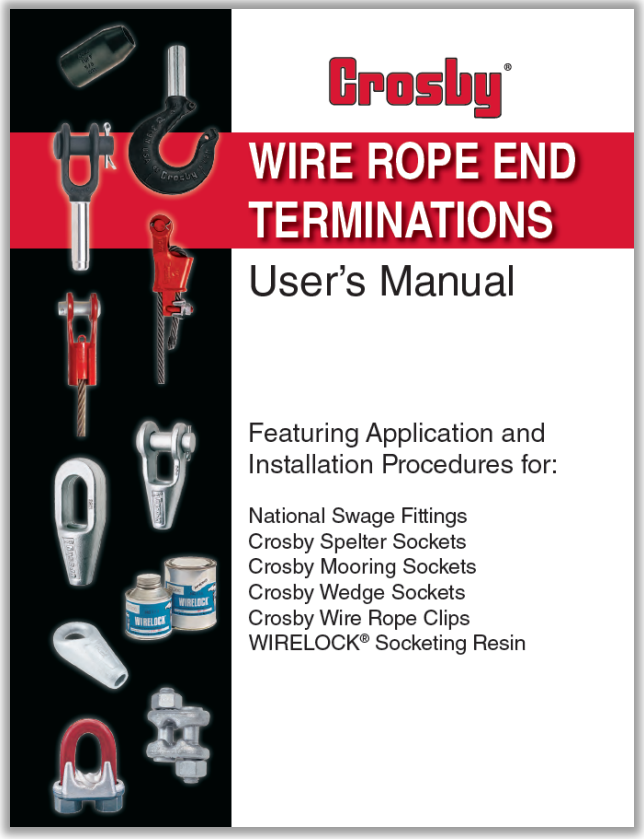


Table of Contents

Wire Rope End Termination User's Manual

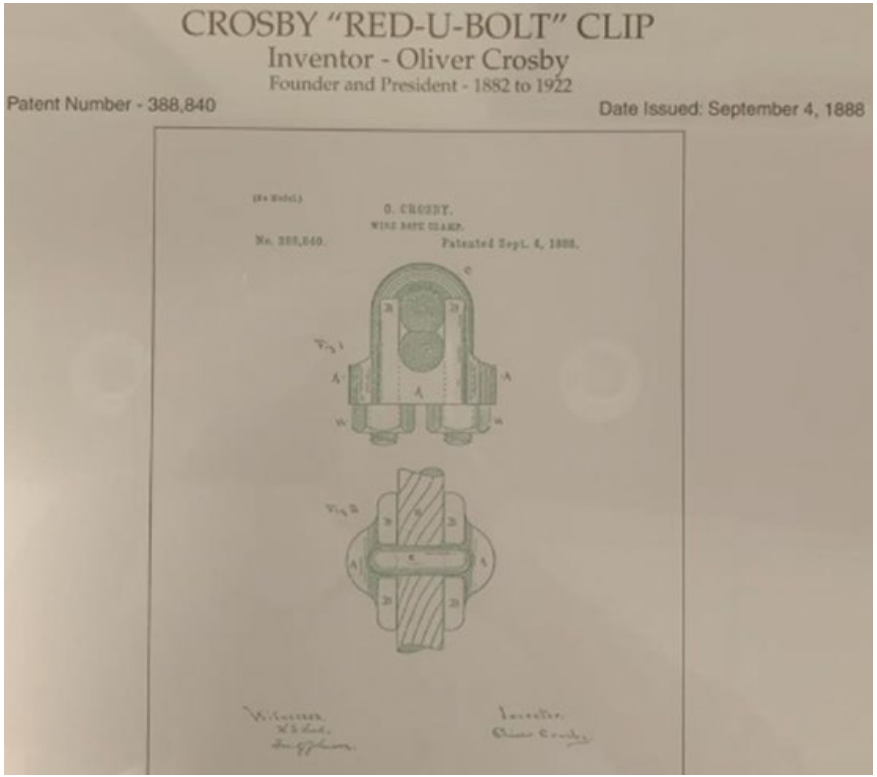
TRIVIA – What is the name of the person that invented the Wire Rope Clip?

Oliver Crosby

TRIVIA – What year was the Genuine Crosby wire rope clip invented

1888

Oliver Crosby and the Wire Rope Clip



TRIVIA – Who can guess?

RODDLES

What are the grooves called in a wire rope clip?

Crosby perfected the wire rope clip over many years of design changes, improvements and testing!!!

G450 & G429 Wire Rope Clips

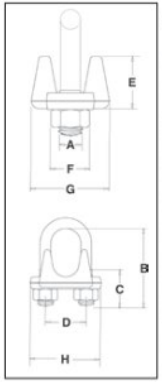
Crosby Academy

Crosby

G-450
Red U-Bolt® clip

- Each base has a Product Identification Code (PIC) for material traceability, the name Crosby or "CG," and a size forged into it.
- Based on the catalog breaking strength of wire rope, Crosby wire rope clips have an efficiency rating of 80% for 1/8" through 7/8" sizes, and 90% for sizes 1" through 3-1/2".
- Entire clip is galvanized to resist corrosive and rusting action.
- Sizes 1/8" through 2-1/2" and 3" have forged bases.
- All clips are individually bagged or tagged with proper application instructions and warning information.
- Clip sizes up through 1-1/2" have rolled threads.
- Meets or exceeds all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, these wire rope clips meet other critical performance requirements, including fatigue life, impact properties, and material traceability not addressed by ASME B30.26.
- Look for the Red U-Bolt®, your assurance of genuine Crosby Clips.

APPLICATION AND WARNING INFORMATION SECTION 17



G-450 Crosby Clips

Rope Size (in)	Rope Size (mm)	Stock No.	Std. Package Qty.	Weight Per 100 (lb)	Dimensions (in) A	B	C	D	E	F	G	H
1/8	3-4*	1010015	100	6	.22	.72	.44	.47	.37	.38	.81	.99
3/16*	5*	1010033	100	10	.25	.97	.56	.59	.50	.44	.94	1.18
1/4	6-7	1010051	100	19	.31	1.03	.50	.75	.66	.56	1.19	1.43
5/16	8	1010079	100	28	.38	1.38	.75	.88	.73	.69	1.31	1.66
3/8	9-10	1010097	100	48	.44	1.50	.75	1.00	.91	.75	1.63	1.94
7/16 - 1/2	11-13	1010131	50	80	.50	1.88	1.00	1.19	1.13	.88	1.91	2.28
9/16 - 5/8	14-16	1010177	50	110	.56	2.25	1.25	1.31	1.34	.94	2.06	2.50
3/4	18-20	1010195	25	142	.62	2.75	1.44	1.50	1.39	1.06	2.25	2.84
7/8	22	1010211	25	212	.75	3.12	1.62	1.75	1.58	1.25	2.44	3.16
1	24-26	1010239	10	252	.75	3.50	1.81	1.88	1.77	1.25	2.63	3.47
1-1/8	28-30	1010257	10	283	.75	3.88	2.00	2.00	1.91	1.25	2.81	3.59
1-1/4	32-34	1010275	10	438	.88	4.44	2.22	2.34	2.17	1.44	3.13	4.13
1-3/8	36	1010293	10	442	.88	4.44	2.22	2.34	2.31	1.44	3.13	4.19
1-1/2	38	1010319	10	544	.88	4.94	2.38	2.59	2.44	1.44	3.41	4.44
1-5/8	41-42	1010337	Bulk	704	1.00	5.31	2.62	2.75	2.66	1.63	3.63	4.75
1-3/4	44-46	1010355	Bulk	934	1.13	5.75	2.75	3.06	2.92	1.81	3.81	5.24
2	48-52	1010373	Bulk	1300	1.25	6.44	3.00	3.38	3.03	2.00	4.44	5.88
2-1/4	56-58	1010391	Bulk	1600	1.25	7.13	3.19	3.88	3.19	2.00	4.56	6.38
2-1/2	62-65	1010417	Bulk	1900	1.25	7.69	3.44	4.13	3.69	2.00	4.69	6.63
** 2-3/4	** 68-72	1010435	Bulk	2300	1.25	8.31	3.56	4.38	4.88	2.00	5.00	6.88
3	75-78	1010453	Bulk	3100	1.50	9.19	3.88	4.75	4.44	2.38	5.31	7.61
** 3-1/2	** 85-90	1010426	Bulk	4000	1.50	10.75	4.50	5.50	6.00	2.38	6.19	8.38

*Electro-plated U-Bolt and Nuts. ** 2-3/4" and 3-1/2" base is made of cast steel.

Made in both USA and Europe

Crosby

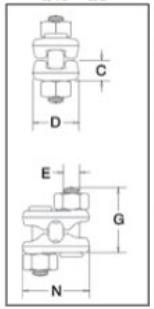
WIRE ROPE END FITTINGS

G-429
Fist Grip®,Clip
3/16" - 5/8"

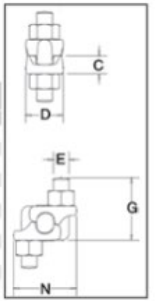
- Entire clip is galvanized to resist corrosive and rusting action.
- Based on the catalog breaking strength of wire rope, Crosby wire rope clips have an efficiency rating of 80% for 3/16" through 7/8" sizes, and 90% for sizes 1" through 1-1/2".
- Bolts are an integral part of the saddle. Nuts can be installed in such a way as to enable the operator to swing the wrench in a full arc for fast installation.
- All sizes have forged steel saddles.
- All Clips are individually bagged or tagged with proper application instructions and warning information.
- Meets or exceeds all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, these wire rope clips meet other critical performance requirements, including fatigue life, impact properties, and material traceability not addressed by ASME B30.26.
- Assembled with standard heavy hex nuts.

