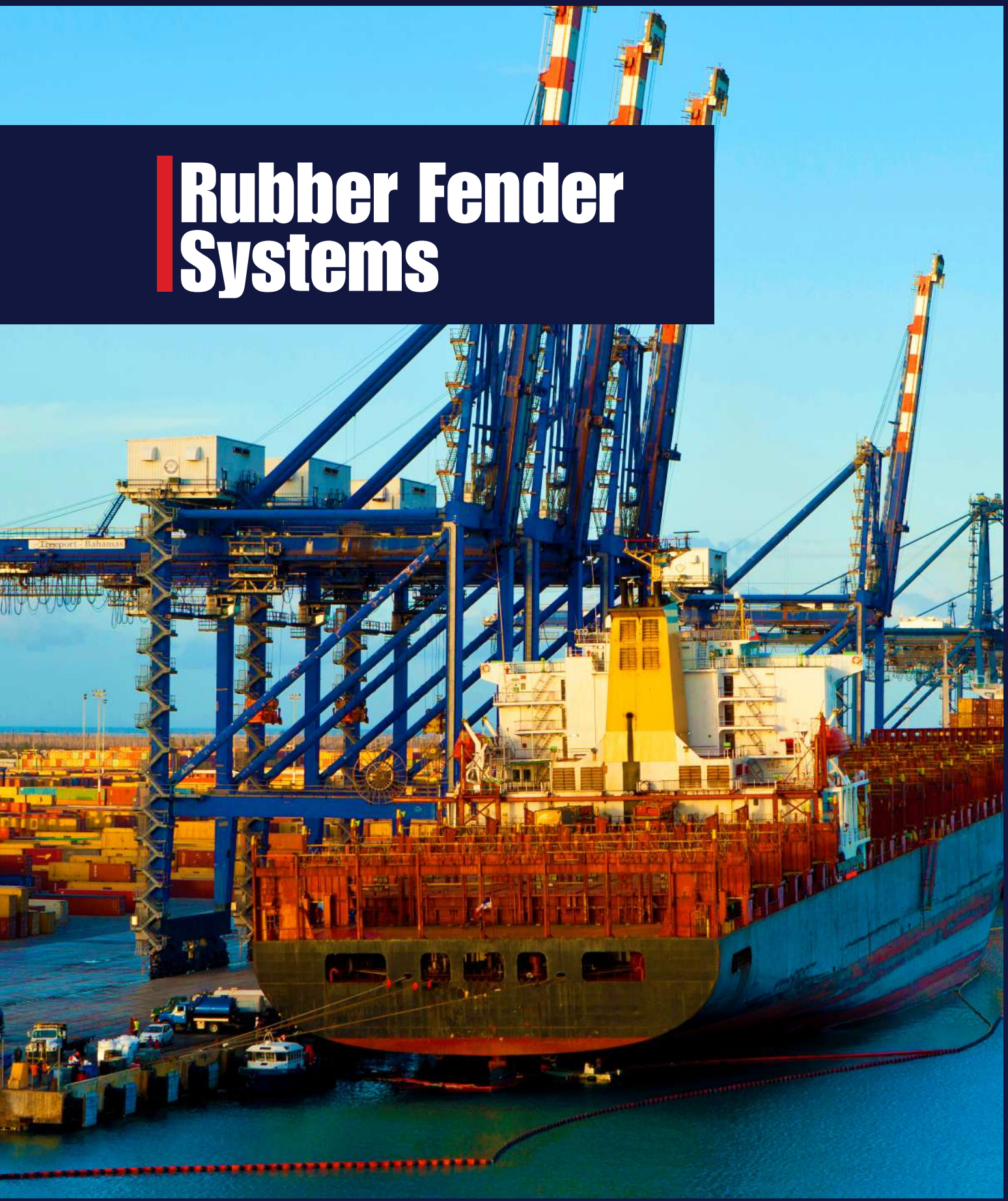
Rubber Fender Systems



Rubtech™

www.rubtech.ae

Robust, modern and sophisticated designs offering real protection during heavy or abnormal impacts.

INDEX

ABOUT US

Established in 1980 in Dubai, United Arab Emirates, the **Hira Group** started activities in the air-conditioning industry and is today one of the most trusted names in the Middle East and India for HVAC requirements.

Hira Industries L.L.C is the manufacturing division of the group with an established state-of-the-art rubber plant, catering to the market demands for moulded and extruded rubber products. Rubtech™ brand of rubber products are made as per customer specifications for industrial, marine and construction industries. At Hira Industries, our mission is to be a full-line designer, producer and supplier of all customized rubber requirements. We aim to constantly improve our products and services by continually reducing the variability of our process and never depending upon inspection to achieve quality, but as a tool to measure this variability. The latest offering from Rubtech™ is a variety of **Rubber Fenders.**

Rubtech™ Rubber Fenders comprises of:

D-Fenders, Cylindrical Fenders, Square Fenders, Arch Fenders, Cone Fenders, Cell Fenders, W&M Fenders, Wing Fenders, Element Fenders, Corner Arch Fenders and Tug Fenders.

Materials

Rubtech™ Fender System components are manufactured from the highest quality Natural Rubber (NR) and Styrene Butadiene Rubber (SBR) based components which meet or exceed the performance. In addition to NR and SBR, other compounds in EPDM and Neoprene are available upon request.

Design & Development

The Rubtech™ Rubber Division of Hira Industries has technically qualified professionals for designing and developing complete new fender system or modifying existing ones to offer total customized solutions and meet stringent customer demand.

The design, production and testing of our Marine Fender Systems are based on Guidelines for the Design of Fender Systems: 2002 edited by MarcCom Work Group 33 of PIANC (World Association for Waterborne Transport Infrastructure); European Standard: Eurocode 3 (EN 1993) - Standard for the Design of Steel Structures; British Standard BS 6349 Maritime Works - Part 4: Code of Practice for Design of Fendering and Mooring Systems.

Regional & International Presence

Rubtech™ has a very strong presence in the UAE, Saudi Arabia, Kuwait, Oman, Qatar, Bahrain and in most of the other Middle East countries. The brand has also been widely accepted in US, UK and other European countries. This itself is a testimony to the high quality standards the division has adopted and sustained in all these years.

Customer Focused Approach

At Hira Rubber division, we believe in total satisfaction that leads to retaining the customer in the long run and consolidating the company's position in the competitive arena. Service-oriented approach has always been on priority and we consider it to be our strength and technical superiority as the core competence.

For any clarifications or assistance,
please feel free to call at +971 4 884 8414 or
send an e-mail to enquiry@rhira.com

We will be more than happy to serve you in the best possible manner.

CONE FENDERS

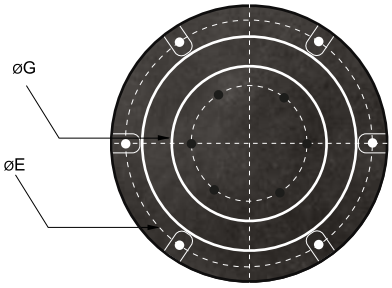
Cone Fenders are the latest generation of cell fender combining excellent energy capacity with low reaction force to give the most efficient performance of any other fenders.

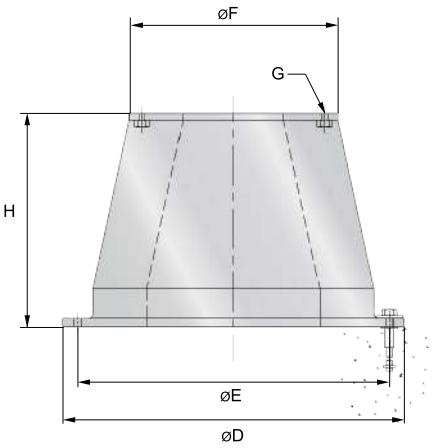
Core features:
Proficient shape, different range of sizes, excellent energy absorption

KEY PERFORMANCE CHARACTERISTICS

- Higher energy absorption to reaction force ratio (E:R)
- Higher load carrying capacity (panels & accessories)
- Higher shear resistance

TECHNICAL DETAILS

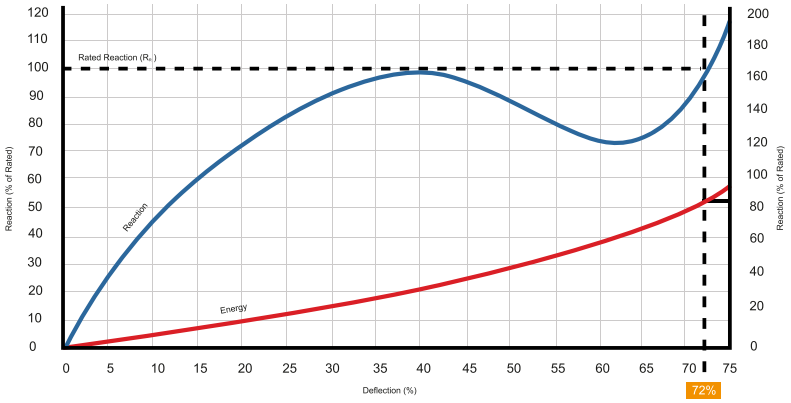




SPECIFICATIONS

	H	ØD	ØF	ØE	ØG	Bolts H1.0-H1.8	Bolts H1.9-H3.1	Attachment Minimum	Weight
RCN 300	300	500	295	440	255	4 x M16	4 x M16	77	40
RCN 350	350	570	330	510	275	4 x M16	4 x M16	77	50
RCN 400	400	650	390	585	340	4 x M16	4 x M20	82	76
RCN 500	500	800	490	730	425	4 x M20	4 x M24	95	160
RCN 550	550	880	540	790	470	4 x M20	4 x M24	95	210
RCN 600	600	960	590	875	515	4 x M20	4 x M30	115	270
RCN 700	700	1120	685	1020	600	4 x M24	4 x M30	120	411
RCN 800	800	1280	785	1165	685	6 x M24	6 x M30	120	606
RCN 900	900	1440	885	1313	770	6 x M30	6 x M30	135	841
RCN 950	950	1520	930	1390	815	6 x M30	6 x M30	142	980
RCN 1000	1000	1600	980	1460	855	6 x M30	6 x M36	150	1125
RCN 1050	1050	1680	1030	1530	900	6 x M30	6 x M36	157	1360
RCN 1100	1100	1760	1080	1605	940	8 x M30	8 x M36	165	1567
RCN 1150	1150	1840	1125	1680	980	8 x M30	8 x M36	175	1779
RCN 1200	1200	1920	1175	1750	1025	8 x M30	8 x M42	180	2028

GENERIC PERFORMANCE CURVE



PERFORMANCE AT RATED DEFLECTION (E-kNm; R-kN)

	H 1.0	H 1.1	H 1.2	H 1.3	H 1.4	H 1.5	H 1.6	H 1.7	H 1.8	H 1.9	H 2.0	
RCN 300	18.2	15.9	15.7	15.5	15.2	15.0	14.8	14.5	14.3	14.1	13.9	E
	126.2	114.9	111.6	108.5	105.3	102.1	98.9	96.4	93.9	91.4	88.9	R
RCN 350	28.2	26.0	25.5	25.0	24.6	24.1	23.7	23.2	22.7	22.3	21.9	E
	170.2	155.5	151.0	146.5	142.0	137.5	133.0	129.7	126.2	122.9	119.5	R
RCN 400	42.8	39.5	38.5	37.6	36.8	35.9	35.0	34.3	33.6	32.9	32.2	E
	224.3	204.0	198.2	192.3	186.4	180.5	174.7	170.2	165.7	161.2	156.7	R
RCN 500	82.3	75.7	74.1	72.5	71.0	69.4	67.8	66.2	64.8	63.2	61.6	E
	345.9	314.8	305.9	296.9	288.1	279.2	270.3	263.4	256.5	249.6	242.7	R
RCN 550	110.2	100.2	98.1	96.1	94.1	92.1	90.1	88.1	86.0	84.1	82.1	E
	417.1	379.3	368.6	357.9	347.2	336.6	325.9	317.7	309.5	301.3	293.0	R
RCN 600	146.2	132.9	129.6	126.2	122.9	119.6	116.3	113.0	109.7	106.3	103.0	E
	489.5	445.2	430.3	415.5	400.6	385.8	371.0	359.3	347.5	335.7	324.0	R
RCN 700	248.0	225.0	220.6	216.2	211.9	207.5	203.1	198.6	194.2	189.9	185.5	E
	659.6	600.3	583.7	567.0	550.4	533.6	517.0	504.0	491.1	478.1	465.2	R
RCN 800	370.9	337.2	330.3	323.3	316.3	309.4	302.4	295.3	288.0	280.9	273.7	E
	870.2	790.9	767.7	744.7	721.7	698.5	675.5	657.5	639.5	621.3	603.3	R
RCN 900	521.8	474.3	464.2	454.0	443.9	433.7	423.7	413.3	403.0	392.6	382.3	E
	1086.6	988.5	959.0	929.4	899.9	870.3	840.8	817.8	794.7	771.7	748.5	R
RCN 950	615.5	559.5	547.4	535.4	523.2	511.2	499.1	487.1	475.0	462.9	450.8	E
	1213.8	1103.9	1070.8	1037.9	1004.9	972.0	938.9	913.5	888.1	862.6	837.2	R
RCN 1000	714.7	649.3	635.2	621.3	607.4	593.4	579.5	565.6	551.5	537.6	523.7	E
	1338.2	1216.9	1180.6	1144.3	1108.1	1071.8	1035.6	1007.4	979.3	951.2	923.1	R
RCN 1050	822.5	747.7	731.8	715.7	699.7	683.6	667.7	651.6	635.6	619.6	603.6	E
	1467.7	1334.2	1294.7	1255.2	1215.6	1176.1	1136.6	1105.6	1074.6	1043.6	1012.6	R
RCN 1100	946.4	860.0	841.7	823.6	805.5	787.2	769.1	751.0	732.7	714.6	696.5	E
	1608.7	1462.4	1419.4	1376.5	1333.6	1290.6	1247.6	1214.1	1180.6	1147.0	1113.5	R
RCN 1150	1082.0	982.8	961.8	940.6	919.5	898.4	877.3	856.1	835.1	813.9	792.8	E
	1761.6	1602.0	1554.3	1506.5	1458.7	1411.0	1363.3	1326.2	1289.2	1252.2	1215.2	R
RCN 1200	1228.4	1116.3	1092.8	1069.3	1045.8	1022.2	998.8	975.3	951.8	928.3	904.7	E
	1916.4	1742.2	1691.2	1640.1	1589.1	1538.0	1487.0	1447.2	1407.5	1367.7	1328.0	R

