

## Fibre Ropes

For most theatre operations rope is used in some form. The rope may be of natural fibre, man-made fibre or wire rope.

Natural fibre ropes have traditionally been used in "Hemp House" theatres, i.e. to fly scenery above a stage where there is no counterweight system and all lifting is done by direct manual effort. It should be noted that the word "hemp" is often misused. Although in the past ropes made from hemp were normally used, it is more common nowadays to use either "flax hemp" or manila. Sisal is an inferior rope and rarely used. British Standards cover the manufacture and use of manila ropes. Use of manmade fibre ropes, such as polyester, is widespread in many applications where previously natural fibre ropes would have been used. Polyester is resistant to oil, chemicals, and changes in ambient temperature and humidity and is smoother to the touch than manila, which has led it to becoming a preferred counterweight line.

The most common application using two types of rope is in counterweight flying systems where the load is suspended by wire rope attached to a counterweight cradle which is restrained to move vertically on the stage side wall. The movement of a balanced counterweight set is by manual hauling of a fibre rope attached to the counterweight top and bottom. Wire ropes are normally used for all power-operated systems such as scenery and lighting hoists. Beware of using ropes made from different materials or of differing sizes of the same material in the same lifting assembly, as the stretch of the rope varies with the material from which it is made. This may result in an unsafe situation, depending on the safe working load of the weakest material.

Natural fibre ropes should comply with BS EN 698, Grade 1 special quality manila or equivalent. Synthetic ropes should comply with BS EN 697 [polyester]. The use of polyamide [nylon] and polypropylene ropes for flying is not recommended as they are susceptible to changes in humidity and temperature.

Load bearing ropes used for "hemp" or counterweight flying should be not less than 16 mm diameter, be of 3-strand construction and be free from serious defects arising from previous use or other cause. Smaller sizes of rope may be used for other purposes e.g. trick lines. Ropes should be stored protected from damp, heat, and the effects of sunlight [either directly or through glass]. The hanging of ropes on wooden or cast cleats permits adequate ventilation.

Where ropes are terminated in a loop or thimble, the splicing shall conform to good commercial practice i.e. not less than 3\* full tucks for natural rope and 4\* full tucks for synthetic ropes, which shall be against the lay of the rope, each with all the yarns in the strand. [\*Please note that the Lifting Equipment Engineers Association recommends 4 full tucks for natural ropes and five full tucks for most artificial ropes].

All ropes should be in one continuous length and free from joints. Any free end of rope should be whipped to prevent unlaying.

All ropes and any associated equipment should have an identification and the safe working load marked thereon and be subject to inspection and registration in accordance with safe practice and the appropriate regulations, if any. See our Rope Label System [page 226].

All ropes should have a factor of safety of not less than 8 based on the maximum rope tension when related to the minimum breaking load of the rope.

This information is based on the ABTT Code of Practice for Flying.

## Why 220m?

220 metres is 120 fathoms which was the British Navy's minimum requirement to anchor a ship. Ropes are still made on "Rope Walks" that are 120 fathoms long.

## FIBRE ROPES

### Flax Hemp

The price of real hemp is so high that our manufacturers have changed to using a flax yarn. The strength of this rope is similar to real hemp and it has the same soft feel. Flax hemp is much easier to handle than manila and is therefore the natural rope of choice for hauling lines on counterweight cradles. When the front cloth of The Lion King rises, the flyman is hauling on our 22 mm flax hemp. See also our 4-strand hauling line below. Certification: BS EN ISO 1181:2004

See our Eye Splicing Service [page 225].



code	per m	code	per 220 m full coil	diameter	breaking strain
ROP304	£1.86	ROP304D	£255.07	12mm	1120kg
ROP305	£3.36	ROP305D	£472.01	16mm	1900kg
ROP306	£3.81	ROP306D	£561.66	18mm	2350kg
ROP307	£4.51	ROP307D	£688.40	20mm	2910kg
ROP308	£5.10	ROP308D	£735.51	22mm	3490kg
ROP309	£6.43	ROP309D	£950.97	24mm	4140kg

### Manila Rope

These 3-strand ropes are manufactured to BS EN ISO 1181:2004 which has replaced BS EN 698, Grade 1. The ropes of 16 mm and above are suitable for hand-hauled flying in theatres and for control lines on counterweight cradles. Manila is hard on the hands and tends to leave small fibre splinters in soft skin. Flax hemp [see above] is a softer option if the ropes are to be used frequently. Manila has about one-third the strength of polyester but it will not melt when left near a hot lamp [burns at 711° F]. Manila has poor resistance to shock loads because of its low stretch properties. The natural appearance of the rope makes them useful for set dressings.

