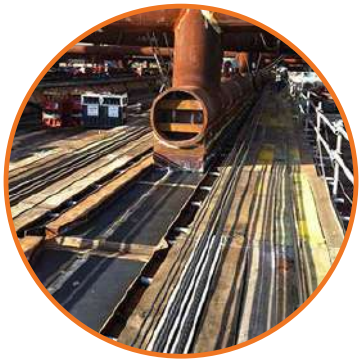
CROSSFLON®
SKIDWAY SYSTEMS
& SLIDE BEARINGS

Beldam Crossley

INDUSTRIAL SEALING, BEARING AND POLYMER EXPERTS



An Integral Part of Your Success

Our Heritage

Beldam Crossley has a proud history, the origins of which date back to 1876. During that time, we have achieved an unrivalled reputation for providing advanced sealing, bearing and polymer based products. This experience and expertise means we are able to offer safe and highly reliable solutions for use in the most arduous of conditions.

Industry Sector Experience

Always at the forefront of new developments, we have responded quickly to the constantly changing worldwide demands of specialised sectors as diverse as aerospace, power generation, construction, marine, automotive, oil & gas, petrochemical and defence.

Quality, Environmental and Occupational Health & Safety Management Standards

All our manufacturing is based in the UK and operates to internationally accepted standards - including a Quality Management System to ISO 9001:2015 and AS9100D, Environmental Management System to ISO 14001:2015 and Occupational Health & Safety Management System to ISO 45001:2018.

This means we are able to provide a proven range of products and services, together with expertise and experience, which offer robust and high quality life-protecting installations in applications where failure is not an option.

Research & Development

Today, we are recognised as being at the leading edge of technology. A position gained through our commitment to research and continued investment in the most sophisticated manufacturing plant and equipment.

With a clear focus on the future, we are committed to being the ‘best in class’ choice by offering groundbreaking ideas, the ultimate in product reliability, and unbeatable customer support.

> “Our products are tailor-made to meet client’s exacting needs, with engineers on hand to support our customer base every step of the way”

FORWARD THINKING SOLUTIONS WITH A HISTORY OF EXPERTISE

EN 9100 Quality Management, ISO 14001 Environmental Management and ISO 45001 Occupational Health & Safety Management certified by BSI under certificate numbers FM 12800, EMS 61643 and OHS 730798.

Crossflon® Skidway Systems & Slide Bearings

Crossflon®

Beldam Crossley has been moulding PTFE for over half a century. We have since developed a wide range of High Performance Crossflon® materials, each suited to a specific application. This has enabled us to become one of the market leaders in providing skidway system & slide bearing solutions to the oil & gas, petrochemical and construction industries.

> “We offer a specialised design & manufacturing service committed to providing for your skidway system & slide bearing needs”

Advantages of Crossflon® Skidway Systems & Slide Bearings

- Crossflon® PTFE has the lowest coefficient of friction of any known solid engineered material including lubricated metal and there is no stick / slip action.
- Crossflon® XF225 is unaffected by water as the moisture absorption is less than 0.01%.
- The life of Crossflon® XF225 is indefinite as it is unaffected by chemicals and weather.
- Not subject to fatigue failure.
- Ease of installation.
- Shear value of the bond exceeds that of Crossflon® PTFE.
- Far less bulky than alternative assemblies.
- Operating temperature ranges from -40°C to +120°C. Alternative bonding sytems are available for temperatures outside this range.
- Maintenance is not required. Capable of operating completely dry as Crossflon® XF225 will never cold weld to itself.
- Provides electrical and thermal insulation thereby minimising galvanic corrosion and heat loss.
- Vibration dampening.
- Able to absorb small particles without increasing the coefficient of friction.
- Crossflon® XF225 is chemically inert.
- Able to accommodate minor misalignment during construction.

Crossflon® Skidway Systems

Crossflon® skidway systems are used to aid the skidding of topsides, jackets and other heavy fabrications. A structure weighing in excess of 47,000 tonnes has been successfully loaded out on a Crossflon® skidway system.

We offer a range of Crossflon® skidway plates to suit customers individual requirements. A typical Crossflon® skidway plate consists of 2.5mm thick dimpled Crossflon® XF225 sheet hot cure factory bonded under controlled conditions to a 3mm thick carbon steel plate. Crossflon® skidway plates are normally manufactured with a 25mm welding lip. This prevents the Crossflon® XF225 from being damaged when the Crossflon® skidway plates are tack welded into position. The PTFE / steel bond line and all upper exposed carbon steel surfaces are generally supplied coated with paint to protect against corrosion.

