Beldam **CROSSFLON®** Crossley High Performance Engineering Plastics

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 Assurance Standards

All our manufacturing is based in the UK and operates to internationally accepted standards - including BS EN ISO 9001:2008 and BS EN ISO AS 9100 Rev. C standards for design and manufacture of products for aerospace, and environmental management system standards to BS EN ISO 14001:2004.

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.

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"

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.

Global Reach

As a global business, Beldam Crossley has a network of Partners worldwide to ensure efficient and consistent product supply.



FORWARD THINKING SOLUTIONS WITH A HISTORY OF EXPERTISE

Materials

High Performance Engineering Plastics

Beldam Crossley have been at the leading edge of development within the polytetrafluoroethylene industry since its introduction into the UK market in the early 1950's.

By continually developing the exclusive and comprehensive Crossflon® XF range of specialist compounded materials, we aim to satisfy the ever increasing demands of today's industries. Great care is taken in selecting the most suitable polymer to match each requirement.

As part of the Beldam Crossley service, we manufacture a wide range of PTFE products and components to individual customers' specifications. In addition, with the latest CNC equipment plus a highly skilled workforce, we can produce complex machined, moulded, and fabricated parts in a wide range of sizes.

Our technical department is always available to assist with design and development of your PTFE parts.

Incorporating the most modern fillers, and backed by our ongoing development and test programme, the Crossflon® XF brand meets the ever increasing requirement for longer life, higher speeds and loads, chemical resistance and cost-effectiveness.

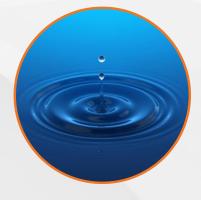


Crossflon® is a registered trade mark of Beldam Crossley Limited.









Bearings

Plane cylindrical and flange type bearings are available in most Crossflon® XF compounds. Please contact us for us advice on selecting the appropriate material for your application.

Rings

Solid and split pistons rings with a wide range of joint configurations can be manufactured to customer specifications. Alternatively, we can assist in designing a ring to meet with your individual requirements.

Sheets & Tapes

Most Crossflon® XF compounds are available in sheet and tape form, which can be etched making them suitable for bonding to other materials or used in wide range of applications where reduced friction is needed. Compounds specifically formulated with FDA compliant components can be used as non-stick coating surfaces in food and drug contact applications.

Formed Parts

We offer hot or cold formed parts in most Crossflon® XF compounds. Please contact us to discuss your requirement.

Rods & Tube

Moulded rods and tubes are available in most Crossflon® XF compounds. Please contact us for more information on the range.

Wear Components

Wear components are available in a wide range of sizes and shapes, other than those indicated above. These include wear strips, pump bodies, and pistons for chemically and thermally demanding operating conditions. We can manufacture to customer specifications or provide design assistance. Please contact us for more information.

Products

- Bearings
- Components
- Rods and Tubes
- Specialty Profiles
- · Rod, Sheet and Tube
- Custom Machined Parts
- Tapes and Thin Sheet
- Seals
- Washers

Processes

- Automatic Moulding
- Compression Moulding
- Machining
- Skiving
- Stamping / Forming
- Etching

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Selection Guide

X	Material Selection Guide										
XF GRADES	Grade	XF222	XF223	XF224	XF226	XF229	XF230	XF231	XF232	XF233	XF234
XF GF	Colour	Maroon	Maroon	Gold	White	Turquoise	Tan	Tan	Black	Black	Black
CE	Max Load "P" (psi) MPa	7	14	5.2	15	14	6.9	20	10	14	14
PERFORMANCE	Max Speed "V" (fpm) m/s	2	2	2	5	2	2	5	5	5	2
PER	Max "PV" (psi-fpm) (MPa. m/s)	0.35	0.7	0.26	0.7	0.78	0.35	0.9	0.42	0.7	0.78
	Rb 25 & Higher			x	x		x	X	X	x	
URFACE	Rc 25 & Higher	Х	X			X					X
MATING SURFACE	Painted metal and porcelain										
2	Aluminium			Х	Х		X	Х			
	FDA Compliant				X		Х	Х			
FN	Steam	Х	Х		Х	X	Х	Х	Х	Х	X
ENVIRONMENT	Wet	Х	Х	X	Х	Х	Х	Х	X	Х	Х
ENV	Dry	Х	Х	Х	Х	X	Х	Х	X	Х	X
	Vacuum	Х	Х	Х	Х	Х	Х	Х	Х		
ENG (4	Coefficient of friction	3	3	1	1	2	4	2	2	2	1
RELATIVE RATING (1= Low, 5=High)	Creep Resistance	3	5	3	4	5	2	4	4	4	5
RELA ⁽¹⁼	Insulation Properties	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No
COMMENTS	Standard This XF	All the parties of th	And "9 9" our "9 9" our "9" ou	Acelent in of tichow. This XF Scroot Are grade.	Cool is used to the last the l	This XF. Ways. ard naterial for is a st.	Piston II company. This XF. For a series. For a series. For a series.	the XE state of the state of the XE state of t	1 Becto 3 90 od of soil of the transfer of the	Aboli-Acellent Phis Are grade h.	ad an matical impaci inpaci



