

# SUNHELM

## Foam Filled Fender

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Polyurethane Foam Filled Fenders is a floating type compression fender that used lightweight and highly elastic



[www.sunhelmmarine.com](http://www.sunhelmmarine.com)



# COMPANY PROFILE

**2006** Years

Company Established

**100+**

Production Sourcing

**15** Years

Supply Chain Experience

**10** Years

OEM Experience

## About SunHelm

SunHelm Marine Co., Ltd is a Chinese manufacturer specializing in maritime products. SunHelm Marine currently has several large-scale modern factories and R&D centers. SunHelm Marine mainly produces pneumatic fenders, marine rubber fenders, foam fenders, hydro-pneumatic fenders, marine airbags, marine salvage airbag, caisson moving airbags, dredging hoses, mooring bollards, air lifting bags and other products.

Based on ship industry chain, SunHelm Marine has expanded its market layout, main business involves ship mooring and berthing, marine engineering, dredging projects, port construction and other fields. SunHelm provides customers with systematic, comprehensive and creative services.

SunHelm Marine focuses on product research and development, we have a technical team of more than 30 people with high professionalism. SunHelm Marine constantly explores marine technology and innovates technical solutions.

SunHelm Marine has a professional technical marketing team and more than 10 sales engineers, with overseas on-site construction experience, to provide customers with "one-stop" services.

SunHelm Marine has a strict quality management system to ensure the excellent quality of its products. SunHelm Marine has certified by five major international classification societies and all products can be qualified with CCS, DNV-GL, BV, LR, SGS, ABS, etc. inspections.

Relying on our own advantages, we are committed to building a comprehensive and high-quality diversified product supply chain. SunHelm Marine products have been exported to more than 70 countries and regions such as Europe, United States, Middle East and Southeast Asia.



As a well-known commercial enterprise in China, SunHelm Marine adheres to the development idea of "integration of products and services, integration of trade and industry, and integration of international and domestic". SunHelm Marine brand is well-known around the world and deeply trusted by customers. We are willing to work together with global partners for a win-win relationship.

## Company Culture

### SUNHELM VISION

Go deep into marine science and technology and contribute SunHelm strength to China's marine industry.

### SUNHELM MISSION

Knowledge first, technology leading, providing customers with "systematic", "comprehensive" and "creative" services.

### SUNHELM VALUES

Technological innovation, team sharing, active work, timely and efficient.



Design



Production



Performance

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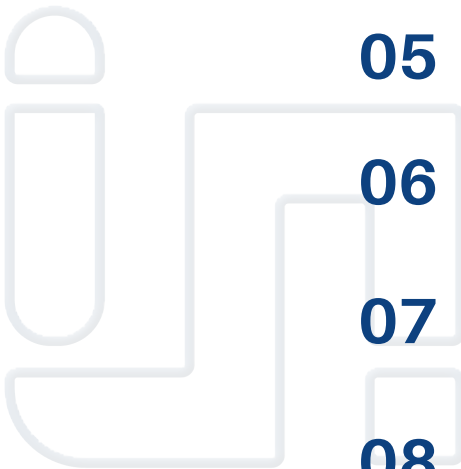
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# FOAM FENDER TYPES

## Floating Foam Fenders

During the ship-to-ship operations, Collision Blocker could be deployed or suspended against a quay wall with deployed or suspended. Whether in the site with small or large tidal, Collision Blocker could adapt to the different working environments as soon. SunHelm's fenders are gentle on soft-skinned ships because the hull pressures are pretty low. It makes the cover skin become powerful and non-marking even against with white-hulled yachts and cruise liners.



## Chain&Tyre Net Type Foam Fenders

EVA foam fender uses light elastic foam as a bumping media. EVA foam fender is environment friendly and has high elastic properties allowing for energy absorption upon contact. The outside of foam fender is coated with polyurea which has anti seeping and anti-aging properties, improves the fenders life expectancy and economic value.



