

Super Cone Fenders



Super cone fenders (SCN) are the latest generation of fenders, with optimal performance and efficiency.

The conical body shape makes the SCN very stable even at large compression angles, and provides excellent shear strength. With overload stops the SCN is even more resistant to overcompression.

FEATURES

Highly efficient geometry

Minimal performance loss even at large berthing angles

Stable shape resists shear

Wide choice of rubber grades

APPLICATIONS

General cargo berths

Bulk terminals

Oil and LNG facilities

Container berths

RoRo and cruise terminals

Parallel motion systems

Monopiles and dolphins

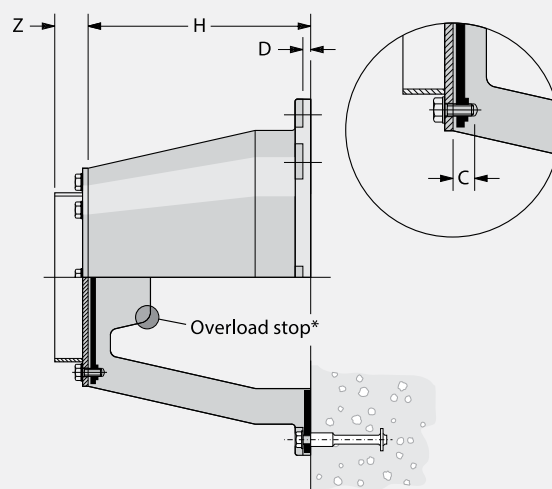
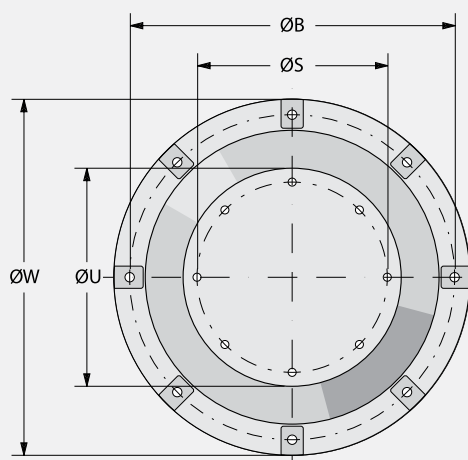
Super Cone Fenders

DIMENSIONS

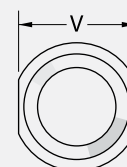
	H	ØW	ØU	C	D	ØB	ØS	F0.9- 1.8 ANCHORS / HEAD BOLTS ^	F1.9- 3.1 ANCHORS / HEAD BOLTS ^	Z _{min}	WEIGHT
SCN 300	300	500	295	27 – 37	20 – 25	440	255	4 x M16	4 x M16	77	40
SCN 350	350	570	330	27 – 37	20 – 25	510	275	4 x M16	4 x M16	77	50
SCN 400	400	650	390	30 – 40	20 – 28	585	340	4 x M16	4 x M20	82	76
SCN 500	500	800	490	32 – 42	30 – 38	730	425	4 x M20	4 x M24	95	160
SCN 550	550	880	540	32 – 42	30 – 38	790	470	4 x M20	4 x M24	95	210
SCN 600	600	960	590	40 – 52	35 – 42	875	515	4 x M20	4 x M30	115	270
SCN 700	700	1120	685	40 – 52	35 – 42	1020	600	4 x M24	4 x M30	120	411
SCN 800	800	1280	785	40 – 52	35 – 42	1165	685	6 x M24	6 x M30	120	606
SCN 860	860	1376	845	40 – 52	35 – 42	1250	735	6 x M24	6 x M30	130	750
SCN 900	900	1440	885	40 – 52	35 – 42	1313	770	6 x M30	6 x M30	135	841
SCN 950	950	1520	930	40 – 52	40 – 50	1390	815	6 x M30	6 x M30	142	980
SCN 1000	1000	1600	980	50 – 65	40 – 50	1460	855	6 x M30	6 x M36	150	1125
SCN 1050	1050	1680	1030	50 – 65	45 – 55	1530	900	6 x M30	6 x M36	157	1360
SCN 1100	1100	1760	1080	50 – 65	50 – 58	1605	940	8 x M30	8 x M36	165	1567
SCN 1150	1150	1840	1125	55 – 70	50 – 58	1680	980	8 x M30	8 x M36	175	1779
SCN 1200	1200	1920	1175	57 – 80	50 – 58	1750	1025	8 x M30	8 x M42	180	2028
SCN 1300	1300	2080	1275	65 – 90	50 – 58	1900	1100	8 x M36	8 x M42	195	2455
SCN 1400	1400	2240	1370	65 – 90	60 – 70	2040	1195	8 x M36	8 x M42	210	3105
SCN 1600	1600	2560	1570	65 – 90	70 – 80	2335	1365	8 x M42	8 x M48	240	4645
SCN 1800	1800	2880	1765	75 – 100	70 – 80	2625	1540	10 x M42	10 x M56	270	6618
SCN 2000	2000	3200	1955	80 – 105	90 – 105	2920	1710	10 x M42	10 x M56	300	9560
SCN 2250	2250	3600	2205	100 – 120	100 – 110	3285	1930	12 x M48	12 x M56	335	13,500
SCN 2500	2500	4000	2450	120 – 150	100 – 120	3650	2150	12 x M48	12 x M64	375	18,500

^ Fender anchors / head bolts indicated are based on a particular grade of steel. Please contact our local office for precise size, material and type for different grades of fenders pertaining to the project requirements.

[Units: mm, kg]



Some SCN sizes have a modified flange for reduced shipping dimensions.



