

— ***MARINE FENDERS*** —



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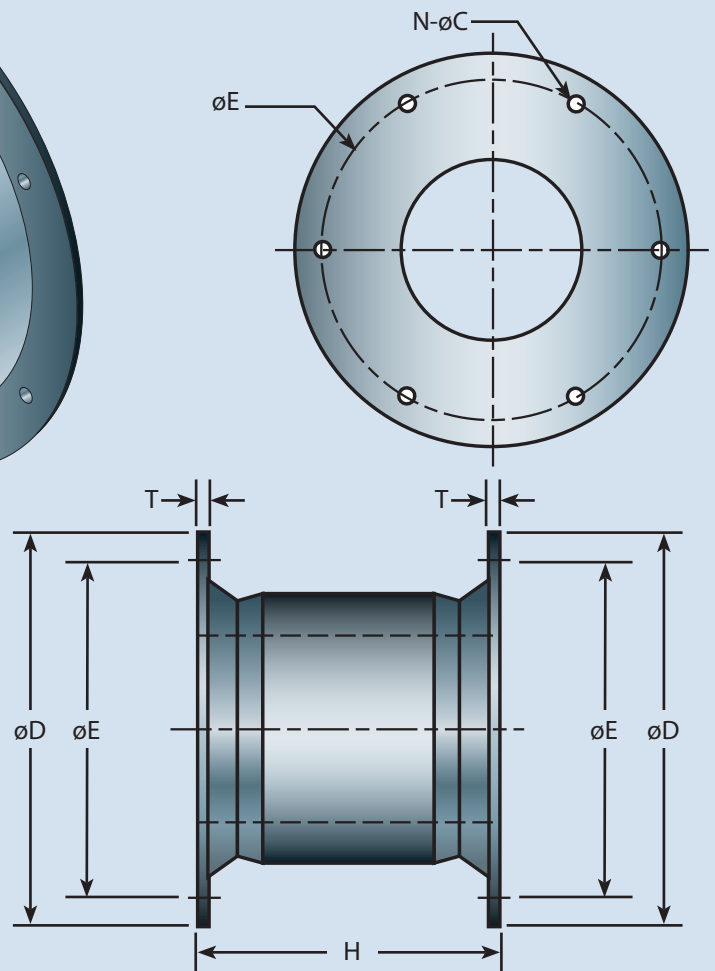
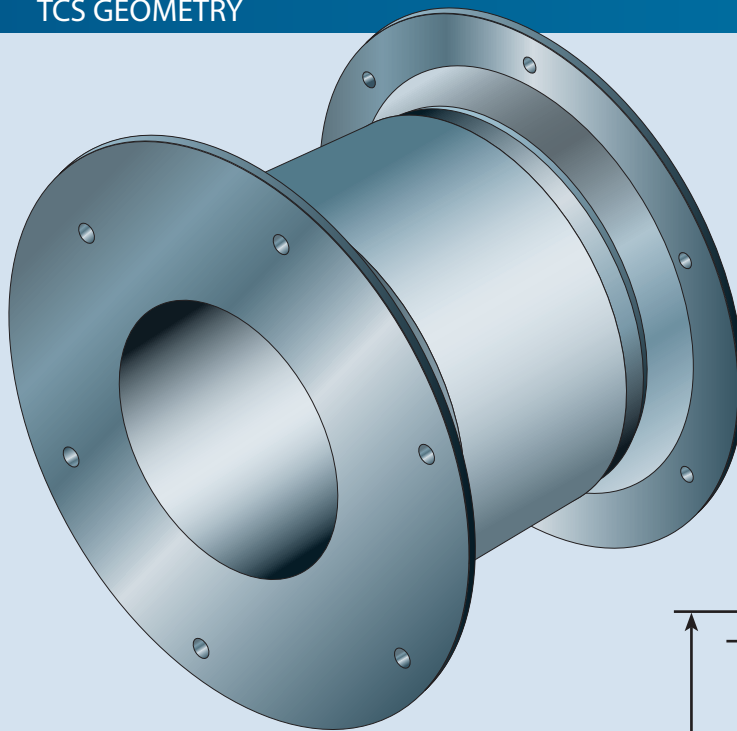
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TCS CELL FENDERS

Tamar Marines cell fenders are the most common and durable fenders available on the market today. Their geometrically symmetrical profile and large flange size distribute load evenly over the back of a panel and allow for easy installation of fixings and mounts. TCS cell fenders are available in a wide range of sizes to cater for any vessel and port configuration you may need.



TCS GEOMETRY

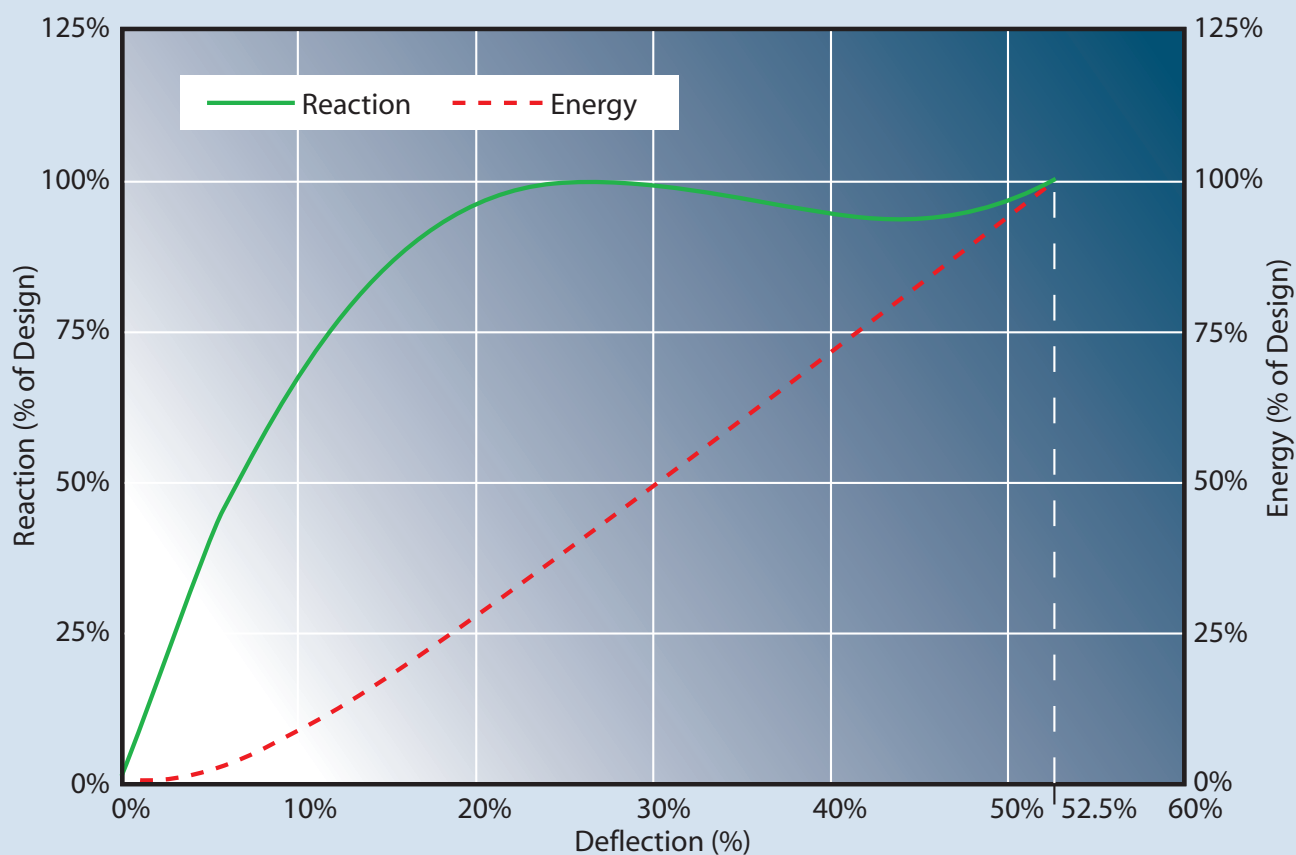


TCS DIMENSIONS

Model	H mm	ϕD mm	ϕE PCD mm	T mm	N- ϕC mm	Bolt Size mm
TCS500	500	650	550	25	4-32	M24
TCS630	630	840	700	30	4-39	M30
TCS800	800	1050	900	30	6-40	M30
TCS1000	1000	1300	1100	35	6-47	M36
TCS1150	1150	1500	1300	40	6-50	M42
TCS1250	1250	1650	1450	45	6-53	M42
TCS1450	1450	1850	1650	47	6-61	M52
TCS1600	1600	2000	1800	52	8-61	M48
TCS1700	1700	2100	1900	55	8-66	M56
TCS2000	2000	2200	2000	55	8-74	M64
TCS2250	2250	2550	2300	60	10-74	M64
TCS2500	2500	2950	2700	70	10-74	M64

Other sizes available. Dimensions are subject to change. Verify current dimensions with Tamar when ordering any fender.

