VULCAN ENGINEERING MEANS QUALITY AND RELIABILITY ASSURED
Vulcan Engineering Limited

Company Aims
Our company aim is to be the largest and best producer and supplier of Single Spring Mechanical Seals in Europe.

The company will achieve its aims By;
Giving our customers such outstanding service, reliability and quality that we never lose them.
THREE Factories
Modern Facilities
World-wide Distribution Centre

Automated Production
Electronic Distribution

Quality and Reliability Assured
“THE BEST SINGLE SPRING SEAL COMPANY TO DO BUSINESS WITH”

Introduction

We Are Pleased to introduce Vulcan Seals. Vulcan, with our two hundred employees in our three factories and world-wide distribution centre, specialise in the manufacture and distribution of:

- Mechanical Seals
- FEP/PFA Encapsulated ‘O’ Rings (Chem-Rings)
- Gland Packings
- Expanded P.T.F.E. Gasket materials (Tefcan)

We will Significantly increase your competitive advantage in the mechanical seal trade
“THE BEST SINGLE SPRING SEAL COMPANY TO DO BUSINESS WITH”

Introduction

We focus on being the world's best manufacturer of “Single Spring” Seals, backed by the most competitive pricing. The key features of this company policy are;

**Vulcan Seal Quality** - We manufacture practically all our own components and materials, with an intense ethos of creating the best designs and material specifications. Electronic drawing, production and inspection systems control our ISO9001 Approved processes, through to final inspection on computer-controlled inspection machines.

**Vertically Integrated Manufacture** – All Vulcan Seals are solely manufactured in-house, in our three modern facilities, of over 11,000 square metres, with increasingly automated production machinery.

We will Significantly increase your competitive advantage in the mechanical seal trade
Introduction

Electronic Distribution – Vulcan have the widest range of “Single Spring” Mechanical Seal Types, available from any manufacturer in the world, available from stock. Supply is automated to you from available E.D.I. down-load of your order, through automated linked computer/stock carousel machines, to guaranteed same-day despatch.

Simply The Best – Our strategy is to be The Electronic Seal Warehouse for our distribution partners world-wide, backed by the best prices and production, designs, materials and quality, the widest stock-range of seal types, sizes and materials, with stock levels accessible on the Web, packaged to our brand or yours, with the most competitive prices.

We will Significantly increase your competitive advantage in the mechanical seal trade
Principle Advantages of Single Spring Mechanical Seals

**Single Spring** - Gives superior axial and angular flexibility. The seal compensates for misalignment and machinery tolerances.

**Non-Clogging** - Large single spring, plus free-movement of the elastomer rubber shaft seal, combats seal failure through build up of solid materials.

**Self-adjusting** – The flexible moving rubber shaft seal accommodate shaft end float and take up wear.

**Minimal Wear** – Strong static seal to the shaft minimises shaft fretting.

We will significantly increase your competitive advantage in the mechanical seal trade.
Principle Advantages of Single Spring Mechanical Seals

**Versatile** – Compact in design and simple to fit. Standard designs and sizes for all common imperial, metric and DIN 24960 (EN12756) Housing are standard.

**Extremely cost effective** – Low capital cost, proven reliability of design, easy to fit and accommodating in use excellent seal performance and ex-stock service on a complete range of seal types, materials and sizes, make Vulcan single seals the choice for the majority of applications.

We will Significantly increase your competitive advantage in the mechanical seal trade
Vulcan Conical Spring Type Seals
Introduction
The Conical Spring Type Seals offered by Vulcan are an extremely popular seal. These robust, technically proficient, seals are designed to suit DIN and common, standard housing dimensions.

Applications
The proven efficient design and wide choice of ‘O’-Ring and face materials enable these seals to be utilised in a large variety of applications. Suited for pumps, mixers, agitators, compressors and other rotary shaft equipment.

Standard Components

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>Retainer</th>
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<tbody>
<tr>
<td>1</td>
<td>Face Ring</td>
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</tr>
<tr>
<td>2</td>
<td>‘O’- Ring</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Coil</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Monolithic Face</td>
<td>5</td>
</tr>
</tbody>
</table>

Vulcan Conical Spring Type Seals PV Chart
Standard Vulcan Conical Spring Types

**Type 8, Type 8DIN and Type 82**
Inserted rotary faced, ‘O’-Ring mounted, conical spring seals, to suit standard common or DIN fitting dimensions. The Type 82 is a balanced version of Type 8 DIN, suitable for stepped shafts.

**Type 8B**
‘O’-Ring mounted, conical spring seals seal of similar design to the standard Type 8 but with a solid stainless steel head and carbon stationary.

**Type 9 and Type 9L**
Conical spring ‘O’-Ring mounted seal, with a monolithic seal head and a choice of 8 standard or long DIN seat.

**Type 12 and Type 12DIN**
‘O’-Ring mounted, conical spring seals, available with solid stainless head as standard, or inserted SIC/TC ring face. Suitable for standard or DIN housings.

**Type 13 and Type 13DIN**
‘O’-Ring mounted, conical spring seals with pressed in, ‘O’-Ring mounted, rotary face, enabling face material interchangeability, to suit common standard or DIN dimensions.

**Type 7D**
As above Type 13 DIN but with a machined, rather than pressed seal head retainer. Designed to suit DIN 24960 (EN12756) standard.
Type 7D Description
Resilient, conical spring, ‘O’-Ring mounted DIN standard seal. With the advantage of being able to replace the faces. The seal is very versatile and is suitable for a large variety of general and arduous duty applications, through a choice of face material combinations.

Positive Drive
Seal is shaft driven, via the coil, providing a positive drive at its base and eliminating common drive pin failures.

Design
Single conical spring, stainless steel, face retainer provides a strong and effective seal, suitable for many duties, including clogging media and hygienic applications.

Self-Aligning
The combination of a resilient ‘O’-Ring and single spring design results in a technically efficient and versatile design, that accommodates both misalignment and vibrations.

‘O’-Ring Housing
The ‘O’-Ring is held within a completely recessed groove providing performance benefits, compared to competitor designs that use a separate drive ring.

Materials
Suitable for a large variety of applications, through a wide choice of ‘O’-Ring and face materials.

Seal Compatibility
(European Based manufacturers)
Vulcan Type 7 = Roten 5 & 45
Vulcan Type 7B = Roten® 5H2
Vulcan Type 7 = Uniten® 5 & 45

Customisable
Can be specially produced to any working length and seat housing dimensions.

Reliable
Robust, non-clogging, self-adjusting and durable, giving highly effective performance.

Cross Sectional Line Drawing

CONCIAL SPRING

VULCAN TYPE 7D
Type 8B Description
Conical spring, ‘O’-Ring mounted seal and seat of similar design to the Type 8 but with a solid stainless seal head and ‘O’-Ring mounted Carbon Seat. This standard face combination is suitable for general and medium duty applications.

Positive Drive
Seal is shaft driven, via the coil, providing a positive drive at its base and eliminating common drive pin failures.

Design
Single conical spring, stainless steel, face retainer provides a strong and effective seal, suitable for many duties, including clogging media and hygienic applications.

Self-Aligning
The combination of a resilient ‘O’-Ring and single spring design results in a technically efficient and versatile design, that accommodates both misalignment and vibrations.

‘O’-Ring Housing
The ‘O’-Ring is held within a completely recessed groove providing performance benefits, compared to competitor designs that use a separate drive ring.

Materials
Suitable for a large variety of applications, through a wide choice of ‘O’-Ring and face materials.

Seal Compatibility
(European Based manufacturers)
Burgmann® Type M3
M.T.U® Europa 4

Cross Sectional Line Drawing

Customisable
Can be specially produced to any working length and seat housing dimensions.

Reliable
Robust, non-clogging, self-adjusting and durable, giving highly effective performance.
**Type 8 Description**
Conical spring, ‘O’-Ring mounted seal with a wide choice of elastomers and face materials. Suitable for a large variety of general duties and arduous duty applications, including those needing high pV value face combinations.

**Positive Drive**
Seal is shaft driven, via the coil, providing a positive drive at its base and eliminating common drive pin failures.

**Design**
Single conical spring, stainless steel, face retainer provides a strong and effective seal, suitable for many duties, including clogging media and hygienic applications.

**Self-Aligning**
The combination of a resilient ‘O’-Ring and single spring design results in a technically efficient and versatile design, that accommodates both misalignment and vibrations.

**‘O’-Ring Housing**
The ‘O’-Ring is held within a completely recessed groove providing performance benefits, compared to competitor designs that use a separate drive ring.

**Materials**
Suitable for a large variety of applications, through a wide choice of ‘O’-Ring and face materials.

**Seal Compatibility**
(European Based manufacturers)
- Burgmann® Type M32
- Burgmann® Type M37
- Burgmann® Type M37G

**Cross Sectional Line Drawing**

**Customisable**
Can be specially produced to any working length and seat housing dimensions.

**Reliable**
Robust, non-clogging, self-adjusting and durable, giving highly effective performance.
Type 82 Description
Conical Spring, ‘O’-Ring mounted, balanced DIN Standard seal for stepped shafts, with reduced shaft size Type 8 DIN Long seat. This balanced seal arrangement is suitable for a large variety of general and high duty applications, with a wide choice of face material and elastomer combinations.

<table>
<thead>
<tr>
<th>Positive Drive</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal is shaft driven, via the coil, providing a positive drive at its base and eliminating common drive pin failures.</td>
<td>Suitable for a large variety of applications, through a wide choice of ‘O’-Ring and face materials.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Design</th>
<th>‘O’-Ring Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single conical spring, stainless steel, face retainer provides a strong and effective seal, suitable for many duties, including clogging media and hygienic applications.</td>
<td>The ‘O’-Ring is held within a completely recessed groove providing performance benefits, compared to competitor designs that use a separate drive ring.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self-Aligning</th>
<th>Reliable</th>
</tr>
</thead>
<tbody>
<tr>
<td>The combination of a resilient ‘O’-Ring and single spring design results in a technically efficient and versatile design, that accommodates both misalignment and vibrations.</td>
<td>Robust, non-clogging, self-adjusting and durable, giving highly effective performance.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seal Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>(European Based manufacturers)</td>
</tr>
<tr>
<td>Burgmann® Type H12N</td>
</tr>
<tr>
<td>Burgmann® Type H17GN</td>
</tr>
</tbody>
</table>

Cross Sectional Line Drawing

Customisable
Can be specially produced to any working length and seat housing dimensions.
**Type 8 DIN Description**
Conical spring, ‘O’-Ring mounted, DIN standard seal and DIN long seat with drive slot. Suitable for a large variety of general and high duty applications through a ready choice of face material and elastomer materials.

**Positive Drive**
Seal is shaft driven, via the coil, providing a positive drive at its base and eliminating common drive pin failures.

**Design**
Single conical spring, stainless steel, face retainer provides a strong and effective seal, suitable for many duties, including clogging media and hygienic applications.

**Self-Aligning**
The combination of a resilient ‘O’-Ring and single spring design results in a technically efficient and versatile design, that accommodates both misalignment and vibrations.