SIZE	V
SCN 950	1440
SCN 1400	2180
SCN 1600	2390
SCN 1800	2700

* Contact our local offices

[Units: mm]

Super Cone Fenders

PERFORMANCE DATA*

			F 0.9 [^]	F 1.0	F 1.1	F 1.2	F 1.3	F 1.4	F 1.5	F 1.6	F 1.7	F 1.8	F 1.9	F 2.0
300	CV	E	7.7	9.0	9.2	9.4	9.6	9.8	10.0	10.4	10.8	11.2	11.6	12.0
		R	49.0	54.0	55.8	57.6	59.4	61.2	63.0	65.6	68.2	70.8	73.4	76.0
	RPD	E _R	8.9	10.4	10.7	10.9	11.1	11.4	11.6	12.1	12.5	13.0	13.5	13.9
		R _R	56.8	62.6	64.7	66.8	68.9	71.0	73.1	76.1	79.1	82.1	85.1	88.2
350	CV	E	12.5	14.0	14.4	14.8	15.2	15.6	16.0	16.6	17.2	17.8	18.4	19.0
		R	67.0	74.0	76.4	78.8	81.2	83.6	86.0	89.4	92.8	96.2	99.6	103.0
	RPD	E _R	14.4	16.1	16.6	17.0	17.5	17.9	18.4	19.1	19.8	20.5	21.2	21.9
		R _R	77.1	85.1	87.9	90.6	93.4	96.1	98.9	102.8	106.7	110.6	114.5	118.5
400	CV	E	18.6	21.0	21.6	22.2	22.8	23.4	24.0	24.8	25.6	26.4	27.2	28.0
		R	87.0	97.0	100.2	103.4	106.6	109.8	113.0	117.4	121.8	126.2	130.6	135.0
	RPD	E _R	21.4	24.2	24.8	25.5	26.2	26.9	27.6	28.5	29.4	30.4	31.3	32.2
		R _R	100.1	111.6	115.2	118.9	122.6	126.3	130.0	135.0	140.1	145.1	150.2	155.3
500	CV	E	36.5	41.0	42.2	43.4	44.6	45.8	47.0	48.4	49.8	51.2	52.6	54.0
		R	137.0	152.0	157.0	162.0	167.0	172.0	177.0	184.0	191.0	198.0	205.0	212.0
	RPD	E _R	41.4	46.5	47.9	49.3	50.6	52.0	53.3	54.9	56.5	58.1	59.7	61.3
		R _R	155.5	172.5	178.2	183.9	189.5	195.2	200.9	208.8	216.8	224.7	232.7	240.6
550	CV	E	49.0	54.0	55.8	57.6	59.4	61.2	63.0	64.8	66.6	68.4	70.2	72.0
		R	165.0	183.0	189.2	195.4	201.6	207.8	214.0	222.4	230.8	239.2	247.6	256.0
	RPD	E _R	55.6	61.3	63.3	65.4	67.4	69.5	71.5	73.5	75.6	77.6	79.7	81.7
		R _R	187.3	207.7	214.7	221.8	228.8	235.9	242.9	252.4	262.0	271.5	281.0	290.6
600	CV	E	63.0	70.0	72.0	74.0	76.0	78.0	80.0	82.0	84.0	86.0	88.0	90.0
		R	189.0	210.0	216.0	222.0	228.0	234.0	240.0	248.4	256.8	265.2	273.6	282.0
	RPD	E _R	71.2	79.1	81.4	83.6	85.9	88.1	90.4	92.7	94.9	97.2	99.4	101.7
		R _R	213.6	237.3	244.1	250.9	257.6	264.4	271.2	280.7	290.2	299.7	309.2	318.7
700	CV	E	117.0	130.0	133.6	137.2	140.8	144.4	148.0	151.4	154.8	158.2	161.6	165.0
		R	280.0	311.0	319.2	327.4	335.6	343.8	352.0	364.0	376.0	388.0	400.0	412.0
	RPD	E _R	131.0	145.6	149.6	153.7	157.7	161.7	165.8	169.6	173.4	177.2	181.0	184.8
		R _R	313.6	348.3	357.5	366.7	375.9	385.1	394.2	407.7	421.1	434.6	448.0	461.4
800	CV	E	171.0	190.0	195.6	201.2	206.8	212.4	218.0	223.4	228.8	234.2	239.6	245.0
		R	359.0	399.0	410.6	422.2	433.8	445.4	457.0	473.2	489.4	505.6	521.8	538.0
	RPD	E _R	189.8	210.9	217.1	223.3	229.5	235.8	242.0	248.0	254.0	260.0	266.0	272.0
		R _R	398.5	442.9	455.8	468.6	481.5	494.4	507.3	525.3	543.2	561.2	579.2	597.2
860	CV	E	215.0	239.0	245	251	258	264	270.0	276	283	289	296	302.0
		R	418.0	465.0	477	489	501	513	525.0	543	561	578	596	614.0
	RPD	E _R	237.6	264.1	270.9	277.8	284.6	291.5	298.4	305.4	312.5	319.6	326.6	333.7
		R _R	461.9	513.8	527.1	540.3	553.6	566.9	580.1	599.8	619.5	639.1	658.8	678.5
900	CV	E	248.0	275.0	282	289	296	303	310.0	317	324	331	338	345.0
		R	462.0	513.0	526	539	552	565	578.0	597	616	635	654	673.0
	RPD	E _R	272.8	302.5	310.2	317.9	325.6	333.3	341.0	348.7	356.4	364.1	371.8	379.5
		R _R	508.2	564.3	578.6	592.9	607.2	621.5	635.8	656.7	677.6	698.5	719.4	740.3
950	CV	E	291.0	322.0	330	339	347	356	364.0	373	381	390	398	407.0
		R	511.0	568.0	583	598	614	629	644.0	666	688	709	731	753.0
	RPD	E _R	320.1	354.2	363.4	372.7	381.9	391.2	400.4	409.9	419.3	428.8	438.2	447.7
		R _R	562.1	624.8	641.5	658.2	675.0	691.7	708.4	732.4	756.4	780.3	804.3	828.3
1000	CV	E	338.0	375.0	385	395	405	415	425.0	435	445	455	465	475.0
		R	567.0	630.0	647	663	680	696	713.0	737	761	786	810	834.0
	RPD	E _R	370.1	410.6	421.6	432.5	443.5	454.4	465.4	476.3	487.3	498.2	509.2	520.1
		R _R	620.9	689.9	708.0	726.2	744.4	762.6	780.7	807.2	833.7	860.2	886.7	913.2