Typical Configurations

‡ Images are for illustrative purposes only. Typical configurations shown.
Alternative arrangements are available, please contact us for more information. See material key on page 7.

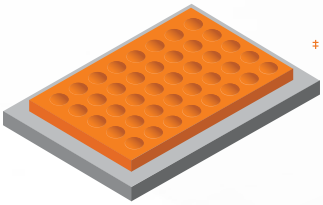
Crossflon® Skidway Plate - Dimpled

Typical Assembly:
2.5mm thick dimpled Crossflon® XF225 bonded to a 3mm thick carbon steel plate.

Typical Dimensions:
Crossflon® XF225:
950mm x 450mm.

Carbon Steel:
1000mm x 500mm.

Method of Installation:
Tack welding.



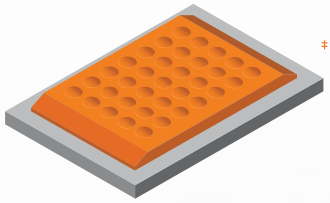
Crossflon® Skidway Plate - Dimpled & Chamfered

Typical Assembly:
2.5mm thick dimpled Crossflon® XF225 bonded to a 3mm thick carbon steel plate.

Typical Dimensions:
Crossflon® XF225:
950mm x 450mm.

Carbon Steel:
1000mm x 500mm.

Method of Installation:
Tack welding.



We offer Crossflon® XF225 with dimples spread uniformly across the skidding surface. The purpose of the dimples is to retain Crossflon® XF500, an additional lubricant, during the construction periods and to assist in reducing the static and dynamic coefficient of friction.

Crossflon® skidway plates are generally manufactured with the edges of the Crossflon® XF225 chamfered to aid the transition of the timber skid shoes during a load-out or launch operation.

Crossflon® Skidway Systems

Crossflon® Lubrication Systems

Crossflon® XF500 is a water repellent grease primarily developed as a lubrication aid for Crossflon® skidway plates, but also suitable for use in general engineering applications where low coefficient of friction and reduction in shear energy is required. It offers technical and commercial advantages over conventional greases such as silicone oil.

We recommend the use of Crossflon® XF100 membrane to reduce the initial static friction caused by absorbent timber skid shoes, lengthy construction periods, uneven loading and construction site debris.

Crossflon® Skidway System - Fabrication Yard

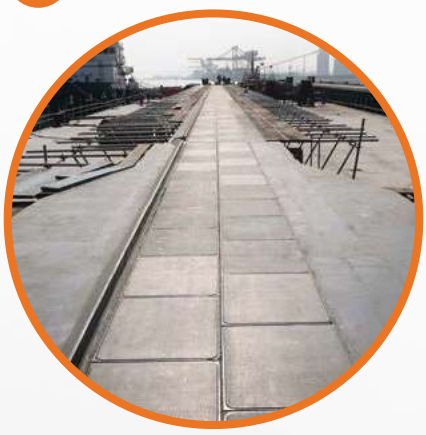
- Crossflon® skidway plates - dimpled & chamfered.
- Crossflon® XF500 lubricant.
- Crossflon® XF100 membrane.

Crossflon® Skidway System - Launch Barge

- Crossflon® skidway plates - dimpled & chamfered.
- Crossflon® XF500 lubricant.

Installation Guide

1



Stage 1

Crossflon® skidway plates are tack welded to the skid beam generally in an offset configuration. This is to distribute pressure more evenly during a load-out or launch operation.

2

Stage 2

Crossflon® XF500 lubricant is applied to the surface of the Crossflon® XF225 and then a layer of Crossflon® XF100 membrane is rolled into position.

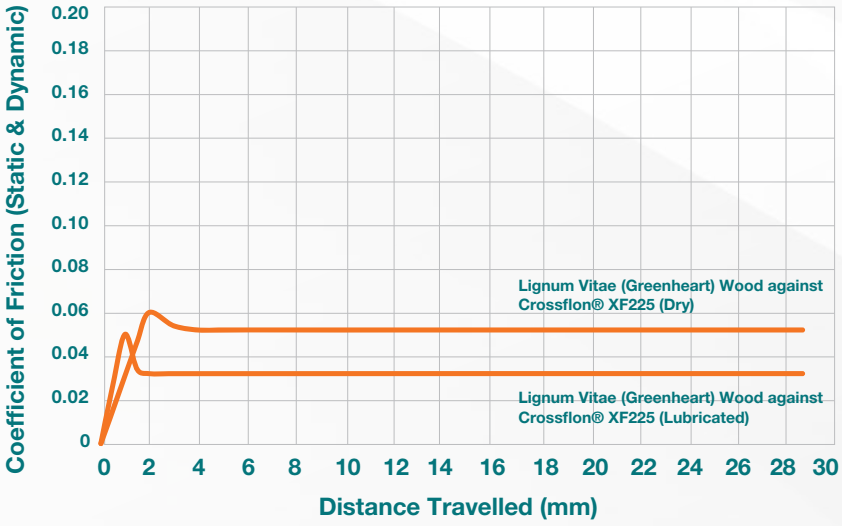
3

Stage 3

Once the Crossflon® XF100 membrane has been installed, the timber skid shoes can be lowered into place for construction to commence.