	H 2.1	H 2.2	H 2.3	H 2.4	H 2.5	H 2.6	H 2.7	H 2.8	H 2.9	H 3.0	H 3.1	
RCN 300	13.6	13.2	12.7	12.3	11.9	11.4	11.2	10.9	10.7	10.5	10.2	E
	86.4	83.4	80.5	77.5	74.6	71.6	69.6	67.5	65.5	63.4	61.3	R
RCN 350	21.5	20.8	20.1	19.4	18.7	18.0	17.5	17.2	16.7	16.3	15.8	E
	116.1	112.2	108.4	104.6	100.7	96.9	94.2	91.5	88.8	86.1	83.4	R
RCN 400	31.6	30.7	29.8	28.8	27.9	27.0	26.4	25.7	25.0	24.3	23.7	E
	152.2	147.2	142.2	137.3	132.3	127.4	123.8	120.1	116.5	112.9	109.4	R
RCN 500	60.1	58.5	56.9	55.4	53.8	52.2	51.0	49.6	48.3	46.9	45.6	E
	235.8	228.0	220.2	212.5	204.6	196.9	191.3	185.7	180.2	174.6	169.1	R
RCN 550	80.1	78.1	76.0	74.1	72.0	70.1	68.1	66.1	64.1	62.0	60.1	E
	284.8	275.4	266.1	256.8	247.4	238.0	231.2	224.2	217.4	210.4	203.5	R
RCN 600	99.7	97.4	95.3	93.0	90.8	88.6	86.3	84.2	81.9	79.8	77.5	E
	312.3	303.0	293.7	284.4	275.1	265.8	259.1	252.4	245.9	239.2	232.6	R
RCN 700	181.1	177.4	173.7	169.9	166.2	162.5	158.5	154.5	150.6	146.6	142.7	E
	452.2	439.0	425.9	412.7	399.5	386.3	377.4	368.4	359.4	350.4	341.3	R
RCN 800	266.6	260.7	254.8	248.9	243.0	237.2	231.1	224.9	218.8	212.8	206.7	E
	585.3	567.6	550.0	532.3	514.8	497.2	484.5	471.9	459.2	446.7	434.0	R
RCN 900	371.9	364.4	356.8	349.3	341.7	334.2	326.6	319.1	311.5	304.0	296.5	E
	725.5	705.0	684.5	664.0	643.6	623.1	609.1	595.1	581.0	567.0	553.0	R
RCN 950	438.7	429.4	420.2	410.9	401.7	392.4	383.4	374.3	365.2	356.1	347.1	E
	811.7	788.2	764.7	741.3	717.8	694.2	677.9	661.5	645.0	628.7	612.3	R
RCN 1000	509.7	499.0	488.2	477.6	466.8	456.1	445.3	434.6	423.9	413.2	402.4	E
	894.9	869.0	843.0	817.0	791.1	765.1	747.3	729.5	711.7	693.8	676.1	R
RCN 1050	587.5	575.4	563.1	551.0	538.8	526.7	514.2	501.9	489.4	477.1	464.7	E
	981.7	953.4	925.3	897.1	868.9	840.6	821.0	801.3	781.7	762.0	742.4	R
RCN 1100	678.4	664.0	649.6	635.3	621.0	606.7	592.2	577.7	563.1	548.6	534.1	E
	1080.0	1048.5	1017.1	985.8	954.3	923.0	900.9	879.0	856.9	834.9	812.9	R
RCN 1150	771.7	755.5	739.2	722.9	706.7	690.4	674.2	658.0	641.7	625.4	609.3	E
	1178.2	1144.0	1109.9	1075.6	1041.4	1007.2	983.8	960.3	936.9	913.5	890.0	R
RCN 1200	881.3	862.7	844.1	825.6	806.9	788.3	769.5	750.8	732.0	713.1	694.3	E
	1288.2	1250.9	1213.4	1176.1	1138.7	1101.3	1075.3	1049.2	1023.1	997.1	971.0	R

CELL FENDERS

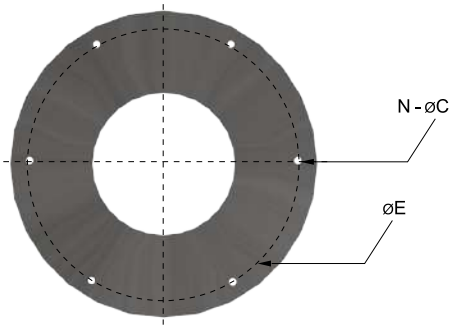
Cell Fenders are one of the most proven and reliable fenders ever designed. The large mounting panels helps to distribute the load over the back of the fender panel frame and allows easy installation of the mounting bolts.

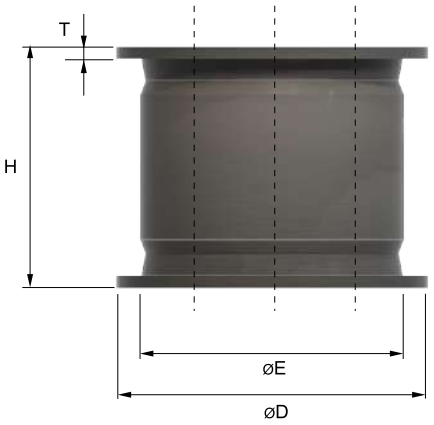
Core features:
Minimum reaction, high efficiency, good angular performance, reduced shear force

KEY PERFORMANCE CHARACTERISTICS

- Good energy absorption to reaction force ratio (E:R)
- Simple and easy installation
- Ideal for low hull pressure requirements
- Large weight supporting capabilities
- Sturdy and dependable construction

TECHNICAL DETAILS





SPECIFICATIONS

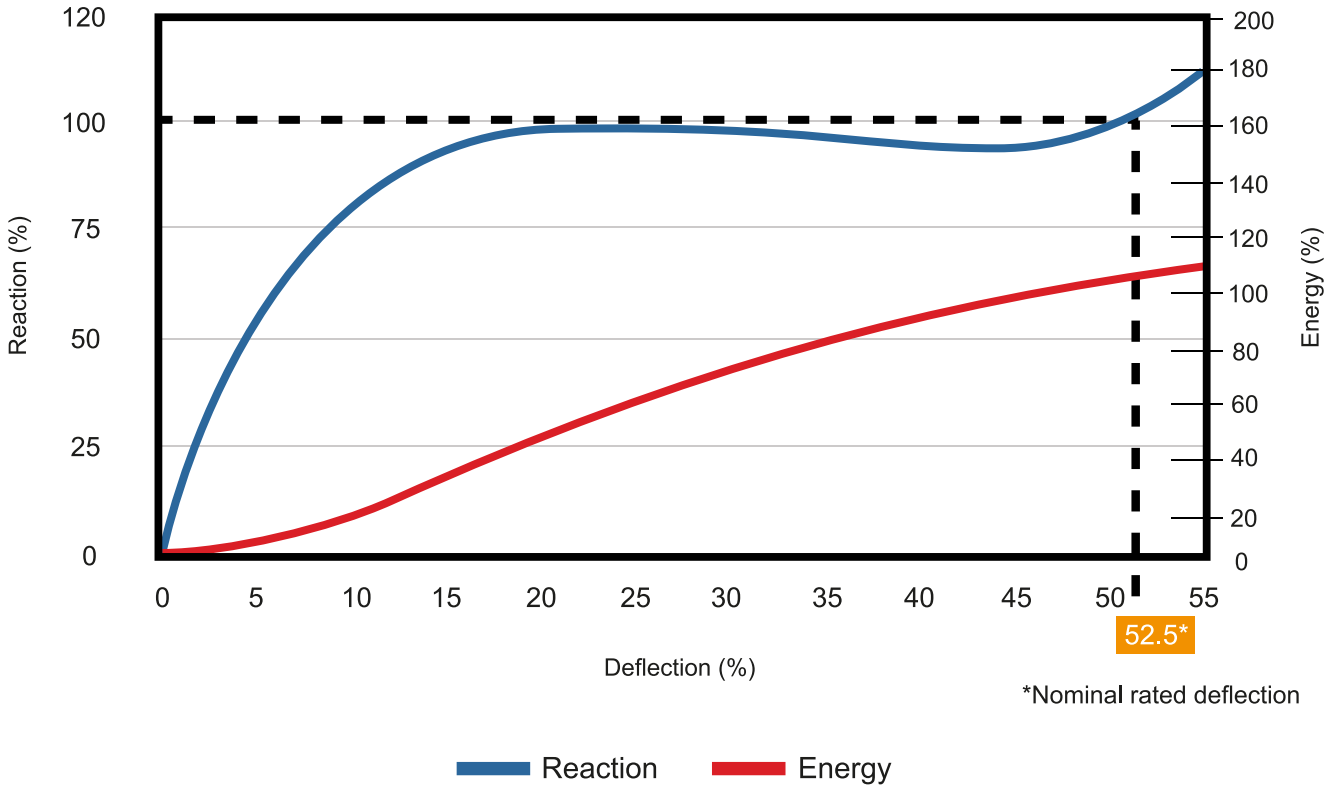
	H	ØD	ØE	T	N - ØC	Weight
RCF 400	400	650	550	24 – 32	4 × M20	75
RCF 500	500	650	550	24 – 32	4 × M24	95
RCF 630	630	840	700	24 – 32	4 × M27	220
RCF 800	800	1050	900	30 – 40	6 × M30	400
RCF 1000	1000	1300	1100	33 – 43	6 × M36	790
RCF 1150	1150	1500	1300	38 – 48	6 × M42	1200
RCF 1250	1250	1650	1450	38 – 48	6 × M42	1500

PERFORMANCE AT RATED DEFLECTION (E-kNm; R-kN)

	H 1.0	H 1.1	H 1.2	H 1.3	H 1.4	H 1.5	H 1.6	H 1.7	H 1.8	H 1.9	H 2.0	
RCF 400	26.4	24.1	23.4	22.7	22.1	21.4	20.7	20.2	20.2	19.7	19.3	E
	147.9	135.3	132.1	128.9	125.6	122.5	119.3	116.2	116.2	113.3	110.3	R
RCF 500	48.5	44.0	43.0	42.1	41.3	40.4	39.5	38.3	38.3	37.2	36.1	E
	228.8	207.4	202.7	197.9	193.2	188.5	183.8	178.9	178.9	174.2	169.5	R
RCF 630	98.3	89.4	87.3	85.4	83.3	81.3	79.3	77.3	77.3	75.3	73.3	E
	356.4	324.0	316.6	309.3	301.8	294.5	287.1	279.8	279.8	272.3	265.0	R
RCF 800	199.1	181.3	177.1	172.9	168.7	164.4	160.1	155.7	155.7	151.3	146.8	E
	567.3	516.1	503.9	491.7	479.4	467.2	454.9	443.0	443.0	430.9	418.9	R
RCF 1000	390.7	355.6	347.3	339.0	330.6	322.2	313.9	305.8	305.8	297.6	289.6	E
	890.1	808.9	790.5	772.0	753.6	735.2	716.8	698.1	698.1	679.4	660.7	R
RCF 1150	585.8	532.8	520.7	508.5	496.4	484.3	472.2	459.8	459.8	447.5	435.1	E
	1162.0	1056.9	1032.4	1007.9	983.5	959.0	934.5	910.0	910.0	885.6	861.1	R
RCF 1250	750.3	682.4	666.4	650.4	634.6	618.6	602.6	586.8	586.8	571.1	555.4	E
	1368.0	1242.9	1214.2	1185.6	1156.9	1128.3	1099.6	1070.8	1070.8	1042.2	1013.5	R

	H 2.1	H 2.2	H 2.3	H 2.4	H 2.5	H 2.6	H 2.7	H 2.8	H 2.9	H 3.0	H 3.1	
RCF 400	18.8	18.3	17.6	17.0	16.3	15.6	14.9	14.2	13.5	12.8	12.2	E
	107.3	104.4	100.5	96.5	92.6	88.8	84.9	80.8	76.6	72.4	68.3	R
RCF 500	35.0	33.8	32.7	31.6	30.5	29.3	28.2	26.9	25.5	24.1	22.7	E
	164.7	160.0	154.0	147.9	141.8	135.7	129.7	123.3	117.0	110.6	104.4	R
RCF 630	71.2	69.3	66.5	63.9	61.3	58.5	55.9	53.2	50.5	47.8	45.2	E
	257.6	250.3	240.4	230.6	220.8	210.9	201.1	191.5	181.9	172.3	162.7	R
RCF 800	142.4	137.9	132.6	127.2	121.9	116.5	111.2	105.6	100.2	94.6	89.0	E
	406.9	394.8	378.9	362.8	346.8	330.8	314.8	298.8	282.7	266.8	250.7	R
RCF 1000	281.5	273.3	262.7	252.3	241.7	231.2	220.6	210.1	199.5	189.0	178.5	E
	642.1	623.5	599.3	575.2	551.0	526.8	502.7	478.7	454.8	430.9	407.0	R
RCF 1150	422.8	410.4	394.6	378.8	363.0	347.2	331.3	315.6	299.8	283.9	268.1	E
	836.6	812.2	781.0	749.8	718.6	687.5	656.2	625.0	593.9	562.7	531.5	R
RCF 1250	539.7	523.9	503.8	483.8	463.7	443.7	423.7	403.4	383.1	362.9	342.6	E
	984.9	956.2	919.3	882.5	845.5	808.7	771.8	735.0	698.2	661.2	624.4	R

GENERIC PERFORMANCE CURVE



ARCH FENDERS

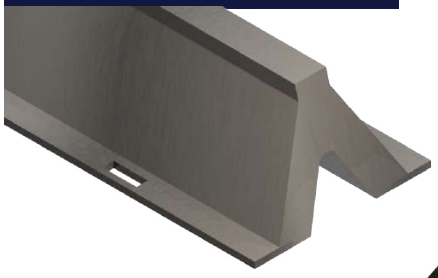
Arch Fenders consist of a single part and available in different widths and heights. The base of the fender consists of a steel plate with mounting holes for bolts which is vulcanized inside the rubber.

Arch Fenders can be mounted either horizontally or vertically for the help of fixing bolts.

