

MARINE OFFSHORE

DNV Det Norske Veritas Cert. n. CERT-04193-99-AQ IND-SINCERT
 EN 13765:2010, approved from CEN
 Directive 97/23/CE "PED" with operating Procedures certified from DNV - CE PED 07.0056.06/2585
 Directive 94/9/CE "ATEX" hose for explosive atmospheres, Cert. held by DNV Rec. nr. CE ATE 08.0117.06/2617 - (AS 2430.1-1987)
 BS 5842:1980 (Conf. 1986)
 BS 3492:1987
 AS 2683-2000 (Hose & hose assemblies for distribution of petroleum and petroleum products)
 AS 2117-1991 (Hose & hose assemblies for petroleum and petroleum products - Marine suction and discharge)
 NAHAD Guidelines (NAHAD 600/2005)

Test procedures:

BS 5173-102.10:1990 section 102.10 - (EN ISO 1402)
 AS1180.5-1999 (method 5)
 AS 1180.13B (Electrical resistance)
 AS1180.13C (Electrical continuity)

Type Approval

Lloyd's Register Type Approved - Cert. N° 13/00002
 DNV - Det Norske Veritas - Type Approval Cert. N° P-12369
 RINA - Registro Italiano Navale - Cert. N° MAC/81398/1/TO/99
 Russian Maritime Register of Shipping
 IBC Code Chapter 5 - Ship's Cargo hoses
 IMO Chemical Carrier Code - Paragraphs 2:12 and 5:7

Welding Process

in according to EN 15608:2005 - EN 439:1996 - EN 15614-1:2005 - EN 6848:2005 - EN 12072:2001 certified by DNV - Det Norske Veritas
 in according to ASME IX certified by RINA



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COMPOTEC®



MULTIPURPOSE MARINE OFFSHORE
Single Carcass Submarine Hose
MP - SCS

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MATEC® GROUP provide a range of high quality, high performance, MULTIPURPOSE suction and discharge hoses, extensively used at offshore moorings throughout the world. The COMPOTEC® Single Carcass Submarine hoses are utilized in high integrity sub-sea installations such as MBM (Multy Buoy Mooring), CALM (Catenary Anchor Leg Mooring), SALM (Single Anchor Leg Mooring) configurations, (Steep 'S', Lazy 'S', Chinese Lantern). COMPOTEC® hose fully complies with the requirements of the "OCIMF Guide to Purchasing, Manufacturing and Testing of Loading and Discharge Hoses for Offshore Moorings, Fourth Edition – 1991".

Single Carcass Submarine Hose Specification

Nominal Bore (mm):	150 (6"), 200 (8"), 250 (10"), 300 (12")
Standard Length:	9.1 Mt (30'), 10.7 Mt (35') & 12.2 Mt (40'). Lengths up to 25 Mt (82') also available.
Hose Construction:	Liner Tube – Composite hose construction, resistant to hydrocarbons, with aromatic content up to 100%, solvents & chemicals Main Carcass – Double wire helix reinforced with multi-layers high tensile textile fabrics and high modulus films. Outer Cover – Fibre reinforced smooth polyester cover, with a thick Orange Polyurethane coating (DURATHANE®) resistant to ageing, abrasion, weathering, sunlight, tearing, oil and seawater penetration.
Flanges:	ANSI B16.5 Class 150 or 300 Hot Dip Galvanised in accordance with BS729 Part 1 or Stainless Sttel on request.
Pressure Rating:	225 Psi (16 Bar), (higher pressure ratings on request)
Minimum Burst Pressure:	75 Bar
Flow Velocity:	Maximum of 21m/s
Fluid Product:	Crude Oil and Liquid Petroleum products, Solvents and Chemicals
Temperature Range:	Fluid Temperature from -40°C to +100°C. Ambient Temperature from -30°C to +60°C.
Minimum Bend Radius:	4 x hose Nominal Bore Diameter.
Electrical Continuity:	Electrically Continuous or Discontinuous as required.

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PATENT DESIGN

Approvals & Quality Assurance

All COMPOTEC® hoses are designed and manufactured under a Quality System in accordance with ISO 9001, and is in compliance with Pressure Equipment Directive (PED) 97/23/EC module D1 (hoses carry CE marking as required). Test certificates issued by our internal quality control in accordance with UNI EN ISO 1402:2009. If required we can arrange a third party Inspection carried out by any independent inspector IACS member. All COMPOTEC® hoses meets the EN, CE, AS, U.S. Coast Guard requirements, NAHAD Guidelines, are Lloyds and DNV approved and ATEX certificate can be released on request. COMPOTEC® MULTIPURPOSE MARINE OFFSHORE hoses are Type approved acc to the European Standard UNI-EN 13765:2010 for Thermoplastic multi-layer hoses and hose assemblies for the transfer of hydrocarbons, solvents and chemicals.

