FLANGE™ GUARDS

Making **FLANGE SHIELDS** *Better*

LEADING MANUFACTURER AND SUPPLIER
OF PIPE SAFETY SHIELDS

Contents

For advice and support please visit our website or contact our highly skilled and experienced team of specialists

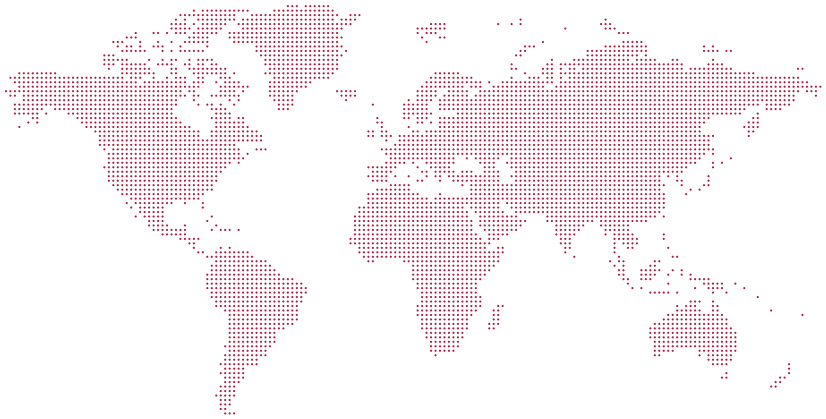
www.flangeguards.com

sales@flangeguards.com

+44 (0)1268 244 369

www.flangeguards.com

We have a dedicated worldwide network of partners and stockholders



View the full list and contact details at: www.**flangeguards**.com

Interested in becoming a partner or stockist? Call Flangeguards on **01268 244 369** for further details on opportunities available.

About Flangeguards

At Our Core

We believe Safety Shield Solutions should be safe, simple and smart.

This is our purpose, we are at your service.

How Do We Achieve This?

- Unrivalled pipe joint safety experience
- Expert understanding of customer applications & issues
- Respect through the supply chain; win-win
- Going the extra mile

Flangeguards are a specialist manufacturer of safety shields to prevent spray-out, splashing and mist formation from leaking pipe joints. We understand this market intimately, it is our speciality.

Flangeguards is a modern, forward thinking business focused on service and innovation. With many decades experience in the flange shield market, we designed a comprehensive product range to provide safe, simple and smart solutions across all client applications.

Manufacturing

Given the critical nature of these products where the price of failure is high, all our safety shields are designed, manufactured and tested in-house. This ensures the consistent high quality in terms of both product and service.

Our growing manufacturing facility utilises the right balance of innovative automation and manual, hand-made attention.

With no internationally accepted standards for Flange Shields, we have created our own Pressure Test Facility to simulate typical pipe joint leaks. This is used to test all shield designs to ensure fitness for purpose. Many such tests are available to view on our website and customer Hydro Testing is also available.

Quality

We are proud of our ISO9001:2015 quality accreditation for both manufacturing and design. The design element is critically important to deliver safe solutions.

We also hold TYPE approval for marine SOLAS applications and are regularly engaging with other 3rd party agencies for newer applications such as LNG and Hydrogen.

We only use the most effective materials and shield designs and will never compromise on quality.

What are flange guards?

Flange guards, otherwise known as spray safety shields, are installed on pipe joints, these being the 'weak points' where leaks occur. For critical pressurised applications, they are the vital first line of defence to prevent fire, explosion and toxic release which would otherwise endanger plant and personnel.

- **Prevent Spray-outs** Typically the most important requirement is to control the leak and create a safe, controlled release. This may be to mitigate the risk of spray or jet which might otherwise result in fire or toxic exposure.
- **Avoid oil mist formation** For certain oil & fuel applications, oil mist formation is just as hazardous as a spray-out. Furthermore, ill-fitting safety shields can actually create mist formation.
- **Provide leak indication** It is important to identify leaks as quickly as possible, though the process will determine the urgency. For certain acid lines, some customers require that flanges must not be concealed. This is achieved using transparent shielding. Alternatively leak-indicator patches can be used. For other process liquids, leaks will be self-evident.
- **Contain leaks** Whilst standard safety shield designs generally do not provide secondary containment (indeed there should be a leak path to avoid pressure build-up), we can offer special designs incorporating drain nipples and a system to channel liquid releases.

We have a variety of shield types and materials to solve practically any problem.

This ensures the guard you use is fit for purpose in terms of design and compatibility with the process.

Where to use

Flange Guards are used where hazardous chemicals are used, stored or transported. Examples include:

- **Flammable Liquids, Gases & Solids**
  Oils (eg. fuel, lubrication, thermal, hydraulic), Hydrogen, Ethylene, Methane, Ammonia, LNG & LPG.
- **Oxidising Agents**
  Nitric acid, Hydrogen Peroxide, Fluorine, Chlorine.
- **Toxic & Corrosive Substances**
  Acids (Hydrochloric, Sulphuric, Nitric, Acetic).
  Bases (Ammonia, Sodium Hydroxide, Potassium Hydroxide.
  Others (Hydrogen Fluoride, Chlorine, Phosphoric Acid).
- **Miscellaneous Dangerous / High Pressure Substances**
  High Pressure Steam, Zinc Oxide.
- **Fluids in Gaseous or Liquid State**
  A growing number of industries are using shields to diffuse the force from a pressurised gas leak to mitigate the risk of jet formation which may ignite and/or extend outside specific process areas.