G-429
Fist Grip®,Clip
3/4" - 1-1/2"

3/16" - 5/8"



3/4" - 1-1/2"



G-429 Fist Grip® Clips

Rope Size (in)*	Rope Size (mm)	Stock No.	Std. Package Qty.	Weight Per 100 (lb)	Dimensions (in) C	D	E	G	N
3/16 - 1/4	5-7	1010471	100	23	.40	.94	.38	1.41	1.44
5/16	8	1010499	100	28	.47	1.06	.38	1.50	1.54
3/8	10	1010514	50	40	.51	1.06	.44	1.84	1.78
7/16 - 1/2	11-13	1010532	50	62	.59	1.25	.50	2.21	2.15
9/16 - 5/8	14-16	1010550	50	103	.72	1.50	.63	2.72	2.57
3/4	18-20	1010578	25	175	.86	1.81	.75	2.94	2.67
7/8	22	1010596	25	225	.97	2.12	.75	3.31	2.86
1	24-26	1010612	10	300	1.13	2.25	.75	3.72	3.06
1-1/8	28-30	1010630	10	400	1.28	2.38	.88	4.22	3.44
1-1/4	32-34	1010658	10	400	1.34	2.50	.88	4.25	3.56
1-3/8 - 1-1/2	36-40	1010676	Bulk	700	1.56	3.00	1.00	5.56	4.12

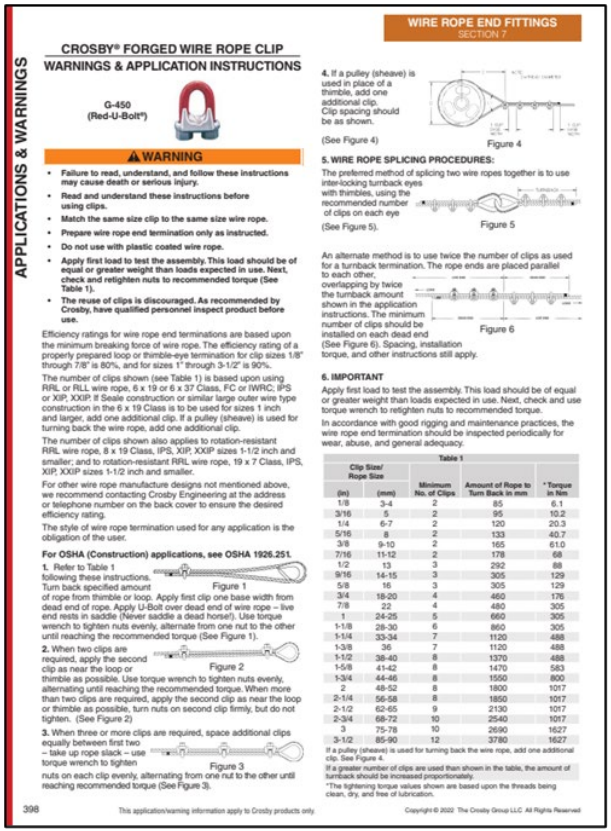
* Sizes through 5/8" incorporate new style design.

Crosby is a Global Manufacturer

This slide is an explanation of Crosby manufacturing processes being the same in Europe as the US.

If assistance is needed with end user please contact your district sales manager

Application of Wire Rope Clips



WIRE ROPE END FITTINGS
SECTION 7

APPLICATIONS & WARNINGS

CROSBY® FORGED WIRE ROPE CLIP
WARNINGS & APPLICATION INSTRUCTIONS

G-450
(Red-U-Bolt®)

⚠WARNING

- Failure to read, understand, and follow these instructions may cause death or serious injury.
- Read and understand these instructions before using clips.
- Match the same size clip to the same size wire rope.
- Prepare wire rope end termination only as instructed.
- Do not use with plastic coated wire rope.
- Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque (See Table 1).
- The reuse of clips is discouraged. As recommended by Crosby, have qualified personnel inspect product before use.

Efficiency ratings for wire rope end terminations are based upon the minimum breaking force of wire rope. The efficiency rating of a properly prepared loop or thimble-eye termination for clip sizes 1/8" through 7/8" is 80%, and for sizes 1" through 3-1/2" is 90%.

The number of clips shown (see Table 1) is based upon using RRL or RLL wire rope, 6 x 19 or 6 x 37 Class, FC or IWRC; IPS or XIP, XXIP. If Seale construction or similar large outer wire type construction in the 6 x 19 Class is to be used for sizes 1 inch and larger, add one additional clip. If a pulley (sheave) is used for turning back the wire rope, add one additional clip.

The number of clips shown also applies to rotation-resistant RRL wire rope, 8 x 19 Class, IPS, XIP, XXIP sizes 1-1/2 inch and smaller; and to rotation-resistant RRL wire rope, 19 x 7 Class, IPS, XIP, XXIP sizes 1-1/2 inch and smaller.

For other wire rope manufacture designs not mentioned above, we recommend contacting Crosby Engineering at the address or telephone number on the back cover to ensure the desired efficiency rating.

The style of wire rope termination used for any application is the obligation of the user.

For OSHA (Construction) applications, see OSHA 1926.251.

1. Refer to Table 1 following these instructions. Turn back specified amount of rope from thimble or loop. Apply first clip one base width from dead end of rope. Apply U-Bolt over dead end of wire rope – live end rests in saddle (Never saddle a dead horse!). Use torque wrench to tighten nuts evenly, alternate from one nut to the other until reaching the recommended torque (See Figure 1).

Figure 1

2. When two clips are required, apply the second clip as near the loop or thimble as possible. Use torque wrench to tighten nuts evenly, alternating until reaching the recommended torque. When more than two clips are required, apply the second clip as near the loop or thimble as possible, turn nuts on second clip firmly, but do not tighten. (See Figure 2)

Figure 2

3. When three or more clips are required, space additional clips equally between first two – take up rope slack – use torque wrench to tighten nuts on each clip evenly, alternating from one nut to the other until reaching recommended torque (See Figure 3).

Figure 3

4. If a pulley (sheave) is used in place of a thimble, add one additional clip. Clip spacing should be as shown.

(See Figure 4)

Figure 4

5. WIRE ROPE SPLICING PROCEDURES:

The preferred method of splicing two wire ropes together is to use inter-locking turnback eyes with thimbles, using the recommended number of clips on each eye (See Figure 5).

Figure 5

An alternate method is to use twice the number of clips as used for a turnback termination. The rope ends are placed parallel to each other, overlapping by twice the turnback amount shown in the application instructions. The minimum number of clips should be installed on each dead end (See Figure 6). Spacing, installation torque, and other instructions still apply.

Figure 6

6. IMPORTANT

Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and use torque wrench to retighten nuts to recommended torque.

In accordance with good rigging and maintenance practices, the wire rope end termination should be inspected periodically for wear, abuse, and general adequacy.

Table 1

Clip Size/ Rope Size (in)	(mm)	Minimum No. of Clips	Amount of Rope to Turn Back in mm	*Torque in Nm
1/8	3-4	2	85	6.1
3/16	5	2	95	10.2
1/4	6-7	2	120	20.3
5/16	8	2	133	40.7
3/8	9-10	2	165	61.0
7/16	11-12	2	178	68
1/2	13	3	292	88
9/16	14-15	3	305	129
5/8	16	3	305	129
3/4	18-20	4	460	176
7/8	22	4	480	305
1	24-25	5	660	305
1-1/8	28-30	6	860	305
1-1/4	33-34	7	1120	488
1-3/8	36	7	1120	488
1-1/2	38-40	8	1370	488
1-5/8	41-42	8	1470	583
1-3/4	44-46	8	1550	800
2	48-52	8	1800	1017
2-1/4	56-58	8	1850	1017
2-1/2	62-65	9	2130	1017
2-3/4	68-72	10	2540	1017
3	75-78	10	2690	1627
3-1/2	85-90	12	3780	1627

If a pulley (sheave) is used for turning back the wire rope, add one additional clip. See Figure 4.

If a greater number of clips are used than shown in the table, the amount of turnback should be increased proportionately.

*The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

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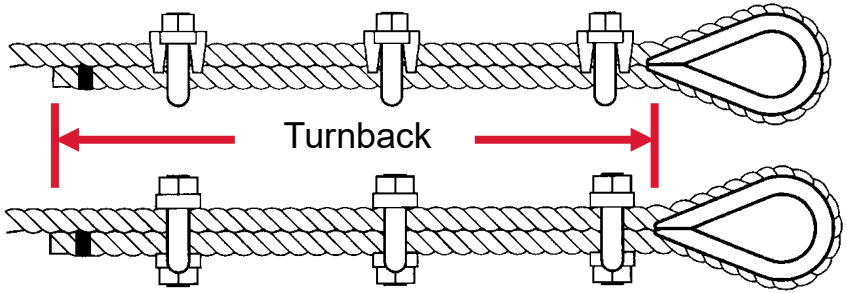
This application/warning information apply to Crosby products only.

