Manuplas®
Marine Products for Ports & Harbours
Buoys, floats and vessel fendering systems
Manuplas®

Better products for challenging situations

For further information about the Manuplas® range of products, please visit www.advancedinsulation.com

Marine

Renewables
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<th>Section</th>
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<td>What can Marine Products Protect?</td>
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<td>30</td>
<td>Global Presence</td>
</tr>
</tbody>
</table>
Advanced Insulation’s Manuplas® division has been a global supplier of buoys, floats and vessel fendering systems to docks, ports and harbours for over 25 years.

Port and harbour facilities and the vessels either accessing or mooring within them need protecting from dangers such as tides, currents, swells, banks, traffic and changes in water depth.

To assist harbour masters to operate in these demanding conditions, Manuplas® provide a range of high performance, low maintenance floats and buoys which are practically unsinkable.

Manuplas® also provide a range of vessel fendering systems, suitable for protecting the hulls and bows of pilot boats, patrol boats, lifeboats, search and rescue vessels, military vessels and workboats operating in and around ports and harbours.
Manuplas®
Sprayed Vessel Fendering

Manuplas® lightweight, durable and low maintenance vessel fenders for ports and harbours

Resilient construction, bespoke design:
+ High performance physically cross-linked polyethylene foam core
+ The foam core is coated with spray applied, unique protective marine grade polyurethane elastomer coating, providing a non-marking finish
+ Flexibility on shape, size and technical specification enables Manuplas® to find a tailored solution for each vessel without investing in mould tooling

Applications include:
+ Pilot and Patrol Boats
+ SAR Vessels
+ Lifeboats
+ Military Boats

<table>
<thead>
<tr>
<th>Highly Impact Absorbent</th>
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<tbody>
<tr>
<td>And abrasion resistant</td>
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<thead>
<tr>
<th>Up to 60% Lighter</th>
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<tr>
<td>Compared to rubber fenders</td>
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<thead>
<tr>
<th>Modular Sections</th>
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<tbody>
<tr>
<td>Quick and easy to replace</td>
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</table>

Find out more about Manuplas® at: www.advancedinsulation.com
Manuplas®
Sprayed Vessel Fender Project

Strategic Marine - Search and Rescue Vessel

Manuplas® supplied a five piece, sprayed bow fender system to Vietnam based Strategic Marine, for the use of their 40m ‘Red Gannet’ SAR Vessel.

The modular approach and design of Manuplas® fender systems offers flexibility on the shape, size and technical specification of fendering solutions. This enables the company to provide a solution for specific vessels without the need to invest in costly and time-consuming mould tooling. This meant that the Manuplas® team was able to provide a solution that could meet the criteria required by Strategic Marine and supply and deliver its solutions within four weeks, quicker than any of its competitors.

“Manuplas® have been with us every step of the way, from our initial point of contact, through to ensuring rapid supply and delivery of the fender sets. Their fendering systems offer the ultimate solution for the shipbuilder, owner and operator alike and because they provide a modular approach, their fenders are easy to install and replace as required”

Phat Luong Xuan, Project Manager at Strategic Marine.

Find out more about Manuplas® at: www.advancedinsulation.com
Manuplas®

Cast Vessel Fendering

High quality, smooth, consistent finish for maximum visual appeal

Highly durable construction:
+ In-house manufactured tooling enables tight quality controls and lead times
+ The fender construction comprises a high performance physically cross-linked polyethylene foam core and a cast applied polyurethane coating
+ Variable core densities to suit vessel usage or specific location
+ Male and female joint system supplied as standard
+ Custom moulded bow and corner sections
+ Easily bonded to the hull for quick installation
+ An extensive library of standard fender moulds is available

<table>
<thead>
<tr>
<th></th>
<th>Up to 1/3 Less Weight</th>
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<tbody>
<tr>
<td></td>
<td>Than rubber fenders</td>
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<table>
<thead>
<tr>
<th></th>
<th>Non-marking</th>
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<tbody>
<tr>
<td></td>
<td>A superior quality external finish</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Highly Impact Absorbent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>And abrasion resistant</td>
</tr>
</tbody>
</table>
# Manuplas® Standard Profile Data