MULTIPURPOSE MARINE OFFSHORE
Single Carcass Floating Hose
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Single Carcass Floating Hose Specification

Nominal Bore (mm):	150 (6"), 200 (8"), 250 (10"), 300 (12")
Standard Length:	9.1 Mt (30'), 10.7 Mt (35') & 12.2 Mt (40'). Lengths up to 25 Mt (82') also available.
Hose Construction:	Liner Tube – Composite hose construction resistant to hydrocarbons with aromatic content up to 100%, solvents and chemicals. Main Carcass – Double wire helix reinforced with multi-layers of high tensile textile fabrics and high modulus films. Flotation Material – Closed Cell Foam Outer Cover – Fibre reinforced smooth polyester cover, with a thick Orange Polyurethane coating (DURATHANE®) resistant to ageing, abrasion, weathering, sunlight, tearing, oil and seawater penetration.
Flanges:	ANSI B16.5 Class 150 or 300 Hot Dip Galvanised in accordance with BS729 Part 1 or Stainless Sttel on request.
Pressure Rating:	225 Psi (16 Bar), (higher pressure ratings on request)
Minimum Burst Pressure:	75 Bar
Flow Velocity:	Maximum of 21m/s
Fluid Product:	Crude Oil and Liquid Petroleum ,products, Solvents and Chemicals.
Temperature Range:	Fluid Temperature from -40°C to +100°C. Ambient Temperature from -30°C to +60°C.
Minimum Bend Radius:	6 x hose Nominal Bore Diameter
Electrical Continuity:	Electrically Continuous or Discontinuous as required.

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MULTIPURPOSE MARINE OFFSHORE
Double Carcass Submarine Hose
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In addition to standard hose carcass (commonly called 'primary' carcass), COMPOTEC® Double Carcass Submarine hoses incorporate an additional second carcass designed to contain any product escape from the standard carcass as a result of a slow leak or sudden failure. Effective, robust and reliable leak detection and indication system is provided.

COMPOTEC® Double Carcass Submarine hoses fully comply with the requirements of the "OCIMF Guide to Purchasing, Manufacturing and Test-ing of Loading and Discharge Hoses for Offshore Moorings, Fourth Edition – 1991"

Double Carcass Submarine Hose Specification

Nominal Bore (mm):	150 (6"), 200 (8"), 250 (10"), 300 (12")
Standard Length:	9.1 Mt (30'), 10.7 Mt (35') & 12.2 Mt (40'). Lengths up to 25 Mt (82') also available.
Hose Construction:	Liner Tube – Composite hose construction, resistant to hydrocarbons, with aromatic content up to 100%, solvents & chemicals. Primary Carcass – Double wire helix reinforced with multi-layers of high tensile textile fabrics and high modulus films. Secondary Carcass –multi-layers of high tensile textile fabrics and films Outer Cover – Fibre reinforced smooth polyester cover, with a thick Orange Polyurethane coating (DURATHANE®) resistant to ageing, abrasion, weathering, sunlight, tearing, oil and seawater penetration.
Flanges:	ANSI B16.5 Class 150 or 300 Hot Dip Galvanised in accordance with BS729 Part 1 or Stainless Steel on request.
Pressure Rating:	Primary Carcass – 225 Psi (16 Bar), (higher pressure ratings on request)
Minimum Burst Pressure:	Primary Carcass - 75 Bar - Secondary Carcass - 30 Bar
Flow Velocity:	Maximum of 21m/s
Fluid Product:	Crude Oil and Liquid Petroleum products, Solvents and Chemicals
Temperature Range:	Fluid Temperature from -40°C to +100°C. - Ambient Temperature from -30°C to +60°C.
Minimum Bend Radius:	4 x hose Nominal Bore Diameter.
Electrical Continuity:	Electrically Continuous or Discontinuous as required.
Leak Detection:	Pressure compensated leak detection system

PATENT DESIGN

Approvals & Quality Assurance

All COMPOTEC® hoses are designed and manufactured under a quality system in accordance with ISO 9001, and is in compliance with Pressure Equip-ment Directive (PED) 97/23/EC module D1 (hoses carry CE marking as required). Test certificates issued by our internal quality control in accordance with UNI EN ISO 1402:2009. If required we can arrange a third party inspection carried out by any independent inspector IACS member.

All COMPOTEC® hoses meets the EN, CE, AS, U.S. Coast Guard requirements, NAHAD Guidelines, are Lloyds and DNV approved and ATEX certificate can be released on request.

COMPOTEC® MULTIPURPOSE MARINE OFFSHORE hoses are Type approved acc to the European Standard UNI-EN 13765:2010 for Thermoplastic multi-layer hoses and hose assemblies for the transfer of hydrocarbons, solvents and chemicals

MULTIPURPOSE MARINE OFFSHORE
Double Carcass Floating Hose
MP - DCF

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In addition to the standard hose carcass (commonly called 'primary' carcass), COMPOTEC® Double Carcass Floating hoses incorporate an addi-tional second carcass designed to contain any product escaping from the standard carcass as a result of a slow leak or sudden failure. Effective, robust and reliable leak detection and indication system is provided.

COMPOTEC® Double Carcass Submarine hoses fully comply with the requirements of the "OCIMF Guide to Purchasing, Manufacturing and Testing of Loading and Discharge Hoses for Offshore Moorings, Fourth Edition – 1991".

