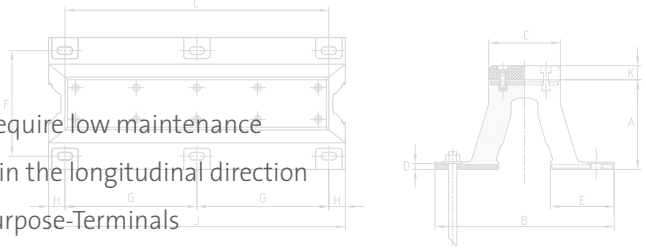


V FENDERS

The V Fender is a commonly used moulded fender type and is available in different cross sections, SX and SH. The main difference is the width of the front face and resulting surface load. Each type can be equipped with an additional embedded steel plate in the fender head. This allows the installation of a low friction PE-rubbing plate, a steel fender panel or the mounting of the fender unit behind a pile construction.



V Fenders:

- Are very robust, durable and require low maintenance
- Provide high shear resistance in the longitudinal direction
- Are most suitable for Multi-Purpose-Terminals
- Can be installed both vertically and horizontally

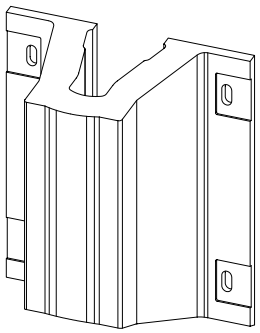
Both V Fender types are available in standard heights from 250 to 1.000 mm and standard length ranging from 1.000 to 3.500 mm **, each in 3 main different hardness grades*.

* Intermediate rubber grades see page 34–35
** Special lengths, diameters, fixing arrangements or end-chamfers available upon request



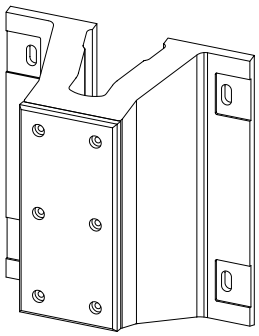
SX FENDERS

The SX Fender is the standard V Fender which is in use for decades. Main applications are berth and terminals for tug boats, general cargo vessels where durable simple and robust solutions are preferred.



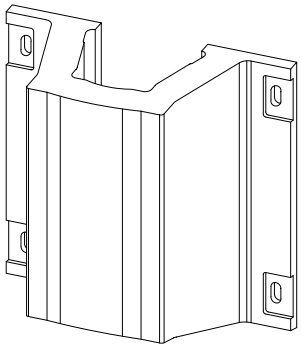
SX-P FENDERS

The SX-P Fender is combining the features of the SX Fender with the possibility to bolt on a low friction front facing pad, a steel panel or to integrate the fender into another structure.

