LANKHORST

THE VITAL CONNECTION

MA MARITIME

WET CARGO.

WIRECO
A World Ahead

CONTENTS

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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. 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' initial rope supply.

RELIABILITY AND SAFETY

Lankhorst Ropes is fully certified according to ISO 9001:2015. 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. Lankhorst Ropes has developed several multi-award winning rope innovations, including the TIPTO® WINCHLINE anti-snap back feature which received the 'Innovation in Ship Operations' award from SEATRADE in 2013, which 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.

LANKHORST

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 Bilbao, Brisbane, Cape Town, Dordrecht (NL), Dubai, Durban, Fujairah, Houston, Philadelphia, Retford (UK), Rio de Janeiro, Rotterdam, Singapore and Sneek (NL).

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.

MARITIME

CR Cranes & OEM | MI Mining | EP Engineered products | WI Wire | OG Oil & Gas | YA Yarns | FI Fishing

DRY CARGO | WET CARGO | TUG & TOWING | CRUISE | DREDGING | INLAND SHIPPING | EPCI | HEAVY LIFT

LANKHORST ROPES FOR WET CARGO

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

Wet cargo shipping companies operate in highly competitive global markets for transportation of non-edible and dangerous liquids, as well as edible non-dangerous liquids. Under increasing cost pressure, wet cargo carriers must operate as efficiently as possible. Optimising mooring and towing operations is an important factor in achieving efficient loading and unloading – reducing unnecessary and costly delays and additional port charges.

Lankhorst Ropes offers a one-stop shop for a broad range of fibre and steel wire ropes for hoisting, luffing, mooring and towing for wet cargo vessels from Aframax oil tankers (75,000 - 115,000 DWT) through Suezmax (160,000 DWT) and VLCC (150,000 and 320,000) and up to T-1 supertankers (550,000 DWT). They offer outstanding service life performance and, as a result, low total cost of ownership.

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, the rope construction is optimised to suit the application and prevailing mooring conditions. All Lankhorst ropes are manufactured from premium materials, tested to OCIMF Meg 3/4 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 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, backed by a global network of stock points, means we are able to provide complete fleet supply ensuring your wet cargo shipping operations remain efficient and cost-effective.

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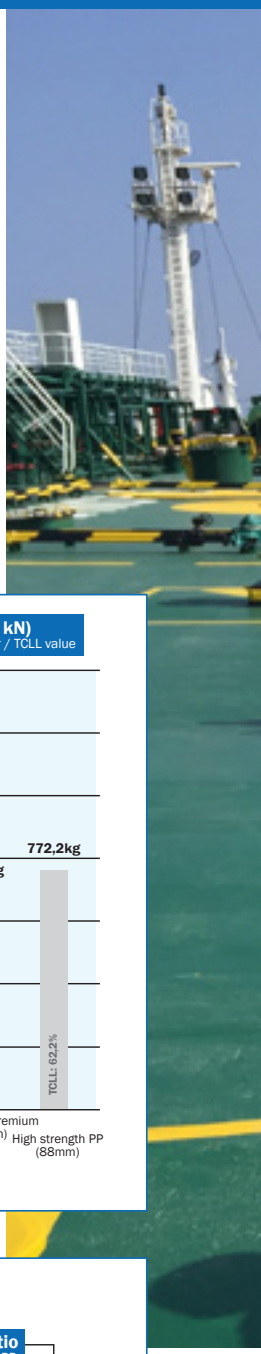
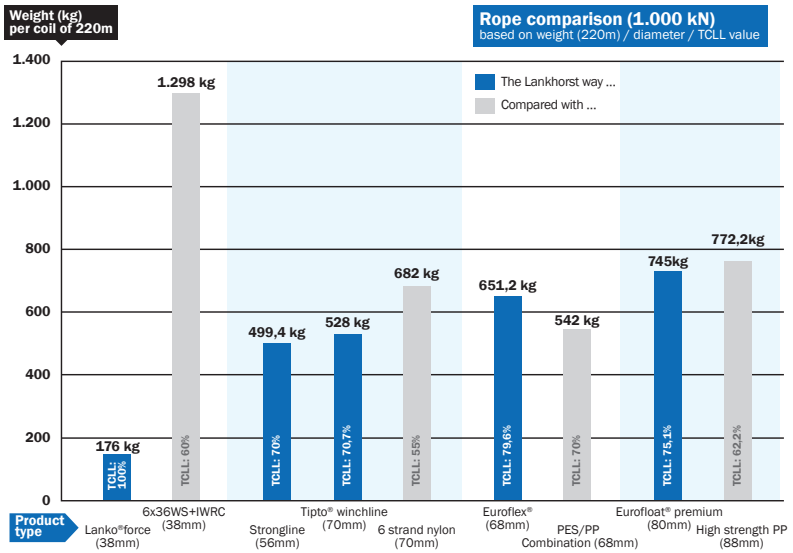
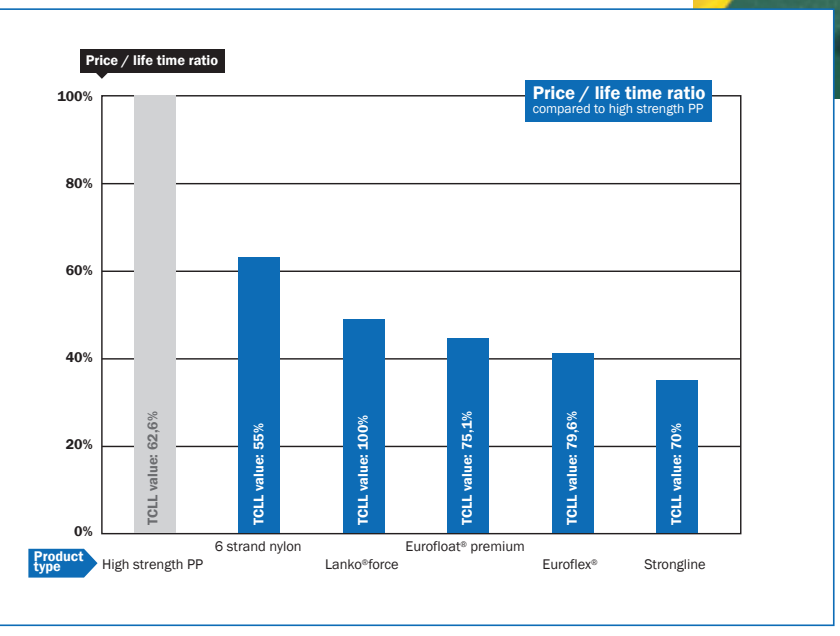
OUR ROPE SYSTEM

± 1.000 kN coil of 220m	Lanko®force	Strongline	Euroflex®	Eurofloat® premium
Density	0,98	1,38	1,14	0,98
Melting point (°C)	147 °C	265 °C	165-265 °C	165-260 °C
Dry / wet (%)	100%	100%	100%	100%
Used Rope elongation (%)	1%	4,5%	8%	9%
UV resistance	excellent	excellent	good	good
TCLL value (%)	100%	70%	79,6%	75,1%







‘THROUGH LIFE, FOR LIFE’ SERVICE MODEL

The cost and operational demands on wet cargo 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 cost-effective 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!

