



*...your innovation provider of high
integrity equipment*

LOADING & DISCHARGE HOSES FOR OFFSHORE MOORINGS

Hose range in accordance with "OCIMF Guide to Purchasing, Manufacturing and Testing of Loading and Discharge Hoses for Offshore Moorings, Fourth Edition – 1991"



OVERVIEW

LOADING & DISCHARGE HOSES FOR OFFSHORE MOORINGS

EMSTEC provide a range of high quality, high performance, oil suction and discharge hoses, extensively used at offshore moorings throughout the world, which 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”. The EMSTEC Loading & Discharge hoses are available with rated working pressures of 15 BAR, 19 BAR and 21 BAR or higher for special applications or specific client requirements. Two distinctive designs within the EMSTEC hose range are available:

- **EMSTEC Single Carcass Hoses (21 Series)** Floating, Submarine & Catenary Hoses
- **EMSTEC Double Carcass Hoses (22 Series)** Floating, Submarine & Canenary Hoses

The EMSTEC **Single Carcass** hose construction consists of three main elements; i) smooth bore elastomeric lining resistant to a variety of hydrocarbons, ii) a standard elastomer reinforced carcass with multi-layers of high tensile textile cords and embedded steel wire helix. iii) a fibre reinforced smooth elastomer cover, resistant to ageing, abrasion, weathering, sunlight, tearing oil and seawater penetration.

In addition to the standard hose carcass (commonly termed ‘primary’ carcass), EMSTEC **Double Carcass** hose incorporate an additional second carcass designed to contain any product escaping from the standard carcass as a result of a slow leak or sudden failure. An effective, robust and reliable, integrated leak detection and indication system is provided.

The EMSTEC **Single Carcass** and **Double Carcass** hose range includes hose construction for **Floating, Submarine and Catenary applications**, utilized in offloading installations worldwide EPS, MBM, SBM, CALM, SALM and Tandem Offloading.

- EMSTEC Single Carcass / Double Carcass Floating Hoses (utilized in high integrity surface installations such as EPS, SBM, CALM, SALM offloading in addition to FPSO, FSO Tandem offloading configurations).
- EMSTEC Single Carcass / Double Carcass Submarine Hoses (utilized in high integrity sub-sea installations such as MBM, SBM, CALM, SALM configurations (i.e. Steep ‘S’, Lazy ‘S’, Chinese Lantern).
- EMSTEC Single Carcass / Double Carcass Catenary Hoses (utilized in high integrity offloading installations subject to high tensile loads such as FPSO, FSO tandem offloading to DP Shuttle Tankers (i.e. BLS, Reel, Chute, Cantilever hang-off arrangements).

The EMSTEC **Single Carcass** and **Double Carcass** hose range is complemented by a comprehensive range of Ancillary Equipment, recommended within “OCIMF SPM Hose Ancillary Equipment Guide” publication.

For additional information on specific hose types and applications, please refer to EMSTEC hose data sheets.



EMSTEC 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”.



EMSTEC hoses are designed and manufactured under a quality system in accordance with ISO 9001, and in compliance with Pressure Equipment Directive (PED) 97/23/EC module H (hoses carry CE marking as required).



Prototype Hose manufacture and testing witnessed and verified by Bureau Veritas (Certifying Authority) and GDC International (Industry Consultants).

PRODUCT RANGE

LOADING & DISCHARGE HOSES FOR OFFSHORE MOORINGS

EMSTEC provide a range of high quality, high performance elastomer reinforced, smooth bore, oil suction and discharge hoses, extensively used at offshore moorings throughout the world. The EMSTEC 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".

EMSTEC hose range includes **Single Carcass** and **Double Carcass** hoses construction for **Submarine, Catenary and Floating** applications, utilized in high integrity offloading installations worldwide.

All EMSTEC hoses are designed and manufactured under a quality system in accordance with ISO 9001, and compliance with Pressure Equipment Directive (PED) 97/23/EC module H (hoses carry CE marking as required).

