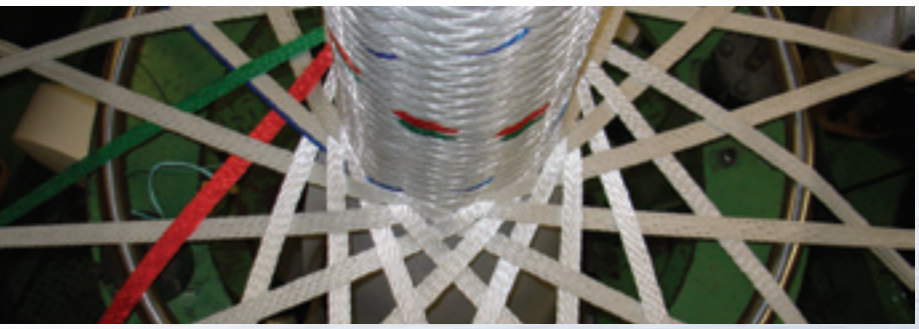
Lankhorst | Ropes



Ropes for **Single Point Mooring**

OFFSHORE DIVISION

www.lankhorstropes.com

Royal Lankhorst Euronete GROUP BV

PROVEN STRENGTH

200 years of experience in development and manufacturing of strong products have proven the strength of Lankhorst

OFFSHORE DIVISION

OFFSHORE DIVISION

COMPANY INFORMATION

Lankhorst Ropes is a member of the Royal Lankhorst Euronete Group. With more than 200 years of experience and 1,200 employees we are a worldwide innovative group with fully equipped production sites and R&D departments, located in the Netherlands, Portugal, Greece and Brasil, for the production of a wide range of products in maritime and offshore ropes, technical yarns, fishing / yachting gear, Pure composites, recycling and moulding materials.

After several years of working in a strategic alliance with Grupo Euronete, a Portuguese leader in the European market for the production of ropes and nets, Lankhorst and Grupo Euronete merged in 1995 into "Lankhorst Euronete Group".

Lankhorst Ropes is divided into two divisions. A Maritime Division with sales offices in the Netherlands, United Kingdom, Spain, United Arab Emirates and Australia, and an Offshore Division which operates from Póvoa de Varzim (Portugal), where Lankhorst acquired Quintas & Quintas Offshore in 2007, and Rio de Janeiro (Brasil).

In order to support the business, Lankhorst Ropes carries strategic stock in Houston, New York, Los Angeles, Cape Town, Durban, Póvoa de Varzim, Bilbao, Rotterdam, Fujairah, Dubai, Singapore, Brisbane, Rio de Janeiro and Panama.

Lankhorst Ropes continuously strives for improved product performance, customer satisfaction and product innovation.

This brochure covers Offshore Ropes used in Single Point Mooring and Tandem Mooring applications.

Offspring International Ltd (OIL)
Formed in 1991 to provide a unique and dedicated service to the offshore industry worldwide. Specialising in offshore mooring systems, OIL is able to evaluate any application and provide the correct solution to meet client specifications.

From individual components to complete turnkey packages, OIL's experience and reputation for excellence positions them at the forefront of today's marine specialists. In addition to their own product portfolio, OIL is the worldwide agent for Lankhorst Ropes – Offshore Division, regarding deep water mooring and single point mooring systems.
All equipment supplied by us is supported by its principals' total commitment to quality. All products are approved by the leading classification societies and supplied with the appropriate certification.

We offer complete project management, ensuring correct and total integration of each system, helping to eliminate operating risks and ensuring targets are met.

We operate under ISO 9001:2008 and other industry related quality management systems, complying with all relevant safety and ecological standards, balancing the needs of man and environment.

OFFSHORE DIVISION

Total System Management

We offer a comprehensive designed package, tailored to suit individual location requirements and water temperatures. We concentrate on operational performance, reliability, safety and ontime delivery.

Our bespoke packages can incorporate:
- Mooring hawsers
- Pick-up and Messenger ropes
- Chafe chains
- Support buoys
- Shackles
- Associated fittings
- Load monitoring equipment
- Marine hose ancillary equipment

Materials

In the manufacture of our mooring system hawsers, we carefully select premium quality yarns of multifilament nylon, HT polyester and blended fibres. For Submerged Turret Loading and recovery systems, we also use Dyneema® fibres. Hawsers can be supplied with Integral Flotation system and/or PU encapsulation for increased durability and operational cost savings.

Construction

We manufacture in Double Braid, Circular Braided (GAMA 98®) and conventional eight strand constructions.

Double Braid is constructed with a separate outer braided sheath and inner braided core. The balanced flexible construction, distributes the weight and strength equally between the sheath and braided core.

GAMA 98® is constructed from high efficiency sub-rope cores laid parallel within an outer braided jacket. Each sub-rope is computer monitored during production to ensure all sub-ropes have equal tension and length. The outer jacket is essentially non load bearing.

Dyneema is a registered trademark of Royal DSM N.V.

Quality & Design

Continuous research and practical field experience, combined with the latest CAD technology have kept us at the forefront of the technological advancement in the design and manufacture of cost effective, safe offshore mooring systems.

All Single Point and Tandem mooring systems are project designed and custom built under rigorous quality assurance conditions which conform to appropriate classification requirements and / or OCIMF 2000 Guidelines.

Technical Support Services

As part of our total commitment to protecting our reputation for quality and service, our Sales Engineering support team is charged with providing invaluable technical support to all our customers. A far reaching service, this can extend from advice given over the telephone regarding the most suitable system for your individual requirements, to visiting operational terminals around the world, with recommendations given at first hand to ensure the most cost effective solutions to in-service problems.

The latest Computer Aided Design and DeskTop Publishing technology allow us to produce "As Built" drawings and fully documented manuals for any mooring system to accompany the QA and/or independent inspection authority certification.

