

Pryžotextiní vyrobky







HISTORIE

Trelleborg Bohemia, a.s. je tradičním českým výrobcem pryžových, pryžokovových a pryžotextilních výrobků s více než 100letou historií pod značkou Rubena.

	1908	Josef Kudrnáč započal s výrobou mazadel, ucpávek a osinko-pryžového zboží.
K U D R N A C	1923	Zahájení výroby technické pryže.
	1929	Zavedení výroby plášťů a duší pro jízdní kola.
	1931	Vyrobení první české pneumatiky a duše pro osobní automobily.
Barum 😳	1934	Tomáš Baťa založil ve Zlíně výrobu klínových řemenů.
	1948	Společnost přijala nové jméno Rubena. Vznik obchodní značky Barum.
R Dubena	1996	Rubena, a.s., Náchod se stává součástí České gumárenské společnosti se sídlem v Praze.
	2000	Rubena Náchod a Gumokov Hradec Králové vytvářejí společnou firmu Rubena a.s., Hradec Králové.
TRELLEBORC	2004	Rubena a.s., Hradec Králové kupuje od společnosti Mitas a.s. výrobu klínových řemenů ve Zlíně.
	2006	Byla založena dceřiná společnost CGS Automotive de Mexico.
	2016	Rubena se stala členem skupiny Trelleborg Group.

ISO 9001

ISO 14001

Osvědčení Vinisterstva obrany ČR, výroba palivových nádrží Úřad pro civilní letectví ČR Oprávnění organizace k výrobě



<u>Hradící vaky</u>

Hradicí vakový jez je permanentní konstrukce zahrnující pryžotextilní membránu (tělo hradicího vakového jezu), která je zafixována do betonového podloží pomocí ocelového kotvení a kotvících šroubů.

Je propojen potrubním systémem s ovládací šachtou, která zajišťuje společně s elektronickým zařízením požadovaný plně automatický provoz přehradní konstrukce.

Svojí jednoduchostí a ekologickou nezávadností je ideální pro malé vodní elektrárny, zavlažovací systémy, úpravu režimu spodních vod, rekreační účely a pro rekonstrukce starších jezů pevných či pohyblivých a protipovodňové prevenci.

Hradící vaky Trelleborg Bohemia, které jsou vyráběny již od r. 1963 jsou nositeli unikátní technologie výroby membrány (tloušťka od 8 do 50 mm) a té nejvyšší technické úrovně, která se opírá o vlastní know-how.

Nízké pořizovací a provozní náklady	Žádné negativní vlivy na životní prostředí
Stovky úspěšných instalací	Velká odolnost proti vzniku vibrací při přepadu vody zvýšená v případě potřeby navulkanizovanými rozražeči
Kompletní montáž a servisní údržba po celém světě	Nenáročná spodní stavba a sanace starých pevných jezů nebo jezů s náplatkami či stavidly
Malé nároky na údržbu a obsluhu	1:3 Možnost úpravy nábřežních pilířů od kolmých až do sklonu 1:3, přičemž osa pilířů nemusí být kolmá na podélnou osu jezu
Bezproblémový zimní provoz	Jednoduchá regulace horní hladiny s přesností ±2 cm i za povodňových průtoků až do kapacity vyhrazeného otvoru
30+ Dlouhá životnost více jak 30 let	Prakticky jediná možná alternativa pro horizontálně nebo i vertikálně zakřivené přelivné hrany



Letecké nádrže

Letecké nádrže jsou pryžotextilní vaky speciální konstrukce opatřené úchytnými šrouby, kterými jsou přichyceny ve vnitřních prostorech draku a v křídlech letounu. Slouží jako zásobníky pohonných hmot v letounech. Tyto tvarové nádrže vyráběné z pryže odolné ropným produktům. Plnění a vyprazdňování nádrží je zabezpečeno zavulkanizovanými kovovými přírubami.

-	Kvalitní výrobek využívaný pro bitevníky české výroby L-159 a další letouny L-39, L-410		<u>()</u>	Tvarová stálost prostoru naplněného palivem zaručena
(1)	Maximální využití vnitřních prostorů letadla pro uložení paliva			Výborně odolává teplotním rozdílům
	Díky pružnosti a dobrém tvarování je zaručena snazší montáž a servis		6 0	Vhodné i pro použití v jiných strojích (např. závodní vozidla a další stroje s požadavkem na lehké, tvarově členité nádrže)

Membrány topných systémů

Membrány jsou konfekčně vyráběné pryžové vaky určené k vyrovnávání tlaků při dilataci topného média v uzavřených topných systémech nebo vodárnách. Ploché vakové membrány se používají do topných tlakových expanzních nádob, které jsou určeny pro použití v soustavách pro pitnou a užitkovou vodu (oddělují od sebe plynový a vodní prostor) a jsou osazeny závěsným systémem pro fixaci.



