

Port security barriers



Creating complete flexible containment solutions

Trelleborg Flexible Containment Solutions (formerly Dunlop GRG), design, develop and manufacture polymer fabrications for many industries. For over 40 years we have been producing an extensive range of products, particularly in the field of heavy duty, rubber-coated textile, PU, TPU and PVC fabrications. Our experience in many challenging settings, industries and applications, has allowed us to continuously improve and develop our products for demanding commercial operations around the world.

Being part of the **Trelleborg Engineered Fabrics** division of the **Trelleborg Group**, one of the largest polymer processors in the world, puts us in a unique position. While working closely with you developing your project, we are supported by a large group of companies with a broad scope of technical expertise resulting in single ownership from raw material to finished product.

With direct access to a large inventory in the supply chain, we are able to maximise product availability, keeping costs and lead times to a minimum, while still providing a highly personal service delivered by an experienced team.

Based in Manchester in the UK, Trelleborg Flexible Containment Solutions has been part of the Trelleborg Group since 2005.

We supply a wide range of markets including the defence, maritime, petrochemical, power, security, agriculture and offshore industries. The Trelleborg Engineered Fabrics division works across technologically advanced industries to produce polymer-coated fabrics worldwide. By developing the optimum solution for your application we go further to engineer the fabric of industry.



PRODUCT OVERVIEW

Providing effective seaborne defence systems presents many unique challenges. Trelleborg Flexible Containment Solutions inflatable boat and port barriers provide a cost-effective, highly flexible and adaptable port security solutions to protect sensitive assets from seaborne attack. Manufactured in the UK, Trelleborg inflatable barriers are a widely used sea and port defence system.

Often installed to safeguard some of the largest sea vessels worldwide and protect valuable shipping ports and defence assets.

Trelleborg has been manufacturing boat barriers for in excess of 25 years using composite technologies originally conceived at Cambridge University. An incident in 2000 led to a global review of port security. Following successful testing as an anti-terrorist device by the US Navy in San Diego Harbour in 2001, the units were enhanced further, making them larger and more robust to combat a broader range of threats.

Trelleborg port security boat barrier systems are currently installed around the world. Their design is such that they can be adapted to any port situation, naval or commercial, and also for the protection of vulnerable coastal land-based assets.



FEATURES & BENEFITS

- Extremely durable, manufactured to resist harsh conditions
- Require little maintenance with a life expectancy in excess of 20 years
- Imposing and highly visual deterrent
- Effectively resists sea borne attack

Designed for high impact - the primary function is to prevent or delay an attacking vessel entering restricted area's, allowing time for secondary security measures to be activated.

Inherently flexible, the portable units are lightweight and easy to inflate or deflate and transport. This design makes them highly versatile with set lengths easily coupled together to configure to many different port layouts, providing a distinct advantage over heavier fixed or fencing based barrier systems which require more complex and costly operations to transport and install.

Easily manoeuvred in water, they are shackled together using standard buoys and anchor systems at predetermined intervals and can be linked in any configuration in lengths of many kilometres. A series of units operates as a simple gate system where access is required. The space between connecting buoys is dependent on geography, climate and tides, and is adaptable to any naval or commercial sea-based or port situation.

Key safety features

- Operates at low pressure.
- No danger of 'bursting' if accidentally punctured.
- If punctured, they will not sink and can still function as an effective barrier. The barrier will slowly deflate (only to 50% of diameter due to a central cable) to enable backup systems to come into play.
- Multiple punctures will not cause catastrophic failure.
- The rubber body of the barrier will not damage passing ships' paint or surfaces which accidentally scrape across the barrier.
- The barrier 'softness' will cause no harm to public or their craft hitting the barrier by accident.



APPLICATIONS

Trelleborg port security barriers are in operation in many settings **worldwide** for the protection of vulnerable assets from seaborne attack. Some of these include the UK submarine service at HM Naval Base in Clyde, home of Britain's Trident nuclear facility, NATO's European naval maintenance shipyard in Croatia, US Navy Mediterranean bases in Italy and Spain, an LNG port in the Middle East and a shipyard in Singapore.