Double Carcass Floating Hose Specification

Nominal Bore (mm):	150 (6"), 200 (8"), 250 (10"), 300 (12"),
Standard Length:	9.1 Mt (30'), 10.7 Mt (35') & 12.2 Mt (40'). Lengths up to 25 Mt (82') also available.
Hose Construction:	Liner Tube – Composite hose construction, resistant to hydrocarbons, with aromatic content up to 100%, solvents & chemicals. Primary Carcass – Double wire helix reinforced with multi-layers of high tensile textile fabrics and high modulus films. Secondary Carcass – –multi-layers of high tensile textile fabrics and films Flotation Material – Closed cell foam Outer Cover Fibre reinforced smooth polyester cover, with a thick Orange Polyurethane coating r (DURATHANE®) resistant to ageing, abrasion, weathering, sunlight, tearing, oil and seawater penetration.
Flanges:	ANSI B16.5 Class 150 or 300 Hot Dip Galvanised in accordance with BS729 Part 1 or Stainless Steel on request.
Pressure Rating:	Primary Carcass – 225 Psi (16 Bar), (higher pressure ratings on request)
Minimum Burst Pressure:	Primary Carcass - 75 Bar Secondary Carcass - 30 Bar
Flow Velocity:	Maximum of 21m/s
Fluid Product:	Crude Oil and Liquid Petroleum products, Solvents and Chemicals
Temperature Range:	Fluid Temperature from -40°C to +100°C. Ambient Temperature from -30°C to +60°C.
Minimum Bend Radius:	6 x hose Nominal Bore Diameter
Electrical Continuity:	Electrically Continuous or Discontinuous as required.
Leak Detection:	Pressure compensated leak detection system.

PATENT DESIGN

Approvals & Quality Assurance

All COMPOTEC® hoses are designed and manufactured under a quality system in accordance with ISO 9001, and is in compliance with Pressure Equipment Directive (PED) 97/23/EC module D1 (hoses carry CE marking as required). Test certificates issued by our internal quality control in accor-dance with UNI EN ISO 1402:2009. If required we can arrange a 3rd Part Inspection carried out by any independent inspector IACS member.

All COMPOTEC® meets the EN, CE, AS, U.S. Coast Guard requirements, NAHAD Guidelines, are Lloyds and DNV approved and ATEX certificate can be released on request.

COMPOTEC® MULTIPURPOSE MARINE OFFSHORE hoses are Type approved acc to the European Standard UNI-EN 13765:2010 for Thermoplas-tic multi-layer hoses and hose assemblies for the transfer of hydrocarbons, solvents and chemicals.

CRYOGETEC CR-SCS - MARINE OFFSHORE
Liquefied Gas Hose

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MATEC® GROUP provide the first COMPOSITE high quality, high performance, **Liquefied Gas** suction and discharge hose, extensively used at offshore moorings throughout the world. **COMPOTEC® CRYOTEC** hoses are designed for use with cryogenic products at temperatures down to -200°C and pressures up to 25 bar. **COMPOTEC® CRYOGETEC** hoses are manufactured according to EN 13766:2010, in two types: Type 1 for **LPG** and Type 2 for **LNG**, each type is subdivided in two classes, one for **onshore** use (Class A), and one for **offshore** use (Class B).

CRYOGETEC Nanogel® – Patented design by Matec® Group
FLEXIBLE COMPOTEC® HOSE WITH INTEGRAL INSULATION VAPOR BARRIER FOR SUB-AMBIENT AND CRYOGENIC APPLICATIONS.

Nanogel® is a flexible aerogel blanket insulation with an integral vapor barrier. It is engineered to deliver maximum thermal protection with minimal weight and thickness, and zero water vapor permeability. **Nanogel®**'s unique properties, extremely low thermal conductivity, superior flexibility, compression resistance, hydrophobicity, and ease of use, make it essential for those seeking the ultimate in thermal protection for cryogenic applications. Using patented nanotechnology, **Nanogel®** insulation combines a silica aerogel with reinforcing fibers to deliver industry-leading thermal performance in an easy-to-handle and environmentally safe product. **Nanogel®**'s extremely low thermal conductivity reduces heat gain and its inherent flexibility makes the product durable and resistant to mechanical abuse. Additional protection (**ARAMEX** braid and **DURATHANE** Orange PU cover) on the outer diameter is available to minimize the abrasion damages and for further protection and insulation. **CRYOGETEC** Hoses with **Nanogel®** patented insulation, can achieve an outer temperature of 23°C on hoses carrying **LNG** at -175 inside.

COMPOTEC® hose fully complies with the requirements of the "OCIMF Guide to Purchasing, Manufacturing and Testing of Loading and Discharge Hoses for Offshore Moorings, Fourth Edition – 1991".