## Donut Fender

The Donut Fenders are made of polyethylene foam with a polyurethane elastomer shell. Special donut fenders have been specifically designed to protect the berthing pipes of the vessels. The internal structure is heavy duty, but it allows the rotation on the support pipe. The polyethylene foam guarantees unsinkability even in case of damage and ensures high energy absorption with low reaction force, which is essential to eliminate the risk of damage to the hulls.



## Custom Made Floating Foam Fenders

SunHelm EVA foam fender parameters are available from 500 mm to 4,500 mm in diameter and 800 mm to 10,600 mm in length, and can be fitted with two or four point mounting systems, depending on the use and application. The standard colors of SunHelm EVA foam fender are black and orange. If customers have any special requirements, we are willing to provide personalized color choices.



# COLLISION BLOCKER FOAM FENDER

## Collision Blocker Foam Fender Introduction

During the ship-to-ship operations, Collision Blocker could against a quay wall with deployed or suspended. Whether in the site with small or large tidal, Collision Blocker could adapt to the different working environments as soon. Sunhelm's fenders are gentle on soft-skinned ships because the hull pressures are pretty low. It makes the cover skin become powerful and non-marking even against with white-hulled yachts and cruise liners. The polyurethane elastomer is highly resistant to the effects of ozone and ultra violet light so the maintenance will be easy and don't need to do frequently. Sunhelm could guarantee that our fenders will never sink or deflate.



## Feature & Benefit

- Fully compliant with US Navy specifications.
- Low hull pressure and non-marking Polyurethane skin.
- Low reaction and high energy options.
- Outer polyurea and skeleton layer are elastic.
- Virtually indestructible
- Excellent corrosion resistance on acid&alkali.
- Non-marking even against white hulls.
- Strong UV resistance.
- Unsinkable design.
- Excellent corrosion resistance on abrasion & stab.
- Design structure is stable and extremely strong.
- High breaking strength & elongation.
- Large energy absorption, low reaction force.
- Superior physical properties.
- No performance loss and unsinkable even if damaged.
- Product environmental protection, no pollution.
- Smaller skin damages can easily be repaired on site.
- Multi outer colors are fender dimension available.
- High-quality polyurea coating, thickness up to 2mm-20mm.

## Application

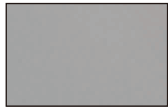
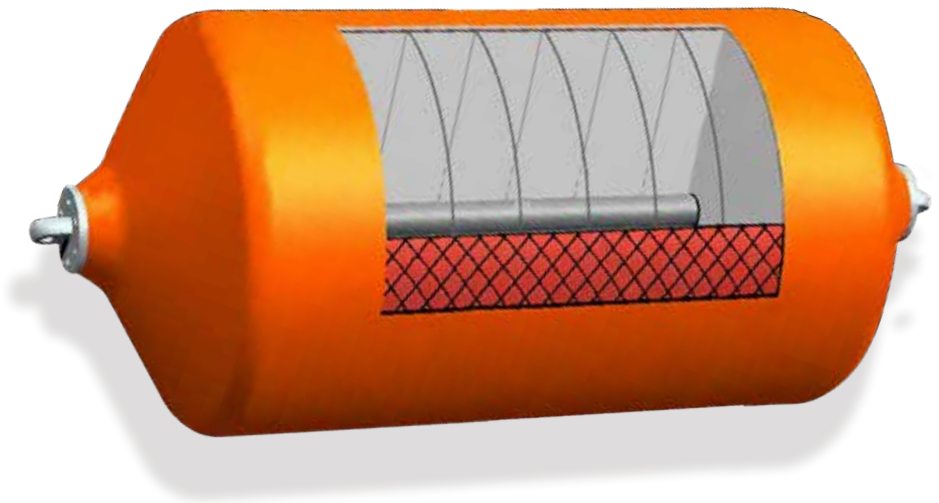
- Cruise ships
- Container vessels
- Bulk cargo
- Ro- Ro and ferries
- Oil and gas tankers
- General cargo
- Navy berths
- Ship-to-ship transfers

Feature & Benefit  
Application





## Unique Structure



### Fully closed cell foam core

As core functional part of foam fender choose supreme PE material, provide fender advanced energy absorption and low reaction force, making the Foam Fender own superior performance in safety, durability and function.