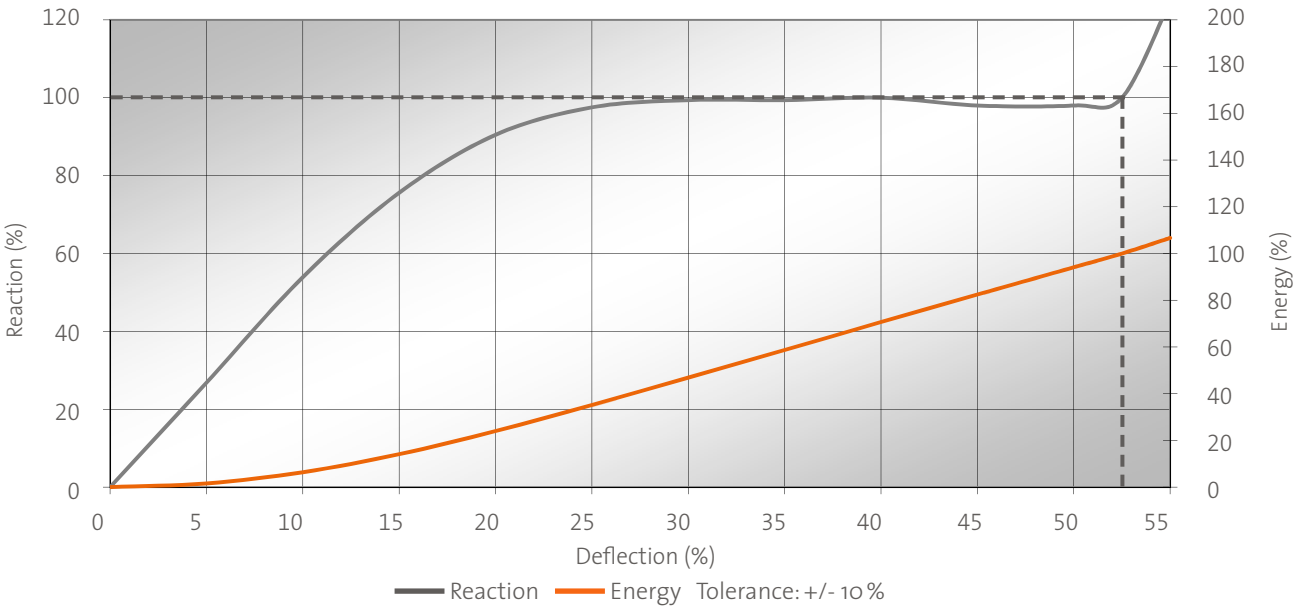


SH FENDERS

The SH Fender is used at terminals which want to combine the advantages of V Fenders with the need for low hull pressure.



GENERIC PERFORMANCE CURVE V FENDERS



FENDER PERFORMANCE AT INTERMEDIATE DEFLECTION

Deflection in % of original fender height	0	5	10	15	20	25	30	35	40	45	50	52,5	55
Energy absorption in % of original value	0	2	6	14	24	35	47	59	71	82	94	100	107
Reaction Force in % of original value	0	27	54	76	91	98	99	100	100	98	98	100	125

TEMPERATURE FACTOR

Temperature in °C	-30	-20	-10	0	10	23	30	40	50	60
Correction Factor	1.559	1.375	1.182	1.083	1.034	1	0.976	0.945	0.918	0.917

VELOCITY FACTOR

Compression Time in sec.	1	2	3	4	5	6	7	8	≥10
Correction Factor	1.014	1.005	1.004	1.003	1.003	1.002	1.000	1.000	1.000

ANGLE FACTOR

Compression Angle in °	0	3	5	8	10	15	20
Energy Correction Factor	100	96	95	94	92	82	54
Reaction Force Correction Factor	100	100	100	100	100	100	100

PERFORMANCE TABLE SX, SX-P, SH (RPD = Rated Performance Data in acc. with PIANC)

Fender Size	E/R	Rubber Grade / Performance Value	G 0.9	G 1.0	G 1.1	G 1.2	G 1.3	G 1.4	G 1.5	G 1.6	G 1.7	G 1.8
250	0,11	Energy	14	**14**	15	16	16	17	18	18	19	20
		Reaction	129	**135**	141	148	154	161	167	174	180	187
300	0,13	Energy	20	**21**	21	22	23	24	25	26	27	28
		Reaction	155	**163**	171	171	186	194	202	209	217	225
400	0,17	Energy	35	**36**	38	40	42	43	45	47	49	50
		Reaction	207	**217**	227	238	248	258	269	279	289	299
500	0,21	Energy	54	**57**	60	62	65	68	70	73	76	79
		Reaction	258	**271**	284	297	310	323	336	348	361	374
600	0,25	Energy	78	**82**	86	90	94	98	101	105	109	113
		Reaction	311	**326**	341	357	372	388	403	418	434	449
800	0,34	Energy	138	**145**	152	159	166	173	180	187	194	201
		Reaction	412	**433**	454	474	495	515	536	557	577	598
1000	0,42	Energy	217	**228**	239	250	260	271	282	293	303	314
		Reaction	516	**542**	568	594	620	645	671	697	723	749