  Drain assemblies can be provided to enable flange leak testing without removing cumbersome external thermal insulation covers.

Not all shield designs are the same

Shields are like insurance policies: Once in place, you think you are covered

Only after an incident you find out: Some give full protection, others are worthless

Typically the most important requirement is to control the leak and create a safe, controlled release. This may be to mitigate the risk of spray or jet which might otherwise result in fire or toxic exposure.

Why do I need them and what drives the requirements?

Drivers

Throughout process industries, focus on safety of personnel and assets is growing dramatically. Whether it be corporate policy for 'zero accidents', industrial insurance, industry-specific regulation, or general best practice, safety shields are increasingly being used to control pipeline leaks.

Insurance requirement

The cost of site fires, explosions and personal injury is significant. Industrial insurers now focus specifically on spray-out and oil mist prevention, and often insist on safety shielding.

Company policy & best practice

To reach the goal of 'zero accidents', many companies create and insist upon safety policies and requirements that often include safety shielding.

Recent incident or near-miss

Very often, site incidents or near-misses will necessitate a safety review, at which time safety shields are considered as corrective or preventative action.

Hazardous area zoning (ATEX)

Many customers use safety shields as part of their case to reduce zoned areas.

Industry regulations

Various regulations exist, some specifying safety shielding, and others recommending shielding as a control measure.

OSHA
"Protective equipment, incl. PPE for eyes, face, head and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided".

EI 15
Energy Industry requirement for oil lines above 1bar pressure. Mainly focused on avoidance of oil mist prevention.

SOLAS
This marine industry regulation includes requirement for shielding/ screening of oil spray within vessel engine rooms.

DSEAR / Hazardous Area Zoning
Dangerous Substances & Explosive Atmospheres Regulation (Europe).

Shields are recommended as a control measure to prevent spray and mist.

Sites now use shields to reduce the size of zoned hazardous areas (since spray and mist is avoided, thus the ATEX 'bubble' is smaller).

OTHER
There are a variety of other reasons to fit shields, including pollution control, general site cleanliness and protection of nearby electrical equipment.

Flange failures cause incidents and accidents around the world, the results of which can be devastating.

Fire, Explosion, Toxic release
All resulting in human and financial loss.

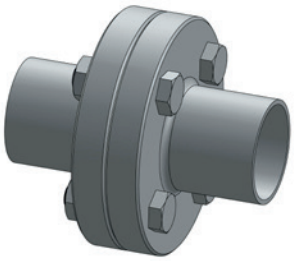
Where do I install flange guards?

Flanges are the most common application for safety shields. They are used to connect pipelines, valves, pumps, strainers and various other pipe joints. But these joints are considered the weak point from a leakage point of view.

Whilst the vast majority of pipe joint seals operate perfectly through correct material selection and routine maintenance, many high profile incidents and accidents have occurred around the world, specifically caused by flange leaks.

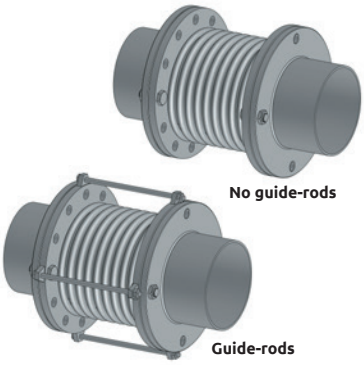
Shields to fit flanges

Flange Guards

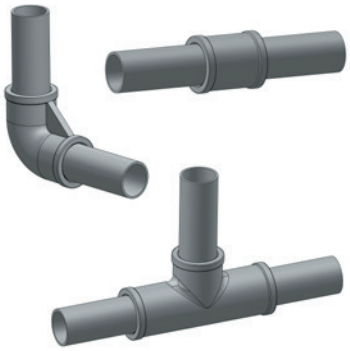


Shields to fit joints and couplings

Expansion Joints



Elbows / Couplings



Shields to fit valves

1 Piece Valves


Diaphragm Valve


Butterfly Valve


Wafer Check Valve


Swing Check Valve


Ball Valves

3 Piece Valves


Globe Valves


Gate Valves

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Styles of flange guards

There are many different shield designs available, but which one should you select?

With no internationally recognised standards and a variety of applications, there is no single shield design suitable for every process.

This makes shield selection challenging so we strongly suggest following these golden rules:

Flange shield selection: The Golden Rules

PROCESS SUITABILITY

Select a shield material compatible with your process media

Consider the wide range of processes, all with their own material compatibilities; strong acids, bases, oil, steam, LGN, hydrogen.

Select a shield design able to handle your pressure & temperature range

With applications ranging from cryogenic to super-heated, and a huge range of pressures from ambient to 300bar / 5,000psi +.