**‘O’-Ring Housing**
The ‘O’-Ring is held within a completely recessed groove providing performance benefits, compared to competitor designs that use a separate drive ring.

**Materials**
Suitable for a large variety of applications, through a wide choice of ‘O’-Ring and face materials.

**Seal Compatibility**
(European Based manufacturers)
- Burgmann® Type M3N
- Burgmann® Type M32N
- Burgmann® Type M37N
- Burgmann® Type M37GN

**Cross Sectional Line Drawing**

**Customisable**
Can be specially produced to any working length and seat housing dimensions.

**Reliable**
Robust, non-clogging, self-adjusting and durable, giving highly effective performance.
Type 9/9L Description
Conical spring, ‘O’-Ring mounted seal, with a monolithic rotary face, available as Type 9L with Type 8 DIN Long or Type 9 with Type 19/8 ‘O’-Ring mounted seat. Also available with Type 8 DIN short ‘O’-Ring mounted seat (see Vulcan seat page) as Type 9S.

Positive Drive
Seal is shaft driven, via the coil, providing a positive drive at its base and eliminating common drive pin failures.

Design
Single conical spring, stainless steel, face retainer provides a strong and effective seal, suitable for many duties, including clogging media and hygienic applications.

Self-Aligning
The combination of a resilient ‘O’-Ring and single spring design results in a technically efficient and versatile design, that accommodates both misalignment and vibrations.

Materials
Suitable for a large variety of applications, through a wide choice of ‘O’-Ring and face materials.

‘O’-Ring Housing
The ‘O’-Ring is held within a completely recessed groove providing performance benefits, compared to competitor designs that use a separate drive ring.

Cross Sectional Line Drawing

Seal Compatibility
(European Based manufacturers)
Vulcan Type 9 = Burgmann® M2
Vulcan Type 9 = Goetze® 76.12
Vulcan Type 9L = Burgmann® M2N
Vulcan Type 9S = Burgmann® M2N4

Customisable
Can be specially produced to any working length and seat housing dimensions.

Reliable
Robust, non-clogging, self-adjusting and durable, giving highly effective performance.
Type 12 DIN Description
A range of highly proficient, widely utilised, ‘O’-Ring mounted, conical spring seals with solid, stainless steel head and carbon seat. To suit standard housings. Suitable for a wide variety of duties. For photo and line drawing see Type 12 DIN page.

Positive Drive
Seal is shaft driven, via the coil, providing a positive drive at its base and eliminating common drive pin failures.

Design
Single conical spring, stainless steel, face retainer provides a strong and effective seal, suitable for many duties, including clogging media and hygienic applications.

Self-Aligning
The combination of a resilient ‘O’-Ring and single spring design results in a technically efficient and versatile design, that accommodates both misalignment and vibrations.

Materials
Suitable for a large variety of applications, through a wide choice of ‘O’-Ring and face materials.

‘O’-Ring Housing
The ‘O’-Ring is held within a completely recessed groove providing performance benefits, compared to competitor designs that use a separate drive ring.

Seal Compatibility
(European Based manufacturers)
M.T.U® Europa 1
Uniten® Type 4

Cross Sectional Line Drawing

Customisable
Can be specially produced to any working length and seat housing dimensions.

Reliable
Robust, non-clogging, self-adjusting and durable, giving highly effective performance.
Type 12 Description
A range of highly proficient, widely utilised, ‘O’-Ring mounted, conical spring seals with solid, stainless steel head and carbon seat. Available to suit DIN 24960 (EN12756) housings. Suitable for a wide variety of general and medium duties.

Positive Drive
Seal is shaft driven, via the coil, providing a positive drive at its base and eliminating common drive pin failures.

Materials
Suitable for a large variety of applications, through a wide choice of ‘O’-Ring and face materials.

Design
Single conical spring, stainless steel, face retainer provides a strong and effective seal, suitable for many duties, including clogging media and hygienic applications.

Self-Aligning
The combination of a resilient ‘O’-Ring and single spring design results in a technically efficient and versatile design, that accommodates both misalignment and vibrations.

‘O’-Ring Housing
The ‘O’-Ring is held within a completely recessed groove providing performance benefits, compared to competitor designs that use a separate drive ring.

Seal Compatibility
(European Based manufacturers)
M.T.U® Europa 2
Roten® Type 2
Roten® Type 4

Cross Sectional Line Drawing

Customisable
Can be specially produced to any working length and seat housing dimensions.

Reliable
Robust, non-clogging, self-adjusting and durable, giving highly effective performance.
Positive Drive
Seal is shaft driven, via the coil, providing a positive drive at its base and eliminating common drive pin failures.

Design
Single conical spring, stainless steel, head retainer provides a strong and effective seal, suitable for many duties, including clogging media and hygienic applications.

Self-Aligning
The combination of a resilient ‘O’-Ring and single spring design results in a technically efficient and versatile design, that accommodates both misalignment and vibrations.

Interchangeable Faces
Seal and seat faces can be interchanged with each other and can be easily replaced.

Materials
Suitable for a large variety of applications, through a wide choice of ‘O’-Ring and face materials.

Seal Compatibility
(European Based manufacturers)
Burgmann ® Type BT-FN
M.T.U® Type Simplex
Roten ® Type 3

Customisable
Can be specially produced to any working length and seat housing dimensions.

Reliable
Robust, non-clogging, self-adjusting and durable, giving highly effective performance.

Cross Sectional Line Drawing

Type 13 Description
‘O’-Ring mounted, conical spring seal with pressed stainless seal head retainer and pressed carbon seat. Highly productionised seal capable of wide ranging service. Seal and seat faces can be inter-changed with each other and can be easily replaced.
**Type 13 DIN Description**

‘O’-Ring mounted, with pressed seal head and seat, plus conical spring, designed to fit DIN 24960 (EN12756) housings. Cost-effective seal suitable for many duties with the option to replace wear faces and ‘O’-Rings during over-hauls.

**Positive Drive**

Seal is shaft driven, via the coil, providing a positive drive at its base and eliminating common drive pin failures.

**Design**

Single conical spring, stainless steel, head retainer provides a strong and effective seal, suitable for many duties, including clogging media and hygienic applications.

**Self-Aligning**

The combination of a resilient ‘O’-Ring and single spring design results in a technically efficient and versatile design, that accommodates both misalignment and vibrations.

**Replaceable faces**

Cost-effective seal suitable for many duties with the option to replace wear faces and ‘O’-Rings during over-hauls.

**Materials**

Suitable for a large variety of applications, through a wide choice of ‘O’-Ring and face materials.

**Seal Compatibility**

(European Based manufacturers)

- M.T.U® Type Simplex DIN
- Uniten® Type 3

**Cross Sectional Line Drawing**

**Customisable**

Can be specially produced to any working length and seat housing dimensions.

**Reliable**

Robust, non-clogging, self-adjusting and durable, giving highly effective performance.

**VULCAN TYPE 13 DIN**
Vulcan Elastomeric Bellows Type Seals
Introduction
Vulcan offer an extensive range of technically efficient and highly versatile, elastomeric bellows seals, suitable for any application dimensions, via our comprehensive standard range or through special manufacture to individual requirements.

Applications
The Vulcan bellows seals designs are highly recommended for duties with media containing solids and for hygienic applications, due to their non-clogging, self adjusting and robust design. These very reliable seals are also customisable, as they can be specially produced to any working length and seat housing configuration.

Standard Components

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>No</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>Coil</td>
</tr>
<tr>
<td>2</td>
<td>Retaining Plates</td>
<td>5</td>
<td>Bellows</td>
</tr>
</tbody>
</table>

All Types Except 1724
**Type 14 Series**
Universal compact DIN seals to suit three standard DIN working lengths.

**Type 19 Series**
Compact or extended working lengths, with a non DIN cross-section, for optimum flexibility and durability.

**Type 1511/1522**
Compact DIN profile seal Types to suit American standard working lengths. Types 1511 and 1522 are bellows equivalents to the Parallel Types 11 and 22 as well as Types A4 and A5.

**Type 1520**
DIN profiled bellows seal to suit common international standard working length. Seal has same working length and seat as the Type 20, and Type A2 Parallel Seals.

**Type 1724**
Metal encased, rubber bellows seal to fit DIN profiles and DIN L1K. The Vulcan seal face is retained to avoid the most common cause of seal installation failure on competitor seal manufacture.
Type 14/142/143 Description
Universal compact DIN seal and seat with a choice of standard DIN working lengths. The robust, heavy duty bellows design provides excellent flexibility and durability. The seal is supplied as standard with the Type 19B seat. Alternatively specify Type 14S, 142S or 143S for this seal to be supplied with a Type 8 DIN Short Seat.

Material Quality
Wide range of high quality elastomers and seal face materials readily available.

Design
An ingenious robust, non-fretting and non-clogging bellows design, capable of accommodating seal face wear, shaft misalignment and tolerances, due to Vulcan’s attention to detail during the design process. The rotary face is resiliently mounted with no bonded joints and therefore will not sustain wear nor damage when in contact with a hard face material, such as Silicon Carbide. The bellows have no moulded joints and are not subjected to torsional stresses. These design features and our proven design face width and loading standards, provide increased seal performance, capability and life.

Retained Components
One sole unit, with no loose parts. The result is an easy fitting, bi-directional seal which is less prone to damage.

Reliability
These are proven very effective designs, highly utilised in many applications. They give extremely reliable performance based upon the bellows design, high strength and flexibility.

Seal Compatibility
(European Based manufacturers)
- John Crane® Type 2100 S
- John Crane® Type 2100 K
- John Crane® Type 2100 N
- Burgmann® Type MG913

Designed for OEM’s
The Type 14/15/17 Series have been designed as Vulcan’s OEM range of seals and offer; Better performance, capability and life compared to standard Parallel Spring Seals. Suitable for a wide variety of applications and media. Customisable to any working length, seat housing dimensions, elastomer colours and name etc. Allowing a unique seal to be marketed by O.E.M.’s, as their own design, which won’t be sold elsewhere. Very cost competitive to produce, especially in larger sizes and hard faces.

Cross Sectional Line Drawing
Type 19/192/193 Description
A robust rubber bellows seal, with a wide non-DIN cross section, for optimum flexibility and durability. Available with a non DIN seat (as shown) or a wide range of ‘O’-Ring or Boot Mounted DIN seats (see Vulcan seats pages). Types 192 and 193 have an extended bellows to meet DIN L1K and L1N working lengths, when fitted with a Type 8 DIN Short ‘O’-Ring or 19B boot mounted Seat.

Material Quality
Wide range of high quality elastomers and seal face materials readily available.

Retained Components
One sole unit, with no loose parts. The result is an easy fitting, bi-directional seal which is less prone to damage.

Design
An ingenious robust, non-fretting and non-clogging bellows design, capable of accommodating seal face wear, shaft misalignment and tolerances, due to Vulcan’s attention to detail during the design process. The rotary face is resiliently mounted with no bonded joints and therefore will not sustain wear nor damage when in contact with a hard face material, such as Silicon Carbide. The bellows have no moulded joints and are not subjected to torsional stresses. These design features and our proven design face width and loading standards, provide increased seal performance, capability and life.