Zakázkový vývoj tvaru, pozice a stavby zádržného systému

000

(

Široký sortiment (cca 700 typů o objemech 100 až 25 000 litrů)





Speciální směs membrán pro pitnou vodu



Protipovodňové stěny

Protipovodňové stěny jsou nádrže polštářového tvaru s vnitřní stabilizační přepážkou vyráběné konfekčně s následnou vulkanizací v kotli. Po naplnění vodou na příslušném místě slouží jako zábrany proti rozlivu vody. Jednotlivé nebo pospojované vaky tvoří stěnu, která je určena k rychlé ochraně proti povodním, lze jimi nahradit běžně používané pytle s pískem. Stěny lze také použít při zahrazování částí vodních toků při "jímkování", při opravách dna nebo břehů. Při umístění přímo kolmo proti silnému vodnímu proudu je nutné použít zdvojené sestavy. Nádrže jsou opatřeny přírubami k plnění vodou, odvzdušňování a vyprazdňování.

Protipovodňové stěny Trelleborg Bohemia jsou mobilní, ekologická a efektivní protipovodňová ochrana, kterou úspěšně testovala i ženijní armáda USA. Pro instalaci stačí jen 2 osoby a čas naplnění nepřesáhne 15 minut. Díly jsou vyráběny v délce 2 - 5 metrů nebo dle konkrétních požadavků zákazníka.

	Mobilní, úsporná*, ekologická a efektivní protipovodňová ochrana		Dlouhodobě odolává běžným klimatickým podmínkám (–25°C do +70°C) a chemickým roztokům
Ŀ	Snadná manipulace a rychlá instalace (pro instalaci stačí 2 osoby a čas naplnění nepřesáhne 15 minut)	0	Možná zakázková výroba dle specifických požadavků zákazníka
K	Není nutná žádná stavební připravenost před použitím	(ه)	Lze použít jako zásobník užitkové vody, sběrný vak pro kontaminovanou vodu nebo jako havarijní sběrný vak
Vvužit	ŕ	۵	Lze plnit vodou z řeky za použití obvyklých čerpadel, případně vodou z hasičských cisteren nebo hydrantů

- mobilní protipovodňová stěna
- havarijní záchytný vak pro chemické roztoky
- rezervoár pro užitkovou vodu
- pro stavbu bazénů a dekontaminačních stanic
- pro pochůzné lávky v povodňových situacích
- pro odklon vodních toků při stavebních a dalších činnostech
- pro vytvoření provizorních jezů na vodních tocích
- vhodná k jímání vody znečištěné nebezpečnými látkami. Neutralizaci lze provést přímo uvnitř vaku



Nestandartní výrobky malých sérií

Lisovací vaky

Lisovací vaky pryžové nebo pryžotextilní konstrukce jsou výrobky polštářového nebo plochého tvaru. Jako medium k plnění lisovacích vaků se používá stlačený vzduch nebo kapalina, nejčastěji upravená voda. Slouží k uzavírání forem v procesu tváření výrobků, např. pro automobilový průmysl, keramický průmysl atp. Princip spočívá ve vyvození tlakové síly ve vaku pomocí stlačeného vzduchu nebo kapaliny, jejíž působením dochází k požadovanému tváření výrobků.

Vaky jsou vyráběny z několika druhů gumárenských směsí, dle určení použití a mohou být vyztuženy textilním vláknem. Vaky vyrábíme až do rozměru 2,5 m šíře a 13 m délky. Krátká dodací doba.

Ostatní lisovací pryžové a pryžotextilní výrobky

Pryžotextilní nafukovací vaky (menších rozměrů) - vhodné pro opravy nerovností karoserií automobilů. Pryžotextilní nafukovací rukávy - určené k tvarování vinutí při výrobě elektromotorů. Silikonotextilní ploché lisovací membrány - užívané při výrobě koberců. Lisovací vaky - užívané v potravinářství k lisování ovoce, hroznů, sýrů a podobně.



Na zakázku vyrobíme tvar a rozměr dle požadavků zákazníka s přihlédnutím k provozu konkrétního vaku.

Izolační vaky

Izolační vaky k olejovým transformátorům slouží k vyrovnávání tlaků v olejových nádržích transformátorů a zároveň chrání použitý olej od vzdušné vlhkosti.



Na zakázku vyrobíme nejrůznější tvary a velikosti izolačních vaků.

Spojky, manžety a násypky

Pryžové nebo pryžotextilní výrobky převážně ruční konfekce s volnou vulkanizací v autoklávu nabízíme s maximálním průměrem 2,8 m a délkou 13 m. Jde například o silikonové spojky a prachovky pro jaderné elektrárny.



Výrobky atypických a rozměrů a tvarů vyrábíme dle potřeb zákazníka pro nejrůznější obory lidské činnosti.

Poznámky:

WWW.RUBENA.EU

ISO-14001 ISO-9001

Trelleborg Bohemia, a.s., Náchodská 449, 549 32 Velké Poříčí, Czech Republic Phone: +420 491 447 536, Fax: +420 491 447 523, E-mail: bags@trelleborg.com



Fuel and Water Storage





Creating complete flexible containment solutions

Trelleborg has a long and proud heritage in the design, development and of products, widely used in the harshest environments and in the most demanding applications. Supported by our parent company, Trelleborg AB, our policy of continuous improvement and investment in R&D ensures that all Trelleborg products are state of the art for reliability, long and trouble free life.