STEP 1 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:

- Review of ships route and mooring conditions

We will jointly go through all details of the trading route (if known) including type of mooring, expected swell conditions, possible currents and risks of surging.

- Review rope route

We will jointly go through all details of the rope route starting from the winch, and calculated winch capacity, to analysis of D/d ratios.

STEP 4 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 should be taken into consideration during the review are the environmental conditions at the ports and terminals, where the vessel will be moored.

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

Test report
Each sample will get its own test certificate as illustrated.

Rope selection criteria
Based on the holistic analyses, Lankhorst will recommend a rope to meet the desired properties for:

- Elongation
- Rope flexibility/stiffness
- Anti-twist
- Break load
- Chafing gear
- Safety risks
- Floatation
- Service life expectations
- Environmental conditions
- International standards.

STEP 2 ROPE INSTALLATION AND CREW TRAINING

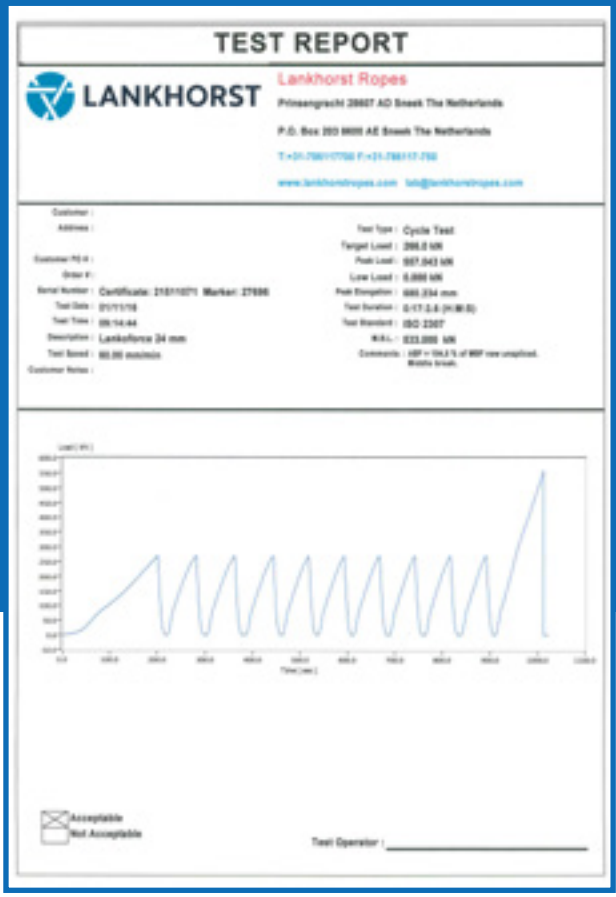
Lankhorst Ropes is committed to equipping crew with the knowledge and skills needed to ensure safe use of fibre ropes and maximum service life. Specifically, we provide:

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

STEP 3 INSPECTION / MAINTENANCE ADVICE / 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:

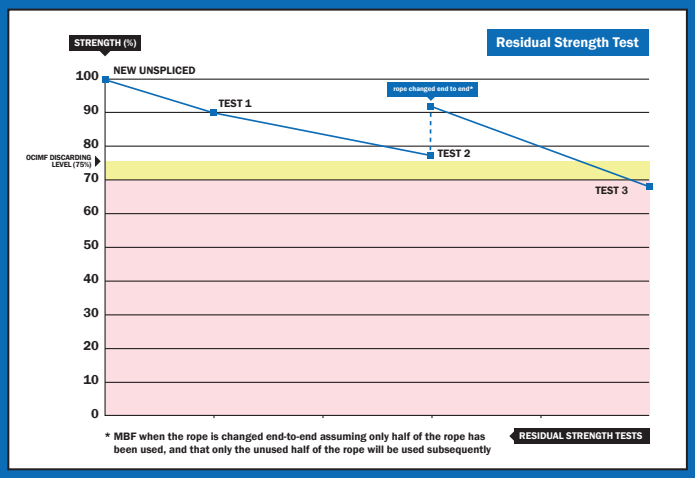
- Hardware condition inspection
- Rope inspection
- Update crew training
- Provide inspection reports.


TEST REPORT

LANKHORST

Lankhorst Ropes

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.



THROUGH LIFE, FOR LIFE

Minimalising risk and increasing safety for people and environment.

STEP 5 RECYCLING OF ROPES

The rope 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 ONLINE ACCESS TO ROPE CERTIFICATES

Lankhorst Ropes offer 24/7 online access to fibre rope and steel wire rope certificates, regardless of the time zone. It provides as standard a manufacturer's certificate for each individual mooring line, connecting shackle and tail. Furthermore, Lankhorst Ropes has a DNV GL type approval for the manufacture of synthetic ropes used for mooring and towing. Check the synthetic rope selection pages to find out for which product a DNV GL L497 'Certificate of Test and Examination of Fibre Ropes' is issued.

Certificates may be mislaid during filing or transportation but can be required immediately to trace and identify ropes. By having direct access to rope certificates, Lankhorst customers are able to instantaneously check all of their ropes' details including construction, diameter, length, minimum breaking load and end termination. Please contact your accountmanager at Lankhorst Ropes for activation.

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Mooring tails can be configured in either single leg or grommet arrangements. Generally, single leg mooring tails configurations have a lower modulus for the same break force and are recommended wherever possible. However, in some operations the smaller rope diameter afforded by a grommet offers advantages in handling or the selection and connection of joining and termination hardware.

In circumstances where practical constrains (for example, the need for a smaller rope diameter) necessitate a grommet configuration, a stiffness value of two times the single leg stiffness (for the rope diameter required to achieve the strength requirements) should be used.

Please consult our sales team for advice on what the best solution for your particular circumstances.

