

Splicing and why we are reluctant to show people how to do it.

Or

Splicing, tell me something technical about it.

First off, go grab a beer. There is a bit of length to this and hopefully it's interesting enough to keep you awake but it may be thirsty work.

This article is written with the average Joe in mind so it doesn't get super deep into the technical and we have tried to word it without using a pile of techno jargon. So it is a basic over view only rather than a highly in depth and probably dead boring technical paper. Using the big words is not really that exciting unless you have a lot of 'rope geek' in you.

We have concentrated on the 2 most common base splices rather than flood you with them all, that would just play with heads a bit much we think. Happy to chat if you want to get real technical though.

So just why are we reluctant to show people how to splice braids?

Basically we see too many people using the wrong splice on the wrong rope and in doing so unintentionally leaving himself or herself open to serious harm to person, boat or whatever. With the growth in differing materials and constructions it is now more important than ever to make sure you know exactly what it is you want to splice. From there you can then use the correct splice for the rope.

Let us expand on that a bit further with this little example.

Below is a photo showing 10 different braids. All are generically called 'Braids', which they all are, but calling a rope a 'braid' is like saying anything with 4 wheels is 'car'. There are lots and many important differences inside that blanket term 'braid'.

As there are many assorted braids there has to be many differing methods of splicing them to achieve the best strength or to even get a finished splice with some of the serious ones. In the below section, to splice all those ropes correctly to retain strength you would need to use a minimum of 4 different splices. Within that 4 is a sub group of 2. By that we mean there is 4 base splices but with a couple of the ropes there are variations inside 2 of the base splices depending on end use. So it's quite possible you would need 6 different splices to ensure minimal strength lose in those 10 braids below.

And as we are sometimes called pricks, often for valid reasons, we have included 2 ropes below that you can't or don't actually splice. One of those 2 ropes you can splice but the people who don't will probably live a lot longer than those who do, it's very specific use rope. Can you pick which of the 10 those 2 are?



Why so many differing splices?

Simple, differing materials and or constructions meaning differing treatment is required to ensure full strengths and reliability.

An example of a very common mistake we see – In the above rope selection is your bog standard polyester cored polyester covered braid, often referred to as 'yachting braid'. This is the common rope found on many boats for example. A yachting braid is what is called a cover-core dependant rope meaning the loads are taken equally by the cover and the core, roughly 50% of the load by each. To splice that rope you do a simple 'cover to core' splice. This mean the cover is spliced into the core, core into cover and the resulting splice retains near full strength, if done correctly.

In the above selection there are also some core-dependant ropes. With these the cover is mainly just a combination of appearance (giving colour choices if required maybe), protection (from UV and boat parts for example) and in some situations for handling as many of the newer flash fibres are slippery as a politician in an election year, in the odd case slipperier, if that is indeed possible.

With core-dependant ropes all the strength is in the core only so if you did a 'cover to core' splice like a normal yachting braid you have just wasted a pile of coin on the fancy core and reduced the ropes strength massively. The correct splice to use to retain maximum strength is a 'core to core' splice. This is one where the core is spliced back into itself and the cover is tucked in just for 'pretty' and has next to no strength input.

We say 'next to no strength input' as even though it will have a little it is only a very small amount, certainly not enough to be counted in the finished result unless you are a top end TP52, Open60 or R930's for example.

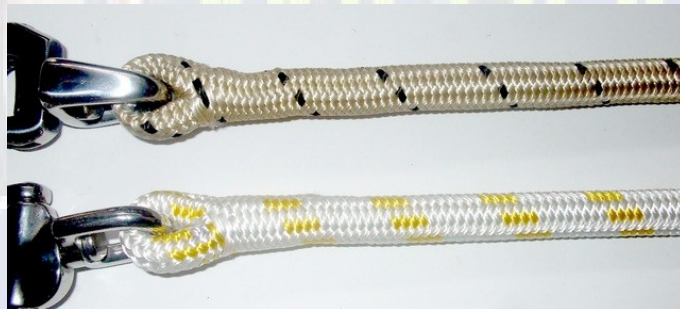
BUT and this is the BUT that worries us, we see more and more core dependant ropes being spliced using the same technique, this is WRONG. Words in big as it could be lethal to get it wrong in some situations.

