PRO PARTS

PRO-PARTS SIA
MARINE FENDERS and BOLLARDS CATALOGUE

info@pro-parts.net

+371 20440444

CONTENT

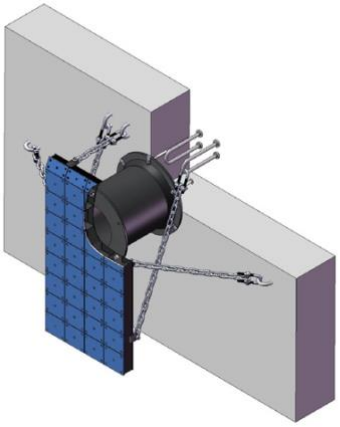
Marine Rubber Fender

1. Super Cell Rubber Fender

Super Cell Fenders have a very long history and remain popular, because of their simplicity, it has high absorption energy per unit weight and low tilt compression performance change among all types of compresses fenders. In the front it is equipped with frontal panel which greatly reduce the face pressure on ship panel and the friction coefficient

Features

- High Performance, Reasonable Structure;
- Can support large panel;
- Easy installation, with long lifespan;
- Large range of performance;

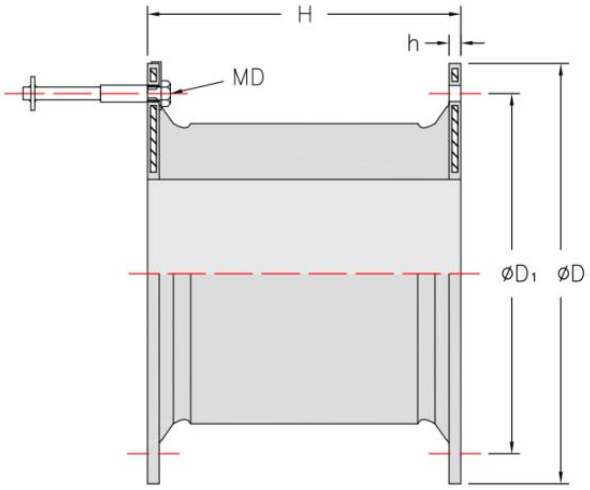


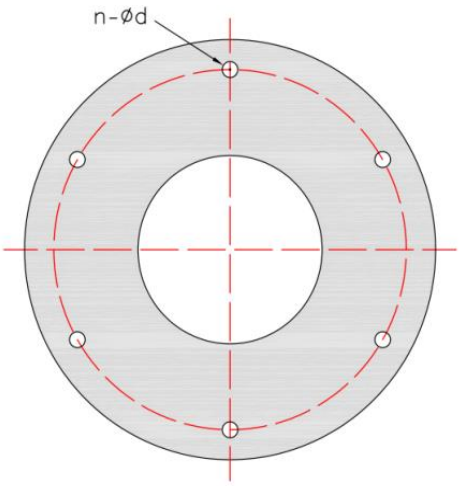
Applications

- General cargo berths;
- Bulk terminals;
- Oil and LNG facilities;
- Container berths;
- Ro-ro and cruise terminals;
- Offshore platforms;
- Multi-user berths;

Specifications

Specifications	H	h	D_1	D	n-ϕd	MD	Reference Weight (kg)
SC500H	500	25	550	650	4-ϕ32	24	111
SC630H	630	30	700	840	4-ϕ39	30	230
SC800	800	30	900	1050	6-ϕ40	32	412
SC1000	1000	35	1100	1300	6-ϕ47	39	825
SC1150	1150	37	1300	1500	6-ϕ50	42	1210
SC1250	1250	40	1450	1650	6-ϕ53	45	1500
SC1450	1450	42	1650	1850	6-ϕ61	52	2310
SC1600	1600	45	1800	2000	8-ϕ61	52	3030
SC1700	1700	50	1900	2100	8-ϕ66	56	3700
SC2000	2000	50	2000	2200	8-ϕ74	64	5260
SC2250	2250	57	2300	2550	10-ϕ74	64	7500
SC2500	2500	70	2700	2950	10-ϕ74	64	10750
SC3000	3000	75	3150	3350	12-ϕ90	76	18500

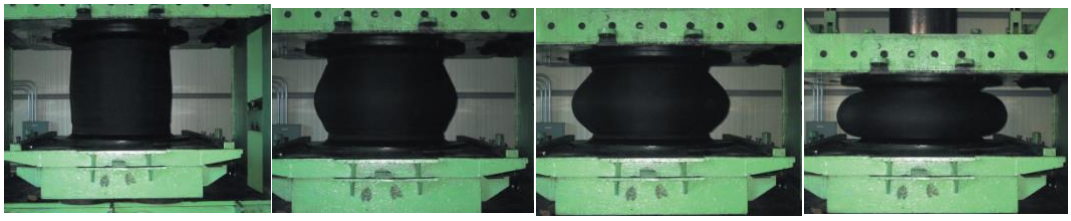




Performance

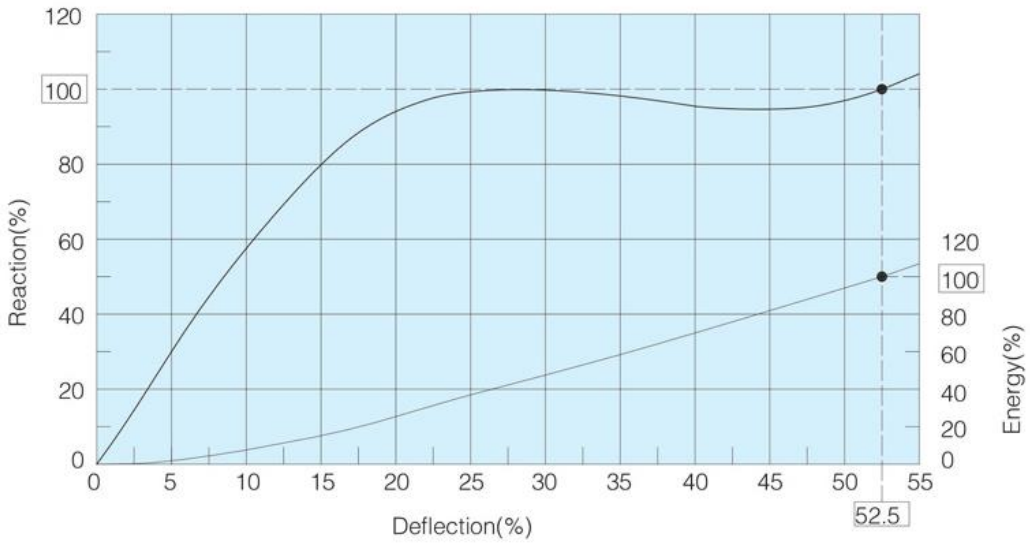
R/F:KN		RL		RO		RH		RS		RE	
E/A:KN-M		52.5%	55%	52.5%	55%	52.5%	55%	52.5%	55%	52.5%	55%
SC500H	R	86	99	108	125	140	160	162	187	182	210
	E	18	19	23	25	30	32	36	38	40	43
SC630H	R	138	147	172	182	224	237	258	274	290	309
	E	38	40	48	50	62	67	72	76	80	85
SC800H	R	211	225	275	292	355	378	412	437	464	493
	E	75	78	98	102	125	132	145	153	163	173
SC1000H	R	349	372	436	463	567	603	655	696	737	784
	E	153	163	195	203	249	264	287	304	324	343
SC1150H	R	462	491	578	614	750	798	865	920	975	1037
	E	233	247	297	309	379	401	437	463	492	521
SC1250H	R	546	581	682	725	886	942	1022	1087	1153	1225
	E	299	316	382	396	486	516	561	594	632	669
SC1450H	R	735	781	918	976	1193	1269	1376	1464	1551	1649
	E	468	495	596	619	760	804	876	928	987	1045
SC1600H	R	894	950	1117	1189	1453	1544	1676	1781	1888	2007
	E	628	665	801	832	1020	1080	1177	1247	1326	1405
SC1700H	R	1009	1073	1262	1342	1640	1743	1892	2012	2131	2266
	E	753	798	960	997	1224	1300	1413	1495	1591	1685
SC2000H	R	1398	1485	1746	1856	2270	2413	2619	2783	2941	3136
	E	1227	1299	1564	1624	1994	2111	2300	2435	2591	2743
SC2250H	R	2085	2216	2454	2607	3188	3390	3679	3911	4145	4406
	E	2060	2180	2472	2566	3150	3336	3628	3848	4095	4337
SC2500H	R	2574	2737	3028	3220	3937	4182	4543	4829	5118	5441
	E	2826	2992	3391	3520	4322	4576	4987	5280	5618	5949
SC3000H	R			3750	4217	4482	5099				
	E			4300	4635	5160	5510				

Note: Tolerance±10%



0% Deflection 15%Deflection 30%Deflection 55%Deflection

Performance Curve



Installation

NO.	Description		Applications	Material
1	Rubber Fender		Absorb ship impact energy to protect dock and vessels	Rubber, SS400
2	Frontal Panel		Distribute reaction forces to provide low hull pressures and cope with large tidal variations	SS400 in JIS G3101; Q235 in GB.T 700-2006; ASTM A36 BS4360-86 Gr. 43A; 1.0037
				SM490 in JIS G3106; Q345B in GB.T 3524-2005 ASTM A633 Gr.50A; 1.0045
3	Face Pads		Reduce friction, protect vessels	UHMW-PE
4	Anchor Accessories	Anchor Nuts	Install fenders to concrete	SS400 in JIS G3101; Q235 in GB.T 700-2006; ASTM A36; BS4360-86 Gr.43A; 1.0037
		Foot board		
		Foot rod		

		Bolts		SS400 in JIS G3101; Q235 in GB.T 700-2006; ASTM A36; BS4360-86 Gr.43A; 1.0037;
		Washers		SUS304/SUS316 in JIS G 4303, 4304; 06Cr19Ni10/06Cr17Ni12Mo2 in GB.T 1220-2007; AISI304/AISI316; BS970 Gr.304/316; 1.4301/1.4401
5	Pad Fixing accessories	Bolts	Install pads onto frontal panel	SUS304/SUS316 in JIS G 4303, 4304; 06Cr19Ni10/06Cr17Ni12Mo2 in GB.T 1220-2007; AISI304/AISI316; BS970 Gr.304/316; 1.4301/1.4401
		Nuts		
		Washers		
6	Panel fixing accessories	Bolts	Assemble fender and panel	SS400 in JIS G3101; Q235 in GB.T 700-2006; ASTM A36; BS4360-86 Gr.43A; 1.0037; SUS304/SUS316 in JIS G 4303, 4304; 06Cr19Ni10/06Cr17Ni12Mo2 in GB.T 1220-2007; AISI304/AISI316; BS970 Gr.304/316; 1.4301/1.4401
		Nuts		
		Washers		
7	Chains	Tensile Chain	Restrict tensions on the fenders	SBC490 in JIS G3105; CM490 GB.T18669-2002;
		Weight Chain	Support the frontal panel in avoid sagging	
		Shear Chain	Prevent fenders system from shear deflection	
8	U-Ring		Holding chains	S25C/S45C in JIS G4051; 25 in GB.T699-1999; ASTM A575 Gr.1025/Gr.1045; BS970 Gr.060A25/45
				SUS304/SUS316 in JIS G 4303, 4304; 06Cr19Ni10/06Cr17Ni12Mo2 in GB.T 1220-2007; AISI304/AISI316; BS970 Gr.304/316; 1.4301/1.4401

2. Super Cone Rubber Fender

Super Cone Rubber Fenders are the 3rd generation product of cell type fender, with more reasonable structure, it is deflection can reach 72.5% to obtain high energy absorption and longer life span. They come in a wide range of standard sizes, can meet multi-berthing conditions.

Features

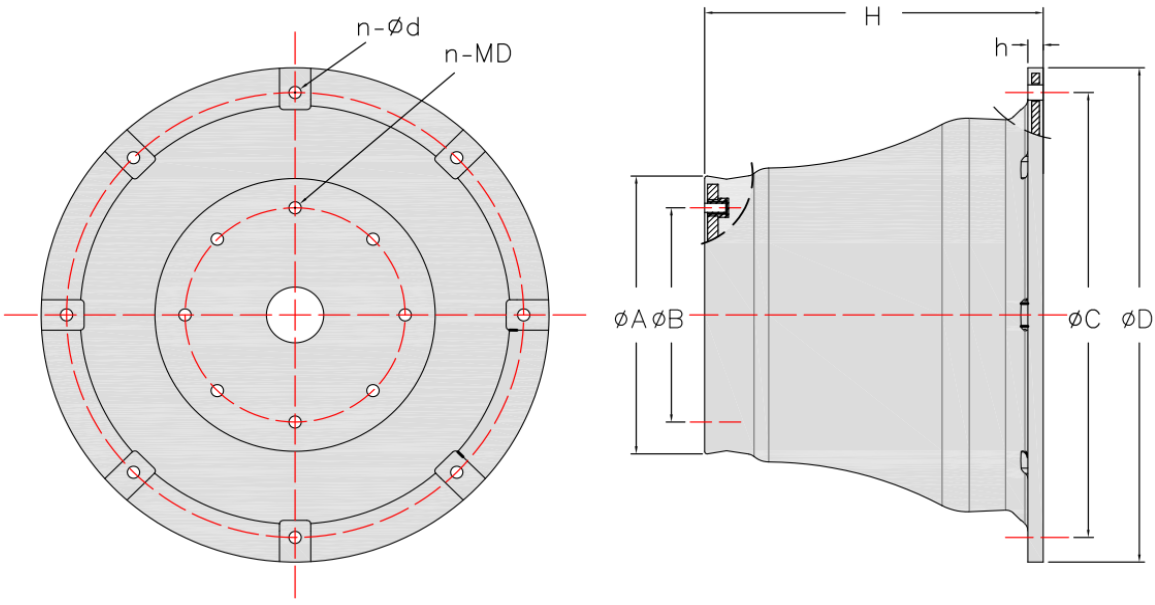
- High Performance;
- Can support large panels;
- Wide range sizes;
- Easy and quick installation;

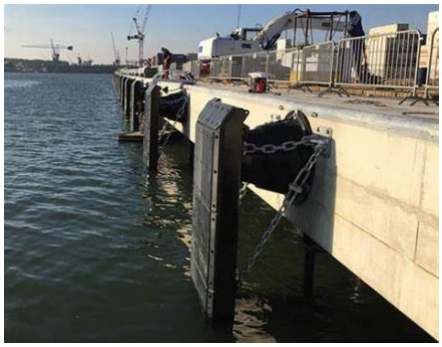
Applications

- General cargo berths;
- Oil and LNG facilities;
- Container terminals;
- Ro-Ro and cruise terminals;
- Bulk terminals;

