

# technix

rubber and plastics ltd

**marine**



**fendering**  
systems



**solutions for all  
your fendering  
needs**



Certificate number 1569/97

a company with experience and expertise  
locally, nationally and internationally  
**freephone 0800 216633**

## Solving Problems and Setting Standards



Technix are one of the UK's leading manufacturers of rubber products for the marine industry. Over 30 years experience in this worldwide market has enabled us to produce the widest range of hollow and solid extruded products, designed and developed exclusively to match the most demanding sea-going and shore-based requirements. Today our range covers every requirement from 22mm light craft fendering to heavy duty 1500mm diameter cylindrical fenders to provide impact protection for quay walls.

This diversity, plus our acknowledged reputation for quality and consistency, means Technix products are now in demand throughout the world for all sectors of the marine industry; from tugs and workboats, to the largest port and quay installations, including marinas, pontoons and lock gates.



Technix offer a complete service, including in-house design and tooling to enable us to produce to customer requirements. Technix are a fully accredited ISO 9002 EN company and are Approved Suppliers to many leading marine companies throughout the world.

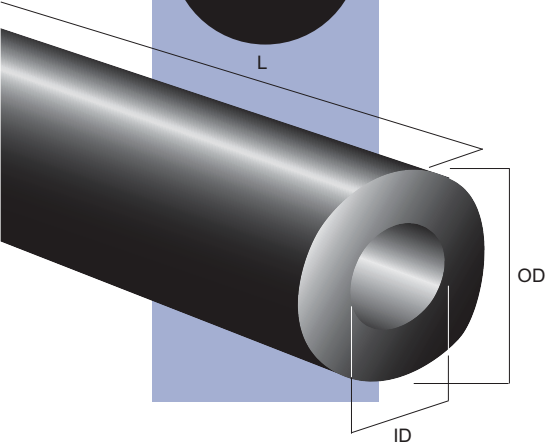


# Quay Fenders

## Hollow Cylindrical



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Technix produce Hollow Cylindrical (HC) Fenders for use on quays, docks, wharfs etc. and due to the vast range of sizes available and the various installation methods they are able to withstand impact from most vessel types. Technix Fenders are produced by the extrusion process and the wrapping method. They can be suspended horizontally, vertically or diagonally, dependent on the application requirements and can be pre-formed and cut to the length required. We can also provide recommendations and quotations for the fixing equipment.

Technix HC Fenders are in use around the world.

Size of Fender		Max Length (L) metres	Weight kg/m	Performance Data per m		Chain Specification Dia
OD mm	ID mm			EkNm	RkN	
90	35	10	6	0.6	41	10mm
100	50	10	7	0.9	45	10mm
125	65	10	11	1.3	54	12mm
150	75	10	16	2.0	66	12mm
200	90	6	27	3.3	83	16mm
200	100	6	29	3.4	88	16mm
250	125	6	43	5.2	110	19mm
305	152	6	43	8.0	135	22mm
400	200	6	112	14	177	25mm
450	225	5	141	17	199	28mm
500	250	5	176	22	221	32mm
600	300	5	253	31	265	35mm
800	400	3	441	55	354	38mm
1000	500	2	701	86	442	Depends on application
1200	600	2	992	124	530	
1400	700	2	1350	169	619	
1500	750	2	1550	194	663	



A shipment ready for despatch



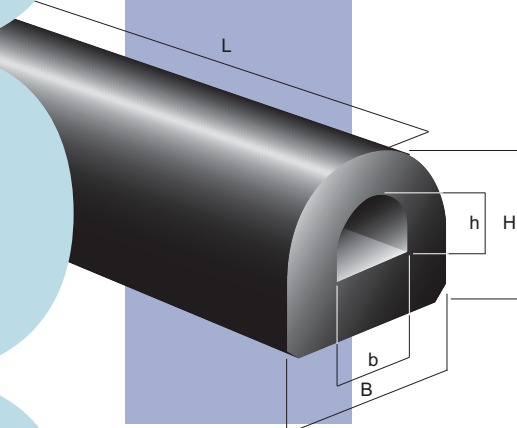
HC Fenders providing proven protection for quay walls

# D-Type Fenders

D Profile  
D Bore



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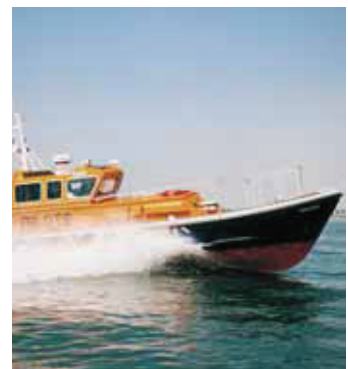
Technix manufacture a range of D-Fenders to meet a wide variety of port installation requirements and they can be produced in continuous lengths of up to 10 metres by our extrusion process. D-Fenders provide an excellent barrier against damage from all sizes and shapes of vessels. Fenders can be pre-curved, chamfered and drilled to aid installation at a relatively low cost and can also be cut to the length required. These fenders can be installed either into a channel or bolted directly to the quay wall. Technix will be pleased to provide competitive quotations for fixing bolts and bars etc, and can also recommend the most suitable fixing method.