See our Eye Splicing Service [page 225].



code	per m	code	per 220 m full coil	diameter	breaking strain
ROP150	£0.26	ROP150D	£40.68	6mm	350kg
ROP151	£0.48	ROP151D	£74.58	8mm	545kg
ROP153	£0.59	ROP153D	£95.30	10mm	705kg
ROP155	£0.98	ROP155D	£155.97	12mm	1065kg
ROP157	£1.19	ROP157D	£200.02	14mm	1450kg
ROP159	£1.78	ROP159D	£275.51	16mm	2030kg
ROP160	£2.08	ROP160D	£325.38	18mm	2440kg
ROP161	£2.59	ROP161D	£399.98	20mm	3250kg
ROP163	£3.50	ROP163D	£387.95	22mm	3860kg
ROP165	£3.79	ROP165D	£474.20	24mm	4570kg

### Counterweight Hauling Rope

This is a 4-strand rope sometimes referred to as "Shroud Laid" rope. It will be found to be slightly firmer than 3-strand rope and it presents a smoother and rounder outside surface which can be helpful in rope locks or if traction is required around a pulley sheave. Ironically this rope comes in 200 m coils, not sure why! ✓ Ideal for counterweight hauling lines and climbing ropes



code	per m	code	per 200 m full coil	diameter	weight	breaking strain
ROP3074	£4.63	ROP3074D	£648.92	20mm	316g/m	2610kg

# FIBRE ROPES

## COTTON ROPE

### Cotton Rope

A lightweight soft 3-strand rope often used for decorative purposes. It can easily be dyed [page 34] and flame-proofed [page 78]. Cotton rope is rather stretchy due to its soft lay up and is not normally used for lifting purposes. It is, however, very comfortable to handle and so it is very popular with aerialists. Some traditional small boats still like to use cotton mainsheets. See also our specialist aerial splicing [page 225].

- ✓ Very soft to handle
- ✓ Excellent decorative rope



code	per m	code	per 55 m full coil	diameter
ROP405	£1.65	ROP405D	£75.63	12mm
ROP407	£3.35	ROP407D	£162.48	18mm
ROP409	£5.45	ROP409D	£265.00	24mm
code	per m	code	per 110 m full coil	diameter
ROP410	£4.15	ROP410D	£358.15	28mm
ROP411	£5.50	ROP411D	£475.55	32mm

## ARTIFICIAL HEMP

### Artificial Hemp

A natural coloured 3-strand synthetic rope with a similar feel to hemp but the strength and rot resistance of synthetics. This type of artificial hemp is made from spun polypropylene with a natural hemp colour. It is UV resistant, does not rot, floats on water and is easy to splice.

- ✓ Easy to splice
- ✓ Economical
- ✓ Floats

Specifications: Melting point: 165-175 °C. Resistance to short term heat: 80 °C. For Historic 3 mm Twine on 15 m reels see page 223.



code	per m	code	per 100 m full reel	diameter	breaking strain
ROP190	£0.37	ROP190D	£31.11	6mm	350kg
ROP191	£0.51	ROP191D	£45.52	8mm	600kg
ROP195	£0.78	ROP195D	£64.75	10mm	900kg
ROP192	£1.04	ROP192D	£88.08	12mm	1340kg
ROP193	£1.40	ROP193D	£116.05	14mm	1740kg
ROP194	£1.83	ROP194D	£154.40	16mm	2180kg
ROP196	£2.27	ROP196D	£190.72	18mm	2730kg
ROP1965	£2.57	ROP1965D	£212.87	20mm	3420kg
ROP197	£3.58	ROP197D	£303.16	24mm	4830kg

### The Biggest Difference between Natural and Artificial Ropes?

Apart from the obvious, there is a very fundamental difference. Natural fibres are short, generally only a few inches long. The ropes are made by twisting these together, there is no glue, just the friction between the fibres providing the strength. Artificial ropes use continuous fibres running the length of the rope.

## LOW-LOAD PULLEY FOR LARGE-DIAMETER ROPES!

### Big Block 32

This brilliant new pulley has been made especially for us by Barton Marine [see their other excellent pulleys from page 230]. Quite often when working on stage the designer requires a much larger rope than is actually required in regards to the weight it has to lift - to make it look more 'real', or to exaggerate the perceived weight. As such, a heavy duty pulley is not necessarily required, and the expense of one not justified, thus this pulley was born!

- ✓ Up to 32 mm rope capacity
- ✓ Swing Cheeks; allows the block to inserted onto pre-rigged lines and the over large hole will take any connector.
- ✓ Economical
- ✓ Good for all large diameter ropes

SPECIFICATION: Takes up to 32 mm Ø rope. WLL 225 kg [4:1 safety factor]. 316 grade stainless steel with a "Spectro" anodised aluminium sheave. CE marked.



code	sheave Ø	max rope Ø	WLL	price
FHSSC32	72mm	32mm	225kg	£123.41

### Taking Rope from a Coil



The inside of a new coil is in the form of a round tunnel. At one end of the tunnel is the inside end of the line. This inside end always comes out first, usually from the bottom of the tunnel and up through the tunnel. Reach through the tunnel until you find the end, and determine on which end to set the coil so the line will uncoil in a **counterclockwise** direction. It can be hard to find the end but it will be there. It is well worth getting this right!

Reach in, draw the end up through the tunnel, and the entire coil will run off without a kink. The important point to bear in mind is

that when you pull on the inside end, the line must uncoil in a counterclockwise direction or it will end up in a mess!

You must always coil in a clockwise direction and **uncoil in a counterclockwise direction.**

### ...and Coiling 3-Strand Rope

As you coil a rope it will encourage a slight twist. Sometimes, if the rope is long, these twists will build up and the rope will get tighter and tighter until it buckles or kinks. This happens when the rope is coiled the wrong way. Right hand lay rope [and virtually all rope is right hand lay] must be **coiled in a clockwise direction.** This will open up the lay slightly and prevent it from misbehaving. See our videos on youtube/flintstheatre. There are other methods, such as the gasket coil (this is the preferred technique of Julian Anderson who teaches the ABTT Bronze Course Knot & Splicing day), or the figure-of-eight coiling method. Regardless of which method you use, just make sure it's kink-free!

