

**OFFSPRING
INTERNATIONAL
LIMITED**

MOORING AND OFFLOADING SYSTEMS

Offspring International

Offspring International specialises in equipment for mooring, offloading and control systems to optimise terminal operations both offshore and quayside. Offspring offers a fully integrated supply of equipment for SPM and CBM buoy mooring, hoses, breakaway couplings, valves & actuators, together with a comprehensive terminal monitoring and management system. Using experience and expertise gained over 30 years, Offspring International is able to support other mooring applications including renewables, chain ferries, port operations, aquaculture etc.

Offspring International is a dedicated team of mooring professionals, bringing together over 150 years' experience in the design, supply and deployment of offshore mooring systems. Offspring is also an active member of the Oil Companies International Marine Forum (OCIMF), contributing its knowledge and experience to Single Point Mooring best practice.



Mooring, Offloading and Terminal Management

Offspring International combines in-depth technical and practical experience with industry leading mooring systems and products. As the exclusive worldwide agent for SPM hawser products and accessories from Lankhorst Euronete Portugal, Offspring is also offers a full range of Single Point Mooring products manufactured and supplied in strict accordance with the OCIMF 2000 'Guidelines for the Purchasing and Testing of SPM Hawsers'.

Using the latest computer aided design technology, Offspring International can produce "As Built" drawings and fully documented manuals for any mooring system to accompany the QA and/or independent inspection authority certification.

As an international agent of leading hose manufacturer MAN Oil & Marine, Offspring supplies a range of floating marine and submarine offloading hoses for a range of applications. In addition, Offspring International is exclusive worldwide agent for Paladon Systems, a valve actuator and control system specialist providing PLEM control systems for CALM Buoys, CBM's and FPSO's including the Autonomous Shutdown Valve (ASV). The innovative ASV utilises pipeline pressure to provide the energy to operate the subsea valves.

In keeping with tanker loading Best Practice, Offspring International, working in partnership with Offshore Ops, offers industry leading software and technologies for better managing mooring and offloading operations. The compact modular system offers a range of terminal management, environmental and equipment monitoring devices, seamlessly integrated into a single, secure software package.

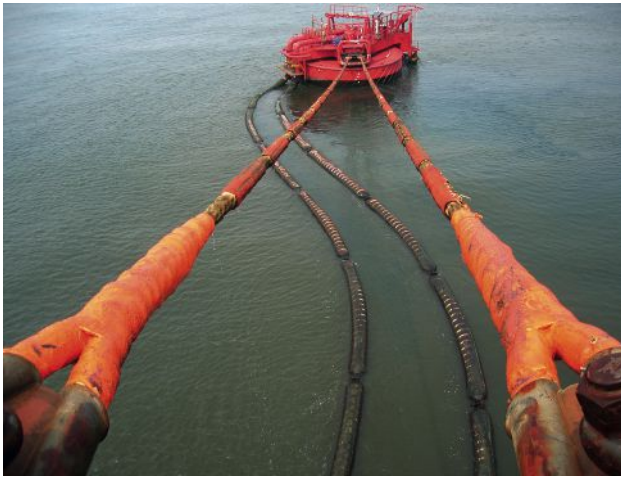
In addition, the software enables improved efficiency in terminal management by allowing comprehensive monitoring and control over consignment scheduling, asset management and policy and procedural adherence.

Offspring International values long-term, customer relationships and so a commitment to excellence in customer service is one of our key strengths. Offspring goes beyond the normal, high level of pre-sales technical advice and project management expected when delivering mooring systems on-time and within budget, to include post-installation reviews and through life operator support.

Mooring Systems – Experience and Know-How

Offshore mooring systems are subject to increasingly demanding operating environments. The design of the mooring system and the integrity of its components are critical to ensuring optimum in-service performance, longevity and operational safety.

Offspring International offers a comprehensive service for CALM buoy and conventional buoy mooring systems from provision of the entire offtake system, to replacement of mooring hawsers, hoses, pressure surge protection and associated hardware. Our approach is based on experience of providing offloading systems across the globe; we take a systematic approach to assessing the offshore environment, hawser and hose design, testing, and installation conditions.



Hawser and Rope – Innovation, Higher Performance

Offspring International, working with Lankhorst Euronete Portugal, has been instrumental in driving up rope performance standards in SPM applications. Through innovative technical solutions and a commitment to customer service, the company has led the development of integral hawser flotation technology and new, higher performing offshore ropes.



