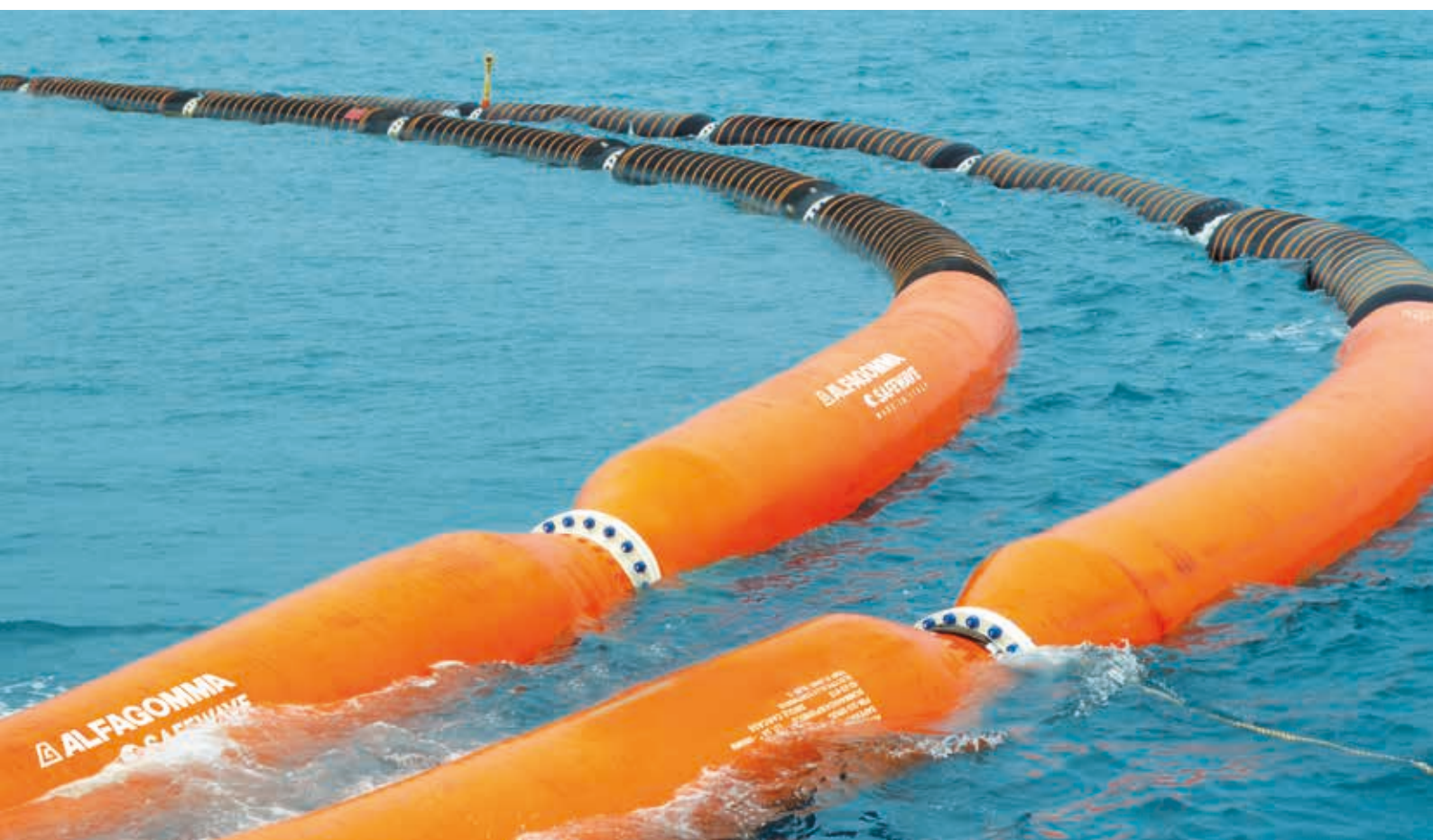




ALFAGOMMA

OIL & MARINE



// ALFAGOMMA

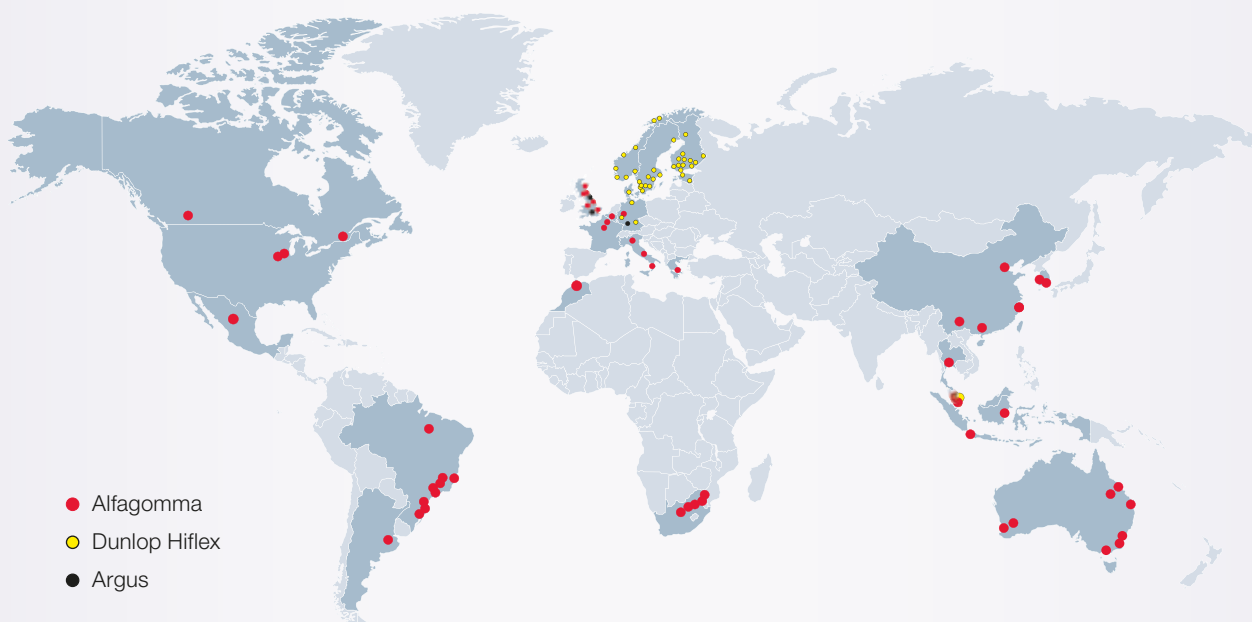
Alfagomma is a leading independent global manufacturer of **highly engineered fluid handling systems**, servicing multiple applications in the industrial market across 5 continents.

OEMs, distributors and major end users consider Alfagomma as a premium quality supplier for its products and service value.

Operational excellence, long-term performance, global presence and local logistic support are some of the company's strengths partners and customers can rely on.

Alfagomma is recognized for its **constant attention towards product innovation**, consistent **high quality exceeding international standards** and the commitment of its personnel to provide partners and customers with the best possible service.

ALFAGOMMA GROUP



ALFAGOMMA // DUNLOP HIFLEX // HIFLEX // ARGUS

// SERVICING OUR CUSTOMERS SINCE 1956

The company's mission is to guarantee **high performance products** meeting **customers' requirements** in order to make their **production processes easier, safer and more efficient**.

Alfagomma works as a **single-source partner** that develops and **manufactures integrated fluid handling systems for any application**.

Engineering expertise, technical support, prompt service and **in-house production** ensure maximum quality and safety.

