

James Walker[®]

Downhole Sealing Guide

Issue 2

- *Sealing solutions for the Oil & Gas industry*
- *Innovative technology offering safety, performance and reliability*
- *Global customer service and product support*



High Performance Sealing Technology



About James Walker

The Oil & Gas industry

James Walker has long been committed to the provision of sealing solutions for the exploration and production of oil and gas.

Our capabilities in high performance materials science are relied upon worldwide by customers who need top quality materials that are validated and proven to operate:

- At extremes of pressure
- In chemically aggressive and physically abrasive environments
- Under rapid gas decompression (RGD) conditions
- In naturally occurring chemical / sour gas environments
- With large clearances and / or poor surface conditions
- To the highest performance specifications laid down by international industry
- With temperature cycling regimes
- At extremes of temperature
- Where failure could have significant health & safety, environmental or financial risk

The correct selection and specification of sealing materials and products is a prerequisite to the safe and effective operation of plant and the prevention of expensive downtime.

Please see the relevant James Walker guide for comprehensive product descriptions.

To get your copy, see the contact details on the rear cover, or visit our website www.jameswalker.biz.



Technology & innovation

- Working in partnership with the Oil & Gas industry for over 40 years
- In-house development of world-beating rapid gas decompression (RGD) resistant elastomers
- Confidential research projects both for and in partnership with clients
- Development of current best in class emissions control technology for valve stem sealing

Testing and verification

- We hold test equipment for all relevant ANSI, API, ASA, ASTM, BS, DIN, DTD, ISO and NATO standards
- Environmental chambers capable of replicating conditions from -70°C to +130°C
- Rapid gas decompression rigs – amongst the most advanced in the world
- Steam skid for testing seal design and materials under steam regimes
- Rotary and reciprocating test rigs with a variety of shaft sizes and speeds up to in excess of 6,000 rpm
- Chemical type-approval testing allowing customers the opportunity for third party-witnessed testing of elastomers and polymers in their anticipated chemical environment

Manufacturing excellence

- Special expertise in the machining of thin-walled annular components
- Highly skilled at working with nickel alloys that are difficult to machine
- Total control from concept through manufacture to supply and commissioning
- Full certification and traceability of all materials
- In-house processing and compound manufacture of elastomers and thermoplastics
- James Walker Moorflex is API Spec Q1 licensed for ring joint manufacture
- ISO 9001:2008 approved for design, manufacture and technical support