## 3-STRAND POLYESTER

### Classic 3-Strand Polyester

This is a wonderful rope, soft in feel, easy to coil, natural coloured with all the advantages of modern materials. Made from matt polyester worsted yarn which provides an historic look and excellent grip.

- ✓ A well behaved rope with a soft hand
  - ✓ A joy to handle
  - ✓ A good choice for use onstage by actors
- Larger diameters available to order.  
See our Eye Splicing Service [page 225].



### Left or Right Hand Lay?

Put the rope in your right palm and a right hand lay rope will point in the direction of your thumb. Easy.

code	per m	code	per 100 m full reel	diameter	breaking strain
ROP117206	£0.53	ROP117206D	£46.75	6mm	350kg
ROP117208	£0.96	ROP117208D	£83.91	8mm	730kg
ROP117210	£1.60	ROP117210D	£137.50	10mm	1100kg
ROP117212	£2.10	ROP117212D	£184.60	12mm	1300kg

### Black 3-Strand Polyester

This is a 100% pure polyester rope that is very easy to splice, extremely tensile and abrasion resistant and will not stiffen up. Available in very large diameters. Conformity: DIN 3331/EN 697 4 Working stretch greater than 15%

- ✓ Very easy to splice
- ✓ Heat set
- ✓ Pure deep black
- ✓ Soft to handle, easy to coil
- ✓ Good choice for spliced barrier ropes etc.

Our Pipe and Large Rope Cutter [page 330] will cut through ropes between 24 and 42 mm diameter.



code	per m	code	per 100 m full reel	diameter	breaking strain
ROP11104	£0.59	ROP11104D	£34.30	4mm	400kg
ROP11106	£0.85	ROP11106D	£72.15	6mm	800kg
ROP11108	£1.34	ROP11108D	£107.19	8mm	1400kg
ROP11110	£1.92	ROP11110D	£153.85	10mm	2000kg
ROP11112	£2.38	ROP11112D	£212.25	12mm	2600kg
ROP11114	£2.94	ROP11114D	£385.25	14mm	3600kg
ROP11116	£4.45	ROP11116D	£339.02	16mm	5000kg
ROP11118	£4.75	ROP11118D	£380.00	18mm	6000kg
		ROP11120D	£452.01	20mm	7000kg
		ROP11124D	£654.15	24mm	10500kg
		ROP11130D	£917.89	30mm	14800kg

## BRAIDED (KERNMANTLE) ROPES

Braided or Kernmantle ropes are basically both the same thing. This type of rope construction consists of a core [German "kern" = core] protected by a sheave [German "mantel" = shell]. The core generally provides the strength while the sheave offers protection. They work well with climbing gadgets and tend to coil up easily. Braided ropes are the preferred type for industrial rope access and sport climbing. The main drawback is that they are rather difficult to splice compared to 3-strand ropes.

### Why buy your ropes from Flints?



You will be joining thousands of clients who source their rope from us. Flints sells thousands of metres of rope every week! We are extremely discerning regarding the quality of the ropes that we supply and we have the buying power to specify that the rope is made to suit the exacting needs of our industry. The rope you buy from us will be of a consistent quality. We are able to negotiate on price to pass on real value. Typically our rope is much cheaper than buying from marine suppliers and the quality is absolutely the best. Our main manufacturers have over 100 years

of experience and are DIN EN 9001:2000 certified and approved. They're able to produce ropes to tolerances of 0.1 mm or better, with heat treatment within +/-1°C. You can be assured of the best quality with real value.

### Which knot to use?

Any knot will reduce the strength of your rope. It is generally agreed that the Figure-of-Eight Loop is one of the strongest knots giving around 75% of the strength of the rope. The Clove Hitch gives around 60% and the Bowline fails between 50% and 60% [scarily it's been recorded to fail as low as 30% in some higher tech ropes]. Anyone working backstage should be able to fluently tie a Bowline and Clove Hitch (secured with an additional half hitch) as the industry standard knots. Be aware that other factors could have a greater effect on the rope's strength, and the reductions stated here are not applicable to all ropes. Tying off your rope around a large diameter smooth cylinder will have little effect on its strength but tying onto a karabiner or anything that forces the rope into a tight bend will weaken the rope. So called "High-Tech" ropes [page 221] should also be treated with caution and never knotted, but always terminated with a spliced eye. For more knot information see our range of rigging books on page 402.

### Black Herkules

A very resilient multi-functional polyester rope of the highest quality, very durable and low stretch. Cover: spin dyed 1:1 plaited polyester. Core: High tenacity braided polyester. A very popular hauling rope.

