LOADING & DISCHARGE HOSES FOR OFFSHORE MOORINGS

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 & Catenary 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 and 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.
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 - Tranport, Handling and Test Equipment

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

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’.

<table>
<thead>
<tr>
<th>21110 FSC - End Reinforced Half Floating (ie. First off Buoy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>21120 FSC - Controlled Buoyancy</td>
</tr>
<tr>
<td>21130 FSC - Main Line Floating</td>
</tr>
<tr>
<td>21140 FSC - Main Line Half Floating</td>
</tr>
<tr>
<td>21150 FSC - Tapered Floating</td>
</tr>
<tr>
<td>21160 FSC - Tail Floating</td>
</tr>
</tbody>
</table>
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.*
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’.

<table>
<thead>
<tr>
<th>21410 SCSC - End Reinforced (i.e. FPSO)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Image of 21410 SCSC - End Reinforced" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>21420 SCSC - Main Line</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Image of 21420 SCSC - Main Line" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>21430 SCSC - Main Line – Controlled / Neutral Buoyancy (for special applications)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Image of 21430 SCSC - Main Line – Controlled / Neutral Buoyancy" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>21440 SCSC - End Reinforced (i.e. Shuttle Tanker)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Image of 21440 SCSC - End Reinforced" /></td>
</tr>
</tbody>
</table>
SINGLE CARCASS HOSE SPECIFICATION


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).
DOUBLE CARCASS FLOATING HOSE

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’.

**‘22’ SERIES**

EMSTEC® Double Carcass Floating Hose DCF-22-1-1.0

**22110 FDC - End Reinforced Half Floating** (i.e. 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)

---

**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 Double 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’.

<table>
<thead>
<tr>
<th>22210 SDC - End Reinforced without float collars (i.e. under Buoy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22310 SDCF - End reinforced with float collars (i.e. under Buoy) *</td>
</tr>
<tr>
<td>22220 SDC - Main Line without float collars</td>
</tr>
<tr>
<td>22320 SDCF - Main Line with float collars</td>
</tr>
<tr>
<td>22230 SDC - End Reinforced without float collars (i.e. off PLEM)</td>
</tr>
<tr>
<td>22330 SDCF - End reinforced with float collars (i.e. off PLEM) *</td>
</tr>
</tbody>
</table>

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

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


**PERFORMANCE CHARACTERISTICS & CONSTRUCTION**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal Bore (mm):</strong></td>
<td>150 (6”), 200 (8”), 250 (10”), 300 (12”), 400 (16”), 500 (20”), 600 (24”)</td>
</tr>
<tr>
<td><strong>Standard Length:</strong></td>
<td>9.1M (30’), 10.7M (35’) &amp; 12.2M (40’) (non-standard less than 12.2M also available)</td>
</tr>
<tr>
<td><strong>Hose Construction:</strong></td>
<td>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).</td>
</tr>
<tr>
<td><strong>Flanges:</strong></td>
<td>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).</td>
</tr>
<tr>
<td><strong>Pressure Rating:</strong></td>
<td>Primary Carcass - 15 BAR, 19 BAR, 21 BAR (higher pressure ratings on request) Secondary Carcass - 15 BAR, 19 BAR, 21 BAR.</td>
</tr>
<tr>
<td><strong>Minimum Burst Pressure:</strong></td>
<td>Primary Carcass - 75 BAR, 95 BAR, 105 BAR Secondary Carcass - 30 BAR, 38 BAR, 42 BAR</td>
</tr>
<tr>
<td><strong>Flow Velocity:</strong></td>
<td>Maximum of 21m/s</td>
</tr>
<tr>
<td><strong>Fluid Product:</strong></td>
<td>Crude Oil and Liquid Petroleum Products (other than liquefied petroleum gases and liquefied natural gases).</td>
</tr>
<tr>
<td><strong>Temperature Range:</strong></td>
<td>Fluid Temperature from -20°C to 82°C. Ambient Temperature from -29°C to 52°C.</td>
</tr>
<tr>
<td><strong>Minimum Bend Radius:</strong></td>
<td>Submarine Hoses - 4 x hose Nominal Bore Diameter. Floating Hose – 6 x hose Nominal Bore Diameter.</td>
</tr>
<tr>
<td><strong>Electrical Continuity:</strong></td>
<td>Electrically Continuous or Discontinuous as required.</td>
</tr>
<tr>
<td><strong>Leak Detection:</strong></td>
<td>Pressure compensated leak detection system for Floating, Submarine &amp; Catenary applications.</td>
</tr>
</tbody>
</table>

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).
ANCILLARY EQUIPMENT

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)

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

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).