**Manuplas®** have a wide range of standard fender profiles

<table>
<thead>
<tr>
<th>Profile Height (mm)</th>
<th>Profile Depth (mm)</th>
<th>Weight (kg/m)</th>
<th>Cast Fender Profile Ref</th>
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</thead>
<tbody>
<tr>
<td>51.4</td>
<td>25.7</td>
<td>1.2</td>
<td>CFT000001</td>
</tr>
<tr>
<td>100</td>
<td>45</td>
<td>2.7</td>
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<tr>
<td>120</td>
<td>60</td>
<td>3.9</td>
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</tr>
<tr>
<td>130</td>
<td>80</td>
<td>4.2</td>
<td>CFT000010</td>
</tr>
<tr>
<td>150</td>
<td>70</td>
<td>5.2</td>
<td>CFT000013</td>
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<tr>
<td>165</td>
<td>128</td>
<td>6.5</td>
<td>CFT000017</td>
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<td>195</td>
<td>100</td>
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<td>200</td>
<td>124</td>
<td>7.6</td>
<td>CFT000021</td>
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<td>200</td>
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<td>8.8</td>
<td>CFT000019</td>
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<tr>
<td>224</td>
<td>102</td>
<td>6.6</td>
<td>CFT000027</td>
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<tr>
<td>250</td>
<td>200</td>
<td>10.5</td>
<td>CFT000029</td>
</tr>
<tr>
<td>500</td>
<td>300</td>
<td>27.6</td>
<td>CFT000032</td>
</tr>
</tbody>
</table>

All fender weights calculated assuming straight fender sections. Custom bow or corner pieces will vary in weight depending on profile characteristics. All fender weights calculated using 33kg/m³ foam. Alternative foam densities are available. All fender weights calculated using 10mm (15mm*) skin thickness. Fendering can be supplied in lengths up to 3m. Custom profiles available on request. Standard foam density information: 25kg/m³ to 123kg/m³. PU thickness information: 8mm minimum no maximum. Table of cast fender profiles is based on our standard specifications and represents a small sample of sizes and specifications available.

To view the full range of standard cast fender profiles please visit www.advancedinsulation.com
Manuplas®

Cast Vessel Fender Projects

Briggs Marine - Pilot Boat

A complete Manuplas® cast fendering set was supplied to Briggs Marine for their Lochin 366 Pilot Boat based on the Rye, East Sussex.

The fendering set featured a lightweight non-abrasion resistant polyurethane elastomer skin.

High stress sections, such as the bow and aft corners were upgraded to a higher density foam core and thicker elastomer, with pre-curved sections for a better fit.

Safehaven Marine - Patrol Vessel

The Barracuda SV11 high speed interceptor and patrol vessel from Safehaven Marine was designed specifically for military and law enforcement roles. The Manuplas® fenders are manufactured from a lightweight polyethylene foam core and cast with a unique protective polyurethane coating. The Barracuda is capable of speeds of 35-40kts+ and this lightweight fender construction (less than one third of the weight of rubber fenders) helps to minimise the weight on the vessel. This ensures that its operations are carried out within very tight time constraints.

Find out more about Manuplas® at: www.advancedinsulation.com
Rubber D
Fendering

Impact resistant rubber fenders for application to vessels and harbour and dock walls

Manuplas® can supply a wide range of rubber fender types including hollow D fenders, solid D fenders, cylindrical fenders, square fenders, M fenders, keyhole fenders and composite fenders. Please see our popular ranges of solid D and hollow D fenders below:

**Solid Rubber D Fenders**

**Double Rubber D Fenders:**
Hollow Rubber D Fenders:

Suit Your Bespoke Requirements
Supplied to your size and specifications

Durable Impact Resistant Rubber
Suitable for a range of marine applications

Large Catalogue of Profiles
The majority of profiles are available off the shelf

All rubber fenders are available in a choice of lengths and standard profiles to meet your requirements. The standard colour supplied is black.

Find out more about Manuplas® at: www.advancedinsulation.com
**Manuplas®**

**Foam Filled Floating Fenders**

Enable safe berthing, protecting port and harbour facilities as well as vessels moored or operating within them

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**Robust and reliable construction:**

- Physically cross-linked thermolaminated closed cell polyethylene foam core in a range of densities. Standard foam density 30-50kg/m³
- Unique spray applied ultra high performance polyurethane elastomer skin
- Rope through or chain through configuration available on selected sizes
- 22 diameter sizes available as standard
- Range of body lengths available
- Nylon reinforcing of the elastomer skin increases tear resistance and extends life of the fender in harsh marine environments
- Kevlar reinforcement is also available as an optional extra

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**Abrasion Resistant**

And non-marking skin

**Easy Installation**

And virtually maintenance free

**High Energy Absorption**

And low reaction forces

**Virtually Unsinkable**

Closed-cell foam remains buoyant even with no skin
Manuplas®
Floating Fender Performance Data

Manuplas® supply a large range of standard specification foam filled floating fenders

