James Walker®

Compression Packings

The comprehensive guide to compression packing products for all pumps, valves, lids and gland sealing duties

High Performance Sealing Technology

James Walker

Introduction

James Walker's constant advances in materials and lubricants, product design and manufacturing techniques, bring you compression packings to match your most modern fluid handling systems – and your older plant.

This guide describes packings that:

- **Provide *best value* fluid sealing for your specific plant duties**
- **Range from state-of-the-art materials to traditional 'natural' yarns**
- **Work in the most chemically aggressive and abrasive environments**
- **Offer world-beating fugitive emission control – often to below 50ppm**
- **Operate under poor mechanical conditions with off-centre shafts or worn bearings**
- **Are approved for potable water, food or liquid/gaseous oxygen duties**
- **Reduce your stockholding levels – as one length-form packing can often be used for many different valves, pumps and other fluid handling plant at a site.**

Industries across the world rely on our packings to help keep their valves, pumps and other equipment operating efficiently day-in and day-out – with energy saving benefits and the minimum of fugitive emissions.

Why use packed glands?

The packed gland stands the test of time, as:

- An exceptionally reliable fluid sealing device
- Simple to install and maintain
- Highly versatile
- Remarkably cost effective in both downtime and materials – especially when compared to complex alternatives.

Non-standard packings

Contact us if you need a non-standard size or special-duty compression packing – we are expert at custom design and production.

With our fluid sealing and application engineering expertise, backed by a wide range of raw materials and flexible production facilities, we are able to solve all your specific sealing problems.

Duties at a glance

Throughout this guide we use icons to indicate different plant applications:

for valve stems

for centrifugal pumps and rotary equipment

for reciprocating pumps and rams

for static duties – tank lids and doors

Four simple steps to find your *best value* packing

Step 1: Turn to *Quick reference chart* on pages 4 & 5. The left-hand column lists packings under six services:

- Rotary, Valve & Reciprocating duties
- Rotary & Valve duties
- Rotary duties only
- Valve & Reciprocating duties
- Valve duties only
- Static (Lids & Doors) duties only.

Step 2: Compare your plant specifications with the *Service Capabilities, Media Guide* and *Industry Sectors* of each packing product that is recommended for the types of duty you need.

Step 3: Check the detailed specifications of each 'short listed' product in the main body of this guide.

Step 4: Contact your local James Walker company or distributor *(see back cover)* for *best value* prices and delivery details.

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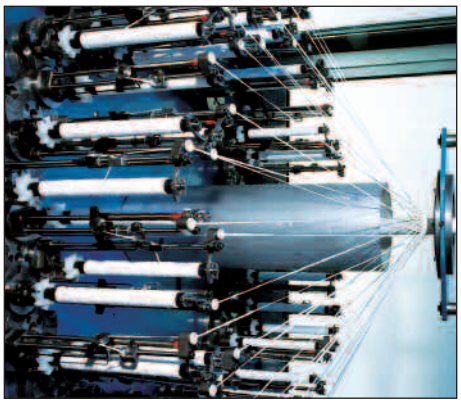

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Quick reference chart

Key: ✓= suitable product ✗ = not suitable n/a = not applicable ● = Certified to TA LUFT for VOC fugitive emission control in valves

Recommended service type	Product name	More details on page	SERVICE CAPABILITIES						
			Rotary		Valve	Reciprocating		Static (Lids/Doors)	Temper
			Shaft speed (m/s)	Pressure (bar)	Pressure (bar)	Rod speed (m/s)	Pressure (bar)	Pressure (bar)	MIN (°C)
Rotary/Valve/ Reciprocating									
	Aluflon	11	12	20	100	2	50	n/a	–50
	Arasele	7	20	25	150	1.5	100	n/a	–50
	Duramid®	8	20	25	150	1.5	150	n/a	–50
	Fluograf®	6	22	10	80	1	80	n/a	–100
	Fluolion® Emulsion XA-P	11	20	25	100	1	100	n/a	–50
	Fluolion® Emulsion 2XA	19	12	25	150	2	100	n/a	–50
	Fluolion® Filament L	10	10	25	150	1	100	n/a	–100
	Fluolion SEQUEL®	9	20	20	100	2	100	n/a	–100
	Fluolion® Sturntite	24	9	25	100	1	100	n/a	–40
	Graphite Filament Packing	17	20	25	150	4	50	n/a	–50
	Hornet	8	20	20	250	2	100	n/a	–50
	Liongraf	9	17.5	20	120	2	80	n/a	–100
	Ramiex	23	17.5	20	250	2	250	n/a	–30
	Supeta XA	20	10	10	70	1	70	n/a	–40
Rotary/Valve									
	Aquagraf	10	20	10	50	n/a	n/a	n/a	–50
	Flexmet A Type M	22	7.5	20	100	1	70	n/a	–70
	Fortuna XA	19	20	15	20	n/a	n/a	n/a	–40
	Super Flexmet XA	21	20	20	70	1	70	n/a	–70
	Supagraf® Moulded Rings (steam)	16	25	10	250	n/a	n/a	n/a	n/a
	Supagraf® RibbonPak (steam)	15	25	25	250	n/a	n/a	n/a	n/a
Rotary									
	Cottonpak Type E	24	7	10	50	1	50	n/a	–40
	Injectable Black	29	6	8	n/a	n/a	n/a	n/a	–10
	Injectable White	29	10	16	n/a	n/a	n/a	n/a	–100
	Injectable Yellow	29	8.5	15	n/a	n/a	n/a	n/a	–50
	Rover Medium Soft Cotton	23	7	10	50	1	50	n/a	–40
Valve/Reciprocating									
	Fluolion® Filament D	10	4	10	250	0.5	50	n/a	–100
	Glengarry	25	4	10	100	1	100	n/a	–40
	Sextant	25	3	10	100	1	100	n/a	–40
Valve									
	Grafpak	17	n/a	n/a	150	n/a	n/a	n/a	–50
	Incoval XA	20	n/a	n/a	150	n/a	n/a	n/a	–40
	KVSP® (Kalrez® and Teflon® rings) ●	28	n/a	n/a	170	n/a	n/a	n/a	0
	KVSP® (Kalrez® and Zymaxx® rings) ●	28	n/a	n/a	170	n/a	n/a	n/a	0
	Supagraf® Control ●	13	n/a	n/a	250	n/a	n/a	n/a	–200
	Supagraf® LF Rings ●	14	n/a	n/a	250	n/a	n/a	n/a	–200
	Supagraf® Premier ●	12	n/a	n/a	250	n/a	n/a	n/a	–200
	Supagraf® RibbonPak M (steam)	15	n/a	n/a	300	n/a	n/a	n/a	n/a
	Supagraf® Tape	16	n/a	n/a	70	n/a	n/a	n/a	–200
	Valvemaster® Packing Sets	28	n/a	n/a	250	n/a	n/a	n/a	–200
Static (Lids/Doors)									
	Armoured Supasca XA	21	1	1	n/a	n/a	n/a	5.0	–10
	Tankatite® 250	27	n/a	n/a	n/a	n/a	n/a	0.5	–30
	Tankatite® 440	26	n/a	n/a	n/a	n/a	n/a	0.7	–50
	Tankatite® 660	26	n/a	n/a	n/a	n/a	n/a	0.6	–50
	Tankatite® 880 Super	27	n/a	n/a	n/a	n/a	n/a	2	–50
	Valcor® Hi-Temp	16	n/a	n/a	n/a	n/a	n/a	n/a	–50

Quick reference chart

● = Other recommended VOC fugitive emission control products

		MEDIA GUIDE								INDUSTRY SECTORS						
ratures MAX (°C)	pH range	Steam	Gases	Process water	Potable water	Strong acids	Caustic alkalis	Oils	Solvents	Chemical	Food	Marine services	Petroleum	Pulp & paper	Power generation	Water & sewage
+130	0-14	✗	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓	✗	✓	✓	✓
+285	0-13	✓	✓	✓	✗	✗	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓
+250	2-13	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
+260	0-14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+270	1-14	✗	✓	✓	✗	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓
+290	2-12	✓	✓	✓	✗	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓
+250	0-14	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+280	1-14	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✗	✗	✓	✗	✗
+95	5-10	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓
+400	0-14	✓	✓	✓	✗	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗
+260	2-13	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
+260	0-14	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+120	4-11	✗	✓	✓	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	✓	✓
+350	4-10	✓	✓	✓	✗	✗	✗	✓	✗	✓	✗	✓	✓	✗	✓	✓
+260	1-13	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✗	✗	✗	✓
+540	6-8	✗	✓	✓	✗	✗	✗	✓	✓	✓	✗	✗	✓	✗	✗	✗
+315	4-10	✓	✓	✓	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	✓	✓
+260	4-10	✓	✓	✓	✗	✗	✗	✓	✓	✓	✗	✓	✓	✗	✓	✗
+650	0-14	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+550	0-14	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗
+90	6-8	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓
+150	4-10	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✓	✗
+250	0-14	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+250	2-13	✗	✓	✓	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
+90	6-8	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓
+250	0-14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓
+95	6-10	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓
+90	6-10	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✓
+550	0-14	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗
+500	2-11	✗	✓	✓	✗	✗	✗	✓	✓	✓	✗	✓	✓	✗	✓	✗
+200	0-14	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗
+260	0-14	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗
+350	1-14	✗	✓	✗	✗	✗	✗	✓	✓	✓	✗	✓	✓	✗	✓	✗
+350	0-14	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗
+450	1-14	✗	✓	✗	✗	✗	✗	✓	✓	✓	✗	✓	✓	✗	✓	✗
+650	0-14	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗
+500	0-14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+550	0-14	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗
+680	4-10	✓	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗	✓	✗	✓	✗
+100	1-13	✗	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
+120	0-14	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
+230	0-14	✗	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
+120	0-14	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
+1000	0-10	✗	✓	✓	✗	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓

Fluograf®

Outstanding pump and valve packing

Description
A highly versatile product that adds a new dimension to compression packing reliability and performance. Made totally from WL Gore & Associates' highly-developed GFO® yarn – combining the benefits of ePTFE, graphite and high temperature lubricants – this cross-plaited packing offers the ideal balance between density, resilience, strength and durability.

James Walker is the only UK manufacturer permitted to print ***100% GFO®*** on the product.

Typical applications
Pumps and valves handling aggressive chemical media in the petrochemical, pulp and paper, power generation and metallurgical sectors, as well as potable water, food products, and steam at up to 260°C.

Specifications
- WRAS approved for use with hot and cold potable water up to 85°C.

Prime features
- Extended service life – by up to 400% in harsh environments.
- Well proven with aggressive media.
- High thermal conductivity for cool running.
- Low coefficient of friction and minimal shaft wear.
- Very good start-up and emergency running characteristics.
- Non hardening.

Chemical properties
Compatible with media in the range pH 0-14, including steam, but *excluding* strong oxidising agents such as aqua regia, fuming nitric acid, oleum, and molten alkali metals.