Crossflon® Skidway Systems - Technical Data

Figure 1: Coefficient of Friction (Static & Dynamic) vs. Distance Travelled



Typical coefficient of friction values are 5 to 8% for static (breakout) and 2 to 5% for dynamic (skidding). These values are based upon the correct installation of the Crossflon® skidway plates, surface finish of the timber skid shoes and the application of a Crossflon® lubrication system.

Actual coefficient of friction values recorded during the load-out of a 32,000 tonne jacket on a Crossflon® skidway system were 5% for static (breakout) and 3% for dynamic (skidding).

Crossflon® XF225 - Technical Data

Crossflon® XF225 is an enhanced form of PTFE, which offers substantially improved performance over the materials traditionally used in the manufacture of skidway plates and slide bearings, namely virgin and 25% glass fibre filled PTFE.

As the technical data shows, Crossflon® XF225 can accommodate significantly higher pressure than 25% glass fibre filled PTFE and yet has coefficient of friction values which are comparable with those of virgin PTFE.

MATERIAL COMPARISON TABLE			
MATERIAL	**VIRGIN PTFE**	**25% GLASS FIBRE FILLED PTFE**	**CROSSFLON® XF225**
DESCRIPTION	A PTFE material that has a low coefficient of friction and high chemical inertness. Suitable for a very wide range of applications that require these characteristics.	A reinforced PTFE material that has high compressive rigidity, low cold flow, high wear resistance and good chemical resistance. For use in most applications involving sealing and bearing.	A reinforced PTFE material that has a low coefficient of friction, high creep resistance, high load bearing capacity and high wear resistance. Specifically developed for skidway and slide bearing applications.
TYPICAL PROPERTIES			
Operating Temperature Range (Continuous Service)	-250°C to +260°C	-250°C to +260°C	-250°C to +260°C
Compressive Strength 1% Strain 5% Strain 0.2% Offset (Based on ASTM D695)	4.0 MPa 11.5 MPa 9.0 MPa	6.2 MPa 16.5 MPa 12.3 MPa	10.8 MPa 30.0 MPa 18.2 MPa
Maximum Pressure (P) Non-Recessed Design Maximum Pressure (P) Recessed Design (Based on 2% Strain)	Up to 6.9 MPa Up to 13.7 MPa	Up to 13.7 MPa Up to 27.5 MPa	Up to 18 MPa Up to 50 MPa
Static Coefficient of Friction (BCL Method)	0.04 - 0.06	0.11 - 0.19	0.04 - 0.08

Crossflon® Slide Bearings

Crossflon® slide bearings are used in a wide range of applications including pipe lines, heat exchangers, pressure vessels, storage tanks, industrial machinery, buildings and bridges.

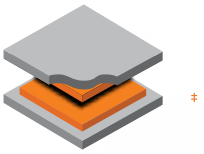
A Crossflon® slide bearing normally comprises of an upper element and a lower element, which operate by sliding against one another. The upper element is generally larger than the lower element by the amount of the anticipated movement. This ensures that the lower element is subjected to uniform load throughout motion and excludes foreign matter from the sliding interface.

Typical Configurations

‡ Images are for illustrative purposes only. Typical Configurations shown. Alternative arrangements are available, please contact us for more information.

Material Key

Crossflon® XF225 | Carbon / stainless steel | Polished stainless steel | Elastomer



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Crossflon® Slide Bearing

Typical Assembly:

Top Sliding Plate:

2.5mm thick Crossflon® XF225 bonded to a 3mm thick carbon / stainless steel plate.

Bottom Sliding Plate:

2.5mm thick Crossflon® XF225 bonded to a 3mm thick carbon / stainless steel plate.

Method of Installation:

Tack welding, full welding, bolting,

‡

Crossflon® Slide Bearing - Recessed

Typical Assembly:

Top Sliding Plate:

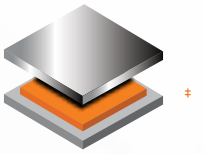
3mm thick polished stainless steel plate.

