Manuplas®
Subsea Buoyancy & Moulded Products
Impact and abrasion protection for a range of applications across the subsea oil and gas, marine and renewables industries
Manuplas®

Better products for challenging situations

For further information about the Manuplas® range of products, please visit www.advancedinsulation.com
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Find out more about Manuplas® at: www.advancedinsulation.com
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Subsea Buoyancy & Moulded Products

Advanced Insulation’s Manuplas® division offer a range of market leading subsea buoyancy solutions alongside moulded polyurethane products which offer subsea impact and abrasion protection

Installation Buoyancy:
Manuplas® buoyancy products are used to assist offshore installation of pipelines and subsea equipment.

Comprising a low density foam core protected by a durable polyethylene shell, Manuplas® buoys are engineered and tested to withstand the harshest handling and hydrostatic operating conditions, whilst delivering the highest technical performance.

The product range includes:
+ General purpose installation buoys
+ Modular buoys
+ Pipe laying floats
+ Modsyn floats

Engineered Buoyancy:
Manuplas® supply buoyancy products designed to survive for the life of the field whilst delivering market leading technical performance. In floating production scenarios, buoyancy is used to configure subsea systems, mitigating unwanted loads and stresses. Products include:
+ Umbilical floats
+ ROV buoyancy
+ Distributed buoyancy

Total Solutions Provider
Manuplas® Buoyancy can be offered alongside ContraTherm® insulation

Water Depths >3000msw
Syntactic lightweight foam buoyancy materials
Manuplas®

Designed to Protect, Built to Last

Manuplas® buoyancy and protection products are manufactured with long lasting, durable and high performance materials

Cable & Pipeline Protection Products:

Manuplas® offer products to provide protection in the harshest operating environments for scenarios where impact, abrasion and over-bending would be catastrophic.

+ Manuplas’ modular interlocking tubular cable protection product is designed to protect cables or pipelines from abrasion and impact.

+ For more complex requirements, Advanced Insulation offer its C.Shield® Cable Protection System (CPS) where key components include a Bellmouth, Latch Assembly and J-Tube Connector, Hybrid Bend Limiter and Impact Protection.

Clamping Solutions:

Manuplas® supply clamping solutions which are adaptable to a wide range of carrier pipe applications:

+ Compliant clamps
+ Grommet clamps

In addition Advanced Insulation provide a C.Shield® Atlas Piggyback System (PBS)

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

Manuplas® subsea installation buoys are designed to provide a general purpose solution to subsea buoyancy

Overview:
The Manuplas® range of subsea installation buoys are available in standard sizes: 100kg, 250kg and 500kg with a choice of dimensions.

Features:
+ Ropes
+ Various through hole arrangements or pad eyes top and bottom
+ Rotary moulded polyethylene shell
+ Cast syntactic foam core with a specification to suit the water depth

Find out more about Manuplas® at: www.advancedinsulation.com
Manuplas® modular buoyancy is a customisable product providing support for mooring systems from surface to 3000msw

Overview:
Manuplas® supply modular buoyancy units in three industry standard sizes:

+ MINI - 1750mm x 1750mm Cross-Section
+ MID - 2350mm x 2350mm Cross-Section
+ MAX - 3000mm x 3000mm Cross-Section

Individual buoyancy elements or complete buoys including central structural steelwork assemblies are also available and can be supplied with a variety of handling options.

Applications:
+ Suspended mooring
+ Equipment installation
+ General offshore operations

Construction:
+ The flotation core component may be syntactic foam for deepwater deployment or more lightweight expanded polymer foams to maximise buoyancy yield in shallow waters
+ Cast with a robust impact resistant rotationally moulded external finish
**Features and Benefits:**

- Modular design, 1-40T of nett buoyancy
- MINI, MID and MAX industry standard sizes
- Compartmentalised design for greater protection
- Flat sides to facilitate stable storage and tight operational configurations
- Central structural steelwork
- Lightweight foam flotation cores

**MINI Modular Buoy**

**MID Modular Buoy**

**MAX Modular Buoy**

**Interlocking Design**
To eliminate rotation during operation

**Easily Adjustable**
To meet specific buoyancy requirement

**Easy to Repair**
Easy buoyancy element change-out if damaged

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

Manuplas® offer a number of pipe laying float solutions tailored to fit a customer’s specific requirements

Overview:
Pipe laying floats are used as temporary buoyancy modules strapped to a pipeline to reduce tension and weight in the pipeline during the installation process for surface or deepwater pipeline installation applications.