Industry Leading – Rope Development, Manufacture, Test and Rigging Facility

Lankhorst Euronete Portugal has a dedicated rope production facility for the design, production, rigging and testing of deepwater mooring ropes and single point mooring hawsers at Viana do Castelo, on the coast about 80km north of Porto, Portugal.

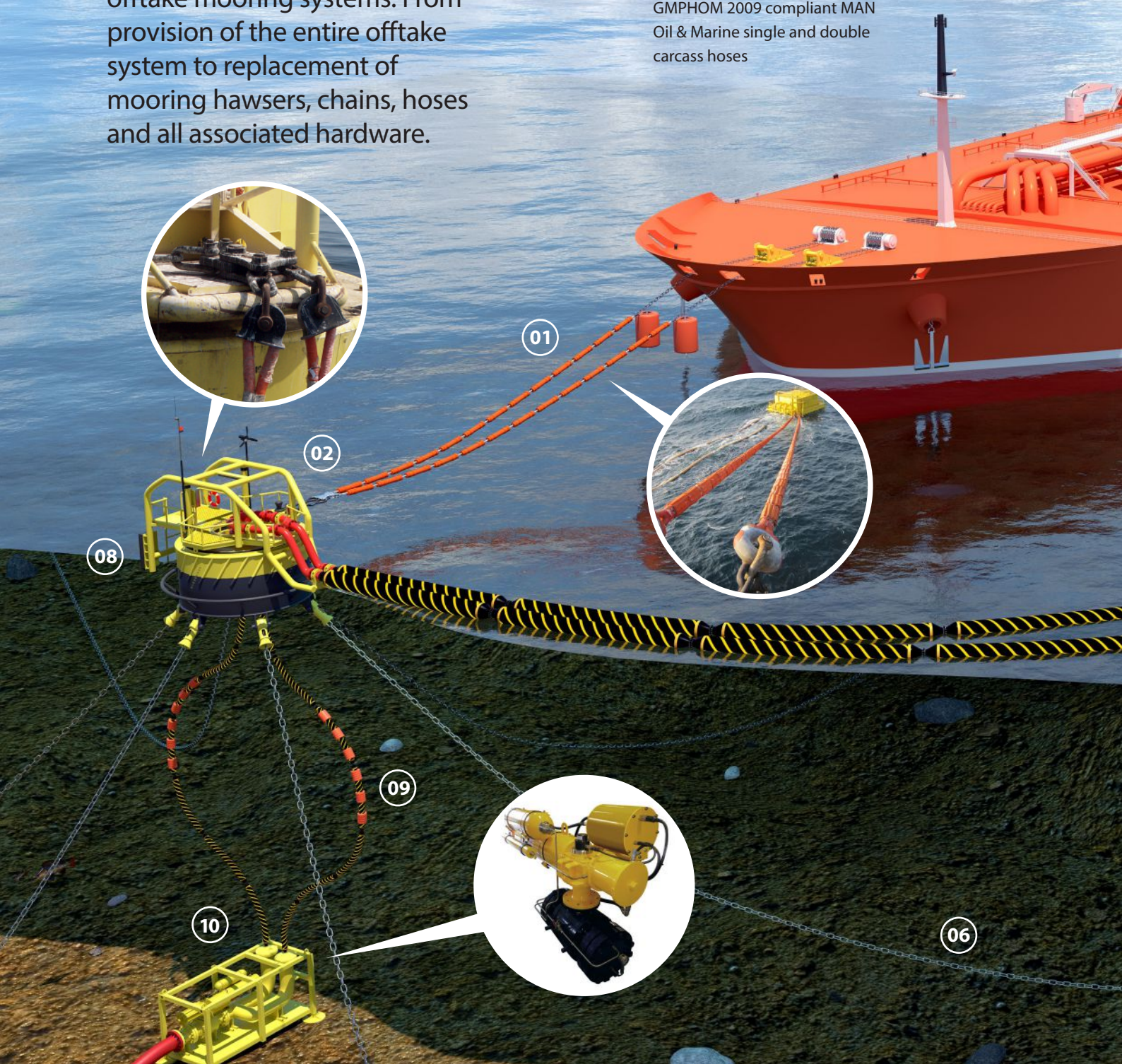
The factory covers some 3,600m² production facilities together with 2,400m² storage area. In addition to state-of-the-art rope production machinery, the factory includes a large SPM makeup and storage area. With access to Lankhorst Euronete Portugal's industry leading test machine, Offspring International is able to develop new SPM ropes and qualify prototype ropes in accordance with international standards and customer specifications.