Reliability
These are proven very effective designs, highly utilised in many applications. They give extremely reliable performance based upon the bellows design, high strength and flexibility.

Seal Compatibility
(European Based manufacturers)
Burgmann® Type MG1
M.T.U® Type FG 1
Burgmann® Type MG12
M.T.U® Type FG 2
Burgmann® Type MG13
M.T.U® Type FG 3

Cross Sectional Line Drawing

Designed for OEM’s
The Type 14/15/17 Series have been designed as Vulcan’s OEM range of seals and offer; Better performance, capability and life compared to standard Parallel Spring Seals. Suitable for a wide variety of applications and media. Customisable to any working length, seat housing dimensions, elastomer colours and name etc. Allowing a unique seal to be marketed by O.E.M’s, as their own design, which won’t be sold elsewhere. Very cost competitive to produce, especially in larger sizes and hard faces.
Type 1520 Description
Metric and Imperial DIN profile seal and a standard seat with working length to suit a common International standard. Seal has same working length and the same seat as our Type 20, but can provide improved seal performance, life and capability.

Material Quality
Wide range of high quality elastomers and seal face materials readily available.

Retained Components
One sole unit, with no loose parts. The result is an easy fitting, bi-directional seal which is less prone to damage.

Design
An ingenious robust, non-fretting and non-clogging bellows design, capable of accommodating seal face wear, shaft misalignment and tolerances, due to Vulcan’s attention to detail during the design process. The rotary face is resiliently mounted with no bonded joints and therefore will not sustain wear nor damage when in contact with a hard face material, such as Silicon Carbide. The bellows have no moulded joints and are not subjected to torsional stresses. These design features and our proven design face width and loading standards, provide increased seal performance, capability and life.

Reliability
These are proven very effective designs, highly utilised in many applications. They give extremely reliable performance based upon the bellows design, high strength and flexibility.

Seal Compatibility
(European Based manufacturers)
Burgmann® Type MG1S/20
HUHN® Type HKL

Cross Sectional Line Drawing

Designed for OEM’s
The Type 14/15/17 Series have been designed as Vulcan’s OEM range of seals and offer; Better performance, capability and life compared to standard Parallel Spring Seals. Suitable for a wide variety of applications and media. Customisable to any working length, seat housing dimensions, elastomer colours and name etc. Allowing a unique seal to be marketed by O.E.M’s, as their own design, which won’t be sold elsewhere. Very cost competitive to produce, especially in larger sizes and hard faces.
Type 1511/1522 Description
DIN profile seal and a standard seat, with a choice of working lengths to suit common American standards. Seal has same working length and the same seat as our Type 11 or Type 22, but can provide improved sealing performance.

Material Quality
Wide range of high quality elastomers and seal face materials readily available.

Retained Components
One sole unit, with no loose parts. The result is an easy fitting, bi-directional seal which is less prone to damage.

Design
An ingenious robust, non-fretting and non-clogging bellows design, capable of accommodating seal face wear, shaft misalignment and tolerances, due to Vulcan’s attention to detail during the design process. The rotary face is resiliently mounted with no bonded joints and therefore will not sustain wear nor damage when in contact with a hard face material, such as Silicon Carbide. The bellows have no moulded joints and are not subjected to torsional stresses. These design features and our proven design face width and loading standards, provide increased seal performance, capability and life.

Reliability
These are proven very effective designs, highly utilised in many applications. They give extremely reliable performance based upon the bellows design, high strength and flexibility.

Seal Compatibility
(European Based manufacturers)
Bellows design of Vulcan 11 and 22. Unique Vulcan Product.

Cross Sectional Line Drawing

Designed for OEM’s
The Type 14/15/17 Series have been designed as Vulcan’s OEM range of seals and offer; Better performance, capability and life compared to standard Parallel Spring Seals. Suitable for a wide variety of applications and media. Customisable to any working length, seat housing dimensions, elastomer colours and name etc. Allowing a unique seal to be marketed by O.E.M’s, as their own design, which won’t be sold elsewhere. Very cost competitive to produce, especially in larger sizes and hard faces.
Type 1724 Description
High performance, wide duty, full convolution rubber bellows seal inside a stainless steel housing. Type 1724 features a non-clogging spring and self alignment capability, and is offered with a choice of Type 24 boot mounted or ‘O’-Ring Short or Long DIN seats.

Material Quality
Wide range of high quality elastomers and seal face materials readily available.

Retained Components
One sole unit, with no loose parts. The result is an easy fitting, bi-directional seal which is less prone to damage.

Designed for OEM’s
The Type 14/15/17 Series have been designed as Vulcan’s OEM range of seals and offer; Better performance, capability and life compared to standard Parallel Spring Seals. Suitable for a wide variety of applications and media. Customisable to any working length, seat housing dimensions, elastomer colours and name etc. Allowing a unique seal to be marketed by O.E.M’s, as their own design, which won’t be sold elsewhere. Very cost competitive to produce, especially in larger sizes and hard faces.

Reliability
These are proven very effective designs, highly utilised in many applications. They give extremely reliable performance based upon the bellows design, high strength and flexibility.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 502

Cross Sectional Line Drawing

Designed for OEM’s
The Type 14/15/17 Series have been designed as Vulcan’s OEM range of seals and offer; Better performance, capability and life compared to standard Parallel Spring Seals. Suitable for a wide variety of applications and media. Customisable to any working length, seat housing dimensions, elastomer colours and name etc. Allowing a unique seal to be marketed by O.E.M’s, as their own design, which won’t be sold elsewhere. Very cost competitive to produce, especially in larger sizes and hard faces.
Vulcan Parallel Spring Diaphragm Type Seals
**Introduction**

Vulcan’s Parallel Spring Type Seals are highly proficient and widely utilised, covering all standard pump shaft, working length and housing size ranges.

**Applications**

The parallel spring family range are ideal for a wide spectrum of application conditions, ranging from general water to food processing, petrochemical and other demanding applications. The seals are highly effective and widely utilised in pumps, mixers, agitators, compressors and other rotary shaft equipment.

**Standard Components**

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<thead>
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<th>No</th>
<th>Description</th>
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<tr>
<td>1</td>
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<td>Spring</td>
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<td>6</td>
<td>Base Plate</td>
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</tbody>
</table>
**Type 10 and 20**
Parallel spring, rubber diaphragm seal to common industry standard dimensions. Usually fitted with boot mounted seats, or specify Type 21 ‘O’-Ring mounted seat.

**Type 11 and 22**
As above, to American standard dimensions, fitted with boot mounted seats or alternatively, specify Type 31 ‘O’-Ring mounted seat.

**Type 24**
As above to DIN 24960 (EN12756) dimension, fitted with boot mounted seat, specify Type 24S if a Type 24 DINS seat is required and Type 24L for the seal to be fitted with a Type 24 DINL seat.
Type 10/20 Description
Metric and imperial shaft size resilient, single spring, rubber diaphragm seal with boot mounted seat as standard. A widely specified and utilised seal Type, capable of long service life.

Accommodating
The seal head automatically adjusts to accommodate misalignment and seal face wear, through the design and flexibility of the rubber diaphragm.

Retained Components
Faces and base plates are retained by adhesive and by mating components, respectively, making handling and fitting easier and more secure.

Improved
Vulcan’s attention to detail and modern in-house design and manufacturing facilities, have enabled Vulcan to create Parallel Spring Seals, with additional improvements to the original designs, whilst still maintaining the main design features, such as self aligning, non fretting/clogging and vacuum application suitability. These improvements result in a superior Vulcan Mechanical Seal, to both the original replacement seal and their other direct market copies.

Customisable
The technically efficient and highly versatile, parallel spring, seal design can be readily customised to suit individual requirements; where a standard seal cannot be utilised.

Reliable
The resulting Vulcan Quality Seal and the high strength and flexibility of the diaphragm, provide a very reliable and accommodating mechanical seal design.

Seal Compatibility
(European Based manufacturers)
Tekhniseal® Type 100/200
Roten® Type 51/21
John Crane® Type 1A/2
Burgmann® Type MG910/920

Cross Sectional Line Drawing

Material Quality
A wide selection of high quality face materials and elastomers are readily available as standard.
Type 11/22 Description
Single spring, rubber diaphragm seal, designed for different sized seat housings and seal working lengths to the Types 10/20. The imperial sizes are most commonly found on American equipment.

Accommodating
The seal head automatically adjusts to accommodate misalignment and seal face wear, through the design and flexibility of the rubber diaphragm.

Retained Components
Faces and base plates are retained by adhesive and by mating components, respectively, making handling and fitting easier and more secure.

Improved
Vulcan’s attention to detail and modern in-house design and manufacturing facilities, have enabled Vulcan to create Parallel Spring Seals, with additional improvements to the original designs, whilst still maintaining the main design features, such as self aligning, non fretting/clogging and vacuum application suitability. These improvements result in a superior Vulcan Mechanical Seal, to both the original replacement seal and their other direct market copies.

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The technically efficient and highly versatile, parallel spring, seal design can be readily customised to suit individual requirements; where a standard seal cannot be utilised.

Reliable
The resulting Vulcan Quality Seal and the high strength and flexibility of the diaphragm, provide a very reliable and accommodating mechanical seal design.

Seal Compatibility
(European Based manufacturers)
Tekhniseal® Type 800/900
Roten® Type 21A/51A
John Crane® Type 21
Burgmann® Type MG921/901

Material Quality
A wide selection of high quality face materials and elastomers are readily available as standard.
**Type 24 Description**
Compact single spring, rubber diaphragm seal specifically designed to comply with DIN 24960 (EN12756) housings. Shown with boot mounted seat, but is also often specified with a Type 24 ‘O’-Ring mounted DIN Long or Short seat (Types 24L or 24S respectively).

**Accommodating**
The seal head automatically adjusts to accommodate misalignment and seal face wear, through the design and flexibility of the rubber diaphragm.

**Retained Components**
Faces and base plates are retained by adhesive and by mating components, respectively, making handling and fitting easier and more secure.

**Improved**
Vulcan’s attention to detail and modern in-house design and manufacturing facilities, have enabled Vulcan to create Parallel Spring Seals, with additional improvements to the original designs, whilst still maintaining the main design features, such as self aligning, non fretting/clogging and vacuum application suitability. These improvements result in a superior Vulcan Mechanical Seal, to both the original replacement seal and their other direct market copies.

**Customisable**
The technically efficient and highly versatile, parallel spring, seal design can be readily customised to suit individual requirements; where a standard seal cannot be utilised.

**Reliable**
The resulting Vulcan Quality Seal and the high strength and flexibility of the diaphragm, provide a very reliable and accommodating mechanical seal design.