ALFAGOMMA'S PRODUCT RANGE



Hydraulic Hose & Fittings



Industrial Hose & Fittings



Manipulated Tubes



Dogleg & Expansion Joints



Offshore products

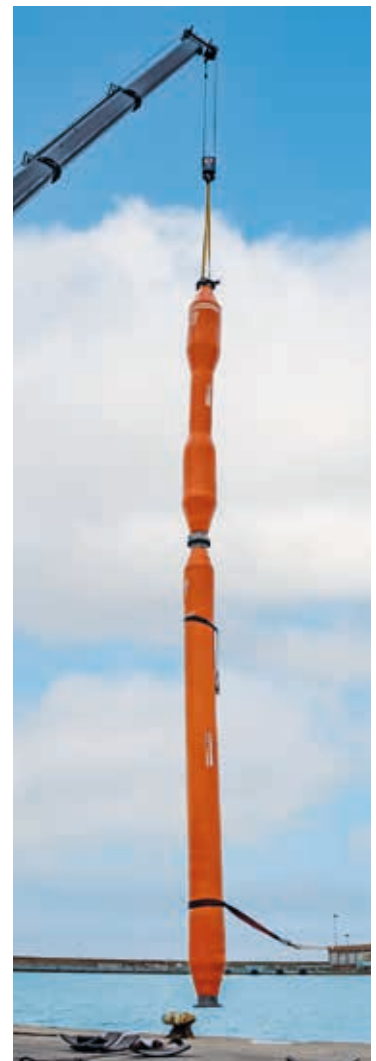


Quick Release & Multi-Couplings

// ALFAGOMMA OIL & MARINE

Driven by **reliability, innovation** and **commitment to quality**, the **Alfagomma Oil & Marine Division** is specialized in the design and manufacture of marine hoses for **offloading** and **loading offshore systems**.

The **extensive range of textile and metallic reinforced hoses** meets the needs of any offshore system and complies with the **GMPHOM 2009**, and customers' specifications.



// MANUFACTURING AND R&D HUB

Alfagomma Oil & Marine plant, ISO 9001, 14001, 45001, and API Spec Q1 certified, is located in Ortona, Italy.

The **plant** is about **60 kilometers** away from the Alfagomma Group's **Research and Development Centre**. The R&D hub is directly involved in the **design** and **choice of materials** for Alfagomma's marine hoses: **a team of engineers** experienced in FEA, CFD and Orcaflex defines the hose characteristics and string configuration.



// EXCELLENCE IN QUALITY

Alfagomma Oil & Marine strives to deliver a superior product:

- **Consistent quality** is critical to success, a **tangible commitment** that runs through every aspect of the organization.
- The strictest control procedures ensure **compliance** to the industry's standards and **international regulations**.