Configurations:
- Single piece unit configured with an open through hole or with a through chain and shackle to assist with handling operations
- Modular float consisting of multiple individual units secured together with a central through pipe complete with pad eyes each end

Features:
- Robust and impact resistant rotationally moulded external shell
- Lightweight foam flotation core
- Interlocking spigot and cuff options

Modular Design
Number of modules adjusted to suit project

Versatile Configuration
Accommodates all subsea pipeline diameters

Integral Strap Grooves
Easy access/quick release by divers & ROVs

Easy to Replace
Damaged modules at minimal cost

Manuplas® | Subsea Buoyancy & Moulded Products
Construction:
Modular Float configurations consist of multiple individual units secured together with a central through rigid bar complete with pad eyes each end.

PUSAD: Rotary Moulded Polyethylene (PE) Shell, Polyurethane (PU Foam Filled Core)
+ Cost effective
+ Modular configuration enabling adjustment to suit project
+ Easily replaceable if damaged
+ Shallow depths down to 250msw

SYNSAD: Rotary Moulded Polyethylene (PE) Shell, Syntactic Foam Core
+ High performance
+ Modular configuration enabling adjustment to suit project
+ Easily replaceable if damaged
+ Range of densities available to suit required depth rating
+ Deep water installation from 500msw – 3000msw

EPSAD: Closed Cell Expanded Polymer (EP) Saddles c/w PU Elastomer Sprayed Skin
+ Lightweight & consistent foam
+ Low water absorption
+ Sprayed with durable polyurethane elastomer skin – impact/abrasion resistant
+ Variety of lengths available to suit buoyancy needs
+ Density can be varied to suit the required depth rating

Single Piece Custom Floats
+ Depending on preferred handling methods, single piece units can be configured with an open through hole, a through chain and shackle assembly or a rigid central pipe with pad eyes each end.
+ In the event of a low volume or bespoke requirement alternative materials are available.
+ Cross-section dimensions sized to best suit shipping by container

Banding Options
Carbon Steel, Inconel Stainless Steel & SMART Bands
Manuplas®

Modsyn Subsurface Buoys

Manuplas® modsyn subsurface buoys provide a solution for subsea buoyancy where small amounts of tethered buoyancy are required.

Overview:
Modsyn buoys are available in three standard sizes with a range of depth ratings available from surface to 3000msw.

Modsysns can be configured with either a central through hole or with fixed eye top and bottom.

Construction:
+ Tough impact/abrasion resistant rotationally moulded polyethylene shell
+ High performance composite syntactic foam core
+ Internal through hole Ø40mm
+ Options: galvanised metalwork

Applications:
+ Umbilical and cable support
+ Installation aids
+ Trimming buoyancy

Features:
+ Durable high quality construction
+ Rotary moulded polyethylene skin formulated to provide UV resistance
+ Simple to attach through central hole using steelwork or ties
+ Colour coding available for depth identification
+ Optional in-moulded graphics
+ Recessed lifting slots for ease of use

Cost Effective Solution
For a wide variety of subsea operations

Implements Onboard Safety
Flat surface to assist stability & handling

£

Manuplas® | Subsea Buoyancy & Moulded Products
Find out more about Manuplas® at: www.advancedinsulation.com
Manuplas® Umbilical Floats

Manuplas® offer a two-piece wrap around flotation module for cables and control umbilicals

Manuplas® Umbilical Floats can be used in combination with ROVs to maintain the necessary length of umbilical buoyancy below the surface or general umbilical requirements for cable or hose buoyancy.

The floats are in two halves with an integral elastomer clamp assembly, configured to the outside diameter of the cable / umbilical with water depth ratings available from surface to 3000msw.

**Construction:**

The flotation core may be high performance syntactic foam for deepwater deployment or more lightweight expanded polymer foams to maximise buoyancy yield in shallower waters. The core may be cast with a rotationally moulded outer skin or a tough and durable sprayed elastomer.