* For explanation of CV and RPD, please refer to note on page 9-10. ^ Fender grades below F0.9 are available upon request. [Units: kNm, kN]

Note: Refer to Index page 89 for 100% natural rubber in a compound.

Super Cone Fenders

PERFORMANCE DATA*

			F 2.1	F 2.2	F 2.3	F 2.4	F 2.5	F 2.6	F 2.7	F 2.8	F 2.9	F 3.0	F 3.1
300	CV	E	12.2	12.4	12.6	12.8	13.0	13.2	13.4	13.6	13.8	14.0	16.0
		R	78.2	80.4	82.6	84.8	87.0	89.8	92.6	95.4	98.2	101.0	111.0
	RPD	E _R	14.2	14.4	14.6	14.8	15.1	15.3	15.5	15.8	16.0	16.2	18.6
		R _R	90.7	93.3	95.8	98.4	100.9	104.2	107.4	110.7	113.9	117.2	128.8
350	CV	E	19.4	19.8	20.2	20.6	21.0	21.4	21.8	22.2	22.6	23.0	25.0
		R	106.0	109.0	112.0	115.0	118.0	122.0	126.0	130.0	134.0	138.0	151.0
	RPD	E _R	22.3	22.8	23.2	23.7	24.2	24.6	25.1	25.5	26.0	26.5	28.8
		R _R	121.9	125.4	128.8	132.3	135.7	140.3	144.9	149.5	154.1	158.7	173.7
400	CV	E	28.6	29.2	29.8	30.4	31.0	31.8	32.6	33.4	34.2	35.0	38.0
		R	139.0	143.0	147.0	151.0	155.0	160.2	165.4	170.6	175.8	181.0	199.0
	RPD	E _R	32.9	33.6	34.3	35.0	35.7	36.6	37.5	38.4	39.3	40.3	43.7
		R _R	159.9	164.5	169.1	173.7	178.3	184.2	190.2	196.2	202.2	208.2	228.9
500	CV	E	55.4	56.8	58.2	59.6	61.0	62.4	63.8	65.2	66.6	68.0	74.0
		R	218.2	224.4	230.6	236.8	243.0	251.0	259.0	267.0	275.0	283.0	311.0
	RPD	E _R	62.9	64.5	66.1	67.6	69.2	70.8	72.4	74.0	75.6	77.2	84.0
		R _R	247.7	254.7	261.7	268.8	275.8	284.9	294.0	303.0	312.1	321.2	353.0
550	CV	E	73.8	75.6	77.4	79.2	81.0	82.8	84.6	86.4	88.2	90.0	99.0
		R	263.4	270.8	278.2	285.6	293.0	302.6	312.2	321.8	331.4	341.0	375.0
	RPD	E _R	83.8	85.8	87.8	89.9	91.9	94.0	96.0	98.1	100.1	102.2	112.4
		R _R	299.0	307.4	315.8	324.2	332.6	343.5	354.3	365.2	376.1	387.0	425.6
600	CV	E	93.0	96.0	99.0	102.0	105.0	108.0	111.0	114.0	117.0	120.0	132.0
		R	292.6	303.2	313.8	324.4	335.0	348.4	361.8	375.2	388.6	402.0	442.0
	RPD	E _R	105.1	108.5	111.9	115.3	118.7	122.0	125.4	128.8	132.2	135.6	149.2
		R _R	330.6	342.6	354.6	366.6	378.6	393.7	408.8	424.0	439.1	454.3	499.5
700	CV	E	169.0	173.0	177.0	181.0	185.0	189.0	193.0	197.0	201.0	205.0	226.0
		R	423.8	435.6	447.4	459.2	471.0	486.2	501.4	516.6	531.8	547.0	601.0
	RPD	E _R	189.3	193.8	198.2	202.7	207.2	211.7	216.2	220.6	225.1	229.6	253.1
		R _R	474.7	487.9	501.1	514.3	527.5	544.5	561.6	578.6	595.6	612.6	673.1
800	CV	E	251.6	258.2	264.8	271.4	278.0	284.4	290.8	297.2	303.6	310.0	341.0
		R	554.6	571.2	587.8	604.4	621.0	642.2	663.4	684.6	705.8	727.0	800.0
	RPD	E _R	279.3	286.6	293.9	301.3	308.6	315.7	322.8	329.9	337.0	344.1	378.5
		R _R	615.6	634.0	652.5	670.9	689.3	712.8	736.4	759.9	783.4	807.0	888.0
860	CV	E	310	318	327	335	343.0	351	360	368	377	385.0	423.0
		R	633	652	672	691	710.0	735	760	786	811	836.0	919.0
	RPD	E _R	342.8	351.8	360.9	370.0	379.0	388.3	397.6	406.9	416.1	425.4	467.4
		R _R	699.7	720.9	742.1	763.3	784.6	812.4	840.2	868.1	895.9	923.8	1015.5
900	CV	E	355	364	374	383	393.0	402	412	421	431	440.0	484.0
		R	694	716	737	759	780.0	807	835	862	890	917.0	1008.0
	RPD	E _R	390.1	400.6	411.2	421.7	432.3	442.6	453.0	463.3	473.7	484.0	532.4
		R _R	763.8	787.4	810.9	834.5	858.0	888.1	918.3	948.4	978.6	1008.7	1108.8
950	CV	E	418	429	441	452	463.0	474	485	497	508	519.0	571.0
		R	777	800	824	847	871.0	902	932	963	993	1024.0	1126.0
	RPD	E _R	460.0	472.3	484.7	497.0	509.3	521.6	533.9	546.3	558.6	570.9	628.1
		R _R	854.3	880.2	906.2	932.1	958.1	991.8	1025.4	1059.1	1092.7	1126.4	1238.6
1000	CV	E	488	501	514	527	540.0	553	566	579	592	605.0	666.0
		R	860	886	913	939	965.0	999	1033	1066	1100	1134.0	1247.0
	RPD	E _R	534.4	548.6	562.8	577.1	591.3	605.5	619.8	634.0	648.2	662.5	729.3
		R _R	941.9	970.6	999.3	1028.0	1056.7	1093.7	1130.7	1167.7	1204.7	1241.7	1365.5