Service capabilities

Valve stem duties

Maximum temperature	+260°C
Minimum temperature	–100°C
Max system pressure	80bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	22m/s
(refer to James Walker for duties up to 28m/s)	
Max system pressure	10bar

Reciprocating pumps & rams

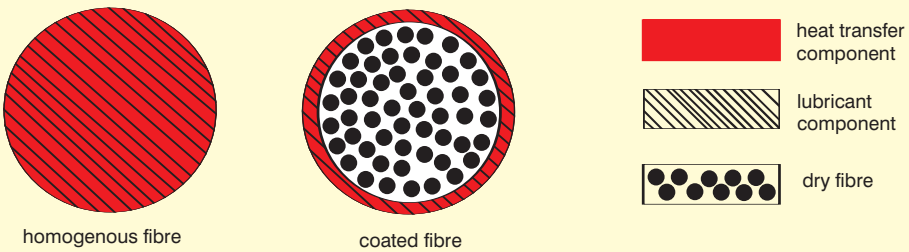
Operating temperatures	As valve stem
Maximum rod speed	1m/s
Max system pressure	80bar

(More severe duties can be sealed with specially designed arrangements)

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Selected sections available in 2m maintenance packs. Also supplied as split preformed rings and sets. Full fitting instructions are included.

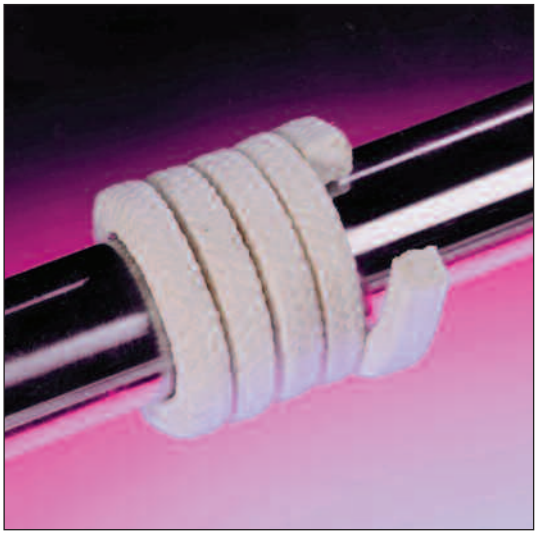
What is so special about GORE™ GFO®?
GFO® is a homogenous fibre, developed specifically for compression packings with heat transfer and lubricant components forming an integral part of the yarn. In contrast, most other packing yarns have these components added as a coating during packing manufacture. Such coatings may be washed out during the service life of the packing.

With its consistently high thermal conductivity, a GFO fibre packing ensures efficient sealing, particularly at high temperatures and speeds. Under arduous conditions where other materials can harden, dry out or even burn, a GFO fibre packing will continue to run trouble-free with controlled leakage.



Arasele

Soft and tough replacement for hard-fibre yellow packings



Typical applications
Gland sealing on rotary or reciprocating pumps and valves that handle highly abrasive slurries or aggressive chemical solutions — typically in the mineral, pulp and paper, wastewater and chemical processing industries.

It is also recommended for water, aqueous solutions and other media in processes where a clean and white, non-staining gland packing is required.

Description
This top-performing clean white gland packing is a highly effective replacement for the hard-fibred yellow products used for their abrasion resistance.

With Arasele, plant operators can readily overcome the shaft and rod wear problems often experienced when inferior grades of aramid-based packing are used with highly abrasive slurries and aggressive chemicals.

Arasele is braided from fine yarns of tough synthetic aromatic polymer fibre. The yarns are texturised and impregnated uniformly and deeply with PTFE dispersion to a high concentration, before being braided over a central core of temperature-resistant white elastomer.

A silicone-free, inert and colourless lubricant is incorporated during the manufacturing process to provide swift and easy running in on dynamic duties.

Arasele proves particularly effective in applications where its rubber core enables the packing to absorb the eccentric movement of shafts or rams that run out-of-true. This construction can also provide the packing with swift recovery from thermal or pressure shocks and cycling.

Prime features
- Kinder to shafts than traditional yellow packings under adverse operating conditions.
- Can eliminate unnecessary shaft wear.
- Excellent resistance to abrasion and chemical attack.
- Resists hydrolysis — making it ideal for use with steam, water and hot aqueous solutions.
- Better thermal conductivity than most white or yellow packings.
- Can absorb eccentric shaft actions and thermal or pressure cycling.
- Reduces users' stockholding by providing long-life gland sealing for most pumps and valves on a site.

Chemical properties
Compatible with media in the range pH 0-13, including steam, water, fuels, oils, solvents, acids and alkalis. *(Note: This chemical resistance is better than that of traditional aramid-based packings.)*

Service capabilities

Valve stem duties

Maximum temperature	+285°C
Minimum temperature	–50°C
Max system pressure	150bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	20m/s
Max system pressure	25bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1.5m/s
Max system pressure	100bar

(Note: Traditional aramid-based packings typically work at a maximum temperature of +250°C.)

How supplied
Ex-stock: in all standard square sections to fit pump and valve glands, boxed in 8m lengths. Also supplied as mould-formed rings and sets. Full fitting instructions are included.

Duramid®

Tough packing for harsh conditions

Description
A tough, high performance packing, cross-plaited from texturised aramid yarns. Each yarn is uniformly impregnated with PTFE dispersion and a silicone-based lubricant that resists chemical attack at high temperatures. Although Duramid® is based on aramid fibre rather than PTFE, its exceptional qualities justify inclusion in this section alongside its sister products, Fluograf® and Hornet.

Typical applications
Valves and pumps handling abrasive and aggressive media in pulp and paper mills, petrochemical plants, power stations, metallurgical plants, sewage works and china clay works. Also suitable for potable water and foodstuffs, medium pressure steam, and hardening fluids such as tar and bitumen.

Specifications
- WRAS approved for use with hot and cold potable water up to 85°C.

Prime features
- Suitable for very wide range of media.
- Excellent abrasion resistance.
- Long service life with minimal shaft wear.
- Resilient and responsive in operation.

Chemical properties
Compatible with media in the range pH 2-13, including water, oils, solvents, medium strength acids and alkalis.

Service capabilities

Valve stem duties

Maximum temperature	+250°C
Minimum temperature	–50°C
Max system pressure	150bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	20m/s
	(refer to James Walker for higher speed duties)
Max system pressure	25bar

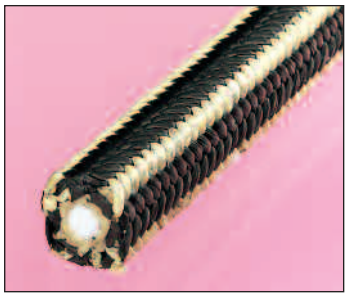
Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1.5m/s
Max system pressure	150bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Hornet

For slurries and abrasive media



Description
A high performance packing that absorbs the eccentric action of worn shafts and bearings. It has a central core of temperature resistant elastomer. The square sectioned packing is cross-plaited with tough aramid fibres at the corners to resist abrasion and wear. PTFE/graphite yarn at the centre of each side dissipates heat and presents a low friction face to the shaft.

Typical applications
Valves and pumps handling highly abrasive slurries in pulp and paper mills, sugar refineries, petrochemical plants, sewage works, metallurgical plants and china clay works. Also suitable for potable water, foodstuffs and steam.

Specifications
- WRAS approved for use with hot and cold potable water up to 85°C.

Prime features
- Excellent abrasion resistance.
- Superior compression and recovery characteristics with out-of-true shafts.
- Excellent extrusion resistance.
- Low shaft wear.

Chemical properties
Compatible with media in the range pH 2-13, including water, fuels, oils, solvents, waxes, and mild acids and alkalis.

Service capabilities

Valve stem duties

Maximum temperature	+260°C
Minimum temperature	–50°C
Max system pressure	250bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	20m/s
Max system pressure	20bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	2m/s
Max system pressure	100bar

How supplied
Ex-stock: all popular square sections from 6.5mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Fluolion SEQUEL®

Pure white for food and pharmaceuticals

Description
An outstanding, non-contaminating packing, made from WL Gore & Associates' highly developed SEQUEL® yarn of ePTFE and an entrapped white solid lubricant with heat conductivity and lubricity features close to graphite. James Walker's design and manufacturing expertise converts the yarn to a cross-plaited packing offering optimum performance, density, resilience and durability.

Typical applications
Rotary and reciprocating plant in the food processing, pharmaceutical, speciality chemicals, and pulp and paper sectors. It is particularly recommended for sugar and chocolate processing, and fine paper production.

Specifications
- SEQUEL® yarn is FDA approved for food and pharmaceutical applications.

Prime features
- Clean, non-contaminating and graphite free.
- Long maintenance-free service life.
- Minimal shaft wear and leakage.
- Superior performance over other pure white packings.

Chemical properties
Compatible with media in the range pH 1-14, *excluding* strong oxidising agents and molten alkali metals.

Service capabilities

Valve stem duties

Maximum temperature	+280°C
Minimum temperature	–100°C
Max system pressure	100bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	20m/s
Max system pressure	20bar

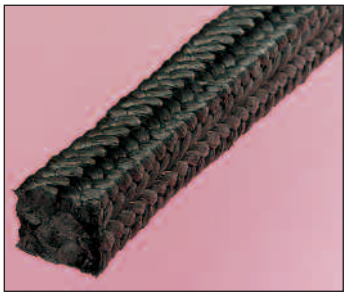
Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	2m/s
Max system pressure	100bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Customers are recommended to use sets of preformed rings for optimum performance, fitting ease and economy. Full fitting instructions are included.

Liongraf

Our universal, economical packing



Description
A highly reliable pump and valve packing of cross-plait construction, based on graphite and PTFE yarn that is thermally stabilised then lubricated with a silicone-free compound.

Typical applications
Widely regarded as an economical packing for universal application and the reduction of stockholding requirements. Well proven in the petrochemical, power generation, marine and metallurgical sectors, and by pump and valve manufacturers for OEM installation. It is suitable for duties with steam, condensate, effluents, fuels and oils, acids, alkalis and chemical solutions.

Prime features
- Strong, durable and extrusion resistant.
- Reliable over a wide range of duties.
- Excellent chemical resistance.
- Low friction with high thermal conductivity.

Chemical properties
Compatible with media in the range pH 0-14, including corrosive fluids and solvents.

Service capabilities

Valve stem duties

Maximum temperature	+260°C
Minimum temperature	–100°C
Max system pressure	120bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	17.5m/s
Max system pressure	20bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	2m/s
Max system pressure	80bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Aquagraf

Potable water and chemical duties

Description
A highly developed gland packing for valves and rotary pumps on potable water systems. The yarn, which comprises a unique blend of expanded PTFE and graphite lubricant, is cross plaited around a silicone rubber core for good compressibility and recovery.

Typical applications
OEM and maintenance for valves and rotating plant in the water supply industry. It is also safe for intermittent contact with food products. Resistance to a wide range of media has extended its duties to chemical, petrochemical and general processing plant.

Specifications
- WRAS approved for use with cold and hot potable water up to 85°C.

Prime features
- Hard wearing with great resilience.
- Elastomeric core absorbs action of worn shafts and valve stems.
- Impressive low friction characteristics.
- Rapidly achieves stable conditions after pump start-up.

Chemical properties
Compatible with media in the range pH 1-13, *excluding* strong oxidising agents such as aqua regia, fuming nitric acid, oleum and molten alkali metals.

Service capabilities

Valve stem duties

Maximum temperature	+260°C
Minimum temperature	–50°C
Max system pressure	50bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	20m/s
Max system pressure	10bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Fluolion® Filament D & L

High chemical resistance

Description
Both **Filament D** and **Filament L** are cross-plaited from tough thermally stable PTFE fibre yarn. **Filament D** is impregnated and densified with particles of PTFE, and the packing is cleaned of all organic matter and volatile content. **Filament L** is impregnated and densified with particles of PTFE and contains an inert running-in lubricant.

