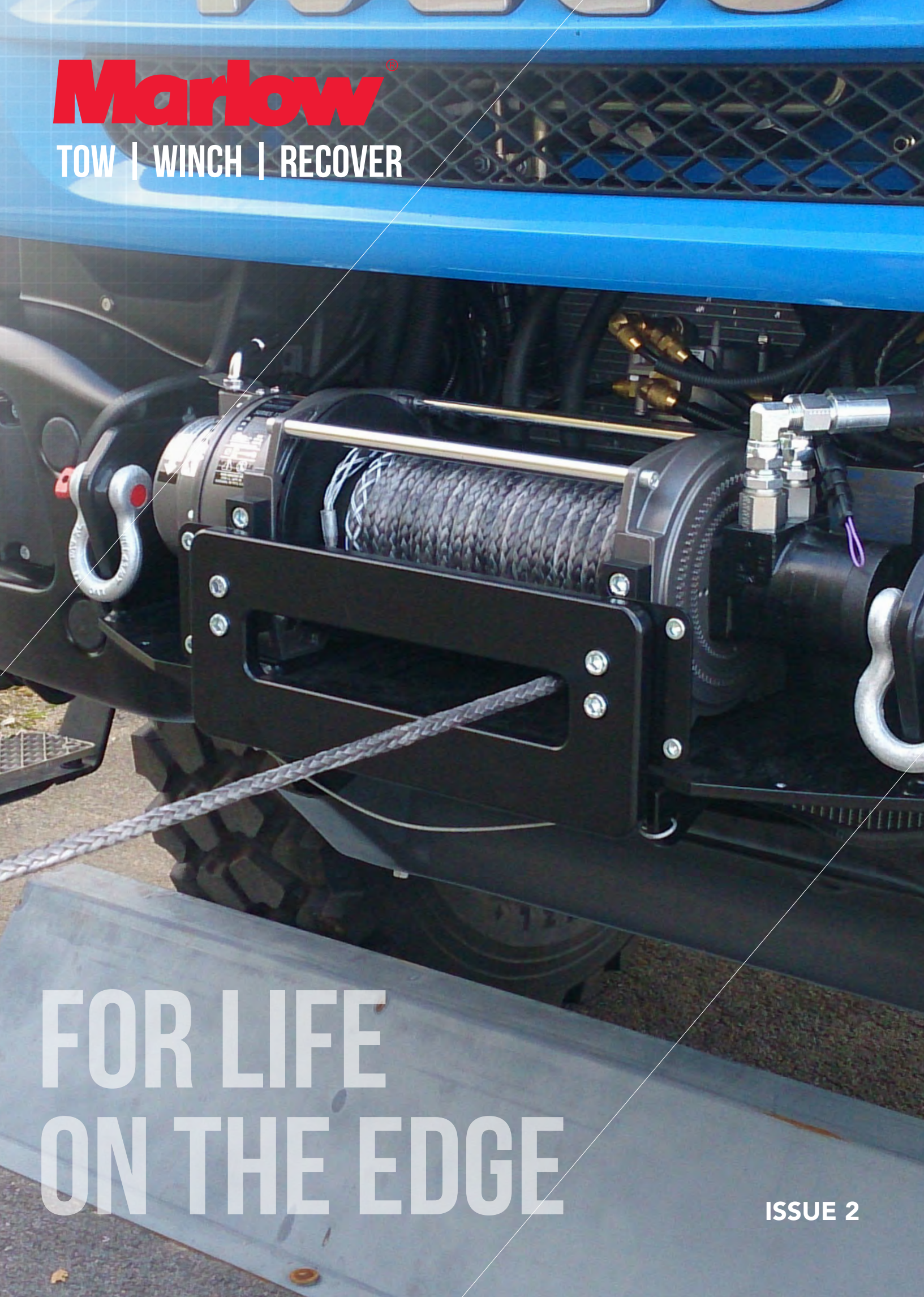


A close-up photograph of a blue vehicle's front end, featuring a black metal grille. Mounted on the front bumper is a heavy-duty black Marlow winch. The winch has a large spool of grey braided rope. A black metal shackle is attached to the left side of the winch, and another is on the right. A black hydraulic hose with silver fittings is connected to the right side of the winch. A thick, grey braided rope is draped over the front of the winch and extends towards the bottom left. The vehicle's tire is visible in the background.