21100 - Single Carcass Floating Hose



21200/21300 - Single Carcass Submarine Hose



21400 - Single Carcass Catenary Hose



22100 - Double Carcass Floating Hose



22200/22300 - Double Carcass Submarine Hose



22400 - Double Carcass Catenary Hose



28500 - Ancillary Equipment



28600/28700 - Transport, Handling and Test Equipment



For additional information on specific hose types and applications, please refer to EMSTEC hose data sheets.

SINGLE CARCASS FLOATING HOSE

'21' SERIES

EMSTEC provide a range of high quality, high performance, oil suction and discharge hoses, extensively used at offshore moorings throughout the world. The EMSTEC **Single Carcass Floating** hoses are utilized in high integrity surface installations such as EPS, SBM, CALM, SALM offloading in addition to FPSO, FSO Tandem offloading configurations.

The EMSTEC 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".

All hoses are designed and manufactured under a quality system in accordance with ISO 9001, and compliance with Pressure Equipment Directive (PED) 97/23/EC module H (hoses carry CE marking as required).

For performance characteristics and specification, please refer to EMSTEC data sheet 'Single Carcass Hose Specification'.

21110 FSC - End Reinforced Half Floating (ie. First off Buoy)



21120 FSC - Controlled Buoyancy



21130 FSC - Main Line Floating



21140 FSC - Main Line Half Floating



21150 FSC - Tapered Floating



21160 FSC - Tail Floating



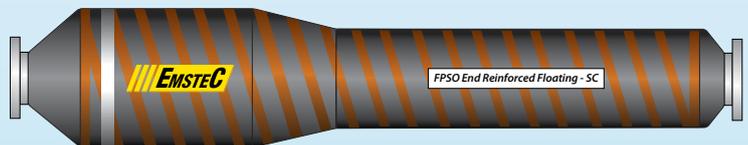
SINGLE CARCASS FLOATING HOSE (continuation)

'21' SERIES

21170 FSC - Tanker Rail Floating



21180 FSC - FPSO - End Reinforced High Buoyancy Floating (ie. First off FPSO to support ERC) *



21190 FSC - ST End Reinforced High Buoyancy Floating (ie. Shuttle Tanker connection to support HEV) *



* NOTE

The **EMSTEC Single Carcass Floating** hoses designed for **special end connection applications** are utilized in high integrity surface installations such as FPSO, FSO Tandem offloading configurations offshore Brazil.

The special hoses are installed at the ends of the floating hose string, connected to the FPSO/FSO hang-off Emergency Release Coupling (ERC) and the Shuttle Tanker bow loading system Hose End Valve (HEV).

The additional buoyancy within the special FPSO end hose will support the ERC on the surface of the sea, if released in an emergency. The Shuttle Tanker end hose will support the HEV on the surface of the sea, during hose transfer and / or emergency release.

For performance characteristics and specification, please refer to EMSTEC data sheet 'Single Carcass Hose Specification'.

SINGLE CARCASS SUBMARINE HOSE

'21' SERIES

EMSTEC provide a range of high quality, high performance, oil suction and discharge hoses, extensively used at offshore moorings throughout the world. The EMSTEC **Single Carcass Submarine** hoses are utilized in high integrity sub-sea installations such as MBM, CALM, SALM configurations (i.e. Steep 'S', Lazy 'S', Chinese Lantern).

The EMSTEC 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".

All hoses are designed and manufactured under a quality system in accordance with ISO 9001, and compliance with Pressure Equipment Directive (PED) 97/23/EC module H (hoses carry CE marking as required).

For performance characteristics and specification, please refer to EMSTEC data sheet 'Single Carcass Hose Specification'.

21210 SSC - End Reinforced without float collars (i.e. under Buoy)



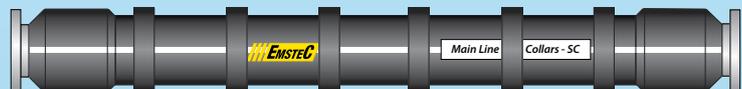
21310 SSCF – End reinforced with float collars (i.e. under Buoy) *



21220 SSC - Main Line without float collars



21320 SSCF - Main Line with float collars



21230 SSC - End Reinforced without float collars (i.e. off PLEM)



21330 SSCF – End reinforced with float collars (i.e. off PLEM) *



*Note: Number and distribution of float collars can be adjusted to suit client specific requirements.