Typical applications
The purity of **Filament D** allows it to be used as a valve packing for oxygen services and food applications. It is also suitable for slow-duty pumps handling chemicals. **Filament L** is a chemically resistant high performance packing for pumps and valves.

Specifications (Filament D only)
- PTFE yarns manufactured according to FDA guidelines.
- BAM approved for service with gaseous oxygen at up to 60°C and 20bar and with liquid oxygen to 250°C and 150bar.
- Potable water approved.

Prime features
- Excellent chemical resistance.
- Long life valve sealing with minimum maintenance.
- Clean and highly conformable for easy fitting.

Chemical properties
Compatible with media in the range pH 0-14, including corrosive acids and alkalis.

Service capabilities

Valve stem duties

	D	*L*
Maximum temperature	+250°C	+250°C
Minimum temperature	–100°C	–100°C
Max system pressure	250bar	150bar

Centrifugal pumps & rotary equipment

	D	*L*
Operating temperatures	As valve stem	As valve stem
Maximum shaft speed	4m/s	10m/s
Max system pressure	10bar	25bar

Reciprocating pumps & rams

	D	*L*
Operating temperatures	As valve stem	As valve stem
Maximum rod speed	0.5m/s	1.0m/s
Max system pressure	50bar	100bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Fluolion® Emulsion XA-P

High performance chemical duties

Description
A universal packing comprising a unique synthetic yarn, densified with particles of PTFE and treated with an advanced silicone-free lubricant. The impregnated yarns are cross-plaited over an elastomeric core, which enables this packing to absorb the eccentric actions of worn shafts and bearings running in very harsh environments.

Typical applications
Pumps, valves and rotating plant that handle hot, abrasive and highly caustic fluid media. This packing is widely used in contact with hot slurries and effluents at pulp and paper mills, and alumina processing plants. It is also employed as a general purpose packing in the chemical industry.

Prime features
- Excellent chemical resistance, including strong acid and alkalis.
- Excellent abrasion resistance.
- Low friction and low wear on shaft sleeves.
- **Supalubrication** of yarns *(page 33)*.
- Non-contaminating lubricants.

Chemical properties
Compatible with media in the range pH 1-14.

Service capabilities

Valve stem duties

Maximum temperature	+270°C
Minimum temperature	–50°C
Max system pressure	100bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	20m/s
Max system pressure	25bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1m/s
Max system pressure	100bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Aluflon

For highly aggressive chemicals and slurries

Description
A white, conformable packing of cross-plait construction. Made from a highly developed yarn, comprising a fine reinforced glass insert with a spun cover of polyolefin fibre, all coated and impregnated with PTFE micro-particles and an inert pure petroleum lubricant.

Typical applications
Developed for pumps that handle caustic slurries in the alumina processing industry. Also recommended for duties throughout the chemical sector on pumps and valves handling media across the widest pH range, including those containing suspended solids.

Prime features
- Outstanding chemical resistance, including strong acids and alkalis.
- Low friction and low wear on shaft sleeves.
- Long life with low maintenance.
- Easy to fit and remove.
- Free of graphite, silicone oils and abrasive fibres.
- WRAS approved for use with cold and hot potable water up to 85°C.

Chemical properties
Compatible with media in the range pH 0-14.

Service capabilities

Valve stem duties

Maximum temperature	+130°C
Minimum temperature	–50°C
Max system pressure	100bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	12m/s
Max system pressure	20bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	2m/s
Max system pressure	50bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Live-loaded systems can be custom-manufactured. Full fitting instructions are included.

Supagraf® Premier

World-beating fugitive emission control

Description
Our top-of-the-range fugitive emission control packing for valves. This cost effective, length-form product is manufactured in exfoliated graphite, reinforced in a novel way to provide additional strength and resistance to pressure and extrusion. It incorporates an advanced lubricant system that prevents the pick-up of graphite on valve stems.

Typical applications
Harsh operating conditions where fugitive emissions from all types of valves need to be reduced to well below 100ppm. Widely used in systems handling fluid media such as hydrocarbon liquid fuels and gases, lubricating oils and processing chemicals.

Specifications
- Certified to TA LUFT requirements for VOC fugitive emission control in valves.
- API 607 Fire Safe Tested and Certified: third party tested to extended specification by independent laboratory in USA.
- Third party verified emission control performance; eg, by CETIM to Shell spec SPE 77/312 class A.

Prime features
- Top of its class in independent tests run on behalf of the CAPI Group (Akzo Nobel, Shell, Dow and DSM).
- Suitable for both rotary and rising-stem valves.
- Low friction action without graphite pick-up.
- No special fitting techniques required.

Chemical properties
Chemically inert within the range pH 1-14, *excluding* strong oxidising agents. Negligible volatile content.

Service capabilities

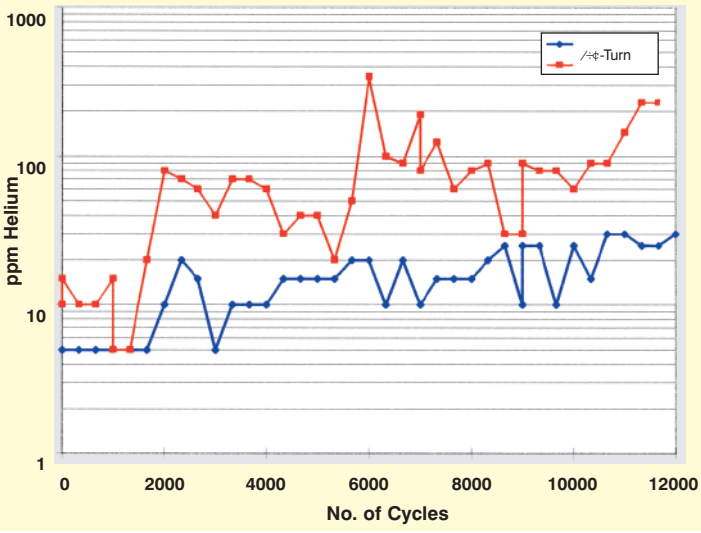
Valve stem duties

Maximum temperature	
Oxidising conditions	+450°C
Minimum temperature	–200°C
Max system pressure	250bar

How supplied
Ex-stock: all popular square sections from 3mm cross-section upwards to suit all standard valves. Boxed in 8m lengths or supplied as split preformed rings and sets. Full fitting instructions are included.

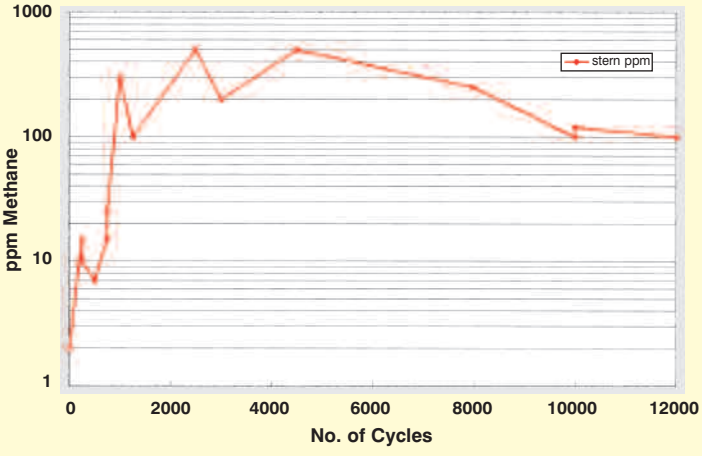
Sealability tests

Leeds University Tests – 40 bar Helium
(Valve Body Temperature Cycling between 300°C and 200°C)



Longevity tests

Supagraf Premier
J.W. Endurance Test, - 40 bar Methane



Supagraf® Control

Fugitive emission control for control valves to TA LUFT requirements

Description
This innovative compression packing for control valves is proven to reduce VOC fugitive emissions to well below 50ppm for over 100,000 stem strokes. Its use represents a ***best available technique (BAT)*** in line with the ***European Union's IPPC Directive***.

Supagraf® Control's long-term, high integrity sealing capability, with very low stem friction for control accuracy, derive from its unique design and manufacture.

It is made of high purity exfoliated graphite, reinforced in a novel way with a non-metallic structure to provide additional strength and resistance to pressure and extrusion. An advanced lubricant system is incorporated to prevent the pick up of graphite on valve stems.

Typical applications
Control valves in systems that handle fluid media such as hydrocarbon liquid fuels and gases, lubricating oils and hazardous process chemicals.

It can be used as a long-term replacement for the PTFE V-type packings that are readily damaged by ingress of dirt and other foreign particles to the gland area.

Specifications
TA LUFT: Masoneilan control valves fitted with Supagraf Control are certified to TA LUFT requirements at leak tightness with helium to $<10^{-4}$mbar.litre.s^{-1}.m^{-1}. The tests were undertaken with 100bar at 20°C and 57bar at a fluid flow temperature of 425°C for 100,000 stem cycles, including four thermal cycles and two gland adjustments.

ISO 15848-1: Masoneilan control valves fitted with Supagraf Control are certified to ISO 15848-1 Class BH, CC3, at -29°C to +425°C. The valves showed helium leakage rates less than 10^{-4}mg.s^{-1}.m^{-1} for 100,000 stem cycles. This was achieved with pressure of 57.5bar at a fluid flow temperature of +425°C and 103.4bar at -29°C to +38°C.

Prime features
- High integrity gland sealing for control valve stems: to well below 50ppm fugitive emission level.
- Long-term adjustment free operation: over 100,000 stem strokes possible with emission levels below 500ppm.
- Very low coefficient of friction for smooth and accurate valve action.
- Reduced friction requirement to save on power consumption and enable smaller actuators to be used.
- Certificated by TUV-Nord to TA LUFT VDI 2440

Summaries of additional tests
In addition to TA LUFT and ISO 15848-1 certifications shown under *Specifications*, the following impressive test results have been achieved.

Thermal cycling: 10,800 valve operating cycles at 20°C and 50bar, followed by 16,700 operating cycles at 280°C and 50bar. Recorded leakage was $<2.2 \times 10^{-4}$ mbar.litre.s^{-1}. *(Third party test by major manufacturer of control valves.)*
Fugitive emission control: 10ppm to 15ppm maximum emission levels for five-ring set of Supagraf Control after 1100 stem strokes and five thermal cycles between ambient and 160°C. *(Test by James Walker Technology Centre.)*

Long-term performance: Over 100,000 stem cycles with emission levels below 500ppm using 40bar methane, without gland adjustment. *(Test by James Walker Technology Centre.)*

Copies of certificates and/or full details of tests can be supplied.

Chemical properties
Chemically inert within the range pH 1-14, *excluding strong oxidising agents*. Low volatiles content.

Service capabilities

Valve stem duties

Maximum temperature	+350°C
Minimum temperature	–200°C
Max system pressure	250bar

How supplied
Split preformed rings and sets for ease of installation and optimal performance, or boxed in 8m lengths for on-site maintenance economy.

Ex-stock: all popular sections from 3mm upwards to suit standard valves. Non-standard square or rectangular sections made to order. Full fitting instructions are included.

Supagraf® LF Rings

Low friction rings for low-torque valve action plus fugitive emission control

Description

Supagraf® LF rings represent a major enhancement of the operational capabilities of graphite sealing rings used on valve stems.

