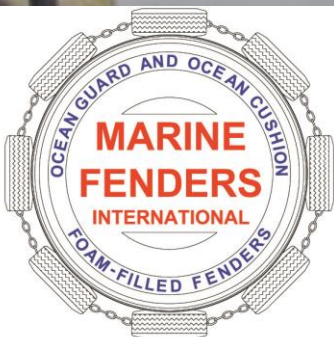


OCEAN GUARD™ SUBMARINE FENDER AND CAMEL SYSTEMS



Product Brochure



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Ocean Guard™ Hydropneumatic Fenders



Ocean Guard™ Hydropneumatic Fenders are for vessels requiring sub-surface fender contact such as submarines. For the fender to stand vertically, it is partially filled with water, pressurized with air, and finally a counterweight of concrete or steel is added.

Its design ensures that the submerged part of the hull is protected properly by the fender at any time.



Performance Features

- Sub-surface vessel contact area
- Low hull pressures
 - Prevents damage of submarine acoustic tiles.
- Adjustable draft
- Mobile

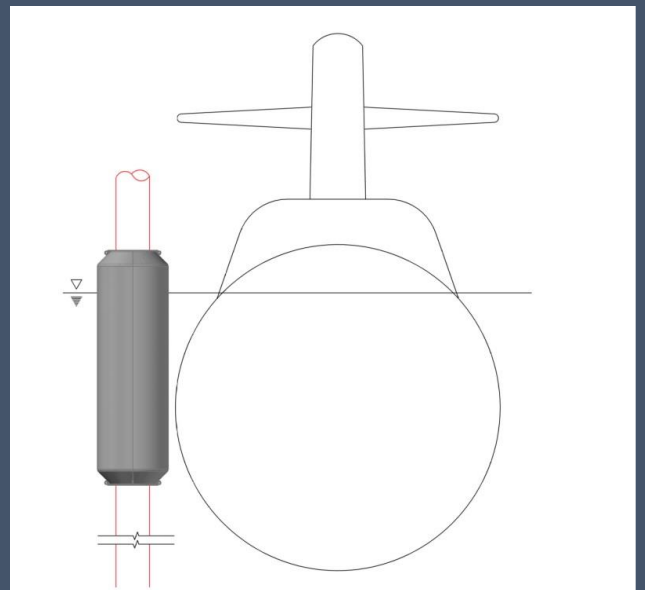
Applications

- Submarine docks
- Submarine to vessel fendering
- Ferry applications
- Oil rigs (semi-submersibles)



Ocean Guard™ Submarine Donut Fenders

Ocean Guard™ Submarine Donut Fender system are for vessels requiring sub-surface fender contact such as submarines. The system is a fixed position system. In addition to providing sub-surface fendering it is designed to self adjust with tidal fluctuations thus providing perfect all tide mooring. Additionally, since the fender can freely turn on the stationary piling, shear forces eliminated. Finally, in comparison to Hydropneumatic fender whose internal water will freeze and damage the fender in freezing temperatures, the Ocean Guard™ Submarine Donut Fender is foam filled and will not damage due to freezing temperatures.



Performance Features

- Sub-surface vessel contact area
- Freely rotating
- Low Shear Forces
- Self adjusting with tidal changes
- Foam filled, not internal water ballast.
-Will not internally freeze and damage
- Self adjusting with tidal changes providing all tide mooring.
- Independent mooring crown can be added.

Ocean Guard™ High-Performance Cylindrical Fender

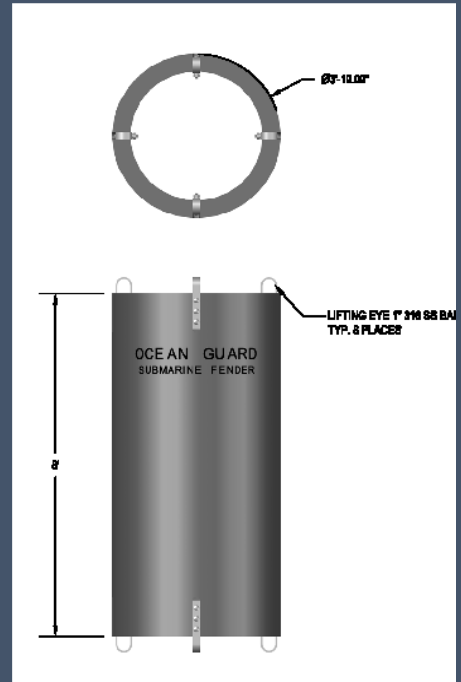
Ocean Guard™ High-Performance Cylindrical Fender system are for vessels requiring sub-surface fender contact such as submarines. The system is designed for quick deployment for operations requiring fendering between a submarine and surface vessel. However, it is also used for submarine-to-submarine fendering as well.

The fender manufactured from tough resilient marine grade urethane elastomer and will stand up to the world's harshest environments. Its compact design allows for easy storage. Finally, in comparison to Hydropneumatic fender whose internal water will freeze and damage the fender in freezing temperatures, the Ocean Guard™ High-Performance Cylindrical Fender is an elastomeric composite and will not damage due to freezing temperatures.



Construction Features

- Urethane Elastomer composite construction
- Eight 316 stainless steel lifting eyes
- UV and Ozone resistant
- Non marking



Performance Features

- Sub-surface vessel contact area
- Quick deployment
- Low Reaction Forces
- Adjustable
- Will not freeze
- Maintenance free design
- Non-marking urethane.