Specifications

Specifications	H	h	ØA	ØB	ØC	ØD	n	Ød	MD
CT600H	600	27	510	390	810	900	6	30	M24
CT700H	700	32	595	455	945	1050	6	38	M30
CT800H	800	36	680	520	1080	1200	6	44	M36
CT900H	900	41	765	585	1215	1350	6	44	M36
CT1000H	1000	45	850	650	1350	1500	6	50	M42
CT1100H	1100	49.5	935	715	1485	1650	6	50	M42
Ct1150H	1150	52	998	750	1550	1725	6	56	M42
CT1200H	1200	54	1020	780	1620	1800	8	50	M42
CT1300H	1300	58.5	1105	845	1755	1950	8	56	M48
CT1400H	1400	66	1190	930	1890	2100	8	60	M48



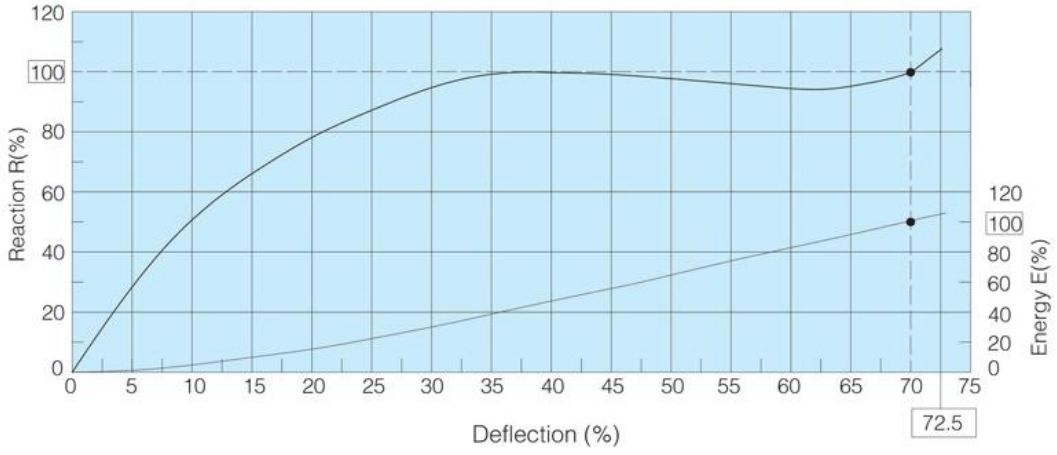


Performance

R/F:KN E/A:KN-M			600H	700H	800H	900H	1000H	1100H	1150H	1200H	1300H	1400H
RS	70%	R(KN)	480	652	862	1078	1339	1430	1632	1746	2125	2255
		E(KN.M)	157	235	368	494	669	830	986	1103	1585	1686
	72.5%	R(KN)	542	691	930	1189	1507	1570	1850	1920	2312	2506
		E(KN.M)	161	243	380	517	735	865	1050	1149	1640	1756
RH	70%	R(KN)	382	522	706	862	1078	1146	1310	1396	1705	1804
		E(KN.M)	127	181	294	399	541	650	785	882	1310	1349
	72.5%	R(KN)	429	568	833	957	1213	1259	1400	1536	1900	2005
		E(KN.M)	129	192	316	431	588	681	835	919	1360	1405
RO	70%	R(KN)	283	384	502	635	784	927	1038	1106	1320	1443
		E(KN.M)	94	150	224	306	437	495	666	705	1043	1079
	72.5%	R(KN)	319	426	576	703	882	1019	1152	1229	1537	1604
		E(KN.M)	104	154	252	334	478	527	717	735	1077	1124
RL	70%	R(KN)	225	308	402	508	628	800	830	890	1125	1150
		E(KN.M)	75	120	179	255	350	408	532	560	750	860
	72.5%	R(KN)	258	341	428	558	698	833	919	979	1200	1278
		E(KN.M)	85	124	208	270	380	432	565	583	800	896

Note: Tolerance±10%

Performance Curve



Installation

NO.	Description		Applications	Material
1	Rubber Fender		Absorb ship impact energy to protect dock and vessels	Rubber, SS400
2	Frontal Panel		Distribute reaction forces to provide low hull pressures and cope with large tidal variations	SS400 in JIS G3101; Q235 in GB.T 700-2006; ASTM A36 BS4360-86 Gr. 43A; 1.0037
				SM490 in JIS G3106; Q345B in GB.T 3524-2005 ASTM A633 Gr.50A; 1.0045
3	Face Pads		Reduce friction, protect vessels	UHMW-PE
4	Anchor Accessories	Anchor Nuts	Install fenders to concrete	SS400 in JIS G3101; Q235 in GB.T 700-2006; ASTM A36; BS4360-86 Gr.43A; 1.0037
		Foot board		
		Foot rod		
		Bolts		SS400 in JIS G3101; Q235 in GB.T 700-2006; ASTM A36; BS4360-86 Gr.43A; 1.0037;
		Washers		
				SUS304/SUS316 in JIS G 4303, 4304; 06Cr19Ni10/06Cr17Ni12Mo2 in GB.T 1220-2007; AISI304/AISI316; BS970 Gr.304/316; 1.4301/1.4401
5	Pad Fixing accessories	Bolts	Install pads onto frontal panel	SUS304/SUS316 in JIS G 4303, 4304; 06Cr19Ni10/06Cr17Ni12Mo2 in GB.T 1220-2007; AISI304/AISI316; BS970 Gr.304/316; 1.4301/1.4401
		Nuts		
		Washers		
6	Panel fixing	Bolts	Assemble fender and panel	SS400 in JIS G3101; Q235 in GB.T 700-2006;
		Nuts		

	accessories	Washers		ASTM A36; BS4360-86 Gr.43A; 1.0037; SUS304/SUS316 in JIS G 4303, 4304; 06Cr19Ni10/06Cr17Ni12Mo2 in GB.T 1220-2007; AISI304/AISI316; BS970 Gr.304/316; 1.4301/1.4401
7	Chains	Tensile Chain	Restrict tensions on the fenders	SBC490 in JIS G3105; CM490 GB.T18669-2002;
		Weight Chain	Support the frontal panel in avoid sagging	
		Shear Chain	Prevent fenders system from shear deflection	
8	U-Ring		Holding chains	S25C/S45C in JIS G4051; 25 in GB.T699-1999; ASTM A575 Gr.1025/Gr.1045; BS970 Gr.060A25/45
				SUS304/SUS316 in JIS G 4303, 4304; 06Cr19Ni10/06Cr17Ni12Mo2 in GB.T 1220-2007; AISI304/AISI316; BS970 Gr.304/316; 1.4301/1.4401

3. Super Arch Rubber Fender

DA-A type Arch Fender

Arch fenders are new generation of V type fenders. Super Arch fenders get bigger compression ratio, higher energy absorption and lower reaction force. Arch fenders are simple and rugged which make them can be used in most severe conditions. Arch fenders can be added with either UHMW-PE face pads or steel panels

Features

- Low reaction force, high energy absorption;
- Strong and hard wearing;
- Excellent shear performance;
- Large range of standard sizes;
- Simple and reasonable structure, long life span;

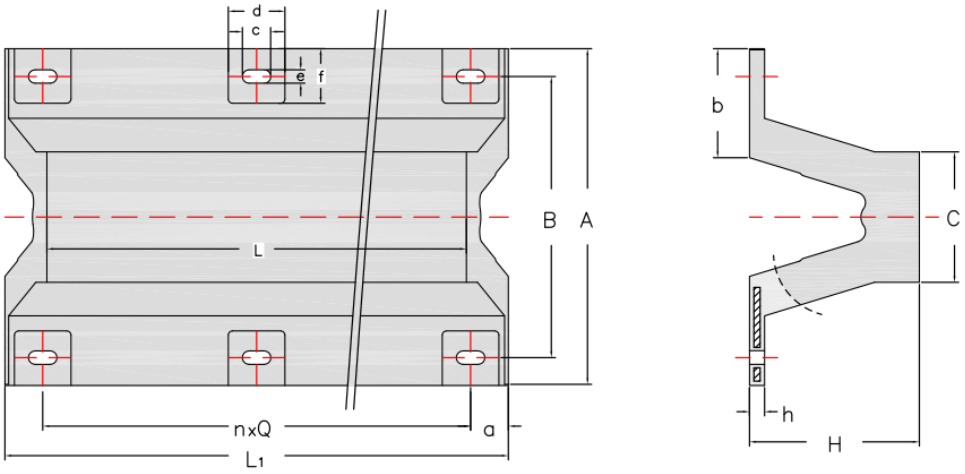
Applications

- RoRo berths;
- General Cargo berths;
- Workboat harbors;
- Barge and tug berths;

Specifications

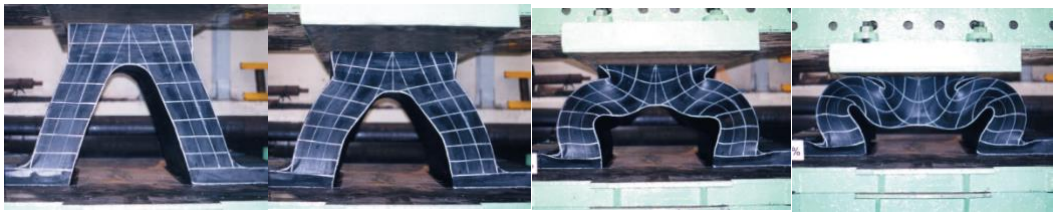
Specification	H	A	B	C	b	h	c	d	e	f	Weight (KG)
DA200H	200	400	320	130	128	30	58	105	29	75	64
DA250	250	500	410	164	160	30	64	125	32	90	86
DA300H	300	600	490	225	195	33	70	140	35	105	129
DA400H	400	800	670	300	260	40	82	165	41	120	210
DA500H	500	1000	840	375	325	45	94	180	47	140	328
DA600H	600	1200	1001	450	390	54	100	195	50	160	486
DA800H	800	1600	1340	600	520	72	136	270	68	260	883
DA1000H	1000	2000	1680	750	650	90	136	290	68	300	1411

[Units:mm]



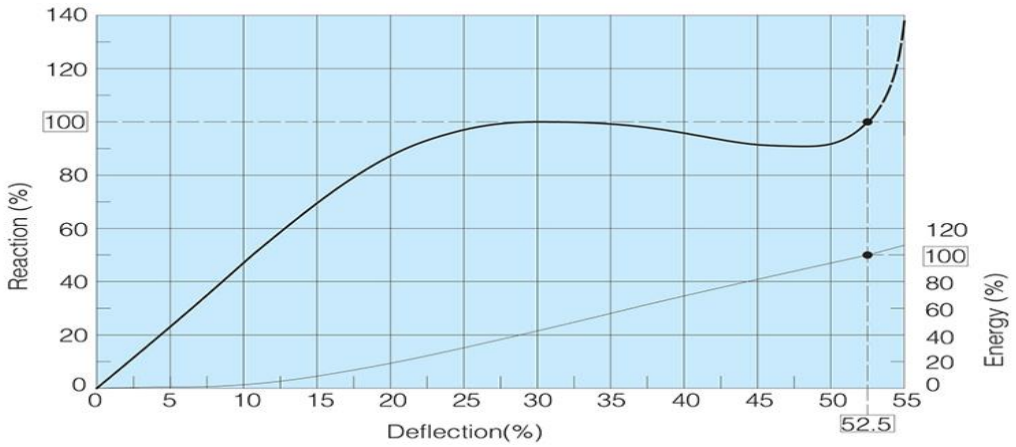
R/F:KN E/A:KN-M			200H	250H	300H	400H	500H	600H	800H	1000H
RS	52.5%	R(KN)	170	270	318	423	529	634	847	1058
		E(KN.M)	11	28	40	72	111	160	284	445
	55%	R(KN)	230	375	441	588	735	881	1176	1470
		E(KN.M)	14	30	43	76	119	172	305	476
RH	52.5%	R(KN)	150	208	244	325	407	488	651	813
		E(KN.M)	10	22	30	55	86	124	219	342
	55%	R(KN)	200	288	339	451	565	678	904	1130
		E(KN.M)	12	23	32	59	91	132	234	367
RO	52.5%	R(KN)	110	172	201	270	337	404	539	675
		E(KN.M)	8	18	25	45	71	102	181	283
	55%	R(KN)	150	239	288	347	468	561	749	937
		E(KN.M)	9	19	26	48	76	109	194	305
RL	52.5%	R(KN)	75	148	174	231	289	347	463	578
		E(KN.M)	5	16	22	39	61	87	156	243
	55%	R(KN)	100	205	241	321	402	482	643	803
		E(KN.M)	6	17	24	42	65	93	167	261

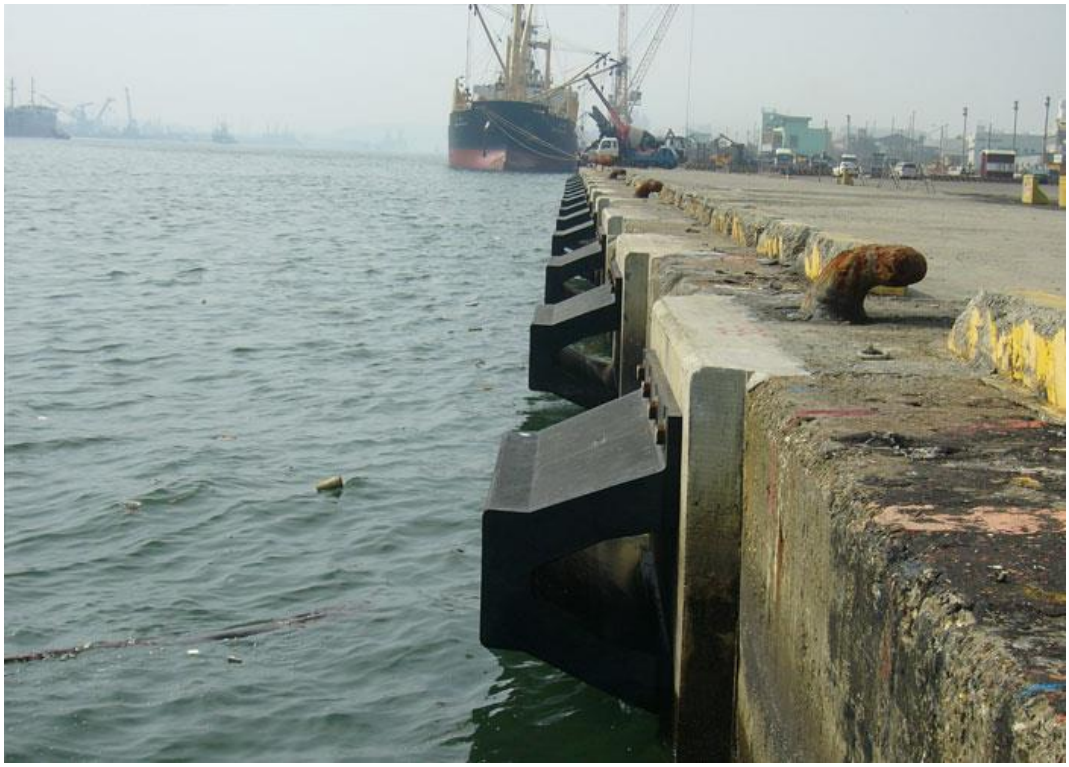
Note: Tolerance ± 10%



0% 15% 30% 52.5%

Performance Curve





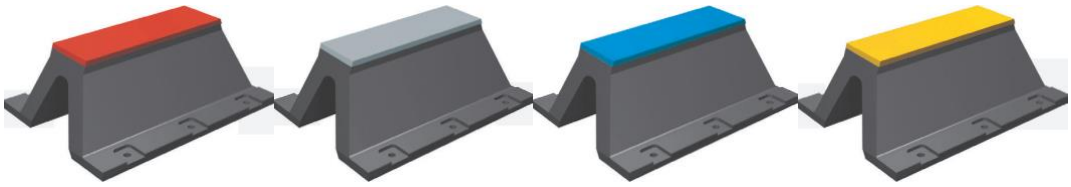
DA-B type Arch fender

DA-B Super Arch fenders are embedded with steel frame and sleeve inside the top part of DA Super Arch Fenders to bolt with frontal panel(bolts with UHMW-PE pad) in order to lessen the friction factor to protect the ship and enhance the fenders life span.

