

Lankhorst|Ropes

THROUGH LIFE,  
FOR LIFE



MARITIME

TUG & TOWING.



WireCo®  
WorldGroup

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# LANKHORST ROPES... THE VITAL CONNECTION



Lankhorst Ropes is a world leading supplier of synthetic fibre and steel wire ropes for the maritime and offshore industries. As a Royal Lankhorst Euronete Group company, Lankhorst Ropes is also part of the world's largest steel wire manufacturer, WireCo WorldGroup.

Founded in 1803, Lankhorst Ropes has over 200 years' experience in the manufacture and supply of high performance ropes for mooring and towing applications.

Our core business is the development and production of high performance, synthetic and steel wire ropes for mooring and anchor systems, as well as towing and crane hoisting and luffing applications. We are committed to setting the standard for maritime ropes through our leading rope brands - TIPTO® 'Strong & Durable' family, EURO 'Strong & Stretch' family and LANKO® 'Strong & Light' family, which provide an optimal combination of breaking strength, life-time safety and ease of handling. All our ropes are produced in accordance with OCIMF recommendations and ISO standards.

As a supplier of steel wire ropes, Lankhorst Ropes has direct access to WireCo's large steel wire manufacturing resource and leading wire rope brands, like Casar ropes. Our design team has many years' experience in applications using both synthetic and steel ropes. Lankhorst offers a one-stop shop for synthetic and steel wire ropes to shipping and offshore companies globally; and we are the key player for new build ships.

## RELIABILITY AND SAFETY

Lankhorst Ropes is fully certified according to ISO 9001:2008. Quality is central to our business ethos, ensuring you benefit from the highest quality products and services. Our factories for both steel wire and fibre ropes are approved by many IACS members, such as Lloyds, DNV/GL, BV and ABS. In addition, Lankhorst Ropes incorporates features like higher visibility, traceability, snap back protection and lower weight in their ropes, making them easier and safer to use.

## INNOVATION AND HIGH PERFORMANCE

Lankhorst Ropes has a reputation for excellence in product innovation. Multi-award winning rope innovations, for example, the TIPTO® WINCHLINE anti-snap back feature received the 'Innovation in Ship Operations' award from SEATRADE in 2013, have led the industry in rope handing and safety. Lankhorst Ropes is leader in providing extraordinary solutions in terms of breaking strength, service life and ease of rope handling.

## SERVICE AND DELIVERY

Lankhorst Ropes maintains stock points at strategic locations and main ports worldwide. Thanks to our widespread network and global presence, you are ensured continuity of supply, fast service and short delivery times. Our global network of stock points and local sales offices includes Algeciras, Bilbao, Brisbane, Cape Town, Dordrecht (NL), Dubai, Durban, Fujairah, Houston, Panama, Perth, Retford (UK), Rio de Janeiro, Rotterdam, Singapore and Sneek (NL).



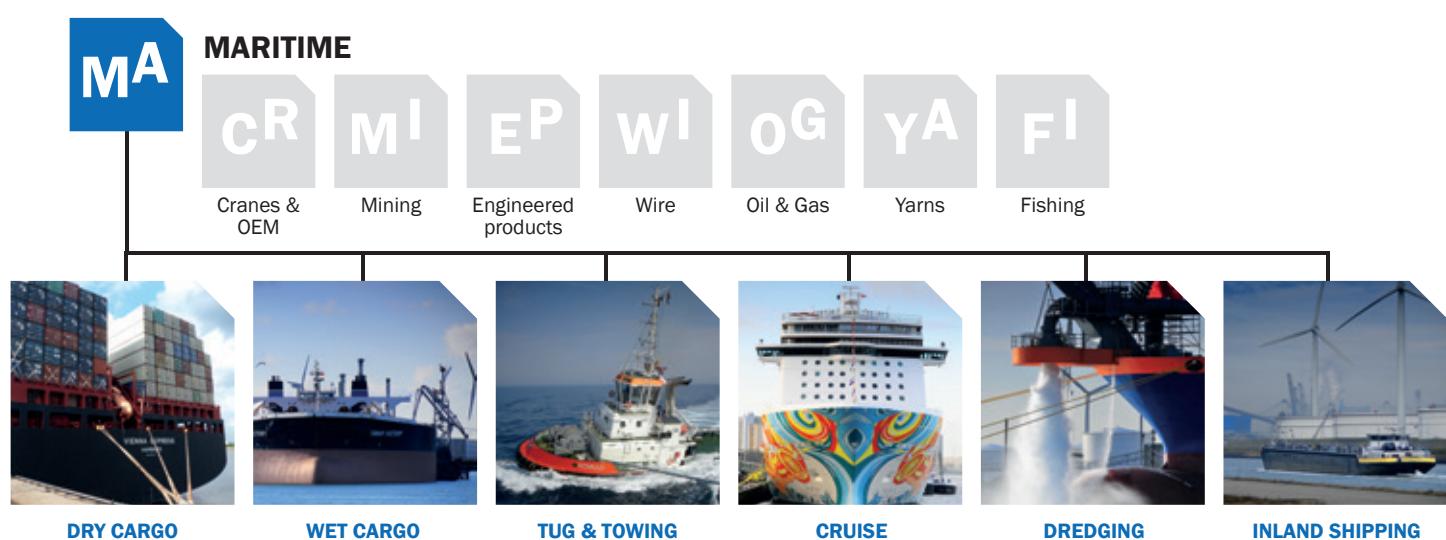
image: courtesy of Craneship Ltd

## PARTNER AND PROBLEM SOLVER

Lankhorst Ropes develops, manufactures and supplies a broad range of ropes directly from stock. Besides fast supply of standard items and rope configurations, Lankhorst Ropes has a dedicated confectioning centre to meet the needs of different market segment demands for specialized and tailor made solutions. In close consultation with our clients, we can bring nearly any desired product to market.

## SUSTAINABLE AND ENVIRONMENTALLY FRIENDLY

Lankhorst Ropes is committed to sustainability in its products and operations, conserving energy and natural resources wherever possible. We introduced the maritime rope industry's first recycling scheme for retired ropes, for use in moulded public furniture, poles and planks, for example. It is an integral part of our sustainability policy and helps many of our partners enhance their environmental policies.



# LANKHORST ROPES FOR TUG AND TOWING

**OUTSTANDING  
SERVICE LIFE  
PERFORMANCE  
AND, AS A  
RESULT, LOW  
TOTAL COST OF  
OWNERSHIP.**



image: courtesy of Craneship Ltd

Safety is paramount in the tug and towing industry. Lankhorst Ropes is committed to providing the equipment needed to ensure the safety of crews and tugs. We offer a range of proven equipment reducing your cost per tow without jeopardizing on-board safety. This can be realized by using STRONGLINE™, LANKO®FORCE, EUROFLEX® and special high performance protective sleeves in combination with the KO-LINK.

KO-LINK is a highly polished, lightweight, aluminium ring, which is inserted and attached to the splice eye of the towline. The ring enhances on-board safety by connecting the main towline and the pennant in such a way that a controlled weak link is created, preventing towing-line overload and premature line failure, by ensuring equal loading on the eyes.

