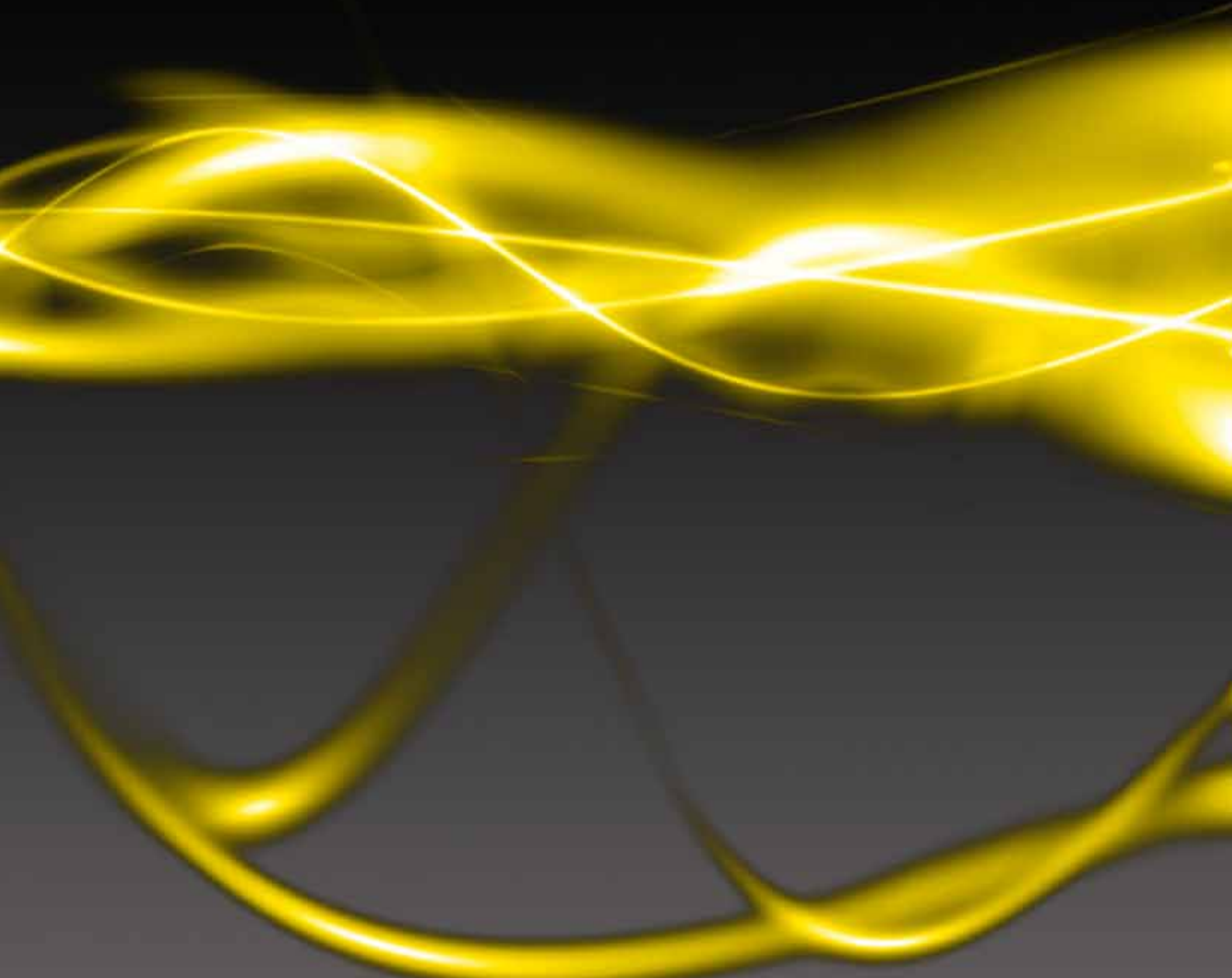




ELASTOMER ENGINEERING





Manufacturing Solutions

Tiflex is a dynamic global manufacturer and distributor that supplies a vast range of specialised products and services to virtually every industrial sector. We have more than 50 production, engineering, distribution, technical support and customer support facilities worldwide backed by extensive IT networks, e-commerce systems and logistics operations - to serve customers in over 100 countries.

Our world-leading areas of expertise encompass high performance elastomer engineering across a broad range of industries, together with plant engineering services. These activities are mainly led by materials technology and design expertise, and range from research, development and manufacture, to product application and equipment refurbishment.

Together with associated knowledge-based services, they

help keep global industry running safely and efficiently, year-in and year-out.