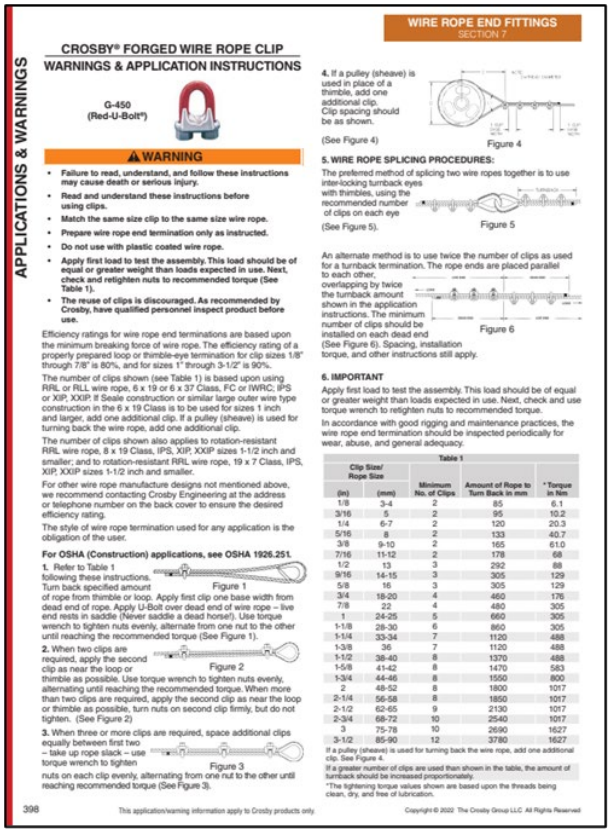
Every Clip is shipped with instructions

Basic Requirements for Proper Termination

- Proper size clips
- Proper Number of Clips
- Proper turnback
- Place clips on in proper sequence
- Proper Orientation
- Proper Torque
- Apply first load and retorque



Application of Wire Rope Clips



APPLICATIONS & WARNINGS

WIRE ROPE END FITTINGS
SECTION 7

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WARNINGS & APPLICATION INSTRUCTIONS

G-450
(Red-U-Bolt®)

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The style of wire rope termination used for any application is the obligation of the user.

For OSHA (Construction) applications, see OSHA 1926.251.

1. Refer to Table 1 following these instructions. Turn back specified amount of rope from thimble or loop. Apply first clip one base width from dead end of rope. Apply U-Bolt over dead end of wire rope – live end rests in saddle (Never saddle a dead horse!). Use torque wrench to tighten nuts evenly, alternate from one nut to the other until reaching the recommended torque (See Figure 1).

Figure 1

2. When two clips are required, apply the second clip as near the loop or thimble as possible. Use torque wrench to tighten nuts evenly, alternating until reaching the recommended torque. When more than two clips are required, apply the second clip as near the loop or thimble as possible, turn nuts on second clip firmly, but do not tighten. (See Figure 2)

Figure 2

3. When three or more clips are required, space additional clips equally between first two – take up rope slack – use torque wrench to tighten nuts on each clip evenly, alternating from one nut to the other until reaching recommended torque (See Figure 3).

Figure 3

4. If a pulley (sheave) is used in place of a thimble, add one additional clip. Clip spacing should be as shown.

(See Figure 4)

Figure 4

5. WIRE ROPE SPLICING PROCEDURES:

The preferred method of splicing two wire ropes together is to use inter-locking turnback eyes with thimbles, using the recommended number of clips on each eye (See Figure 5).

Figure 5

An alternate method is to use twice the number of clips as used for a turnback termination. The rope ends are placed parallel to each other, overlapping by twice the turnback amount shown in the application instructions. The minimum number of clips should be installed on each dead end (See Figure 6). Spacing, installation torque, and other instructions still apply.

Figure 6

6. IMPORTANT

Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and use torque wrench to retighten nuts to recommended torque.

In accordance with good rigging and maintenance practices, the wire rope end termination should be inspected periodically for wear, abuse, and general adequacy.

Table 1

Clip Size/ Rope Size (in)	(mm)	Minimum No. of Clips	Amount of Rope to Turn Back in mm	*Torque in Nm
1/8	3-4	2	85	6.1
3/16	5	2	95	10.2
1/4	6-7	2	120	20.3
5/16	8	2	133	40.7
3/8	9-10	2	165	61.0
7/16	11-12	2	178	68
1/2	13	3	292	88
9/16	14-15	3	305	129
5/8	16	3	305	129
3/4	18-20	4	460	176
7/8	22	4	480	305
1	24-25	5	660	305
1-1/8	28-30	6	860	305
1-1/4	33-34	7	1120	488
1-3/8	36	7	1120	488
1-1/2	38-40	8	1370	488
1-5/8	41-42	8	1470	583
1-3/4	44-46	8	1550	800
2	48-52	8	1800	1017
2-1/4	56-58	8	1850	1017
2-1/2	62-65	9	2130	1017
2-3/4	68-72	10	2540	1017
3	75-78	10	2690	1627
3-1/2	85-90	12	3780	1627

If a pulley (sheave) is used for turning back the wire rope, add one additional clip. See Figure 4.

If a greater number of clips are used than shown in the table, the amount of turnback should be increased proportionately.

*The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

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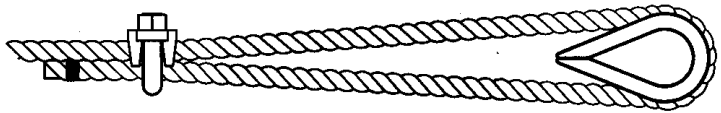
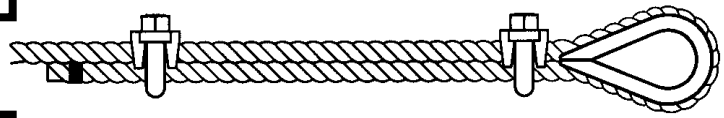
This application/warning information apply to Crosby products only.

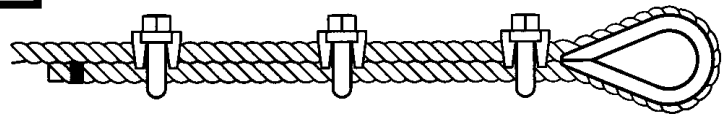
Every Clip is shipped with instructions



1 Apply first clip one base width from dead end.



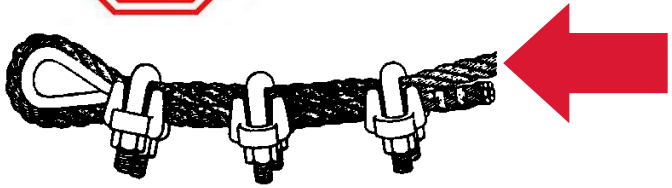
2 Apply second clip as near the thimble as possible.



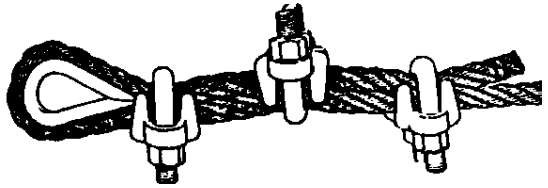
3 Apply all additional clips evenly between the first two.

Never “Saddle” a “Dead Horse”

Never place “u-bolt” over the live line



All three U-Bolts are on the live line.



U-Bolts are staggered, one U-Bolt is on the live line.

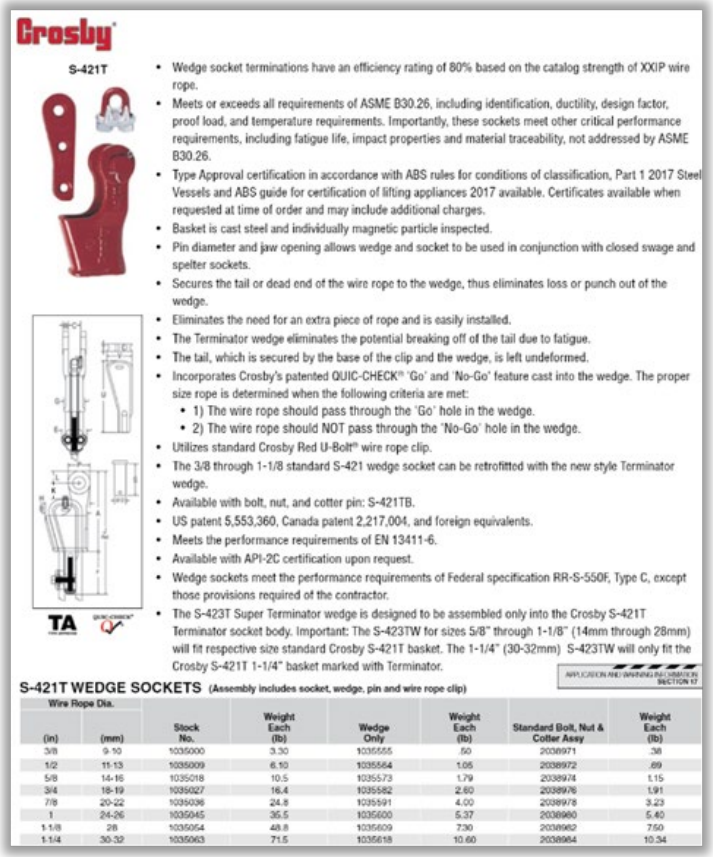
Incorrect splicing of two wire ropes, U-Bolts are on live line.