### Laminated foam core (Non-Winding)

Fender adopt foam lamination production technology. This structure can exert its maximum mechanical performance and ensure the superiority of energy absorption and reaction force.



### Reinforced nylon tire cord skeleton layer

Multi-layer cords (Premium Quality) are winding during the polyurethane spraying process. This advanced skeleton process extremely durable to all types of weather, forces, and marine conditions.



### Black Technology Coating

Our exclusive research and development of Black Technology Materials (Non-marking Polyurethane) sprayed on the outside of foam core, which like wearing a strong and elastic armor to protect foam core permanently.



### Heavy Duty Central Axis

Foam Fender equipped with the heavy-duty central axis as standard which plays the role of supporting and installing foam fenders.



### High Strength End Flange

End flange is the important safety connection point which is made of superior-quality steel to ensure the safety and long-term application of foam fender hanging



### 360° Swivel End Fittings

The fender installation chain and fender flange are directly connected by 360° swivel ring and shackle, which equipped with strengthening accessories and made of advanced tensile strength steel.



# Specification

Fender Size D x L [mm]	LOW CAPACITY			STANDARD CAPACITY			HIGH CAPACITY		
	Energy Absorption (kJ/m)	Reaction Force [kN]	Pressure [kN/ m <sup>2</sup> ]	Energy Absorption (kJ/m)	Reaction Force [kN]	Pressure [kN/ m <sup>2</sup> ]	Energy Absorption (kJ/m)	Reaction Force [kN]	Pressure [kN/ m <sup>2</sup> ]
500*1,000	6	38	104	9	64	172	11	78	224
700*1,500	17	82	104	28	136	172	34	166	224
1,000*1,500	30	105	104	49	174	172	60	212	224
1,000*2,000	45	154	104	74	255	172	90	311	224
1,200*2,000	60	175	104	99.5	289	172	121	353	224
1,500*3,000	151	347	104	249	574	172	304	701	224
1,700*3,000	185	379	104	306	627	172	374	765	224
2,000*3,500	298	519	104	492	858	172	601	1048	224
2,500*4,000	513	719	104	848	1189	172	1035	1451	224
2,500*5,500	788	1086	104	1304	1796	172	1592	2194	224
3,000*4,900	912	1064	104	1509	1760	172	1842	2149	224
3,300*4,500	929	1000	104	1537	1654	172	1877	2019	224
3,300*6,500	1570	1647	104	2596	2724	172	3170	3326	224

INTERMEDIATE SIZES AND DIFFERENT FOAM CAPACITIES AVAILABLE UPON REQUEST ABOVE MENTIONED SIZES ARE INDICATIVE AND MAY CHANGE DURING FINAL DESIGN PROCESS

## Installation Diagram

Foam Fender could be installed with a two or four point mounting system, depending on the application.



Two Point Mounting System



Four Point Mounting System

# SPARTAN SHIELD FOAM FENDER

## Spartan Shield Foam Fender Introduction

SunHelm Spartan Shield EVA foam fender uses light elastic foam as a bumping media. EVA foam fender is environment friendly and has high elastic properties allowing for energy absorption upon contact. The outside of foam fender is coated with polyurea which has anti seeping and anti-aging properties, improves the fenders life expectancy and economic value. Foam filled fender is soft, flexible and is highly resistant to cracking even under cold temperature.

SunHelm Spartan Shield foam fenders are available in diameters from 500 mm to 4,500 mm and lengths from 800 mm to 10,600 mm, different foam hardness grades as well as special shapes and sizes. The fenders could be installed with a two or four point mounting system, depending on the application.



## Feature & Benefit

- Strong CTN System, fully protect the fender body.
- Design structure is stable and extremely strong.
- Large energy absorption, low reaction force.
- No performance loss and unsinkable even if damaged.
- Smaller skin damages can easily be repaired on site.
- Low hull pressure and non-marking Polyurethane skin.
- Outer polyurea and skeleton layer are elastic.
- High-quality polyurea coating, thickness up to 2mm-20mm.
- Excellent corrosion resistance on acid&alkali.
- Strong UV resistance.
- Excellent corrosion resistance on abrasion & stab.
- High breaking strength & elongation.
- Superior physical properties.
- Product environmental protection, no pollution.
- Multi outer colors are fender dimension available.