Performance

R/F:KN E/A:KN-M			200H	250H	300H	400H	500H	600H	800H	1000H
RS	50%	R(KN)	241	257	326	413	511	613	831	1015
		E(KN.M)	13	24	35	64	102	133	265	417
RH	50%	R(KN)	196	208	242	316	401	462	621	788
		E(KN.M)	11	19	27	49	78	108	200	312
RO	50%	R(KN)	157	165	200	261	354	386	510	638
		E(KN.M)	8	15	21	41	64	83	150	262
RL	50%	R(KN)	103	144	158	229	269	299	456	539
		E(KN.M)	6	12	16	31	54	71	126	221

Note: Tolerance ±10%



4. D type Rubber Fender

D type Rubber fender manufactured with extruded technical, D type Rubber fender is simple rubber fender profiles, any length could be available for these extruded fenders.

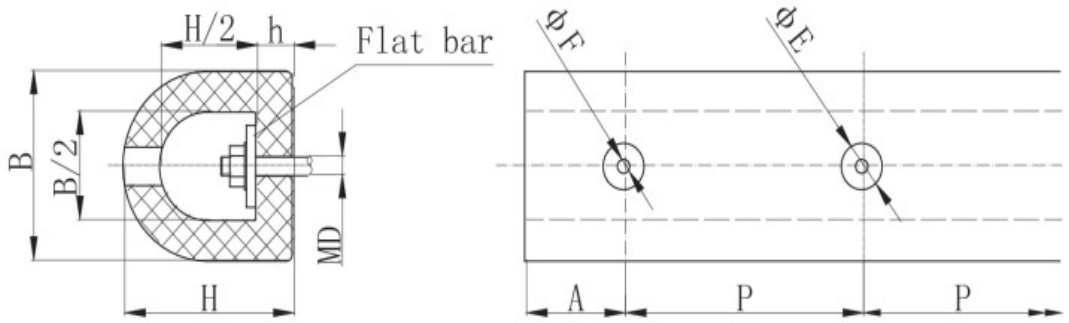
Features

- Simple installation and maintenance;
- Various fixing methods;
- Various length could be available;
- Color with black and gray;

Applications

- Tug and workboats;
- Inland waterways;
- Jetties and wharves for small craft;
- Pontoon protection;

Specifications

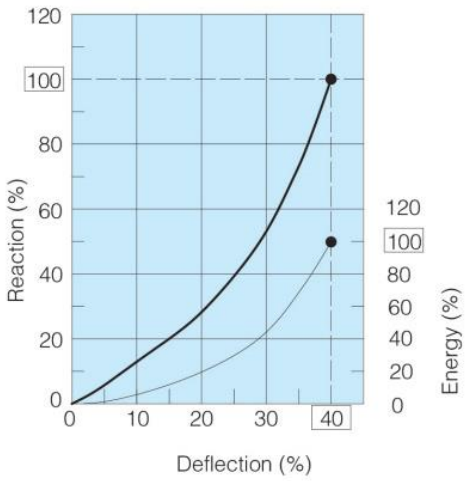


Size	B	H	h	A	P	MD	F	E	Reference weight （kg）
DD100	100	100	30	100~150	400~500	M20	25	60	10
DD150	150	150	35	100~150	400~500	M22	27	60	18.5
DD200	200	200	50	100~150	400~500	M24	30	60	35
DD250	250	250	62.5	100~200	400~500	M27	33	65	55
DD300	300	300	75	100~200	400~600	M30	35	65	78
DD400	400	400	100	100~200	400~600	M36	40	80	140
DD500	500	500	125	100~200	400~600	M42	45	95	218

Performance

R/F:KN E/A:KN-M	Deflection at 40%	
	R(KN)	E(KN.M)
DD100	42	0.8
DD150	75	2
DD200	101	3.6
DD250	126	5.7
DD300	151	8.2
DD400	202	14.5
DD500	252	22.7

Performance Curve



GD Type Rubber Fender

GD Type Rubber Fender is a new one type of fender developed from D type fender, double wing installation, can be used under the most severe conditions.

Features

- Higher reaction force;
- Easy to install and maintenance;
- Simple design;

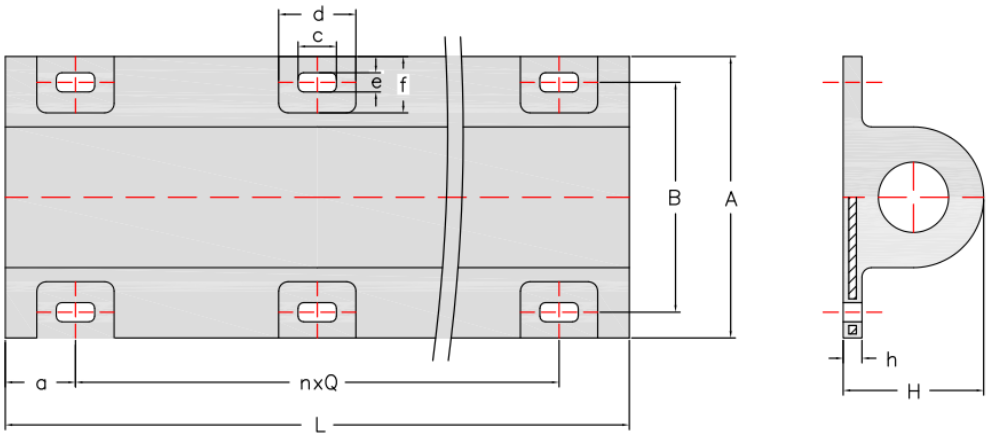
Applications

- Tug and workboats;
- Inland waterways;
- Jetties and wharves for small craft;
- Pontoon protection;

Specifications

	H	A	B	h	c	e	d	f
GD280HX540	280	540	430	40	82	41	165	120
GD300HX540	300	540	430	40	82	41	165	120
GD300HX600	600	600	490	40	82	41	165	120

[Units:mm]



6. Square Rubber Fender

Extruded fenders are simple rubber profiles, usually attached with bolts to the structure. Extrusions can be made in virtually any length then cut and drilled to suit each application.

Features

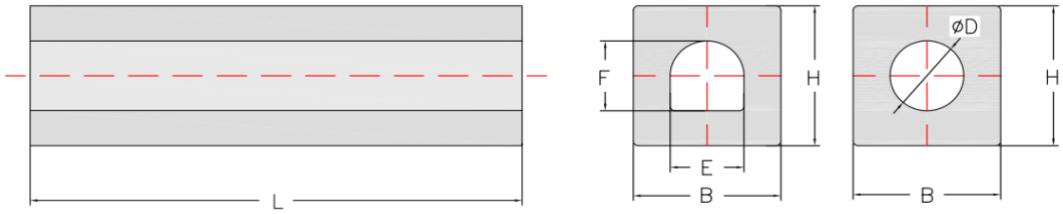
- Higher reaction force;
- Easy to install and maintenance;
- Simple design;

Applications

- Tug and workboats;
- Inland waterways;
- Jetties and wharves for small craft;
- Pontoon protection;

Specifications

Specification	150H	200H	250H	300H	400H	500H
H	150	200	250	300	400	500
B	150	200	250	300	400	500
D	75	100	125	150	200	250
E	75	100	125	150	200	250
F	75	100	125	150	200	250



[Units:mm]

7. W Type Rubber Fender

W type rubber fenders have been developed for use as push-pads for tugboats,and are also ideal for protecting the berthing section of a pontoon or bridge piles.

Features

- Large contact area and very low hull pressures;
- Easy Installation;
- Extreme-duty design;

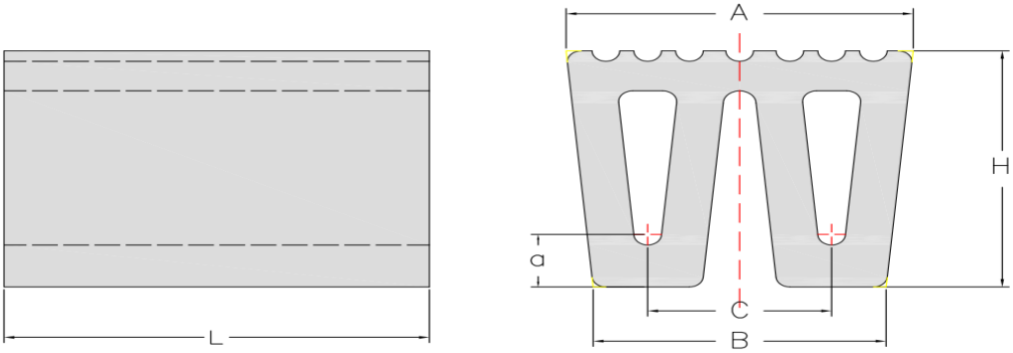
Applications

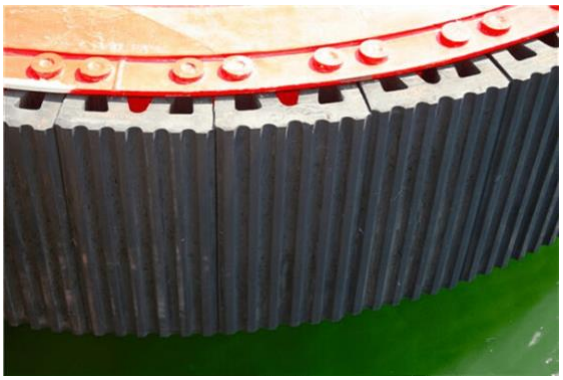
- Large harbour tugs;
- Ocean-going tugs;
- Icebreakers;

Specifications

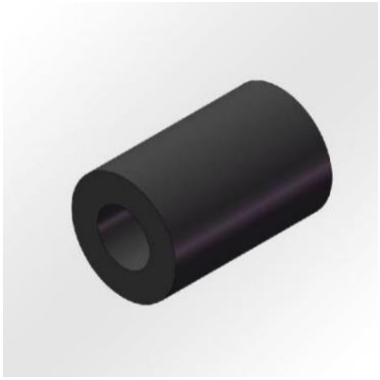
Specification	A	B	C	H	a
480x300	480	420	260	300	65
500x350	500	420	260	350	80
500x450	500	422	265	450	100

[Units:mm]





Cylindrical Rubber Fender



Cylindrical Fenders are simple to install and operate which makes these units an economical solution for remote locations and for multi user berths where vessel types cannot always be predicted.

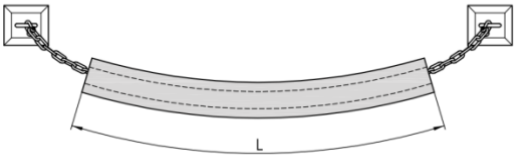
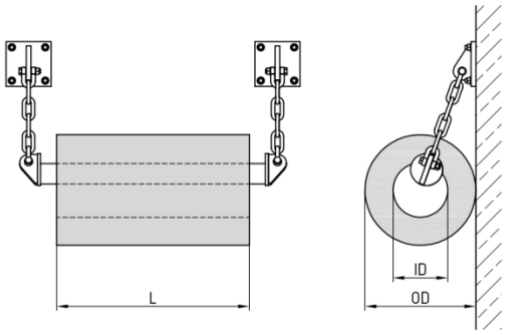
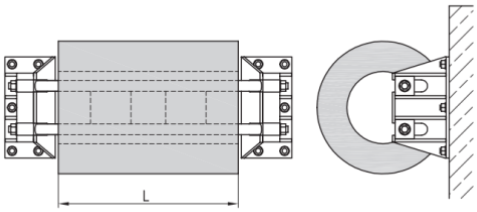
Features

- Simple and economic design
- Easy to install, allowing multiple usage at different berths
- Low reaction, reasonable energy absorption, low hull pressure
- Versatile installation, vertical, horizontal, diagonal

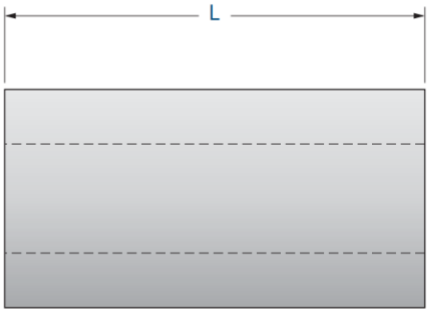
Applications

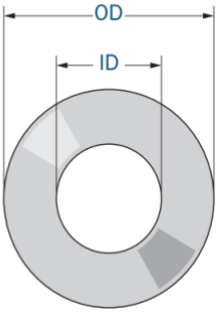
- Bulk cargo berths
- General cargo quays
- Ro-Ro and ferry terminals
- Fishing and workboat berths
- Pontoons and floating structures
- Tug havens