**Features:**

- Two-piece purpose built flotation modules
- Strapping location grooves incorporated
- Polyurethane elastomer / steel clamp construction
- Optional customer graphics
- Axial load testing capability

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

Manuplas® offer a range of composite foam ROV buoyancy blocks for use in operating depths down to 6000msw. Available for Manned, Autonomous and Remote Operated Vehicles

Construction:

- PVC based copolymer foams are traditionally used for shallow water (<600msw) deployment, where as pure syntactic foams available in low density variants are used for depths down to 6000msw
- Composite syntactic foam core comprising injection moulded macrospheres encapsulated within a polyurethane based syntactic foam matrix
- The buoyancy blocks are laminated and then machined into customised complex shapes as required using in-house CNC machining facilities, enabling a fast turnaround from bespoke design to delivery.
- A light stable and wear resistant polyurethane based elastomer external coating is applied to the client colour and surface finish specifications.

+ Alternatively pure syntactic foam blocks can be manufactured using high strength thermosetting resin incorporating hollow glass microspheres

Features:

+ Lightweight Low Density and Ultra-low density syntactic foam cores provide exceptional buoyancy and enable reliable operational performance at deeper depths
+ High performance polyurethane elastomer coating and light stable topcoat

Bespoke Design & Build

To meet specific project requirements

In-House Tooling

CNC facility for tight controls of quality

Range of Options

Surface finishes and customer graphics
Find out more about Manuplas® at: www.advancedinsulation.com
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Distributed Buoyancy Modules

Manuplas® offers distributed buoyancy for reducing tension load on subsea risers and umbilicals

Overview:
Manuplas® manufacture buoyancy and ballast modules complete with appropriate clamping systems engineered to suit each riser scenario. These are known as Distributed Buoyancy Modules (DBMs).

In compliant riser systems, which utilise rigid or flexible lines, DBMs are employed to create an optimised configuration (e.g. Lazy or Steep wave) to relieve damaging tensions loads, enabling a long design life (25 years) despite arduous offshore conditions.

Clamping Technology:
Each module must be located using an internal clamp at specific points along the riser length with no risk of slippage throughout its operational lifetime.

On Steel Catenary Risers it is often possible to utilise large clamping loads without any detrimental effect to the riser itself, employing steel or other more exotic alloys. However this is not possible without insulated or multi-layered risers possessing a softer clamping surface. In such cases, traditional clamps can be too stiff to cope with geometric contractions and the riser maybe damaged by such attachment - Manuplas® compliant clamp technology mitigates this problem with an innovative interface.

Type Approval API17L1
Industry recognised type approval of DBM Clamp
The two main elements to a DBM:

1. **The Internal Clamp Assembly:**
   + Clamps can vary from integral rubber fingers, to polyurethane grommet clamps to the compliant clamp depending on loading requirements.
   + Rubber inserts form a friction grip against the flexible riser and increase surface contact between the rubber insert and flexible riser/umbilical.
   + Single, double and triple clamp fastener arrangement methods are available depending on load conditions with a single clamp capable of holding a 2000kg uplift DBM.

2. **External Buoyancy Element:**
   + The buoyancy unit core is designed to withstand the hydrostatic loads applicable at the specified water depth rating
   + Durable, long lasting polyethylene shell which is highly impact and abrasion resistant
   + High performance material which is resilient to seawater, UV exposures and fracture
   + Versatile configuration can accommodate all subsea riser and umbilical diameters
   + Can be designed with integral VIV strakes to provide a cost effective anti vibration solution.
   + Low maintenance design
   + Safe and simple installation and release
   + Long design life (25 years) in challenging offshore conditions
   + Customised specifications to suit customer’s unique application
   + Optional customer graphics

**Installation:**

For ease of installation, Manuplas® supply DBMs to site with all components of the clamp assembled, leaving the clamp in a hinge position with only one holding bolt remaining to completely fit the clamp onto the flexible riser.
Manuplas®

Grommet Clamps

Manuplas® offer a grommet clamp designed to provide improved containment and centralizing of umbilicals and pipelines and protect the rope or cable passed through it

Applications:
+ Offshore new pipeline installation
+ Offshore retro-fit pipelines, risers and jumpers
+ Offshore wind farm marine cabling

Features and Benefits:
+ Safe, simple and fast installation
+ Can be configured with multiple straps/bands for all performance requirements
+ Can be installed by subsea divers
+ Designed for project lifetimes

Construction:
+ The clamp is moulded from high performance marine grade cast polyurethane elastomer to allow sufficient grip during operation
+ Through bolt holes

One-Fit Solution
Single design for multiple project requirements

Cast Mould Manufacture
Ensure parts conform to tight geometric tolerances

Resilient Materials
Seawater, UV exposures and fracture
Manuplas®
Cable Protection

Manuplas® offer modular interlocking tubular cable protection designed to protect cables or pipelines from abrasion and impact.