KEY PERFORMANCE CHARACTERISTICS

- Strong bolting arrangement helps in quick & easy installation
- Long service life
- Excellent shear resistance

TYPES OF ARCH FENDERS

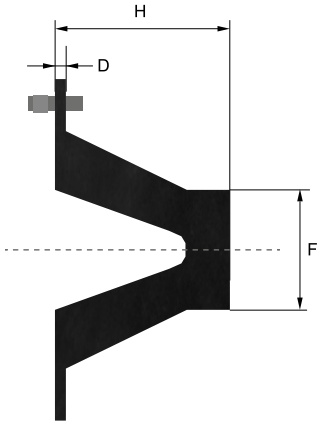


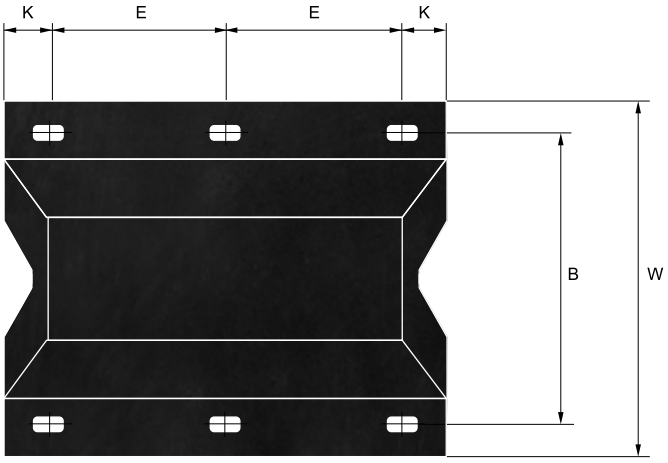
RAF

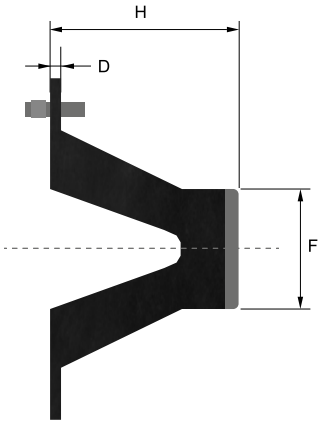
RAFP

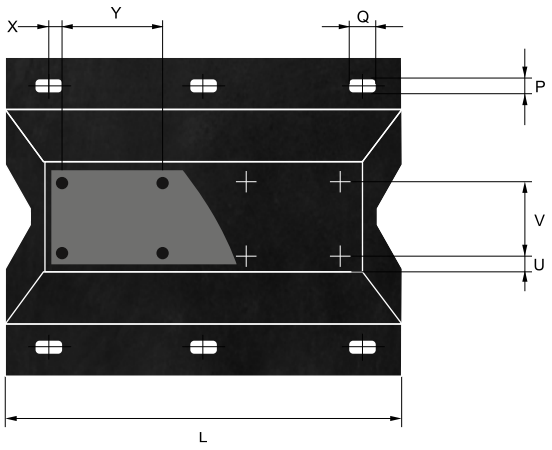
RAF: Arch Fender with plain surface on top
RAFP: Arch Fencer with UHMWPE sheet for sliding

SPECIFICATIONS







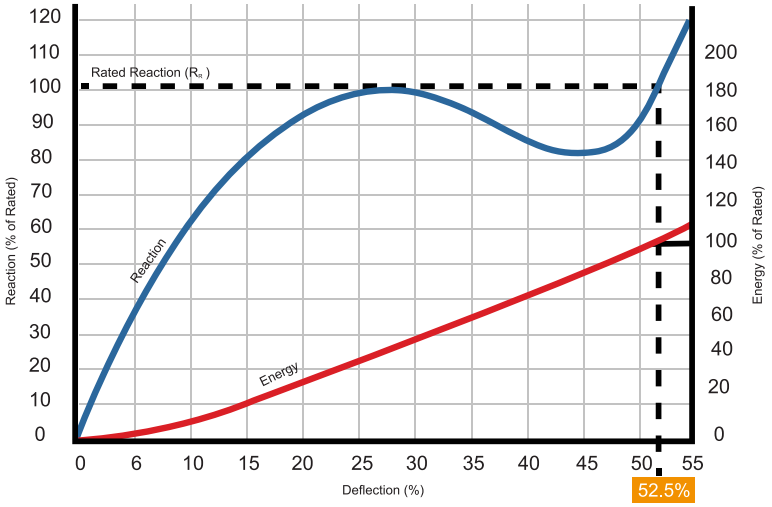


	H	A	B	W	F	D	K	E	pxQ	Anchors / Head Bolt	Weight	
											RAF	RAFP
RAF/RAFP 150	150	108	240	326	98	16–20	50	500	20×40	M16	28	35
RAF/RAFP 200	200	142	320	422	130	18–25	50	500	25×50	M20	48	62
RAF/RAFP 250	250	164	400	500	163	20–30	62.5	500	28×56	M24	69	90
RAF/RAFP 300	300	194	480	595	195	25–32	75	500	28×56	M24	107	128
RAF/RAFP 400	400	266	640	808	260	25–32	100	500	35×70	M30	185	217
RAF/RAFP 500	500	318	800	981	325	25–32	125	500	42×84	M36	278	352
RAF/RAFP 600	600	373	960	1160	390	28–40	150	500	48×96	M42	411	488
RAF/RAFP 800	800	499	1300	1550	520	41–50	200	500	54×108	M48	770	871
RAF/RAFP 1000	1000	580	1550	1850	650	50–62	250	500	54×108	M48	1289	1390

AFPE	U	V	UHMW-PE Face Pads Steel Frame Connection			
			X	Y	X	Y
150	49	0	60-70	330-410	70-90	250-300
200	65	0	60-70	330-410	70-90	250-300
250	45	73	70-85	330-410	70-90	250-300
300	50	95	70-85	330-410	70-90	250-300
400	60	140	70-85	330-410	70-90	250-300
500	65	195	70-85	330-410	70-90	250-300
600	65	260	70-85	330-410	70-90	250-300
800	70	380	70-85	330-410	70-90	250-300
1000	80	490	70-85	330-410	70-90	250-300

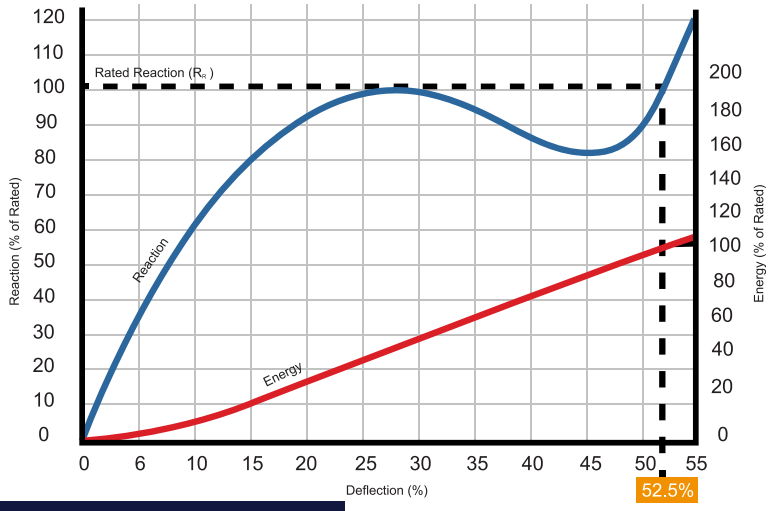
L	Anchors
1000	6 No
1500	8 No
2000	10 No
2500	12 No
3000	14 No

GENERIC PERFORMANCE CURVE



PERFORMANCE AT RATED DEFLECTION (E-kNm; R-kN)

	H 1.0	H 1.1	H 1.2	H 1.3	H 1.4	H 1.5	H 1.6	H 1.7	H 1.8	H 1.9	H 2.0	H 2.1	H 2.2	H 2.3	H 2.4	H 2.5	H 2.6	H 2.7	H 2.8	H 2.9	H 3.0	
RAF 150	8.7	8.5	8.2	8.0	7.8	7.6	7.4	7.3	7.1	6.8	6.6	6.5	6.3	6.2	6.0	5.9	5.7	5.6	5.4	5.2	5.1	E
	149.4	145.8	142.3	138.8	135.2	131.7	128.0	124.3	120.5	116.8	113.1	110.5	107.9	105.3	102.7	100.1	97.5	94.9	92.2	89.7	87.0	R
RAF 200	15.4	15.1	14.7	14.3	14.0	13.6	13.2	12.9	12.5	12.2	11.8	11.5	11.2	10.9	10.6	10.4	10.1	9.8	9.5	9.2	8.9	E
	198.7	194.0	189.3	184.6	179.9	175.2	170.3	165.3	160.4	155.4	150.5	147.0	143.5	139.9	136.4	132.9	129.5	126.1	122.7	119.4	115.9	R
RAF 250	23.9	23.3	22.8	22.2	21.7	21.1	20.5	19.9	19.4	18.8	18.2	17.7	17.3	17.0	16.6	16.1	15.7	15.2	14.8	14.3	13.9	E
	246.1	240.2	234.4	228.5	222.8	216.9	210.9	204.8	198.7	192.7	186.6	182.4	178.2	174.0	169.8	165.6	161.2	156.7	152.3	147.9	143.5	R
RAF 300	34.1	33.3	32.5	31.7	30.9	30.1	29.3	28.4	27.6	26.9	26.1	25.4	24.8	24.1	23.5	22.9	22.2	21.7	21.1	20.4	19.8	E
	292.5	285.7	278.7	271.8	264.8	257.8	250.7	243.5	236.4	229.2	222.1	217.0	211.9	206.8	201.7	196.6	191.5	186.4	181.3	176.2	171.1	R
RAF 400	60.2	58.8	57.3	56.0	54.5	53.1	51.6	50.2	48.7	47.3	45.9	44.8	43.7	42.6	41.6	40.5	39.4	38.3	37.1	36.1	35.0	E
	387.6	378.2	368.8	359.4	350.0	340.6	331.1	321.7	312.3	302.9	293.5	286.8	280.2	273.6	267.0	260.3	253.4	246.6	239.6	232.8	225.9	R
RAF 500	92.8	90.6	88.4	86.1	84.0	81.7	79.5	77.3	75.1	72.8	70.7	69.0	67.3	65.6	63.9	62.2	60.6	58.9	57.2	55.6	53.9	E
	477.7	466.4	455.0	443.7	432.4	421.1	409.5	398.0	386.4	374.9	363.4	355.0	346.6	338.2	329.9	321.4	313.1	304.7	296.4	287.9	279.6	R
RAF 600	130.7	127.8	124.9	121.9	119.0	116.1	113.1	110.2	107.2	104.3	101.3	98.9	96.5	94.2	91.7	89.4	86.9	84.6	82.1	79.8	77.3	E
	571.4	557.6	543.9	530.2	516.4	502.6	488.9	475.1	461.4	447.7	433.9	423.9	414.1	404.2	394.3	384.4	374.2	364.1	353.9	343.8	333.6	R
RAF 800	233.6	228.0	222.5	216.9	211.4	205.8	200.2	194.6	189.1	183.6	178.0	173.8	169.5	165.3	161.0	156.8	152.6	148.4	144.2	139.9	135.7	E
	750.8	732.7	714.8	696.8	678.7	660.7	642.7	624.7	606.6	588.6	570.7	557.5	544.4	531.3	518.1	505.0	491.7	478.3	464.9	451.6	438.3	R
RAF 1000	360.1	351.4	342.9	334.4	325.8	317.2	308.6	300.1	291.6	282.9	274.4	268.0	261.7	255.3	248.9	242.6	236.0	229.4	222.9	216.2	209.6	E
	926.4	904.2	882.0	859.9	837.7	815.6	793.1	770.8	748.3	726.0	703.5	687.3	671.1	654.8	638.6	622.3	606.1	589.9	573.6	557.3	541.2	R



PERFORMANCE AT RATED DEFLECTION (E-kNm; R-kN)

	H 1.0	H 1.1	H 1.2	H 1.3	H 1.4	H 1.5	H 1.6	H 1.7	H 1.8	H 1.9	H 2.0	E 2.1	E 2.2	E 2.3	E 2.4	E 2.5	E 2.6	E 2.7	E 2.8	E 2.9	E 3.0	
RAFP 150	11.1	10.8	10.6	10.3	10.0	9.8	9.6	9.4	9.1	8.8	8.6	8.4	8.2	8.0	7.8	7.6	7.4	7.2	7.0	6.7	6.5	E
	175.5	171.5	167.5	163.6	159.6	155.6	151.4	147.2	142.9	138.7	134.6	131.5	128.5	125.4	122.4	119.3	116.2	113.2	110.1	107.0	103.9	R
RAFP 200	19.7	19.2	18.7	18.3	17.8	17.5	17.0	16.6	16.1	15.7	15.2	14.8	14.4	14.0	13.7	13.4	13.0	12.7	12.3	11.9	11.6	E
	234.0	228.6	223.3	217.8	212.5	207.1	201.7	196.4	190.9	185.5	180.2	176.0	171.8	167.5	163.3	159.1	154.9	150.7	146.4	142.3	138.1	R
RAFP 250	30.5	29.8	29.2	28.5	27.7	27.0	26.3	25.6	24.9	24.2	23.4	22.9	22.3	21.8	21.3	20.8	20.3	19.7	19.2	18.6	18.1	E
	290.1	283.3	276.6	269.9	263.2	256.4	249.7	243.0	236.2	229.5	222.8	217.6	212.6	207.5	202.3	197.2	192.2	187.0	181.9	176.9	171.7	R
RAFP 300	43.5	42.5	41.5	40.6	39.5	38.5	37.5	36.6	35.5	34.5	33.4	32.8	32.0	31.2	30.4	29.6	28.9	28.1	27.3	26.5	25.7	E
	345.2	337.4	329.6	321.7	313.9	306.1	298.0	290.0	281.9	273.8	265.8	259.7	253.8	247.8	241.8	235.9	229.6	223.5	217.2	211.0	204.8	R
RAFP 400	76.6	74.9	73.1	71.4	69.6	67.9	66.1	64.4	62.5	60.7	59.0	57.6	56.3	54.9	53.6	52.3	50.9	49.5	48.2	46.8	45.4	E
	456.3	445.8	435.3	424.8	414.3	403.8	393.3	382.9	372.4	361.8	351.4	343.4	335.4	327.4	319.4	311.4	303.2	295.0	286.7	278.6	270.4	R
RAFP 500	118.3	115.5	112.8	110.1	107.3	104.6	101.9	99.2	96.4	93.7	91.0	88.9	86.8	84.7	82.6	80.5	78.4	76.2	74.2	72.1	69.9	E
	563.1	550.2	537.4	524.6	511.7	498.9	485.8	472.8	459.7	446.6	433.6	423.6	413.7	403.8	393.9	384.1	373.9	363.8	353.6	343.5	333.4	R
RAFP 600	169.4	165.5	161.7	157.9	154.1	150.2	146.3	142.2	138.2	134.1	130.1	127.1	124.2	121.3	118.4	115.5	112.4	109.3	106.3	103.2	100.1	E
	672.8	657.2	641.8	626.3	610.8	595.4	579.9	564.4	548.9	533.5	518.0	506.1	494.2	482.3	470.4	458.6	446.5	434.4	422.3	410.2	398.1	R
RAFP 800	297.7	290.8	283.9	277.1	270.3	263.3	256.5	249.7	242.8	236.0	229.0	223.8	218.4	213.1	207.9	202.5	197.2	191.9	186.6	181.3	176.0	E
	885.3	864.9	844.5	824.2	803.9	783.5	762.9	742.4	721.7	701.1	680.6	664.9	649.2	633.5	617.8	602.0	586.3	570.6	554.9	539.2	523.5	R
RAFP 1000	458.6	448.1	437.7	427.1	416.7	406.2	395.6	384.8	374.1	363.4	352.8	344.7	336.6	328.5	320.4	312.3	304.2	296.1	288.1	280.0	271.9	E
	1092.0	1066.8	1041.8	1016.6	991.6	966.4	941.1	915.7	890.4	865.1	839.8	820.6	801.4	782.0	762.8	743.6	724.2	704.7	685.3	665.9	646.4	R

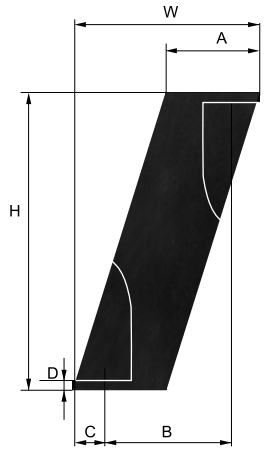
ELEMENT FENDERS

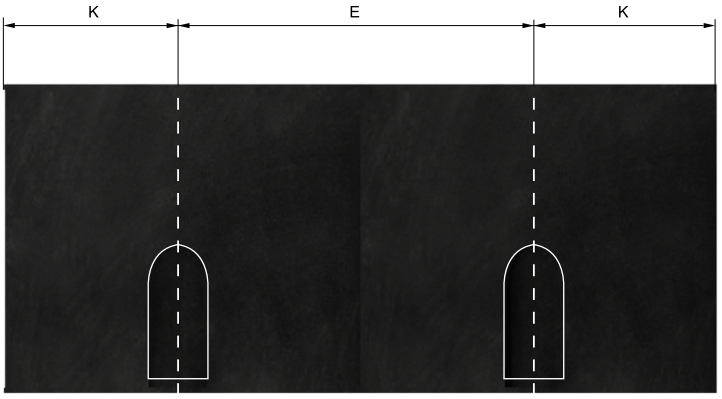
Rubtech™ ERF type (also called the Element or Leg) fender provides a compact solution for mounting of fenders in limited areas. They can also be used with UHMW-PE shield to provide a low cost alternative to an Arch Type Fender.

