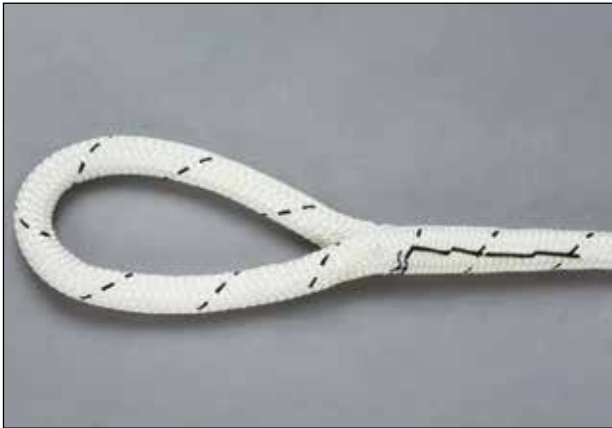


Splicing Instructions

Standard Double Braid Eye Splice

Type 1 Double Braid Ropes

Introduction



Double Braid Eye Splice

This document describes the steps required to perform a Double Braid Eye Splice in Type 1 double braid.

Type 1 double braid ropes consist of ropes that are made entirely of polyester, nylon, polyolefins or some combination of these materials. Type 2 double braid ropes contain high modulus fibers such as Plasma®, Spectra®, Technora®, Vectran®, etc. in the core. Type 2 ropes utilize a different type of splice.



The following tools are required to perform the splice:

- Large ruler or measuring tape
- Knife
- Large needle
- Splicing fid
- Marker pen
- Adhesive tape (plastic or paper)
- Scissors

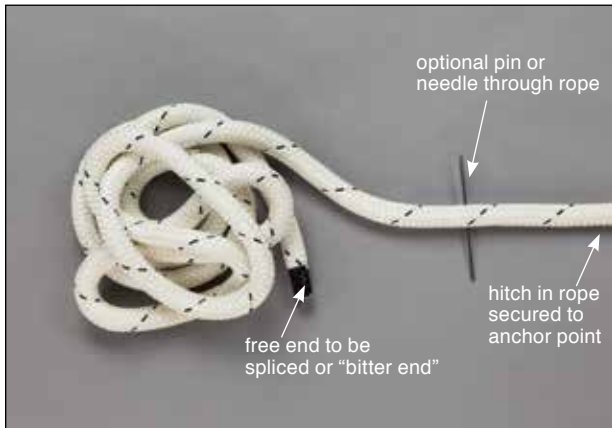
All splicing should be performed on a clean, flat surface.

Fid Chart

Rope Dia.		Fid Length		Rope Size (Circ.)
in.	mm	in.	mm	
1/4"	6	5-1/4"	133	3/4"
5/16"	8	7"	178	1"
3/8"	9	8"	203	1-1/8"
7/16"	11	8-3/4"	222	1-1/4"
1/2"	12	10-1/2"	267	1-1/2"
9/16"	14	12-1/4"	311	1-3/4"
5/8"	16	14"	356	2"
3/4"	18	16"	406	2-1/4"
7/8"	22	19"	483	2-3/4"
1"	24	21"	533	3"
1-1/16"	26	22-1/2"	572	3-1/4"
1-1/8"	28	24"	610	3-1/2"
1-1/4"	30	26"	660	3-3/4"
1-5/16"	32	28"	711	4"

