

General Pulley Information

The breaking load of pulleys is normally determined by attaching the head fixing of the block to one end of a testing machine while both legs of a U-bolt (or a loop of rope) are placed over the sheave and attached to the other end of the machine. The machine then pulls apart the head and the sheave until it fails. If the pulley fails at 1,000 kg then that is generally the manufacturer's stated breaking load.

However, if you attach the head of the pulley to your theatre grid and reeve a rope through it and attach one end to a **1,000 kg weight** on the floor you will need to exert **2,000 kg headload** to actually lift the weight because it will require a 1,000 kg pull while still suspending a 1,000 kg weight. Therefore, to determine a safe working load, Flints would recommend that the breaking load is immediately halved and then divided by eight [which is the ABTT code for wire rope]. For example: For our popular Opera Web Block, which would fail at 2,500 kg on a test bed, we give a working load limit of 156 kg $[2,500 \div 2 = 1,250 \div 8 = 156 \text{ kg}]$. The WLL is more than you would want to haul by hand but considerably below the breaking load.

Marine equipment tends to state the safe working load as half the breaking load, other suppliers use different calculations. We have tried to clarify the situation in this catalogue by giving the information as clearly and boldly as we can in the special safety boxes.

Choosing the correct pulley size

To obtain the maximum working life, strength and the least friction the pulley sheave diameter should be at least 8 times the diameter of the rope. In the case of wire ropes the sheave diameter should ideally be 30 times the diameter of the wire. However, there are many applications where these large diameter sheaves would be completely impractical in which case choose a pulley that fits the job but take into account a shorter working life and reduced breaking load. Regularly inspect the rope or wire for signs of wear. Be careful when choosing pulleys to fit fibre ropes. Rope diameters can vary, three-strand ropes often reduce in diameter when under load but can exceed their stated diameter when not under tension.

Bearings or not

Bearings are necessary to obtain highly efficient blocks. Small pulleys with bearings were originally developed for land yachts by Harken where there was a need for extremely rapid rope movement with low friction.

Choose blocks with bearings when your rope needs to run very fast or when a series of blocks are being used together and the combined friction will build up. The maximum rolling load on bearings is often below a plain bearing block.

Generally, a plain bearing is either a plain hole or a hole lined with a brass or Oilite bush. For most uses they are perfectly adequate and for pulleys subjected to long periods just supporting a static load they are the preferred choice. They are generally stronger, more reliable and cheaper.

It is important that any equipment purchased for lifting purposes is selected by a person competent to do so.

Is it a Block or is it a Pulley?

They're sometimes called "blocks" and sometimes "pulleys"; and sometimes both in the same paragraph. Halls and Doughty products are made up of multiple sheaves [aka "pulleys"] that rotate independently and when put with end plates are "blocks". "Block" is also used in marine environments, see the Barton pages [page 230]. "Pulley" is the short version of "pulley block". We'll keep using both terms so no one feels left out.

Fun and Games Ordering Pulleys

It all seems quite simple. You choose your blocks and you choose your brackets and place the order. That is fine until you order a 1-way pulley, a 2-way pulley and a 3-way pulley and two parallel mounting brackets and one across mounting bracket. We need to know which pulley has which bracket! Furthermore, Doughty will no longer supply the blocks and the brackets separately, they must be supplied assembled by an appropriately qualified person. This isn't because they don't trust you with bolts, spacers and a spanner, it is so they can label the assembled pulley with a SWL. So, in an ideal world this is what we would like:

Please supply:

One off 2-way 100mm fibre block DOUT42837 c/w DOUT42870 girder bracket and so on...

Probably best to leave a mobile number too!

Pulleys with Becket



A becket is simply an additional rope attachment point on a pulley. To make up a simple purchase system it is best to choose blocks fitted with a becket. The becket provides the most effective anchorage position for the line to be tied or spliced to. We hold stocks of certain blocks fitted with beckets which are now listed together with the other pulleys of the same size. We can easily order other sizes – please phone our Rigging Manager for details.

Reverse Shackles

It's all about the pin. These products have a removable pin and shackle.

The pin and shackle dismantled.



The pin placed like this allows the block to move at a 90° angle to the sheave.



The pin placed like this allows the block to move inline to the sheave



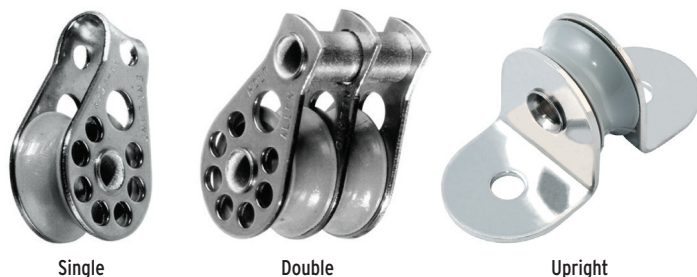
MINI PULLEYS

Single and Double Mini Pulleys

Invaluable as guides for small trip lines. The pulleys can be secured with a small shackle [4 mm pin], Dyneema or polyester cord or even cable ties for light loads. The axles are hollow so they can be fixed with a screw for side mounting purposes. We also have a small upright block. Made from 316-grade stainless steel with acetal sheaves.

SAFETY

Breaking Load
275kg



Single

Double

Upright

code	description	sheave Ø	rope Ø	price
PUL530	Single	16mm	2-5mm	£4.98
PUL533	Double	16mm	2-5mm	£9.42
PUL534	Upright	16mm	2-5mm	£11.28

MINI PULLEYS FOR WIRE ROPE OR CORD

16 mm High Tension Blocks

This High Tension range is made from 316-grade stainless steel throughout giving incredible strength to weight ratios. The ball race is machined using the latest CNC technology which ensures absolute consistency in production. Ideal for use with 4 mm Dyneema Pro [page 221] or flexible wire ropes. Shackle pin: Ø 4 mm.

- ✓ Maximum sheave efficiency
- ✓ Minimum friction for all high load applications



Single

Double

SAFETY

Breaking Load
275kg

code	sheave Ø	rope Ø	description	price
HA4568	16mm	2-4mm	Single	£20.30
HA4569	16mm	2-4mm	Double	£43.43

25 mm High Tension Blocks

A larger and stronger version of the 16 mm blocks listed above. These incredible lightweight blocks are perfect for use with highly technical lines such as Dyneema Pro [page 221] or flexible wire ropes. Shackle pin: Ø 5 mm.