* For explanation of CV and RPD, please refer to note on page 9-10.

[Units: kNm, kN]

Super Cone Fenders

PERFORMANCE DATA*

			F 0.9 [^]	F 1.0	F 1.1	F 1.2	F 1.3	F 1.4	F 1.5	F 1.6	F 1.7	F 1.8	F 1.9	F 2.0
1050	CV	E	392.0	435.0	446.6	458.2	469.8	481.4	493.0	504.4	515.8	527.2	538.6	550.0
		R	626.0	695.0	713.4	731.8	750.2	768.6	787.0	813.4	839.8	866.2	892.6	919.0
	RPD	E _R	427.3	474.2	486.8	499.4	512.1	524.7	537.4	549.8	562.2	574.6	587.1	599.5
		R _R	682.3	757.6	777.6	797.7	817.7	837.8	857.8	886.6	915.4	944.2	972.9	1001.7
1100	CV	E	450.0	500.0	513.6	527.2	540.8	554.4	568.0	581.4	594.8	608.2	621.6	635.0
		R	685.0	761.0	781.6	802.2	822.8	843.4	864.0	893.4	922.8	952.2	981.6	1011.0
	RPD	E _R	490.5	545.0	559.8	574.6	589.5	604.3	619.1	633.7	648.3	662.9	677.5	692.2
		R _R	746.7	829.5	851.9	874.4	896.9	919.3	941.8	973.8	1005.9	1037.9	1069.9	1102.0
1150	CV	E	514.1	570.3	585.5	600.7	616	631.2	646.4	661.6	676.8	692	707.2	722.4
		R	750	833.2	855.1	877.1	899	921	942.9	974.9	1007	1039	1071	1103
	RPD	E _R	560.3	621.7	638.2	654.8	671.4	688	704.5	721.1	737.7	754.3	770.9	787.4
		R _R	817.5	908.2	932.1	956	979.9	1003.9	1027.8	1062.7	1097.6	1132.5	1167.3	1202.2
1200	CV	E	585.0	650.0	667.6	685.2	702.8	720.4	738.0	755.4	772.8	790.2	807.6	825.0
		R	818.1	909.0	933.4	957.8	982.2	1006.6	1031.0	1066.0	1101.0	1136.0	1171.0	1206.0
	RPD	E _R	637.7	708.5	727.7	746.9	766.1	785.2	804.4	823.4	842.4	861.3	880.3	899.3
		R _R	891.7	990.8	1017.4	1044.0	1070.6	1097.2	1123.8	1161.9	1200.1	1238.2	1276.4	1314.5
1300	CV	E	742.5	825.0	847.0	869.0	891.0	913.0	935.0	957.0	979.0	1001.0	1023.0	1045.0
		R	957.6	1064.0	1092.4	1120.8	1149.2	1177.6	1206.0	1246.6	1287.2	1327.8	1368.4	1409.0
	RPD	E _R	805.6	895.1	919.0	942.9	966.7	990.6	1014.5	1038.3	1062.2	1086.1	1110.0	1133.8
		R _R	1039.0	1154.4	1185.3	1216.1	1246.9	1277.7	1308.5	1352.6	1396.6	1440.7	1484.7	1528.8
1400	CV	E	927.0	1030.0	1057.6	1085.2	1112.8	1140.4	1168.0	1195.4	1222.8	1250.2	1277.6	1305.0
		R	1111.5	1235.0	1268.0	1301.0	1334.0	1367.0	1400.0	1447.2	1494.4	1541.6	1588.8	1636.0
	RPD	E _R	1001.2	1112.4	1142.2	1172.0	1201.8	1231.6	1261.4	1291.0	1320.6	1350.2	1379.8	1409.4
		R _R	1200.4	1333.8	1369.4	1405.1	1440.7	1476.4	1512.0	1563.0	1614.0	1664.9	1715.9	1766.9
1600	CV	E	1381.5	1535.0	1576.6	1618.2	1659.8	1701.4	1743.0	1784.4	1825.8	1867.2	1908.6	1950.0
		R	1447.2	1608.0	1651.6	1695.2	1738.8	1782.4	1826.0	1888.0	1950.0	2012.0	2074.0	2136.0
	RPD	E _R	1478.2	1642.5	1687.0	1731.5	1776.0	1820.5	1865.0	1909.3	1953.6	1997.9	2042.2	2086.5
		R _R	1548.5	1720.6	1767.2	1813.9	1860.5	1907.2	1953.8	2020.2	2086.5	2152.8	2219.2	2285.5
1800	CV	E	1966.5	2185.0	2244.0	2303.0	2362.0	2421.0	2480.0	2539.0	2598.0	2657.0	2716.0	2775.0
		R	1835.1	2039.0	2094.0	2149.0	2204.0	2259.0	2314.0	2392.6	2471.2	2549.8	2628.4	2707.0
	RPD	E _R	2094.3	2327.0	2389.9	2452.7	2515.5	2578.4	2641.2	2704.0	2766.9	2829.7	2892.5	2955.4
		R _R	1954.4	2171.5	2230.1	2288.7	2347.3	2405.8	2464.4	2548.1	2631.8	2715.5	2799.2	2883.0
2000	CV	E	2700.0	3000.0	3080.0	3160.0	3240.0	3320.0	3400.0	3480.0	3560.0	3640.0	3720.0	3800.0
		R	2259.9	2511.0	2578.0	2645.0	2712.0	2779.0	2846.0	2941.8	3037.6	3133.4	3229.2	3325.0
	RPD	E _R	2862.0	3180.0	3264.8	3349.6	3434.4	3519.2	3604.0	3688.8	3773.6	3858.4	3943.2	4028.0
		R _R	2395.5	2661.7	2732.7	2803.7	2874.7	2945.7	3016.8	3118.3	3219.9	3321.4	3423.0	3524.5
2250	CV	E	3843.9	4271.0	4385.0	4499.0	4613.0	4727.0	4841.0	4955.0	5069.0	5183.0	5297.0	5411.0
		R	2871.9	3191.0	3276.0	3361.0	3446.0	3531.0	3616.0	3738.0	3860.0	3982.0	4104.0	4226.0
	RPD	E _R	4036.1	4484.6	4604.3	4724.0	4843.7	4963.4	5083.1	5202.8	5322.5	5442.2	5561.9	5681.6
		R _R	3015.5	3350.6	3439.8	3529.1	3618.3	3707.6	3796.8	3924.9	4053.0	4181.1	4309.2	4437.3
2500	CV	E	5273.5	5859.4	6015.6	6171.9	6328.1	6484.4	6640.6	6796.9	6953.2	7109.4	7265.7	7422.0
		R	3531.1	3923.4	4028.1	4132.8	4237.5	4342.2	4446.9	4596.6	4746.3	4895.9	5045.6	5195.3
	RPD	E _R	5537.1	6152.4	6316.4	6480.5	6644.5	6808.6	6972.6	7136.7	7300.8	7464.9	7629.0	7793.1
		R _R	3707.6	4119.6	4229.5	4339.4	4449.4	4559.3	4669.2	4826.4	4983.6	5140.7	5297.9	5455.1

