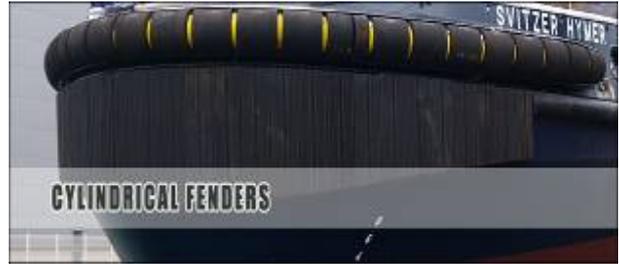




FENDER
MARINE

FENDER MARINE





CYLINDRICAL FENDERS (Ship Fenders).



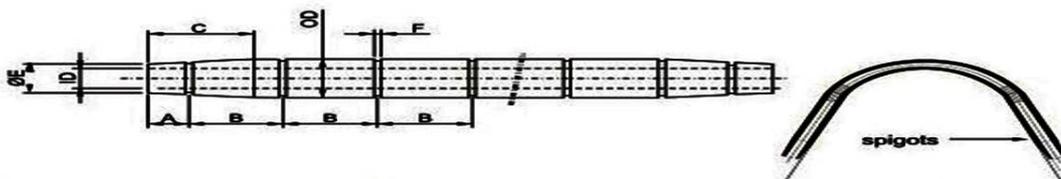
Cylindrical fenders are commonly used fenders recommended for all types of application to ensure a safe and linear berthing for the different kind of vessels. Cylindrical fenders are an economical solution to protect most of the berthing structures and offer much ease for installation. With 50% design compressive deflection, this kind of rubber fender can effectively buffer the collision between docks and ships.

FENDER MARINE Cylindrical fenders have with high energy absorption and low reaction force. We are manufacturing our cylindrical fenders by Molding, Extrusion and wrapping methods as per the customer requirements for Offshore and Ships. FENDER MARINE Cylindrical rubber fender is mainly suitable for tugboat and pushing vessel. It can be installed at the bow, side and stern of a ship to push and drag the ship.

FENDER MARINE Cylindrical Rubber fender features low reaction force, less surface pressure, and reasonable energy absorption. Due to its simple shape, this marine fender is easy to install and maintain. It is suitable for all kinds of ships and docks. It has good adaptability for the pitching and rolling of ships during berthing. This rubber fender can be used as the suspended type defense equipment for various docks. As per the requirement of the length of the fender it can be suited in one or more sections/lengths, when there are multiple lengths spigots or connector plugs are used for installation.

FENDER MARINE can supply PRE-CUREVED fenders as per the customer requirements.

Basic standards of Hollow Cylindrical Fenders are = OD of fender = 2* ID of Fender.



Product Reference	OD mm	ID mm	A mm	B mm(max)	C mm	E mm
FM-C-SF200	200	100	150	530	500	150
FM-C-SF250	250	125	200	570	500	190
FM-C-SF300	300	150	225	600	700	225
FM-C-SF380	380	190	250	630	800	260
FM-C-SF400	400	200	300	670	800	300
FM-C-SF500	500	250	300	730	900	375
FM-C-SF600	600	300	350	800	900	450
FM-C-SF700	700	350	350	860	1000	525
FM-C-SF800	800	400	350	930	1000	600
FM-C-SF900	900	450	350	1000	1100	675
FM-C-SF1000	1000	500	350	1000	1200	750

Dimensions F depends on dimensions of Webbing Straps or Chains.

Apart from the above any other size, shape can be developed as per client's requirement.

The data above are examples for reference only & are not as per any specific standards. They can be accepted as per one's requirement.

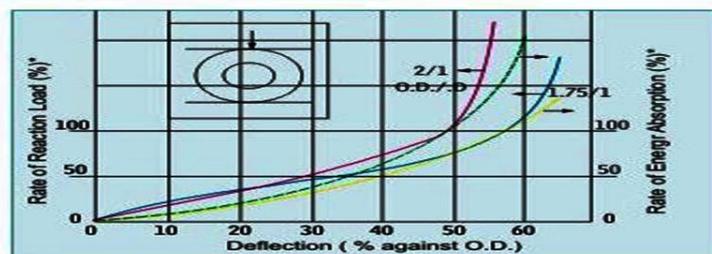


CYLINDRICAL FENDERS (Jetty Fenders).

Cylindrical rubber-dock fender is a type of Cylindrical fender with hollow inside diameter in proportionate with the outer diameter. Generally, the standard proportion / ratios between the outside diameters and the inside diameters are 2:1 and 1.75:1. These cylindrical fenders are used to clamp upon the quay / jetty for absorbing the shock or impact created by rubbing of the steel of a vessel with the quay. The hollow inside of the fender acts as a spring which gives cushioning effect and the load/shock is dispersed all over the fender, thus protecting the quay and the vessel's body. Cylindrical fender can be installed horizontally along with chains on either side or at an angle.