CRYOGETEC Marine Offshore Hose Specification

Nominal Bore (mm):	150 (6"), 200 (8"), 250 (10"), 300 (12")
Standard Length:	9.1 Mt (30'), 10.7 Mt (35') & 12.2 Mt (40'). Lengths up to 25 Mt (82') also available.
Hose Construction:	Liner Tube – Composite hose construction, resistant to cryogenic products at temperatures down to -200°C and pressures up to 25 bar Main Carcass – Double wire helix reinforced with multi-layers high tensile textile fabrics and high modulus films. Outer Cover – Fibre reinforced smooth polyester cover, with a thick Orange Polyurethane coating (DURATHANE®) resistant to ageing, abrasion, weathering, sunlight, tearing, oil and seawater penetration.
Flanges:	ANSI B16.5 Class 150 or 300 Hot Dip Galvanised in accordance with BS729 Part 1 or Stainless Steel on request.
Pressure Rating:	25 Bar
Minimum Burst Pressure:	100 Bar
Flow Velocity:	Maximum of 21m/s
Fluid Product:	Liquefied Petroleum Gas (LPG) & Liquefied Natural Gas (LNG)
Temperature Range:	Fluid Temperature from -200°C to +80°C. - Ambient Temperature from -30°C to +60°C.
Minimum Bend Radius:	4 x hose Nominal Bore Diameter.
Electrical Continuity:	Electrically Continuous or Discontinuous as required.

PATENT DESIGN

Approvals & Quality Assurance

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CRYOGETEC CR-SCF -MARINE OFFSHORE
Floating Liquefied Gas Hose

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CRYOGETEC Nanogel® – Patented design by Matec® Group
FLEXIBLE COMPOTEC® HOSE WITH INTEGRAL INSULATION VAPOR BARRIER FOR SUB-AMBIENT AND CRYOGENIC APPLICATIONS.

Nanogel® is a flexible aerogel blanket insulation with an integral vapor barrier. It is engineered to deliver maximum thermal protection with minimal weight and thickness, and zero water vapor permeability. **Nanogel®**'s unique properties, extremely low thermal conductivity, superior flexibility, compression resistance, hydrophobicity, and ease of use, make it essential for those seeking the ultimate in thermal protection for cryogenic applications. Using patented nanotechnology, **Nanogel®** insulation combines a silica aerogel with reinforcing fibers to deliver industry-leading thermal performance in an easy-to-handle and environmentally safe product. **Nanogel®**'s extremely low thermal conductivity reduces heat gain and its inherent flexibility makes the product durable and resistant to mechanical abuse. Additional protection (**ARAMEX** braid and **DURATHANE** Orange PU cover) on the outer diameter is available to minimize the abrasion damages and for further protection and insulation. **CRYOGETEC** Hoses with **Nanogel®** patented insulation, can achieve an outer temperature of 23°C on hoses carrying **LNG** at -175 inside.

COMPOTEC® hose fully complies with the requirements of the "OCIMF Guide to Purchasing, Manufacturing and Testing of Loading and Discharge Hoses for Offshore Moorings, Fourth Edition – 1991".

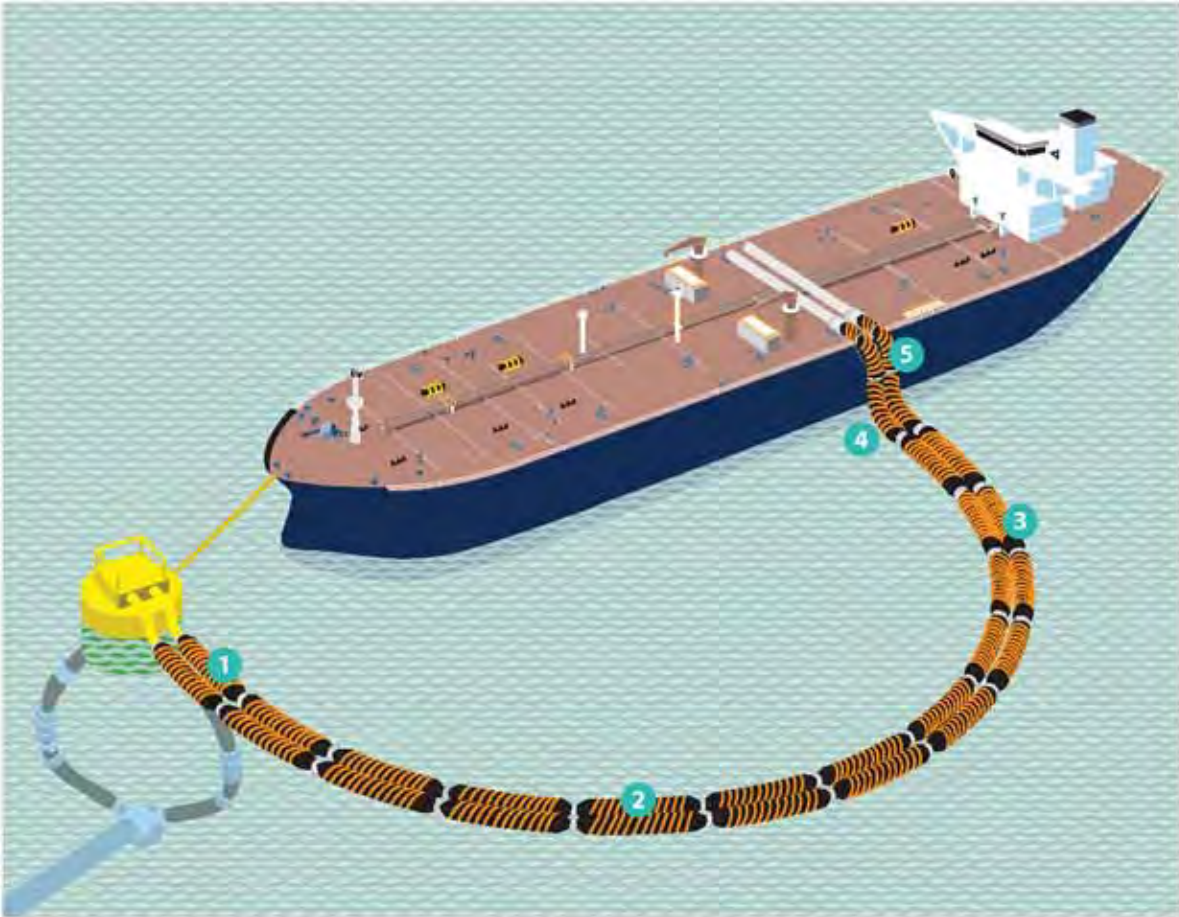
CRYOGETEC Marine Floating Hose Specification