Our Technical Department, responsible for research, design and development, product engineering and quality data management, is manned by highly qualified engineers and inspectors. In addition to a fully equipped chemical laboratory for forensic analyses, we have direct access to in-house computer controlled testing equipment to evaluate, reverse bend, elongation, abrasion, tensile loading of yarn and fibre ropes with a load capacity up to 1200 tonnes.

OCIMF

We can supply a full range of products manufactured and supplied in strict accordance with the OCIMF 2000 "Guidelines for the Purchasing and Testing of SPM Hawsers". Our technical department is committed to ongoing testing, development, optimisation of rope designs, which is an ongoing process.

FACILITY & QUALITY

We have the world's largest rigging bay dedicated to SPM mooring ropes and specialty products such as deep water ropes. The facility is supported with over a decade of experience and expertise from the former business of Quintas & Quintas Offshore. Modern production and testing equipment permits all the following activities to be undertaken in-house.

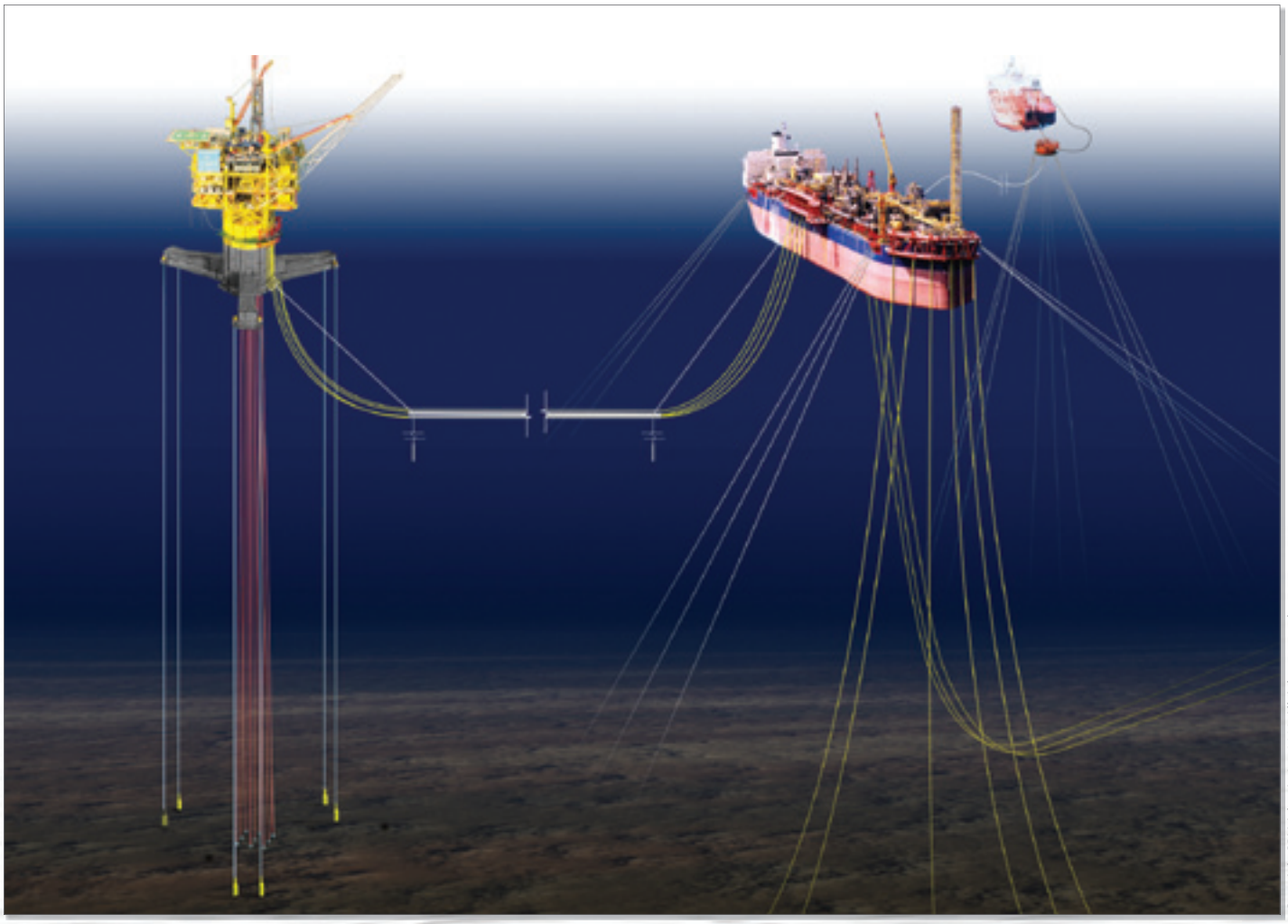
- Extrusion of rope yarns
- Conversion (twisting) of flat yarn into rope yarn
- Stranding of rope yarns into strands
- Braiding or twisting of strands into sub-ropes
- Closing (over braiding) of sub-ropes into mooring ropes
- 3rd Braid jackets and integral flotation
- Full scale prototype rope testing
- Tension-Tension fatigue testing
- Stiffness and elongation testing
- Simulation of installation and 'what-if' scenarios

EQUIPMENT SELECTION

Mooring Hawsers
When selecting hawsers, terminal operators should take into account not only strength but also energy absorption and fatigue performance. Detailed information can be found in the OCIMF 2000 'Guidelines for the Purchasing and Testing of SPM Hawsers'.

The NWBS (New Wet Break Strength), energy absorption and fatigue performance of hawsers will deteriorate during service under the influence of factors such as service life, cyclic load history, hawser type, construction, environmental conditions, damage and stowage arrangements between use. Terminal operators should take these factors into account when determining the appropriate hawser for the mooring system and hawser retirement criteria.