Product Reference	OD x ID mm	Chain Size mm	Ø Steel Bar mm	Ø Anchor mm	Fixing arrangements
FM-C-JF100	100 x 50	16	25	25	
FM-C-JF125	125 x 62	16	25	25	
FM-C-JF150	150 x 75	16	25	25	
FM-C-JF200	200 x 100	19	28	25	
FM-C-JF250	250 x 125	19	28	25	
FM-C-JF300	300 x 150	22	32	32	
FM-C-JF350	350 x 175	22	32	32	
FM-C-JF380	380 x 190	22	32	32	
FM-C-JF400	400 x 200	25	38	36	
FM-C-JF450	450 x 225	25	38	40	
FM-C-JF500	500 x 250	28	42	40	
FM-C-JF600	600 x 300	30	46	42	
FM-C-JF700	700 x 350	32	50	46	
FM-C-JF800	800 x 400	34	55	48	
FM-C-JF900	900 x 450	34	55	48	
FM-C-JF1000	1000 x 500	38	60	55	

PERFORMANCE CURVE



Apart from the above any other size, shape can be developed as per client's requirement. The data above are examples for reference only & are not as per any specific standards. They can be accepted as per one's requirement.



D FENDERS.

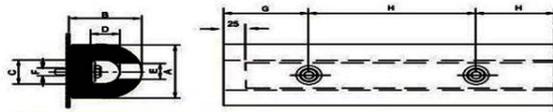


FENDER MARINE D Fenders are used for tugs, barges, work boats, and pilot boats as side belting and protective fenders against heavy rubbing, brushing and pushing forces. These D-Type Fenders having higher energy absorption capacity, thus minimizing the face contact. These fenders can also be mounted on quay by means of anchor bolts.

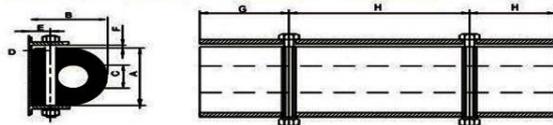
FENDER MARINE D type Fenders are supplied in DD, DO, and Solid shapes. Long length D Fenders can be supplied to match the Aft or Bow Radius.

D type fenders are commonly used on vessels as well as small jetties. They are compression molded or Extruded type. These fenders are used to absorb the berthing energy during mooring or berthing so as to protect the ship and the dock from being damaged. It is suitable for various docks, wharfs, and ship sides. This rubber fender is of moderate reaction force, and higher energy absorption than the cylindrical type fenders. It is easy and convenient to install and change. The width of its bottom is small, so this marine fender can be installed at ship side and skeleton type docks.

DRILLING HOLES AND INSTALLATION METHODS OF FENDER MARINE D FENDERS



Installation E 1										
A	B	C	D	E	F	G	H	Flat bar	Bolt size	
100	100	50	50	30	15	90-130	200-300	40x5	M12	
120	120	60	60	30	15	90-130	200-300	40x5	M12	
150	150	75	75	40	20	110-150	250-350	60x8	M16	
200	200	100	100	50	25	130-180	300-400	80x10	M20	
250	250	125	125	60	30	140-200	350-450	90x12	M24	
300	300	150	150	60	30	140-200	350-450	100x12	M24	
400	400	200	200	75	35	140-200	350-450	150x15	M30	

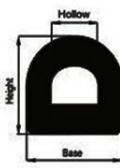


Installation E 2										
A	B	C	D	E	F	G	H	Flat bar	Bolt size	
100	100	50	15	25	10	90-130	200-300	50x6	M12	
125	125	62	15	25	12	90-130	200-300	50x6	M12	
150	150	75	20	30	12	110-150	250-350	60x8	M16	
200	200	100	25	45	15	130-180	300-400	80x10	M20	
250	250	125	30	50	20	140-200	350-450	100x10	M24	
300	300	150	30	60	25	140-200	350-450	110x12	M24	
400	400	200	35	80	30	140-200	350-450	130x15	M30	

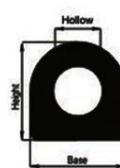
Apart from the above any other size, shape can be developed as per client's requirement. The data above are examples for reference only & are not as per any specific standards. They can be accepted as per one's requirement.

PERFORMANCE AT 50% DEFLECTION

Product Reference	Base x Height x D Hollow mm	R (Ton/m)	E (Ton-M/m)
FM-DD100	100 x 100 x 50	11.0	0.15
FM-DD150	150 x 150 x 75	14.3	0.36
FM-DD200	200 x 200 x 100	19.0	0.63
FM-DD250	250 x 250 x 125	23.4	0.98
FM-DD300	300 x 300 x 150	28.5	1.42
FM-DD350	350 x 350 x 175	33.5	1.91
FM-DD400	400 x 400 x 200	38.0	2.52



Product Reference	Base x Height x Round Hollow mm	R (Ton/m)	E (Ton-M/m)
FM-DO100	100 x 100 x 50	19.0	0.15
FM-DO150	150 x 150 x 75	21.8	0.39
FM-DO200	200 x 200 x 100	29.0	0.70
FM-DO250	250 x 250 x 125	36.3	1.09
FM-DO300	300 x 300 x 150	43.5	1.58
FM-DO350	350 x 350 x 175	51.0	2.15
FM-DO400	400 x 400 x 200	56.0	2.81