Technix D-Fenders are specified for installation in many parts of the world.

Ref	Size of Fender		Bore Size Base (b) x Height (h) mm x mm	Max Length (L) metres	Weight kg/m	Hole Centres mm	Bolt Size
	Base (B) mm	Height (H) mm					
K33	100	95	50 x 40	10	7.4	200-300	M16
M21	152	152	76 x 76	10	18	200-300	M16
M22/1	203	152	100 x 76	6	25.2	300-400	M20
M22/2	254	203	125 x 100	6	37.6	400-500	M24
M23/1	254	127	125 x 63	6	26.3	400-500	M24
M23/2	305	127	152 x 63	6	31.3	400-500	M30
M23/3	305	152	152 x 76	6	32.4	400-500	M30
M25	200	200	100 x 100	6	33.8	300-400	M20
M25/25	250	250	125 x 125	6	51.1	400-500	M24
M30/25	300	250	150 x 125	6	60.8	400-500	M30
M30	300	300	150 x 150	6	74.7	400-500	M30
M35	350	350	175 x 175	4	101.6	500-600	M36
M40	400	400	200 x 200	4	132.8	500-600	M36

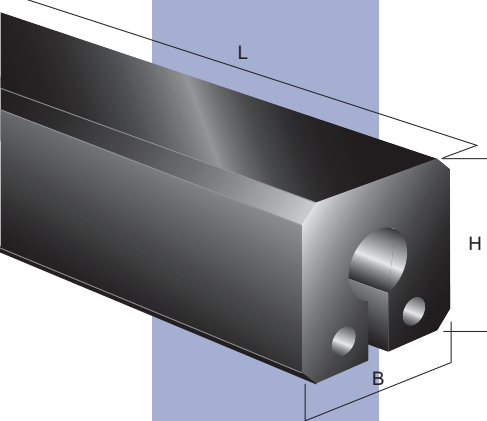
All Technix Rubber D-Fenders are also available in solid section

1" equals 25.4 mm



# Tug Fenders

## Keyhole



Technix produce Keyhole Fenders for use on all types of tugs and workboats and they are designed specifically to combat the rigours of today's tough marine environment. Fenders can be supplied cut and angled to suit the vessel hull and provide maximum protection for the bow area. Keyhole Fenders are normally installed using the bolt on method.

Technix Keyhole Fenders protect many tug fleets currently in operation throughout the world.

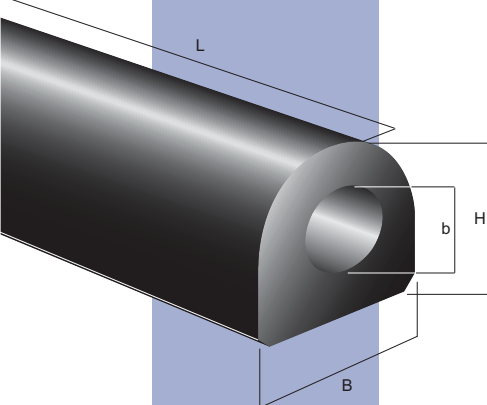
Ref	Size of Fender Base (B) mm	Height (H) mm	Max Length (L) metres	Min Length metres	Weight kg/m
K200/200	200	200	6	0.3	25
K250/250	250	250	6	0.3	56
K300/300	300	300	6	0.3	78
K350/350	350	350	4	0.3	116

Detailed dimension drawings are available on request

1" equals 25.4 mm



## D-Fenders Circ. Bore



Technix manufacture D-Fenders for all types of craft ranging from tug boats to life-boats and they are designed to absorb the energy from impact with the quayside or from other vessels. D-Fenders can be predrilled, chamfered and extruded to lengths of up to 10 metres to suit the vessel. These fenders are usually installed in a channel similarly to Quay D-Fenders.

Size of Fender Base (B) mm	Height (H) mm	Bore Size (b) mm	Max Length (L) metres	Weight kg/m	Hole Centres mm	Bolt Size
100	100	50	10	8.7	200-300	M16
150	150	75	10	19.6	250-350	M16
200	200	100	6	34.8	250-350	M20
250	250	125	6	54.8	300-400	M24
300	300	150	6	78.4	300-400	M30
350	350	175	4	106.6	400-500	M36
400	400	200	4	139	400-500	M36

Detailed dimension drawings are available on request

1" equals 25.4 mm

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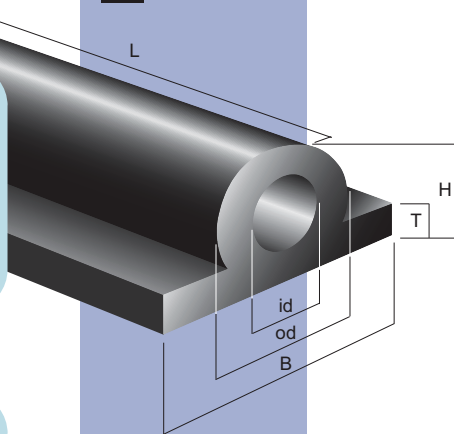
For further information call the Technix Helplines:

Tel: +44 (0) 1489 789944 Fax: +44 (0) 1489 798866

Web: [www.technix-rubber.com](http://www.technix-rubber.com)

# Tug Fenders cont.

## Wing Fenders



Base (B) Ref	Size of Fender		Base (T) mm	Max Length (L) metres
	Outer dia (od) mm	Inner dia (id) mm		
180	100	50	25	10
245	150	75	30	6
320	200	100	40	6
410	250	125	50	4

Detailed dimension drawings are available on request

1" equals 25.4 mm

Technix manufacture Wing Fenders which are mounted onto the sides of ship's belting to protect it from impact damage when in contact with other craft and the quayside.

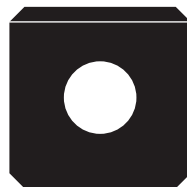


# Techlene Fenders

## Techlene Type 5



## Techlene Square Type 15



## Techlene Keyhole Type 8

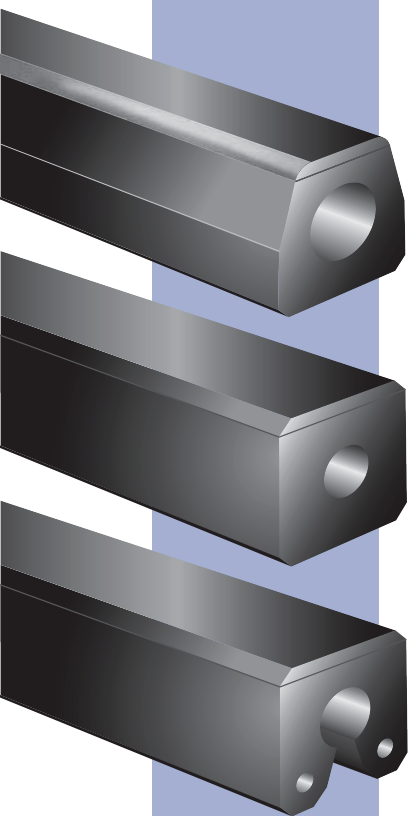


In these fenders the essential qualities of rubber - namely, elasticity and the ability to act as a shock absorber - are combined with the high durability and low friction coefficient of polyethylene.

In a mould a molecular bond between the rubber and the top layer of UHMW Polyethylene is brought about under conditions of high temperature. The cohesion values thus attained are at least equal to 10 N/mm ISO 813. The polyethylene top layer reduces friction by approximately a factor of 9, and thereby reduces the frictional force between one ship and another and between ship and construction. Thus both are provided with extra protection in the case of collision or tearing under the impact of waves.

Techlene fenders are often used on:

- service and supply ships, pilot boats;
- quays, locks and sheet piling



### Technix Type 5

dimensions 80 x 80 mm, with hole Ø 42 mm  
 dimensions 100 x 100 mm, with hole Ø 45 mm  
 dimensions 120 x 120 mm, with hole Ø 62 mm  
 dimensions 150 x 150 mm, with hole Ø 73 mm

### Technix Square Type 15

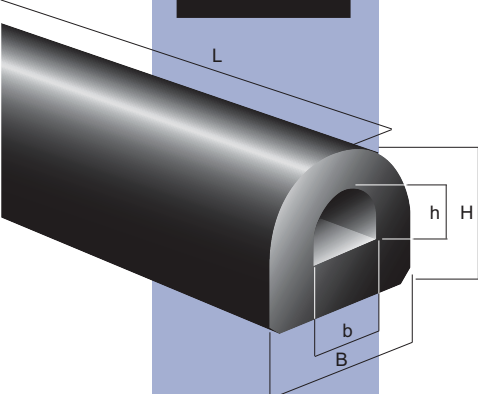
dimensions 200 x 200 mm, with hole Ø 75 mm  
 dimensions 250 x 250 mm, with hole Ø 100 mm  
 dimensions 304 x 304 mm, with hole Ø 125 mm  
 dimensions 350 x 350 mm, with hole Ø 120 mm

### Technix Keyhole Type 8

dimensions 200 x 200 mm, holes Ø 25 mm pitch 130 mm  
 dimensions 250 x 250 mm, holes Ø 25 mm pitch 150 mm  
 dimensions 304 x 304 mm, holes Ø 33 mm pitch 184 mm  
 dimensions 350 x 350 mm, holes Ø 33 mm pitch 210 mm

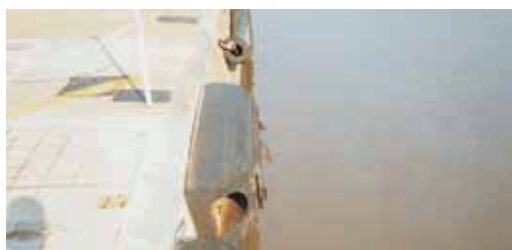
## Other Marine Fenders

### Small D Fenders



Technix manufacture a vast range of solid and hollow marine fenders suitable for all applications both on all types of vessels and the quayside. A selection of these are detailed below.