Similarly, Lankhorst Rope's Defender® offers high abrasion resistance for hawser, towing line or pennant, preserving the condition of the ropes. Defender's hollow braid design allows it to be easily adjusted to the size of rope being used, and can be made from different types of yarns, in order to offer extra strength, floatability and other characteristics.

Lankhorst's high strength STRONGLINE rope offers high abrasion resistance and easy handling through its parallel core and braided protective cover design. As well as ensuring long service life, the cover provides protection to crew from snap back. STRONGLINE's highly visible orange markings also help to indicate twisting which may shorten the service life of the rope.

Ease of handling, and rope safety are the trademark of Lankhorst Ropes. Manufactured in the EU using the latest in-house yarn extrusion and rope production techniques, rope construction is optimised to suit the application. All Lankhorst ropes are manufactured from premium materials, tested to OCIMF recommendations, and offer full rope traceability. Moreover, we work closely with our suppliers such as DSM Dyneema, to ensure the highest quality standards from raw materials, through to the manufacture, delivery and installation of the finished rope.

Consistent rope performance is vital during mooring and towing. Using Lankhorst ropes, vessel operators are assured that their ropes are made with the greatest materials consistency to provide the same elongation, and service life, enabling more efficient rope management and supply through Lankhorst Ropes' extensive global stock point network. In this way, the risk of mixed mooring is eliminated.

Lankhorst has a dedicated fibre rope R&D centre providing the technical know-how needed to produce award-winning rope innovations in rope handling and safety. In-built anti-snap back designs reduce the risks to crew, as does the A3 splice that makes rope handling easier and safer during mooring and towing.

Lankhorst Ropes 'Your' partner for new build and replacement ropes. The breadth and depth of our range of fibre and steel wire ropes and associated hardware, backed by a global network of stock points, means we are able to provide complete fleet supply ensuring your operations remain efficient and cost-effective.

# 'THROUGH LIFE, FOR LIFE' SERVICE MODEL

The cost and operational demands on tug operators have never been greater. Maintaining a competitive edge is often the sum of marginal gains, small improvements, which when taken together can make a big difference. Lankhorst Ropes' Through Life, For Life service is designed to do just this.

Lankhorst Ropes: Through Life, For Life gives operators a portfolio of rope service life support and sustainability benefits unmatched in the industry.

From development of a mooring plan to rope selection and management through predictive service-life rope testing and training, Lankhorst provides complete 'through life' rope service – we want you to experience the benefit of working with our ropes in terms of longer rope service-life, easier handling and safe operation.

And then we go further. Commitment to Green manufacture combined with a longer lasting rope service-life, and ultimately rope recycling, translates into levels of sustainability that make a significant contribution to your environmental policies. Looked at in this way, life enhancing, sustainability is built-in with Lankhorst Ropes: Through Life, For Life; and it makes good business sense too!

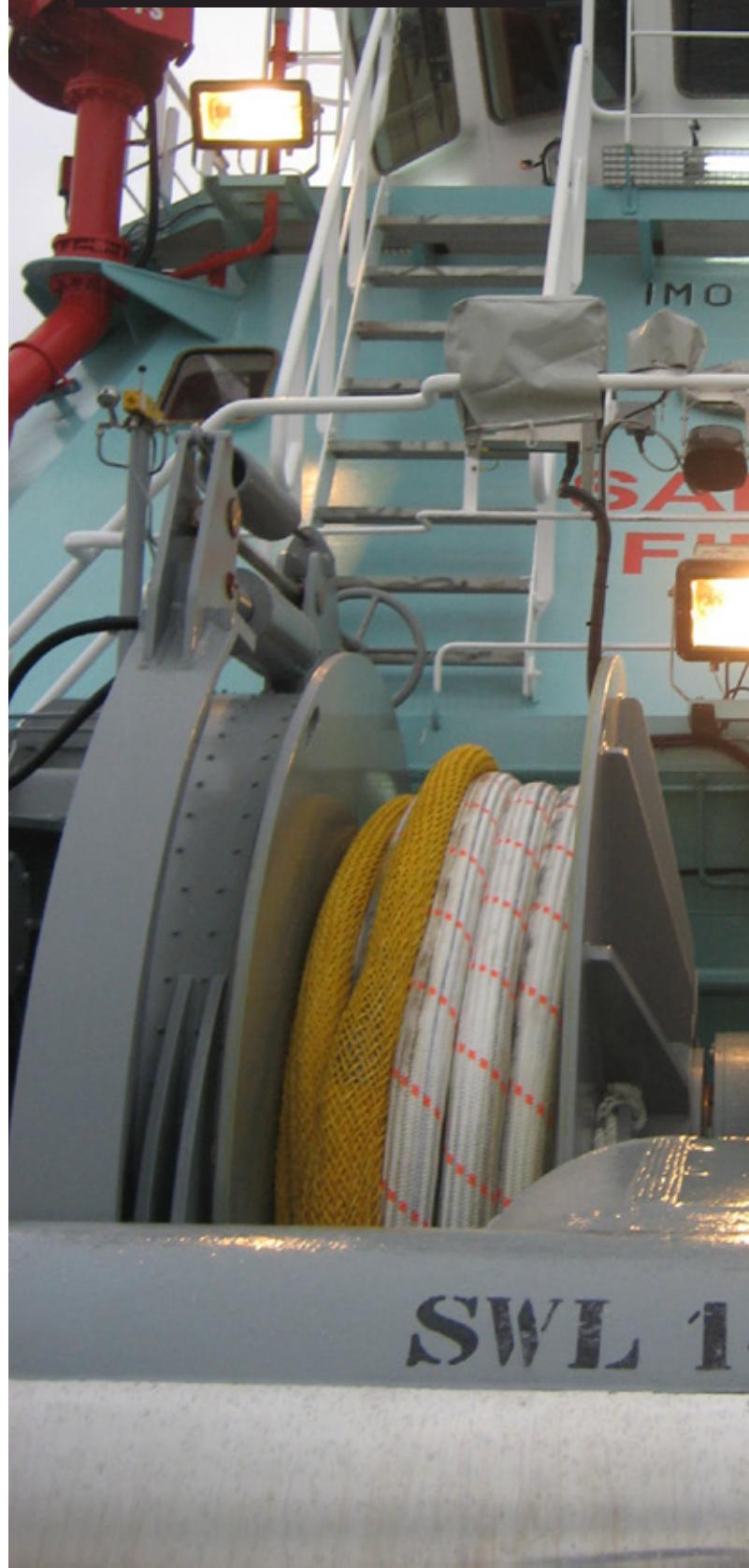
## ROPE SELECTION

Making the correct rope selection is vital. The cost-effectiveness and safety of shipping operations are dependent on selecting the correct rope. Lankhorst takes a holistic approach to prevent early failure of the rope:

- Analysis of type of tow job and harbour conditions  
We will jointly analyse all details including type of towing job, expected swell conditions, possible currents and risks of surging.
- Analysis of the configuration of technical tug layout  
We will jointly analyse all details of the rope route starting from the winch, and calculated winch capacity, to analysis of D/d ratios.