PIPE JOINT SUITABILITY

Select a shield design suitable for your specific pipe joints

Review all pipe connections in the area of concern. Identify which ones present sufficient risk of a leak and require shields. Make an inventory of pipe joint types and sizes.

NOTE: *For retrofit applications, this is best done by physically walking the plant (flanges with a spacer, orifice or other obstruction need to be highlighted).*

SHIELD PURPOSE

Be clear about what you want the shield to do

Generally, the main purpose of flange shields are to control the leak, not stop or seal it. For some applications, visual leak indication is important. For others, it's controlling the direction of the leak.

DUE DILIGENCE

Select a specialist shield manufacturer or supplier

Not all manufacturers are specialists, some just copy existing designs with look-alikes. Further, not all shield designs are pressure tested. Engage with a specialist who will assist in choosing the right shield for your applications.

NOTE: *As shield designs evolve, it is increasingly important to consider the practical impacts of using shields:*

- *How easy are they to fit/remove.*
- *How forgiving are they for non-standard fittings/ obstructions.*
- *How can flange corrosion be avoided.*

Contact one of our experts who can assist you in choosing the right shield for your applications:

sales@flangeguards.com

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Our shield designs

With four decades of experience, we have developed a complete range. We always adhere to our second set of golden rules:

Product range: The Golden Rules

SAFE

Our first priority is for the Safety Shield to be FIT FOR PURPOSE

The shield must effectively diffuse the force from a pressurised leak, preventing direct or lateral spray and mist formation – controlling the release safely.

The shield must perform in line with site and process conditions.

SIMPLE

Shields must be easy to specify and use

Simple fitting & remove is critical in order for the shield to be adopted by the maintenance team.

Too many shield designs and options makes specification complicated. Quick connection and multi-size functionality makes this much easier.

SUITABLE

The shield range must accommodate all process applications

There is not one single shield design suitable for all process applications. The trick is to develop the smallest range of shield designs to accommodate the vast majority of applications.

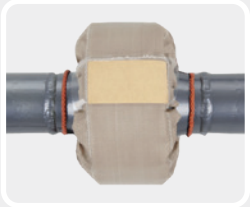
Whilst we never compromise quality, good safety shields must also be economically viable.

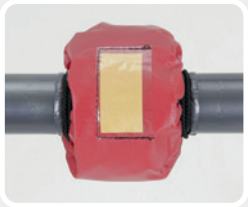
OUR PRODUCT RANGE COMPRISES TWO SHIELD DESIGNS

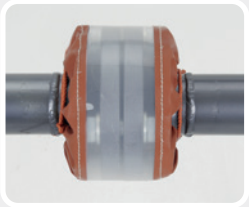
Our **SUREBAND®** shield design has been developed to overcome common issues associated with older designs. **SUREBAND®** is the perfect shield for the vast majority of standard flange and valve applications.

We do also continue to manufacture the conventional fabric bag design, not least because it can be fabricated into a wide range of non-standard shapes and sizes.

SUREBAND®







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The SUREBAND® difference

SAFER

Our PDT technology makes SUREBAND® the most effective shield design on the market

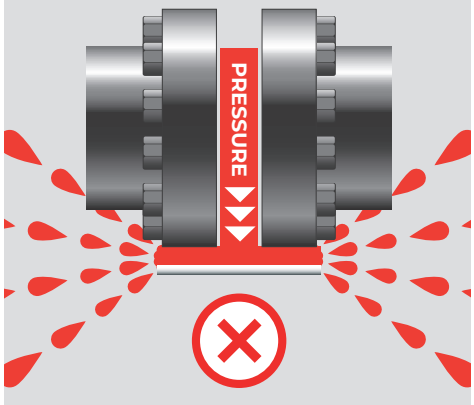
Innovation in Safety Spray Shield design

SUREBAND® PDT
(pressure diffusion technology)

Uses a specially formulated multi-layered mesh that is held against the flange. The pressure is diffused in a controlled manner thus preventing formation of a mist/vapour cloud. At the point of exit from the shield, the leak takes the form of a safe, vertical drip or stream.

Our leak testing facility has proven that pressure diffusion is required to prevent spray and mist formation. However, many shield designs have no diffusion – and this can create a worse leak than no shield at all.

HAZARDOUS SPRAY & MIST



Shield with no PDT

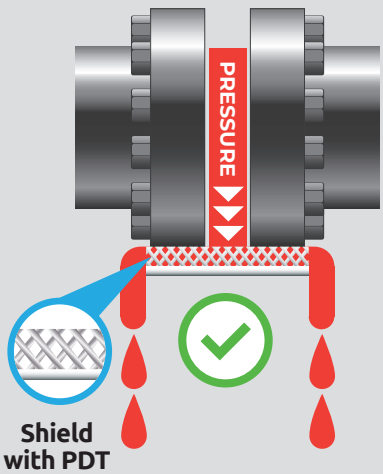
FEATURES

- DIFFUSES PRESSURE IN A CONTROLLED MANNER
- PREVENTS MIST/VAPOUR CLOUD

BENEFITS

- SAFE CONTROLLED LEAK
  - Effective leak force diffusion even at high pressure
- AUTOMATIC SELF DRAINING
  - Reduced risk of flange corrosion
  - Reduced operator risk (fabric 'bag' design holds leaking liquid)

SAFE RELEASE



Shield with PDT
(Pressure Diffusion Technology)

QUICKER

Our Quick-fit connection makes installation and removal quick and simple

SUREBAND® has been designed with simplicity in mind. Unlike conventional 'pull-cord' shields, no knots are required. This is a significant benefit, especially when removing shields – and tightly tied knots are typically cut, not untied.