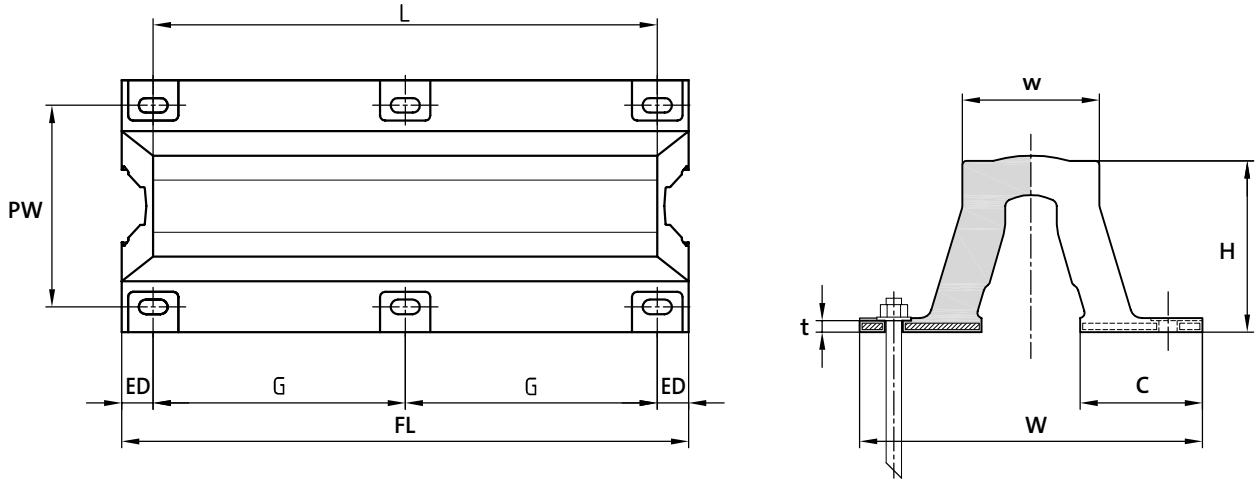
Energy absorption in kNm, Reaction force in kN at rated deflection of 52,5%. Performance values are for single unitof 1000 mm length, Standard tolerance of +/- 10 %

Bulk Terminal, Klintehamn, Sweden

G 1.9	G 2.0	G 2.1	G 2.2	G2.3	G 2.4	G 2.5	G 2.6	G 2.7	G 2.8	G 2.9	G 3.0	G 3.1	Fender Size
20 193	21 200	22 206	22 212	23 219	24 225	24 232	25 238	26 245	26 251	27 258	28 264	28 270	250
29 232	30 240	31 248	32 255	33 263	34 271	35 279	36 286	37 294	38 302	39 309	40 317	41 325	300
52 310	54 320	55 330	57 341	59 351	61 361	62 372	64 382	66 392	68 402	69 413	71 423	73 433	400
81 387	84 400	87 413	89 426	92 439	95 452	97 465	100 477	103 490	106 503	108 516	111 529	114 542	500
117 465	121 480	125 495	129 511	133 526	137 542	140 557	144 572	148 588	152 603	156 619	160 634	164 649	600
208 618	215 639	221 660	228 680	235 701	242 721	249 742	256 763	263 783	270 804	277 824	284 845	291 866	800
325 775	336 801	346 826	357 852	368 878	379 904	389 930	400 956	411 981	422 1007	432 1033	443 1059	454 1085	1000