## THROUGH LIFE, FOR LIFE

**Longer rope service-life,  
easier handling, safe  
operation, green  
manufacture and rope  
recycling.**





## RESIDUAL STRENGTH TESTING

Lankhorst Ropes will provide a continuous residual strength testing program in order to assist in determining the best moment to change the rope end-to-end in order to ensure the best economical life time and to optimise safety on board. We believe this should be based on mooring hours, i.e. the number of hours a line has been used in mooring the vessel. This can be quantified by vessel and reported back to the manufacturer. Other factors which ought to be taken into consideration are local environmental conditions at the ports and terminals.

## TEST REPORT

Each sample will get its own test certificate as illustrated.

## ROPE SELECTION CRITERIA

Base on the holistic analyses, Lankhorst will recommend a rope to meet the desired properties based on:

- Elongation properties
- Rope flexibility/stiffness
- Break load
- Chafing gear
- Safety risks
- Floatability
- Service Life expectations
- Environmental conditions
- International standards

## INSTALLATION OF ROPE AND CREW TRAINING

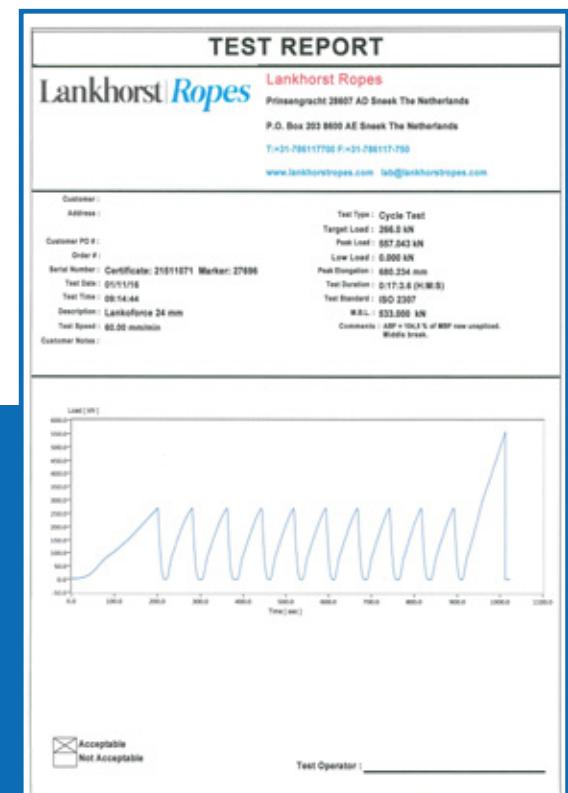
Lankhorst Ropes is committed to equipping crew with the knowledge and skills needed to ensure safe use of fibre ropes and maximum service life. Specifically, we provide:

- Training on rope handling
- Splicing instructions
- Installation on new (@shipyard) or existing (@ports) vessels
- Hardware inspection including all on-vessel equipment

## INSPECTION/MAINTENANCE/TRAINING

Regular inspection is important in ensuring maximum rope service life. In addition to the crew training on rope handling and inspection, Lankhorst Ropes will make periodic visits to the vessel in port to undertake:

- Hardware inspection
- Full length rope inspection
- Update crew training
- Produce an Inspection report

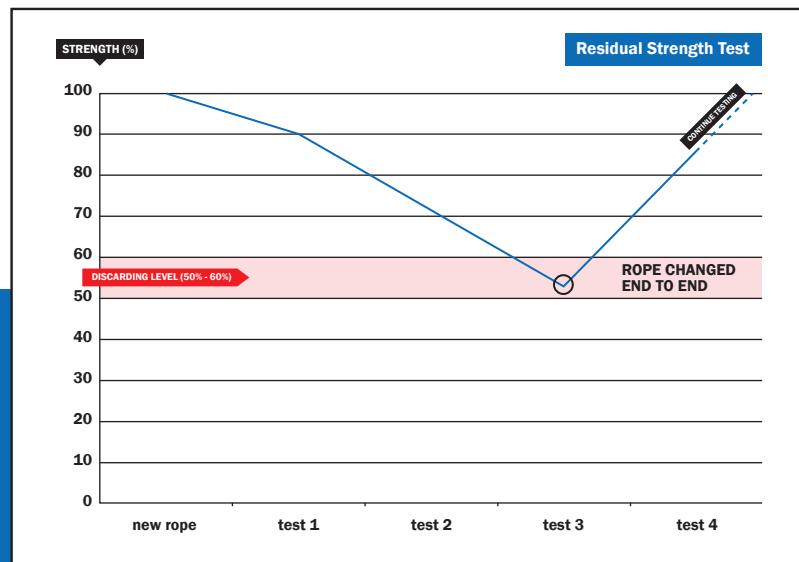


## VISUAL INSPECTION

The rope-sample is visually inspected. Photos are taken for the final residual strength test report before pulling the sample to destruction.

## DEVELOPING SAFE RETIREMENT CRITERIA

By a continuous process of analysis and testing, it is possible to determine the most economical and safest points for ending rope usage and ultimately rope retirement.



## RECYCLING OF ROPES

The two testing and recycling programmes can be combined. Ropes which are returned for testing and deemed unusable, can be used for recycling into other polymer products. On the image you see an offshore vessel with KLP® Deck Covers made by Lankhorst Engineered Products.

Proof of participation in the recycling programme is shown by a logo on the Work Certificate.

The recycling programme is an exclusive programme. It is not meant for ad hoc single rope returning for recycling as an alternative to disposal by our customers. The intention is that the whole fleet's ropes will be recycled in time.

Check the rope selection pages to find out which products participate in the recycling programme.





## ROPE TRACEABILITY

Record keeping is essential for the safe use of mooring and towing ropes. Lankhorst high performance ropes carry a unique Product Identification Code (PIC). This PIC code is printed on a tape inside the rope and on the protective barrier in the eye. It corresponds with the factory certificate number for each rope, providing an effective way of managing rope use and maintenance.

#### 24/7 ACCESS TO ROPE CERTIFICATES

Lankhorst Ropes is able to offer 24/7 access to fibre rope and steel wire rope certificates, regardless of the time zone.

Certificates may be mislaid during filing or transportation but can be required immediately to trace and identify ropes. By providing direct access to rope certificates, Lankhorst customers will be able to instantaneously check all of their ropes' details including construction, diameter, length, minimum breaking load and end termination.