Nominal Bore (mm):	150 (6"), 200 (8"), 250 (10"), 300 (12")
Standard Length:	9.1 Mt (30'), 10.7 Mt (35') & 12.2 Mt (40'). Lengths up to 25 Mt (82') also available.
Hose Construction:	Liner Tube – Composite hose construction resistant to cryogenic products at temperatures down to -200°C and pressures up to 25 bar. Main Carcass – Double wire helix reinforced with multi-layers of high tensile textile fabrics and high modulus films. Flotation Material – Closed Cell Foam Outer Cover – Fibre reinforced smooth polyester cover, with a thick Orange Polyurethane coating (DURATHANE®) resistant to ageing, abrasion, weathering, sunlight, tearing, oil and seawater penetration.
Flanges:	ANSI B16.5 Class 150 or 300 Hot Dip Galvanised in accordance with BS729 Part 1 or Stainless Steel on request.
Pressure Rating:	25 Bar
Minimum Burst Pressure:	100 Bar
Flow Velocity:	Maximum of 21m/s
Fluid Product:	Liquefied Petroleum Gas (LPG) & Liquefied Natural Gas (LNG)
Temperature Range:	Fluid Temperature from -200°C to +80°C. - Ambient Temperature from -30°C to +60°C.
Minimum Bend Radius:	6 x hose Nominal Bore Diameter
Electrical Continuity:	Electrically Continuous or Discontinuous as required.

