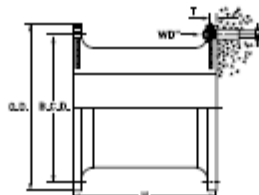
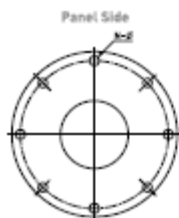
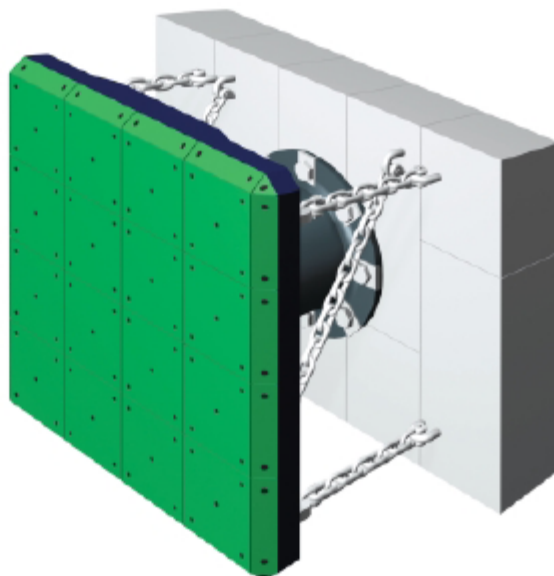


Super Spool Fender

Super spool fender has been improved over the ordinary spool fender at the buckling point and in the shape of the edge of the leg. Its wider dispersion of stress has been corroborated by the FEM (finite element method).

The wider dispersion of stress makes it possible to increase the design deflection from 45% to 52.5%, resulting in superior performance of the super spool fender, as well as being durable.

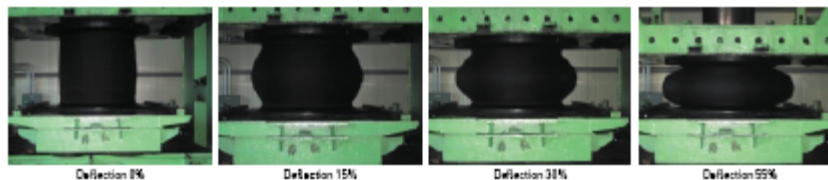


Super Spool Fender Dimension

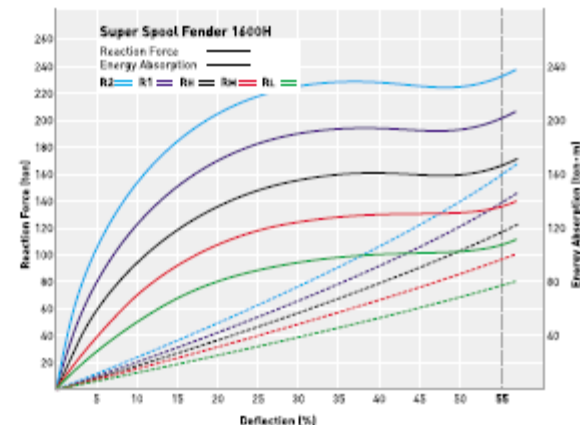
Dimension	WD*	O.D.	P.C.D.	N ^o ∅	N ^o ∅ (Slot Hole)	T
500H	1	650	550	4-32	4-32 >40	25
630H	1 1/8	640	700	4-39	4-39 >49	25
650H	1 1/8	670	730	4-39	4-39 >49	25
800H	1 1/4	1050	900	6-40	6-40 >50	30
1000H	1 1/2	1300	1100	6-47	6-47 >58	35
1150H	1 3/4	1500	1300	6-50	6-50 >65	37
1200H	1 3/4	1550	1350	6-53	6-53 >65	40
1250H	1 3/4	1650	1450	6-53	6-53 >65	40
1400H	2	1800	1600	6-60	6-60 >75	42
1450H	2	1850	1650	6-60	6-60 >75	42
1600H	2	2000	1800	8-60	8-60 >75	45
1700H	2 1/4	2100	1900	8-66	8-66 >80	50
2000H	2 1/2	2200	2000	8-74	8-74 >95	50
2250H	2 1/2	2550	2300	10-74	10-74 >95	57