SPM Buoy / Tandem Mooring and Offloading Systems

- 01 HAWSER**
Lankhorst Offshore SPM Hawser in accordance with OCIMF 2000 guidelines
- 02 CALM BUOY BRIDLE**
Secure and reliable hawser connection
- 03 FLOATING HOSE**
GMPHOM 2009 compliant MAN Oil & Marine single and double carcass hoses

Offspring International offers a range of bespoke packages for both single point and tandem offtake mooring systems. From provision of the entire offtake system to replacement of mooring hawsers, chains, hoses and all associated hardware.

- 04 MARINE BREAKAWAY COUPLING**
Rapid response breakaway coupling
- 05 HOSE END VALVES**
Robust & lightweight hose end valves to reduce the impact on the buoyancy of the floating offloading hoses
- 06 ANCHOR CHAIN**
Catenary anchor mooring chains in all material grades
- 07 ANCHOR**
Anchor holds the CALM securely
- 08 BUOY VALVES**
On & Off type valves to control the transfer of fluid
- 09 UNDER BUOY HOSE**
GMPHOM 2009 compliant MAN Oil & Marine single and double carcass hoses



10 PLEM CONTROL & SUBSEA VALVES

Subsea valves and proven conventional control systems for PLEM & PLET as well as Paladon Systems' Autonomous Shutdown Valve, providing fully autonomous and fail-safe control

11 TANDEM MOORING

Tandem offtake mooring hawser

12 MANIFOLD PRESSURE TRANSDUCER

Manifold Pressure monitoring with Surge Protection for the CALM mooring and/or tandem mooring

OFFSHORE OPS' VESSEL MONITORING SYSTEM

13 INTEGRATED TERMINAL MANAGEMENT

This compact modular system offers a range of terminal management, environmental and equipment monitoring devices, seamlessly integrated into a single, secure software package.

The tanker is the primary point for monitoring and control of the buoy, however, data can be monitored from multiple locations using a secure internet connection. The system monitors the heading of the tanker in addition to its GPS position and that of the buoy, mooring line tension and manifold pressure.

Offshore Ops' Vessel Mooring System (VMS) is monitored on portable equipment taken on board the tanker for final approach. Once moored, tanker excursion and tanker manifold pressure are monitored in real time, together with all SPM and environmental data.



Single Point Mooring – Bespoke Supply

Offspring International's range of bespoke packages for single point and tandem offtake mooring systems includes:



Mooring Hawsers

Compliant with OCIMF 2000 Guidelines including chafe chains, pick-up and messenger ropes, support buoys, hawser shackles, associated fittings and load monitoring equipment.



Valves & Actuators

Working with Marine Division and Paladon Systems, Offspring International offers a range of high quality offshore valves and control systems ensuring safe and efficient fluid transfer operations between pipeline, buoy and tanker.

Offspring supplies all valves from ball, butterfly, gate (including through conduit), globe, check and plug valves either manual or actuated, as well as Paladon Systems' range of proven conventional control systems for PLEM and innovative Autonomous Shutdown Valve (ASV), which offers fully autonomous and fail-safe control of PLEM valves.

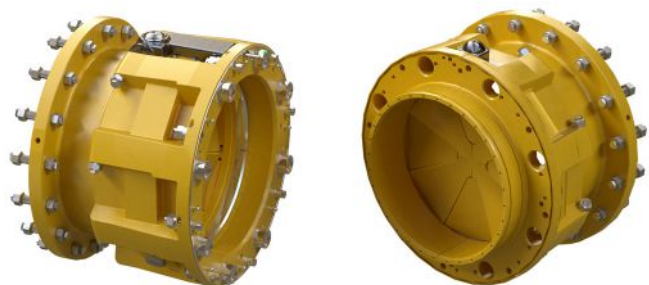
All valves supplied are designed and manufactured under quality systems in accordance with ISO 9001 and to the applicable standards from the American Petroleum Institute (API), American National Standards Institute (ANSI) and American Society of Mechanical Engineers (ASME).



Floating & Submarine Hoses

Offspring International offers a comprehensive range of OCIMF GMPHOM 2009 compliant hoses from MAN Oil & Marine. These include single and double carcass floating marine and submarine hoses, dock hoses and long length conduit hoses.

