

**James Walker®**

# Oil & Gas Products Guide

Issue 3.1



- *High-integrity sealing products & complementary components*
- *For upstream & downstream applications*
- *Standard & custom-designed items*
- *Global supply & full technical support*
- *Backed with 130 years of world-leading experience*

High Performance Sealing Technology



# Introduction



## Background of innovation in the Oil & Gas sector

From the development of the first rapid gas decompression (RGD) resistant elastomers to our work on thermoplastic valve seats, James Walker companies have always had a strong focus on the real issues faced by those operating in the Oil and Gas industry.

Through this highly focused approach and by delivering advances in materials and sealing technology, James Walker developments are continually helping to improve operational performance and safety, providing our customers with an essential competitive advantage.

### Trademark acknowledgements

James Walker acknowledges the following trademark as mentioned in this publication. All other names bearing the ® symbol are registered trademarks of James Walker:

**Inconel®** Special Metals Corporation  
**PEEK™** Victrex plc  
**Xylan®** Whitford Corporation

## In-depth understanding

Whatever the application, when you contact James Walker, you will be talking to someone who not only understands the problem but also understands your industry.

James Walker engineering and support teams bring experience from virtually every major industrial sector to bear on the problems faced by our customers. The breadth and depth of this combined experience often provides solutions where others fail.

Our Oil and Gas industry expertise covers upstream and downstream operations.

We advise:

- Original equipment manufacturers.
- Plant design engineers and specifiers.
- Exploration and production operators.
- Pipeline operators.
- Refinery operators.
- Terminal operators.
- And maintenance engineering staff at all levels.

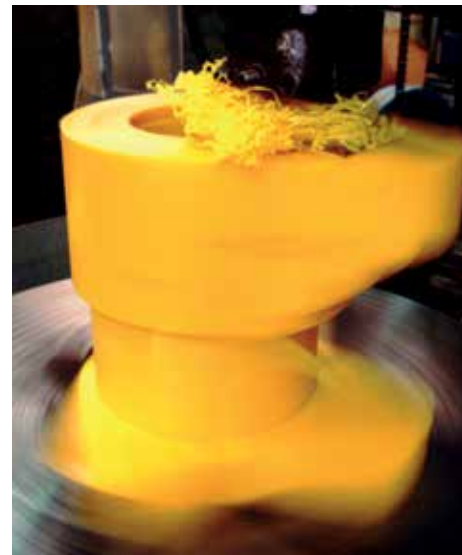
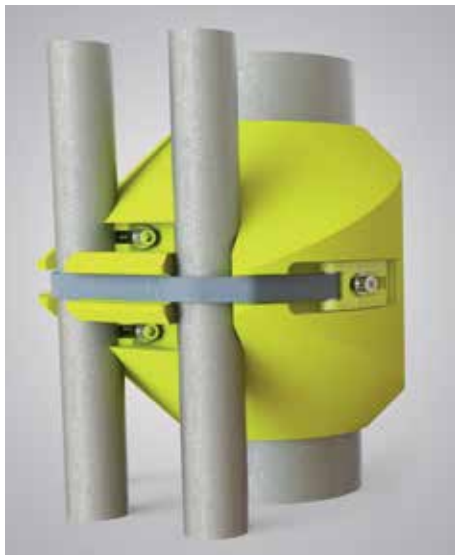
## ISO 9001 Quality Management

Our quality systems are third-party registered to ISO 9001 and AS/EN 9100. We are also regularly assessed and quality approved by a wide range of industry bodies and individual customers.

## Contents

	Page
<b>Thermoplastic components</b>	
Range of thermoplastics	3
Typical applications	3
Design & manufacture	3
<b>Elastomer-based seals</b>	
'O' rings	4
Springsele® & Teesele®	4
FS Casing & Tubing Seal	4
P-Seal	5
Metal end cap seals	5
Casing & tubing hanger packers	5
<b>Metallic gaskets</b>	
API & ASME metal ring joints	6
Metaflex® spiral wound gaskets	6
Metakamm® Kammprofile-type gaskets	6
<b>Precision metal components</b>	
Thin-wall machining	7
Precision machining	7
Coatings & treatments	7
<b>Valve sealing components</b>	
Supagraf® Premier	8
Supagraf® Control	8
Valve seats in Devlon® V-API thermoplastic	8
<b>Spring-energised PTFE lip seals</b>	9
<b>Expansion joints &amp; bellows</b>	
Comflex® expansion joints	9
Comflex® flexible bellows	9
<b>Tension monitoring fasteners</b>	10
<b>Pipe supports</b>	10
<b>Anti-vibration mountings</b>	11
<b>Flange management</b>	11
<b>James Walker Oil &amp; Gas contacts</b>	12

# Thermoplastic components



## Range of thermoplastics

Our thermoplastic materials cover the most arduous Oil and Gas applications.