<table>
<thead>
<tr>
<th>Body Diameter (mm)</th>
<th>Body Length (mm)</th>
<th>Reaction Force @60% Compression (Kn)</th>
<th>% Compression (Kn)</th>
<th>Weight (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>1000</td>
<td>26.7</td>
<td>1.9</td>
<td>7.4</td>
</tr>
<tr>
<td>500</td>
<td>1000</td>
<td>74.2</td>
<td>8.7</td>
<td>15.4</td>
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<tr>
<td>600</td>
<td>1000</td>
<td>89.1</td>
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<td>700</td>
<td>1500</td>
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<td>65.7</td>
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<tr>
<td>900</td>
<td>1800</td>
<td>240.0</td>
<td>51.0</td>
<td>121.0</td>
</tr>
<tr>
<td>1000</td>
<td>2000</td>
<td>296.9</td>
<td>69.3</td>
<td>132.9</td>
</tr>
<tr>
<td>1200</td>
<td>2000</td>
<td>356.3</td>
<td>99.8</td>
<td>163.0</td>
</tr>
<tr>
<td>1500</td>
<td>3000</td>
<td>668.1</td>
<td>233.8</td>
<td>381.3</td>
</tr>
<tr>
<td>2000</td>
<td>4000</td>
<td>1187.7</td>
<td>554.2</td>
<td>1037.1</td>
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<tr>
<td>2500</td>
<td>5000</td>
<td>1856.0</td>
<td>1082.0</td>
<td>1746.8</td>
</tr>
<tr>
<td>3000</td>
<td>6000</td>
<td>2672.3</td>
<td>1870.6</td>
<td>2848.8</td>
</tr>
<tr>
<td>3300</td>
<td>6500</td>
<td>3184.5</td>
<td>2452.0</td>
<td>3309.7</td>
</tr>
</tbody>
</table>

The table of fender sizes is based on our standard specification and represents a small sample of sizes and specifications available. Standard foam density 30-35kg/m³. Note all values within this document may vary due to material property and dimensional tolerances and operational conditions.

Find out more about Manuplas® at: www.advancedinsulation.com
ABP Fender Project

Manuplas® foam-filled floating fenders with chain/tyre net

Associated British Ports (ABP), the owners of the Port of Southampton, specified Manuplas® Foam-Filled Fenders with Chain/Tyre Net.

Joe Atkinson, Engineering Technician at ABP, says: “The Port can be incredibly demanding and therefore the fendering needs to be resilient enough to cope with challenges of berthing large vessels safely.

With pneumatic fendering, there’s a risk, that if overloaded, the valve will fail, potentially causing damage to our ship to shore walkways. We therefore opted for foam fendering – but it needed to provide high energy absorption whilst being extremely durable.”

The Manuplas® fenders are constructed with a nylon reinforced polyurethane elastomer skin which provides increased tear resistance, extending the fenders life when operating in demanding conditions. Even if the skin is punctured, the fenders closed cell structure makes them practically unsinkable.

The fenders polyethylene foam core provides very high energy absorption and low reaction forces, making berthing safer and easier.

The chain/tyre net extends the fenders life further by providing additional protection from sharp objects and the absorption of excessive loads during berthing.

Joe Atkinson added: “The berth these fenders are situated on has a slight curvature to the quayside which could potentially be problematic when installing fixed fendering. However Manuplas’ solution presented no such problems and was simple to install”.

Manuplas® | Marine Products for Ports & Harbours
Manuplas®

Donut Fenders

Manuplas® foam-filled donut fenders are installed over monopiles to maximise protection and enhance visibility

Standard and custom sizes and specifications available.

Kevlar reinforcing of polyurethane elastomer skin to increase tear resistance.

Constructed with either a low friction polyethylene central tube or UHMW-PE wear pads.

Applications include:
+ Dock and port entrances
+ Bridge supports

<table>
<thead>
<tr>
<th>High Energy Absorption</th>
</tr>
</thead>
<tbody>
<tr>
<td>To protect the application and nearby vessels</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quick &amp; Easy Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>And low maintenance</td>
</tr>
</tbody>
</table>

Find out more about Manuplas® at: www.advancedinsulation.com
Manuplas®

Commercial Mooring Buoys

Manuplas® low maintenance mooring buoys are ideal for vessel applications in ports and harbours, and are used by the RNLI & MOD

Durable, long lasting construction:

+ Closed cell polyethylene foam core in a range of densities
+ Reinforced high performance polyurethane elastomer skin
+ Available with chain through, pad eye or handling crucifix configuration, non-slip deck, LED lantern and/or radar reflector

Manuplas® offer a range of different mooring buoys available as standard:

- Commercial Mooring Buoy
  - Chain Through
- Commercial Mooring Buoy
  - Pad Eye
- Barrel Buoy
  - Chain Through
- Barrel Buoy
  - Handling Crucifix
- Barrel Buoy
  - Modular

Find out more about Manuplas® at: www.advancedinsulation.com
Manuplas®

Chain Support Buoys

Manuplas® manufacture and supply resilient chain support buoys which can be used for a range of marine applications.