POLAR FLEXI-TANKS

Being part of Trelleborg Industrial Solutions, a division of Trelleborg AB, one of the largest polymer processors in the world, provides Trelleborg with the latest polymer technology from a global leader. Trelleborg accesses a broad range of technical expertise within the Trelleborg Group including raw materials. By working closely with our customers from initial feasibility through to design, manufacture and installation, we ensure project delivery to the agreed specification and often, by providing expertise, below expected cost. Trelleborg serves a wide range of markets including the defence, maritime, petrochemical, power, security, agriculture and offshore industries. Trelleborg Industrial Solutions business area works across technologically advanced industries to produce polymer and polymer-coated fabrics globally for applications including Fluid handling, anti-vibration, moulded components, pipe seals and sealing profiles. By developing the optimum solution for your application we go further to engineer your solution. Our experienced team coordinate closely with our customer's technical team to provide guidance and support throughout the process to provide a highly personal service. Our Technical Centre of Excellence and support team are based in Greater Manchester in the UK, with manufacturing based in the Czech Republic. Our state of the art manufacturing facility, which houses some of the largest fabrication machinery in the world, is renowned for producing, dam membranes, with life cycles often in excess of 20 years.







PRODUCT OVERVIEW

Critical to the success of international military and humanitarian operations is the mobilisation of large quantities of fuel and water. Trelleborg provides a range of easily transported and rapidly deployable liquid storage solutions for use in the most extreme environments. Trelleborg flexible tanks are a standard, internationally recognised product used by both military and humanitarian organisations for the temporary storage and distribution of fuel and water. They are available from 1,000 litres to 1,000,000 litres and supplied in a variety of material to suit the application. The collapsible tanks are quick to deploy and can be stored using a minimum of space, ideal for environments where it can be difficult to establish more permanent solution such as steel tanks. One of the most challenging problems for fuel and water storage is the harsh environments where conflicts or relief operations may be conducted. Trelleborg flexible tanks have been successfully deployed from Arctic/ Antarctic to tropical and desert conditions.

FLEXIBLE FUEL AND WATER STORAGE

These flexible tanks are manufactured from specially developed rubber-coated textiles, PU and TPU which are specifically designed to offer high abrasion and tear resistance. Each product will be designed for the specific duty required including all types of fuels, liquid fertiliser, potable and non-potable water. Trelleborg also offers a broad range of chemical-resistant flexible tanks. The units can withstand extremes of temperature and almost any environment.

FEATURES & BENEFITS

- Durable and able to withstand harsh conditions
- Manufactured from high-quality materials
- · Flexible and easily deployed

Strong and reliable under harsh

conditions, Trelleborg flexible tanks have been designed to offer high abrasion, UV and fuel resistance. Able to withstand extremes of temperature they are suitable for use in both tropical and arctic conditions. The units are constructed from high strength woven fabrics coated with high quality specially engineered compounds, providing a strong and durable liquid container. The materials have been designed to have high tensile strength with excellent tear and puncture resistance. Flexible and easily deployed in any environment - Where there is need for temporary liquid storage flexible tanks can be deployed quickly and filled on site and are available with all accessories needed to receive and deliver the fuel or water to generators, vehicles and helicopters, etc. Once the application is complete they can be emptied, cleaned and stored for future use. Built to international standards for any environment - access to potable water is essential logistics for both military and humanitarian operations, particularly in arid environments. The flexible nature of the tanks allows large quantities of water to be stored and distributed safely.

· Built to an internationally recognised military standard

• Available in a wide range of specifications

Available in a range of specifications depending on requirements - access to Ranging in capacities from 1,000 up to 1,000,000 litres, Trelleborg flexible tanks are supplied in different material specifications depending on storage requirements and contained fluids such as fuel, potable or non-potable water. Trelleborg can also supply pumps, filter systems, pipework and connections. Other products - Trelleborg also provides other products for use alongside flexible tanks including bund liners, ground sheets and UV covers bund liners - used in conjunction with flexible tanks they provide a reliable containment around tanks to prevent fuel spillage with excellent tear and puncture resistance.



APPLICATIONS

Trelleborg flexible tanks have been in use in military and NATO-lead missions as well as humanitarian operations around the world. Used in theatres of operations such as Iraq and Afghanistan, these units are able to meet the challenge of providing fuel and water storage solutions in harsh environments that are difficult to access and where temperatures and dust are a major problem. Manufactured to internationally recognised military specifications, Trelleborg flexible tanks are critical to the success of military bulk fuel distribution networks. Purpose built Polar Flexi Tanks have also played a key role in storing and transporting fuel in 'the Coldest Journey', a recent Antarctic expedition where flexible tanks withstood temperatures as low as minus 90 °C. Trelleborg flexible tanks provide a wide range of flexible liquid storage and distribution applications and are an essential component to military and relief operations worldwide.





Heavy Duty Rubber – For the demanding requirements of the military environment specifically designed to meet British defence specification DGFLS279 with an operational life of 15 years.

Standard Rubber – A lighter weight fabric design to store distillate fuel oils with up to 40 % aromatic content, with an operational life of 5 - 7 years.

TPU – coated high tenacity polyester woven fabric designed to store aviation fuel and diesel, with an operational life of 3 - 5 years.

PVC - a Non-toxic PVC-coated high tenacity polyester woven fabric for potable water, with an operational life of 3 - 5 years.

CAPACITY (LITRES)	LENGHT (M)	WIDTH (M)	HEIGHT (M, WHEN FULL)
5.000	4.30	2.60	0.70
10.000	5.10	3.45	0.80
25.000	7.55	4.33	1.10
50.000	8.50	6.06	1.40
100.000	11.70	7.79	1.50
200.000	19.80	7.79	1.50

Sizes vary depending on materials and applications, above sizes are for guidance only. All other sizes, including bespoke dimensions, are available.