- ✓ Amazing strength with virtually no weight



Single

Double

SAFETY

Breaking Load
275kg

code	sheave Ø	rope Ø	description	price
HA4379	25mm	2-5mm	Single	£24.09
HA4679	25mm	2-5mm	Double	£52.47

Mini Upright Block

A small stainless steel block with a 25 mm diameter chromed brass sheave designed for small wire ropes or high tech ropes such as Dyneema. Useful for model theatre grids and working props. The maximum wire size is 4 mm [although the ABTT would have something to say about running a 4 mm wire around a 25 mm sheave!] The manufacturers only state the breaking load of a similar pulley in the range which is 950 kg. The breaking load of this pulley is dependent on the fixings through the lugs.



code	sheave Ø	max wire Ø	price
PULSS0108	25mm	4mm	£15.40

High Load Wire Rope Block

Side cheeks are made from 316-grade stainless steel. The brass sheave runs on a stainless steel centre bush. A useful pulley for unobtrusive guiding of small wire ropes, such as awning rigging etc.



SAFETY	Min Breaking Load	Safety Factor	WWL
	750kg	2 to 1	375kg

code	sheave Ø	max wire Ø	description	price
BAR91301	45mm	5mm	Fixed eye	£34.88

Aluminium Wire Rope Cheek Block

Side cheeks are made from marine-grade aluminium grey anodised for durability. The sheaves are precision turned from aluminium bar which is then silver anodised. They run on nylon bearings to reduce friction under load. The rivets are 316-grade stainless steel. A similar pulley in this range has a break load of 1,750 kg but the strength of this block will depend on its fixings. For maximum strength, fixings should pass through the hollow centres of the rivets. Fastening diameter: 5 mm. Base size: 103 x 53 mm.

For a full range of Rope Cheek Blocks see page 231.



code	sheave Ø	max wire Ø	price
BAR91650	51mm	4mm	£64.01

Barton Pulleys

This range of tough lightweight blocks is made from the highest quality materials to ensure ultimate efficiency and long working life. The plain brass bearing ensures free running even under high loads. They are available with a swivel head or a reverse shackle which allows the block to be fixed in parallel or at right angles. Blocks can also be supplied with ball bearing sheaves to order.

Alasdair personally vouched for the reliability of these Barton blocks as he has used them in demanding applications on his luxury yacht for well over 20,000 nautical miles over the last 21 years with no failures or even signs of wear.

And he's not the only one impressed. In the German magazine *Die Yacht* they tested Barton Size 4 and a Barton Cruiser block against 14 other blocks from eight leading manufacturers. Both the Barton blocks finished in the top five and the Barton Cruiser block won overall for "its smooth running under maximum load and attractive price". *Voiles et Voiliers* magazine was also full of praise "both Barton pulleys were least expensive on offer, yet performed most satisfactorily under load". A sad note in the reports was that many of the blocks by other leading manufacturers failed well below the manufacturer's stated breaking load. Well done Barton! Made in Whitstable!

SMALL BARTON BLOCKS

Size 0 Blocks

A strong and lightweight range of blocks for use with lines up to 5 mm. Fitted with plain bearings for greater load capacity and good static loading. SPECIFICATION: Sheave size: 20 x 8 mm. Max rope Ø: 5 mm.



SAFETY

Min Breaking Load	Safety Factor	WWL
750kg	2 to 1	375kg

code	description	price
BARN00110	Single Fixed Eye	£5.71
BARN00130	Single Swivel	£16.37
BARN00131	Single Swivel with Becket	£17.73
BARN00210	Double Fixed Eye	£14.55
BARN00230	Double Swivel	£24.40
BARN00231	Double Swivel with Becket	£26.03
BARN00310	Triple Fixed Eye	£24.29
BARN00330	Triple Swivel	£33.22
BARN00331	Triple Swivel with Becket	£34.58

MEDIUM-DUTY YACHT BLOCKS

Size 1 Blocks

Hugely popular general purpose blocks. Flints holds very large stocks of these pulleys. Swivels now fitted with mini shackle for easy attachment. SPECIFICATION: Sheave size: 30 x 12 mm. Max rope Ø: 8 mm. See also page 157 for economical Cloth Stretching Runners.



Single Fixed Eye Single Fitted with Becket Double Swivel Triple Fixed Eye

SAFETY

Min Breaking Load	Safety Factor	WWL
710kg	2 to 1	355kg

code	description	price
BARN01110	Single Fixed Eye	£7.91
BARN01130	Single Swivel	£13.19
BARN01131	Single Swivel with Becket	£16.18
BARN01210	Double Fixed Eye	£13.17
BARN01230	Double Swivel	£24.34
BARN01310	Triple Fixed Eye	£20.32
BARN01330	Triple Swivel	£23.25

Size 2 Blocks

The slightly larger sheave diameter on these blocks will help reduce friction and rope wear. Choose them in preference to Size 1 blocks for more demanding applications.

SPECIFICATION: Sheave size: 35 x 12 mm. Max rope Ø: 8 mm.



SAFETY

Min Breaking Load	Safety Factor	WWL
740kg	2 to 1	370kg

code	description	price
BARN02110	Single Fixed Eye	£9.86
BARN02130	Single Swivel	£14.48
BARN02131	Single Swivel with Becket	£17.59
BARN02210	Double Fixed Eye	£15.42
BARN02230	Double Swivel	£27.05
BARN02231	Double Swivel with Becket	£30.21
BARN02310	Triple Fixed Eye	£28.10
BARN02330	Triple Swivel	£30.13

Size 3 Blocks

SPECIFICATION: Sheave size: 45 x 13 mm. Max rope Ø: 10 mm.



SAFETY

Min Breaking Load	Safety Factor	WWL
800kg	2 to 1	400kg

code	description	price
BARN03110	Single Fixed Eye	£11.31
BARN03130	Single Swivel	£15.95
BARN03210	Double Fixed Eye	£19.06
BARN03230	Double Swivel	£30.92
BARN03310	Triple Fixed Eye	£29.67
BARN03330	Triple Swivel	£35.62

Size 5 Blocks

Great value and capable of handling up to 12 mm diameter ropes.
SPECIFICATION: Sheave size: 54 x 17 mm. Max rope Ø: 12 mm.