Customer service

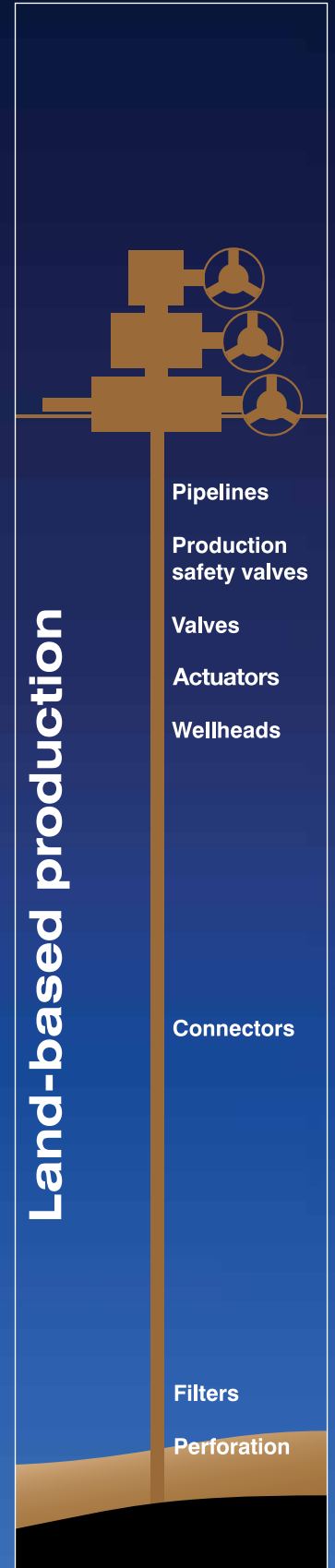
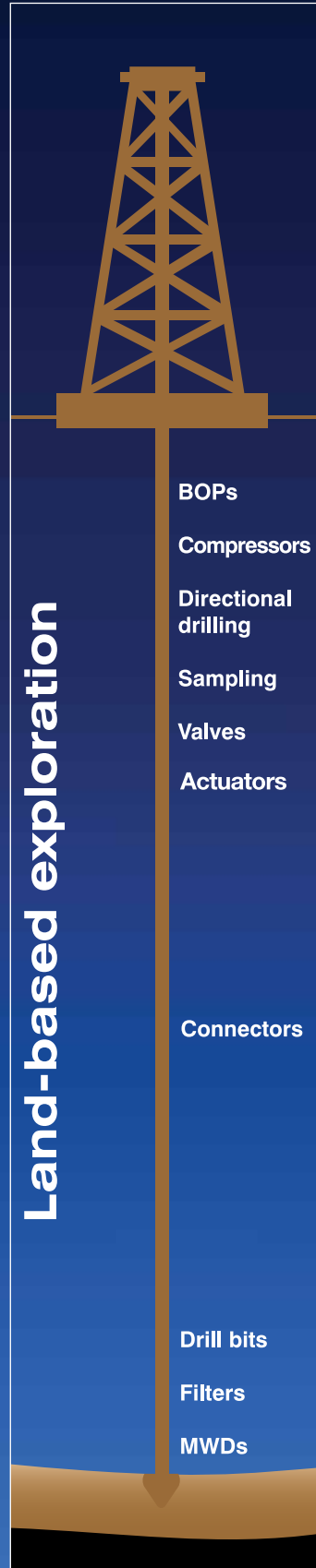
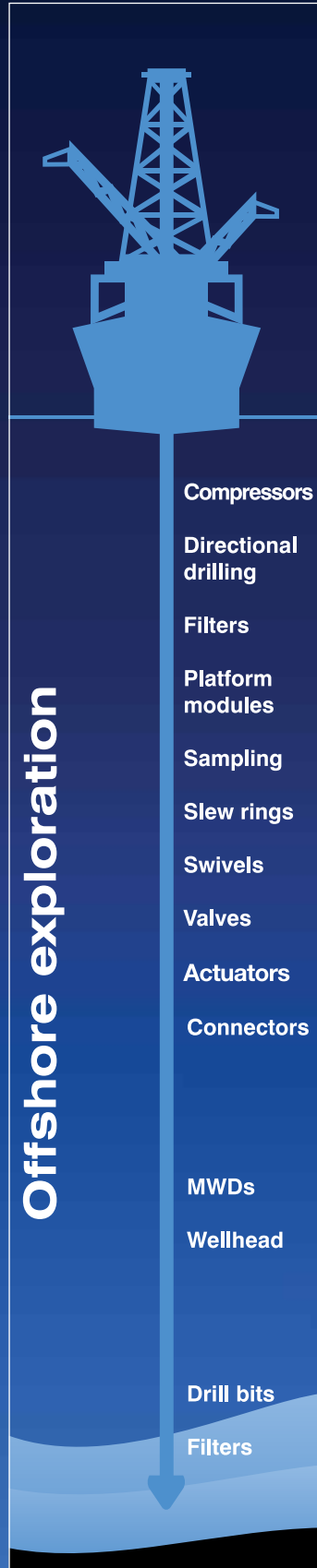
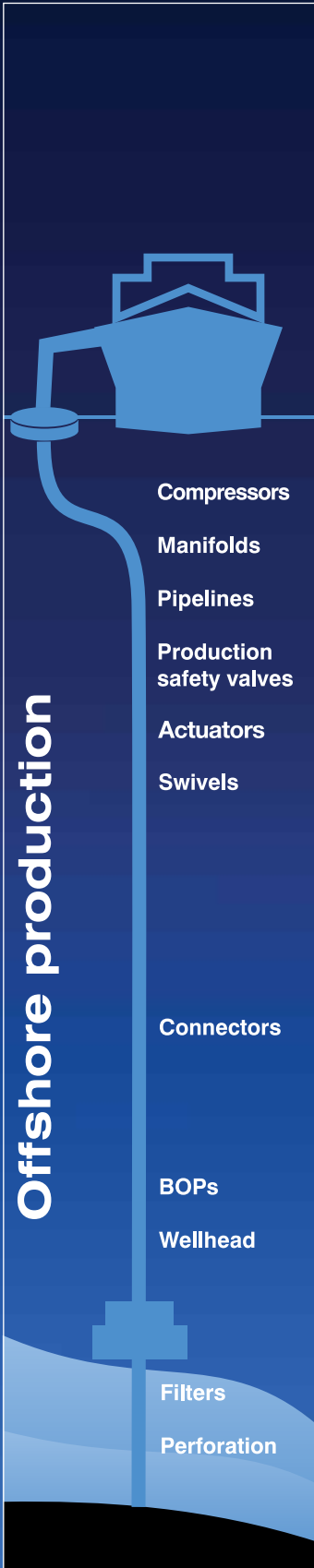
- Key operational hubs in Aberdeen, Houston, Singapore and Rio de Janeiro
- Worldwide family of James Walker companies
- Over 50 production, engineering, distribution and customer support sites spread across Europe, Australasia, Asia Pacific, Africa and the Americas
- Local network of James Walker companies and official distributors working in close partnership with customers in well over 100 countries

General information

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.