**Seal Compatibility**
(European Based manufacturers)
Tekhniseal® Type 500/552
Roten® Type 52
John Crane® Type 521
Burgmann® Type MG912

**Material Quality**
A wide selection of high quality face materials and elastomers are readily available as standard.

**Cross Sectional Line Drawing**
Introduction
The A1 to A5 range are elastomeric bellows, bidirectional, parallel spring mechanical seals, offering superior design and performance compared to market alternatives. This has been achieved by superior face materials and innovative (patent pending) design features. These seals are supplied with a boot mounted seat as standard and can also be supplied with an ‘O’-Ring mounted alternative, if required.

Applications
These seals are suitable for pumps, mixers, compressors and other rotary equipment. They are often used for a diverse range of applications including; water, petrochemical, chemical, food processing, refrigeration and other arduous duties.
The mechanical drive mechanism of the AX range incorporates a patent pending design. This innovative solution eliminates the problem of seal failure, due to excessive wear by the thin metal drive components cutting a groove into the retainer, common to competitors' seals. The drive area has been increased by over 250%, to greatly reduce the contact drive pressure and consequent wear. The unique seal head design also retains the drive ring by a locking mechanism. This results in security and ease of assembly, due to the unitised design of the cartridge rotary unit.
Seal Face Drive

Vulcan’s designs include improved seal face/retainer engagement. The seal face slot is designed to achieve a positive drive from the retainer crimps and to eliminate chipping of the face. It can be demonstrated, from the seal comparison diagram below, that the Vulcan seal has a superior drive location area and doesn't drive at the weakest point, as per the standard competitors design; which will be prone to chipping.

Mechanical Face Loading

Face loading on the Vulcan Ax seal ranges has been designed to enhance seal life, whilst not affecting performance capabilities. The linear progressive, Vulcan design, utilises proven values within the seal industry, which will result in less heat generation, less power consumption, less wear and therefore, increased seal performance, capability and life. Common competitor designs have wide variances in face loading, between shaft sizes.

Proper Metric Sizes

Vulcan have designed correct, true metric sizes for our range of A1 to A5 seals. Our most common competitor merely utilises imperial size bellows with a special drive ring. This is technically incorrect and also leads to obvious customer confusion, because the bellows still state the imperial sizes! So a customer will read for instance, 0254 being a 1” bellows fitted to what is infact a 25mm seal.
Type A1
The A1 is a flexible seal, suitable for the narrower seal housing, due to the compact radial cross-sectional design and suits common European seal housing standards. The Type A1 has a long working length and is fitted with a seal head retainer backing plate.

Type A2
The A2 Type coil fits over the seal head, reducing the overall working length, making this seal suitable for short gland depth applications, to common European seal housing standards.

Type A3
A thin, radial, cross sectioned, Type A4 variant designed to suit common American seal housing standards.

Type A4
As per the Type A2 seal but designed to suit common American standards, working length and seat housing dimensions.

Type A5
Spring profile as per the Type A1 seal but designed to suit common American standards and supplied without the seal head retainer backing plate, utilised on the Type A1.
**Type A1 Description**
Robust, long working length, highly accommodating and reliable, rubber diaphragm balanced seal, which provides enhanced seal capability, performance and life. Improved design features further enhance this popular seal. Suitable for common UK and Euro housing dimensions.

**Balanced**
The Vulcan AX range seals are specially balanced to a recognised industry standard, to reduce heat and friction at the seal interface. This allows for higher operating parameters to be achieved and prolongs seal life. Many competitor’s seals are not truly balanced throughout the range and therefore do not offer the full benefits of a balanced seal.

**Bellows Disk**
The Vulcan AX seal family includes a bellows disk, as a standard design feature. This component provides radial support to the bellows, ensuring no bellows/shaft contact, which could result in seal wear and possible hang-up. This component is routinely omitted in the Crane® USA designs but is included on UK/European Type 1A and 2. Without the disk, the bellows ID’s are very close to the shaft and can be problematic, due to bellows extrusion and shaft contact/stiction.

**Base Plate Retaining**
Vulcan A1 to A5 seal types retain the base plates on the coil as standard, providing support during seal fitting.

**Cross Sectional Line Drawing**

**Bellows Design**
The flexible bellows compensates for primary seal face wear and machinery misalignment, such as shaft end float. The Vulcan AX bellows contains an additional drive ring supporting lip, to ensure that the drive ring is held in a positive position, away from the bellows. This feature is not included in many alternative designs, which can result in possible bellows interference, affecting seal performance.

**Seal Face Retaining**
The Vulcan seal face is retained by inert grease and NOT glue. Some seal suppliers chose to utilise glue which can create a leakage path, and on chemical attack, the glue can migrate into seal components and product.

**Seal Compatibility**
(European Based manufacturers)
John Crane® Type 1A
Type A2 Description
Robust, short working length highly accommodating and reliable, rubber diaphragm balanced seal which provides enhanced seal capability, performance and life. Improved design features further enhance this popular seal. Suitable for common UK and Euro housing and working length dimensions.

Balanced
The Vulcan AX range seals are specially balanced to a recognised industry standard, to reduce heat and friction at the seal interface. This allows for higher operating parameters to be achieved and prolongs seal life. Many competitor’s seals are not truly balanced throughout the range and therefore do not offer the full benefits of a balanced seal.

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The Vulcan AX seal family includes a bellows disk, as a standard design feature. This component provides radial support to the bellows, ensuring no bellows/shaft contact, which could result in seal wear and possible hang-up. This component is routinely omitted in the Crane ® USA designs but is included on UK/European Type 1A and 2. Without the disk, the bellows ID's are very close to the shaft and can be problematic, due to bellows extrusion and shaft contact/stiction.

Base Plate Retaining
Vulcan A1 to A5 seal types retain the base plates on the coil as standard, providing support during seal fitting.

Seal Face Retaining
The Vulcan seal face is retained by inert grease and NOT glue. Some seal suppliers chose to utilise glue which can create a leakage path, and on chemical attack, the glue can migrate into seal components and product.

Bellows Design
The flexible bellows compensates for primary seal face wear and machinery misalignment, such as shaft end float. The Vulcan AX bellows contains an additional drive ring supporting lip, to ensure that the drive ring is held in a positive position, away from the bellows. This feature is not included in many alternative designs, which can result in possible bellows interference, affecting seal performance.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 2

Cross Sectional Line Drawing
Type A3/A4 Description
Robust, short working length highly accommodating and reliable rubber diaphragm balanced seal, which provides enhanced seal capability, performance and life. Improved design features further enhance this popular seal. Suitable for common US standard housing and working length dimensions.

Balanced
The Vulcan AX range seals are specially balanced to a recognised industry standard, to reduce heat and friction at the seal interface. This allows for higher operating parameters to be achieved and prolongs seal life. Many competitor’s seals are not truly balanced throughout the range and therefore do not offer the full benefits of a balanced seal.

Bellows Disk
The Vulcan AX seal family includes a bellows disk, as a standard design feature. This component provides radial support to the bellows, ensuring no bellows/shaft contact, which could result in seal wear and possible hang-up. This component is routinely omitted in the Crane® USA designs but is included on UK/European Type 1A and 2. Without the disk, the bellows ID's are very close to the shaft and can be problematic, due to bellows extrusion and shaft contact/stiction.

Base Plate Retaining
Vulcan A1 to A5 seal types retain the base plates on the coil as standard, providing support during seal fitting.

Bellows Design
The flexible bellows compensates for primary seal face wear and machinery misalignment, such as shaft end float. The Vulcan AX bellows contains an additional drive ring supporting lip, to ensure that the drive ring is held in a positive position, away from the bellows. This feature is not included in many alternative designs, which can result in possible bellows interference, affecting seal performance.

Seal Face Retaining
The Vulcan seal face is retained by inert grease and NOT glue. Some seal suppliers chose to utilise glue which can create a leakage path, and on chemical attack, the glue can migrate into seal components and product.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 4 (USA)
Type A5 Description
Robust, long working length highly accommodating and reliable rubber diaphragm balanced seal, which provides enhanced seal capability, performance and life. Improved design features further enhance this popular seal. Suitable for common US standard housing and working length dimensions.

Balanced
The Vulcan AX range seals are specially balanced to a recognised industry standard, to reduce heat and friction at the seal interface. This allows for higher operating parameters to be achieved and prolongs seal life. Many competitor’s seals are not truly balanced throughout the range and therefore do not offer the full benefits of a balanced seal.

Bellows Disk
The Vulcan AX seal family includes a bellows disk, as a standard design feature. This component provides radial support to the bellows, ensuring no bellows/shaft contact, which could result in seal wear and possible hang-up. This component is routinely omitted in the Crane® USA designs but is included on UK/European Type 1A and 2. Without the disk, the bellows ID’s are very close to the shaft and can be problematic, due to bellows extrusion and shaft contact/stiction.

Base Plate Retaining
Vulcan A1 to A5 seal types retain the base plates on the coil as standard, providing support during seal fitting.

Seal Face Retaining
The Vulcan seal face is retained by inert grease and NOT glue. Some seal suppliers chose to utilise glue which can create a leakage path, and on chemical attack, the glue can migrate into seal components and product.

Bellows Design
The flexible bellows compensates for primary seal face wear and machinery misalignment, such as shaft end float. The Vulcan AX bellows contains an additional drive ring supporting lip, to ensure that the drive ring is held in a positive position, away from the bellows. This feature is not included in many alternative designs, which can result in possible bellows interference, affecting seal performance.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 1 (USA)
Introduction
The Vulcan Type 9X mechanical seals are robust, general purpose, parallel spring, pusher type seals, designed to suit standard metric and imperial housing dimensions, that are commonly found mainly in the marine and textile industries. These are a direct replacement for John Crane® Flexibox® Types R00, R10, R20 and R30 series, together with Pillar® US1, US2 and US3 series (CGU).

Applications
The Type 9X seal ranges are mainly used in marine pump applications, but are designed to satisfy the sealing requirements of rotating shaft equipment for a wide variety of applications, including; marine, textile, pulp and paper, refrigeration compressors, waste treatment etc.
Standard Components

**Vulcan Parallel Spring ‘O’-Ring Mounted Type Seals PV Chart**

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>Type</th>
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<td>1</td>
<td>Stationary ‘O’-Ring</td>
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<td>Washer</td>
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</tr>
<tr>
<td>8</td>
<td>Drive Collar With Grub Screws</td>
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</table>
Vulcan Parallel Spring ‘O’-Ring Mounted Seals

Type 95, Type 96 and Type 97
These are the standard series 9x range, supplied with either solid or inserted rotary face, in a wide variety of face and elastomer materials.
All types provide a positive drive to the rotary face, by a heavy duty spring, which is supplied either with left or right-hand wound springs, depending on whether clockwise or anti-clockwise shaft direction.
Three versions are available and vary only by the method of providing the drive to the rotary seal face.
- Type 95 - Drives directly from shaft.
- Type 96 - Type 95 components with the addition of a split ring and washer for simple shaft abutment.
- Type 97 - Type 95 components with addition of a grub screwed drive collar.