SAFETY	Min Breaking Load	Safety Factor	WWL
	1,500kg	2 to 1	750kg

code	description	price
BARN05130	Single Swivel	£38.02
BARN05120	Single Reverse Shackle	£25.51
BARN05131	Single Swivel with Becket	£42.86
BARN05230	Double Swivel	£45.35
BARN05220	Double Reverse Shackle	£37.09
BARN05231	Double Swivel with Becket	£49.95
BARN05330	Triple Swivel	£55.84
BARN05320	Triple Reverse Shackle	£44.80

HEAVY-DUTY YACHT BLOCKS

Size 6 Blocks

This range of rugged quiet high load blocks are made from injection moulded side plates with all load-bearing components in 316-grade stainless steel. The acetal sheaves run smoothly under extremely high loads on a stainless steel centre pin with a brass bush. Ball bearing versions are available to order.
SPECIFICATION: Sheave size: 64 x 17 mm. Max rope Ø: 12 mm



Single Swivel



Double Reverse Shackle



Triple Reverse Shackle

SAFETY	Min Breaking Load	Safety Factor	WWL
	2,000kg	2 to 1	1,000kg

code	description	price
BARN06130	Single Swivel	£51.88
BARN06120	Single Reverse Shackle	£34.94
BARN06220	Double Reverse Shackle	£44.96
BARN06320	Triple Reverse Shackle	£54.02

Size 7 Blocks

Toughest yacht pulleys we hold in stock. Capable of demanding work.
SPECIFICATION: Sheave size: 70 x 20 mm. Max rope Ø: 14 mm



SAFETY	Min Breaking Load	Safety Factor	WWL
	2,500kg	2 to 1	1,250kg

code	description	price
BARN07130	Single Swivel	£64.41
BARN07120	Single Reverse Shackle	£42.65
BARN07220	Double Reverse Shackle	£53.04
BARN07320	Triple Reverse Shackle	£18.73

UPRIGHT YACHT BLOCKS

Upright Yacht Blocks

A range of well-made, quiet, upright blocks which are competitively priced and will give years of reliable service. Please note that the breaking loads given below will depend on the strength of the fixings.
SPECIFICATION: Fastenings: 4 off 5 mm Ø on all sizes.



code	description	sheave Ø	max rope Ø	min BL	price
BARN01150	Single Size 1	30mm	8mm	710kg	£16.80
BARN01250	Double Size 1	30mm	8mm	710kg	£20.97
BARN03150	Single Size 3	45mm	10mm	800kg	£21.23
BARN03250	Double Size 3	45mm	10mm	800kg	£28.97
BARN04150	Single Size 4	54mm	12mm	1500kg	£31.18
BARN04250	Double Size 4	54mm	12mm	1500kg	£44.21

SIDE MOUNTING CHEEK BLOCKS [SINGLE & DOUBLE]

Side Mounting Turning Blocks [Cheek Blocks]

These economical quiet and tough blocks can be mounted directly to timber, steel or alloy battens. Supplied with a plastic base shield to isolate dissimilar metals [necessary in salt water environments]. Flints has some of these blocks specially made for us as doubles.
SPECIFICATION: Fastenings: 5 mm Ø on all sizes except size 1 which requires 4 mm Ø.



BARN01160 looks like this... ...all the others look like this.

code	description	base plate length	base plate width	max rope Ø	min BL	price
BARN01160	Single Size 1	55mm	30mm	8mm	710kg	£7.46
BARN02160	Single Size 2	79mm	43mm	8mm	740kg	£14.66
BARN99554	Double Size 2	79mm	43mm	8mm	740kg	£12.40
BARN03160	Single Size 3	92mm	52mm	10mm	800kg	£17.32
BARN99556	Double Size 3	92mm	52mm	10mm	770kg	£19.66
BARN04160	Single Size 4	107mm	66mm	12mm	1500kg	£25.59
BARN99557	Double Size 4	107mm	66mm	12mm	1260kg	£27.92

Changes to the Barton Pulley Range

A few years ago Barton updated their range of pulleys. The new pulleys are still manufactured in the UK, and have been developed to meet the existing design endurance and reliability. With a sleek dark graphite sheave, they look stylish and clean in situ. The specifications are not significantly different from previous ranges, though in some cases the WLL is improved, and the weight reduced. See also the BIG BLOCK 32 on page 218 for large diameter ropes. NB: The Size 4 blocks have now transitioned to Size 5 blocks - except for the side-mounted cheek blocks - it's all a bit complicated!



SNATCH BLOCKS

Snatch Blocks

The sides of these blocks hinge open allowing them to be inserted into previously rigged lines making them useful for brailing purposes. The rugged blocks that we supply are excellent value. We now stock a smaller version for ropes up to 12 mm Ø. See also the Petzl Rescue Pulley [page 233].



SAFETY		Min Breaking Load	Safety Factor	WWL
	BARCW1451	1,300kg	2 to 1	660kg
	BARCW1452	1,100KG	2 to 1	550KG

code	description	max rope Ø	price
BARCW1451	Fitted with Stainless D Shackle	14mm	£99.75
BARCW1452	Fitted with Stainless Snap Shackle	14mm	£96.84

ROPE ORGANISERS

Rope Organisers

Useful for tidying up complicated rope arrangements and for guiding ropes into clutches. Fixings should go through the axle of the sheaves with 6 mm machine screws (not supplied). Takes rope up to 12 mm diameter and the sheaves are grooved to accept wire as well.



code	description	max rope Ø	price
BAR584	4-way	12mm	£62.32

SNATCHET BLOCKS

Harken Snatchet Block

Harken quality pulley with combined carabiner. Two versions available; one is ratcheting, one is not! Snatchet pulleys can be inserted into the middle of an existing rig eliminating the need to take the load off a loaded line and rerig. The ratcheting version can grip loaded hauling lines to help relieve the operator of much of the strain! SPECIFICATION: Height: 72 mm. Width: 146.5 mm. Weight: 178 g. Maximum line Ø: 14 mm. Breaking load: 38 kN. Maximum working load: 10 kN



code	description	price
HARSN65R	Ratcheting	£228.50
HARSN65	Non-Ratcheting	£180.52

TACKLE

Quadruple Purchase Tackle

Tackles can solve many lifting problems. They are much faster than hand winches and more economical. This tackle arrangement will give a quadruple purchase. The sheaves we have selected are fitted with ball races to reduce friction. They can be supplied with or without adjustable angle camlocks to temporarily hold the load. A useful general purchase tackle.