Defence & aerospace pedigree

We are committed to working closely with governments in support of elastomeric designs to enhance their defence capabilities. This service naturally extends to equipment manufacturers and maintenance contractors operating on a global basis.

The long-term partnerships we have fostered with customers, since our company was founded in 1882, have proved to be among the most valuable key strengths that we offer.

Our business started with the development and supply of fluid sealing products to improve the safety and efficiency of the 'new' high pressure, high temperature steam

engines used by naval and commercial fleets. From this start we have diversified into a wide range of industries which has broadened our expertise and allowed us to become experts in solving elastomeric engineering design problems. We then turn these designs into products in our state-of-the-art UK manufacturing facility. Since then, our long-established pedigree in high performance elastomer engineering technology has led us to supply many generations of products used in:

- Naval forces - surface ships, submarines, support craft
- Air forces - fixed wing combat aircraft, helicopters, logistics and support aircraft, training aircraft
- Ground forces - fighting vehicles, personnel carriers, field guns, rocket launchers
- Civil aerospace - engines, fuel systems, airframes, doors

Much of our high level work for the defence and aerospace sectors is confidential. We are accustomed to operating under these conditions and fully respect the security issues involved.

Quality culture

Quality design, quality manufacture and quality service are paramount throughout Tiflex's operations. No effort is spared to achieve the highest standards.

We start with the best raw materials and use advanced manufacturing techniques with strict quality control, culminating in an exacting inspection of finished products. This culture of quality is reinforced by our top-level technical support, logistics network and a multitude of customised services for the defence and aerospace sectors.



Standards

Our quality standards are third party registered to BS EN ISO 9001:2008. We are also regularly assessed and quality approved by a wide range of industry bodies and individual customers, including multinational corporations, utilities and government organisations.

With regard to the defence and aerospace sectors, we hold:

- AS-EN 9100 accreditation
- AS-EN 9104 accreditation

Together with the ability to store and package products to Ministry of Defence and aerospace standards.

In addition, we are accredited suppliers to many original equipment manufacturers and contractors.



Accredited Suppliers to:

- BAE Systems
- Ministry of Defence (UK)
- Bombardier
- Babcock
- Anixter
- LUL
- Rolls-Royce
- Balfour Beatty
- QinetiQ

Leading with technology - Expert advice from the Tiflex Technology Centre

Our success is founded on the technical expertise and support we give to customers with expert advice, specialised materials and product designs.

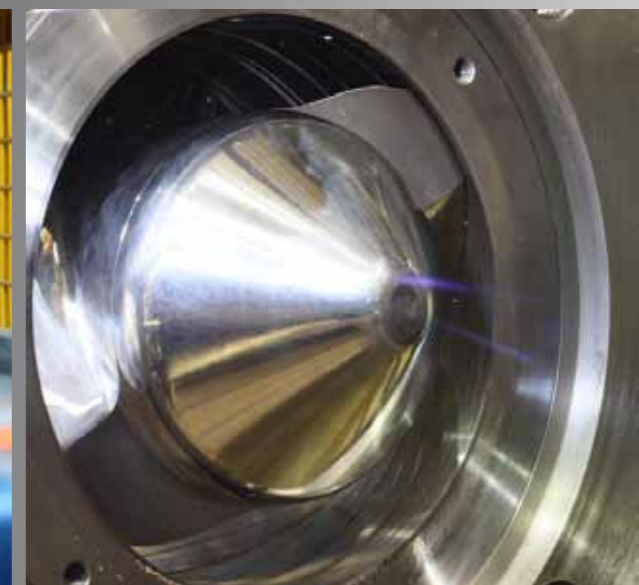
Tiflex's applications and field engineers solve sealing problems around the world. They will advise and custom-design the optimum elastomeric solution for your plant and equipment. As well as working with customers at original design stage, they are just as willing to go into the field to solve expensive on-site problems.