SX FENDERS

Small Craft Jetty, Port Klang, Malaysia



SX FENDER DIMENSIONS

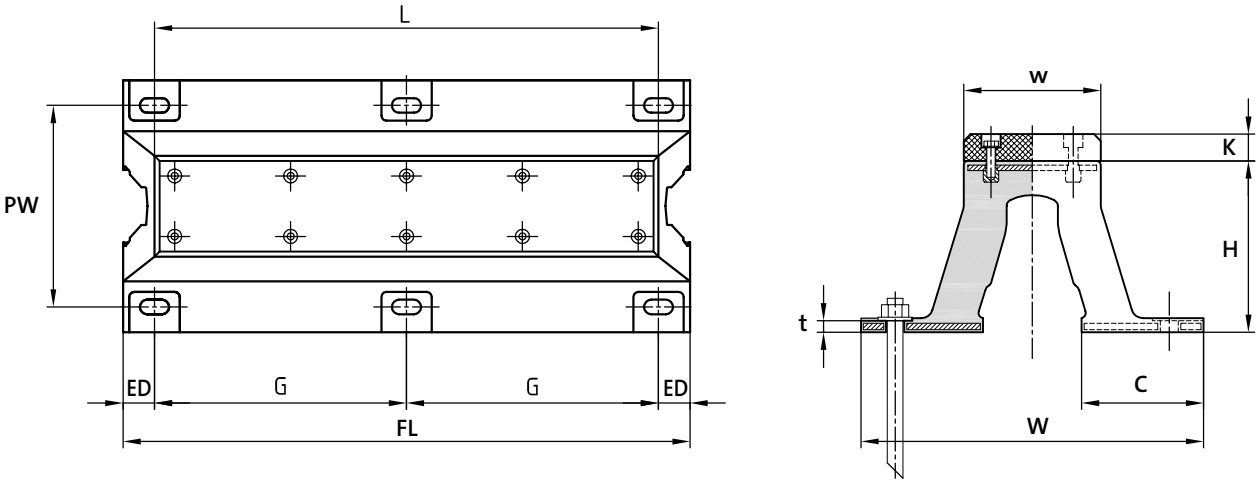
Fender Size	H [mm]	W [mm]	w [mm]	t [mm]	C [mm]	PW [mm]	Anchors
SX 250	250	500	200	18	178	400	M24
SX 300	300	600	240	23	213	480	M30
SX 400	400	800	320	27	285	640	M36
SX 500	500	1000	400	29	358	800	M36
SX 600	600	1200	480	34	425	960	M42
SX 800	800	1500	640	38	520	1300	M48
SX 1000	1000	1800	800	47	610	1550	M48

Fender Size	L [mm]	ED [mm]	G [mm]	FL [mm]	Anchors	Weight [kg]
SX 250	1000	112.5	1 x 900	1125	4	85
	1500	112.5	2 x 700	1625	6	123
	2000	117.5	3 x 630	2125	8	162
	2500	112.5	3 x 800	2625	8	200
	3000	112.5	4 x 725	3125	10	239
	3500	112.5	5 x 680	3625	12	277
SX 300	1000	125.0	1 x 900	1150	4	129
	1500	125.0	2 x 700	1650	6	187
	2000	130.0	3 x 630	2150	8	244
	2500	125.0	3 x 800	2650	8	302
	3000	125.0	4 x 725	3150	10	359
	3500	125.0	5 x 680	3650	12	417
SX 400	1000	150.0	1 x 900	1200	4	240
	1500	150.0	2 x 700	1700	6	342
	2000	155.0	3 x 630	2200	8	445
	2500	150.0	3 x 800	2700	8	548
	3000	150.0	4 x 725	3200	10	651
	3500	150.0	5 x 680	3700	12	754
SX 500	1000	175.0	1 x 900	1250	4	358
	1500	175.0	2 x 700	1750	6	506
	2000	180.0	3 x 630	2250	8	654
	2500	175.0	3 x 800	2750	8	802
	3000	175.0	4 x 725	3250	10	951
	3500	175.0	5 x 680	3750	12	1099
SX 600	1000	200.0	1 x 900	1300	4	525
	1500	200.0	2 x 700	1800	6	734
	2000	205.0	3 x 630	2300	8	944
	2500	200.0	3 x 800	2800	8	1153
	3000	200.0	4 x 725	3300	10	1363
SX 800	1000	250.0	1 x 900	1400	4	890
	1500	250.0	2 x 700	1900	6	1227
	2000	255.0	3 x 630	2400	8	1563
	2500	250.0	3 x 800	2900	8	1900
	3000	250.0	4 x 725	3400	10	2237
SX 1000	1000	300.0	1 x 900	1500	4	1397
	1500	300.0	2 x 700	2000	6	1902
	2000	305.0	3 x 630	2500	8	2406
	2500	300.0	3 x 800	3000	8	2910
	3000	300.0	4 x 725	3500	10	3414