CONFIGURATION OPTIONS MOORING LINES

single

LANKO®FORCE — **EWL tails of EUROFLEX®**

double

LANKO®FORCE — **EWL tails of EUROFLEX®**

single

6x36WS+IWRC — **EWL tails of EUROFLEX®**

double

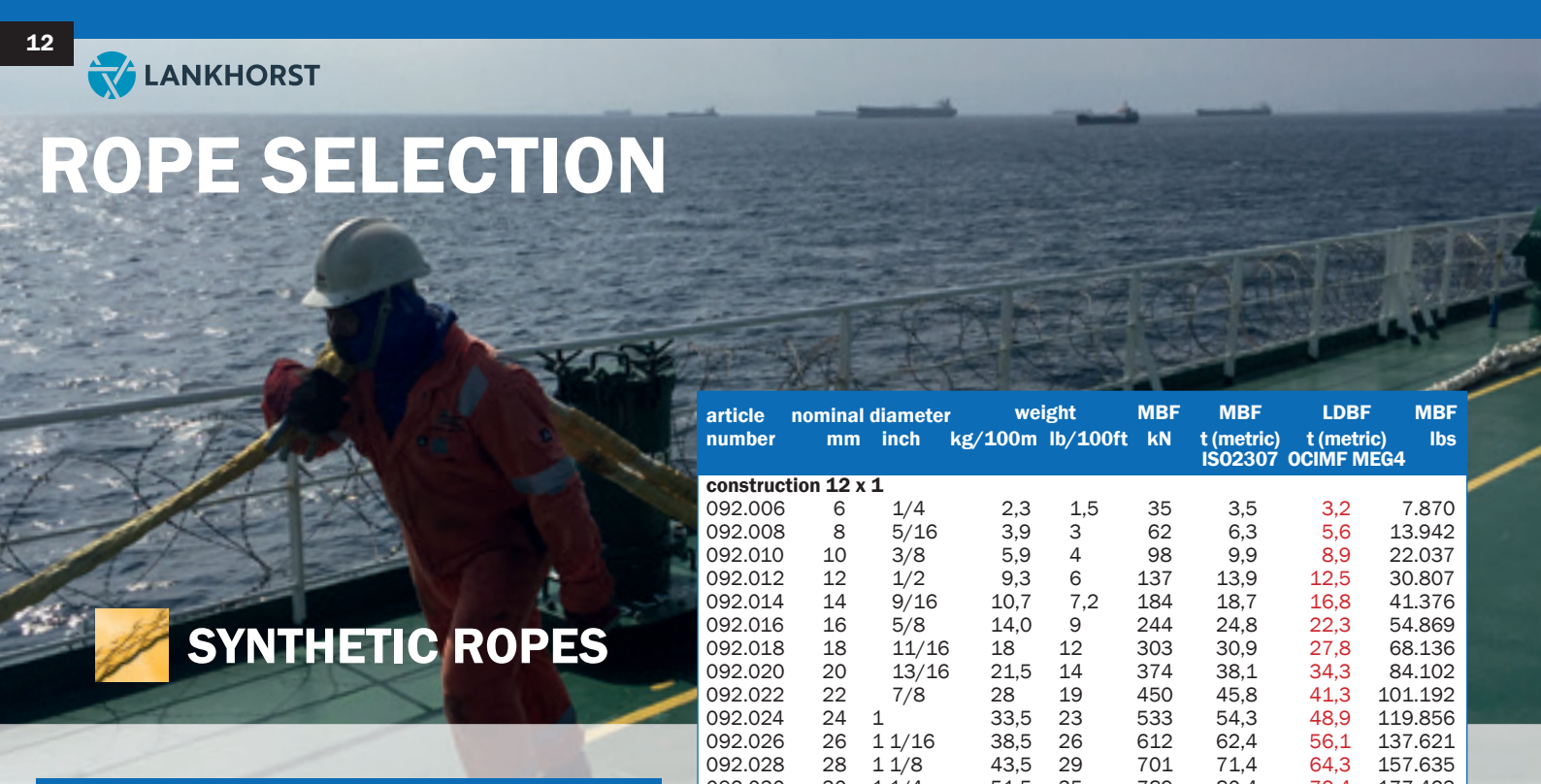
6x36WS+IWRC — **EWL tails of EUROFLEX®**

ROPE SOLUTION OVERVIEW

Elongation of used rope at 50%	Features
LANKO®FORCE: 1% EUROFLEX®: 8%	• 7 times lighter than steel wire rope • Easier rope handling reduces mooring time • Reduced snap-back risk due to low elongation of LANKO®FORCE • High rope flexibility
6x36WS+IWRC: 1-2% EUROFLEX®: 8%	• Traditional steel wire mooring system • Proven track record

LANKHORST

ROPE SELECTION



SYNTHETIC ROPES

HIGH MODULUS ROPES

LANKO®FORCE

12 strand braided rope, made of DYNEEMA® 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. Available in 12 x 1 construction (up to 86mm) and 12 x 3 construction (from 88mm). In a 12 x 3 construction each strand is a 3 strand rope.

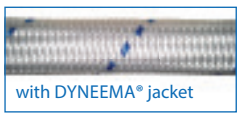
SPECIFIC GRAVITY	0,98 (floating)
UV-RESISTANCE	excellent
ABRASION RESISTANCE	excellent
CHEMICAL RESISTANCE	good
MELTING POINT	approx. 147 °C
CONSTRUCTION	12 x 1 strand plaited up to 86mm 12 x 3 strand plaited from 88mm
TCLL VALUE	100%
COLOUR	yellow
WATER ABSORPTION	0%
ELONGATION USED ROPE	1%
QUICK BURY SPLICE	