The rings are precision moulded from high purity expanded graphite foil to which a special low friction coating has been sinter bonded. The 5µm thick coating is bonded to the expanded graphite before the moulding process to ensure maximum service life.

Typical applications

- Valves where fugitive emission control to 50ppm or less is required
- Valves that handle dry gases or other fluids, where friction on standard graphite seals is unacceptably high.
- Valves that suffer judder, hesitation or erratic action due to carbon pick-up or high-spot friction on the spindle.

Prime features

- Greatly reduces the torque needed for efficient valve operation.
- Saves on power consumption and enables smaller actuators to be used.
- Lowers the break-out friction for smoother valve operation.
- Retains exceptionally low-friction characteristics with fugitive emission control for up to 20,000 valve cycles.
- Subsequent manual adjustment extends performance to 60,000 cycles.
- Fire-safe capability enables rings to be used in plant subjected to fire rating tests.
- Can be supplied live-loaded.

Chemical compatibility

Chemically inert to most media in the range pH 0-14.

Service capabilities

Valve stem duties

Maximum temperature	+350°C
Minimum temperature	–200°C
Max service pressure	250bar

How supplied

Precision moulded rings in endless form or with single split or as matched scarf-split halves. Sections 1.5mm to 40mm; diameters 2mm ID to over 1100mm ID.

Laboratory tests

Independent tests confirm our low-friction, low torque claims.

In comparative tests, sets of Supagraf LF rings were compressed in a gland housing and the friction coefficients determined at two levels of compressive stress. The tests were repeated with sets of standard graphite rings.

In both cases, Supagraf LF displayed exactly half the friction coefficient of the standard graphite.

	Friction coefficient
Supagraf LF rings	
@ 10MPa stress	0.11
@ 40MPa stress	0.07*
Standard graphite rings	
@ 10MPa stress	0.22
@ 40MPa stress	0.14*

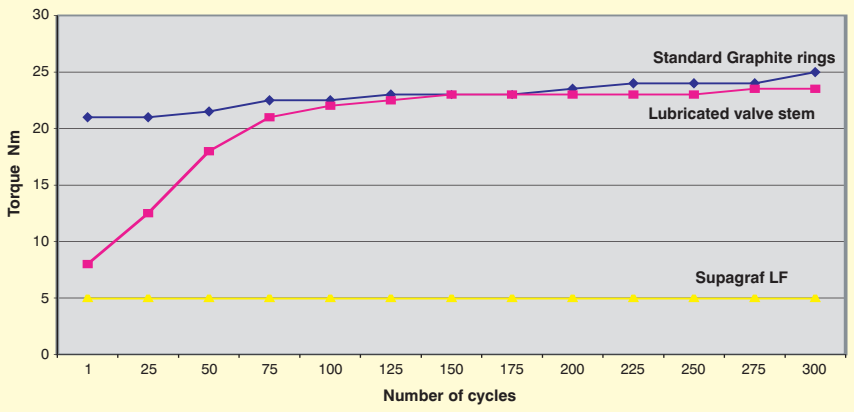
(*Surface characteristics improve on these graphite rings as the material compresses.)

Torque figures taken during extended valve cycling tests showed that valve stem torque remained constant at 5Nm for Supagraf LF rings *(see graph)*.

For standard graphite rings, the torque rose from 21Nm to 25Nm during the first 300 operating cycles.

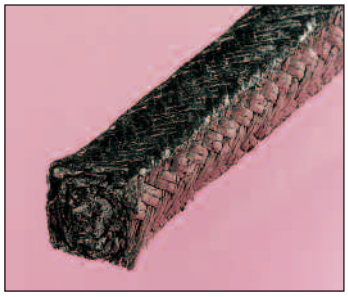
With a lubricated valve stem, the torque for standard graphite rings increase from 7Nm to 23Nm during the first 150 cycles as the lubricant was removed by valve action.

VALVE STEM TORQUE



Supagraf® RibbonPak

High rotary speeds with aggressive media



Description
High purity exfoliated graphite ribbons, plaited into a flexible length-form packing for convenient on-site maintenance.

Typical applications
High speed rotary pumps handling water or slurry in pulp and paper processing. Also a general purpose valve stem packing for steam and chemical processing duties.

Prime features
- Excellent chemical resistance across very wide temperature range.
- Replaces moulded graphite foil sealing rings.
- Flexible and compressible.
- Easy to install – no special tools needed.
- Reduces stockholding requirements.

Chemical properties
Chemically inert within the range pH 0-14, *excluding* strong oxidising agents. Negligible volatile content. Low in extractable trace impurities such as chloride and sulphur.

Service capabilities

Valve stem duties

Maximum temperatures	
Steam	+550°C
Oxidising conditions	+450°C
Non-oxidising	+850°C
Minimum temperature	–200°C
Max system pressure	250bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	25m/s
Max system pressure	25bar

How supplied
Ex-stock: all popular square sections from 3mm upwards, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Supagraf® RibbonPak M

Length-form graphite packing with reinforcement

Description
Plaited length-form packing of pure exfoliated graphite ribbons that are reinforced with fine Inconel wires to provide additional strength plus resistance to pressure and extrusion.

Typical applications
Valves handling steam, condensate, fuel, oils, gases, chemicals, process water or effluent. This product is widely used in petrochemical plants, refineries, power stations and steel mills.

Prime features
- Exceptional temperature range.
- Excellent chemical resistance.
- Long service life with rotary or rising-stem valves.
- Low friction and high thermal conductivity.
- Easy to cut, shape and install.
- Replaces moulded graphite foil rings and reduces stockholding.
- Extended shelf life – does not harden.

Chemical properties
Chemically inert within the range pH 0-14, *excluding* strong oxidising agents. Negligible volatile content. Low in extractable trace impurities such as chloride and sulphur.

Service capabilities

Valve stem duties

Maximum temperatures	
Steam	+650°C
Oxidising conditions	+450°C
Non-oxidising	+1000°C
Minimum temperature	–200°C
Max system pressure	300bar

How supplied
Ex-stock: all popular square sections from 3mm cross-section upwards to suit all standard valves. Boxed in 8m lengths or supplied as split preformed rings and sets. Full fitting instructions are included.

Supagraf® Moulded Rings

Graphite rings with exceptional operating qualities

Description
High efficiency graphite sealing rings, moulded to precise density and dimensions. Manufactured from expanded high purity graphite foil without the use of binders, elastomers or fillers. Also available as **Wire Reinforced Supagraf®** with an internal reinforcement of stainless steel wire, orientated in all planes for high loads; and as **Passivated Supagraf®**, containing a corrosion inhibitor to minimise galvanic action.

Typical applications
Valves and high speed rotary pumps for virtually all industries and fluid media. The rings are particularly recommended for systems handling high-temperature steam, demineralised water, potable water, heat transfer media, petroleum products, inorganic and organic acids, alkalis, hot waxes and oils.

Specifications (plain Supagraf®)
- WRAS approved for use with cold and hot potable water up to 85°C.
- Meets UK Electrical Generating Industry Standard 155701: *Preformed flexible graphite valve packing rings*.

Prime features
- Outstanding sealing performance over long adjustment-free periods.
- Excellent chemical resistance.
- Very wide temperature range.
- Low friction and high heat transfer.
- Fire safe capability.
- Capable of sealing liquid and gaseous oxygen up to 90°C: consult James Walker's Technical Services Team.
- Highest purity **Nuclear Grade** also available.

Chemical properties
Chemically inert within the range pH 0-14. Extractable chloride ion content typically 25ppm, sulphur <100ppm for standard grade, Chloride ion <10ppm, and sulphur <60ppm for **Nuclear Grade**. No loss of volatiles, even at high temperatures. Lower limiting temperatures may apply when used with oxidising agents such as nitric, sulphuric or chromic acid.

Physical properties

Carbon content (grade dependent) %	98 – 99.8
Density range, g/cm³	1.1 – 1.8
Coefficient of linear expansion, for ring of density 1.4g/cm³	$7x10^{6}$
Thermal conductivity, for ring of density 1.4g/cm³ @ 20°C, W/mK, axially	400
radially	6
Coefficient of friction to steel	0.05

Service capabilities

Valve stem duties

Maximum temperatures	
Steam	+650°C
Oxidising conditions	+500°C
Non-oxidising	+1000°C
Minimum temperature	–200°C
Max system pressure	250bar

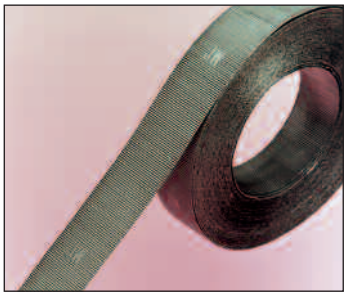
Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	25m/s
Max system pressure	10bar

How supplied
Precision moulded rings in endless form, or with single split or as matched scarf-split halves. Sections 1.5mm to 40mm; diameters 2mm to over 1100mm. Recommended densities: 1.5g/cm³ for rotary pumps; 1.6g/cm³ for valve stem duties (with end rings of **Grafpak** – *page 17*), although rings of higher densities, or a combination of high and low density rings may be used for specific applications (see also **Valvemaster®**, *page 28*). Full fitting instructions are included.

Supagraf® Tape

Maintenance expedient for valves



Description
Supagraf® exfoliated graphite in easy-to-use textured tape form. Can be supplied with self-adhesive backing.

Typical applications
A widely used maintenance expedient for winding around a valve stem then compressing into the stuffing box. Suitable for use in many industries with valves handling media such as high-temperature steam, demineralised water, potable water, heat transfer media, petroleum products, inorganic and organic acids, alkalis, hot waxes and oils. Version with self-adhesive backing can also be used as emergency gasket replacement.

Specifications
- WRAS approved for use with cold and hot potable water up to 85°C.

Prime features & Chemical properties
See details of plain Supagraf® Moulded Rings, above.

Physical properties

Carbon content, %	98 minimum
Density, g/cm³	0.7
Coefficient of friction to steel	0.05

Service capabilities

Valve stem duties

Maximum temperature	+500°C
Minimum temperature	–200°C
Max system pressure	70bar

How supplied
Ex-stock in convenient cassettes for protection and ease of dispensing. 0.5mm thick tape: 10mm wide x 10m long, 15mm x 10m, 20mm x 15m, 25mm x 15m. Also available with self-adhesive backing.

Grafpak

For high temperature/pressure steam

Description
Dense, high strength packing of cross-plaited premier quality graphite filament yarns. Treated with pure graphite before and after plaiting, and further treated with special corrosion inhibitors.

Typical applications
Control valves and main stop valves on high temperature/pressure steam circuits at power stations, chemical plants, industrial services, and on marine installations. Also suitable for duties with water, condensate, alkalis, acids, solvents and most chemicals.

Frequently used as end rings in conjunction with **Supagraf® Moulded Rings** *(page 16)* and in **Valvemaster®** live-loaded control system *(page 28)*.

Prime features
- Suitable for wide range of aggressive media.
- Low friction for low torque operation.
- Tough and resistant to fretting and extrusion.

Chemical properties
Chemically inert within the range pH 0-14, *excluding* strong oxidising agents.

Service capabilities

Valve stem duties

Maximum temperatures	
Steam & oxidising conditions	+550°C
Non-oxidising	*(significantly higher, refer to James Walker)*
Minimum temperature	–50°C
Max system pressure	150bar typical *(refer to James Walker for higher pressures)*

How supplied
Ex-stock: all popular square sections from 3mm cross-section upwards to suit all standard valves. Boxed in 8m lengths or supplied as split preformed rings and sets. Full fitting instructions are included.