### Devlon® S Grade

Our premium grade thermoplastic with highest molecular weight, giving superior mechanical properties. It is ideal for large components: bearings, thrust plates, pulleys, seal rings, gears, etc.

### Devlon® V-API

Similar performance to S Grade, but designed for high temperature/pressure duties. Dimensional stability with low moisture absorption make it suitable for many offshore components: valve seats, bundle spacers, cable protectors, tubing hanger centralisers, hot stabs, etc.

### Devlon® T100

Our proprietary cast material that covers a wide range of duties. With its inherently stress-free and excellent wear properties, low friction and improved impact strength, it is recommended for bushes, clamps, bearing rings, and crane sheaves.

### Devlube®

Self-lubricating material for dry running applications where low friction is needed and lubrication is not possible.

Other materials include: Devlon® A153 nylon 6/6 with low thermal expansion, polypropylene, UHMWPE, acetal, PTFE, and PEEK™.

## Typical applications

### Top tension risers

- TTR centralisers.

### Clamping systems

- Riser clamps.
- Umbilical clamps.
- Piggy back clamps
- Pipe handling clamps.

### Pipelines/flowlines

- Flowline bundle spacers.
- Pipe-in-pipe centralisers.

### ROV (remotely operated vehicles)

- Bushes and bearings.
- Supports.
- Indicators.
- Actuator parts.
- Single port, dual port, quad port stabs.
- Stab plate protectors.
- High pressure ROV tree caps.

### Valves

- Valve seats.
- Valve components.

## Design & manufacture

We specialise in the custom-design, prototyping and manufacture of high-integrity thermoplastic components for all sectors of the Oil and Gas industry.

Our thermoplastic materials are amongst the toughest and hardest wearing available. Produced by monomer casting or extrusion, our materials provide a comprehensive range of wear resistance, impact strength and toughness, with almost limitless application potential.

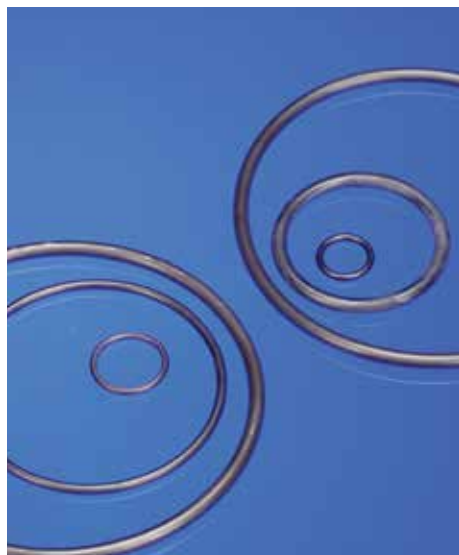
Benefits to the Oil and Gas sector are:

- Do not support marine growth.
- Lower cost than metal components.
- 1/7th of the weight of steel.
- Zero corrosion.
- Low friction.
- Resistance to shock loading.
- Significantly improved life span.
- Exceptional resistance to wear.

Our strength lies in the ability to control the entire production process. We control the formulation and compounding of our thermoplastics, with materials mixed at the point of casting using techniques that allow instantaneous switching between formulae. Precision machining and finishing is performed in-house to customers' specifications.

This facility offers optimum production flexibility and allows rapid reaction to urgent orders, without unduly disrupting the manufacturing process.

## Elastomer-based seals



Springseal®



Teeseal®



### 'O' rings

The 'O' ring, or toroidal seal, is an exceptionally versatile sealing device. Applications ranging from automotive to critical refinery or aerospace duties make it the world's most popular volume-produced seal.

'O' rings have many benefits, they:

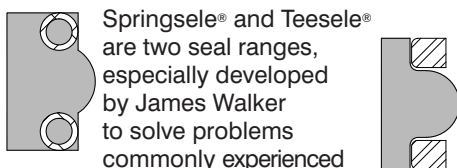
- Suit many static and dynamic duties.
- Occupy little space.
- Will seal in both directions.
- Are compatible with most fluid media.
- Elastomeric rings can function between  $-65^{\circ}\text{C}$  and  $+327^{\circ}\text{C}$  ( $-85^{\circ}\text{F}$  and  $+620^{\circ}\text{F}$ ) according to material type.
- PTFE rings can perform at temperatures down to  $-200^{\circ}\text{C}$  ( $-328^{\circ}\text{F}$ ).

James Walker has been making high quality 'O' rings since this sealing method was introduced in the 1930s.

We precision mould 'O' rings in over 100 grades of high performance and general-purpose elastomers to international, national or industry standards, as well as to custom specifications.

