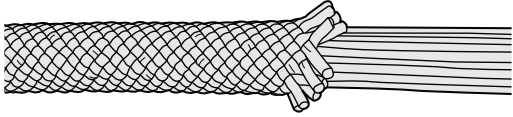
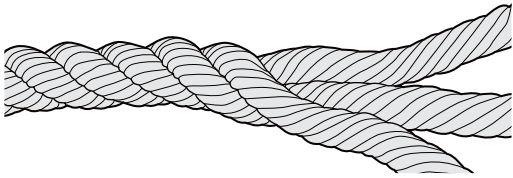


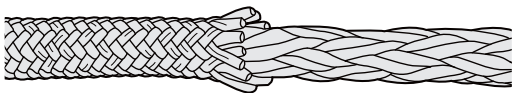
## ROPE CONSTRUCTION



**Kernmantle** - Kernmantle rope consists of twisted parallel fibers (the kern) surrounded by a tightly braided sheath (the mantle). The core fibers provide the majority (about 70%) of the rope's strength. The sheath is tightly braided providing significantly higher abrasion resistance. There are two distinct types of kernmantle: dynamic and static. Dynamic is used for recreational climbing due to its high shock absorption capabilities. Static kernmantle has very low stretch and works well for industrial applications. Due to its construction, it remains round through descent devices and allows minimal twist on the rope. The properties of static kernmantle make it ideal for use as a life line or descent line.



**3-Strand** - 3-Strand ropes are an inexpensive rope option. They tend to have a lower breaking strength than double braid or kernmantle, so a larger diameter must be used to achieve the same strength. Due to their construction, 3-Strand ropes have a tendency to rotate under load and provide less abrasion resistance. These characteristics make it a poor load line. With regard to safety and working at height, 3-Strand is most commonly used as a lifeline due to compliance with OSHA requirements and compatibility with 5/8" rope grabs.



**Double Braid** - Double braided rope is, as the name implies, a braided core surrounded by a braided sheath. The inner and outer braids are generally designed to share the load equally with very low elongation. Double braid rope remains round under tension, imparts no rotational force when loaded and has a soft hand. These characteristics make it ideal for use as a load rope.

## DIAMETER

As ropes get thicker, they get stronger. But there's a misconception that to be as safe as possible you should get the thickest rope available. In reality, your rigging is only as strong as your weakest component. The capstan, shackles, slings, blocks, and rope all must be considered. If you're using a 1,000 pound capstan hoist, most 1/2" Double Braids have an MBS high enough to safely handle the maximum load for the hoist; even with the safety factor, and any loss of strength due to knots, termination plates, or sewn eyes. While a 5/8" rope has a higher breaking strength, it would not matter since the hoist is only capable of lifting 1,000 pounds. Another thing to consider is the sheave diameter of the blocks being used. There are many options which can handle 1/2" synthetic rope, but few exist that are strong enough to justify 5/8" rope.

## INSPECTION

Each time you use your rope, you should perform a visual inspection to ensure it's safe to use. Check for cuts, nicks, burns, excess fraying, flat or uneven spots, burns, harness, glossing, discoloration from sun exposure or chemicals, or inconsistencies in the rope. Refer to the manufacturers recommendations for complete inspection and usage instructions. Use a rope log, like the one available on [www.colsafety.com/learn](http://www.colsafety.com/learn) to keep a complete record of inspections.

Another practice which is becoming more common is individual serial numbers for rope. This permanent label is useful to document when a rope goes into service, as well as track inspections.

**Have additional rope questions?  
Give our Gear Experts® a call!**



## ROPE DIAMETERS

6 mm

7 mm

8 mm

5/16"

9 mm

3/8"

10 mm

11 mm

7/16"

12 mm

1/2"

13 mm

14 mm

15 mm

16 mm

5/8"

17 mm

18 mm

19 mm

3/4"