Manuplas® chain support buoys are manufactured from polyethylene foam and coated in a polyurethane elastomer skin. They are both impact and abrasion resistant.

Manuplas® offer a number of different chain support buoy options:

+ Swivel eyes top and bottom
+ Chain through arrangement
+ Pick-up buoys

**Applications include:**

+ Moorings
+ Markers
+ Pick-up operations
+ Pipe or chain systems

<table>
<thead>
<tr>
<th>Non-Marking</th>
<th>Bespoke Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-colour polyurethane elastomer skin</td>
<td>And a range of options are available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skin Reinforcement</th>
<th>Durable and Reliable</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Kevlar is available as optional</td>
<td>For optimum service life</td>
</tr>
</tbody>
</table>
Manuplas®

Navigation Buoys

Manuplas® has supplied IALA compliant navigation buoys for over 25 years

+ Available in a range of diameters for in-shore applications.
+ Constructed from a closed cell polyethylene foam core and a spray applied self-coloured UV stable polyurethane elastomer skin
+ Configured with self-contained LED lights, radar reflector and top mark assembly as required

**Navigation Hull diameters available:**

- 1250
- 1750 / 1800
- 2000
- 2000 / 2500
- 3000

**Lightweight & Modular**

Design for easy installation

**Low Maintenance**

And long lasting
Manuplas®

Marker Buoys

Manuplas® IALA compliant marker buoys are easy to install and are practically maintenance free

+ Available in 10 configurations as standard, ranging from 0.6m - 1.5m diameter
+ Marker buoys suited to operating in currents up to five knots can be supplied
+ The hull / daymark core construction is closed cell rigid expanded polystyrene or resilient thermolaminated polyethylene foam
+ The hull / daymark skin construction is a polyurethane elastomer skin as standard
+ Can be configured with either a pad eye or through hole for mooring
+ Can be fitted with lifting eyes for easy installation
+ All metal work hot dipped galvanised
+ Options available include: self contained LED lights, radar reflector and top mark

6 Knot Fast Water Buoys
Also available from Manuplas®
Manuplas® Spar Buoys

Manuplas® supply IALA compliant spar buoys

Manuplas® highly visual spar buoys are ideal for marking dangers, waterways and mooring fields.

Applications:
+ Ports and harbours
+ Channels / waterways
+ River waterways

Additional options available: self contained LED lights, radar reflector and/or top mark
Polyethylene foam core coated in a self-colour UV stabilised polyurethane elastomer skin
Stainless steel lifting eye
Stainless steel mooring eye for maximum stability and durability

Highly Impact Absorbent
And virtually unsinkable for high reliability

Lightweight
For easy installation and maintenance

Find out more about Manuplas® at: www.advancedinsulation.com
Manuplas®
Marine Product Applications

Manuplas® marine products are supplied to a broad range of customers across many industries

Manuplas® marine port and harbour products are used across the following customer groups:

+ Port Managers
+ Harbour Masters
+ Boat Builders
+ Boat Operators
+ Search & Rescue
+ The Military
+ Buoy Inspection & Maintenance Organisations

Marine | Renewables | Defence | Transport

Manuplas® | Marine Products for Ports & Harbours
Manuplas®

What can Marine Products Protect?

Manuplas® marine products can protect a range of vessels and infrastructure both inshore and offshore

+ The hulls and bows of commercial and leisure boats
+ Port, harbour, dock and marina facilities / infrastructure
+ Offshore facilities and infrastructure

Find out more about Manuplas® at: www.advancedinsulation.com
Advanced Insulation is a market-leading insulation provider with global reach

Advanced Insulation offers a fully comprehensive service for its Manuplas marine products which includes design, manufacture and technical support.

Requests for quotation and marketing enquiries should be submitted to: sales@manuplas.co.uk

With branches across the world, the company can offer organisations and businesses a comprehensive array of products including fendering systems, marine buoys, subsea buoyancy, cable protection systems, clamping solutions, insulation jackets, passive fire protection jackets, topside and subsea insulation, cryogenic spill protection, blast and fire walls.

A full technical support service is available for all products, at any location.
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