PATENT DESIGN

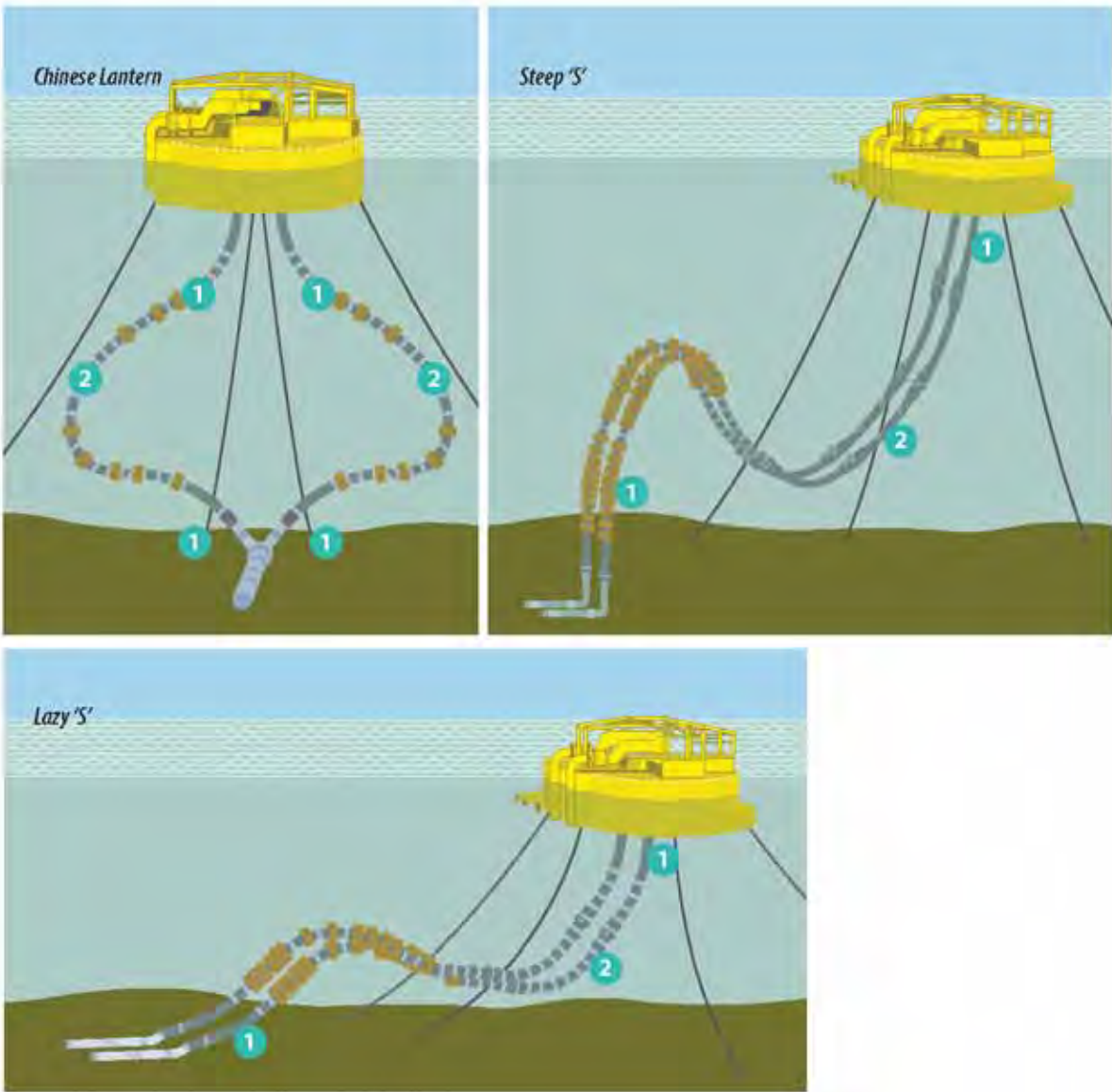
Approvals & Quality Assurance

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No	Position	Common	Type	Optional Type	Characteristics	Use
1	Buoy Connection	First off buoy	Floating		One end reinforced	Connection to surface pipework on SBM
2	Mainline	Mainline	Floating			Principal component of floating hose string
3	Optional Taper*	Taper	Floating	Taper	Integral reducing bore	Connects large bore mainline to smaller bore tail hose
4	Tail	Tail hose	Floating		Electrically discontinuous see Section 5.3.1	Smaller diameter than mainline to handle rail hose at tanker end
5	Rail	Rail Hose	Floating		Greater flexibility with lifting lugs	Over rail hose for conventional midships manifold connection

Example of Floating Hoses in a CALM System *Reducing spool pieces or Y tanks are commonly used alternatives to taper hoses



Examples of Submarine Hoses in a CALM System

No	Position	Common Name	Type	Optional Type	Characteristics	Use
1	End Hose	End	Submarine		One end reinforced	Connection to rigid pipe-work on SPM or PLEM
2	Mainline	Mainline	Submarine			Principal component of submarine hose string

Example of Submarine Hoses in a CALM System

Single Anchor Leg Mooring (SALM)