Specifications

Fender size	Dimensions				Typcial Fixing Arrangements
	D(mm)	d(mm)	Max Length (mm)	Approx weight(kg/m)	
CY150 x L	150	75	10000	17.2	
CY200 x L	200	100	10000	29	
CY250 x L	250	125	10000	45.3	
CY300 x L	300	150	10000	65.2	
CY350xL	350	175	10000	94	
CY400 x L	400	200	8000	116	
CY500 x L	500	250	8000	181	
CY600 x L	600	300	3000	255	
CY700 x L	700	350	3000	375	
CY800 x L	800	400	3000	453	
CY900 x L	900	450	3000	620	
CY1000 x L	1000	500	3000	707	
CY1100xL	1100	550	3000	766	
CY1200 x L	1200	600	3000	1018	
CY1300xL	1300	650	3000	1294	
CY1400 x L	1400	700	3000	1386	
CY1500xL	1500	750	3000	1591	
CY1600 x L	1600	800	3000	1810	
CY1700 x L	1700	850	3000	2210	
CY1800xL	1800	900	3000	2480	
CY1900xL	1900	950	3000	2765	
CY2000xL	2000	1000	3000	3063	

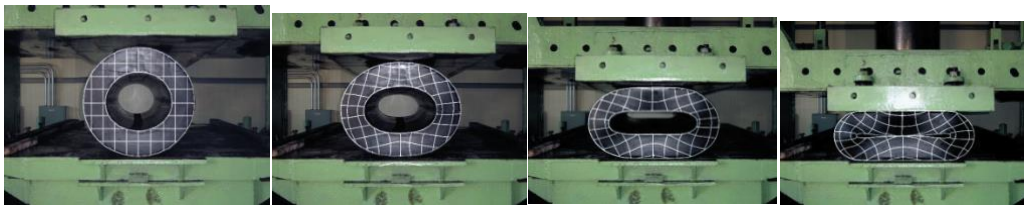
Note:Length are available on requests





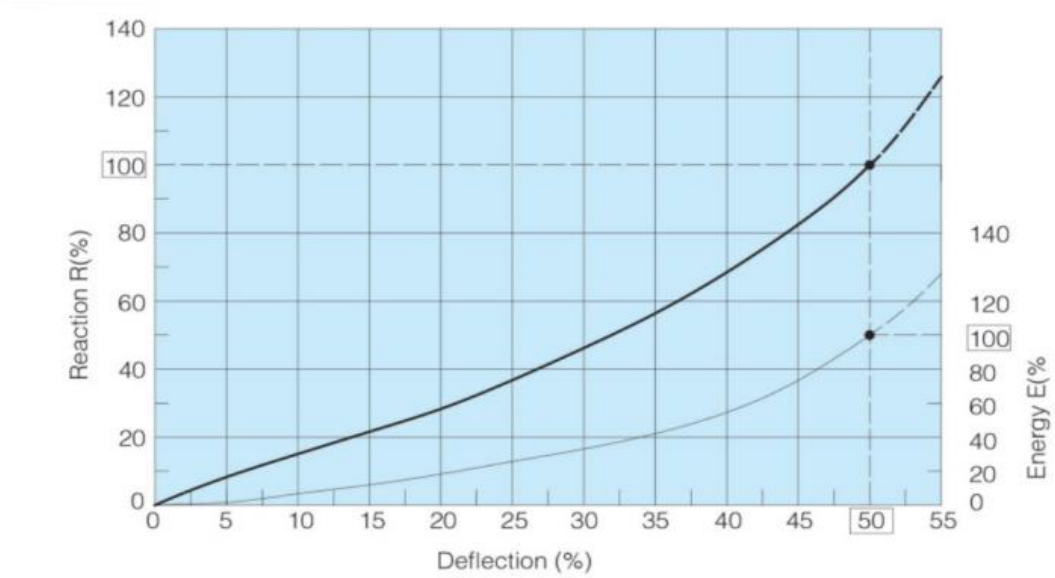
Performance

Fender (mm)	Rate Compression Deformation50%			
	Performance			
	RO		RH	
	R(KN)	E(KN.M)	R(KN)	E(KN.M)
CY150 x 1000	44	1.5	73	2.3
CY200 x 1000	60	2.6	95	4.2
CY250 x 1000	75	4	120	6.5
CY300 x 1000	89	6.0	143	9
CY350 x 1000	104	8	167	13
CY400 x 1000	119	10	191	17
CY500 x 1000	148	16	239	26
CY600 x 1000	179	24	286	37
CY700 x 1000	208	31	334	50
CY800 x 1000	237	41	383	66
CY900 x 1000	268	52	430	84
CY1000 x 1000	297	64	479	103
CY1100 x 1000	331	77	528	129
CY1200 x 1000	363	95	574	152
CY1300 x 1000	392	108	623	179
CY1400 x 1000	422	128	670	208
CY1500 x 1000	451	147	718	238
CY1600 x 1000	481	176	776	282
CY1700 x 1000	511	206	824	338
CY1800 x 1000	541	247	872	406
CY1900 x 1000	570	288	920	487
CY2000 x 1000	653	321	1054	584



0% 15% 30% 50%

Performance Curve



9. Tugboat Rubber Fender

Tugboat fender are installed on tug boats, must work harder, for longer and under more extreme conditions than any other fender type.

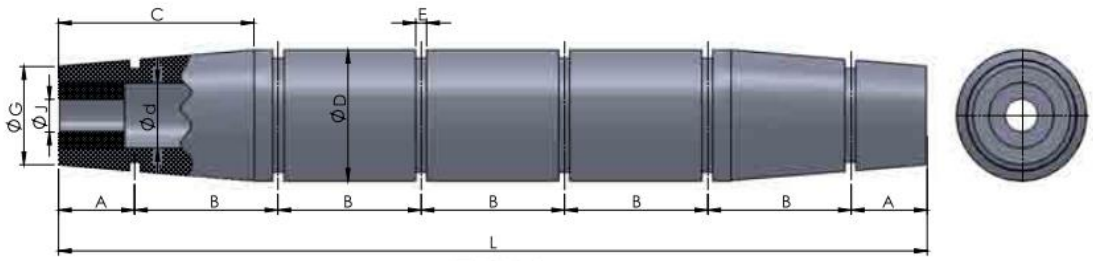
Features

- Simple design and installation;
- Reasonable structure;
- Widely lengths;

Applications

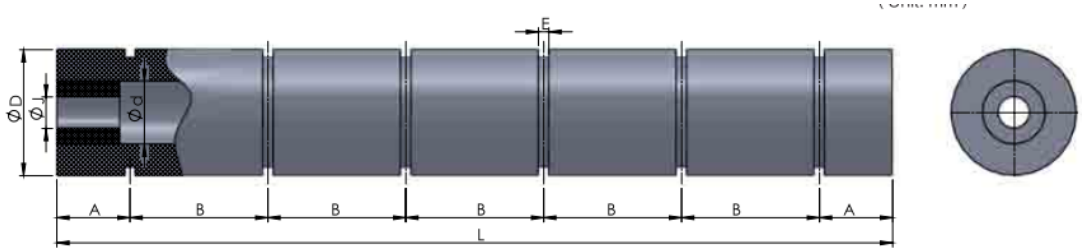
- Tug boat
- Work boat
- Flatboat

Specification



D	d	A	B(Max)	C	G	J
300	150	225	600	700	225	75
400	200	300	670	800	300	100
500	250	300	730	900	375	100
600	300	350	800	900	450	125
800	400	350	930	1000	600	125
900	450	350	1000	1100	675	150
1000	500	350	1000	1200	750	150

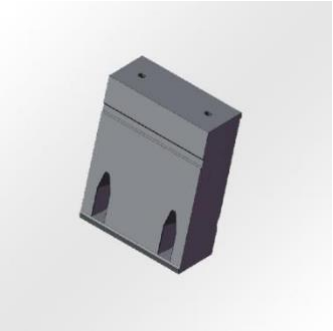
[Unit:mm]



D	d	A	B(Max)	J
300	150	225	600	75
400	200	300	670	100
500	250	300	730	100
600	300	350	800	125
800	400	350	930	125
900	450	350	1000	150
1000	500	350	1000	150

[Unit:mm]

10. ME Rubber Fender



ME Rubber fender with higher energy absorption, with smaller changes in performance under angular compression. The equipped frontal panel can greatly reduce the hull pressure, and the UHMW-PE pad can reduce the shear force during the berthing.

Features

- Low reaction force, high energy absorption;
- Highly efficient shape;
- Various size;

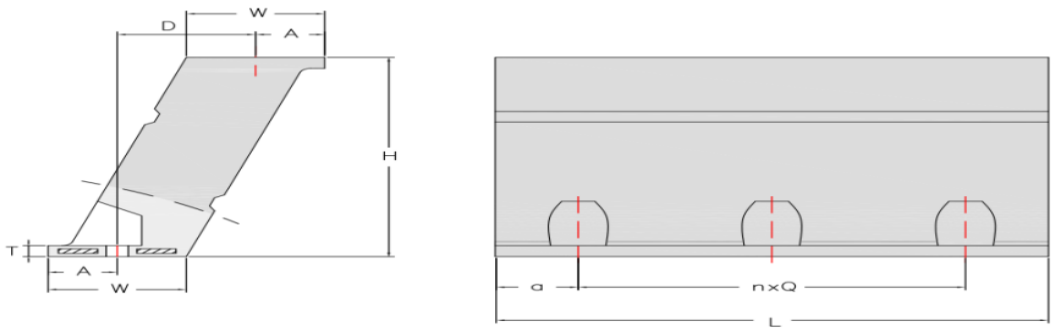
Applications

- RoRo and cruise ship;
- Container terminals;
- Bulk and general cargo berths;
- Tanker berths;

Specifications

Specification	H	A	W	T	D	L	a	Q	n	Bolt
ME300	300	47	94	15	94	2000	250	500	3	M24
ME400	400	63	125	17	124	2000	250	500	3	M24
ME500	500	87	158	20	142	2000	250	500	3	M30
ME550	550	87	172	20	170	2000	250	500	3	M30
ME600	600	87	188	20	199	2000	250	500	3	M30
ME750	750	118	235	26	230	2000	250	500	3	M36
ME800	800	129	250	26	240	2000	250	500	3	M36
ME1000	1000	162	322	31	310	2000	250	500	3	M42
ME1250	1250	202	401	36	388	2000	250	500	3	M48
ME1450	1450	228	454	41	445	2000	250	500	3	M48
ME1600	1600	257	500	50	480	2000	250	500	3	M56

[Unit:mm]

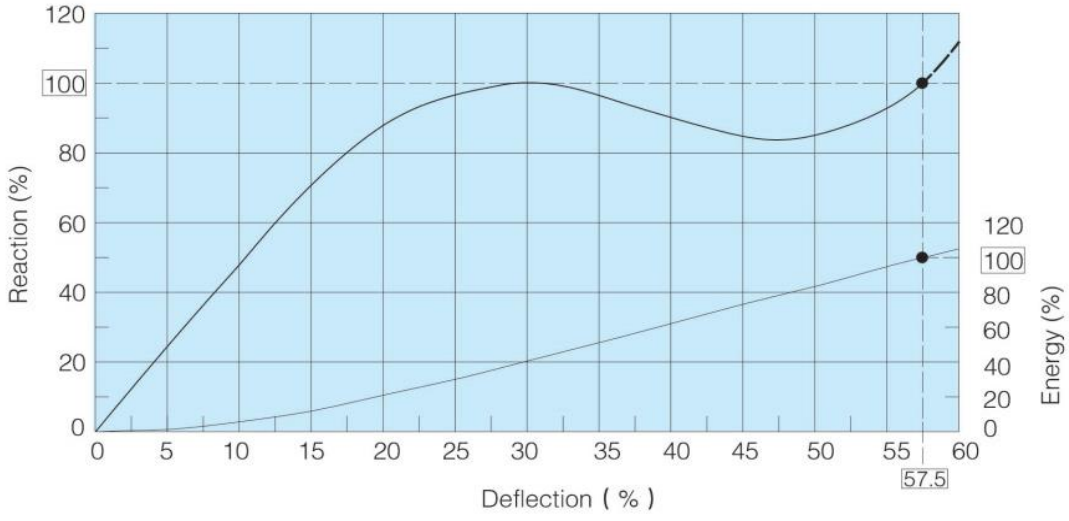


Performance

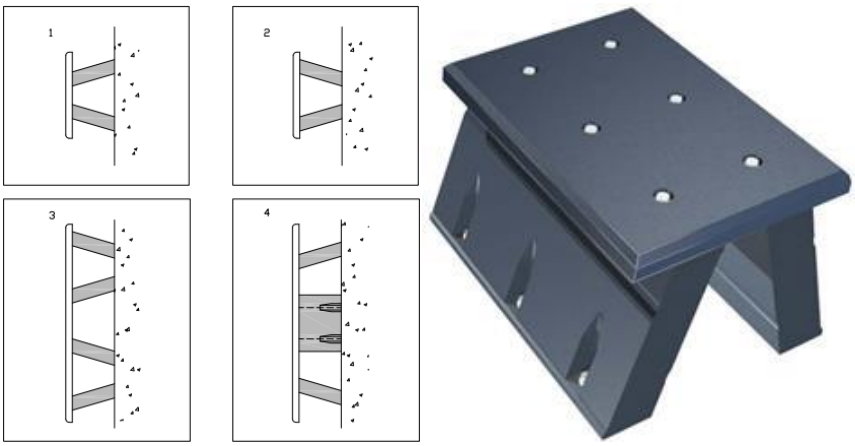
R/F:KN E/A:KN-M			300 H	400 H	500 H	550 H	600H	750 H	800 H	1000 H	1250 H	1450 H	1600 H
RO	57.5 %	R	110	150	187	206	224	282	299	374	467	543	599
		E	15	27	43	52	62	96	110	172	268	361	440
RH	57.5 %	R	161	214	267	294	320	402	428	534	667	775	855
		E	22	39	61	75	89	137	157	245	383	516	628

Note: Tolerance ± 10%

Performance Curve



Fender Combination Type


1
2
3
4


NO.25
NO.40

11. Pneumatic Rubber Fender

Pneumatic fenders are suit for ship-to-wharf and ship-to-ship; Larger size fenders are commonly complied with a chain-tyre net for added protection.