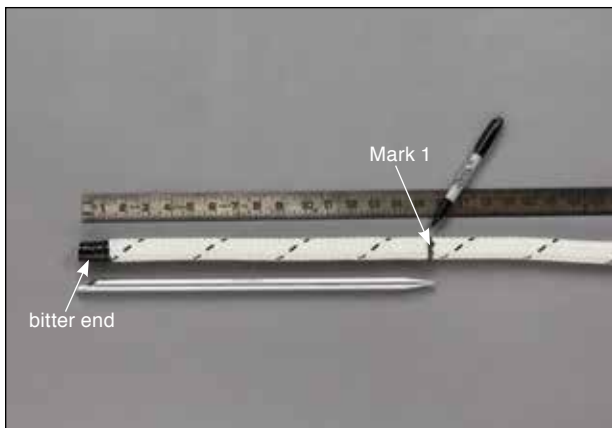
Rope Dia.		Fid Length		Rope Size (Circ.)
in.	mm	in.	mm	
1-1/2"	36	32"	813	4-1/2"
1-5/8"	40	35"	889	5"
1-3/4"	44	38"	965	5-1/2"
2"	48	42"	1067	6"
2-1/8"	52	46"	1168	6-1/2"
2-1/4"	56	50"	1270	7"
2-1/2"	60	52"	1321	7-1/2"
2-5/8"	64	56"	1422	8"
2-3/4"	68	60"	1524	8-1/2"
3"	72	63"	1600	9"
3-1/4"	80	70"	1778	10"
3-5/8"	84	77"	1956	11"
4"	88	84"	2137	12"
4-1/4"	104	91"	2311	13"

Step 1 Rope set-up



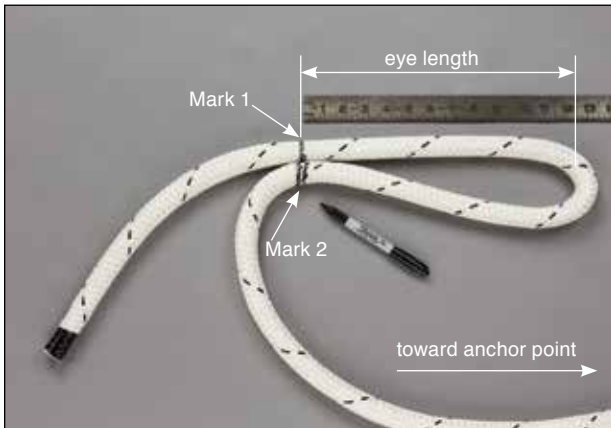
1.1 Secure the rope to a sturdy post or anchor point by tying a hitch type knot 7–10 fid lengths down from the free end of the rope (the bitter end). If possible, insert a large sewing needle or pin through the rope just in front of the knot to assist in holding the cover and core together.

Quality Check The rope extending from the anchor point to the bitter end will be subjected to varying loads during the splicing process. Consequently, both the knot and the anchor point must be strong enough to withstand the applied forces without slipping or pulling loose.



1.2 Lay the rope out in a straight line from the anchor point to the free or bitter end. Using the fid chart, determine the appropriate fid length based on the rope diameter or circumference. Measure a distance equal to the fid length from the bitter end of the rope towards the anchor point and make a mark around the circumference of the rope (Mark I).

Step 2 Measurements and markings

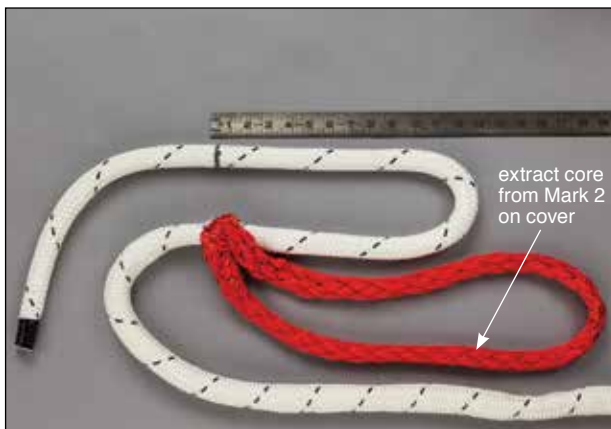


Quality Check Ensure accurate markings in Step 2. Inaccurate marks will directly affect the quality of the splice.

