SECTION 081-511-101
Issue 2, December 1981
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B PLASTIC ROPE

DESCRIPTION AND USE

CONTENTS PAGE

1. GENERAL

1.01 This section covers the description and use of B plastic rope.

1.02 This section is being reissued to show changes to some of the working and breaking strengths, to update packaging information, and to delete reference to Section 649-315-107. Revision arrows are used to emphasize the more significant changes.

1.03 The B plastic rope is light weight and rot resistant and has a high dielectric strength when clean and dry. It can be used satisfactorily as a replacement for manila rope for handlines, aerial pulling lines, blocks and slings, and pulling winch lines in underground ducts.

2. DESCRIPTION

2.01 The B plastic rope is made of continuous monofilament or fibrillated polypropylene fiber and is of three-strand medium (regular) lay construction. ▮It is available in seven sizes: 1/4 inch diameter on reels containing 1200, 1800, or 2400 feet; 3/8 and 1/2 inch diameter on reels containing 1200 feet; 5/8, 3/4, 1, and 1-1/4 inch diameter on reels containig 600 feet. On special request, lengths other than standard are available. The sizes 5/8-inch diameter or larger may be packed in self-dispensing containers or in coils covered with wrapping.◀

2.02 The strength of B plastic rope, relative to manila rope, is such that the safe working strength for any size plastic rope is greater than the same size manila rope. The recommended safe working strengths for new plastic ropes are listed in Table A.

2.03 The elongation of plastic rope at normal working loads is about twice that of manila rope. This is an advantage from the standpoint of absorbing shock loads but can be a disadvantage when winding plastic rope under tension onto a storage or take-up reel. ***When wound under tension, plastic rope develops constricting forces of such magnitude that there is a possibility of collapsing the reel. This possibilty must be considered before deciding to use plastic rope on any pulling-in operation.***

3. PRECAUTIONS

3.01 All safety precautions covered in Section 081-510-101 are applicable to the use of plastic rope and must be observed.

3.02 Since plastic rope has a higher coefficient of friction than manila rope and melts at approximately 325°F, it should not be used on stationary capstans or near open flames or heated objects that could melt or damage the rope.

3.03 Dielectrically there is little difference in wet plastic or manila rope. The precautions required when using manila rope should be exercised

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TABLE A

B PLASTIC ROPE

SIZE (DIAMETER) (IN.)	MINIMUM BREAKING STRENGTH (POUNDS)	SAFE WORKING STRENGTH (POUNDS) (SEE NOTE)
1/4	1,250	350
3/8	2,700	700
1/2	4,200	1200
5/8	6,200	1600
3/4	8,500	2200
1	14,000	3700
1-1/4	21,000	5500

Note: A splice in a rope has approximately 85 percent of the strength of the rope.

with plastic rope when working on joint-use pole lines.

4. TYING AND SPLICING PLASTIC ROPE

4.01 Knots, hitches, and splices described in Section 081-510-101 are satisfactory for plastic rope with the exception of the square knot, eye splice, and short straight splice.

MODIFIED SQUARE KNOT FOR PLASTIC ROPE

4.02 A modified square knot, made by taking an extra turn in the rope ends, is satisfactory for use with plastic rope. The method of tying the knot is illustrated in Fig. 1.

SPLICING PLASTIC ROPE

4.03 The recommended method of making an eye splice in plastic rope is to use 3 full tucks and 2 split tucks. The split tucks are made by cutting away one-half of each strand after the 3 full tucks have been made and continuing the 2 tucks with each of the half strands. This method is illustrated in Fig. 2.

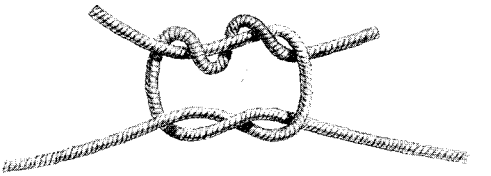


Fig. 1—Modified Square Knot

4.04 The recommended method of making a short straight splice in plastic rope is to use the 3 full tucks and 2 split tucks in a manner similar to that used for the eye splice. This method is illustrated in Fig. 3.

5. INSPECTION

5.01 The strength of plastic rope may be reduced as a result of:

(a) ***Overstressing:*** Rope may lose its strength if overloaded or subjected to sudden stresses.