Ongoing pipe maintenance require shields to be removed. Gloves are generally mandatory, so pull-cord knots are typically cut off rendering these shields useless and unable to be refitted.

Operatives are more likely to re-fit **SUREBAND**®, as they are so simple. This is critical for ongoing safety, and necessary, particularly where shields are used within hazardous area zoning calculations, thus failure to re-install the shields invalidates zone classification.

The ***Clear*** shield uses proprietary new hook & loop technology delivering staggering shear strength

The ***Steel*** shield uses a quick-connection latch which locks into one of a series of specially designed louvre slots.

FEATURES

- CLEAR SHIELD HOOK + LOOP TECHNOLOGY
- STEEL SHIELD LATCH
- SIMPLE INSTALLATION

BENEFITS

- QUICK POSITIVE CONNECTION
- MORE LIKELY TO BE RE-FITTED

FLEXIBLE

MULTI-SIZE FUNCTION

Our clever Multi-Size system means one shield fits multiple flange sizes. In fact, 5 shield sizes fit all 28 standard flanges between ½" and 6" / 15mm and 150mm pipe size (across multiple pressure classes).

This reduces stockholding and speeds up delivery dramatically. It also prevents fitting errors where site surveys are required (fixed size shields require precise flange measurement).

SUREBAND® can be made to fit either a specific flange size or multiple flange sizes. Custom sizes can be created upon request.

FEATURES

- ONE SHIELD FITS MULTIPLE FLANGE SIZES
- 5 SHIELD SIZES FOR 28 FLANGE SIZES BETWEEN ½" AND 6" / 15MM AND 150MM PIPE SIZE
- SHIELD SIZE RANGES CAN BE TAILORED TO CUSTOMER REQUIREMENT

BENEFITS

- CONSIDERABLE STOCK SAVING AND SHORTER LEAD TIME
- IMPROVED FLEXIBILITY, LESS ERRORS WITH FITTING
- MEET EXACTING REQUIREMENTS

The SUREBAND® Range

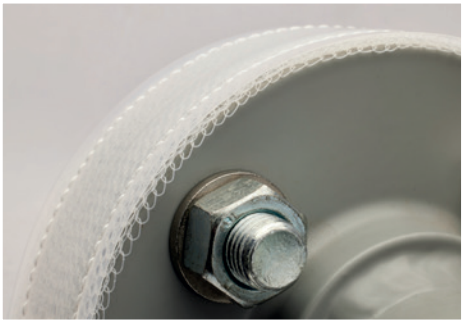
We have three SUREBAND® models accommodating a wide range of process applications. All offer our SAFE, QUICK and FLEXIBLE features.

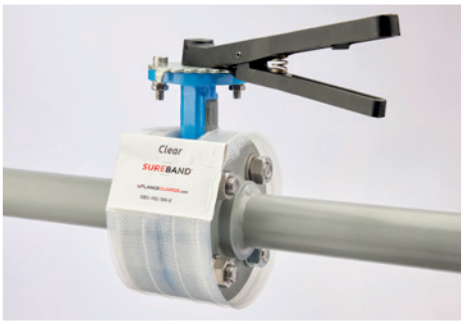
For corrosive applications

For high pressure & temperature applications

For marine SOLAS applications

SUREBAND® *Clear*





FEATURES

- PRESSURE DIFFUSION TECHNOLOGY (PDT)
- QUICK-FIT CONNECTION
- MULTI-SIZE FUNCTION
- SELF DRAINING

BENEFITS

- PREVENTS SPRAY, MIST, VAPOUR
- CONTROLS & CHANNELS THE RELEASE
- SIMPLE FITTING & REMOVAL
- REDUCES RISK OF FLANGE CORROSION

SUREBAND® is a revolutionary safety spray shield manufactured by Flangeguards.

SUREBAND® ***Clear*** comprises a clear ETFE outer and multi-layered ETFE mesh inner. Incredibly durable hook & loop connects the shield together, providing unparalleled shear strength (exceeding by far, the process pressure requirements).

These materials are assembled and held in place using pure polymer PTFE thread. Insight: This is historically the 'weak' point of fabric 'bag' style shields, invariably using PTFE coated glass thread, which wears during the sewing process and over time on site.

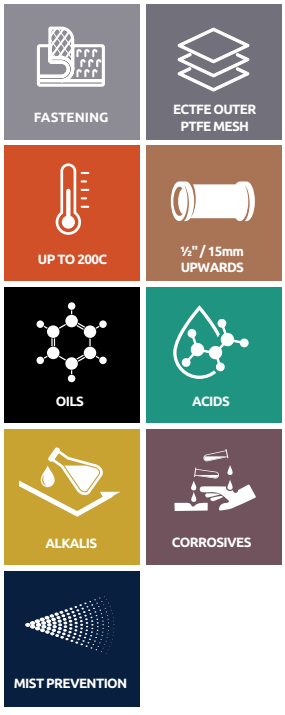
SUREBAND® ***Clear*** installation is quick and easy with incredibly strong, heavy duty Velcro fastener ensuring correct fitment.