TCS GENERALIZED PERFORMANCE CURVE



Intermediate grades can be interpolated from standard grades

TCS PERFORMANCE

Model	Standard Rubber Grades										Weight (kg)
	T4		T3		T2		T1		T0		
	R kN	E kN-m	R kN	E kN-m	R kN	E kN-m	R kN	E kN-m	R kN	E kN-m	
TCS 500	182	40.2	162	35.6	140	30.1	108	23.4	86.3	17.8	110
TCS 630	290	80.4	258	71.6	224	61.7	172	47	138	38.2	235
TCS 800	464	163	412	145	355	125	275	96	211	74.5	410
TCS 1000	737	324	655	287	567	249	436	191	349	153	805
TCS 1150	975	492	865	437	750	379	578	291	462	233	1223
TCS 1250	1153	632	1022	561	886	486	682	374	546	299	1490
TCS 1450	1551	987	1376	876	1193	760	918	585	735	468	2330
TCS 1600	1888	1326	1676	1177	1453	1020	1117	786	894	628	3020
TCS 1700	2131	1591	1892	1413	1640	1224	1262	941	1009	753	3730
TCS 2000	2941	2591	2619	2300	2270	1994	1746	1534	1398	1227	5023
TCS 2250	4145	4095	3679	3628	3188	3150	2454	2424	2085	2060	7410
TCS 2500	5118	5618	4543	4987	3937	4322	3028	3325	2574	2826	10750

R = reaction E = energy Values shown are for standard 52.5% deflection Maximum deflection = 55% R = 106% E = 106% Tolerance = +/- 10%

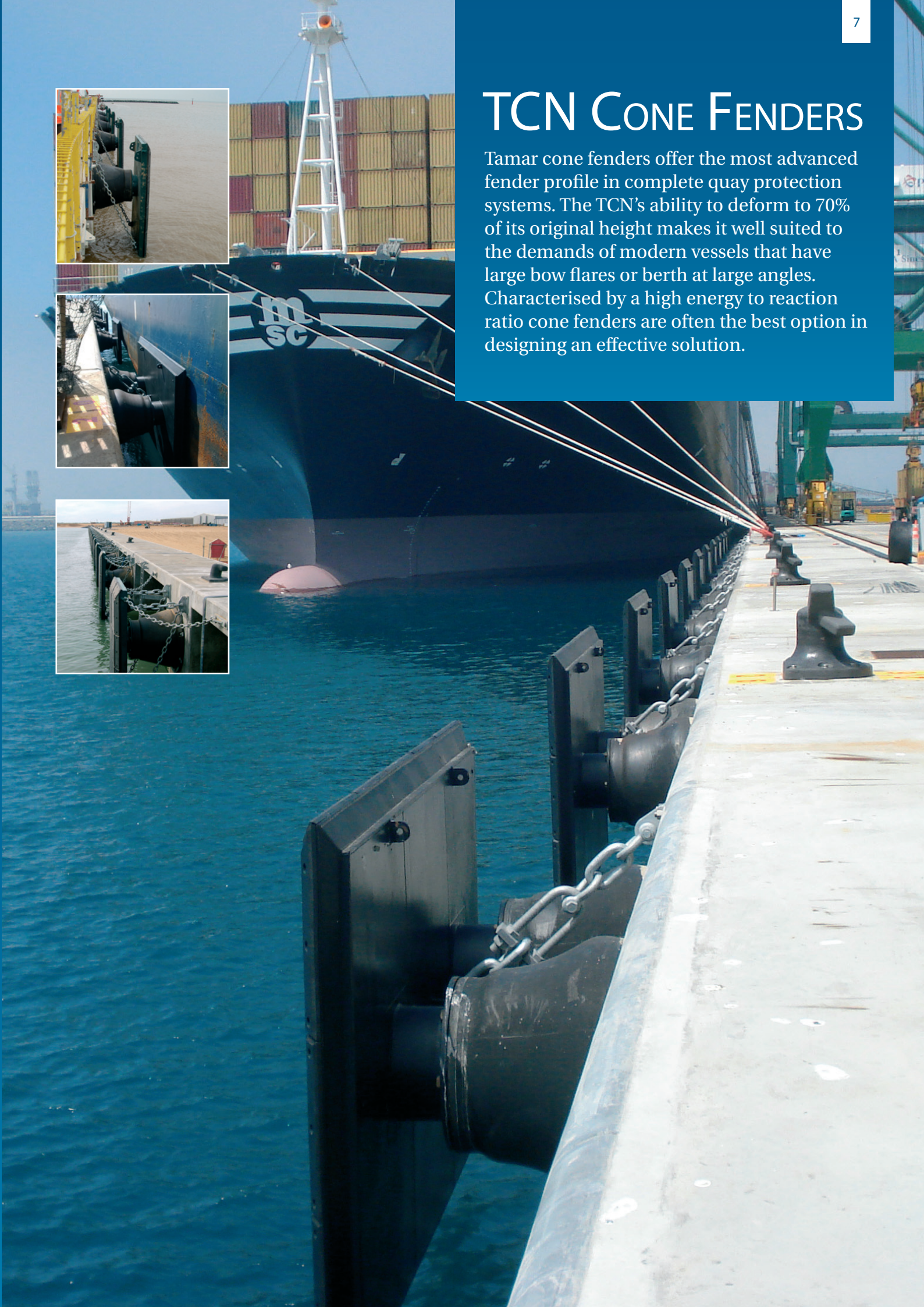
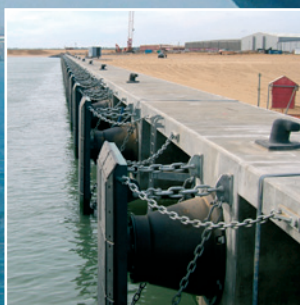
TCS INTERMEDIATE RUBBER GRADES

Grade	Unit	500 kN kN-m	630 kN kN-m	800 kN kN-m	1000 kN kN-m	1150 kN kN-m	1250 kN kN-m	1450 kN kN-m	1600 kN kN-m	1700 kN kN-m	2000 kN kN-m	2250 kN kN-m	2500 kN kN-m
T0	R	86.3	138	211	349	462	546	735	894	1009	1398	2085	2574
	E	17.8	38.2	74.5	153	233	299	468	628	753	1227	2060	2826
T0.1	R	88.5	141	217	358	474	560	753	916	1034	1433	2122	2619
	E	18.4	39.1	76.7	157	239	307	480	644	772	1258	2096	2876
T0.2	R	90.6	145	224	366	485	573	772	939	1060	1468	2159	2665
	E	18.9	40.0	78.8	161	245	314	491	660	791	1288	2133	2926
T0.3	R	92.8	148	230	375	497	587	790	961	1085	1502	2196	2710
	E	19.5	40.8	81.0	164	250	322	503	675	809	1319	2169	2976
T0.4	R	95.0	152	237	384	508	600	808	983	1110	1537	2233	2756
	E	20.0	41.7	83.1	168	256	329	515	691	828	1350	2206	3026
T0.5	R	97.2	155	243	393	520	614	827	1006	1136	1572	2270	2801
	E	20.6	42.6	85.3	172	262	337	527	707	847	1381	2242	3076
T0.6	R	99.3	158	249	401	532	628	845	1028	1161	1607	2306	2846
	E	21.2	43.5	87.4	176	268	344	538	723	866	1411	2278	3125
T0.7	R	101	162	256	410	543	641	863	1050	1186	1642	2343	2892
	E	21.7	44.4	89.6	180	274	352	550	739	885	1442	2315	3175
T0.8	R	104	165	262	419	555	655	881	1072	1211	1676	2380	2937
	E	22.3	45.2	91.7	183	279	359	562	754	903	1473	2351	3225
T0.9	R	106	169	269	427	566	668	900	1095	1237	1711	2417	2983
	E	22.8	46.1	93.9	187	285	367	573	770	922	1503	2388	3275
T1	R	108	172	275	436	578	682	918	1117	1262	1746	2454	3028
	E	23.4	47.0	96.0	191	291	374	585	786	941	1534	2424	3325
T1.1	R	111	177	283	449	595	702	946	1151	1300	1798	2527	3119
	E	24.1	48.5	98.9	197	300	385	603	809	969	1580	2497	3425
T1.2	R	114	182	291	462	612	723	973	1184	1338	1851	2601	3210
	E	24.7	49.9	102	203	309	396	620	833	998	1626	2569	3524
T1.3	R	118	188	299	475	630	743	1001	1218	1375	1903	2674	3301
	E	25.4	51.4	105	208	317	408	638	856	1026	1672	2642	3624
T1.4	R	121	193	307	488	647	764	1028	1251	1413	1956	2748	3392
	E	26.1	52.9	108	214	326	419	655	880	1054	1718	2714	3724
T1.5	R	124	198	315	502	664	784	1056	1285	1451	2008	2821	3483
	E	26.8	54.4	111	220	335	430	673	903	1083	1764	2787	3824
T1.6	R	127	203	323	515	681	804	1083	1319	1489	2060	2894	3573
	E	27.4	55.8	113	226	344	441	690	926	1111	1810	2860	3923
T1.7	R	130	208	331	528	698	825	1111	1352	1527	2113	2968	3664
	E	28.1	57.3	116	232	353	452	708	950	1139	1856	2932	4023
T1.8	R	134	214	339	541	716	845	1138	1386	1564	2165	3041	3755
	E	28.8	58.8	119	237	361	464	725	973	1167	1902	3005	4123
T1.9	R	137	219	347	554	733	866	1166	1419	1602	2218	3115	3846
	E	29.4	60.2	122	243	370	475	743	997	1196	1948	3077	4222
T2	R	140	224	355	567	750	886	1193	1453	1640	2270	3188	3937
	E	30.1	61.7	125	249	379	486	760	1020	1224	1994	3150	4322
T2.1	R	142	227	361	576	762	900	1211	1475	1665	2305	3237	3998
	E	30.7	62.7	127	253	385	494	772	1036	1243	2025	3198	4389
T2.2	R	144	231	366	585	773	913	1230	1498	1690	2340	3286	4058
	E	31.2	63.7	129	257	391	501	783	1051	1262	2055	3246	4455
T2.3	R	147	234	372	593	785	927	1248	1520	1716	2375	3335	4119
	E	31.8	64.7	131	260	396	509	795	1067	1281	2086	3293	4522
T2.4	R	149	238	378	602	796	940	1266	1542	1741	2410	3384	4179
	E	32.3	65.7	133	264	402	516	806	1083	1300	2116	3341	4588
T2.5	R	151	241	384	611	808	954	1285	1565	1766	2445	3434	4240
	E	32.9	66.7	135	268	408	524	818	1099	1319	2147	3389	4655
T2.6	R	153	244	389	620	819	968	1303	1587	1791	2479	3483	4301
	E	33.4	67.6	137	272	414	531	830	1114	1337	2178	3437	4721
T2.7	R	155	248	395	629	831	981	1321	1609	1816	2514	3532	4361
	E	34.0	68.6	139	276	420	539	841	1130	1356	2208	3485	4788
T2.8	R	158	251	401	637	842	995	1339	1631	1842	2549	3581	4422
	E	34.5	69.6	141	279	425	546	853	1146	1375	2239	3532	4854
T2.9	R	160	255	406	646	854	1008	1358	1654	1867	2584	3630	4482
	E	35.1	70.6	143	283	431	554	864	1161	1394	2269	3580	4921
T3	R	162	258	412	655	865	1022	1376	1676	1892	2619	3679	4543
	E	35.6	71.6	145	287	437	561	876	1177	1413	2300	3628	4987
T3.1	R	164	261	417	663	876	1035	1394	1697	1916	2651	3726	4601
	E	36.1	72.5	147	291	443	568	887	1192	1431	2329	3675	5050
T3.2	R	166	264	422	671	887	1048	1411	1718	1940	2683	3772	4658
	E	36.5	73.4	149	294	448	575	898	1207	1449	2358	3721	5113
T3.3	R	168	268	428	680	898	1061	1429	1740	1964	2716	3819	4716
	E	37.0	74.2	150	298	454	582	909	1222	1466	2387	3768	5176
T3.4	R	170	271	433	688	909	1074	1446	1761	1988	2748	3865	4773
	E	37.4	75.1	152	302	459	589	920	1237	1484	2416	3815	5239
T3.5	R	172	274	438	696	920	1088	1464	1782	2012	2780	3912	4831
	E	37.9	76.0	154	306	465	597	932	1252	1502	2446	3862	5303
T3.6	R	174	277	443	704	931	1101	1481	1803	2035	2812	3959	4888
	E	38.4	76.9	156	309	470	604	943	1266	1520	2475	3908	5366