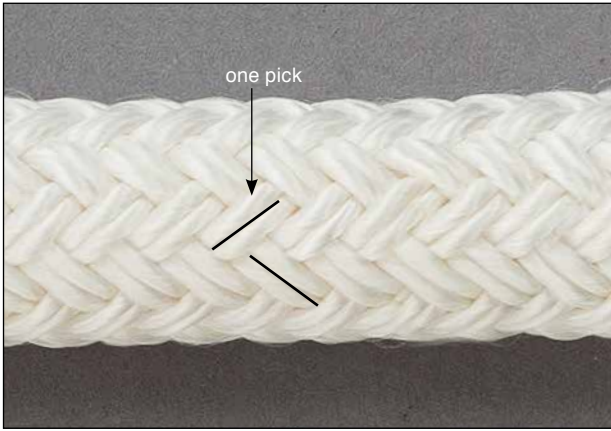
2.1 Using Mark 1 as a reference point, form an eye in the bitter end of the rope. When the proper size of eye has been determined make a mark on the rope directly opposite Mark 1. This is Mark 2.



2.2 Use a large needle, fid or similar tool to separate the cover yarns at Mark 2, exposing the core. Make a mark on the exposed core with the marker pen. This is Core Mark 1.



2.3 Extract the core braid at Mark 2 on the cover, pulling the core out of the cover from Mark 2 towards the hitch knot at the anchor point. Pull the bitter end of the core out of the cover braid as well.



NOTE: A pick is a point on the braid in which one strand in the left or "s" direction crosses over or under a strand in the right or "z" direction. This is illustrated in the image to the left.

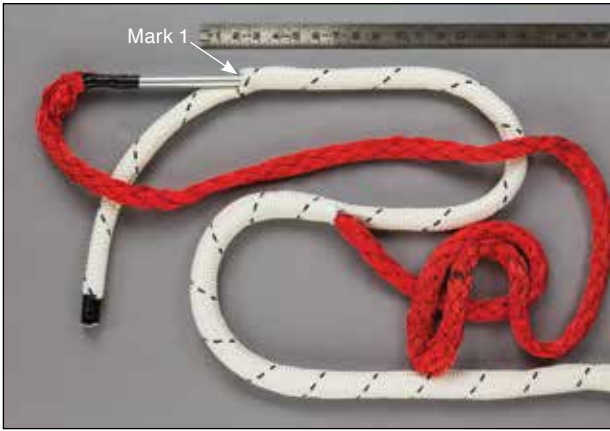
2.4 Using the table below as a guide, count the prescribed number of picks from Core Mark 1 down toward the anchor point and make a heavy mark completely around the core (Core Mark 2).

*Guide for counting picks:

1/4" – 5/8" (6mm – 16mm)	10 picks
3/4" – 1-3/4" (18mm – 44mm)	7 picks
2" (48mm) and larger	12 picks



2.5 Tape the fid to the bitter end of the core.



2.6 Insert the fid into the cover at Mark 1 toward Mark 2.

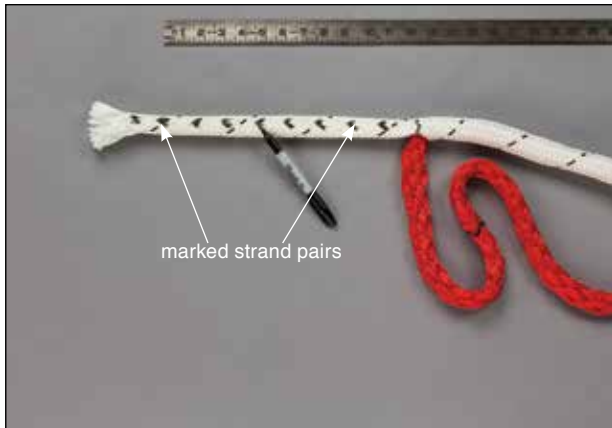
Quality Check When inserting the fid into the cover make sure the core is not twisted.



