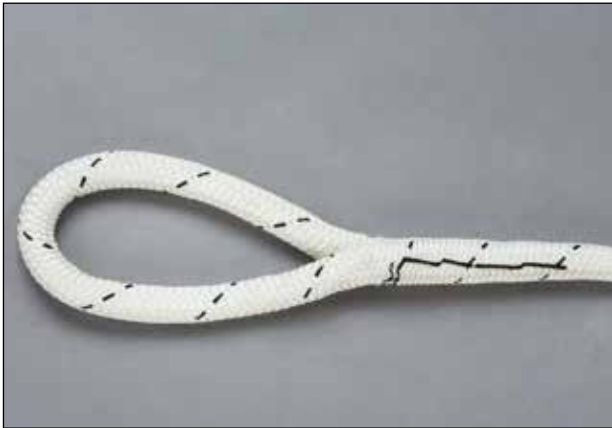


Splicing Instructions

# Core Dependent Double Braid Eye Splice

Type 2 Double Braid Ropes

# Introduction



## Core Dependent Double Braid Eye Splice

This document describes the steps required to perform a Core Dependent Double Braid Eye Splice in Type 2 double braid.

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

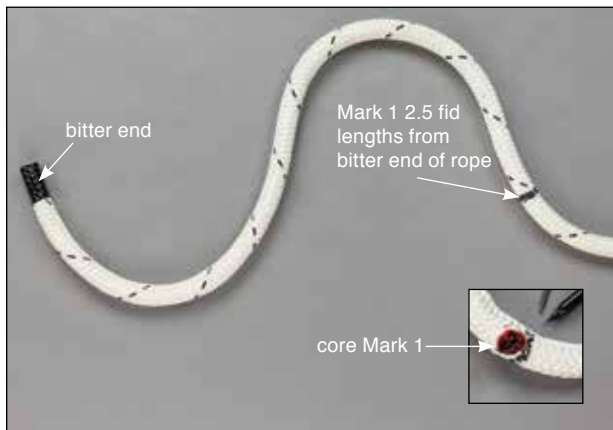
All splicing should be performed on a clean, flat surface.

### 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"

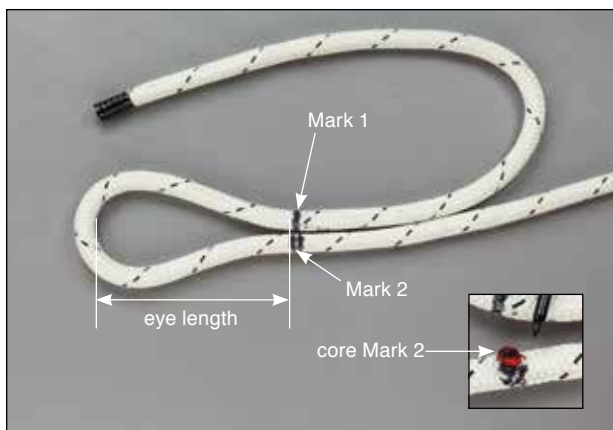
Rope Dia.		Fid Length		Rope Size (Circ.)
in.	mm	in.	mm	
1-1/2"	36	32"	813	4-1/2"
1-5/8"	40	35"	889	5"
1-3/4"	44	38"	965	5-1/2"
2"	48	42"	1067	6"
2-1/8"	52	46"	1168	6-1/2"
2-1/4"	56	50"	1270	7"
2-1/2"	60	52"	1321	7-1/2"
2-5/8"	64	56"	1422	8"
2-3/4"	68	60"	1524	8-1/2"
3"	72	63"	1600	9"
3-1/4"	80	70"	1778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

# Step 1 Measurement and Markings



**1.1** Lay out the section of the rope being spliced on a flat surface. 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.

Measure a distance of 2-1/2 fid lengths from the bitter end down the length of the rope toward the knot. Make a mark on the cover of the rope at this point (Mark 1). Carefully open up the cover braid and make a mark on the core as well (Core Mark 1).