Construction:
+ Interlocking modules moulded in high performance polyurethane elastomer
+ In-house CNC machining facility enables fast production of prototype and production tooling to reduce lead times
+ Integral strap grooves are incorporated to house all types of metallic or polymeric strapping. Manuplas® can assist in the supply and specifications of the strapping most appropriate for the installation and service conditions.

Features:
+ Tough, impact & abrasion resistant
+ Interlocking moulding design assists in ease of installation
+ Neutrally buoyant in seawater
+ Non-marking material

C.Shield® Advanced Cable Protection System (CPS):
Advanced Insulation also offers its C.Shield® CPS which includes a Bellmouth, Latch Assembly, J-Tube Connector, Hybrid Bend Limiter and Impact Protection.

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

Manuplas® offer a range of metal banding options which can be used with products including pipe laying floats, umbilical floats, piggyback saddles and cable protection.

The banding options offered by Manuplas® include:

- Carbon Steel
- Grade 316 Stainless Steel
- Monel
- Inconel

Manuplas® is also able to offer an alternative polymeric strapping system which incorporates a single buckle, is fully non-corrosive and very easy to install:

- HCL Smartband

Manuplas® can provide fully comprehensive installation advice and support and can provide installation tooling.

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<th>Cost Effective</th>
<th>Corrosion Resistant</th>
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<td>Reliable and long lasting</td>
<td>And straightforward to install</td>
<td>Ideal for harsh subsea conditions</td>
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Smart® Band is a registered trademark of HCL Fasteners Ltd.
Manuplas®

In-house Testing Facilities

Manuplas® have a comprehensive range of in-house testing facilities to ensure optimum product performance

- **Deep Water Testing**
  - Hydrostatic test chamber rated to 300 Bar

- **Shallow Water Testing**
  - Hydrostatic test chamber rated to 100 Bar

- **Macrosphere Testing**
  - Testing cells rated to 700 Bar

Find out more about Manuplas® at: www.advancedinsulation.com
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Applications for Subsea Buoyancy & Moulded Products

Manuplas® subsea buoyancy and moulded products can be applied to a wide range of applications across the subsea oil and gas, marine and renewables industries

+ Offshore pipelines
+ Subsea installation
+ Steel catenary risers
+ Flexible risers and umbilicals
+ Offshore operations
+ Umbilical support
+ Cable protection
+ Offshore wind farm marine cabling

Oil & Gas  Marine  Renewables
Manuplas®

Single Source Solutions Provider

Advanced Insulation offer a cost-effective solution for subsea oil and gas projects by providing a full package of products alongside Manuplas® buoyancy and moulded products.

- **Manuplas® Buoyancy**
  - Installation and engineered buoyancy

- **ContraTherm®**
  - Syntactic flexible subsea insulation

- **Clamping Solutions**
  - Piggyback, compliant & grommet clamps

- **C.Tag® Markers**
  - High visibility underwater markers

- **Cable Protection**
  - Bend stiffeners & J-tube seals

- **C-Ling®**
  - Offshore wind farm anti-corrosion solution

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

Advanced Insulation is a market-leading insulation provider with global reach

Advanced Insulation’s Manuplas trading division offers a fully comprehensive service that includes survey, design, manufacture, application 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 buoyancy, cable protection systems, subsea and topside insulation, subsea markers, fendering systems, passive fire protection, cryogenic spill protection and blast and fire walls.

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

**Design, manufacture, technical support & sales**

1. United Kingdom
   - Unit 18 Estover Road
   - Estover
   - Plymouth
   - PL6 7PY
   - Tel: +44(0)1752 771740

2. Angola
   - Rua Direita do Gamek
   - N26 Base Kubics
   - Largo Corimba-Samba
   - Luanda
   - Tel: +244923 364 273

3. Brazil
   - Rodovia SP 107, km 29
   - Jaguariúna – SP
   - Caixa Postal 255
   - 13820-000
   - Tel: +55 19 41417117

4. Kazakhstan
   - 184/1 Iksanova St.,
   - 090300, Burlin region,
   - Aksai
   - West Kazakhstan Oblast
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5. South Korea
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6. Malaysia
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   - Kota Kemuning
   - Shah Alam 40460
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   - P. O. Box 18512
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   - Tel: +971 4 8819821

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   - #925
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   - Saint John,
   - NB
   - E2L 2E9
   - Tel: +1 (780) 905 4723

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