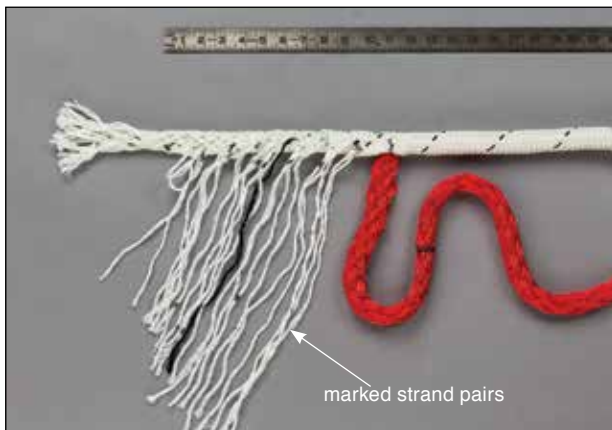
2.7 Milk the fid through the cover braid until it reaches the point where the core was extracted from the rope (Mark 2 on the cover). With the tip of the fid positioned at the point of extraction, carefully continue to push the fid past Mark 2. Avoid snagging the core inside the cover with the tip of the fid. Continue to push the fid about 1/3 fid length past Mark 2 and then exit the fid and core through the cover.

Quality Check Be sure to pull several inches (75+mm) of the core through the jacket so that it will not get pulled back inside the core during the next few steps.

Step 3 Splicing the core and cover together

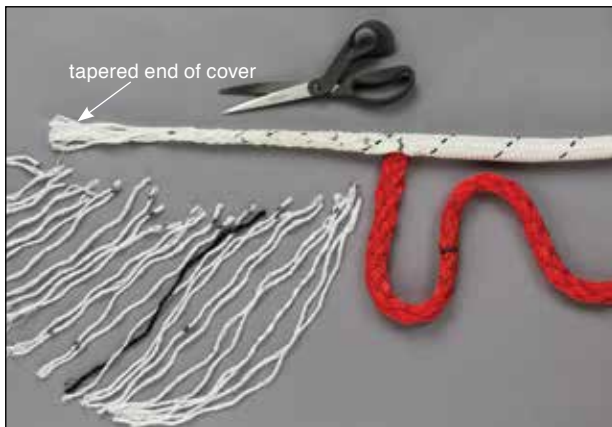


3.1 Remove any tape around the bitter end of the cover. Working from Mark 1 on the cover count 5 picks (strand pairs) toward the bitter end of the rope and mark the 5th pair to form a V shaped mark on the cover. Then count down 4 picks and mark the 4th pair. Alternate counting and marking the 5th and then 4th pick (strand pair) until you reach the end of the rope.

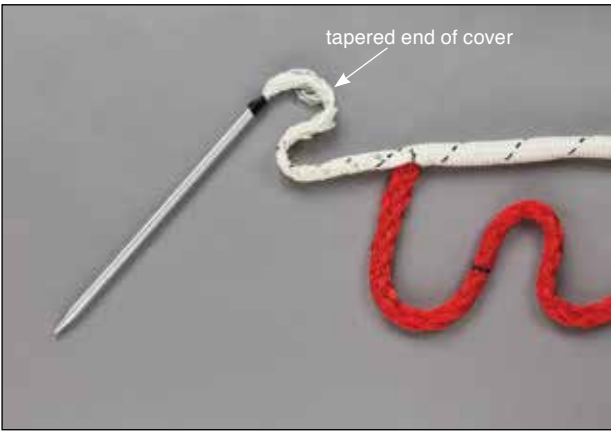


3.2 Pull each of the marked strand pairs out from the end of the cover braid.

Quality Check Be careful to only pull the strand ends out from the bitter end of the cover braid. Don't pull on the cover strands past the point where the core braid exits the cover.



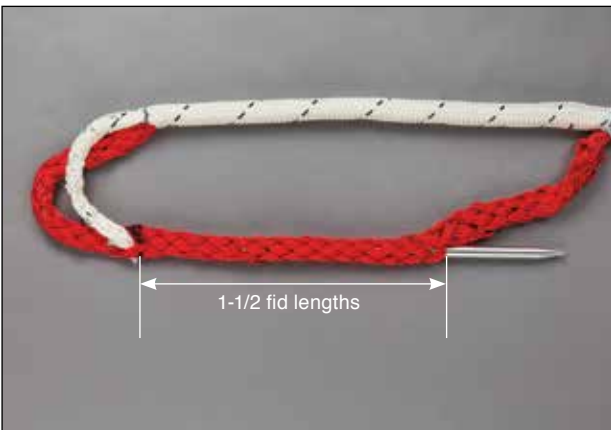
3.3 Trim each of the strand pairs at the point where they exit from the cover braid.