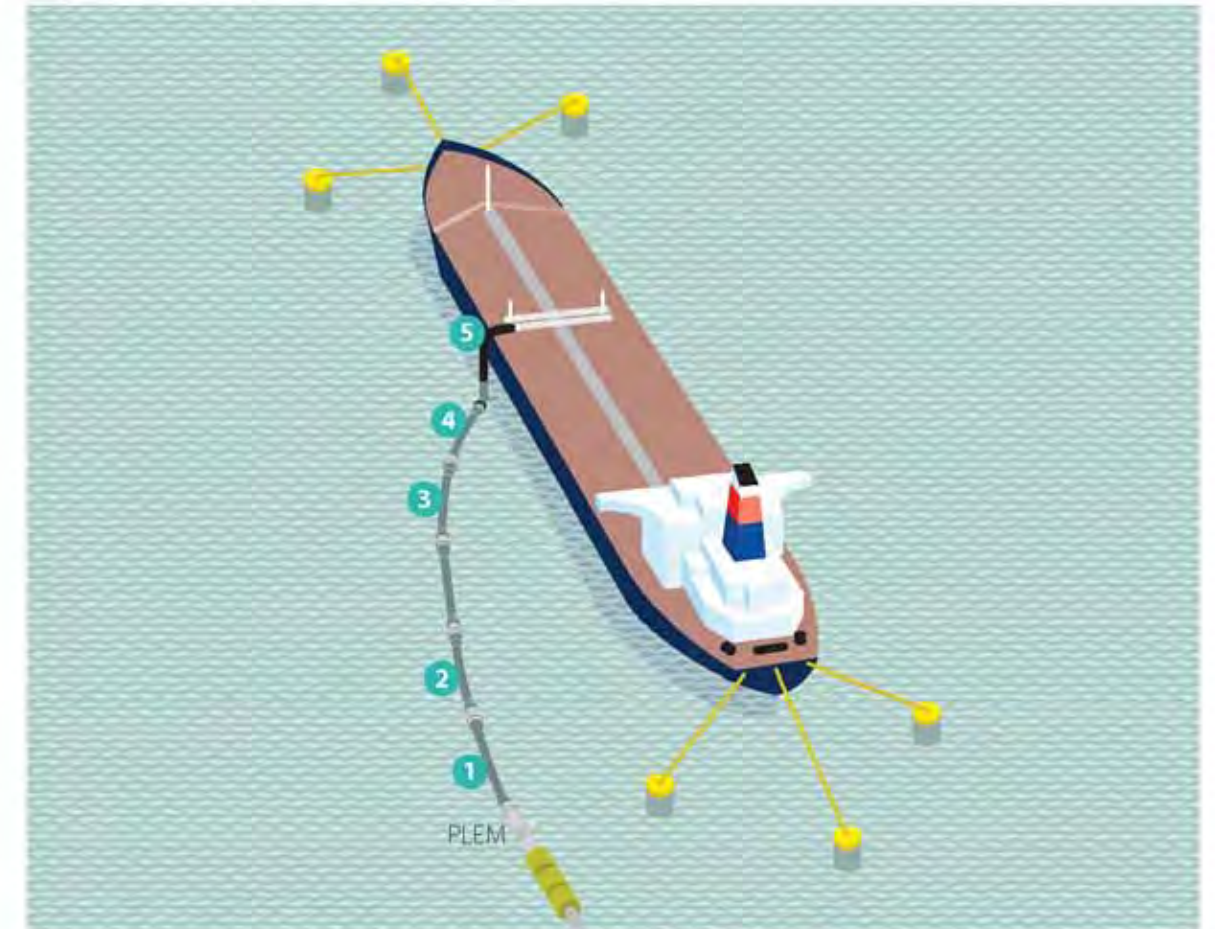


Example of Hoses in a SALM System (Refer to Table 14 overleaf)

No	Position	Common Name	Type	Optional Type	Characteristics	Use
1	SALM Connection	Specially Reinforced Submarine End	Submarine		One end reinforced	Sub-sea connection to SALM
2	Mainline	Specially Reinforced Submarine Mainline	Submarine			Principal component of submarine hose string
3	Part Floating	Variably Reinforced Part Floating	Part Floating		With location collars for floats	Breakwater hose
4	Mainline	Mainline	Floating			Principal component of floating hose string
5	Optional Taper*	Taper	Floating	Taper	Integral reducing bore	Connects large bore mainline to smaller bore tail hose
6	Tail	Tail hose	Floating		Electrically discontinuous see Section 5.3.1	Smaller diameter than mainline to handle rail hose at tanker end
7	Rail	Rail hose	Floating		Greater flexibility with lifting lugs	Over rail hose for conventional midships manifold connection
8	Jumper end hose	Jumper end hose	Submarine		One end reinforced	Submarine jumper end connection
9	Jumper mainline	Jumper mainline	Submarine			Submarine jumper mainline

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Multi Buoy Mooring (MBM)

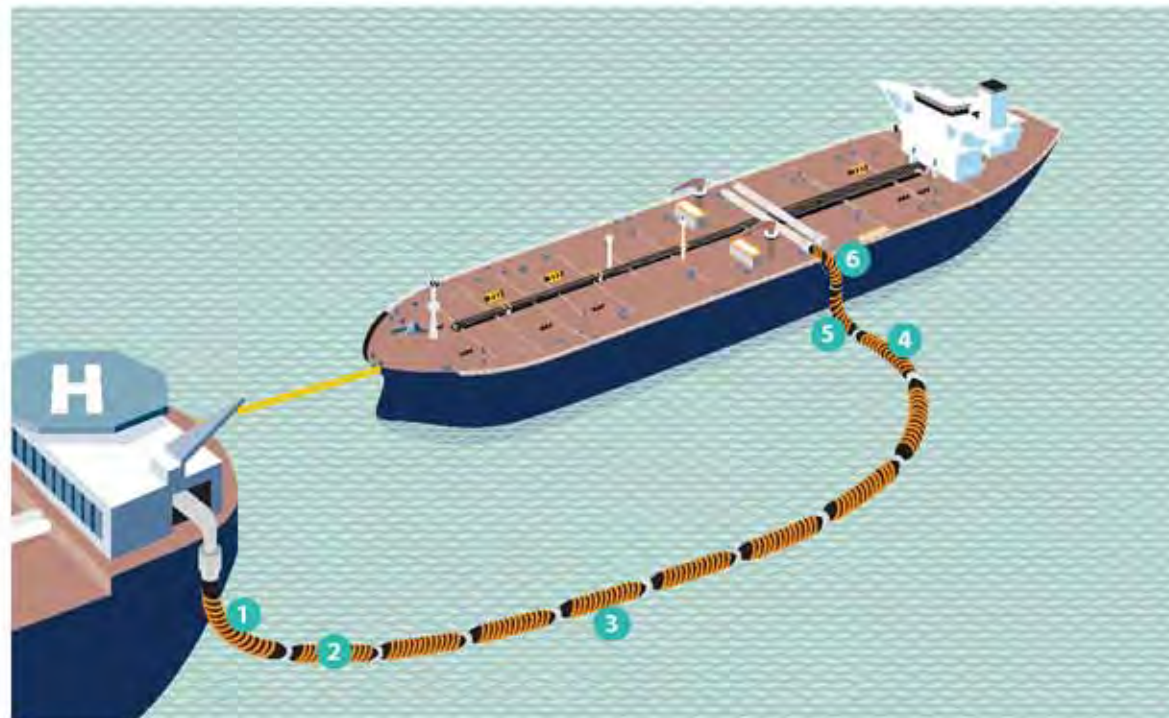


Example of Hoses in a Multi Buoy Mooring System

No	Position	Common Name	Type	Optional Type	Characteristics	Use
1	PLEM Connection	PLEM Connection	Submarine		One end reinforced	Connection to rigid pipework on PLEM
2	Mainline	Mainline	Submarine		Neutral or reduced buoyancy	Principal component of submarine hose string
3	Optional Taper*	Taper	Submarine		Integral reducing bore	Connects large bore mainline to smaller bore tail hose
4	Tail	Tail Hose	Submarine		Electrically discontinuous see Section 5.3.1	Smaller diameter than mainline to handle rail hose at tanker end
5	Rail	Rail Hose	Submarine		Greater flexibility with lifting lugs	Over rail hose for conventional midships manifold connection