Marlow[®]

TOW | WINCH | RECOVER

FOR LIFE
ON THE EDGE

ISSUE 2

TOWING WINCH RECOVER

Marlow's superior range of technically better ropes provide engineered solutions for all towing, winching and recovery operations across the commercial, support, recreational and combat vehicle sectors.

Wire rope replacement is becoming increasingly important in many vehicle recovery applications due to the significant benefits gained from modern synthetic ropes; offering greater strength, handling and safety improvements over traditional wire products. Marlow's experience in this field has been gained over 20 years of working across industry sectors in the field of wire replacement technology.

The Marlow Ropes brand is recognised around the world for quality, performance and innovation, and the with ties to the local community going back over 200 years. However, with our history and reputation comes responsibility and we are committed to

maintaining the quality and service that our customers have come to expect.

As to the future, we strive for innovation and growth, constantly looking at ways to improve and develop – not only our range of world beating products, but our service and availability to every customer around the globe.

We are proud that our ropes continue to be manufactured in the UK.

This brochure details our range of specialist vehicle application ropes. If you require more information, please do not hesitate to contact us:

UK office: sales@marlowropes.com
+44 (0) 1323 444 444

USA office: salesusa@marlowropes.com
+1508 830 0444

Marlow®

TECHNICALLY BETTER.

WHY CHOOSE SYNTHETIC FIBRE (HMPE) OVER WIRE ROPE?

Historically wire ropes have been used for many applications requiring strength members. However, there are many drawbacks to using wire rope, some of which are highlighted below. Replacing ropes made from steel wire with those made from high performance fibres holds many advantages and none more so than in safety and performance.

Synthetic fibre ropes are 8x lighter than steel wire for a given diameter

8

Synthetic fibre ropes are 15 x stronger than wire weight for weight

15

0

No hazardous wire splinters with synthetic fibre ropes



No yield point



No water absorption or corrosion

No strength loss when synthetic fibre ropes overlap on winch drums



No kinking

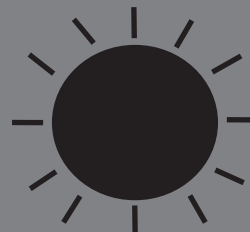


No recoil



Torque balanced

Abrasion resistant



UV resistant

Synthetic fibre ropes retain 100% strength after chemical exposure

100%

At approximately 60% of its breaking load, steel wire reaches its yield point, beyond this point steel wire becomes permanently and irrevocably deformed. Not only does any stretch not recover, but the wire becomes stiffer and brittle and must be retired immediately.

The above figures are based on using SK78 (HMPE)

TECHNICAL FIBRE WINCH ROPES



Marlow’s range of Recoverline and Marlow Winch Lines cater for all wire rope replacement applications including commercial and military vehicle recovery, high loads and recreational offroad 4x4.

.....
RECOVERLINE
.....

Marlow Recoverline has a unique outer braid that provides protection from abrasion, UV and other sources of external damage. This cover is designed to provide excellent abrasion resistance and to protect the core, however if it becomes damaged then the contrasting colour core becomes visible resulting in a clear retirement point before there is any significant strength loss.



Construction: 12 strand UHMPE braided core, 16 plait braided UHMPE cover, Marlow ArmourCoat PU impregnation

RECOVERLINE SK78

MATERIAL	DIAMETER		MASS		AV. STRENGTH			MIN. STRENGTH		
	mm	Inch	g/m	lb/100ft	kg	lb	kN	kg	lb	kN
SK78	10	13/32	57.5	3.86	7510	16600	73.7	6980	15400	68.5
SK78	12	15/32	90	6.04	10800	23800	106	10000	22100	98.5
SK78	14	9/16	124	8.28	15100	33300	148	14100	31000	138

RECOVERLINE SK99

MATERIAL	DIAMETER		MASS		AV. STRENGTH			MIN. STRENGTH		
	mm	Inch	g/m	lb/100ft	kg	lb	kN	kg	lb	kN
SK99	10	13/32	57.5	3.86	8940	19700	87.7	8220	18100	80.7
SK99	12	15/32	90	6.04	12500	27500	123	11500	25300	113.0
SK99	14	9/16	124	8.28	17500	38600	172	16100	35500	158



MARLOW WINCHLINE

Marlow Winch Line has a low stretch, high strength 12-strand construction which improves abrasion resistance and protects from the ingress of dirt, grit and oil.