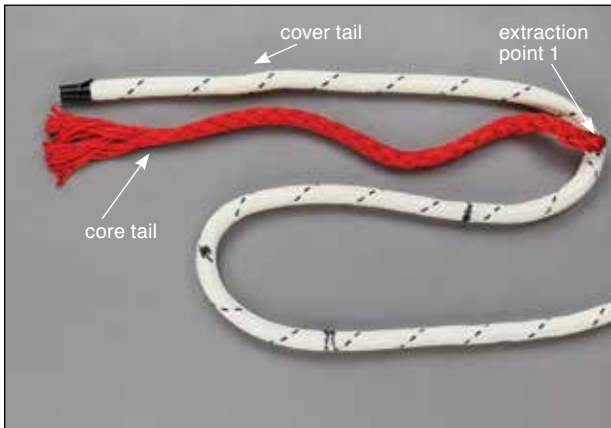


**1.2** Using Mark 1 as a reference point, form an eye in the bitter end of the rope. The eye should be sized about 2 inches (51mm) larger than the required size of the finished eye when measured from the base of the eye to the top. When the proper size of eye has been determined make a mark on the rope directly opposite Mark 1. This is Mark 2. Carefully open up the cover braid and make a mark on the core as well (Core Mark 2).

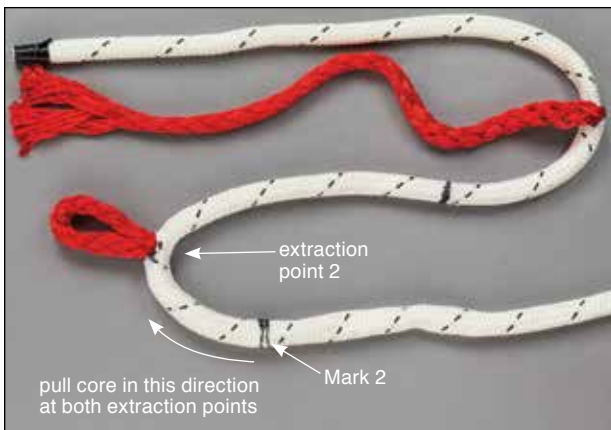


**1.3** From both Mark 1 and 2, measure a distance equal to 3/4 of a fid length towards the bitter end of the rope and mark the cover at each point. These will be Extraction Points 1 and 2.