U-Bolt

Base “Saddle”

Crosby's in the Wild - Dollywood

Wedge Sockets



Crosby

S-421T

- Wedge socket terminations have an efficiency rating of 80% based on the catalog strength of XXIP wire rope.
- Meets or exceeds all requirements of ASME B30.26, including identification, ductility, design factor, proof load, and temperature requirements. Importantly, these sockets meet other critical performance requirements, including fatigue life, impact properties and material traceability, not addressed by ASME B30.26.
- Type Approval certification in accordance with ABS rules for conditions of classification, Part 1 2017 Steel Vessels and ABS guide for certification of lifting appliances 2017 available. Certificates available when requested at time of order and may include additional charges.
- Basket is cast steel and individually magnetic particle inspected.
- Pin diameter and jaw opening allows wedge and socket to be used in conjunction with closed swage and spelter sockets.
- Secures the tail or dead end of the wire rope to the wedge, thus eliminates loss or punch out of the wedge.
- Eliminates the need for an extra piece of rope and is easily installed.
- The Terminator wedge eliminates the potential breaking off of the tail due to fatigue.
- The tail, which is secured by the base of the clip and the wedge, is left undeformed.
- Incorporates Crosby's patented QUIC-CHECK® 'Go' and 'No-Go' feature cast into the wedge. The proper size rope is determined when the following criteria are met:
  - 1) The wire rope should pass through the 'Go' hole in the wedge.
  - 2) The wire rope should NOT pass through the 'No-Go' hole in the wedge.
- Utilizes standard Crosby Red U-Bolt® wire rope clip.
- The 3/8 through 1-1/8 standard S-421 wedge socket can be retrofitted with the new style Terminator wedge.
- Available with bolt, nut, and cotter pin: S-421TB.
- US patent 5,553,360, Canada patent 2,217,004, and foreign equivalents.
- Meets the performance requirements of EN 13411-6.
- Available with API-2C certification upon request.
- Wedge sockets meet the performance requirements of Federal specification RR-S-550F, Type C, except those provisions required of the contractor.
- The S-423T Super Terminator wedge is designed to be assembled only into the Crosby S-421T Terminator socket body. Important: The S-423TW for sizes 5/8" through 1-1/8" (14mm through 28mm) will fit respective size standard Crosby S-421T basket. The 1-1/4" (30-32mm) S-423TW will only fit the Crosby S-421T 1-1/4" basket marked with Terminator.

TA

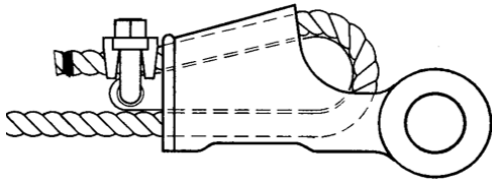
APPLICATION AND WARNING INFORMATION SECTION 17

S-421T WEDGE SOCKETS (Assembly includes socket, wedge, pin and wire rope clip)

Wire Rope Dia. (in)	Wire Rope Dia. (mm)	Stock No.	Weight Each (lb)	Wedge Only	Weight Each (lb)	Standard Bolt, Nut & Cotter Assy	Weight Each (lb)
3/8	9-10	1035000	3.30	1035555	.50	2038971	.38
1/2	11-13	1035009	6.10	1035564	1.06	2038972	.69
5/8	14-16	1035018	10.5	1035573	1.79	2038974	1.15
3/4	18-19	1035027	16.4	1035582	2.80	2038976	1.91
7/8	20-22	1035036	24.8	1035591	4.00	2038978	3.23
1	24-26	1035045	35.5	1035600	5.37	2038980	5.40
1-1/8	28	1035054	48.8	1035609	7.30	2038982	7.50
1-1/4	30-32	1035063	71.5	1035618	10.60	2038984	10.34

- Meets ASME B30.26
  - Identification, ductility, design factor, proof load and temp requirements
- ABS Type Approval
  - Part 1 2017 Steel Vessels
  - ABS guide for certification of lifting appliances
- Individually Magnetic Particle Inspected
- Eliminates potential “knock out” of wedge
- Eliminates need for extra piece of rope
- No fatigue on or breaking of tail due to fatigue
- No deformation of rope with clip base on wire rope
- Meets performance requirements of EN 13411-6 and Federal specifications RR_S-550F, Type C
- Available with API 2C certification upon request

Wedge Sockets



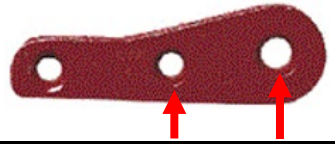
Terminator Wedge Socket invented by Crosby in 1996

- Revolutionized the crane industry practices

Why the need to have both a 421 and 422 models

- Looks at ear spacing and pin diameter to fit boom or dead end
- 422 has dual bodies for multiple wire rope sizes
- Wedges for 422 are made for individual wire rope sizes
- 421 was mainly designed around McKissick blocks

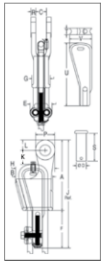
'Go' and 'No-Go' Quic-Check Feature



QUIC-CHECK®

Crosby

S-421T



- Wedge socket terminations have an efficiency rating of 80% based on the catalog strength of XXIP wire rope.
- Meets or exceeds all requirements of ASME B30.26, including identification, ductility, design factor, proof load, and temperature requirements. Importantly, these sockets meet other critical performance requirements, including fatigue life, impact properties and material traceability, not addressed by ASME B30.26.
- Type Approval certification in accordance with ABS rules for conditions of classification, Part 1 2017 Steel Vessels and ABS guide for certification of lifting appliances 2017 available. Certificates available when requested at time of order and may include additional charges.
- Basket is cast steel and individually magnetic particle inspected.
- Pin diameter and jaw opening allows wedge and socket to be used in conjunction with closed swage and spelter sockets.
- Secures the tail or dead end of the wire rope to the wedge, thus eliminates loss or punch out of the wedge.
- Eliminates the need for an extra piece of rope and is easily installed.
- The Terminator wedge eliminates the potential breaking off of the tail due to fatigue.
- The tail, which is secured by the base of the clip and the wedge, is left undeformed.
- Incorporates Crosby's patented QUIC-CHECK® 'Go' and 'No-Go' feature cast into the wedge. The proper size rope is determined when the following criteria are met:
  - 1) The wire rope should pass through the 'Go' hole in the wedge.
  - 2) The wire rope should NOT pass through the 'No-Go' hole in the wedge.
- Utilizes standard Crosby Red U-Bolt® wire rope clip.
- The 3/8 through 1-1/8 standard S-421 wedge socket can be retrofitted with the new style Terminator wedge.
- Available with bolt, nut, and cotter pin: S-421TB.
- US patent 5,553,360, Canada patent 2,217,004, and foreign equivalents.
- Meets the performance requirements of EN 13411-6.
- Available with API-2C certification upon request.
- Wedge sockets meet the performance requirements of Federal specification RR-S-550F, Type C, except those provisions required of the contractor.
- The S-423T Super Terminator wedge is designed to be assembled only into the Crosby S-421T Terminator socket body. Important: The S-423TW for sizes 5/8" through 1-1/8" (14mm through 28mm) will fit respective size standard Crosby S-421T basket. The 1-1/4" (30-32mm) S-423TW will only fit the Crosby S-421T 1-1/4" basket marked with Terminator.

APPLICATION AND WARNING INFORMATION SECTION 17

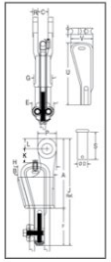
S-421T WEDGE SOCKETS (Assembly includes socket, wedge, pin and wire rope clip)

Wire Rope Dia.				Dimensions (in)														
(in)	(mm)	S-421T Stock No.	S-421TB Stock No.	A	B	C +/- .09	D	G	H	J*	K*	L	P	R	S	T	U	V
3/8	9-10	1035000	1035203	5.69	2.72	.81	.81	1.38	3.06	7.80	1.88	.88	1.56	.44	2.13	.44	1.25	1.38
1/2	11-13	1035009	1035212	6.88	3.47	1.00	1.00	1.62	3.76	8.91	1.26	1.06	1.94	.50	2.56	.53	1.75	1.88
5/8	14-16	1035018	1035221	8.25	4.30	1.25	1.19	2.12	4.47	10.75	1.99	1.22	2.25	.56	3.25	.69	2.00	2.19
3/4	18-19	1035027	1035230	9.88	5.12	1.50	1.38	2.44	5.28	12.36	2.41	1.40	2.63	.66	3.63	.78	2.34	2.56
7/8	20-22	1035036	1035249	11.25	5.85	1.75	1.63	2.69	6.16	14.37	2.48	1.67	3.13	.75	4.31	.88	2.69	2.94
1	24-26	1035045	1035258	12.81	6.32	2.00	2.00	2.94	6.96	16.29	3.04	2.00	3.75	.88	4.70	1.03	2.88	3.28
1-1/8	28	1035054	1035267	14.38	6.92	2.25	2.25	3.31	7.62	18.34	2.56	2.25	4.25	1.00	5.44	1.10	3.25	3.56
1-1/4	30-32	1035063	1035276	16.34	8.73	2.62	2.50	3.56	9.39	20.48	2.94	2.34	4.50	1.06	6.13	1.19	4.62	4.94