Graphite Filament Packing

Highly versatile gland packing

Description
Cross-plaited packing of high strength graphite yarn, impregnated with PTFE dispersion and graphite powder to increase density and sealing efficiency.

Typical applications
Gland packing duties with a wide range of media across many industrial sectors. Its versatility with valves, rotary equipment and reciprocating pumps allows users to standardise on one range of packings for the majority of their general plant.

Prime features
- Excellent chemical and thermal resistance.
- Good thermal conductivity.
- Excellent lubricity.
- Dense and resilient for long operational life.

Chemical properties
Chemically inert within the range pH 0-14, *excluding* strong oxidising agents such as concentrated sulphuric and nitric acid, plus molten alkali metals, fluorine gas and fluorine compounds.

Service capabilities

Valve stem duties

Maximum temperature	+400°C
Minimum temperature	–50°C
Max system pressure	150bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	20m/s
Max system pressure	25bar

Reciprocating pumps & rams

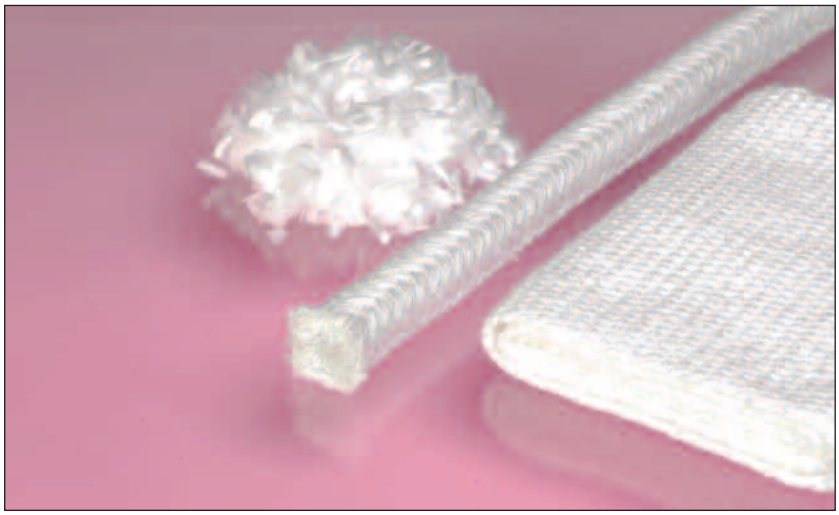
Operating temperatures	As valve stem
Maximum rod speed	4m/s
Max system pressure	50bar

How supplied
Ex-stock: all popular square sections from 3mm cross-section upwards, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Non-hazardous silica fibre

Valcor® Hi-Temp

Non-hazardous fibre construction for 1000°C



Descriptions

This innovative product is braided as a gland packing for high efficiency static and slow rotatry sealing applications at up to 1000°C constant. It also fulfils other high temperature duties in different forms of construction.

Valcor® Hi-Temp is manufactured from an exceptionally stable fibre material that is soft, non-irritating, non-hazardous, and is not limited by World Health Organisation (WHO) or European Union (EU) restrictions.

The heat-resistant fibres are produced using advanced chemical fibre technology, then spun into a flexible yarn in the UK with a low percentage of glass fibre and Inconel wire reinforcement. Our products are braided or woven from this specially developed and superior yarn.

The yarn contains no organic agents or processing additives. It therefore retains its physical and chemical properties at very high temperatures and does not decompose into hazardous substances as happens with many normal ceramics.

Typical applications

Compression packings of Valcor Hi-Temp are used for very high temperature static sealing applications or slow rotary duties.

Examples include door seals for annealing furnaces at steelworks, kiln packings, protective surfaces on pottery kiln cars, and stem gland sealing on valves handling very high temperature gases.

Valcor Hi-Temp is also supplied in various other constructions for high temperature duties across industry, including:

- Braided insulation sleeves
- Webbing tapes
- Ladder tapes
- Twisted ropes
- Lagging ropes
- Blankets and paper
- Woven cloth.

Prime features

- Compression packing will seal efficiently at 1000°C, with excursions to 1100°C.
- Competitively priced, non-hazardous alternative to normal ceramic fibre based compression packings.
- Far better value for money than other non-hazardous high temperature materials such as those made of pure silica fibre.

Health & Safety considerations

Average diameter of the mineral fibre used in Valcor Hi-Temp is 9µm, which is considered **non-hazardous to health**.

No protection for breathing, eye, hand or body is required by the WHO or EU for the material's normal handling, storage or use. For further details, please refer to our Material Safety Data Sheet (MSDS) on Valcor Hi-Temp, which is available on request.

Note: Normal ceramic fibres, as often used in the manufacture of very high temperature compression packings, are around 3µm in diameter. These much finer fibres are now considered ***hazardous to health****, with WHO and EU restrictions applied to the products that contain them.*

Chemical properties

Valcor Hi-Temp is compatible with fluid media in the range pH 0-10, *excluding* hydrofluoric acid and hydrogen fluoride. It has excellent resistance to water, organic chemicals and other acids.

Service capabilities

Static duties – furnace doors

Max temperatures (constant)	1000°C
Max temperature (intermittent)	1100°C
Minimum temperature	–50°C

Valve stem duties

Max temperature (constant)	1000°C
Max temperature (intermittent)	1100°C
Minimum temperature	–50°C

How supplied

As densely braided compression packings (square, round or rectangular) from 3mm to 100mm sections, in any length. Full fitting instructions are included.

All other constructions of Valcor Hi-Temp are manufactured to order.

All products in our XA range have been specifically developed by James Walker as economical replacements for traditional asbestos-based compression packings.

Fluolion® Emulsion 2XA

Cost effective multi-service on land and sea

Description
A high performance packing, cross plaited in a specially developed yarn that is spun from a blend of glass and three other fibres, and impregnated with PTFE dispersion. The result is a strong and flexible product offering low surface friction and high thermal conductivity.

Typical applications
Multi-service on pumps and valves in the marine, petrochemical, power generation, and pulp and paper industries. It is recommended for duties involving solvents, oils and petroleum products, process water and effluents, low pressure steam, and dilute acids.

Prime features
- Multi-service and highly cost effective.
- Extended working life.
- Heat, wear and chemical resistant.
- Clean, flexible and easy to fit.

Chemical properties
Compatible with media in the range pH 2-12, *excluding* highly corrosive solutions.

Service capabilities

Valve stem duties

Maximum temperature	+290°C
Minimum temperature	–50°C
Max system pressure	150bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	12m/s
Max system pressure	25bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	2m/s
Max system pressure	100bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Incoval XA

Wire-reinforced high-temperature packing

Description
A resilient valve packing, comprising a core of glass fibres bonded with a high temperature polymer and treated with graphite and an organic corrosion inhibitor. The core is over-braided with a jacket of Inconel-reinforced glass yarn, treated with high purity graphite binder and a corrosion inhibitor to give a smooth low-friction surface.

Typical applications
Valves in heavy industry where high temperatures and pressures are involved. It is recommended for duties with oils and petroleum products, air, water, gases and non-corrosive chemicals. Limited to low pressure/temperature steam services.

Prime features
- General purpose, high temperature valve packing.
- Inconel reinforced for heavy duties.
- Dense and resilient construction.
- **Supalubrication** of yarns *(page 33)*.

Chemical properties
Compatible with media in the range pH 2-11, *excluding* corrosive chemicals.

Service capabilities

Valve stem duties

Maximum temperature	+500°C *(not steam)*
Minimum temperature	–40°C
Max system pressure	150bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

XA range

Fortuna XA

High speeds and high temperatures

Description
A dense and flexible packing that is plaited from a special spun yarn blended from four synthetic fibres, coated with graphite. The yarn is impregnated under controlled condition of heat, pressure and vacuum, with a high viscosity petroleum-based lubricant then coated with high purity flake graphite before plaiting.

Typical applications
High speed rotary pumps on boiler feed systems in the power generation, marine and petrochemical industries. Also other pump and valve duties involving high temperatures and extreme conditions with steam, process water and oils.

Prime features
- Dense, flexible and responsive packing.
- Well proven in the power generation industry.
- Graphited yarns for low friction, good thermal conductivity and reduced fretting.
- **Supalubrication** of yarns *(page 33)*.

Chemical properties
Compatible with media in the range pH 4-10, including oil, gases and a variety of chemicals.

Service capabilities

Valve stem duties

Maximum temperature	+315°C
Minimum temperature	–40°C
Max system pressure	20bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	20m/s
Max system pressure	15bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Supeta XA

Economical and versatile

Description
Dense, resilient packing, plaited from high quality texturised glass yarns. Each fibre of the yarn is coated with a special graphite lubricant to reduce fretting when compressed. The graphited glass yarns are further lubricated with a heat-resistant petroleum-based compound, then finally coated with high purity flake graphite prior to braiding. **Supeta XA Twist** is available for small radial section glands.

Typical applications
General service duties on pumps or valves handling media such as steam, process water, waste water, oils and gases. Widely used in the chemical, petroleum, marine, power generation and sewage treatment sectors.

Prime features
- Economical general purpose packing.
- Highly versatile – reduces stock inventories.
- Temperatures to 350°C, including steam.
- Unique graphite-based lubricant system.
- **Supalubrication** of yarns *(page 33)*.

Chemical properties
Compatible with media in the range pH 4-10.

Service capabilities

Valve stem duties

Maximum temperature	+350°C
Minimum temperature	–40°C
Max system pressure	70bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	10m/s
Max system pressure	10bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1m/s
Max system pressure	70bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. **Supeta XA Twist** for small radial section glands: 1.5mm and 3mm diameter sections on spools containing 500g. Full fitting instructions are included.

Super Flexmet XA

High performance lead foil packing

Description
An exceptionally reliable, high performance, valve and pump packing. Constructed of lead foils that are treated with oil and graphite, then crinkled, twisted and folded around a core of graphite lubricated glass yarns to form a dense, strong packing. Lubricants are gradually released as the foil is deformed in the gland, to ensure long and consistent service.

Typical applications
High speed rotary pumps and valves that handle steam, process water, brine, gases, solvents or oil-based products at relatively high temperatures. Also recommended for reciprocating compressors, especially on refrigeration plant.

Prime features
- Well proven for long operating life.
- Exceptionally reliable in high speed rotary pumps.
- Strong and easy to fit.

Chemical properties
Compatible with media in the range pH 4-10, including ammonia and many types of refrigerant.

Service capabilities

Valve stem duties

Maximum temperature	+260°C
Minimum temperature	–70°C
Max system pressure	70bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	20m/s
Max system pressure	20bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1m/s
Max system pressure	70bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 4m spirals or coils. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Flexmet A Type M

Aluminium foil for high temperatures

Description
A metallic packing comprising pure aluminium foil that is coated with high quality petroleum oil and high purity flake graphite. The foil is crinkled, then twisted and folded over a core of graphite lubricated glass yarns to form a dense, strong packing that is deformable and resilient. Lubricants are gradually released as the foil is deformed in the gland, to ensure long and consistent service.

Typical applications
Widely used in the petroleum industry on rotary pumps and valves that handle high temperature media including oils, solvents and non-corrosive solutions. Also popular on refrigeration plant compressors where it can be used with a wide range of refrigerants.