We stock many thousands of types and sizes of 'O' rings including rapid gas decompression (RGD) grades, ready for same-day despatch. Non-stocked 'O' rings can be supplied within days.

### Springseal® & Teeseal®



Springseal® and Teeseal® are two seal ranges, especially developed by James Walker to solve problems commonly experienced by the manufacturers and users of oilfield equipment.

Both seal types are double acting and will seal applications that are subjected to:

- Extremes of pressure and temperature.
- Attack by oilfield media.
- Large extrusion clearances.
- Arduous mechanical conditions.

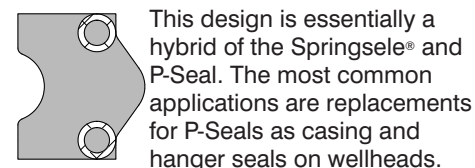
Teeseal® is capable of operating in a dynamic mode, whereas Springseal® is recommended for static duties. Both seals can operate at high pressures with large extrusion gaps. They are used for many oil and gas duties, including:

- Down-hole.
- Wellhead.
- Surface equipment.
- Valves, high-pressure pipelines and riser systems.

They can be:

- Fitted at original equipment stage.
- Retrofitted in any existing housing designed for 'O' rings with back-up rings.
- Custom-designed and manufactured to fit non-standard housings.

### FS Casing & Tubing Seal



This design is essentially a hybrid of the Springseal® and P-Seal. The most common applications are replacements for P-Seals as casing and hanger seals on wellheads.

The combination of design, materials and construction ensures that high-performance FS seals retain their sealing integrity under adverse conditions, including:

- Stab-in operations.
- Wide ranges of temperature and pressure.
- Chemically aggressive and highly abrasive oilfield media.

This seal can be retrofitted to many conventional P-Seal housings with minor modifications to the ports. It offers reductions in installation time without the need for pack-off operations.

Our FS Casing and Tubing Seal has been validated on rough casings in DNV witnessed tests to API 6A Appendix F, PR2 procedures at 69MPa (10,000psi) and  $-18^{\circ}\text{C}$  to  $+121^{\circ}\text{C}$  ( $0^{\circ}\text{F}$  to  $+250^{\circ}\text{F}$ ).

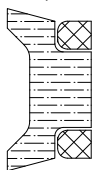
Full temperature capability is  $-29^{\circ}\text{C}$  to  $+177^{\circ}\text{C}$  ( $-20^{\circ}\text{F}$  to  $+350^{\circ}\text{F}$ ) depending on size, pressure and material.

The FS Seal is supplied to suit standard API casings from 2 7/8 to 30 inches diameter.

## Elastomer-based seals



### P-Seal



This static seal is used in casing and tubing heads to seal rough casing and production tubing. It is energised by injection of plastic packing sticks.

- Profiled sealing element of rubberised fabric or homogeneous elastomer.
- Anti-extrusion elements comprise mesh of compressed stainless steel wire.
- Wide range of top quality elastomer and fabric materials suitable for oilfield duties to meet customer specifications.
- Our P-Seals have been tested in accordance with API 6A specification.

In action, the inside diameter (primary sealing face) acts on outside diameter of the casing/tubing running through it. A groove/recess in opposite face houses injected plastic packing to energise the system and create an effective seal.

P-Seals are supplied to suit standard API casing/tubing sizes.

#### Plastic packing sticks

We make two grades for use with P-Seals and other designs that are energised by the injection of plastic packing.

- Standard temperature packing sticks (LR5640/C2 grade).
- Higher temperature packing sticks (LRCM100B grade).

Both have thermally stable viscosity/flow characteristics, together with low surface friction and good surface adhesion.

### Metal end cap seals



Our metal end cap seals are hybrid metal/elastomeric products with a high level of the extrusion resistance necessary for high pressure casing and tubing application.

We have a long history of successfully designing these seals for ISO 10423 F.1.11 (pressure and thermal cycling) accreditation.

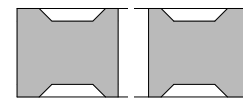
#### Special features:

- Metal end caps are chemically bonded to an element of high performance elastomer.
- Elastomer energises the system for efficient sealing.
- Intimate metal-to-metal contact is maintained between the end cap and the sealing surface.
- End caps provide extrusion resistance and support for the elastomeric element.

Metal components are typically manufactured of stainless steel or nickel alloys for corrosion resistance.

Our metal end cap seals are often custom designed and manufactured to suit specific wellhead sealing environments. They are also available in a range of sections, sizes and materials.

### Casing & tubing hanger packers



We produce a wide range of fully developed and rigorously tested

hanger packers for casing or production tubing.