Construction: 12 Strand HMPE,
Pre-stretched, Marlow ArmourCoat

Other diameters are available

MARLOW WINCHLINE

DIAMETER		WEIGHT		AVERAGE SPLICED LENGTH			MIN BREAK LOAD (kN)		
mm	inch	g/m	lb/100ft	kg	lb	kN	kg	lb	kN
6	7/32	19.6	1.32	3130	6900	30.7	2880	6350	28.3
8	5/16	34.3	2.30	6340	14000	62.2	5830	12900	57.2
9	23/64	41.7	2.80	7640	16800	75.0	7030	15500	69.0
10	13/32	51.5	3.46	9530	21000	93.5	8770	19300	86.0
11	7/16	61.3	4.11	11700	25800	114.9	10800	23800	105.7
12	15/32	71.1	4.77	13400	29500	131.4	12300	27200	120.9

DYNALINE MAX

Dynaline Max takes the wire rope replacement concept of Marlow Winch Line a stage further by adding Marlow's 'Max' super pre-stretching process. Dynaline Max offers much higher strength than a standard Marlow Winch Line rope. The higher break load for a given diameter offers a higher factor of safety or the possibility to down size the rope, thereby allowing a longer length to be fitted on the winch.

Construction: 12 Strand HMPE, 'Max' Super pre-stretched, Marlow ArmourCoat

DYNALINE MAX 78

DIAMETER		WEIGHT		AV. BREAK LOAD (spliced)			MIN BREAK LOAD (spliced)		
mm	inch	g/m	lb/100ft	kg	lb	kN	kg	lb	kN
7	1/4	35.6	2.39	7510	16600	73.7	6980	15400	68.5
9	3/8	54.0	3.62	10800	23800	106	10000	22100	98.1
11	7/16	75.5	5.06	15100	33300	148	14100	31000	138
12	15/32	90.0	6.04	18000	39700	177	16700	36900	164
13	1/2	107.0	7.18	21100	46600	207	19700	43400	193

DYNALINE MAX 99

DIAMETER		WEIGHT		AV. BREAK LOAD (spliced)			MIN BREAK LOAD (spliced)		
mm	inch	g/m	lb/100ft	kg	lb	kN	kg	lb	kN
7	1/4	35.6	2.39	8940	19700	87.7	8220	18100	80.7
9	3/8	54.0	3.62	12500	27500	123	11500	25300	113
11	7/16	75.5	5.06	17500	38600	172	16100	35500	158
12	15/32	90.0	6.04	20900	45900	205	19200	42200	188
13	1/2	107.0	7.18	24500	54000	241	22600	49600	221

Pre-spliced options available.
See page 10



DYNALINE DEFENDER

WITH
Dyneema®

DYNALINE DEFENDER
IN USE ON JLTV
ARMoured VEHICLE
© OSHKOSH

Specifically designed for use in the harshest working environments of the commercial and military recovery sectors. The Defender is manufactured from a 100% Dyneema® SK78 or SK99 core and a thin Dyneema® cover which acts as a dual purpose; protecting from abrasion caused by sand and grit whilst ensuring the rope maintains a firm, round profile which minimises the risk of rope 'dive'.

DYNALINE DEFENDER

DIAMETER		MASS		SK78 AV. STRENGTH			SK78 MIN. STRENGTH			SK99 AV. STRENGTH			SK99 MIN. STRENGTH		
mm	Inch	g/m	lb/100ft	kg	lb	kN	kg	lb	kN	kg	lb	kN	kg	lb	kN
7	1/4	30.8	2.07	4570	10100	44.8	4250	9380	41.7	5440	12000	53.4	5010	11000	49.1
8	5/16	48.4	3.25	7510	16600	73.7	6980	15400	68.5	8940	19700	87.7	8220	18100	80.7
9	3/8	57.3	3.84	9390	20700	92.1	8730	19200	85.6	11200	24600	110	10300	22600	101
10	13/32	71.1	4.77	10800	23800	106	10000	22100	98.1	12500	27500	123	11500	25300	113
12	15/32	88.6	5.94	12600	27800	124	11700	25800	115	14600	32100	143	13400	29600	132
14	18/32	109.6	7.35	15100	33300	148	14100	31000	138	17500	38600	172	16100	35500	158
15	9/16	124.1	8.32	18000	39700	177	16700	36900	164	20900	45900	205	19200	42200	188
16	20/32	141.1	9.46	21100	46600	207	19700	43400	193	24500	54000	241	22600	49600	221
18	23/32	185.2	12.42	26400	58300	259	24600	54200	241	30700	67500	301	28200	64100	277
20	25/32	235.2	15.77	32900	72400	323	30600	67400	300	38100	83800	374	35100	77100	344