^ Fender grades below F0.9 are available upon request.

[Units: kNm, kN]

*Note:

1. CV: slow speed constant velocity (2-8mm/s) compression.
2. RPD: Rated performance data, in accordance with PIANC with initial berthing velocity 150mm/s. RPD is corrected for decreasing velocity (DV) of compression of fenders by deceleration factors (0.74) (Please refer to fender design manual page 32).
3. RPD = CV (performance) * VF (velocity factor).
4. VF has been determined through experiments. Its value depends on strain rate (compression time) and nature of the rubber compounds (100% natural rubber, 100% synthetic rubber or blend).

Super Cone Fenders

PERFORMANCE DATA*

			F 2.1	F 2.2	F 2.3	F 2.4	F 2.5	F 2.6	F 2.7	F 2.8	F 2.9	F 3.0	F 3.1
1050	CV	E	565.0	580.0	595.0	610.0	625.0	640.0	655.0	670.0	685.0	700.0	770.0
		R	948.0	977.0	1006.0	1035.0	1064.0	1101.0	1138.0	1175.0	1212.0	1249.0	1374.0
	RPD	E _R	615.9	632.2	648.6	664.9	681.3	697.6	714.0	730.3	746.7	763.0	839.3
		R _R	1033.3	1064.9	1096.5	1128.2	1159.8	1200.1	1240.4	1280.8	1321.1	1361.4	1497.7
1100	CV	E	652.0	669.0	686.0	703.0	720.0	737.0	754.0	771.0	788.0	805.0	886.0
		R	1042.4	1073.8	1105.2	1136.6	1168.0	1208.2	1248.4	1288.6	1328.8	1369.0	1506.0
	RPD	E _R	710.7	729.2	747.7	766.3	784.8	803.3	821.9	840.4	858.9	877.5	965.7
		R _R	1136.2	1170.4	1204.7	1238.9	1273.1	1316.9	1360.8	1404.6	1448.4	1492.2	1641.5
1150	CV	E	742.2	762	781.7	801.5	821.3	841	860.8	880.6	900.4	920.1	1012.9
		R	1137.6	1172.3	1206.9	1241.6	1276.2	1320.9	1365.6	1410.3	1455	1499.7	1649.2
	RPD	E _R	809	830.5	852.1	873.6	895.2	916.7	938.3	959.8	981.4	1002.9	1104.1
		R _R	1240	1277.8	1315.5	1353.3	1391.1	1439.8	1488.5	1537.2	1586	1634.7	1797.6
1200	CV	E	847.0	869.0	891.0	913.0	935.0	957.0	979.0	1001.0	1023.0	1045.0	1150.0
		R	1243.2	1280.4	1317.6	1354.8	1392.0	1439.8	1487.6	1535.4	1583.2	1631.0	1794.0
	RPD	E _R	923.2	947.2	971.2	995.2	1019.2	1043.1	1067.1	1091.1	1115.1	1139.1	1253.5
		R _R	1355.1	1395.6	1436.2	1476.7	1517.3	1569.4	1621.5	1673.6	1725.7	1777.8	1955.5
1300	CV	E	1073.6	1102.2	1130.8	1159.4	1188.0	1216.4	1244.8	1273.2	1301.6	1330.0	1463.0
		R	1453.4	1497.8	1542.2	1586.6	1631.0	1688.0	1745.0	1802.0	1859.0	1916.0	2107.0
