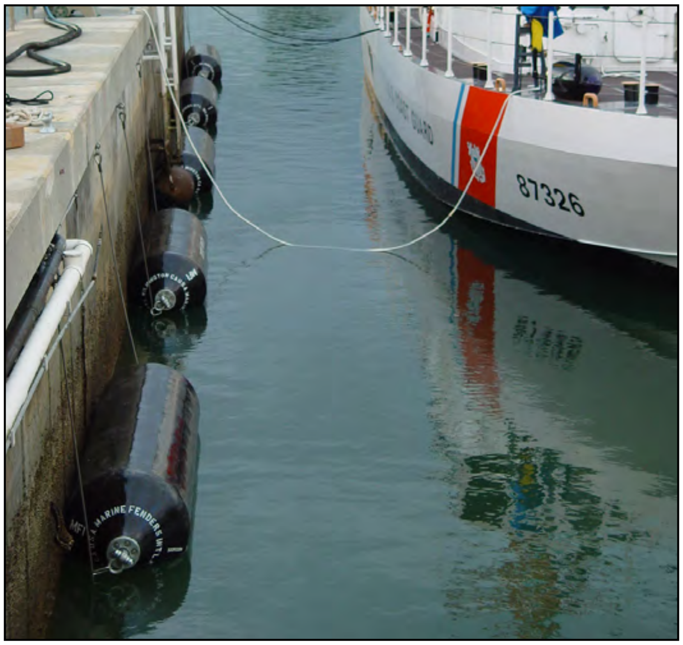
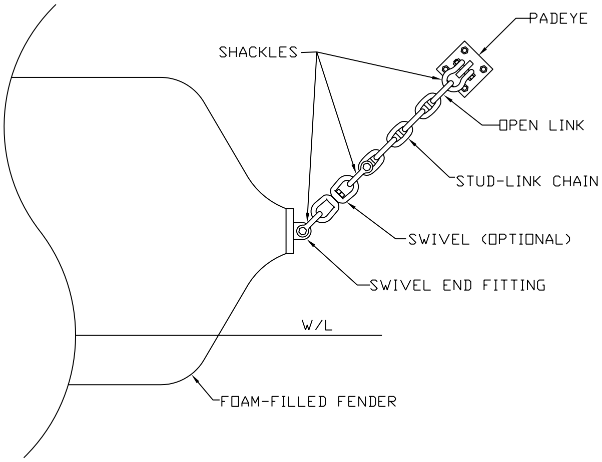
LOW MAINTENANCE

The design of the foam-filled Ocean Guard™ Netless Fender is highly resistant to environmental hazards such as extreme temperatures, hydrocarbons, fresh and salt water, ozone and ultraviolet radiation. The fender skin is even resistant to chemicals such as diesel fuels.

Additionally, since the internal construction consists of a solid heat laminated foam core, there is no need to maintain air pressure, inflation or relief values, as with pneumatic fenders.





INSTALLATION

Ocean Guard™ Netless Fenders are designed for easy installation. Their buoyant construction allows the option of a floating installation. The unique end fittings and ultra heavy duty internal chain are also ideal for a fixed hanging installation. Both installations can include a 2-point and 4-point mounting arrangement. Typical mounting hardware includes dock plate padeyes, anchor bolts, shackles, swivels and stud link chain.

CONSTRUCTION FEATURES

FOAM CORE

Construction begins with a resilient energy absorbing closed cell cross-linked polyethylene foam core which is heat laminated into one piece solid foam core. This heat lamination process produces a thermal bond between the layers of foam which is stronger than the foam itself. It will not delaminate even under the most abusive berthing conditions. This ensures that the foam core construction of the fender will provide years of quality service and performance.

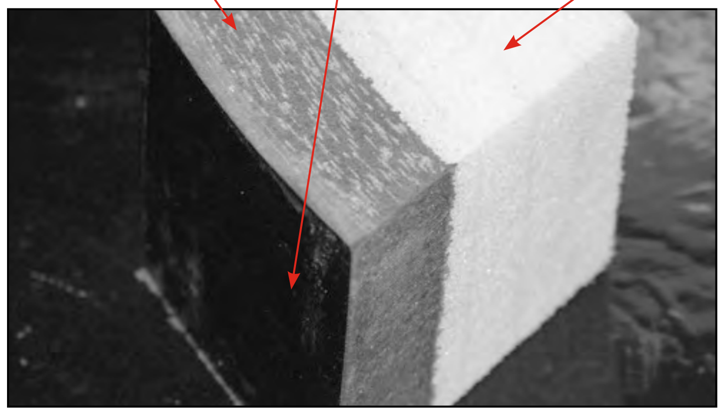
Because of this foam core, if punctured the fender will not experience a catastrophic failure as would pneumatic fenders.