To demonstrate strengths of a spliced rope using a 10mm as an example –
10mm cover and core dependant rope, the 'yachting braid' – approx 2500 kilo break load
10mm Yachting Braid with a 'cover to core' splice – approx 2200 kilo break load.

10mm core dependant rope and we'll use a Dyneema SK75 cored for the example – approx. 4300 kilos
10mm cored rope with a 'core to core' splice – approx. 3800 kilos break load
But a 10mm Dyneema cored rope with a 'cover to core' splice – approx. 1000 kilos break load and that is if you have done a bloody good splice, often it would be less than that, sometimes a LOT LESS.

So you can see it's not hard to get a flash rope and then basically throw the goodness of that clean out the porthole by doing the wrong splice if you don't know your rope.

And to make it all a little more tricky. One of the below is a Cover to Core and the other is a Core to Core splice. Nothing jumps out at you to say which is which does it.



They can look exactly the same and usually do.

A quick note about rope loads here – 98% of ropes are tested brand new in a dry clean factory by using a slowish pull, so quite unlike what you'll be doing to the rope when your boom is thrashing around at 3am in 40 knots 20 miles off the Taranaki Coast with a 4-year-old rope trying to control the madness.

There is also not really a standardised system between manufacturers for testing a lot of ropes, with some types like climbing ropes there is, so it is common to see quite a variance in loads between what are basically the same rope just from differing manufacturers. Some publish the 'minimum' loads they get, some publish 'the maximum ever seen', some use an average from new to some that has been used for 6 months and some use other methods. Also some manufacturers publish loads that include a termination i.e. a splice on the end but most manufacturers don't.

So when comparing ropes just going on break loads alone might not be the best idea unless you know exactly how that number was achieved, you may pick an optimistic rope load when in fact the pessimistic rope load may actually be a stronger choice.

Basically as most ropes are made on the same or very similar machines with raw product, most mainly from only a couple of big suppliers, most ropes of a similar size and type should be very similar in loads. There is a few processes some rope manufacturers use to tweak this and that which will have a bearing on end strength but generally the strength variances won't be huge.

If you run into a rope that is far stronger than similar sized ones from other manufacturers it probably will be a different in physical attributes like being a lot firmer and/or stiffer and be more nasty to splice.

And don't forget a splice does reduce strength, as does any fondling of the rope. As a general rule, allow a strength loss of 15% for a good splice. Often it will be less than that but giving yourself a little wiggle room isn't a bad thing.

For a knot work on 50% lose. Some knots in some ropes are less than that but in many common, especially the new flasher fibres, 50% lose is what you do get, on occasions even more. A good splice is, 99.9% of the time, far stronger than a good knot.

You also need to know the differing Core constructions

Braid core construction is how the rope made when talking the inside 'core'. You have to know that before deciding which splice to use. That is very important and a 'must know'.

Here are those same ropes again but this time showing the cores



As you can see there is a range of types hiding under those 'all look pretty much the same' covers or 'jackets' as they can also be called.

Splice **A** just like you normally would splice **B** next to it and someone could very easily die. It's that simple so don't even think about going there. Splice **B** the same way you normally would splice **A** and it would be great but you have just totally wasted an hour or more of your time for no benefit.

Splice **D** just like you normally would **E** and everything will be fine BUT splice **E** the same way you normally would **D** and you have thrown a lot of money away and possibly but yourself in danger due to a dramatic strength reduction.

Now some many have noticed with **D** and **E** the covers look the same but only because they are, colour excluded. And although the photo doesn't show it that well, both cores look identical in construction, again only because they are. So if the cover and core are made the same way, why do you need differing splices? That, dear viewers, is yet another trick bit you need to know, more on that shortly.

Splice **H** like you would **G** and you would be legend as it would be nearly impossible.

And you can't splice **I** anything like you splice any of the rest.