REBEL KERR

Marlow's REBEL Kinetic Energy Recovery Rope (K.E.R.R) is made from 100% UV stabilised Nylon / Polyamide which offers unrivalled elongation characteristics. Designed for vehicle recovery by the transfer of kinetic energy which is then transferred into the rope and which subsequently transfers to the stuck vehicle, thereby increasing the energy used in the pull and freeing the stuck vehicle more easily. It is also often referred to as 'snatch' recovery.

REBEL KERR

MATERIAL	DIAMETER		MASS		AV. STRENGTH			MIN. STRENGTH		
	mm	Inch	g/m	lb/100ft	kg	lb	kN	kg	lb	kN
NYLON / POLYAMIDE	22	7/8	306.7	20.52	14,100	30,900	138	12,600	27,800	124
NYLON / POLYAMIDE	28	1 1/8	489.0	32.79	22,500	49,500	221	20,200	44,500	198



KERR / SNATCH ROPE

The K.E.R.R is a Nylon / Polyamide rope designed and developed by Marlow and the British Forces to provide fast and effective recovery of armoured vehicles. It allows quick and easy deployment for rapid recovery without the need for special vehicles.

DIAMETER		LENGTH		MASS		MIN BREAK LOAD (kg)		NSN No
mm	inch	m	ft	kg	lbs	kg	lbs	
24	15/16	4.5	15'	2.84	6.3	12,030	26500	
24	15/16	8	26'	4.26	9.4	12,030	26500	
28	1 3/32	10	33'	7.28	16	15,800	34800	
32	1 1/4	12.2	40'	11.31	25	20,000	44100	4020-99-831-9499
36	1 13/32	12.2	40'	14.4	32	24,800	54700	
40	1 9/16	13.7	45'	19.8	42	30,000	66100	4020-99-832-0800
48	1 7/8	13.7	45'	28.4	63	42,000	92600	4020-21-902-3218
52	2 1/16	13.7	45'	33.2	73	48,800	108000	
56	2 7/32	13.7	45'	36	78	56,000	123000	
60	2 9/25	13.7	45'	46.5	103	63,800	141000	4020-01-218-4488
64	2 17/32	15	49'	50.4	111	72,000	159000	4020-01-902-1077
68	2 11/16	19	62'	65	143	79,500	175000	
72	2 27/32	21	69'	89	197	90,000	198000	
80	3 5/32	21	69'	110	243	110,000	243000	4020-01-210-2154



TECHNICAL FIBRE

RECOVERY LINES



D12 PLUS

For larger winches and high load applications Marlow also manufactures a range of 12 strand Dyneema® up to 40mm diameter and 1255 (kN) break load. Where the higher break loads for a given diameter are required, D12 Plus is also available in Dyneema SK99.

For applications where flex fatigue is a critical factor, such as two drum traction winches, D12 Plus is available in Dyneema® XBO, a treatment applied at the yarn manufacturing stage which increases resistance to bending fatigue.