Once installed, the internal mesh is compressed against the flange, preventing direct and lateral spray. The liquid pressure inside the shield is rapidly diffused, resulting in a safe drip-release.

SUREBAND® ***Clear*** incorporates a replaceable litmus leak indicator strip to provide visual warning of leaks of hazardous liquids.

In the event of a leak **SUREBAND®** ***Clear*** can be re-used thus providing a long term solution.

SUREBAND® ***Clear*** has been pressure tested in excess of 50 bar, is suitable for maximum surface temperature of 200˚C and fits pipe sizes from ½" / 15mm upwards.



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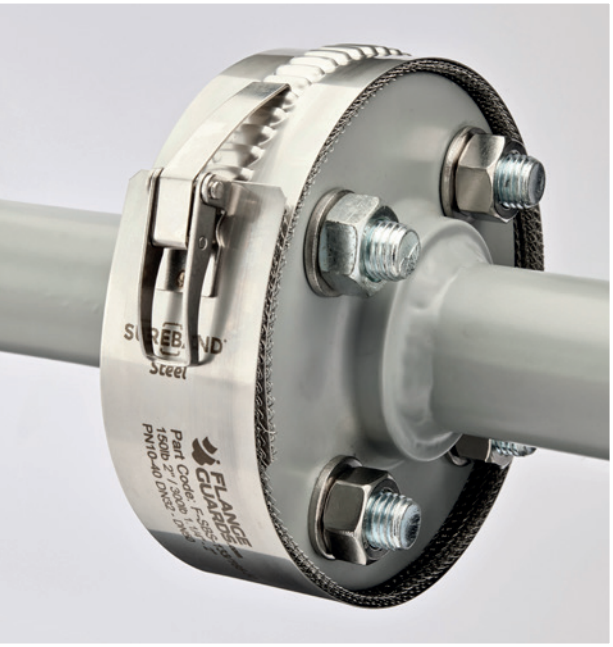
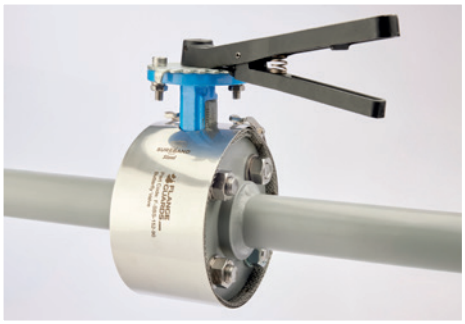
SUREBAND® Steel





FEATURES

- PRESSURE DIFFUSION TECHNOLOGY (PDT)
- QUICK-FIT CONNECTION
- MULTI-SIZE FUNCTION
- SELF DRAINING

BENEFITS

- PREVENTS SPRAY, MIST, VAPOUR
- CONTROLS & CHANNELS THE RELEASE
- SIMPLE FITTING & REMOVAL
- REDUCES RISK OF FLANGE CORROSION

SUREBAND® is a revolutionary safety spray shield manufactured by Flangeguards.

SUREBAND® ***Steel*** comprises a 316 stainless steel band and an internal layer of 316 stainless steel mesh. This material provides unparalleled heat resistance.

SUREBAND® ***Steel*** installation is quick and easy with the metal quick-connection latch, ensuring correct fitment.

Once installed the steel mesh is compressed against the flange itself. This mesh, which is crimped along the centre to fill the gap between the two flange faces quickly and efficiently diffuses the spray-out, resulting in a safe drip-release.

SUREBAND® ***Steel*** is quick to install and typically used on high pressure pipelines.

In the event of a leak **SUREBAND®** ***Steel*** can be reused thus providing a long term solution.

SUREBAND® ***Steel*** has been pressure tested to 335 bar, is suitable for maximum surface temperature in excess of 500 ˚C and fits pipe sizes from ½" / 15mm upwards.

SUREBAND® *Marine*

FEATURES

- PRESSURE DIFFUSION TECHNOLOGY (PDT)
- QUICK-FIT CONNECTION
- MULTI-SIZE FUNCTION
- RE-USABLE AFTER MAINTENANCE

BENEFITS

- PREVENTS SPRAY, MIST, VAPOUR
- CONTROLS & CHANNELS THE RELEASE
- SIMPLE FITTING & REMOVAL
- VERY LOW WHOLE-LIFE COST

SUREBAND® *Marine* is a simple and cost-effective solution, overcoming issues relating to conventional ANTI-SPLASH tape. Designed specifically for SOLAS Consolidated Edition 2020, Chapter II-2, Part B, Regulation4:

2.2.5.3 Oil fuel lines / Lubricating oil / Other flammable oils "shall be screened or otherwise suitably protected to avoid spray of oil leakage onto the sources of ignition"

With 3 shields covering 139 flange sizes, **SUREBAND® *Marine*** offers unparalleled flexibility. Additionally, we offer a 10m roll which can be cut and used to fit virtually any flange (standard or non-standard).