These vary considerably in design, and generally comprise a square or rectangular section profile that is compressed axially in a housing to generate radial sealing forces against the casing or tubing.

#### Our range covers

- Dual/multiple tubing designs in both split and endless form.
- Compact wellhead types incorporating robust anti-extrusion elements.
- Sliding seal rings.
- 'Trash' seals and retainer cups/support rings.
- High temperature, high pressure annulus seals.

Packers are made of homogeneous elastomer, or may incorporate reinforcement in the form of rubberised fabric, woven steel mesh, or solid metal end caps to resist extrusion.

Each form of construction has been fully developed and tested.

Our casing and hanger tubing packers are manufactured in sizes to suit specific applications and operating conditions.

## Metallic gaskets



### API & ASME metal ring joints

Manufactured in the UK by API licensee James Walker Moorflex, these precision-machined ring joint gaskets are used worldwide in high-pressure oilfield applications as well as on refining and processing plant.

They are supplied to API 6A (oilfield use) and ASME B16.20 (general use) standards to fit ASME, BS and DIN flanges. James Walker Moorflex is licensed by the American Petroleum Institute to apply the API monogram to gaskets in accordance with API 6A PLS4.

#### Machined metal gaskets include

- R type (oval and octagonal) solid sections to fit standard ring joint flanges with trapezoidal grooves.
- Types RX and BX with complex bevelled edge sections for wellhead pressures above 690bar (10,000psi).
- Lens section, convex, wedge, doublecone, and weld ring types.

These are manufactured in a variety of metals, including soft iron, low carbon steel, stainless steels, alloy steels, super alloy steels, and high nickel alloys.

Metal ring joint gaskets are supplied to the listed standards, and customers' own specifications, in all sizes and materials.



### Metaflex® spiral wound gaskets

Metaflex® gaskets are spiral wound in V-section metal strip and a softer filler material so that flange surfaces are presented with a spiral of alternate metal/filler layers. They are quick to install and easy to remove.

These gaskets will seal flanges where temperature, pressure, vibration or flow rates are beyond the capability of conventional jointing materials. They are widely used on pipelines, pressure vessels and heat exchangers.

#### Prime features

- Gaskets are made to a variety of sizes and shapes: circular, obround, square, oval and diamond. Gaskets for non-standard flanges are made to order.
- Combinations of metal winding strip and filler are selected to suit fluid media and operating conditions.
- Operating temperatures from cryogenic up to 1000°C (1832°F).
- System pressures from high vacuum to in excess of 35MPa (5076psi).
- Support rings, inside and/or outside of spiral, enable gasket to be used for high line pressure on flat or raised flanges.

Metaflex® gaskets are manufactured in accordance with all relevant standards to suit flange designations: ASME B16.5, BS 1560 pt 3.2, ASME B16.47 Series A (MSS-SP44), ASME B16.47 Series B, BS EN 1092; plus DIN, JIS and NF.



### Metakamm® Kammprofile-type gaskets

Metakamm® gaskets are widely used on flange joints of high pressure pipework and vessels where operating conditions fluctuate. They are recommended for heat exchangers and condensers.

#### Features

- These gaskets comprise a metal core (typically stainless steel or nickel alloy) with concentric grooves on either side.
- They usually have a soft layer of sealing material bonded to both grooved faces.
- Sealing face materials include graphite, and PTFE.
- Metakamm® gaskets with facings of graphite or PTFE are certified as meeting TA-Luft emission control requirements.
- Undamaged cores can often be factory fitted with new soft faces to reduce plant maintenance costs.

#### Operating capabilities

Maximum system pressure: 25MPa/250bar.  
Operating temperature (graphite faces): up to +650°C in steam; or +500°C in oxidising media.

#### Sizes

Standard diameters: 10mm to 3600mm NB. Standard thicknesses: 3.0mm and 4.0mm cores with 0.5mm soft facings. Non-standard thicknesses: 2.0mm core upwards.

## Precision metal components



### Thin-wall machining

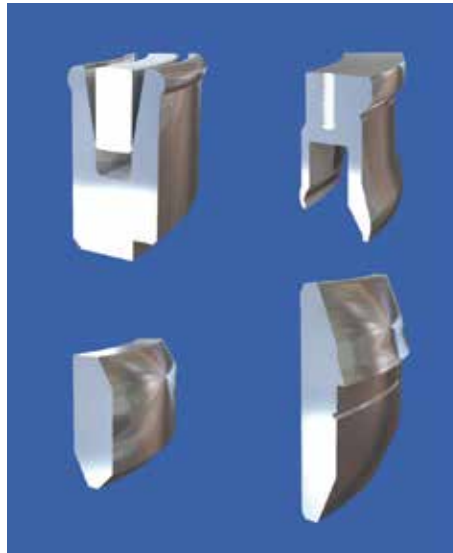
The need for precision machined components in the Oil and Gas sector has increased substantially as exploration and production operations go deeper and into more demanding environments.