## Application

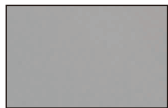
- Navy vessel berths and cruise terminals
- Offshore work platform
- Mooring operations
- Ship to ship operations
- Ship to shore operations
- Oil & Gas Terminals

Feature & Benefit  
Application





## Unique Structure



### Fully closed cell foam core

As core functional part of foam fender choose supreme PE material, provide fender advanced energy absorption and low reaction force, making the Foam Fender own superior performance in safety, durability and function.



### Laminated foam core (Non-Winding)

Fender adopt foam lamination production technology. This structure can exert its maximum mechanical performance and ensure the superiority of energy absorption and reaction force.



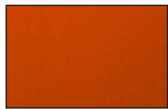
### Reinforced nylon tire cord skeleton layer

Multi-layer cords (Premium Quality) are winding during the polyurethane spraying process. This advanced skeleton process extremely durable to all types of weather, forces, and marine conditions.



### Enhanced Chain Tyre Net

The net is composed of high-quality truck/aircraft tires, high-strength hot-dip galvanized chains (wrapped in rubber sleeve), and the chain intersections are connected by reinforced shackles.



### Black Technology Coating

Our exclusive research and development of Black Technology Materials (Non-marking Polyurethane) sprayed on the outside of foam core, which like wearing a strong and elastic armor to protect foam core permanently.



### Heavy Duty Central Axis

Foam Fender equipped with the heavy-duty central axis as standard which plays the role of supporting and installing foam fenders.



### High Strength End Flange

End flange is the important safety connection point which is made of superior-quality steel to ensure the safety and long-term application of foam fender hanging.



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## Installation Diagram

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Two Point Mounting System



Four Point Mounting System

# Donut Fender

## Donut Fender Introduction

The Donut Fenders are made of polyethylene foam with a polyurethane elastomer shell. Special donut fenders have been specifically designed to protect the berthing pipes of the vessels. The internal structure is heavy duty, but it allows the rotation on the support pipe.

The polyethylene foam guarantees unsinkability even in case of damage and ensures high energy absorption with low reaction force, which is essential to eliminate the risk of damage to the hulls. They can be purposely created for any pipe type and any pipe diameter.



## Feature & Benefit

- Freely rotates around a pile.
- Superior energy absorb and low reaction force.
- Lower reaction force than rubber fender & keep high energy absorption.
- Compression & recovery efficiency golden ratio.
- Extremely low hull pressure, non-marking polyurethane coating.
- Anti-burst, anti-sinking, ultimate security.
- Remain functions under accidental damage.
- Excellent anti-ultraviolet light (UV) resistance.
- Resistance to acid, alkali and salt and marine biology corrosion.
- Resist all kinds of rough marine environments (Tropic & Frigid Zone).
- Material and technical process determine long service life.
- Suit all sites no matter small or large tidal changes.
- Customization of fender size and shape.

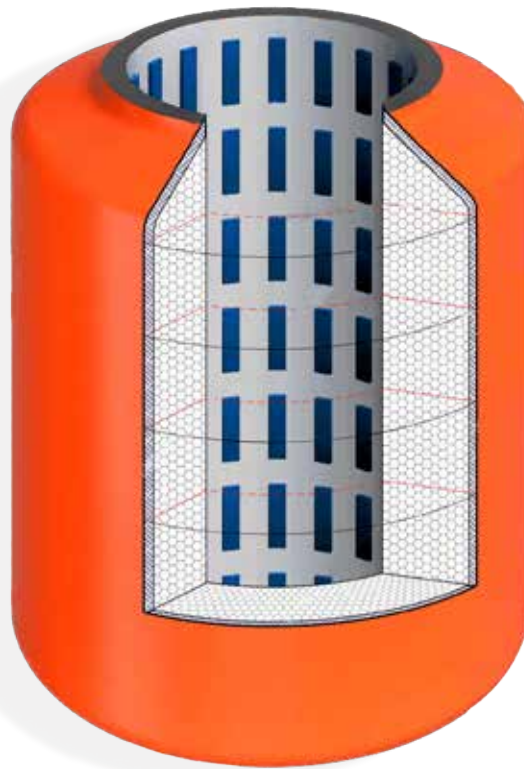
## Application

- Corner protection
- Turning structures
- Lead-in jetties
- Simple breasting dolphins
- Bridge protection