# ROPE SOLUTION OVERVIEW

## CONFIGURATION FOR 80t BOLLARD PULL

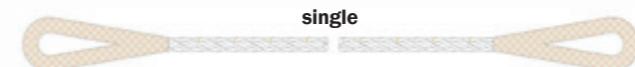
Main line	Pennant	Total weight	Elongation of used rope at break	Features
 <p><b>STRONGLINE</b> ø 80mm</p> <p>417 kg / 100m MBF: 1.890 kN</p> <p>TCLL: 70%</p>	 <p><b>LANKO®FORCE</b> ø 48mm</p> <p>36 kg / 20m MBF: 1.853 kN</p> <p>TCLL: 100%</p>  <p><b>LANKO®FORCE</b> ø 38mm</p> <p>56 kg / 20m MBF: 2.024 kN</p> <p>TCLL: 100%</p>	453kg	LANKO®FORCE: 2,2% STRONGLINE: 7,5%	<ul style="list-style-type: none"> <li>Popular towing system for tug owners.</li> <li>Elongation of STRONGLINE provides shock absorption</li> <li>LANKO®FORCE is lightweight pennant for quick, safe and easy handling</li> <li>Connecting main line with pennant with KO-LINK system</li> <li>Optional 'single': DEFENDER® jacketed version to increase abrasion resistance</li> </ul>
 <p><b>LANKO®FORCE</b> ø 48mm</p> <p>126 kg / 100m MBF: 1.853 kN</p> <p>TCLL: 100%</p>	 <p><b>LANKO®FORCE</b> ø 48mm</p> <p>36 kg / 20m MBF: 1.853 kN</p> <p>TCLL: 100%</p>  <p><b>LANKO®FORCE</b> ø 38mm</p> <p>56 kg / 20m MBF: 2.024 kN</p> <p>TCLL: 100%</p>  <p><b>EUROFLEX®</b> ø 88mm</p> <p>149 kg / 20m MBF: 1.870 kN</p> <p>TCLL: 79,6%</p>	162kg 182kg 275kg	LANKO®FORCE: 2,2% EUROFLEX®: 12,5%	<ul style="list-style-type: none"> <li>Popular towing system where weight and speed of connecting is key</li> <li>Suitable for winch system designed solely for steel wire</li> <li>Extremely long service life</li> <li>EUROFLEX® pennant resolves shock absorption</li> <li>EUROFLEX® pennant resolves shock absorption</li> <li>Optional 'single': DEFENDER® jacketed version to increase abrasion resistance</li> </ul>
 <p><b>6x36WS+IWRC</b> ø 52mm</p> <p>1.110 kg / 100m MBF: 1.890 kN</p> <p>TCLL: 60%</p> 	 <p><b>LANKO®FORCE</b> ø 48mm</p> <p>36 kg / 20m MBF: 1.853 kN</p> <p>TCLL: 100%</p>  <p><b>LANKO®FORCE</b> ø 38mm</p> <p>56 kg / 20m MBF: 2.024 kN</p> <p>TCLL: 100%</p>  <p><b>6x36WS+IWRC</b> ø 52mm</p> <p>277 kg / 25m MBF: 1.890 kN</p> <p>TCLL: 60%</p>  <p><b>EUROFLEX®</b> ø 88mm</p> <p>149 kg / 20m MBF: 1.870 kN</p> <p>TCLL: 79,6%</p>	1.142kg 1.162kg 1.387kg 1.255kg	6x36WS+IWRC: 1,5% LANKO®FORCE: 2,2% EUROFLEX®: 12,5%	<ul style="list-style-type: none"> <li>Traditional towing system with a proven track record</li> <li>LANKO®FORCE pennant is an option for quick, safe and easy handling by the crew</li> <li>EUROFLEX® pennant resolves shock absorption</li> <li>Optional 'single': DEFENDER® jacketed version to increase abrasion resistance</li> </ul>

image: courtesy  
of Craneship Ltd



## CONNECTIONS

### COW HITCH

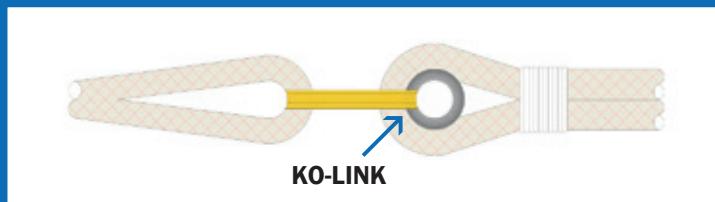
If one of the rope connections is a short length, either a pennant or a stretcher, then a cow hitch connection can be easily performed on deck. The cow hitch is supposed to be easy to separate again, however, in practice it can be difficult to get the knot out. A soft round sling tied on the top of each eye can help to separate the two eyes.



Cow hitch drawing of a LANKO®FORCE (34mm) to an EUROFLEX® (72mm)

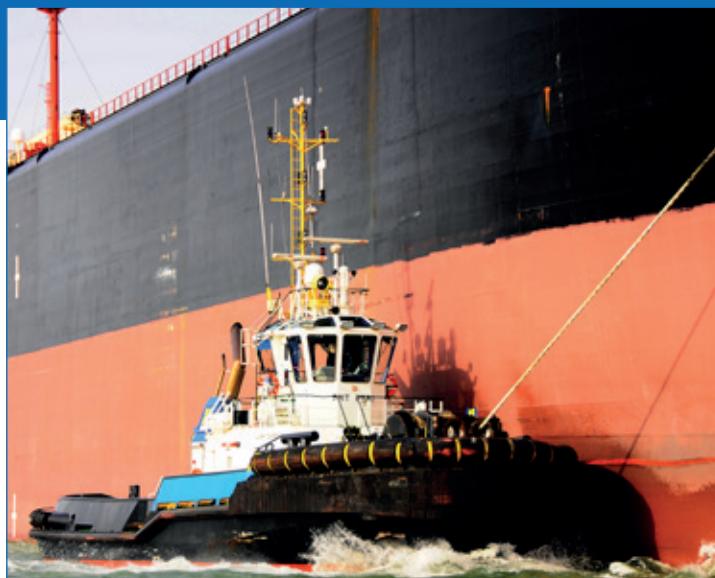
### KO-LINK

KO-LINK is a highly polished, light weight seawater resistant aluminum ring, which is inserted and attached to the spliced eye of the main tow line. The ring connects this main towline and the pennant by a LANKO®FORCE (HMPE) seizing. The advantage of such a connection is that a tow line configuration overload protection is created. This will prevent the main towing rope as well as the pennant from breaking, thus increasing service life.



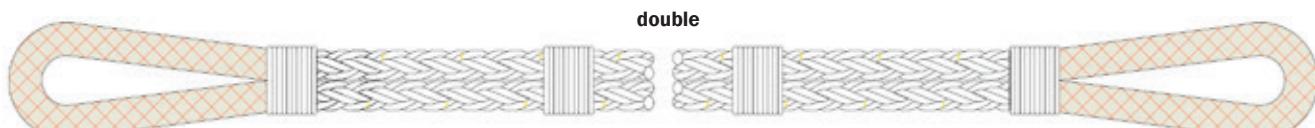
## STRETCHERS

EUROFLEX® stretchers are mainly used in combination with low stretching materials as steel wire rope (6x36WS+IWRC) and LANKO®FORCE. EUROFLEX® stretchers are very well resistant against heat built-up due to the 50% A-grade polyester (high melting point) that is used on the outside end of each yarn. EUROFLEX® stretchers need to absorb heavy shock loads that can occur during towing operations. EUROFLEX® stretcher are superior in terms of tension-tension fatigue, due to the extremely high TCLL value of 79,6%. This makes EUROFLEX® the best solution for your high-performance stretcher.



**EUROFLEX®**  
Ø 88mm      99,4 kg / 20m      TCLL: 79,6%  
                  MBF: 1.870 kN      Elongation: 12,5%

Single legged stretchers provide elongation in the towing system. Stretch that is required for some harbor conditions with high swell and strong currents.



**EUROFLEX®**  
Ø 68mm      59,2 kg / 20m      TCLL: 79,6%  
                  MBF: 1.140 kN      Elongation: 12,5%

Double legged stretcher provide elongation in the towing system. Double legged stretchers are required for application with extremely high break load requirements.