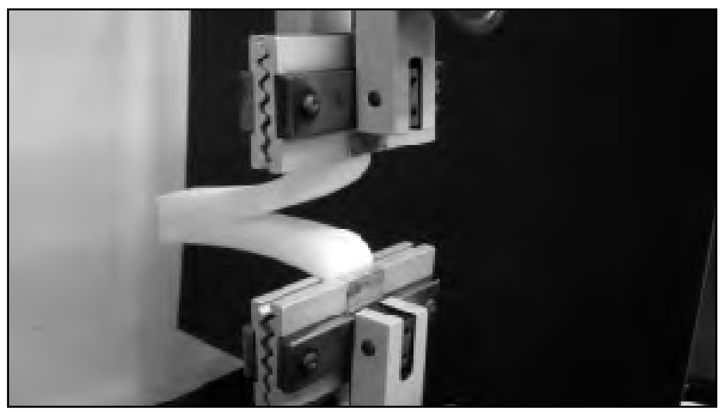
REINFORCED ELASTROMERIC SKIN

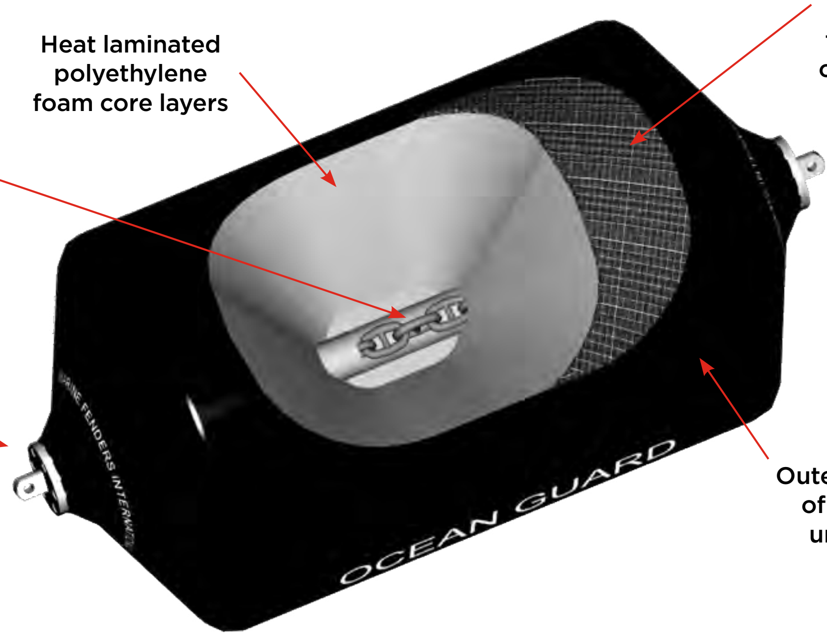
The energy absorbing foam core is protected by a tough, thick filament nylon tire cord reinforced elastomer skin. This non-marking reinforced elastomer fender skin is the wear surface of the fender. The reinforcing filaments are continuously wound in a helix pattern through up to 90% of the elastomer skin, and wrap around the fender swivel end fitting housings on each end of the fender. This continuous reinforcement of the elastomer skin not only increases the tensile and tear strength of the elastomer but also distributes loads through the fender skin.

Our elastomer skin exemplifies the latest in urethane technology. This tough, resilient material is specially formulated to withstand the world's harshest conditions, providing superior performance in extreme temperatures, toxic environments, against hydrocarbons, salt water, ozone, and ultraviolet radiation. Its smooth, sleek construction is not prone to snagging on dock or hull protrusions.