Features

- Safety and Reliability;
- Soft reaction force
- Strong against shearing force;
- Simple and low cost installation;

Applications

- Oil and gas tankers;
- LNG/LPG Loading terminals;
- Fast ferries and aluminium vessels;

Specifications

Size(DiaxL)	Deflection at 60%	
	R(KN)	E(KN.M)
300X500	14	1
400X800	30	3
500X1000	64	6
600X1000	74	8
700X1500	137	17
1000X1500	182	32
1000X2000	257	45
1200X2000	297	63
1350X2500	427	102
1500X3000	579	153
1700X3000	639	191
2000X3500	875	308
2500X4000	1381	663
2500X5500	2019	943

3300X6500	3015	1814
3300X10600	5257	3067
4500X9000	5747	4752
4500X12000	7984	6473

12. Foam Filled Fender

Foam filled fender system is one kind of tough heavyduty floating fenders system for harbor, offshore and ship-to-ship application. Ever-Guard foam fenders are able to absorb 40% more energy than similar sized pneumatic rubber fenders, with relatively gently reaction force as compared to other marine fender systems

Features &Advantages

- High energy absorption and low reaction force
- Wide range of standard and customer size
- Tough, nylon reinforced polyurethane skin
- Unsinkable design even if skin is punctured
- Low Maintenance
- Easy installation
- Burst Resistance
- Colored UV resistant PU skin
- Protective chain and tire net
- Toughest rubber skin is option
- Large standoff distance

Performance

Foam fenders are normally supplied with standard capacity. Low reaction capacity or high capacity is also available upon request.

Foam Grades	Low Reaction	Standard	High Capacity	Extra High Capacity	Super High Capacity
E	LR	STD	HC	EHC	SHC
Ratio	0.6	1.0	1.3	1.9	2.6

Diameter x Length		Standard Capacity Foam Filled Fenders			
Metric	English	Energy Absorption at 60% Compression		Reaction Force at 60% Compression	
(mm)	(ft)	(ft-kips)	(ton-m)	(kip)	(ton)
700x1500	2.3x4.9	19	3	30	13
1000x1500	3.3x4.9	35	5	39	17
1000x2000	3.3x6.5	50	7	57	26
1200x2000	3.9x6.5	67	10	63	28
1350x2500	4.4x8.2	112	16	94	42
1500x3000	4.9x9.8	171	24	130	59
1700x3000	5.6x9.8	208	29	139	63
2000x3500	6.5x11.5	335	47	190	86
2000x4000	6.5x13.1	398	56	226	102
2000x4500	6.5x14.7	460	64	261	118
2500x4000	8.2x13.1	591	82	269	122
2500x5500	8.2x18.0	885	123	402	182
3000x6000	9.8x19.7	1365	189	516	234
3300x4500	10.8x14.7	1105	153	380	172
3300x6500	10.8x21.4	1786	248	614	279

13. Ship Launching Airbag

Air bags are widely used for marine engineering projects ship launching and hauling out.heavy lifting and transportation.ship salvage, etc Those applications are found to be cost-effective and convenient.
Airbag ship launching technology overcomes restrictions of traditional ship launching methods and can enhance the building and repairing capacity of shipyards.After years of development this technology has become into a mature and flexible one Its launching capability reaches 15,000 tonnes light weight.

Specifications

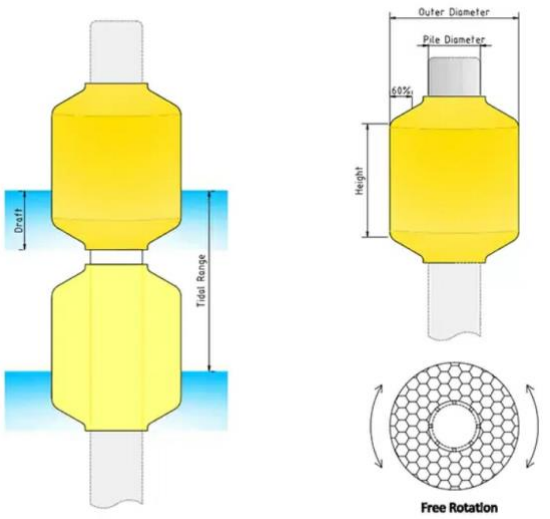
Diameter	Working pressure	Working height	Bearing capacity per unit length	
			KN/m	ton/m
D=1.0m	0.20Mpa	0.6 m	125.76	12.82
		0.5m	157.16	16.02
D=1.2m	0.17Mpa	0.7m	133.61	13.62
		0.6 m	160.3	16.34
D=1.5m	0.13Mpa	0.9 m	122.63	12.5
		0.8 m	143.03	14.58
		0.7 m	163.43	16.66
D =1.8m	0.11 Mpa	1.1 m	120.96	12.33
		1.0m	138.22	14.09
		0.9 m	155.59	15.86
		0.8 m	172.85	17.62
		0.7m	190.22	19.39
D=2.0m	0.10Mpa	1.2m	125.76	12.82
		1.1 m	141.46	14.42
		1.0 m	157.16	16.02
		0.9 m	172.85	17.62
		0.8 m	188.64	19.23

14. Donut Marine Fender

The Donut Fender is a specific type of foam fender. It is designed to simply slip over a stationary monopile and float freely around a pile. This allows the donut fender to maintain the same attitude in the water even where extreme tidal fluctuations occur. So Donut Fenders are an effective solution for simple berthing dolphins, guiding and turning structures.

Specifications

Performance



Outer Dia (mm)	Outer Dia (ft)	Pile Dia (mm)	Pile Dia (ft)	Energy Absorption (kNm)	Reaction Force (KN)	Energy Absorption (ft-kip)	Reaction Force (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
1520	5	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
2030	6.7	1067	3.5	18.6	186	4.2	12.8
2210	7.3	1185	3.9	22.3	204	5	14
2290	7.5	1219	4	23.6	210	5.3	14.4
2490	8.2	1345	4.4	28	229	6.3	15.7
2540	8.3	1372	4.5	29.3	234	6.6	16
2790	9.2	1524	5	35.3	256	7.9	17.6
2970	9.8	1636	5.4	40.1	273	9	18.7
3050	10	1676	5.5	42.1	280	9.5	19.2
3300	10.8	1829	6	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	224
3810	12.5	2134	7	65.9	350	14.8	24
3960	13	2241	7.4	72.1	366	16.2	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

15. Rubber Ladder

Rubber Ladders mainly install vertically on the quay wall functioned both as rubber fender and ladder. It's reliable and easy for installation.

Features

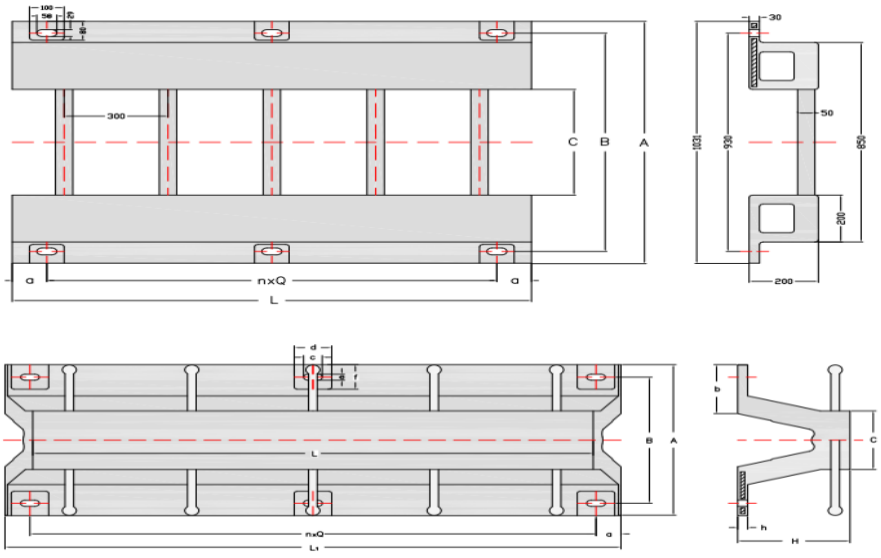
- As the normal ladder;
- Protect the seawall;
- Easy to maintenance;

Application

Any jetties and wharves which the small craft berth.

Specifications

Specification	Height	Length							
H200	200	900	1200	1500	1800	2100	2400	2700	3000
H250	250	900	1200	1500	1800	2100	2400	2700	3000
H300	300	900	1200	1500	1800	2100	2400	2700	3000
H400	400	900	1200	1500	1800	2100	2400	2700	3000



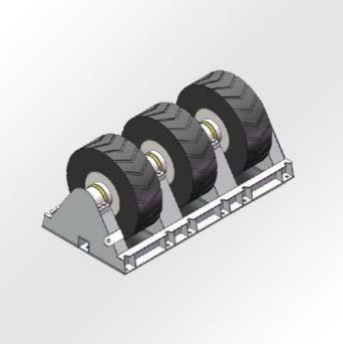
[Unit:mm]

16. Roller/Wheel Fender

Roller/Wheel fenders are widely used on exposed corners to help ships manoeuvre into berths and narrow channels such as locks and dry-dock entrances.

Features

- Low rolling resistance;
- Low maintenance cost;
- Use single or multiple stacks;



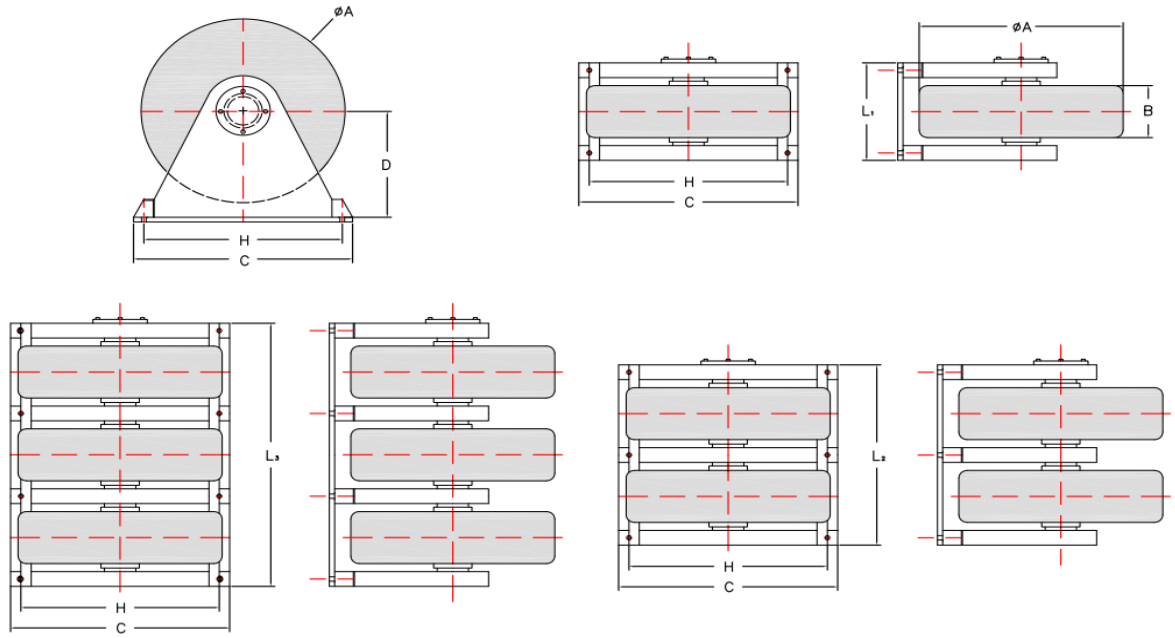
Applications

- Dry-dock entrances and walls;
- Lock approaches;
- Exposed corners;

Specifications

Type A

AxB(MM)	Z_1							Z_2		Z_3	
	A	B	C	D	L_1	H	Weight	L_2	Weight	L_3	Weight
600X200	600	200	695	320	420	620	127	770	245	1120	365
750X250	750	250	870	400	510	775	249	935	501	1360	735
900X300	900	300	1040	480	610	930	465	1120	878	1630	1291
1200X400	1200	400	1380	640	820	1240	1045	1500	2041	2180	3005
1500X500	1500	500	1740	800	1010	1550	2011	1850	3915	2690	5784
1800X600	1800	600	2080	960	1210	1860	3441	2215	6701	3220	9891
2100X700	2100	700	2440	1155	1410	2205	5610	2590	10925	3770	15895
2400X800	2400	800	2770	1280	1610	2480	8115	2950	15701	4290	23300



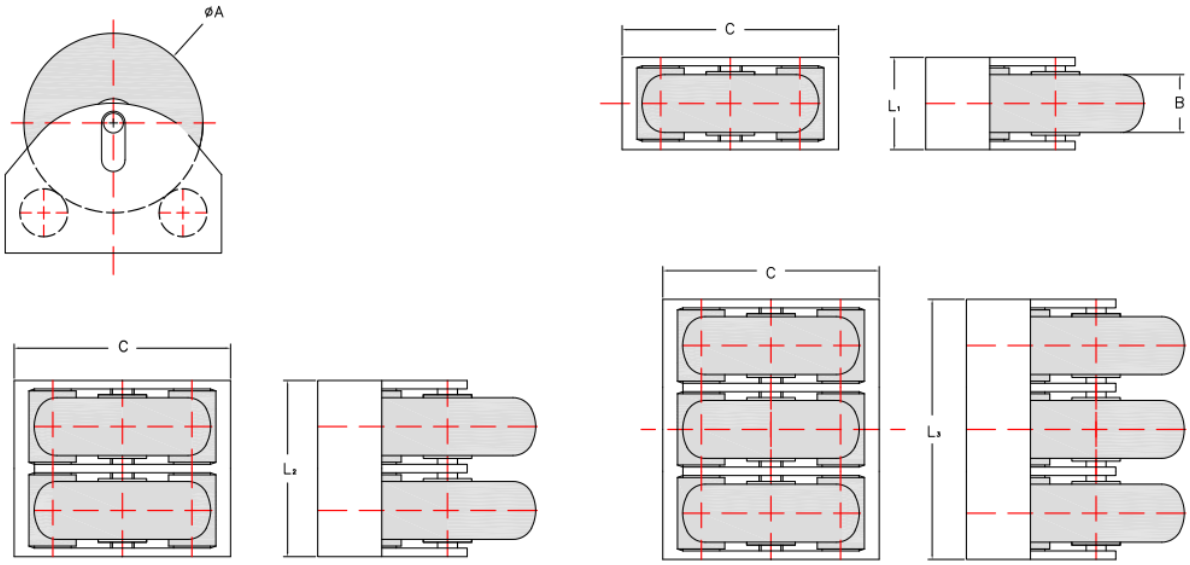
Performance

AXB(mm)	Max.Deflection (mm)	Z_1		Z_2		Z_3	
		Reaction Force KN	Energy Absorption KN.M	Reaction Force KN	Energy Absorption KN.M	Reaction Force KN	Energy Absorption KN.M
600x200	125	67	2	134	5	202	7
750x250	159	105	5	210	9	315	14
930x300	185	151	8	302	16	453	24
1200x400	260	269	19	539	39	814	58
1500x500	325	419	38	843	76	1264	113
1800x600	390	608	65	1215	130	1823	196
2100x700	455	823	102	1647	204	2470	306
2400x800	510	1108	140	2156	280	3234	420