Ref	Size of Fender		Bore size base (b) x height (h) metres	Max Length (L) metres	Weight kg/m
	Base (B) mm	Height (H) mm			
M12/1	24	16	16 x 10	10	0.3
M12/2	32	24	24 x 11	10	1.1
M12/3	48	32	29 x 16	10	1.5
M12/4	64	41	38 x 19	10	2.7
M7060	70	60	42 x 40	10	2.5
M8065	80	65	42 x 40	10	2.7
M4	114	95	57 x 51	10	7.2



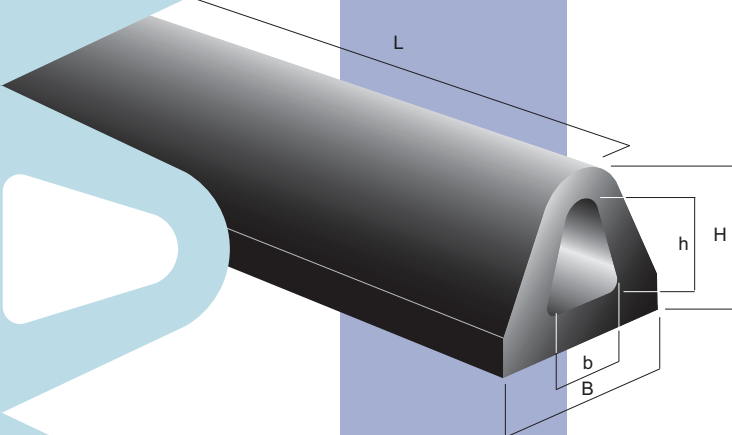
7 For further information call the Technix Helplines:  
 Tel: +44 (0) 1489 789944 Fax: +44 (0) 1489 798866  
 Web: [www.technix-rubber.com](http://www.technix-rubber.com)

# Other Marine Fenders

## Delta D Section



L



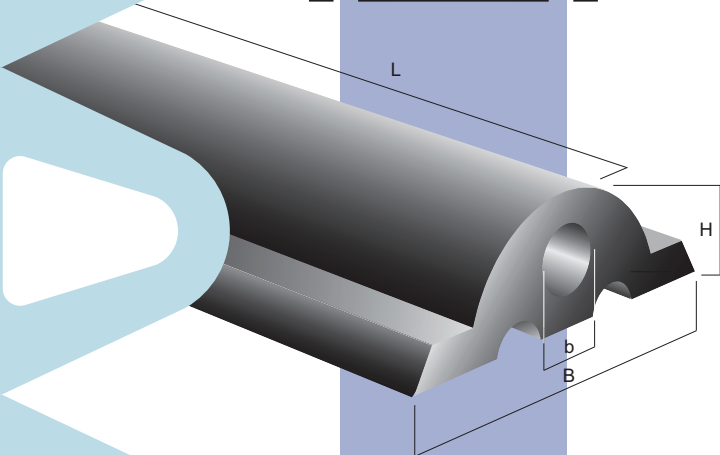
Ref	Size of Fender Base (B) mm	Height (H) mm	Bore size base (b) x height (h) metres	Max Length (L) metres	Weight kg/m
D40	40	22	20 x 12	10	0.6
D60	60	52	30 x 30	10	2.0
D80	80	70	40 x 40	10	3.5
D110	110	95	55 x 55	10	6.6
D150	150	130	75 x 75	10	12.3



## M7, M8, M9, M10 D Fenders



L

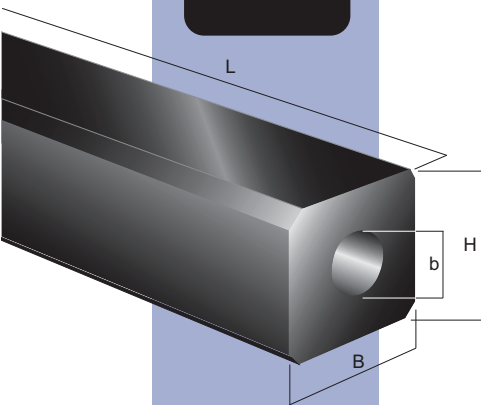


Ref	Size of Fender Base (B) mm	Height (H) mm	Bore size base (b) x height (h) metres	Max Length (L) metres	Weight kg
M7	162	54	29 dia	10	4.8
M8	229	83	35 dia	10	13.0
M9	203	114	79 x 54	10	12.9
M10	159	57	83 x 25	10	5.5

We are unable to catalogue all the many different sections we produce. Separate data sheets are available on request detailing individual actual size fenders and extrusions. If you would like information on anything not featured in this catalogue, or for details of our bespoke and customised manufacturing service please contact our helpline.