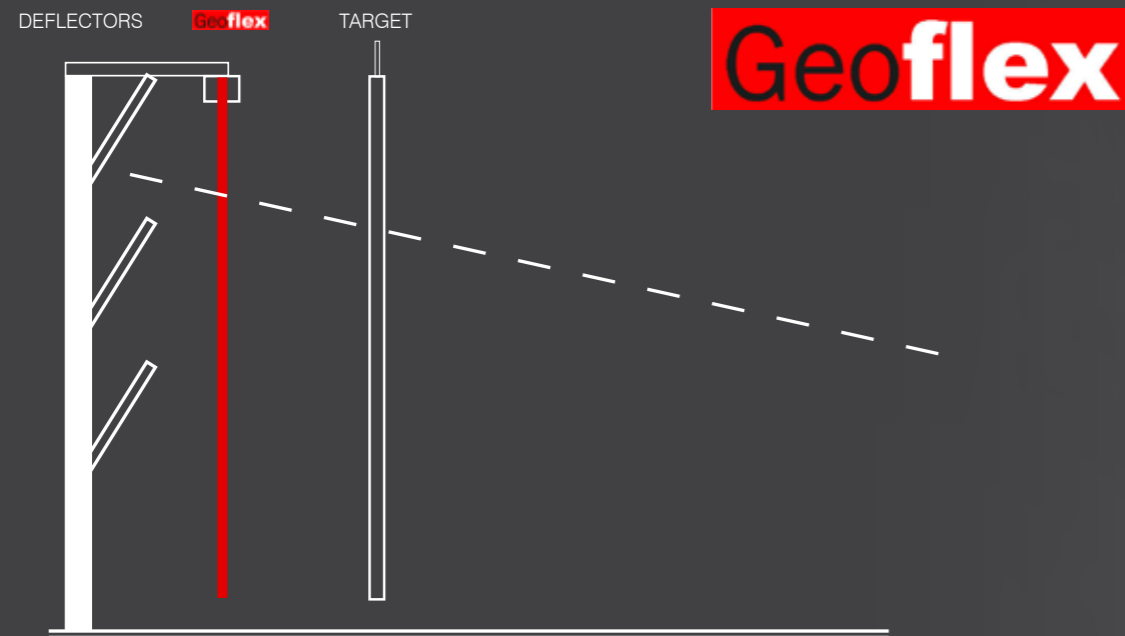
This level of advice on high technology elastomeric consultancy/trouble-shooting is freely available to original equipment designers, end users, maintenance specialists and plant refurbishment contractors.

Materials testing, development & research

Our team of polymer technologists is dedicated to the continuous improvement of the materials we use - and the development of new ones. Unlike the majority of polymer product manufacturers, we design, develop and mix all of our elastomer compounds.

In addition to the standard test equipment in our Materials Laboratory that we use to monitor the quality of our compounds, we also have state-of-the-art specialised tools to characterise them and diagnostic tools for performance investigations.





Geoflex



Treadmaster Marine Deck Coverings

Treadmaster Original is the world leader in anti-slip decking, combining exceptional slip resistance with durability. It provides a high degree of insulation and reduces reflective glare from deck surfaces.

Treadmaster Glow Tec (pictured left) is manufactured with a scientifically advanced 'glow in the dark' resin, making it an ideal product to replace your current safety signs. The emergency safety flooring charges in artificial, natural or even moonlight and provides excellent visibility in dark areas if lights fail. This tough and robust low maintenance flooring has excellent traction underfoot in wet or dry conditions.

Target Backing

Geoflex Red TB has been developed from a natural rubber compound that affords a 'self-healing' property when penetrated by a bullet. Leaving only the smallest pinhole witness after the bullet has travelled through the curtain. Geoflex Red TB takes care of downrange back splatter, eliminates the risk of bullet ricochet and reduces airborne lead dust- all of which combine to offer a safer, cleaner shooting range.

Spall Lining

Based on the work carried out in the development of out target backing rubber, Tiflex are developing an energy absorbing elastomeric materials that could be used as Spall liners in military vehicles by reducing the amount and spread of spall.

Features and Benefits

- Self-healing significantly reduces the risk of back splatter.
- Natural acoustic damping reduces downrange noise levels.
- Cost effective solution able to withstand extensive use before patching or replacement is required.
- Simple installation with an easy patch/repair system.
- Easy to rotate or move to another firing position for further extended product life.

Elastomer Engineering

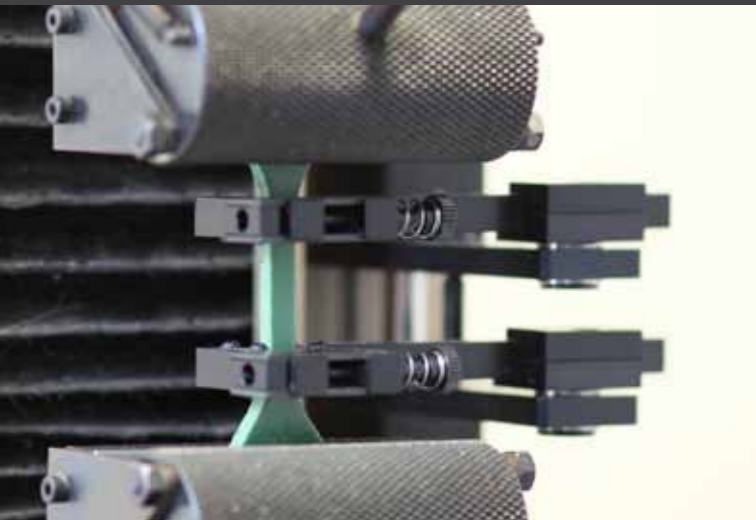
World-class materials & products from a world leader in elastomer technology

High performance elastomers

- Over 300 grades formulated and compounded in-house.
- Elastomers custom-developed to meet optimum requirements.
- Compounds to resist extremes of temperature and pressure, abrasion and chemical attack.
- State-of-the-art facilities for precision compounding.
- Rigorous testing and control with full traceability.