Note: Tolerance:±10%

Type B

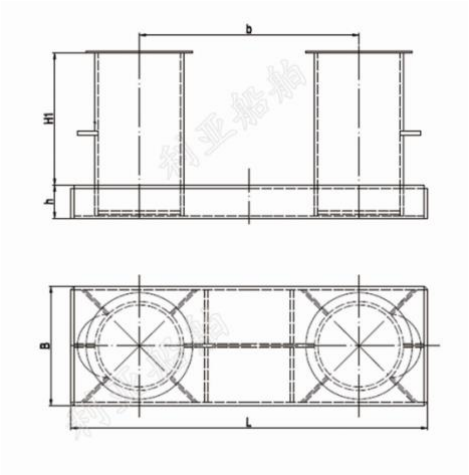
AXB(mm)	Max.Deflection (mm)	Z_1		Z_2		Z_3	
		Reaction Force KN	Energy Absorption KN.M	Reaction Force KN	Energy Absorption KN.M	Reaction Force KN	Energy Absorption KN.M
1200x400	431	248	48	496	96	744	144
1500x500	541	388	94	776	187	1166	281
1800x600	650	559	162	117	323	1676	485
2100x700	762	761	257	1519	514	2283	770
2400x800	851	990	383	1980	766	2969	1147



Note: Tolerance:±10%

Mooring Bollard

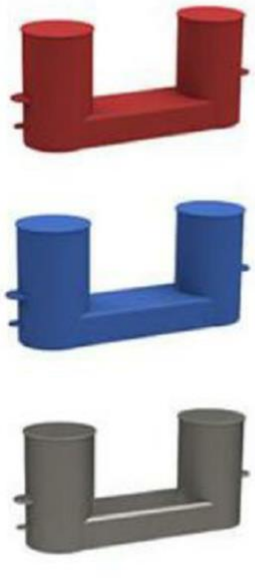
1. ISO 3913 Double Bollard

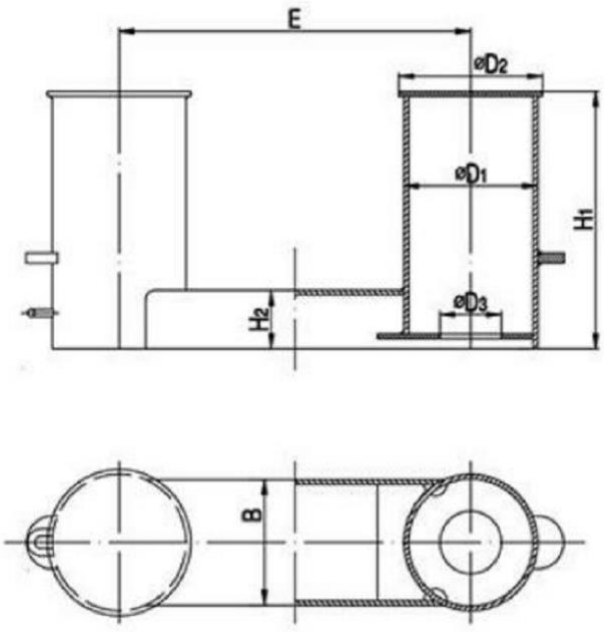


Nominal diameter	D	H1	b	B	L	h	Reference calculated mass(kg)	Max breaking load of applicable rope					Manila and sisal fibre ropes	Synthetic fibre rope
								P (KN)	Wire rope					
									NO.2	NO.4	NO.5	NO.6		
100	114	150	250	165	445	50	18.9	29	9	8	8	6.3	20	14
125	139	190	315	195	540	60	29.4	39	10	9	9	8	24	18
160	165	250	400	225	670	70	44.7	49	11.2	10	10	10	28	20
200	216	300	500	290	860	85	79.5	78	14	12.5	12.5	12.5	36	26
250	267	380	630	360	1065	100	139	118	18	16	16	14		30
315	318	480	800	430	1300	125	261	196	22.4	20	20	20	55	39
355	355	530	890	480	1475	145	361	255	25	22.4	22.4	22.4	65	45
400	406	600	1000	550	1630	160	502	314	30	25	25	25	75	53
450	457	680	1130	620	1840	170	685	382	33.5	28	30	28	80	56
500	508	750	1250	690	2040	190	911	451	35.5	31.5	31.5	30	90	64
560	558	830	1380	750	2240	210	1208	549	40	33.5	35.5	33.5	100	70
630	609	940	1570	820	2510	225	1601	686		37.5	40	35.5	110	77
710	711	1050	1750	960	2840	260	2252	804		40	42.5	40	120	84
800	812	1200	2000	1100	3240	295	3071	981		45	47.5	42.5		

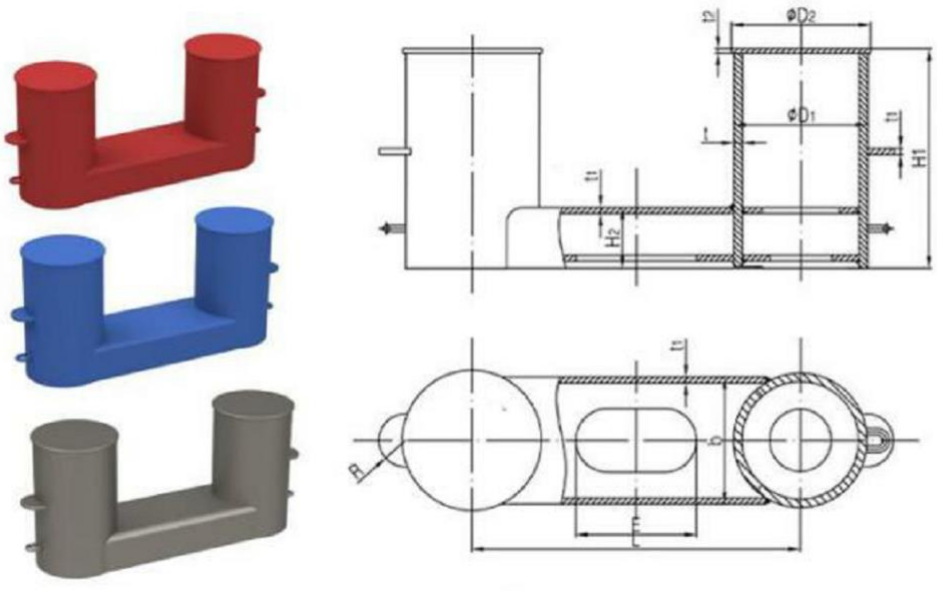
2. DIN 82607 Double Bollard

Item No.	SWL (KN)	Dimensions(mm)							Mass (KG)
		B	E	D1	D2	D3	H1	H2	
1	10	130	430	139.7	160		370	105	21
2	20	180	570	193.7	215		470	115	53
3	30	250	700	273	300		570	135	100
5	50	300	880	323.9	355	150	670	150	155
8	80	330	1050	355.6	390	170	780	175	265
12	120	420	1200	457	490	210	860	195	465
20	200	470	1350	508	545	235	970	230	650
32	320	530	1400	559	600	235	1000	270	765
45	450	620	1500	660	700	310	1200	320	1290
57	570	660	1600	711	750	400	1250	350	1610

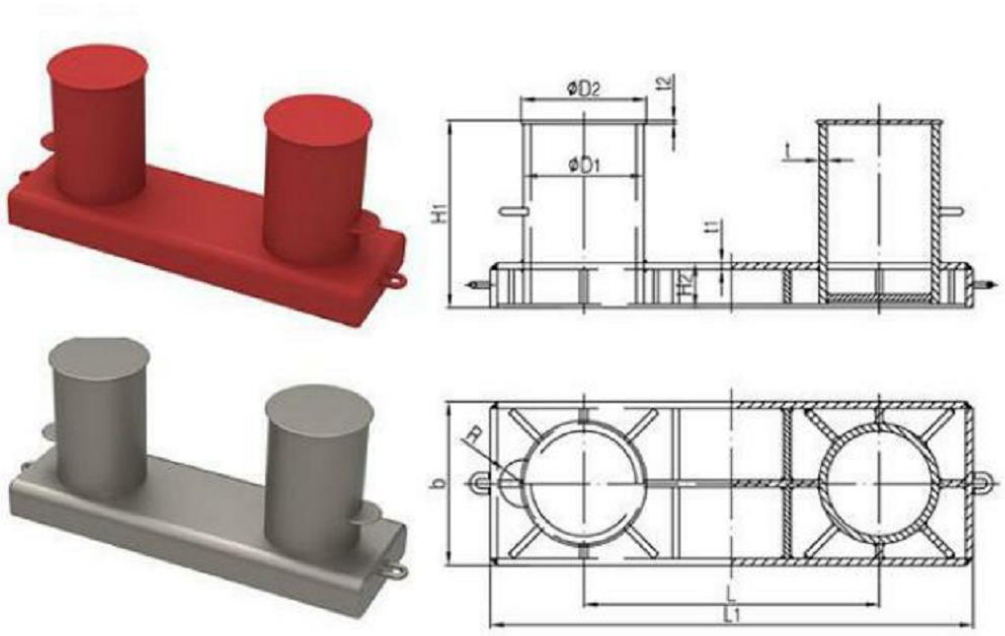




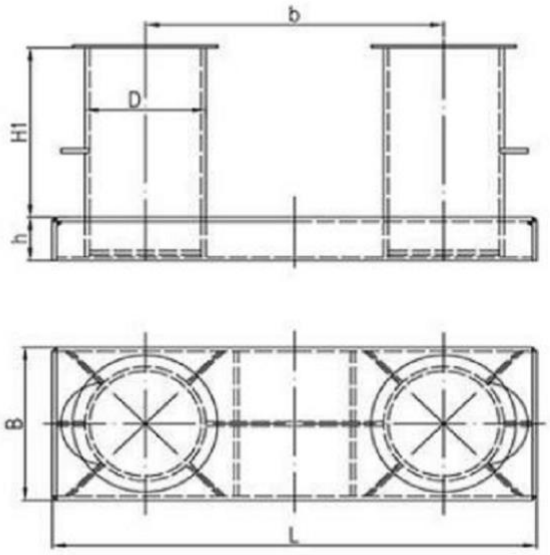
3. ISO 13795 Double Bollard(Type A)



4. ISO 13795 Double Bollard(Type B)

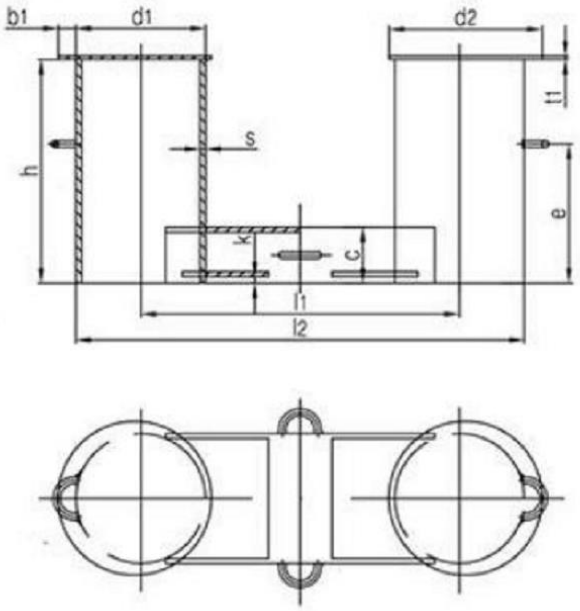


5. JIS F2001 Double Bollard



Nominal diameter	D	H1	b	B	L	h	Reference calculated mass(kg)	Max breaking load of applicable rope					Manila and sisal fibre ropes	Synthetic fibre rope
								P (KN)	Wire rope					
									NO.2	NO.4	NO.5	NO.6		
100	114	150	250	165	445	50	18.9	29	9	8	8	6.3	20	14
125	139	190	315	195	540	60	29.4	39	10	9	9	8	24	18
160	165	250	400	225	670	70	44.7	49	11.2	10	10	10	28	20
200	216	300	500	290	860	85	79.5	78	14	12.5	12.5	12.5	36	26
250	267	380	630	360	1065	100	139	118	18	16	16	14		30
315	318	480	800	430	1300	125	261	196	22.4	20	20	20	55	39
355	355	530	890	480	1475	145	361	255	25	22.4	22.4	22.4	65	45
400	406	600	1000	550	1630	160	502	314	30	25	25	25	75	53
450	457	680	1130	620	1840	170	685	382	33.5	28	30	28	80	56
500	508	750	1250	690	2040	190	911	451	35.5	31.5	31.5	30	90	64
560	558	830	1380	750	2240	210	1208	549	40	33.5	35.5	33.5	100	70
630	609	940	1570	820	2510	225	1601	686		37.5	40	35.5	110	77
710	711	1050	1750	960	2840	260	2252	804		40	42.5	40	120	84
800	812	1200	2000	1100	3240	295	3071	981		45	47.5	42.5		

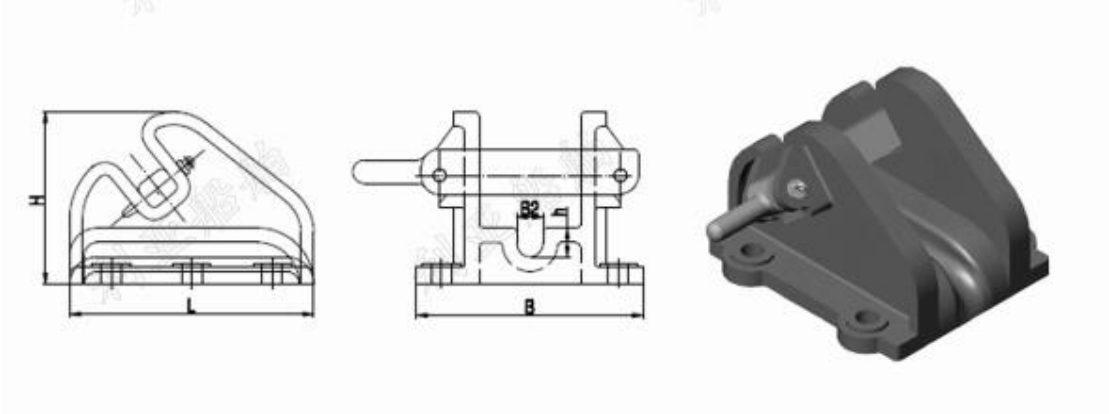
6. NS2584 Double Bollard



Normal Size Dn	d1xs		Dimension									SWL		Weight KG
	Tube	Plate	d2	b1	h	l1	l2	e	c	t1	k	Mooring KN	Towing KN	
125	139.7*10	140*10	170	20	250	315	455	165	80	6	15	45	130	26
160	168.3*10	168*10	200	24	300	400	568	195	90	6	15	55	155	38
200	219.1*12.5	219*12	260	32	400	500	719	250	100	6	15	100	285	75
250	273*12.5	273*12	330	40	500	630	903	315	125	10	15	130	365	124
315	323.9*16	324*16	390	48	600	800	1124	375	150	10	20	205	540	230
400	406.4*17.5	406*16	480	56	700	1000	1406	435	175	10	20	280	740	356
500	508*25	508*12	600	72	830	1250	1758	515	200	12	25	510	1300	723
630	610*25	610*22	720	88	1000	1570	2180	615	225	16	25	615	1550	1084
710	711*28	711*25	830	96	1100	1750	2461	675	250	16	25	815	2150	1532