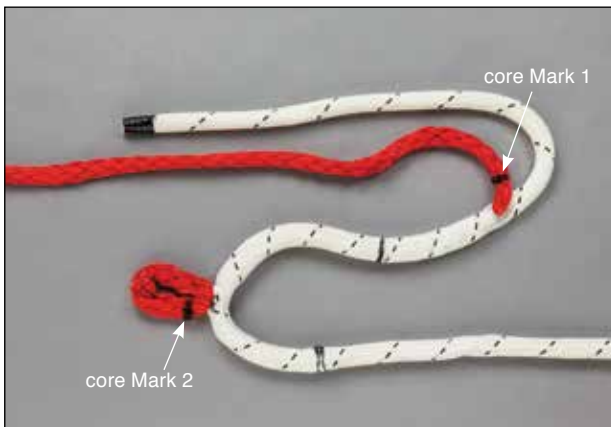
## Step 2 Extracting the Core



**2.1** Open the cover braid at Extraction Point 1 using a large needle, fid or similar tool and pull out the core.

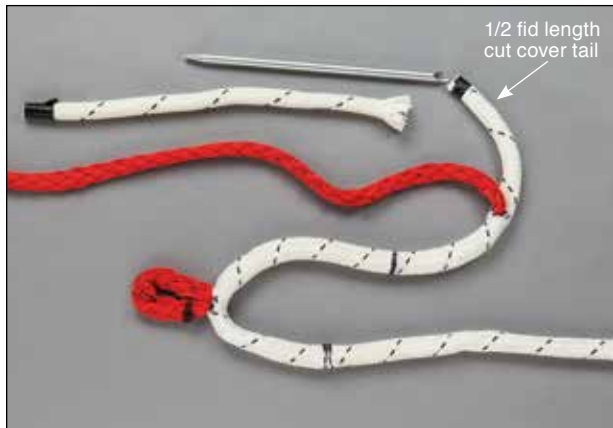


**2.2** At Extraction Point 2 pull out a loop of the core. The core will need to be pulled from the direction of Mark 2.



**2.3** Pull out the exposed sections of the core until the marks made on the core at Marks 1 & 2 are exposed at the Extraction Points.

## Step 3 Splicing the Core and Cover Together



**NOTE:** For sizes 1/4" – 9/16" dia. (6 mm–14 mm) skip to Step 3.4. For larger diameters, continue with step 3.1.

**3.1** Starting at Extraction Point 1, measure 1/2 fid length towards the bitter end of the cover. Cut the end of the cover off at this point. Attach a fid to the end of the cut cover tail.

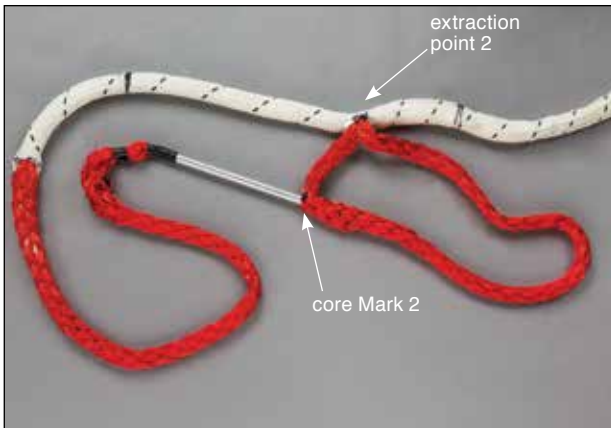
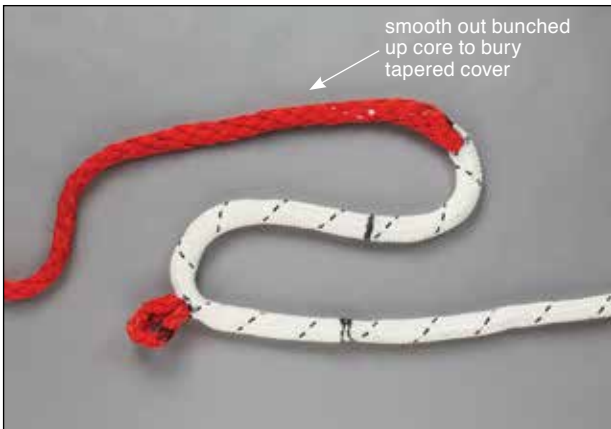


**3.2** Insert the fid at Mark 1 on the core and push the fid through toward the bitter end, exiting the core at a point approximately 2/3 of a fid length down from the insertion point. Pull the fid out of the core exposing the entire fid and as much of the cover tail as possible. This will require bunching up the core back toward Extraction Point 1.