Chafe Chains
Each mooring hawser should terminate at its shipboard end with a chafe chain. The standard recommend size of the chafe chain has been established at 76mm based on the diameter of the material forming the common stud links. Terminal operators should select the appropriate chain by taking into account the designed SPM mooring arrangement, SWL required and the properties of the chain grade selected. Typically chafe chains form a single chain of approximately 8 metres or more in length, composed of 76mm stud link chain. If through-type chain support buoys are utilised the length of the chain may have to be increased. Each chain should terminate, at the shipboard end with an oblong plate for connecting the chain to the pick up rope bow shackle.



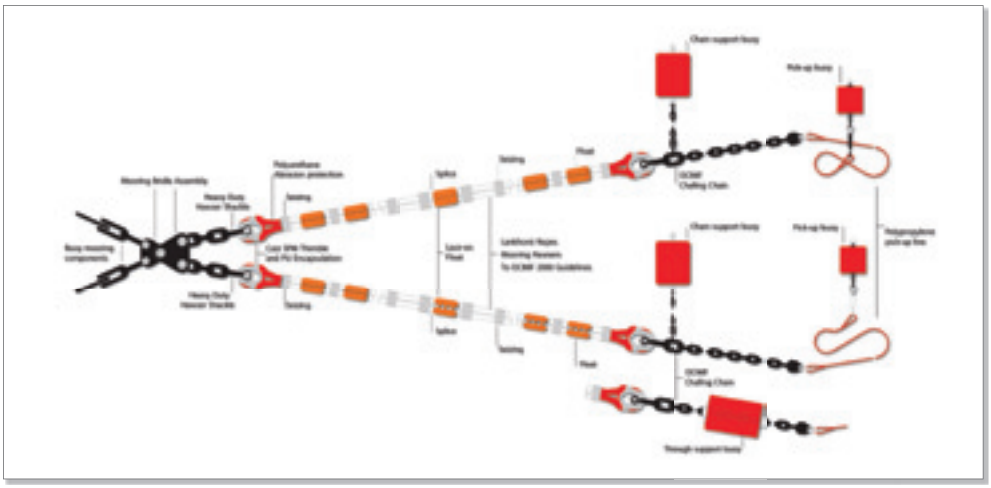
From individual components to complete turnkey packages, Lankhorst's and OIL's experience and reputation for excellence positions them at the forefront of today's offshore specialists.

Weak Links
Weak links, if fitted, should be selected such that the recommended bow chain stopper, chafe chain, hawser or connection to the SPM do not constitute the weakest yield strength of MBL component of the entire system. Weak links, if fitted, should be designed, manufactured and tested under a certification scheme.

Support Buoys
When the berth is unoccupied, each chafe chain may be supported by flotation devices. One method is to use a swivel ended type support buoy that is connected by a short length of chain to the end link of the chafe chain, adjacent to the hawser. Another method is to use a through type chain support buoy. Support buoys should have reserve buoyancy equivalent to at least 20% of the weight in air of the material to be supported.

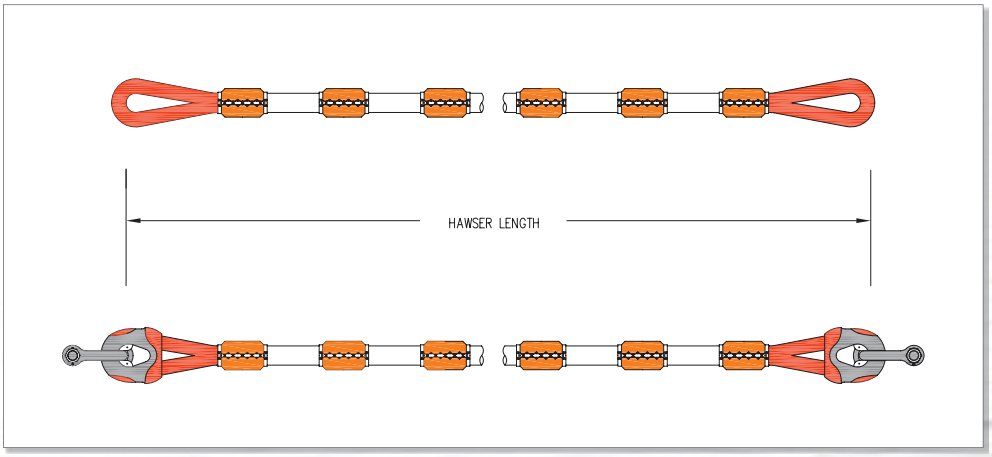
Pick-up / Messenger Rope
The pick-up rope is connected to the ship end of the chafe chain and typically consists of 150 metres of floating rope (generally polypropylene based) complete with an eye at each end. The rope can vary in length from 120 – 180 metres, and in diameter from 64 – 80 mm. At some terminals where the pick-up rope is not kept connected to the chafe chain when the berth is unoccupied, differing arrangements may be employed to facilitate connection / disconnection of the pick-up rope.