Turning Dolphin, Baltic Sea

SX-P FENDERS

Waterland Terminal, Amsterdam, Netherlands



SX-P FENDER DIMENSIONS

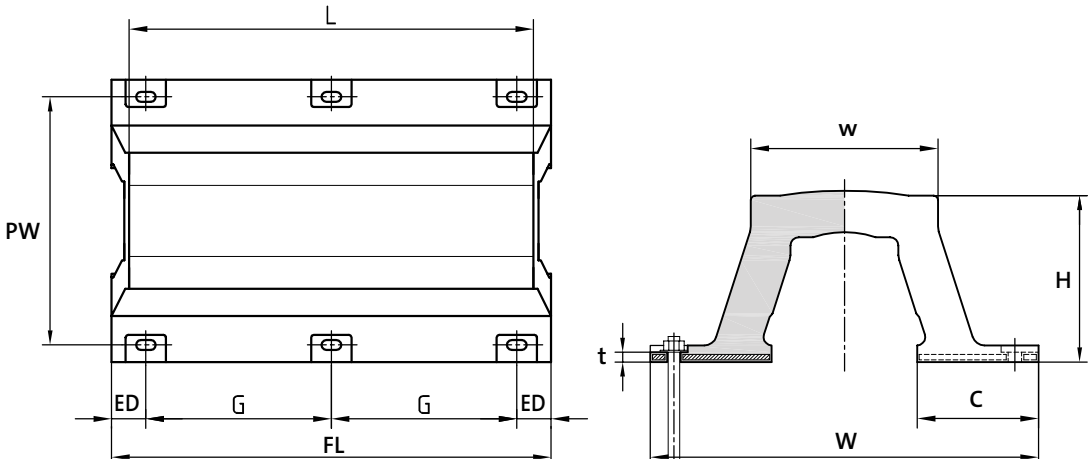
Fender Size	H [mm]	W [mm]	w [mm]	t [mm]	C [mm]	PW [mm]	K [mm]	Anchors	Bolts
SX-P 250	250	500	200	18	178	400	40	M24	M16
SX-P 300	300	600	240	23	213	480	40	M30	M20
SX-P 400	400	800	320	27	285	640	40	M36	M20
SX-P 500	500	1000	400	29	358	800	50	M36	M24
SX-P 600	600	1200	480	34	425	960	50	M42	M24
SX-P 800	800	1500	640	38	520	1300	60	M48	M30
SX-P 1000	1000	1800	800	47	610	1550	80	M48	M36

Fender Size	L [mm]	ED [mm]	G [mm]	FL [mm]	Anchors	Weight [kg]
SX-P 250	1000	112.5	1 x 900	1125	4	102
	1500	112.5	2 x 700	1625	6	148
	2000	117.5	3 x 630	2125	8	194
	2500	112.5	3 x 800	2625	8	240
	3000	112.5	4 x 725	3125	10	287
	3500	112.5	5 x 680	3625	12	332
SX-P 300	1000	125.0	1 x 900	1150	4	155
	1500	125.0	2 x 700	1650	6	224
	2000	130.0	3 x 630	2150	8	293
	2500	125.0	3 x 800	2650	8	362
	3000	125.0	4 x 725	3150	10	431
	3500	125.0	5 x 680	3650	12	500
SX-P 400	1000	150.0	1 x 900	1200	4	288
	1500	150.0	2 x 700	1700	6	410
	2000	155.0	3 x 630	2200	8	534
	2500	150.0	3 x 800	2700	8	658
	3000	150.0	4 x 725	3200	10	781
	3500	150.0	5 x 680	3700	12	905
SX-P 500	1000	175.0	1 x 900	1250	4	430
	1500	175.0	2 x 700	1750	6	607
	2000	180.0	3 x 630	2250	8	785
	2500	175.0	3 x 800	2750	8	962
	3000	175.0	4 x 725	3250	10	1141
	3500	175.0	5 x 680	3750	12	1319
SX-P 600	1000	200.0	1 x 900	1300	4	630
	1500	200.0	2 x 700	1800	6	881
	2000	205.0	3 x 630	2300	8	1133
	2500	200.0	3 x 800	2800	8	1384
	3000	200.0	4 x 725	3300	10	1636
SX-P 800	1000	250.0	1 x 900	1400	4	1068
	1500	250.0	2 x 700	1900	6	1472
	2000	255.0	3 x 630	2400	8	1876
	2500	250.0	3 x 800	2900	8	2280
	3000	250.0	4 x 725	3400	10	2684
SX-P 1000	1000	300.0	1 x 900	1500	4	1676
	1500	300.0	2 x 700	2000	6	2282
	2000	305.0	3 x 630	2500	8	2887
	2500	300.0	3 x 800	3000	8	3492
	3000	300.0	4 x 725	3500	10	4097