R = reaction E = energy Values shown are for standard 52.5% deflection Maximum deflection = 55% R = 106% E = 106% Tolerance = +/- 10%

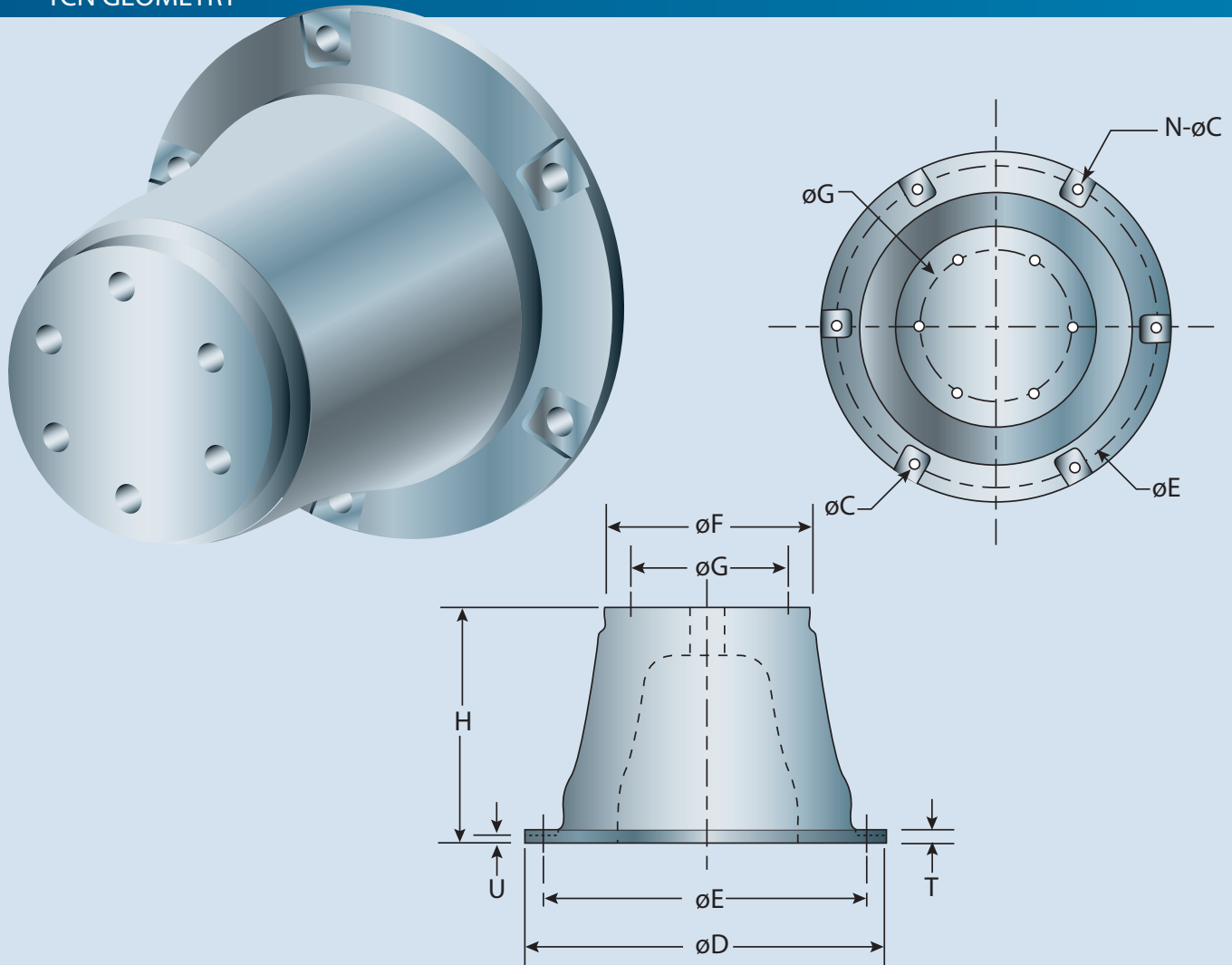
TCN Cone Fenders

Tamar cone fenders offer the most advanced fender profile in complete quay protection systems. The TCN's ability to deform to 70% of its original height makes it well suited to the demands of modern vessels that have large bow flares or berth at large angles. Characterised by a high energy to reaction ratio cone fenders are often the best option in designing an effective solution.



TCN CONE FENDERS

TCN GEOMETRY



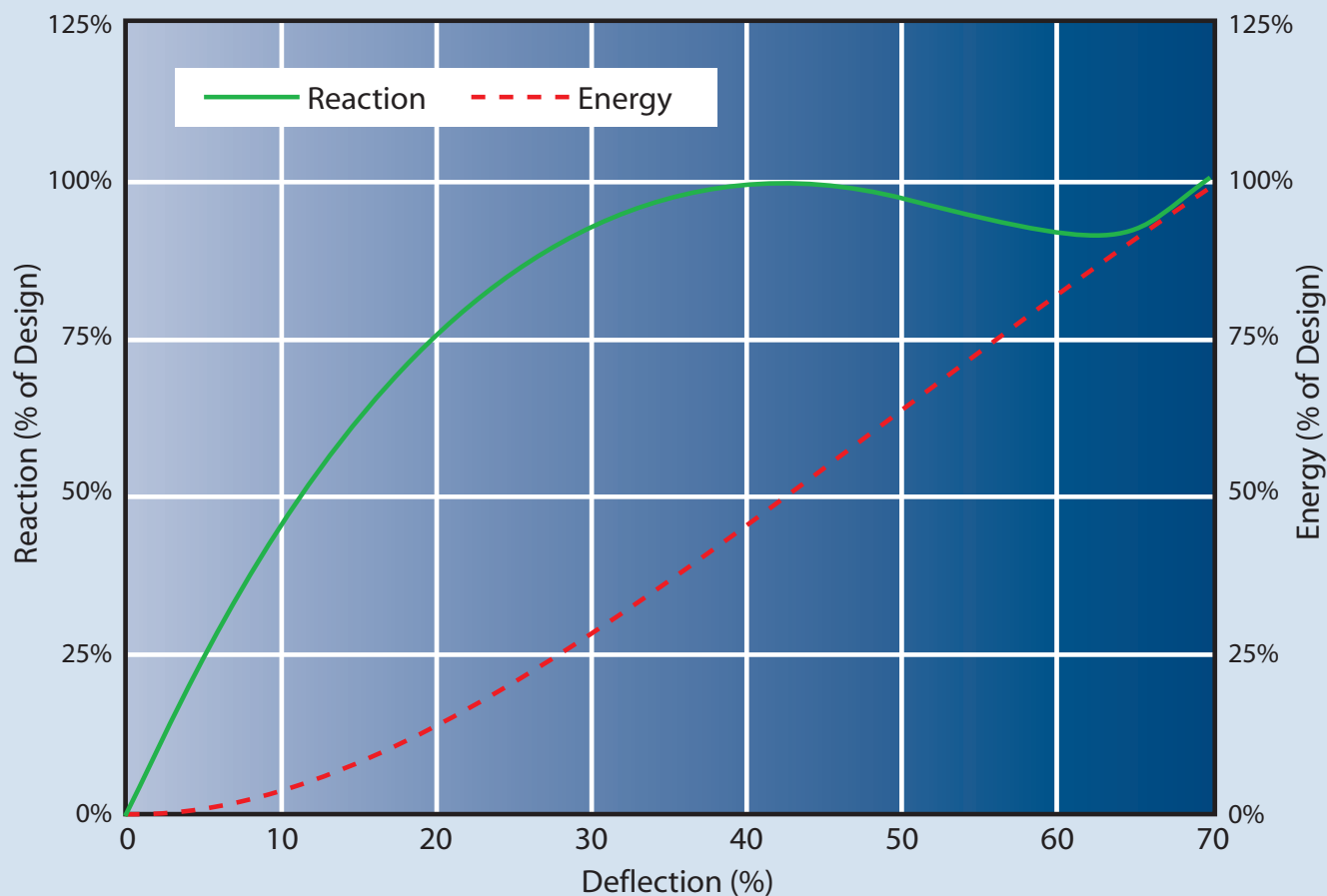
TCN DIMENSIONS

Model	H mm	ϕD mm	ϕE PCD mm	ϕF mm	ϕG PCD mm	T mm	U mm	N- ϕC mm	Bolt Size
TCN 500	500	750	675	425	325	25	21	4-30	M24
TCN 600	600	900	810	510	390	27	22	6-30	M24
TCN 700	700	1050	945	595	455	32	26	6-38	M30
TCN 800	800	1200	1080	680	520	36	29	6-44	M36
TCN 900	900	1350	1215	765	585	41	33	6-44	M36
TCN 1000	1000	1500	1350	850	650	45	37	6-50	M42
TCN 1100	1100	1650	1485	935	715	50	42	6-50	M42
TCN 1150	1150	1725	1550	998	750	52	42	6-50	M42
TCN 1200	1200	1800	1620	1020	780	54	44	8-50	M42
TCN 1300	1300	1950	1755	1105	845	59	48	8-60	M48
TCN 1400	1400	2100	1890	1190	930	66	54	8-60	M48
TCN 1600	1600	2400	2160	1360	1060	72	58	8-70	M52

Other sizes available. Dimensions are subject to change. Verify current dimensions with Tamar when ordering any fender.