KEY PERFORMANCE CHARACTERISTICS

- Low reaction force & high energy absorption
- The fender can be combined into different types & sizes of fender system upon required performance
- Optimum performance can be achieved at perpendicular or angular compression

TECHNICAL DETAILS





SPECIFICATIONS

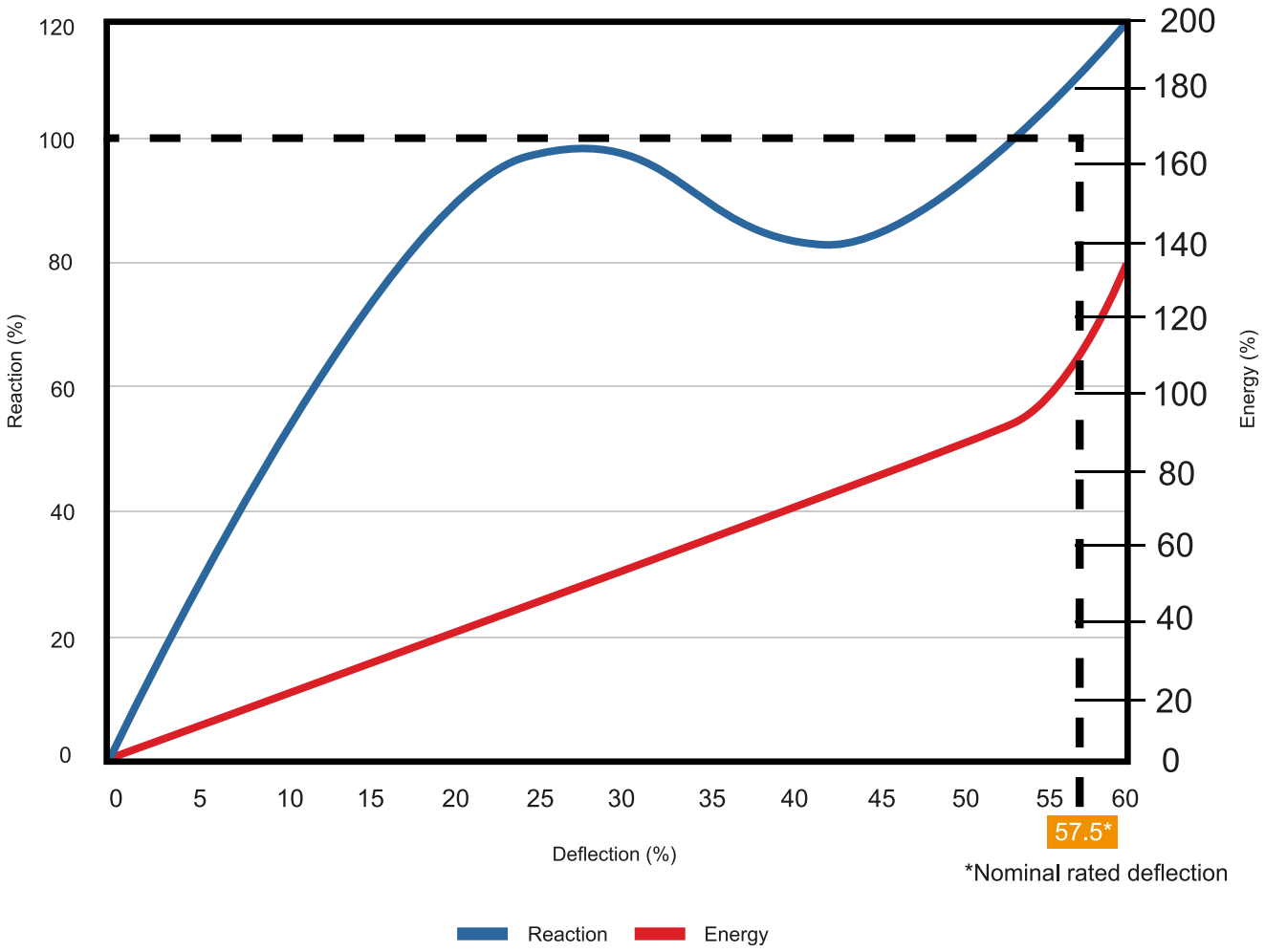
Fender Size	H (mm)	W (mm)	A (mm)	B (mm)	C (mm)	D (mm)	K (mm)	E (mm)	Bolts	Weight (kg/m)
REF 250	250	158	80	78	40	17	50	300	M20	30
REF 300	300	187	94	93	47	17	100	400	M20	46
REF 400	400	250	125	124	63	17	250	500	M24	66
REF 500	500	316	158	142	87	20	250	500	M30	111
REF 550	550	344	172	170	87	20	250	500	M30	132
REF 600	600	373	188	199	87	20	250	500	M30	153
REF 700	700	443	225	217	113	26	250	500	M36	222
REF 750	750	466	235	230	118	26	250	500	M36	239
REF 800	800	498	250	240	129	26	250	500	M36	268
REF 900	900	569	289	279	145	31	250	500	M42	367
REF 1000	1000	634	322	310	162	31	250	500	M42	454
REF 1200	1200	762	390	372	195	36	250	500	M48	625

PERFORMANCE AT RATED DEFLECTION (E-kNm; R-kN)

	H 1.0	H 1.1	H 1.2	H 1.3	H 1.4	H 1.5	H 1.6	H 1.7	H 1.8	H 1.9	H 2.0	
REF 250	16.6	14.6	14.6	14.6	14.6	14.6	13.7	12.7	12.7	12.7	11.7	E
	158.9	144.3	144.3	141.4	137.5	134.6	130.7	127.7	123.8	120.9	117.0	R
REF 300	23.4	21.5	21.5	20.5	19.5	18.5	18.5	18.5	17.6	17.6	16.6	E
	191.1	174.5	171.6	167.7	157.0	154.1	151.1	147.2	144.3	141.4	138.5	R
REF 400	41.9	38.0	37.1	36.1	36.1	35.1	34.1	33.2	32.2	32.2	31.2	E
	229.1	208.7	204.8	199.9	196.0	192.1	187.2	183.3	179.4	174.5	170.6	R
REF 500	66.3	60.5	59.5	57.5	56.6	55.6	54.6	52.7	51.7	50.7	48.8	E
	286.7	263.3	257.4	251.6	246.7	240.8	235.0	230.1	224.3	218.4	213.5	R
REF 550	80.9	73.1	71.2	70.2	68.3	67.3	65.3	64.4	62.4	61.4	59.5	E
	314.9	287.6	281.8	275.9	270.1	264.2	258.4	252.5	246.7	239.9	234.0	R
REF 600	95.6	86.8	84.8	82.9	80.9	80.0	78.0	76.1	74.1	72.2	70.2	E
	343.2	314.0	308.1	301.3	294.5	288.6	281.8	275.0	269.1	262.3	255.5	R
REF 700	128.7	117.0	115.1	112.1	110.2	107.3	105.3	102.4	100.4	97.5	95.6	E
	402.7	366.6	358.8	352.0	344.2	336.4	328.6	320.8	313.0	305.2	298.4	R
REF 750	147.2	133.6	130.7	127.7	125.8	122.9	119.9	117.0	114.1	112.1	109.2	E
	431.9	392.0	384.2	375.4	367.6	359.8	352.0	343.2	335.4	327.6	319.8	R
REF 800	168.7	153.1	150.2	147.2	143.3	140.4	137.5	134.6	131.6	127.7	124.8	E
	458.3	413.4	405.6	397.8	387.1	379.3	371.5	362.7	355.9	345.2	336.4	R
REF 900	213.5	194.0	190.1	186.2	182.3	178.4	174.5	170.6	166.7	162.8	158.9	E
	515.8	469.0	459.2	449.5	439.7	431.0	421.2	411.5	401.7	392.0	383.2	R
REF 1000	264.2	239.9	235.0	230.1	225.2	220.4	215.5	210.6	205.7	200.9	196.0	E
	572.3	520.7	509.9	499.2	488.5	477.8	467.0	457.3	446.6	435.8	425.1	R
REF 1200	376.4	342.2	334.4	326.6	318.8	311.0	303.2	294.5	286.7	278.9	271.1	E
	688.4	626.0	611.3	596.7	582.1	567.5	552.8	538.2	523.6	509.0	582.1	R

	H 2.1	H 2.2	H 2.3	H 2.4	H 2.5	H 2.6	H 2.7	H 2.8	H 2.9	H 3.0	H 3.1	
REF 250	11.7	11.7	10.8	10.8	10.8	10.8	9.8	9.7	9.4	9.1	8.8	E
	114.1	110.2	107.8	104.9	100.9	98.0	94.1	91.1	87.2	84.3	80.4	R
REF 300	16.6	16.6	15.7	15.7	14.7	14.7	14.7	13.7	13.7	12.7	12.7	E
	134.6	131.6	129.4	126.4	122.5	119.6	116.6	112.7	109.8	106.8	103.9	R
REF 400	30.2	29.3	28.4	28.4	27.4	26.5	25.5	24.5	24.5	23.5	22.5	E
	165.8	161.9	158.8	153.9	149.9	145.0	141.1	137.2	132.3	128.4	123.5	R
REF 500	47.8	46.8	45.1	44.1	43.1	42.1	40.2	39.2	38.2	36.3	35.3	E
	207.7	201.8	198.0	192.1	186.2	181.3	174.4	169.5	164.6	158.8	153.9	R
REF 550	58.5	56.6	54.9	53.9	51.9	51.0	49.0	48.0	46.1	45.1	43.1	E
	228.2	222.3	217.6	211.7	205.8	199.9	194.0	188.2	181.3	175.4	169.5	R
REF 600	69.2	67.3	65.7	63.7	61.7	59.8	57.8	56.8	54.9	52.9	51.0	E
	248.6	242.8	237.2	230.3	224.4	217.6	210.7	204.8	198.0	191.1	184.2	R
REF 700	92.6	90.7	88.2	86.2	83.3	81.3	78.4	76.4	73.5	71.5	68.6	E
	290.6	282.8	276.4	268.5	260.7	253.8	246.0	238.1	230.3	222.5	214.6	R
REF 750	106.3	103.4	100.9	99.0	96.0	93.1	90.2	87.2	85.3	82.3	79.4	E
	312.0	303.2	296.9	289.1	281.3	273.4	264.6	256.8	248.9	241.1	233.2	R
REF 800	121.9	119.0	116.6	112.7	109.8	106.8	103.9	100.9	97.0	94.1	91.1	E
	328.6	320.8	315.6	304.8	296.9	289.1	280.3	272.4	262.6	253.8	246.0	R
REF 900	155.0	150.2	147.0	143.1	139.2	135.2	131.3	127.4	123.5	119.6	115.6	E
	373.4	363.7	355.7	346.9	337.1	327.3	317.5	307.7	298.9	289.1	279.3	R
REF 1000	191.1	186.2	182.3	177.4	172.5	167.6	162.7	157.8	152.9	148.0	143.1	E
	414.4	403.7	394.9	385.1	374.4	363.6	352.8	342.0	331.2	321.4	310.7	R
REF 1200	263.3	257.4	251.9	246.0	240.1	234.2	227.4	221.5	215.6	208.7	202.9	E
	479.7	469.0	459.6	448.8	437.1	426.3	415.5	403.8	393.0	381.2	370.4	R

GENERIC PERFORMANCE CURVE



CYLINDRICAL FENDERS

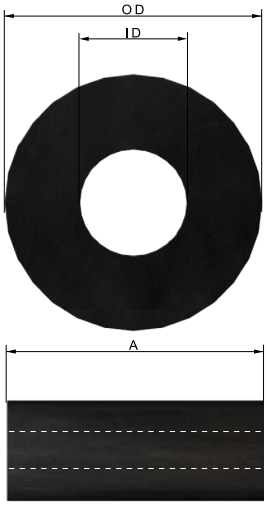
Hollow Cylindrical Fenders offer an excellent protection system for quays, docks, jetties and major ports.

Cylindrical Fenders are manufactured by extrusion available up to 2000mm OD.