TYPICAL OFFTAKE SYSTEM

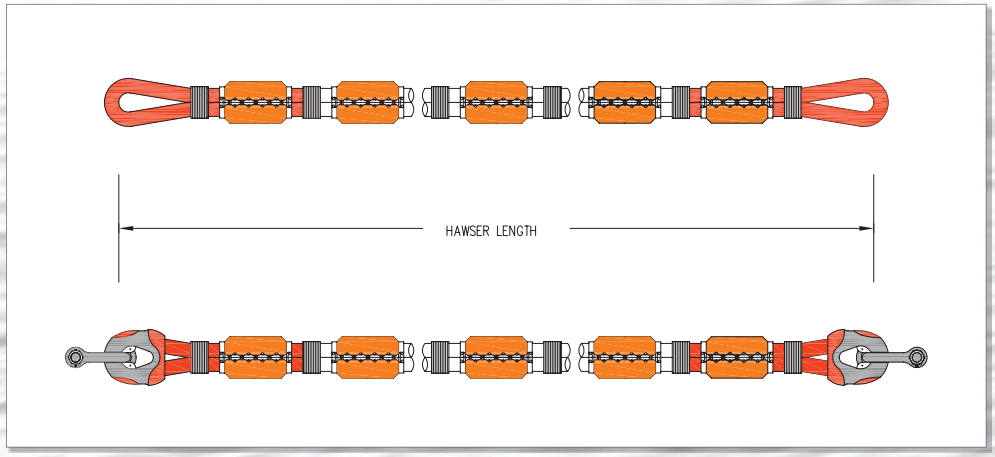


Typical Dual Hawser Configuration

HAWSER CONFIGURATIONS



Single leg type mooring hawser



Grommet type mooring hawser

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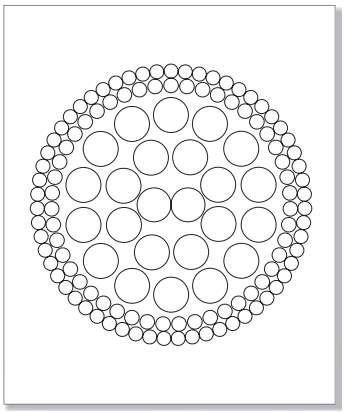
HAWSER DATA - DOUBLE BRAID CONSTRUCTION

Rope with a braided sheath over a braided hollow core (also called 2 in 1 and Braidline).



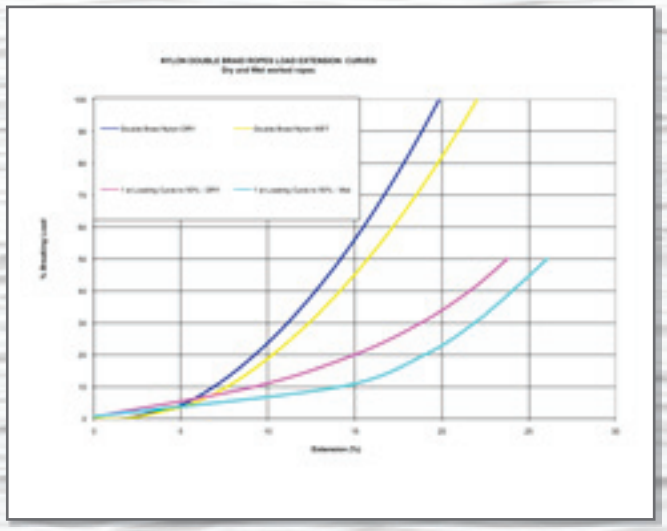
Material: NYLON
Construction: Double braided ropes are constructed by braiding a sheath over a braided hollow core. They have 32 core strands and 64 sheath strands with an equal number of left and right hand providing a perfectly torque free rope.

Double Braid is acknowledged as the best rope construction manufactured to absorb the enormous dynamic forces generated at SPM's.

Manufactured, inspected and supplied in accordance with the OCIMF 2000 "Guidelines for the Purchasing & Testing of SPM Hawsers"

Double Braid Nylon				
Dia mm	Size Inch	Weight kg/100m	NDBS kN	NDBS Tonne
80	10	397	1648	168
88	11	481	1940	198
96	12	572	2252	230
104	13	671	2583	263
112	14	779	2933	299
120	15	893	3301	337
128	16	1020	3687	376
136	17	1146	4091	417
144	18	1280	4511	460
152	19	1426	4949	501
160	20	1580	5404	551
168	21	1740	5876	599

Other sizes are available on request



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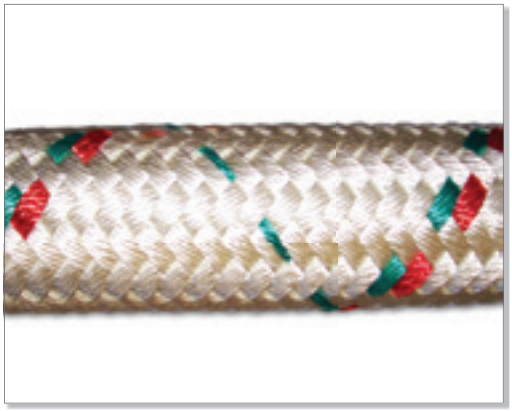
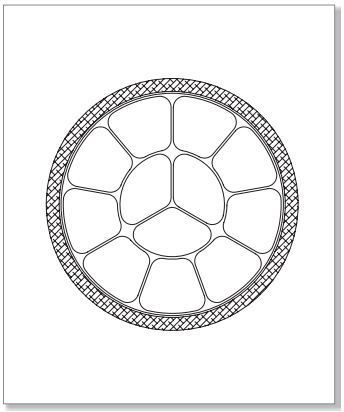
HAWSER DATA - GAMA 98® (PARALLEL STRAND) CONSTRUCTION

Rope in which components are laid parallel to each other within an outer braided jacket (also called circular braided). The jacket is non-load bearing.



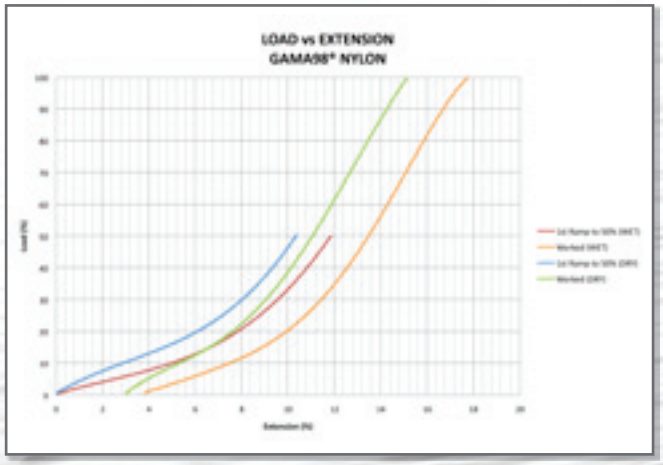


Material: NYLON
Construction: The GAMA 98® ropes are made from high efficiency sub-rope cores laid parallel within an outer braided jacket. Each sub-rope is computer monitored during manufacture to ensure all sub-ropes have equal tension and length. The GAMA 98® has become the industry standard for FPSO/FSO offtake mooring hawser arrangements.