TCN CONE FENDER TECHNICAL DATA

TCN GENERIC PERFORMANCE CURVE



Intermediate grades can be interpolated from standard grades

TCN PERFORMANCE

Model	Standard Rubber Grades								Weight (kg)
	T4		T3		T2		T1		
	R kN	E kN-m	R kN	E kN-m	R kN	E kN-m	R kN	E kN-m	
TCN 500	307	81.3	245	65.1	196	54.7	157	43.8	140
TCN 600	441	140	353	112	282	94.5	226	75.6	230
TCN 700	601	223	481	179	384	150	308	120	390
TCN 800	785	333	628	267	502	224	402	179	540
TCN 900	993	474	794	380	636	319	508	255	755
TCN 1000	1226	650	981	521	785	437	628	350	1020
TCN 1100	1483	865	1187	693	950	582	760	466	1505
TCN 1150	1621	989	1297	792	1038	665	830	532	1600
TCN 1200	1765	1124	1412	900	1130	756	904	605	1960
TCN 1300	2072	1428	1657	1144	1326	961	1061	769	2400
TCN 1400	2403	1784	1922	1429	1538	1200	1230	961	3060
TCN 1600	3139	2663	2511	2133	2009	1792	1607	1434	4600

R = reaction E = energy Values shown are for standard 70% deflection Maximum deflection = 72.5% R = 112% E = 104% Tolerance = +/- 10%

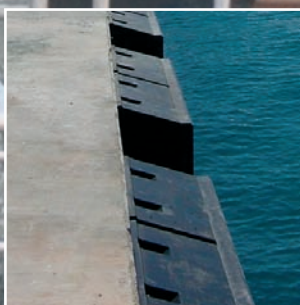
TCN INTERMEDIATE RUBBER GRADES

Grade	Unit	500 kN kN-m	600 kN kN-m	700 kN kN-m	800 kN kN-m	900 kN kN-m	1000 kN kN-m	1100 kN kN-m	1150 kN kN-m	1200 kN kN-m	1300 kN kN-m	1400 kN kN-m	1600 kN kN-m
T0.7	R	145	209	285	372	470	581	703	768	836	982	1138	1486
	E	40.7	70.6	111	166	236	324	431	492	560	711	889	1327
T0.8	R	149	215	293	382	482	597	722	788	859	1008	1168	1527
	E	41.8	72.4	114	170	242	333	443	505	575	731	913	1362
T0.9	R	153	220	300	392	495	612	741	809	881	1035	1199	1567
	E	42.9	74.2	117	175	249	341	454	519	590	750	937	1398
T1	R	157	226	308	402	508	628	760	830	904	1061	1230	1607
	E	44.0	76.0	120	179	255	350	466	532	605	769	961	1434
T1.1	R	161	232	316	412	521	644	779	851	927	1088	1261	1647
	E	45.1	77.8	123	184	261	359	478	545	620	788	985	1470
T1.2	R	165	237	323	422	534	659	798	872	949	1114	1292	1687
	E	46.2	79.6	126	188	268	367	489	559	635	807	1009	1506
T1.3	R	169	243	331	432	546	675	817	892	972	1141	1322	1728
	E	47.3	81.4	129	193	274	376	501	572	650	827	1033	1541
T1.4	R	173	248	338	442	559	691	836	913	994	1167	1353	1768
	E	48.4	83.2	132	197	281	385	512	585	665	846	1057	1577
T1.5	R	177	254	346	452	572	707	855	934	1017	1194	1384	1808
	E	49.5	85.0	135	202	287	394	524	599	681	865	1081	1613
T1.6	R	180	260	354	462	585	722	874	955	1040	1220	1415	1848
	E	50.6	86.8	138	206	293	402	536	612	696	884	1104	1649
T1.7	R	184	265	361	472	598	738	893	976	1062	1247	1446	1888
	E	51.7	88.6	141	211	300	411	547	625	711	903	1128	1685
T1.8	R	188	271	369	482	610	754	912	996	1085	1273	1476	1929
	E	52.8	90.4	144	215	306	420	559	638	726	923	1152	1720
T1.9	R	192	276	376	492	623	769	931	1017	1107	1300	1507	1969
	E	53.9	92.2	147	220	313	428	570	652	741	942	1176	1756
T2	R	196	282	384	502	636	785	950	1038	1130	1326	1538	2009
	E	55.0	94.0	150	224	319	437	582	665	756	961	1200	1792
T2.1	R	201	289	394	515	652	805	974	1064	1158	1359	1576	2059
	E	56.0	95.8	153	228	325	445	593	678	770	979	1223	1826
T2.2	R	206	296	403	527	668	824	997	1090	1186	1392	1615	2109
	E	57.0	97.6	156	233	331	454	604	690	785	998	1246	1860
T2.3	R	211	303	413	540	683	844	1021	1116	1215	1425	1653	2160
	E	58.0	99.4	159	237	337	462	615	703	799	1016	1269	1894
T2.4	R	216	310	423	552	699	863	1045	1142	1243	1458	1692	2210
	E	59.0	101	162	241	343	471	626	716	814	1034	1292	1928
T2.5	R	221	318	433	565	715	883	1069	1168	1271	1492	1730	2260
	E	60.0	103	165	246	350	479	638	729	828	1053	1315	1963
T2.6	R	225	325	442	578	731	903	1092	1193	1299	1525	1768	2310
	E	61.0	105	167	250	356	487	649	741	842	1071	1337	1997
T2.7	R	230	332	452	590	747	922	1116	1219	1327	1558	1807	2360
	E	62.0	107	170	254	362	496	660	754	857	1089	1360	2031
T2.8	R	235	339	462	603	762	942	1140	1245	1356	1591	1845	2411
	E	63.0	108	173	258	368	504	671	767	871	1107	1383	2065
T2.9	R	240	346	471	615	778	961	1163	1271	1384	1624	1884	2461
	E	64.0	110	176	263	374	513	682	779	886	1126	1406	2099
T3	R	245	353	481	628	794	981	1187	1297	1412	1657	1922	2511
	E	65.0	112	179	267	380	521	693	792	900	1144	1429	2133
T3.1	R	251	362	493	644	814	1006	1217	1329	1447	1699	1970	2574
	E	66.6	115	183	274	389	534	710	812	922	1172	1465	2186
T3.2	R	257	371	505	659	834	1030	1246	1362	1483	1740	2018	2637
	E	68.2	118	188	280	399	547	727	831	945	1201	1500	2239
T3.3	R	264	379	517	675	854	1055	1276	1394	1518	1782	2066	2699
	E	69.8	120	192	287	408	560	745	851	967	1229	1536	2292
T3.4	R	270	388	529	691	874	1079	1305	1427	1553	1823	2114	2762
	E	71.4	123	197	293	418	573	762	871	990	1258	1571	2345
T3.5	R	276	397	541	707	894	1104	1335	1459	1589	1865	2163	2825
	E	73.0	126	201	300	427	586	779	891	1012	1286	1607	2398
T3.6	R	282	406	553	722	913	1128	1365	1491	1624	1906	2211	2888
	E	74.6	129	205	307	436	598	796	910	1034	1314	1642	2451
T3.7	R	288	415	565	738	933	1153	1394	1524	1659	1948	2259	2951
	E	76.2	132	210	313	446	611	813	930	1057	1343	1678	2504
T3.8	R	295	423	577	754	953	1177	1424	1556	1694	1989	2307	3013
	E	77.8	134	214	320	455	624	831	950	1079	1371	1713	2557
T3.9	R	301	432	589	769	973	1202	1453	1589	1730	2031	2355	3076
	E	79.4	137	219	326	465	637	848	969	1102	1400	1749	2610
T4	R	307	441	601	785	993	1226	1483	1621	1765	2072	2403	3139
	E	81.0	140	223	333	474	650	865	989	1124	1428	1784	2663

R = reaction E = energy Values shown are for standard 70% deflection Maximum deflection = 72.5% R = 112% E = 104% Tolerance = +/- 10%

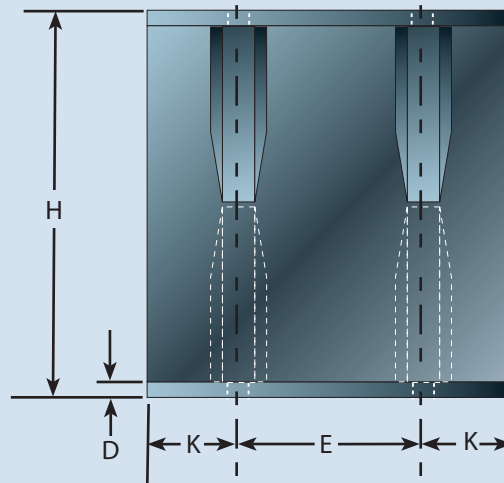
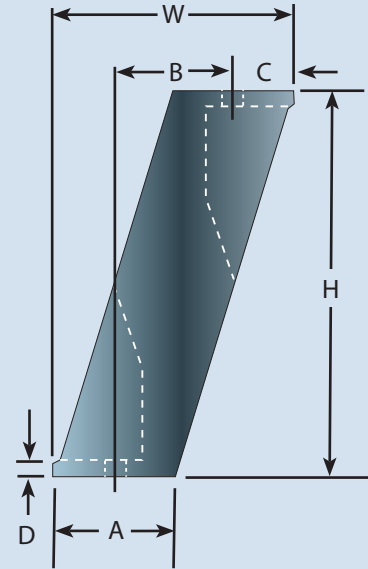
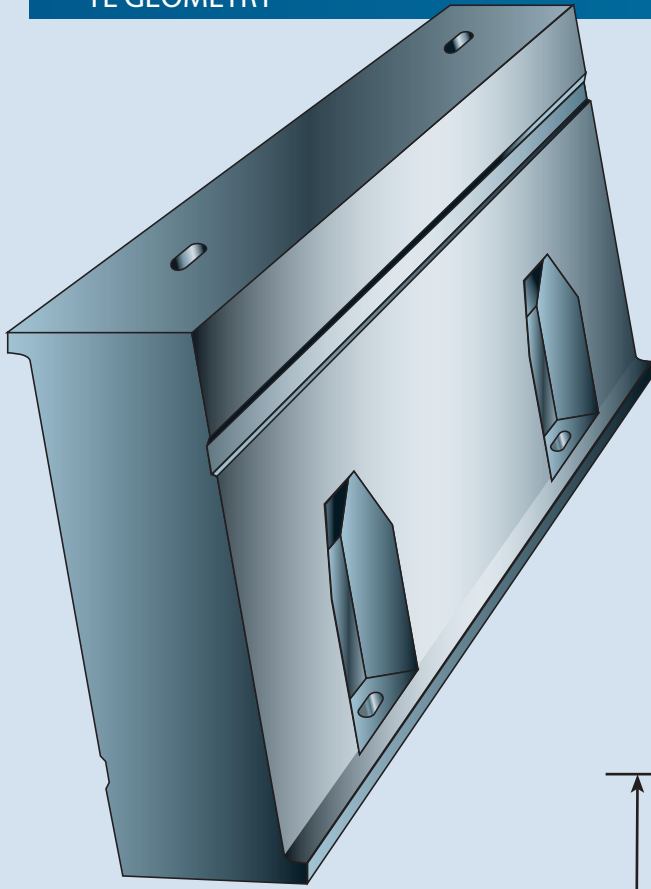
TL LEG FENDERS