Prime features
- Well proven in consistent long-term service.
- Very wide temperature range.
- Dense, strong and resilient.

Chemical properties
Compatible with media in the range pH 6-8, *excluding* steam and corrosive media.

Service capabilities

Valve stem duties

Maximum temperature	+540°C
Minimum temperature	–70°C
Max system pressure	100bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	7.5m/s
Max system pressure	20bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1m/s
Max system pressure	70bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 4m spirals or coils. Also supplied as split preformed rings and sets. Full fitting instructions are included.

XA range

Armoured Supasca XA

Very high temperature static duties

Description
A core of braided glass yarns, coated with graphite, and protected by a tough sleeve of braided copper wire.

Typical applications
Extensively used as a furnace door and kiln packing, and for exhaust expansion glands. It can also be used for **very slow** rotating duties when liberally coated with **Copper Anti-Seize Compound** *(page 32)*.

Prime features
- Tough and flexible for arduous duties.
- Static sealing duties up to 680°C.

Chemical properties
Resists super-heated steam, hot air and hot gases in the range pH 4-10.

Service capabilities

Static duties – furnace doors

Maximum temperature	+680°C
Minimum temperature	–10°C
Max system pressures	
Static/Rotary	5bar/1bar
Max rotary speed	1m/s

How supplied
All popular round or square cross sections from 3mm to 50mm, in lengths to order. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Ramiex

Our strongest natural fibre packing

Description
Versatile, high-performance packing, cross-plaited from top-quality bleached ramie fibre yarns that are impregnated with an advanced PTFE dispersion lubricant. The result is a consistent packing of uniform density and compressibility.

Ramie, a tropical nettle plant, produces a fibre of extreme durability, rot resistance and significantly greater strength than flax, cotton or hemp.

Typical applications
Used with great success in the mining and quarrying industries on reciprocating pumps working at 300bar with water containing highly abrasive particles. Also used for water-based hydraulic systems, pulp and paper processing with cellulose slurry, brine circulation, cooling water systems, and with fluids that crystallise or contain suspended solids.

Prime features
- Excellent extrusion resistance.
- Excellent abrasive resistance.
- Excellent rot resistance.
- Low friction and low wear.
- Kind to shafts and sleeves.
- **Supalubrication** of yarns *(page 33)*.

Chemical properties
Compatible with media in the range pH 4-11.

Service capabilities

Valve stem duties

Maximum temperature	+120°C
Minimum temperature	–30°C
Max system pressure	250bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	17.5m/s
Max system pressure	20bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	2m/s
Max system pressure	250bar
	(can be extended to 700bar with special support rings on some applications)

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Rover Medium Soft Cotton

'Natural' choice for water & oil media

Description
Superior quality packing, plaited from fine cotton yarns of soft texture. Each yarn is uniformly impregnated under heat and pressure with a petroleum-based grease and graphite prior to plaiting.

Typical applications
The 'natural' choice for marine or land-based pumps and valves that handle cold water or oil.

Prime features
- Optimum density.
- Good flexibility.
- Easy to cut and fit.
- Very economical.

Chemical properties
Compatible with media in the range pH 6-8.

Service capabilities

Valve stem duties

Maximum temperature	+90°C
Minimum temperature	–40°C
Max system pressure	50bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	7m/s
Max system pressure	10bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1m/s
Max system pressure	50bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Larger cross-sections manufactured to order. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Flax, cotton & ramie

Cottonpak Type E

White, graphite-free cotton packing

Description
Superior quality packing, plaited from fine cotton yarns of soft texture. Each yarn is uniformly impregnated under heat and pressure with a tallow lubricant prior to plaiting.

Typical applications
Rotary pumps, and reciprocating plant with soft metal rams, handling cold water.

Prime features
- Clean, white and graphite-free.
- Good flexibility.
- High lubricity in aqueous environments.
- Kind to shafts and sleeves.
- Easy to handle, cut and fit.

Chemical properties
Compatible with media in the range pH 6-8.

Service capabilities

Valve stem duties

Maximum temperature	+90°C
Minimum temperature	–40°C
Max system pressure	50bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	7m/s
Max system pressure	10bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1m/s
Max system pressure	50bar

How supplied
Ex-stock: all popular square sections from 3mm to 25mm, boxed in 8m lengths. Larger cross-sections manufactured to order. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Fluolion® Sturntite

Premier packing for marine duties

Description
Dense, robust packing, plaited from the finest quality flax yarns, impregnated with Fluolion® PTFE and petroleum-based grease. Flax yarns are selected for strength, durability, rot resistance and lubricant retention properties.

Typical applications
Very well proven product on marine duties – widely used on stern glands and rudder posts of all sizes, bilge pumps and valves, etc. Non-marine applications include pumps and valves handling waste water or sewage.

Prime features
- Designed for marine duties.
- Long life with low leakage.
- Reduced shaft wear.
- Flexible for easy fitting.

Chemical properties
Compatible with media in the range pH 5-10.

Service capabilities

Valve stem duties

Maximum temperature	+95°C
Minimum temperature	–40°C
Max system pressure	100bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	9m/s
Max system pressure	25bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1m/s
Max system pressure	100bar

How supplied
Ex-stock: all popular square sections from 3mm to 22mm, boxed in 8m lengths; and 25mm to 50mm sections in 9m lengths. Other cross-sections manufactured to order. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Sextant

Economical packing for marine duties

Description
Firm, yet flexible and compressible packing, plaited from good quality flax yarns impregnated with blended tallow lubricant then coated with mica. Flax yarns are selected for strength, durability, rot resistance and lubricant retention properties.

Typical applications
Economical and reliable grade frequently used for marine stern glands and rudder posts. Also popular for general service in hydraulic rams, valves, reciprocating pumps and accumulators, particularly in aqueous environments.

Prime features
- White graphite-free construction.
- Flexible and easy to fit.
- Lubricates and protects surfaces in aqueous duties.

Chemical properties
Compatible with media in the range pH 6-10.

Service capabilities

Valve stem duties

Maximum temperature	+90°C
Minimum temperature	–40°C
Max system pressure	100bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	3m/s
Max system pressure	10bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1m/s
Max system pressure	100bar

How supplied
Ex-stock: all popular square sections from 3mm to 32mm, boxed in 8m lengths. Larger cross-sections manufactured to order. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Glengarry

General purpose in aqueous environments

Description
A top performing flax-based packing. This dense and flexible, yet compressible, product is plaited from good quality flax yarns, each uniformly impregnated with a tenacious tallow lubricant then coated with graphite. Flax yarns are selected for strength, durability, rot resistance and lubricant retention properties.

Typical applications
General service in hydraulic rams, valves, reciprocating pumps and accumulators, particularly in aqueous environments where the tallow lubricant minimises friction and helps to protect contacting metal surfaces.

Prime features
- Ideal for water-based media.
- Flexible and easy to fit.
- Lubricates and protects surfaces.

Chemical properties
Compatible with media in the range pH 6-10.

Service capabilities

Valve stem duties

Maximum temperature	+95°C
Minimum temperature	–40°C
Max system pressure	100bar

Centrifugal pumps & rotary equipment

Operating temperatures	As valve stem
Maximum shaft speed	4m/s
Max system pressure	10bar

Reciprocating pumps & rams

Operating temperatures	As valve stem
Maximum rod speed	1m/s
Max system pressure	100bar

How supplied
Ex-stock: all popular square sections from 3mm to 32mm, boxed in 8m lengths. Larger cross-sections manufactured to order. Also supplied as split preformed rings and sets. Full fitting instructions are included.

Tankatite® range

Tankatite® represents state-of-the-art packing design and manufacture. This comprehensive range of tank lid packings has been constantly developed to meet increasingly stringent international regulations that cover the maritime transport of chemical and potentially hazardous cargoes. Extensions to the range cover the requirements of road and rail transport, and static or mobile tank containers.

Tankatite® 440

For all types of vessel

Description
A resilient elastomeric core, spirally wrapped with PTFE tape and surrounded with successive braided jackets of inert polypropylene yarn. Specially reinforced corners are incorporated to build the section to the required packing size. The braided structure is spirally wrapped with further layers of PTFE tape to provide an impermeable barrier to liquids and gases, then finally enclosed in a robust, abrasion resistant braid of PTFE yarns.

Typical applications
Sealing of tank lids, main hatches, inspection and cleaning covers on tankers carrying all known bulk liquid cargoes in all International Maritime Organisation (IMO) classes.

Specifications
- Meets US Coast Guard requirements for lid sealing of hazardous cargoes.
- Pressure tight beyond Lloyd's and DNV test criteria.

Prime features
- Gas-tight environmental seal.
- Protects cargo from sea water ingress.
- Withstands repeated opening/closing cycles.
- Unaffected by steam and other tank cleaning systems.
- Suitable for smooth recesses in stainless steel lids as well as those with rougher surface finishes.

Chemical properties
Inert to media in range pH 0-14, including all known bulk liquid cargoes in all IMO classes.

Service capabilities

Static duties – tank lids

Maximum temperature	+120°C
Minimum temperature	–50°C
Maximum tank pressure	0.7bar

How supplied
Any square or rectangular section of 12.5mm upwards is made to order; also endless rings to fit specific tank lid recesses. Full fitting instructions are included.

Tankatite® 660

For heated cargoes

Description
A heat resistant grade of Tankatite®. Similar in construction to Tankatite® 440, but with braided jackets of high quality glass fibre yarns instead of polypropylene.

Typical applications
Seals for tank lids that cover heated cargoes, such a molten bitumen, which need to be transported at elevated temperatures to prevent solidification in the tank.

Prime features
- Gas-tight environmental seal for heated cargoes.
- Protects cargo from sea water ingress.
- Withstands repeated opening/closing cycles.
- Unaffected by steam and other tank cleaning systems.

Chemical properties
Inert to media in range pH 0-14, including all known bulk liquid cargoes in all IMO classes.

Service capabilities

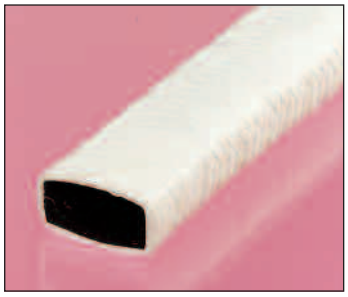
Static duties – tank lids

Maximum temperature	+230°C
Minimum temperature	–50°C
Maximum tank pressure	0.6bar

How supplied
Any square or rectangular section of 12.5mm upwards is made to order; also endless rings to fit specific tank lid recesses. Full fitting instructions are included.

Tankatite® 250

For road and rail tankers



Description
A modified form of Tankatite® 440, specifically developed for production at smaller and rectangular cross sections.

Typical applications
Seals to fit the smaller tank lid recesses of road and rail tankers.

Prime features
- Easy to cut and fit in small section lid recesses.
- Tough, resilient and long-life product.
- Withstands repeated opening/closing cycles.
- Controls emission levels from tanks.
- Protects tank contents from contamination.
- Withstands arduous cleaning systems.

Chemical properties
Inert to all chemical media within range pH 1-13 at normal operating temperatures, *excluding* fluorine gas.

Service capabilities

Static duties – tank lids

Maximum temperature	+100°C
Minimum temperature	–30°C
Maximum pressure	0.5bar

How supplied
As length form packing or endless rings, in sections to fit popular lid recess dimensions. Full fitting instructions are included.