With Rope Lock	description	price
BARN16631	Fiddle Swivel Becket Cam with bearings	£114.72
BARN16430	Fiddle Swivel with bearings	£79.80
BARRKITN1	Both together [15% less]	£141.48
Without Rope Lock	description	price
BARN16431	Fiddle Swivel Becket Cam with bearings	£82.97
BARRFKITN2	Both together [15% less]	£118.39

JAG SYSTEM

Jag System

This hauling kit provides optimal efficiency and compactness. The mesh cover prevents the hauling line from getting tangled. The sheaves are mounted on sealed ball bearings for extra efficiency. A versatile 4:1 advantage system allows for easy pickoffs, makes a releasable anchor, or provides tension in a system. When coupled with an I'D descender [page 360] it makes a reversible rescue kit to pickoff and rescue a victim. Extremely compact – the smallest version has a collapsed length of just 320 mm [1000 mm extended]. The Jag System comes with two Am'D Triact-Lock autolocking karabiners. The pulleys are also available for individual purchase so that longer hauling systems can be made. SPECIFICATION: Sheave Ø: 25 mm. Max rope Ø: 11 mm. Rope supplied: 8 mm. Efficiency: 91%.



SAFETY		Min Breaking Load	Safety Factor	WWL
		16kN	2.66 to 1	6kN
code	description	collapsed length	extended length	price
PETP044AA00	Complete System	320mm	1000mm	£185.00
PETP044AA01	Complete System	340mm	2000mm	£200.00
PETP044AA02	Complete System	400mm	5000mm	£240.00
PETP45	Jag Pulley alone			£56.00
PETP54	Jag Traxion alone			£90.00

HARKEN® HEXARATCHETS [INDUSTRIAL & MARINE]

Harken® Hexaratchets

These popular ratchet blocks will grip loaded hauling lines to relieve the operator of much of the strain. The design of the sheave is such that when the rope is eased off it will slide around the sheave without the sheave turning. Hence a hefty lantern can be lifted and held in place without having to hold the full weight. It gives an 8:1 advantage with a 180° wrap. These blocks do NOT lock the rope so the load can be gently lowered against the fixed sheave.

Industrial version [HAR441549] is individually marked and supplied with instructions. Conformity: EN1315.

Marine version [HAR1549] is not certified.

- ✓ Very popular with professional riggers
- ✓ Now fully certified and individually marked
- ✓ The set screw in the 3-way head allows the head to be fixed parallel, at right angles or to freely swivel



SAFETY	Min Breaking Load	Safety Factor	WWL
	20kN	4 to 1	5kN [509kgf]

code	Type	turns	sheave Ø	max rope Ø	list price	Tradeline
HAR441549	Industrial	Clockwise	76mm	14mm	£204.29	£190.30
HAR1549	Marine	Clockwise	76mm	14mm	£209.01	£195.55

SELF-JAMMING

Micro Traxion

An ultralight compact progress capture pulley which is 50% lighter and smaller than the Mini Traxion. Ideal for work and rescue kits. Designed for crevasse rescue, hauling and self-rescue. It can also be used as an emergency ascender. The aluminium sheave is fitted with sealed ball bearings giving a remarkable 91% efficiency.

SPECIFICATION: Takes ropes from 8 - 11 mm Ø. CE EN 567, UIAA. Efficiency: 91%



PPE

SAFETY	Working Load Limit	Working Load Limit of Grab
	2 x 2.5kN = 5kN headload	2.5kN [254kgf]

code	weight	sheave Ø	max rope Ø	price
PETP53	85g	25mm	11mm	£72.00

BARTON RATCHET BLOCK 55MM

Barton Ratchet Block 55mm

55mm Ratchet Block from Barton made from high density nylon and glass fibre reinforced polymer with a high level of UV protection. Internal components are made from marine grade 316 stainless steel and the 12 faced aluminium sheave is anodised in gunmetal silver.



SAFETY	Min Breaking Load	Safety Factor	WWL
	1,200kg	4 to 1	300kg

code	sheave Ø	max rope Ø	price
BAR90500	55mm	11mm	£75.53

OPERA WEB BLOCK™

Opera Web Block

Flints designed this block to meet the need for a pulley which can be quickly rigged to flying bars for the purpose of hoisting lanterns and sound equipment into position before their final fixing. It is not acceptable under current health and safety legislation to carry items up a Tallscope, ladder or tower. By rigging this quick block, items can be raised into position by a crew member at stage level. The pulley is simply passed through its own tested CE marked web [EN 566] and it is ready to use. The sheave is fitted with a Delrin® ball race for low friction even at high loads. There is a becket underneath so that purchase arrangements can be made. It will take 14 mm rope but we would recommend hauling with 10 or 12 mm Matt Braided Polyester Rope [page 220]. A very useful and popular bit of kit at a competitive price.



SAFETY	Min Breaking Load	Safety Factor	WWL
	2,500kg	16 to 1	156kg

code	sheave Ø	max rope Ø	price	10+
PUL99002	70mm	14mm	£43.47	£39.91

LARGE PRUSSIK PULLEY

Large Single Prussik

We stock this pulley primarily to be used with the ALF - Auto Locking Fall Arrest Pulley [page 233] but it has many other heavy-duty uses. The large diameter sheave holds ropes apart which can be useful in hauling applications. Conformity: EN 12278.



SAFETY	Breaking Headload Limit
	70kN [7,138kgf]

code	weight	mbs	max rope Ø	price
SAFRP066	463g	70kN	16mm	£44.96

RESCUE BLACK

Rescue Black P50AN Pulley

With pivoting side plates so it can be inserted anywhere along a rope [see also Snatch Blocks page 232]. This is the most advanced rescue pulley, made for professionals. It will accept up to three karabiners and the sealed ball bearing yields a maximum efficiency of 95%. Designed for heavy loads and intensive use. The side plates are clearly marked showing both the WLL for the head [8 kN] and the WLL for the individual lines [4 kN]. Individually tested. Conformity: CE EN 12278, NFPA 1983 General Use.



SAFETY	Breaking Headload	Safety Factor	Working Headload
	3,669kgf	4.5 to 1	815kgf

code	weight	sheave Ø	rope Ø	price
PETP50AN	185g	38mm	7-13mm	£53.00

PULLEYS

OSCILLANTE

Oscillante Side Swing Pulley

A useful and very popular pulley for emergency use. Designed for occasional use when hauling or in a pulley system. Good strength to weight ratio. Nylon sheave and aluminium side plates.

Conformity: CE EN 12278, UIAA

SPECIFICATION: WLL: 4 kN [2 kN on one rope end]

Min BL: 15 kN. Efficiency: 71%.