MAN Oil & Marine hoses are designed and manufactured to OCIMF GMPHOM 2009 guidelines and ISO 9001 industrial standards, with hose performance certified by ABS (American Bureau of Shipping). Offspring International also offers a range of ancillary items enabling the safe installation and operation of offloading hoses including pressure monitoring equipment and navigational aids alerting vessels to the presence of floating hoses.



Marine Breakaway Couplings

Fluid transfer operations in harsh offshore environments are at risk of tanker breakaway and internal surge pressures, causing oil spills and damage to hoses and fittings. To mitigate the risks of transfer operations Offspring International offers a range of marine breakaway couplings from leading producers.

Petal Valve Coupling

The rapid response of the petal valve design sets the benchmark for minimal oil leakage and pressure surge protection, yet is easy to reset on-site after activation, allowing terminal operations to quickly resume. Seamlessly integrated within the flexible hose string, a full-bore design ensures uninterrupted flow and zero pressure loss.

OCIMF Compliance Across All Systems

All Offspring International SPM systems and products offer outstanding operational performance, reliability and safety. Additionally Offspring International follows the latest OCIMF guidelines and recommendations for our mooring systems.

- ▶ OCIMF 2000 'Guidelines for the Purchasing & Testing of SPM Hawsers'
- ▶ OCIMF 2018 'Guidelines for Offshore Tanker Operations'
- ▶ OCIMF 2015 'Single Point Mooring Maintenance and Operations Guide'
- ▶ OCIMF 2009 'Guide to Manufacturing and Purchasing Hoses for Offshore Moorings'



Conventional Buoy Moorings

In addition to SPM systems, Offspring International is able to supply Conventional Buoy Mooring systems providing effective mooring for tankers 5,000 to 50,000 DWT and larger at shallow water terminals.

Comprising supply and installation of mooring buoys, pipeline end manifold (PLEM), offloading hoses, and telemetry and control, Offspring International provides full engineering design and specification of the CBM including mooring system, buoys, PLEM and hose interface.



Navigational Moorings – High Performance, Secure Moorings

Offspring International supplies a range of high performance, chain moorings for synthetic and steel navigational buoys. Designed for a wide variety of environments both inshore and offshore, the mooring system includes sinker, pendant chain, swivel piece, bridle chains and shackles, as required.

The mooring system is well proven – Offspring International has been supplying navigational moorings since 1991. Over this time we've provided mooring systems for buoys used for long-term navigation aids, as well as hazard warning systems, windfarms, ports and harbours, LNG facilities and offshore platforms.

24/06/2016:02:25 Starboard Load Cell 1st Alarm 53 Ton. Alarm 1 set at 50 Ton

24/06/2016:02:25 Combined Load Cell 1st Alarm 103 Ton. Alarm 1 set at 100 Ton

24/06/2016:02:25 Port Load Cell 1st Alarm 52 Ton. Alarm 1 set at 50 Ton

24/06/2016:03:25 Wind Speed 1st Alarm 29.5 knots. Alarm 1 set at 25.3 knots

VESSEL	
HEADING:	54°
SPEED:	0 KNOTS
TO BUOY	
DISTANCE:	64 M
BEARING:	49° (NE)
RESET MAP ZOOM	
PLAYBACK	

OFFSHORE OPS

Offshore Ops – Integrated Terminal Management

Offshore Ops' fully OCIMF SMOG 2015 compliant Integrated Terminal Management System has been systematically developed over 15 years to provide 'live' data on a wide range of operational and environmental factors. It offers effective operations management, significantly reducing risk and enhancing mooring and offloading safety and performance.

The compact modular system, suitable for SPM and CBM, provides data which can be monitored from multiple locations using a secure internet connection, as well as automatic SMS alarm notifications to selected key personnel. Receiving 'live' data from the buoy and portable vessel monitoring system ensures informed decisions can be made and implemented immediately. Historical data can be used to monitor performance over time and maximise offloading system availability by using predictive wear analysis and planned maintenance to extend service life.



For more information on Offspring International
 Mooring and Offloading Systems
 call +44 (0)1384 453880
 email mail@offspringinternational.com
 or visit www.offspringinternational.com



UK
 Unit 8
 Castle Court 2
 Castlegate Way
 Dudley
 West Midlands
 DY1 4RH

Tel. +44 (0)1384 453880
Fax. +44 (0)1384 453888

USA
 28577 Jaeger Drive
 Laguna Niguel
 CA 92677
Tel. +1 949 215 3268