KEY PERFORMANCE CHARACTERISTICS

- Very versatile for a number of berthing scenarios
- Variable lengths can be manufactured
- Easy to replace & maintain
- Sturdy & dependable

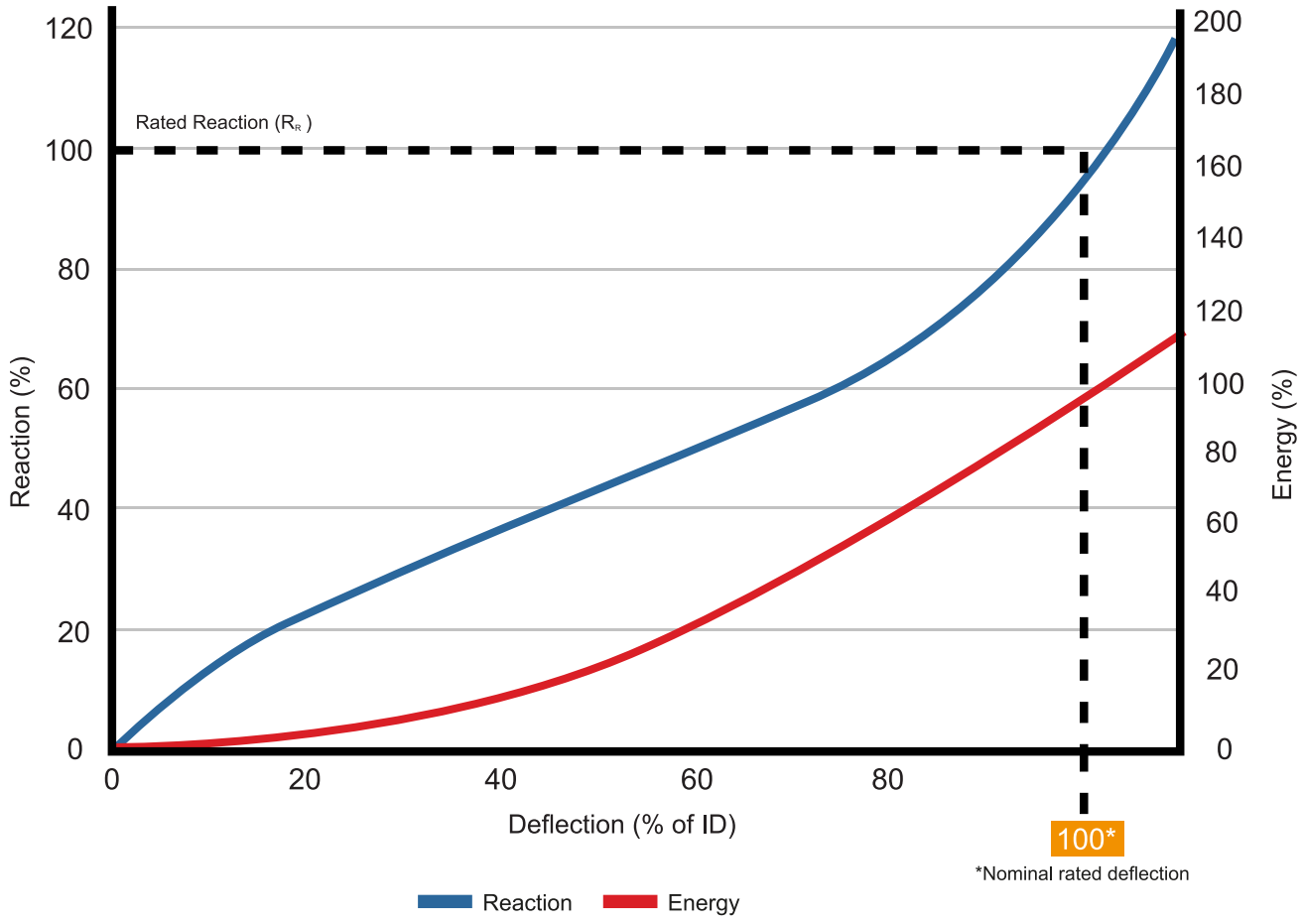
TECHNICAL DETAILS



SPECIFICATIONS

Fender	Size OD x ID (mm)	Performance at rated deflection (E - kNm; R - kN)		P (kN/m^2)	Weight (kg/m)
		E (kNm/m)	R (kN/m)		
RCY 100	100 x 50	0.8	42.4	538.8	7
RCY 125	125 x 65	1.3	50.2	492.5	11
RCY 150	150 x 75	1.8	64	543.7	16
RCY 175	175 x 75	2.7	90.6	769.3	24
RCY 200	200 x 100	3.3	84.7	538.8	29
RCY 250	250 x 125	5	106.4	541.8	45
RCY 300	300 x 150	7.3	127.1	538.8	65
RCY 380	380 x 190	11.6	161.5	541.8	105
RCY 400	400 x 200	12.9	169.4	538.8	116
RCY 450	450 x 225	16.4	191.1	540.8	147
RCY 500	500 x 250	27.6	270.9	689.5	181
RCY 600	600 x 300	39.4	325.1	689.5	255
RCY 800	800 x 400	70.9	433.4	689.5	453
RCY 900	900 x 450	84.7	463	689.5	573
RCY 1000	1000 x 500	110.3	541.8	689.5	707
RCY 1100	1100 x 600	129	532.9	565.4	800
RCY 1200	1200 x 600	159.6	650.1	589.5	1018
RCY 1300	1300 x 700	181.2	640.3	582.1	1131
RCY 1400	1400 x 700	216.7	758.5	689.5	1386

GENERIC PERFORMANCE CURVE



CORNER ARCH FENDERS

HCA series Corner Arch Fenders are an improved version of other solid features like Arch and W Type Fenders.

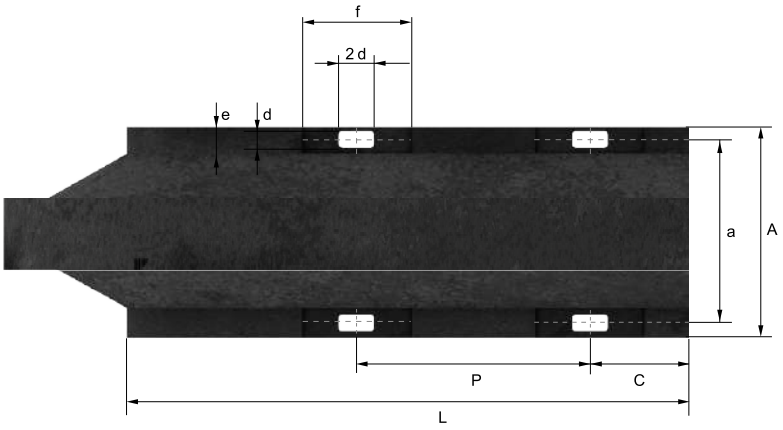
Rubtech™ Corner Arch Fenders are fully reinforced with steel plate, which spreads berthing loads on a wider area thus, reducing pressure on jetty walls.

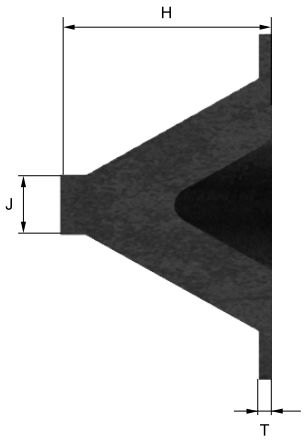
The strong and resilient mechanisms ensure a long life to the structure and protect the vessels and crafts from damages.

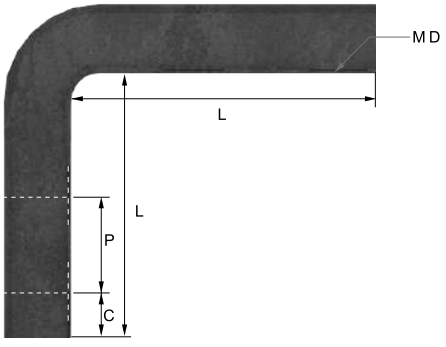
KEY PERFORMANCE CHARACTERISTICS

- Higher energy absorption to reaction force ratio (E:R)
- Higher load carrying capacity
- Higher shear resistance

TECHNICAL DETAILS







SPECIFICATIONS

Specifications	H	L	A	P	a	c	d	e	f	J	T	h	MD
150H x 500L	150	500	300	200	240	75	25	55	95	98	22.5	16.5	M22
200H x 750L	200	750	400	350	320	100	29	75	105	130	35	30	M24
250H x 750L	250	750	500	350	410	100	34	90	125	164	37.5	20.5	M27
250H x 1000L	250	1000	500	550	410	150	34	90	125	164	37.5	20.5	M27

DO-FENDERS

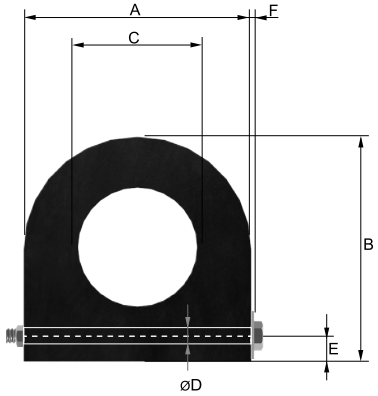
DO Fenders are available in different sizes for a wide range of general purpose applications. They are perfect for small jetties, wharfs and serving small boats, tugs, barges, etc.

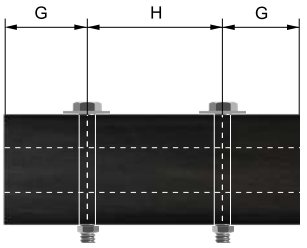
DO Fenders can be manufactured in any length. The maximum length is restricted only by transport and internal handling.

KEY PERFORMANCE CHARACTERISTICS

- Easy installation
- Good energy absorption ratio
- Ideal for small jetties, work boats, pontoons, protection, inland waterways & general purpose applications.

TECHNICAL DETAILS





SPECIFICATIONS

A	B	C	D	E	F	G	H	Flat Bar	Bolt Size	Weight
100	100	30	15	25	10	90-130	200-300	50X6	M12	9.6
150	150	65	20	30	12	110-150	250-350	60X8	M16	19.5
200	200	75	25	45	15	130-180	300-400	80X10	M20	36.5
250	250	100	30	50	20	140-200	350-450	100X10	M24	55.8
300	300	125	30	60	25	140-200	350-450	110X12	M24	79.3
350	350	150	35	70	25	140-200	350-450	120X12	M30	106.8
400	400	175	35	80	30	140-200	350-450	130X15	M30	138.4
400	400	200	35	80	30	140-200	350-450	130X15	M30	129.8
500	500	250	35	100	30	140-200	350-450	130X15	M36	202.8

DD-FENDERS

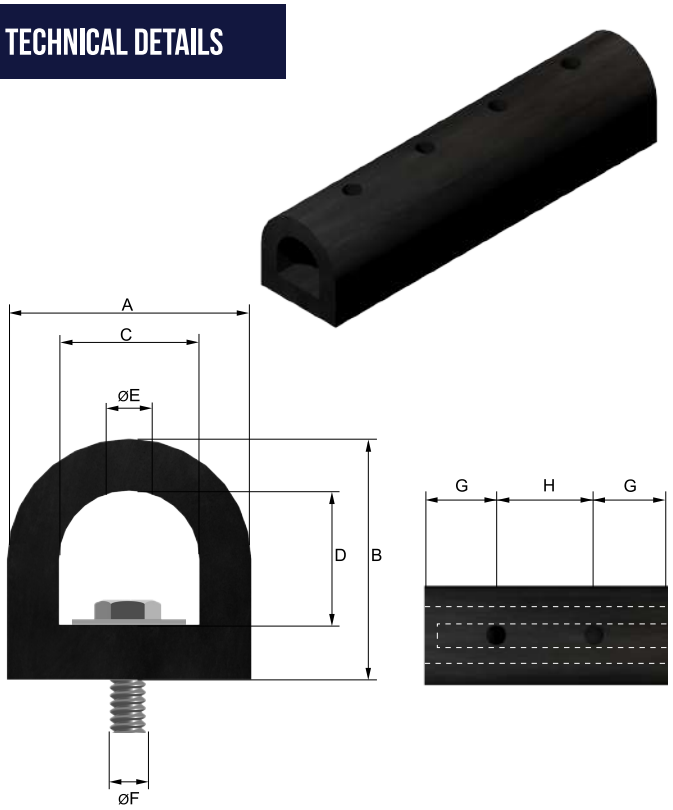
DD Fenders are available in different sizes for a wide range of general purpose applications. They are perfect for small jetties, wharfs and serving small boats, tugs, barges, etc.

DD Fenders can be manufactured in any length. The maximum length is restricted only by transport and internal handling.

KEY PERFORMANCE CHARACTERISTICS

- Easy installation
- Good energy absorption ratio
- Ideal for small jetties, work boats, pontoons, protection, inland waterways & general purpose applications.

