

# Rope splicing

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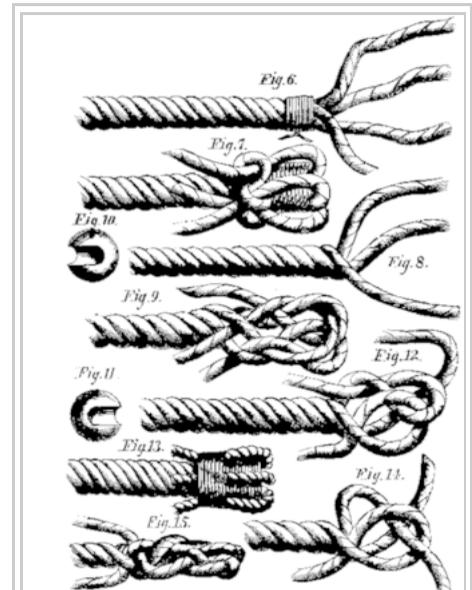
**Rope splicing** in ropework is the forming of a semi-permanent joint between two ropes or two parts of the same rope by partly untwisting and then interweaving their strands. Splices can be used to form a stopper at the end of a line, to form a loop or an eye in a rope, or for joining two ropes together.<sup>[1]</sup> Splices are preferred to knotted rope, since while a knot typically reduces the strength by 20–40%,<sup>[2]</sup> a splice is capable of attaining a rope's full strength.<sup>[3]</sup> However, splicing usually results in a thickening of the line and, if subsequently removed, leaves a distortion of the rope. Most types of splices are used on 3-strand rope, but some can be done on 12-strand or greater single-braided rope, as well as most double braids.

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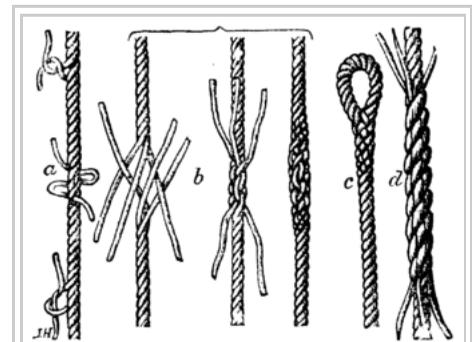
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## Types of splices

- **back splice** (also called an **end splice**) – A splice where the strands of the end of the rope are spliced directly back into the end without forming a loop. It is used to finish off the end of the rope to keep it from fraying. The end of the rope with the splice is about twice the thickness of the rest of the rope. With nylon and other plastic materials, the back splice is often no longer used; the rope strands are simply fused together with heat to prevent fraying.<sup>[4]</sup>
- **cut splice** (originally called **cunt splice**) – A splice similar to the eye splice. It is typically used for light lines (e.g., the log-line) where a single splice would tend to come undone, the rope being frequently wet.<sup>[5]</sup> It makes a very strong knot. A cut splice is a join between two ropes, made by side splicing the ends slightly apart, to make an eye in the joined rope which lies shut when the rope is taut. Its original name was bowdlerised to "cut splice".
- **eye splice** – A splice where the working end is spliced into the working part forming a loop.

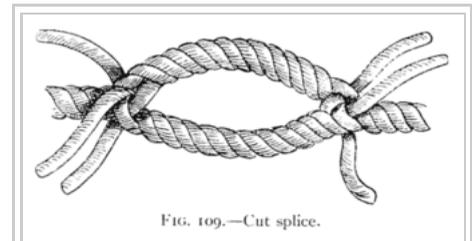


Stages in splicing the end of a rope, from *Scientific American*, 1871



Examples of splices in different stages of completion, from the *Nordisk familjebok*: a) long splice b) tapered short splice c) eye splice d) short splice

- **ring splice** – Attached the working end of a rope to a ring or clew.<sup>[6]</sup>
- **chain splice** – Attached the working end of a rope to a chain.<sup>[7]</sup>
- **figure-eight "splice" knot**- A splice-like bend knot used for joining two ropes.
- **horseshoe splice** – A cut splice where the two sides of the loop are of unequal length.
- **long splice** – A **splice** used to join two rope ends forming one rope the length of the total of the two ropes. The long splice, unlike most splice types, results in a splice that is only very slightly thicker than the rope without the splice, but sacrifices some of the strength of the short splice. It does this by replacing two of the strands of each rope end with those from the other, and cutting off some of the extra strands that result. The long splice allows the spliced rope to still fit through the same pulleys, which is necessary in some applications.<sup>[8]</sup>
- **short splice** – Also a splice used to join the ends of two ropes, but the short splice is more similar to the technique used in other splices and results in the spliced part being about twice as thick as the non spliced part, and has greater strength than the long splice. The short splice retains more of the rope strength than any knots that join rope ends.<sup>[9]</sup>
- **Soft shackle** – Dyneema soft shackles are strong, light and safe and are increasingly replacing stainless steel shackles.



An unfinished cut splice



A line eye-spliced to a snap shackle.



A short splice, with ends whipped

[10]

Splices are often **tapered** to make the thicker splice blend into the rest of the line. There are two main types of tapering, the standard and the "West Coast Taper".

- **Standard tapers** progressively remove a portion of each remaining strand—one-third at a time is typical, resulting in a taper of two additional tucks beyond the splice—thus making each successive tuck produce a narrower splice. This is only practical with laid-lines, i.e., those made up of numerous strands laid side by side.
- **West Coast taper** (also known as a Fisherman's Taper) is effected by extra-tucks of entire strands, such that the second strand is interweaved one more time than the first and the third is interweaved an additional time after the second.

## Splicing tools

A fid is a hand tool made from wood, plastic, or bone and is used in the process of working with rope. A variety of fid diameters are available depending on the size of rope being used. Styles of fid designs include:<sup>[11]</sup>

- **Swedish fid** is conical instrument with a somewhat long taper.
- **Tubular fid** aid in splicing double-braided rope.

- **Uni-fid** needed to splice braid with a parallel core.

A Marlinspike is a tool, usually made of steel and often part of a sailor's pocketknife, which is used to separate strands of rope from one another. They can range in size anywhere from 3 inches to 5 feet long, with a round or flattened point.<sup>[12]</sup>

A pulling fid is often used for smaller diameters of braided ropes. Also a Softfid is a great tool when dealing with tightly braided ropes.

## See also

- Eye splice
- Whipping knot
- Western Union splice
- Nicopress Swaged Sleeve
- T-splice
- Talurit swaged sleeve
- Rat-tail splice



## References

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## External links

- David Steel, *Explanation of the terms used in rigging* (1794) ([http://www.bruzelius.info/Nautica/Etymology/English/Steel\(1794\)\\_p161.html](http://www.bruzelius.info/Nautica/Etymology/English/Steel(1794)_p161.html)), *The Maritime History Virtual Archives*
- A. Hyatt Verrill, *Knots, Splices and Rope Work* (<http://www.gutenberg.org/etext/13510>) from Project Gutenberg
- Eye splice instruction with braided rope (<http://www.ropeloft.co.uk/demo1.htm>), *ropeloft.co.uk*
- Grog's Rope Splicing (<http://www.animatedknots.com/indexsplicing.php?LogoImage=LogoGrog.png&Website=www.animatedknots.com#ScrollPoint>), *Animated Knots by Grog*
- Teufelberger Splicing Guides (<http://www.teufelberger.com/index.php?id=1263>)
- PremiumRopes Rope Splicing Instruction Videos (<http://www.premiumropes.com/splicing-rope/splicing-instruction-videos>)

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