SAFETY	Working Headload Limit
	407kgf

code	sheave Ø	rope Ø	weight	price
PETP02A	25mm	7-11mm	42g	£15.00

FIXE

Fixe Pulley Black

A pulley with fixed side plates to allow very quick installation onto a rope and karabiner. Ideal for use with any oval-shaped karabiner such as the OK Screw-lock Karabiner [page 205]. Compact and lightweight. Conformity: CE EN 12278, UIAA.

SPECIFICATION: WLL: 5kN. Efficiency: 71%.



SAFETY	Working Headload Limit
	4509kgf

code	sheave Ø	rope Ø	weight	price
PETP05WN	21mm	7-13mm	90g	£22.00

CLOTH STRETCHING PULLEYS

Cloth Stretching Pulley

Occasionally when stretching a cloth or gauze between two vertical wires it is preferable to use pulleys to run along the wires rather than Gauze Hanks [page 157]. This quiet smooth-running pulley has a removable clevis pin so it can be inserted onto made-up wires. Its weight and lack of friction helps the cloth fly in. The clevis pin can go straight through a well-placed eyelet in the cloth but, if there are no eyelets, why not take a look at Holdons [page 158] and Spaniflex, the useful adjustable bungee loops [page 224]?



Cloth Stretching Pulley attached to a Mini Holdon (not included)

code	price	50+
BARN99115	£5.58	£5.12

TRANSPORT

Tandems

In-line double pulleys for use as transport pulleys on ropes or cables. They can operate at speeds of up to 10 m/s. Great for adventure parks. Individually tested. Conformity: CE EN 12278.

SAFETY	Min Breaking Load	Safety Factor	Safe Working Load
	2,246kgf	2.4 to 1	1,019kgf

Tandem

Tandem is designed for fibre ropes up to 13 mm Ø with a maximum working efficiency of 71%.



code	max fibre Ø	price
PETP21	12mm	£41.00

Tandem Speed

Tandem Speed has stainless steel sheaves with sealed ball bearings and can be used on wire ropes up to 12 mm Ø [or fibre ropes up to 13 mm Ø] with a maximum working efficiency of 95%.



code	max fibre Ø	max wire Ø	price
PETP21SPE	13mm	12mm	£60.00

WOODEN BLOCKS

Traditional Ash Blocks

These blocks are strong, simple and functional. They are often used for period set dressings. Bindings are heavy-gauge stainless steel with a fixed eye head. Sheaves are a generous size made from Tufnol running on a stainless steel spindle. The shell is high quality ash formed into a smooth oval shape and varnished.

SPECIFICATION: Sheave Ø: 50 mm. Suits rope sizes: 10 - 12 mm. Other sizes for ropes up to 26 mm diameter are available to order.



Double with Becket

SAFETY	Type	Breaking Load	Safety Factor	SWL
	Single	3,500kg	2 to 1	1,750kg
	Single with Becket	3,500kg	2 to 1	1,750kg
	Double	4,000kg	2 to 1	2,000kg
	Double with Becket	4,000kg	2 to 1	2,000kg

code	description	price
PUL0610	Single	£108.95
PUL0611	Single with becket	£117.23
PUL0612	Double	£143.28
PUL0613	Double with becket	£159.86

LARGE DIAMETER ROPE PULLEYS

Big Block 32

This brilliant 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 be inserted onto pre-rigged lines and the over large hole will take any connector.
- ✓ Economical
- ✓ Good for all large diameter ropes [page 217]

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



HALLS CLASSIC STYLE BLOCKS

Hall Stage Pulleys

Halls have been streamlining their pulley ranges recently and, for larger pulleys with a marked SWL, most customers are swapping to the Doughty alternative. However, the Classic Style Halls blocks that we are all familiar with are still available in smaller sizes for fibre ropes in sheave sizes up to 75mm. They remain popular for lighter applications.

Halls Recommended Sheave Sizes:

- A 38 mm diameter sheave takes fibre ropes up to 6 mm.
- A 50 mm diameter sheave takes fibre ropes up to 10 mm.
- A 75 mm diameter sheave takes fibre ropes up to 14 mm.
- A 75 mm diameter sheave takes wire ropes up to 4 mm.*

Awning Pulleys 245

Capable of being mounted to a variety of fixing points, this pulley type solves a variety of problems. It can be fixed via a shackle to eyebolts, girder clamps or chain, and always self-adjusts to find the correct pulling angle, regardless of irregular fixing points.



code	sheave Ø	Type	price
HAL235	38mm	1-way	£26.76
HAL240	50mm	1-way	£30.40
HAL245	75mm	1-way	£63.40

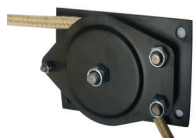
Awning Pulley for Wire Rope

This pulley takes 4 mm wire using an 18:1 D:d ratio. A pulley for 5 mm is available on special order.

code	Type	sheave Ø	price
HAL08278	1-way	75mm	£73.93

Side Fixing Pulleys 244

A useful pulley with a variety of uses. Fixed to the wall it is used for curtain tracks, safety curtain releases and scenery track lines. It can be used on the floor to divert ropes or it can be fixed to scenery for effect lines.



code	sheave Ø	Type	price
HAL220	38mm	1-way	£26.76
HAL225	50mm	1-way	£30.40
HAL230	75mm	1-way	£61.50
HAL221	38mm	2-way	£37.53
HAL226	50mm	2-way	£47.10
HAL231	75mm	2-way	£95.40
HAL222	38mm	3-way	£52.94
HAL227	50mm	3-way	£65.55
HAL232	75mm	3-way	£139.34

Ceiling Fixing Pulley 183

Intended for use either as a ceiling, wall or timber fixing pulley. These pulleys have bolted angle iron supports which are more substantial than the upright pulleys listed below.



code	sheave Ø	Type	price
HAL170	75mm	1-way	£79.89
HAL171	75mm	2-way	£94.82
HAL172	75mm	3-way	£131.44
HAL173	75mm	4-way	£164.34

Upright Guide Pulleys 243

A general purpose pulley with a variety of uses. Used principally for curtain track diverters or for release or operating cables.



code	sheave Ø	Type	price
HAL200	38mm	1-way	£26.76
HAL205	50mm	1-way	£30.40
HAL215	75mm	1-way	£61.50
HAL201	38mm	2-way	£37.43
HAL206	50mm	2-way	£47.10
HAL216	75mm	2-way	£95.40
HAL202	38mm	3-way	£52.94
HAL207	50mm	3-way	£65.55
HAL217	75mm	3-way	£139.34
HAL203	38mm	4-way	£70.20
HAL208	50mm	4-way	£82.24
HAL218	75mm	4-way	£182.42

DOUGHTY MEDIUM-DUTY PULLEYS

Doughty Medium and Heavy-Duty Pulleys

Doughty introduced this updated heavy-duty range of pulleys a few years ago. Both the Doughty pulley systems are of modular construction. Sheaves can be ordered for fibre or wire rope and various fixing arrangements can be supplied fitted to your block. All Doughty pulleys are supplied assembled to order by Doughty, and Certificates of conformity can be issued if required.