Sealing products & accessories for downhole duties

Actuators

- Custom Chevron® (Shallex®) packings
- Custom plastic seals
- 'O' rings
- Solosele® G-AE
- Engineered plastics components
- RotaBolt® tension control fasteners
- Teesele®
- Wear rings
- Wiper rings

BOPs

- BOP seals
- Custom mouldings
- 'O' rings
- RotaBolt® tension control fasteners
- Shear blade seals
- Springsele®
- Teesele®

Compressors

- 'O' rings
- Engineered plastics components
- Springsele®

Connectors

- D seals
- EF seals
- 'O' rings
- RotaBolt® tension control fasteners
- Solosele® G
- Springsele®

Directional drilling

- Custom mouldings
- D seals
- 'O' rings
- Springsele®

Drill bits

- Custom mouldings
- Grease compensator diaphragms
- Grease pressure vent diaphragms
- Tricone seals

Filters

- 'O' rings
- Solosele® G
- Springsele®

Manifolds

- Moorside® API ring joints with inserts
- 'O' rings
- RotaBolt® tension control fasteners
- Springsele®
- Flange isolation and protection

Mud pumps

- Automatic packings
- Chevron® (Shallex®) mud pump packing
- Cup seals
- Length form packings
- U rings

MWDs

- Custom mouldings
- Composite seals (Lionsele® P or G)
- Engineered plastics components
- 'O' rings

Perforation

- D seals
- 'O' rings
- Springsele®

Pipelines

- Enclosure door seals
- Moorside® API ring joints
- Pipe repair seals
- RotaBolt® tension control fasteners
- Pipe in pipe centralisers
- Flowline bundle spacers

Platform modules

- Comflex® turbine inlet/exhaust bellows
- RotaBolt® tension control fasteners
- Tico® anti-vibration mounts
- Tico® pipe support products

Production safety valves

- Moorside® API ring joints
- 'O' rings
- RotaBolt® tension control fasteners
- Springsele®
- Teesele®
- Wear/bearing rings

Pumps

- Chevron® (Shallex®) packings
- Length form packings
- 'O' rings
- Pump bladders
- RotaBolt® tension control fasteners
- Teesele®

Risers

- Wear/bearing rings
- EF seals
- 'O' rings
- RotaBolt® tension control fasteners
- Solosele® G
- Springsele®
- Riser clamps and centralisers
- Umbilical and piggyback clamps
- Tubing hanger centralisers
- Stress / keel joint guides

Sampling

- Wear/bearing rings
- 'O' rings
- Scraper/wiper rings
- Teesele®

Slew rings

- RotaBolt® tension control fasteners

Swivels

- Composite seals
- Lotork –special low-friction seal for high pressure swivel applications
- 'O' rings
- RotaBolt® tension control fasteners
- Solosele® G
- Engineered plastics components

Valves

- Compression packings –including TA-Luft certified for emission control
- D seals
- Moorside® API ring joints
- 'O' rings
- Devlon® V-API valve seats
- Valve seat carriers
- Springsele®
- Teesele®
- U rings

Wellheads

- Casing & tubing hanger packing
- Custom mouldings
- EF seals
- FS Casing & Tubing Seals
- Metaflex® spiral wound gaskets
- Metal end cap seals
- Metal-metal seals
- Moorside® API ring joints
- 'O' rings
- P seals
- RotaBolt® tension control fasteners
- Springsele®
- Teesele®
- Tie down & lock down screw packings
- Devlon® thermal barrier

Downhole Sealing Guide

Some of our most popular products for exploration & production applications

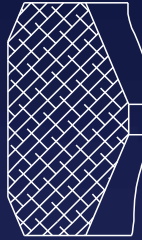
Chevron® mud pump packings

- Double V-ring packing that outperforms many traditional mud pump packings.
- Designed for highly abrasive media containing solids, oils and water.
- Low friction — low wear.
- Materials: rings of solid NBR, aramid reinforced NBR, and UHMWPE. Spacers of brass.
- Also known as Shallex® in some regions.



Moorside® API ring joints

- Metal ring joint gaskets for high pressure oilfield duties.
- Precision manufactured in the UK under API licence.
- Materials: soft iron, low carbon steel, stainless steels, and nickel-based alloys.
- Supplied to API or ASME standards.
- Stocked ranges of standard sections and sizes. Custom designs manufactured.