URETHANE SKIN AND ENERGY ABSORBING FOAM CORE CONSTRUCTION







OCEAN GUARD™ NETLESS

FENDERS		LOW REACTION				STANDARD CAPACITY				HIGH CAPACITY				EXTRA HIGH CAPACITY				SUPER HIGH CAPACITY				FENDER	
SIZE		ENERGY ABSORPTION		REACTION FORCE		ENERGY ABSORPTION		REACTION FORCE		ENERGY ABSORPTION		REACTION FORCE		ENERGY ABSORPTION		REACTION FORCE		ENERGY ABSORPTION		REACTION FORCE		SAFE WORKING END PULL LOAD	
ENGLISH	METRIC																						
FT X FT	M X M	FT-KIPS	TON-M	KIPS	TONS	FT-KIPS	TON-M	KIPS	TONS	FT-KIPS	TON-M	KIPS	TONS	FT - KIPS	TON-M	KIPS	TONS	FT - KIPS	TON-M	KIPS	TONS	KIPS	KN
2 x 4	0.6 x 1.2	7	1	12	5	11	2	20	9	14	2	26	12	21	3	38	17	29	4	52	24	9.5	42
3 x 5	0.9 x 1.5	19	3	27	12	31	4	45	20	40	6	59	27	59	9	86	39	81	11	117	53	9.5	42
3 x 6	0.9 x 1.8	23	3	29	13	39	5	48	22	51	7	62	28	71	10	91	41	101	14	125	57	9.5	42
3 x 8	0.9 x 2.4	33	5	41	19	55	8	68	31	72	10	88	40	105	15	129	59	143	20	177	80	17.0	76
4 x 6	1.2x1.8	36	5	34	16	60	8	56	26	78	11	73	33	114	16	106	48	156	22	146	66	17.0	76
4 x 8	1.2 x 2.4	53	7	50	23	89	12	83	38	116	16	108	49	169	23	158	72	231	32	216	98	17.0	76
4 x 10	1.2 x 3.0	71	10	67	30	118	16	111	50	153	21	144	65	224	31	211	96	307	42	289	131	17.0	76
4 x 12	1.2 x 3.7	88	12	82	37	146	20	136	62	190	26	177	80	277	38	258	117	380	53	354	161	24.0	107
5 x 8	1.5 x 2.4	81	11	60	27	135	18	100	45	176	24	130	59	257	36	190	86	351	49	260	118	17.0	76
5 x 10	1.5 x 3.0	108	15	80	37	180	25	134	61	234	32	174	79	342	47	255	116	468	65	348	158	24.0	107
5 x 12	1.5 x 3.7	135	19	100	45	225	31	167	75	293	41	217	98	428	59	317	144	585	81	434	197	24.0	107
5 x 14	1.5 x 4.3	161	22	120	55	269	37	200	91	350	48	260	118	511	71	380	172	699	97	520	236	34.0	151
6 x 12	1.8 x 3.7	180	25	112	50	300	41	186	84	390	54	242	110	570	79	353	160	780	108	484	220	34.0	151
6 x 14	1.8 x 4.3	218	30	135	61	364	50	225	102	473	65	293	133	690	96	428	194	946	131	585	265	34.0	151
6 x 16	1.8 x 4.9	256	35	159	72	427	59	265	120	555	77	345	156	811	112	504	229	1110	154	689	313	50.0	222
7 x 14	2.1 x 4.3	292	40	155	70	487	67	259	117	633	88	337	153	925	128	482	223	1266	175	673	305	50.0	222
