

PNEUMATIC FENDER PRODUCTS

SEA & TEC



SEA & TEC CO.,LTD.
PNEUMATIC FENDER PRODUCTS

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ISO 9001 : 2008
ISO 14001 : 2004
ISO 17357 : 2014



SEA & TEC CO.,LTD.
PNEUMATIC FENDER PRODUCTS

We, Sea&Tec, specializes in manufacturing high quality of pneumatic fender on the basis of qualified and delicate technical know-how piled up for over 20years.

We are always committed to the guaranteed satisfaction of clients, continuously upgrading and developing quality products and technical services, making effort to keep the cost of clients competitiveness.

Offering Competitive Price and high quality fender with technical services and on-time delivery is the real engine of Sea&Tec as WORLD LEADING MANUFACTURER.

Dear sirs,
Sincerely thank you for your sincere attention you have paid to us SEA&TEC CO.,LTD.

We SEA & TECC since its foundation, have recognized continuous extension of installations, creative research & development, human and natural environment as the most important factors of the management of an enterprise.

In addition, based upon, our technical power and affluent experience accumulated for over 20 years, We have provided Navy worldwide and ship owners, ship to ship transfer operators and ship yard with the most advanced marine & shipping safety goods & technology, hereby not only having received favorable comments from many companies but also having grown up & developed to a manufacturer specialized in producing various ship-related fender products with our production & technical power acknowledged in particular from abroad and pride of ship maintenance & repair.

Furthermore, we, SEA & TEC CO., LTD. think that we have to put more and more spurs to development of new material and reasonable cost reduction under the labor-management conciliation so as to comply with the requirements in the future and not to stop to be satisfied with the customer's expectation but to continue to make out such the products to realize it furthermore to customer emotion, that is just our-SEA & TEC CO., LTD's-way to go forward.

Thank you

President, KWAK, BYUNG-WAN





HISTORY OF SEA&TEC



2010s

- 2014. 06 VERIFICATION ON QUALITY BY ISO 17357-1:2014(LLOYD'S REGISTER QUALITY ASSURANCE)
- 2014. 04 TAKING OUT A PATENT FOR PANAMA CHOCKS COVER
- 2013. 12 TAKING OUT A PATENT FOR RIB TYPE PNEUMATIC FENDER PRODUCTION MOLD AND MANUFACTURE METHOD
- 2013. 11 TAKING OUT A PATENT FOR DESIGN OF RIB TYPE PNEUMATIC FENDER
- 2013. 08 ACQUIREMENT OF ISO 14001:2004(LLOYD'S REGISTER QUALITY ASSURANCE)
- 2013. 01 VERIFICATION ON QUALITY BY ISO 17357:2002(LLOYD'S REGISTER QUALITY ASSURANCE)
- 2011. 11 EXPANSION OF PRODUCTION FACILITY AND A MOVE TO NEW FACTORY



2000s

- 2008. 11 DEVELOPMENT OF A NEW TYPE OF THE PNEUMATIC FENDER AND SET UP A RIB TYPE
- 2008. 10 VERIFICATION ON QUALITY BY ISO 17357:2002 (AMERICAN BUREAU OF SHIPPING)
- 2007. 08 REGISTERED AS A VENTURE COMPANY BY KOREAN TECHNOLOGY FUND
- 2007. 06 ACQUIREMENT OF ISO 9001:2000(LLOYD'S REGISTER QUALITY ASSURANCE)
- 2006. 07 TAKING OUT A PATENT FOR PNEUMATIC FENDER PRODUCTION MOLD AND MANUFACTURE METHOD
- 2006. 06 ESTABLISHMENT OF SEA & TEC CO., LTD.
- 2002. 08 EXPANSION OF PRODUCTION FACILITY AND A MOVE



1990s

- 1994. 05 ESTABLISHMENT OF DAEJIN FENDER SERVICES CORPORATION

CERTIFICATIONS

We Sea&Tec are holding a variety of certificates to convince our clients of quality control and technology development.