// ALFAGOMMA SAFEWAVE

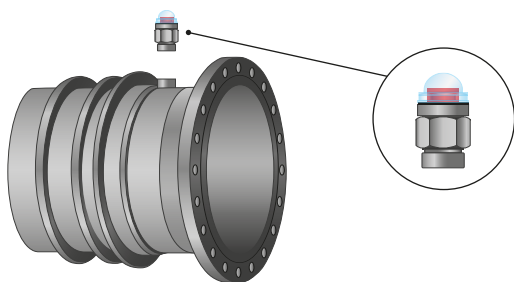
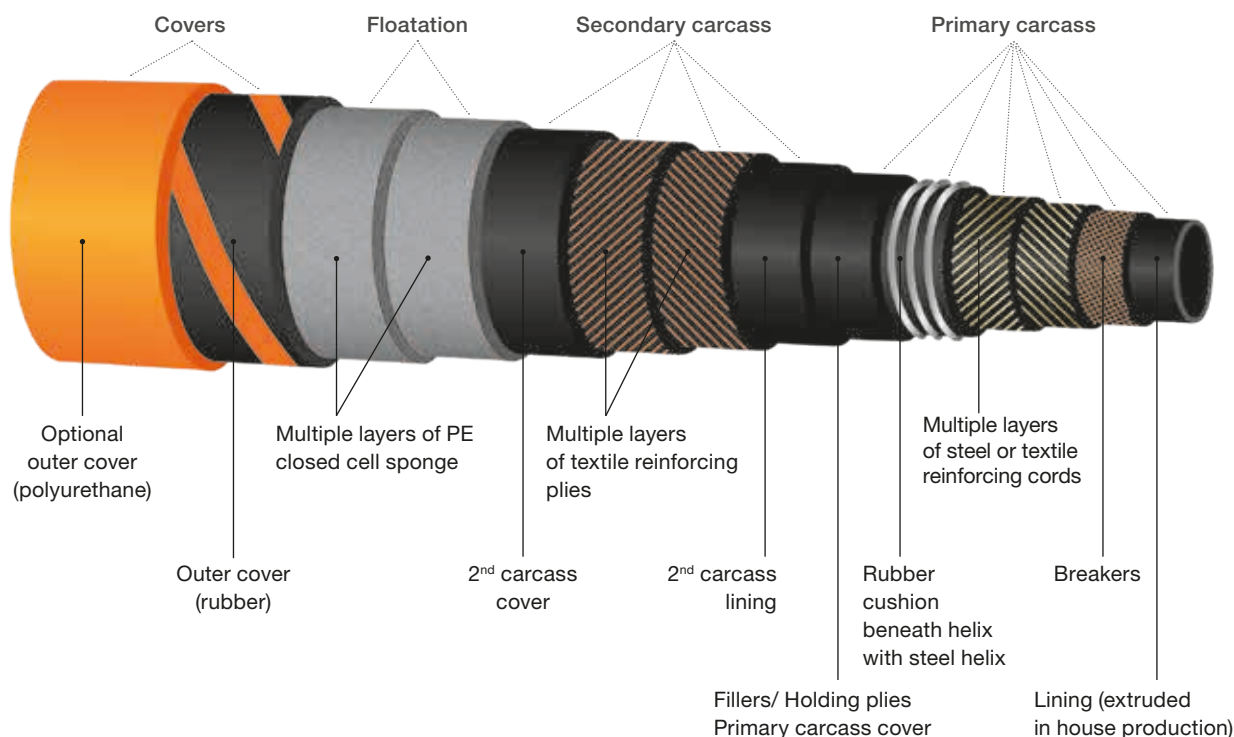
Safewave marine hoses are designed for safe operations and long service life:

- The extruded lining grants **integrity** and **optimal rubber adhesion** to the end-fittings.
- Reinforcing materials have been selected and tested to **guarantee durability** and **flexibility**.
- The synthetic rubber cover **guarantees resistance to UV-rays, abrasion and tearing**.

Alfagomma Safewave product range is compliant to, and exceeds, the requirements of **GMPHOM 2009**, **BS EN 1765**, **BS EN 1762**, **API 17K**, and meet the most stringent customers' specifications.

ALFAGOMMA SAFEWAVE

HOSE STRUCTURE



LEAK DETECTION SYSTEM

On double carcass hose types, the alert sensor installed on the fittings detects the oil that flows inside the secondary carcass in case of a leakage or burst in the first carcass. Mechanical, optical or electronic leak sensing technologies can be provided.

// CALM/ SPM - FLOATING HOSES



CALM/ SPM CARGO TRANSFER SYSTEMS

CALM/ SPM systems are typically used in water depths less than 80 meter, but more sophisticated designs are in service in deeper waters.

The buoy is typically spread moored to the seabed using a series of mooring chains. CALM/ SPM buoys include a 360° rotating turntable thereby allowing the moored vessel to freely weathervane around the buoy

whilst moored to it. **A series of floating hoses are used to connect the tanker manifolds to the buoy manifolds** and a series of submarine hoses used to connect the buoy manifolds to the subsea PLEM in various configurations, Chinese Lantern, Lazy S, Steep S, etc.