Most tanks are made to order; we have a standard range and can tailor sizes and accessories to meet with your specific requirements. We can manufacture tanks up to 1,000,000 litre capacity; flexible tanks having a capacity of more than 200,000 litres can require non-standard fittings. Please contact our sales and technical team to discuss your job specific requirements to ensure you get the best possible service from your tank.

Accessories

- Pumps
- Filter systems
- Pipework
- Connections

TYPICAL ASSEMBLY

FLEXIBLE FUEL AND WATER STORAGE



4 Drain connection - under at each end

8 Seam





Bargeone



Dunlop dracone barge

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Trelleborg Industrial Solutions business area works across technologically advanced industries to produce polymer and polymer-coated fabrics globally for applications including Fluid handling, anti-vibration, moulded components, pipe seals and sealing profiles. By developing the optimum solution for your application we go further to engineer to engineer your solution.







PRODUCT OVERWIEV

The Dracone barge has been used to transport large volumes of liquids at sea for decades and is time-proven. They have been in use with many military organisations for fuel transfer from sea to shore, coastguards for oil spill collection and removal of black and grey water. Many oil companies use the Dracone Barge as an essential part of their oil spill response equipment. Available in a range of sizes up to 1,000,000 litres, the Dracone barge is a flexible, towable bladder constructed from high-performance materials enabling it to withstand hostile ocean conditions. The Dracone barge was originally developed at Cambridge University in the 1950's during the Suez oil crises in order to transport fuel from the Persian Gulf. Since then, this unique, versatile, durable and highly reliable product has had an unrivalled record of operational performance worldwide Dracone barges continue to operate globally, providing a unique system of bulk liquid transport and oil spill collection and removal in a range of applications and industries.

Originally used for military purposes for the bulk transportation of refined fuels, they have many other commercial and military applications.

DRACONE BARGE

The Dracone barges are in service with, amongst many others, the UK Ministry of Defence, the United States and Indian Coast Guards, the US Navy, the Australian Ministry of Defence and almost all oil companies own. In military operations, they are primarily used to transfer bulk volumes of fuel from a ship to the shore. The Dracone barge is simple to operate, which allows it to be repeatedly ferried to and from an oil spill containment area.

FEATURES & BENEFITS

DRACONE BARGE

Dracone barges

- Versatile large capacity for transportation and storage of liquids
- · Durable and able to withstand harsh conditions
- Suitable for fuels, oil spill collection, grey and black water
- · Easily towed in open water
- Quickly deployed and air transportable
- Very long life expectancy >20 years



Strong and reliable under harsh conditions - The Dracone barge is constructed from synthetic rubber-coated nylon fabric, making it highly resistant to all weather conditions, abrasion, sunlight, oil and sea water.

The construction of the nose and tail moldings, based on modern composite technology and extensively tested under stress analysis, is essential to the overall strength of the unit. For use in pollution control, the inside has a nitrile coating that is specially designed to store distillate fuel oils of up to 30 % aromatic content.

Easily towed in open water - With non- inflatable buoyancy panels, the Dracone barge will float whether empty or full and will follow the exact course of the towing vessel, allowing tight maneuvers to be executed. Designed for towing in open seas, the unit has undergone intensive stress analysis to determine the optimal design for maximum stability in water.

Rapidly deployable and adaptable with a large capacity and 'fold away' flexibility the Dracone barge is an essential part of the oil spill first response kit. Easy to set up and quick to launch from a quayside, the deck of an offshore vessel, or drop launched by crane or helicopter with minimal lifting equipment, it can be quickly transported to critical areas, filled to an enormous capacity to limit oil spill movements, and then easily towed for safe disposal.

Other products - Alongside the Dracone barge, Trelleborg also provide other essential products for pollution control:

• **Flexible pillow tanks** - Primarily for use on land for the temporary storage of large quantities of fuels, water and crude oil, flexible tanks can be manufactured to specified sizes to fit available space on oil spill collection ships. The tanks are easily filled and once emptied can be folded or stored away.

• **Bund liners** - Used in conjunction with flexible tanks they provide a reliable containment around the tanks to prevent fuel spillage.

GENERAL DESCRIPTION

UNIT SPECIFICATION	Available in a range of sizes and capacities, but can also be custom made to fulfil a specific client need. General specifications are shown below.		
MATERIALS AND CONSTRUCTION	Constructed from high-tenacity woven nylon fabric coated with polychloroprene. Interior coated with nitrile rubber for transporting distillate fuel oils of up to 30% aromatic content. Nose and tail mouldings constructed based on modern composite technology using rubber encapsulated nylon cord.		
CONNECTIONS	Fill/discharge hoses can be offered to suit customer requirements. Standard connections include 4" or 6" (100 m or 150 mm) but it is possible to modify hardware to suit.		
TOWING	Depending on size can be safely towed at 6 - 10 knots in moderate seas.		
Accessories • Towing hose	• Cargo net • Navigation marker	Towing rope Nosecone pump	