Crosby

WIRE ROPE END FITTINGS

US-422T



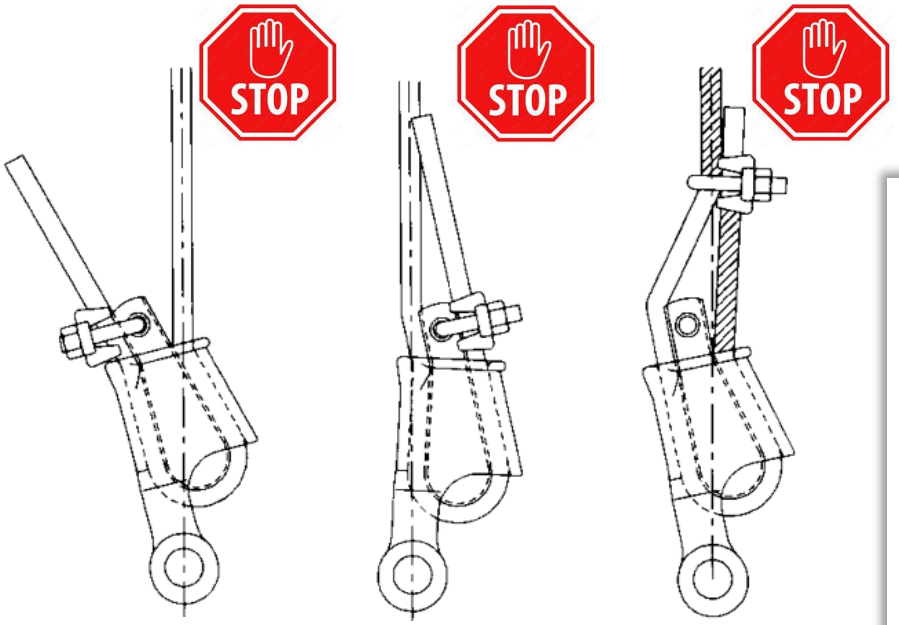
- Wedge socket terminations have an efficiency rating of 80% based on the catalog strength of XXIP wire rope.
- Meets or exceeds all requirements of ASME B30.26, including identification, ductility, design factor, proof load, and temperature requirements. Importantly, these sockets meet other critical performance requirements, including fatigue life, impact properties, and material traceability not addressed by ASME B30.26.
- Basket is cast steel and individually magnetic particle inspected.
- Wedges are color coded for easy identification.
  - Blue - largest wire line size for socket.
  - Black - mid size wire line for socket.
  - 7/16" on US4
  - 9/16" on US5
  - Orange - smallest wire line size for socket.
- By simply changing out the wedge, each socket can be utilized for various wire line sizes (ensure correct wedge is used for wire rope size).
- Cast into each wedge is the model number of the socket and the wire line size for which the wedge is to be used.
- Load pin is forged and headed on one end.
- US-422T wedge sockets contain a hammer pad (lip) to assist in proper securement of termination.
- Incorporates Crosby's patented QUIC-CHECK® 'Go' and 'No-Go' feature cast into the wedge. The proper size rope is determined when the following criteria are met:
- 1) The wire rope should pass through the 'Go' hole in the wedge.
- 2) The wire rope should NOT pass through the 'No-Go' hole in the wedge.
- Available with API-2C certification upon request.
- UWO-422T Wedges are to be used only with the US-422T Wedge Socket Assemblies.

APPLICATION AND WARNING INFORMATION SECTION 17

US-422T Utility Wedge Sockets

Model No.	Wire Rope Size (in)	Wire Rope Size (mm)	Stock No.	Weight Each (lb)	Wedge Only Stock No.	Wedge Only Weight Each (lb)	Dimensions (in) A	B	C +/- .09	D	G	H	J	K	L	P	R	S	T	U	V
US4T	3/8	10	1044300	4.6	1047310	0.7	6.81	3.55	1.00	1.00	1.63	2.81	8.43	1.38	1.06	1.94	.50	2.53	.44	1.91	2.14
US4T	7/16	11	1044309	4.6	1047301	1.0	6.81	3.55	1.00	1.00	1.63	2.81	8.73	1.08	1.06	1.94	.50	2.53	.53	1.76	1.88
US4T	1/2	13	1044318	4.6	1047329	1.0	6.81	3.55	1.00	1.00	1.63	2.81	8.73	1.02	1.06	1.94	.50	2.53	.53	1.76	1.88
US5T	1/2	13	1044327	8.5	1047338	2.0	9.19	4.23	1.41	1.25	2.13	3.31	11.19	1.84	1.50	3.00	.63	3.25	.75	1.92	2.16
US5T	9/16	14	1044336	8.5	1047347	1.8	9.19	4.23	1.41	1.25	2.13	3.31	11.47	2.40	1.50	3.00	.63	3.25	.69	2.00	2.18
US5T	5/8	16	1044345	8.5	1047356	1.8	9.19	4.23	1.41	1.25	2.13	3.31	11.47	2.34	1.50	3.00	.63	3.25	.69	2.00	2.18
US6T	5/8	16	1044354	9.4	1047365	3.0	9.45	4.70	1.50	1.25	2.24	3.63	11.91	2.48	1.50	3.00	.56	3.25	.88	2.38	2.75
US6T	3/4	19	1044363	9.4	1047374	2.5	9.45	4.70	1.50	1.25	2.24	3.63	11.81	2.03	1.50	3.00	.56	3.25	.88	2.13	2.63
US8AT	5/8	16	1044372	17.5	1047383	3.2	10.59	5.68	1.81	1.63	2.38	5.53	13.19	1.91	1.53	2.88	.75	4.13	.69	3.26	3.50
US8AT	3/4	19	1044381	17.5	1047392	3.4	10.59	5.68	1.81	1.63	2.38	5.84	13.54	2.38	1.53	2.88	.75	4.13	.78	3.12	3.38
US7*	7/8	22	1038580	16.5	1046674	2.6	11.26	5.11	1.31	1.25	2.69	—	—	2.56	1.63	3.26	.66	3.25	1.06	2.12	2.56
US7*	1	25	1038589	16.5	1046683	2.6	11.26	5.11	1.31	1.25	2.69	—	—	2.56	1.63	3.26	.66	3.25	1.06	1.88	2.38

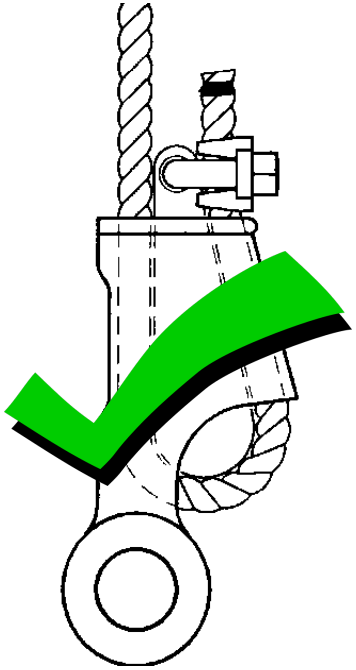
Proper Installation



Wrong! Rope Backward

Wrong! Wedge Backward

Wrong! Tail to Live line



S-423T Super Terminator Wedge Socket

Purpose

- First wedge socket designed to take advantage of the performance properties associated with higher performance, high strength, compacted strand, rotation resistance wire rope

Product Information

- All the bells and whistles of the 421 Terminator
- Uses same Becket (Socket) Body
- Significantly increase the termination efficiency over existing wedge sockets available today
- Broader wedge radius
- Terminations on most ropes have a min efficiency rating of 80% of the rope's catalog breaking strength
- Eliminates the 'first load" required from other standard wedge sockets

S505 Swaging Sleeves

Crosby

S-505
Swaging Sleeve

Cross Section of Swaged Sleeve

- For flemish eye wire rope splicing.
- Designed for low temperature toughness.
- Resists cracking when swaged (equals or exceeds stainless steel sleeves).
- Special processed low carbon steel.
- COLD TUFF® for better swageability.
- Can be stamped for identification after swaging without concern for fractures when following these directions:
  - Use round corner stamps to a maximum depth of 1.38mm.
  - The area for stamping should be on the side of the sleeve in the plane of the sling eye, and no less than 7mm from either end of the sleeve.
- Standard steel sleeve terminations have efficiency ratings as follows based on the catalog strength of wire rope.
- Do not use on wire rope size other than size shown.

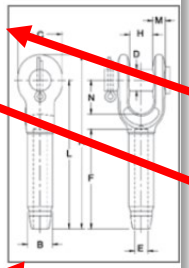
Manufactured in Little Rock, Arkansas

- Heat treated after extruding or machining
  - Special processed low carbon steel
  - Best sleeves at low temperatures
  - Best resistance to cracking

S501 & S502 Swage Sockets

S-501

- Forged from special bar quality carbon steel, suitable for cold forming.
- Swage socket terminations have an efficiency rating of 100% based on the catalog strength of wire rope.
- Hardness controlled by spheroidize annealing.
- Stamp for identification after swaging without concern for fractures (as per directions in Wire Rope End Terminations User's Manual).
- Swage sockets incorporate a reduced machined area of the shank which is equivalent to the proper 'after swage' dimension. Before swaging, this provides for an obvious visual difference in the shank diameter. After swaging, a uniform shank diameter is created allowing for a QUIC-CHECK® and permanent visual inspection opportunity.
- S-501 Swage Sockets are recommended for use with 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC or IWRC wire rope.
- In accordance with ASME B30.9, all slings terminated with swage sockets shall be proof loaded.*



S-501 Open Swage Sockets

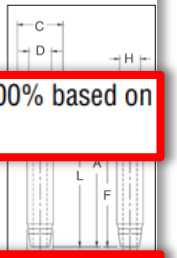
S-501 and S-501B Open Socket Specifications