Over the past few years, James Walker has developed and perfected special manufacturing techniques for the precision machining of annular thin-walled components.

Our expertise prevents thin-walled components being crushed on the machine, whilst allowing precise profiles to be achieved repeatedly to tight tolerances and with absolute concentricity.

Many of these components are manufactured from high-nickel alloys that are notoriously difficult to machine and control.

We machine components in-house of sizes from 25mm (0.98in) OD to 2300mm (90.6in) OD, and to a maximum depth of 500mm (19.7in).



### Precision machining

Our precision machined components enhance the efficiency and reliability of exploration and production operations at Oil and Gas fields across the world.

Typical areas of application include:

- Wellheads.
- Manifolds.
- Blow-out preventers (BOPs).
- Production safety valves.
- Risers.
- Valves.
- Chokes.
- Pipelines.

We are totally conversant with industry standards and quality plans, and understand sweet and sour environments and the materials required.

All high-performance alloys are sourced from trusted suppliers, and we maintain full materials traceability with permanent records held.

Machining is undertaken and fully controlled in-house, where we have the capability for production of components up to 2.3m (90.6in) diameter. We also offer high-integrity metal-to-rubber bonding.



### Coatings & treatments

Metal components can be finished in a wide range of coatings, depending on customers' exact requirements. These include:

- Xylan® fluoropolymer.
- Zinc phosphate.
- Molybdenum disulphide.
- Silver.
- Gold.
- Zinc.

Heat treatment processes include:

- Nitriding.
- Vacuum annealing.
- Stress relieving.

Post-machining processes, including non-destructive testing (NDT), coatings and heat treatments are carried out by approved and certified sub-contractors.

## Valve sealing components



### Supagraf® Premier

Supagraf® Premier is our top of the range fugitive emission control product for valves. This cost-effective compression packing is made of exfoliated graphite, reinforced to provide additional strength, plus resistance to pressure and extrusion.

It is recommended for sealing rising stem or rotary valves operating in harsh conditions where fugitive emissions need to be reduced to well below 100ppmV. This product is used worldwide on valves handling hydrocarbon liquids and gases, lubricating oil and process chemicals.

#### Third-party certifications

- API 622: average emission level of 10.5ppmV, over five thermal and 1510 mechanical valve cycles.
- TA Luft Rev 07.2002 requirements, and VDI 2440 for emission control in valves.
- Shell SPE 77/312 Class A, Rev 16.10.2002.
- Shell SPE 77/312 Class B, Rev 06.2007, with 47.4MPa helium in Class 2500 valve.
- API 607 Edition 4 Fire Safety.

#### Valve stem operating duties

Maximum temperature (oxidising): +450°C  
 Minimum temperature: -200°C  
 Maximum system pressure: 25MPa/250bar

Supplied as split preformed rings or sets, or in boxes containing 8m. Sizes: all popular sections from 3mm upwards. Non-standard sections made to order.



### Supagraf® Control

Supagraf® Control is an innovative compression packing for control valves, that reduces VOC emissions to well below 50ppmV over 100,000 valve strokes.

This product provides long-term high integrity sealing capability, with very low stem friction for valve control accuracy and lower actuator power consumption.

It is made of high purity exfoliated graphite, reinforced with a non-metallic structure to provide additional strength plus resistance to pressure and extrusion.

#### Third-party certifications

- TA Luft/VDI 2440: in Masoneilan control valves, at 10MPa and 20°C; and 5.7MPa and 425°C for 100,000 valve cycles.
- ISO 15848-1, Class BH, CC3: in Masoneilan control valves at 10.34MPa and -29°C to +38°C; and 5.75MPa and +425°C, for 100,000 valve cycles.

#### Valve stem operating duties

Maximum temperature (oxidising): +350°C  
 Minimum temperature: -200°C  
 Maximum system pressure: 25MPa/250bar

Supplied as split preformed rings or sets, or in boxes containing 8m. Sizes: all popular sections from 3mm upwards. Non-standard sections made to order.



### Valve seats in Devlon® V-API thermoplastic

Devlon® V-API is a proprietary thermoplastic developed by James Walker, in close co-operation with the valve industry, as a superior soft valve seat material.

Formulated to provide enhanced performance across a wide temperature and pressure range, V-API is widely specified by valve manufacturers and is approved for use by major Oil and Gas producers. It offers:

- Superior pressure/temperature range in comparison to PTFE or Nylon 6.
- Excellent machineability for creation of desired surface finish.
- Proven operation up to a pressure of 41.4MPa (6000psi), subject to valve and seat design.
- Proven operation from -50°C (-58°F) to +176°C (+350°F), subject to valve and seat design.
- Low moisture absorption and superior dimensional stability over PTFE in high pressure applications.
- Lower frictional losses than PEEK™.
- Exceptional wear/abrasion resistance.
- Excellent life performance in soft valve seat applications.