Type 98
Heavy duty, single spring, pusher type seal, supplied with either solid or inserted rotary face, in a wide variety of face and elastomer materials.
Seal is driven by a grubbed screwed collar, similar to the Type 97.
The Type 98 design is unique compared to Type 95, 96 and 97, as it designed to suit different housing sizes and is supplied with a double ‘O’-Ring stationary seat, as standard.
Type 95/95N
Robust, general purpose, unbalanced pusher Type seal capable of many shaft-sealing duties. The Type 95 drives directly from the shaft, and is also available with a short, non-pinned seat as Type 95N, Seal illustrated shows a Stainless Steel rotary face.

Material Quality
All 9x Types are available from stock, with a wide range of face and stationary materials, including Tungsten Carbide, Silicon Carbide or Ceramic inserted rotary faces, Chrome Dioxide coated Stainless Steel rotary faces, and Carbon, Tungsten Carbide or Silicon Carbide stationaries.

Design
The Vulcan 9X seal ranges can either be supplied with solid rotary faces or inserted hard faces, with improved tracking capabilities to many competitors’ equivalents. Seal face loading has been designed to ensure optimum seal performance and therefore longer seal life. Some main competitors seals do not have a linear progression of increasing spring force with shaft size nor optimum closing forces.

Superior Face Combinations
As is evidenced from the pV Chart and from any Seal Technical literature, the competitor norms of Stainless Steel vs Carbon or Ceramic vs Carbon faces, as standard on their seals, have, substantially lower capability, performance and life in comparison to Vulcans preferred face combination of Carbon vs Silicon Carbide. This Carbon vs SIC face combination is offered as the standard by Vulcan, at no extra price, to give the very best quality and performance. Why compromise on quality or accept a higher price for the best seal face combination, for standard, common Marine and Textile duties?

Seal Compatibility
(European Based manufacturers)
John Crane® (Flexibox)
Type R00

Cross Sectional Line Drawing
**Type 96**
Robust, general purpose, unbalanced pusher Type seal capable of many shaft-sealing duties. The Type 96 drives from the shaft via the split ring, inserted in the coil tail. Seal illustrated shows a Silicon Carbide rotary face.

**Material Quality**
All 9x Types are available from stock, with a wide range of face and stationary materials, including Tungsten Carbide, Silicon Carbide or Ceramic inserted rotary faces, Chrome Dioxide coated Stainless Steel rotary faces, and Carbon, Tungsten Carbide or Silicon Carbide stationaries.

**Design**
The Vulcan 9X seal ranges can either be supplied with solid rotary faces or inserted hard faces, with improved tracking capabilities to many competitors’ equivalents. Seal face loading has been designed to ensure optimum seal performance and therefore longer seal life. Some main competitors seals do not have a linear progression of increasing spring force with shaft size nor optimum closing forces.

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As is evidenced from the pV Chart and from any Seal Technical literature, the competitor norms of Stainless Steel vs Carbon or Ceramic vs Carbon faces, as standard on their seals, have, substantially lower capability, performance and life in comparison to Vulcans preferred face combination of Carbon vs Silicon Carbide. This Carbon vs SIC face combination is offered as the standard by Vulcan, at no extra price, to give the very best quality and performance. Why compromise on quality or accept a higher price for the best seal face combination, for standard, common Marine and Textile duties?

**Seal Compatibility**
(European Based manufacturers)
John Crane® (Flexibox)
Type R10
Type 97
Robust, general purpose, unbalanced pusher Type seal, capable of many shaft-sealing duties. The Type 97 drives from the shaft via the drive collar with grub screws inserted in the coil tail.

Material Quality
All 9x Types are available from stock, with a wide range of face and stationary materials, including Tungsten Carbide, Silicon Carbide or Ceramic inserted rotary faces, Chrome Dioxide coated Stainless Steel rotary faces, and Carbon, Tungsten Carbide or Silicon Carbide stationaries.

Design
The Vulcan 9X seal ranges can either be supplied with solid rotary faces or inserted hard faces, with improved tracking capabilities to many competitors’ equivalents. Seal face loading has been designed to ensure optimum seal performance and therefore longer seal life. Some main competitors seals do not have a linear progression of increasing spring force with shaft size nor optimum closing forces.

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Seal Compatibility
(European Based manufacturers)
John Crane® (Flexibux) Type R20
N.S.O. Gagle Type 15O5 & 15M5

Cross Sectional Line Drawing
**Type 98**
Robust ‘O’-Ring mounted, unbalanced, metric shaft, parallel spring seal, as per Type 97, but with the addition of a double ‘O’-Ring mounted Stationary Seat. Most commonly found in marine and textile dyeing applications.

**Material Quality**
All 9x Types are available from stock, with a wide range of face and stationary materials, including Tungsten Carbide, Silicon Carbide or Ceramic inserted rotary faces, Chrome Dioxide coated Stainless Steel rotary faces, and Carbon, Tungsten Carbide or Silicon Carbide stationaries.

**Design**
The Vulcan 9X seal ranges can either be supplied with solid rotary faces or inserted hard faces, with improved tracking capabilities to many competitors’ equivalents. Seal face loading has been designed to ensure optimum seal performance and therefore longer seal life. Some main competitors seals do not have a linear progression of increasing spring force with shaft size nor optimum closing forces.

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As is evidenced from the pV Chart and from any Seal Technical literature, the competitor norms of Stainless Steel vs Carbon or Ceramic vs Carbon faces, as standard on their seals, have, substantially lower capability, performance and life in comparison to Vulcans preferred face combination of Carbon vs Silicon Carbide. This Carbon vs SIC face combination is offered as the standard by Vulcan, at no extra price, to give the very best quality and performance. Why compromise on quality or accept a higher price for the best seal face combination, for standard, common Marine and Textile duties?

**Seal Compatibility**
(European Based manufacturers)
Nippon Pillar CCU/MS-1

**Cross Sectional Line Drawing**
Vulcan P.T.F.E Wedge Type Seals
Introduction

Vulcan’s extensive 16XX range of Multi-Sprung Seals are commonly specified for arduous applications, such as corrosive process fluids or demanding operating parameters. The standard designs are available with a chemically resistant PTFE wedge component, which is spring loaded to force the flexible angular lip of the wedge into tight contact with the shaft. The same spring force impacts a sufficient load to the rotary face to create a suitable seal interface with a varied choice of standard stationary seats, most commonly our Type 25 V Seat. Balanced face designs are also available for higher duty applications. ‘O’-Ring variants, of both balanced and non-balanced Types, are available as standard. All the seal faces and wedges interchange with most common competitor designs by fitting into their retainers.

Applications

The 16XX family range are ideally suited for corrosive duties and are commonly utilised in the chemical industry, due to the inertness and sealing nature of the wedge design. These seals are also very suitable for a wide spectrum of application conditions. Their operating suitability range is enhanced by the ‘O’-Ring alternative design and the wide range of available elastomers.
Standard Components

Standard Wedge Type

Balanced O-Ring Type

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<th>N</th>
<th>Description</th>
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<td>Retainer</td>
</tr>
<tr>
<td>3</td>
<td>Wedge/O-Ring</td>
<td>7</td>
<td>Grub Screws</td>
</tr>
</tbody>
</table>

Vulcan P.T.F.E Wedge Type Seals PV Chart

Notes:
1. Type 1609B/1609BS/1659B
   1659BS/1645B/1645BS
   multiply by factor 1.4

For information on how to utilise this PV chart please refer to the technical section.
Type 1609 Series
Standard multi-sprung, grub screwed seal, available in a wide variety of face and secondary seal, materials and designs.

Type 1659 Series
As above, but compact design complies to DIN 24960 (EN12756) and ISO 3069 standards.

Type 1645 Series
Thin profiled, multi-sprung, grub screwed seal, conforming to ANSI B73 for American standard equipment.
Type 1609/1609S Description
Multiple Spring seal with a highly effective design, commonly used in chemical and petro-chemical duties. These seals are frequently fitted with the Type 25 seat. Standard Type 1609 incorporates a PTFE Wedge secondary seal, with the alternative ‘O’-Ring Type as 1609S.

Range
A comprehensive range of these common chemical industry seals are available, from Vulcan, as standard.

Materials
Grade M825 Triple Phenolic Resin Impregnated Carbon has been adopted by Vulcan, as our standard for the 16XX range, in order to offer direct face material equivalence, as well as the ability to swap faces into our most common competitors seals. 316 stainless steel is standard throughout all metal components in the 16XX seal ranges, improving chemical resistance capabilities. Please refer to our data-sheets for all materials alternatives, such as; Hastelloy® Metal parts, Glass Filled P.T.F.E. Wedges or faces and ‘O’-Ring material options.

Reliability
These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

Improved Design
The Vulcan 16XX range are superior performance seals, specifically designed to incorporate a number of improvements, compared to the original seal design and other direct copies.
- No awkward setting pieces
  The 16XX designs have eliminated the setting clips, making the seals easier and more reliable to fit.
- Improved face loading values
  Vulcan’s 16XX proven face loading designs are superior to competitor designs with higher loading values, which are detrimental to seal performance and life.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 109 or 8-1 (‘O’-Ring)

Cross Sectional Line Drawing
Type 1609B/1609BS Description
Multiple Spring, stepped shaft, balanced seal, alternative to the Type 1609/1609S. Standard Type 1609B utilises a PTFE wedge shaft seal, or specify Type 1609BS for the ‘O’-Ring version. Commonly fitted with the next shaft size down Type 25 seat.

Range
A comprehensive range of these common chemical industry seals are available, from Vulcan, as standard.

Materials
Grade M825 Triple Phenolic Resin Impregnated Carbon has been adopted by Vulcan, as our standard for the 16XX range, in order to offer direct face material equivalence, as well as the ability to swap faces into our most common competitors seals. 316 stainless steel is standard throughout all metal components in the 16XX seal ranges, improving chemical resistance capabilities. Please refer to our data-sheets for all materials alternatives, such as; Hastelloy® Metal parts, Glass Filled P.T.F.E. Wedges or faces and ‘O’-Ring material options.

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These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

Improved Design
The Vulcan 16XX range are superior performance seals, specifically designed to incorporate a number of improvements, compared to the original seal design and other direct copies.
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The 16XX designs have eliminated the setting clips, making the seals easier and more reliable to fit.
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Vulcan’s 16XX proven face loading designs are superior to competitor designs with higher loading values, which are detrimental to seal performance and life.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 109B or 8B1 (‘O’-Ring)

Cross Sectional Line Drawing
Type 1645/1645S Description
Narrow profile, multiple-spring seal, designed for common American installation dimensions, in chemical process industry equipment. Complies with ANSI B73-1974 centrifugal pump standard. Standard Type 1645 utilises a PTFE Wedge secondary seal and Type 1645S uses an ‘O’-Ring. Commonly fitted with Vulcan Type 25 seat.

Range
A comprehensive range of these common chemical industry seals are available, from Vulcan, as standard.