- ✓ Working stretch is less than 5%
- ✓ Absolutely non-kinking
- ✓ Excellent adhesion to winch drums
- ✓ Withstands hard winch usage

✗ Knot holding not quite as good as our matt polyester

Other sizes from 4 mm to 28 mm are available to order by the full reel.



code	per m	code	per 100 m full reel	diameter	breaking strain
ROP155008	£1.79	ROP155008D	£145.71	8mm	1600kg
ROP155010	£2.50	ROP155010D	£203.95	10mm	2500kg
ROP155012	£3.76	ROP155012D	£315.29	12mm	3500kg
ROP155016	£6.89	ROP155016D	£541.67	16mm	5000kg

# FIBRE ROPES

## Matt Black Braided Polyester

A very strong multipurpose rope which is comfortable to handle and easy to coil. The ropes that we supply have a matt cover which, although more expensive than shiny polyester ropes, considerably adds to comfort and grip and it also helps to ensure that knots do not accidentally work loose. Polyester is marginally less strong than nylon but it does have better chafe resistance, less stretch, and it does not weaken when wet. Synthetic ropes are not ideally suited for permanent dead hanging of equipment in theatres as the rope might weaken if brought into contact with hot lamps or if a fire occurred. Available in pure black or [unflecked] white and now also in classic hemp colour. The 8 mm x 8-plait rope is the ideal hauling line for 3-Way Track, Unitrack, and Unirail tab tracks. Use 6 mm x 8-plait in Halls T60 tracks. Conformity: BS 4928 DIN EN 697. Flints can eye splice the 16-plait braided ropes, please see page 225 for prices.



- ✓ Comfortable to handle
  - ✓ Easy to coil
  - ✓ Matt black finish or pure white
  - ✓ Unflecked finish
  - ✓ Fantastic value
  - ✓ Long-lasting durability
  - ✓ Low working stretch – less than 7%
  - ✓ Will not rot
  - ✓ Unaffected by moisture
  - ✓ Good knot holding
  - ✓ Excellent chafe resistance
  - ✓ Very good strength
  - ✓ Very good electrical insulation
  - ✓ Very good UV resistance
  - ✓ Wide range of sizes
  - ✓ Resistant to acid
- Also available as Small Cords [page 223].

code	per m	code	per 100 m full reel	10+ reels	dia.	breaking strain	plait
ROP120	£1.14	ROP120D	£80.09	£72.08	6mm	520kg	8
ROP122	£1.40	ROP122D	£105.35	£94.81	8mm	1000kg	16
ROP124	£2.19	ROP124D	£180.21	£162.19	10mm	1900kg	16
ROP126	£2.69	ROP126D	£220.26	£198.23	12mm	2400kg	16
ROP128	£3.16	ROP128D	£287.33	£258.60	14mm	2900kg	24
ROP130	£4.35	ROP130D	£379.12	£341.21	16mm	3500kg	24
ROP134	£5.50	ROP134D	£481.90	£433.71	20mm	5300kg	24

## Pure Matt White Polyester Rope

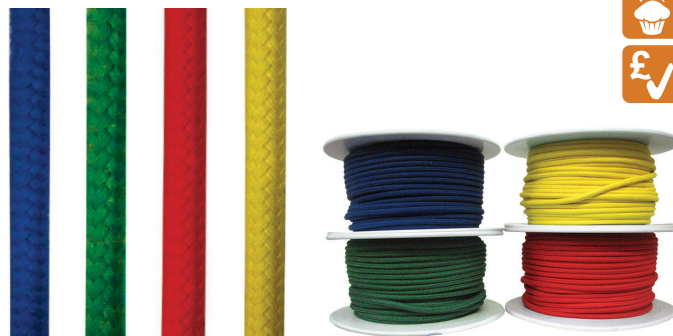
The Matt Braided Polyester Ropes are also stocked in pure unflecked white. Yacht ropes normally have coloured marker flecks on them but theatre designers like their white ropes white. Flints has these ropes specially made.



code	per m	code	per 100 m full reel	10+ reels	dia.	breaking strain	plait
ROP120W	£1.14	ROP120WD	£80.09	£72.08	6mm	520kg	8
ROP122AW	£1.40	ROP122AWD	£107.45	£96.70	8mm	1000kg	8
ROP122W	£1.40	ROP122WD	£107.45	£96.70	8mm	1000kg	16
ROP124W	£2.19	ROP124WD	£180.21	£162.19	10mm	1900kg	16
ROP126W	£2.69	ROP126WD	£220.26	£198.23	12mm	2400kg	16
ROP128W	£3.16	ROP128WD	£287.33	£341.21	14mm	2900kg	24
ROP130W	£4.35	ROP130WD	£379.12	£341.21	16mm	3500kg	24
ROP134W	£5.50	ROP134WD	£481.90	£433.71	20mm	5300kg	24

## Polyester Ropes in Pure Colours

Flints can supply blue, yellow, green and red matt polyester. These ropes are made especially for us and are pure colour without the usual marker flecks so they can be used for digital keying effects. We can have other diameters made but subject to minimum quantity restrictions. Please phone for details.



code	per m	code	per 100 m full reel	10+ reels	dia.	Colour	breaking strain	plait
ROP122B	£1.53	ROP122BD	£126.39	£113.75	8mm	Blue	1000kg	16
ROP122Y	£1.53	ROP122YD	£126.39	£113.75	8mm	Yellow	1000kg	16
ROP122G	£1.53	ROP122GD	£126.39	£113.75	8mm	Green	1000kg	16
ROP122R	£1.53	ROP122RD	£126.39	£113.75	8mm	Red	1000kg	16
ROP124B	£2.40	ROP124BD	£197.73	£177.96	10mm	Blue	1900kg	16
ROP124Y	£2.40	ROP124YD	£197.73	£177.96	10mm	Yellow	1900kg	16
ROP124G	£2.40	ROP124GD	£197.73	£177.96	10mm	Green	1900kg	16
ROP124R	£2.40	ROP124RD	£197.73	£177.96	10mm	Red	1900kg	16

## Classic Polyester Braided

All the advantages of a modern braided rope but in a traditional natural colour. The outer braid is made from matt polyester yarn which gives excellent grip. The core is plaited polyester. The 20 mm Ø would make for an excellent counterweight line.