Manufactured, inspected and supplied in accordance with the OCIMF 2000 "Guidelines for the Purchasing & Testing of SPM Hawsers"

GAMA 98® Nylon				
Dia mm	Size Inch	Weight kg/100m	NDBS kN	NDBS Tonne
80	10	400	1802	184
88	11	480	2172	221
96	12	570	2574	262
104	13	670	3010	307
112	14	760	3480	355
120	15	900	3982	406
128	16	1020	4518	461
136	17	1150	5086	518
144	18	1270	5688	580
152	19	1430	6322	644
160	20	1560	6989	712
168	21	1720	7688	784

Other sizes are available on request



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HAWSER FLOTATION

SPM Hawsers typically manufactured from nylon (SG 1.14) will not float naturally in seawater. A hawser which sinks will foul the catenary moorings of a CALM buoy or other subsea equipment. We have a range of flotation methods.

- Lace-on hawser floats
- Integral hawser flotation
- Tubular floats

Please ask us for detailed data sheets on the below flotation types.

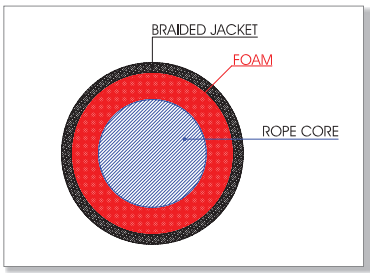
Lace-on hawser float
The integrity of the mooring hawser depends on the floats sustaining hawser buoyancy. All our floats feature a double outer layer manufactured from high abrasion resistant ballistic nylon cloth. All seams are double stitched from heavy denier yarn using a locking stitch, so yarn breakages cannot lead to an unzipping effect. The floats utilise high quality 48 kg/m3 100% closed cell polyethylene foam, and high quality eyelets exceeding Shell pull test standards. Additionally these floats can be polyurethane elastomer coated on the outside.

No. Of Pockets	Single Hawser mm	Grommet Hawser mm	Nett Buoyancy kg	Approx. Dry Wt kg	Width Dimension mm
3	80 - 96		4.8	0.8	385
4	104 - 128		5.4	1.0	480
5	136 -152	80 - 96	8.0	1.3	575
6	160 - 184	104 - 128	9.6	1.4	670
7	192	120 - 128	11.2	1.7	765
8		136 -144	12.8	1.9	860
9		152 - 168	14.4	2.1	965
10		176 - 184	16.0	2.3	1080
11		192	17.6	2.5	1145

NOTE: Width dimension is taken when the float is laid out flat and foams are installed.
Measured under a pre-load of 2.5kg.
All floats are approximately 1065mm in length.

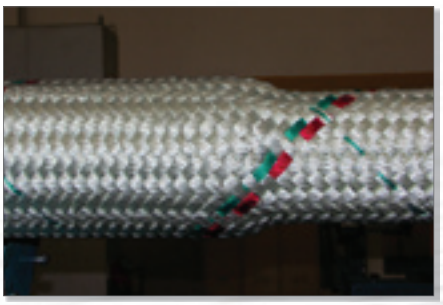
Integral Flotation
It has been reported by operators using mooring hawsers with conventional lace-on floats, that during the lifetime of the hawser the floats tend to suffer damage and can be ripped away from the rope. This can be costly to the operator having to secure replacement floats and organise maintenance crews to replaced damaged / missing floats. Our Integral Flotation system overcomes these issues, and in addition offers many other operational benefits.

Mooring hawsers incorporating our Integral Flotation system are wrapped in closed cell buoyancy foam, ensuring sufficient reserve buoyancy is calculated into the construction to support the hawser in seawater. This is covered with an over braided jacket. Additionally this can be polyurethane elastomer coated to enhance abrasion characteristics of the assembly.



Benefits of Integral Flotation:

- Integral Flotation system does not need to be replaced / maintained during the hawser lifetime, eliminating the need for spare floats and expensive maintenance crews.
- The construction of the Integral Flotation system enhances the abrasion resistance of the hawser to external mechanical damage, ie. Floating hose flanges.
- At CALM buoys where the hawsers maybe left floating in the water between offtakes, the Integral Flotation system reduces the amount the rope will flex with the wave action. This reduces internal yarn-on-yarn abrasion damage and can help to increase retirement programmes.
- Ropes left floating in the water between offtakes are subject to 'water wash' through the rope, which over time will remove the unique marine finishes applied to modern day synthetic fibres to reduce abrasion / fatigue damage internally. The Integral Flotation system with polyurethane elastomer coating restricts water wash.



Tubular float
In cases where long service life with minimal maintenance is required, we recommend the use of our Tubular Floats. These are available in varying lengths and diameter to suit. Tubular floats are stiffer than the fibre rope, so flexing may occur at the exit points from the floats. The longer the float length, the greater the flexural concentration. Therefore we do recommend a larger quantity of short length floats, as opposed to a smaller quantity of longer length floats.