Bottom Sliding Plate:

5mm thick Crossflon® XF225 bonded into a 2.5mm deep recess in an 8mm thick carbon / stainless steel plate.

Method of Installation:

Tack welding, full welding, bolting, mortar embedment.



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Crossflon® Slide Bearing - Counterfaced

Typical Assembly:

Top Sliding Plate:

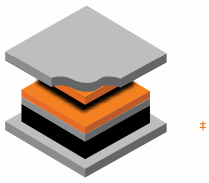
3mm thick polished stainless steel plate.

Bottom Sliding Plate:

2.5mm thick Crossflon® XF225 bonded to a 3mm thick carbon / stainless steel plate.

Method of Installation:

Tack welding, full welding, bolting, mortar embedment.



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Crossflon® Slide Bearing - Elastomeric

Typical Assembly:

Top Sliding Plate:

2.5mm thick Crossflon® XF225 bonded to a 3mm thick carbon / stainless steel plate.

Bottom Sliding Plate:

2.5mm thick Crossflon® XF225 bonded to a 3mm thick carbon / stainless steel plate bonded to a 6mm thick elastomer sheet bonded to a 3mm thick carbon / stainless steel plate.

Method of Installation:

Tack welding, full welding, bolting, mortar embedment.

We offer slide bearings in a range of configurations, and each is designed to suit the specific application. A typical slide bearing element consists of 2.5mm thick Crossflon® XF225 sheet hot cure factory bonded under controlled conditions of temperature and pressure to a 3mm thick steel backing plate for welding to the installation. Alternative material thicknesses can be supplied.

Crossflon® slide bearings can be fixed to the installation by full welding, tack welding, mortar embedment or bolting. The appropriate slide bearing configuration should be selected to suit the method of installation. Care should be taken to adequately protect the surface of the Crossflon® XF225 during installation.

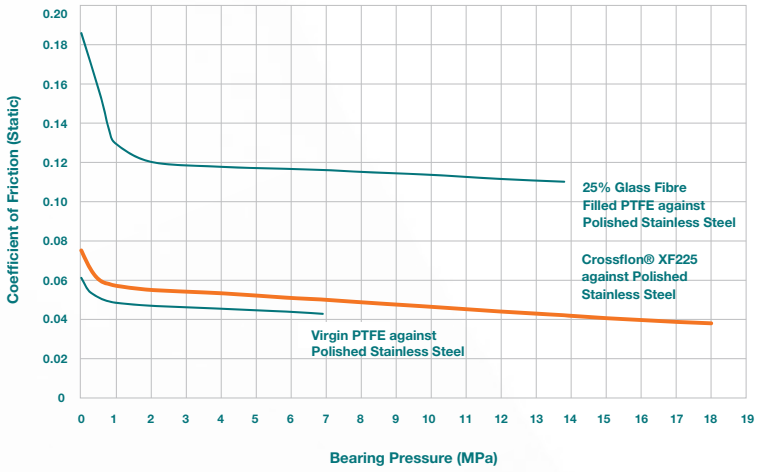
Substantial deviations from parallel movement of the structure can be accommodated by incorporating an elastometric element within the Crossflon® slide bearing.

Crossflon® slide bearings generally employ Crossflon® XF225 (a specially compounded reinforced PTFE) at the operating surface. Crossflon® XF225 is capable of accommodating loads of up to 18 MPa. The load bearing capacity of Crossflon® XF225 can be increased by containing it in a recessed steel backing plate and using polished stainless steel plate as the counterface.

For special considerations or difficult conditions, please contact us for assistance.

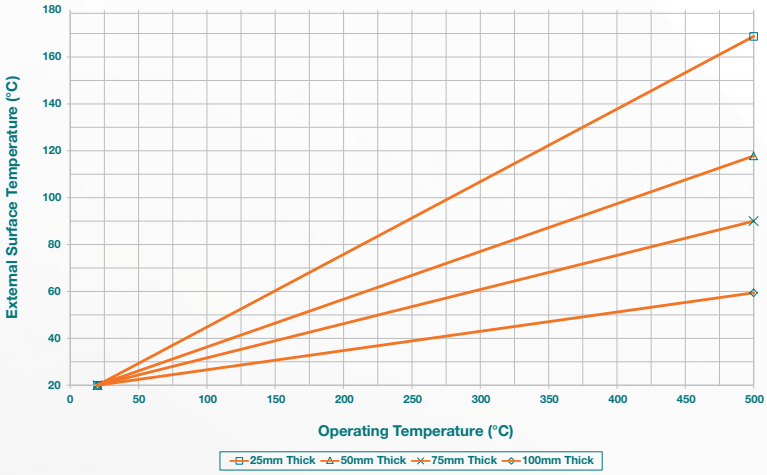
Crossflon® Slide Bearings - Technical Data