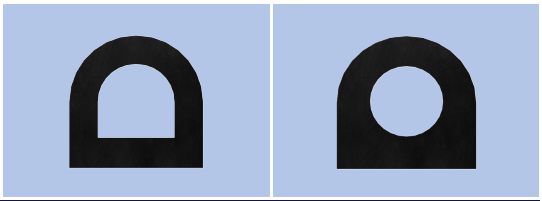
TECHNICAL DETAILS



SPECIFICATIONS

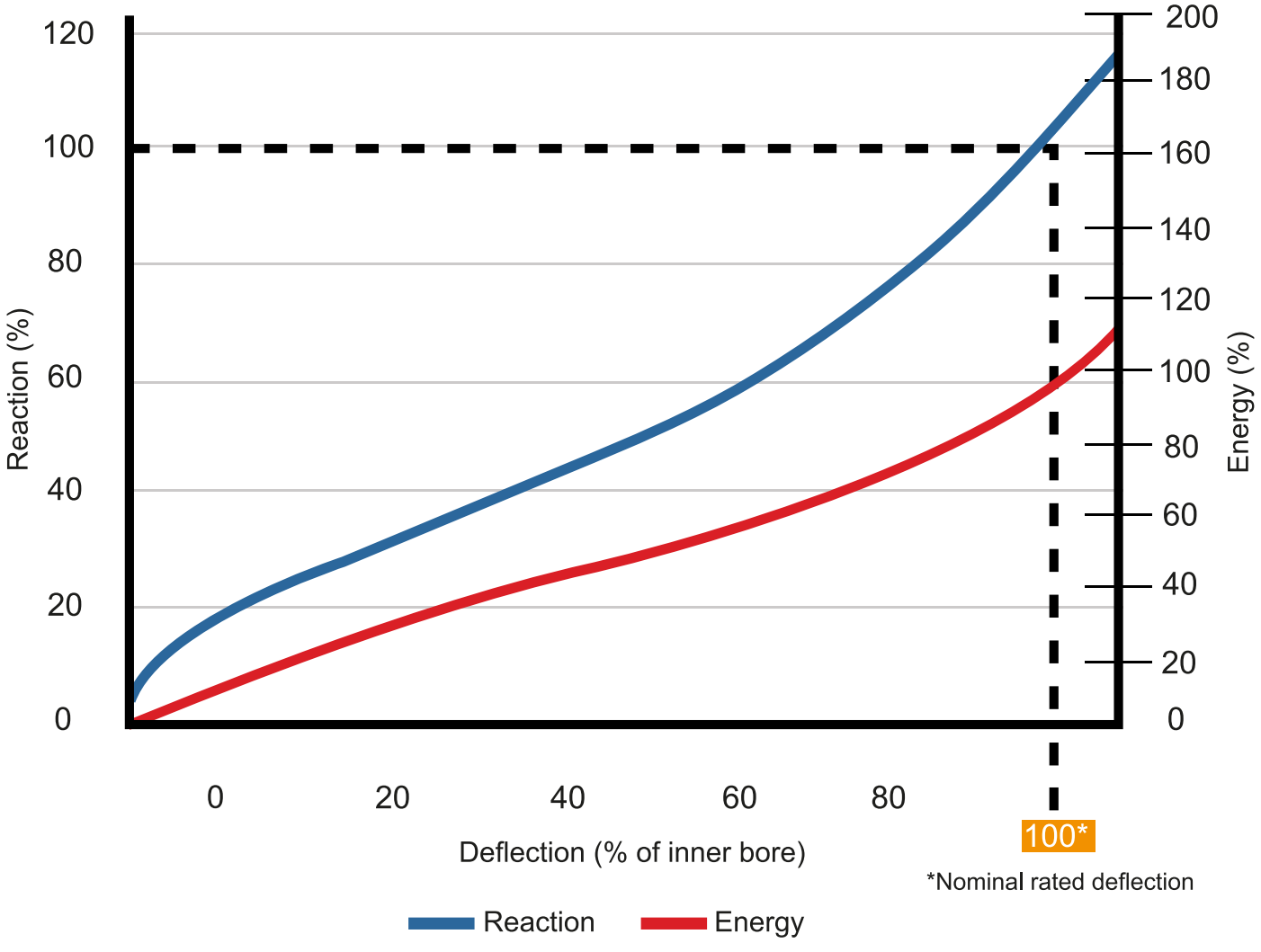
A	B	C	D	øE	øF	G	H	Flat Bar	Bolt Size	Weight
80	70	45	30	30	15	90-130	200-300	35x5	M12	4.4
100	100	50	45	30	15	90-130	200-300	40x5	M12	8.1
125	125	60	60	40	20	110-150	250-350	50x6	M16	12.5
150	150	75	75	40	20	110-150	250-350	60x8	M16	17.5
200	150	100	80	50	25	130-180	300-400	80x10	M20	21.9
200	200	100	100	50	25	130-180	300-400	80x10	M20	31.2
250	200	125	100	60	30	140-200	350-400	90x12	M24	37.8
250	250	125	125	60	30	140-200	350-400	90x12	M24	48.7
300	300	150	150	60	30	140-200	350-400	110x12	M24	70.2
350	350	175	175	75	35	140-200	350-400	130x15	M30	95.5
380	380	190	190	75	35	140-200	350-400	140x15	M30	112.6
400	300	175	150	75	35	140-200	350-400	130x15	M30	93
400	400	200	200	75	35	140-200	350-400	150x15	M30	124.8
500	500	250	250	90	45	160-230	400-500	180x20	M36	195

RATED PERFORMANCE



Performance at rated deflection (E - kNm; R - kN)				
Fender Size	E (kNm)	R (kN)	E(kNm)	E (kN)
100	1.4	77	1.9	157
150	3.2	115	4.2	23
200	5.7	153	7.5	314
250	8.9	191	11.7	392
300	12.9	230	16.9	471
350	17.6	268	22.9	549
400	23	306	29.4	628
500	35.9	383	46	785

GENERIC PERFORMANCE CURVE



SQUARE FENDERS

Square Fenders are manufactured in various design and sizes and can be used for a wide range of purposes.

Compared to D Fenders, Square Fenders are widely used where extra rigidity and strong bumpers are required.

KEY PERFORMANCE CHARACTERISTICS

- Easy installation
- Good energy absorption ratio
- Ideal for small jetties, work boats, pontoons, protection, inland waterways & general purpose applications.

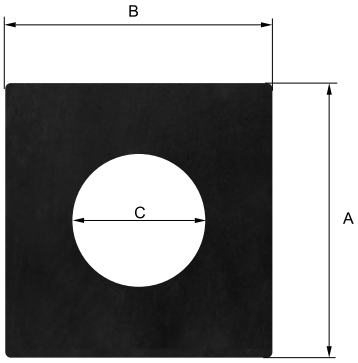
TYPES OF SQUARE FENDERS

RFS-SD RFS-SO RFS-SS

RFS-SO: Fenders with O shaped inner chamber
RFS-SD: Fenders with D shaped inner chamber
RFS-SS: Solid Fenders without inner chamber

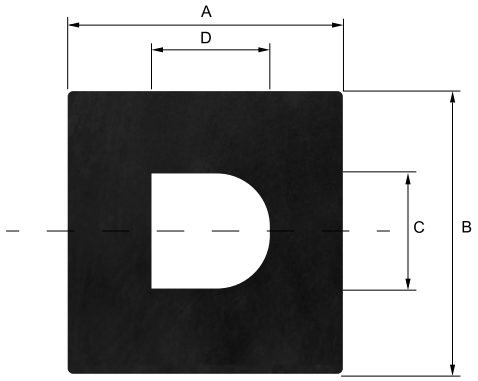
SPECIFICATIONS

SQUARE FENDER SO TYPE



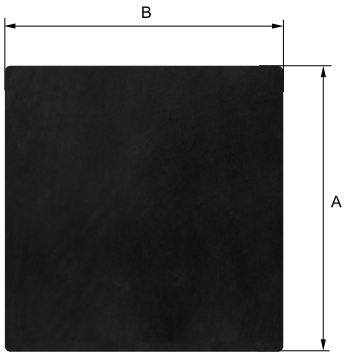
A in mm	B in mm	C in mm	Weight (kg/m)
100	100	30	11.4
150	150	65	23.6
200	200	75	43.8
200	200	100	39.5
250	200	100	52
250	250	100	67.2
300	250	100	82.6
300	300	150	93
400	400	200	158
500	500	250	247
600	600	300	347

SQUARE FENDER SD TYPE



A in mm	B in mm	C in mm	D in mm	Weight (kg/m)
100	100	50	45	9.9
150	150	70	65	22.7
200	200	90	95	39.8
250	250	120	120	61.1
300	300	125	135	92
400	400	200	200	153
500	500	250	250	239

SQUARE FENDER SS TYPE



A in mm	B in mm	Weight (Kg/m)
100	100	12
150	150	27
200	200	48
250	250	75
300	300	108
400	400	192
500	500	300

W & M FENDERS

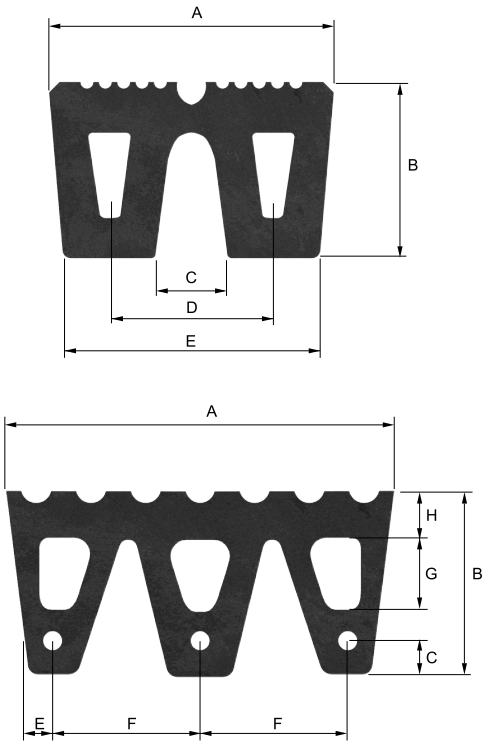
W&M Fenders are suitable for application on the bow and stem of tugs, supply vessels and ice breakers. The grooves on the top of the fender gives extra grip and low pressure while pushing.

Applications:
Supply vessels, tug boats, ice breakers, barges, corners of berths

KEY PERFORMANCE CHARACTERISTICS

- Offer an excellent alternative for Square Fenders
- Easy installation
- Can be installed on curved structure and rounded corners

TECHNICAL DETAILS



SPECIFICATIONS

A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Weight (kg/m)
320	200	100	180	280	51
400	250	110	220	350	81
480	300	135	265	420	120
500	360	125	265	390	156
500	450	90	250	420	180

A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Weight (kg/m)
400	200	40	23	50	150	56
500	250	50	27	60	190	89
600	300	60	33	70	230	132
800	400	80	44	95	305	235

TUG FENDERS

Tug Fenders work harder, longer and under more extreme conditions than any other fender type.

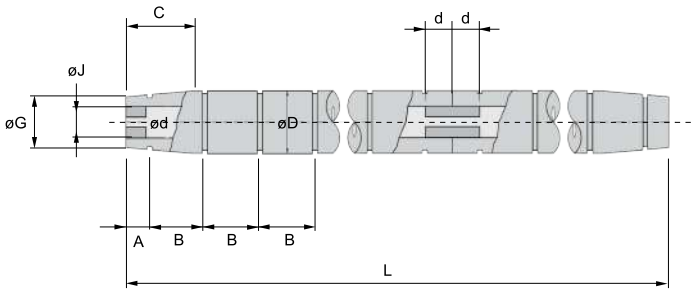
Tugs may be fitted with up to four types of fenders - each type serving a particular application.

As many Tugs become more powerful, some exceeding 100t bollard pull, choosing the right type, size and arrangement of fenders becomes critical.

KEY PERFORMANCE CHARACTERISTICS

- Bollard Pull
- Initial contact loads
- Dynamic load effects
- Friction requirements
- Pushing angles
- Hull attachment
- Fender tolerances
- Material quality
- Spares availability

TECHNICAL DETAILS



SPECIFICATIONS

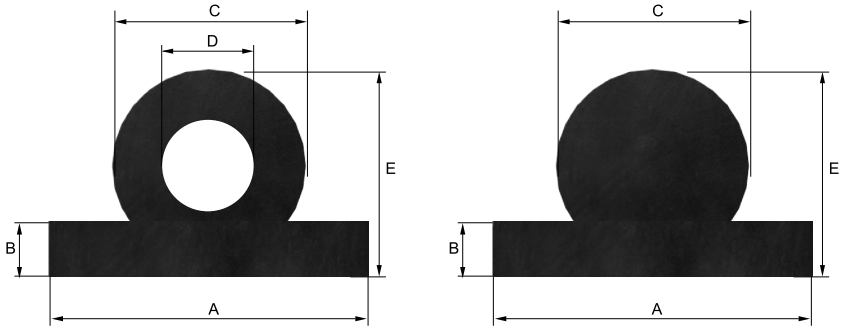
øD	ød	A	B_{max}	C	øG	øJ	Weight
250	125	200	570	500	190	75	45.5
300	150	225	600	700	225	75	65.2
380	190	280	650	800	280	100	105
400	200	300	670	800	300	100	116
450	225	300	700	850	350	100	147
500	250	300	730	900	375	100	181
600	300	350	800	900	450	125	255
800	400	350	930	1000	600	125	453
900	450	350	1000	1100	675	150	573
1000	500	350	1060	1200	750	150	707

WING FENDERS

Wing Fenders are used as an alternative for the protection of vessel walls, docks and berths. Wing Fenders are generally mounted in a profile and easy to install when replacement is required.

Applications:
Wing Fenders are widely used in various sizes and designs on: work boats, pilot boats, piers, tug boats, quays and warehouses.

TECHNICAL DETAILS



SPECIFICATIONS

A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Weight (kg/m)
180	25	100	50	100	11
215	30	150	75	150	20
245	30	150	75	150	21
280	40	200	100	200	36
320	40	200	100	200	38
370	50	250	125	250	57
410	50	250	125	250	60

A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg/m)
180	25	100	100	13
215	30	150	150	26
245	30	150	150	27
280	40	200	200	40
320	40	200	200	48
370	50	250	250	72
410	50	250	250	78

BOAT LANDING RUB STRIP

Boat Landing Rub Strips for offshore oil and gas jacket are built to absorb the impact energy from berthing boats or vessels. It plays the important role of protecting the jacket and vessel when they are berthing, while resisting the harsh environment at sea and operating in even the most severe weather. On impact by a berthing vessel, rubber surface of the Rub Strips transfer the load and kinetic energy is absorbed and dissipated as heat and a smaller reaction force against the vessel by the rubber as it undergoes shear and compression.

Rubtech™ Rub Strips are made of high-quality rubber that are designed to absorb impact energy and are free from maintenance once installed. To ensure that our customers' needs are met, we can manufacture Rub Strips with a variety of profiles to suit different environment. The profile can be solid or hollow and has a variety of mounting options from bolted type to sliding type as per project requirements.

SWAY & SURGE FENDERS

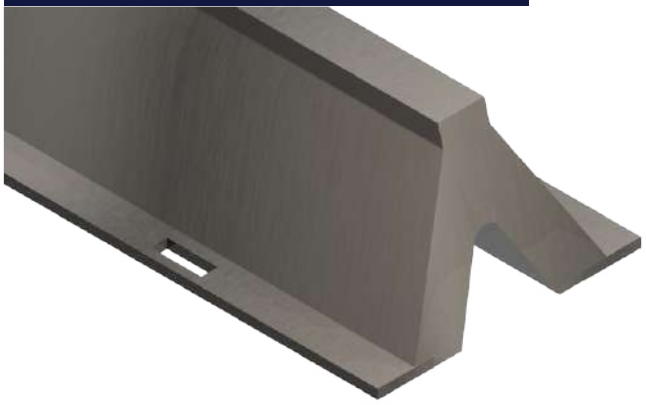
Sway and Surge Fenders consist of a single part and available in different width and height. The base of the fender consists of a steel plate with mounting holes for bolts which is vulcanized inside the rubber.

Sway and Surge Fenders can be mounted either horizontally or vertically with the help of fixing bolts.