9001 영문(UKAS)



14001 영문(UKAS)



ISO14001-Lloyd



ISO17357-1 2014



디자인등록증



특허증영문_1



특허증영문_2



펜더제조방법 특허증1



펜더제조방법 특허증2

PNEUMATIC RUBBER FENDER & ST PNEUMATIC FENDER



OUTSTANDING ADVANTAGE

Safety performance in Reaction Force and Energy Absorption

The purpose of Fender is to absorb the kinetic energy of the ship for protection of hull. In this aspect, SEA & TEC Fender shows off low reaction force and high energy absorption and it makes it possible for fender to perform well under any condition and to protect ships and any mooring facilities.

No deformation under harsh condition

SEA & TEC Fender utilizes the compressibility and elasticity of the air, for this reason, performance deterioration and deformation of external shape due to fatigue are absolutely absent. Especially, ST Fender can withstand low temperature and harsh weather condition.

HEAVY-DUTY RELIABILITY

SEA & TEC Fenders are composed of several rubber layers as well as strong reinforcement cord layer and this enable fender to be extremely resistant to pressure and cutting, other external impact. In addition, Fenders with Dia 2.5 M upward are equipped with safety valves to protect Fender against over pressure by releasing over-pressurized air outward.

SIMPLE INSTALLATION AND REPAIR

Because of superior buoyancy of fender supported by seawater, Fender can be moored to the ships and jetty with guy rope or chain, and even if fender seriously get damaged by ship's hull, It can be easily removed from the quay or jetty and repaired in safe. Thus Maintenance and Repairing cost will be tremendously reduced.

PNEUMATIC FENDER



TYPES OF FENDERS



Sling Type

The purpose of Fender is to absorb the kinetic energy of the ship for protection of hull. In this aspect, SEA & TEC Fender shows off low reaction force and high energy absorption and it makes it possible for fender to perform well under any condition and to protect ships and any mooring facilities.



Chain and Tyre Net Type Fender

For this method of hanging, the fender is secured by a net of wire or chain line to protect the rubber surface body. Net hanging is suitable method for large size fenders. The wire or chain line is covered with rubber sleeves to eliminate paint scratching of the hull or damage to the fender from netting. For fender of extra large size, rubber tires are attached to the nets, or the body of the fender is corapped in a protective cover for more effective preservation.

MAINTENANCE AND STORAGE

Cleaning of Rubber Surface

When not using for a long time, wash the fender surface with fresh water before putting it into storage. Any oil sticking on the rubber surface should be cleaned off with soapsuds.

Control of Internal Pressure

When storing the fender for a long time without use, store after reducing slightly the atmospheric temperature.

Beware of Heat Sources, Grease and Machine Oil

When not in use, try to keep the fender away from heat sources, grease, machine oil and other substances that might damage it.

Recommend not to Direct Exposure to the Sunlight

Keep the fender out of the direct exposure to the sunlight, and store it in a dry and cool place. When that is not possible, just put a cover on it.

DOCK APPLICATION

Floating Type SEA & TEC Pneumatic Rubber Fender Selection Table

The table of calculated energy of each size of ship as against approaching speed is listed under General Information in pages 11. Please find the figure which corresponds to ship size and approaching velocity and, after determining energy absorption, choose the appropriate fender size in the performance on page 8.

Installation Methods (Jetty, Quay and Dolphin Use) Installation Methods

At both ends of the fender' s chain or wire net, first shackles, then swivel joints and then a further shackle should be installed. A guy chain or guy rope is secured to the outer shackle. The swivel joint prevents twisting of the guy.

Equipment

The size of the necessary parts required for installation of the SEA & TEC pneumatic Fender(1000 & over of net hanging type) is to be recommended by our skilled engineers.

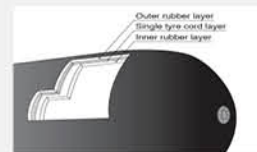


CONSTRUCTION AND ITS COMPONENTS

The main construction components of SEA & TEC pneumatic fender consist of two parts which are fender body and its meta hangers. Basically, there are two types of hangers; 1) direct hanging type, and 2) net hanging type.

Construction of Fender Body

The body of SEA & TEC pneumatic rubber fender consists of 3 layers; an inner rubber layer, a reinforcing cord layer and a rubber outer layer.



Rubber Outer Layer

Thick rubber is adhered externally for the protection of the foundation of pneumatic fender. This is highly resistant to cutting, harsh weather or sea water.