7 x 16	2.1 x 4.9	344	47	183	83	574	79	305	138	746	103	397	180	1091	151	580	263	1492	206	793	360	50.0	222
7 x 18	2.1 x 5.5	396	55	211	95	660	91	351	159	858	119	456	207	1254	173	667	303	1716	237	913	414	70.0	311
8 x 12	2.4 x 3.7	319	44	148	67	531	73	246	111	690	95	320	145	1008	139	468	212	1379	191	642	291	70.0	311
8 x 14	2.4 x 4.3	371	51	173	78	619	85	288	130	805	111	374	170	1176	163	547	248	1609	233	749	340	70.0	311
8 x 16	2.4 x 4.9	440	61	205	93	733	101	341	155	953	132	443	201	1393	193	648	294	1906	264	887	402	70.0	311
8 x 18	2.4 x 5.5	508	70	236	107	847	117	394	179	1101	152	512	232	1609	223	749	340	2202	305	1024	464	70.0	311
8 x 20	2.4 x 6.1	577	80	268	122	961	133	447	203	1249	173	581	264	1826	253	849	385	2499	346	1162	527	70.0	311
9 x 14	2.7 x 4.3	467	65	193	88	779	108	322	146	1012	140	418	190	1480	205	611	277	2025	280	837	380	70.0	311
9 x 16	2.7 x 4.9	534	74	221	100	890	123	368	167	1157	160	478	217	1691	234	688	317	2314	320	957	434	70.0	311
9 x 18	2.7 x 5.5	619	86	256	116	1032	143	427	194	1342	186	555	252	1961	271	811	368	2683	371	1110	503	70.0	311
10 x 16	3.0 x 4.9	649	90	241	109	1081	150	402	182	1405	194	523	237	2054	284	764	347	2811	389	1045	474	70.0	311
10 x 18	3.0 x 5.5	755	104	281	127	1258	174	468	212	1635	226	608	276	2390	331	889	403	3271	452	1217	552	70.0	311
10 x 20	3.0 x 6.1	861	119	320	145	1435	198	534	242	1866	258	694	315	2727	377	1015	460	3731	516	1388	630	110.0	489
10 x 24	3.0 x 7.3	1087	150	404	184	1811	250	674	306	2286	316	850	386	3341	462	1244	564	4572	632	1702	772	110.0	489
11 x 18	3.4 x 5.5	889	131	301	159	1482	219	501	265	1927	267	651	295	2816	389	952	432	3853	533	1303	591	110.0	489
11 x 20	3.4 x 6.1	1018	145	344	167	1696	241	573	279	2141	296	745	338	3223	446	1090	494	4410	610	1491	676	110.0	489
12 x 20	3.7 x 6.1	1298	179	425	193	2163	299	708	321	2812	389	920	417	4109	568	1346	611	5623	778	1841	835	110.0	489
13 x 26	4.0 x 7.9	1944	269	591	268	3240	448	985	447	4212	583	1281	581	6156	815	1872	849	8424	1165	2561	1162	110.0	489
14 x 28	4.3 x 8.5	2400	332	678	308	4000	553	1130	513	5200	719	1469	665	7600	1051	2147	974	10400	1438	2938	1333	110.0	489