- ✓ Traditional appearance
  - ✓ Easy to handle
  - ✓ Excellent grip
- Larger diameters available to order



code	per m	code	per 100 m full reel	dia.	breaking strain	plait
ROP117306	£0.74	ROP117306D	£64.50	6mm	520kg	16
ROP117308	£1.17	ROP117308D	£102.72	8mm	1000kg	16
ROP117310	£1.90	ROP117310D	£166.68	10mm	1900kg	16
ROP117312	£2.39	ROP117312D	£210.04	12mm	2400kg	24
ROP117314	£3.31	ROP117314D	£289.98	14mm	2900kg	24
ROP117316	£4.48	ROP117316D	£392.97	16mm	3500kg	24

## Problems with rope sizes?

Take care when choosing a rope to fit existing pulleys. Rope diameters will reduce when a load is applied. Short lengths of 3-strand rope will expand when cut off a coil as the tension is released. Natural fibre ropes will sometimes vary in dimensions slightly from batch to batch. If you think the rope that you need is going to be a close fit please seek advice or ask for a sample before placing an order.

## HIGH TECH ROPES

### Technora Rope

A modern paraaramid fibre rope widely used on camera dollies for accurate positioning.

- ✓ Eight times stronger than steel (weight for weight)
- ✓ Extremely low stretch – ideal for accurate positioning.
- ✓ Does not burn or melt
- ✓ Survives brief exposure up to 400°C.
- ✗ Degrades rapidly when exposed to UV light



code	per m	code	per 100 m full reel	dia.	breaking strain
ROP15806	£4.01	ROP15806D	£339.81	6mm	2600kg
ROP15808	£6.16	ROP15808D	£522.42	8mm	4000kg
ROP15810	£9.50	ROP15810D	£805.55	10mm	6300kg

### Dyneema® D-Pro

With this technical line you will achieve optimised breaking strengths with minimal creep due to the Liros Heat Stretch System. Resistance to abrasion, low weight, and ease of splicing are features that make this line the optimum for any application where very high strength and very low stretch are desired. Black.

- ✓ Good choice for high load tab tracks or scenery carriers as it has no outer cover to cause slippage on rope clamps
- ✓ Working stretch less than 1.3% therefore no whiplash
- ✓ Generally higher breaking strength than wire rope with minimal weight
- ✗ Not suitable for knots - must be terminated with a spliced eye



code	per m	code	per 100 m full reel	dia.	breaking strain
ROP150501	£0.74	ROP150501D	£51.03	1mm	195kg
ROP1505015	£0.80	ROP1505015D	£60.49	1.5mm	230kg
ROP150502	£1.01	ROP150502D	£81.67	2mm	410kg
ROP150503	£1.52	ROP150503D	£126.19	3mm	950kg
ROP150504	£2.31	ROP150504D	£192.45	4mm	1300kg
ROP150505	£3.38	ROP150505D	£281.46	5mm	2600kg
ROP150506	£5.53	ROP150506D	£463.43	6mm	4300kg
ROP150508	£7.05	ROP150508D	£597.42	8mm	5300kg
ROP150510	£10.68	ROP150510D	£838.75	10mm	9000kg

### Matt Black Dyneema® Rope [polyester cover]

These matt pure black Dyneema® ropes have exceptional strength with a low stretch of less than 1.5%. They are covered with a high quality matt 16-plait polyester cover so that they are comfortable to handle. Unlike Kevlar, these ropes are not prone to catastrophic failure and can be run around sheaves with a diameter just five times the rope diameter. The low stretch properties can be very helpful to avoid sagging return lines on long tab tracks.



code	per m	code	per 100 m full reel	dia.	breaking strain
ROP433	£1.28	ROP433D	£104.73	3mm	400kg
ROP436	£2.64	ROP436D	£220.00	6mm	1000kg
ROP438	£4.45	ROP438D	£323.60	8mm	1500kg
ROP4310	£5.95	ROP4310D	£450.00	10mm	2400kg

## A Word of Warning

High Tech ropes are immensely strong but that doesn't necessarily mean they are a better choice for all applications. If a falling weight is arrested by a nylon or polyester rope, the rope will stretch and absorb a great deal of the shock loading.

If a falling weight is arrested by a Dyneema® line there will be virtually no stretch and huge impact forces are liable to break the line or tear out the anchor point. We have seen many examples of "weaker" ropes successfully arresting falling weights while much "stronger" Dyneema® ropes have failed. On the plus side, there will be no whiplash which is why many tug drivers are choosing Dyneema® for their tow lines. So choose Dyneema® when the loads are constant and the lack of stretch is advantageous.

High tech ropes can be useful because of the smaller diameter to strength ratio, provided their limitations are taken into account.