• Recovery bend

Navigation marker

- Quick release hook
- DRACONE TYPE A1 A2 D5 D10 Е F J L 0 519.00 **100% CAPACITY** т³ 4.55 9.1 22.75 45.50 100.00 191.00 385.00 1100.00 **85% CAPACITY** 3.90 7.80 45.50 38.60 85.00 162.00 327.25 441.00 935.00 т³ LENGTH 14.17 15.95 31.45 38.45 50.45 66.00 66.00 91.45 8.58 m DIAMETER 1.42 1.42 4.23 0.94 0.94 1.87 2.35 2.82 3.28 m **EMPTY WEIGHT** 270 310 430 780 1000 2275 3540 4060 6500 kg

LAYOUT OF A DRACONE



Accessories

- 1 Main towing ropes
- 2 Towing pendant
- 3 Recovery bend

- 4 Towing hose 5 Nose cone 6 Mooring ring
- 7 Dracone barge

- 8 Stabiliser 9 Mooring ring
- 10 Tow line
- 11 Light float with navigation light





Dunlop low pressure pneumatic fenders

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PRODUCT OVERWIEV

Dunlop low-pressure (LP) pneumatic fenders play an essential role in the safe berthing of ships at sea in emergency or other operations such as refueling. Unlike other fenders, Dunlop LP fenders are designed to spread berthing forces over a large area, achieving a far lower load reaction and hull pressure than any other fender system. This makes them ideal for use when berthing vessels with singe, non-metallic or weakened hulls. While durable enough to stand up to the most hostile environments at sea, the LP fenders are considerably lighter than a high-pressure fender of equivalent performance, and can easily be carried, inflated at point of use and deployed in a range of emergency applications. This reduces deck space to an absolute minimum compared with alternative fender types. They are also easy to deflate and store for later use which significantly reduces UV light and Ozone damage resulting in extremely long life.

LOW PRESSURE FENDERS

It is not unusual for Dunlop fenders to still be in use 25 years after first delivery. Available in a range of standard sizes, they can also be custom made to a specific requirement. Dunlop has been supplying LP pneumatic fenders to the maritime industry for decades.

FEATURES & BENEFITS

- Spreads berthing forces over the full length of the fender as opposed to a point-contact resulting in very low hull pressures to reduce the risk of hull damage.
- Effectively and safely absorbs the kinetic energy of the moving vessel during the berthing operation.
- Lowest load reactions of any alternative fender system. High pressure and foam filled fenders are also available from Trelleborg Marine Systems so Dunlop offers unbiased selection guidance.
- ISO17357-2:2014 (E) compliant and tested by the American Bureau of Shipping for peace of mind.
- Ideal for use with single hull, non-metallic or weakened vessels or those with sensitive electronic systems requiring protection when berthing. Unlikely to damage vessels during unintended collisions.
- Light weight and low package size makes the Dunlop fenders particularly suitable for coast guard and rescue vessels where fender requirements may not be known in advance.
- No special davits required and can be quickly and safely deployed at point of use.



LP Fenders can easily be carried, inflated and deployed in a range of emergency applications via air, sea or land. This flexibility makes them particularly suited for ship to ship operations and offer a significant impact on time and costs of transport. As they can be transported and deployed quickly, the Dunlop fenders are key to preventing oil spill from damaged vessels, thereby minimising damage to the environment. Easy to deflate and store for later use. When deflated they can be rolled into small, lightweight packages and are therefore very cost effective by increasing deck space and reducing storage weight. As they operate at a nominal pressure of 70 mbar (1 Psi), any convenient air supply can be used for inflation. Their low inflation pressure also makes repairs and maintenance easy and safe. Durable and unencumbered by external fittings, the units can be towed while inflated and attachments suitable for towing and mooring can be provided at each end of the fender to provide flexibility of deployment. In addition, girthing ropes are fitted for ease of handling and maneuvering using standard ship mechanical handling gear.

APPLICATIONS

A high-energy absorbing capacity coupled with ease of handling enables ships of even the largest tonnage to be safely fendered in various conditions and berthing operations. Dunlop LP pneumatic fenders have been in operation worldwide in many applications, both military and commercially, for many years.

These include ship to ship transfer and refueling/replenishment at sea, offshore mooring, naval applications, salvage and cargo recovery, rescue and emergency floatation. They are extensively used for military operations at sea including mine sweeping. Many commercial companies specialising in salvage and emergency choose Dunlop fenders to reduce risk and lower their operating costs.

They feature in the operations of International salvage companies who specialise in providing a quick response to marine emergencies around the globe and by specialist shipbuilders.



GENERAL DESCRIPTION

LOW PRESSURE FENDERS

UNIT SPECIFICATION	Manufactured in diameters from 1.0 m to 4.5 m; lengths of tenders can made to customer requirements and in accordance with ISO 17357-2:2014 (E)
MATERIALS AND CONSTRUCTION	Constructed from a woven high tenacity, continuous filament nylon-based fabric, coated on both sides with an abrasion resistant synthetic rubber compound. Individual sections are constructed such that they are of strength equivalent to the base material or fabric
LOAD REACTION	The maximum specific load reaction pressure that can be developed from a LP fender occurs at at 60% compression and is 11 tonnes $perm^2$
ENERGY ABSORPTION	Dependent on the size of the fender
INFLATION AND DEFLATION	Units operate at o nominal pressure of 70mbar (1 Psi). Any convenient air supply, compressor or blower can be used for inflation