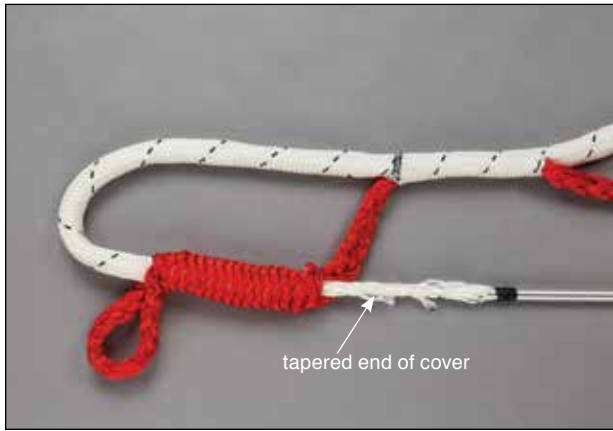
3.4 Remove the fid from the bitter end of the core and tape it to the tapered bitter end of the cover.



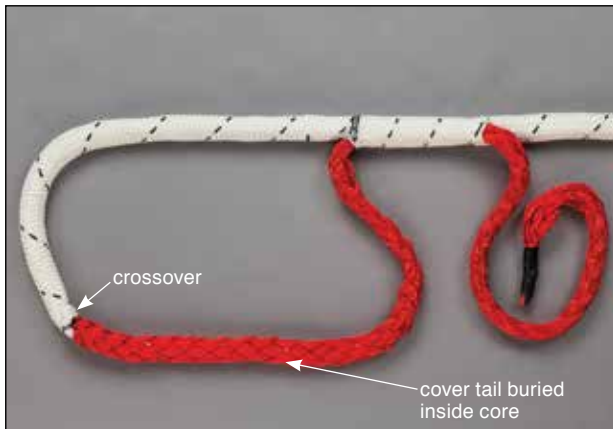
3.5 Insert the fid into the core at Core Mark 2 (step 2.4) in the direction of the anchor point.



3.6 Push the fid through the core for a distance of 1.5 fid lengths from Core Mark 2. Pull the end of the fid out of the core.



3.7 Pull the fid out of the core exposing the entire fid and as much of the cover tail as possible. This will require bunching up the core back toward Core Mark 2.

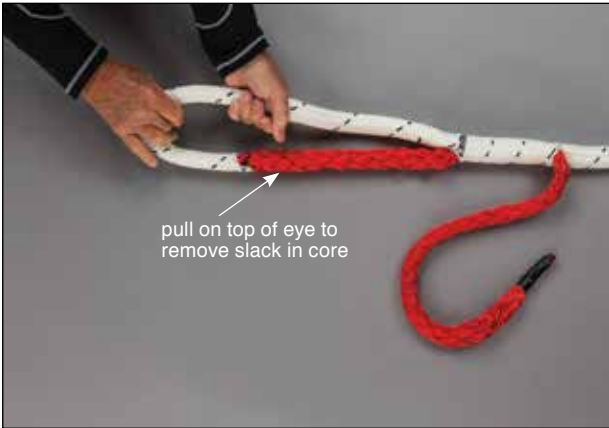


3.8 Remove the fid and tape from the end of the cover. Pull the ends of both the core and cover until the marks on the cover and core are adjacent to each other. This is the crossover. Keep the marks tightly together for the remainder of the splice procedure.