Elastomer manufacturing

- Bonding to metals or plastics, plus production of special composites
- Compression moulding up to 9 metres long
- Continuous vulcanisation of rolls up to 2 metres wide.
- Plastic or metal inserts securely moulded in.
- Extrusion of simple or complex profiles, by continuous or batch production.
- Complex rubber mouldings.
- CNC machining of rubber sheet up to 3 x 2 metres
- Die cutting
- Plastic welding
- Colour matching service and the ability to process coloured rubbers



Tiflex Laboratory Development and Test Facilities

Production development & testing

We have extensive in-house manufacturing and product test facilities. These are used during the development of new products and also to ensure that optimum performance is maintained when the item is in production.

To support our applications we use:

Compound Mixing and Sheetting - Primary development and QC facilities include a Francis Shaw K1 Intermix allowing processing of 3 litre batches of compound, together with 12" and 18" two-roll mills for processing the mixes into sheet form.

Vulcanising - Two 600 x 600mm vulcanising presses with temperature control up to 170°C complete the laboratory's primary processing equipment for QC and development purposes.

Compressive Stiffness Properties - We have two servohydraulic compression testers (Mayes ESH1000kN

and Dartec 2000kN) used for measuring a range of properties fundamental to the working of all anti-vibration materials. These machines can test at compressive loads up to 2000kN, static compression speeds up to 1200mm/min and dynamic test frequencies up to 40Hz.

Fire Retardancy

At Tiflex Ltd our technologists have developed a range of fire retardant materials that are suitable for use in the most demanding and safety critical environments. Our flooring products are fully tested to NES711, NES713, EN ISO 4589-2, EN ISO 4589-3 and approved for use on submarines.

The materials are used in underground trains throughout the world, and we have developed resilient fire retardant products for a wide range of applications including the offshore oil and gas industry, commercial shipping and military applications. Other fire tests include BS6853, DIN5510, NFF 16-101, ASTM 648, IMO RES A653.

Viscosity and Rheology

We use a Negretti Viscometer to assess the quality of

critical incoming rubber consignments.

Rheological properties of production and development materials is analysed using a Monsanto Rheometer.

Rubber Hardness Testing

We have a comprehensive range of equipment to test the hardness of elastomeric materials from soft sponges to hard plastics.

Tensile Properties

Two tensile testing machines are used for evaluating tensile strength, modulus, extensibility, tear and stress relaxation properties of both rubber and textiles at forces up to 25kN.

Electrical Resistance

Primarily for evaluating the electrical insulation properties of railtrack materials we can measure electrical resistance at voltages up to 1000Vdc.

Slip Resistance

An essential property of passenger transport safety flooring is the dynamic slip resistance, which we can measure on Treadmaster flooring in both wet and dry conditions using

either low speed coefficient of friction measurements or a high speed pendulum skid assesment.

Abrasion Resistance

Resistance to abrasion is a fundamental requirement for flooring and rail track products and we assess this using a Teledyne Taber abrader fitted with a specific grade of abrasive under controlled load and time conditions.

Weathering Properties

Our Treadmaster flooring materials and new pigments in development are subjected to an assessment of resistance to accelerate out-door weathering conditions in a Q-Lab UV tester - an environment combining high levels of UV radiation with increased temperature and moisture in programmable combinations.

Colour Assessment

An essential requirement for the development and production of flooring to customer's precise colour schemes is a sophisticated colour analyser. We use a Datacolor spectrophotometer coupled to advanced colour management and analysis software to give one of the most sophisticated colour analysis systems available.

ELASTOMER ENGINEERING



Elastomer Engineering
of the Defence & Aerospace Industries

Custom design & manufacture

- In-house tool design and CAD/CAM machining
- Design and development of precision elastomeric components.
- Prototyping, testing and full-scale manufacture.

Elastomeric sealing products - High-performance fluid sealing technology at its very best.