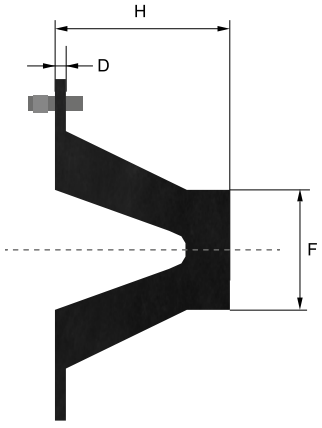
KEY PERFORMANCE CHARACTERISTICS

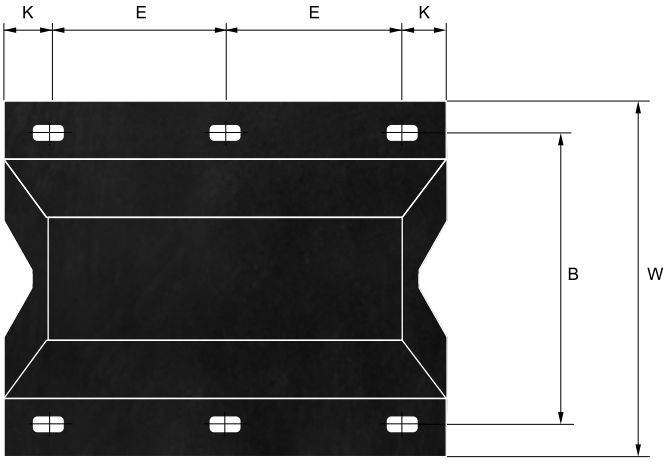
- Strong bolting arrangement helps in quick & easy installation
- Long service life
- Excellent shear resistance

TYPES OF SWAY AND SURGE FENDERS



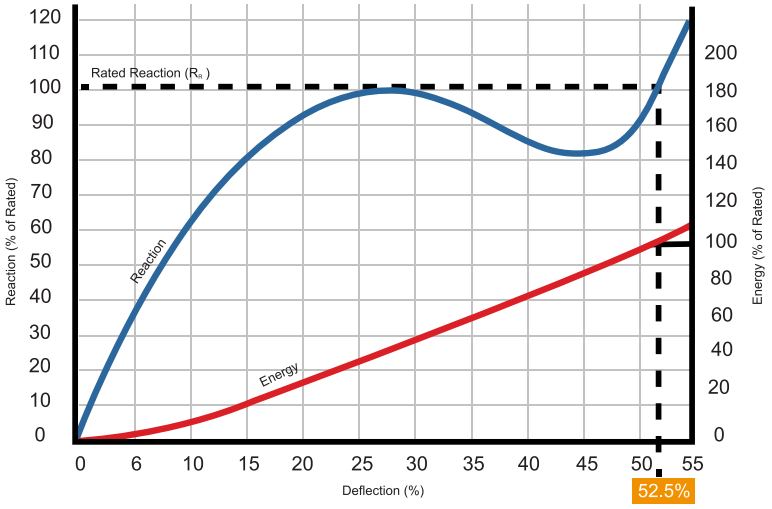
SPECIFICATIONS





	H	A	B	W	F	D	K	E	pxQ	Anchors / Head Bolt	Weight	
											RAF	RAFP
RAF/RAFP 150	150	108	240	326	98	16–20	50	500	20×40	M16	28	35
RAF/RAFP 200	200	142	320	422	130	18–25	50	500	25×50	M20	48	62
RAF/RAFP 250	250	164	400	500	163	20–30	62.5	500	28×56	M24	69	90
RAF/RAFP 300	300	194	480	595	195	25–32	75	500	28×56	M24	107	128
RAF/RAFP 400	400	266	640	808	260	25–32	100	500	35×70	M30	185	217
RAF/RAFP 500	500	318	800	981	325	25–32	125	500	42×84	M36	278	352
RAF/RAFP 600	600	373	960	1160	390	28–40	150	500	48×96	M42	411	488
RAF/RAFP 800	800	499	1300	1550	520	41–50	200	500	54×108	M48	770	871
RAF/RAFP 1000	1000	580	1550	1850	650	50–62	250	500	54×108	M48	1289	1390

GENERIC PERFORMANCE CURVE



	H 1.0	H 1.1	H 1.2	H 1.3	H 1.4	H 1.5	H 1.6	H 1.7	H 1.8	H 1.9	H 2.0	H 2.1	H 2.2	H 2.3	H 2.4	H 2.5	H 2.6	H 2.7	H 2.8	H 2.9	H 3.0	
RAF 150	8.7	8.5	8.2	8.0	7.8	7.6	7.4	7.3	7.1	6.8	6.6	6.5	6.3	6.2	6.0	5.9	5.7	5.6	5.4	5.2	5.1	E
	149.4	145.8	142.3	138.8	135.2	131.7	128.0	124.3	120.5	116.8	113.1	110.5	107.9	105.3	102.7	100.1	97.5	94.9	92.2	89.7	87.0	R
RAF 200	15.4	15.1	14.7	14.3	14.0	13.6	13.2	12.9	12.5	12.2	11.8	11.5	11.2	10.9	10.6	10.4	10.1	9.8	9.5	9.2	8.9	E
	198.7	194.0	189.3	184.6	179.9	175.2	170.3	165.3	160.4	155.4	150.5	147.0	143.5	139.9	136.4	132.9	129.5	126.1	122.7	119.4	115.9	R
RAF 250	23.9	23.3	22.8	22.2	21.7	21.1	20.5	19.9	19.4	18.8	18.2	17.7	17.3	17.0	16.6	16.1	15.7	15.2	14.8	14.3	13.9	E
	246.1	240.2	234.4	228.5	222.8	216.9	210.9	204.8	198.7	192.7	186.6	182.4	178.2	174.0	169.8	165.6	161.2	156.7	152.3	147.9	143.5	R
RAF 300	34.1	33.3	32.5	31.7	30.9	30.1	29.3	28.4	27.6	26.9	26.1	25.4	24.8	24.1	23.5	22.9	22.2	21.7	21.1	20.4	19.8	E
	292.5	285.7	278.7	271.8	264.8	257.8	250.7	243.5	236.4	229.2	222.1	217.0	211.9	206.8	201.7	196.6	191.5	186.4	181.3	176.2	171.1	R
RAF 400	60.2	58.8	57.3	56.0	54.5	53.1	51.6	50.2	48.7	47.3	45.9	44.8	43.7	42.6	41.6	40.5	39.4	38.3	37.1	36.1	35.0	E
	387.6	378.2	368.8	359.4	350.0	340.6	331.1	321.7	312.3	302.9	293.5	286.8	280.2	273.6	267.0	260.3	253.4	246.6	239.6	232.8	225.9	R
RAF 500	92.8	90.6	88.4	86.1	84.0	81.7	79.5	77.3	75.1	72.8	70.7	69.0	67.3	65.6	63.9	62.2	60.6	58.9	57.2	55.6	53.9	E
	477.7	466.4	455.0	443.7	432.4	421.1	409.5	398.0	386.4	374.9	363.4	355.0	346.6	338.2	329.9	321.4	313.1	304.7	296.4	287.9	279.6	R
RAF 600	130.7	127.8	124.9	121.9	119.0	116.1	113.1	110.2	107.2	104.3	101.3	98.9	96.5	94.2	91.7	89.4	86.9	84.6	82.1	79.8	77.3	E
	571.4	557.6	543.9	530.2	516.4	502.6	488.9	475.1	461.4	447.7	433.9	423.9	414.1	404.2	394.3	384.4	374.2	364.1	353.9	343.8	333.6	R
RAF 800	233.6	228.0	222.5	216.9	211.4	205.8	200.2	194.6	189.1	183.6	178.0	173.8	169.5	165.3	161.0	156.8	152.6	148.4	144.2	139.9	135.7	E
	750.8	732.7	714.8	696.8	678.7	660.7	642.7	624.7	606.6	588.6	570.7	557.5	544.4	531.3	518.1	505.0	491.7	478.3	464.9	451.6	438.3	R
RAF 1000	360.1	351.4	342.9	334.4	325.8	317.2	308.6	300.1	291.6	282.9	274.4	268.0	261.7	255.3	248.9	242.6	236.0	229.4	222.9	216.2	209.6	E
	926.4	904.2	882.0	859.9	837.7	815.6	793.1	770.8	748.3	726.0	703.5	687.3	671.1	654.8	638.6	622.3	606.1	589.9	573.6	557.3	541.2	R

MARINE MOORING BOLLARDS

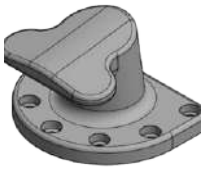
Marine Mooring Bollards provide a simple yet efficient method for fulfilling mooring requirements to allow safe securing of vessels next to jetties, wharves, berths and dolphins in ports and harbors. Rubtech™ offers a wide range of cast iron or steel bollards in various sizes, grades and capacities.

Our bollards are designed and manufactured in accordance to standards and guidelines such as BS6349: Part 4 and PIANC. Bollards are safety critical components and ESC strives to provide bollards with superior service life and resistance to physical and corrosive environment.

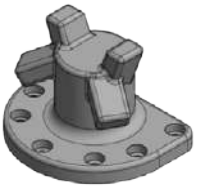
STANDARD DESIGNS

We offer a full range of Mooring Bollards:

- Cast iron & steel bollards in a range of configurations.
- Upto 300 ton capacity
- Complete with anchoring sets
- Corrosion protection coating options - primer, epoxy coating, galvanized, duplex (galvanized & painted)
- Fully customizable as bollards vary significantly between ports & countries.



T-HEAD



HORN

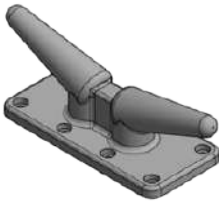
KIDNEY

SINGLE BITT

DOUBLE BITT

PILLAR

Displacement	Approx. Bollard Rating
Up to 2,000 tons	10 tons
2,000-10,000 tons	30 tons
10,000-20,000 tons	60 tons
20,000-50,000 tons	80 tons
50,000-100,000 tons	100 tons
100,000-200,000 tons	150 tons
Over 200,000 tons	200-300 tons



CLEAT

SPECIFICATIONS

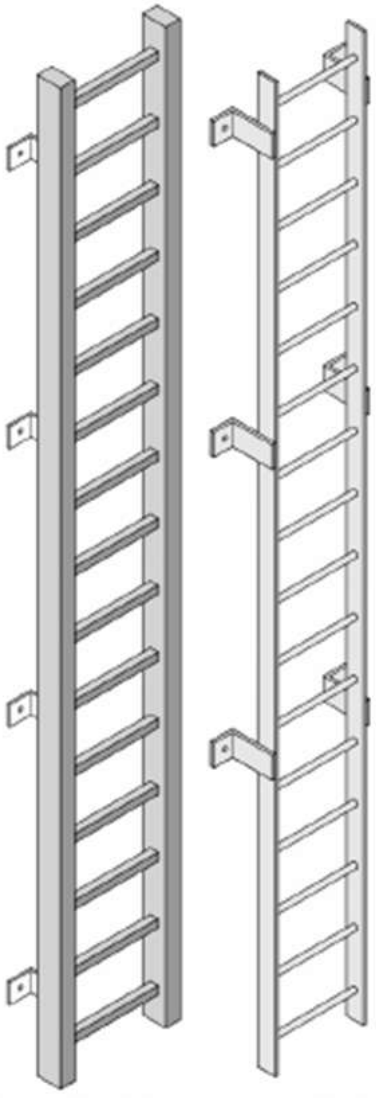
Rubtech™ Bollards are produced to the highest specifications. The table gives indicative standards and grades, but many other options are available upon request.

Material	Standard(s)
Ductile Cast Iron	BS EN 1563 ASTM A536 GB/T 1348
Cast Steel	ASTM A27 ASTM A148 GB/T 11352 EN 10293
Over 200,000 tons	ISO 898 BS 3692 ASTM F1554

LADDERS

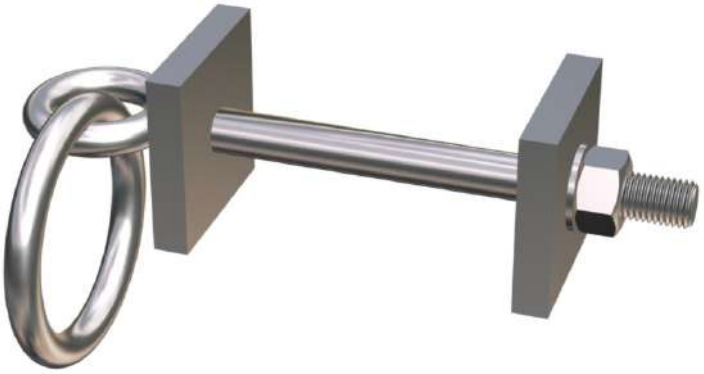
Rubtech™ offers a wide range of safety Ladders as per project requirements. Ladders are available in both stainless steel, hot dip galvanized or can just be supplied painted with marine grade paints.

Rubtech™ Ladders are available in various length from 2 meters to 12 meters.



MOORING RING

Mooring Rings are available in 1 ton to 100 ton pull capacity in different materials and grades.



CHAINS

Some fender systems need Chains to help support heavy components or to control how the fender deflects and shears during impact. Open Link or Stud Link Chains are commonly used and these can be supplied in several different strength grades.

KEY PERFORMANCE CHARACTERISTICS

- Choice of open or Stud Link Chain
- Various link length available
- Proof load tested & certified
- Galvanised as standard
- Variety of matched accessories

TECHNICAL DETAILS

SPECIFICATIONS

øG	3.0 D links			3.5 D links			4.0 D links			5.0 D links			MBL	
	L	W	Weight	L	W	Weight	L	W	Weight	L	W	Weight	SL2	SL3
14	42	18	0.2	49	20	0.2	56	20	0.2	70	21	0.3	124	154
16	48	21	0.3	56	22	0.3	64	22	0.3	80	24	0.4	160	202
18	54	23	0.4	63	25	0.4	72	25	0.5	90	27	0.5	209	262
20	60	26	0.5	70	28	0.6	80	28	0.6	100	30	0.8	264	330
22	66	29	0.7	77	31	0.8	88	31	0.8	110	33	1	304	380
25	5	33	1.1	88	35	1.1	100	35	1.2	125	38	1.5	393	491
28	84	36	1.4	98	39	1.6	112	39	1.7	140	42	2	492	616
30	90	39	1.8	105	42	2	120	42	2.1	150	45	2.5	566	706
32	96	42	2.2	112	45	2.4	128	45	2.5	160	48	3	644	804
35	105	46	2.8	123	49	3.1	140	49	3.3	175	53	4	770	964
38	114	49	3.6	133	53	3.9	152	53	4.3	190	57	5.1	900	1130
40	120	52	4.2	140	56	4.6	160	56	5	200	60	6	1010	1260
45	135	59	6	158	63	6.5	180	63	7.1	225	68	8.5	1275	1590
50	150	65	8.2	175	70	8.9	200	70	9.7	250	75	11.6	1570	1960
55	165	72	10.9	193	77	11.9	220	77	12.9	275	83	15.5	1900	2380
60	180	78	14.2	210	84	15.4	240	84	16.8	300	90	20.1	2260	2770

SHACKLES

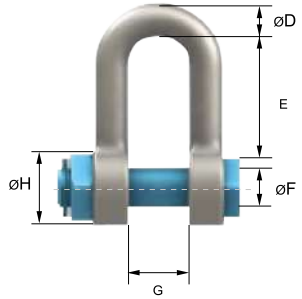
Shackles are referenced to the nominal chain diameter for equivalent strength and typically of larger diameter material.

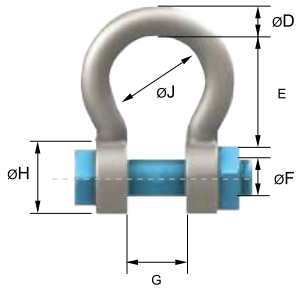
Care is needed to ensure all chain system components fit together.