article number	nominal diameter mm	inch	weight kg/100m	lb/100ft	MBF kN	MBF t (metric) ISO2307	LDBF t (metric) OCIMF MEG4	MBF lbs
construction 12 x 1								
092.006	6	1/4	2,3	1,5	35	3,5	3,2	7.870
092.008	8	5/16	3,9	3	62	6,3	5,6	13.942
092.010	10	3/8	5,9	4	98	9,9	8,9	22.037
092.012	12	1/2	9,3	6	137	13,9	12,5	30.807
092.014	14	9/16	10,7	7,2	184	18,7	16,8	41.376
092.016	16	5/8	14,0	9	244	24,8	22,3	54.869
092.018	18	11/16	18	12	303	30,9	27,8	68.136
092.020	20	13/16	21,5	14	374	38,1	34,3	84.102
092.022	22	7/8	28	19	450	45,8	41,3	101.192
092.024	24	1	33,5	23	533	54,3	48,9	119.856
092.026	26	1 1/16	38,5	26	612	62,4	56,1	137.621
092.028	28	1 1/8	43,5	29	701	71,4	64,3	157.635
092.030	30	1 1/4	51,5	35	789	80,4	72,4	177.423
092.032	32	1 5/16	59	40	887	90,4	81,4	199.461
092.034	34	1 3/8	64	43	991	101,0	90,9	222.847
092.036	36	1 1/2	72	48	1.076	109,7	98,7	241.961
092.038	38	1 9/16	80	54	1.191	121,4	109,3	267.822
092.040	40	1 5/8	89	60	1.314	133,9	120,5	295.481
092.040	42	1 5/8	98	66	1.420	144,8	130,3	319.230
	43	1 6/8	103	69	1.490	151,9	136,7	334.967
092.044	44	1 3/4	107	72	1.559	158,9	143,1	350.574
	45	1 3/4	114	76	1.630	166,2	149,6	366.440
092.046	46	1 13/16	117	79	1.741	177,5	159,7	391.276
092.048	48	1 7/8	128	86	1.853	189,0	170,1	416.686
092.050	50	2	137	93	2.000	203,9	183,5	485.722
092.052	52	2 1/16	149	101	2.160	220,3	198,2	492.468
092.054	54	2 1/8	162	109	2.291	233,6	210,3	514.955
092.056	56	2 1/4	174	117	2.490	254,0	228,5	559.929
092.060	60	2 3/8	200	134	2.820	287,6	258,8	634.137
092.062	62	2 7/16	213	143	2.921	297,8	268,0	656.624
092.064	64	2 5/8	227	153	3.210	327,4	294,6	721.837
092.068	68	2 11/16	258	173	3.610	368,2	331,3	811.785
092.072	72	2 13/16	288	194	4.010	409,0	368,0	901.734
092.074	74	2 15/16	304	204	4.201	428,3	385,5	944.459
092.076	76	3	320	215	4.401	448,7	403,9	989.433
092.080	80	3 3/16	355	239	4.510	459,9	413,9	1.014.169
092.082	82	3 1/4	373	251	4.751	484,4	436,0	1.068.138
097.084	84	3 5/16	391	263	4.951	504,8	454,3	1.113.113
092.086	86	3 3/8	410	276	5.152	525,3	472,8	1.158.087
construction 12 x 3								
092.088	88	3 7/16	430	289	5.320	542,4	488,2	1.196.006
092.092	92	3 5/8	469	315	5.879	599,4	539,5	1.321.670
092.096	96	3 3/4	510	343	6.478	660,5	594,5	1.456.372

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. The figures in red refer to the Line Design Breaking Force (LDBF); e.g. spliced dry condition (wet for nylon) as per OCIMF MEG4 recommendations.

optional:

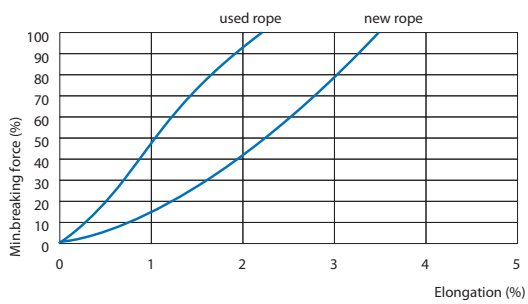
with polyester jacket



with DYNEEMA® jacket

with DEFENDER® jacket

ELONGATION:



WINCHLINES

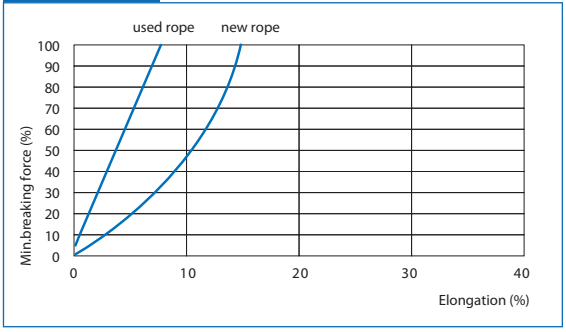
STRONGLINE™

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. A major advantage of using STRONGLINE™ for mooring your product or crude carrier is that there is no requirement for mooring tails. This means a major cost and hassle reduction over the life of the vessel. No need for tail replacement every 18 months.

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.

MADE OF 100% POLYESTER

ELONGATION:

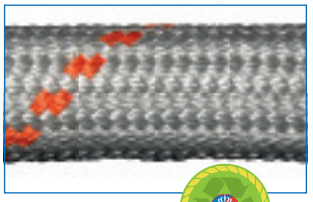


article number	nominal diameter mm	inch	weight kg/100m	lb/100ft	MBF kN	MBF t (metric) ISO2307	LDBF t (metric) OCIMF MEG4	MBF lbs
081.056	56	2 1/4	227	152	1.106	112,7	101,4	248.550
081.060	60	2 3/8	256	172	1.256	128,1	115,2	282.260
081.064	64	2 5/8	284	190	1.411	143,8	129,5	317.093
081.068	68	2 11/16	307	206	1.578	160,9	144,8	354.622
081.072	72	2 13/16	367	246	1.744	177,8	160,1	391.927
081.076	76	3	390	261	1.922	195,9	176,4	431.929
081.080	80	3 3/16	417	280	2.100	214,1	192,7	471.931
081.088	88	3 7/16	493	330	2.500	254,9	229,4	561.823
081.092	92	3 5/8	528	354	2.722	277,5	249,8	611.712
081.096	96	3 3/4	560	375	2.922	297,9	268,1	656.658

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.
The figures in red refer to the Line Design Breaking Force (LDBF); e.g. spliced dry condition (wet for nylon) as per OCIMF MEG4 recommendations.

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 USED ROPE	4,5%
A3 SPLICE	
ENHANCED EYE PROTECTION	



PENDING

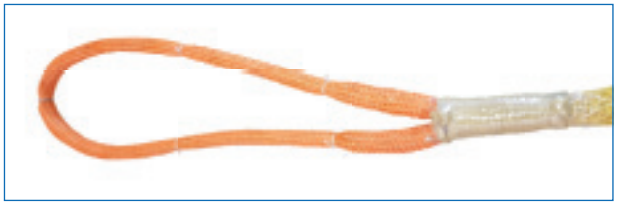
A3 splice

In case of the unique A3 splice, the splice and the eye have been fully integrated. The A3 splice handling advantages include:

- No doubling of the rope in the splice area, therefore no doubling of the splice weight
- No stiffness due to the splicing, the rope maintains its natural flexibility
- Neater spooling on the storage drum of the winch if the line has an eye at both ends
- It yields 100% splice efficiency

Enhanced eye protection

Standard polyester hose eye protection suffers a lot from abrasion which is why Lankhorst has replaced it with a polyester Defender® protection: a hollow braided sleeve that can be easily adjusted to the circumferential size of the rope to be protected, offering a high abrasion resistance. It is standard on our jacketed ropes.