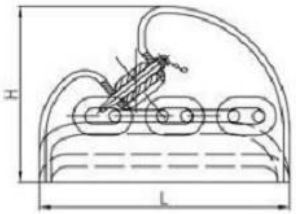
7. Cable Stopper

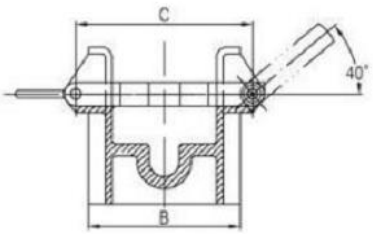
7.1JIS F2002 Casting Bar type chain cable stopper(Bolt Mouting)

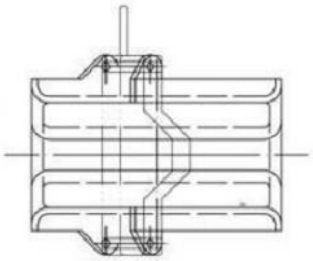


Nominal NO.	Cable Dia.	B	H	L	h	B2	Reference calculated mass(kg)
19	17-19	195	190	270	32	32	22
22	20-22	215	216	310	37	38	31
25	23-25	240	241	345	43	43	44
28	26-28	265	270	385	48	49	58
32	30-32	305	305	435	54	55	89
36	34-36	340	342	490	61	61	122
40	38-40	370	378	540	68	65	160
44	42-44	405	412	590	75	72	208
48	46-48	440	450	640	82	78	272
52	50-52	470	491	695	88	85	338
56	54-56	495	522	745	95	92	414
60	58-60	530	564	795	102	98	505
64	62-64	565	600	850	109	104	618
68	66-68	590	635	900	116	110	737

7.2JIS F2015-87 Casting Bar Type Chain Stopper

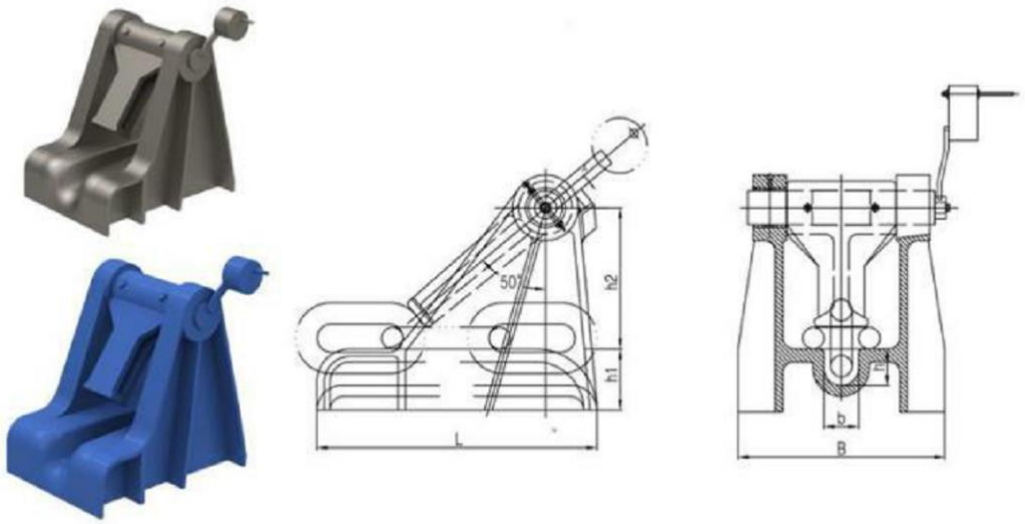






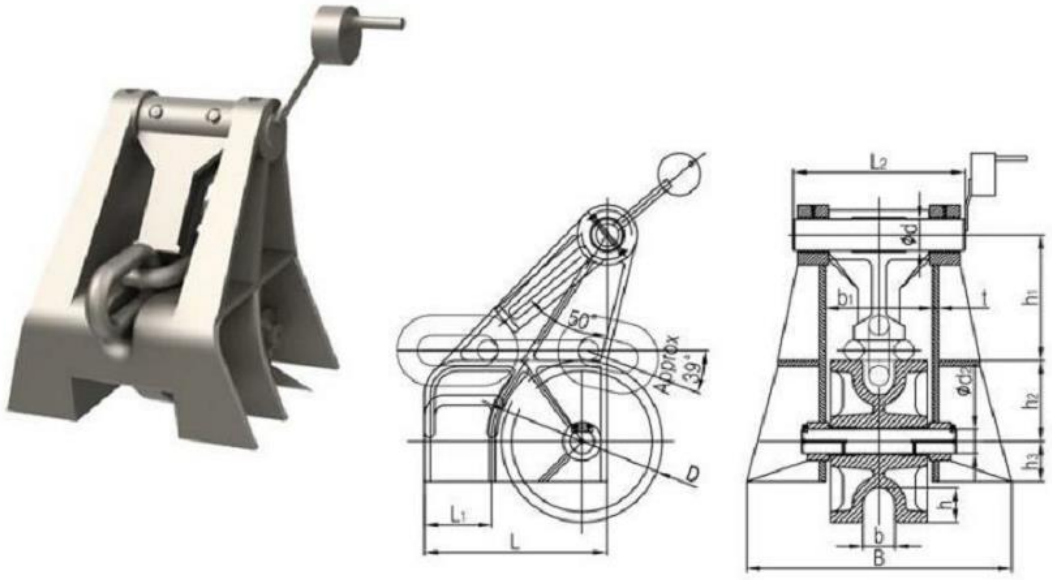
	38-40	42-44	46-48	50-52	54-56	58-60	62-64	66-68	70-73	76-78
L	540	590	640	695	745	795	850	900	960	1020
H	378	412	450	491	528	564	600	635	675	715
B	336	366	397	428	457	488	517	547	582	617
C	390	424	460	494	530	564	600	636	678	720
Mass(KG)	111	139	176	216	261	319	396	482	608	739

7.3JIS F2031 Cast Steel Pawl Type Chain Cable Stoppers for Grade 3 chain Cable



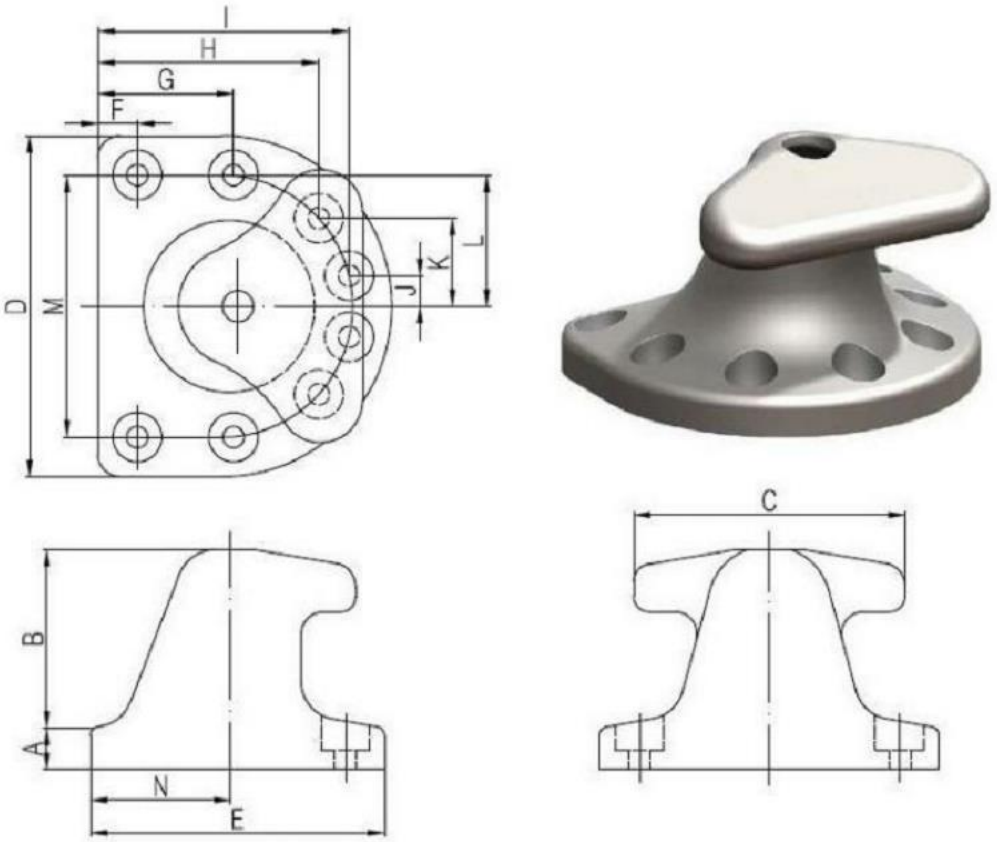
Nominal Size(mm)	Dimension(mm)						Mass(KG)
	B	b	L	h	h1	h2	
58-60	600	95	780	102	182	394	495
62-64	630	101	835	109	191	421	582
66-68	660	107	885	116	200	446	701
70-73	700	115	950	125	212	478	846
76-78	750	123	1015	133	222	511	964
81-84	800	134	1095	143	235	550	1268
87-90	850	143	1170	153	248	588	1498
92-95	900	151	1235	162	260	620	1769
97-102	950	161	1350	175	276	665	2277
105-107	1000	170	1400	185	289	703	2664
111-114	1050	180	1480	195	302	742	3054
117-122	1120	191	1585	207	318	790	3660

7.4JIS F2032 Roller Bar Type Chain Cable Stoppers for Grade 3 Chain Cable



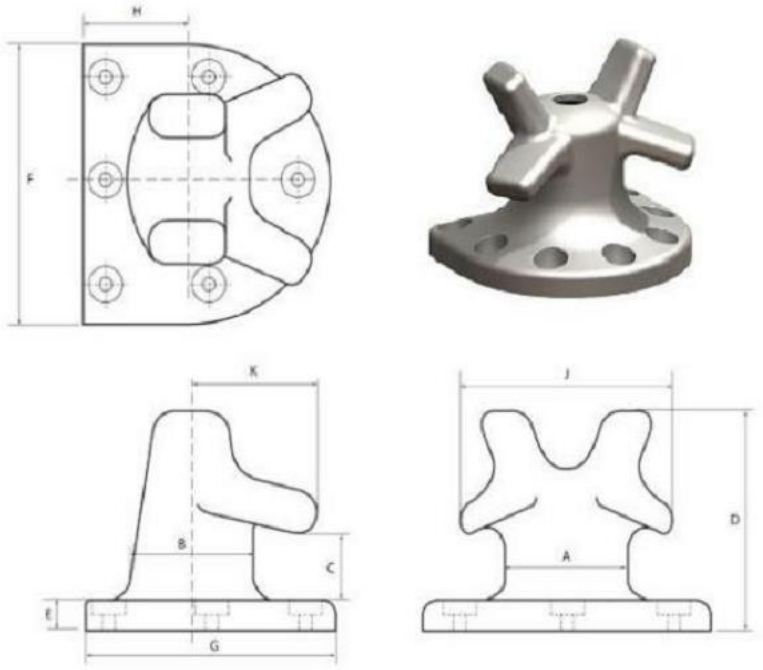
Nominal Size (mm)	Dimensions											Mass(KG)
	B	L	D	d	d1	b	h	h1	h2	h3	t	
70-73	980	660	584	116	87	118	125	422	292	146	22	997
76-78	1040	700	624	123	93	126	133	450	312	156	23	1198
81-84	1110	760	672	131	99	136	143	483	336	164	25	1465
87-90	1190	810	720	139	106	146	153	515	360	180	27	1772
92-95	1250	860	760	146	112	154	162	545	380	190	28	2073
97-102	1320	920	816	156	120	165	175	584	406	204	30	2504
105-107	1390	981	864	163	128	173	185	617	432	216	32	2928
111-114	1460	1026	912	172	135	184	195	651	456	228	34	3409
117-122	1550	1100	976	182	142	197	208	695	488	244	36	4103
122-132	1660	1190	1056	194	154	213	225	750	528	264	40	5163

8. T Head Bollard



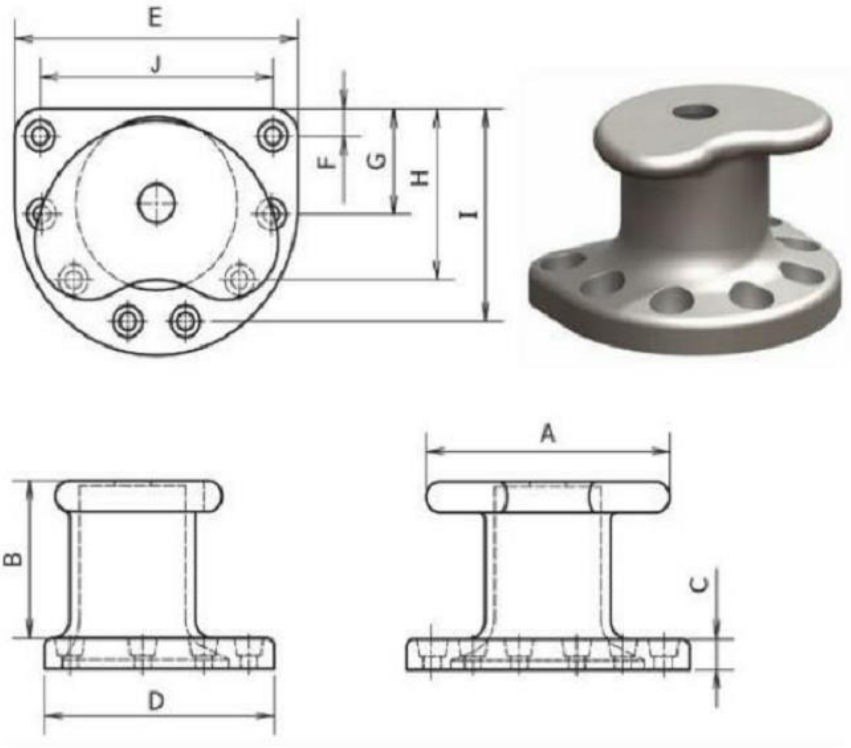
SWL(Ton)	Dimension (mm)														Bolts	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	No.	Dia
10	47	199	305	381	330	44	/	/	243	103	/	/	292	189	4	M24
15	52	219	335	419	363	49	/	/	267	114	/	/	321	208	4	M24
20	54	240	351	438	380	51	/	232	329	/	152	/	336	217	5	M24
30	57	250	366	457	396	53	/	242	343	/	159	/	351	226	5	M30
50	70	308	451	564	489	66	/	298	423	/	196	/	432	279	5	M36
75	80	354	518	648	561	76	/	298	463	105	241	/	497	321	6	M42
100	80	413	610	762	660	89	305	496	572	/	195	291	584	377	7	M42
125	87	458	671	838	726	98	335	546	629	/	215	320	643	415	7	M48
150	93	492	719	899	779	105	360	586	674	/	231	343	689	445	7	M48
200	97	521	762	952	826	111	349	559	694	119	299	365	730	472	8	M56