Construction: 12 Strand Dyneema® SK75, SK78, SK99 or XBO, Marlow ArmourCoat

D12 PLUS



MATERIAL	DIAMETER		MASS		AV.STRENGTH			MIN. STRENGTH		
	mm	Inch	g/m	lb/100ft	kg	lb	kN	kg	lb	kN
SK75 / SK78	18	23/32	195	13.1	34,100	75,200	334.0	31,400	69,200	308
SK75 / SK78	20	25/32	239	16.0	41,000	90,400	402.0	37,700	83,200	370
SK75 / SK78	22	7/8	289	19.4	48,300	106,000	474	44,400	97,900	436
SK75 / SK78	24	15/16	318	21.3	53,000	117,000	520	48,700	107,000	478
SK75 / SK78	26	1 1/32	391	26.2	64,400	142,000	632	59,200	131,000	581
SK75 / SK78	28	1 3/32	434	29.1	69,700	154,000	684	64,100	141,000	629
SK75 / SK78	30	1 3/16	521	34.9	83,200	184,000	817	76,600	169,000	751
SK75 / SK78	32	1 1/4	579	38.8	92,000	203,000	903	84,600	187,000	830
SK75 / SK78	34	1 11/32	636	42.7	99,000	218,000	971	91,100	201,000	894
SK75 / SK78	36	1 13/32	694	46.6	106,000	234,000	1,040	97,800	216,000	959
SK75 / SK78	38	1 1/2	781	52.4	119,000	263,000	1,170	110,000	242,000	1,080
SK75 / SK78	40	1 9/16	868	58.2	130,000	288,000	1,280	120,000	265,000	1,180

Larger diameters up to 96m are available

RD WINCHLINE

The RD Winch Line has been specifically designed for use with the Rapid Deployment Transporter (RDT), the Vehicle Recovery System (VRS) and the Compact Recovery Trailer.

Currently in use with most major recovery operators, this proven product is available as a pre-spliced or sewn assembly.



RD WINCHLINE

MATERIAL	DIAMETER		MASS		AV.STRENGTH			MIN. STRENGTH		
	mm	Inch	g/m	lb/100ft	kg	lb	kN	kg	lb	kN
SK75/78/PES	8	5/16	39	2.62	3490	7670	34.2	3140	6900	30.8



Marlow have worked for over 14 years with professional vehicle operators to create a specialist product that meets their standards and which is used in the recovery of vehicles on their automatic winch lines.

TECHNICAL FIBRE

TOW ROPES



BLACK RHINO SLING



WHITE RHINO SLING



RHINO SLING - LIFTING & RECOVERY

High strength | Light weight | Improved D:d ratios | Flexible | Hard wearing | Dyneema® SK78/SK75

Manufactured using our high strength pre-stretched D12* with our ChafeGuard Dyneema® cover. The construction of this sling results in very high strength and low weight, providing easy handling and allowing safe and quick installation and change overs.

The design of the Rhino Sling allows for much shorter lengths and improved D:d ratios in the spliced eyes when compared to traditional constructions.

Super low stretch thanks to the pre-stretched D12* strength member, the multi-use Rhino Sling is suitable for all lifting and recovery operations.