Materials
Grade M825 Triple Phenolic Resin Impregnated Carbon has been adopted by Vulcan, as our standard for the 16XX range, in order to offer direct face material equivalence, as well as the ability to swap faces into our most common competitors seals. 316 stainless steel is standard throughout all metal components in the 16XX seal ranges, improving chemical resistance capabilities. Please refer to our data-sheets for all materials alternatives, such as: Hastelloy® Metal parts, Glass Filled P.T.F.E. Wedges or faces and ‘O’-Ring material options.

Reliability
These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

Improved Design
The Vulcan 16XX range are superior performance seals, specifically designed to incorporate a number of improvements, compared to the original seal design and other direct copies.
• No awkward setting pieces
The 16XX designs have eliminated the setting clips, making the seals easier and more reliable to fit.
• Improved face loading values
Vulcan’s 16XX proven face loading designs are superior to competitor designs with higher loading values, which are detrimental to seal performance and life.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 9T or 8-1T (‘O’-Ring)

Cross Sectional Line Drawing
Type 1645B/1645BS Description
Multiple-Spring, stepped shaft, balanced seal to common American Installation dimensions. Standard Type 1645B incorporates a PTFE Wedge secondary seal with Type 1645BS being the ‘O’-Ring variant. Commonly fitted with the next shaft size down Type 25 seat.

Range
A comprehensive range of these common chemical industry seals are available, from Vulcan, as standard.

Materials
Grade M825 Triple Phenolic Resin Impregnated Carbon has been adopted by Vulcan, as our standard for the 16XX range, in order to offer direct face material equivalence, as well as the ability to swap faces into our most common competitors seals. 316 stainless steel is standard throughout all metal components in the 16XX seal ranges, improving chemical resistance capabilities. Please refer to our data-sheets for all materials alternatives, such as; Hastelloy® Metal parts, Glass Filled P.T.F.E. Wedges or faces and ‘O’-Ring material options.

Reliability
These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

Correlation Compatibility
(European Based manufacturers)
John Crane® Type 9BT or 8B1T (‘O’-Ring)

Improved Design
The Vulcan 16XX range are superior performance seals, specifically designed to incorporate a number of improvements, compared to the original seal design and other direct copies.
• No awkward setting pieces
The 16XX designs have eliminated the setting clips, making the seals easier and more reliable to fit.
• Improved face loading values
Vulcan’s 16XX proven face loading designs are superior to competitor designs with higher loading values, which are detrimental to seal performance and life.
Type 1659/1659S Description
Narrow profile, multiple spring seal with a highly efficient design, frequently specified in chemical process industry pumps. Use Type 1659 with a PTFE Wedge or Type 1659S for ‘O’-Ring variant. Commonly fitted with Vulcan Type 24 DIN Long or Type 24 DIN Short Stats.

Range
A comprehensive range of these common chemical industry seals are available, from Vulcan, as standard.

Materials
Grade M825 Triple Phenolic Resin Impregnated Carbon has been adopted by Vulcan, as our standard for the 16XX range, in order to offer direct face material equivalence, as well as the ability to swap faces into our most common competitors seals. 316 stainless steel is standard throughout all metal components in the 16XX seal ranges, improving chemical resistance capabilities. Please refer to our data-sheets for all materials alternatives, such as; Hastelloy® Metal parts, Glass Filled P.T.F.E. Wedges or faces and ‘O’-Ring material options.

Reliability
These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

Improved Design
The Vulcan 16XX range are superior performance seals, specifically designed to incorporate a number of improvements, compared to the original seal design and other direct copies.
• No awkward setting pieces
  The 16XX designs have eliminated the setting clips, making the seals easier and more reliable to fit.
• Improved face loading values
  Vulcan’s 16XX proven face loading designs are superior to competitor designs with higher loading values, which are detrimental to seal performance and life.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 59U or 58U (‘O’-Ring)
Type 1659B/1659BS Description
Multiple-Spring, stepped shaft, balanced seal. Standard Type 1659B incorporates a PTFE Wedge shaft seal, or specify Type 1659BS for the ‘O’-Ring version. Commonly supplied with a suitable smaller shaft size Type 24 DIN Long or Type 24 DIN Short Seat.

Range
A comprehensive range of these common chemical industry seals are available, from Vulcan, as standard.

Materials
Grade M825 Triple Phenolic Resin Impregnated Carbon has been adopted by Vulcan, as our standard for the 16XX range, in order to offer direct face material equivalence, as well as the ability to swap faces into our most common competitors seals. 316 stainless steel is standard throughout all metal components in the 16XX seal ranges, improving chemical resistance capabilities. Please refer to our data-sheets for all materials alternatives, such as; Hastelloy® Metal parts, Glass Filled P.T.F.E. Wedges or faces and ‘O’-Ring material options.

Reliability
These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

Improved Design
The Vulcan 16XX range are superior performance seals, specifically designed to incorporate a number of improvements, compared to the original seal design and other direct copies.
• No awkward setting pieces
The 16XX designs have eliminated the setting clips, making the seals easier and more reliable to fit.
• Improved face loading values
Vulcan’s 16XX proven face loading designs are superior to competitor designs with higher loading values, which are detrimental to seal performance and life.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 59B or 58B (‘O’-Ring)

Cross Sectional Line Drawing
Vulcan Wave Spring Type Seals
Introduction

The Vulcan Wave Spring Range of Bi-Directional mechanical seals offer proven design and wave spring technology, in a multitude of material combinations, with superior designs but at very competitive pricing.

Applications

This range was specifically designed for rotary lobe pumps, whose principle application is normally for liquids of high viscosity. These are commonly found in the food, dairy, brewery and pharmaceutical industries. Their compact design makes these seals an excellent choice for confined stuffing boxes areas or even external mounted applications.

Standard Components

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<tr>
<th>No</th>
<th>Description</th>
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<th>Description</th>
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<tr>
<td>3</td>
<td>Sleeve/Retainer</td>
<td>6</td>
<td>Backing Plate</td>
</tr>
</tbody>
</table>

Vulcan Wave Spring Type Seals PV Chart
Vulcan wave springs are not manufactured by the more traditional die ‘stamping’ processes. Initially, spring temper round wire is cold rolled in stages, on all surfaces, to produce the desired rectangular section. The wire is then coiled on edge to form the required number of waves and number of turns to the correct finished diameter.

This ‘circular grain’ process produces wave springs with uniform grain microstructures and smooth exterior surfaces, free from pits, scratches, cracks and other imperfections.

Die stamped springs have cross-grain microstructure which can cause ‘breakout’ at the outer edges which subsequently affects their load/deflection characteristics and fatigue (cycling) performance.
The most significant advantage of the Vulcan manufacturing method is that there are no tooling charges, making it quicker and easier to produce prototypes and small volume batches. Modifications to the design can also be made immediately with minimal costs – unlike the stamped springs where tool modifications are lengthy and expensive.

Vulcan’s precision manufacture also enables wave springs to be offered with a consistent and accurate spring rate from spring to spring. Stamped wave washers are inaccurate and typically non-repeatable, with variable spring rate from spring to spring. This has been shown in our recent load testing of wave spring samples.

The waveform produced by Vulcan edge coiling is sinusoidal with no abrupt straight edges, thus offering a larger and even contact surface.

Deburring or tumbling is not generally required since the springs are produced from round edge flat wire – ideal for restricted radial cavities.
Vulcan Edge Wound Wave Spring vs. Die Stamped Washers

Stamped wave springs are commonly specified to free height tolerance alone, and are unable to offer any exact loading. Vulcan springs can be designed to satisfy a specific spring rate requirement. I.e. minimum and maximum loads between two pre determined work heights.

Unlike stamped springs that require heat treatment to obtain their spring properties, Vulcan springs require no heat treatment after forming, only stress relieving, consequently load predictability is more accurate.

The load tolerance for a stamped spring is commonly +/- 20-30%, whereas Vulcan springs offer a standard tolerance of +/- 10%.

Materials – in production stamped wave springs produce an extensive amount of scrap, whereas the Vulcan method produces very little. Stamping can also involve higher material costs for large diameter springs and exotic alloys.
The ‘overlap’ type wave spring permits radial expansion or growth in diameter within a bore, without the risk of binding or hang-up normally associated with stamped washers. The ends are free to move circumferentially as the spring outside diameter grows during compression.

e.g. The OD of an overlap spring would fit 0.020” loose per side in a bore. Its ID clears a shaft by 0.010” per side. As the spring is deflected, the OD and ID grow larger until the OD contacts the bore. Continued deflection causes the ends to slide over each other while the OD presses against the bore. If a stamped wave spring were in this situation, if deflected enough would guarantee buckling of the waves and spring failure.

In conclusion, wave springs produced by the edge winding process are characterised by smooth, exterior surfaces, free of pits, scratches, cracks and other minute imperfections. By contrast, subsequent manufacturing procedures for stamped wavy washers can lead to problems such as fatigue cracking and inaccurate and inconsistent loading between springs. All told, the metallurgy, the mechanical properties and the uniform dimensional stability of the Vulcan edge wound wave spring provide a component for precision quality applications.
Standard Wave Spring Spring Types

Type 1688
The robust wave spring seal is ideally suited for standard, rotary lobe pump, stuffing boxes, of compact design. The seal is positively driven by grub screws and supplied from Vulcan with monolithic hard face materials as our standard.

Type 1688L
As above but supplied with a Type 24 DINL pinned stat, to suit DIN standard housing dimensions.

Type 1682
A wave spring seal to suit standard rotary lobe pumps. The Type 1682 is similar in design to the Type 1688 but is driven directly from the grub screws.

Type 1677
The Type 1677 is a positively, bi-direction driven wave spring seal, utilising crest to crest wave spring technology, offering excellent axial movement capabilities. The seal is radially compacted and designed to suit DIN 24960 (EN12756). The design of this seal head, enables easy replacement of a wide range of high quality materials and elastomers, supplied as standard.

Type 1678
Designed as per the Type 1677 but with a stepped face, to provide a balanced seal for stepped shafts.
Type 1677 Description
Wave-spring ‘O’-Ring mounted seal with shrink fitted face, commonly utilised in the European chemical process industries. Manufactured to suit DIN 24960 (EN12756) dimensions. Supplied with the Type 8 DIN Long seat as standard, but also available with other Vulcan seats, especially Type 8B, as Type 1677B.

Type 167X Superior Design
These seals utilise a double wave-spring. If the seal manufacturer’s design solution is to use two wave-springs welded together, then this creates a weak spot, prone to both mechanical failure and corrosive attack. Vulcan Type 167X seals incorporate a one-piece designed, crest to crest wave spring, removing the possibility of corrosion to weld spots. This removes the most common seal failure mode on such seals. The seals contain an energised rotary ‘O’-Ring, reducing shaft fretting and ensuring positive shaft sealing. Our design has a chamfer at the front wall of the ‘O’-Ring groove and a dynamic ring backing plate constantly energising and pressing the ‘O’-Ring forward and down onto the shaft. This overcomes ‘O’-Ring hang-up on the shaft, the second common ultimate seal failure mode found on other manufacturer’s designs.