Bespoke Products

- Flexible products to absorb movement, impacts and resist chemicals.
- Specialise in fire retardant products
- Submarine tiles
- Torpedo cradle liners
- Recoil buffers
- Bellows

Vibration attenuation

Scientifically designed materials to attenuate noise, vibration & shock loads.

Pipe grips

- Tico® Pipe Grips - safe, reliable and easy to install.
- Approved for marine, offshore and land-based applications.
- U-bolts fully encased in fire retardant elastomer cover.
- Designed for use with Stainless Steel and Cu/Ni pipes.
- Prevent wear, accept vibration and thermal movement.
- Isolate pipes to prevent electrolytic corrosion.

Clip strip

- Tico® Clip Strip - for effective and economical pipe isolation.
- Approved for marine, offshore & land-based applications.
- Cork-elastomer strip with raised shoulders for positive location.
- Reduces and absorbs shock, noise and vibration.
- Prevents electrolytic action between dissimilar metals.
- Three grades accommodate temperatures up to 300°C.

Mounting pads & buffers

- Tico® S machinery mounts - rapid bolt-free installation with all types of flat machinery base, also attenuate noise and vibration.
- Tico® Adjustamount - swift precision leveling or gradient generation for plant and machinery.
- Tico® LF mounting pads - easy-to-install bonded sandwich pads for isolating plant or structures at low frequencies.
- Tico® CF pads -critical frequency isolation of plant from structures at down to 8Hz under load.
- Tico® Hi-duty pads and buffers - three grades that cushion massive impact and shock loads to prolong machinery life.

Flooring & decking

- Treadmaster TM7 and TM9 (Vamac)- specialist low smoke, low toxicity, fire retardant flooring products.
- Treadmaster® Original anti-slip decking - excellent slip resistance with durability and comfort in wet and dry conditions.
- Treadmaster® ER - for engine rooms and other below deck areas where machinery and mineral oils are used.
- Maintaining the integrity & reliability of process equipment.

Acoustic Signature Control materials

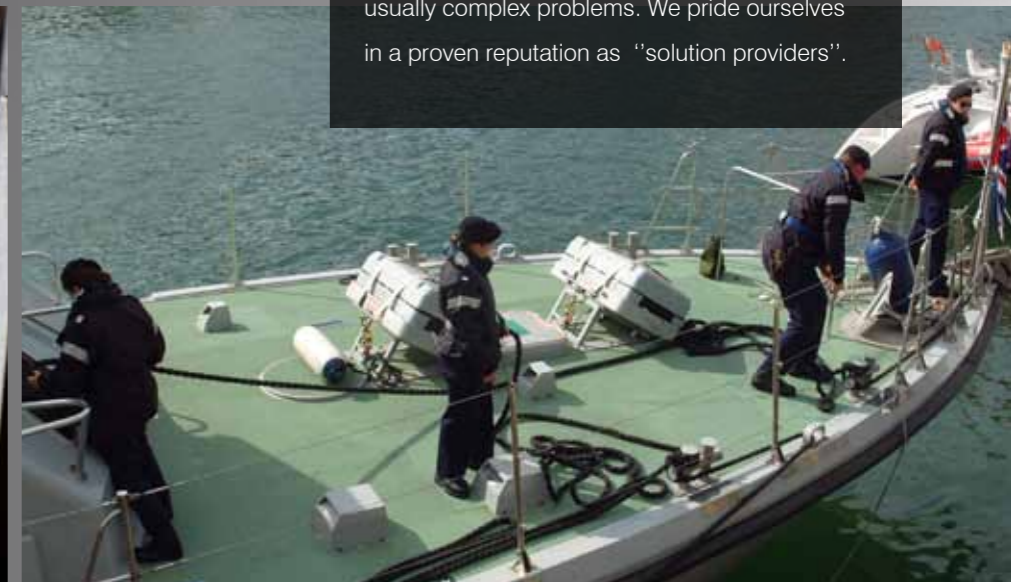
Tiflex have the ability to design, develop and manufacture a range of Acoustic Signature Control materials. These can be tailored to each application to meet the performance specification for each application.

We are also capable of developing other materials for use in Stealth technology or Radar absorbing materials.

Over the years Tiflex have also developed a range of materials for underwater acoustic applications for use as baffles in Anechoic Tanks.

Solution Providers

Over many years Tiflex has invested in the best people needed to develop the imaginative and novel ideas required to successfully deliver innovative solutions in response to new and usually complex problems. We pride ourselves in a proven reputation as "solution providers".



- o Cost effective, high-integrity elastomer engineering
- o High performance vibration attenuation
- o Standard and custom-designed products
- o Researched, developed, tested and proven
- o Backed by surety of global supply



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