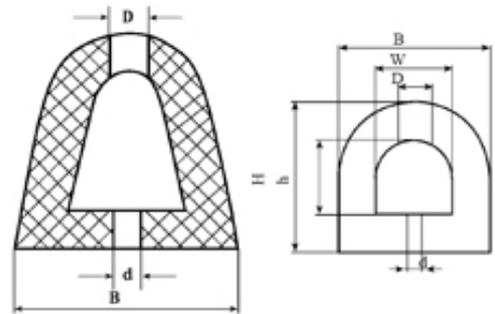
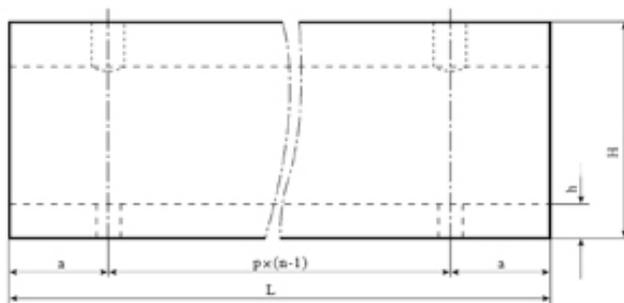
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DELTA FENDERS.

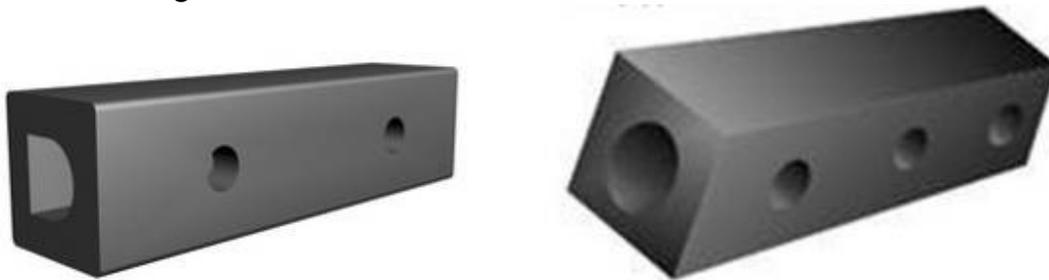
FENDER MARINE DELTA FENDERS

- Available in Synthetic & Natural Rubbers
- Available in All colors
- Available in long Length
- Minimizes Surface Contact
- Suitable for all Vessels and Marinas
- Easy Mounting
- Wide range of applications
- Cutting and drilling service





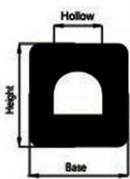
SQUARE & RECTANGULAR FENDERS.



FENDER MARINE Square & Rectangle type fenders are used for tugs, barges, work boats and pilot boats as side belting and protective fenders against heavy Rubbing, Impact, Brushing and Pushing force. These square type fenders having a higher energy absorption capacity so minimizing the face contact.

Square fenders are commonly used on vessels as well as small jetties. They are compression molded or Extruded fenders generally used on tug, boats and ships. This type rubber fender is installed on docks to protect the Docks and Ships from being damaged at the time of berthing. The rated deflection of our square rubber boat fender is 40-50 %. According to the reaction force, our square rubber boat fender can be grouped into standard reaction force type and high reaction force type.

PERFORMANCE AT 50% DEFLECTION



Product Reference	Base x Height x D Hollow mm	R (Ton/m)	E (Ton-M/m)
FM-SD150	150 x 150 x 75	12.4	0.62
FM-SD200	200 x 200 x 100	29.8	1.11
FM-SD250	250 x 250 x 125	37.3	1.73
FM-SD300	300 x 300 x 150	44.7	2.49
FM-SD350	350 x 350 x 175	53.0	3.39
FM-SD400	400 x 400 x 200	59.8	4.44



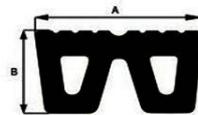
Product Reference	Base x Height x Round Hollow mm	R (Ton/m)	E (Ton-M/m)
FM-SO150	150 x 150 x 75	16.8	0.39
FM-SO200	200 x 200 x 100	21.0	0.69
FM-SO250	250 x 250 x 125	26.0	1.01
FM-SO300	300 x 300 x 150	31.0	1.56
FM-SO350	350 x 350 x 175	34.5	1.95
FM-SO400	400 x 400 x 200	41.0	2.52

Apart from the above any other size, shape can be developed as per client's requirement.
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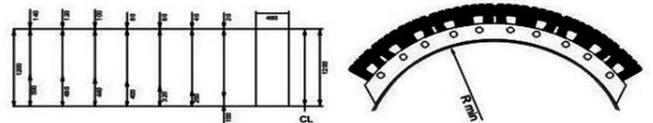


W FENDERS.