TL Leg fenders can be used in a variety of situations as a compact alternative to TCS and TCN fenders. Leg fenders come in a variety of heights, lengths and mounting configurations to accommodate your every need. TL fenders can be coupled with a lightweight UHMW face to provide an alternative to plastic faced arches.



TL LEG FENDERS

TL GEOMETRY

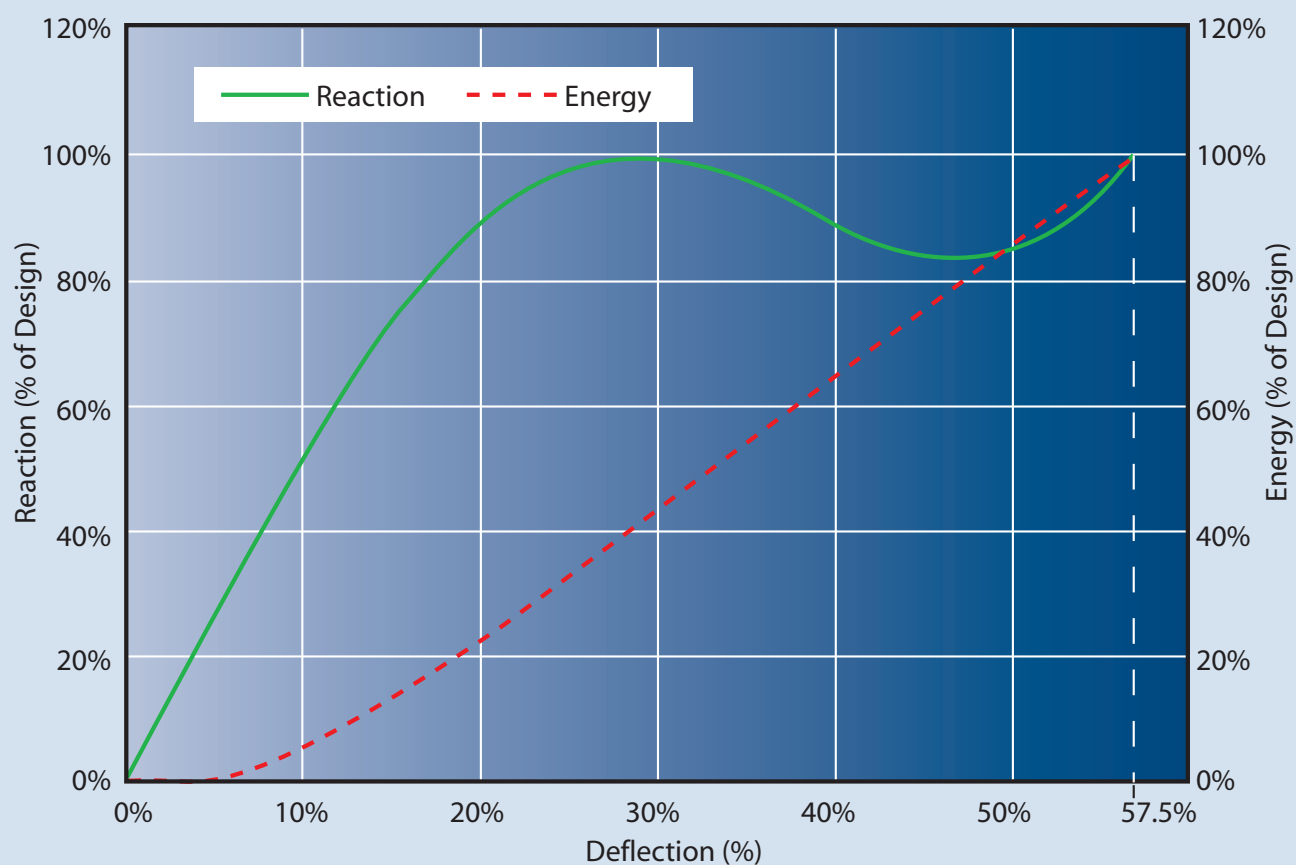


TL LEG FENDERS DIMENSIONS

Model	H mm	A mm	B mm	C mm	W mm	D mm	K mm	E mm	Bolt Size mm
TL 300	300	94	94	47	188	15	200	2X300	M20
TL 400	400	125	124	63	250	17	250	500	M24
TL 500	500	158	142	87	316	20	250	500	M30
TL 550	550	172	170	87	344	20	250	500	M30
TL 600	600	188	199	87	373	20	250	500	M30
TL 750	750	235	230	118	466	26	250	500	M36
TL 800	800	250	240	129	498	26	250	500	M36
TL 1000	1000	322	310	162	634	31	250	500	M42
TL 1250	1250	401	388	202	792	36	250	500	M48
TL 1450	1450	454	454	228	910	41	250	500	M48
TL 1600	1600	500	480	257	994	50	250	500	M56

Other sizes available. Dimensions are subject to change. Verify current dimensions with Tamar when ordering any fender.
Dimension table based on 1000mm lengths for one leg.

TL GENERALIZED PERFORMANCE CURVE



Intermediate grades can be interpolated from standard grades

TL PERFORMANCE

Model	Standard Rubber Grades								Weight (kg/m)
	T4		T3		T2		T1		
	R kN	E kN-m	R kN	E kN-m	R kN	E kN-m	R kN	E kN-m	
TL 300	160	22.1	136	18.8	112	15.5	88.2	12.2	46.7
TL 400	214	39.2	182	33.4	150	27.5	118	21.7	109
TL 500	267	61.3	227	52.1	187	43.0	147	33.9	110
TL 550	294	74.1	250	63.1	206	52.0	162	41.0	125
TL 600	320	88.2	272	75.1	224	61.9	176	48.8	147
TL 750	401	138	341	117	281	96.8	221	76.2	230
TL 800	427	157	363	133	299	110	235	86.7	254
TL 1000	534	245	454	209	374	172	294	136	408
TL 1250	668	383	568	326	468	269	368	212	636
TL 1450	774	515	658	438	542	362	426	285	1017
TL 1600	854	627	726	534	598	440	470	347	1253

R = reaction E = energy Values shown are for standard 57.5% deflection Maximum deflection = 62.5% R = 129% E = 114% Tolerance = +/- 10%
Performance based on 1000mm length.