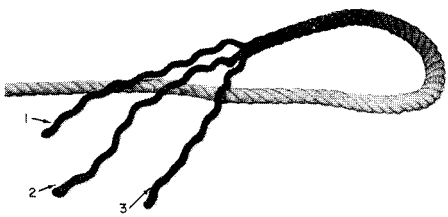
(b) ***Internal Friction:*** Working ropes over sheaves which are too small or running rope around too small an object causes internal friction which can damage the internal fibers.

(c) ***External Wear:*** Dragging rope over rough or sharp surfaces or over itself will damage external fibers. Since plastic rope is more susceptible to abrasion than manila rope, extra care should be taken to avoid situations that could damage external fibers.

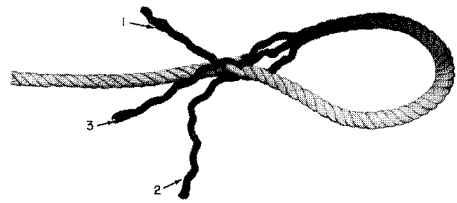
(d) ***Mud, Sand, and Dust:*** Hauling rope through mud, sand, or dust will cause fine particles of grit to work between the fibers and grind them into a fine powder.

(e) ***Chemicals:*** Plastic rope is resistant to most chemicals; however, some acids and oils can have an injurious effect on the fibers.

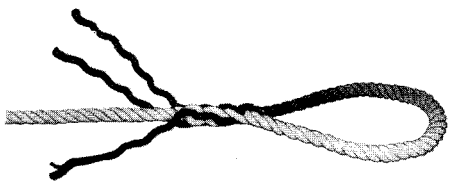
* NOTE:
ROPE IS NORMALLY SINGLE COLOR. IT IS SHOWN HERE AS TWO COLOR FOR THE PURPOSE OF CLEARLY ILLUSTRATING THE SPLICE.



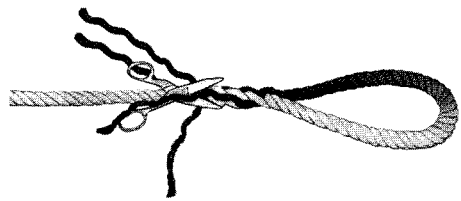
A- UNTWIST THE STRANDS 1,2,3 AND FORM A BIGHT. *



B- SELECT STRAND 2 AND TUCK IT UNDER STRAND OF MAIN ROPE. TUCK 1 UNDER ADJOINING STRAND AND 3 UNDER REMAINING STRAND. *



C- PULL ENDS DOWN TIGHT AND COMPLETE 3 TUCKS WITH EACH STRAND. *

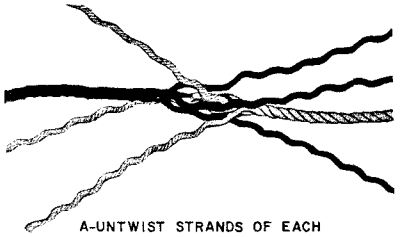


D- CUT AWAY ONE HALF OF EACH STRAND AND COMPLETE TWO TUCKS WITH REMAINING HALF OF EACH STRAND. *

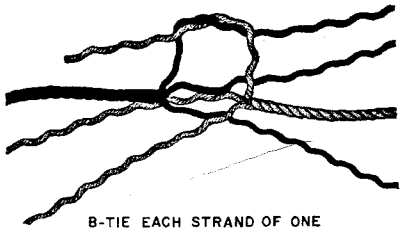
E- AFTER COMPLETING TWO HALF TUCKS, ROLL SPLICE BETWEEN TWO FLAT SURFACES AND TRIM SURPLUS ENDS. *

F- COMPLETED SPLICE SHOULD BE FIRM WITH NO LOOSE TUCKS. *

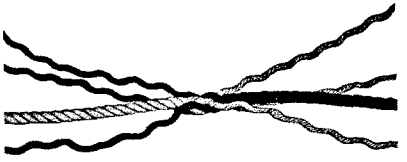
Fig. 2—Eye Splice—B Plastic Rope



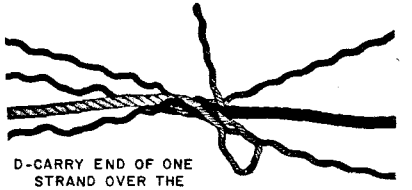
A-UNTWIST STRANDS OF EACH ROPE AND BUTT THE ENDS. LAY STRANDS OF ONE ROPE ALTERNATELY BETWEEN STRANDS OF OTHER ROPE.