Fully machined valve seats are supplied in diameters from 0.5-inch (12.7mm) to 77-inch (1956mm). Also in billet form and as semi-finished components.



# Spring-energised PTFE lip seals Expansion joints & bellows

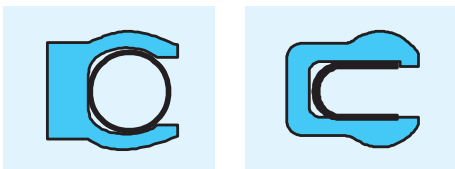


## Spring-energised PTFE lip seals

Our Uni-Seal is a spring actuated and pressure assisted seal consisting of a jacket of virgin or filled-PTFE, and a corrosion resistant metal spring energiser. Designs are available for radial, radial flange and axial applications.

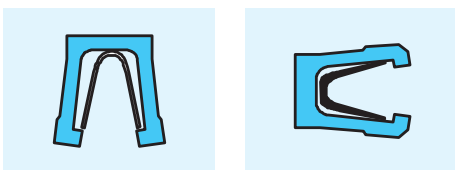
Spring load can be tailored to meet special low friction requirements in dynamic applications, and loading can be increased for cryogenic sealing.

Uni-Seal variants have maximum pressure capabilities up to 80MPa (11,600psi) or temperatures up to 290°C (544°F). We offer four basic types.



Types J01-J10  
with helicoil spring.

Types J20-J29  
with U-spring.



Types J30-J31  
with U-finger spring.

Types J40-J42  
with V-band spring.



## Comflex® expansion joints

We have global experience in the design, manufacture and installation of expansion joints for gas turbines at on-shore and offshore locations. Our service includes on-site evaluation using thermal imaging.

These joints are made of non-asbestos materials, with a composite construction that provides durability and increased flex fatigue life over other systems, and avoids loss of insulation caused by shake-down or compaction.

### Comflex® GT Exhaust Expansion Joint

- Accepts high temperatures, large movements, pulsations and vibration.
- Grades rated up to 1000°C (1832°F).

### Comflex® GT Inlet Expansion Joint

- Offers long life, with excellent sound attenuation and particulate free inner surface.

### Comflex® Multi-Layer Fabric Wrap

- An emergency measure for failed expansion joints that often becomes the permanent solution.

Comflex® Gas Turbine Exhaust and Inlet expansion joints are made to order to any shape and size. Comflex® Multi-Layer Fabric Wrap is available in widths 250mm, 375mm and 500mm.



## Comflex® flexible bellows

Standard and custom designed bellows are available. The selection of bellows design, convolution width, construction and materials will depend on your specific application.

### Comflex® Fabric Reinforced Bellows

- Vulcanised construction in heavy duty elastomer-proofed fabric.
- Used as heavy duty protectors on hydraulic rams and other dynamic systems.

### Comflex® Rubber Bellows

- Absorb displacement and motion between flanges.
- Made in nitrile (NBR) or ethylene-propylene (EPDM) synthetic elastomers.

### Comflex® PTFE Lined Rubber Bellows

- For chemical environments.

Comflex® Fabric Reinforced, Rubber Bellows and PTFE Lined Rubber Bellows are made to order.

## Tension monitoring fasteners Pipe supports



### RotaBolt® tension monitoring

Our RotaBolt® range of tension control fasteners provides either finger-tip or visual monitoring of tension throughout the life of a bolted joint. Pre-set bolt loads can be swiftly checked and maintained.

RotaBolts have been specified in the oil and gas sector for many years on flange joints and structural assemblies subject to fatigue, vibration, pressure containment or slippage. Examples include:

- Wellheads, risers and pipelines.
- Platform modules and cranes.
- Valves, pumps and pressure vessels.
- Swivels and slew rings.

The inclusion of RotaBolt® tension control at plant design stage will help ensure the integrity of bolted joints where safety, reliability, security and ease of maintenance are essential.

RotaBolt® systems surpass traditional tightening methods such as hydraulic tensioners, flogging, and torque systems. Such techniques have severe control limitations that can result in unpredictable bolt tension and joint failure.

We manufacture RotaBolts in alloy steels, cupro-nickel, nickel and titanium alloys. Existing fasteners can also be modified.

With RotaBolt® Types 1 and 2, tension is easy to finger-check, even when wearing diving equipment. RotaBolt® Vision is readily monitored at a distance, and in many locations where access is difficult.