Dunlop LP pneumatic fenders are made to the ISO 17357- 2:2014 specification

Accessories

- Blower unit
- Medium duty delivery and suction hose Inflation adaptor
- Transportation/storage case repair kits
- Pressure gauge assembly lifting slings
- Cargo nets

NOMINAL	NOMINAL SIZE (M)		APPROX. FOLDED SIZE (M)	
DIAMETER	LENGHT	WEIGHT (KG)	LENGTH x WIDTH x HEIGHT	CONSTRUCTION
1.0	5.0	90	1.5 x 0.8 x 0.7	
1.0	6.0	110	1.5 x 0.9 x 0.7	
1.0	8.0	140	1.5 x 0.9 x 0.8	
1.5	4.0	110	1.6 x 0.8 x 0.7)Dereel End
1.5	5.0	135	1.6 x 09 x 0.8	Parcer End
1.5	6.0	160	1.6 x 1.0 x 0.9	
1.5	8.0	210	1.6 x 1.0 x 1.0	
1.8	6.0	210	1.8 x 1.0 x 0.9	
1.8	8.0	270	1.8 x 1.0 x 1.0	
1.8	10.0	330	1.8 x 1.2 x 1.1	
1.8	12.0	390	1.8 x 1.2 x 1.2	
2.3	8.0	360	2.0 x 1.0 x 1.0	
2.3	10.0	440	2.0 x 1.2 x 1.0	}Ciompea Ena
2.3	12.0	520	2.0 x 1.2 x 1.2	
2.3	16.0	680	2.0 x 1.4 x 1.3	
2.75	10.0	600	3.8 x 1.3 x 1.25	
2.75	14.0	800	3.8 x 1.45 x 1.35	
2.75	18.0	1200	3.8 x 1.6 x 1.4	
2.75	22.0	1600	3.8 x 1.7 x 1.55	
3.2	12.0	800	3.8 x 1.4 x 1.3	
3.2	16.0	1040	3.8 x 1.5 x 1.4	
3.2	20.0	1280	3.8 x 1.65 x 1.5	}Moulded End
3.2	24.0	1520	3.8 x 1.75 x 1.6	
4.5	18.0	1600	3.8 x 1.6 x 1.45	
4.5	22.0	2000	3.8 x 1.7 x 1.6	
4.5	26.0	2400	3.8 x 1.8 x 1.75	
4.5	30.0	2800	3.8 x 1.9 x 1.9	

FEATURES & BENEFITS



Dunlop low pressure fenders have also undergone third party type approval testing based on the requirements of ISO 17357:2002. These tests included parallel plate compression, compression recovery, angular compression and durability testing. The results of these tests confirmed previous test data and theoretical performance ratings and were witnessed, reviewed and endorsed by the American Bureau of Shipping. Further details of the testing procedures and the results can be provided on request.





Security Barriers



Dunlop port security barriers

Trelleborg has a long and proud heritage in the design, development and manufacture of polymer coated fabric products. For decades we have been producing an extensive range of products, widely used in the harshest environments and in the most demanding applications. Supported by our parent company, Trelleborg AB, our policy of continuous improvement and investment in R&D ensures that all Trelleborg products are state of the art for reliability, long and trouble free life.

Being part of Trelleborg Industrial Solutions, a division of Trelleborg AB, one of the largest polymer processors in the world, provides Trelleborg with the latest polymer technology from a global leader. Trelleborg accesses a broad range of technical expertise within the Trelleborg Group including raw materials. By working closely with our customers from initial feasibility through to design, manufacture and installation, we ensure project delivery to the agreed specification and often, by providing expertise, below expected cost. Our experienced team coordinate closely with our customer's technical team to provide guidance and support throughout the process to provide a highly personal service. Our Technical Centre of Excellence and support team are based in Greater Manchester in the UK, with manufacturing based in the Czech Republic. Our state of the art manufacturing facility, which houses some of the largest fabrication machinery in the world, is renowned for producing dam membranes, with life cycles often in excess of 20 years. Trelleborg serves a wide range of markets including the defence, maritime, petrochemical, power, security, agriculture and offshore industries. Trelleborg Industrial Solutions business area works across technologically advanced industries to produce polymer and polymer-coated fabrics globally for applications including fluid handling, anti-vibration, moulded components, pipe seals and sealing profiles. By developing the optimum solution for your application we go further to engineer to engineer your solution.







PRODUCT OVERWIEV

Trelleborg port security barriers provide a proven, durable and cost effective solution against seaborne threats whether deliberate or accidental. They are available from 1.4 m to 2.4 m diameter, in individual standard lengths of 25 m or can custom made. They are interconnected using marine grade shackles, quick release catches and/or closure plates to form almost any barrier length and configuration required. Our inflatable barriers are manufactured from a purpose-built rubber coated fabric, which incorporates high levels of protection against abrasion, tear, UV and Ozone resulting in a design life expectancy in excess of 20 years.

These barriers have been installed to effectively safeguard some of the most sensitive global naval bases, high value shipping and petrochemical ports. Their low draft ensures that gateway systems are operated quickly and conveniently. The Trelleborg port security barriers require very little service and maintenance attention and provide continuity and integrity of protection throughout the life of the barrier. This results in the lowest through-life costs of any equivalent port protection barrier. As the main body is made of rubber coated fabric, there are few metal components which reduces maintenance and replacement costs even further. The barriers are sensitive to the environment and, whilst alternative systems can cause extensive risks, the Trelleborg port security barriers will not harm local marine life or ecology.

