

# SCA 超级鼓型护舷

Super Cell Rubber Fenders

超级鼓型护舷，相比普通护舷，结构设计更加合理，有更高的压缩量，在较低的反力下，拥有更高的吸能量。

与钢制防冲板成套使用，前置有低摩擦系数的PE面板。降低了对船舶傍板压力，使护舷系统更加坚实耐用，并减少对

Provide good energy capability, high deflection;  
Match up with frontal panel and low friction PE pad;  
Strong and well designed;  
Low hull pressure, reduced shear force;  
Suitable for a wide range of berthing applications.

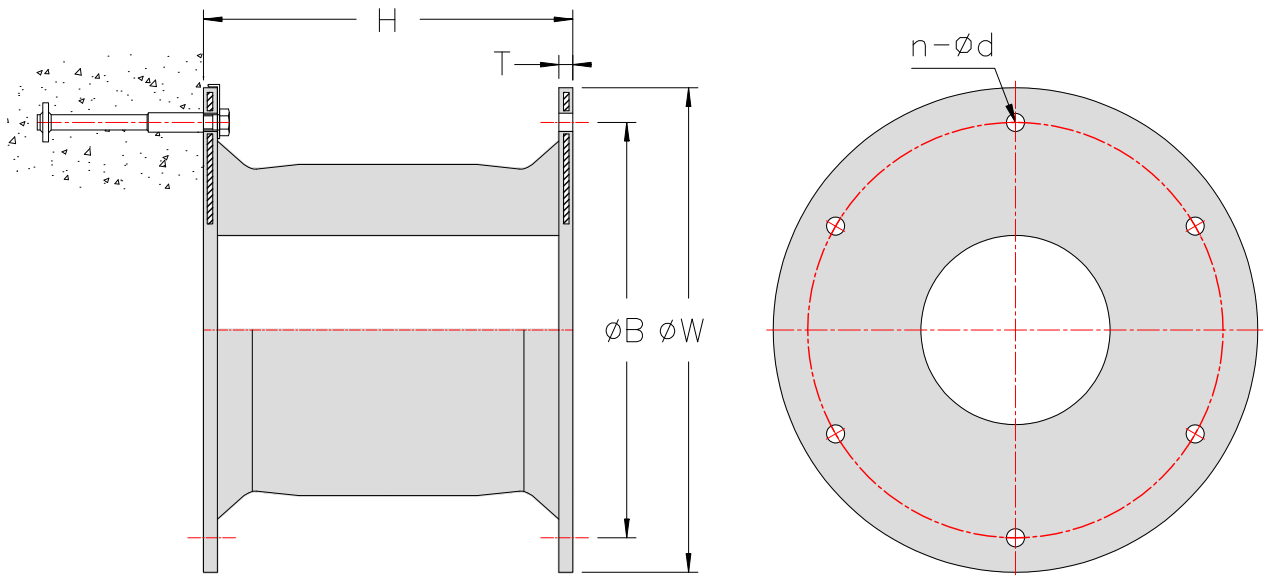


# SCA 超级鼓型护舷

Super Cell Rubber Fenders



## 规格型号 Specification



规格 Specification	H	T	ΦB	ΦW	Φd	螺栓 Anchors	重量(kg) Weight
500H	500	25	550	650	32	4-M24	112
630H	630	30	700	840	39	4-M30	231
800H	800	30	900	1050	40	6-M33	410
1000H	1000	35	1100	1300	47	6-M39	822
1150H	1150	40	1300	1500	50	6-M42	1220
1250H	1250	45	1450	1650	53	6-M45	1488
1450H	1450	47	1650	1850	61	6-M52	2330
1600H	1600	50	1800	2000	61	8-M52	3022
1700H	1700	55	1900	2100	66	8-M56	3730
2000H	2000	55	2000	2200	74	8-M64	5258
2250H	2250	60	2300	2550	74	10-M64	7452
2500H	2500	70	2700	2950	74	10-M64	10755
3000H	3000	85	3150	3350	90	12-M76	18582

[Units: mm]