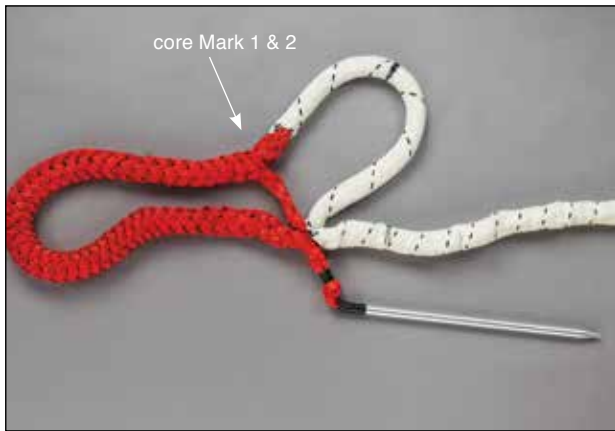




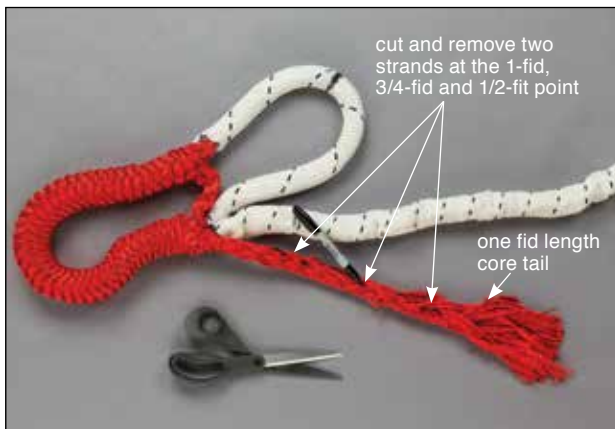
**3.3** Remove the fid from the cover and taper the end of the cover strands. When tapering the cover it is best to divide the strands into four groups and cut the ends of each group at different lengths. Once the cover strands are tapered, smooth out the bunched up section of core to bury the tapered end of the cover back inside the core.



**3.4** At Extraction Point 2, increase the size of the exposed core loop by pulling out additional core from the section of rope leading back to the anchor point. Attach the fid to the bitter end of the core. Once attached, insert the fid at Mark 2 on the core and push the fid toward the anchor point.



**3.5** Continue to insert the fid for a distance of approximately 3 fid lengths toward the anchor point until Core Mark 1 and Core Mark 2 meet. When the core marks are together the fid must be pulled through the cover braid until the entire fid and a one fid length of core are exposed.



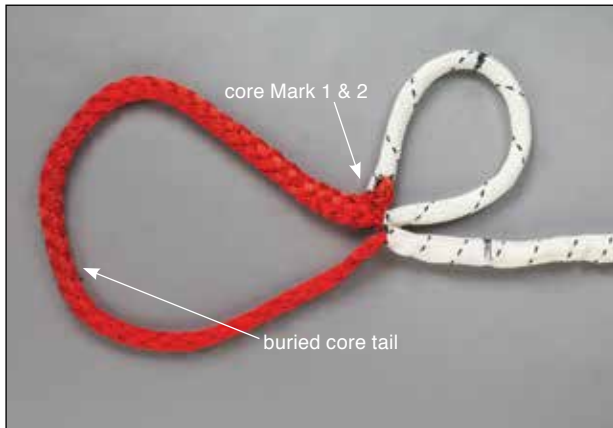
**3.6** Cut and remove a left and right pair of strands at a point 1 fid length from the end of the core. Repeat this process at the 3/4-fid point and the 1/2-fid point. A total of six strands will be cut and removed to taper the core tail.



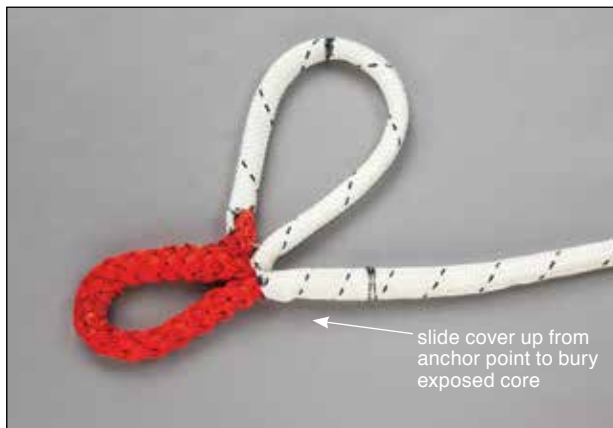
**3.7** Fan out the remaining strands at the end of the core tail and cut them at an angle to complete the taper.