Example of Hoses in a Multi Buoy Mooring System * Reducing spool pieces or Y tanks are commonly used alternatives to taper hoses

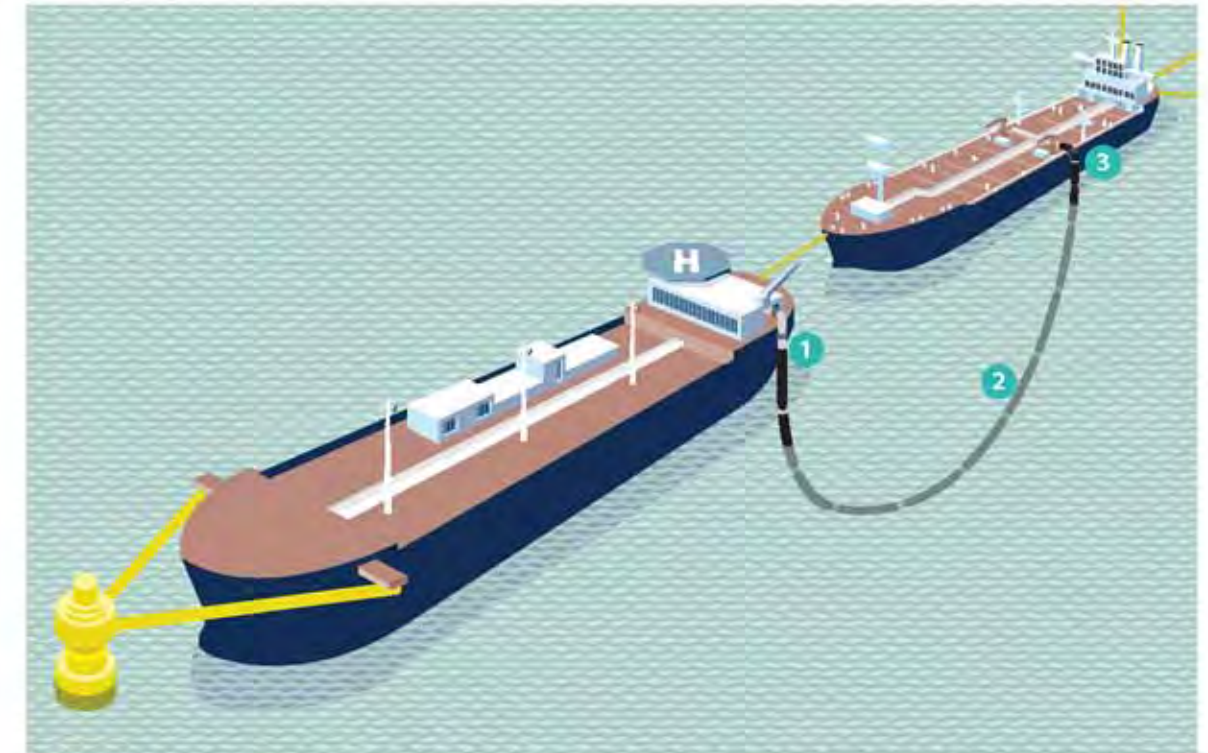
Tandem Mooring



Example of Floating Hoses in a Tandem Mooring System

No	Position	Common Name	Type	Optional Type	Characteristics	Use
1	FPSO Connection	Off take Connection	Floating	Reel	One end reinforced – usually customised to meet system design requirements	Connection to FPSO
2	Reduced buoyancy	Reduced buoyancy	Floating	Reel	Neutral or reduced buoyancy	Usually next 2 or 3 hose sections in system
3	Mainline	Mainline	Floating	Reel		Principal component of floating hose string
4	Optional Taper*	Taper	Floating	Reel	Integral reducing bore	Connects large bore mainline to smaller bore tail hose
5	Tail	Tail hose	Floating	Reel	Electrically discontinuous see Section 5.3.1	Smaller diameter than mainline to handle rail hose at tanker end
6	Rail	Rail hose	Floating Rail	Reel	Greater flexibility with lifting lugs	Over rail hose for conventional midships manifold connection

Example of Floating Hoses in a Tandem Mooring System *Reducing spool pieces or Y tanks are commonly used alternatives to taper hoses



Example of Catenary Hoses in a Tandem Mooring System

No	Position	Common Name	Type	Optional Type	Characteristics	Use
1	FPSO Connection	Off take Connection or Bow Connector hose	Submarine	Reel	One end reinforced – usually customised to meet system design requirements	Connection to FPSO or tanker bow loading point
2	Mainline	Mainline	Submarine	Reel	Neutral or reduced buoyancy	Principal component of catenary
3	Off take Connection	Rail Hose	Submarine	Reel	Greater flexibility with lifting lugs	Over rail hose for conventional midships manifold connection

Example of Catenary Hoses in a Tandem Mooring System

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