Feature & Benefit  
Application



## Unique Structure



### Low-friction UHMV bearing pads

The low-friction UHMV bearing pads which need minimal maintenance. It can help the float to freely rotate around a pile, rises and falls with water level.



### High quality inner steel pipe

The central steel tube resists mooring load and provides a stable, non-abrasive core for the foam body. And engineered component, the central tube is a precise length.



### Reinforced nylon tire cord skeleton layer

Multi-layer cords (Premium Quality) are winding during the polyurethane spraying process. This advanced skeleton process extremely durable to all types of weather, forces, and marine conditions.



### Laminated foam core (Non-Winding)

Fender adopt foam lamination production technology. This structure can exert its maximum mechanical performance and ensure the superiority of energy absorption and reaction force.



### Fully closed cell foam core

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### Black Technology Coating

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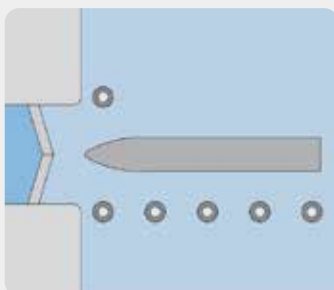
# Specification

DONUT OUTER DIA [MM]	DONUT OUTER DIA [FT]	PILE DIA [MM]	PILE DIA [FT]	ENERGY ABSORPTION [KNM]	REACTION FORCE [KN]	ENERGY ABSORPTION [FT-KIP]	REACTION FORE [KIP]
1270	4.2	610	2	7.2	116	1.6	7.9
1450	4.8	710	2.3	9.2	131	2.1	9.0
1520	5.0	762	2.5	10.5	140	2.4	9.6
1780	5.8	914	3	14.1	162	3.2	11.2
1910	6.3	995	3.3	16.4	175	3.7	12.0
2030	6.7	1067	3.5	18.6	186	4.2	12.8
2210	7.3	1185	3.9	22.3	204	5.0	14.0
2290	7.5	1219	4	23.6	210	5.3	14.4
2490	8.2	1345	4.4	28.0	229	6.3	15.7
2540	8.3	1372	4.5	29.3	234	6.6	16.0
2790	9.2	1524	5.0	35.3	256	7.9	17.6
2970	9.8	1636	5.4	40.1	273	9.0	18.7
3050	10.0	1676	5.5	42.1	280	9.5	19.2
3300	10.8	1829	6.0	49.5	304	11.1	20.8
3450	11.3	1933	6.3	54.6	319	12.3	21.9
3530	11.6	1981	6.5	57.2	327	12.9	22.4
3810	12.5	2134	7.0	65.9	350	14.8	24.0
3960	13.	2241	7.4	72.1	366	16.20	25.1
4060	13.3	2286	7.5	75.1	374	16.9	25.6
4220	13.8	2388	7.8	81.3	389	18.3	26.7

The above sizes are standard only, and a variety of sizes are available upon request.

## Installation Diagram

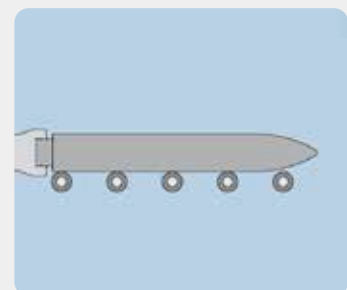
Foam Fender could be installed with a two or four point mounting system, depending on the application.