TL INTERMEDIATE RUBBER GRADES

Grade	Unit	300 kN kN-m	400 kN kN-m	500 kN kN-m	550 kN kN-m	600 kN kN-m	750 kN kN-m	800 kN kN-m	1000 kN kN-m	1250 kN kN-m	1450 kN kN-m	1600 kN kN-m
T0.7	R	80.8	108	135	149	162	203	216	270	338	391	432
	E	11.2	20.0	31.2	37.7	44.8	69.7	80.1	125	195	262	319
T0.8	R	83.2	112	139	153	166	209	222	278	348	403	444
	E	11.5	20.5	32.1	38.8	46.2	71.8	82.4	129	201	270	328
T0.9	R	85.6	115	143	158	171	215	229	286	358	414	457
	E	11.9	21.1	33.0	39.9	47.5	73.9	84.7	132	206	277	338
T1	R	88.0	118	147	162	176	221	235	294	368	426	470
	E	12.2	21.7	33.9	41.0	48.8	76.0	87.0	136	212	285	347
T1.1	R	90.4	121	151	166	181	227	241	302	378	438	483
	E	12.5	22.3	34.8	42.1	50.1	78.1	89.3	140	218	293	356
T1.2	R	92.8	124	155	171	186	233	248	310	388	449	496
	E	12.9	22.9	35.7	43.2	51.4	80.2	91.6	143	223	300	366
T1.3	R	95.2	128	159	175	190	239	254	318	398	461	508
	E	13.2	23.4	36.6	44.3	52.8	82.3	93.9	147	229	308	375
T1.4	R	97.6	131	163	180	195	245	261	326	408	472	521
	E	13.5	24.0	37.5	45.4	54.1	84.4	96.2	150	235	316	384
T1.5	R	100	134	167	184	200	251	267	334	418	484	534
	E	13.9	24.6	38.5	46.5	55.4	86.5	98.5	154	241	324	394
T1.6	R	102	137	171	188	205	257	273	342	428	496	547
	E	14.2	25.2	39.4	47.6	56.7	88.6	101	158	246	331	403
T1.7	R	105	140	175	193	210	263	280	350	438	507	560
	E	14.5	25.8	40.3	48.7	58.0	90.7	103	161	252	339	412
T1.8	R	107	144	179	197	214	269	286	358	448	519	572
	E	14.8	26.3	41.2	49.8	59.4	92.8	105	165	258	347	421
T1.9	R	110	147	183	202	219	275	293	366	458	530	585
	E	15.2	26.9	42.1	50.9	60.7	94.9	108	168	263	354	431
T2	R	112	150	187	206	224	281	299	374	468	542	598
	E	15.5	27.5	43.0	52.0	62.0	97.0	110	172	269	362	440
T2.1	R	114	153	191	210	229	287	305	382	478	554	611
	E	15.8	28.1	43.9	53.1	63.3	99.0	112	176	275	370	449
T2.2	R	117	156	195	215	234	293	312	390	488	565	624
	E	16.2	28.7	44.8	54.2	64.6	101	115	179	280	377	459
T2.3	R	119	160	199	219	238	299	318	398	498	577	636
	E	16.5	29.3	45.7	55.3	65.9	103	117	183	286	385	468
T2.4	R	122	163	203	224	243	305	325	406	508	588	649
	E	16.8	29.9	46.6	56.4	67.2	105	119	187	292	392	478
T2.5	R	124	166	207	228	248	311	331	414	518	600	662
	E	17.2	30.5	47.6	57.6	68.5	107	122	191	298	400	487
T2.6	R	126	169	211	232	253	317	337	422	528	612	675
	E	17.5	31.0	48.5	58.7	69.8	109	124	194	303	408	496
T2.7	R	129	172	215	237	258	323	344	430	538	623	688
	E	17.8	31.6	49.4	59.8	71.1	111	126	198	309	415	506
T2.8	R	131	176	219	241	262	329	350	438	548	635	700
	E	18.1	32.2	50.3	60.9	72.4	113	128	202	315	423	515
T2.9	R	134	179	223	246	267	335	357	446	558	646	713
	E	18.5	32.8	51.2	62.0	73.7	115	131	205	320	430	525
T3	R	136	182	227	250	272	341	363	454	568	658	726
	E	18.8	33.4	52.1	63.1	75.0	117	133	209	326	438	534
T3.1	R	138	185	231	254	277	347	369	462	578	670	739
	E	19.1	34.0	53.0	64.2	76.3	119	135	213	332	446	543
T3.2	R	141	188	235	259	282	353	376	470	588	681	752
	E	19.5	34.6	53.9	65.3	77.6	121	138	216	337	453	553
T3.3	R	143	192	239	263	286	359	382	478	598	693	764
	E	19.8	35.1	54.9	66.4	78.9	123	140	220	343	461	562
T3.4	R	146	195	243	268	291	365	389	486	608	704	777
	E	20.1	35.7	55.8	67.5	80.2	125	143	223	349	469	571
T3.5	R	148	198	247	272	296	371	395	494	618	716	790
	E	20.5	36.3	56.7	68.6	81.5	128	145	227	355	477	581
T3.6	R	150	201	251	276	301	377	401	502	628	728	803
	E	20.8	36.9	57.6	69.6	82.8	130	147	231	360	484	590
T3.7	R	153	204	255	281	306	383	408	510	638	739	816
	E	21.1	37.5	58.5	70.7	84.1	132	150	234	366	492	599
T3.8	R	155	208	259	285	310	389	414	518	648	751	828
	E	21.4	38.0	59.5	71.8	85.4	134	152	238	372	500	608
T3.9	R	158	211	263	290	315	395	421	526	658	762	841
	E	21.8	38.6	60.4	72.9	86.7	136	155	241	377	507	618
T4	R	160	214	267	294	320	401	427	534	668	774	854
	E	22.1	39.2	61.3	74.0	88.0	138	157	245	383	515	627

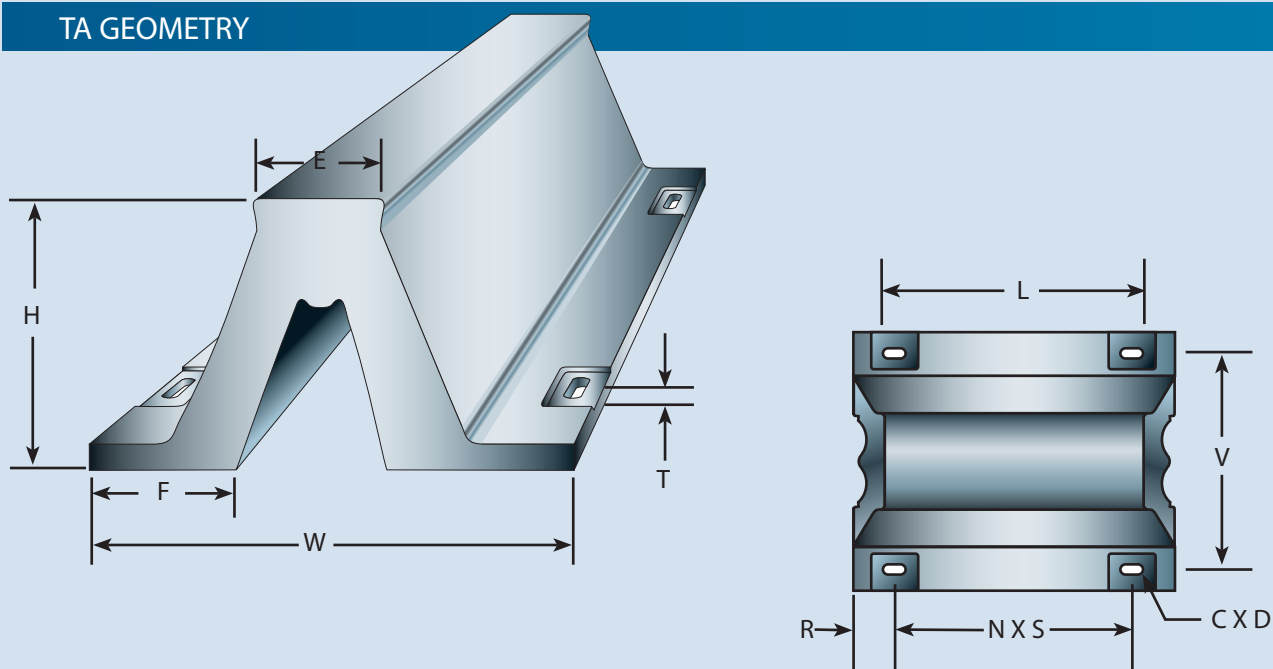
R = reaction E = energy Values shown are for standard 57.5% deflection Maximum deflection = 62.5% R = 129% E = 114% Tolerance = +/- 10%
Based on 1000mm lengths for one leg.

TA ARCH FENDERS

TA arch fenders represent a compact option for vessels with high allowable hull pressures. In berths that receive a high frequency of traffic they represent a stable long lasting alternative to other types of fender. TA fenders are available in a wide variety of sizes and lengths and come with an option for UHMW face pads.



TA GEOMETRY



TA DIMENSIONS

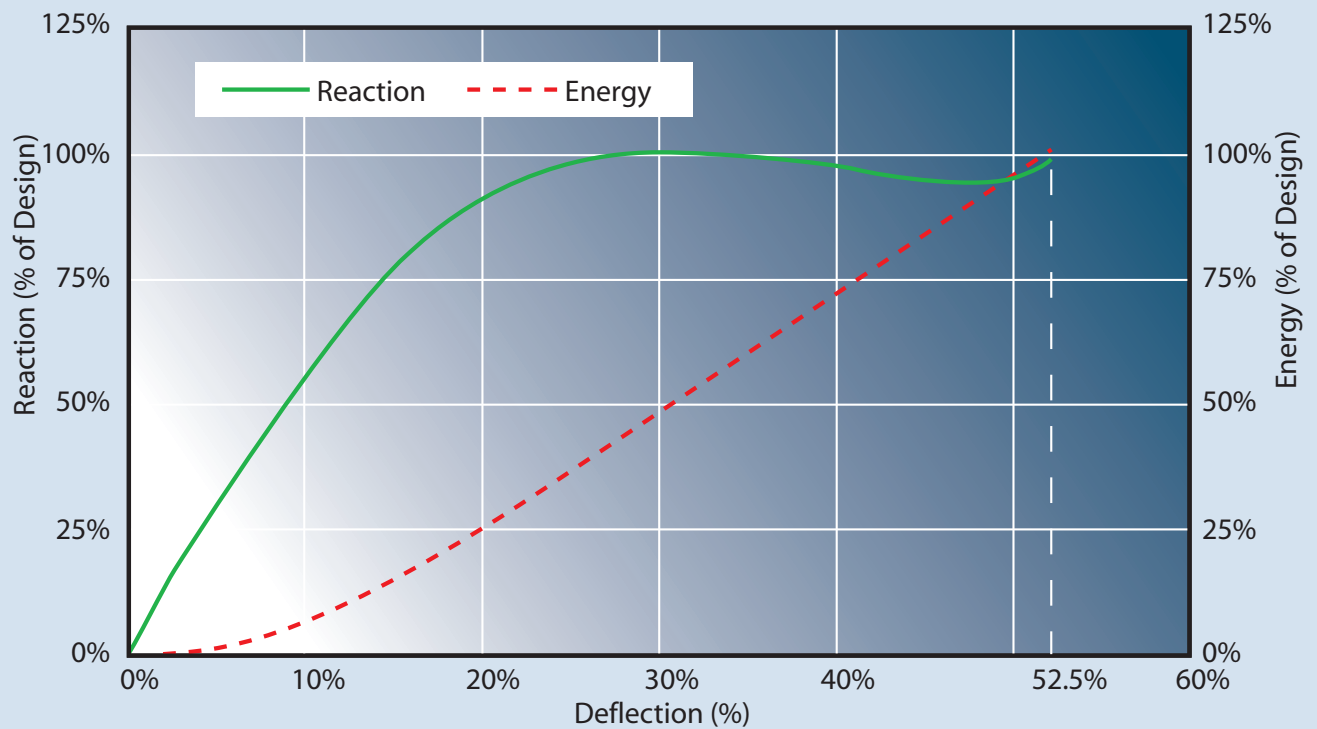
Model	H mm	W mm	V mm	E mm	F mm	T mm	C X D mm	Bolt Size mm
TA 250	250	500	410	164	160	20.5	32 X 64	M27
TA 300	300	600	490	225	195	24	35 X 70	M30
TA 400	400	800	670	300	260	30	41 X 82	M36
TA 500	500	1000	840	375	325	33	47 X 94	M42
TA 600	600	1200	1010	450	390	36	50 X 100	M48
TA 800	800	1600	1340	600	520	45	68 X 136	M64
TA 1000	1000	2000	1680	750	650	60	68 X 136	M64

all dimensions are in millimeters

Model	L											
	1m		1.5m		2m		2.5m		3m		3.5m	
	R	N X S	R	N X S	R	N X S	R	N X S	R	N X S	R	N X S
TA 250	130	1 x 865	133	2 x 680	133	3 x 620	128	3 x 790	133	4 x 715	130	5 x 673
TA 300	140	1 x 870	140	2 x 685	138	3 x 625	140	3 x 790	145	4 x 715	140	5 x 674
TA 400	150	1 x 900	150	2 x 700	148	3 x 635	150	3 x 800	150	4 x 725	150	5 x 680
TA 500	160	1 x 930	160	2 x 715	158	3 x 645	160	3 x 810	165	4 x 730	160	5 x 686
TA 600	170	1 x 960	170	2 x 730	168	3 x 655	170	3 x 820	170	4 x 740	170	5 x 692
TA 800	180	1 x 1040	180	2 x 770	180	3 x 680	183	3 x 845	180	4 x 760	-	-
TA 1000	200	1 x 1100	200	2 x 800	200	3 x 700	-	-	-	-	-	-