OFFSHORE DIVISION

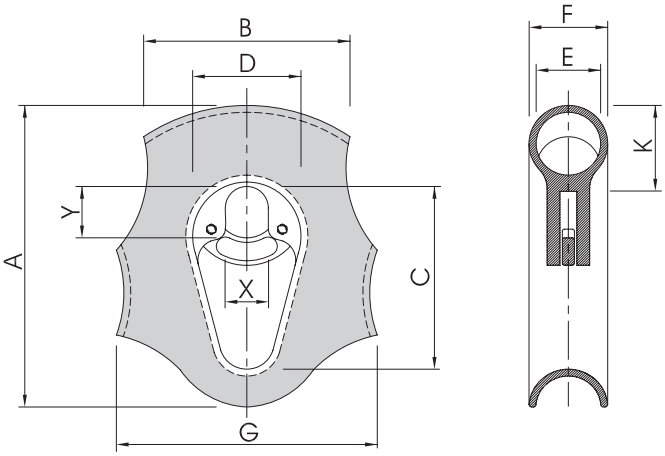
THIMBLES & SHACKLES

Cast SPM Hawser Thimble

Material:
Cast steel
Stainless steel

Finish:
Galvanised (mild steel)
Self coloured (stainless steel)

Rope Size inch	A mm	B mm	C mm	D mm	E mm	F mm	G mm	K mm	X mm	Y mm	Weight Kg
11″-13″	530	320	270	175	132	157	477	170	105	105	52
14″-15″	655	476	357	258	154	183	598	200	116	124	83
16″-18″	795	542	380	283	184	212	721	252	136	140	118
19″-21″	940	657	457	348	209	265	880	309	158	177	315
22″-24″	1043	814	575	410	244	298	867	360	180	200	406

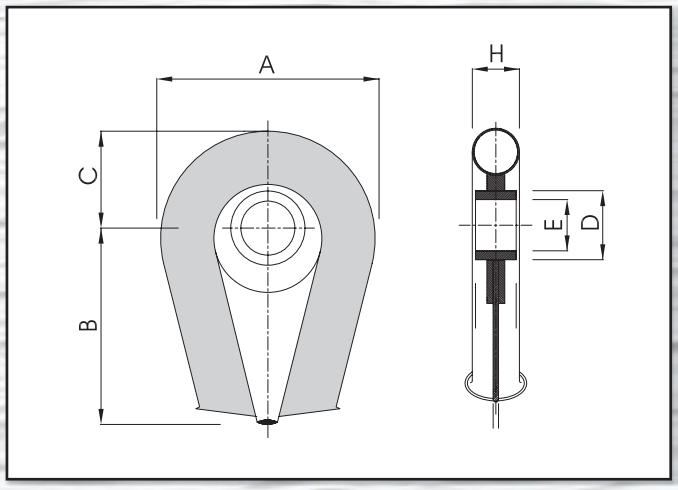


Tubular Hawser Thimble

Rope Size inch	A mm	B mm	C mm	D mm	E mm	H mm	Weight Kg
12″	521	416	250	194	144	140	46
15″	625	539	282	194	144	168	74
18″	734	640	336	219	169	194	126
21″	829	780	374	219	169	219	176
24″	924	915	421	273	201	245	272

Material:
Mild steel

Finish:
Galvanised / Plastic coating on request



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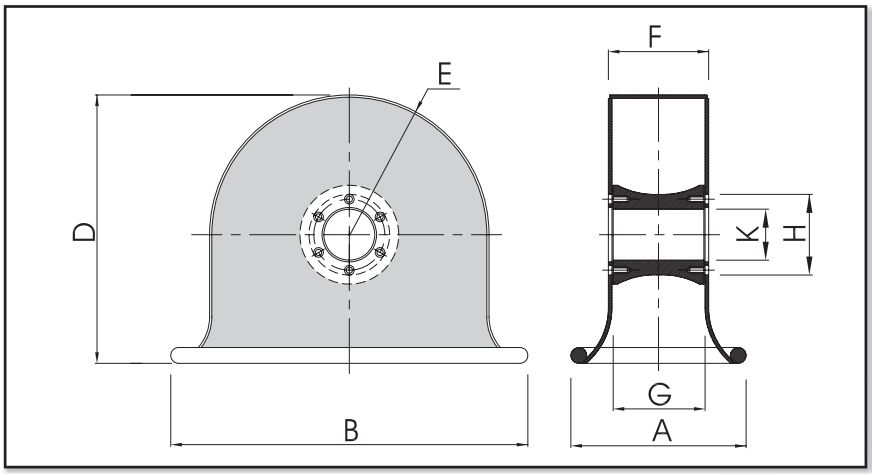
Bellmouth Hawser Thimble

Material:
Mild steel
Stainless steel

Finish:
Galvanised (mild steel)
Self coloured (stainless steel)

Rope Size inch	A mm	B mm	D mm	E mm	F mm	G mm	H mm	K mm	Weight Kg
10″-12″	400	640	480	195	166	147	175	86	75
15″-16″	440	746	608	248	193	172	196	105	110
18″-21″	454	844	660	300	228	205	204	118	135
22″-24″	450	1000	758	400	266	245	290	135	236

For connecting to a special shackle, dimension K can be revised to suit.

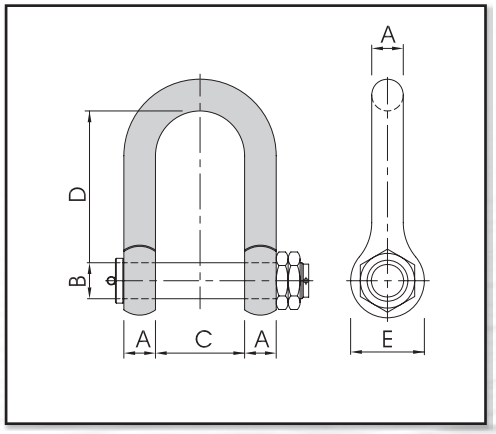


Heavy Duty Hawser Shackles

Material:
Forged high alloy steel
Quenched & tempered

Finish:
Galvanised / painted

Minimum break load: 5 x SWL



Rope Size	A mm	B mm	C mm	D mm	E mm	Weight kg	SWL Tonne	Proof Load Tonne	MBL Tonne
11/13″	70	76	175	350	165	65	60	90	300
14/15″	80	90	220	390	178	87	85	127.5	425
16/18″	90	100	254	430	210	130	110	165	550
19/21″	100	114	280	480	235	194	130	195	650
22/23″	125	133	300	600	265	354	200	300	1000
24/27″	130	146	333	720	305	410	225	337.5	1125
250T 15″	115	125	220	400	238	198	250	482	612
200T 18″	105	120	254	500	228	187	200	330	498
250T 18″	125	130	254	500	238	248	250	482	612
200T 21″	115	125	280	500	238	223	200	330	498