**Solid and Hollow Square/Rectangular Fenders**



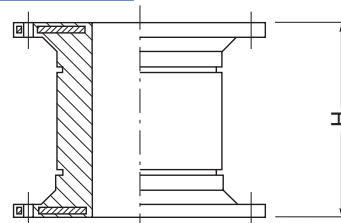
Base (B) mm	Size of Fender Height (H) mm	Bore (b) mm	Max Length (L) metres	Weight kg/m
102	51	25	10	5.9
102	102	50	10	10.6
127	127	50	10	17.7
152	25	12	10	4.6
152	102	50	10	16.9
152	127	50	10	21.7
152	152	76	10	23.2
203	152	76	6	32.6
203	203	76	6	45.8
229	102	50	6	26.7
229	152	76	6	37.8
250	152	76	6	41.8
250	203	76	6	57.8
250	250	102	6	67.9
300	250	102	6	83.5
300	300	130	6	95.9
350	350	175	4	123.1
400	400	200	4	160.7

Detailed dimension drawings are available on request

1" equals 25.4 mm

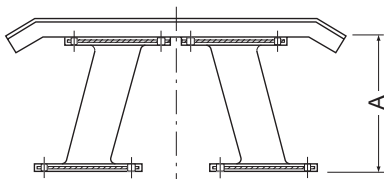
**"Cell" Fender**

**Dimensions Range:**  
H = 500mm - 2250mm



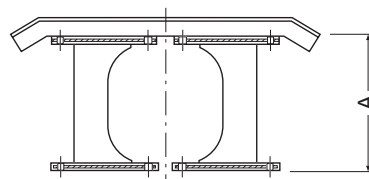
**"HPI" Fender**

**Dimensions Range:**  
A = 800mm - 1250mm



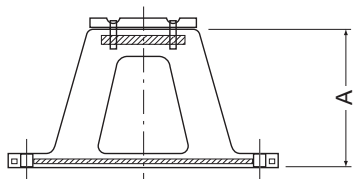
**"H" Fender**

**Dimensions Range:**  
A = 600mm - 2000mm



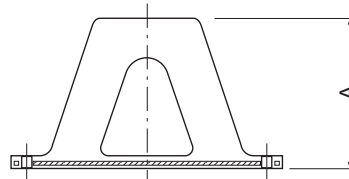
**"TTV" Fender**

**Dimensions Range:**  
A = 200mm - 1000mm



**"V" Fender**

**Dimensions Range:**  
A = 200mm - 1000mm



# Sliding Strips and Plates

## U.H.M.W. Polyethylene for Harbour and Marine Construction

**Fenderings (docks and ships), jetties, buffers, pontoons, locks, piles, bumpers and gates**



As ever increasing environmental concern surrounds the use of hardwoods in marine construction, Technix have introduced the perfect alternative; Techplas. This versatile material offers superior performance and is suitable for use in a variety of applications, including Quay Constructions, Pier Heads, Ro Ro Berths, Pontoons, Locks, Piles, River Laybys, Sluice Gates and Floating Gates. Techplas is ideally suited as a protective cover for Steel, Concrete and Wood Constructions.

Manufactured in large press moulded sheets, which are cut to size and machined to customers own requirements, the Techplas range is available from 6mm to 140mm thick standard 2, 3 & 4 metre lengths cut to any required width.

In marine situations worldwide **Ultra High Molecular Weight Polyethylene** will provide

tough cost-effective alternatives to traditional materials.

**Nil Absorption** - Repels sea water, acid, alkali and electrolytic-attack resistance and completely non-polluting.

**Low Friction Co-efficient** - Low friction co-efficient gives excellent sliding properties, vital in protecting dock structures and ship paint work during vessel to quay contact.

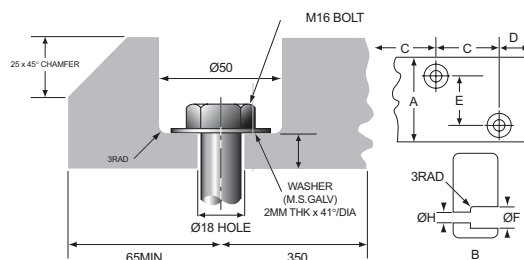
**Total Resistance to Marine Animals and Vegetation** - Will not support growth or organisms, is impervious to fungal attack and remains clean and unobstructed in all conditions.

**Hard-wearing** - Will not fracture or delaminate under load - very high impact and bending strength.

**Weather Resistance** - Operates without loss of efficiency in a broad temperature range from -150°C to +100°C. Is stabilised for ultraviolet and resistant to sunlight attack. Will not crack or break in Arctic conditions.

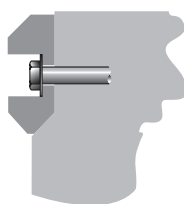
**Noise Reduction** - Is a completely inert, dead material, significantly reducing noise particularly on metal to metal contact.

**Simple Fitting** - Can be cut, drilled and chamfered on standard wood machining equipment. Can also be re-faced, fitted to flat or curved surfaces and supplied in one piece to any length with the option of pre-drilled fixing holes.