KEY PERFORMANCE CHARACTERISTICS

- D-shaped or Bow Shackles
- Selection always based on chain diameter and NBL
- Available in mild steel HDG & stainless steel

TECHNICAL DETAILS





SPECIFICATIONS

øD	øF	øH	G	Dee Shackle		Bow Shackle			NBL
				E	Weight	E	øJ	Weight	
13	16	26	22	43	0.4	51	32	0.4	120
16	19	32	27	51	0.7	64	43	0.8	195
19	22	38	31	59	1.1	76	51	1.3	285
22	25	44	36	73	1.5	83	58	1.9	390
25	28	50	43	85	2.6	95	68	2.8	510
28	32	56	47	90	3.3	108	75	3.8	570
32	35	64	51	94	4.7	115	83	5.3	720
35	38	70	57	115	6.2	133	95	7	810
38	42	76	60	127	7.6	146	99	8.8	1020
45	50	90	74	149	12.8	178	126	15	1500
50	57	100	83	171	18.2	197	138	20.7	2100
57	65	114	95	190	27.8	222	160	29.3	2550
65	70	130	105	203	35.1	254	180	41	3330
75	80	150	127	230	60	330	190	64.5	5100
89	95	178	146	267	93	381	238	110	7200
102	108	204	165	400	145	400	275	160	9000

U ANCHOR

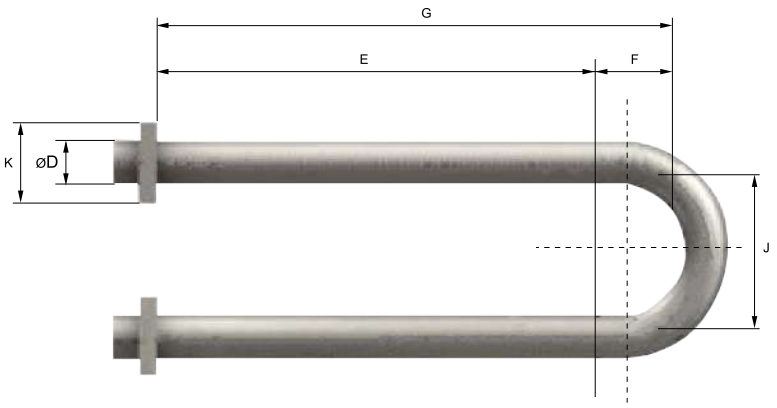
U Anchors are used when normal brackets are not required.

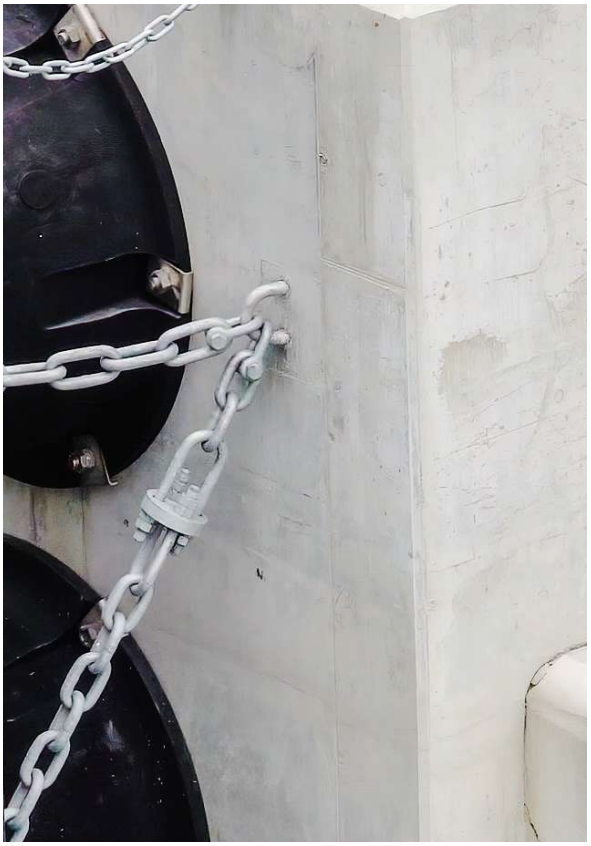
It is normally casted into the concrete wall as a permanent solution for installing fenders.

KEY PERFORMANCE CHARACTERISTICS

- Available in grade 8.8/hot dip galvanized
- Available in stainless steel SS316
- Easy to install
- Various sizes & special dimensions available upon request

TECHNICAL DETAILS





SPECIFICATIONS

øD	E	F	G	J	K	t	Weight	NBL
26	260	60	320	104	50	12	3.4	209
30	300	70	370	120	50	15	5.1	264
34	340	70	410	136	60	15	7.3	304
36	360	70	430	144	60	20	8.6	393
42	420	90	510	168	70	20	13.7	492
44	440	100	540	176	80	20	16.1	566
48	480	100	580	192	80	25	20.5	644
50	500	110	610	200	90	25	23.7	770
56	560	120	680	224	100	30	33.4	900
60	600	130	730	240	110	30	41.1	1010
66	660	140	800	264	120	35	54.8	1275
74	740	160	900	296	130	40	76.9	1570

BRACKETS

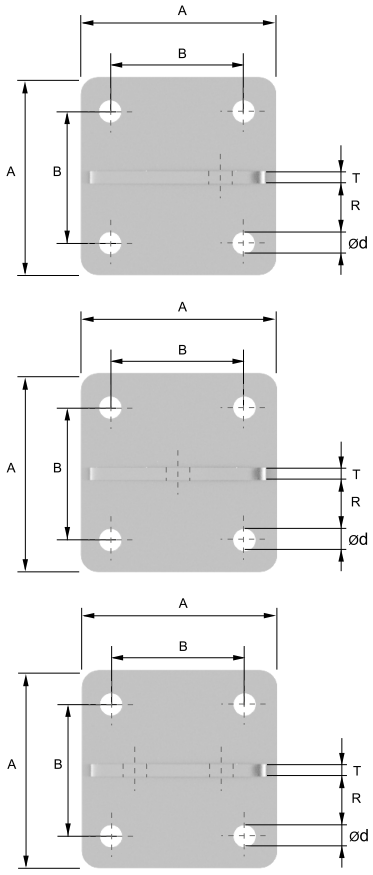
Chain Brackets are often designed on a project by project basis to suit the chain system and load combinations.

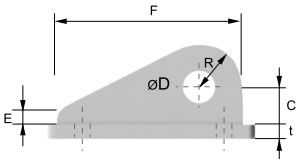
All Brackets are designed with either two or four anchor holes as required to suit the applied loads.

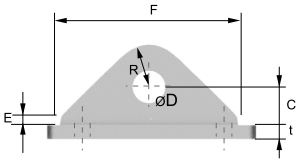
KEY PERFORMANCE CHARACTERISTICS

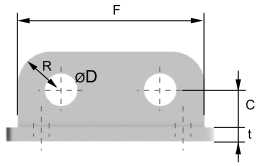
- Type CB1 are generally used for shear & weight chains
- Type CB2 are usually used with tension chains
- Type CB3 are used to connect weight & tension chains
- Various sizes & arrangements are provided for different applications

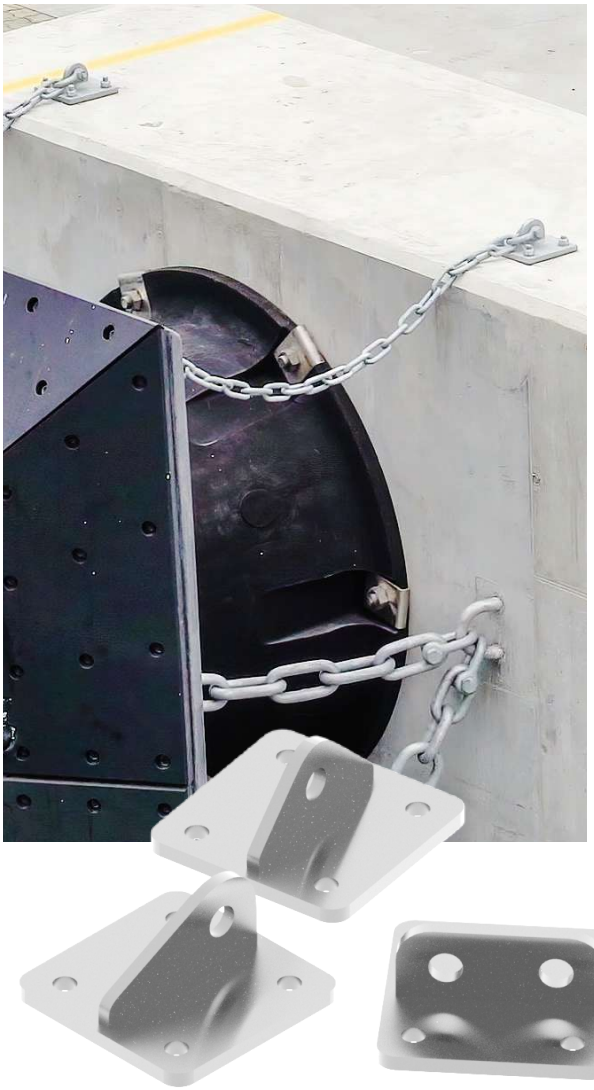
TECHNICAL DETAILS











SPECIFICATIONS

A	B	C	E		F	ød	R	t	T	Single Lug		Twin Lug		Anchor
			CB1/CB3	CB2						Shackle	øD	Bolt Pin	øD	
190	110	40	20	75	160	24	40	15	30	19	28	M24 x 90	28	2/4 x M20
220	130	45	20	90	190	24	50	15	30	22	28	M24 x 90	28	2/4 x M20
250	150	50	25	100	210	28	55	20	40	25	36	M30 x 120	36	2/4 x M24
280	160	60	25	115	240	28	65	20	40	28	36	M30 x 120	36	2/4 x M24
320	190	65	35	130	270	36	75	25	45	32	42	M36 x 140	42	2/4 x M30
350	210	70	35	140	300	36	80	25	50	35	42	M36 x 140	42	2/4 x M30
380	220	80	35	155	320	42	85	30	50	38	50	M42 x 160	50	2/4 x M36
420	250	85	40	170	360	42	95	30	60	42	50	M42 x 170	50	2/4 x M36
440	260	90	40	180	360	50	100	30	60	44	60	M48 x 180	60	2/4 x M42

CHEMICAL ANCHOR

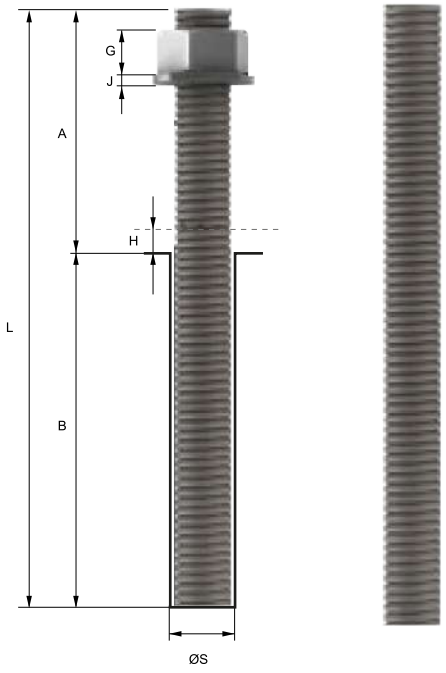
Chemical Anchors are used for installing fenders onto existing concrete or where Cast-in Anchors are unsuitable.

The Anchor is usually secured into a drilled hole using special grout capsules. Non-standard sizes and other grout systems are available upon request.

KEY PERFORMANCE CHARACTERISTICS

- Available in grade 8.8/hot dip galvanized
- Available in stainless steel SS316
- Easy to install
- Various sizes & special dimensions available upon request

TECHNICAL DETAILS



SPECIFICATIONS

Thread	B	E	G	J	L (typ.)	øS
M12	110	5 - 8	10	2.5	-	15
M16	140	6 - 9	13	3	175	20
M20	170	6 - 9	16	3	240	25
M24	210	8 - 12	19	4	270	28
M30	280	8 - 12	24	4	360	35
M36	330	10 - 15	29	5	420	40
M42	420	14 - 21	34	7	500	50
M48	480	16 - 24	38	8	580	54
M56	560	18 - 27	45	9	-	64

CAST-IN ANCHOR

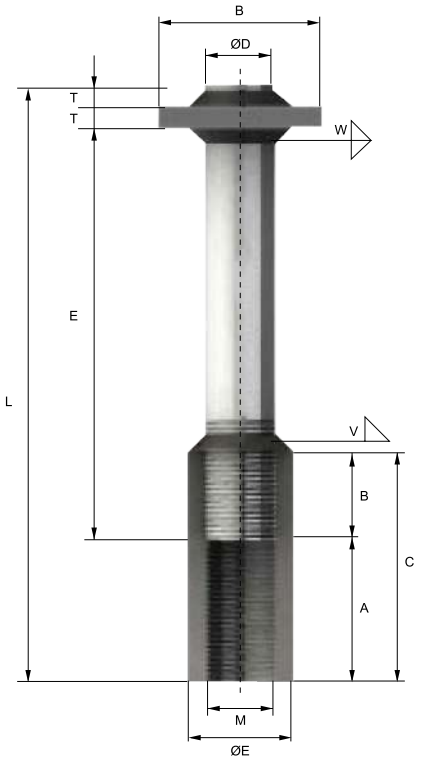
Cast-in Anchor is a traditional anchor design used for installing Fenders to a new concrete. The Anchor has a threaded socket, a long tail and a square anchor plate.

Non-standard sizes and other Cast-in Anchor types are available upon request.

KEY PERFORMANCE CHARACTERISTICS

- Available in grade 8.8/hot dip galvanized
- Available in stainless steel SS316
- Easy to install
- Various sizes & special dimensions available upon request

TECHNICAL DETAILS



SPECIFICATIONS

Thread	A	B	C	øD	E	øF	L	S (sq)	T	V	W	Weight
M20	40	20	60	20	150	30	200	60	10	5	8	0.9
M24	48	25	73	24	185	36	250	70	10	6	8	1.4
M30	60	35	95	30	200	45	270	80	10	6	8	2.3
M36	72	40	112	36	240	54	320	90	12	8	10	3.9
M42	84	50	134	42	270	63	360	110	12	10	10	6.2
M48	96	60	156	48	300	72	400	110	15	10	10	8.8
M56	112	70	182	56	340	84	550	120	15	12	12	13.2

Rubtech™

www.rubtech.ae

Hira Industries LLC

Head Office:
PO Box. 50673, DIP 2, Dubai, United Arab Emirates
Tel: +971 4 884 8414, Fax: +971 4 884 8434
Email: enquiry@rhira.com , www.rhira.com

Factory:
PO Box. 9013, Al Ghail Industrial Area
Ras Al Khaimah, United Arab Emirates.
Tel: +971 7 258 9006, Fax: +971 7 258 9008

CATALOGUE-RUBTECH-
RUBBER FENDER SYSTEM-
4MAR22