Port of Sochi, Russia

SH FENDER

Turning Dolphin, Baltic Sea



SH FENDER DIMENSIONS

Fender	H [mm]	W [mm]	w [mm]	t [mm]	C [mm]	PW [mm]	Anchors
SH 250	250	625	280	18	203	530	M 24
SH 300	300	750	340	23	245	640	M 30
SH 400	400	1000	450	27	325	850	M 30
SH 500	500	1200	560	30	380	1040	M 36
SH 600	600	1400	675	35	438	1230	M 42
SH 800	800	1800	900	40	550	1600	M 48
SH 1000	1000	2200	1125	40	663	2000	M 48

Size	L [mm]	ED [mm]	G [mm]	FL [mm]	Anchors	Weight [kg]
SH 250	1000	120.0	1 x 840	1080	4	98
	1500	120.0	2 x 670	1580	6	144
	2000	120.0	2 x 920	2080	6	190
	2500	120.0	2 x 1170	2580	6	237
	3000	115.0	3 x 950	3080	8	283
	3500	115.0	3 x 1100	3530	8	329
SH 300	1000	130.0	1 x 830	1090	4	150
	1500	125.0	2 x 670	1590	6	220
	2000	130.0	2 x 915	2090	6	290
	2500	125.0	2 x 1170	2590	6	360
	3000	135.0	3 x 940	3090	8	431
	3500	130.0	3 x 1110	3590	8	501
SH 400	1000	140.0	1 x 840	1120	4	247
	1500	140.0	2 x 670	1620	6	361
	2000	140.0	2 x 920	2120	6	475
	2500	140.0	2 x 1170	2620	6	589
	3000	135.0	3 x 950	3120	8	703
	3500	145.0	3 x 1110	3620	8	816
SH 500	1000	150.0	1 x 850	1150	4	389
	1500	150.0	2 x 675	1650	6	566
	2000	150.0	2 x 925	2150	6	743
	2500	150.0	2 x 1175	2650	6	920
	3000	150.0	3 x 950	3150	8	1097
	3500	160.0	3 x 1110	3650	8	1274
SH 600	1000	170.0	1 x 840	1180	4	552
	1500	170.0	2 x 670	1680	6	800
	2000	170.0	2 x 920	2180	6	1047
	2500	170.0	2 x 1170	2680	6	1294
	3000	165.0	3 x 950	3180	8	1542
SH 800	1000	200.0	1 x 840	1240	4	954
	1500	200.0	2 x 670	1740	6	1375
	2000	200.0	2 x 920	2240	6	1768
	2500	200.0	2 x 1170	2740	6	2179
	3000	195.0	3 x 950	3240	8	2590
SH 1000	1000	230.0	1 x 840	1300	4	1426
	1500	230.0	2 x 670	1800	6	2030
	2000	230.0	2 x 920	2300	6	2634
	2500	230.0	2 x 1170	2800	6	3237
	3000	225.0	3 x 950	3300	8	3841

Car Terminal, Zeebrugge, Belgium