Design and dimensions shown may be changed without prior notice



Single and double carcass with metallic or textile reinforcement.

Hose ID: from 6" to 24"

Rated working pressure: 15, 19, and 21 bar.

GMPHOM
2009

// FIRST OFF BUOY FOB



Hose design with one end reinforced, for use at locations where the hose strings are attached to rigid manifolds. The function of the end reinforcing is to move the bending moment towards the more flexible mid-section of the hose.

// MAINLINE



Hose design whose construction is uniformly the same along the hose length. Mainline hoses form the majority of hoses within a typical hose string.

// TAPERED/ REDUCER



Ridux hose design with a tapered structure to facilitate attachment of MBC's and/ or Tail hoses. Typical reductions being 24/20", 20/16", 16/12".

// TAIL



Hose design whose construction is optimized in terms of flexibility, strength and weight. Tail hoses are used to connect the mainline hoses or MBC to the Tanker Rail hose.

// TANKER RAIL



Hose design with barbell shaped buoyancy jackets providing increased flexibility in the mid section. Tanker rail hoses are used to connect the hose string to the tanker manifold.

// CALM/ SPM - SUBSEA HOSES



CALM/ SPM CARGO TRANSFER SYSTEMS

CALM/ SPM systems are typically used in water depths less than 80 meter, but more sophisticated designs are in service in deeper waters.

The buoy is typically spread moored to the seabed using a series of mooring chains. CALM/ SPM buoys include a 360° rotating turntable thereby allowing the moored vessel to freely weathervane around the

buoy whilst moored to it. A series of floating hoses are used to connect the tanker manifolds to the buoy manifolds and a series of submarine hoses used to connect the buoy manifolds to the subsea PLEM in various configurations, Chinese Lantern, Lazy S, Steep S, etc.

Design and dimensions shown may be changed without prior notice



Single and double carcass with metallic or textile reinforcement.

Hose ID: from 6" to 24"

Rated working pressure: 15, 19, and 21 bar.

GMPHOM
2009

// FIRST OFF BUOY FOB



Hose design with one end reinforced, for use at locations where the hose strings are attached to rigid manifolds. The function of the end reinforcing is to move the bending moment towards the more flexible mid-section of the hose.

// MAINLINE WITH 7 COLLARS



Hose design whose construction is uniformly the same along the hose length. Mainline hoses form the majority of hoses within a typical hose string.

// FIRST OFF PLEM FOP



Hose design with one end reinforced, for use at locations where the hose strings are attached to rigid manifolds. The function of the end reinforcing is to move the bending moment towards the more flexible mid-section of the hose.

// FPSO - FLOATING HOSE TANDEM LOADING



TANDEM CARGO OFFLOADING SYSTEMS

Tandem mooring system are commonly used to transfer cargo from storage vessels like FSO's, FSU's and FPSO's etc. to various types of shuttle tankers. The cargo offloading hose strings are permanently attached to the various storage vessels, either via fixed rigid manifolds or hose reels, from which they

are deployed to the shuttle tankers midship or bow manifolds. The specific type of loading system will dictate what type of offloading hoses can be used, which could be either floating, submarine, or catenary types, all of which are available in single or double carcass designs.

Design and dimensions shown may be changed without prior notice



Single and double carcass with metallic or textile reinforcement.

Hose ID: from 6" to 24"

Rated working pressure: 15, 19, and 21 bar.

GMPHOM
2009

// FIRST OFF FS0/ FPS0



Hose design fully reinforced, for use at locations where the hose strings are attached to rigid manifolds and subjected to high tensile loads. The function of the end reinforcing is to move the bending moment towards the more flexible mid-section of the hose.

// MAINLINE



Hose design whose construction is uniformly the same along the hose length. Mainline hoses form the majority of hoses within a typical hose string.