LANKHORST

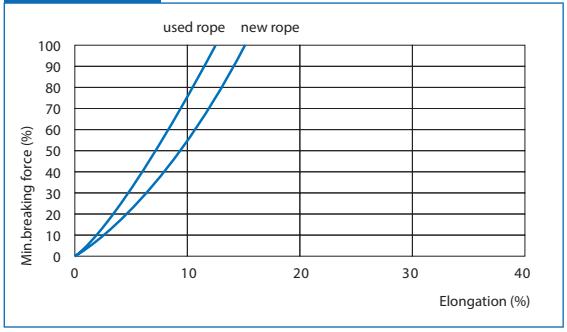
SOFT ROPES

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.

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

ELONGATION:

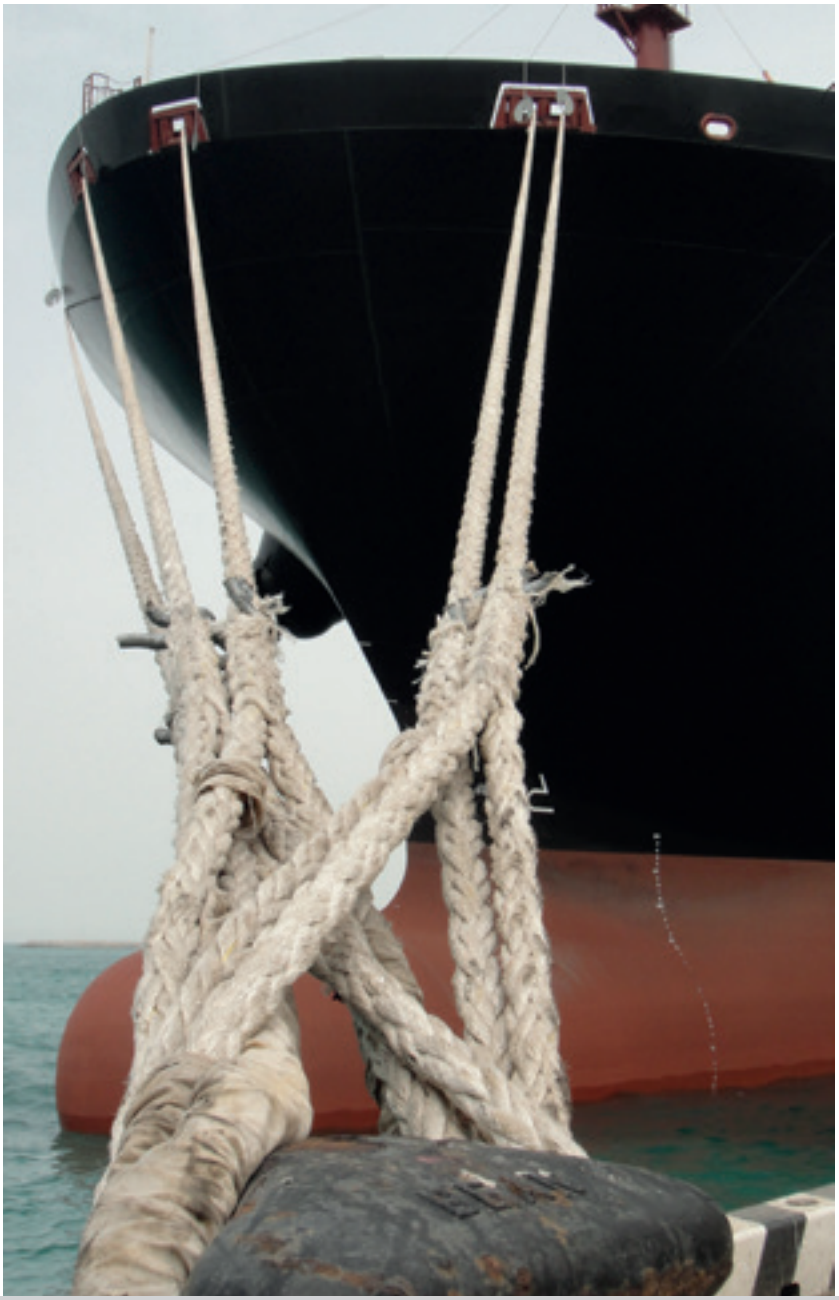


Made of:
47% polyolefin
53% polyester

article number	nominal diameter mm	inch	weight kg/100m	lb/100ft	MBF kN	MBF t (metric) ISO2307	LDBF t (metric) OCIMF MEG4	MBF lbs
152.416	32	1 5/16	65	43	281	28,6	25,8	63.172
152.440	36	1 1/2	83	55	353	36,0	32,4	79.358
152.418	40	1 5/8	102	69	432	44,0	39,6	97.118
152.419	44	1 3/4	124	83	518	52,8	47,5	116.452
152.420	48	1 7/8	148	99	612	62,4	56,1	137.584
152.429	52	2 1/16	173	116	714	72,8	65,5	160.514
152.430	56	2 1/4	201	135	823	83,9	75,5	185.019
152.427	60	2 3/8	231	155	941	95,9	86,3	211.546
152.428	64	2 5/8	263	177	1.061	108,2	97,3	238.523
152.426	68	2 11/16	296	199	1.197	122,0	109,8	269.098
152.424	72	2 13/16	332	223	1.334	136,0	122,4	299.897
152.425	76	3	370	249	1.481	151,0	135,9	332.944
152.431	80	3 3/16	411	276	1.628	166,0	149,4	365.991
152.432	88	3 7/16	497	334	1.964	200,2	180,2	441.527
152.422	96	3 3/4	590	396	2.321	236,6	212,9	521.784
152.434	104	4 1/8	689	463	2.699	275,1	247,6	606.762
152.435	112	4 7/16	803	540	3.119	317,9	286,1	701.182
152.436	120	4 3/4	923	620	3.549	361,8	325,6	797.851
152.437	128	5 1/16	1.050	706	4.022	410,0	369,0	904.186
152.438	136	5 3/8	1.187	798	4.515	460,2	414,2	1.015.017
152.439	144	5 2/3	1.334	896	5.040	513,8	462,4	1.133.042

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.
The figures in red refer to the Line Design Breaking Force (LDBF); e.g. spliced dry condition (wet for nylon) as per OCIMF MEG4 recommendations.