Crossflon® XF222 is primarily used in the manufacture of seals. It has excellent load and wear characteristics and is compatible with soft mating surfaces. This material is light maroon in colour and specifically formulated for use in food and drug contact applications with all components being FDA compliant.

Typical Product & Application Description

Products	Applications
 Automatically moulded bearings & components Skived sheet Piston / Piston rings Stamped / Machined formed seals Machined parts Moulded shapes 	 Pumps Mixers Compressors Appliances Automotive Insulators Linear slides Pipe support Wear bands

Design Criteria

Performance & Mat	ing Surfaces
Temperature - Typical Range °F (°C)	-250°C to +260°C
Short term limiting PV @ 0.5 m/s Maximum (P) Maximum (V)	0.35 MPa.m/s 7 MPa 2 m/s
Shaft Hardness - Minimum	60-62 Shore D
Shaft finish recommended Ra µin(µm)	8 - 16 (0.2-0.4)
Shaft Material	Steel
Engineering Info	ormation
Friction - static & dynamic	0.15 - 0.18
Water Absorption ASTM D570	0%
Flammability ASTM D635	Non-Flammable
	Non-Flammable
Chemical Resistance	Inert

Physical D	ata
Elongation ASTM D4894	180%
Tensile Strength ASTM D4894 (MPa)	14
Deformation ASTM D621	6.4%
Specific Gravity ASTM D792	2.27 g/cm ³



Crossflon® XF223 is maroon in colour and has a good balance of physical properties whilst maintaining chemical resistance. This material is compatible with most hardened steel surfaces and eliminates the need for lubrication in most environments. It is ideally suited to rotary and linear bearing applications.

Typical Product & Application Description

Products	Applications				
	• Pumps				
Automatically moulded	• Mixers				
bearings & components	• Compressors				
Sleeve, flanged and thrust	 Appliances 				
bearings	 Automotive 				
Piston rings	• Insulators				
Stamped and formed seals	• Linear slides				
Machined parts	Pipe support				
Moulded shapes	• Wear bands				
	Textile industry				

Design Criteria

Performance & Mat	ing Surfaces				
Temperature - Typical Range °F (°C)	-250°C to +260°C				
Short term limiting PV @ 0.5 m/s Maximum (P) Maximum (V)	0.70 MPa.m/s 14 MPa 2 m/s				
Shaft Hardness - Minimum	62 Shore D				
Shaft finish recommended Ra µin(µm)					
Shaft Material	Steel				
For sing a view Information					
Engineering Info	ormation				
Engineering Info	ormation				
Engineering Info	0.13 - 0.15				
Friction - static & dynamic	0.13 - 0.15				
Friction - static & dynamic Water Absorption ASTM D570	0.13 - 0.15 0%				
Friction - static & dynamic Water Absorption ASTM D570 Flammability ASTM D635	0.13 - 0.15 0% Non-Flammable				

Physical Data				
Elongation ASTM D4894	160%			
Tensile Strength ASTM D4894 (MPa)	11			
Deformation ASTM D621	2.2%			
Specific Gravity ASTM D792	2.27 g/cm ³			



Crossflon® XF224 is gold in colour and has been specifically formulated to operate against soft mating surfaces such as aluminium, brass, mild steel, other plastics and stainless steel. This material possesses no hard or abrasive fillers, has a low coefficient of friction, good creep resistance and compressive strength along with very low wear rates in comparison to unfilled PTFE.