Fenders are available in alternative lengths, typical lengths are as follows: 1.5m, 2.0m, 2.5m, 2.5m, 3.0m, 3.5m

TA GENERALIZED PERFORMANCE CURVE



Intermediate grades can be interpolated from standard grades

TA PERFORMANCE

Model	Rubber Grade								Weight kg/m
	T4		T3		T2		T1		
	R kN	E kN-m	R kN	E kN-m	R kN	E kN-m	R kN	E kN-m	
TA 250	265	27.8	203	21.4	169	17.7	145	15.2	87.5
TA 300	318	40.2	244	30.4	201	24.5	174	21.6	125
TA 400	423	71.5	325	54.9	270	45.1	231	39.2	205
TA 500	529	111	407	86.0	337	70.6	289	60.8	325
TA 600	634	160	488	124	404	102	347	87.0	480
TA 800	847	284	651	219	539	181	463	156	875
TA 1000	1058	445	813	342	675	283	578	243	1400

R = reaction E = energy Values shown are for standard 52.5% deflection Maximum deflection = 55% R = 139% E = 107% Tolerance = +/- 10%
Performance based on 1000mm length.

TA INTERMEDIATE RUBBER GRADES

Grade	Unit	TA 250 kN kN-m	TA 300 kN kN-m	TA 400 kN kN-m	TA 500 kN kN-m	TA 600 kN kN-m	TA 800 kN kN-m	TA 1000 kN kN-m
T1	R	145	174	231	289	347	463	578
	E	15.2	21.6	39.2	60.8	87.0	156	243
T1.1	R	147	177	235	294	353	471	588
	E	15.5	21.9	39.8	61.8	88.5	159	247
T1.2	R	150	179	239	299	358	478	597
	E	15.7	22.2	40.4	62.8	90.0	161	251
T1.3	R	152	182	243	303	364	486	607
	E	16.0	22.5	41.0	63.7	91.5	164	255
T1.4	R	155	185	247	308	370	493	617
	E	16.2	22.8	41.6	64.7	93.0	166	259
T1.5	R	157	188	251	313	376	501	627
	E	16.5	23.1	42.2	65.7	94.5	169	263
T1.6	R	159	190	254	318	381	509	636
	E	16.7	23.3	42.7	66.7	96.0	171	267
T1.7	R	162	193	258	323	387	516	646
	E	17.0	23.6	43.3	67.7	97.5	174	271
T1.8	R	164	196	262	327	393	524	656
	E	17.2	23.9	43.9	68.6	99.0	176	275
T1.9	R	167	198	266	332	398	531	665
	E	17.5	24.2	44.5	69.6	101	179	279
T2	R	169	201	270	337	404	539	675
	E	17.7	24.5	45.1	70.6	102	181	283
T2.1	R	172	205	276	344	412	550	689
	E	18.1	25.1	46.1	72.1	104	185	289
T2.2	R	176	210	281	351	421	561	703
	E	18.4	25.7	47.1	73.7	106	189	295
T2.3	R	179	214	287	358	429	573	716
	E	18.8	26.3	48.0	75.2	109	192	301
T2.4	R	183	218	292	365	438	584	730
	E	19.2	26.9	49.0	76.8	111	196	307
T2.5	R	186	223	298	372	446	595	744
	E	19.6	27.5	50.0	78.3	113	200	313
T2.6	R	189	227	303	379	454	606	758
	E	19.9	28.0	51.0	79.8	115	204	318
T2.7	R	193	231	309	386	463	617	772
	E	20.3	28.6	52.0	81.4	117	208	324
T2.8	R	196	235	314	393	471	629	785
	E	20.7	29.2	52.9	82.9	120	211	330
T2.9	R	200	240	320	400	480	640	799
	E	21.0	29.8	53.9	84.5	122	215	336
T3	R	203	244	325	407	488	651	813
	E	21.4	30.4	54.9	86.0	124	219	342
T3.1	R	209	251	340	419	503	671	838
	E	22.0	31.4	56.6	88.5	128	226	352
T3.2	R	215	259	356	431	517	690	862
	E	22.7	32.4	58.2	91.0	131	232	363
T3.3	R	222	266	371	444	532	710	887
	E	23.3	33.3	59.9	93.5	135	239	373
T3.4	R	228	274	386	456	546	729	911
	E	24.0	34.3	61.5	96.0	138	245	383
T3.5	R	234	281	402	468	561	749	936
	E	24.6	35.3	63.2	98.5	142	252	394
T3.6	R	240	288	417	480	576	769	960
	E	25.2	36.3	64.9	101	146	258	404
T3.7	R	246	296	432	492	590	788	985
	E	25.9	37.3	66.5	104	149	265	414
T3.8	R	253	303	447	505	605	808	1009
	E	26.5	38.2	68.2	106	153	271	424
T3.9	R	259	311	463	517	619	827	1034
	E	27.2	39.2	69.8	109	156	278	435
T4	R	265	318	478	529	634	847	1058
	E	27.8	40.2	71.5	111	160	284	445

R = reaction E = energy Values shown are for standard 52.5% deflection Maximum deflection = 55% R = 139% E = 107% Tolerance = +/- 10%
Performance based on 1000mm length.

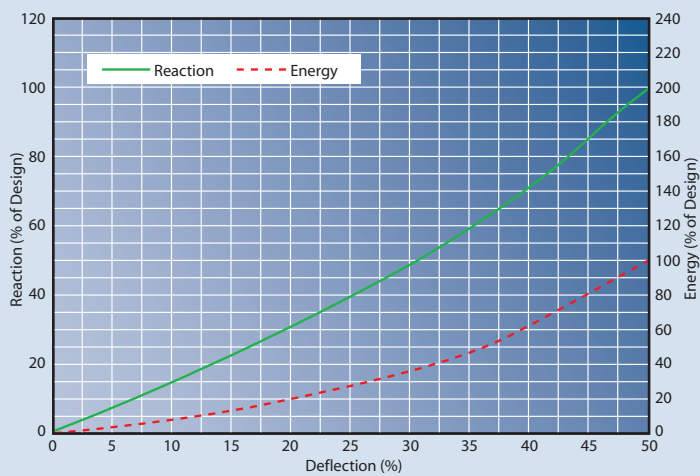
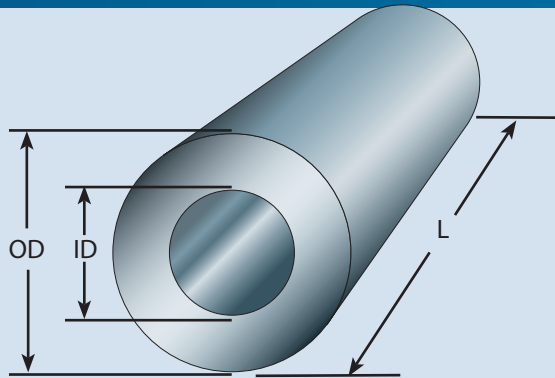
PROFILE FENDERS

TCY cylindrical fenders and Tamar's range of profile fenders are an economical solution to absorbing berthing energies. With a variety of mounting options available cylindrical fenders can be tailored to suit any budget or quay. Utilising a variety of hardware, chain and steel mounting bars TCY fenders provide quay protection for any size vessel or port. Tamar's profile fenders are available in a range of sizes, lengths and profiles to suit any application, their diverse range allows them to be used as vessel or quayside fendering in a variety of situations.



PROFILE FENDERS

TCY CYLINDRICAL RUBBER FENDERS



Outer Dia mm	Inner Dia mm	Weight kg/m	Reaction		Energy	
			T2 kN	T4 kN	T2 kN-m	T4 kN-m
150	75	16	44.0	73.0	1.50	2.30
200	100	39	60.0	95.0	2.60	4.20
250	125	46	75.0	120	4.00	6.50
300	150	66	89.0	143	6.00	9.00
350	175	90	104	167	8.00	13.0
400	200	118	119	191	10.0	17.0
500	250	184	148	239	16.0	26.0
600	300	265	179	286	24.0	37.0
700	350	361	208	334	31.0	50.0
800	400	471	237	383	41.0	66.0
900	450	596	268	430	52.0	84.0
1000	500	736	297	479	64.0	103
1100	550	890	331	528	77.0	129
1200	600	1060	363	574	95.0	152
1300	650	1244	392	623	108	179
1400	700	1442	422	670	128	208
1500	750	1656	451	718	147	238
1600	800	1884	481	776	176	282
1700	850	2127	511	824	206	338
1800	900	2384	541	872	247	406
1900	950	2657	570	920	288	487
2000	1000	2944	653	1054	321	584

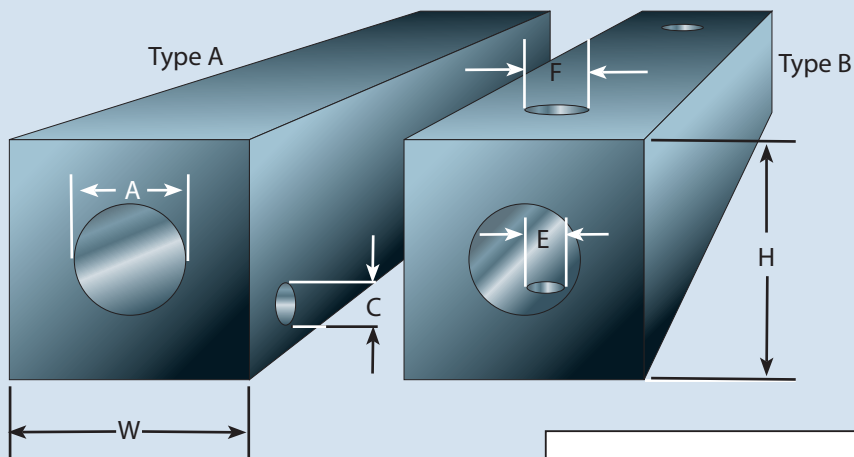
R=reaction E = energy Design deflection = 50%

Performance based on 1000mm length.