Reinforcing Tire Cord Layer

The foundation uses for its strong nylon fabric and tire cord with rubber. The number of plies of the reinforcement layer is designed so as to ensure sufficient pressure depending on respective circumstances such as the service conditions and the size of the fender.



SIZE AND CHARACTERISTICS

Selection of Size

When selecting the size of fender to be employed, it should be selected so that the kinetic energy of contact between two vessels or between a vessel and berthing facilities may be absorbed by a single fender.

Of course, the best method is to use several small fenders to distribute the contact energy to be absorbed. However, it must be taken account of that simultaneous contact to all fenders does not always take place, and unless one tender is capable of absorbing all contact energy, damage to the fender or to the hull of the ship might result.

Inner Rubber Layer

The inner rubber layer consists of an excellent airtight compound with strong adhesive properties.



Safety Valve

At both ends of the fender's chain or wire net, first shackles, then swivel joints and then a further shackle should be installed. A guy chain or guy rope is secured to the outer shackle. The swivel joint prevents twisting of the guy.



Air Compression & Performance Test

The above components are mold vulcanized as one body under high pressure after they have been assembled. The adhesion is perfect and strong. Furthermore, each product is shipped after confirmation of its pressure-proof by air pressure test.



ST PNEUMATIC FENDER PERFORMANCE TABLE

SPF-50P

INTERNAL INITIAL PRESSURE: 50 kPa

FENDER SIZE	ENERGY ABSORPTION	REACTION FORCE	HULL PRESSURE AT 60% DEF.	SAFETY VALVE PRESSURE SETTING	TESTING PRESSURE
mm(D)xmm(L)	kN-m	kN	kPa	kPa	kPa
300 × 600	0,5	24	134	—	200
500 × 800	4,9	52	130	—	200
500 × 1000	6,3	67	134	—	200
600 × 1000	8,8	78	130	—	200
600 × 1200	10,7	95	132	—	200
700 × 1500	18,7	142	136	—	200
800 × 1200	17,4	116	123	—	200
800 × 1500	23,7	158	132	—	200
1000 × 1500	35,5	189	126	—	200
1000 × 2000	50,1	267	134	—	200
1200 × 1800	59,4	264	123	—	200
1200 × 2000	69,4	308	129	—	200
1200 × 3000	109	482	134	—	200
1350 × 2500	111	439	130	—	200
1500 × 2500	135	479	128	—	200
1500 × 3000	168	596	133	—	200
1500 × 4000	229	815	136	—	200
1700 × 3000	210	658	129	—	200
2000 × 3000	282	752	126	—	200
2000 × 3500	336	896	128	—	200
2000 × 4000	381	1018	132	—	200
2000 × 6000	611	1631	136	—	200
2500 × 4000	660	1409	141	175	250
2500 × 5500	961	2051	149	175	250
2500 × 7200	1308	2793	152	175	250
2500 × 7700	1356	2960	158	175	250
2500 × 9100	1631	3482	153	175	250
3000 × 5000	1136	2021	135	175	250
3300 × 4500	1188	1921	130	175	250
3300 × 5000	1480	2394	134	175	250
3300 × 6000	1650	2669	142	175	250
3300 × 6500	1915	3097	145	175	250
3300 × 8600	2448	4148	155	175	250
3300 × 10600	3338	5398	155	175	250
4500 × 6400	3238	3798	134	175	250
4500 × 7000	3792	4497	143	175	250
4500 × 9000	4960	5883	146	175	250
4500 × 11000	6286	7453	151	175	250
4500 × 12000	6987	8284	154	175	250