* for slings up to 120mt D12+ used on larger slings

RHINO SLING

DIAMETER		MINIMUM LENGTH**		SUGGESTED LENGTH**		WEIGHT		EYE SIZE		STRENGTH RATING (mt) (MBL)		WLL(mt): Lifting (7:1)		WLL (mt): Towing (2:1)	
mm	inch	mm	inch	mm	feet	kg	lbs	mm	inch	tonnes	lbs	tonnes	lbs	tonnes	lbs
16	5/8	0.30	12	1.5	5	0.20	0.44	250	10	10	22000	1.43	3150	5.00	11000
16	5/8	0.30	12	3	10	0.40	0.89	250	10	10	22000	1.43	3150	5.00	11000
16	5/8	0.30	12	6	20	0.81	1.8	250	10	10	22000	1.43	3150	5.00	11000
18	6/8	0.35	14	1.5	5	0.32	0.7	250	10	15	33000	2.14	4720	7.50	16500
18	6/8	0.35	14	3	10	0.64	1.4	250	10	15	33000	2.14	4720	7.50	16500
18	6/8	0.35	14	6	20	1.28	2.8	250	10	15	33000	2.14	4720	7.50	16500
26	1	0.50	20	3	10	1.10	2.4	250	10	25	55000	3.57	7870	12.5	27500
26	1	0.50	20	6	20	2.20	4.9	250	10	25	55000	3.57	7870	12.5	27500
26	1	0.50	20	10	33	3.76	8.1	250	10	25	55000	3.57	7870	12.5	27500
34	1 3/8	0.65	26	3	10	1.82	4.0	250	10	45	99000	6.43	14200	22.5	49500
34	1 3/8	0.65	26	6	20	3.65	8.0	250	10	45	99000	6.43	14200	22.5	49500
34	1 3/8	0.65	26	10	33	6.08	13.4	250	10	45	99000	6.43	14200	22.5	49500
42	1 5/8	0.80	31	3	10	2.69	5.9	250	10	60	132000	8.57	18900	30.0	66000
42	1 5/8	0.80	31	6	20	5.38	11.9	250	10	60	132000	8.57	18900	30.0	66000
42	1 5/8	0.80	31	10	33	8.97	19.8	250	10	60	132000	8.57	18900	30.0	66000
50	2	0.95	37	6	20	3.58	15.8	250	10	75	165000	10.7	23600	37.5	82500
50	2	0.95	37	10	33	7.16	26.3	250	10	75	165000	10.7	23600	37.5	82500
50	2	0.95	37	15	49	11.9	39.5	250	10	75	165000	10.7	23600	37.5	82500
58	2 2/8	1.10	43	6	20	9.85	21.7	400	16	100	220000	14.3	31500	50.0	110000
58	2 2/8	1.10	43	10	33	16.4	36.2	400	16	100	220000	14.3	31500	50.0	110000
58	2 2/8	1.10	43	15	49	24.6	54.3	400	16	100	220000	14.3	31500	50.0	110000
60	2	1.15	39	6	20	10.9	24.0	400	16	120	265000	17.1	37800	60.0	132500
60	2	1.15	39	10	33	18.1	40.0	400	16	120	265000	17.1	37800	60.0	132500
60	2	1.15	39	15	49	27.2	60.0	400	16	120	265000	17.1	37800	60.0	132500
62	2 4/8	1.20	47	6	20	14.5	32.0	400	16	150	330000	21.4	47200	75.0	165000
62	2 4/8	1.20	47	10	33	24.2	53.3	400	16	150	330000	21.4	47200	75.0	165000
62	2 4/8	1.20	47	15	49	36.3	80.0	400	16	150	330000	21.4	47200	75.0	165000
74	2 7/8	1.40	55	6	20	19.8	43.6	400	16	200	441000	28.6	63000	100	220500
74	2 7/8	1.40	55	10	33	33.0	72.7	400	16	200	441000	28.6	63000	100	220500
74	2 7/8	1.40	55	15	49	49.5	109	400	16	200	441000	28.6	63000	100	220500
84	3 2/8	1.60	63	6	20	26.4	58.2	400	16	250	551000	35.7	78700	125	275500
84	3 2/8	1.60	63	10	33	44.0	96.9	400	16	250	551000	35.7	78700	125	275500
84	3 2/8	1.60	63	15	49	66.0	145	400	16	250	551000	35.7	78700	125	275500
94	3 5/8	1.80	71	6	20	31.7	69.8	400	16	300	661000	42.9	94500	150	330500
94	3 5/8	1.80	71	10	33	52.8	116	400	16	300	661000	42.9	94500	150	330500
94	3 5/8	1.80	71	15	49	79.2	174	400	16	300	661000	42.9	94500	150	330500

** CUSTOM LENGTHS AVAILABLE

HMPE TOW ROPE

Light weight and strong, HMPE Tow Ropes have been designed specifically for medium weight, front line armoured vehicles. Safer and lighter than wire, these 24 Plait Dyneema cover/ 12 strand Dyneema construction tow ropes can be quickly and easily deployed in critical situations by a single person.



HMPE TOW ROPE

DIAMETER		LENGTH		WEIGHT		MIN BREAK LOAD	
mm	inch	m	ft	kg	lbs	kg	lbs
50	2.0	4.8	15.7	7.8	17.2	40000	88,000

POLYESTER TOW ROPE

Strong, lightweight and flexible with excellent UV resistance, Marlow's 8 Strand Polyester Tow Ropes are ideally suited for small to medium sized armoured vehicles.