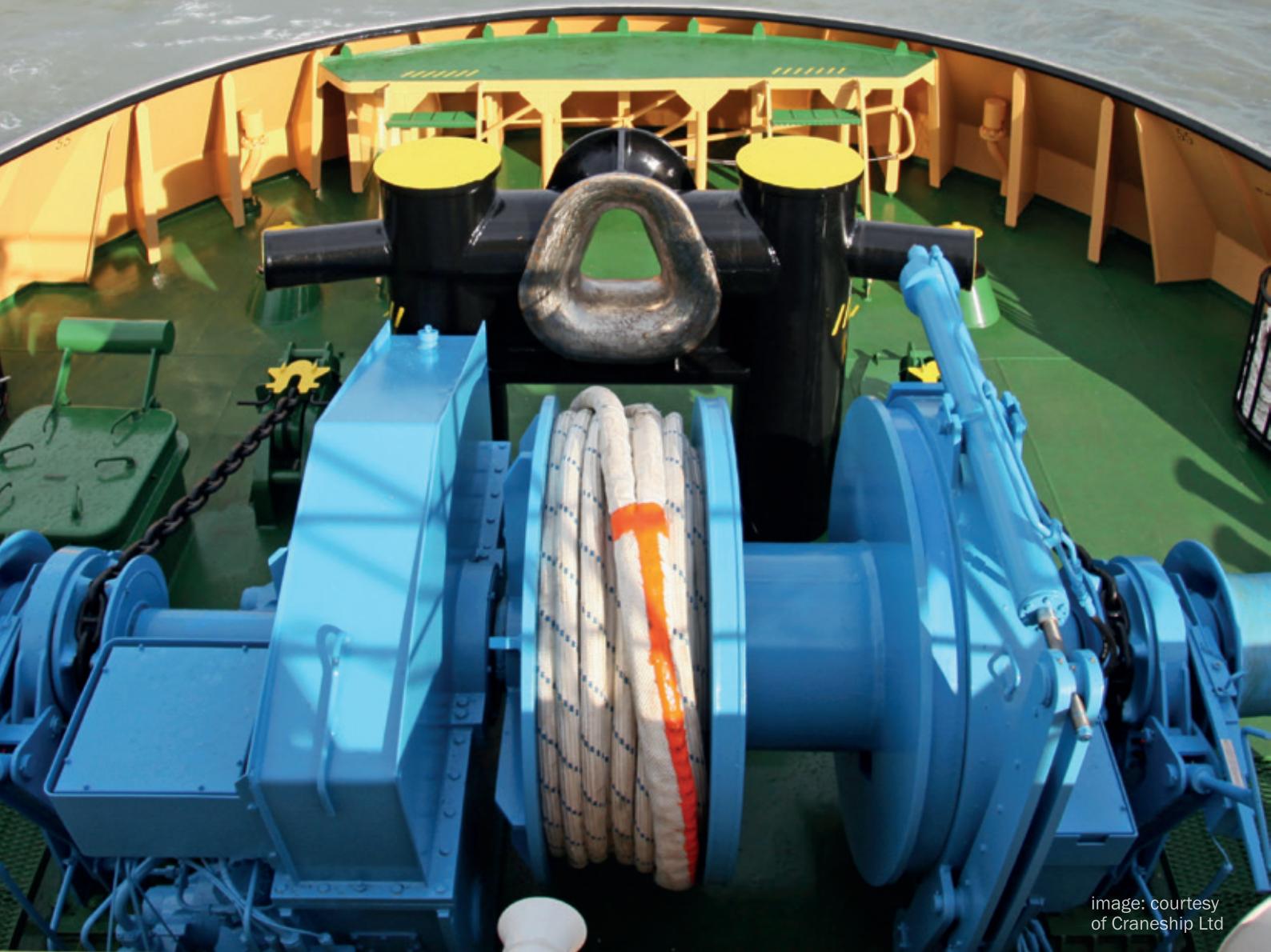


image: courtesy of Cranship Ltd

## CHAFING PROTECTION

### LANKO® FORCE WITH DEFENDER® JACKET



#### FEATURES:

- light weight
- excellent abrasion resistance
- excellent UV-resistance
- floating

Art. number	Core diameter (mm)	Outside diameter (mm)	O.D Circ. (inch)	Weight (kg/100m) (lbs/100 ft)	Minimum Breaking Force (kN) (Mt)	Breaking Force (lbs)
092.748	48	60	7 1/2	185	85	1.853 188,95 416.571
092.752	52	64	8	208	100	2.160 220,26 485.587
092.756	56	72	9	236	118	2.490 253,91 559.774
092.760	60	78	9 3/4	275	136	2.820 287,56 633.961
092.764	64	82	10 1/4	320	155	3.210 327,32 721.637

Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according ISO 2307:2010. The MBF refers to the breaking strength in the rope/wire itself, without splices or any other form of termination that can be formed with or without the use of accessories/fittings.

LANKO®FORCE with Defender® jacket is a 12 strand core rope covered with a DYNEEMA® braid. It is an easy to handle, lightweight rope enabling quick mooring and towing connections. In addition, the open structure of the braided jacket allows the LANKO®FORCE rope inside to be readily inspected, as well as retaining the rope's floating characteristic. The DYNEEMA® braid is woven in such a way that it provides maximum protection against heavy abrasion when using damaged and rusted fairleads and bollards. This is a significant benefit in preventing mooring / towing line damage, when the condition of these items is not known in advance. Moreover, by using the LANKO®FORCE with DEFENDER® jacket as a pennant, the overall total cost of rope ownership is reduced and safety increased.



## LANKO® FORCE WITH DYNEEMA® JACKET



LANKO® FORCE with braided DYNEEMA® jacket is produced for applications where heat build-up and heavy abrasion is expected. The DYNEEMA® jacket is durable jacket with excellent abrasion / heat resistance, as well as floating properties. Applications: mooring, towing, salvage and lifting.

Art. number	Circ. (inches)	Diameter (mm)	Weight (kg/100m)	Weight (lbs/100 ft)	Minimum (kN)	Breaking Force (Mt)	Force (lbs)
092.540	5	40	91,1	61,5	1.177	120,02	264.602
092.542	5 1/4	42	97,8	66	1.303	132,87	292.928
093.166	5 1/2	44	116	78,3	1.544	157,44	347.107
093.168	6	48	138	93,1	1.782	181,71	400.612
092.552	6 1/2	52	157	106	2.141	218,32	481.319
092.556	7	56	184	124	2.283	232,80	513.242
092.560	7 1/2	60	210	142	2.635	268,69	592.375
092.562	7 3/4	62	224	151	2.780	283,48	624.972
092.365	8	64	238	167	2.983	304,18	670.609

Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according ISO 2307:2010. The MBF refers to the breaking strength in the rope/wire itself, without splices or any other form of termination that can be formed with or without the use of accessories/fittings.