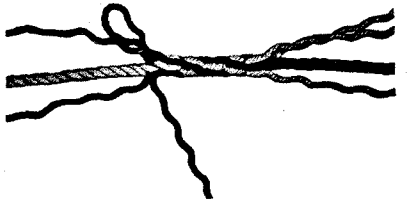
B-TIE EACH STRAND OF ONE ROPE TO CORRESPONDING STRAND OF OTHER ROPE WITH AN OVERHAND KNOT.



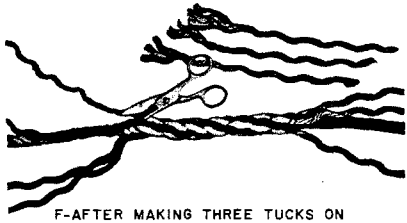
C-PULL OVERHAND KNOTS TIGHT.



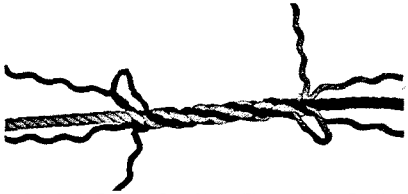
D-CARRY END OF ONE STRAND OVER THE ADJACENT STRAND AND TUCK IT UNDER THE NEXT STRAND. PROCEED TO SUCCESSIVE STRANDS IN ORDER UNTIL THREE TUCKS HAVE BEEN MADE WITH EACH STRAND.



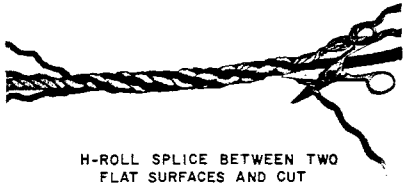
E-AFTER COMPLETION OF THREE TUCKS ON ONE END OF SPLICE, FOLLOW THE SAME PROCEDURE FOR OTHER END OF SPLICE.



F-AFTER MAKING THREE TUCKS ON EACH END OF SPLICE, SEPARATE STRAND AND CUT AWAY HALF OF EACH STRAND.



G-MAKE TWO ADDITIONAL TUCKS WITH EACH HALF STRAND ON EACH END OF SPLICE.



H-ROLL SPLICE BETWEEN TWO FLAT SURFACES AND CUT OFF EXCESS STRAND.

I-COMPLETED SPLICE SHOULD BE FIRM WITH NO LOOSE TUCKS.

Fig. 3—Short Straight Splice—B Plastic Rope

(f) ***Broken, Cut, or Compressed Fibers:*** Misalignment of tackle or kinks may cause broken or cut fibers. Kinks can cause a rope to break under moderate tension. Contact with sharp tools or other edges or being run over by vehicles or other equipment can damage fibers.

5.02 Each employee shall be responsible for determining that rope in his possession is in good condition. The surface of the rope should be examined once each week. Once each month the rope should be inspected to determine its internal condition.

5.03 Ropes that are not in the possession of any one employee should be inspected frequently; each time they are used it should be determined that they are in good condition.

5.04 If upon inspecting a rope, a condition is found that raises any doubt as to its being safe to use, exchange the rope for one in good condition in accordance with local routine.

5.05 To inspect the surface of a rope, examine the entire length of the rope for:

(a) Abrasions or excessive number of broken fibers

(b) Cuts

(c) Soft or unusually flexible areas

(d) Burned or melted fibers (caused by a hot substance, chemical action, or friction).

5.06 To inspect a rope to determine its internal condition, separate the strands at three-foot intervals and at any areas that look or feel suspicious and examine the part for:

(a) Broken fibers

(b) Fine powder (indicates the presence of grit).

6. STORING AND TRANSPORTING PLASTIC ROPE

6.01 New rope should be left on the shipping reel until it is required for use. Do not store plastic rope near radiators, stoves, steampipes, or in any place where the rope may be subjected to excessive heat.

6.02 Even though plastic rope is reasonably impervious to moisture, it should not be stored when wet. Hang wet rope in loose coils to allow free circulation of air and allow the rope to dry completely before storing.

6.03 When transporting plastic rope it should be hung on brackets provided for this purpose or wound, with a minimum of tension, on a storage reel. Never transport coils of rope on the floor of a truck or in truck compartments that contain sharp edged tools.

6.04 Do not store B plastic rope outdoors where it is exposed to weather.