POLYESTER TOW ROPE

DIAMETER		LENGTH		WEIGHT		MIN BREAK LOAD (kg)	
mm	inch	m	ft	kg	lbs	kg	lbs
28	1 3/32	4	13	4.46	9.8	16,000	35000
32	1 1/4	2.5	8	3.89	8.6	20,900	46000
32	1 1/4	4	13	6.22	13.7	20,900	46000
40	1 9/16	8	26	10	22	34,500	76000



OPTIONS & ASSEMBLIES



SPLICED WINCH LINE ASSEMBLIES

Our Winch Lines and Dynaline Max are also available in pre-spliced made to order assemblies. Factory spliced with a tubular steel thimble and a choice of standard or competition hooks. Pre-spliced winch lines are available in a range of lengths (or tailor made) with either a terminal or tapered end for connection to the winch or as an extension. Technora tails for specific high friction/high heat applications can also be added to spliced assemblies. Standard spliced lengths of 25m, 30m and 38m in all diameters.



ROPE BAG

The Marlow rope bag is able to accommodate your K.E.R.R /snatch rope.



COLOUR

BLACK



SOFT SHACKLES

Factory spliced Soft Shackles offer outstanding strength at a fraction of the weight of conventional steel shackles.

SOFT SHACKLE

ROPE DIAMETER		MASS		AV.SPLICED STRENGTH			MIN. SPLICED STRENGTH		
mm	inch	g/m	lb/100ft	kg	lb	kN	kg	lb	kN
6	7/32	15	0.06	3600	7920	35.3	2800	6336	28.3
8	5/16	40	0.11	7290	16038	71.5	5832	12830	57.2
9	3/8	55	0.13	8786	19330	86.2	7029	15464	69.0
10	13/32	78	0.17	10958	24107	107.5	8766	19285	86.0
11	7/16	100	0.20	13466	29626	132.1	10773	23701	105.7



LIGHT WEIGHT RECOVERY KIT

(GVW 5,455kg – 7,955kg,
12,000lbs – 17,500lbs)

The Marlow Light Weight Recovery kit contains all the necessary equipment needed to carry out a quick and efficient recovery of a stranded or disabled light tactical vehicle.



KERR
(KINETIC ENERGY
RECOVERY ROPE)



HEAVY DUTY SOFT
SHACKLES

SYNTHETIC WINCH LINE
EXTENSION ROPE



LIGHTWEIGHT SNATCH BLOCKS



STORAGE BAG

TECHNICAL INFORMATION - PHYSICAL PROPERTIES & CARE IN USE

WINCHES AND CAPSTANS

When a rope is wound onto a winch it is important that the wraps are neat and tightly wound. This can be achieved by winding the rope on whilst under tension. If the rope is wound on slack then it will be more prone to burying between the turns of the previous layer.

Length of rope that can be held on a winch drum or reel can be calculated as follows:

Length (m) = $\frac{710000 \times T(F2-D^2)}{d^2}$

WHERE:

T= Traverse in metres
F= Flange diameter in metres
D= Drum diameter in metres
d= Rope diameter in millimetres

TERMINATIONS:

SPLICES: Most Marlow ropes can be spliced, this is normally the preferred method of termination. A good splice using the recommended method should not reduce the strength of a rope by more than 10%.

KNOTS: A knot will reduce the strength of the rope, sometimes very significantly. This 'loss' is caused by the tight bends and compression found in any knot. The amount a rope will be weakened will depend on the knot, type of rope and the material from which it is made but can be up to 60%.

EYE SIZES: Wherever possible the angle formed at the throat of a splice when it is loaded should be 30 degrees or less. This means that the length of the eye when flat must be at least 2.7 times the diameter of the object over which the eye is to be used and the distance from the bearing point to the throat when in use should be at least 2.4 times the diameter. Some materials like Aramids and HMPEs (Dyneema®) will require a larger eye with an angle at the throat of 15 degrees or less.

CHEMICAL RESISTANCE:

CHEMICAL RESISTANCE

This table shows the residual strengths of synthetic fibres after chemical exposure under specific conditions.

CHEMICAL	CONC (W/W%)	TEMP. (°C)	TIME (HOURS)	NYLON	POLYESTER	POLYPROPYLENE	ARAMID	HMPE
ACIDS								
HYDROCHLORIC	34	20	100	0	90	100	95	100
NITRIC	66	20	100	0	70	100	95	95
SULPHURIC	96	20	100	0	100	100	40	90
FORMIC	90	20	100	0	95	100	90	100
ACETIC	100	20	10	85	95	100	100	100
ALKALIS								
CAUSTIC SODA	40	20	100	50	0	90	90	100
CAUSTIC SODA	20	70	150	100	0	100	85	90
CAUSTIC POTASH	40	20	100	90	0	90	90	100
SOLVENTS								
TRICHLOROETHYLENE	100	30	150	100	95	80	100	100
CARBON TETRACHLORIDE	100	20	150	100	100	100	98	100
BENZENE	100	70	150	100	100	100	98	95
METACRESOL	100	100	4	0	0	100	80	100
OXIDISING AGENTS								
HYDROGEN PEROXIDE	10	20	100	0	100	90	95	100