# 性能

## Performance

规格 Specification		性能 Performance													
		500H	630H	800H	1000H	1150H	1250H	1450H	1600H	1700H	2000H	2250H	2500H	3000H	
RE	52.5%	R	182	290	464	737	975	1153	1551	1885	2131	2941	4145	5118	
		E	40	80	163	324	492	632	987	1326	1591	2591	4095	5618	
	55%	R	210	309	493	784	1037	1225	1649	2007	2266	3136	4406	5441	
		E	43	85	173	343	521	669	1045	1405	1685	2743	4337	5949	
RS	52.5%	R	162	258	412	655	865	1022	1376	1676	1892	2619	3679	4543	
		E	36	72	145	287	437	561	876	1177	1413	2300	3628	4987	
	55%	R	187	274	437	696	920	1087	1464	1781	2012	2783	3911	4829	
		E	38	76	153	304	463	594	928	1247	1495	2435	3848	5280	
RH	52.5%	R	140	224	355	567	750	886	1193	1453	1640	2270	3188	3937	5687
		E	30	62	125	249	379	486	760	1020	1224	1994	3150	4322	7456
	55%	R	160	237	378	603	798	942	1269	1544	1743	2413	3390	4182	6619
		E	32	67	132	264	401	516	804	1080	1300	2111	3336	4576	7521
RO	52.5%	R	108	172	275	436	578	682	918	1120	1262	1746	2454	3028	4314
		E	23	47	96	191	295	375	585	786	945	1535	2425	3330	5676
	55%	R	125	182	292	463	614	725	976	1189	1342	1856	2607	3220	5099
		E	25	50	102	203	309	396	619	832	997	1624	2566	3520	6028
RL	52.5%	R	86	138	211	349	462	546	735	894	1009	1398	2085	2574	3677
		E	18	38	75	153	233	299	468	628	753	1227	2060	2826	4897
	55%	R	99	147	225	372	491	581	781	950	1073	1485	2216	2737	4217
		E	19	40	78	163	247	316	495	665	798	1299	2180	2992	5193

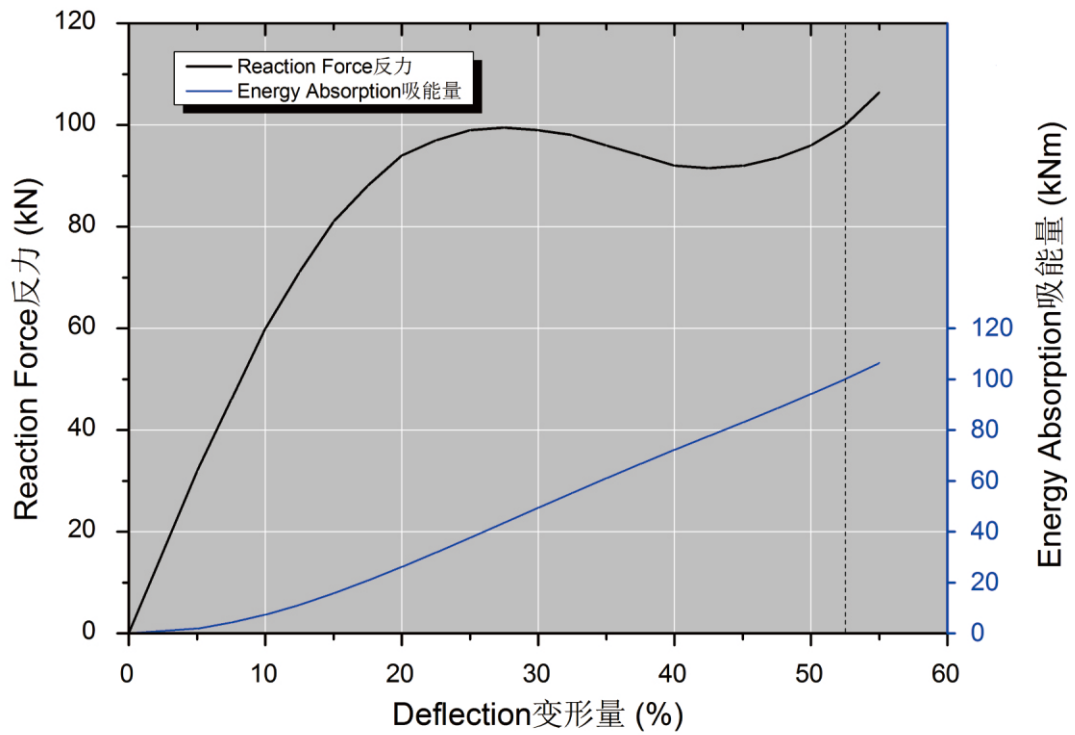
[Units: kN, kNm]