SINGLE CARCASS CATENARY HOSE

'21' SERIES

EMSTEC provide a range of high quality, high performance, oil suction and discharge hoses, extensively used at offshore moorings throughout the world. The EMSTEC **Single Carcass Catenary** hoses are utilized in high integrity floating offloading installations such as FPSO, FSO tandem offloading to DP Shuttle Tankers (i.e. Reel, Chute, Cantilever hang-off arrangements).

The EMSTEC 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".

All hoses are designed and manufactured under a quality system in accordance with ISO 9001, and compliance with Pressure Equipment Directive (PED) 97/23/EC module H (hoses carry CE marking as required).

For performance characteristics and specification, please refer to EMSTEC data sheet 'Single Carcass Hose Specification'.

21410 SCSC - End Reinforced (i.e. FPSO)



21420 SCSC - Main Line



21430 SCSC - Main Line – Controlled / Neutral Buoyancy (for special applications)



21440 SCSC - End Reinforced (i.e. Shuttle Tanker)



SINGLE CARCASS HOSE SPECIFICATION

'21' SERIES

EMSTEC Single Carcass Submarine, Floating & Catenary 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".

PERFORMANCE CHARACTERISTICS & CONSTRUCTION

Nominal Bore (mm):	150 (6"), 200 (8"), 250 (10"), 300 (12"), 400 (16"), 500 (20"), 600 (24")
Standard Length:	9.1M (30'), 10.7M (35') & 12.2M (40') (non-standard less than 12.2M also available)
Hose Construction:	Liner Tube – NBR based Rubber, resistant to hydrocarbons with aromatic content up to 60%. Main Carcass – Elastomer reinforced with multi-layers of high tensile textile cords and embedded steel wire helix. Floatation Material (Floating Hoses only) – Closed Cell Foam Outer Cover – Fibre reinforced smooth elastomer cover, resistant to ageing, abrasion, weathering, sunlight, tearing and oil and seawater penetration. (Polyurethane coating available on request).
Flanges:	ANSI B16.5 Class 150 or 300 Flat Face (FF), Hot Dip Galvanised in accordance with BS729 Part 1. (Raised Face (RF) flange face available on request).
Pressure Rating:	15 BAR, 19 BAR, 21 BAR (higher pressure ratings on request)
Minimum Burst Pressure:	75 BAR, 95 BAR, 105 BAR
Flow Velocity:	Maximum of 21m/s
Fluid Product:	Crude Oil and Liquid Petroleum Products (other than liquefied petroleum gases and liquefied natural gases).
Temperature Range:	Fluid Temperature from -20°C to 82°C. Ambient Temperature from -29°C to 52°C.
Minimum Bend Radius:	Submarine Hose - 4 x hose Nominal Bore Diameter. Floating Hose – 6 x hose Nominal Bore Diameter
Electrical Continuity:	Electrically Continuous or Discontinuous as required.

For information regarding hose types and applications, please refer to relevant EMSTEC hose data sheets.

DESIGN APPROVAL & QUALITY ASSURANCE

All of the 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 H (hoses carry CE marking as required).

Prototype Hose manufacture and testing witnessed and verified by Bureau Veritas (Certifying Authority) and GDC International (Industry Consultant).



ISO 9001
Design



ISO 9001
Manufacture



Prototype Approval
(BV)



Prototype Approval
(GDC)

DOUBLE CARCASS FLOATING HOSE

'22' SERIES

EMSTEC provide a range of high quality, high performance, oil suction and discharge hoses, extensively used at offshore moorings throughout the world. The EMSTEC **Double Carcass Floating** hoses are utilized in high integrity surface installations such as EPS, SBM, CALM, SALM offloading in addition to FPSO, FSO Tandem offloading configurations.

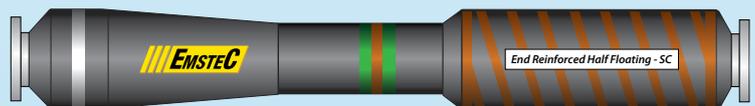
In addition to the standard hose carcass (commonly termed 'primary' carcass), EMSTEC **Double Carcass Floating** hoses incorporate an additional second carcass designed to contain any product escaping from the standard carcass as a result of a slow leak or sudden failure. An effective, robust and reliable leak detection and indication system is provided.