	RPD	E _R	1164.9	1195.9	1226.9	1257.9	1289.0	1319.8	1350.6	1381.4	1412.2	1443.1	1587.4
		R _R	1576.9	1625.1	1673.3	1721.5	1769.6	1831.5	1893.3	1955.2	2017.0	2078.9	2286.1
1400	CV	E	1340.6	1376.2	1411.8	1447.4	1483.0	1518.4	1553.8	1589.2	1624.6	1660.0	1826.0
		R	1687.4	1738.8	1790.2	1841.6	1893.0	1959.0	2025.0	2091.0	2157.0	2223.0	2445.0
	RPD	E _R	1447.8	1486.3	1524.7	1563.2	1601.6	1639.9	1678.1	1716.3	1754.6	1792.8	1972.1
		R _R	1822.4	1877.9	1933.4	1988.9	2044.4	2115.7	2187.0	2258.3	2329.6	2400.8	2640.6
1600	CV	E	2003.0	2056.0	2109.0	2162.0	2215.0	2268.0	2321.0	2374.0	2427.0	2480.0	2728.0
		R	2203.0	2270.0	2337.0	2404.0	2471.0	2557.0	2643.0	2729.0	2815.0	2901.0	3191.0
	RPD	E _R	2143.2	2199.9	2256.6	2313.3	2370.1	2426.8	2483.5	2540.2	2596.9	2653.6	2919.0
		R _R	2357.2	2428.9	2500.6	2572.3	2644.0	2736.0	2828.0	2920.0	3012.1	3104.1	3414.4
1800	CV	E	2850.6	2926.2	3001.8	3077.4	3153.0	3228.4	3303.8	3379.2	3454.6	3530.0	3883.0
		R	2792.0	2877.0	2962.0	3047.0	3132.0	3241.0	3350.0	3459.0	3568.0	3677.0	4045.0
	RPD	E _R	3035.9	3116.4	3196.9	3277.4	3357.9	3438.2	3518.5	3598.8	3679.1	3759.5	4135.4
		R _R	2973.5	3064.0	3154.5	3245.1	3335.6	3451.7	3567.8	3683.8	3799.9	3916.0	4307.9
2000	CV	E	3904.0	4008.0	4112.0	4216.0	4320.0	4424.0	4528.0	4632.0	4736.0	4840.0	5324.0
		R	3430.0	3535.0	3640.0	3745.0	3850.0	3984.6	4119.2	4253.8	4388.4	4523.0	4975.0
	RPD	E _R	4138.2	4248.5	4358.7	4469.0	4579.2	4689.4	4799.7	4909.9	5020.2	5130.4	5643.4
		R _R	3635.8	3747.1	3858.4	3969.7	4081.0	4223.7	4366.4	4509.0	4651.7	4794.4	5273.5
2250	CV	E	5559.0	5707.0	5855.0	6003.0	6151.0	6299.0	6447.0	6595.0	6743.0	6891.0	7580.0
		R	4359.4	4492.8	4626.2	4759.6	4893.0	5064.0	5235.0	5406.0	5577.0	5748.0	6323.0
	RPD	E _R	5837.0	5992.4	6147.8	6303.2	6458.6	6614.0	6769.4	6924.8	7080.2	7235.6	7959.0
		R _R	4577.4	4717.4	4857.5	4997.6	5137.7	5317.2	5496.8	5676.3	5855.9	6035.4	6639.2
2500	CV	E	7625.1	7828.2	8031.3	8234.4	8437.5	8640.6	8843.7	9046.8	9249.9	9453.0	10398.0
		R	5359.4	5523.4	5687.5	5851.5	6015.6	6225.9	6436.2	6646.4	6856.7	7067.0	7773.4
	RPD	E _R	8006.4	8219.6	8432.9	8646.1	8859.4	9072.6	9285.9	9499.1	9712.4	9925.7	10917.9
		R _R	5627.3	5799.6	5971.9	6144.1	6316.4	6537.2	6758.0	6978.8	7199.6	7420.4	8162.1

[Units: kNm, kN]