Custom sizes and capacities available

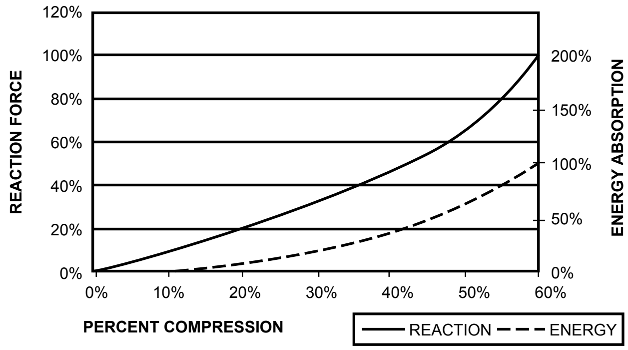
* Actual values for above sizes may vary +/- 15% due to variations in materials, speed of compression, temperatures and tolerances. Performance based on 60% compression.

OCEAN GUARD™ NETLESS

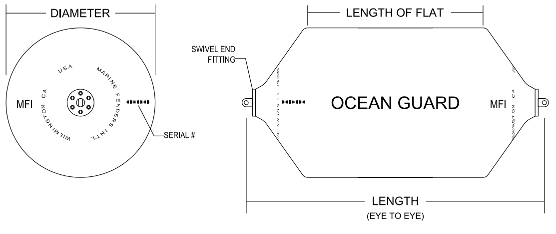
FENDERS		LOW REACTION				STANDARD CAPACITY				HIGH CAPACITY			
SIZE		ENERGY ABSORPTION		REACTION FORCE		ENERGY ABSORPTION		REACTION FORCE		ENERGY ABSORPTION		REACTION FORCE	
METRIC	ENGLISH												
M X M	FT X FT	FT-KIPS	TON-M	KIPS	TONS	FT-KIPS	TON-M	KIPS	TONS	FT-KIPS	TON-M	KIPS	TONS
0.7 x 1.5	2.3 x 4.9	11	2	18	8	19	3	30	14	25	3	39	18
0.7 x 2.0	2.3 x 6.5	17	2	27	12	28	4	44	20	33	5	52	24
0.7 x 3.0	2.3 x 9.8	29	4	46	21	49	7	77	35	50	7	78	35
1.0 x 1.5	3.3 x 4.9	21	3	18	8	35	5	39	18	46	6	51	23
1.0 x 2.0	3.3 x 6.5	30	4	34	15	50	7	57	26	65	9	74	34
1.0 x 3.0	3.3 x 9.8	53	7	58	26	89	12	97	44	75	10	86	74
1.2 x 2.0	3.9 x 6.5	40	6	38	17	67	9	63	29	87	12	82	37
1.2 x 2.5	3.9 x 8.2	56	8	52	23	94	13	86	39	109	15	103	46
1.35 x 2.5	4.4 x 8.2	67	9	56	25	112	15	94	43	146	20	122	55
1.35 x 3.0	4.4 x 9.8	86	12	71	32	144	20	118	54	175	24	146	66
1.5 x 3.0	4.9 x 9.8	103	14	78	35	171	24	130	59	222	31	169	77
1.7 x 3.0	5.6 x 9.8	125	17	83	38	208	29	139	63	270	37	181	82
1.7 x 4.5	5.6 x 14.7	212	29	139	63	354	49	232	105	360	50	241	109
2.0 x 3.5	6.5 x 11.5	201	28	114	52	335	46	190	86	436	60	247	112
2.0 x 4.0	6.5 x 13.1	239	33	136	62	398	55	226	103	517	72	294	133
2.0 x 4.5	6.5 x 14.7	276	38	157	71	460	64	261	118	598	83	339	154
2.5 x 4.0	8.2 x 13.1	335	46	161	73	591	82	269	122	768	106	350	159
2.5 x 4.5	8.2 x 16.4	398	55	181	82	663	92	301	137	1046	145	475	215
2.5 x 5.5	8.2 x 18.0	531	73	241	109	885	122	402	182	1151	159	523	237
3.0 x 4.9	9.8 x 16.0	633	88	239	108	1055	146	339	154	1372	190	519	235
3.0 x 6.0	9.8 x 19.7	819	113	310	141	1365	189	516	234	1775	245	671	304
3.0 x 7.0	9.8 x 23.0	973	135	367	166	1621	224	611	277	1923	266	727	330
3.3 x 4.5	10.8 x 14.7	663	92	228	103	1105	153	380	172	1437	199	494	224
3.3 x 6.5	10.8 x 21.3	1072	148	368	167	1786	247	614	279	2322	321	798	362
3.3 x 8.5	10.8 x 27.9	1498	207	516	234	2496	345	860	390	2323	321	799	362
3.3 x 10.6	10.8 x 34.8	1909	264	656	298	3181	440	1094	496	4135	572	1422	645

FENDER PRESSURE AT 60% DEFLECTION			
CAPACITY	ENGLISH UNITS KIPS/SQ FT	METRIC UNITS TONS/SQ METER	METRIC UNITS KN/SQ METER
Low Reaction	2.2	10.6	104
Enhanced	2.9	14.1	138
Standard	3.6	17.6	172
Advanced	4.1	20.2	198
High Capacity	4.7	22.9	224
Advanced High	5.8	28.2	276
Extra High Capacity	6.8	33.4	327
Advanced Extra High	8.1	39.6	388
Super High Capacity	9.4	45.7	449
Advanced Super High	10.8	52.7	517
Ultra High	12.2	59.7	586