Typical Product & Application Description

Products	Applications
 Automatically moulded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Machined parts Moulded shapes 	 Printers Copiers Air compressors Appliances Automotive Insualatos Linear slides Anrmometers Wear bands Solenoid valves Refrigeration valves

Design Criteria

Performance & Mat	ing Surfaces
Temperature - Typical Range °F (°C)	-250°C to +260°C
Short term limiting PV @ 0.5 m/s Maximum (P) Maximum (V)	0.26 MPa.m/s 5.2 MPa 2 m/s
Shaft Hardness - Minimum	60 Shore D
Shaft finish recommended Ra µin(µm)	8 - 16 (0.2-0.4)
Shaft Material	316 Stainless Steel and Non-Ferrous
Engineering Info	ormation
Engineering Info	0.12 - 0.13
Friction - static & dynamic	0.12 - 0.13
Friction - static & dynamic Water Absorption ASTM D570	0.12 - 0.13
Friction - static & dynamic Water Absorption ASTM D570 Flammability ASTM D635	0.12 - 0.13 0% Non-Flammable

Physical Data				
Elongation ASTM D4894	250%			
Tensile Strength ASTM D4894 (MPa)	16.5			
Deformation ASTM D621	2%			
Specific Gravity ASTM D792	1.9 g/cm ³			



Crossflon® XF226 is specifically formulated for use in food and drug applications with all components being FDA compliant. This material is white in colour and primarily used in the manufacture of bearings. Crossflon® XF226 offers excellent load and wear characteristics and is compatible with soft mating surfaces.

Typical Product & Application Description

Products	Applications
	• Pumps
Automatically moulded	• Mixers
bearings & components	• Compressors
Sleeve, flanged and thrust	 Appliances
bearings	Chute Liners
Piston rings	 Insulators
Stamped and formed seals	• Linear slides
Machined parts	Shaft bearings
 Moulded shapes 	 Wear bands
	• Seals
Stamped and formed sealsMachined parts	Linear slidesShaft bearingsWear bands

Design Criteria

Performance & Mat	ing Surfaces
Temperature - Typical Range °F (°C)	-250°C to +260°C
Short term limiting PV @ 0.5 m/s Maximum (P) Maximum (V)	0.75 MPa.m/s 15.0 MPa 5 m/s
Shaft Hardness - Minimum	60 - 62 Shore D
Shaft finish recommended Ra µin(µm)	8 - 16 (0.2-0.4)
Shaft Material	Mild, 303 and 316 Stainless Steel

Engineering Info	ormation
Friction - static & dynamic	0.1 - 0.11
Water Absorption ASTM D570	0%
Flammability ASTM D635	Non-Flammable
Chemical Resistance	Inert
Thermal Conductivity BTU/hr/sq. ft./°F/in. (W/m•K)	0.38 W/m•K
Linear Coefficient of 78° to 300°F Thermal Expansion (26° to 149°C) (x 10 -5 m/m °C)	Diameter 4.1 Length 5

Physical D	ata
Elongation ASTM D4894	400%
Tensile Strength ASTM D4894 (MPa)	22
Deformation ASTM D621	3.9%
Specific Gravity ASTM D792	2.33 g/cm ³



Crossflon® XF229 is turquoise in colour and suitable for us in a wide range of applications. It has excellent thermal conductivity and cold flow resistance. This material is inert to most chemicals and is well suited for use in seals exposed to elevated temperatures, high loads or steam contact. Crossflon® XF229 is suitable for use in contacts with food and drugs with all components being FDA compliant.

Typical Product & Application Description

Products	Applications
• Packings	• Lathes
Sleeve, flanged and thrust	• Gibs, guideways
bearings	• Compressors
Piston rings	 Appliances
Stamped parts	Rotary tables
Machined parts	Motor mounts
Moulded shapes	• Linear slides
• Wear bands	Pipe supports
• Seal rings	Hydraulic presses

Design Criteria

Performance & Mat	ing Surfaces
Temperature - Typical Range °F (°C)	-250°C to +260°C
Short term limiting PV @ 0.5 m/s Maximum (P) Maximum (V)	0.78 MPa.m/s 14 MPa 2 m/s
Shaft Hardness - Minimum	63 Shore D
Shaft finish recommended Ra µin(µm)	8 - 16 (0.2-0.4)
Shaft Material	Mild / Hardened steel
Engineering Info	ormation

Engineering Info	ormation
Friction - static & dynamic	0.08 dry
Water Absorption ASTM D570	0%
Flammability ASTM D635	Non-Flammable
Chemical Resistance	Data available
Thermal Conductivity BTU/hr/sq. ft./°F/in. (W/m•K)	0.75 W/m•K
Linear Coefficient of 78° to 300°F Thermal Expansion (26° to 149°C) (x 10 -5 m/m °C)	Diameter 5.3 Length 7.0

Physical D	ata
Elongation ASTM D4894	250%
Tensile Strength ASTM D4894 (MPa)	24
Deformation ASTM D621	2.4%
Specific Gravity ASTM D792	3.38 g/cm ³



Crossflon® XF230 is primarily used in the manufacture of bearings and seals. This tan coloured composite material provides excellent high temperature performance and wear resistance. It is compatible with soft mating surfaces and can be used in food and drug contact applications with all components being FDA compliant.