### FEATURES:

- light weight
- excellent abrasion resistance
- excellent UV-resistance
- floating

## LANKO® FORCE WITH POLYESTER® JACKET



LANKO® FORCE with polyester jacket is produced for applications where heat build-up and heavy abrasion is expected. The polyester jacket is a durable with excellent abrasion / heat resistance, but with non-floating properties. Applications: mooring, towing, salvage and lifting

Art. number	Circ. (inches)	Diameter (mm)	Weight (kg/100m)	Weight (lbs/100 ft)	Minimum (kN)	Breaking Force (Mt)	Force (lbs)
092.340	5	40	97	65	1.177	120,02	264.600
092.342	5 1/4	42	104	70	1.303	132,87	292.926
092.344	5 1/2	44	122	82	1.544	157,44	347.105
092.348	6	48	139	93	1.782	181,71	400.610
092.352	6 1/2	52	164	110	2.141	218,32	481.316
092.356	7	56	195	131	2.283	232,80	513.239
092.360	7 1/2	60	221	149	2.635	268,69	592.372
092.364	8	64	248	167	2.983	304,18	670.605

Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according ISO 2307:2010. The MBF refers to the breaking strength in the rope/wire itself, without splices or any other form of termination that can be formed with or without the use of accessories/fittings.



### FEATURES:

- light weight
- very good abrasion resistance
- excellent UV-resistance

# ROPE SELECTION



## SYNTHETIC ROPES

### HIGH MODULUS ROPES

### LANKO® FORCE



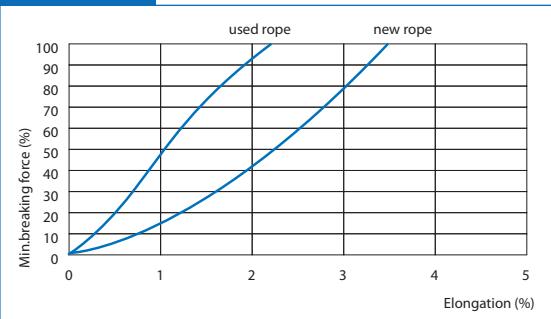
12 strand braided rope, made of DYNEMA® yarns. LANKO®FORCE is an excellent alternative for heavy and lumbersome steel wire ropes in situations requiring manual handling of the rope. It is stronger than conventional steel wire rope, yet the corresponding weight is 7 times lower. The improved handling characteristics are especially suitable for towing and mooring applications. Another important benefit of LANKO®FORCE is that the rope is floating. Moreover, when replacing fibre rope, the reduction in rope diameter can lead to substantial savings in the weight and size of the mooring winches, for example, when incorporated in the design of a new build vessel the cost saving is substantial.

Art. number	Circ. (inches)	Diameter (mm)	Weight (kg/100m)	Weight (lbs/100 ft)	Minimum (kN)	Breaking Force (Mt)	(lbs)
092.006	3/4	6	2,3	1,5	35	3,57	7.868
092.008	1	8	3,9	3	62	6,32	13.938
092.010	1 1/4	10	5,9	4	97	9,89	21.806
092.012	1 1/2	12	9,3	6	137	13,97	30.799
092.014	1 3/4	14	10,6	7,5	184	18,76	41.365
092.016	2	16	14,3	9	244	24,88	54.853
092.018	2 1/4	18	18	12	303	30,90	68.117
092.020	2 1/2	20	21,5	14	374	38,14	84.079
092.022	2 3/4	22	28	19	450	45,89	101.164
092.024	3	24	33,5	23	533	54,35	119.823
092.026	3 1/4	26	37,5	25	612	62,41	137.583
092.028	3 1/2	28	43,5	29	701	71,48	157.591
092.030	3 3/4	30	51,5	35	789	80,45	177.374
092.032	4	32	59	40	887	90,45	199.406
092.034	4 1/4	34	65	44	991	101,05	222.786
092.036	4 1/2	36	71	48	1.076	109,72	241.894
092.038	4 3/4	38	80	54	1.191	121,45	267.747
092.040	5	40	88,5	59	1.314	133,99	295.399
092.044	5 1/2	44	109	73	1.559	158,97	350.477
092.048	6	48	126	85	1.853	188,95	416.571
092.052	6 1/2	52	149	100	2.160	220,26	485.587
092.056	7	56	176	118	2.490	253,91	559.774
092.060	7 1/2	60	202	136	2.820	287,56	633.961
092.064	8	64	230	155	3.210	327,32	721.637
092.068	8 1/2	68	259	174	3.610	368,11	811.560
092.072	9	72	290	195	4.010	408,90	901.484
092.080	10	80	358	241	4.510	459,88	1.013.888
092.088	11	88	430	289	5.320	542,48	1.195.984
092.096	12	96	510	343	6.230	635,27	1.400.560
092.104	13	104	600	403	6.800	693,40	1.528.701
092.112	14	112	695	467	7.810	796,39	1.755.758
092.120	15	120	798	536	8.870	904,47	1.994.055
092.128	16	128	910	611	9.970	1.016,64	2.241.345
092.136	17	136	1.030	692	11.100	1.131,87	2.495.379
092.144	18	144	1.150	773	12.400	1.264,43	2.787.631

Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according ISO 2307:2010. The MBF refers to the breaking strength in the rope / wire itself, without splices or any other form of termination that can be formed with or without the use of accessories / fittings.

	SPECIFIC GRAVITY	0,98 (floating)
	UV-RESISTANCE	excellent
	ABRASION RESISTANCE	excellent
	CHEMICAL RESISTANCE	good
	MELTING POINT	approx. 147 °C
	CONSTRUCTION	12 strand plaited
	TCLL VALUE	100%
	COLOUR	yellow
	WATER ABSORPTION	0%
	ELONGATION	2,2%
	QUICK BURY SPLICING	

#### ELONGATION:



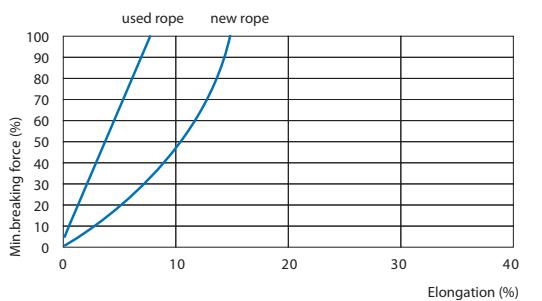
## SYNTHETIC ROPES

### STRONGLINE™

STRONGLINE™ has a rope construction comprising a parallel core with a braided protective cover. The parallel core produces a far higher strength rope than might be expected for a rope of this diameter and material. The protective cover ensures a long service life due to its excellent resistance against abrasion. Regular maintenance can significantly lengthen the rope service life. The main applications of STRONGLINE™ are towing and mooring.

When STRONGLINE™ is installed on a towing winch, twists in the rope during installation can reduce the service life of the rope once put to work. To prevent twisting, it is crucial to use a turning table for unwinding from a coil. To facilitate the installation and avoiding induced twisting, a longitudinal marking has been added to the STRONGLINE™ during manufacture. Please make sure the longitudinal marking line is always on the same position while winding up the STRONGLINE™ on your towing winch.