## Step 4 Finishing the Splice



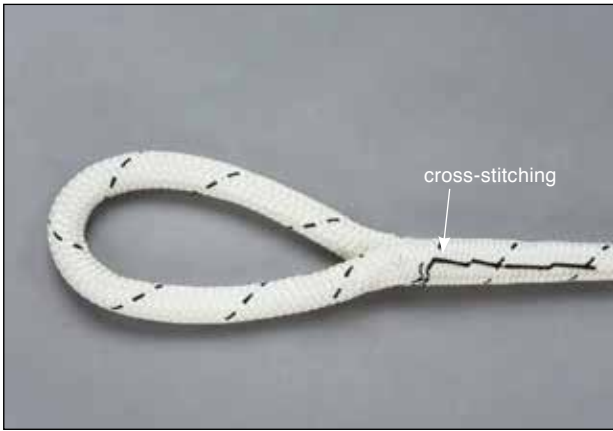
**4.1** Smooth the exposed core from the point where the two core marks coincide toward the anchor point until the tapered end of the core is completely buried.



**4.2** Working from the anchor point, smooth the cover of the rope toward Core Marks 1 & 2 until the entire exposed core is buried inside the cover and the eye is completely formed. A winch or come-along may be used to tension the splice to assist in burying the core.







**NOTE:** For sizes 1/4" dia.–9/16" dia. (6 mm–14 mm), skip to Step 5. For ropes with buried cover tails (5/8" or 16mm dia. and larger) finish the splice as per Step 4.3.

**4.3** After the eye slice is complete, cross-stitching the splice below the base of the eye is recommended.

# Whipping



## Double Braid Whipping

The following steps describe the method used to install a whipping at the base of the completed eye. Whipping with appropriate size nylon twine prevents the eye splice from potentially coming loose when the rope is not under load or when lines are mishandled.



The following tools are required to install the whipping:

- Scissors
- Tape
- Nylon twine

Note: The twine should be at least the same diameter as one of the twisted strands of the cover.

Whipping should be performed on a clean, flat surface.

## Step 5 Install the Whipping



**5.1** Cut rope cover tail diagonally starting at the core entry point at the base of the eye. The length of the cover tail after cutting should be at least 3" (76mm) at its longest point.



**5.2** Tape over the cover braid tail from the base of the eye to the end of the cover tail.



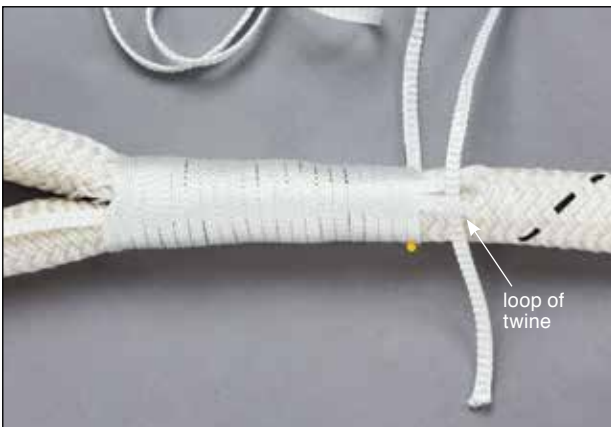
**5.3** Lay a loop of twine along the spliced area of the rope with the loop facing away from the eye. The bitter end of the twine should extend past the base of the eye.



**5.4** Starting at the base of the eye begin to wrap the standing part of the twine tightly over the taped and spliced area of the rope. Avoid gaps between adjacent wraps of the twine. Continue to wrap the twine down to a point just before the loop of twine at the end of the splice.



**5.5** Insert the end of the twine through the exposed loop.





**5.6** Pull the bitter end of the twine until the loop and a length of the standing part of the twine are buried midway through the whipped area. If the whipping needs to be tightened further, both ends of the twine can then be pulled simultaneously.



**5.7** Trim both ends of the twine.



**5.8** Completed whipping.

# 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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