- 注 (1) RE-超高反力型, RS-超高反力型, RH-高反力型, RO-标准反力型, RL-低反力型 ;  
 Note: (2) R-反力, E-吸能量 ;  
 (3) 设计压缩量: 52.5%, 最大压缩量: 55% ;  
 (4) 性能公差: 反力 $\leq$ +10%, 吸能 $\geq$ -10%

RE: Extreme high Reaction Force, RS: Super high Reaction Force, RH: High Reaction Force  
 RO: Standard Reaction Force, RL: Low Reaction Force  
 R: Reaction Force, E: Energy Absorption;

PIANC系数 PIANC factors					
角度系数 Angular compression Factor		温度系数 Temperature Factor		速度系数 Velocity Factor	
角度 (度) Angle (degree)	AF	温度 (摄氏度) Temperature (°C)	TF	时间 (秒) Time (second)	VF
0	1.000	50	0.882	1	1.005
3	0.977	40	0.926	2	1.002
5	0.951	30	0.969	3	1.001
8	0.909	23	1.000	4	1.001
10	0.883	10	1.056	5	1.000
15	0.810	0	1.099	6	1.000
20	0.652	-10	1.143	8	1.000
		-20	1.186	$\geq$ 10	1.000
		-30	1.230		

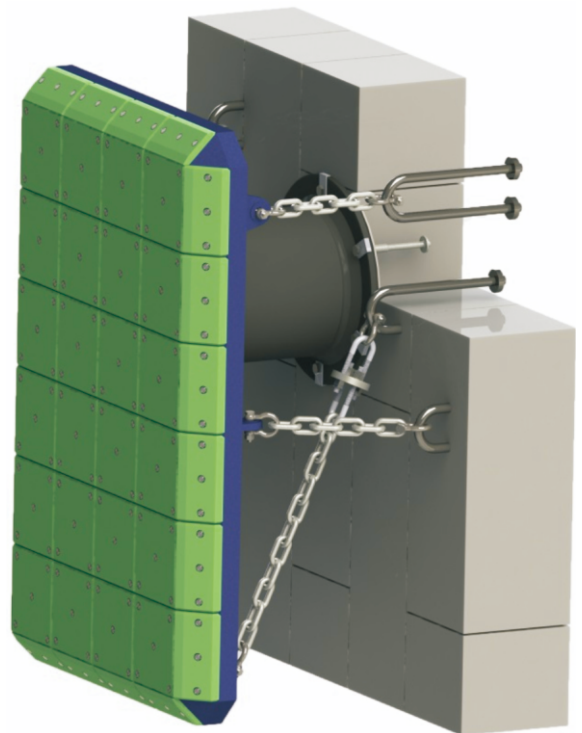
## 性能曲线 Performance Curve



## 护舷总成及配件 Fender Assembly & Accessories

鼓型护舷系统一般包括：橡胶护舷、防冲板、贴面板、紧固件、锚链等。

A cell fender system includes Rubber fender, frontal panel, facing pad, fasteners, anchors, chain systems, etc.



## »» 主要配件及用途 Main Accessories and Applications

序号 No.	名称 Description		用途 Application	常用材质 Material
1	橡胶护舷 Rubber Fender		吸收船舶冲击能量，保护船舶与码头 Absorb ship impact energy to protect dock and vessels	橡胶 Rubber, Q235
2	预埋件 Cast-in Anchors	预埋螺母、螺栓 Precast Nut & Bolt	用于把护舷固定在码头上 For fender fixing to dock	不锈钢、Q235热镀锌 Stainless Steel, Q235 HDG
		预埋U型环 U Anchor	吊挂链条用 Holding chains	Q235喷漆 (或热镀锌) Q235 Painted(or HDG)
3	防冲板 Frontal Panel		承受护舷产生的反力，增加与船体的接触面积，降低船体面压。 Bear the force caused by fender buffer, increase the contact area with ship and lessen hull pressure.	Q235/Q355喷漆 (热喷锌、铝) Q235/Q355 Painted(or hot zinc/aluminum spraying)
4	贴面板 Facing Pad		降低摩擦系数保护船体不受损伤 Reduce friction coefficient to protect hull	超高分子量聚乙烯 UHMW-PE
5	联接螺栓、螺母 Bolt & Nut		用于护舷与防冲板及其它部件的联接 For fender fixing to Front panel or other parts	不锈钢、Q235热镀锌 Stainless Steel, Q235 HDG
6	链条系统 Chain System	承重链 Weight Chain	承受防冲板的重量，防止护舷下垂 Support the steel panel and prevent excessive drooping of the system	Q235, CM490热镀锌或涂漆 Q235, CM490 HDG or painted
		水平链 Tension Chain	当护舷上部受力时限制上部护舷拉伸 Limit fenders deflection while fender local part under strain	Q235, CM490热镀锌或涂漆 Q235, CM490 HDG or painted
		剪切链 Shear Chain	防止护舷系统受剪切变形 Prevent fenders system from shear deflection	Q235, CM490热镀锌或涂漆 Q235, CM490 HDG or painted