SPF-80P

INTERNAL INITIAL PRESSURE: 80 kPa

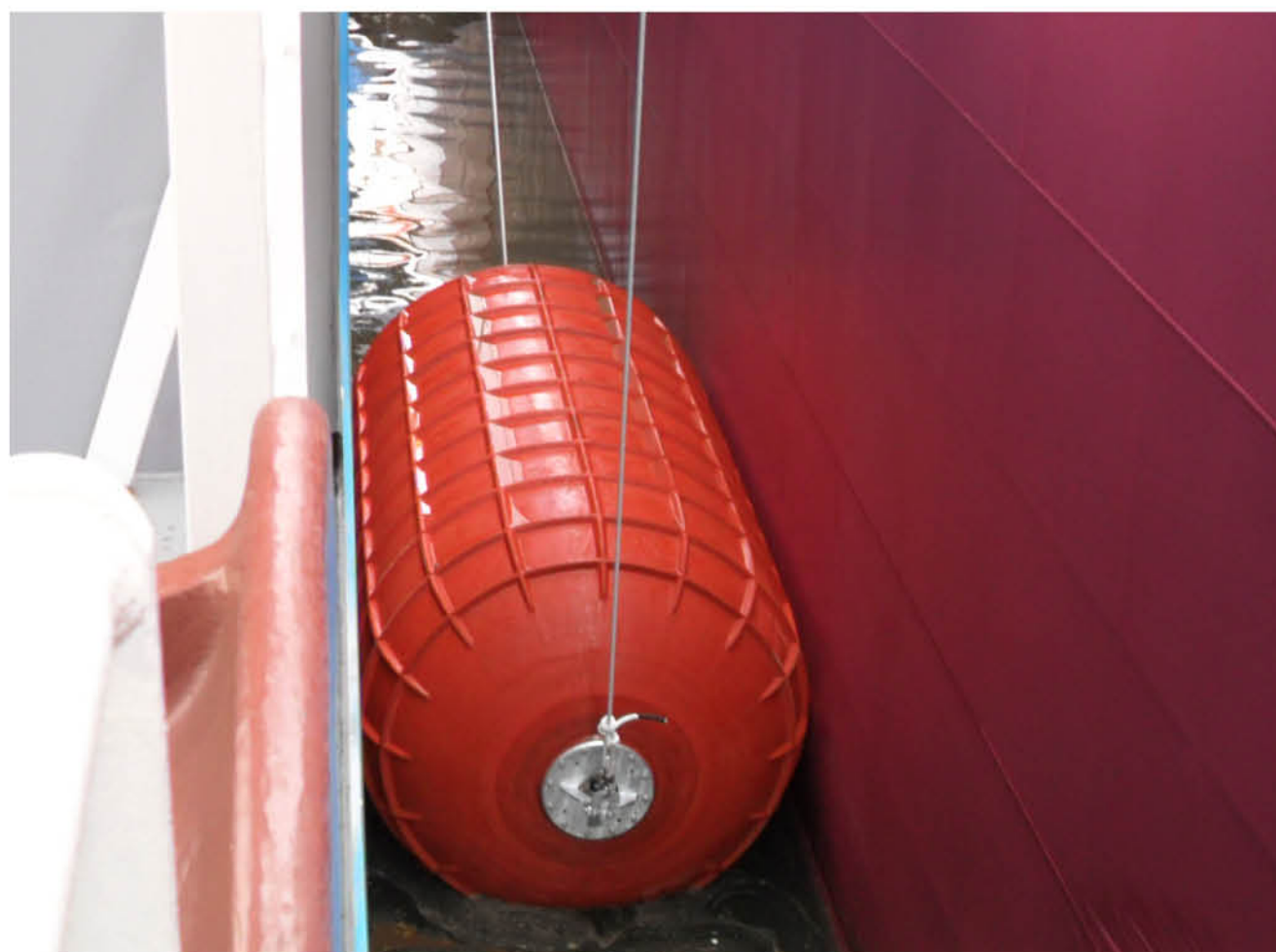
FENDER SIZE	ENERGY ABSORPTION	REACTION FORCE	HULL PRESSURE AT 60% DEF.	SAFETY VALVE PRESSURE SETTING	TESTING PRESSURE
mm(D)xmm(L)	kN-m	kN	kPa	kPa	kPa
300 × 600	0,6	31	173	—	250
500 × 800	6,3	67	168	—	250
500 × 1000	8,2	87	174	—	250
600 × 1000	11,2	100	167	—	250
600 × 1200	13,8	123	171	—	250
700 × 1500	24,1	184	176	—	250
800 × 1200	23,1	154	160	—	250
800 × 1500	30,6	204	170	—	250
1000 × 1500	45,7	244	163	—	250
1000 × 2000	64,7	345	173	—	250
1200 × 1800	77,3	344	160	—	250
1200 × 2000	89,5	398	166	—	250
1200 × 3000	140	623	173	—	250
1350 × 2500	149	572	170	—	250
1500 × 2500	174	620	166	—	250
1500 × 3000	218	776	173	—	250
1500 × 4000	296	1053	176	—	250
1700 × 3000	272	853	168	—	250
2000 × 3000	386	1030	172	—	250
2000 × 3500	440	1174	168	—	250
2000 × 4000	506	1351	174	—	250
2000 × 6000	790	2109	176	—	250
2500 × 4000	931	1831	184	230	300
2500 × 5500	1353	2659	194	230	300
2500 × 7200	1864	3660	203	230	300
2500 × 7700	1887	3888	206	230	300
2500 × 9100	2293	4505	199	230	300
3000 × 5000	1593	2608	174	230	300
3300 × 4500	1673	2491	168	230	300
3300 × 5000	2043	3040	180	230	300
3300 × 6000	2339	3479	185	230	300
3300 × 6500	2707	4029	188	230	300
3300 × 8600	3416	5442	202	230	300
3300 × 10600	4677	6959	199	230	300
4500 × 6400	4520	4986	175	230	300
4500 × 7000	5337	5823	185	230	300
4500 × 9000	6948	7581	188	230	300
4500 × 11000	8828	9632	188	230	300
4500 × 12000	9667	10548	196	230	300