INSPECTION & RETIREMENT:

INSPECTION: It is important that a rope is regularly inspected to ensure that it is undamaged and is still fit for service. The entire length of rope should be examined. The following are some of the points that should be checked. The degree to which any of the following may be allowed before the rope is retired will be dependant on the assumptions made when the rope and safety factors were determined.

EXTERNAL ABRASION: When a multifilament rope is subjected to abrasion the outer filaments will quickly become broken and a furry finish will develop. This furry layer will protect the yarns underneath preventing further abrasion. If this condition does not stabilise and continues to develop then there may be excessive abrasion that could lead to significant strength loss.

INTERNAL ABRASION: The rope should be opened up so that the condition of the internal yarns can be assessed. If they show signs of abrasion then there could be some exposure to abrasive particles or there may be inter yarn abrasion.

ROPE STRENGTHS AND WEIGHTS

Rope strengths are tested according to Marlow's QA25 and 26 quality procedures. Generally these procedures are in line with BS EN ISO 2307, however, a number of other internationally recognised test standards are used including EN 1891 and EN 564. Rope mass is determined by weighing a sample of rope whose length has been measured at a reference load. For most ropes this load is calculated as:

REFERENCE LOAD (kg) = D²/8
Where D is the rope nominal diameter (mm)

Most rope strengths in this catalogue are given in kilograms (kg). However, the correct measure of force or breaking strength is kilonewtons (kN). Conversion factors from one to the other are:

kg to kN x 0.00981
kN to kg x 101.972

WORKING LOADS

Marlow Ropes specify a minimum breaking load. It is the responsibility of the user to determine an appropriate factor of safety and safe working load. This factor of safety must be determined after considering all the risks, the strength reducing factors, and the expected life of the rope.

STORAGE: Ropes should be stored in a suitable clean, dry place out of direct sunlight and away from extreme temperature. Do not store ropes on dirty floors or drag over rough ground – dirt and grit can work between the fibres and cause abrasion damage. Keep ropes away from chemicals and in cases of long term storage, hose down with fresh water to reduce dirt and salt that can affect the life and efficiency.

Braided ropes can have excessive twist imparted into them by incorrect handling. Ideally these ropes should be "hanked" in a figure of 8 fashion this avoids putting twist in and will ensure free running when deployed. If supplied on a reel, this must be allowed to rotate freely on a central pin so that the rope may be drawn off from the top layer. Never take the rope from a reel lying on its side unless placed onto a turntable.

SHEAVES, PULLEYS AND ROLLERS: When any rope is used around a sheave there will be a reduction in its strength and life. For most non-specialised applications a sheave diameter 8-10 times the rope diameter will suffice, however certain materials such as Aramids may require a sheave size of up to 20 times diameter.

The profile of the groove in a sheave should support the entire rope. Normally a semicircle of 10% greater diameter than that of the rope is appropriate. 'V' groove sheaves should be avoided since they compress the rope and have points of local friction reducing the life of the rope. Sheaves should be maintained so that they rotate freely in use.

GLAZING: If a rope has been subjected to excessive heat then there may be glazed or glossy areas of rope. The glazing is caused when the yarns melt, if this has happened then the nearby yarns will also have been exposed to elevated temperatures and will have been affected. This type of damage is often seen if ropes slip on winch barrels or capstans.

DISCOLOURATION: This could indicate the presence of dirt that may cause internal abrasion or could be an indication of chemical damage. If chemical damage is suspected then the amount that the rope has been weakened is very difficult to assess and the rope should be retired.

INCONSISTENCIES: If any section of the rope is found to contain lumps, flat areas or thin bits then this could indicate that the rope has been damaged internally. This type of damage is often caused by overloading or shock loads.

No rope will last forever and it is important to ensure that if there are any risks if a rope fails then it should be retired after an appropriate period.

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