#### ELONGATION:



Art. number	Circ. (inches)	Diameter (mm)	Weight (kg/100m)	Weight (lbs/100 ft)	Minimum (kN)	Breaking Force (Mt)	(lbs)
081.056	7	56	227	152	995	101,46	223.685
081.060	7 1/2	60	256	172	1.130	115,23	254.034
081.064	8	64	284	190	1.270	129,50	285.507
081.068	8 1/2	68	307	206	1.420	144,80	319.229
081.072	9	72	367	246	1.570	160,09	352.950
081.076	9 1/2	76	390	261	1.730	176,41	388.920
081.080	10	80	417	280	1.890	192,72	424.889
081.088	11	88	493	330	2.250	229,43	505.820
081.092	11 1/2	92	528	354	2.450	249,83	550.782
081.096	12	96	560	375	2.630	268,18	591.248

#### Other diameters on request

Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according ISO 2307:2010. The MBF refers to the breaking strength in the rope / wire itself, without splices or any other form of termination that can be formed with or without the use of accessories / fittings.

	SPECIFIC GRAVITY	1,38
	UV-RESISTANCE	excellent
	ABRASION RESISTANCE	excellent
	CHEMICAL RESISTANCE	good
	MELTING POINT	approx. 265 °C
	CONSTRUCTION	parallel cores with jacket
	TCLL VALUE	70%
	COLOUR	white
	MARKER YARN	orange
	WATER ABSORPTION	< 1%
	ELONGATION	7,5%
	A3 SPLICING	

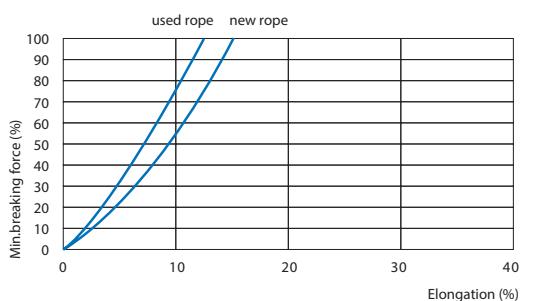


### EUROFLEX®



Continuing industry demand for mooring and towing ropes with higher strength AND smaller diameters, has led to the development of EUROFLEX®. Its excellent handling properties, softness and flexibility, combined with high energy absorption capability and abrasion resistance, make the EUROFLEX® one of the best ropes available today for mooring and towing for both shipping and offshore operations.

#### ELONGATION:



Art. number	Circ. (inches)	Diameter (mm)	Weight (kg/100m)	Weight (lbs/100 ft)	Minimum (kN)	Breaking Force (Mt)	(lbs)
152.428	8	64	263	177	1.010	102,99	227.057
152.426	8 1/2	68	296	199	1.140	116,25	256.282
152.424	9	72	332	223	1.270	129,50	285.507
152.425	9 1/2	76	370	249	1.410	143,78	316.981
152.431	10	80	411	276	1.550	158,05	348.454
152.432	11	88	497	334	1.870	190,68	420.393
152.422	12	96	590	396	2.210	225,35	496.828
152.434	13	104	689	463	2.570	262,06	577.759
152.435	14	112	803	540	2.970	302,85	667.683
152.436	15	120	923	620	3.380	344,66	759.854
152.437	16	128	1.050	706	3.830	390,55	861.018
152.438	17	136	1.187	798	4.300	438,47	966.678
152.439	18	144	1.334	896	4.800	489,46	1.079.083

Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according ISO 2307:2010. The MBF refers to the breaking strength in the rope / wire itself, without splices or any other form of termination that can be formed with or without the use of accessories / fittings.

	SPECIFIC GRAVITY	1,14		TCLL VALUE	79,6%
	UV-RESISTANCE	good		COLOUR	white
	ABRASION RESISTANCE	very good		MARKER YARN	yellow
	CHEMICAL RESISTANCE	good		WATER ABSORPTION	12,5%
	MELTING POINT	approx. 165 °C/ 265 °C		ELONGATION	<0,5%
	CONSTRUCTION	8 strand plaited			

#### Made of:

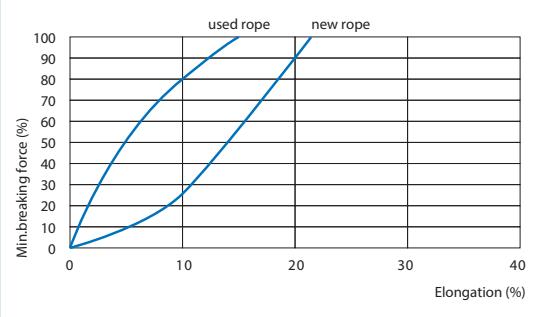
47% polyolefin  
53% polyester

## TUG MOORING ROPES

### TIPTO®TWELVE



#### ELONGATION:



Art. number	Circ. (inches)	Diameter (mm)	Weight (kg/100m)	Weight (lbs/100 ft)	Minimum (kN)	Breaking Force (Mt)	Force (lbs)
111.532	4	32	53	36	177	18.06	39.791
111.536	4 1/2	36	66	44	222	22.65	49.908
111.540	5	40	75,6	51	269	27.45	60.474
111.544	5 1/2	44	92,4	62	321	32.76	72.164
111.548	6	48	109	73	378	38.57	84.978

Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according ISO 2307:2010. The MBF refers to the breaking strength in the rope / wire itself, without splices or any other form of termination that can be formed with or without the use of accessories / fittings.

TIPTO®TWELVE, the 12 strand braided construction makes the rope rounder, more stable, more compact and more regular on the surface. This increases the abrasion resistance and the life-time. Due to its flexibility this ropes is recommended to be used on the mooring bit's in a figure 8 configuration.

TIPTO®TWELVE ropes in the range from 32 mm up to 48 mm have been upgraded with an extra marker yarn. The rope size can now easily (and above all) without mistake be identified.

	SPECIFIC GRAVITY	0,93 (floating)		TCLL VALUE	70,7%
	UV-RESISTANCE	very good		COLOUR	yellow
	ABRASION RESISTANCE	very good		MARKER YARN	orange
	CHEMICAL RESISTANCE	good		WATER ABSORPTION	0%
	MELTING POINT	approx. 140 °C		ELONGATION	14%
	CONSTRUCTION	8 strand plaited			

## EUROFLOAT® PREMIUM

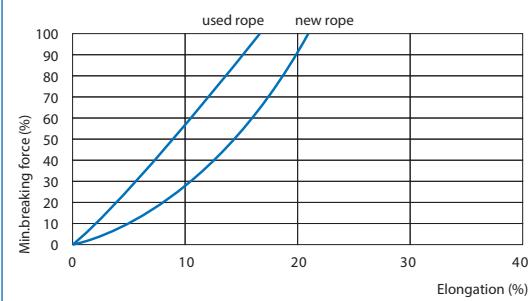


Art. number	Circ. (inches)	Diameter (mm)	Weight (kg/100m)	Weight (lbs/100 ft)	Minimum (kN)	Breaking Force (Mt)	Force (lbs)
152.636	4 1/2	36	67	45	259	26,41	58.226
152.640	5	40	85	57	324	33,04	72.838
152.644	5 1/2	44	99	67	377	38,44	84.753
152.648	6	48	120	80	456	46,50	102.513
152.652	6 1/2	52	141	95	534	54,45	120.048
152.656	7	56	162	109	613	62,51	137.808

Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according ISO 2307:2010. The MBF refers to the breaking strength in the rope / wire itself, without splices or any other form of termination that can be formed with or without the use of accessories / fittings.