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OFFSHORE DIVISION

SUPPORT BUOYS & PICK-UP BUOYS

Nominal Dimensions			Nominal	Reserve
Body Length	Overall Length	Body Diameter	Weight	Buoyancy
(mm)	(mm)	(mm)	(kg)	(kg)
1110	1445	1200	180	900
1550	1895	1200	225	1360
1900	2145	1400	280	1815
2000	2270	1400	350	2270
2000	2370	1450	425	2720
2000	2560	1650	500	3620
2000	2560	1850	625	4540
2300	2860	1900	725	5454

Swivel End Type Buoy

Chain Through Type Buoy

Nominal Dimensions			Nominal	Reserve
Body Length	Overall Length	Body Diameter	Weight	Buoyancy
(mm)	(mm)	(mm)	(kg)	(kg)
1550	1908	1100	370	900
1550	1908	1265	410	1360
2000	2408	1280	551	1815
2000	2408	1400	580	2270
2000	2408	1505	620	2720
2000	2408	1705	760	3620
2400	2810	1850	1150	4540
2400	2810	1950	1400	5454

Our range of chain support buoys have a typical reserve buoyancy of 900kg up to 5000kg – but our flexible manufacturing process allows us to produce products to suit our customers exact buoyancy requirements. The buoys can be supplied with swivel eyes top and bottom, or with a chain through / locking plate arrangement. We also supply pick-up buoys with reserve buoyancy of up to 500kg.

Spherical Type Pick-up Buoy

Nominal Dimensions		Nominal	Reserve
Diameter	Overall Length	Weight in Air	Net Buoyancy
(mm)	(mm)	(kg)	(kg)
660	900	35	100

OFFSHORE DIVISION

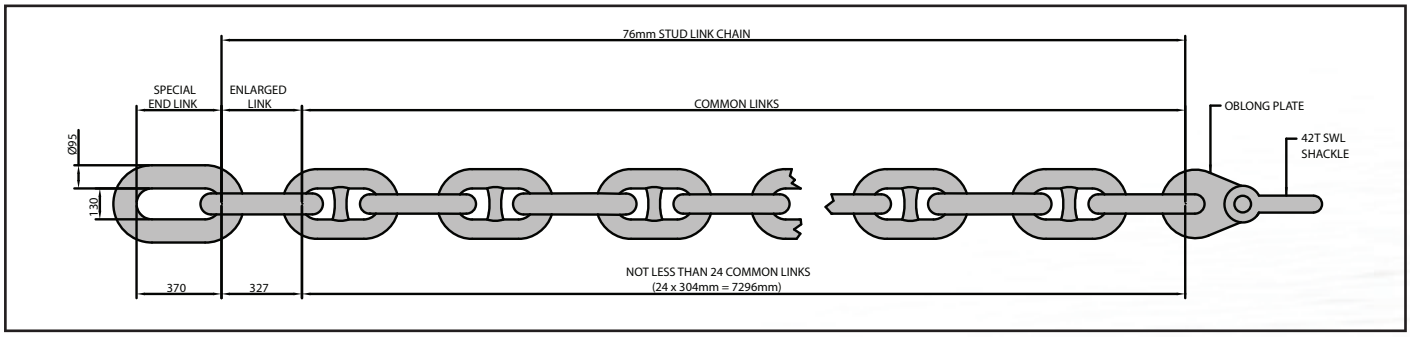
CHAFE CHAINS & FLOATING PICK-UP / MESSENGER LINES

Chafe Chains

We can supply a full range of OCIMF compliant Chafe Chains, as well as customer bespoke assemblies configured to individual operator specifications.

- Chafe Chain A OCIMF 2007, 4th Edition – for use with full range of ship sizes
- Chafe Chain B OCIMF 2007, 4th Edition – for use with ships of 350,000 tonnes or less deadweight
- Chafe Chains A and B as per OCIMF 1993, 3rd Edition
- Weak links, Kenter shackles, Joining shackles, Delta plates etc.
- Topside SPM Bridle Assemblies

Typical Chain A / B configuration per OCIMF 2007.
Chain manufactured, tested and inspected in accordance with IACS W22.



Type	Size mm	Grade per IACS W22	SWL tonne	MBL tonne
A	76	R4	250	611.7
B	76	R3	200	479.8

The number and size of chains used should be determined by the terminal operator after an analysis of the maximum mooring load. If necessary, weak links or quick release devices should be incorporated into the mooring system.

Floating Pick-up / Messenger Lines

Our range of floating pick-up / messenger lines are based on our Lankhorst TIPTO® Brand ropes. These ropes exhibit high strength, excellent abrasion resistance and energy absorption properties, ensuring a long life-time. The low weight makes the handling on board easier. Lankhorst TIPTO® Brand ropes are supplied in high visibility yellow colour and have a specific gravity of 0.93 – self floating.

Circ. (inches)	Diameter (mm)	Weight (kg/100m)	MBF (kN)
3	24	27.3	103
3 ½	28	37.3	137
4	32	53	177
4 ½	36	66	222
5	40	75.6	269
6	48	109	378
7	56	149	508
8	64	194	651
9	72	246	814
10	80	305	992

Lankhorst are able to supply Spunstaple Polypropylene floating pick-up / messenger lines if required, manufactured in 8-strand squareline construction. Please ask for details.

OFFSHORE DIVISION

TESTING & TECHNICAL SUPPORT INFORMATION

Residual Hawser Strength Testing
We can assist operators to understand hawser behaviour and performance in specific field operations by residual strength testing of used / retired mooring hawsers.

Our fully equipped laboratories in Portugal have the capability to analyse mooring hawsers for condition, signs of internal abrasion damage or ingress of foreign particles, and perform residual break tests. This information will help operators to understand the hawsers in use at their terminal and make better informed judgements on current and future retirement programmes. Our engineers are able to offer advice and guidance on this. Customers are always welcome to witness testing of hawsers.

