

## Rubber Fender:

Rubber Fenders/Rubber Buffers are usually installed on dock or ship, which could absorb collision energy during ships are landing. This will protect both ship and dock.

Normally there are two types of rubber fenders: Solid rubber fender and floating rubber fender. Solid rubber fenders has been used for a long history since it is easily to be made and long time life. Solid fenders include D type rubber fender, GD type rubber fender, DA type rubber fender, CY (Cylindrical) type rubber fender, SC (Super Cell) type rubber fender, CO (Cone) type rubber fender, etc.. Floating rubber fender has a short history but because their good property, now floating fenders are widely used in ship industry. Commonly there are two type floating rubber fender: Pneumatic rubber fender and Filled rubber fender.

In China, at present the standard of solid rubber fender is < HG/T 2866-2003>. The standard of floating rubber fender is < CB-T 3948> and ISO17357:2002 <High pressure Floating pneumatic rubber fenders>

## Pneumatic Rubber Fenders

Pneumatic fenders is a leading anti-collision device for marine application in the world today. This compressed air rubber fender is used as a protective medium. Therefore, pneumatic rubber fenders serves as a protective medium against collision when ship-to-ship contact (STS) and ship-to-berthing (STB). Pneumatic fenders has the advantages of massive energy absorption with low unit surface pressure acted upon the ship. So pneumatic fenders has become an ideal ship protection medium used extensively by large tankers, LPG vessels, ocean platforms, large docks, harbor and wharfs.

### **Application:**

Pneumatic fenders are suitable for many applications including:

- I Tankers, Gas Carriers and Bulk Cargo Ships
- I Fast ferries and aluminum hulled vessels
- I Temporary or permanent installations
- I Rapid response and emergency fendering
- I As stand-off fenders to realign ships with shore facilities



**Specification:**

Pneumatic 50 Fender Technical Performance Table

Normal Size DXL	Initial Pressure 0.5kgf/cm <sup>2</sup> Deflection at 60%			Safety valve pressur e kPa	Testing pressure kPa
	Guaranteed energy absorption		Hull pressur e kPa		
	E.A KN-M(T ON-M)	R.F KN(TON)			
500 x 1000	5.9 (0.6)	64 (6.5)	131	-	147
600 x 1000	7.8 (0.8)	74 (7.5)	125	-	147
700 x 1500	16.7 (1.7)	135 (13.8)	133	-	147
1000 x 1500	31.4 (3.2)	179 (18.3)	121	-	147
1000 x 2000	45.1 (4.6)	255 (26.0)	131	-	147
1200 x 2000	61.8 (6.3)	294 (30.0)	125	-	147
1350 x 2500	100 (10.2)	423 (43.1)	138	-	147
1500 x 2500	110 (11.2)	445 (45.4)	132	-	147
1500 x 3000	151 (15.4)	574 (58.5)	131	-	147
1500 x 4000	159 (16.2)	608 (62.0)	135	-	147
1700 x 3000	189 (19.3)	633 (64.5)	127	-	147
2000 x 3500	304 (31.0)	867 (88.4)	127	-	147
2500 x 4000	654 (67)	1363 (139)	135	175	196
2500 x 5500	932 (95)	2,001 (204)	147	175	196
3000 x 5000	1078 (110)	2038 (208)	140	175	245
3300 x 4500	1,157 (118)	1,863 (190)	129	175	245

## Physical properties of rubber material:

List Item		Outer layer rubber	Inner layer rubber	Test method
Before aging	Tensile strength	Over 18 MPa	Over 10 MPa	ISO 37:1994
	Elongation	Over 400%	Over 400%	ISO 37:1994
	Hardness	Under 70jã	Under 60jã	ISO 7619:1997
After aging (Air oven aging 70jæjÅ1jæ, 96 h)	Tensile strength	Over 80% of the value before aging		ISO 37:1994
	Elongation	Over 80% of the value before aging		ISO 37:1994
	Hardness	Not to exceed the original property by more than 8		ISO 7619:1997
Tear		Over 400 N/m	--	ISO 34-1:1994
Compression set		Under 30% (70jæjÅ1jæ, 22 h)	--	ISO 851:1991
Static ozone aging test		No cracks	--	ISO 1431 -1:1989

Note:

1. The color of the outer cover is black. Other colors are available.
2. Hardness test: Durometer hardness Type A.
3. Static ozone aging test: After elongation by 20% and exposure to 50 pphma at 40jæ for 96 h.

## Testing and quality:

OKIN is very focused on the quality of their product. OKIN has invested in the most equipment for testing in order to meet the customer's demands for high quality. OKIN's fenders are used by customers world wide and they have been tested under rough conditions both in warm and cold climate. The large amounts of satisfied customers are our best references.

## Approved for tough conditions

All fenders are manufactured in accordance with ISO 17357:2002  
Pneumatic fenders can be delivered in various sizes and executions, with tyre and chain net. The fenders are manufactured and tested in accordance with ISO 9001 certification. Performance curves will be delivered upon request for the size you want.

All types of fenders can be delivered with various accessories

This is adapted to the actual fender size and has been constructed to meet the forces that the fenders are constructed. This is an important part of a package delivery for the very best installation.

Any kind of chains, anchor and shackles can be supplied upon to your requirement.

Remark: For more information such as drawings and installing instruction, please email us at [sales@okinrubber.com](mailto:sales@okinrubber.com).