EUROFLOAT®PREMIUM

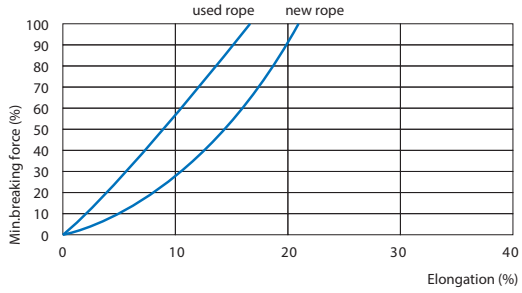
	SPECIFIC GRAVITY	0,98 (floating)
	UV-RESISTANCE	good
	ABRASION RESISTANCE	very good
	CHEMICAL RESISTANCE	good
	MELTING POINT	approx. 165°C/ 260°C
	CONSTRUCTION	8 strand plaited
TCLL	TCLL VALUE	75,1%
	COLOUR	off white
	MARKER YARN	double green markers
	WATER ABSORPTION	0,1%
	ELONGATION USED ROPE	9%

Using our latest in-house extrusion technology, Lankhorst has developed EUROFLOAT®PREMIUM rope to meet the requirements of today's modern tanker fleet. This floating high performance rope is constructed from high strength polyolefin and polyester yarns. It is manufactured to the latest EN and ISO standards, and complies with OCIMF recommendations. The rope's floating characteristic makes it a safe rope to work with, while its high TCLL value ensures excellent fatigue resistance.

article number	nominal diameter mm	inch	weight kg/100m	lb/100ft	MBF kN	MBF t (metric) ISO2307	LDBF t (metric) OCIMF MEG4	MBF lbs
152.632	32	1 5/16	53	36	207	21,1	19,0	46.535
152.636	36	1 1/2	67	45	259	26,4	23,7	58.226
152.640	40	1 5/8	85	57	324	33,0	29,7	72.838
152.644	44	1 3/4	99	67	377	38,4	34,6	84.753
152.648	48	1 7/8	120	80	456	46,5	41,8	102.513
152.652	52	2 1/16	141	95	534	54,4	49,0	120.048
152.656	56	2 1/4	162	109	613	62,5	56,3	137.808
152.660	60	2 3/8	188	126	701	71,4	64,3	157.591
152.664	64	2 5/8	216	145	799	81,4	73,3	179.622
152.669	68	2 11/16	245	165	900	91,8	82,6	202.328
152.672	72	2 13/16	275	185	1.000	101,9	91,7	224.809
152.676	76	3	305	205	1.098	111,9	100,7	246.840
152.680	80	3 3/16	339	218	1.205	122,8	110,5	270.895
152.688	88	3 7/16	411	276	1.470	149,9	134,9	330.469
152.696	96	3 3/4	490	319	1.735	176,9	159,2	390.044

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. The figures in red refer to the Line Design Breaking Force (LDBF); e.g. spliced dry condition (wet for nylon) as per OCIMF MEG4 recommendations.

ELONGATION:



Made of:
84% polyolefin
16% polyester

LANKHORST

EUROFLEX® MOORING TAIL

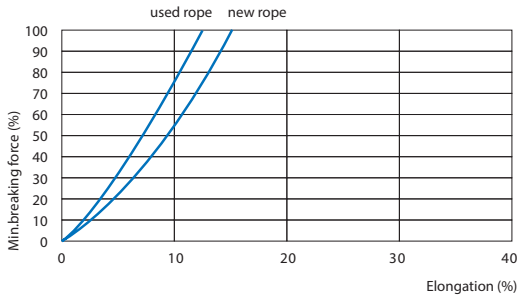
PENDING

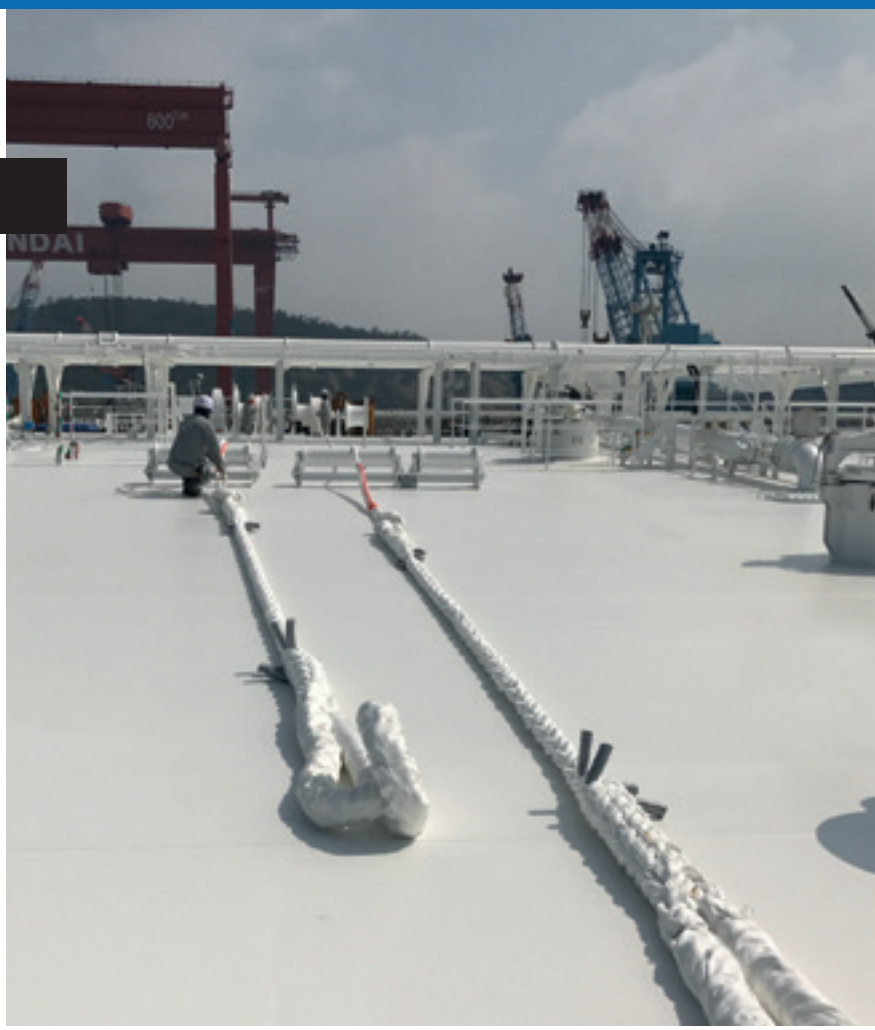
Mooring tails absorb shock/energy within the mooring system. The EUROFLEX® MOORING TAILS surpass nylon tails in quality, as a result the energy absorption is greater, and the rope remains elastic for longer. Moreover, the rope does not lose a large portion of its dry MBF when wet. As the EUROFLEX® MOORING TAILS' strength is higher than that of nylon, a smaller diameter of rope can be used, providing better handling. Made of polyester and polyolefin composite yarns, the standard length is 11 m (Effective Working Length). For those circumstances where more stretch is required, the EUROFLEX® MOORING TAILS are also available in 22 m EWL. Both versions are fitted with two protected and spliced eyes of 2 m and 1m respectively.

OCIMF MEG4 guidelines recommend mooring tails with a TDBF of 125 - 130% related to the ship design MBF. EUROFLEX® MOORING TAILS have equal breaking strength under wet and dry conditions.