WD: Anchor Size See Page 61

Super Spool Fender Compression Test



Performance Curve

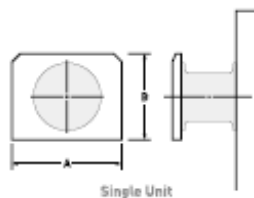


Super Spool Fender Performance Table

Size	500H	630H	650H	800H	1000H	1150H	1200H	1250H	1400H	1450H	1600H	1700H	2000H	2250H
R2	R Flonl	22.9	36.3	38.7	58.6	91.8	121.3	131.9	143.1	179.5	192.6	236.6	264.6	463.6
	E A (ton-m)	4.9	9.7	10.7	20.0	39.1	59.5	67.4	76.5	107.4	119.3	160.3	192.2	445.7
R1	R Flonl	20	31.8	33.8	51.3	80.1	105.8	115.3	125.1	157.0	168.4	205.0	231.5	405.5
	E A (ton-m)	4.1	8.2	9.0	16.8	32.8	50.2	56.8	64.1	90.1	100.0	136.5	161.3	374.0
RH	R Flonl	16.5	26.2	27.9	42.3	66.1	87.3	95.2	108.3	129.6	139.0	169.2	191.1	336.7
	E A (ton-m)	3.5	6.9	7.6	14.2	27.7	42.6	47.9	54.1	76.1	84.5	113.5	136.1	315.7
RM	R Flonl	13.5	21.4	22.8	34.5	54.0	71.6	77.6	84.2	105.6	113.3	138.0	155.7	272.8
	E A (ton-m)	2.9	5.8	6.3	11.8	23.0	35.0	39.7	45.0	63.2	70.2	94.3	113.1	262.2
RL	R Flonl	10.6	17.1	18.2	27.6	43.2	57.1	62.0	67.3	84.4	90.64	110.6	124.5	218.1
	E A (ton-m)	2.3	4.4	5.0	9.4	18.4	28.0	31.7	36	50.5	56.16	75.4	90.68	209.6

*R: F: Reaction Force (ton) *E: A: Energy Absorption (ton-m) *Tolerance: +10% *Deflection: 55%

Morse Rubber



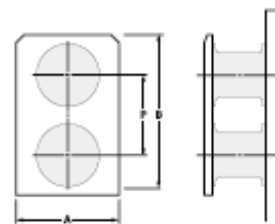
Single Unit

Rubber Grade		RH			RM			RL		
Surface Pressure (ton/m ²)										
Size		30	25	20	30	25	20	30	25	20
800H	Alm	1.30	1.40	1.60	1.20	1.30	1.40	1.10	1.20	1.25
	Blm	1.28	1.37	1.50	1.15	1.25	1.40	1.10	1.10	1.25
	P1m	1.60	1.70	1.90	1.45	1.60	1.75	1.35	1.40	1.55
1000H	Alm	1.55	1.70	1.85	1.40	1.50	1.70	1.35	1.35	1.50
	Blm	1.85	2.00	2.25	1.70	1.90	2.10	1.65	1.65	1.80
	P1m	1.85	2.00	2.20	1.70	1.90	2.00	1.60	1.65	1.80
1200H	Alm	2.15	2.35	2.40	2.00	2.15	2.45	1.90	1.90	2.10
	Blm	2.10	2.30	2.40	1.90	2.10	2.25	1.85	1.90	2.10
	P1m	2.45	2.65	2.95	2.20	2.40	2.70	2.05	2.15	2.40
1400H	Alm	2.40	2.60	2.90	2.20	2.40	2.65	2.05	2.10	2.35
	Blm	3.00	3.30	3.70	2.70	2.95	3.30	2.40	2.60	2.90
	P1m	2.95	3.20	3.60	2.70	2.90	3.25	2.40	2.60	2.90
1600H	Alm	3.35	3.65	4.10	3.00	3.30	3.70	2.70	2.90	3.25
	Blm	3.30	3.60	4.05	3.00	3.25	3.60	2.60	2.90	3.20
	P1m									

Two Units (horizontally)

Rubber Grade		RH			RM			RL		
Surface Pressure (ton/m ²)										
Size		30	25	20	30	25	20	30	25	20
800H	Alm	2.30	2.60	2.60	2.29	2.60	2.60	2.25	2.25	2.60
	Blm	1.45	1.45	1.75	1.15	1.15	1.15	1.15	1.15	1.15
	P1m	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
1000H	Alm	2.90	3.20	3.50	2.90	3.20	3.20	2.90	2.85	3.20
	Blm	1.75	1.75	2.00	1.40	1.40	1.75	1.30	1.40	1.40
	P1m	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
1200H	Alm	3.80	4.10	4.70	3.55	3.80	4.10	3.55	3.55	3.80
	Blm	2.00	2.00	2.35	1.75	1.75	2.05	1.65	1.65	1.75
	P1m	1.90	1.90	2.00	1.90	1.90	1.90	1.90	1.90	1.90
1400H	Alm	4.10	4.70	4.70	4.10	4.60	4.70	4.10	4.10	4.60
	Blm	2.35	2.35	2.95	2.05	2.05	2.35	1.90	1.90	2.05
	P1m	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1600H	Alm	4.75	5.05	5.05	4.55	4.65	4.90	4.60	4.60	4.60
	Blm	2.35	2.65	3.25	2.05	2.40	2.75	2.00	2.00	2.35
	P1m	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
2000H	Alm	5.35	5.95	6.60	5.35	5.55	5.70	5.20	5.35	5.35
	Blm	3.30	3.60	3.90	2.65	3.00	3.60	2.60	2.65	3.00
	P1m	3.00	3.00	3.20	3.00	3.00	3.00	3.00	3.00	3.00

*P: Spacing between fenders.