Lankhorst Ropes have participated in many Joint Industry Projects (JIP) and have been instrumental in helping to shape the industry and the rules / guidelines governing the use of fibre ropes in offshore applications. In addition to the JIPs, we also participate in privately sponsored research projects and other JIPs specifically related to Fibre Rope Mooring applications, Chain and Mooring Jewellery.

Technical Support Information
Our SPM sales and engineering team is always on hand to provide comprehensive customer care and technical support services. We are able to undertake site surveys and bespoke development work. Further technical information on our range of SPM associated products is available upon request by sending an email to spm@lankhorstropes.com

- Double Braid Nylon – Load v Extension data
- Double Braid Nylon – Fatigue (TCLL) data
- GAMA 98® - Load v Extension data
- GAMA 98® - Fatigue (TCLL) data
- OCIMF 2000 Form A Compliance Certificates
- Single Leg vs Grommet Hawser Configuration
- OCIMF Chafe Chain drawings / data sheets
- Pick-up rope / Messenger Line data sheets
- SPM Hawser Reference List
- SPM Technical Manual
- Operation & Maintenance Manual
- Synthetic Fibre Material & Rope constructions

Trial Fits
All assemblies and components are fully fitted prior to despatch from factory to ensure no interface issues once items arrive at site.




GLOSSARY OF TERMS

Marine terms and abbreviations are open to variation around the world, the following are used in all our literature and correspondence:

BOW CHAIN STOPPER
A mechanical device for securing chafe chains onboard a tanker.

BRAIDED ROPE
Rope constructed by braiding or interweaving strands together.

BRAIDLINE OR DOUBLE BRAID ROPE
Rope consisting of a hollow core of many braided strands enclosed in a cover of many braided strands.

BREAKING LENGTH
The length of rope, whose mass will equal that of its breaking strength.

CBS
Calculated breaking strength.

CHAFE CHAIN
A length of stud-link chain at the end of an SPM mooring hawser which passes through a ship's fairlead and is used to connect the SPM mooring hawser to the bow chain stopper of a tanker.

CIRCULAR BRAIDED ROPE
Rope consisting of multiple parallel laid load-bearing cores, enclosed in a non-load bearing braided jacket.

CONVENTIONAL TANKER
An oil tanker equipped for regular trading and not specially designed or adapted for loading at offshore terminals requiring specialised mooring or bow loading equipment.

DISPLACEMENT
The mass of water in tonnes displaced by a vessel at a given draft.

DWT
Deadweight tonnage of a vessel at the maximum summer draft, expressed in tonnes.

EIGHT STRAND ROPE
Rope construction of two pairs of strands with right hand twist and two pairs of strand with left hand twist, braided together in such a way that pairs of strands of opposite twist overlay one another.

END FOR END SPLICE
The joining of two ropes by means of a splice.

FPSO
Floating Production, Storage and Offloading unit.

FSO
Floating Storage and Offloading unit.

GROMMET ROPE OR DOUBLE LEG HAWSER
An assembly of rope spliced into an endless loop then two legs seized together to form a singl length. Ancillary equipment fitted as required.

LAID ROPE
Rope constructed by laying and twisting several strands together. The direction of the twist is opposite that of the strand twist. Common forms are three, four and six strand (with core).

LINEAR DENSITY
The weight per unit length of the rope.

MAXIMUM SUMMER DRAFT
Maximum summer draft for which the structural strength of the ship has been designed.

OFFSHORE DIVISION

TESTING & TECHNICAL SUPPORT/INFORMATION

MBL
Minimum breaking load of a new mooring line or chain, as declared by the manufacturer. It does not include allowance for splicing (mooring line) or for wear and tear.

MINIMUM YIELD LOAD
The mooring load applied to a mooring fitting (eg. Bow fairlead, bow chain stopper) that, if exceeded, would cause permanent (plastic) deformation of the fitting, its components or foundations and, therefore, impair or otherwise compromise its continued safe use.

MOORING HAWSER
An assembly of rope and fittings, terminations, flotation aids and anti-chafe protection.

NEW WET BREAKING STRENGTH (NWBS)
The average breaking strength of prototype ropes that have been soaked in water and conditioned by 10 load cycles.

OCIMF
Oil Companies International Marine Forum, a London based organisation of marine representatives from SPM terminal operators, primarily oil companies.

PTC
Polyester tubular cloth

PU
Polyurethane elastomer

REFERENCE LOAD
A nominal pre-tension load, approximately 1% of the breaking load, which is applied to the rope to remove slack when taking certain measurements.

ROPE SIZE
Is a number approximately equivalent to the nominal diameter measured in mm.

ROPE STRENGTH FACTOR
The ratio of the strength of the finished rope to the sum of the strengths of the rope yarns used to make the rope.

SAFE WORKING LOAD (SWL)
A load less than the yield or breaking load by a safety factor defined by a code, standard or good engineering practice.

SHUTTLE TANKER
An oil tanker specially designed or adapted for loading at offshore terminals requiring specialised mooring or bow loading equipment.

SINGLE POINT MOORING (SPM)
An integrated mooring arrangement for bow mooring a conventional tanker. For example conventional tanker bow mooring arrangements to Catenary Anchor Leg Mooring (CALM) system, Single Anchor Leg Mooring (SALM) system, FPSO or FSO.

SINGLE ROPE ASSEMBLY
An assembly of a single rope with terminations at each end. Ancillary equipment fitted as requested.

SPLICED EYE
A loop formed at the end of a rope and secured by interweaving the strands or braids.

TANDEM MOORING
A hawser-mooring arrangement between two vessels, either bow-to-bow or bow-to-stern. It is normally taken to mean a mooring arrangement between the bow of a conventional tanker and the stern of bow of a FPSO or FSO.

LANKHORST ROPES – Offshore Division

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