Performance values and deflections are only for fenders in which the inside diameter equals 50% of outside diameter.

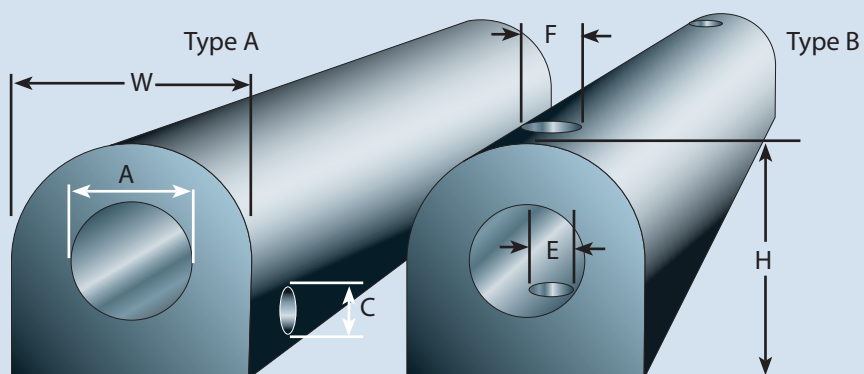
Contact Tamar for performance at deflections greater than 50%.

TSO SQUARE O-BORE RUBBER FENDERS



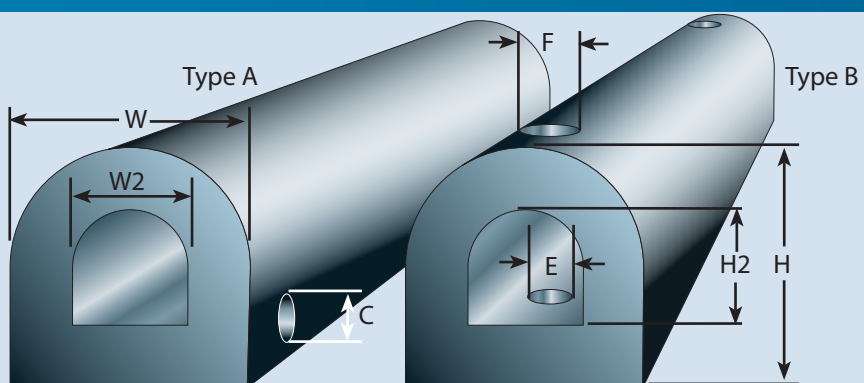
all dimensions are in millimeters								
H	150	200	250	300	350	400	500	600
W	150	200	250	300	350	400	500	600
A(ø)	75	100	125	150	175	200	250	300
C/E(ø)	27	30	33	36	40	45	50	55
F(ø)	60	65	75	80	85	95	105	115
Bolt Size	22	25	29	32	35	38	44	50

TDO D•O-BORE RUBBER FENDERS



TDO Fenders								
all dimensions are in millimeters								
H	150	200	250	300	350	400	500	600
W	150	200	250	300	350	400	500	600
A(ø)	75	100	125	150	175	200	250	300
C/E(ø)	27	30	33	36	40	45	50	55
F(ø)	60	65	75	80	85	95	105	115
Bolt Size	22	25	29	32	35	38	44	50

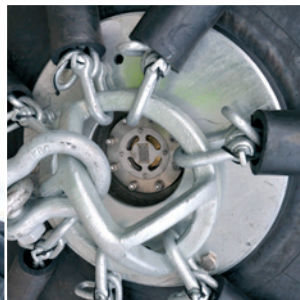
TDD D•D-BORE RUBBER FENDERS



TDD Fenders								
all dimensions are in millimeters								
H	150	200	250	300	350	400	500	600
W	150	200	250	300	350	400	500	600
C/E(ø)	27	30	33	36	40	45	50	55
F(ø)	60	65	75	80	85	95	105	115
Bolt Size	22	25	29	32	35	38	44	50

PNEUMATIC FENDERS

Tamar Marine pneumatic fenders provide the most portable and versatile fendering option for your port. Easy to manoeuvre, store and maintain pneumatic fenders can be used as quay protection and ship to ship transfers on a permanent or semi-permanent basis. Available in high or low pressure configurations and a vast selection of sizes; large pneumatic fenders also feature a safety valve and can be equipped with rope or tyre nets for increased protection and longevity.



PNEUMATIC FENDER PERFORMANCE DATA

INTERNAL INITIAL PRESSURE: 50 kPa (0.5 kgf/cm²)

FENDER SIZE	ENERGY ABSORPTION		REACTION FORCE		HULL PRESSURE AT 60% DEF.		SAFETY VALVE PRESSURE SETTING		TESTING PRESSURE		
	mm(D) x mm(L)	kN-m	tf-m	kN/m2	tf/m2	kN/m2	tf/m2	kPa	kgf/cm2	kPa	kgf/cm2
300 x 600		0.5	0.1	24	2.4	134	13.7	-	-	147	1.5
500 x 800		4.9	0.5	52	5.3	130	13.3	-	-	147	1.5
500 x 1000		6.3	0.6	67	6.8	134	13.7	-	-	147	1.5
600 x 1000		8.8	0.9	78	8	130	13.3	-	-	147	1.5
600 x 1200		10.7	1.1	95	9.7	132	13.5	-	-	147	1.5
700 x 1500		18.7	1.9	142	14.5	136	13.9	-	-	147	1.5
800 x 1500		23.7	2.4	158	16.1	132	13.5	-	-	147	1.5
1000 x 1500		35.5	3.6	189	19.3	126	12.9	-	-	147	1.5
1000 x 2000		50.1	5.1	267	27.2	134	13.7	-	-	147	1.5
1200 x 2000		69.4	7.1	308	31.4	129	13.2	-	-	147	1.5
1200 x 3000		109	11.1	482	49.2	134	13.7	-	-	147	1.5
1350 x 2500		111	11.3	439	44.8	130	13.3	-	-	147	1.5
1500 x 2500		135	13.8	479	48.9	128	13.1	-	-	147	1.5
1500 x 3000		225	17.1	670	60.8	133	13.6	-	-	147	1.5
1500 x 4000		229	23.4	815	83.2	136	13.9	-	-	147	1.5
1700 x 3000		210	21.4	658	67.1	129	13.2	-	-	147	1.5
1700 x 7200		516	52.7	1621	165.4	133	13.6			147	1.5
2000 x 3000		282	28.8	752	76.7	126	12.9	-	-	147	1.5
2000 x 3500		336	34.3	896	91.4	128	13.1	-	-	147	1.5
2000 x 6000		611	62.3	1631	166	136	13.9	-	-	147	1.5
2500 x 4000		660	67.3	1409	144	141	14.4	177	1.8	196	2.0
2500 x 5500		961	98.1	2051	209	149	15.2	177	1.8	196	2.0
2500 x 9100		1631	166	3482	355	153	15.6	177	1.8	196	2.0
3000 x 5000		1136	116	2021	206	135	13.8	177	1.8	196	2.0
3300 x 4500		1188	121	1921	196	130	13.3	177	1.8	245	2.5
3300 x 6500		1915	195	3097	316	145	14.8	177	1.8	245	2.5
3300 x 10600		3338	341	5398	551	155	15.8	177	1.8	245	2.5
4500 x 7000		3792	387	4497	459	143	14.6	177	1.8	245	2.5
4500 x 9000		4960	506	5883	600	146	14.9	177	1.8	245	2.5
4500 x 12000		6987	713	8284	845	154	15.7	177	1.8	245	2.5

Fenders Compliant with ISO 17357

Tolerance +/- 10%

PNEUMATIC RIB FENDER PERFORMANCE DATA

INTERNAL INITIAL PRESSURE: 50 kPa (0.5 kgf/cm²)

FENDER SIZE	"ENERGY ABSORPTION"		"REACTION FORCE"		"HULL PRESSURE AT 60% DEF."		"SAFETY VALVE PRESSURE SETTING"		"TESTING PRESSURE"	
mm(D) x mm(L)	kN-m	tf-m	kN	tf	kN/m2	tf/m2	kPa	kgf/cm2	kPa	kgf/cm2
500 x 1000	6.9	0.7	73.7	7.5	148	15.1	-	-	147	1.5
1000 x 1500	39	4	208	21.2	139	14.2	-	-	147	1.5
1000 x 2000	55	5.6	294	30	147	15	-	-	147	1.5
1500 x 2500	148	15.1	527	53.8	141	14.4	-	-	147	1.5
1500 x 3000	184	18.8	656	66.9	146	14.9	-	-	147	1.5
2000 x 3500	370	37.8	986	101	141	14.4	-	-	147	1.5
2000 x 6000	672	68.6	1794	183	150	15.3	-	-	147	1.5
2500 x 4000	726	74.1	1550	158	155	15.8	177	1.8	196	2.0
2500 x 5500	1057	108	2256	230	164	16.7	177	1.8	196	2.0
3300 x 4500	1306	133	2113	216	143	14.6	177	1.8	245	2.5
3300 x 6500	2106	215	3406	348	159	16.2	177	1.8	245	2.5
3300 x 10600	3671	375	5938	606	170	17.3	177	1.8	245	2.5

Fenders Compliant with ISO 17357

Tolerance +/- 10%

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