#### RotaBolt® Type 1

Our original design that delivers assured operational reliability. Benefits include:

- Increased tension performance allowing bolt quantity, diameter or strength to be reduced.
- Less machining, fewer holes drilled and fewer bolts to be tightened.
- Reduces all aspects of bolted joint installation and maintenance.

#### RotaBolt® Type 2

Two tension settings in a single sensor provides a range of tension control for installation and in-service checking.

- Dual load indicator cap gives the choice of an operational tension range control.
- Proven performance on offshore, petrochemical, nuclear and rail projects.

#### RotaBolt® Vision

This is the world's first safety bolt to give a clear, visual indication of loss of tension across the bolted joint. It operates on the same internal air-gap technology as the original RotaBolt®, but has a visual indicator that shows an unbroken yellow line across the head of the bolt.

When any tension is lost across the bolt, the indicator rotates by 90 degrees to show a distinct right angle break in the yellow line. This is clearly visible up to 25 metres away, and is ideal for bolted joints in locations where access is restricted and close inspection is difficult.

### Pipe support systems

Our Tico® pipe support products are widely used on offshore, on-shore and marine pipework systems. They are fire retardant components that do not support the surface spread of flame.

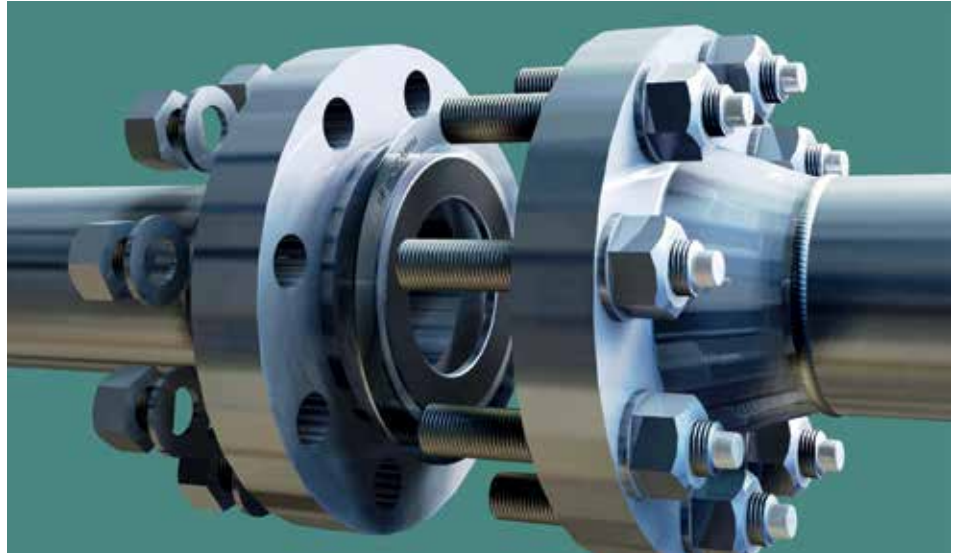
**Tico® Pipe Grips** are designed specifically to isolate pipes, minimising vibration transmission between the pipework and hanger, and preventing corrosion between dissimilar metals.

We have two designs of pipe grip, a Guide Type with a PTFE inside surface to allow movement of the pipework, and a Grip Type that securely holds the pipe to prevent movement. They are available for use with stainless steel or Cu/Ni pipes.

**Tico® Clamp Blocks** provide protection and uniform spacing of pipe lines. They absorb shock, noise and vibration caused by fluid velocity and turbulence in pipes, that would otherwise be transmitted through the clamp to the surrounding structure or building. They are supplied in single or multiple pipe carrying sections.

**Tico® Clip Strips** provide the highest level of shock and vibration isolation between pipework and hanger. Available in three grades for varying applications, they fit most common strap widths, are easy to install and can be manufactured to withstand temperatures up to 300°C.

# Anti-vibration mountings Flange management



## Anti-vibration mounting pads

Our Tico® machinery mounting products are designed to attenuate vibration and transmitted noise, and to match today's fast changing industrial environment. Typical on-shore and offshore applications include fans, motors and gearboxes.

### Tico® S machinery mounts

These resilient mounting pads are recommended for general plant duties and are compatible with all types of machine base. They are manufactured from a blend of selected cork particles and elastomers.

### Tico® Hi-duty pads and buffers

We have three grades of very tough and resilient pad that absorb highly destructive shock loads to prolong machinery life. Pad composition is varied to suit specific duties and retain its properties under extreme conditions.

### Tico® LF mounting pads

These scientifically designed bonded-sandwich pads are designed to isolate disturbing low frequencies at the plant/structure interface.