EMSTEC 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".

All 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 H (hoses carry CE marking as required).

For performance characteristics and specification, please refer to EMSTEC data sheet 'Double Carcass Hose Specification'.

22110 FDC - End Reinforced Half Floating (ie. First off Buoy)



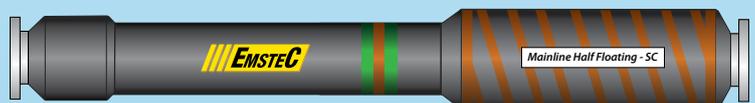
22120 FDC - Controlled Buoyancy



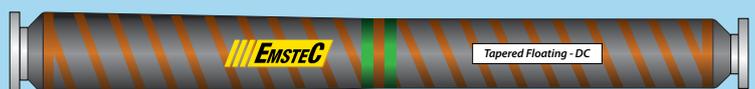
22130 FDC - Main Line Floating



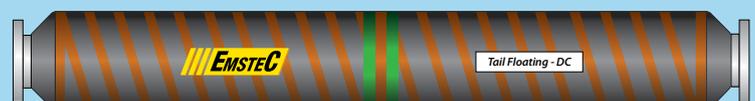
22140 FDC - Main Line Half Floating



22150 FDC - Tapered Floating



22160 FDC - Tail Floating



DOUBLE CARCASS FLOATING HOSE (continuation)

'22' SERIES

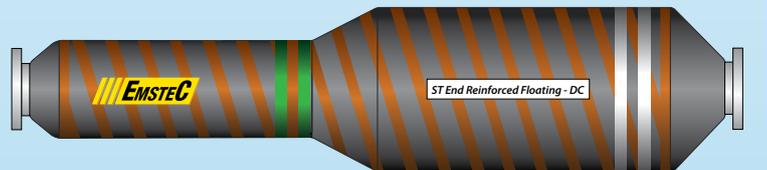
22160 FDC - Tanker Rail Floating



22180 FDC - FPSO - End Reinforced High Buoyancy Floating (ie. First off FPSO to support ERC) *



22190 FDC - ST End Reinforced High Buoyancy Floating (ie. Shuttle Tanker connection to support HEV) *



* NOTE:

The EMSTEC **Doublee Carcass Floating** hoses designed for **special end connection applications** are utilized in high integrity surface installations such as FPSO, FSO Tandem offloading configurations offshore Brazil.

The special hoses are installed at the ends of the floating hose string, connected to the FPSO/FSO hang-off Emergency Release Coupling (ERC) and the Shuttle Tanker bow loading system Hose End Valve (HEV).

The additional buoyancy within the special FPSO end hose will support the ERC on the surface of the sea, if released in an emergency. The Shuttle Tanker end hose will support the HEV on the surface of the sea, during hose transfer and / or emergency release

For performance characteristics and specification, please refer to EMSTEC data sheet 'Double Carcass Hose Specification'.

DOUBLE CARCASS SUBMARINE HOSE

'22' SERIES

EMSTEC provide a range of high quality, high performance, oil suction and discharge hoses, extensively used at offshore moorings throughout the world. The EMSTEC **Double Carcass Submarine** hoses are utilized in high integrity sub-sea installations such as MBM, CALM, SALM configurations (i.e. Steep 'S', Lazy 'S', Chinese Lantern).

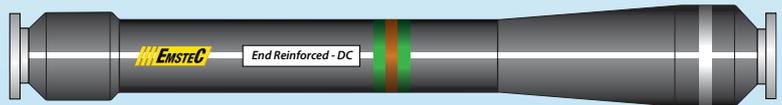
In addition to standard hose carcass (commonly termed 'primary' carcass), EMSTEC **Double Carcass Submarine** hoses incorporate an additional second carcass designed to contain any product escape from the standard carcass as a result of a slow leak or sudden failure. Effective, robust and reliable leak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

The EMSTEC 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".

All 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 H (hoses carry CE marking as required).

For performance characteristics and specification, please refer to EMSTEC data sheet 'Double Carcass Hose Specification'.