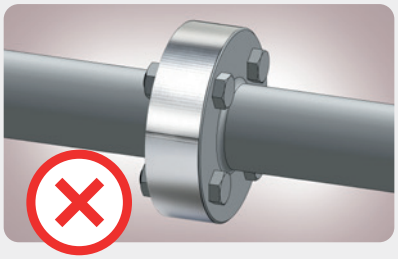
Cost comparison between SUREBAND® *marine* and ANTI-SPLASH tape

ANTI-SPLASH Tape is single-use which must be peeled or cut off during maintenance, with new tape applied afterwards. Over the vessel lifetime, this becomes increasingly expensive, sourcing new tape from ship chandlers.

Cost per flange depends on several factors. Most important is the way the tape is installed. Manufacturer's instructions specify that flanges are wrapped down to the pipe:

SUREBAND® *Marine* is fitted and removed in seconds (no tools). This means it can be re-used after maintenance, proving a long-term solution.

Three sizes fit multiple flanges and for ultimate flexibility, a 10m roll is available.



When installed correctly, ANTI-SPLASH tape is more expensive than **SUREBAND® *Marine*** even as a one-off purchase.

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Technical fabric and PVC laminate shields

Our fabric 'bag' style shields are manufactured in three materials and represent the highest quality in this design category.

Whilst we recommend **SUREBAND®** for standard flanges, the fabric 'bag' style still has its place – and can be fabricated into complicated shapes and sizes to accommodate non-standard pipe joint applications.

Installed without the need for special tools, using a Velcro strip and draw strings on either side to hold the shield tight against the flange. This design is well established to prevent spray-out, controlling the leak into a safe path.

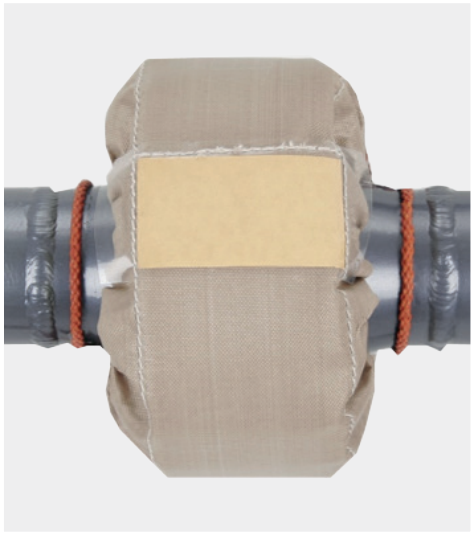
Technical fabric shields

For corrosive chemicals & fuel/lubrication oil applications

PTFE

Manufactured from three layers of woven, PTFE coated fibreglass

- CENTRAL PTFE COATED SCRIM FOR EXTRA STRENGTH
- PTFE COATED GLASS THREAD
- PTFE BRAIDED DRAW STRINGS
- LITMUS INDICATOR PATCH



PTFE-CLEAR

Manufactured with central clear ETFE and PTFE coated fibreglass sides

- CLEAR CENTRE PERMITS VISUAL FLANGE INSPECTION
- PTFE COATED GLASS THREAD
- PTFE BRAIDED DRAW STRINGS
- LITMUS INDICATOR PATCH

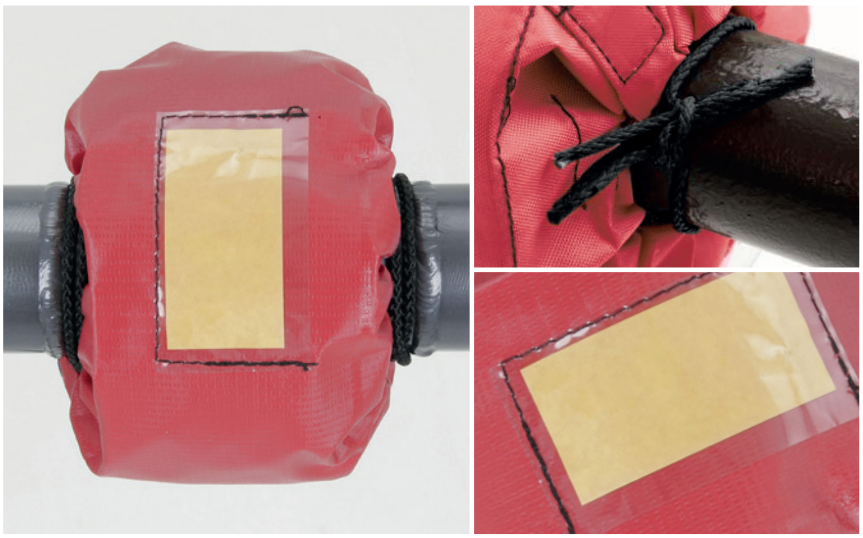
PVC laminate shields

For applications with low corrosion, pressure & temperature

PVC

Manufactured from two layers of PVC laminate, offering economic solutions

- LITMUS INDICATOR PATCH
- LOW COST SOLUTION
- PVC DRAW STRINGS



Other options and products

SHAPES & SIZES

We manufacture shields to fit a multitude of different sizes and shapes, and can create cut-outs for valve handles, paddles and other protrusions. Typical applications include:

- VALVES (BUTTERFLY, BALL, GLOBE ETC)
- COUPLINGS,TEES, ELBOWS
- PUMP ASSEMBLIES
- EXPANSION JOINTS

OPTIONS

Need a drain assembly or special labelling per-shield?
No problem. We always endeavour to accommodate special client requests. Typical applications include:

- DRAINS (VARIOUS LENGTHS)
- ID TAGS & LABELS
- ADDITIONAL STRAPPING & LOCKS
- ALTERNATIVE SHIELD MATERIALS

We also manufacture a comprehensive range of Thermal Insulation Covers
www.**thermalinsulationcovers**.com

Survey and Installation

Safety shields are made to fit specific pipe joints. To ensure the shield is fit for purpose, it is important to select the design and material which are compatible with the process. Further, the pipe joint dimensions are required in order for the shields to fit correctly.

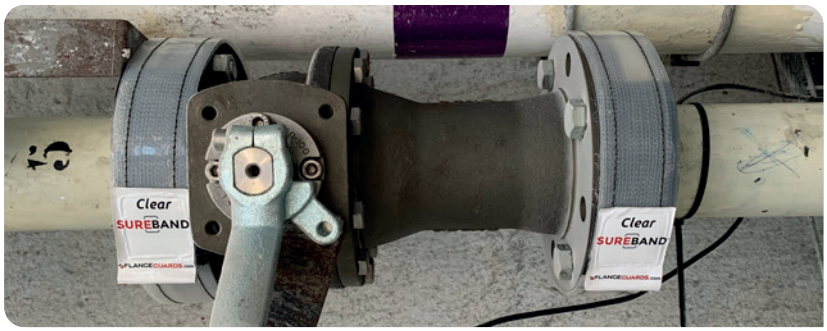
Our Total Shield Solutions guidebook provides detailed information about correct shield selection. It contains a section on sizing and self-surveying, and includes blank survey sheets which can be used on site. The guidebook is available as a free download from our website.

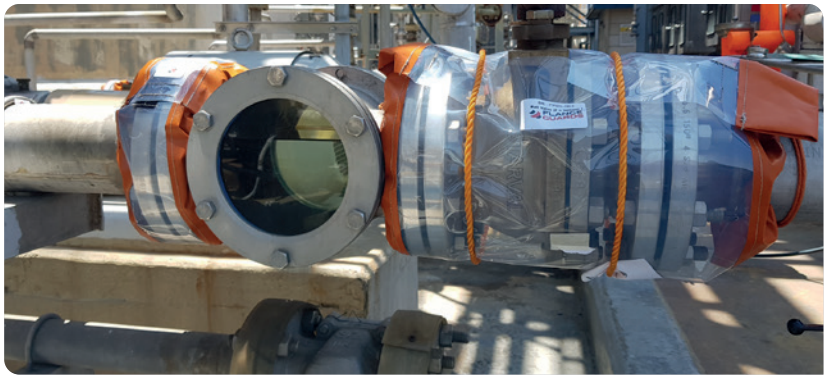
HELP WITH SURVEY AND INSTALL

If in doubt, ask us. We have over twenty five years' experience and are always happy to make recommendations and clarify specific dimensions required.

We help ensure you select the appropriate shield for your application.

Here are just a few examples where we have helped companies mitigate hazards and risk to plant, equipment and health.

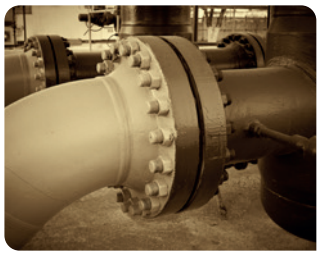




Applications

Spray safety shields are commonly used to control the accidental release of liquids from failed flanges, joints and connections. Typical applications for safety spray shields include:

If left unshielded, and the flange fails, the results can be catastrophic:



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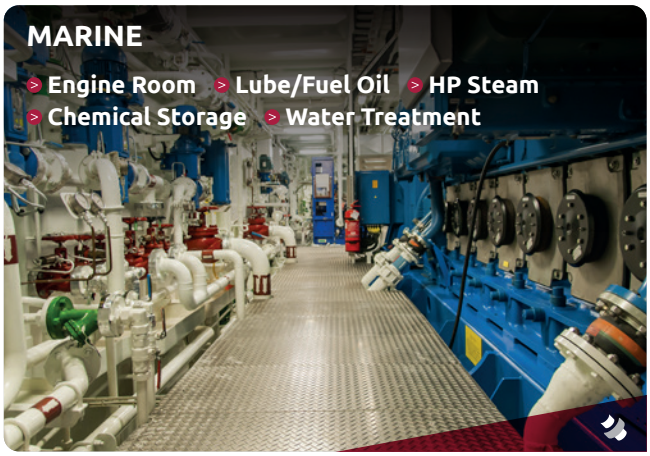
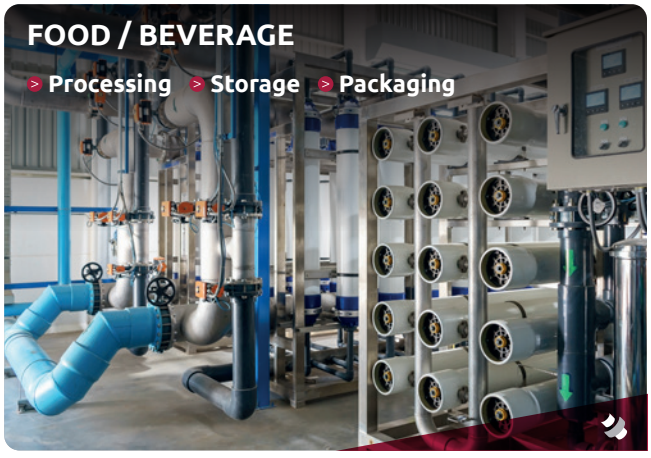
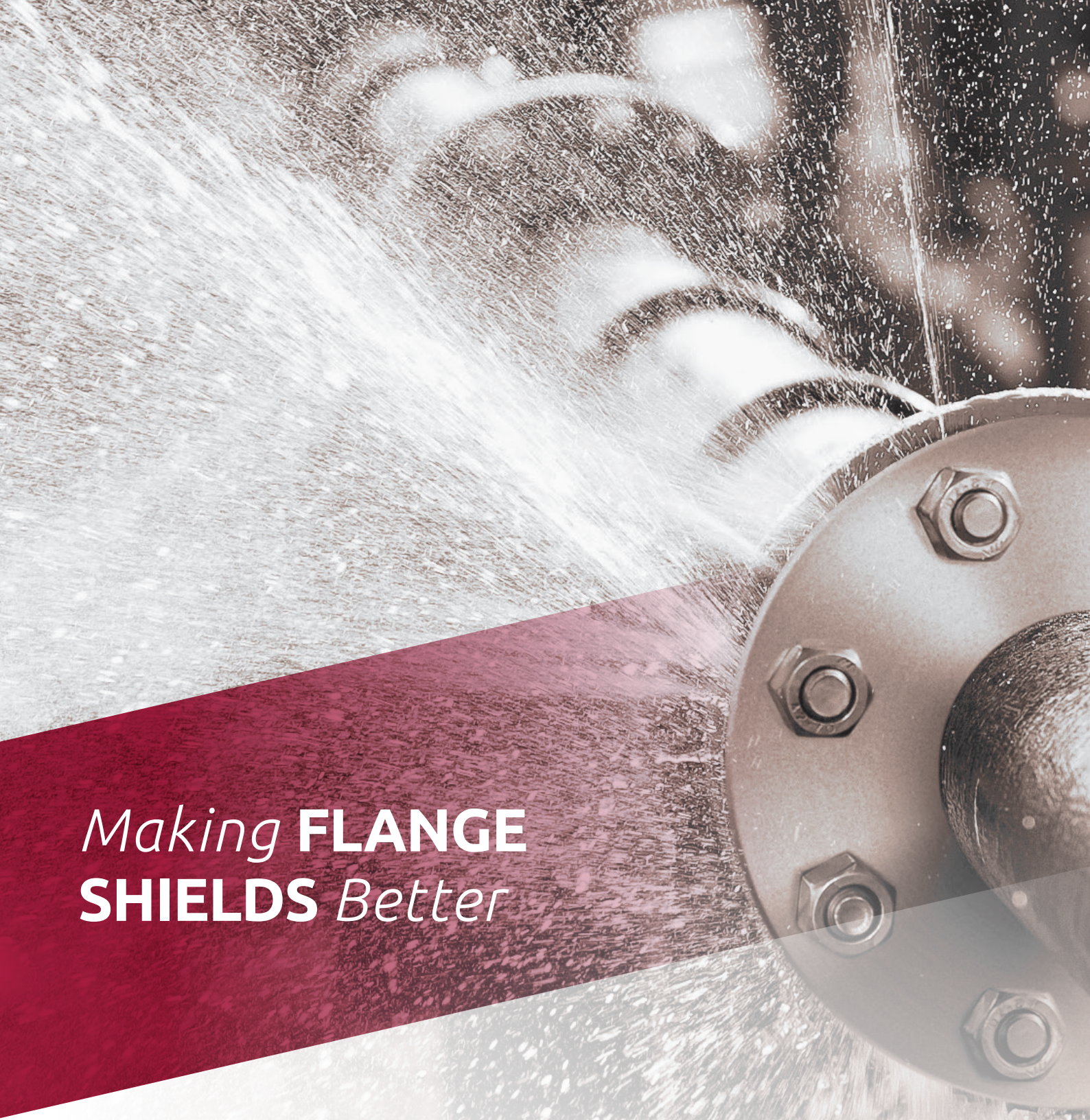
Industries

Flange guards, or spray safety shields as they are otherwise known, are used in all manner of industry, in particular those involved in the processing of flammable, volatile, toxic or corrosive liquids.

Key industries where greater protection of plant equipment and personnel is necessary due to the nature of the processing include:







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