**Tico® Bond Slip** low-friction sliding bearings allow large lateral movement with high vertical loads for ductwork, pipework and machinery. They are also used for positioning heavy plant during construction operations.

## Flange management

James Walker combines expertise in gasket technology and bolting technology to help customers ensure the sealing integrity of critical flange-joint systems.

Leak-tight and reliable flange joints are essential in the global drive to reduce fugitive emissions and potentially dangerous leaks in petrochemical operations. Leaks waste valuable product and energy, and can create health and safety as well as environmental problems.

Where leaks occur, it is often the gasket that is blamed. But gaskets do not fail on their own — it is the complete bolted joint assemblies that fails. In 85% of these cases, the failures are attributed to incorrect bolt loads.

There are four vital keys to ensuring leak-free critical flange joints:

### 1. Design — flange geometry

- Ensure that all the materials are suitable for the critical assembly.
- Use flange calculation programmes to determine the optimal load on the gasket to achieve the best load/leakage rate, and ensure the flanges are suitable — strong enough, without exceeding flange rotation criteria. Always take account of working temperatures and pressure cycles.
- When in doubt, conduct additional finite element analyses (FEA).

### 2. Component quality

Check that all components of the jointing assembly — flanges, bolts, washers and the gasket — meet the design criteria.

### 3. Execution quality

This includes contractor competence, protocols and procedures, plus flange alignment.

Ensure that all stated procedures — end-user's and James Walker protocols — are followed, and that every step is completed properly.

### 4. Installed bolt tension

After the flange joint tightening cycle, always check that the calculated bolt tension has been achieved.

This can only be done accurately by using a load indicator system such as RotaBolt®. Other techniques, including hydraulic tensioners, flogging, and torque systems, have severe control limitations that can result in unpredictable bolt tension and joint failure.

RotaBolt is a highly accurate load indicating bolt that is very easy to install during joint assembly. In addition, it allows swift and simple monitoring of bolt tension throughout the life of the joint.

## James Walker Oil & Gas support worldwide

### Australia (Perth)

Tel: +61 (0)2 9721 9500  
Fax: +61 (0)2 9721 9580  
Email: perth.au@jameswalker.biz

### Germany (Hamburg)

Tel: +49 (0)40 386 0810  
Fax: +49 (0)40 389 3230  
Email: sales.de@jameswalker.biz

### Singapore

Tel: +65 6777 9896  
Fax: +65 6777 6102  
Email: sales.sg@jameswalker.biz

### Brazil (São Paulo)

Tel: +55 11 4392 7360  
Fax: +55 11 4392 5976  
Email: sales.br@jameswalker.biz

### Italy (Milan)

Tel: +39 02 257 8301  
Fax: +39 02 263 00487  
Email: sales.it@jameswalker.biz

### UK (Aberdeen)

Tel: +44 (0)1270 536140  
Fax: +44 (0)1270 536065  
Email: oilandgas@jameswalker.biz

### France (Lyon)

Tel: +33 (0)437 497 480  
Fax: +33 (0)437 497 483  
Email: sales.fr@jameswalker.biz

### Norway (Bergen)

Tel: +47 5 5112950  
Fax: +47 5 5138005  
Email: sales.no@jameswalker.biz

### USA (Houston)

Tel: +1 281 875 0002  
Fax: +1 281 875 0188  
Email: oilandgas@jameswalker.biz

**Health warning:** If PTFE or fluoroelastomer (eg, FKM, FFKM, FEPM) products are heated to elevated temperatures, fumes will be produced which may give unpleasant effects, if inhaled. Whilst some fumes are emitted below 250°C from fluoroelastomers or below 300°C from PTFE, the effect at these temperatures is negligible. Care should be taken to avoid contaminating tobacco with particles of PTFE or fluoroelastomer, or with PTFE dispersion, which may remain on hands or clothing. Material Safety Data Sheets (MSDS) are available on request.

Information in this publication and otherwise supplied to users is based on our general experience and is given in good faith, but because of factors which are outside our knowledge and control and affect the use of products, no warranty is given or is to be implied with respect to such information. Unless governed by type approval or contract, specifications are subject to change without notice. Statements of operating limits quoted in this publication are not an indication that these values can be applied simultaneously.

To ensure you are working with the very latest product specifications, please consult the relevant section of the James Walker website: [www.jameswalker.biz](http://www.jameswalker.biz).

## James Walker UK Ltd

Oil and Gas Team  
Gawsworth House  
Westmere Drive  
Crewe, Cheshire CW1 6XB  
United Kingdom  
Tel: +44 (0)1270 536140  
Fax: +44 (0)1270 536065  
Email: oilandgas@jameswalker.biz

[www.jameswalker.biz](http://www.jameswalker.biz)



FS 582756

FS 582756