Generally these ropes should be treated as one would treat wire ropes and only terminated with a spliced eye. If in doubt as to the suitability of the rope for the application, check.

## Dynamic, Semi-Static or Static?

Ropes used for industrial access, climbing and fall arrest can be classified as three types:

Dynamic = elongation at break above 40%

Semi-Static = elongation at break 35 - 40%

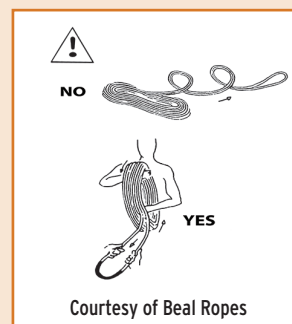
Static = elongation at break below 35%

As nylon [polyamide] is the most stretchy rope it is used almost exclusively as dynamic and semi-static lines. But nylon in its yarn state stretches only 16 - 27% so extra stretch is added by braiding and by heat treatments to ensure a 40% stretch is achieved.

The stretch is an important safety factor as the G-force of a falling object can be roughly calculated by the fall distance divided by the arrest distance. Therefore a person falling 2 m being arrested by a nylon rope which stretched 200 mm would be subjected to a G-force of 10 but if the rope was Dyneema® with just 2 mm stretch the G-force would be 1,000 and possibly fatal.

Dynamic and semi-static lines are classed as PPE [Personal Protective Equipment] Category 3, C-type inspection. They must be made by an ISO 9001 registered company.

## Uncoiling Hanks



Climbing and industrial access ropes are often supplied as hanks. Be careful because the method of manufacture and hanking varies with different manufacturers. Some have made them more user-friendly but normally if you just grab a new hank of a climbing rope and throw it on the floor you will be in for a very unpleasant surprise! You will end up with a kinked-up mess which could take an hour to sort out. **Always read the instructions** before unwrapping the rope. Generally, the way

to uncoil a new hanked climbing rope is to slip both your arms through it and then unwind it as if it is rotating on a drum. You will need two people. Don't forget that many semi-static ropes require soaking before they are unwound.

### Read the instructions!

For demo videos of coiling techniques visit our YouTube channel – <http://www.youtube.com/FlintsTheatre> or simply scan the QR code



# FIBRE ROPES

## INDUSTRIAL ROPE ACCESS

### Beal Dynamic Apollo 11mm diameter

This popular industrial rope is manufactured to the exacting standards you would expect. Supplied as 50 m hanks. They are constructed to withstand an "F2" fall [page 356]. Dynamic ropes are also designed to reduce the impact of a fall. UIAA norm states the impact must be less than 1,200 daN – this rope will transmit 840 daN. EN 892.



code	diameter	Type	Colour	length	price
ROPBC11A50R	11mm	Rope	Red	50m	£149.36

### Cow's Tails

This dynamic rope is for creating anchor lanyards (Cow's Tails) for the attachment of the user's harness to an anchor point. Check with the harness manufacturer which harness points are suitable for cow's tails. This dynamic rope must not be used to make a fall arrest lanyard in conjunction with an energy absorber. The knots used must have a minimum static strength of 15 kN. Tests have proved that a correctly tied figure-of-eight knot gives a minimum static strength in excess of 15 kN. Other knots may increase energy absorption but not meet the 15 kN strength. Only trained persons should tie knots to create Cow's Tails. CE EN 892.



code	Type	Colour	length	size	price
ROPLICT4A	Cow's Tail	varies	4m	11mm	£25.01
ROPLICT5A	Cow's Tail	varies	5m	11mm	£28.58

### Semi-Static

These ropes are ideal for fixed rigging used exclusively for descender-descent and ascender-ascent. Minimum elasticity is desirable yet the ropes are semi-static to protect against "F1" falls [page 356]. Soak the ropes before use and dry [expect 5% shrinkage]. The ropes are constructed from 100% nylon [polyamide]. Suitable for use with the ASAP Mobile Fall Arrester [page 359]. Conformity: EN 1891 Type A. SPECIFICATION: Breaking load: 3,263 kgf [3,200 daN]. Breaking load with Figure-of-Eight knot: 2,141 kgf [2,100 daN].



code	diameter	Type	Colour	length	price
ROPBCST1150	11mm	industry	White	50m	£100.68
ROPBCSTN1150	11mm	Intervention	Black	50m	£126.87
ROPBCSTN1100	11mm	Intervention	Black	100m	£249.18
ROPBCSTN11200	11mm	Intervention	Black	100m	£498.37

### Orange Rescue Rope

Beal's bright orange Rescue Rope. Highly visible semi-static rope designed especially for easy location in rescue situations. This rope features a polyester sheath. Conformity: EN 1891 Type A. SPECIFICATION: Breaking load: 3,000 daN [kg]. Strength with sewn terminations: 2,400 daN [kg]. Weight: 65 g per metre.



code	diameter	length	price
ROPBCSR105050	10.5mm	50m	£114.18

## SASH CORDS

Originally made to counterbalance sash windows. Sash cords were made of natural jute but they were sometimes waxed to help prevent rot. The stiff waxed type was not suitable for stage use. Years ago there wasn't much choice when it came to small cords and jute sash was very popular. Then black cotton "Sash" arrived to fill a need for a black small cord. Pure black polyester "Sash" is now readily available. Polyester is much stronger than jute and less stretchy than cotton. It will not rot but it is more expensive. Matt black polyester sash is listed on page 220. The 6 mm size [ROP120] is the equivalent of No 4, and the 8 mm size [ROP122A] is the equivalent of No 6. So now there's a choice!