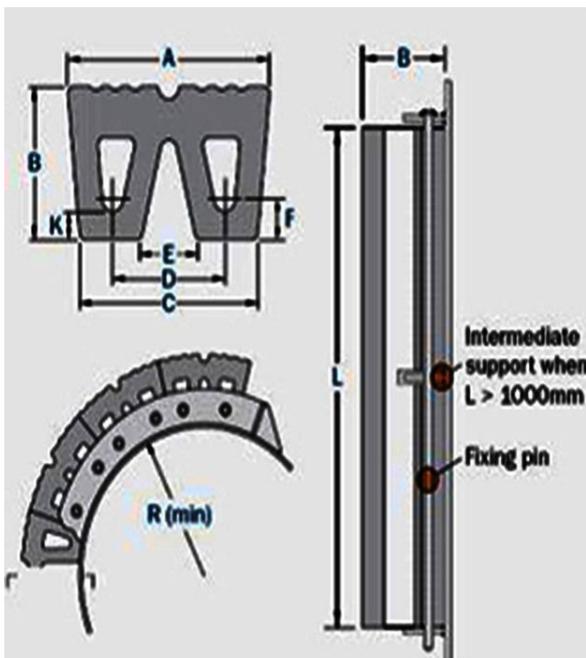
Product Reference	A x B mm
FM-W320	320 x 200
FM-W480	480 x 300
FM-W500	500 x 450

INSTALLATION EXAMPLE OF FENDER MARINE W TYPE FENDER



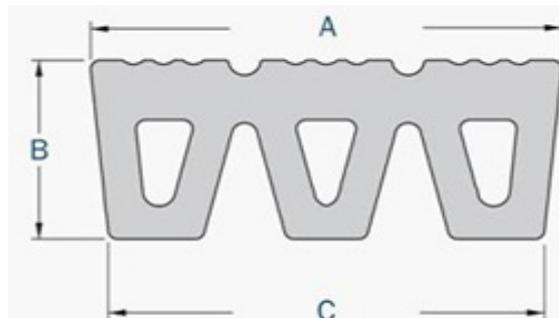
FENDER MARINE “W” Type Fenders are installed in to the bow and the aft portion of the ocean going tugs, to protect the hull of the vessel, against the damages caused during pushing and Pulling operations/ towages. These fenders are installed in similar manner as those of Key Hole Fenders.

With 50% design compressive deflection, this kind of W - rubber fender can effectively buffer the collision between docks and ships. Our W fenders have with high energy absorption and low reaction force. This type rubber fender is installed on Ship front area to protect the Ships from being damaged at the time of berthing. We can customize marine fenders in accordance with your special requirements for performance and specifications. For instance, the tensile strength ranges from 12MPa to 16MPa.

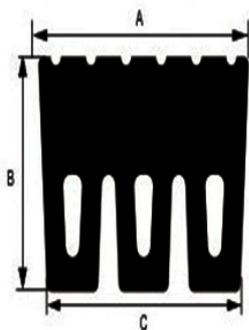




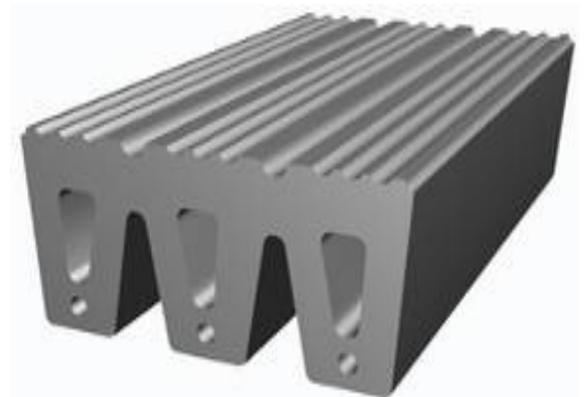
M FENDERS.



FENDER MARINE “M” type marine fender is used to absorb the berthing energy so as to protect the vessel or the dock from being damaged during mooring or berthing. It features high energy absorption, low reaction force, reasonable structure, easy installation and maintenance.



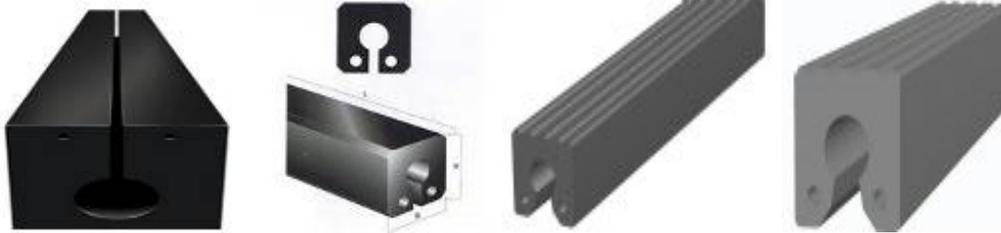
Product Reference	A x B x C mm
FM M600	600 x 400 x 550



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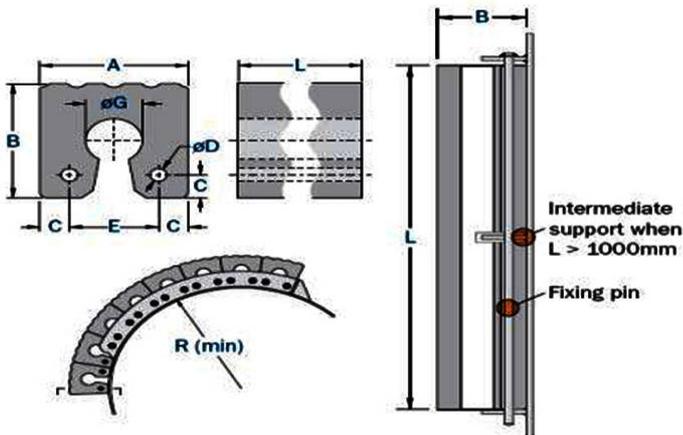


KEY HOLE FENDERS.