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

ELONGATION:





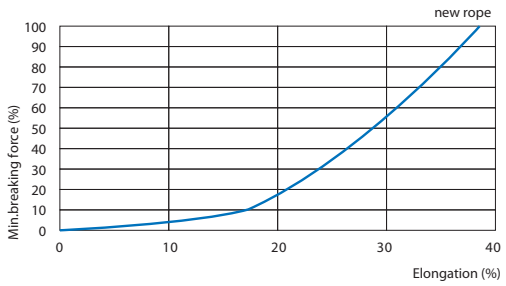
article number	nominal diameter mm	inch	weight kg/tail	lb/tail	MBF kN	MBF t (metric) ISO2307	TDBF t (metric) OCIMF MEG4	MBF lbs
EWL: 11m								
152.448	48	1 7/8	23,7	52	612	62,4	56,1	137.584
152.450	56	2 1/4	34,2	75	823	83,9	75,5	185.019
152.447	60	2 3/8	39,3	86	941	95,9	86,3	211.546
152.449	62	2 7/16	42,0	92	1.000	101,9	91,7	224.810
152.451	64	2 5/8	44,7	98	1.061	108,2	97,3	238.523
152.454	68	2 11/16	50,3	110	1.197	122,0	109,8	269.098
152.452	72	2 13/16	56,4	124	1.334	136,0	122,4	299.897
152.455	76	3	66,6	146	1.481	151,0	135,9	332.944
152.453	80	3 3/16	70,4	163	1.628	166,0	149,4	365.991
152.492	82	3 1/4	73,2	161	1.701	173,5	156,1	382.402
152.497	83	3 1/4	75,0	165	1.742	177,6	159,8	391.619
152.446	84	3 5/16	81,4	179	1.785	182,0	163,8	401.286
152.456	88	3 7/16	89,5	197	1.964	200,2	180,2	441.527
152.444	96	3 3/4	106,2	234	2.321	236,6	212,9	521.784
EWL: 22m								
152.462	60	2 3/8	64,7	142	941	95,9	86,3	211.546
152.460	72	2 13/16	93,0	205	1.334	136,0	122,4	299.897
152.461	80	3 3/16	119,2	262	1.628	166,0	149,4	365.991
152.463	88	3 7/16	144,1	317	1.964	200,2	180,2	441.527
152.465	96	3 3/4	171,1	376	2.321	236,6	212,9	521.784

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. The figures in red refer to the Tail Design Breaking Force (TDBF); e.g. spliced dry condition (wet for nylon) as per OCIMF MEG4 recommendations.

Made of:
47% polyolefin
53% polyester

TIPTO®LON MOORING TAIL (NYLON)

ELONGATION:



The standard nylon mooring rope for all purposes. Produced according the latest EN and ISO standards. It combines high (dry) strength and excellent abrasion resistance. Its high elasticity makes the rope very suitable as a mooring tail. In some occasions loading and discharge jetties and ship's berth are located in area's which are exposed to swell / surge or other severe conditions. It could be worthwhile considering to use longer tails which are made out of nylon.

Our TIPTO®LON mooring tails are made out of nylon and have a high stretch characteristics. By using these type of tails the dynamic peak loads in the main mooring lines can be reduced significantly with a minimum of increase in ship excursion at the same time. Reductions in peak loads will increase safety and the life time of your main mooring lines. A tail is 22 meter.

article number	nominal diameter mm	inch	weight kg/tail	lb/tail	MBF kN	MBF t (metric) ISO2307	TDBF t (metric) OCIMF MEG4	MBF lbs
61.384	84	3 5/16	128,5	86,1	1.694	172,7	140,0	380.691
61.392	92	3 5/8	154,0	103,2	2.014	205,3	166,3	452.604
61.451	96	3 3/4	167,6	112,4	2.222	226,5	183,5	499.348
61.300	100	3 15/16	181,8	121,9	2.375	242,1	196,1	533.731
61.308	108	4 1/4	212,3	142,3	2.708	276,1	223,7	608.566

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. The figures in red refer to the Tail Design Breaking Force (TDBF); e.g. spliced dry condition (wet for nylon) as per OCIMF MEG4 recommendations.

SPECIFIC GRAVITY	1,14
UV-RESISTANCE	good
ABRASION RESISTANCE	very good
CHEMICAL RESISTANCE	good
MELTING POINT	approx. 218°C
CONSTRUCTION	8 strand plaited
TCLL VALUE	55%
COLOUR	white
WATER ABSORPTION	4%
ELONGATION NEW ROPE	28%

LANKHORST

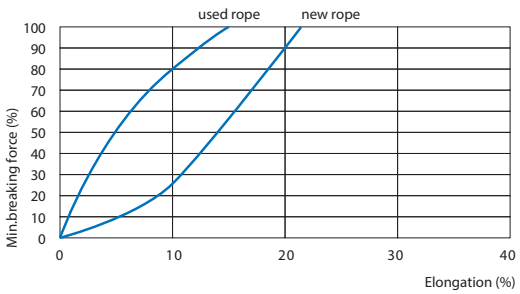
TIPTO®EIGHT

A high-performance mooring rope, TIPTO®EIGHT'sstrength, abrasion resistance and energy absorption ensure a long service life and low cost of ownership. The rope's small diameter and low weight make handling easier on board. As TIPTO®EIGHT is a floating rope, the risk of getting the rope caught in the ship and tug propeller is minimal, thus avoiding costly downtime.

article number	nominal diameter mm	inch	weight kg/100m	lb/100ft	MBF kN	MBF t (metric) ISO2307	LDBF t (metric) OCIMF MEG4	MBF lbs
111.693	40	1 5/8	75,6	51	269	27,4	24,6	60.474
111.721	44	1 3/4	92,4	62	321	32,7	29,4	72.164
111.695	48	1 7/8	109	73	378	38,5	34,6	84.978
111.737	52	2 1/16	128	86	441	45,0	40,4	99.141
111.697	56	2 1/4	149	100	508	51,8	46,6	114.203
111.698	60	2 3/8	171	115	578	58,9	53,0	129.940
111.699	64	2 5/8	194	130	651	66,3	59,7	146.351
111.700	68	2 11/16	220	148	731	74,5	67,1	164.335
111.701	72	2 13/16	246	165	814	83,0	74,7	182.994
111.703	80	3 3/16	305	205	992	101,1	91,0	223.010
111.735	88	3 7/16	369	248	1.180	120,3	108,2	265.275
111.705	96	3 3/4	438	294	1.400	142,7	128,4	314.733
111.741	104	4 1/8	515	346	1.620	165,1	148,6	364.190
111.743	112	4 7/16	596	400	1.870	190,6	171,6	420.393
111.691	120	4 3/4	686	461	2.130	217,2	195,4	478.843
111.744	128	5 1/16	779	523	2.410	245,7	221,1	541.790
111.746	136	5 3/8	880	591	2.710	276,3	248,7	609.232
111.739	144	5 2/3	987	663	3.030	308,9	278,1	681.171

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. The figures in red refer to the Line Design Breaking Force (LDBF); e.g. spliced dry condition (wet for nylon) as per OCIMF MEG4 recommendations.