9. Twin Horn Bollard



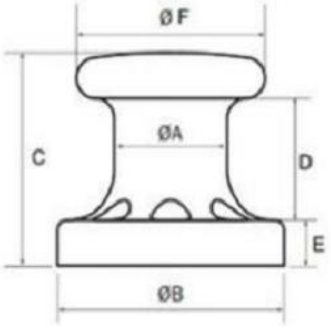
SWL (Ton)	Dimension (mm)										Bolts	
	A	B	C	D	E	F	G	H	J	K	No.	Dia.
5	127	57	48	152	19	305	152	76	222	76	4	20
10	178	127	108	362	57	349	305	102	382	115	5	24
15	178	152	118	401	64	400	349	133	420	127	5	24
20	203	203	140	476	70	483	406	165	407	165	5	24
30	254	254	152	533	76	610	572	267	508	184	6	24
40	305	305	152	617	127	610	610	305	610	210	4	36
50	317	317	178	597	83	762	660	279	559	229	7	30
60	317	317	178	597	83	762	660	279	559	229	7	30
75	355	355	191	743	95	851	724	305	761	241	7	36
100	356	356	202	774	114	965	838	356	762	242	7	48
150	432	432	254	851	114	1016	914	381	838	278	7	48
200	432	432	254	857	120	1016	914	381	838	278	7	56
*Dimension may vary according to different mold.												

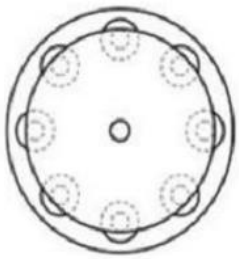
10. Kidney Bollard



SWL(Ton)	Dimension (mm)										Bolts	
	A	B	C	D	E	F	G	H	I	J	No.	Dia
15	275	194	41	288	325	50	-	-	213	250	4	24
20	330	216	51	345	390	60	-	213	300	300	5	24
30	385	257	54	402	455	70	-	258	350	350	5	30
50	413	264	60	431	488	75	-	226	353	375	6	36
75	481	298	70	503	569	88	238	381	438	438	7	36
100	550	340	79	575	650	100	272	436	500	500	7	42
125	605	375	89	632	715	110	299	479	550	550	7	48
150	660	410	95	690	780	120	326	523	600	600	7	56
200	759	457	111	793	897	138	345	543	671	690	8	56
*Dimension may vary according to different mold												

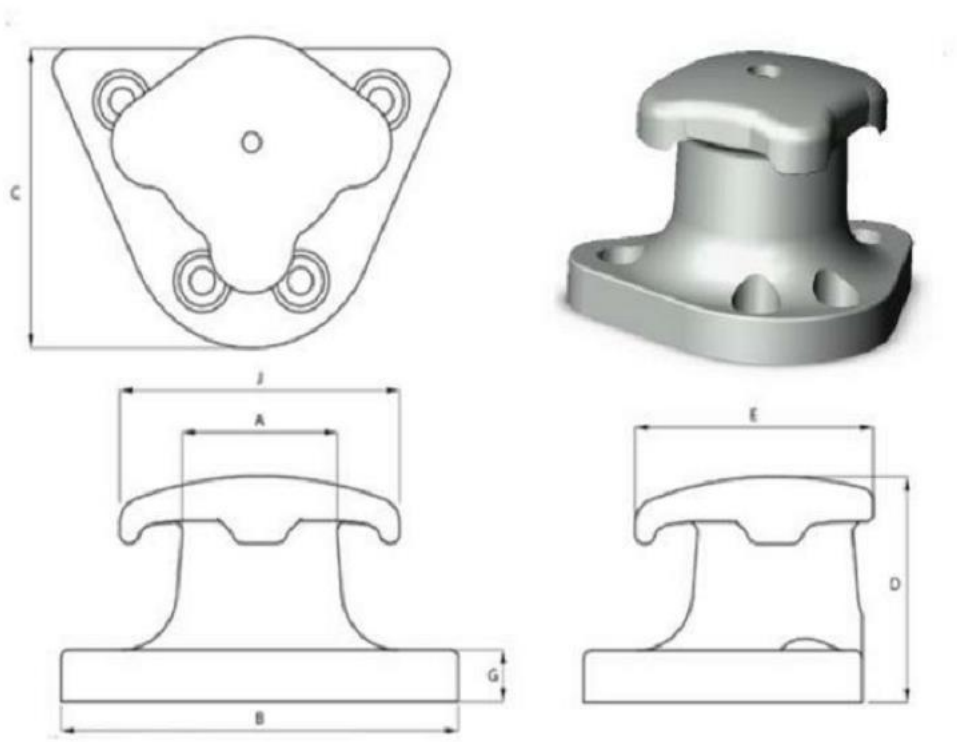
11. Pillar Bollard





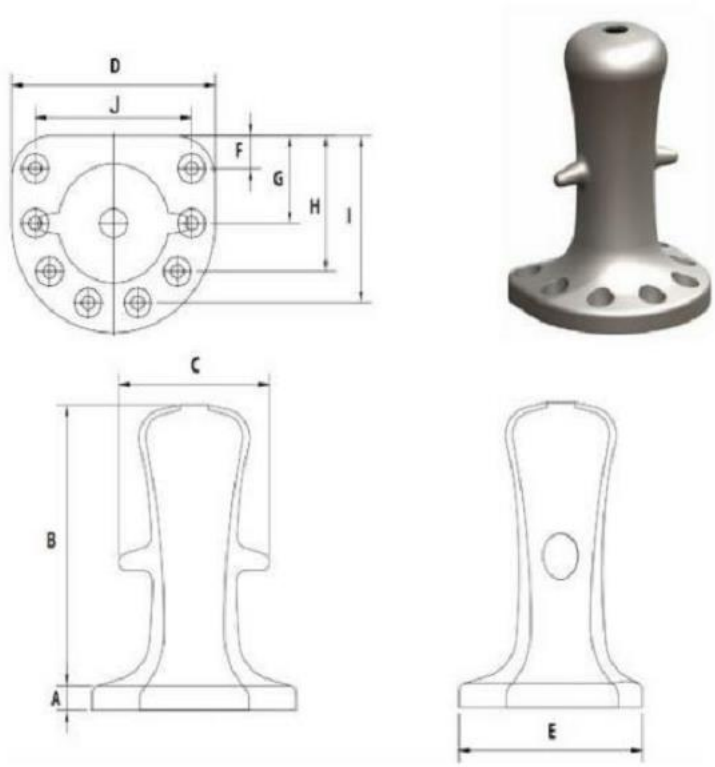
SWL(Ton)	Dimension (mm)						Bolts	
	A	B	C	D	E	F	No.	Dia.
10	204	300	350	248	57	280	4	24
15	229	381	368	254	51	356	4	24
30	254	559	426	254	83	432	5	30
50	305	610	533	305	114	508	8	30
75	457	914	864	648	102	610	8	36
100	559	1067	762	510	102	813	8	45
150	559	1067	762	510	102	813	8	48
*Dimension may vary according to different mold.								

12. Triton Head Bollard



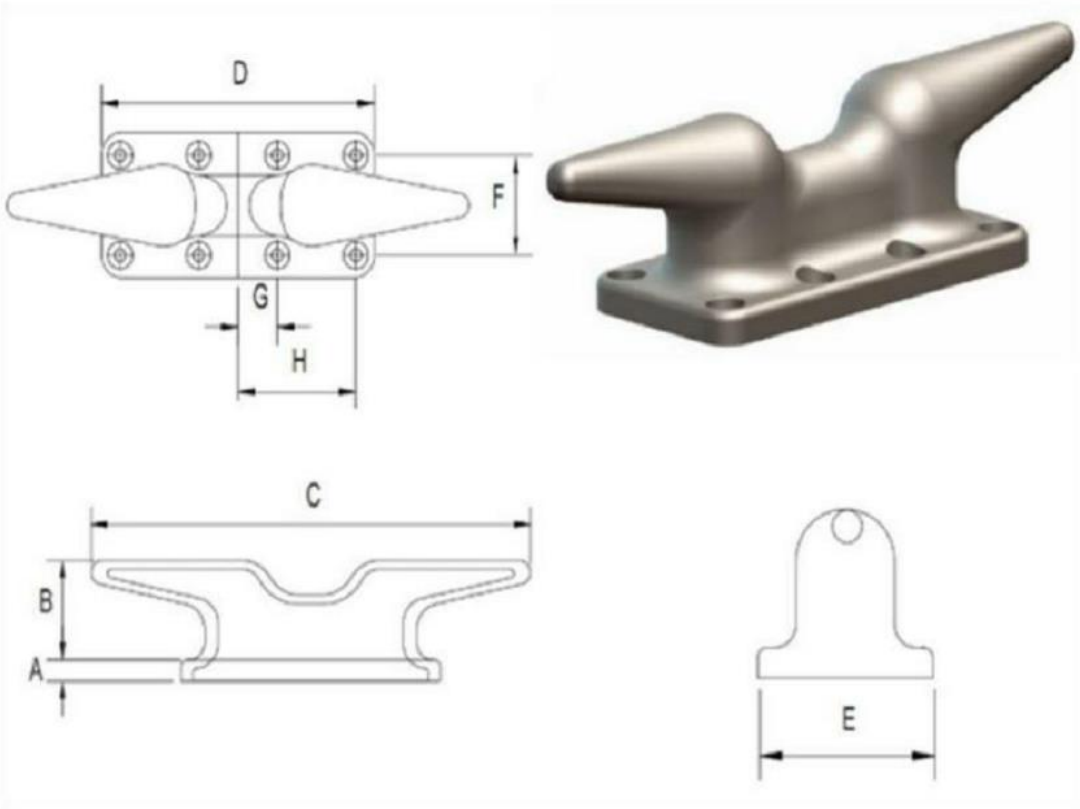
SWL(Ton)	Dimensions							Bolts	
	A	B	C	D	E	F	G	No.	Dia.
10	168	333	240	218	206	240	45	4	24
30	210	417	300	272	257	300	55	4	30
50	250	555	400	363	340	400	75	4	36
75	311	690	500	465	425	500	102	4	42
100	394	880	625	485	535	630	120	4	48
150	467	1020	720	545	613	720	125	4	56
200	482	1070	750	565	642	750	130	4	64
*Dimension may vary according to different mold									

13. Single Bitt Bollard



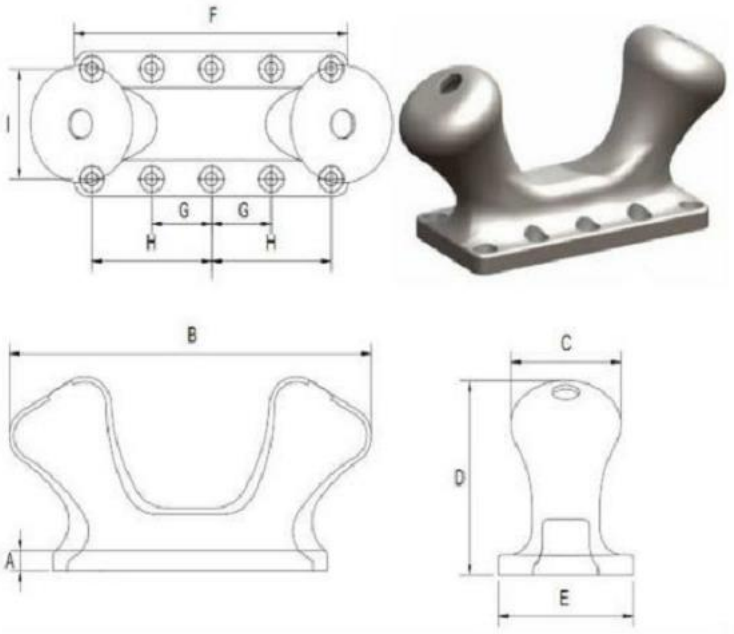
SWL(Ton)	Dimension (mm)										Bolts	
	A	B	C	D	E	F	G	H	I	J	No.	Dia
10	44	390	224	325	284	46	-	-	205	234	4	24
15	44	429	246	358	313	50	-	-	225	257	4	24
20	54	454	263	358	322	54	-	201	281	275	5	24
30	60	540	307	419	377	63	-	236	328	321	5	30
50	70	686	391	533	480	80	-	256	394	409	6	36
75	82	829	475	648	583	97	-	311	478	497	6	42
100	89	925	559	762	686	114	330	522	597	584	7	48
125	92	2057	604	823	741	123	357	564	645	631	7	48
150	98	1153	659	899	809	135	390	616	704	689	7	56
200	111	1270	726	991	892	149	396	614	755	759	8	56

14. Single Bitt Bollard



SWL(Ton)	Dimension (mm)								Bolts	
	A	B	C	D	E	F	G	H	No.	Dia.
24	44	159	610	406	216	140	-	165	6	20
30	51	178	762	508	267	178	-	203	6	24
36	51	203	914	610	305	209	-	254	6	24
42	51	229	1067	660	305	216	95	285	8	24
54	64	292	1371	838	406	279	121	362	8	30

15. Inclined Double Bitts Bollard



SWL(Ton)	Dimension (mm)									Bolts	
	A	B	C	D	E	F	G	H	I	No.	Dia.
20	38	673	204	335	267	533	70	222	191	8	20
30	46	781	236	389	302	604	81	258	221	8	22
50	56	942	285	469	356	711	98	311	267	8	30
75	62	1144	346	570	432	864	189	378	324	10	36
100	73	1346	407	670	508	1016	222	444	381	10	42
125	80	1548	468	771	584	1168	256	512	438	10	42
150	91	1683	509	838	635	1270	278	556	476	10	48
200	98	1885	570	938	702	1422	311	622	533	10	56
*Dimension may vary according to different mold.											