Tankatite® 880 Super

For static and mobile tank containers

Description
A clean, length form packing manufactured from an inert reinforced polypropylene yarn, impregnated with PTFE and an inert resin to provide a non-stick surface. It contains a resilient core for improved performance.

Typical applications
Seals for lids and fittings on tank containers for road, rail or static use, that contain chemicals, petroleum products or foodstuffs. Seals for lids and fittings on dedicated tanks that handle aggressive cargoes under an inert gas blanket. It can replace moulded rubber sealing components and low cost packings.

Prime features
- Excellent value for money.
- Equivalent performance to moulded rubber seals.
- Easy to cut and fit in small section lid recesses.
- Excellent sealing capability on repeated opening/closing cycles.
- Controls emission levels from tanks.
- Protects tank contents from external contamination.
- Withstands arduous cleaning systems.

Chemical properties
Inert to media in range pH 0-14, and totally compatible with a full range of cargoes, including chemicals, petroleum products and foodstuffs.

Service capabilities

Static duties – tank lids

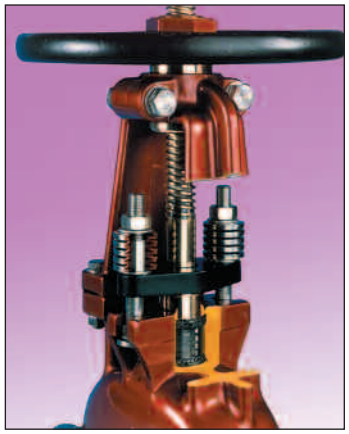
Maximum temperature	+120°C
Minimum temperature	–50°C
Maximum tank pressure	2bar

How supplied
As coil form packing and endless rings, in sections to fit popular lid recess dimensions. Full fitting instructions are included.

Customised packings

Valvemaster® Packing Sets

Live-loaded for longer life



Description
A live-loaded system for high integrity sealing of valves and slow rotary equipment operating in arduous conditions. Comprises **Supagraf® Moulded Rings** *(page 16)* of differing graphite construction located along the valve stem – to give even distribution of radial stress on the gland – with lubrication/anti-extrusion rings of tough **Grafpak** packing *(page 17)* at each end.

Disc-spring stacks operate on the gland follower to provide live-loading action for self adjustment over long maintenance-free periods.

Typical applications
Inaccessible valves controlling hazardous media, especially valves subject to thermal/pressure cycling and vibration. Industries include chemical and hydrocarbon processing, oil/gas production, power generation, sewage treatment and nuclear.

Prime features
- Self adjusts to minimise routine maintenance.
- Even radial stress gives 25 per cent higher sealing efficiency.
- Live-loading helps compensate for thermal cycling, pressure variations in media, and vibration.
- Suitable for wide range of media.
- Low breakout friction for smooth valve operation.

Chemical properties
Suitable for steam, water, condensate, oils, hot waxes, solvents, organic and inorganic acids, alkalis and most other chemicals within the pH 0-14 range. Temperature limits apply to strong oxidising agents.

Service capabilities

Valve stem duties

Maximum temperatures (packings)	
Steam & oxidising media	+550°C
Minimum temperature	–200°C
Pressure range	High vacuum to 250bar
Temperature ranges (springs)	
Stainless steel	–150°C to +250°C
Inconel	–200°C to +550°C

How supplied
Each Valvemaster® set is custom-designed and manufactured to match precisely the physical dimensions and operating conditions of a specific valve. Full fitting instructions are included.

KVSP®

Fugitive emission control with Kalrez®

Description
KVSP® is the Kalrez® Valve Stem Packing system from DuPont Performance Elastomers. It comprises alternate V-rings of Kalrez perfluoroelastomer FFKM, and rings of Teflon® PTFE or Zymaxx® (composite of carbon fibre and PFA Teflon) to form a three- or five-part packing set.

Typical applications
Widely used to minimise fugitive emissions, particularly in control valves.

A five-part set can typically reduce valve stem leakage to less than 10ppm at oil, gas, petrochemical and chemical processing plants.

Specifications
Kalrez/Zymaxx configuration, with addition of flexible graphite end ring, has passed API 607 3rd Edition Fire Test, and complies with BS 6755.

Prime features
- Very low friction when lubricated with Krytox® fluorinated grease as supplied with kits.
- Kalrez V-rings energise under axial load to form highly efficient fluid seal.
- Rigid back-up rings of Teflon or Zymaxx limit the extrusion of Kalrez elements.

Chemical properties
All KVSP components display outstanding chemical resistance; inert to media in range pH 0-14.

Service capabilities

Valve stem duties

Maximum temperatures	
With Teflon rings	+200°C
With Zymaxx rings	+260°C
	(plus short excursions to +280°C)
Minimum temperature	0°C
Max system pressure	170bar

How supplied
Stand alone packing sets and accurately calibrated live-loading kits, together with full technical support, are supplied by James Walker as Authorised Distributor of Kalrez parts in the UK. Full fitting instructions are included. DuPont Performance Elastomers recommends that individual valve designs and duties are verified before KVSP installation.

Injectable Black, White & Yellow

Three grades cover the majority of fluid media

Descriptions
Each grade of our injectable packings comprises a homogeneous blend of fibres/fillers, lubricant particles and lubricating grease. These products are pressure-injected by hand-operated gun through a valve directly into the gland housing, where two end rings of conventional packing are suitably sited to retain the sealing compound. The gland follower is then adjusted to compress the materials and form a seal.

Injectable Black is based on graphite fibre and high temperature non-melting grease.

Injectable White is based on a blend of mixed PTFE fibres with PTFE solids and a high temperature grease.

Injectable Yellow is based on a blend of Kevlar® fibres with PTFE solids and a pure lubricant.

Typical applications
Centrifugal pumps and rotary mixers that handle cooling water, aqueous solutions, oils or solvents, particularly in processing sectors such as pulp and paper, metallurgical or mineral. Injectables are sometimes used because they readily conform to worn shafts or irregular housings.

Prime features
- Can be controlled to give low leakage.
- No strip-down needed for repacking.
- Effective in less than perfect mechanical conditions.
- No flush required.
- Extended service life can be achieved.

Chemical properties
Between them, these three products provide a wide range of compatibility with media including water, oils, acids, alkalis and solvents.

Injectable Black	pH range 4-10
Injectable White	pH range 0-14
Injectable Yellow	pH range 2-13

Service capabilities

Injectable Black

Centrifugal pumps & rotary equipment

Maximum temperature	+150°C
Minimum temperature	–10°C
Maximum shaft speed	6m/s
System pressure range	Vacuum to 8bar

Injectable White

Centrifugal pumps & rotary equipment

Maximum temperature	+250°C
Minimum temperature	–100°C
Maximum shaft speed	10m/s
System pressure range	Vacuum to 16bar

Injectable Yellow

Centrifugal pumps & rotary equipment

Maximum temperature	+250°C
Minimum temperature	–50°C
Maximum shaft speed	8.5m/s
System pressure range	Vacuum to 15bar

End rings
Please note that end rings of conventional packing should be selected in the normal way to meet temperature, pressure and surface speed parameters of the application.

How supplied
Ex-stock: 2kg tubs, complete with fitting instructions. Injection guns also supplied.

Complementary products & services

Pre-formed packing rings

Precision moulded to fit each gland

Description
Precision moulded rings of our length-form compression packings, custom-made to an exact fit for a specific gland.

Typical applications
Widely used by valve and pump manufacturers for convenience and surety of installation during equipment assembly. They are also recommended for on-site maintenance and/or refurbishment when operating conditions are severe in terms of pressure and/or chemical attack.

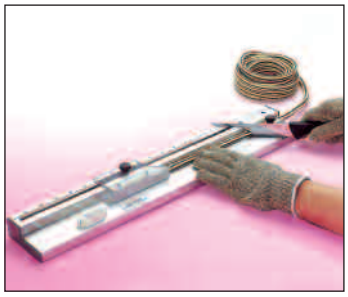
Prime features
- Ease of installation.
- Minimum initial adjustment needed.
- Precise fit in gland for high integrity sealing.
- Accurately controlled packing density for duties at higher than normal pressures.

Service capabilities
The pressure rating of standard length form packings can often be significantly increased by special moulding techniques during the manufacture of rings. *Please discuss your specific applications with our Technical Services Team.*

How supplied
Sets of rings are custom-moulded to order and supplied with either butt or scarf cut joins as required. ***Special sets*** can be designed and manufactured to combine the advantages of two or more packing products, and/or supplied with extrusion resistant end rings and spacers.

Packing Ring Cutter

Easy-to-use hand tool for scarf joints



Description
A robust and accurate cutting jig that simplifies the production of perfectly matching 45° scarf joints on packings.

Prime features
- Removes guesswork in cutting scarf joints for reliable sealing of valves and pumps.
- Simple to use for on-site maintenance and workshop-based refurbishment.
- Made from strong aluminium-alloy extrusions.
- Contains two precision scales: one for packing section, the other for inside diameter of ring.
- Supplied with knife to cut the toughest synthetic yarn packings. *Note: please follow local safety instructions for hazard-free use; also wear cut-resistant gloves.*

Service capabilities
Suitable for packing sections of 3mm to 20mm, and ring inside diameters of 10mm to 140mm. Just match the section of the packing to the ring inside diameter required, then simply cut the exact ring length required with perfect scarf joints.

How supplied
Ex-stock: boxed and labelled, with full instructions included.

Packing Extractors

Trouble free removal of old packings

Description
Highly effective and widely used extraction tools, with a long flexible shank to gain access to glands in difficult positions. The corkscrew tips are designed to embed firmly in all types of length-form packing, including badly worn and hardened products. A T-handle provides good grip for both screw action and the efficient removal of packing.

Service capabilities
- Size 1: 5mm and 6.5mm packings.
- Size 2: 8mm and 10mm packings.
- Size 3: 11mm, 12.5mm and 16mm packings.
- Size 4: 20mm packings and larger.

How supplied
Fixed-tip extractors: individual sizes, or as full set of Sizes 1 – 4.
Replaceable-tip extractors: individual sizes, or as full set of Sizes 1 – 4.
Replacement tips: supplied individually.

Molyon Grease

Excellent adhesion properties

Description
A product of soft consistency, comprising a blend of non-melting petroleum greases (bentone type) and fine particles of pure high quality molybdenum disulphide.

Typical applications
Lubrication of compression packing and seals prior to installation for duties with non-corrosive media or environments. Also used as a general lubricant.

Prime features
- Good adhesion and spread on metal surfaces.
- Film of lubricating molybdenum disulphide remains on surface even when grease carrier has gone.

Chemical properties
Compatible with most engineering materials, *excluding* items made from natural rubber, butyl or ethylene-propylene.

Service capabilities

Maximum temperature	+150°C
Minimum temperature	–20°C

How supplied
Ex-stock: packs of 10 x 175g tubes or 1kg tubs. Other quantities supplied on request.

Graphite Grease

Lubricant & anti-seize compound

Description
Thick paste of non-melting petroleum greases (bentone type) blended with a high quality lubricating grade of natural fine graphite particles.

Typical applications
Lubrication of compression packing and seals prior to installation for duties with non-corrosive media or environments. Also used as a general lubricant and anti-seize compound.

Prime features
- Contains 50 per cent graphite by weight.
- Good tack/adhesion on metal surfaces.
- Spreads with reasonable ease.
- No solvent content.