说明：

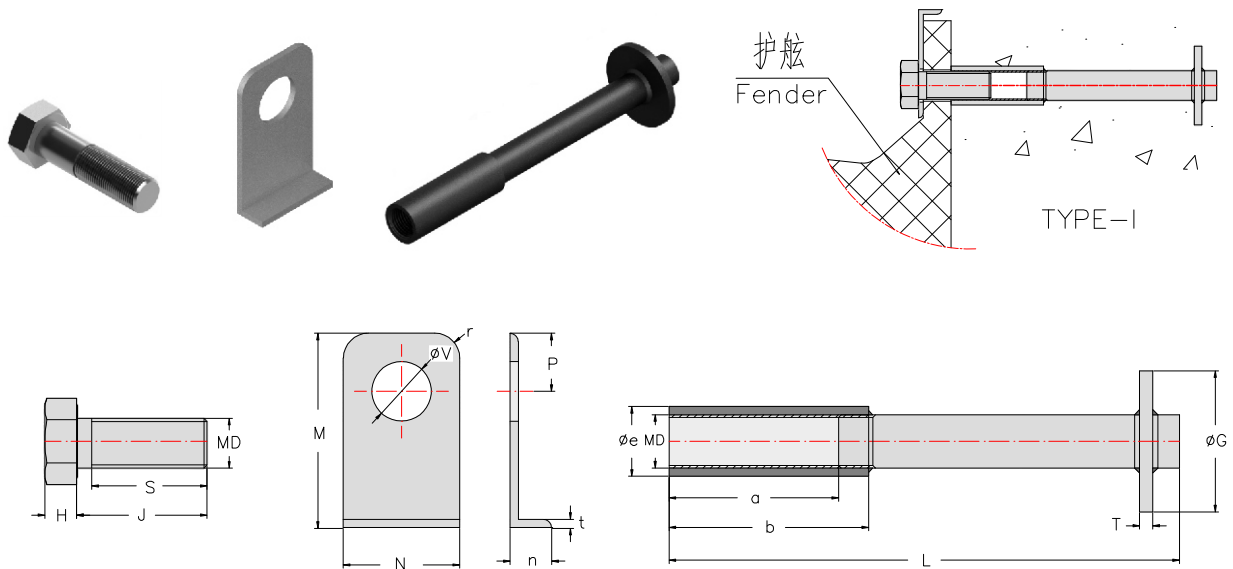
以下配件包括预埋件、螺栓和螺母等，均为标准型号，如有特殊规格要求，请联系中海橡设计部门。

Note:

The following accessories including Precast anchor, bolts and nuts, etc are all standard models, Special specification please contact the CMR design department.

## 预埋件-I Precast Nut-I

适用于新浇筑混凝土  
Used for installing fenders to new concrete.

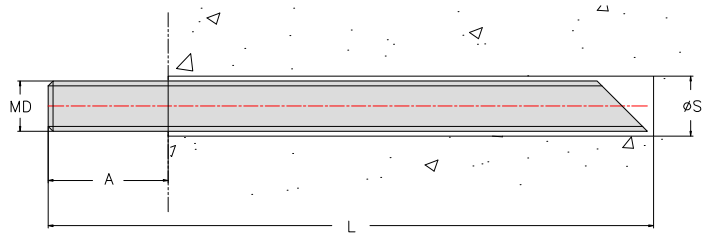
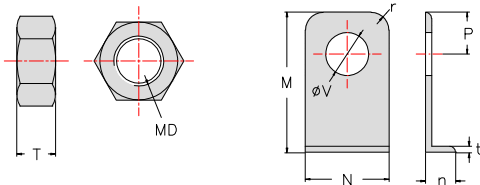
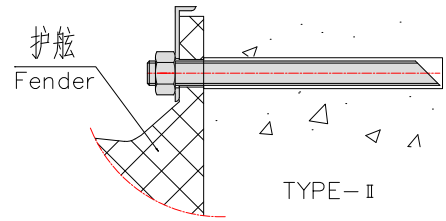
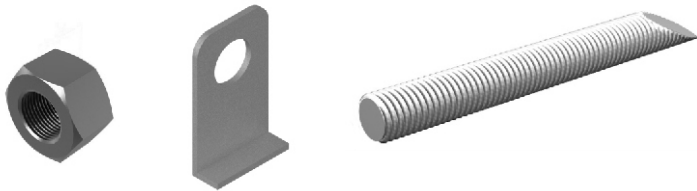