And if you are thinking you would splice **A**, **F**, **H** and **J**, yes you can but we wouldn't as you are playing with ropes that have very specific uses, Industry standards to adhere to and Codes of Practice to comply with. Even while those 4 look the same they are specifically made for quite specific and differing uses.

Actually you would have to be bloody good to splice those 4 the same anyway as they have quite different 'cover core ratios'. Ya What? We hear you say.

'Cover Core Ratios' are the amount of cover to the amount of core. In a standard yachting braid this is roughly 50/50. But that can vary quite a bit according to the ropes intended purpose.

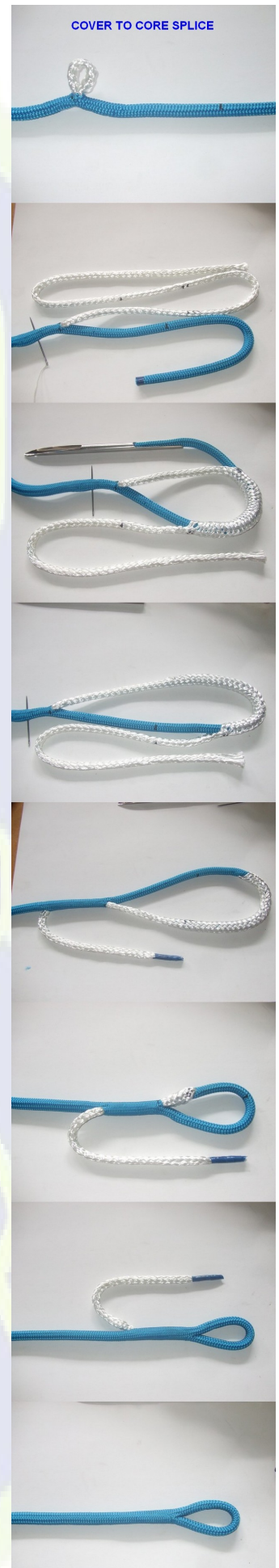
As an example of that rope **A** has a relatively small cover and a lot more core. Then we'll pick a rope that looks the same so we'll say rope **H**. Rope **H** has a relatively small core and a lot more cover. The photo doesn't show the core-core ratios at all well but if you look at ropes **A** and **H** you can see the protruding cores are quite different in size yet both ropes are the same size, well not quite as there is actually 0.5mm difference to be precise.

So knowing the core construction is very important.

So now I know what the core construction is am I good to go?

Nope, but one more key point to suss and you're all but there.

We'll continue with the ropes **D** and **E** example. So if they are constructed identically why can't I use the same splice?



Very simple answer to that, they are made using fibres made from differing raw materials. One is a polyester cover over a polyester core so a cover-core dependant braid where the one next to it is a polyester cover over a Dyneema core so that makes it a core dependant braid. As we have learnt already that means 2 different splices need to be used to ensure strength and safety of each rope.

Generally most fibres are reasonable easy to identify if you have a little knowledge or have been told what to look for but it is highly important you do know which is which. As a general rule most of the newer fibres like Dyneema, Spectra, Vectran and others like that use very similar splices, if not the same, so that is at least one good thing.

Also many manufacturers tend to roughly follow the same lines and have a single black fleck to denote Dyneema or Spectra, some use a grey one to show it as a Vectran. BUT DO NOT rely on them all having that or even if a rope has that, it being a fancy cored rope. As shown just above with the **D** and **E** examples they could look exactly the same from the outside. Yes we are bastards and picked 2 rope that look the same for the example, it does push the point well though don't you think.

So another factor to consider before roaring into any splice. What material/s is the braid made from?

Other bits and bobs relevant.