// TAPERED/ REDUCER



Ridux hose design with a tapered structure to facilitate connection of MBC's and/ or Tail hoses. Typical reductions being 24/20", 20/16", 16/12".

// TAIL



Hose design whose construction is optimized in terms of flexibility, strenght and weight. Tail hose are used to connect the mainline hoses or MBC to the Tanker Rail hose.

// TANKER RAIL



Hose design with barbell shaped buoyancy jackets providing increased flexibility in the mid section. Tanker Rail hoses are used to connect the hose string to the tanker manifold.

// CBM/ MBM - SUBMARINE HOSES



CBM/ MBM CARGO TRANSFER SYSTEMS

A Conventional Buoy Mooring system (CBM or MBM) is typically used in relatively shallow water close to shore, whereby the tankers are mooring between a series of mooring buoys that are permanently fixed to the seabed. The number of mooring buoys within a CBM/ MBM system will depend on several factors but would typically consist of between 4-6 buoys and mooring lines. The cargo loading / offloading hose

string consists of multiple sections of negatively buoyant submarine hose which are connected to the subsea pipelines PLEM and left resting on the seabed between operations.

Once a tanker has berthed on the mooring, the tanker end of the hose string is lifted from the seabed and connected to the tanker manifold, at which point loading operations can commence.

Design and dimensions shown may be changed without prior notice



Single and double carcass with metallic or textile reinforcement.

Hose ID: from 6" to 24"

Rated working pressure: 15, 19, and 21 bar.

GMPHOM
2009

// FIRST OFF PLEM



Hose design with one end reinforced, for use at locations where the hose strings are attached to rigid manifolds. The function of the end reinforcing is to move the bending moment towards the more flexible mid-section of the hose.

// MAINLINE



Hose design whose construction is uniformly the same along the hose length. Mainline hoses form the majority of hoses within a typical hose string.

// REDUCER



Ridux hose design with a tapered structure to facilitate attachment of MBC's and/ or Tail hoses. Typical reductions being 24/20", 20/16", 16/12".

// TAIL



Hose design whose construction is optimized in terms of flexibility, strength and weight. Tail hose are used to connect the mainline hoses or MBC to the Tanker Rail hose.

// TANKER RAIL



Hose design used to connect the hose string to the tanker manifold.

// SHIP TO SHIP

**SHIP TO SHIP (STS) CARGO TRANSFER SYSTEM**

A Ship To Ship (STS) transfer is a transfer between two vessels moored alongside each other, which is typically carried out with both vessels stationary. STS transfers can also be carried out with both vessels underway, especially in the case of military

naval vessels. STS transfers are also used for cargo lightering purposes, when a laden tanker is required to reduce its draft by offloading cargo when entering into and navigating shallow waters.

Design and dimensions shown may be changed without prior notice

ALFAGOMMA **SAFEBWAVE**

Single carcass with metallic or textile reinforcement.

Hose ID: from 6" to 12"

Rated working pressure: 15 bar.

Standard
BS EN 1765
Type 15/L

// STS HOSE



Hose design for dock service operations with increased flexibility and lower weight, suitable for discharge applications only.

// SPECIAL PRODUCTS

Alfagomma Oil & Marine provides a wide range of technical solutions:

- **NBR lining** for low temperature applications (up to -50 °C).
- **HNBR lining** for transfer of crude oil with high levels of Hydrogen Sulphide (H₂S).
- **FKM lining** to transfer fluids with up to 100% of aromatic content.
- **Special metallic reinforced** designs for extra high tensile hose loads (> 250 ton).
- **Polyurethane cover** with outstanding abrasion, tearing and weathering resistance.



Low temperature test chamber (-50 °C), Castelnuovo Vomano, Teramo (Italy).



Rubber compound development in Sant'Atto, Teramo (Italy).



Mechanical & Physical Lab in Sant'Atto, Teramo (Italy).



Chemical Lab in Sant'Atto, Teramo (Italy).

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