Service capabilities

Maximum temperature	+150°C
Minimum temperature	–20°C

How supplied
Ex-stock: packs of 10 x 200g tubes or 1kg tubs. Other quantities supplied on request.

Silicone Grease

For food & potable water plant

Description
A translucent gel that combines the properties of silicone fluid with a degree of structure to provide a stiff consistency.

Typical applications
A versatile grease for lubricating packings and seals prior to installation, as well as valves and taps used in the food processing and potable water industries. Can be used as an anti-seize compound, and also gives a degree of protection against dust, moisture, chemicals and corrosion.

Specifications
- Produced from FDA-approved materials.
- WRAS listed for use with cold and hot potable water up to 85°C.

Prime features
- Excellent lubricating performance across wide temperature range.
- Very low order of toxicity.
- Wide chemical resistance.
- Safe to use with most rubbers and plastics.

Chemical properties
Compatible with most engineering materials, including rubbers and plastics, but *excluding* items made from silicone or fluorosilicone compounds. Low halogen content: <20ppm chloride.

Service capabilities/properties

Maximum temperature	+200°C
Minimum temperature	–50°C
Flash point	>+300°C
Penetration test (ASTM D217)	
Unworked	250-280
Worked	250-285
Radiation resistance	
Onset of gellation (approx)	10Mrad [10^5Gy]

How supplied
Ex-stock: packs of 10 x 175g tubes or 1kg tubs. Other quantities supplied on request.

Complementary products & services

Copper Anti-Seize Compound

General purpose lubricant paste

Description
High purity anti-seize lubricant in paste form. Comprises copper and graphite particles in a high melting point petroleum carrier. Contains no lead.

Typical applications
Prevention of seizing, galling, thread damage and high friction problems on bolts, studs, valve stems, pipe fittings, press fits, etc.

Prime features
- Can be used at up to 1000°C.
- Easy to apply by brush.
- Good adhesion.
- Excess can be wiped free.

Chemical properties
Sample analysis of elemental impurities shows: chlorine <100ppm, zinc <100ppm, sulphur <50ppm, fluorine <15ppm, lead <5ppm; cadmium, mercury and tin <2ppm each.

Service capabilities/properties

Maximum temperature	+1000°C
Flash point (carrier)	+240°C
Drop point (carrier)	Infusible
Oil separation (carrier) @ 150°C	Nil
Penetration test (ASTM D217) Worked @ 25°C (carrier)	265-295

How supplied
Ex-stock: packs of 10 x 200g tubes or 500g tubs. Other quantities supplied on request.

Nickel Anti-Seize Compound

For high temperatures & corrosive environments

Description
Very high purity anti-seize lubricant in paste form. Compounded from graphite and nickel in a high melting point petroleum carrier.

Typical applications
Used instead of **Copper Anti-Seize Compound** *(see above)* where a copper-based product is unsuitable due to temperature limitations, fluid incompatibility or corrosive environment (eg, at sea). Suitable for nuclear industry duties where purity of content is a major consideration.

Prime features
- Can be used at up to 1400°C.
- Low level of impurities.
- Resists corrosion.
- Good adhesion.

Chemical properties
Sample analysis of elemental impurities shows: chlorine <15ppm, fluorine <15ppm, zinc <15ppm, sulphur <10ppm, lead <10ppm; tin and copper <5ppm each; cadmium and mercury <2ppm each.

Service capabilities/properties

Maximum temperature	+1400°C
Flash point (carrier)	+240°C
Drop point (carrier)	Infusible
Oil separation (carrier) @ 150°C	Nil
Penetration test (ASTM D217) Worked @ 25°C (carrier)	265-295

How supplied
Ex-stock: packs of 10 x 200g tubes or 500g tubs. Other quantities supplied on request.

Training CD-ROM

Free to our customers

Description
Compression Packings – A guide to their fitting and use, is a ten minute training film for plant engineers and maintenance staff. It explains the theory of gland packing systems used in pumps and valves, and features an easy-to-follow practical demonstration of the correct and safe procedures for removing old packings and fitting the latest types.

James Walker's Training CD-ROM contains four highly informative short training films. The other three titles are:
- *Calendered Non-asbestos Gaskets.*
- *Hydraulic Sealing Components.*
- *High Performance Elastomers*.

This CD-ROM auto-boots under Windows® 98/NT or higher. A sound card is needed on the PC to appreciate the films fully.

How supplied
Free of charge to users or specifiers of James Walker products.

Custom-designed & non-standard products

We are experts in the custom-design and manufacture of compression packings and other braided materials to solve specific problems for industry.

When you want products that are outside our standard size range – just ask us. We can swiftly make lengths or rings to order on our automated braiding and plaiting machines.

True production flexibility, backed by substantial stocks of top quality raw materials, means we can efficiently meet the most urgent demands.

And, when your working parameters fall beyond the scope of our standard products, we have an in-house development team that will create new or modified packing designs to meet your exact operational requirements.

Non-standard products
The vast majority of products listed elsewhere in this guide are held in stock for immediate supply to customers.

The following is a small selection of products we have developed to meet unusual demands and now manufacture-to-order.

Soot blower packing rings (LRCM056). These unique rings are based on knitted copper wire and graphite yarns. The tough, dense packings are specially developed to combat wear and resist the action of excessive lance movement.

Graphite-free Hornet (LRCM085). Similar to our highly popular **Hornet** packing *(page 8)*, but cross-plaited with aramid fibres at the corners and white PTFE yarns at the centre of each side. Used with abrasive media on duties where graphite products cannot be tolerated.

High temperature lid seals (LRCM162B & LRCM297). Silicone-coated glass braided over a rubber core, typically used as lid seals on crucibles of molten aluminium.

Braided glass yarns (LRCM190). Various types of special compression packing made from braided glass yarns. Round, square and rectangular sections are available in different densities. Yarns can also be braided over rubber cores.

Grafpak with wire (LRCM275). Wire-reinforced version of our graphite-based **Grafpak** packing *(page 17)* for high pressure/temperature applications.

Aramid with PTFE (LRCM370). Specially developed valve stem packing made from PTFE yarns containing an aramid core.

Higher temperature Armoured Supasca XA. Special version of our **Armoured Supasca XA** *(page 22)* with stainless steel wire braided over a silica-based core. Used for duties at 1000°C and above.

Silicone-coated braided glass sleeving. For protecting cables and pipes from excessive heat or impact by hot particles.

Other products – we also supply ranges of related products for industry, including:
- Glass webbing tape
- Ladder tapes
- Cloths
- Rope/pipe lagging
- Twisted cord
- Lagging cloth
- Sewing twine
- Gauge glasses & seals
- Packing sleeves with eyelets.

What is Supalubrication?

Supalubrication is our innovative process that improves the lifetime performance of compression packings.

Based on our knowledge of materials technology and tribology, we have developed a new system that deeply impregnates packing yarns with blends of fluid and solid lubricants plus special additives.

Machinery for the Supalubrication process has been custom-built to our design. This impregnates, dries and rewinds a multitude of yarns simultaneously. It uses the latest drying technology to give highly efficient in-line yarn impregnation.

The first packings to benefit from Supalubrication are **Fluolion® Emulsion XA-P** *(page 11)* and **Ramiex** *(page 23)*. Improved uniformity and depth of lubrication give these products a speedier run-in and longer sealing life with the minimum of attention.

A new graphite Supalubrication system is also now used for **Fortuna XA** *(page 20)*, **Incoval XA** *(page 19)* and **Supeta XA** *(page 20)*. This applies a highly developed graphite lubricant to glass yarns. The result is deeper impregnation, leading to higher density packings with better resistance to fretting, reduced friction and increased thermal conductivity.

James Walker

James Walker in action

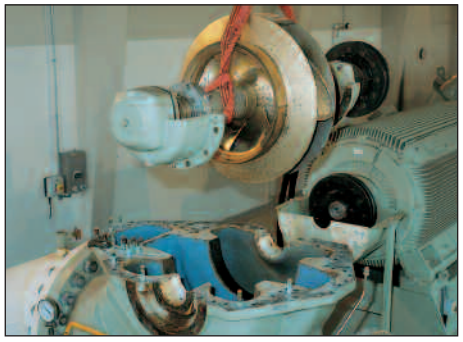
Immediate supply

We will supply you with compression packing products, when and where you need them.

Our automated warehouse holds ten million sealing products ready for same day despatch. These include vast stocks of compression packings in all popular sizes and grades used by industry.

A close-knit network of James Walker companies and official distributors covers over 100 countries. This is supported by a web-based system and a highly developed logistics operation to give you surety of supply for JIT regimes and your normal maintenance schedules.

Installation service



We offer an expert and economical service for the repair and refurbishment of valves, pumps and rotary equipment.

Experienced site teams, such as those from James Walker Engineering Services, are skilled at the rapid removal of packings by high pressure water jet and traditional methods. They can also undertake any in-situ machining that is required before installing new packings to the original or improved specifications.

These services are often carried out under maintenance contracts, but are also performed as part of carefully planned leak detection and repair (LDAR) programmes to minimise fugitive VOC emissions at petrochemical sites.

When necessary, plant is fully refurbished or re-engineered in James Walker's dedicated workshops.

Research & development

Teams of scientists and development engineers at the James Walker Technology Centre work at the leading edge of fluid sealing knowledge. They deliver the new materials, products and manufacturing techniques that improve the sealing of today's plant and meet tomorrow's sealing demands.

They also work on joint venture research projects with other organisations in the European Sealing Association – of which we are a founder member – and sponsor high-level research in partnership with world leading users of sealing technology.

In addition to our in-house test laboratories that verify the viability of our materials and seal designs, we regularly commission independent test houses across the world for third-party certification of our products to international and industry standards.

James Walker customer support

We aim to supply you with the very best:

- Customer service
- Technical support
- Fluid sealing products
- Delivery
- After sales service.

Our high technology Customer Support Centre leads the fluid sealing industry with its service to tens of thousands of customers worldwide.

On-site technical advice comes from our local teams backed by highly experienced applications engineers and James Walker Technology Centre. Together they have the knowledge and facilities to solve any fluid sealing problem for our customers.

User training is another important service we provide. Our specialists regularly host sessions to instruct plant engineers and designers in the selection and installation of sealing products. This service is backed by free CD-ROMs *(page 32)*.

James Walker quality

We select the best raw materials for each product and use advanced manufacturing techniques with strict quality control and traceability at every stage. This culminates in an exacting inspection procedure for the finished product. Stockholding and distribution meet similar exacting standards.

Our quality systems are third-party registered to BS EN ISO 9001:2000. We are also regularly assessed and quality approved by a wide range of industry bodies and individual customers, including multinational corporations, utilities and government organisations.

Alphabetical Index

Trademark acknowledgements

James Walker acknowledges the following trademarks as mentioned in this guide.

Trademark	**Company**
Kalrez®	DuPont Performance Elastomers
Kevlar®	DuPont
Krytox®	DuPont
KVSP®	DuPont Performance Elastomers
GFO®	WL Gore & Associates
GORE™ GFO®	WL Gore & Associates
SEQUEL®	WL Gore & Associates
Teflon®	DuPont
Windows® 98/NT	Microsoft Corporation
Zymaxx®	DuPont

All other names bearing the ® symbol are registered trademarks of James Walker.

Health warning: *If PTFE or fluoroelastomer (eg, FKM, FFKM, TFE/P) 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.*

James Walker

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