Ocean Guard™ Foam Filled Submarine Fender

Ocean Guard™ Foam Filled Submarine Fenders are designed to be used for submarine and other vessels which require sub-surface contact. They can also be used for conventional ship fendering. However, they are primarily used for submarine to shore and ship to submarine operations. A counterweight of either concrete or steel is used to maintain the desired fender waterline below the surface of the water.

The foam filled construction of this fender allow it to preform in all environmental conditions. In comparison, Hydropneumatic fenders are internal internally ballasted with water which will freeze in extreme temperatures and damage the fender.

The outer skin of the Ocean Guard™ Foam Filled Submarine Fenders Fender is an elastomeric composite and will not damage due to freezing temperatures.

The fender manufactured from tough resilient marine grade urethane elastomer and will stand up to the world's harshest environments.



Performance Features

- Sub-surface vessel contact area
- Quick deployment
- Low Reaction Forces
- Adjustable
- Will not freeze
- Maintenance free design
- Non-marking urethane.

Construction Features

- Thermal laminated Foam filled internal construction
- Nylon filament reinforced Urethane Elastomer skin construction
- Integral swivel end fittings.
- UV and Ozone resistant
- Non marking



Ocean Guard™ Universal Submarine Separator

Ocean Guard™ Universal Submarine Separator are designed to be used for submarine and other vessels which require sub-surface contact. However, they are primarily used for submarine to submarine and ship to submarine operations. An Ocean Guard composite floats is designed to maintain the separator at the appropriate fendering depth.

Ocean Guard™ Universal Submarine Separator buoy is a resilient composite design with virtually no maintenance.

There are 2 options for fendering section of this system, the triangular fendering system and one with a cylindrical fendering system

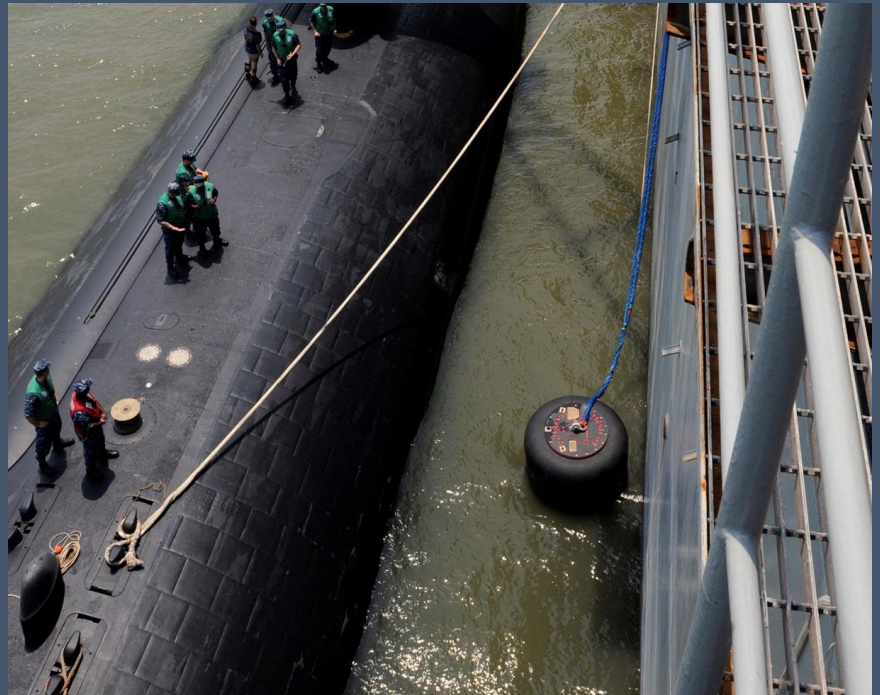


Construction Features

- Buoyancy float consists of
 - Closed cell foam cores
 - Nylon filament reinforced Urethane
 - Elastomer skin construction
- Heavy duty fendering system

Performance Features

- Sub-surface vessel contact area
- Quick deployment
- Adjustable
- Low Maintenance design



Ocean Guard™ Deep Draft Submarine Camel

Ocean Guard™ Deep Draft Submarine Camel are designed to be used for submarine and other vessels which require sub-surface contact. Depending on the application, there are a couple of versions offered.

The most common consists of a lighter weight this Deep Draft Submarine camel features seal welded tubular steel construction (bottom pipes are open), vertically positioned submarine side fenders, a wide body design and a narrow berthing footprint.

UHMW-PE panels are built into the back side of the camel for contact to the pier..



Ocean Guard™ Deep Draft Submarine Fender

Ocean Guard™ Deep Draft Submarine Camel are designed to be used for submarine and other vessels which require sub-surface contact. Depending on the application, there are a couple of versions offered.

In addition to the lighter weight Ocean Guard™ Deep Draft Submarine Camel, larger and heavier duty camels are also available and feature many of the same features such as

- Seal welded tubular steel construction
- Each sealed member is 100% filled with closed cell urethane foam
- Vertically positioned submarine side fenders,
- A wide body design and a narrow berthing footprint.
- Large composite grating working platform
- Large Arch fendering submarine side
- Smaller pier side arch fenders..





QUALITY
VALUE
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