### Jute Sash Cord

A natural coloured multipurpose cord suitable for non-load bearing applications. No 6 is the standard cord for throw lines. Widely used in tab tracks [Halls T60 uses No 4] although many people now prefer to use matt polyester [page 220]. Please note: to find the approximate diameter of the cord add 2 mm to the size of rope quoted [e.g. No 4 sash is approximately 6 mm diameter]. Some clients prefer to order their sash cord in traditional hanks as they find it easier to divvy up the cord amongst the crew. We also stock eight 12.5 m hanks joined to make 100 m. The size 8 is now available in black.



code	diameter	description	length	price
ROP042MD100	6mm	No. 4 Jute Sash [economical option for T60]	100m	£36.52
ROP044MD100	8mm	No. 6 Jute Sash [economical option for T70]	100m	£58.41
ROP046MD100	10mm	No 8 Jute Sash	100m	£65.15
ROP060BD100	8mm	Black No 6 Jute Sash	100m	£59.83
ROP044JSJHK	8mm	Joined Hanks of No 6 Jute Sash	8 x 12.5m	£60.99

### Black Cotton Sash Cord

A very soft natural cotton braided cord dyed black. Rather stretchy but soft to handle. See also 8 mm Matt Black Polyester [page 220.]



code	diameter	description	per m
ROP052M	8mm	No 6 Cotton Sash	£1.69

code	diameter	description	per 100 m
ROP052MD100	8mm	No 6 Cotton Sash	£109.67

## Working at Height?

To see our full range of harness, ascenders, rope grabs, lanyards and fall arrest equipment, see our Working at Height section on page 352.

Petzl ASTRO®  
BOD FAST



Petzl RIG



## CORDS AND STRINGS

### Nylon Cord

A very strong braided cord. Useful for trip lines and lacing. Nylon has high stretch characteristics when under heavy load. If stretch could pose a problem then choose polyester below or Dyneema® [page 221]. Ends can be sealed with a hot knife. Available in black or white. Polyamide and nylon are two names for the same material. NB: the breaking strain is 10% less when wet. For extreme use with constant loads we list pure Dyneema® with a higher breaking strength than wire of the same diameter and with a stretch of less than 1.3%.



black	price	white	price	10+ dia.	length	breaking strain [when dry]
ROPNC10B	£14.95	ROPNC10W	£14.66	£13.45	1mm	100m 35kg
ROPNC15B	£17.75	ROPNC15W	£17.40	£15.97	1.5mm	100m 40kg
ROPNC20B	£19.37	ROPNC20W	£18.99	£17.43	2mm	100m 100kg
ROPNC25B	£20.95	ROPNC25W	£20.54	£18.85	2.5mm	100m 140kg
ROPNC30B	£25.82	ROPNC30W	£25.31	£23.24	3mm	100m 180kg
ROPNC35B	£28.56	ROPNC35W	£28.05	£25.70	3.5mm	100m 260kg
ROPNC40B	£30.58	ROPNC40W	£29.98	£27.52	4mm	100m 340kg

### Matt Polyester Cord

These matt polyester cords which have less stretch than nylon and hold their knots perfectly. They make ideal ties for lacing, tying up cables and general use where natural string or sash line would not be strong enough. Available in black or white. Conformity: EN 697.



code	per m	code	per 100 m reel	dia.	Colour	breaking strain
ROP117	£0.66	ROP117D	£54.96	3mm	Black	110kg
ROP117W	£0.66	ROP117WD	£54.96	3mm	White	110kg
ROP118	£0.80	ROP118D	£64.35	4mm	Black	170kg
ROP118W	£0.80	ROP118WD	£64.35	4mm	White	170kg
ROP119	£0.83	ROP119D	£67.02	5mm	Black	300kg
ROP119W	£0.83	ROP119WD	£67.02	5mm	White	300kg

### Boxes of Coloured Polyester Line

Handy boxes of 10 2 mm or 3 mm diameter reels of brightly coloured polyester line which is very UV resistant, will not stiffen up and is very flexible. Each box has an assortment of red, yellow, green, black and blue. We also sell the 3 mm cords as individual reels.



code	diameter	Colour	length	price
ROP10402	2mm	multiple	10 x 30m	£56.10
ROP10403	3mm	multiple	10 x 15m	£45.54
ROP1043188	3mm	Black	15m	£5.50
ROP1043228	3mm	White	15m	£5.50
ROP1043171	3mm	Red	15m	£5.50
ROP1043010	3mm	Blue	15m	£5.50
ROP1043086	3mm	Green	15m	£5.50
ROP1043059	3mm	Yellow	15m	£5.50

## NATURAL STRINGS

### Sisal

A useful traditional ball of string. How long is a ball of string? Twice the distance from one end to the centre.



code	approx length	weight	price
ROP058	33m	250g	£2.79
ROP055	330m	2.5kg	£12.58

### Tarred Marlin

A wonderful dark brown natural twine which smells of old ships. Heaven. We've sourced the same quality but at a much lower price. See below for historic-looking cord.