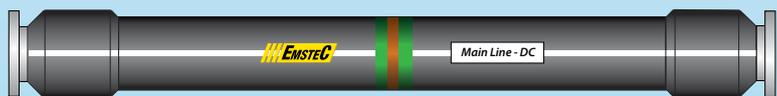
22210 SDC - End Reinforced without float collars (i.e. under Buoy)



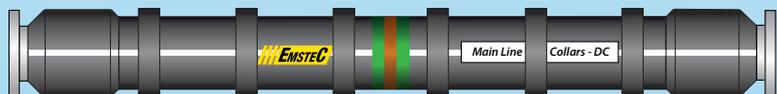
22310 SDCF - End reinforced with float collars (i.e. under Buoy) *



22220 SDC - Main Line without float collars



22320 SDCF - Main Line with float collars



22230 SDC - End Reinforced without float collars (i.e. off PLEM)



22330 SDCF - End reinforced with float collars (i.e. off PLEM) *



*Note: Number and distribution of float collars can be adjusted to suit client specific requirements.

DOUBLE CARCASS CATENARY HOSE

'22' SERIES

EMSTEC provide a range of high quality, high performance, oil suction and discharge hoses, extensively used at offshore moorings throughout the world. The EMSTEC **Double Carcass Catenary** hoses are utilized in high integrity floating offloading installations such as FPSO, FSO tandem offloading to DP Shuttle Tankers (i.e. Reel, Chute, Cantilever hang-off arrangements).

In addition to the standard hose carcass (commonly termed 'primary' carcass), EMSTEC **Double Carcass Catenary** hoses incorporate an additional 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.

The EMSTEC Double Carcass Catenary 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".

All 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 H (hoses carry CE marking as required).

For performance characteristics and specification, please refer to EMSTEC data sheet 'Double Carcass Hose Specification'.

22410 SCDC - End Reinforced (i.e. FPSO)



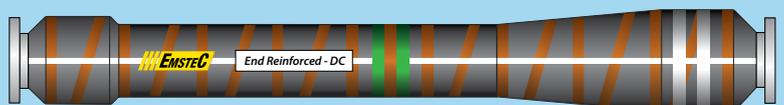
22420 SCDC - Main Line



22430 SCDC - Main Line – Controlled / Neutral Buoyancy (for special applications)



22440 SCDC - End Reinforced (i.e. Shuttle Tanker)



DOUBLE CARCASS HOSE SPECIFICATION

'22' SERIES

EMSTEC Double Carcass Submarine, Floating & Catenary 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".

PERFORMANCE CHARACTERISTICS & CONSTRUCTION

Nominal Bore (mm):	150 (6"), 200 (8"), 250 (10"), 300 (12"), 400 (16"), 500 (20"), 600 (24")
Standard Length:	9.1M (30'), 10.7M (35') & 12.2M (40') (non-standard less than 12.2M also available)
Hose Construction:	Liner Tube – NBR based Rubber, resistant to hydrocarbons with aromatic content up to 60% Primary Carcass – Elastomer reinforced with multi-layers of high tensile textile cords and embedded steel wire helix. Secondary Carcass – Elastomer reinforced with multi-layers of high tensile textile cords Floatation Material (Floating Hoses only) – Closed cell foam Outer Cover – Fibre reinforced smooth elastomer cover, resistant to ageing, abrasion, weathering, sunlight, tearing and oil and seawater penetration. (Polyurethane coating available on request).
Flanges:	ANSI B16.5 Class 150 or 300 Flat Face (FF), Hot Dip Galvanised in accordance with BS729 Part 1. (Raised Face (RF) flange face available on request).
Pressure Rating:	Primary Carcass - 15 BAR, 19 BAR, 21 BAR (higher pressure ratings on request) Secondary Carcass - 15 BAR, 19 BAR, 21 BAR.
Minimum Burst Pressure:	Primary Carcass - 75 BAR, 95 BAR, 105 BAR Secondary Carcass - 30 BAR, 38 BAR, 42 BAR
Flow Velocity:	Maximum of 21m/s
Fluid Product:	Crude Oil and Liquid Petroleum Products (other than liquefied petroleum gases and liquefied natural gases).
Temperature Range:	Fluid Temperature from -20°C to 82°C. Ambient Temperature from -29°C to 52°C.
Minimum Bend Radius:	Submarine Hoses - 4 x hose Nominal Bore Diameter. Floating Hose – 6 x hose Nominal Bore Diameter.
Electrical Continuity:	Electrically Continuous or Discontinuous as required.
Leak Detection:	Pressure compensated leak detection system for Floating, Submarine & Catenary applications.

