5.- Four basic knots



There are countless situations where the rigger will be required to tie a safe and reliable knot or hitch using a fiber rope as part of the rigging operation. Fastening a hook, making eyes for slings, and tying on a tagline are a few of these situations. The fibers in these ropes are either natural or synthetic. Natural fiber ropes should be used cautiously for rigging since their strength is more variable than that of synthetic fiber ropes and they are much more subject to deterioration from rot, mildew, and chemicals.

The following 3 fiber ropes are the most widely used in rigging:

- •Polypropylene
- •Nylon
- •Polyester

Fiber ropes types and uses

Polypropylene:

Is the most common fiber rope used in rigging. It floats but does not absorb water. It stretches less than other synthetic fibers such as nylon. It is affected, however, by the ultraviolet rays in sunlight and should not be left outside for long periods. It also softens with heat and is not recommended for work involving exposure to high heat.

Nylon:

This fiber is remarkable for its strength. A nylon rope is considerably stronger than the same size and construction of polypropylene rope. But nylon stretches and hence is not used much for rigging. It is also more expensive, loses strength when wet, and has low resistance to acids.

Polyester:

This ropes are stronger than polypropylene but not so strong as nylon. They have good resistance to acids, alkalies, and abrasion; do not stretch as much as nylon; resist degradation from ultraviolet rays; and don't soften in heat.

WARNING: All fiber ropes conduct electricity when wet. When dry, however, polypropylene and polyester have much better insulating properties than nylon.









It is critical to know the weight of the material being moved. In order to achieve this, we will learn how to perform area/volume calculations that will allow us to determine the weight.

Weight of the object being moved can be obtained by:

- •Work Package or Engineering Report
- •Load Indicating Device (Dyna)
- •Drawings, Blueprints, Manufacture's Label
- •Hand Calculations



Guidelines for Raising and Lowering Loads by Hand

•Only poly rope, ½ inch minimum size, shall be used for lowering and raising material by hand. Small rope or line, even when strong enough, introduce significantly greater risk of injury to hands and fingers.

•A chain fall or another method shall be used if the risk assessment for the job shows that the load cannot be safely handled by hand. Loads exceeding 50 lbs. should not be lowered or raised by hand without supervisor approval and only if other methods are not possible.

•All knots used in lowering or raising operations shall be checked by another trained rigger prior to use.

4 basic knots, hitches and when to use them

Square (flat) knot:

Can be used for tying two ropes of the same diameter together. It is unsuitable for wet or slippery ropes and should be used with caution since it unties easily when either free end is jerked.

Bowline:

Never jams or slips when properly tied. A universal knot if properly tied and untied. Two interlocking bowlines can be used to join two ropes together. Single bowlines can be used for hoisting or hitching directly around a ring.

Clove hitch:

The Clove Hitch can be used to tie a rope to a cord of a pipe. It is also a good choice when securing cable drops to objects. A Clove Hitch will maintain its grip on a pipe as long as weight is applied. The more weight, the tighter the grip. Once you release the weight, the hitch is easy to loosen and remove.

Half hitch and double hatch hitch:

This type of knot is used to secure rope to a fixed object, like a pipe. The first part of the knot is a round turn, which controls the load and provides friction against the support. This allows you to make the line taught. Two successive half hitches tied around an object makes up the common clove hitch. Two successive half hitches tied around the standing part of a rope is known as two half-hitches or double half hitch.









Knots and Hitches Square (Flat) Knot



Knots and Hitches Bowline

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Knots and Hitches <u>Clove Hitch</u>



Knots and Hitches Half Hitch & Double Half Hitch

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