

The SHOCK of the OLD

Part 20: Pulling Strings

Learning the ropes is harder these days; Moray MacPhail is here to help.

So far we have a hull with a number of well-configured and attached spars – which is a fine thing but won't get you very far. Now to add sails with their associated ropes and attachments. I subscribe to the view that sailing boats benefit from the process of evolution so it makes sense to make best use of materials both ancient and modern to rig your craft. Let's start with ropes.

HMPE

We looked at using Dyneema and Spectra – two trade names of HMPE, high modulus polyethylene fibre – for standing rigging in W152. To recap, it comes in three main varieties:

- A braided rope usually made from 12 strands of HMPE which form a kind of tube. It looks a bit like pyjama



cord and is characterised by being so light it floats, very strong, low stretch, and happy to bend without much loss of strength. It is also slippery, so most normal knots don't work very well and it doesn't stay put in clutches and jammers. The slipperiness also means that it has to be carefully spliced – though the tube construction makes splicing pretty straightforward. It is not very good at resisting abrasion, so leads and fittings must be very smooth. I'll call this 'braided HMPE'.

- You can also get it with a braided polyester outer jacket. For reasons best known to rope makers, this has mostly been available in such vile colours that Classic Marine asked English Braids for a cruising version in the much more respectable beige seen below here. To make sure the jacket is compatible



Above: New favourites: from left to right, hemp, polypropylene and polyester.
Below: 'Normal' nowadays: braided polyester in a variety of colours and finishes



with the inner core, the polyester outer needs to be woven very tight and hard. This variant is gripped well by winches, jammers and clutches. Personally I find it unpleasant to handle without gloves. This is usually referred to as 'racing HMPE' or similar.

- One of the main snags with racing HMPE ropes – aside from the feel – is the cost. To alleviate this while retaining the low weight and stretch properties of the fibre, ropes usually referred to as something like 'cruising HMPE' have been developed which have a centre core of HMPE packed out with polypropylene and then jacketed with polyester. It is halfway between racing HMPE and braid-on-braid polyester coming next...

Polyester-based ropes

Also known as Terylene in the UK or Dacron, in the US, polyester is the stuff from which most 'ordinary' rope and line is made. It is resistant to rot and ultra-violet – UV- degradation, sinks in water and comes in a variety of constructions:

- Three-strand pre-stretched can be spliced in the normal fashion, though it is a good idea to use 4 or 5 tucks instead of the 3 used in natural fibre ropes. The 'pre-stretch' refers to an extra tweak imparted during the making of the rope which makes it more suitable for halyards

and bell ropes – can you imagine the cacophony which would result from using stretchy bell ropes? The snag with this construction is that it can kink, so it's unusual to use it as a sheet, and its tendency to twist can cause problems when used as a halyard. For years now a buff coloured 3-strand polyester rope has been available for traditional boats.

- Plaited pre-stretched comes in all sizes from $\frac{1}{32}$ " (about 1mm) upwards but is not usually used much above $\frac{5}{16}$ " (8mm) when braided rope – see below – takes over. This is well behaved, and finds use as lacings in the smaller sizes and halyards in the larger. But it can't be readily spliced – so you knot or seize it.

- Braided rope is the stuff most widely used for sheets.. Available in a variety of constructions and outer finishes, it starts at about $\frac{3}{16}$ " (5mm). The most common is a braided outer on a braid core, referred to as braid-on-braid. You can splice it with some practice – though I have never got the hang of it – but each manufacturer uses a slightly different construction, so you need to follow the instructions appropriate to that rope. As with the 3-strand polyester, there are plain buff versions of this type of rope.

The list of other man-made rope materials should start with...

Polypropylene

Slightly more stretchy than polyester, polypropylene floats in water and under UV it degrades over time. It tends to come in 3-strand form – except ski/ rescue ropes which are braided – and the main variation is the way in which the material is incorporated into the rope. I don't claim to understand the process, but can give some feel for the results.

- Staple spun poly-prop is the hairy cheap stuff you can get in blue, orange or white and which is seen on farms, fishing boats and building sites. Except for moorings it's not often seen in a yachting environment.



Above: Plaited polypropylene twines, popular for decorative ropework.

- Mono/multifilament poly-prop is deceptively like polyester but it does degrade over time and can melt if surged round a mooring post. How to tell one from the other? Chuck it into the water, holding on to one end! If it floats it's poly-prop. It's not a bad rope, but be aware of its limitations, and keep looking for the brittleness which comes with age – like splinters which appear on the outer fibres.

- Hemp-style ropes are now cheaper than the natural ropes they replace and are better behaved and longer lasting. They are available in both 3-strand and braided construction. You can have a soft finish, which looks well when new, but is rather

stretchy, not particularly long-lived, yet more comfortable for sheets. The harder finished varieties like Spunflex look rather shiny when new but last longer, typically 10-15 years, stretch much less and are cheaper.

Nylon

Nylon is very stretchy and so is useful for anchor ropes and towing lines. Its stretchiness makes it very good at storing energy but if it breaks that energy is released extremely quickly. I have seen a 2" (50mm) nylon hawser part. As it snaked up the side deck of a mine-sweeper, it put two men in hospital and wrecked guard-rails, an inflatable boat and a host of



Old favourites! Above: left to right, sisal, hemp and cotton. Below: Coir is the natural fibre rope most widely used for fenders.

minor fittings. Mountaineers like the stretchiness; should they fall, other less elastic ropes might stop them – literally – dead.

Natural Fibre Ropes

There are many types of natural fibre ropes, occasionally used in boats but much more often in non-marine roles. Unlike synthetic ropes, the nature of the material means that the ropes do vary from batch to batch. They all rot over time, so need to be checked if used outside. Here is just a flavour of the types available, see the references at the end for a proper treatment.

- **Coir:** Made from coconut fibre, *cocus nucifera*, it's not very strong but is very stretchy. Coir fibre traditionally has many uses, including carpets, doormats, upholstery stuffing and brushes. As a rope it can also be used with animals and agricultural work. Its main use in a marine environment is as fendering for boats.

- **Cotton** is very soft and pleasing to the touch. It is naturally white, unbleached and can be readily dyed. Traditionally used for narrowboat ropework and for livestock halters.

- **Hemp** Produced from the stalk of *cannabis sativa*, this was the rope material of choice for millennia. It's lovely to work with and ideal for traditional ropework, as well as in gyms and theatres, due to the reduced risk of friction burns.

- **Manila** As strong as hemp, with less tendency to rot, this rope from the *musa textilis* plant was very popular before the advent of man-made fibres. A fairly coarse rope, manila is the landscape gardener's rope of choice but can also be used in construction and agricultural work. It weathers from an initial brown to an agreeable brown/grey.

- **Sisal** Cream in colour but more even in construction than manila, sisal is often used with pets and animals, as well as garden projects. Made from the leaves of the cactus-like *agave sisalana*, this makes a low cost natural fibre rope though not particularly strong or rot-proof.

Natural fibre ropes used to be the choice of impoverished sailors but

so little is made today that even that advantage has gone. Coir is still used for fenders and decorative ropework but it is hard to justify its use in a marine setting. And the same is true for all the other natural fibre ropes. Next time we'll see how these ropes perform in practice.

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Recommended reading

The Complete Rigger's Apprentice: Tools and Techniques for Modern and Traditional Rigging, Second Edition – Brion Toss – ISBN 0071849785
The Marlinspike Sailor – Hervey Garret Smith – ISBN 0070592187
Knots Step by Step: A Practical Guide to Tying & Using Over 100 Knots – Des Pawson – ISBN 0241471214