### Jetty Top Edging Strip

M12 Standard Anchor with set bolt and special 41 O/D washer



A	B	C	D	E	F	G	H	Bolt	Washer
125	55	350	125	30	50	15	14	12	41 O/D
260	55	350	125	125	50	15	18	16	41 O/D
300	70	450	125	150	50	25	18	16	41 O/D

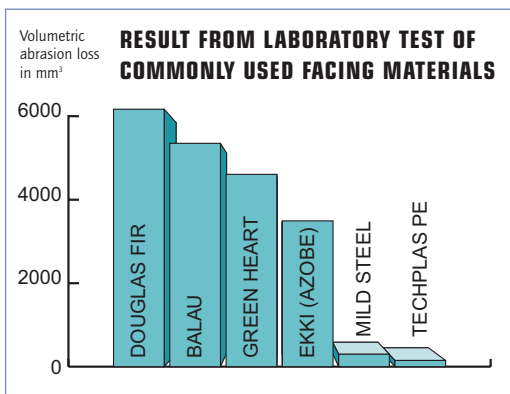
## Co-efficient of Friction

UHMW Polymer has self-lubricating and high-slip properties, making it ideal for inshore applications as it protects dock structures and paint work during ship quay contacts, for wear strips, side plates, bearing and brushing - all areas where sliding contact is encountered.

Material	Static	Kinetic	Test Method
Mild Steel vs. Mild Steel	.30-40	.25-35	ASTM
Mild Steel vs. Techplas	.15-20	.12-20	D 1894
Techplas vs. Techplas	.20-30	.20-30	

## Comparison of Dynamic Co-efficient of Friction on Polished Steel

Property	Techplas	Nylon 616	Nylon 6	PTFE	Derlin	Nylatron GS
Dry	.10-.22	.15-.40	.15-.40	0.4-.25	.15-.35	.12-.20
Water	.05-.10	.14-.19	.14-.19	0.4-0.8	.10-.20	.10-.12
Oil	.05-.08	.02-.11	.02-.11	0.4-0.5	.05-.10	.08-.10



## Sand Slurry Abrasion Tests\*

Material	Specific Gravity (g.cm <sup>3</sup> )	Relative Volumetric Abrasion
Acetal	1.42	700
Beechwood	0.83	2700
Carbon steel	7.45	160
Epoxy resin	1.53	3400
TECHPLAS	0.94	100
TECHPLAS antistatic sheet	1.02	150
Low density polyethylene	0.92	600
Phenolic resin	1.40	2500
Plexiglass	1.31	1800
Polypropylene	0.90	660
Polyvinyl chloride (PVC)	1.33	920
PTFE	2.26	530
PTFE (25% Glass Fibre)	2.55	570

This table gives an indication of the abrasion resistance of Techplas polymer.

A value of a 100 was designated for the amount of volumetric abrasion lost of the Techplas specimen. The value shown for the other materials are those of volumetric loss compared to Techplas. The higher the figure the more abrasion loss.

### \* Conditions of Sand Slurry Test:

**Slurry:** 2 parts water 3 parts sand (0.2mm to 1.0mm, 0.008" to 0.04")

**Test specimen:** 1" x 3" x ¼"

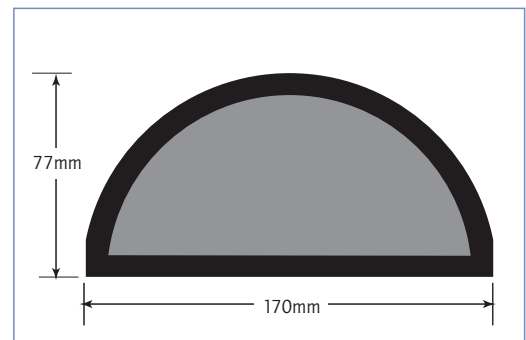
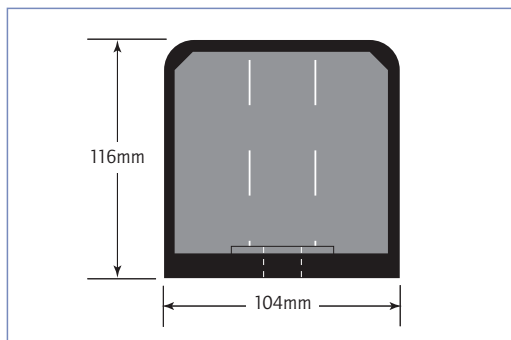
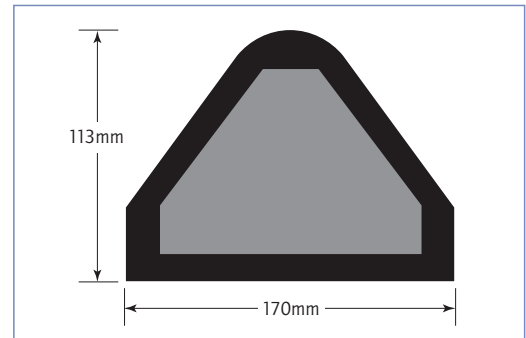
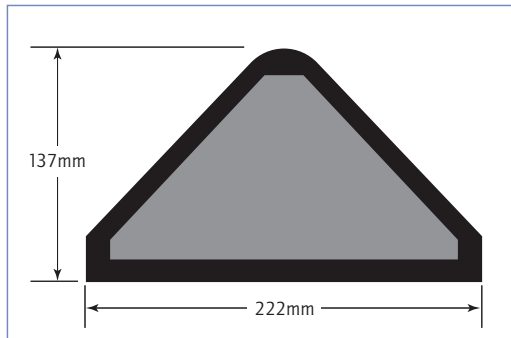
**Rotational speed of test specimen:** 1200rpm