Doughty Medium-Duty Pulleys

The sheaves are plain bearing lubricated nylon and are profiled grooved for either fibre or wire rope. Conformity: BS 7905-1:2001, BS EN ISO 12100:2010



SAFETY	Breaking Headload	Safety Factor	Safe Working Load
	450kg	3 to 1	150kg

code	sheave Ø	suits rope Ø	Type	no of grooves	price
DOUT42836	100mm	12mm	Fibre	1	£48.24
DOUT42837	100mm	12mm	Fibre	2	£91.35
DOUT42838	100mm	12mm	Fibre	3	£134.40
DOUT42839	100mm	12mm	Fibre	4	£177.44
DOUT42800	100mm	4mm	Wire	1	£48.24
DOUT42801	100mm	4mm	Wire	2	£91.35
DOUT42812	100mm	4mm	Wire	3	£134.40
DOUT42813	100mm	4mm	Wire	4	£177.44
DOUT42846	150mm	18mm	Fibre	1	£82.86
DOUT42847	150mm	18mm	Fibre	2	£155.35
DOUT42848	150mm	18mm	Fibre	3	£229.63
DOUT42849	150mm	18mm	Fibre	4	£302.94
DOUT42820	150mm	6mm	Wire	1	£82.86
DOUT42821	150mm	6mm	Wire	2	£155.35
DOUT42822	150mm	6mm	Wire	3	£229.63
DOUT42823	150mm	6mm	Wire	4	£302.94
DOUT42855	180mm	18mm	Fibre	1	£111.35
DOUT42856	180mm	18mm	Fibre	2	£210.36
DOUT42857	180mm	18mm	Fibre	3	£309.42
DOUT42858	180mm	18mm	Fibre	4	£408.57
DOUT42830	180mm	6mm	Wire	1	£111.35
DOUT42831	180mm	6mm	Wire	2	£210.36
DOUT42832	180mm	6mm	Wire	3	£309.42
DOUT42833	180mm	6mm	Wire	4	£408.57

Ordering Protocol

When ordering for more than one line please be aware that the system is modular: single sheaves will be put together as a double, triple or quadruple. Should you require your sheaves to operate in reverse directions please phone us and we will advise on a way of achieving your objective. When you are ordering we need to know which pulley has which bracket! So in an ideal world this is what we would like:

Please supply: One off: 2-way 100mm fibre block DOUT42837 c/w DOUT42870 girder bracket

DOUGHTY MOUNTING OPTIONS

Doughty pulleys can no longer be supplied without the brackets, so please specify requirements when ordering

Multibeam Girder Brackets

Pair of 50 x 50 x 5 mm angle brackets universally drilled and suitable for mounting your pulleys to grids with hook bolts or coach screws. Picture shows brackets mounted – the price is just for the brackets.



code	description	length	price
DOUT42885	Multibeam Bracket [pair]	270mm	£51.59
DOUT42886	Multibeam Bracket [pair]	450mm	£59.88

Multifix Brackets

Pair of 30 x 30 x 3 mm angle brackets 150 mm long universally drilled and slotted.



Multifix Brackets with Across Mounting

Supplied with 48 mm diameter U-bolts to fit across a bar. NB: if you require the pulleys to run parallel with the tube you will need the parallel tube version shown below.

code	description	price
DOUT42860	Brackets [pair]	£14.32
DOUT42861	Brackets + 48 mm Ø U-bolts [set]	£18.46

Multifix Brackets with Parallel Tube Plates

Consists of the brackets listed above but fitted with a plate so that the pulley can be mounted parallel to the bar.



code	description	price
DOUT42890	Brackets [pair] + 48 mm Ø U-bolts + plate	£49.63

Girder Brackets

A drilled and slotted pressed channel supplied with M12 Lindapters to fit RSJ's. [Can be fitted to the pulleys of your choice on request]. For single or double sheave setups, just 1 is required, for triple or quad, 2 are required.



code	beam width min	beam width max	length	price
DOUT42870	3"	6"	270mm	£48.49
DOUT42872	6"	12"	450mm	£55.43

Side Plates

Converts your chosen block to a side mounted version ideal for wall mounting.

code	description	price
DOUT42897	To fit 100 mm basic pulley	£41.72
DOUT42898	To fit 150 mm basic pulley	£48.24
DOUT42899	To fit 180 mm basic pulley	£56.18



Awning Eye

A casting to convert basic pulleys to awning blocks. These castings have now been reduced in width to 16 mm so that they will take a Crosby 1 t bow or D shackle. They can be fitted to singles, doubles or triples but will be positioned to one side on double blocks which makes the block cant over slightly when loaded. Made to order.

code	price
DOUT42865	£20.74



DOUGHTY HEAVY-DUTY PULLEYS

Doughty Heavy-Duty Pulleys

The sheaves are constructed of MOS 2 nylon with ball races for smooth friction-free operation. The side plates are 5 mm thick steel to provide an immensely strong construction. The design has been tested to a stringent 10:1 ratio. As standard, the blocks are made up from single-, double- and triple grooved sheaves with the quadruple being assembled from two doubles. 5-way blocks are made from a triple and a double. Should you require your sheaves to operate in reverse directions please phone us and we will advise on a way of achieving your objective. To order, firstly choose your basic block then select one of the fittings shown alongside. Conformity: BS 7905-1:2001, BS EN ISO 12100:2010

*See the next page for information regarding D:d ratios.