PORT SECURITY BARRIERS

Each barrier system is unique and will have different local challenges. The Trelleborg technical team has decades of experience and provides a full design and consultancy service from initial concept through to installation. Mooring buoys and slide rails used to connect the individual barriers are manufactured by Trelleborg, our parent company, which results in single source responsibility and access to full technical expertise. Mooring buoy anchoring will be dependent upon local conditions but can include self-propelled anchors, drag anchors and concrete dead weights. Installation can be provided by Trelleborg using dedicated expertise or we can provide full supervision of local contractors.

FEATURES & BENEFITS

- Minimum maintenance resulting in lowest cost of ownership.
- Rugged and durable to provide high levels of barrier system integrity.
- Imposing and highly visual deterrent.
- Tested and proven to repel determined attacks whilst causing minimal damage during accidental collisions.
- Easily installed, flexibility in configuration and suitable for seasonal deployment.
- Low draft reduces marine growth, allows simple operation of gateways and provides maximum barrier height.
- Standard diameters of 1.4, 1.8 and 2.4 m and adaptable for protection of pipelines and fixed assets from accidental collisions.



Key safety features

- Operates at low pressure for safety.
- No danger of catastrophic deflation or sudden release of stored energy if accidentally punctured.
- An individual barrier will slowly deflate to 50% of its diameter to enable the barrier system maintains its integrity.
- Resistant to small arms fire.
- The rubber body construction will not damage passing vessels which may accidentally contact the barrier.
- The barrier 'softness' will cause no harm to public or their craft hitting the barrier by accident.
- Ecologically sensitive and will not harm marine life.

Designed for high impact

The primary function is to prevent or delay an attacking vessel entering restricted area thereby providing time for secondary security measures to be deployed. 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 that require more complex and costly operations to transport and install.

Easily maneuvered in water, they are shackled together using standard buoys and anchor systems at predetermined intervals and can be linked in any configuration and practically any length. A series of units operates as a simple gate system to provide authorized access into and out of the secured zone. The space between connecting buoys is dependent on geography, climate and tides and is adaptable to virtually any naval or commercial port location.

APPLICATIONS

PORT SECURITY BARRIERS







Trelleborg port security barriers are protecting high value marine assets in many ports globally.

Whilst suitable for any port, the rubber coated fabric construction makes them the preferred choice for submarine bases or where there is a high level of public and commercial traffic.

As they are easily and quickly inflated and deflated, they can be used for seasonal deployment or when security threat levels are elevated.

A simple, lower cost demarcation barrier of 0.5 or 1 m diameter is available where port vessel movement control is required such as around piers and pipeline jetties.

With an unrivalled versatility in design and installation, the barriers can easily be adapted to any port situation, naval or commercial in addition to the protection of sensitive land-based assets that may be vulnerable to sea attack, such as coastal power plants, desalination plants and petrochemical installations.

They can be used to provide temporary or short term protection for visiting dignitaries or high value military assets in repair shipyards The Trelleborg port security barriers have been deployed in numerous Olympic Games venues.

In addition to their extensive use at military sites, The Trelleborg port security barrier has been adapted to provide protection of fixed assets such as fuel pipeline.

For example, 2 barriers are installed at Changi airport to protect the main fuel lines jetty from accidental collision by the first response.

UNIT SPECIFICATION	Manufactured in various sizes typically in 25 m lengths and 2.3 m 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	Shackled together with buoys and anchor systems, design dependent on environmental conditions and threat levels.
CONNECTION & MOORING	Optional connectors between barriers include specific closure plates, marine shackles or quick release connectors. Bouys, anchor systems and pilings are designed to suit local conditions.
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 4 mm 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 complete security package.
- Dive nets and anti-debris nets easily incorporated.
- Marine solar navigation warning lights.
- Reflexive strips.
- Tamper alarms at connectors.



PORT SECURITY BARRIERS







Marine Exclusion Barrier Systems

Trelleborg Inflatable Exclusion Barrier Systems are rapidly gaining acceptance as the preferred solution for protecting sensitive areas in river waterways, ports, harbours and marinas in addition to military and commercial docks. Easily deployed, the Trelleborg Exclusion Barrier Systems provide highly visible exclusion perimeters around valuable or sensitive assets to ensure traffic is isolated from the exclusion zone.

Designed for a long life, the barrier has a low operating pressure and the robust design ensures that vessels will not be damaged during accidental collision whilst not compromising the exclusion perimeter. They can be adapted to provide protection for piers or jetties and water intake zones for desalination, power plants and oil and gas installations. Trelleborg is a global leader in marine systems and, uniquely, the raw material, barriers and mooring buoys are all manufactured by the company ensuring that a Trelleborg Inflatable Exclusion Barrier System is manufactured to the highest quality using the latest production techniques with single source responsibility. Trelleborg also manufactures a full range of anti-terrorist barriers from 1.4 m to 2.4 m diameter and, with a wealth of marine experience, we provide consultancy from design through to installation and commissioning to ensure your Exclusion Barrier System provides the precise and optimum solution required.