With a versatile design, the units can easily be adapted to any port situation, **naval** or **commercial**, as well as the protection of sensitive land-based assets that may be vulnerable to sea attack, such as **coastal power plants**.

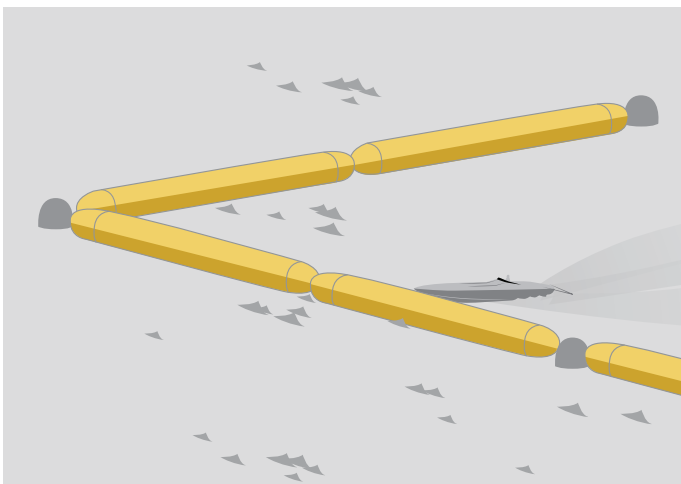
In addition to their extensive use at military sites, they have many other applications including **commercial shipyards**, coastal oil and **gas ports**, **nuclear power plants** and security forces protecting **private residences** on the coast.



Norfolk, USA



Croatia



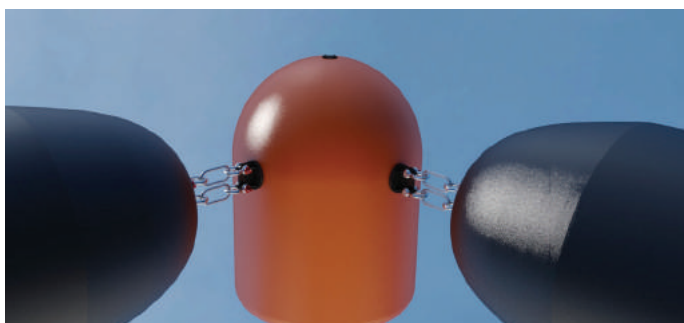
Faslane, Scotland

GENERAL DESCRIPTION

UNIT SPECIFICATION	Manufactured in various sizes typically in 25m lengths and 2.3m diameter. Operating with an initial internal pressure of 1Psi.
INSTALLATION	Trelleborg Flexible Containment Solutions have a partner company which specialise in the installation and continual maintenance of our barrier systems.
INFLATION & DEFLATION	Each end of the barrier is inflated and deflated through a corrosion resistant valve located in one of the end closure plates, which also houses a separate pressure monitoring valve. The two closure plates are linked internally by a high strength sheathed wire cable running the length of the barrier, externally they are both fitted with an integral mooring fitting.
CONNECTION & MOORING	Shackled together with buoys and anchor systems, design dependent on environmental conditions and threat levels.
TESTING	Barriers have been tested against multiple shots from small hand guns 50 calibre, 7.63 and 5.56 NATO. The worst penetration was a 4mm hole left by 0.375 magnum, other rounds just separated the fabric and closed back over.