NB: due to an unfortunate positioning of the bracket fixing bolts the 100 mm diameter pulleys can only be used with the bracket uppermost. All the other sizes below can be reeved either way.



code	sheave Ø	suits rope Ø	Type	no of grooves	price
DOUT42931	100mm	12mm	Fibre	1	£90.68
DOUT42932	100mm	12mm	Fibre	2	£127.35
DOUT42933	100mm	12mm	Fibre	3	£164.03
DOUT42934	100mm	12mm	Fibre	4	£200.73
DOUT42935	100mm	12mm	Fibre	5	£237.42
DOUT42901	100mm	4mm	Wire	1	£90.68
DOUT42902	100mm	4mm	Wire	2	£127.35
DOUT42903	100mm	4mm	Wire	3	£164.03
DOUT42904	100mm	4mm	Wire	4	£200.73
DOUT42905	100mm	4mm	Wire	5	£237.42
DOUT42941	150mm	18mm	Fibre	1	£142.80
DOUT42942	150mm	18mm	Fibre	2	£179.71
DOUT42943	150mm	18mm	Fibre	3	£224.67
DOUT42944	150mm	18mm	Fibre	4	£269.63
DOUT42945	150mm	18mm	Fibre	5	£322.80
DOUT42911	150mm	6mm	Wire	1	£142.80
DOUT42912	150mm	6mm	Wire	2	£179.71
DOUT42913	150mm	6mm	Wire	3	£224.67
DOUT42914	150mm	6mm	Wire	4	£269.63
DOUT42915	150mm	6mm	Wire	5	£322.80
DOUT42951	200mm	18mm	Fibre	1	£194.92
DOUT42952	200mm	18mm	Fibre	2	£247.03
DOUT42953	200mm	18mm	Fibre	3	£299.14
DOUT42954	200mm	18mm	Fibre	4	£351.25
DOUT42955	200mm	18mm	Fibre	5	£413.95
DOUT42921	200mm	6mm	Wire	1	£194.92
DOUT42922	200mm	6mm	Wire	2	£247.03
DOUT42923	200mm	6mm	Wire	3	£299.14
DOUT42924	200mm	6mm	Wire	4	£351.25
DOUT42925	200mm	6mm	Wire	5	£413.95

SAFETY

Ø	Breaking Load	Safety Factor	SWL
100mm	2,000kg	10 to 1	200kg
150mm	4,000kg	10 to 1	400kg
200mm	6,000kg	10 to 1	600kg

Ordering Protocol

When you are ordering we need to know which pulley has which bracket! So in an ideal world this is what we would like:

Please supply: One off: 3-way 100mm wire block DOUT42903 c/w DOUT42997 side mounting plate

DOUGHTY HEAVY-DUTY MOUNTING OPTIONS

Doughty pulleys can no longer be supplied without the brackets, so please specify requirements when ordering

Multibeam Brackets

A pair of universal drilled [13 mm Ø for M12] and slotted angle brackets. They can be used for upright, wall or ceiling fixings or used with 48 mm Ø U-bolts or half couplers to clamp to scaffold tubes. These brackets are tested to 600 kg WLL using the worst case of bolts utilising the end holes only.



code	fits beams min	fits beams max	length	price
DOUT42990	3"	6"	225mm	£58.57
DOUT42995	6"	12"	450mm	£57.48

U-Bolts and Saddle

Designed for use on Doughty Multibeam Brackets [page 236] but they have many other uses.



code	fits tube Ø	material Ø	price
DOUT56900	50mm	8mm	£1.86

Side Mounting Plates

Allows the blocks to be mounted against walls or on the floor to act as winch return pulleys. The price is for the mounting plate only. See also the Low Level Return Pulley [page 179]. Made to order with required block.



code	description	suits pulley Ø	price
DOUT42997	Side Mounting Plate for 100 m Ø	100mm	£24.12
DOUT42998	Side Mounting Plate for 150 m Ø	150mm	£27.30
DOUT42999	Side Mounting Plate for 200 m Ø	250mm	£30.53

Awning Profile

For use on the single, double and triple blocks only. Provides a centralised fixing point for a shackle enabling the pulley to cant to the desired position. Hole: Ø 16.5 mm for up to 2 t shackles. Made to order with required block.



code	description	price
DOUT42984	Awning Profile for 100 and 150 mm single	£30.92
DOUT42985	Awning Profile for 100 and 150 mm double	£32.94
DOUT42986	Awning Profile for 100 and 150 mm triple	£35.99
DOUT42987	Awning Profile for 200 mm single	£29.71
DOUT42988	Awning Profile for 200 mm double	£30.92
DOUT42989	Awning Profile for 200 mm triple	£35.63

Do you climb vertical ladders for your work? Have a look at the ALF Auto Locking Fall Arrest Pulley [page 233].

Choice of Sheaves

There is the "ideal world" and there is the "real world" and sadly they are often quite a long way apart.

Wire Ropes: The Association of British Theatre Technicians state that the diameter of a wire rope sheave [D] should be 30 times the diameter of the wire being used [d]. This ratio is referred to as the D/d ratio. In fact, there are a whole series of factors which will affect the pulley sheave choice. With a D/d ratio of 30, using a flexible wire rope you should expect to get about 93% of the wire's strength and a good service life. In a theatre grid there should be adequate space for large diameter sheaves. However, on a small piece of scenic machinery this may be impractical. A D/d ratio of 18 will still provide 90% of the wire's strength but the working life will be reduced. This is generally regarded as the lowest ratio that should be used. It enables a 5 mm wire to run around a 90 mm diameter sheave at 90% of its WLL for a reduced lifecycle. If smaller ratios are used, both the WLL's and the design life will need to be substantially reduced. Apart from the D/d ratio [the larger the better] it is important that the wire is correctly supported in the sheave's groove. If the groove is too tight the wire will be crushed and if it is too open then the inner strands of the wire will take higher loads. The wire may also become unstable, rolling from side to side until it jumps out of the groove in disgust. The correct groove diameter should be just 5% greater than the wire diameter. The groove angle is open to some debate. In the USA groove angles are 30°, in Germany 45°, in the UK 52° and the international standard is 60°. Flints' sheaves [FHS codes] have groove angles of 50°. The fleet angle of the wire entering a sheave must not exceed 5°. The pulleys must run freely. A sheave with bearings will be more efficient than a plain bearing sheave but plain bearings [they are either just holes or sleeved holes] are a good choice if the sheave is to remain under a static load for long periods.

Fibre Rope Sheaves: The minimum D/d ratio for fibre rope sheaves is generally regarded as 8 to 1 [with the exception of certain aramid fibres]. The rope should be supported in a round groove about 10% bigger than the rope diameter. Avoid using V grooves which will cause damage and add extra friction to the rope. Measuring the diameter of fibre ropes is not an exact science. A three strand rope will expand when it is cut off its coil and then reduce when under load. It may be worth ordering a sample pulley on a "sale or return" basis to check your rope is a good fit. Chafe will always be the major enemy so you should ensure any side plates are either clear of the rope or at least have smooth radiused edges.