S-501 Stock No.	S-501B Stock No. †	Rope Size (in)	Rope Size (mm)	Wt. Each (lb)	Ultimate Load** (t)	Before Swage Dimensions (in) A	B	C	D	E	F	H	L	M	N	Tolerance +/- H	Max. After Swage Dim. (in)	Swager / Die Data Die Description	Stock No. 500 1000 1500 Ton 5 x 7	Stock No. 1500 3000 Ton 6 x 12	Side Load 1500 Ton 6 x 12	Side Load 3000 Ton 6 x 12
1039021	1054001	1/4	6	.52	5.4	4.78	.50	1.38	.69	.27	2.19	.69	4.00	.38	1.47	.06	.46	1/4 Socket	1192845	-	-	-
1039049	1054010	5/16	8	1.12	11.8	6.3	.78	1.62	.81	.34	3.25	.80	5.34	.48	1.67	.06	.71	5/16-3/8 Socket	1192863	-	-	-
1039067	1054029	3/8	9-10	1.30	13.6	6.3	.78	1.62	.81	.41	3.25	.80	5.34	.48	1.67	.06	.71	5/16-3/8 Socket	1192863	-	-	-
1039085	1054038	7/16	11-12	2.08	18.1	7.82	1.01	2.00	1.00	.49	4.31	1.00	6.69	.56	1.96	.06	.91	7/16-1/2 Socket	1192881	-	-	-
1039101	1054047	1/2	13	2.08	21.3	7.82	1.01	2.00	1.00	.55	4.31	1.00	6.69	.56	1.96	.06	.91	7/16-1/2 Socket	1192881	-	-	-
1039129	1054056	9/16	14	4.67	31.8	9.54	1.27	2.38	1.19	.61	5.38	1.25	8.13	.68	2.21	.06	1.16	9/16-5/8 Socket	1192907	-	-	-
1039147	1054065	5/8	16	4.51	34.9	9.54	1.27	2.38	1.19	.68	5.38	1.25	8.13	.68	2.21	.06	1.16	9/16-5/8 Socket	1192907	-	-	-
1039165	1054074	3/4	18-20	7.97	43.5	11.61	1.56	2.75	1.38	.80	6.44	1.50	10.00	.80	2.69	.06	1.42	3/4 Socket	1192925	-	-	-
1039183	1054083	7/8	22	11.52	51.5	13.37	1.72	3.13	1.63	.94	7.50	1.75	11.63	.94	3.20	.07	1.55	7/8 Socket	1192943	-	-	-
1039209	1054092	1	24-26	17.80	71.4	15.47	2.00	3.69	2.00	1.07	8.63	2.00	13.38	1.07	3.68	.08	1.80	1 Socket	1192961	-	-	-
1039227	1054104	1-1/8	28	25.25	83.3	17.35	2.25	4.12	2.25	1.19	9.63	2.25	15.00	1.19	4.18	.10	2.05	1-1/8 Socket	1192989	-	-	-
1039245	1054113	1-1/4	32	35.56	109	19.2	2.53	4.59	2.50	1.34	10.69	2.50	16.50	1.27	4.68	.10	2.30	1-1/4 Socket	1193005	-	-	-
1039263	1054122	1-3/8	34-36	43.75	136	21.1	2.81	5.25	2.50	1.46	11.88	2.41	18.13	1.46	5.25	.10	2.56	1-3/8 Socket	1193023	-	-	-
1039281	1054131	1-1/2	38-40	58.50	181	23.17	3.08	5.50	2.75	1.59	12.81	3.00	19.75	1.70	5.70	.10	2.81	1-1/2 Socket	1193041	1191267	1195355	1195192
1039307	1054140	1-3/4	44	88.75	228	26.7	3.40	6.25	3.50	1.87	15.06	3.50	23.00	2.11	6.67	.10	3.06	1-3/4 Socket	1193069	1191276	1195367	1195209
1042767	1054159	2	48-52	146.2	272	31.15	3.94	7.80	3.75	2.12	17.06	4.00	26.75	1.81	8.19	.10	3.56	2 Socket	1193087	1191294	1195379	1195218

*Maximum Proof Load shall not exceed 50% of XXIP rope catalog breaking strength. ** The Ultimate Loads of 3/4" through 1 1/4" sizes have been increased to meet the requirements for 8 strand 2160 Grade pendants. † **Assembly with bolt, nut and cotter pin. Note: Fittings designed only to be used on exact sizes listed.**
NOTE: Before using any Crosby fitting with any other type lay, construction or grade of wire rope, it is recommended that the termination be destructive tested and documented to prove the adequacy of the assembly to be manufactured.

S-502

- Forged from special bar quality carbon steel, suitable for cold forming.
- Swage socket terminations have an efficiency rating of 100% based on the catalog strength of wire rope.



provides for an obvious visual difference in the shank diameter. After

HECK®

7, IPS

or XIP (EIP), XXIP (EEIP), RRL, FC or IWRC wire rope.

S-502 Closed Swage Sockets

S-502 Closed Socket Specifications

S-502 Stock No.	Rope Size (in)	Rope Size (mm)	Wt. Each (lb)	Ultimate Load** (t)	Before Swage Dimensions (in) A	B	C	D	E	F	H	L	Max. After Swage Dim. (in)	Swager / Die Data Die Description	Stock No. 500 1000 1500 Ton 5 x 7	Stock No. 1500 3000 Ton 6 x 12	Side Load 1500 Ton 6 x 12	Side Load 3000 Ton 6 x 12
1039325	1/4	6	.33	5.4	4.28	.50	1.38	.76	.27	2.19	.50	3.50	.46	1/4 Socket	1192845	-	-	-
1039343	5/16	8	.75	11.8	5.42	.77	1.62	.88	.34	3.25	.68	4.50	.71	5/16-3/8 Socket	1192863	-	-	-
1039361	3/8	9-10	.72	13.6	5.42	.78	1.62	.88	.41	3.25	.68	4.50	.71	5/16-3/8 Socket	1192863	-	-	-
1039389	7/16	11-12	1.42	18.1	6.88	1.01	2.00	1.07	.49	4.31	.87	5.75	.91	7/16-1/2 Socket	1192881	-	-	-
1039405	1/2	13	1.42	21.3	6.88	1.01	2.00	1.07	.55	4.31	.87	5.75	.91	7/16-1/2 Socket	1192881	-	-	-
1039423	9/16	14	2.92	31.8	8.59	1.27	2.38	1.28	.61	5.38	1.14	7.25	1.16	9/16-5/8 Socket	1192907	-	-	-
1039441	5/8	16	2.85	34.9	8.59	1.27	2.38	1.28	.68	5.38	1.14	7.25	1.16	9/16-5/8 Socket	1192907	-	-	-
1039469	3/4	18-20	5.00	43.5	10.25	1.56	2.88	1.49	.80	6.44	1.33	8.63	1.42	3/4 Socket	1192925	-	-	-
1039487	7/8	22	6.80	51.5	11.87	1.72	3.12	1.73	.94	7.50	1.53	10.09	1.55	7/8 Socket	1192943	-	-	-
1039502	1	24-26	10.40	71.4	13.56	2.00	3.62	2.11	1.07	8.63	1.78	11.50	1.80	1 Socket	1192961	-	-	-
1039520	1-1/8	28	14.82	83.3	15.03	2.25	4.00	2.37	1.19	9.75	2.03	12.75	2.05	1-1/8 Socket	1192989	-	-	-
1039548	1-1/4	32	21.57	109	16.94	2.53	4.50	2.62	1.34	10.81	2.25	14.38	2.30	1-1/4 Socket	1193005	-	-	-
1039566	1-3/8	34-36	28.54	136	18.59	2.81	5.00	2.62	1.46	11.88	2.29	15.75	2.56	1-3/8 Socket	1193023	-	-	-
1039584	1-1/2	38-40	38.06	181	20.13	3.08	5.38	2.87	1.59	12.81	2.56	17.00	2.81	1-1/2 Socket	1193041	1191267	1195355	1195192
1039600	1-3/4	44	51.00	228	23.56	3.40	6.25	3.63	1.87	15.06	3.08	20.00	3.06	1-3/4 Socket	1193069	1191276	1195367	1195209
1042589	2	48-52	89.25	272	27.13	3.94	7.25	3.88	2.12	17.06	3.31	23.00	3.56	2 Socket	1193087	1191294	1195379	1195218

Maximum Proof Load shall not exceed 50% of XXIP rope catalog breaking strength. *The Ultimate Loads of 3/4" through 1 1/4" sizes have been increased to meet the requirements for 8 strand 2160 Grade pendants. Note: Fittings designed only to be used on exact sizes listed.
NOTE: Before using any Crosby fitting with any other type lay, construction or grade of wire rope, it is recommended that the termination be destructive tested and documented to prove the adequacy of the assembly to be manufactured.

- Swage socket terminations have an efficiency rating of 100% based on the catalog strength of wire rope.
- Hardness controlled by spheroidize annealing.
- In accordance with ASME B30.9, all slings terminated with swage sockets shall be proof loaded.*

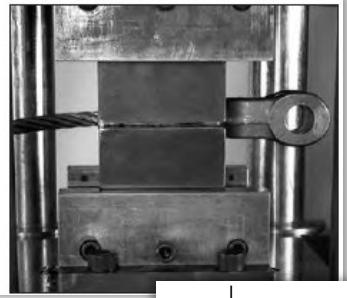
S501 & S502 Swage Sockets

Step 1: For proper insertion, mark rope using Column F Dimension on page 37-38.