**Test period:** 24 hours Temperature of apparatus increases to 120°F

# Cast PU D-Fendering Foam Filled Core

## for Dock Quays and Commercial Vessels

Technix PU/Foam Fendering is manufactured from a core of closed cell Resilient Polyethylene Foam which is covered with a Tough Abrasive Resistant Flexible Polyurethane Elastomer Skin. We can also spray any foam profile eliminating tooling costs. Below a small selection of profiles available.

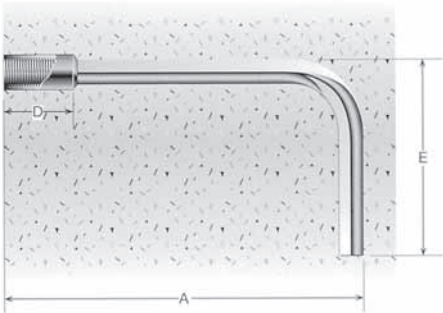


- High resistance to abrasion
- High resistance to cutting
- Excellent wear characteristics
- Good impact resistance
- Range of densities for core for degree of energy absorption to be varied
- Lightweight
- Easily fitted - can be bonded with suitable adhesive
- Closed cell foam buoyancy will remain intact if punctured or even damaged
- Any shape or sized manufactured to suit individual requirements
- Different colours for high visibility operations
- Non-marking



# Concrete Anchor System

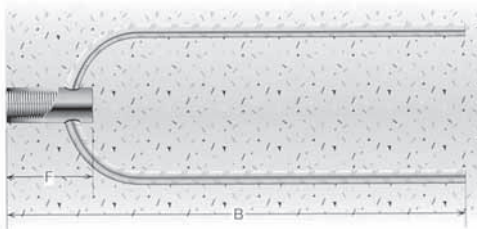
## Type NC 1



Every system is only as effective as its weakest point. We therefore ensure that anchorage details are satisfactory in meeting operational requirements whether this be for sliding fender or large fender systems.

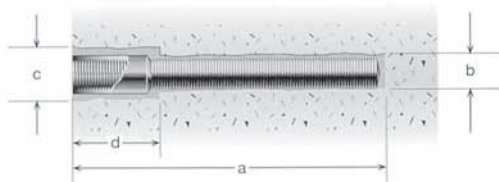
The embedded anchor forms a permanent part of the wharf structure and therefore anchors are offered with a hot dipped galvanised finish or manufactured from stainless steel.

## Type NC 2



We recommend for new installations that cast-in ferrule system be utilised (i.e. types NC 1, NC 2). This system provides protection against physical damage to the anchor that may occur with the use of stud style systems.

## Type EC 1



For installations where the fender is required to be attached to an existing concrete structure we are able to provide very effective and easy to use epoxy resin anchoring systems which are also suitable for underwater installation.

Alternatively a cementitious grout system for the more difficult to install larger sizes is available.

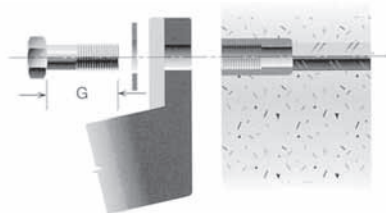
## Type EC 2



### Some of the fixing/mounting methods used:

Technix has both the expertise and the equipment to supply customised products, which means that considerable savings can be made in terms of the total installation costs. Examples include the drilling of fixing holes, the radial prebending of fenders, the chamfering of fenders, the manufacturing of linking and connecting pieces and the delivery of connection plugs.

## Typical Fixing Detail



# Concrete Anchor System

NC1 NC2	Thread Size						
	M20	M24	M30	M36	M42	M48	M56
A*	325	385	525	600	600	600	700
B	500	500	600				
F	68	77	96				
D	75	85	105	125	150	160	180
E	220	270	350	400	400	400	400
G	60	75	90	100	125	130	165

Other dimensions are possible to suit site conditions.

\*Dimension A based on 20MPa concrete and may be reduced for higher strength concrete.

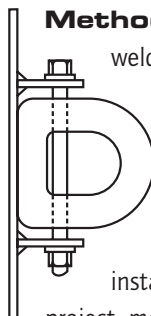
EC1 EC2	Thread Size						
	M20	M24	M30	M36	M42	M48	M56
a	300	350	350	600	750	950	1000
b	30	35	40	44	48	55	65
c	32	40	45	55	70	85	100
d	75	85	105	125	150	160	180
e	45	60	80	90	100	120	170
G	60	75	90	100	125	130	165

Other dimensions are possible to suit site conditions.