Reliability
These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

Compact Seal
The uniform wave spring forces, provide excellent axial movement capabilities, compared to conventional mechanical seals. Use of a wave-spring allows the seal design to be very compact, giving an assured seal for short, confined glands.

Seal Compatibility
(European Based manufacturers)
Burgmann® Type M7N

Cross Sectional Line Drawing
**Type 1678 Description**
Stepped shaft balanced seal, otherwise similar to our Type 1677. Both designs are energised by a special continuous wave spring with no weld spots, and are available in the same materials. Commonly fitted with a reduced shaft size Type 8 DIN Long seat.

**Type 167X Superior Design**
These seals utilise a double wave-spring. If the seal manufacturer’s design solution is to use two wave-springs welded together, then this creates a weak spot, prone to both mechanical failure and corrosive attack. Vulcan Type 167X seals incorporate a one-piece designed, crest to crest wave spring, removing the possibility of corrosion to weld spots. This removes the most common seal failure mode on such seals. The seals contain an energised rotary ‘O’-Ring, reducing shaft fretting and ensuring positive shaft sealing. Our design has a chamfer at the front wall of the ‘O’-Ring groove and a dynamic ring backing plate constantly energising and pressing the ‘O’-Ring forward and down onto the shaft. This overcomes ‘O’-Ring hang-up on the shaft, the second common ultimate seal failure mode found on other manufacturer’s designs.

**Reliability**
These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

**Compact Seal**
The uniform wave spring forces, provide excellent axial movement capabilities, compared to conventional mechanical seals. Use of a wave-spring allows the seal design to be very compact, giving an assured seal for short, confined glands.

**Cross Sectional Line Drawing**

**Seal Compatibility**
(European Based manufacturers)
Burgmann® Type H7N
Type 1682 Description
Rotary based, bi-directional, wave-spring seal to suit standard rotary lobe SSP® pumps. The Type 1682 is driven directly from the grub-screws. Most commonly found in the food, brewing and dairy industries.

Type 168X Superior Design
Types 1688, 1688L and 1682 are supplied with monolithic rotary heads, in both standard and hard face alternatives, to improve the seal operating performance in viscous fluids. This is achieved by eliminating the possibility of spinning and damage common to inserted face designs. Competitors inserted T.C/Sic seal face rings are prone to spinning, particularly in the viscous or coagulating fluids, which are common to rotary lobe pump applications. Common, popular sizes of Type 168x seals are fitted with our special, split Sinusoidal Wave-Springs. These split wave-springs offer a more consistent and accurate spring rate than traditional wave-springs. The Sinusoidal waves offer a larger and more even contact and the split over-lap minimises the working stresses which frequently result in fracture, buckling or hang-up with a stamped, non-split, wave-spring.

Reliability
These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

Compact Seal
The uniform wave spring forces, provide excellent axial movement capabilities, compared to conventional mechanical seals. Use of a wave-spring allows the seal design to be very compact, giving an assured seal for short, confined glands.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 87
Type 1688 Description
Wave spring mechanical seal with thin cross section and short working length. Most commonly used on rotary lobe pumps, found extensively in the food, process, dairy and brewery industries. Popular, common sizes are fitted with Vulcan’s Sinusoidal Split Wave-Springs.

Type 168X Superior Design
Types 1688, 1688L and 1682 are supplied with monolithic rotary heads, in both standard and hard face alternatives, to improve the seal operating performance in viscous fluids. This is achieved by eliminating the possibility of spinning and damage common to inserted face designs. Competitors inserted T.C/Sic seal face rings are prone to spinning, particularly in the viscous or coagulating fluids, which are common to rotary lobe pump applications. Common, popular sizes of Type 168x seals are fitted with our special, split Sinusoidal Wave-Springs. These split wave-springs offer a more consistent and accurate spring rate than traditional wave-springs. The Sinusoidal waves offer a larger and more even contact and the split over-lap minimises the working stresses which frequently result in fracture, buckling or hang-up with a stamped, non-split, wave-spring.

Reliability
These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

Compact Seal
The uniform wave spring forces, provide excellent axial movement capabilities, compared to conventional mechanical seals. Use of a wave-spring allows the seal design to be very compact, giving an assured seal for short, confined glands.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 80 with DF Seat
**Type 1688L Description**
Wave spring mechanical seal with thin cross section and short working length. Most commonly used on rotary lobe pumps, found extensively in the food, process, dairy and brewery industries. Popular, common sizes are fitted with Vulcan’s Sinusoidal Split Wave-Springs.

**Type 168X Superior Design**
Types 1688, 1688L and 1682 are supplied with monolithic rotary heads, in both standard and hard face alternatives, to improve the seal operating performance in viscous fluids. This is achieved by eliminating the possibility of spinning and damage common to inserted face designs. Competitors inserted T.C/Sic seal face rings are prone to spinning, particularly in the viscous or coagulating fluids, which are common to rotary lobe pump applications. Common, popular sizes of Type 168x seals are fitted with our special, split Sinusoidal Wave-Springs. These split wave-springs offer a more consistent and accurate spring rate than traditional wave-springs. The Sinusoidal waves offer a larger and more even contact and the split over-lap minimises the working stresses which frequently result in fracture, buckling or hang-up with a stamped, non-split, wave-spring.

**Reliability**
These are proven, very effective designs, highly utilised in many applications. They give extremely reliable performance based upon Vulcan’s design improvements and the quality materials utilised.

**Compact Seal**
The uniform wave spring forces, provide excellent axial movement capabilities, compared to conventional mechanical seals. Use of a wave-spring allows the seal design to be very compact, giving an assured seal for short, confined glands.

**Seal Compatibility**
(European Based manufacturers)
John Crane® Type 80 with BP Seat

**Cross Sectional Line Drawing**
## Standard Components

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<th>Description</th>
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<th>Type 18</th>
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**Vulcan Water Pump Type Seals PV Chart**

Notes:
For information on how to utilise this PV chart please refer to the technical section.
Introduction

Vulcan supply a substantial range of cost effective and reliable water pump seals, that are commonly utilised in high volume commercial, domestic and industrial water systems. These seal types generally serve applications such as swimming pools, spa pools, shower pumps, central heating systems, irrigation and light fluid duties.

Swimming Pool Seals

With over fifteen years extensive specific experience, Vulcan are leading manufacturers of seals for the International Swimming Pool Industry. We have a comprehensive range of seal assemblies and designs, backed by an ex-stock service. Vulcan seal and seat face materials, as standard, are superior to industry norms. Exact designs, excellent materials, a wide stock range and the ability to manufacture to any industry design or requirement, complement the Vulcan Swimming Pool Seal Range.
Standard Vulcan Water Pump Type Seals

**Type 60 and 65**
Sleeve mounted, rubber bellows seals of compact unitised design. Suitable for small shaft diameter, general low pressure applications. These rubber driven, rotary seal types are easily fitted and mass produced, under Vulcan’s stringent quality procedures.

**Type 70 and 75**
Stationary based, unitised rubber bellows seals, utilised in high volume, small shaft diameter applications. These seals are successfully used in engine coolant pumps, as well as many other general water applications, proving the reliability of the seal design and construction. The adequate shaft clearance enables one size to be used on a number of shaft sizes, whilst being stationary seal based increases rotational speed capabilities.

**Type 18**
Enclosed rubber bellows seal, with short axial fitting length, ideal for equipment where space is restricted. In addition to the standard carbon face, Vulcan also offer hard face alternatives for the more demanding applications. The seal is also fitted with an internal plug as standard to aid assembly.
**Type 18 Description**
Compact, enclosed rubber bellows seal with a wide stationary seat. Very short working length makes the Type 18 ideal for equipment where space for a seal is restricted. Seal is supplied with a top hat retainer (remove upon installation).

**Material Quality**
Wide range of high quality elastomers and seal face materials readily available. Superior seal material selection especially Ceramic purity and Carbon quality increases reliability, capability, performance and life.

**Reliability**
The Vulcan Water Pump seals are high quality, bi-directional, seal designs containing positively designed, material benefits and features.

**Cost Effective**
These proven, mass produced seals, with their additional benefits and superior material quality, result in an exceptional, cost effective choice of seal.

**Seal Compatibility**
(European Based manufacturers)
- Burgmann® Type BT-AR
- Cyclam Type BT, PRR, TAR
- M.T.U. Type FA

**Cross Sectional Line Drawing**
**Type 60 Description**
Sleeve mounted, rubber bellows seal with shaft drive ring. Mass produced and easily fitted for low pressure, general applications on small diameter shafts.

**Material Quality**
Wide range of high quality elastomers and seal face materials readily available. Superior seal material selection especially Ceramic purity and Carbon quality increases reliability, capability, performance and life.

**Reliability**
The Vulcan Water Pump seals are high quality, bi-directional, seal designs containing positively designed, material benefits and features.

**Cost Effective**
These proven, mass produced seals, with their additional benefits and superior material quality, result in an exceptional, cost effective choice of seal.

**Seal Compatibility**
Unique Vulcan Product.

**Cross Sectional Line Drawing**
Type 70 Description
Coolant pump seal primarily utilised in combustion engine water pumps. The clearance of the seal and seat above the shaft allows one size to be used on several shaft diameters.

Material Quality
Wide range of high quality elastomers and seal face materials readily available. Superior seal material selection especially Ceramic purity and Carbon quality increases reliability, capability, performance and life.

Reliability
The Vulcan Water Pump seals are high quality, bi-directional, seal designs containing positively designed, material benefits and features.

Seal Compatibility
Unique Vulcan Product.

Cross Sectional Line Drawing

Cost Effective
These proven, mass produced seals, with their additional benefits and superior material quality, result in an exceptional, cost effective choice of seal.
Type 65 Description
Sleeve mounted, rubber bellows seal, with dimensions to equate to the common American seal standard. Mass produced and easily fitted for low pressure, general applications on small shaft diameters.

Material Quality
Wide range of high quality elastomers and seal face materials readily available. Superior seal material selection especially Ceramic purity and Carbon quality increases reliability, capability, performance and life.

Reliability
The Vulcan Water Pump seals are high quality, bi-directional, seal designs containing positively designed, material benefits and features.

Cost Effective
These proven, mass produced seals, with their additional benefits and superior material quality, result in an exceptional, cost effective choice of seal.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 106
Pac-Seal Type 16

Cross Sectional Line Drawing
Type 75 Description
Coolant pump seal primarily utilised in combustion engine water pumps, with dimensions to equate to the common American seal standard.

Material Quality
Wide range of high quality elastomers and seal face materials readily available. Superior seal material selection especially Ceramic purity and Carbon quality increases reliability, capability, performance and life.

Reliability
The Vulcan Water Pump seals are high quality, bi-directional, seal designs containing positively designed, material benefits and features.

Seal Compatibility
(European Based manufacturers)
John Crane® Type 6A
Pac-Seal Type 68

Cost Effective
These proven, mass produced seals, with their additional benefits and superior material quality, result in an exceptional, cost effective choice of seal.

Cross Sectional Line Drawing
Vulcan Direct Replacement Seals
**Introduction**
In addition to our standard range of stock seal types, Vulcan also manufacture and stock many thousands of individual seal designs for specific pumps and applications.