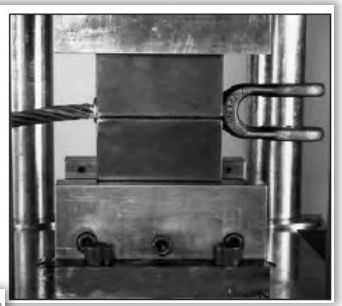
Step 2: Slide rope into socket until it is fully inserted in the shank. Inspect mark for full insertion.

Step 3: Lubricate both die cavities and lower die face. See pages 37 and 38 for proper die selection.

Step 4: 1st pass – allow dies to remain open approximately 1/2 the distance from time initial contact is made between socket and dies. Rotate fitting 45 to 90 degrees.

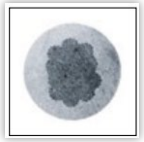


Step 5: 2nd pass – allow dies to remain open approximately ½ the distance from time initial contact is made between socket and dies. Rotate fitting 45 to 90 degrees.



Step 6: 3rd pass – If sharp flashing does not occur, close dies. Open dies and rotate fitting 45 to 90 degrees.

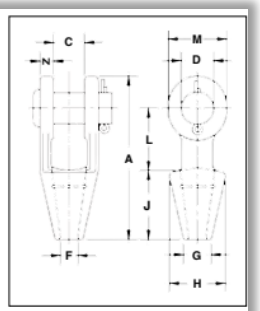
U.S. Patent 5,152,630 and foreign equivalents.



Spelter Sockets – Open and Closed

G-416 / S-416

- Forged steel sockets through 1-1/2", cast alloy steel 1-5/8" through 4".
- Spelter socket terminations have an efficiency rating of 100%, based on the catalog strength of wire rope.
- Ratings are based on recommended use with 6 x 7, 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC or IWRC wire rope.
- Strand constructed with minimal number of wires (e.g. 1 x 7) requires special consideration that socket basket length be five (5) times the strand diameter or fifty (50) times the wire diameter, whichever is the greater.
- All cast steel sockets 1-5/8" and larger are magnetic particle inspected and ultrasonic inspected. Proof testing available on special order.
- Available with bolt nut and cotter: G-416B.
- Open Grooved Sockets meet the performance requirements of Federal Specification RR-S-550F, Type A, except for those provisions required of the contractor.



G-416 / S-416 Open Spelter Sockets

Rope Dia. (in)	Rope Dia. (mm)	Structural Strand Dia. (in)	Ultimate Load (t)	Stock No. G-416 Galv.	Stock No. S-416 S.C.	Weight Each (lb)	Dimensions (in) A	C	D	F	G	H	J	L	M	N	Tolerance +/- C
5/16-3/8	8-10	—	12	1039637	1039646	1.30	4.84	.81	.81	.50	.81	1.69	2.25	1.75	1.50	.44	.06
7/16-1/2	11-13	—	20	1039655	1039664	2.25	5.56	1.00	1.00	.56	.94	1.88	2.50	2.00	1.88	.50	.06
9/16-5/8	14-16	1/2	27	1039673	1039682	3.60	6.75	1.25	1.19	.69	1.13	2.25	3.00	2.50	2.25	.64	.06
3/4	18	9/16-5/8	43	1039691	1039708	5.83	7.94	1.50	1.38	.81	1.25	2.62	3.50	3.00	2.62	.62	.06
7/8	20-22	11/16-3/4	55	1039717	1039726	9.65	9.25	1.75	1.63	.94	1.50	3.25	4.00	3.50	3.13	.80	.06
1	24-26	13/16-7/8	78	1039735	1039744	15.50	10.56	2.00	2.00	1.13	1.75	3.75	4.50	4.00	3.75	.88	.06
1-1/8	28-30	15/16-1	92	1039753	1039762	21.50	11.81	2.25	2.25	1.25	2.00	4.12	5.00	4.62	4.12	1.00	.12
1-1/4 - 1-3/8	32-35	1-1/16 - 1-1/8	136	1039771	1039780	31.00	13.19	2.50	2.50	1.50	2.25	4.75	5.50	5.00	4.75	1.13	.12
1-1/2	38	1-3/16 - 1-1/4	170	1039799	1039806	47.25	15.12	3.00	2.75	1.63	2.75	5.25	6.00	6.00	5.38	1.19	.12
* 1-5/8	* 40-42	1-5/16 - 1-3/8	188	1039815	1039824	55.00	16.25	3.00	3.00	1.75	3.00	5.50	6.50	6.50	5.75	1.31	.12
* 1-3/4 - 1-7/8	* 44-48	1-7/16 - 1-5/8	268	1039833	1039842	82.00	18.25	3.50	3.50	2.00	3.13	6.38	7.50	7.00	6.50	1.56	.12
* 2 - 2-1/8	* 50-54	1-11/16 - 1-3/4	291	1039851	1039860	129.00	21.50	4.00	3.75	2.25	3.75	7.38	8.50	9.00	7.00	1.81	.12
* 2-1/4 - 2-3/8	* 56-60	1-13/16 - 1-7/8	360	1039879	1039888	167.00	23.50	4.50	4.25	2.50	4.00	8.25	9.00	10.00	7.75	2.13	.12
* 2-1/2 - 2-5/8	* 64-67	1-15/16 - 2-1/8	424	1041633	1041642	252.00	25.50	5.00	4.75	2.88	4.50	9.25	9.75	10.75	8.50	2.38	.12
* 2-3/4 - 2-7/8	* 70-73	2-3/16 - 2-7/16	511	1041651	1041660	315.00	27.25	5.25	5.00	3.12	4.88	10.50	11.00	11.00	9.00	2.88	.25
* 3 - 3-1/8	* 75-80	2-1/2 - 2-5/8	563	1041679	1041688	380.00	29.00	5.75	5.25	3.38	5.25	11.12	12.00	11.25	9.50	3.00	.25
* 3-1/4 - 3-3/8	* 82-86	2-3/4 - 2-7/8	722	1041697	1041704	434.00	30.88	6.25	5.50	3.62	5.75	11.88	13.00	11.75	10.00	3.12	.25
* 3-1/2 - 3-5/8	* 88-92	3 - 3-1/8	779	1041713	1041722	563.00	33.25	6.75	6.00	3.88	6.50	12.38	14.00	12.50	10.75	3.25	.25
* 3-3/4 - 4	* 94-102	—	875	1041731	1041740	783.00	36.25	7.50	7.00	4.25	7.25	13.62	15.00	13.50	12.50	3.50	.25

* Cast alloy steel.

G-416 / S-416

G-417 / S-417

TRAINING!!!!
Self Colored or Galvanized
Forged – Up through 1-1/2”
Cast Alloy 1-5/8” & Larger
100% Magnetic Particle
100% Ultrasonic
Made in the USA

Country of Origin - ???

- Examples of competition re-creation of material certs not showing the origin mill certs

Wirelock – DNV, Lloyds, ABS, Navy, Coast Guard

WIRELOCK®
Socketing Compound

- 100% termination efficiency.
- Temperature operating range is -65° F to +240° F (-54°C to +116°C).
- Ideal for on-site applications.
- No hazardous molten metal.
- Improved fatigue life.
- Pouring temperature without booster pack is 48° F to 110° F (6.67°C to 43.3°C).
- One booster pack if pouring temperature is 35° F to 48° F (1.67°C to 8.89°C).
- Two booster packs if pouring temperature is 27° F to 35° F (-2.78°C to +1.67°C).
- Refer to Crosby® Wire Rope End Terminations Manual for more information.
- Storage temperature is 68° F (20°C) max. Store in well ventilated area away from sunlight and sources of ignition.

WIRELOCK® W416-7 Socket Compound

W416-7 Kits				Booster
Kit Size	Kit Per Case	Stock No.	Weight Each (lb)	Pak Stock No.
100	20	1039602	.62	1039603
250	12	1039604	1.25	1039605
500	12	1039606	2.54	1039607
1000	12	1039608	4.59	1039609
2000	6	1039610	9.00	1039611

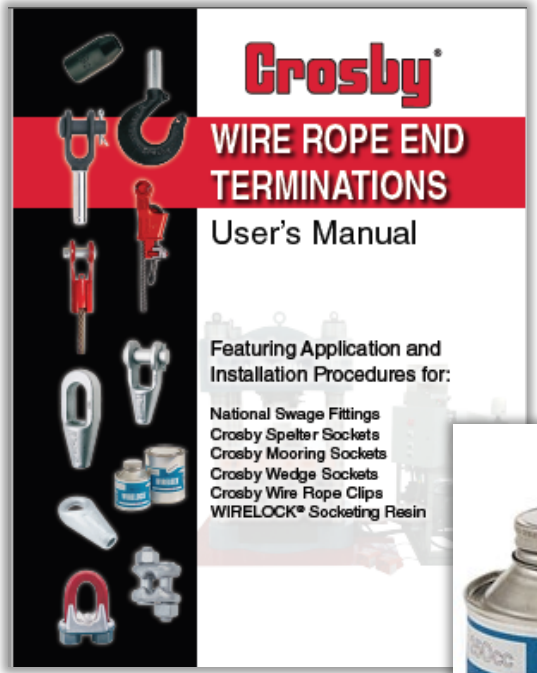
Guide to amount WIRELOCK® Required

Wire Rope Size		WIRELOCK Required	Wire Rope Size		WIRELOCK Required
(in)	(mm)	(cc)	(in)	(mm)	(cc)
1/4	6-7	9	1-3/4	44	700
5/16	8	17	1-7/8	48	700
3/8	9-10	17	2	51	1265
7/16	11	35	2-1/8	54	1265
1/2	13	35	2-1/4	56	1410
9/16	14	52	2-3/8	60	1410
5/8	16	52	2-1/2	64	1830
3/4	20	86	2-5/8	67	1830
7/8	22	125	2-3/4	70	2250
1	26	160	3	76	3160
1-1/8	28	210	3-1/4	82	3795
1-1/4	32	350	3-1/2	88	4920
1-3/8	36	350	3-3/4	94	5980
1-1/2	40	420	4	102	7730
1-5/8	42	495	—	—	—

Wirelock is a hazardous material regulated by US DOT, ICAO/IATA and IMO for transportation.