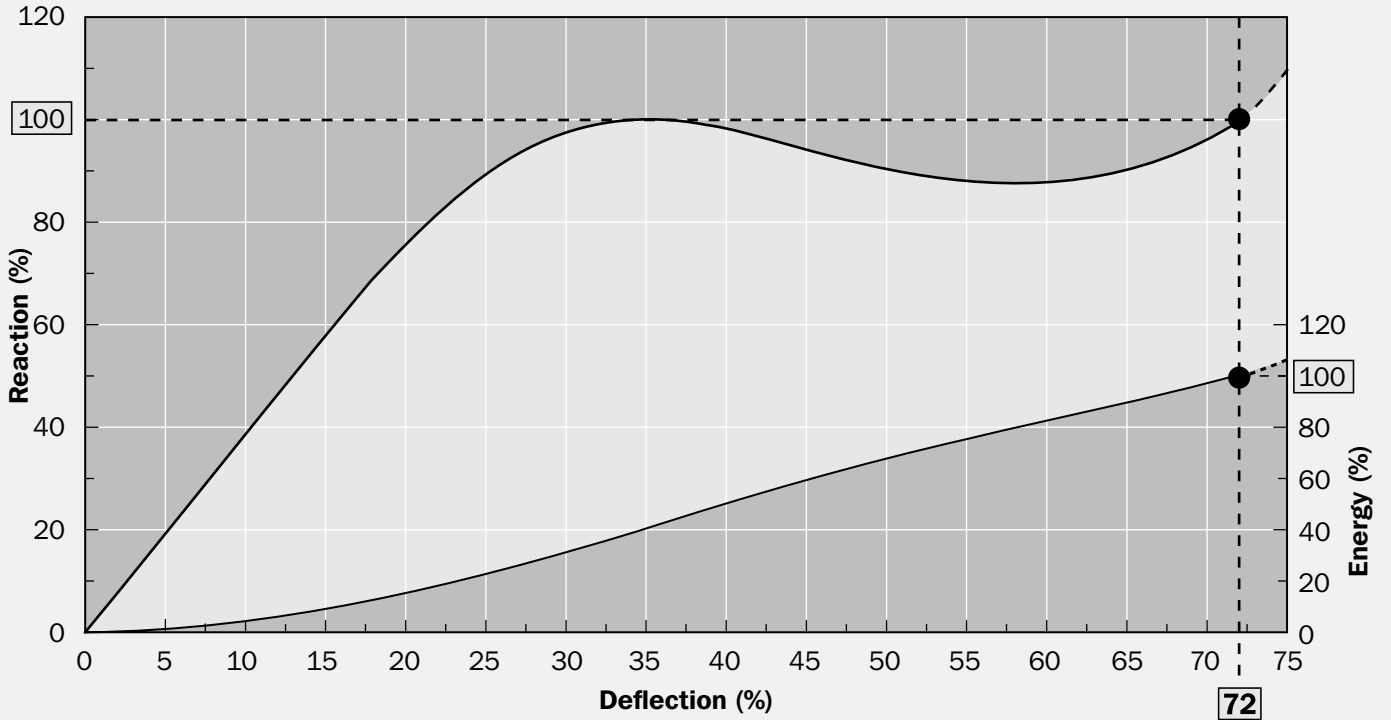
- For other initial berthing velocities, VF should be calculated separately (Refer to fender design manual).
- Performance for RPD is based on a rubber compound with a blend of NR and SBR. 100% Natural rubber compound (Refer to Appendix A) and 100% Synthetic rubber compound are available on request. Please contact TMS office.
- In case of fenders are tested in decreasing velocity (DV) mode, RPD = DV (performance).
- Fender performance is subject to ±10% manufacturing tolerance (+10% for reaction force and -10% for energy).
- RPD is reported at 23°C ± 5°C temperature and 0° compression angle.

Super Cone Fenders

INTERMEDIATE DEFLECTIONS

D_i (%)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	72	75
E_i (%)	0	1	4	8	15	22	31	40	50	59	67	75	82	89	96	100	106
R_i (%)	0	20	39	58	76	90	98	100	98	94	90	88	88	90	96	100	110

Nominal rated deflection may vary at RPD. Refer to the Performance Tolerances table in the Fender Application Design Manual.

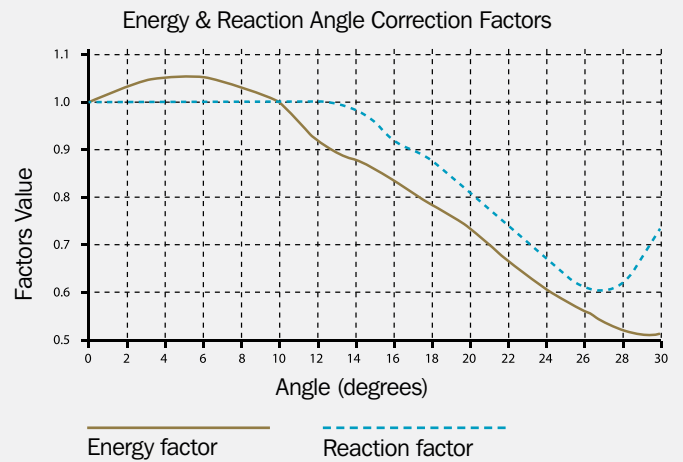


Generic curve shown. Actual curve geometry may vary depending on grade, temperature, velocity and angle.

ANGLE FACTOR (AF) TABLE

ANGLE (°)	ENERGY FACTOR	REACTION FACTOR
0	1.000	1.000
3	1.039	1.000
5	1.055	1.000
8	1.029	1.000
10	1.000	1.000
15	0.856	0.950
20	0.739	0.800

The graph shows fender performance with no chain restraints up to 12 degrees and chain restraints for angles above 12 degrees. Fender is fitted with a standard frontal frame.



Super Cone Fenders

VELOCITY FACTOR (VF) TABLE

COMPRESSION TIME (SECONDS)	BLEND OF NATURAL AND SYNTHETIC RUBBER (CATALOG COMPOUND)	100% NATURAL RUBBER (REFER TO APPENDIX A)	100% SYNTHETIC RUBBER (SBR)
	VF	VF	VF
1	1.20	1.14	1.31
2	1.16	1.10	1.25
3	1.14	1.09	1.22
4	1.13	1.07	1.20
5	1.11	1.06	1.19
6	1.10	1.06	1.17
7	1.09	1.05	1.16
8	1.09	1.04	1.15
9	1.08	1.04	1.14
10	1.07	1.03	1.14
11	1.07	1.03	1.13
12	1.06	1.02	1.12
13	1.06	1.02	1.12
14	1.05	1.02	1.11
15	1.05	1.01	1.11
16	1.05	1.01	1.10
17	1.04	1.01	1.10
18	1.04	1.01	1.09
19	1.04	1.00	1.09
20	1.03	1.00	1.08

Compression time needs to be calculated using the following formula: $t = d/(f \cdot Vd)$

Where:

t = compression time (seconds)*

d = rated deflection (mm)

Vd = initial berthing velocity (mm/s)

f = 0.74 deceleration factor (Peak reaction force occurs at between 30% - 40% deflection, where there has been a deceleration due to energy absorption. f represents the factor associated with deceleration.)