ST RIB FENDER

In the near future, It seems to pretty difficult to get used tyre protecting pneumatic fender and this expensive consumable goods require strong durability and anti-abrasion.

But actually, Fender can be torn by so many risk factors and its original function can not last as many years as we expect, Pneumatic Fender with complete chain and tyre looks securing sufficient durability but easily give damage to the hull, Thus we developed and recommend ST RIB FENDER as more evolved alternative to solve these matters.



ST RIPFENDER PERFORMANCE TABLE

SRP-50P

INTERNAL INITIAL PRESSURE : -50 kPa

FENDER SIZE	ENERGY ABSORPTION	REACTION FORCE	HULL PRESSURE AT 60% DEF.	SAFETY VALVE PRESSURE SETTING	TESTING PRESSURE
mm(D) x mm(L)	kN-m	kN	kPa	kPa	kPa
300 X 600	3.1	33.5	148	—	200
500x1000	6.9	73.7	148	—	200
600x1200	9.4	101	148	—	200
800x1500	24.9	166	145	—	200
1000x1500	39.0	208	139	—	200
1000x2000	55.0	294	147	—	200
1200x2000	76.2	339	142	—	200
1500x2500	148	527	141	—	200
1500x3000	184	656	146	—	200
2000x3500	370	986	141	—	200
2500x4000	726	1550	155	175	250
2500x5500	1057	2256	164	175	250
3300x4500	1306	2113	143	175	250
3300x5500	1628	2633	151	175	250
3300x6500	2106	3406	159	175	250

SRF-80P

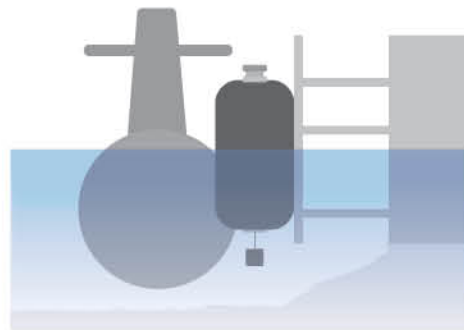
INTERNAL INITIAL PRESSURE : -80 kPa

FENDER SIZE	ENERGY ABSORPTION	REACTION FORCE	HULL PRESSURE AT 60% DEF.	SAFETY VALVE PRESSURE SETTING	TESTING PRESSURE
mm(D) x mm(L)	kN-m	kN	kPa	kPa	kPa
300x600	4.5	47.7	189	—	250
500x1000	9.0	95.4	191	—	250
600x1200	13.0	138	189	—	250
800x1500	32.1	214	186	—	200
1000x1500	50.3	268	179	—	250
1000x2000	71.1	378	189	—	250
1200x2000	98.6	438	180	—	250
1500x2500	193	684	183	—	250
1500x3000	241	857	191	—	250
2000x3500	484	1287	184	—	250
2500x4000	942	2004	201	230	300
2500x5500	1353	2659	194	230	300
3300x4500	1693	2731	184	230	300
3300x5500	2247	3344	192	230	300
3300x6500	2732	4415	206	230	300

ST HYDRO PNEUMATIC FENDER

ST Hydropneumatic Fenders have been designed and developed for submarines and other Navy vessel to protect parts of vessels that are sinking under waterline.