For information regarding hose types and applications, please refer to relevant EMSTEC hose data sheets.

DESIGN APPROVAL & QUALITY ASSURANCE

All of the 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 H (hoses carry CE marking as required). Prototype Hose manufacture and testing witnessed and verified by Bureau Veritas (Certifying Authority) and GDC International (Industry Consultant).



ISO 9001 Design



ISO 9001 Manufacture



Prototype Approval (BV)



Prototype Approval (GDC)

ANCILLARY EQUIPMENT

ANCILLARIES

EMSTEC provide a range of high quality, high performance, oil suction and discharge hoses, extensively used at offshore moorings throughout the world. The EMSTEC **Single Carcass** and **Double Carcass** hose range is complemented by a range of Ancillary Equipment in addition to equipment to aid Transportation, Handling and Testing.

For performance characteristics and specification, please refer to EMSTEC equipment data sheets.

28510 - Flange Jointing

- 28511 - Studs and Nuts
- 28512 - Gaskets
- 28513 - Anodes
- 28514 - Flange Insulation Kits



28520 - Chain assemblies

- 28521 - Pick-up Chain
- 28522 - Snubbing Chain



28530 - Hose End Fittings

- 28531 - Butterfly Valve
- 28532 - Lifting Spool Piece
- 28533 - Camlock Coupling
- 28534 - Lightweight Blind Flange



28540 - Buoyancy Equipment

- 28541 - Pick-up Buoy
- 28542 - Floating Concentric Reducer
- 28543 - Floating 'Y' Piece
- 28544 - Hose Floats



28550 - Hose Marker Lights

- 28551 - Winker Light

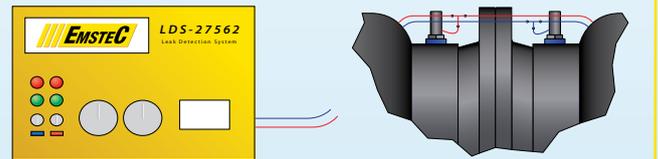


ANCILLARY EQUIPMENT (continuation)

ANCILLARIES

28560 - Continuous Leak Detection System

- 28561 - Single Line Leak Detection
- 28562 - Closed Circuit Leak Detection
- 28563 - Visual Indicator



28570 - Special Hose Connector / Couplings

- 28571 - Hose End Valve (i.e. Hose connection to BLS)
- 28572 - Emergency Release Coupling (ERC)
- 28573 - Marine Breakaway Coupling (MBC)



TRANSPORT, HANDLING AND TEST EQUIPMENT

ANCILLARIES

EMSTEC provide a range of high quality, high performance, oil suction and discharge hoses, extensively used at offshore moorings throughout the world. The EMSTEC **Single Carcass** and **Double Carcass** hose range is complemented by a range of Ancillary Equipment in addition to equipment to aid Transportation, Handling and Testing.

For performance characteristics and specification, please refer to EMSTEC equipment data sheets.

28600 - Hose Transport and Handling Equipment

28610 Lifting Beam

28620 Hose Transport / Storage Pallet



28700 - Hose Test Equipment

28710 Test Unit – Pressure Pump

28720 Test Unit – Vacuum Pump

28730 Test Unit – Pressure & Vacuum Pump

28740 Test Unit – Filling, Pressure and Vacuum Pumps





EMSTEC Loading & Discharge 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".



Designed and manufactured under quality system in accordance with ISO 9001, and in compliance with Pressure Equipment Directive (PED) 97/23/EC module H (hoses carry CE marking as required).



Prototype Hose manufacture and testing witnessed and verified by Bureau Veritas (Certifying Authority) and GDC International Ltd. (Industry Consultant).