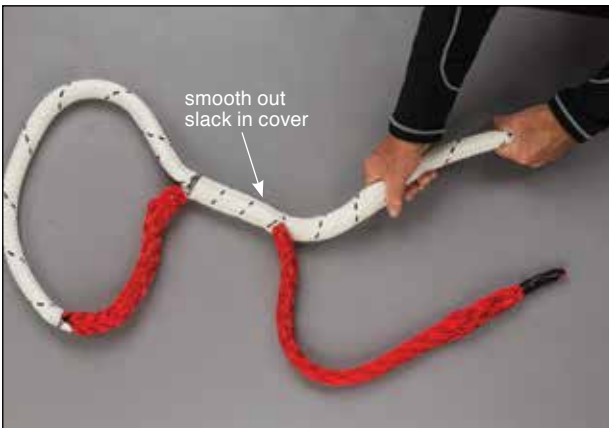


3.9 Starting at the crossover, milk or smooth out any excess slack in the exposed core to bury the tapered cover tail. Then smooth out the cover braid from the crossover back to the point where the core tail exits from the cover.

Step 4 Finishing the eye splice



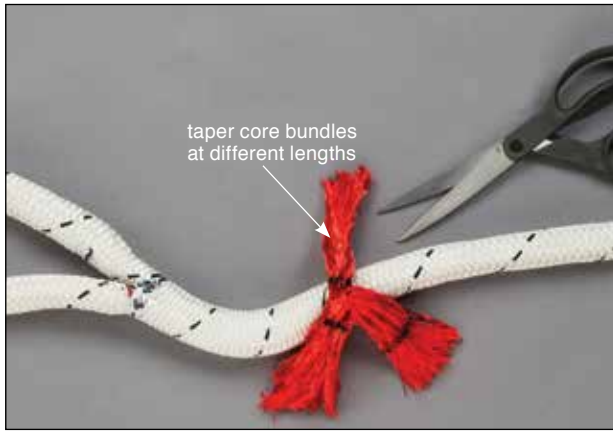
4.1 Pull on the cover side of the eye to remove any slack or bunching of the exposed section of core.



4.2 Working from the standing part of the rope attached to the anchor point, milk or smooth out any slack in the cover towards the base of the eye. Continue to alternate between Step 4.1 and 4.2 until all slack is removed from the cover and the exposed core has been completely buried in the cover in the eye.

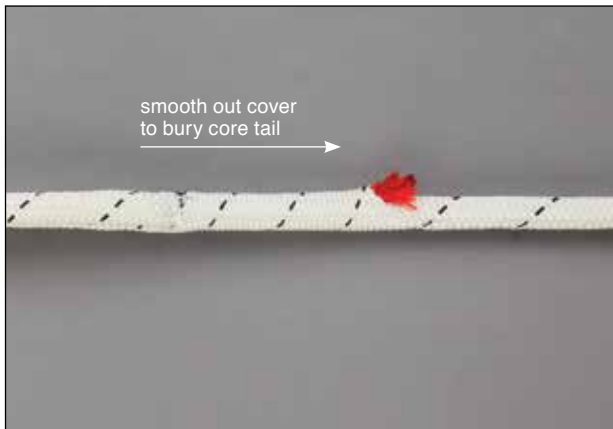


4.3 Mark the core at the point where it exits the cover.

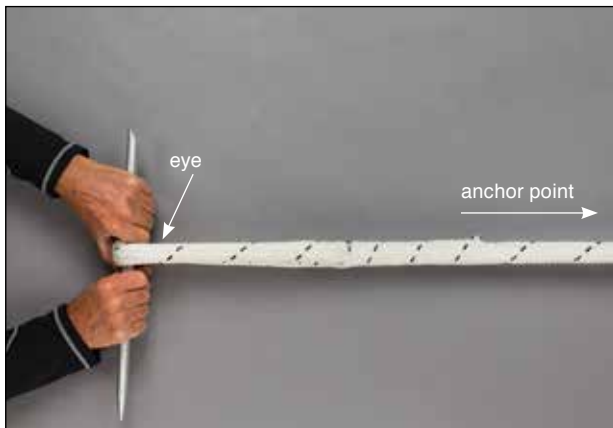


4.4 Pull the core tail out from the cover about 1/3rd of a fid length and cut off the excess core tail at the mark that was just made. Then taper the exposed end of the core.

Quality Check When tapering the core it is best to divide the strands into groups and cut the ends of each group at different lengths.