Two Units (vertically)

Rubber Grade		RH			RM			RL		
Surface Pressure (ton/m ²)										
Size		30	25	20	30	25	20	30	25	20
800H	Alm	1.40	1.65	1.65	1.35	1.40	1.40	1.10	1.10	1.40
	Blm	2.35	2.35	3.00	2.25	2.35	2.65	2.23	2.20	2.60
	P1m	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
1000H	Alm	1.65	1.65	2.00	1.40	1.65	1.65	1.40	1.40	1.40
	Blm	3.00	3.40	3.40	3.00	3.00	3.30	2.85	2.85	3.00
	P1m	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
1200H	Alm	1.95	2.25	2.55	1.70	1.95	2.85	1.65	1.65	2.00
	Blm	3.90	3.90	4.20	3.65	3.60	3.85	3.55	3.60	3.60
	P1m	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
1400H	Alm	2.25	2.60	2.90	2.00	2.00	2.30	1.85	2.00	2.00
	Blm	4.20	4.50	4.80	4.20	4.50	4.80	4.15	4.15	4.50
	P1m	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1600H	Alm	2.30	2.90	3.20	2.10	2.30	2.60	2.10	2.10	2.25
	Blm	5.15	4.80	5.40	4.50	4.90	5.10	4.50	4.50	4.80
	P1m	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
2000H	Alm	3.20	3.50	4.10	2.60	3.20	3.60	2.30	2.60	2.90
	Blm	5.75	6.00	6.30	5.45	5.45	5.80	5.15	5.40	5.70
	P1m	3.00	3.00	3.00	3.00	3.00	3.00	2.90	3.00	3.00

*P: Spacing between fenders.

Three Units

Rubber Grade		RH			RM			RL		
Surface Pressure (ton/m ²)										
Size		30	25	20	30	25	20	30	25	20
800H	Alm	3.35	3.50	3.80	3.35	3.50	3.50	3.35	3.35	3.50
	Blm	1.45	1.45	1.75	1.15	1.15	1.45	1.15	1.15	1.15
	P1m	1.15	1.15	1.20	1.15	1.15	1.15	1.15	1.15	1.15
1000H	Alm	4.70	4.70	5.05	4.30	4.50	4.50	4.35	4.35	4.40
	Blm	1.65	1.75	2.05	1.45	1.45	1.80	1.30	1.45	1.45
	P1m	1.50	1.50	1.40	1.50	1.50	1.50	1.50	1.50	1.50
1200H	Alm	6.20	6.20	6.20	5.65	5.65	5.95	5.65	5.65	5.65
	Blm	1.75	2.05	2.65	1.65	1.75	2.05	1.65	1.75	1.75
	P1m	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90

*P: Spacing between fenders.

Four Units (two horizontally, two vertically)

Rubber Grade		RH			RM			RL		
Surface Pressure (ton/m ²)										
Size		30	25	20	30	25	20	30	25	20
800H	Alm	2.60	2.60	2.90	2.30	2.30	2.60	2.30	2.30	2.30
	Blm	2.40	2.70	3.00	2.25	2.35	2.65	2.25	2.25	2.35
	P1m	1.15	1.15	1.20	1.15	1.15	1.15	1.15	1.15	1.15
1000H	Alm	1.15	1.15	1.20	1.15	1.15	1.15	1.15	1.15	1.15
	Blm	3.20	3.50	3.80	2.90	2.90	3.20	2.85	2.85	2.90
	P1m	3.00	3.30	3.40	2.60	3.00	3.30	2.85	2.85	3.00
1200H	Alm	1.50	1.60	1.60	1.50	1.50	1.50	1.50	1.50	1.50
	Blm	1.50	1.60	1.60	1.50	1.50	1.50	1.50	1.50	1.50
	P1m	3.80	4.10	4.70	3.55	3.80	4.10	3.55	3.55	3.80
1400H	Alm	3.90	4.20	4.50	3.60	3.60	3.90	3.55	3.55	3.60
	Blm	1.90	1.90	2.00	1.90	1.90	1.90	1.90	1.90	1.90
	P1m	1.90	1.90	2.00	1.90	1.90	1.90	1.90	1.90	1.90
1600H	Alm	4.60	4.70	5.35	4.10	4.10	4.70	4.10	4.10	4.10
	Blm	4.20	4.60	5.10	4.10	4.20	4.50	4.10	4.10	4.20
	P1m	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1800H	Alm	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
	Blm									
	P1m									

*P1, P2: Spacing between fenders.