Accessories

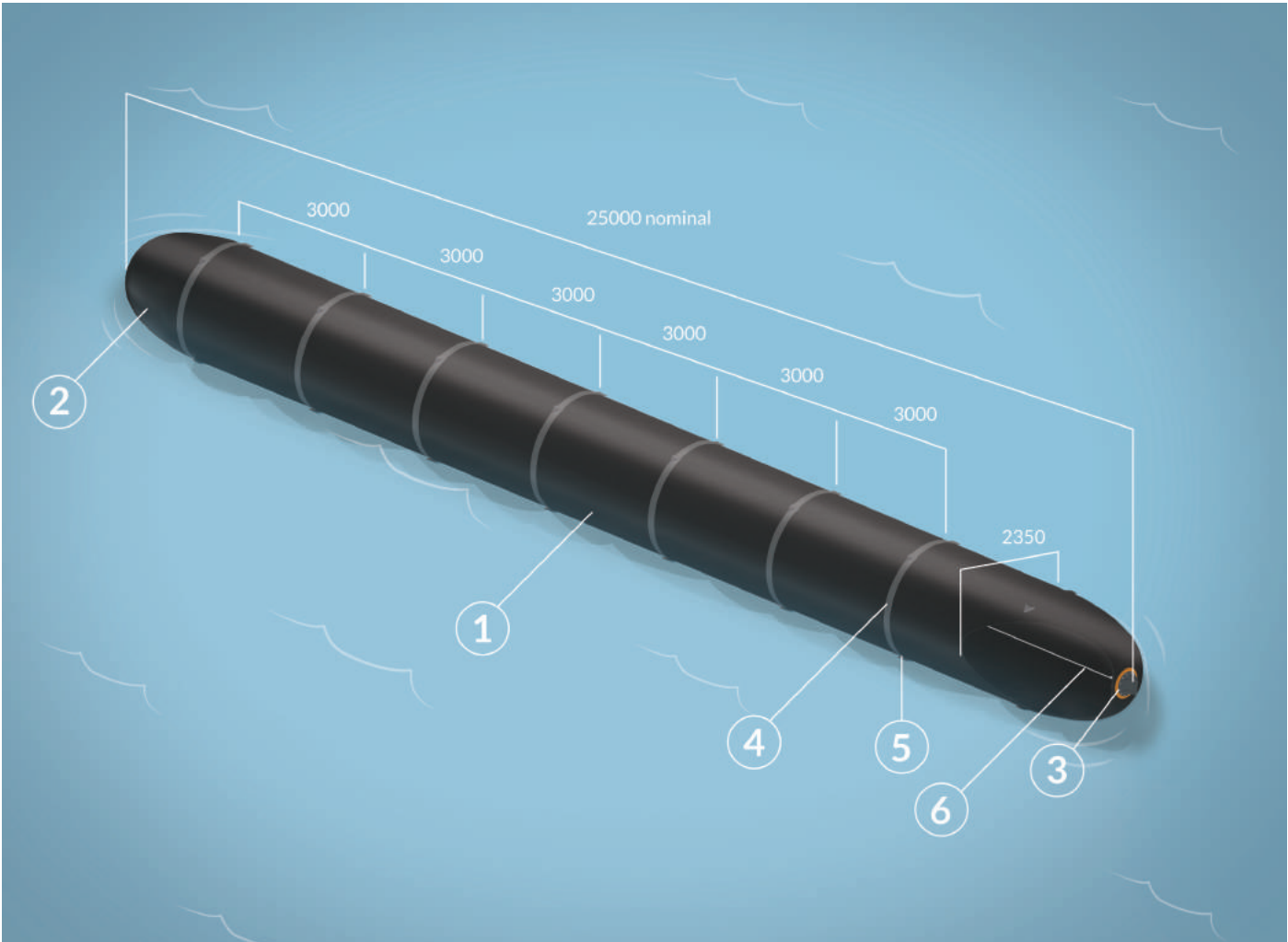
- A range of sonar, radar and camera equipment can be installed to provide a more comprehensive protection package
- Duck Dive Net for further protection from Jet Ski craft
- Navigational lighting
- Barrier covers printed with warning signs
- Tamper alarms at connectors



Buoys manufactured to order from our sister company Trelleborg Offshore



Item	Description
1	Barrier Body
2	Hemispherical End Moulding
3	End Assembly
4	Suspension Band
5	Suspension Band Connection Point
6	Tension Cable



*In accordance with our established policy of constant improvement, we reserve the right to amend these specifications at any time without notice. Photographs shown may feature non-standard equipment.



Trelleborg Flexible Containment Solutions is part of the Engineered Fabrics division of Trelleborg, a world-leading engineering group developing advanced polymer technology solutions that seal, damp and protect people and processes. With 100 years of experience and continual research, we engineer the fabric of industry through customised and pre-conceived solutions adapted to your exact application.

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