**GENERIC PERFORMANCE CURVE
OCEAN GUARD FENDER**

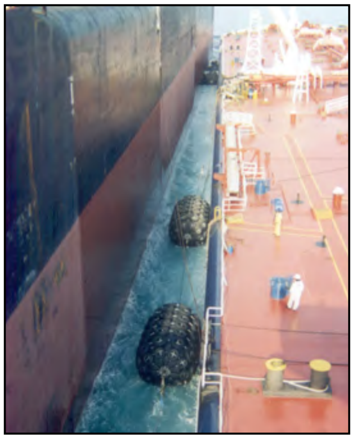


FENDERS		EXTRA HIGH CAPACITY				SUPER HIGH CAPACITY				ULTRA HIGH CAPACITY				FENDER	
SIZE		ENERGY ABSORPTION		REACTION FORCE		ENERGY ABSORPTION		REACTION FORCE		ENERGY ABSORPTION		REACTION FORCE		SAFE WORKING END PULL LOAD	
METRIC	ENGLISH														
M X M	FT X FT	FT-KIPS	TON-M	KIPS	TONS	FT-KIPS	TON-M	KIPS	TONS	FT-KIPS	TON-M	KIPS	TONS	KIPS	KN
0.7 x 1.5	2.3 x 4.9	36	5	57	26	49	7	78	35	65	9	102	46	10	42
0.7 x 2.0	2.3 x 6.5	48	7	76	34	65	9	104	47	96	13	151	68	10	42
0.7 x 3.0	2.3 x 9.8	72	10	114	52	98	14	156	71	167	23	261	118	10	42
1.0 x 1.5	3.3 x 4.9	67	9	74	34	91	13	123	56	119	16	133	60	10	42
1.0 x 2.0	3.3 x 6.5	95	13	108	49	130	18	148	67	170	24	194	88	10	42
1.0 x 3.0	3.3 x 9.8	75	10	86	39	75	10	86	39	303	42	330	150	10	42
1.2 x 2.0	3.9 x 6.5	127	18	120	54	174	24	164	74	228	32	214	97	17	76
1.2 x 2.5	3.9 x 8.2	159	22	150	68	218	30	205	93	320	44	292	133	17	76
1.35 x 2.5	4.4 x 8.2	213	29	179	81	291	40	244	111	381	53	320	145	17	76
1.35 x 3.0	4.4 x 9.8	256	35	215	97	349	48	293	133	490	68	401	182	17	76
1.5 x 3.0	4.9 x 9.8	325	45	247	112	445	62	338	153	581	80	442	200	24	107
1.7 x 3.0	5.6 x 9.8	395	55	264	120	541	75	361	164	707	98	473	214	24	107
1.7 x 4.5	5.6 x 14.7	527	73	352	160	721	100	481	218	1204	166	789	358	24	107
2.0 x 3.5	6.5 x 11.5	637	88	361	164	871	120	494	224	1139	158	646	293	34	151
2.0 x 4.0	6.5 x 13.1	756	105	429	195	1035	143	588	267	1353	187	768	349	34	151
2.0 x 4.5	6.5 x 14.7	874	121	496	225	1196	165	679	308	1564	216	887	403	50	222
2.5 x 4.0	8.2 x 13.1	1123	155	511	232	1573	213	699	317	2009	278	915	415	70	311
2.5 x 4.5	8.2 x 16.4	1529	211	694	315	2091	289	950	431	2254	312	1023	464	70	311
2.5 x 5.5	8.2 x 18.0	1682	233	764	347	2301	318	1045	474	3009	416	1367	620	70	311
3.0 x 4.9	9.8 x 16.0	2005	277	758	344	2743	379	1037	470	3587	496	1153	523	70	311
3.0 x 6.0	9.8 x 19.7	2594	359	980	445	3549	491	1342	609	4641	642	1754	796	110	489
3.0 x 7.0	9.8 x 23.0	2810	389	1062	482	3845	532	1454	659	5511	762	2077	942	110	489
3.3 x 4.5	10.8 x 14.7	2100	290	722	327	2873	397	988	448	3757	520	1292	586	110	489
3.3 x 6.5	10.8 x 21.3	3393	469	1167	529	4644	642	1596	724	6072	840	2088	947	110	489
3.3 x 8.5	10.8 x 27.9	3394	469	1168	530	4645	642	1597	724	8486	1174	2924	1326	110	489
3.3 x 10.6	10.8 x 34.8	6044	836	2079	943	8271	1144	2844	1290	10815	1496	3720	1687	110	489



Custom sizes and capacities available

* Actual values for above sizes may vary +/- 15% due to variations in materials, speed of compression, temperatures and tolerances. Performance based on 60% compression.