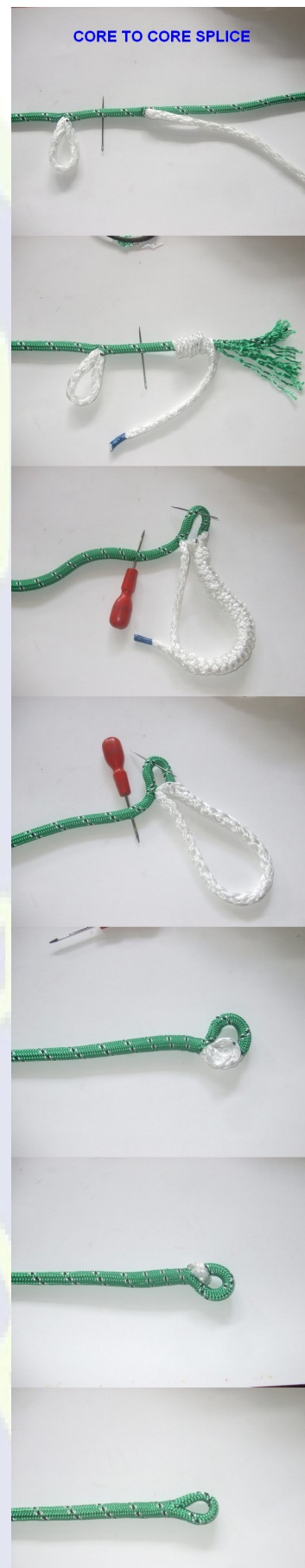
All good having a go but splicing is a bit of an art. To make a splice look good is reasonably easy but to make it look good and retain full strength is a little trickier than many think. We have people in watching us from time to time and a common comment heard is 'Oh I didn't realise you had to do all of that, I just thought you.....!'. The people who splices well usually do it day in day out which can make it look very easy. But as they do it all day they are well aware of what it is they are working on and how to treat it in the right fashion. Most pro splicers also do it in a fraction of the time an 'occasional' splicer would. We have had more than a couple of people in saying 'can you finish this splice please as I've spend 4 hours on it already'. A good splicer would have done a pile of splices, had lunch and done the weekends rugby picks in that same time frame.

The reason a Pro does it so quick is they are well practised, know what they are splicing and know the tricks of the trade. There are more than a few tricks the Pros use that aren't on the interweb or easily found places. It is usually one of these small tricks that make it look so much easier than it can be and often is. All just part of the joy of being a professional rope wrangler.

Summery -

So to be able to splice a braid first you **must** be able to recognise just how it is made and from what materials and for what purpose. Once you know those you can select the best splice for the rope to ensure the finished splice retains maximum strength, you conform with Industry standards, conform with Codes of Practice many industries now have and you don't cock-up leaving a potentially nasty situation for people and gear. Not to mention making it look good. A poor looking splice makes people nervous and often for good reasons.

As all the above is a big hurdle for most it is one of the main reasons we are reluctant to show people how to do it. It would be like a motor mechanic showing someone who can't tell a diesel from a petrol motor how to do a service on it, a disaster just waiting to happen if they picked the wrong one.



Now the fun bit if you're up for it.

Just what are the ropes shown in the below photo? Have a crack and feel free to email us what you think. We'll happily tell you just how good or bad your guesses are.

A few clues to help you:

- One braid in the photo is not splice able at all and is actually just a very high tech protection cover with a mouse line inside.
- One can be spliced if you are good enough but industry standards and the Code of Practice generally means no one does splice it. In common use this rope is only knotted, using very flash specific knots though.
- One is a Static climbing rope
- One is a Dynamic climbing rope
- Two are specifically aimed at Arbourists (the dudes who chop trees around. Not the ones who cut them down, those are called Lumberjacks and they're OK)
- Three have flash fibre cores (admittedly that is very hard to tell in the photo)
- Only 2 are commonly referred to as standard 'Yachting Braid'.
- Three are made in Germany, one in the US, one in Aussie, the rest in NZ.
- All but three have full polyester only covers. One has Polyester and Vectran. One is a Zylon/Vectran with a hint of polyester for colour combos and the third is Nylon.
- All materials below are Polyester, Nylon, Vectran, Zylon (PBO) or Dyneema.



Answers to - info@chainsropesandanchors.co.nz

Fine Print -

This article was written in a non-technical manner on purpose. In no way does it try to explain everything required in depth or completely. While it may refer to Laws or similar in no way would we suggest using it to tell a Court it is wrong, we think you'll lose and do so badly if you try. No professional or amateur splicers were physically hurt in the writing of this article.

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