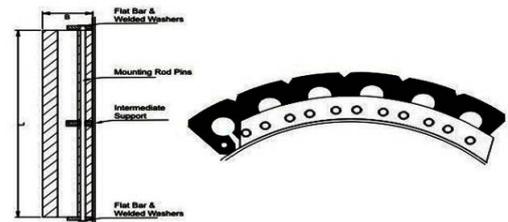
FENDER MARINE Key Hole Fenders are used as an alternative to W-Fenders incase of extreme loads. The Key Hole Cross Section is very tough but can be curved around the hull. Fixing /Mounting is very simple with this type of fender.

Keyhole fenders are the most versatile bow, stern fenders used on the Tug Boats and small Port Crafts/Ferries. They offer maximum protection to the Tugs/Ferries with its typical profile and load absorbing capabilities.



Product Reference	A x B mm
FM-KH200	200 x 200
FM-KH250	250 x 250
FM-KH300	300 x 300
FM-KH400	400 x 400

INSTALLATION EXAMPLE OF FENDER MARINE KEY HOLE FENDERS



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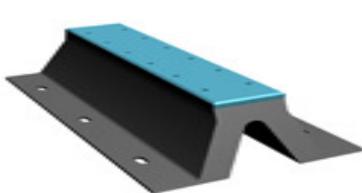
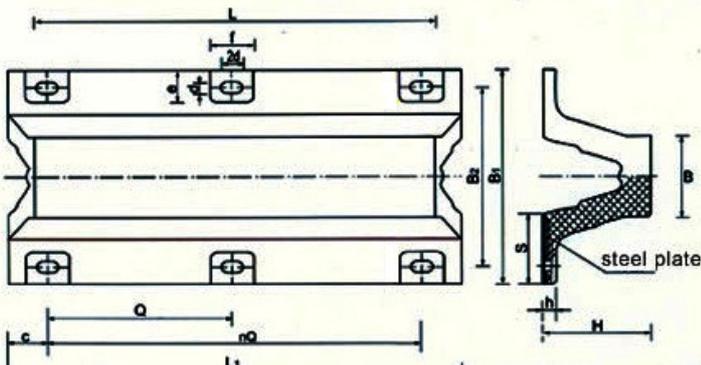




ARCH FENDERS.

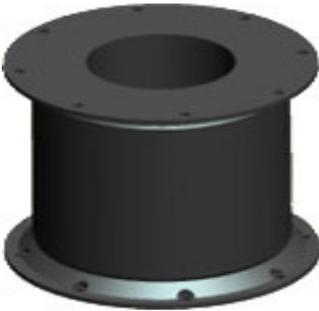


FENDER MARINE Arch fenders were introduced to improve upon the performance of cylindrical fenders. Arch fenders have a better Energy / Reaction force ratio and recommended for all types of applications. The very shape of these fenders helps to dissipate the stress evenly. These Compression Molded fenders are very easy to install and are maintenance free. Generally our Arch fenders are preferred for small to medium range Vessels. Arch Type rubber fenders are installed on docks and structures to absorb the collision energy between ship and dock during berthing. There are two types of Arch fenders; High reaction force type and Standard reaction force type. The design compressive deflection is 50%. . This rubber fender features low reaction force and high energy absorption. It is of reasonable structure, long service life, firm installation and easy replacement.

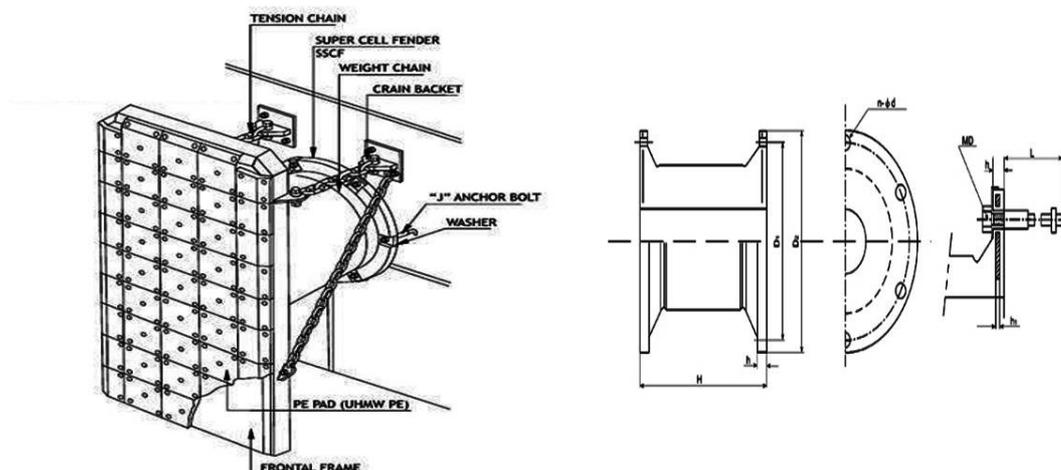




CELL FENDERS

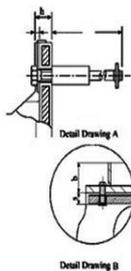
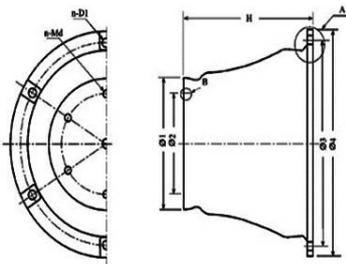