In addition, ST Hydropneumatic Fenders show off stable performance and soft compression during berthing. Considering submarine operation performed under harsh condition, ST Hydropneumatic Fenders are composed of stronger construction than normal fenders in order to withstand heavy load from counter weight, etc.



Technical details for ST HYDRO-PNEUMATIC FENDER

Performance Table for IP50

SIZE X D	INTERNAL PRESSURE	BODY WEIGHT	SAFETY VALVE PRESSURE SETTING	TESTING PRESSURE	Please contact us directly about technical questions on submarine fenders
mm(D) x mm(L)	kPa	Kg	kPa	kPa	
1700×7200	50	940		200	
2000×6000	50	930		200	
2500×5500	50	1300	175	250	
2500×7700	50	1854	175	250	
2500×9100	50	2300	175	250	
3300×6500	50	2200	175	250	
3300×8600	50	3140	175	250	
3300×10600	50	4200	175	250	
4500×9000	50	5000	175	250	
4500×11000	50	5600	175	250	
4500×12000	50	7000	175	250	

Note 1. Weight of the fender body and net torrence $\pm 10\%$
2. Reaction force torrence $\pm 10\%$

Performance Table for IP80

SIZE X D	InitialInternal Pressure	BodyWeight	Safety Valve Pressure Setting	Testing Pressure	Please contact us directly about technical questions on submarine fenders
mm(D) x mm(L)	kPa	Kg	kPa	kPa	
1700×7200	80	1140		250	
2000×6000	80	1100		250	
2500×5500	80	1460	230	300	
2500×7700	80	2030	230	300	
2500×9100	80	2480	230	300	
3300×6500	80	2520	230	300	
3300×8600	80	3350	230	300	
3300×10600	80	4700	230	300	
4500×9000	80	5500	230	300	
4500×11000	80	6100	230	300	
4500×12000	80	7600	230	300	

Note 1. Weight of the fender body and net torrence $\pm 10\%$
2. Reaction force torrence $\pm 10\%$

QUALITY MANAGEMENT



Compression Test to comply with ISO 17357

Compression Test

Parallel Compression Test
Angular Compression Test
Curve-Surface Compression Test
Angular Compression Test

Rubber Specimen Lab Test

Normal Test

Tensile Strength
Elongation
Durometer Hardness(A-type) Static Ozone Aging Test

Heat Aging Test

Tensile Strength
Elongation
Durometer Hardness(A-type) Static Ozone Aging Test

Hydrostatic-Pressure Test

CV TYPE FENDER



CV Fender

CV is the most versatile fender in the world. It is the first fender to be reinforced by an embedded steel plate across the entire bottom of the fender, and the first dynamically stable type fender against outer force in various directions. It is easy in handling and maintaining.

OV TYPE FENDER



OV FENDER

OV Fender is newly designed with 15% increased energy absorption capacity when it is compared to other type of fenders of same size with same rubber grades. With the most suitable structures and shape design, compression capacity has been increased from 45% to 52.5%. It is easy to install and replace because it has simple structure and same anchor bolts holes location as OV. 17% of reaction force have been decreased when OV is compared to existing arch type fenders with same energy absorption capacity.

BC TYPE SHIP FENDER



BP FENDER

Bumper type fender is suitable for protecting port facilities from lateral berthing load. It keeps the damage of fender at minimum due to an unbreakable shape, and has large contact area with vessel hull. It is suitable for gravity type quay.

RC, DC TYPE FENDER

The volumes of energy absorption and reaction force of this fender are greater than those of hollow cylindrical fender. The side for attachment is flat so that it can be secured more firmly than cylindrical fender. The ratio among standard dimensions : height=2, width=2, inside diameter=1.

BC Type fender has no damage to the paint as well as ship hull due to low face pressure and it is adjustable to any variety of shape with the flexibility. It is easy to install the grooved body with simple chain, wire or rope.