规格 Specification	螺栓 Hex Bolt				垫片 L-Washer							预埋螺母 Precast Nut			地角杆, 地角板 Anchor Rod, plate		
	MD	H	J	S	N	n	M	P	t	V	r	a	b	e	T	L	G
500H	M24	17	70	55	60	22	83	25	5	28	15	75	100	36	6-10	300	75
630H	M30	19	75	60	65	20	110	33	5	34	15	75	105	38	8-12	330	85
800H	M33	23	85	70	70	25	117	35	5	36	15	85	120	42	8-12	360	85
1000H	M39	26	95	75	80	26	148	40	6	43	25	85	125	49	8-12	430	95
1150H	M42	26	100	80	85	28	151	43	6	46	25	85	125	55	12-16	500	105
1250H	M45	30	110	90	90	31	153	45	6	49	30	95	140	59	12-16	500	125
1450H	M52	35	120	95	100	31	158	50	6	56	30	100	150	69	12-16	570	135
1600H	M52	35	120	95	100	34	158	50	6	56	30	100	150	69	12-16	570	140
1700H	M56	35	135	110	110	40	165	55	8	63	30	105	165	75	16-20	620	140
2000H	M64	40	150	125	116	38	165	58	8	70	40	125	190	79	16-20	700	150
2250H	M64	40	150	125	120	43	195	60	8	70	40	125	190	79	16-20	700	150
2500H	M64	40	170	125	125	50	202	65	10	70	50	125	190	79	16-20	700	175
3000H	M76	50	190	145	140	55	207	70	10	84	50	135	210	95	20-24	800	175

[Units: mm]

# >> 预埋件-II

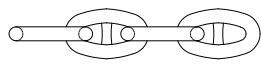
## Anchor Bolt- II



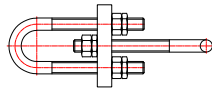
规格 Specification	锚固螺栓 Anchor Bolt				螺母 Nut	垫片 L-Washer						
	MD	A	L	φS		T	N	n	M	P	t	V
500H	M24	60	280	30	22	60	22	83	25	5	28	15
630H	M30	70	360	38	26	65	20	110	33	5	34	15
800H	M33	75	400	42	28	70	25	117	35	5	36	15
1000H	M39	85	460	50	32	80	26	148	40	6	43	25
1150H	M42	95	510	55	34	85	28	151	43	6	46	25
1250H	M45	105	550	60	36	90	31	153	45	6	49	30
1450H	M52	115	630	65	42	100	31	158	50	6	56	30
1600H	M52	115	630	65	42	100	34	158	50	6	56	30
1700H	M56	125	680	68	45	110	40	165	55	8	63	30
2000H	M64	130	780	75	51	116	38	165	58	8	70	40
2250H	M64	140	780	75	51	120	43	195	60	8	70	40
2500H	M64	150	780	75	51	125	50	202	65	10	70	50
3000H	M76	180	940	88	64	140	55	207	70	10	84	50

[Units: mm]

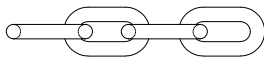
## 锚链结构及规格 Structure and specification of Chains