FENDER MARINE Cell fenders are mostly installed for docks (Dock medium type to VLCC) where Reaction Force is an important criteria. Among all types of fenders, Cell fenders offer minimum reaction per ton-meter energy absorbed. The very geometrical shape gives it sturdiness, shear resistance, compact structure and the capacity to absorb energy equally from all directions. The Cylindrical buckling column absorbs axial loads effectively and buckles radically. This results in multi directional dispersion of energy. Cell fenders are the most durable rubber fenders available and are currently the largest molded fenders made. 2000-2500 mm high cell fenders are typically used for LNG berths. In order to distribute the reaction force, cell fenders are typically supplied with large fender panels, which keep the hull pressure low. Our Cell Type rubber fender is installed on docks to absorb the collision energy between ship and dock at the time of berthing. In comparison to common marine fenders, the design compressive deflection of FENDER MARINE Cell rubber fender is increased by 13%, the energy absorption is increased by 17%, and the E/R is increased by 15%, on the condition that the reaction force is not increased. With higher E/R, this marine fender can be used for off-shore docks, especially suitable for dolphin wharf. This super cell rubber fender has no impingement steel frame at the head, which greatly reduces the surface pressure. The surface pressure can be controlled below 25 tons per square meter, upon request.

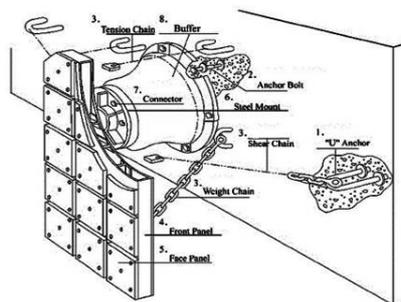




CONE FENDERS.

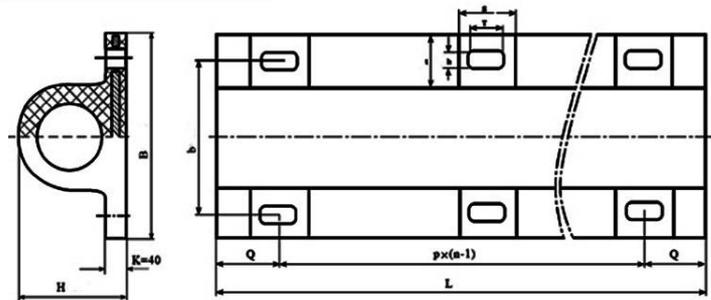


FENDER MARINE Cone fenders are an improved version of Cell type Fender recently introduced and recommended for all type of applications including high tidal variation sites. This advanced feature of lesser height of fenders improves material handling capabilities of Deck / Vessel Cranes which reduces overall cost of the project. Due to the geometrical shape of the fenders it can deflect more and it can absorb more energy from any direction. Maintaining reaction force, but doubling energy absorption, can be achieved by using two identical cone fenders in a back-to-back arrangement. In order to distribute the reaction force, cone fenders are typically supplied with large fender panels, which keep the hull pressure low. Cone have good energy absorption to reaction force ratio (E/R); Integrated and fully-embedded fender flanges make assembly & installation simple; Good shear force resistance due to the large diameter of the fender flanges; large fender footprint with good force distribution could lead to relative light panel construction. FENDER MARINE cone rubber fender adopts tapered rubber with a steel frame at the head. This new structural design increases the design compressive deflection from 52.5% to 70%, on the condition that the reaction force is not increased. This type of rubber fender lightens the structure of a dock and thus reduces the construction cost of a dock. Therefore, a cone rubber fender, one of the best rubber fenders, is an ideal replacement of super cell rubber fenders. FENDER MARINE cone rubber fender is suitable for the docks that requires low reaction force and high energy absorption, the docks that requires low surface pressure of the ship's panel, off-shore open berths and large docks like oil wharf and container terminal, as well as all places that are suitable for super cell marine fender.





WING OR GD FENDERS.



FENDER MARINE Wing fenders are compression molded fenders and are generally used on tugs, boats and ships. It is easy to install and replace. It has excellent sea water resistance and resistance to ozone ageing and ultra violet rays. This Wing Type fender is used to absorb the berthing energy during mooring or berthing so as to protect the ship and the dock from being damaged. It is suitable for various docks, wharfs sides. It has higher energy absorption than D type rubber fender. It features higher installation strength and long service life. This rubber fender is suitable for frame type docks.