Solosele®G & G-AE

- Compact rod/gland and single acting piston seal.
- Saves housing space without compromising sealing integrity.
- Excellent response to both high and low pressure fluids.
- Materials: sealing element of NBR or FKM. Anti-extrusion element of fabric reinforced synthetic elastomers.
- G-AE has base ring of low friction engineering plastic.



Comflex® expansion joints

- Expansion joints for turbine inlet and exhaust ducts.
- Composite construction using non-asbestos materials.
- Very durable: better flex fatigue life than comparable systems.
- Exhaust grades to 1000°C.
- Inlet grades with excellent sound attenuation and particulate free inner surface.
- Also Multi-Layer Fabric Wrap for emergency applications.



'O' rings

- Highly versatile seals for static and dynamic duties.
- Precision moulded in over 100 elastomer grades, including NBR, HNBR, FKM.
- Large stocks held of RGD resistant 'O' rings.
- Supplied in all metric and inch sizes: SAE AS568, BS1806, BS 4518, plus DIN and Japanese specifications.
- Custom designs moulded.



Springsele® & Teesele®

- Extrusion-resistant double acting seals for arduous sealing applications.
- Springsele® for static and stab-in duties.
- Teesele® for dynamic and static duties.
- Materials: HNBR or FKM — RGD resistant elastomers.
- Validated to API 6A.



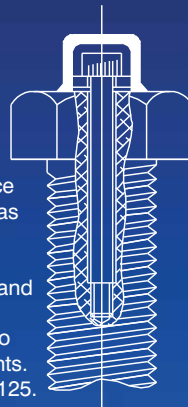
FS Casing & Tubing Seals

- For arduous duties where there are large clearances between mating surfaces.
- Replaces metal end cap seals and plastic pack arrangements.
- Materials: HNBR elastomers with RGD resistance.
- Stainless steel antiextrusion toroidal springs.
- Standard API diameters from 4 inch to 30 inch.
- DNV witnessed to API 6A.



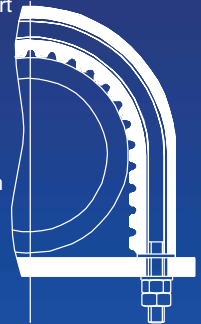
RotaBolt®

- Bolts and studs with accurate tension control indicators.
- For bolted joints where precise tensioning is critical.
- Finger feel or visual device indicates when tension has dropped below specified limit.
- Suitable for subsea and land based applications.
- Wide range of materials to suit corrosive environments.
- Standard sizes M12 to M125.



Tico® anti-vibration products

- Tico® Pipe Grips — support pipework, accommodate thermal movement and help prevent electrolytic corrosion.
- Tico® Clip Strips — for highest level of shock and vibration isolation between pipework and hanger.
- Tico® Mounting Pads — scientifically designed to isolate noise and vibration at high or low frequencies.



Metaflex® spiral wound gaskets

- For flange sealing with high pressures, temperatures, flow rates or vibration.
- V-section stainless steel or nickel alloy strip, combined with graphite or PTFE filler.
- ASME, BS and DIN standards.
- TA-Luft emission control certified.
- Shapes: circular, oval, obround, square, diamond.
- Standard sizes up to 3550mm OD.



Specialist machined components

- Metal seals and H4 gaskets.
- Thinwall machining.
- Casing and tubing hangers.
- Metal - elastomer bonded composite components.
- Precision machining capability.
- Large range of exotic alloys.
- Full materials traceability.



Devol thermoplastic engineering

- Re-engineering of metal components in a wide range of engineering thermoplastics.
- Corrosion resistance and weight reduction benefits.
- 3D and FEA design capability plus rapid prototyping.
- Flexible manufacturing from 1 to 1,000's.
- Production capability from a few millimetres to 2m diameter.
- Ball valve seats and insert materials.

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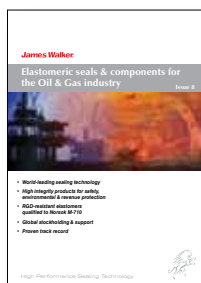
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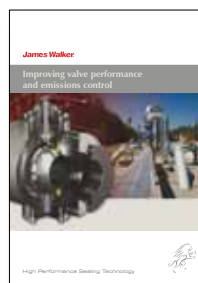
Elastomeric products



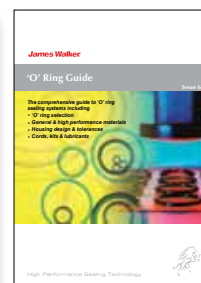
RotaBolt® tension control



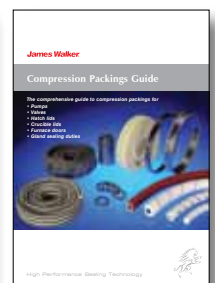
Gasket technology



Valve components



'O' rings



Compression packing

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