OCEAN CUSHION™ STANDARD CAPACITY

FOAM FILLED FENDER
WITH CHAIN & AIRCRAFT TIRE NETS

ENGLISH SIZES											
FENDERS		STAND OFF		STANDARD CAPACITY				HIGH CAPACITY			
SIZE		DIAMETER UNCOMPRESSED		ENERGY ABSORPTION		REACTION FORCE		ENERGY ABSORPTION		REACTION FORCE	
ENGLISH	METRIC										
FT X FT	M X M	FT	M	FT -KIPS	TON-M	KIPS	TONS	FT-KIPS	TON-M	KIPS	TONS
3 x 6	0.92 x 1.83	4.1	1.2	36	5	55	25	52	7	79	36
4 x 6	1.22 x1.83	5.3	1.6	65	9	72	33	94	13	103	47
4 x 8	1.22 x 2.44	5.3	1.6	85	12	98	44	123	17	138	63
5 x 10	1.53 x 3.05	6.5	2.0	165	23	152	69	239	33	214	97
5 x 16	1.53 x 4.88	6.5	2.0	259	36	240	109	375	52	338	153
6 x 12	1.83 x 3.66	7.5	2.3	295	41	217	98	428	59	306	139
7 x 14	2.13 x 4.27	8.5	2.6	450	62	260	118	652	90	366	166
8 x 12	2.44 x 3.66	9.8	3.0	465	64	268	122	674	93	377	171
8 x 16	2.44 x 4.88	9.8	3.0	662	95	380	172	959	133	535	243
9 x 14	2.75 x 4.27	10.8	3.3	730	101	373	169	1058	146	525	238
9 x 18	2.75 x 5.49	10.8	3.3	937	130	480	218	1358	188	676	307
10 x 16	3.05 x 4.88	11.8	3.6	976	135	450	204	1414	196	634	287
10 x 20	3.05 x 6.10	11.8	3.6	1286	179	590	268	1864	258	831	377
11 x 18	3.35 x 5.49	12.8	3.9	1386	192	581	264	2009	278	818	371
11 x 22	3.35 x 6.71	12.8	3.9	1697	235	711	323	2459	340	1001	454
12 x 24	3.70 x 7.30	13.8	4.2	2196	304	844	383	3183	440	1189	539
13 x 26	3.96 x 7.90	14.8	4.5	2785	385	987	448	4036	558	1390	631
14 x 28	4.27 x 8.53	15.8	4.8	3421	473	1128	512	4958	686	1589	721