ADVANTAGES

- Provides a clear and imposing deterrent from entry into a restricted area.
- Very cost-effective and extremely difficult to breach.
- Will not cause damage to vessels accidentally colliding with the barrier.
- Strong yet lightweight with a low internal pressure to ensure accidental impacts are absorbed without damaging the barrier.
- Manufactured from the highest quality polychloroprene coated fabric produced by Trelleborg with high abrasion, high tear strength, UV and Ozone protection for very long-life.
- Easily deployed and adaptable to almost any installation.
- Reduced storage space if the barrier is to be deployed seasonally.
- Mooring options available from Trelleborg including sliding rails, mooring buoys, piling etc.
- Trelleborg will provide full system design and support through to final installation.
- Extremely low maintenance and site-repairable.
- · Options include reflective strips, warning signs, marine-standard warning lights and storage containers.



LONG LASTING, HARD WEARING, WEATHER RESISTANT, DURABLE, PORTABLE, FLEXIBLE, SAFE

Constructed from Trelleborg's own unique engineered time-proven, high tenacity, polychloroprene coated fabric the Trelleborg Exclusion Barrier system is highly durable and will stand the test of time.

Available in diameters of 500 mm and 1000 mm and supplied in lengths up 25 m. Linked together with a flexible, strong coupling, sections can be linked with others to create the custom length required whether it is utilised in open sea, harbour, jetties or piers and will provide a visible and imposing barrier which is extremely difficult to breach. Our specialist team can provide full system design advice and guidance to help you with a fully customised system, with a wide range of mooring options to suit your specific location as well as additional design features such as increased visibility, warning signs and standard marine warning lights. The Trelleborg Exclusion Barriers system is inflatable and lightweight compared with alternative solutions so initial installation and redeployment are made significantly easier than larger traditional more cumbersome fixed systems. This feature is important if you make regular or seasonal changes to demarcation zones, the system can be deflated, removed, relocated and re-inflated elsewhere or stored when not in use. This very cost effective solution also offers an additional level of safety and protection to vessels which may accidently collide with the barrier. Inflated to just 70 Mbar internal pressure the Trelleborg Exclusion Barrier system offers a very safe alternative to other solutions such as hard foam filled systems.





Dry Storage System





Dunlop dry storage system

The Trelleborg Dry Storage System can be used to protect a multitude of high value assets including military hardware, ammunition, emergency equipment such as generators, pumps and compressors, medical equipment and just about any high value asset that may be used only periodically. This enables assets to be decentralised and stored where they will be required resulting in rapid deployment when needed.

The system has been proven in arctic, desert, dry and humid ambient conditions. NATO standard camouflage netting can also be incorporated.

Each Dry Storage System unit is supplied with a base and rail, an inflatable sealing tube, a two-ply butyl cover, protection material, inflation and vacuum connections, desiccant bags to remove any remaining moisture and sensors to connect a handheld portable hygrometer. Depending upon the application, wooden or polymer flooring will be included to absorb the static weight of the asset being protected. The base is inserted inside the sealing frame and the flooring is positioned onto the base.

The asset is positioned onto the base and the two-ply butyl cover is positioned over the asset, usually with some additional material to protect the asset, with desiccant bags positioned inside the cover. The humidity sensor(s) is supplied with a length of cable so that the sensor can be placed inside the cover to suit the application. The cover is then inserted inside the sealing rail, the inflatable seal is inserted into the rail and inflated, which then provides a seal between the base and the cover.

Air is then vacuumed out of the unit to remove humidity inside the Dry Storage System. This significantly reduces relative humidity and the effect of oxidation is eliminated thereby protecting the asset for long periods of time. Maintenance is limited to periodic visual checks and humidity readings to ensure the Dry Storage System is holding the vacuum. Inadvertent damage to the unit can be repaired on-site very easily and a repair kit is supplied with each unit. Other optional accessories include a hand-held hygrometer compressor/vacuum pump and associated hoses, spare desiccant bags supplied in a sealed package and a specific packing crate to store the system when not in use. Installation is simple and quick utilising a minimum of labour and once the asset is installed inside the Dry Storage System, it is protected against atmospheric degradation for long periods thereby extending the asset's expected life. The system has a design life in excess of 20 years and can be used over and over again leading to a versatile, durable and robust protection system.





ADVANTAGES

DRY STORAGE SYSTEM

- Significantly prolongs the life of the stored asset and thereby offers a very short return on investment.
- Asset is available for almost immediate use when removed from the Dry Storage System.
- Assets can be decentralised and stored where they are likely to be needed.
- Designed for long life using best available materials of construction designed for -40 °C to +120 °C and with high UV and Ozone protection.
- Suitable for almost any location and eliminates the need for expensive climate controlled buildings.
- · Easily rigged and derigged using minimum amount of labour.
- Can be reused many times and for a variety of assets.
- Extremely low maintenance and site repairable.
- Minimum site tooling required so can be utilised in very remote locations.



Dunlop GRG Holding Limited and Trelleborg Bohemia, a.s. are parts of the Industrial Solutions business area of Trelleborg, a world-leading engineering group developing advanced polymer technology solutions that seal, damp and protect people, processes and the environment.

With over 100 years of experience and continual research, we engineer the fabric of industry through customised solutions adapted to your exact application.

WWW.TRELLEBORG.COM

WWW.RUBENA.EU

Trelleborg Bohemia, a.s., Nachodska 449, 549 32 Velke Porici, Czech Republic Tel: +420 491 447 581, E-mail: dunlopgrg@trelleborg.com