code	approx diameter	description	weight	price
ROP250WT	1mm	Whipping Twine	250g	£15.43
ROP250ST	3mm	Serving Twine	250g	£14.40

## 3-STRAND POLYESTER CORD

### 3-Strand Polyester Cord

Hemp performance, but softer, more weather resistant, and with a higher load performance. Made from spun polyester. Ideal for whipping, lashing and model boat rigging. This is a 3mm version of the Classic 3 Strand Polyester Rope [page 219].



code	diameter	length	price	10+
ROPHC3N10	3mm	10m	£6.90	£6.21

## FISHING LINE

### Flints Nylon Monofilament Fishing Line

Use for suspending when wire isn't appropriate and you want the thread to be inconspicuous. Can also be used for fishing. Natural nylon colour.



code	diameter	breaking strain	length	price
ROPFL03	0.3mm	4kg	100m	£2.50
ROPFL06	0.6mm	14kg	100m	£2.75
ROPFL12	1.2mm	48kg	100m	£3.25

# FIBRE ROPES

## BRAIDED LOOPS

### Braided Loops

These loops are made from black 8 mm polyester braided cord. They are 450 mm long [circumference 900 mm]. When used with a Clummet® they are very useful for keeping your ropes and cables organised. Just trap a loop under the Clummet®, draw it through the coil of rope to be hung up and then hook the loop back over the Clummet®. For Clummetts® see page 167.



code	diameter	description	EWL	price
FHS006LOOP	8mm	Loop	450mm	£3.62

## ECONOMY ROPE AND STAKES

### Ropes and Stakes

Economy grade polypropylene rope suitable for fencing off outdoor areas at festivals and show grounds. Two coil sizes. The stakes are steel and sold singly. To complete the job you may need Club Hammers [page 319] and Line Marking Chalk Sprays [page 76].



code	description	diameter	length	price
ROPBC30	Blue Rope	10mm	30m	£14.04
ROPBC220	Blue Rope	10mm	220m	£84.54
ROPSTAKE	Stake			£5.25

## SHOCK CORD LOOPS

### Spanfixes – shock cord loops

These loops of shock cord with a nylon hook at one end are hugely popular. They are perfect for stretching projection screens but also useful for awnings, banners and cloths. The elastic will exert a constant tension giving a totally wrinkle-free cloth even under variable heat, humidity and weather conditions. The loops are made from 5 mm diameter shock cord and measure 250 mm end to end. They will stretch by 100% [+/-10%]. In black or white. Supplied in bags of 10



code	Colour	length	qty	price	10+	100+
ROP090	Black	250mm	10 per bag	£10.40	£9.36	£8.76
ROP090W	White	250mm	10 per bag	£10.40	£9.36	£8.76

### Spaniflex – adjustable shock cord loops

A quickly adjustable black shock cord loop. Made from 5 mm shock cord approx. 500 mm long. Will make a maximum loop of 200 mm. Useful for touring situations when the distance between the cloth and the eyelet can be variable.

We can supply custom Bungee Straps made to your requirements!



The shock cord is pulled down into the toothed groove and held firmly in place.

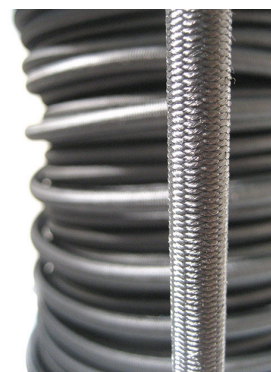


code	length	qty	price	10+ bags
ROP090S10	500mm	10 per bag	£15.75	£14.17

## BUNGEE SHOCK CORD

### Bungee Shock Cord

Highly elastic rubber with excellent stretch characteristics. The cover is braided out of abrasion resistant and highly resilient polyester. Core from high quality latex rubber. Available in black or white. When the Dangerous Sports Club were on trial for bungee jumping off the Clifton Suspension Bridge the judge was undecided whether to give them a suspended sentence or a long stretch. Supplied by the metre or in a full drum which is 100 m.



code	per m	code	100 m full drum	diameter	Colour
ROP072M	£0.39	ROP072MD	£26.12	3mm	Black
ROP074M	£0.59	ROP074MD	£40.76	5mm	Black
ROP076M	£0.89	ROP076MD	£57.47	7mm	Black
ROP078M	£0.99	ROP078MD	£61.65	8mm	Black
ROP080M	£1.57	ROP080MD	£103.98	10mm	Black
ROP072	£0.39	ROP072D	£26.12	3mm	White
ROP074	£0.59	ROP074D	£40.76	5mm	White
ROP076	£0.89	ROP076D	£57.47	7mm	White
ROP078	£0.99	ROP078D	£61.65	8mm	White
ROP080	£1.57	ROP080D	£103.98	10mm	White

## BUNGEE CLIPS

### Bungee Clips

Two styles of black clip to terminate your bungee. Type A is held with a knot which hides in the recess and Type B has a collar that clips into place to neatly secure the bungee.



Type A

Type B

code	Style	bungee size	price
ROP085	Knot Type A	5-6mm	£0.71
ROP086	Knot Type A	7-8mm	£0.79
ROP081	Collar Type B	5-6mm	£0.92
ROP083	Collar Type B	7-8mm	£1.07