ELONGATION:



SPECIFIC GRAVITY	0,93 (floating)
UV-RESISTANCE	very good
ABRASION RESISTANCE	very good
CHEMICAL RESISTANCE	good
MELTING POINT	approx. 140°C
CONSTRUCTION	8 strand plaited
TCLL VALUE	70,7%
COLOUR	yellow
MARKER YARN	orange
WATER ABSORPTION	0%
ELONGATION USED ROPE	5%

TIPTO®TWELVE

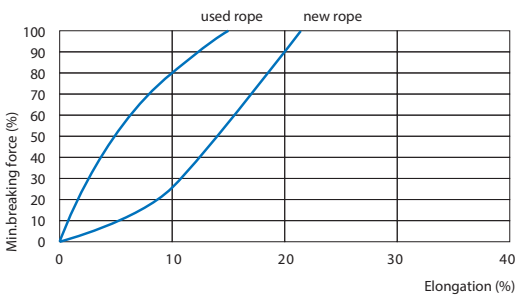
TIPTO®TWELVE, available in 16 mm to 48 mm diameter, is the successor of the well-known TIPTO®EIGHT. The construction is different, yet the material remains the same. The 12 strand braided construction makes the rope rounder, more stable, more compact and with a smoother surface. This increases abrasion resistance and, as a result, the service life of the rope. TIPTO®TWELVE can be used for mooring, using either bollards and/or winches. All TIPTO®TWELVE coils are supplied with a quality label, stating "Original product of Lankhorst Ropes". TIPTO®TWELVE ropes in the range from 32 mm up to 48 mm diameter have been upgraded with an extra marker yarn. The rope size can now easily (and above all) without mistake be identified.

article number	nominal diameter mm	inch	weight kg/100m	lb/100ft	MBF kN	MBF t (metric) ISO2307	LDBF t (metric) OCIMF MEG4	MBF lbs
111.516	16	5/8	12,1	8	48	4,8	4,4	10.791
111.520	20	13/16	18,9	13	72	7,4	6,6	16.366
111.524	24	1	27,3	18	103	10,5	9,4	23.155
111.528	28	1 1/8	37,3	25	137	13,9	12,5	30.799
111.532	32	1 5/16	53	36	177	18,0	16,2	39.791
111.536	36	1 1/2	66	44	222	22,6	20,3	49.908
111.540	40	1 5/8	75,6	51	269	27,4	24,6	60.474
111.544	44	1 3/4	92,4	62	321	32,7	29,4	72.164
111.548	48	1 7/8	109	73	378	38,5	34,6	84.978

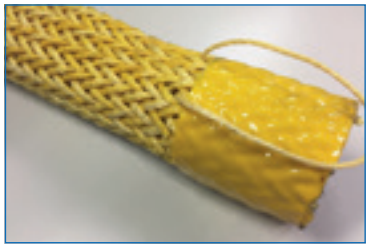
These diameters are available in several standard lengths.
Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according ISO 2307:2010. The MBF refers to the breaking strength in the rope / wire itself, without splices or any other form of termination that can be formed with or without the use of accessories / fittings. The figures in red refer to the Line Design Breaking Force (LDBF); e.g. spliced dry condition (wet for nylon) as per OCIMF MEG4 recommendations.

SPECIFIC GRAVITY	0,93 (floating)
UV-RESISTANCE	very good
ABRASION RESISTANCE	very good
CHEMICAL RESISTANCE	good
MELTING POINT	approx. 140°C
CONSTRUCTION	12 strand plaited
TCLL VALUE	70,7%
COLOUR	yellow
MARKER YARN	orange
WATER ABSORPTION	0%
ELONGATION USED ROPE	5%

ELONGATION:



LANKHORST ROPES PROTECTION SLEEVES



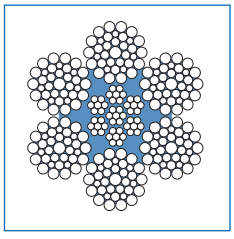
DEFENDER®
A high performance protection sleeve for permanent fixing on a hawser, towing line or pennant. The braided strands offer high abrasion resistance. The sleeve is made in a hollow braid, and can be easily be adjusted to the circumferential size of the rope being protected. The DEFENDER® can be made from different types of yarns, offering extra strength, floatability and other characteristics. Please consult our sales staff for the optimal product in your application.

TIPTO®WEB
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.

STEEL WIRE ROPES

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.



Galva-nized | Greased | 1960
RHRL | No Swivel

Optional
RHLL | LHRL
LHLL | Bio degradable lubricant
Compact

article number	nominal diameter mm	weight kg/100m	weight lb/100ft	minimum breaking force kN	minimum breaking force t (metric)	minimum breaking force lbs
292.039	30	368	247	628	64	141.000
281.108	32	419	281	715	72,9	161.000
281.893	34	472	316	807	82,2	181.000
281.891	36	530	355	904	92,1	203.000
281.894	38	590	396	1.008	102,7	227.000
281.913	40	654	440	1.120	114,2	252.000
281.914	42	721	485	1.230	125,4	277.000
281.915	44	792	532	1.350	137,6	304.000
281.916	46	866	582	1.480	150,9	332.000
281.918	48	942	633	1.610	164,1	362.000
281.919	50	1.020	687	1.740	177,4	390.000
281.923	51	1.060	715	1.820	185,5	409.000
282.109	52	1.110	743	1.890	192,7	425.000
282.114	54	1.190	801	2.040	208	460.000
282.130	56	1.280	862	2.190	223,3	492.000
282.108	58	1.380	925	2.350	239,6	528.000
282.123	60	1.470	989	2.510	255,9	564.000
282.126	62	1.570	1.060	2.680	273,2	603.000
282.135	64	1.680	1.130	2.860	291,6	643.000

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.

Other steel wire ropes available such as (but not limited to):
Full range of accommodation ladder wires, lifeboat fall wires, rescue boat wires, rescue davit wires, bosun store davit wires, fuel oil hose handling davit wires, engine room crane wires, emergency cargo pump handling davit wires, cargo machinery room crane wires and provision crane wires.

RELATED ACCESSORIES Full range available

TØNSBERG MOORING LINK

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THE VITAL CONNECTION

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

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