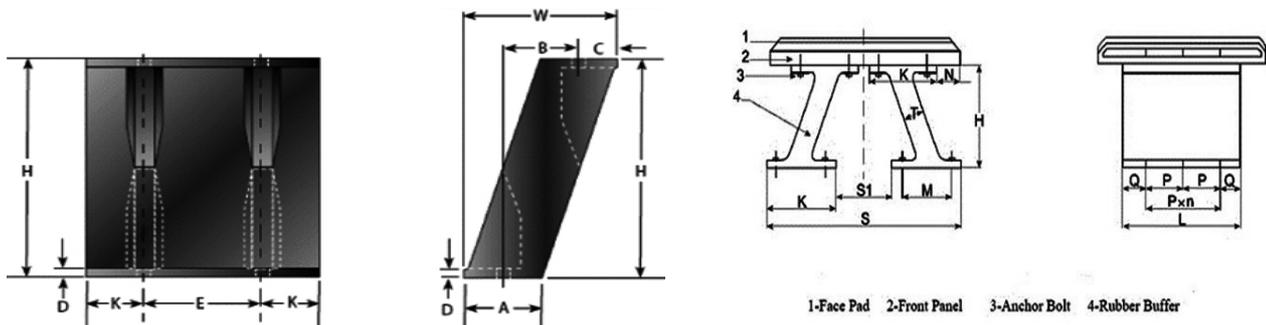




I & IV FENDERS



FENDER MARINE I & IV type rubber fenders are installed on docks to protect the Docks and Ships from being damaged at the time of berthing. Our rubber marine fender is of large top area, which provides small surface pressure. With high energy absorption and low reaction force, this rubber fender is suitable for ten-thousand-ton docks. The span between two supporting arms is adjustable. It is also available to combine multiple supporting arms. The design compressive deflection is up to 52.5%. The impingement plate adopts UHWPE plate or nylon plate, with low friction coefficient 0.07, which is good for berthing. This marine fender could be installed vertically or horizontally, with no need for supported anchor chain. It is simple and convenient to install, repair and replace.





SHEAR FENDERS.

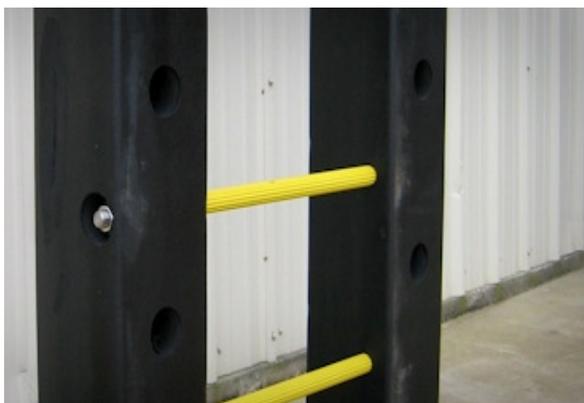


FENDER MARINE Shear Type fender is used to absorb the berthing energy during mooring or berthing so as to protect the ship and the dock from being damaged. It is suitable for various docks, wharfs sides.

STRIP/BOAT LANDING FENDERS.



FENDER MARINE Strip Type fender is used to absorb the berthing energy during mooring or berthing so as to protect the ship and the dock from being damaged. It is suitable for various docks, wharfs sides.





WHITE / COLOURED NON MARKING FENDERS.

FENDER MARINE White and colored Fenders are used to absorb the berthing energy during mooring or berthing so as to protect the ship and the dock from being damaged. It is suitable for various docks, wharfs sides and also used for special applications. It is also used in the automotive Industry.