ACETAL RESIN SHEAVES

Acetal Sheaves

An economical series of plain bearing sheaves ideally suited to polyester ropes. Updated to reflect the new dark grey sheaves seen on the new Barton pulleys [page 230].



code	sheave Ø	bore Ø	max rope Ø	width	price
BARN64804	35mm	8mm	8mm	12mm	£2.00
BARN64809	45mm	8mm	10mm	12mm	£3.60
BARN64814	64mm	13mm	12mm	18mm	£1.89
BARN64816	71mm	13mm	14mm	19mm	£9.10

Ultralegere

A very small and ultra-lightweight sheave often used to convert symmetrical karabiners [Petzl OK page 205] into emergency rescue pulleys. Nylon. Min BL: 1 kN. Weight: 10 g.



code	sheave Ø	bore Ø	max rope Ø	width	price
PETP00A	40mm	14.8mm	7-13mm	20mm	£6.00

NYLON SHEAVES

Nylon Sheaves with Bearings

[Nylon with Molybdenum Disulphide] These excellent nylon sheaves are designed for 5 and 6 mm wire ropes. Nylon has better impact and corrosion resistance and are much lighter than cast iron sheaves. They are excellent value. Fitted with bearings with side shields for free running. Widely used for the construction of stage machinery such as lift units etc. We have utilised large 20 mm bore bearings in the heavy-duty 230 mm sheaves [FHS070] so that they can be used in multiple groups on strong, large diameter, axles. All the wire grooves are the nominal wire Ø plus 5%. The groove angle is 50°. Maximum permissible fleet angle: 5°.



code	sheave Ø	bore Ø	wire Ø	width	price
FHS063	50mm	12mm	5mm	18mm	£26.15
FHS065	100mm	12mm	6mm	18mm	£30.34
FHS066	150mm	12mm	6mm	18mm	£35.44
FHS070	230mm	20mm	6mm	28mm	£60.90

MINIATURE SHEAVES

Mini Cassette

A very small but high load stainless steel sheave with stainless balls in a polypropylene cage. These small free-running sheaves are ideal for special effects using 1.5 or 2 mm stainless wire rope or nylon cords.

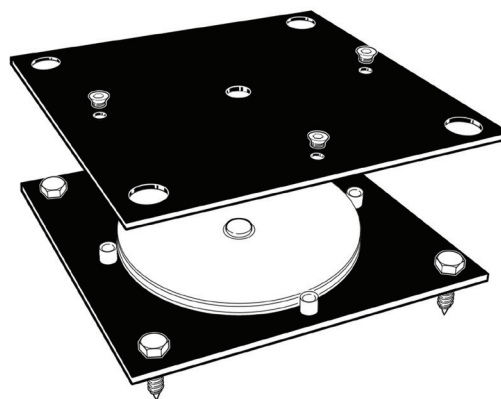


code	diameter	bore Ø	width	price
PUL531	25mm	8mm	6mm	£17.46

LOW LEVEL RETURN

Low Level Return Pulley

A 230 mm diameter aluminium sheave grooved to take 6 mm wire rope mounted in between two 300 mm square plates so that the overall thickness is just 18 mm. Fitted with an Oilite bush bearing and nylon side washers. These pulleys were designed by Flints to act as return pulleys for our truck winches and can be mounted within the thickness of a 19 mm ply floor. Fixings: four M10 coach screws which are accessed through large diameter holes in the top plate but are hidden within the 18 mm depth when tightened down. SPECIFICATION: Sheave Ø: 230 mm. Thickness: 18 mm. Max wire rope Ø: 6 mm.



code	description	weight	price
FHS503	Whole assembly	4.9kg	£111.50
FHS504	Sheave only	868g	£44.65

ROPE LOCK FRAME

Rope Lock Frame

This substantial rope lock frame has a return sheave for a 20 – 22 mm hauling line. The frame can be supplied with or without a rope lock to lock off the hauling line. Fitted with angles drilled with 13 mm Ø holes for bolting down to the stage.
SPECIFICATION: Length: 400 mm [outer edge of angles]. Depth: 300 mm. Height: 500 mm [excluding rope lock]. Sheave Ø: 230 mm. Fixings: M12 bolts or coach screws [sold separately].



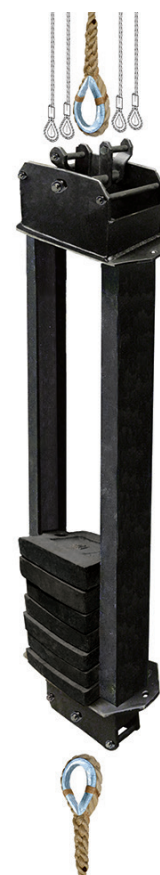
code	description	price
FHS107K	Including rope lock	£795.00
FHS107P	Excluding rope lock	£595.00

COUNTERWEIGHT CRADLES

Temporary Counterweight Cradle [Double or single purchase]

A temporary counterweight cradle capable of taking 22 x 10 kg tongue and tongue counterweights giving an overall weight 250 kg. The cradle has been designed to be capable of converting to double purchase with the addition of our Header Sheave [FHS105S] and our Return Sheave [FHS106]. The main wires can be secured directly to two M12 high tensile machine screws which will pass through the eye of any standard thimble. The fibre rope hauling line attaches directly to the M20 bolts which also act as axles when the system converts to double purchase. This design make a very neat fixing point for both the wires and the hauling line. The guide wires can be threaded through the 10 mm Ø chamfered holes [390 mm hole centres] or, if the wires cannot be threaded, they can be attached to the holes by means of a twisted shackle [WIR1628SS] in which case the wire centres will be 430 mm.

SPECIFICATION: Length: 424 mm. Width: 150 mm. Height: 1,565 mm. Sheave Ø: 230 mm. Weight: 35 kg.
SPECIFICATION HEADER SHEAVE: Nylon MDS sheave grooved for 4 x 6mm wires plus a central groove for 20-22 mm Ø rope. Sheave Ø: 230 mm..



code	description	price
FHS113	Single purchase	£319.00
FHS113DP	Double purchase	£765.60
FHS109	Counterweight 10 kg [see page 173 for bulk deals]	£39.90
WIR1628SS	Twisted shackles for guide wires [four needed]	£1.95
FHS105S	Header sheave only	£260.68
FHS106	Rope return sheave only	£198.00