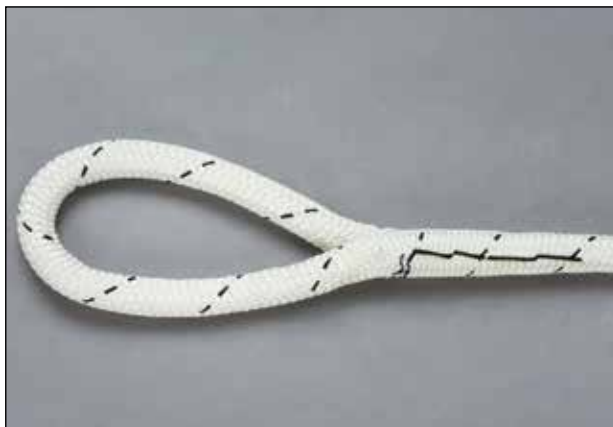


4.5 Once the core strands are tapered, smooth out the bunched up section of cover from the base of the eye towards the tapered ends of the core to bury the exposed ends of the core back inside the body of the rope.



4.6 To finish the splice, hold the top of the eye and pull against the anchor point. This will assist in removing any remaining slack in the rope and burying the exposed core in the eye. Cover slack can also be removed by milking the cover back towards the eye from the anchor point while keeping the rope under some slight tension.

Technique Tip If you have a larger fid or rod available, it can be inserted through the back of the eye and used to pull the eye in a straight line. Sufficient tension will further assist in burying the exposed core and crossover point.



4.7 After the eye splice is complete, cross stitching is recommended.

Glossary

Bitter End – End of the rope closest to the working area.

Core – Inner braid of a double braid rope. The core is contained within the cover braid.

Core Dependent Rope – A double-braid rope in which the core carries the entire load and the cover is primarily for protection from abrasion and external damage.

Cover/Sleeve/Jacket – Outer braid of a double braid rope that covers the core braid.

Cross Stitching – A series of sewing stitches using twine that locks a splice into place to prevent it from slipping or being pulled apart. Reference Cortland's Cross Stitching Instructions, CT_TL_060 document.

Crossover – The point in a splice where the core enters the cover and the cover enters the core.

Eye Allowance – Length of the rope that determines the final eye size.

Eye Splice – The splice that is necessary to form an eye at the end of a rope.

Fid – A metal, wood or plastic tool used as an aid in splicing. Fids typically are tapered at one end and have a method to allow attaching the cover or core of the rope being spliced at the other end. Some fids are also intended to be used as a measuring tool when laying out the splicing marks on the rope.

Fid Length – A fid length is a unit of measurement originally based on the design of tubular fids used for splicing double braids. A fid length is now generally defined as 7 x the rope circumference or 21 x the rope diameter.

Grommet – (or Endless Grommet or Endless Loop) – A line that is spliced into a loop rather than having eyes.

Milk – The act of removing slack in the cover or core by sliding the loose braid back over the rope element that has been buried inside the loose section.

Pick – A point on either the core or cover braid in which one strand in the left or "S" direction crosses over or under a strand in the right or "Z" direction.

Splice – The process used to make an eye or join two ends of rope together.

Standing End – The end of the rope not in use.

Standing Part – The central section of rope away from the end being used or spliced.

Strands – A twisted (S twist or Z twist) bundle of yarn comprising one of the discrete components used to make a braided rope.

S-Twist – A strand in which the fibers are twisted in a left-hand direction.

Taper – Trimming or cutting a strand or braid so that it gradually becomes thinner toward one end.

Thimble – A ring or tear-drop shaped form, often of metal or plastic, that fits on the rope on the inside of an eye splice. It is used to prevent sharp bending of the rope at the top of the eye & to protect the inside of the eye from chafing or cutting.

Unlay (Unbraid) – To take apart and separate the strands of a rope into individual components.

Whipping – Securing rope ends or sections of a rope or splice by wrapping twine tightly around the object to be whipped.

Z-Twist – A strand in which the fibers are twisted in a right-hand direction.

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