## Fender Fixing Instructions

### D Shaped Fenders

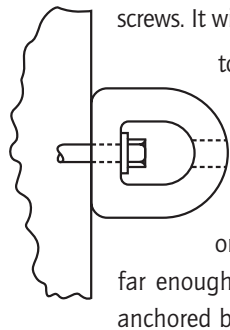
**Method A** - Metal bars should be fillet welded to form angle pieces to hull on each side of fender, as shown. The distance between the bars should be 12.5mm or more greater than the nominal base dimension of the fender to be installed. The metal bars should not project more than half the nominal fender projection dimension from the hull.



Drill through metal and fender so that the bolt shank will lie above the base of the fender as shown. A steel strip may be placed in the bore of the fender to lie underneath the bolt shank.

Galvanised or non-ferrous components should be used.

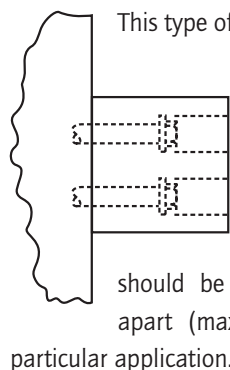
**Method B** - A flat metal strip as wide as possible is inserted through the bore of the fender. Drill through fender and metal strip at 18" centres (maximum) for bolts, and 12" centres (maximum) for



screws. It will be necessary to enlarge the top hole to allow the bolt head to pass through it. Metal strips should not terminate at the end on one fender but should extend far enough into the next fender to be anchored by at least one bolt.

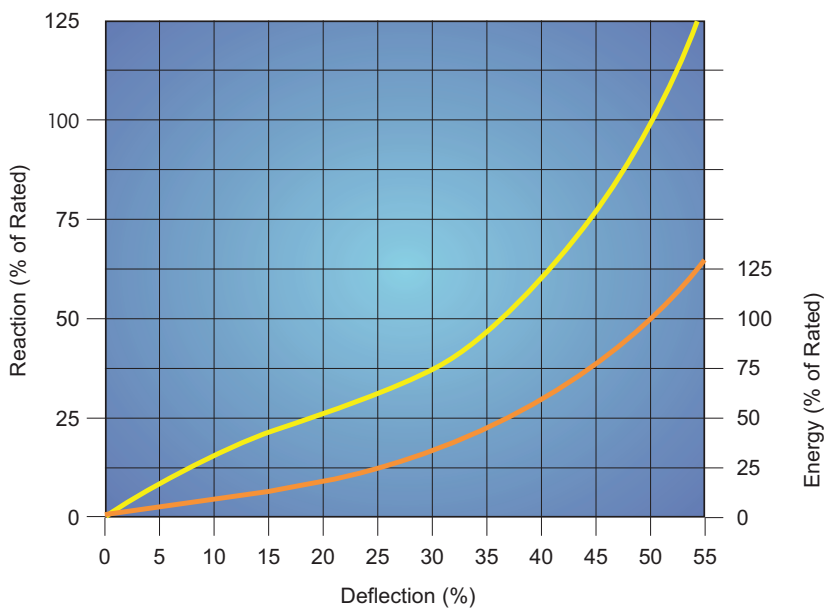
Galvanised or non-ferrous components should be used.

### Solid Rectangular Fenders



This type of fender may be secured as in Method 'A' above or, alternatively, they may be drilled at regular intervals and countersunk to approximately half their depth as shown. The holes should be staggered and up to 18" apart (maximum) depending on the particular application.

# Technical Information



Reaction and energy is expressed as a percentage of the performance values quoted on page 3 of the catalogue. For example, a 1000mm OD x 500mm ID x 1500mm long would have the following performance from the table:

### At rated deflection of 50%

Rated Deflection 50% of 1000mm = 500mm  
 Rated Reaction 1.5m x 442kN per metre 663kN  
 Rated Energy = 1.5m x 86kNm per metre 129kNm

### At a deflection of 30%

Rated Deflection = 30% of 1000mm = 300mm  
 Rated Reaction = 38% of 663kN = 252kN  
 Rated Energy = 34% of 129kNm = 44kNm

## Rubber Specification

Test	Test Method	Limits
Tensile	BS 903 A2	1.6 kg/mm <sup>2</sup> minimum
Elongation	BS 903 A2	300% minimum
Hardness	BS°	65° - 75°C
Heat ageing	7 days at 70°C a) Tensile retention b) Elongation retention c) Hardness change	90% minimum 80% minimum +7° BS maximum
Compression set	BS 903 A6A 22 hours at 70°C	30% maximum
Tear resistance	BS 903 A3	5.36 kg std. 2mm sample minimum
Material	SBR/natural rubber	

**Styrene Butadiene/natural rubber blend. Filled with carbon black. The material has resistance to ultra violet light, ageing, sea water, fatigue and abrasion. The rubber is of uniform quality and free from foreign substances.**

Other materials also available: EPDM/NEOPRENE/NITRILE. We can supply coloured materials on request.

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