Guiding structures



Corner protection



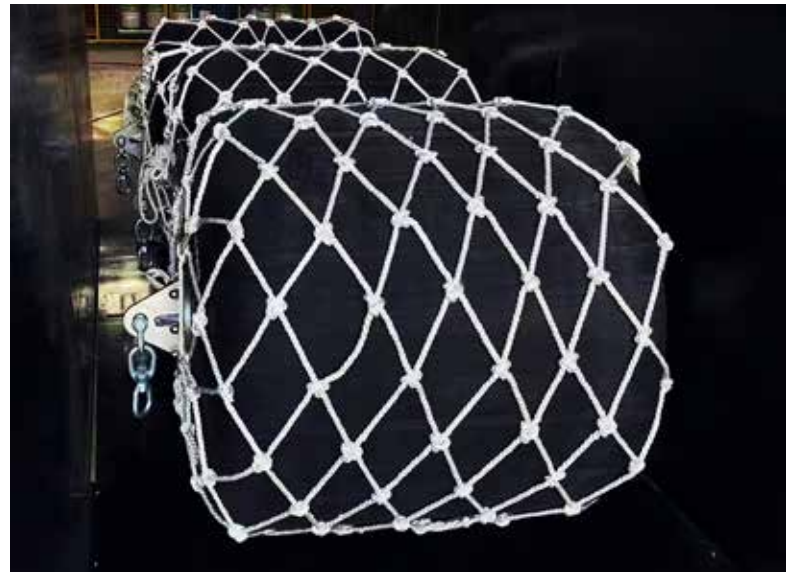
Breasting dolphins

# OTHER TYPE FOAM FENDER



## Floating Rubber Foam Fender

SunHelm independently developed and produced floating rubber foam fenders for berthing operations. The product uses polyethylene as the foam core, wrapped by high-quality rubber outside the foam core body, and finally vulcanized as a whole. This type of product has the advantages of high energy absorption, low reaction force, anti-aging, corrosion resistance, light weight, and convenient operation. Demonstrated excellent product safety and stability.



## Nylon Net Foam Fender

Adding the chain tyre net system to foam fender is to further protect the fender, prolong the service life and apply in heavy duty project, if the small size foam fender (such as 0.5m\*1m) is installed with chain tyre net system, the overall purchase cost of the user will be increased, based on the consideration of this, we developed nylon net on the fenders, which can reduce fender abrasion. Play the role of protecting the fender.

# CUSTOM MADE FOAM FENDERS



## Color Customized

Orange, Black, White and Navy-Grey are the main colors, other colors can also be customized.

## Size Customized

According to the ship type, the foam fender has a regular size, but the regular size of some projects cannot meet the actual needs, so it needs to be customized. For example, we have customized D1.8m-L6m for the project.

## Polyurethane Customized

As the "Jacket" of foam fender - the thickness of polyurethane coating is customizable according to the requirements of project.

## Chamfer Customized

Chamfer refers to the inclination angle of the two ends of the fender, which can be customized according to a certain angle.

## Foam Density Customized

The density of the foam determines the energy absorption and reaction force. Foam Fender currently has low capacity, standard capacity and high capacity. Other foam density can also be customized according to project's requirement to meet different capacity.

# FOAM FENDER CASE

## North America Project

**Product:** Foam Fender

**Purpose:** Wharf Construction

**Qty:** 15pcs

**Size:** D1.35m\*L2.5m

**Date:** 2023





## French Project

**Product:** Foam Fender

**Purpose:** Port-Reconstruction

**Qty:** 23pcs

**Size:** D2.5m\*L5.5m

**Date:** 2022



## UAE Project

**Product:** Foam Fender

**Purpose:** Dock Berthing

**Qty:** 20pcs

**Size:** D0.5m\*L1.0m

**Date:** 2023







Foam Fender of SunHelm Marine have covered more than 70 countries and regions on 6 continents, and the growth rate and market share of key markets have been increasing every year, which is highly praised by the market and users. Foam Fender mainly used for STS and dock berthing.