Wirelock – Shelf Life & Pouring Temps

- Each kit has a shelf life clearly marked on each container which must be observed.
- The shelf life is 18 months from the date of manufacturing.
- Store at temperatures not exceeding 70°F.
- Never use out-of-date material.
- Booster packs are available for pouring sockets at temperatures < 48° F.



Application of Wire Rope Clips

Wire rope clips are essential components used in various industries for securing wire rope ends to form a loop or to join two wire ropes together. Here are their common uses:

1. Forming Wire Rope Loops

- **Eye Splices**: Creating fixed loops at the end of a wire rope for attachments to hooks, shackles, or rings.
- **Guy Wires**: Used in structural support systems, such as securing poles, antennas, or towers.

2. Securing Wire Rope Ends

- **Lifting Applications**: Securing rope ends to prevent fraying and maintain structural integrity.
- **Towing and Anchoring**: Often used to secure loads in marine or construction environments.

3. Temporary Connections

- **Scaffolding**: Providing adjustable and secure connections for scaffolding systems.
- **Construction**: Temporary rigging for holding materials or structural elements in place.

4. Wire Rope Repairs

- Joining broken wire ropes temporarily until a permanent solution can be implemented.

5. Agricultural Uses

- Securing fencing and enclosures.
- Tensioning wire ropes for gates or barriers.

6. Marine Applications

- Forming loops for attaching to mooring lines, buoys, or other marine rigging systems.

Application of Swage Sockets

Swaged sockets are commonly used in applications where secure, high-strength terminations for wire ropes are required. They are designed for precise swaging (mechanical compression) onto the wire rope, creating a permanent connection. Here are the most common uses for swaged sockets:

1. Cranes and Hoisting Systems

•Swaged sockets are widely used in crane ropes, both in mobile cranes and tower cranes, to ensure a reliable termination for lifting heavy loads.

2. Rigging and Lifting Applications

•They are often utilized in slings and rigging systems where high strength and safety are critical.

3. Marine and Offshore Applications

•Used in mooring lines, towing ropes, and winch systems due to their corrosion resistance and secure connections.

•Common in offshore oil and gas platforms.

4. Construction Industry

•Employed in tensioning cables, guy lines, and structural supports for bridges, buildings, and towers.

5. Mining Operations

•Used in draglines, winch ropes, and haulage systems due to their ability to withstand heavy loads and tough conditions.

6. Entertainment and Event Rigging

•Applied in stage rigging and suspension systems for lights, sets, and other equipment.

7. Cable-Stayed Structures

•Found in architectural features like cable-stayed bridges and tensile structures, where aesthetics and performance are both important.

8. Utilities and Energy

•Utilized in transmission tower guying, wind turbine installations, and other energy-related infrastructure.

9. Forestry and Logging

•Used in chokers and other cable systems for dragging logs and timber.

Swaged sockets provide a strong, neat, and low-profile termination, making them an ideal choice for applications where durability and reliability are paramount.

Application of Spelter (Poured) Sockets

Spelter or poured sockets are widely used in lifting, rigging, and tensioning applications where strong and permanent terminations are required on wire ropes. Their reliability and strength make them ideal for high-load and critical applications. Here are the most common uses for spelter or poured sockets:

1. Cranes and Lifting Applications

- **Overhead Cranes:** Used for the primary wire ropes to terminate at the crane drum or hook block.
- **Tower Cranes:** Securing wire ropes for hoisting and guying purposes.
- **Mobile Cranes:** Creating strong, permanent terminations for main and auxiliary hoist lines.

2. Marine and Offshore Applications

- **Mooring Lines:** Securing ships or floating platforms to docks or anchors.
- **Towing Lines:** On tugboats and for subsea operations.
- **Rigging on Offshore Platforms:** Supporting structural components and heavy lifts.

3. Structural Applications

- **Bridge Construction:** Used in suspension and cable-stayed bridge systems for wire rope terminations.
- **Guy Wires:** Anchoring utility poles, communication towers, and wind turbines.
- **Prestressed Concrete:** Providing high-strength terminations for tension cables.

4. Mining and Quarrying

- **Hoist Ropes:** Terminations on drum hoists for mine shaft operations.
- **Dragline Ropes:** Used in large excavating equipment for securing draglines and hoisting buckets.

5. Oil and Gas Industry

- **Drilling Operations:** Terminations for drill lines on rigs.
- **Anchor Ropes:** Holding down floating drilling platforms or other subsea installations.

6. Heavy Construction

- **Earth-Moving Equipment:** Used on large shovels or draglines to secure ropes.
- **Rigging for Large Lifts:** High-capacity terminations for lift planning in heavy construction projects.

7. Entertainment Industry

- **Suspension of Structures:** In staging or rigging systems for concerts or theatrical events.
- **Cable Systems:** High-strength terminations in aerial performance rigs.

8. Transportation and Logistics

- **Cable Cars and Trams:** Terminations for traction cables.
- **Cargo Ships:** Securing heavy cargo handling gear.

9. Military Applications

- **Anchoring and Rigging:** For military equipment and tactical operations.
- **Naval Applications:** Rigging in naval ships for mooring and towing.

Spelter sockets are chosen for their ability to provide a termination strength equal to or greater than the breaking strength of the rope, ensuring maximum efficiency and safety in these applications.

Application of Wedge Sockets

Wedge sockets are widely used in lifting and rigging applications for securely terminating wire rope. Their primary function is to provide a reliable and easily adjustable connection point for wire rope. Here are the most common uses for wedge sockets:

1. Cranes and Hoisting Systems

•Wedge sockets are frequently used on mobile, tower, and overhead cranes to terminate the wire rope used for lifting loads.

•They allow for quick installation and removal, making them ideal for environments where ropes need to be replaced or adjusted regularly.

2. Winches and Draglines

•Used in construction and mining for anchoring wire rope in winch systems or draglines.

•The design allows for easy adjustment, which is critical in operations requiring frequent length modifications.

3. Towing and Pulling Applications

•Common in the towing industry for terminating ropes on recovery vehicles.

•Wedge sockets ensure a secure connection while providing a quick method for detaching or re-attaching ropes.

4. Marine and Offshore

•In offshore drilling and marine environments, wedge sockets are used in mooring lines and other rigging systems.

•Their ease of use makes them practical for temporary or emergency rigging.

5. Construction and Industrial Lifting

•Used in rigging setups for lifting and positioning heavy materials.

•Their versatility and reliability make them a staple in construction projects involving wire rope slings and hoists.

6. Logging and Forestry

•Employed in wire rope systems for hauling logs and other heavy materials in forestry operations.

•The quick-release design is beneficial for dynamic environments like logging sites.

Advantages of Wedge Sockets:

•**Ease of Use:** Simple design allows for fast assembly and disassembly.

•**Versatility:** Suitable for various wire rope diameters and applications.

•**Adjustability:** Wire rope length can be easily adjusted without the need for special tools.

•**Safety:** When properly installed, they provide a strong and reliable termination.

Considerations:

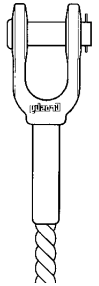
•**Compatibility:** Ensure the wedge socket is compatible with the wire rope diameter.

•**Load Capacity:** Verify the working load limit (WLL) of the socket matches the application.

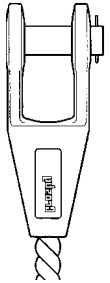
•**Inspection:** Regular inspections are necessary to detect wear or damage to both the socket and wire rope.

Quiz – Wire Rope Terminations

- Which wire rope terminations can be re-used
  - A. Swage Sockets
  - **B. Spelter Sockets**
  - **C. Wire Rope Clips**
  - D. S505 sleeves
  - **E. Wedge Sockets**
- Which wire rope terminations have the strongest efficiencies
  - **A. Swage and Spelter Sockets**
  - B. Swage Sleeves
  - C. Turnback Sleeves
  - D. Wedge Sockets
  - E. Wire Rope Clips
- What is the most mis-used wire rope termination in the world
  - A. Swage and Spelter Sockets
  - B. Swage sleeves
  - C. Turnback Sleeves
  - D. Wedge Sockets
  - **E. Wire Rope Clips**

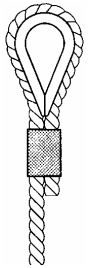


Swage Sockets

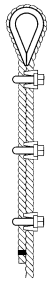


Spelter Sockets

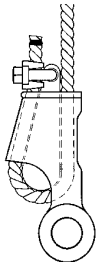
Flemish Eye



Turnback Eye



Wire Rope Clips



Wedge Sockets

Questions?