Typical Product & Application Description

Products	Applications
 Packings Sleeve, flanged and thrust bearings Piston rings Stamped parts Extruded parts Machined parts Moulded shapes Wear bands Seal rings 	 Lathes Gibs, guideways Compressors Appliances Rotary tables Motor mounts Linear slides Pipe supports Hydraulic presses

Design Criteria

Performance & Mat	ing Surfaces
Temperature - Typical Range °F (°C)	-250°C to +260°C
Short term limiting PV @ 0.5 m/s Maximum (P) Maximum (V)	0.42 MPa.m/s 10 MPa 2 m/s
Shaft Hardness - Minimum	60 Shore D
Shaft finish recommended Ra µin(µm)	8 - 16 (0.2-0.4)
Shaft Material	Stainless to hardened steel
Engineering Info	ormation
	Jillauoli
Friction - static & dynamic	0.1 - 0.12
Friction - static & dynamic Water Absorption ASTM D570	
·	0.1 - 0.12
Water Absorption ASTM D570	0.1 - 0.12
Water Absorption ASTM D570 Flammability ASTM D635	0.1 - 0.12 0% Non-Flammable

Physical D	ata
Elongation ASTM D4894	280%
Tensile Strength ASTM D4894 (MPa)	25
Deformation ASTM D621	3.5%
Specific Gravity ASTM D792	2 g/cm ³

Diameter 11.5

Length 13.9

A more complete data sheet is available upon request.

Linear Coefficient of 78° to 300°F

Thermal Expansion (26° to 149°C)

(x 10 -5 m/m °C)



Crossflon® XF231 has been specifically formulated for vacuum service. Tan in colour, this material has good load bearing properties, very low wear rates and is compatible with soft mating surfaces. It is well suited to parts that are subject to high abrasion at elevated temperatures in corrosive environments. All the constituents of Crossflon® XF231 are FDA compliant, which means it can be used in food and drug contact applications.

Typical Product & Application Description

Products	Applications
 Automatically moulded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Machined parts Moulded shapes 	 Vacuum pumps Mixers Compressors Appliances Automotive Insulators Linear slides Shaft support Wear bands

Design Criteria

Performance & Mat	ing Surfaces
Temperature - Typical Range °F (°C)	-250°C to +260°C
Short term limiting PV @ 0.5 m/s Maximum (P) Maximum (V)	0.9 MPa.m/s 20.0 MPa 5 m/s
Shaft Hardness - Minimum	60 - 62 Shore D
Shaft finish recommended Ra µin(µm)	8 - 16 (0.2-0.4)
Shaft Material	All steels and aluminum
Engineering Info	ormation
Engineering Info	0.1 - 0.12
Friction - static & dynamic	0.1 - 0.12
Friction - static & dynamic Water Absorption ASTM D570	0.1 - 0.12
Friction - static & dynamic Water Absorption ASTM D570 Flammability ASTM D635	0.1 - 0.12 0% Non-Flammable

Physical Data	
Elongation ASTM D4894	290%
Tensile Strength ASTM D4894 (MPa)	16
Deformation ASTM D621	4.6%
Specific Gravity ASTM D792	2.04 g/cm ³



Crossflon® XF232 is black in colour and provides a good balance of properties for bearing applications. It has an extremely low coefficient of friction, a high level of chemical inertness and good wear resistance especially against soft mating surfaces. This material has higher creep resistance and thermal conductivity than unfilled PTFE to allow for greater loading ability and cooler running when used in dry conditions.