# FOAM FENDER TECHNOLOGY

## ■ HIGH ABSORPTION & LOW REACTION

There are all kinds of types of the core foams made by SunHelm. The different density of foams will achieved different performances by foam fenders. The foams will be soft and weak reaction forces when they with low density, high density foams is tough and suffer more impact power. After few compression processing, the foam contains millions of tiny air bubbles and will reach a great balance. Generally, performance of foams fenders need to be evaluated after few times deflections testing.

## ■ REINFORCEMENT SYSTEM

SunHelm have achieved a unique method to enhance the strength of foam fenders. We applied covered skin and consolidation in the same time. Different homogeneous layers could offer additional intensity and protection for both ends. SunHelm's unique method could achieved better performance compete with traditional way of producing.

## ■ STRONG WEAR RESISTANT

The spray applied by polyurethane elastomer could offer great and balance cover matrix that create perfect using resistance and non-marking feature.

## ■ NEVER BEEN SINKABLE

SunHelm closed cell foam construction is puncture-proof with high strength. Cells are independent so it is water-proof. The foam core could be returned to factory after serving a long time. SunHelm will be responsible to have fully inspections and repairing for old foam and replace the old skin by new. After those processing, SunHelm's foam filled fender could restart their serving for our dear customer.

## ■ SAFETY AND RELIABLE

Sunhelm's foam fenders and buoyancys is burst-free and won't explode guarantee. The damage may happen in hostile environment with low rates. Sunhelm's team will try our best to repair it if it's possible to use continuously.



# COMPRESSION TEST

## SunHelm Foam Fenders Series

Foam Fender continuous load test apply a fixed compression load to 40% of the diameter fender, and keep loading for 24 hours, record the load and deformation for each hour. The rebound of fender is detected immediately after the load is released, test time is 24 hours. If the fender cannot recover to 90% of its original diameter within 6 hours after the load is relieved, it means that the fender has failed the test.



COMPRESSION TEST



# FOAM FENDER SYSTEM

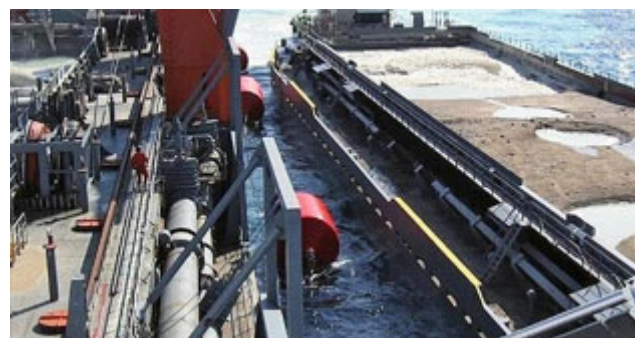
## Berthing Solutions

In berthing applications, foam fenders become a cushioning protective device to protect the hull and dock. Foam Fender is made of environmentally friendly materials and new polymer materials, widely used in ports, offshore , Oil platform operations.



## STS (Ship to Ship) Solutions

Ship-to-Ship (STS) transfer operation is the transfer of cargo between seagoing ships positioned alongside each other, either while stationary or underway. When the two ships are berthing with each other, there needs to be protective equipment between the two ships for hull protection. At this time, foam fender become a protective device with cushioning properties.



# FOAM FENDER SYSTEM

## Bridge Blocking Project

Foam Fender cooperates with the steel structure bracket to form a group of floating units, and each floating unit is connected by a blocking net to build a security defense line. This technology is independently developed and designed by SunHelm Company, and has applied for a number of patented technologies.



## Buoyancy Project

Foam Fender itself has buoyancy, and through the technology upgrade by SunHelm, it has become a new type of buoyancy device, which has the characteristics of no sinking, anti-aging, acid and alkali corrosion resistance, marine biological corrosion resistance, and UV resistance, long-service life etc.



# SUNHELM

## Foam Filled Fender

Contribute SunHelm Strength To Global Marine Strategy

### Thank You For Using SunHelm Foam Fender

We are looking forwards the cooperation with you again.  
If have any question, please feel free to contact us by email or phone,  
SunHelm will be your best product solution partner.

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[www.sunhelmmarine.com](http://www.sunhelmmarine.com)

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