Figure 2: Coefficient of Friction (Static) vs. Bearing Pressure



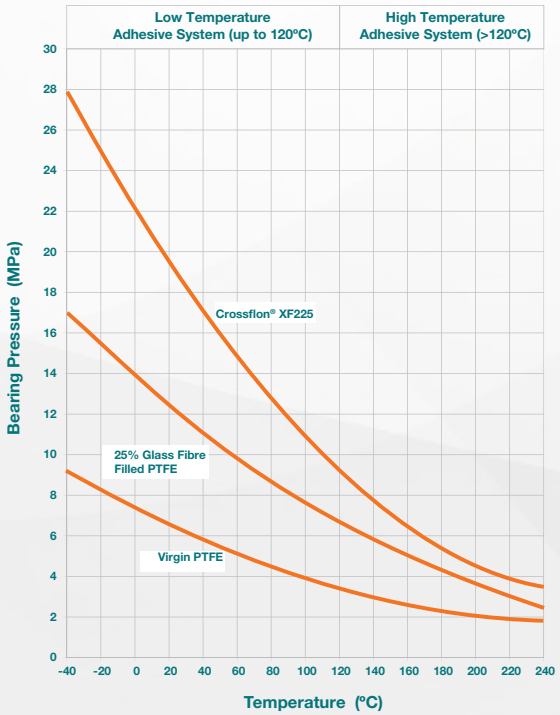
Dimpled & Plain Crossflon® Slide Bearings

Figure 3: Temperature Change For Various Thicknesses Of Thermal Insulation Board



Crossflon® XF225 is an enhanced form of PTFE, which offers substantially improved performance over the materials traditionally used in the manufacture of skidway plates and slide bearings, namely virgin and 25% glass fibre filled PTFE.

Figure 4: Recommended Maximum Bearing Pressure



Selection Guide

- Calculate the overall load of the structure as this will indicate the total area of the Crossflon® slide bearing required at an appropriate temperature and pressure.
- Consider the function and rigidity of the structure to determine the quantity and positions of the Crossflon® slide bearings.
- Take account of any unusual conditions that will affect the Crossflon® slide bearing during operation, such as the temperature at the sliding interface, angular misalignment and the need for acoustic or vibration dampening.
- The type of adhesive used is determined by the temperature range at which the Crossflon® slide bearings will be operating. We ask therefore that this information is specified on all enquires.
- Determine the most suitable method of fixing the Crossflon® slide bearings to the installation.
- Consider the operating environment and select the type of steel for the backing plates accordingly.
- If you have any difficulty in specifying your Crossflon® slide bearings, please contact us for assistance.

Case Studies

Case Study 1

A Crossflon® skidway system was used to aid the load-out of this 47,830 tonne (includes deck support frame) topside.

Case Study 2

A Crossflon® skidway system was used to aid the successful load-out of this 32,000 tonne jacket.

Case Study 3

A Crossflon® skidway system was used to aid the successful load-out and launch of this 30,000 tonne jacket.

Case Study 4

Crossflon® skidway systems were used to aid the successful load-out of a 15,600 tonne (includes deck support frame) topside.

Case Study 5

Crossflon® skidway systems were used to aid the load-out of this 12,300 tonne (includes deck support frame) topside.

Case Study 6

Crossflon® skidway systems were used to aid the successful load-out and launch of this 9,000 tonne jacket.

Case Studies

Case Study 7

Crossflon® slide bearings were used in the construction of the Tottenham Hotspur Stadium.

Case Study 8

Crossflon® slide bearings were used in the construction of London Bridge Station.

Case Study 9

Crossflon® slide bearings were used in the construction of London Heathrow Airport Terminal 2 (The Queen's Terminal).

Case Study 10

Crossflon® slide bearings were used in the construction of two bridges connecting the North Rankin A and B Platforms.

Case Study 11

Crossflon® slide bearings were used in the construction of The Leadenhall Building.

LOCAL SERVICE IN A GLOBAL MARKET

With a highly equipped manufacturing base, Beldam Crossley supported by its partners worldwide, is perfectly placed to provide an immediate response to match every customer's requirements. Our team are technically trained to offer advice on all our products in the most demanding of applications across all industry sectors.

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