Typical Product & Application Description

Products	Applications
 Automatically moulded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Machined parts Moulded shapes 	 Pumps Mixers Compressors Appliances Automotive lip seals Liners Linear Slides Pipe supports Wear bands Dust seals Solenoid valves TPS shaft seals EGR valves

Design Criteria

Performance & Mat	ing Surfaces
Temperature - Typical Range °F (°C)	-250°C to +260°C
Short term limiting PV @ 0.5 m/s Maximum (P) Maximum (V)	0.42 MPa.m/s 14 MPa 5 m/s
Shaft Hardness - Minimum	62 Shore D
Shaft finish recommended Ra µin(µm)	8 - 16 (0.2-0.4)
Shaft Material	Steel
Engineering Info	ormation
Friction - static & dynamic	0.1 - 0.2
Water Absorption ASTM D570	0%
Flammability ASTM D635	Non-Flammable
Chemical Resistance	Inert
Thermal Conductivity BTU/hr/sq. ft./°F/in. (W/m•K)	0.69 (W/m•K)
Linear Coefficient of 78° to 300°F Thermal Expansion (26° to 149°C) (x 10 -5 m/m °C)	Diameter 6.0 Length 8.3

Physical Data	
Elongation ASTM D4894	150%
Tensile Strength ASTM D4894 (MPa)	10
Deformation ASTM D621	6.5%
Specific Gravity ASTM D792	2.15 g/cm ³



Crossflon® XF233 has been specifically formulated for use in water related applications. This material possesses high creep resistance, good thermal conductivity, increased hardness and excellent wear properties. Black in colour this material is compatible with most soft mating surfaces and when improved chemical resistance is needed, a good alternative to Crossflon® XF224.

Typical Product & Application Description

Products	Applications
Automatically moulded bearings & components Sleeve, flanged and thrust	PumpsMixersCompressorsAppliancesAutomotive
Piston ringsStamped and formed sealsMachined partsMoulded shapes	 Fresh water submerged Thrust bearings Plating tanks Wear bands Ovens

Design Criteria

Performance & Mat	ing Surfaces	
Temperature - Typical Range °F (°C)	-250°C to +260°C	
Short term limiting PV @ 0.5 m/s Maximum (P) Maximum (V)	0.70 MPa.m/s 14 MPa 5 m/s	
Shaft Hardness - Minimum	62 Shore D	
Shaft finish recommended Ra µin(µm)	8 - 16 (0.2-0.4)	
Shaft Material	Hard, mild and stainless steels	
Engineering Information		
Engineering Info	ormation	
Engineering Info	ormation 0.13 - 0.16	
Friction - static & dynamic	0.13 - 0.16	
Friction - static & dynamic Water Absorption ASTM D570	0.13 - 0.16 0%	
Friction - static & dynamic Water Absorption ASTM D570 Flammability ASTM D635	0.13 - 0.16 0% Non-Flammable	

Physical Data	
Elongation ASTM D4894	90%
Tensile Strength ASTM D4894 (MPa)	14
Deformation ASTM D621	4.6%
Specific Gravity ASTM D792	2.04 g/cm ³



Crossflon® XF234 has been specifically formulated for bearing applications. This black coloured material has excellent wear and deformation properties, but reduced chemical resistance and should not be used in conditions where it might be oxidised.

It has high dimensional stability and thermal conductivity and is suitable for use in steam and heavy duty mechanical services.

Typical Product & Application Description

Products	Applications
 Automatically moulded bearings & components Sleeve, flanged and thrust bearings Piston rings Stamped and formed seals Machined parts Moulded shapes 	 Pumps Mixers Compressors Appliances Automotive Insulators Linear slides Pipe supports Wear bands

Design Criteria

Performance & Mat	ing Surfaces
Temperature - Typical Range °F (°C)	-250°C to +260°C
Short term limiting PV @ 0.5 m/s Maximum (P) Maximum (V)	0.78 MPa.m/s 14 MPa 2 m/s
Shaft Hardness - Minimum	70 Shore D
Shaft finish recommended Ra µin(µm)	8 - 16 (0.2-0.4)
Shaft Material	Steel
Engineering Info	ormation
Friction - static & dynamic	0.11 - 0.13
Water Absorption ASTM D570	0%
Flammability ASTM D635	Non-Flammable
Chemical Resistance	Data available
Thermal Conductivity BTU/hr/sq. ft./°F/in. (W/m•K)	0.41 W/m•K
Linear Coefficient of 78° to 300°F Thermal Expansion (26° to 149°C) (x 10 -5 m/m °C)	Diameter 4.9 Length 3.7
Thermal Expansion (26° to 149°C)	Length 3.7

Physical Data	
Elongation ASTM D4894	160%
Tensile Strength ASTM D4894 (MPa)	22
Deformation ASTM D621	1.4%
Specific Gravity ASTM D792	3.8 g/cm ³

A more complete data sheet is available upon request.

Crossflon® is a registered trade mark of Beldam Crossley Limited.



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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