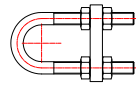
有档锚链  
Stud Link Chains



张紧器  
Tensioner -1



无档锚链  
Open Link Chains



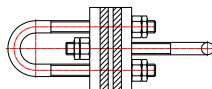
自制卸扣  
Tensioner -2



弓形卸扣 G-2130  
Bow Shackle



D形卸扣 G-2130  
Dee Shackle



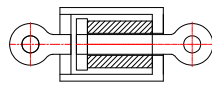
橡胶弹簧 -1  
Shock Absorber -1



弓形卸扣 G-209  
Bow Shackle



D形卸扣 G-210  
Dee Shackle

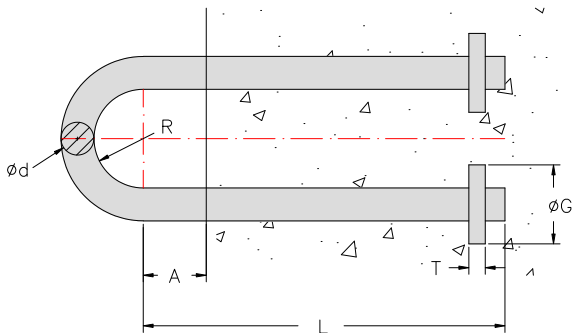


橡胶弹簧 -2  
Shock Absorber -2

规格 Specification	链环 Links	卸扣 Shackle	自制卸扣 Tensioner
500H	Φ20.5	Φ22	M24
630H	Φ20.5	Φ22	M24
800H	Φ26	Φ28	M30
1000H	Φ28	Φ32	M33
1150H	Φ32	Φ35	M36
1250H	Φ34	Φ38	M42
1450H	Φ36	Φ38	M42
1600H	Φ38	Φ45	M48
1700H	Φ40	Φ45	M48
2000H	Φ42	Φ45	M48
2250H	Φ42	Φ45	M48
2500H	Φ46	Φ50	M56
3000H	Φ46	Φ50	M56
材质 Material	Q235 HDG, Gr. U2 HDG.	Gr. S HDG	Q235/GR8.8 HDG

[Units: mm]

## 预埋U型环 U Anchor



规格 Specification	Φd	R	L	A	T	ΦG
500H	40	70	600	50	20~30	100
630H	40	70	600	50	20~30	100
800H	50	80	650	50	20~30	110
1000H	55	90	730	50	20~30	120
1150H	60	100	780	50	25~35	140
1250H	60	100	780	50	25~35	140
1450H	60	100	780	70	25~35	140
1600H	65	105	830	70	25~35	150
1700H	65	105	830	70	25~35	150
2000H	70	115	880	70	25~35	160
2250H	70	115	880	70	25~35	160
2500H	80	120	930	70	25~35	160
3000H	80	120	930	80	25~35	160

[Units: mm]

说明 以上表格信息仅供参考，锚链以及预埋U型环等配件根据实际需求选定；

Note: 特殊配件及型号需求请联系我公司。

All chain and accessories information is for guidance only.

Every chain design should be checked to confirm suitability for the intended application.





## 护舷的安装间距以及承重 Clearances and Weight support

### 护舷的最小安装间隙 Minimum Clearances

橡胶护舷和防冲板之间以及附近必须有足够的空间，使其在受力变形时不会发生阻碍。  
There must be enough space around and between the cell fenders and the steel panel to allow them to deflect without interference.

规格 Specification	边缘 Edge (A)	间距 Centres (B)
500H	510	700
630H	600	880
800H	700	1120
1000H	850	1500
1150H	990	1730
1250H	1060	1870
1450H	1200	2180
1600H	1270	2400
1700H	1470	2550
2000H	1560	2880
2250H	1710	3360
2500H	1910	3730
3000H	2240	4500

[Units: mm]

以上表格数据仅供参考,如有疑问,进行咨询。  
Distances given in the above diagram are for guidance. If in doubt, please contact us.

### 护舷承重 Weight support

护舷系统在没有支撑锚链的情况下，防冲板的限定重量指南  
Cell fenders can support a lot of static weight. The table is a guide to the permitted weight of front panel before additional support chains may be required.

护舷性能 Performance	水平单鼓或多鼓 Single or multiple horizontal (n≥1)	垂直单鼓或多鼓 Multiple vertical (n≥2)	H
低反力 RL	$W_H \leq n \times 0.95 \times w$	$W_V \leq n \times 1.2 \times w$	
标准反力 RO	$W_H \leq n \times 1.1 \times w$	$W_V \leq n \times 1.45 \times w$	H≤800
高反力 RH	$W_H \leq n \times 1.3 \times w$	$W_V \leq n \times 1.75 \times w$	
低反力 RL	$W_H \leq n \times 10 \times w \times 0.6$	$W_V \leq n \times 13.5 \times w \times 0.6$	
标准反力 RO	$W_H \leq n \times 15 \times w \times 0.6$	$W_V \leq n \times 19 \times w \times 0.6$	H≥1000
高反力 RH	$W_H \leq n \times 19 \times w \times 0.6$	$W_V \leq n \times 23.5 \times w \times 0.6$	

n = 护舷的数量 number of Cell fenders.

W = 护舷的重量 Fender weight

WH = 水平布置防冲板的重量 panel weight – single or multi-horizontal