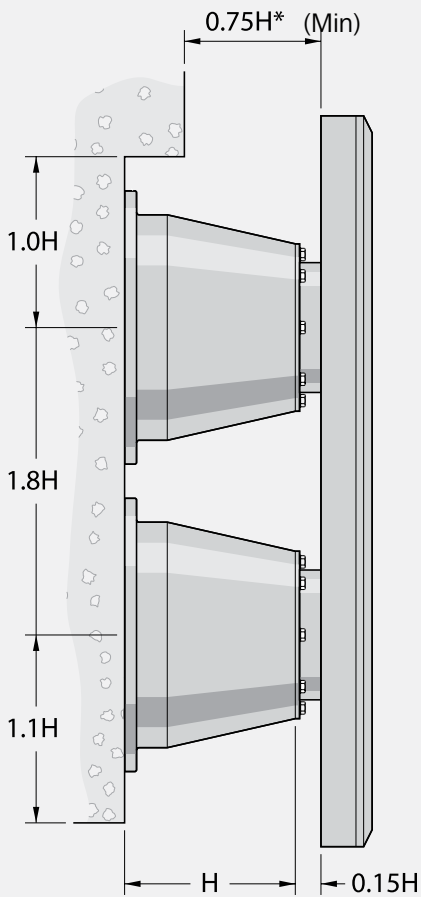
* Applicable for both partial deflection and rated deflection.

TEMPERATURE FACTOR (TF) TABLE

TEMPERATURE (°C)	BLEND OF NATURAL AND SYNTHETIC RUBBER (CATALOG COMPOUND)	100% NATURAL RUBBER (REFER TO APPENDIX A)	100% SYNTHETIC RUBBER (SBR)
	TF	TF	TF
+50	0.916	0.914	0.918
+40	0.947	0.946	0.948
+30	0.978	0.978	0.979
+23	1.000	1.000	1.000
+10	1.030	1.025	1.038
+0	1.075	1.053	1.108
-10	1.130	1.080	1.206
-20	1.249	1.142	1.410
-30	1.540	1.315	1.877

Super Cone Fenders

CLEARANCES



There must be enough space around and between super cone fenders and the steel panel to allow them to deflect without interference.

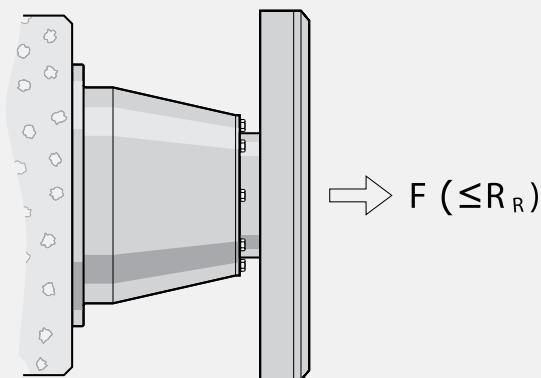
Distances given in the above diagram are for guidance. Please enquire if in doubt.

*Does not allow for bow flares

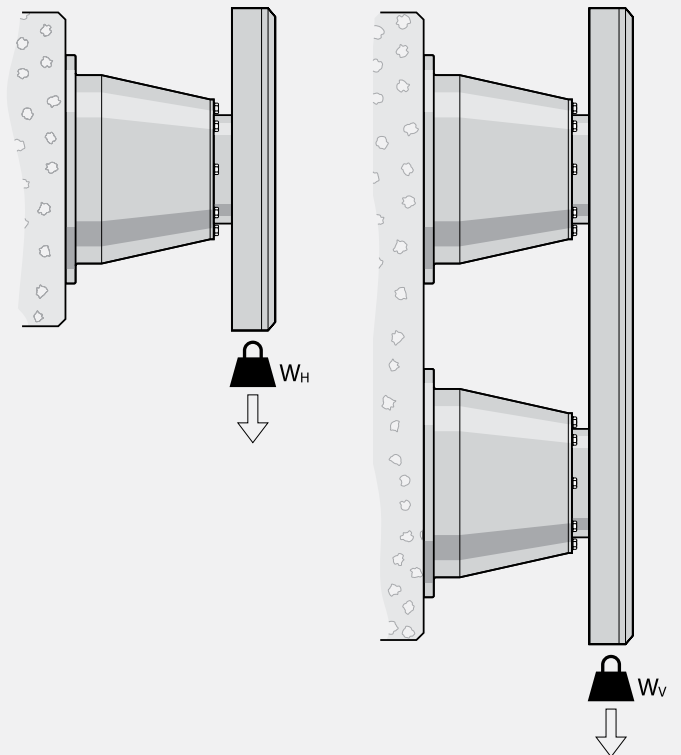
TENSION

If the tensile load exceeds the rated reaction then tension chains may be required.

Please ask for advice on the design of tension chains.



WEIGHT SUPPORT



Super cone fenders can support a lot of static weight. The table is a guide to the permitted weight of front panel before additional support chains may be required.

SCN	PANEL WEIGHT (kg)	
	SINGLE OR MULTIPLE HORIZONTAL (n ≥ 1)	MULTIPLE VERTICAL (n ≥ 2)
F1	$W_H \leq n \times 1.0 \times W$	$W_V \leq n \times 1.25 \times W$
F2	$W_H \leq n \times 1.3 \times W$	$W_V \leq n \times 1.625 \times W$
F3	$W_H \leq n \times 1.5 \times W$	$W_V \leq n \times 1.875 \times W$

n = Number of super cones.
 W = Super cone weight
 W_H = Panel weight (single or multi-horizontal)
 W_V = Panel weight (single or multi-vertical)

Interpolate for other grades.

Refer to your local office when Super Cone direction is reversed.

1. PHILIPPINES

2. ITALY

3. SINGAPORE

4. USA

5. GHANA

6. SWEDEN

7. UNITED KINGDOM

8. QATAR