Using our latest in-house extrusion technology has made it possible to offer you the newly designed EUROFLOAT® PREMIUM rope which is fully in-line with the requirements of the modern fleet of today. This floating high performance rope is constructed from high strength polypropylene and polyester yarns. Due to its flexibility this ropes is recommended to be used on the mooring bit's in a figure 8 configuration.

#### ELONGATION:



Made of:  
84% polyolefin  
16% polyester

	SPECIFIC GRAVITY	0,98 (floating)
	UV-RESISTANCE	good
	ABRASION RESISTANCE	very good
	CHEMICAL RESISTANCE	good
	MELTING POINT	approx. 165 °C/ 260 °C
	CONSTRUCTION	8 strand plaited
	TCLL VALUE	75,1%
	COLOUR	off white
	MARKER YARN	two green markers
	WATER ABSORPTION	0,1%
	ELONGATION	15%

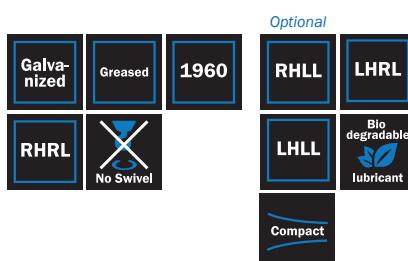


image: courtesy of Craneship Ltd

## 6X36WS + IWRC



Standard wire rope with higher breaking strength. Used for all kinds of purposes, i.e. luffing, mooring, towing, anchoring and coupling push barges. The independent wire rope core provides more strength and stability to the wire rope compared to a fibre core. Construction is according to ISO standard.



Art. number	Diameter (mm)	Weight (kg/100m) (lbs/100 ft)	Minimum Breaking Force (kN) (Mt)	64,04	141.000
292.039	30	368	628	72,91	161.000
281.108	32	419	715	82,29	181.000
281.893	34	472	807	92,18	203.000
281.894	36	530	904	102,79	227.000
281.913	38	590	1.120	114,21	252.000
281.914	40	654	1.230	125,42	277.000
281.915	42	721	1.350	137,66	304.000
281.916	44	792	1.480	150,92	332.000
281.918	46	866	1.610	164,17	362.000
281.919	48	942	1.740	177,43	390.000
281.923	50	1.020	1.820	185,59	409.000
282.109	51	1.060	1.900	192,72	425.000
282.114	52	1.110	2.040	208,02	460.000
282.130	54	1.190	2.190	223,31	492.000
282.108	56	1.280	2.350	239,63	528.000
282.123	58	1.380	2.510	255,94	564.000
282.126	60	1.470	2.680	273,28	603.000
282.135	62	1.570	2.860	291,63	643.000
	64	1.680	1.130		

### Larger diameters on request

Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according to ISO 2408:2004 and EN 12385-4. The MBF refers to the breaking strength in the rope / wire itself, without splices or any other form of termination that can be formed with or without the use of accessories / fittings.



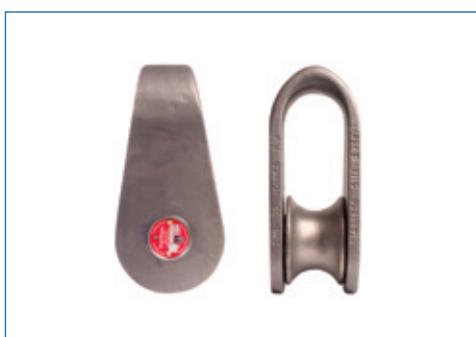
## RELATED ACCESSORIES

Full range available

### MANDAL FAIRLEAD SHACKLE

### HEAVY DUTY REINFORCED ROPE THIMBLE W/LINK

### CROSBY® G-2130 H-SHACKLES WITH BOLT



## TRIANGLE PLATE



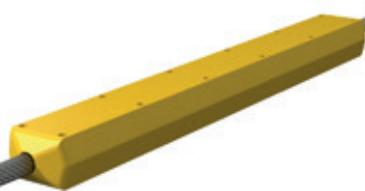
## CLOSED SPUTTER SOCKET



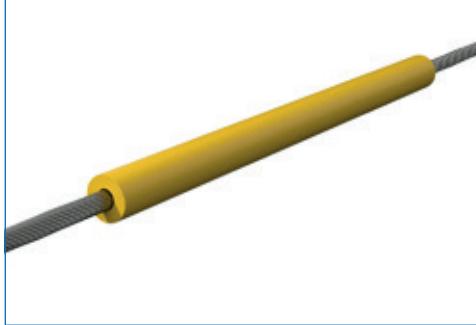
## SHORT BOW SOCKET



## TOWING SHOES



## TOWING SLEEVES



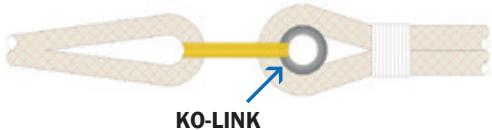
## TIPTO®WEB PROTECTION SLEEVE



## KO-LINK

KO-LINK is a highly polished, lightweight, seawater resistant aluminium ring, which is inserted and attached to the spliced eye of the main tow line. The ring connects this main towline and the pennant by a LANKO®FORCE (HMPE) seizing. The advantage of such a connection is that a tow line overload protection configuration is created. This prevents the main towing rope, as well as the pennant, breaking, thus increasing rope service life. In addition, by using the KO-LINK there is no need to use the common cow-hitch knot which, if poorly made, can cause unequal loading on the eyes resulting in premature line failure. In the event a cow hitched pennant parts, often the eye of the main line gets distorted as well. This could result in total replacement of the whole towing rope configuration.

The KO-LINK also makes it possible to replace the pennant in an easy, quick and safe way. By implementing the KO-LINK in your towing configuration, it will reduce your cost per tow and increase safety on board.



TIPTO®WEB sleeves are finished with a protective seam all around. Two large Velcro strips enable the sleeves to be applied easily and to accommodate different diameters of hawsers, two eyelets, one on either side, enable the crew to secure the sleeve in the right position on the hawser. The standard length is 3 meter.



**THROUGH LIFE,  
FOR LIFE**



## Lankhorst|Ropes

P.O. Box 203, 8600 AE Sneek, The Netherlands

### **GLOBAL MARITIME SALES**

T: +31 (0)515 487 655  
F: +31 (0)515 487669  
E: maritime@lankhorstropes.com  
Customer Service:  
T: +31 (0)515 487 645  
E: cs@lankhorstropes.com

### **DOMESTIC SALES**

T: +31 (0)78 6117 700  
E: domestic@lankhorstropes.com  
Customer Service:  
T: +31 (0)78 6117 741  
E: csdomestic@lankhorstropes.com

### **INLAND SHIPPING**

T: +31 (0)515 487 592  
E: riverships@lankhorstropes.com

### **UK MARITIME SALES**

T: +44 (0)1777 712 690  
E: sales@lankhorstropesuk.com

### **SPAIN MARITIME SALES**

T: +34 (0)94 3665 968  
E: comercial@lankhorstropes.es

### **MIDDLE EAST MARITIME SALES**

T: +971 (0)4 457 8866  
E: maritime@lankhorstropes.com  
Customer Service:  
T: +31 (0)515 487 645  
E: cs@lankhorstropes.com

### **AUSTRALIA MARITIME SALES**

T: +61 (0)7 5574 6556  
E: sales@leaustralia.com.au