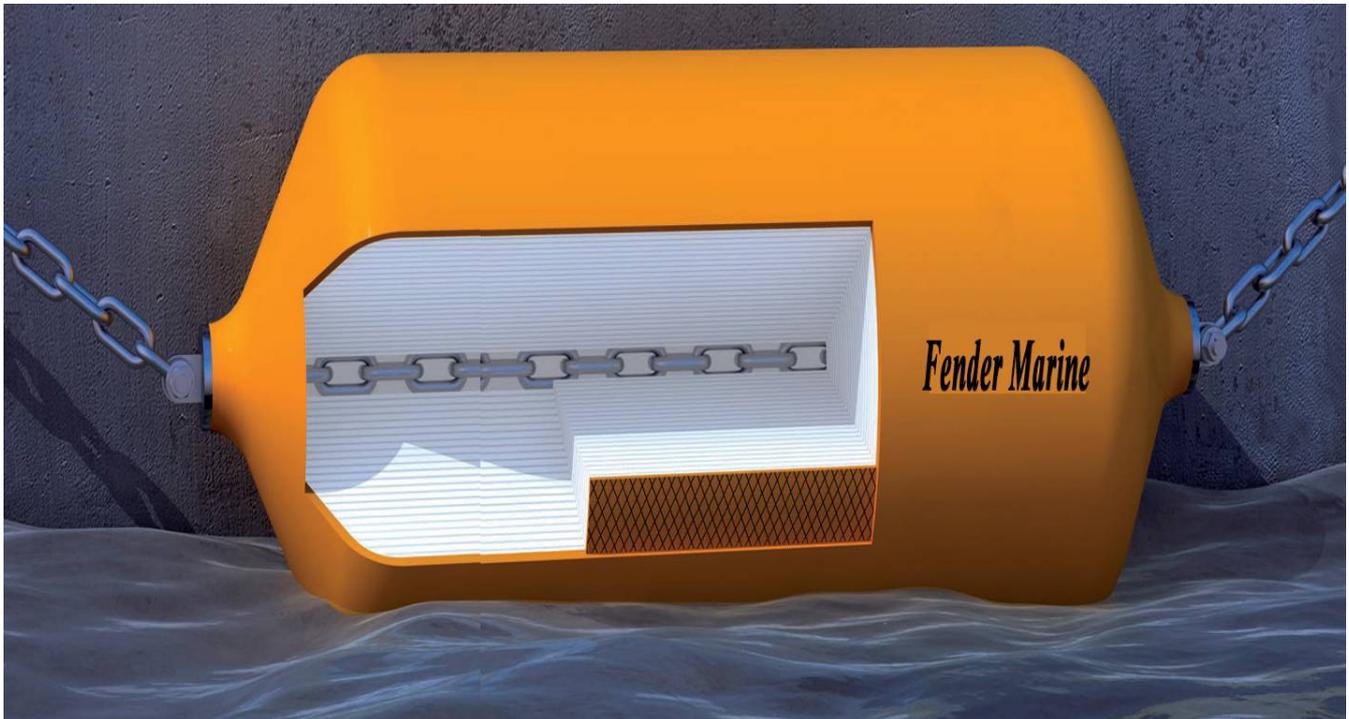
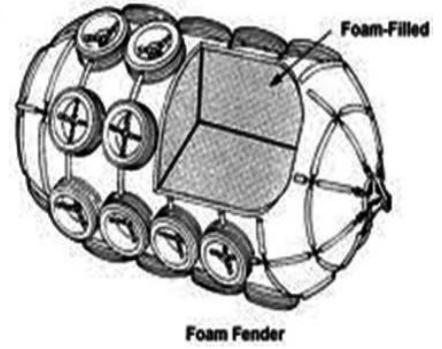
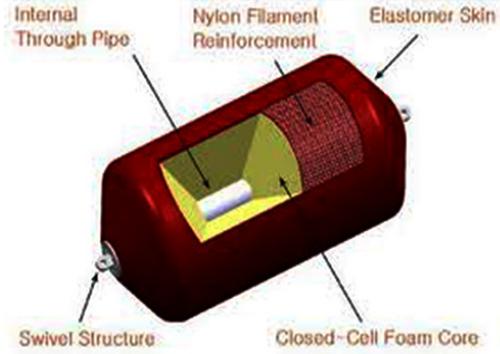
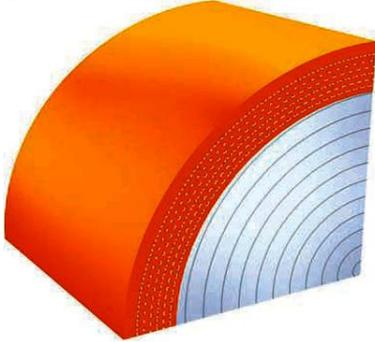
FOAM FENDERS & BUOYS.

FENDER MARINE Foam fenders work equally well in harbors or between vessels. Low hull pressures protect soft-skinned ships. FENDER MARINE combines a Durable, Non-marking finish with Low maintenance, Low reaction and high energy absorptions, No chain/tire net required, Virtually indestructible, Unsinkable design, Non-marking even against white hulls, Maintains safe stand-off distances, Low hull pressures, Wide range of standard and custom sizes, Well proven design and low maintenance and operational cost.





Foam Filled
Marine Fenders



OTHER MARINE ACCESSORIES.

SHOCK PADS.



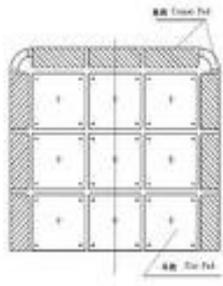
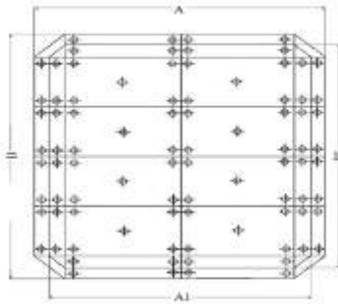
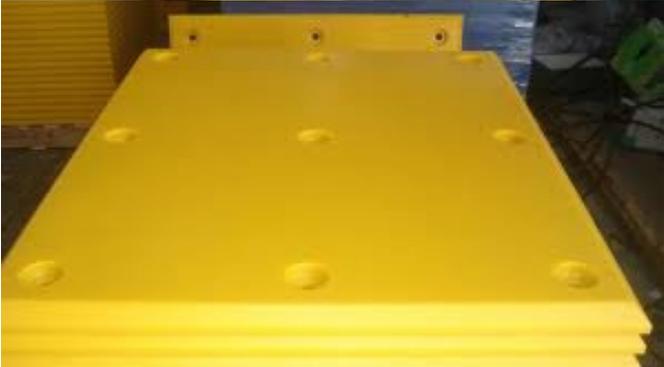
RUBBER RINGS.



RUBBER PACKINGS & SEALS.



ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE (UHMW-PE) PADS/SHEETS.



POLYURETHANE PRODUCTS.

FENDER MARINE also manufactures and exports all types of Polyurethane products.



OTHER RUBBER PRODUCTS.

FENDER MARINE also manufacture and export all types of Extruded and Moulded Rubber Products for applications in Automotive Industry like O-Rings, Gaskets, Oil Seals, Lip Seals, Hydraulic Seals, Bushes, Rubber Strips, etc.







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