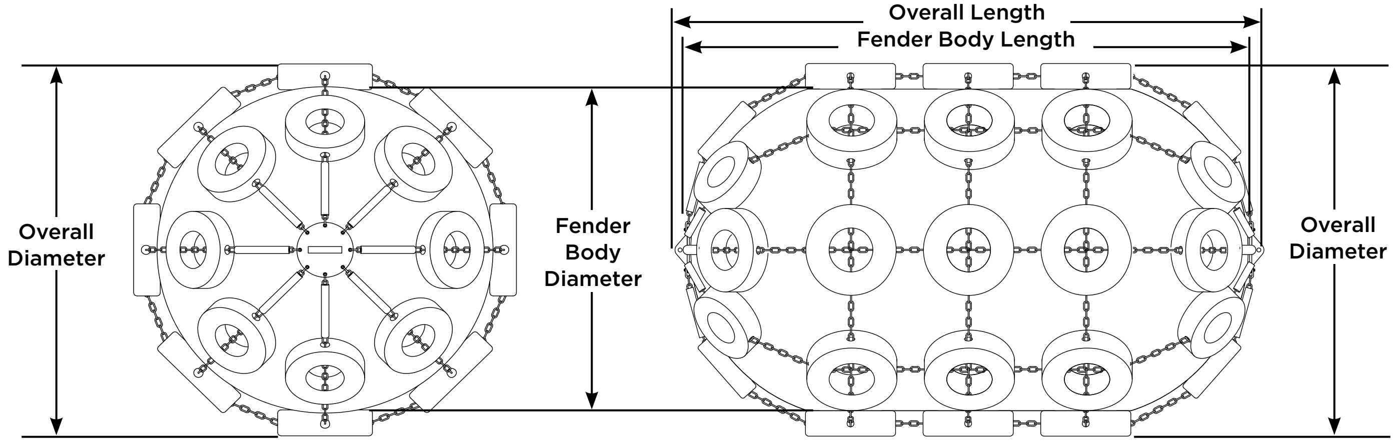
PERFORMANCE AT 60% COMPRESSION

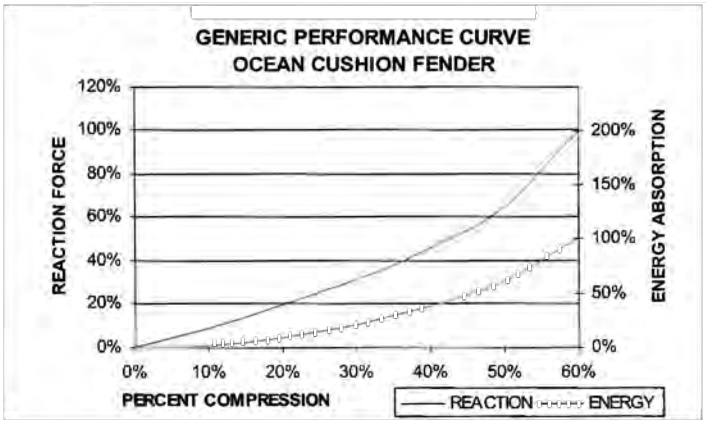
METRIC SIZES											
FENDERS		STAND OFF		STANDARD CAPACITY				HIGH CAPACITY			
SIZE		DIAMETER UNCOMPRESSED		ENERGY ABSORPTION		REACTION FORCE		ENERGY ABSORPTION		REACTION FORCE	
METRIC	ENGLISH										
M X M	FT X FT	FT	M	FT-KIPS	TON-M	KIPS	TONS	FT-KIPS	TON-M	KIPS	TONS
1.00 x 1.50	3.3 x 4.9	4.4	1.3	35	5	50	23	50	7	71	32
1.00 x 2.00	3.3 x 6.6	4.4	1.3	49	7	67	30	71	10	96	43
1.20 x 2.00	3.9 x 6.6	5.3	1.6	64	9	76	34	93	13	107	49
1.20 x 2.50	3.9 x 8.2	5.3	1.6	80	11	94	43	116	16	132	60
1.35 x 2.50	4.4 x 8.2	5.9	1.8	103	14	108	49	150	21	152	69
1.35 x 4.00	4.4 x 13.1	5.9	1.8	165	23	172	478	239	33	242	110
1.50 x 3.00	4.9 x 9.8	6.4	2.0	156	22	146	66	226	31	206	93
1.70 x 3.00	5.6 x 9.8	7.1	2.2	196	27	162	73	284	39	227	103
1.70 x 4.50	5.6 x 14.8	7.1	2.2	297	41	244	111	430	60	344	156
2.00 x 3.50	6.6 x 11.5	8.1	2.5	318	44	222	101	461	64	313	142
2.00 x 4.00	6.6 x 13.1	8.1	2.5	371	51	259	117	538	74	365	165
2.20 x 4.50	7.2 x 14.8	8.7	2.7	500	69	321	146	725	100	452	205
2.20 x 5.50	7.2 x 18.0	8.7	2.7	609	84	390	177	883	122	549	249
2.50 x 4.00	8.2 x 13.1	10.0	3.0	542	75	305	138	786	109	430	195
2.50 x 5.50	8.2 x 18.0	10.0	3.0	793	110	447	203	1149	159	629	285
3.00 x 6.00	9.8 x 19.7	11.6	3.5	1213	168	571	259	1758	243	804	365
3.30 x 4.50	10.8 x 14.8	12.6	3.8	1010	140	430	195	1464	202	606	275
3.30 x 6.50	10.8 x 21.3	12.6	3.8	1581	219	675	306	2291	317	9511	431
3.30 x 10.6	10.8 x 34.8	12.6	3.8	2774	384	1185	538	4020	556	1669	757
4.20 x 8.40	13.8 x 27.6	15.6	4.8	3325	460	1110	503	4819	666	1563	709

PERFORMANCE AT 60% COMPRESSION

* Actual values for above sizes may vary +/- 15% due to variations in materials, speed of compression, temperatures and tolerances. Performance based on 60% compression.

Ocean Cushion foam filled fenders are also available in other sizes and capacity models, Low Reaction, High, Extra High, and Super High Capacity.


Overall Diameter
Fender Body Diameter
Overall Length
Fender Body Length
Overall Diameter


GENERIC PERFORMANCE CURVE
OCEAN CUSHION FENDER
REACTION FORCE
ENERGY ABSORPTION
120%
100%
80%
60%
40%
20%
0%
200%
150%
100%
50%
0%
0%
10%
20%
30%
40%
50%
60%
PERCENT COMPRESSION
REACTION
ENERGY


SEA-LINK
8040203