**We are leading providers of seals for O.E.M. Equipment due to the following principal advantages;**

- Ability to design and manufacture, almost any, seal to customer requirements.
- In-house production of practically all materials, components and the tools/moulds.
- Vertically integrated, in-house design, production and quality control, allows small runs and fast turn-round.
- A Can-Do Philosophy linked to a commercial readiness to produce specials.
- Agreements to produce a specific design/detail, that are not made available for sale to anybody else.
- The best Range, Quality, Service and Price available from any one manufacturer.
VULCAN TYPE 89 SEALS TO SUIT VIKING® PUMPS

Vulcan produce and stock a range of seals to suit several Viking® pumps, including the Positive Displacement and Rotary Lobe pumps. The Vulcan Type 89 is a specific design to replace the original seals found in the popular Viking® 4225 pump range, and has the double-pinned seat required for the housings on this pump type. Seals are available from stock with inserted silicon carbide faces on both the rotary and stationary. Fitted with Viton® ‘O’-Rings. Other ‘O’-Ring and face materials are available, if specified at time of order.

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Vulcan Codes

Where XXXX is stated in the code, replace with appropriate shaft size code. Available with Viton® ‘O’-Rings as standard, if E.P. or Nitrile is required, Replace the V character in the code with E or N.

XXXX.89.V.S. Type 89 complete seal, with inserted silicon carbide rotary face vs. silicon carbide inserted stationary face, Viton® ‘O’-Rings.

XXXX.89.V.H. Type 89 complete seal, with inserted tungsten carbide rotary face vs. tungsten carbide inserted stationary face, Viton® ‘O’-Rings.
VULCAN TYPE 8W TO SUIT ALLWEILER® SPF10 AND SPF20 PUMPS.

Vulcan produce and stock seals to suit the Allweiler® SPF10 and SPF20 pumps. Seals have tapered right-hand springs with inserted carbon or tungsten carbide faces vs. inserted silicon or tungsten carbide stationaries. Viton® ‘O’-Rings are supplied as standard, if you require another elastomer please specify at time of order.

Vulcan Codes

If E.P. or Nitrile is required, replace the V character in the code with an E or N.

Where xxxx appears in the code, please replace with 0150 for SPF10, and 0200 for SPF20 pumps.

xxxx.8W.V.D. Type 8W, with carbon faced rotary and inserted silicon seat

xxxx.8W.V.H. Type 8W, with tungsten carbide faces to rotary and seat.
VULCAN TYPE 95 AND 8X TO SUIT HAMWORTHY® PUMPS.
Vulcan manufacture a complete range of standard and special Type 95 and Type 97 seals to suit Hamworthy® pumps; please contact us with the pump or seal part number. Vulcan also produce a special seal to suit the Hamworthy® JOB 22 pump. Seals have tapered right-hand springs, with inserted carbon faces vs. monolithic silicon carbide, gasket mounted, seat. Viton® ‘O’-Rings and P.T.F.E. gasket are supplied as standard, if you require another elastomer please specify at time of order.

Vulcan Codes
If E.P. or nitrile is required, replace the V character in the code with an E or N.
0220.8X.V.D. Type 8X, with inserted carbon faced rotary, and monolithic silicon seat.
VULCAN TYPE 8Y TO SUIT ANEMA® PUMPS.
Vulcan produce and stock seals to suit Anema® pumps. Available in 30mm and 35mm sizes, seals have tapered right-hand springs with inserted carbon faces vs. monolithic stainless steel plate seats. Nitrile ‘O’-Rings are supplied as standard, if you require another elastomer please specify at time of order.

Vulcan Codes
If E.P. or Viton® is required, replace the N character in the code with an E or V. Where xxxx appears in the code, please replace with 0300 or 0350 for 30 or 35mm shaft size.

xxxx.8Y.N.Q. Type 8Y, with inserted carbon faced rotary and stainless steel seat.
VULCAN TYPE 28 SEALS TO SUIT HAIGH® MACERATORS.
Vulcan produce and stock 1.1/4” rotaries, and 1.3/4” complete seals, to suit Haigh® macerators. Rotaries have carbon faces with Nitrile elastomers, complete seals have a Ni-Resist steel seat with Nitrile ‘O’-Ring.

Vulcan Codes

0317.28.N.C.SEAL  1.1/4” Rotary seal only, with carbon face and Nitrile rubber bellows.

0444.28.N.C.SEAL  1.3/4” Rotary seal only, with carbon face and Nitrile rubber bellows.

0444.28.N.F.1    1.3/4” Complete seal, with carbon face rotary Vs. Ni-Resist seat.

VULCAN TYPE 281 SEALS
Vulcan also offer a complete 53mm shaft seal to suit Imperial Machine Company® waste-disposal units, model numbers 1204 and 1604. Seals have stainless steel rotary faces vs. carbon seats, with Viton® elastomers. Please contact us for details.
VULCAN TYPE 121 TO SUIT SIHI® PUMPS.
Vulcan produce and stock a modified 38mm Type 12 seal to suit the reduced housing size found on Sihi® pumps. Available from stock in the usual face and elastomer combinations for Type 12.

Vulcan Codes
If E.P. or Viton® is required, replace the N character in the code with an E or V.

0380.121.L.N.P.  38mm Type 121, left-hand coil with stainless rotary face, carbon seat.
0380.121.R.N.P.  38mm Type 121, right-hand coil with stainless rotary face, carbon seat.
VULCAN TYPE 13 SERIES TO SUIT LOWARA® PUMPS

Vulcan also produce and stock Type 131 seals to suit Lowara® CEA/A, BG/A, CO/A and HM/A pumps fitted with the new SM motor. They are modified Type 13 tapered right-hand spring seals, with Silicon or Tungsten Carbide faces vs. Silicon or Tungsten Carbide stationaries supplied with the usual choice of ‘O’-Rings, please specify at time of order. Other face material combinations available to order. Practically all common Lowara® pumps can be fitted with a direct replacement Vulcan Type 13/13DIN seal or similar. Please contact us with the pump model number or sample seal.

Vulcan Codes

If E.P. or Viton® is required, replace the N character in the code with an E or V.

0380.121.L.N.P. 38mm Type 121, left-hand coil with stainless rotary face, carbon seat

0380.121.R.N.P. 38mm Type 121, right-hand coil with stainless rotary face, carbon seat.
VULCAN TYPE 1688W

Vulcan manufacture seals to suit SR® Series Pumps from SSP®. Vulcan Type 1688W seal and seat assemblies are designed to fit the most popular rotary lobe pumps, without any modification. The monolithic Tungsten Carbide or Stainless Steel seal head avoids face spinning problems, associated with competitor designs in common lobe pump duties.

Type 1688W Superior Design
Types 1688W are supplied with monolithic rotary heads, in both standard and hard face alternatives, to improve the seal operating performance in viscous fluids. This is achieved by eliminating the possibility of spinning and damage common to inserted face designs. Competitors inserted T.C/Sic seal face rings are prone to spinning, particularly in the viscous or coagulating fluids, which are common to rotary lobe pump applications. Common, popular sizes of Type 1688W seals are fitted with our special, split Sinusoidal Wave-Springs. These split wave-springs offer a more consistent and accurate spring rate than traditional wave-springs. The Sinusoidal waves offer a larger and more even contact and the split over-lap minimises the working stresses which frequently result in fracture, buckling or hang-up with a stamped, non-split, wave-spring.
VULCAN TYPE 1688Y

Vulcan seals to suit Johnson® Positive Displacement Pumps Vulcan Type 1688Y seal and seat suit Johnson® positive displacement pumps, in all standard shaft sizes. Again the monolithic seal head provides seal capability, performance and increased life benefits.

Type 1688Y Superior Design

Types 1688Y are supplied with monolithic rotary heads, in both standard and hard face alternatives, to improve the seal operating performance in viscous fluids. This is achieved by eliminating the possibility of spinning and damage common to inserted face designs. Competitors inserted T.C/Sic seal face rings are prone to spinning, particularly in the viscous or coagulating fluids, which are common to rotary lobe pump applications. Common, popular sizes of Type 1688W seals are fitted with our special, split Sinusoidal Wave-Springs. These split wave-springs offer a more consistent and accurate spring rate than traditional wave-springs. The Sinusoidal waves offer a larger and more even contact and the split over-lap minimises the working stresses which frequently result in fracture, buckling or hang-up with a stamped, non-split, wave-spring.
VULCAN SEALS TO SUIT E.M.U.® PUMPS AND MIXERS.

Vulcan offer a range of seals to suit both EMU® Pump and Mixers applications, including the enclosed block seals. Available in either repair kit form, or as a complete mechanical seal assembly, fitted within the stainless steel outer collet. The Vulcan Type 1640 is a direct replacement for the E.B.S. Seal fitted to the most common EMU® Pumps. Repair kits comprise of all wear parts being; two stationaries with ‘O’-Rings, central rotary with elastomer diaphragm, anti-rotation pins and springs for stationaries and retaining pins for the collets.
VULCAN TYPE 192K SEALS TO SUIT KSB® PUMPS
Vulcan produce and stock a range of elastomer bellows seals to suit the most common types of standard KSB® pumps. Available from stock with carbon or silicon carbide rotary faces with silicon carbide seats, in the three standard elastomers.

Vulcan Codes

Where XXXX is stated in the code, add the appropriate size code. If E.P. or Viton® is required, replace the N character in the code with an E or V. If carbon vs. silicon carbide faces are required, replace the S character in the code with a D.

XXXX.192K.N.S. Complete seal, with silicon carbide rotary face vs silicon carbide boot seat.
VULCAN TYPE 94 SEALS TO SUIT TUCHENHAGEN® PUMPS

Vulcan produce and stock a complete range of balanced seals to suit the Tuchenhagen® A and Z series pumps, seal types F1 to F5. Available with inserted carbon face seal heads, and inserted silicon carbide, or chrome dioxide coated stainless steel rotary counterfaces. E.P. ‘O’-Rings are fitted as standard. If Nitrile or Viton® is required, please specify this at time of order.

Vulcan Codes

NB:- Shaft size is measured from the minimum ID of the rotary counterface. If Nitrile or Viton® is required, replace the E character in the code with an N or V. Where xxxx is stated in the code, add the relevant size code according to the dimension table.

xxxx.94.E.D. Type 94 seal, with carbon faced head, and inserted silicon carbide counterface.

xxxx.94.E.O. Type 94 seal, with carbon faced head, and chrome dioxide coated counterface.
Vulcan have extensive sealing experience within the refrigeration industry, and have developed a comprehensive range of seals, fitted with the specific elastomers required to suit the exacting, cryogenic duties and refrigerants commonly found. As there are a wide range of compressor models, and generally each compressor has model specific seal arrangements, Vulcan have developed many seal designs to suit these compressor applications. Furthermore these seals can be fitted without amendment to the existing housings. Our exact designs, excellent materials, wide stock range and the ability to manufacture to any industry design or requirement, complement the Vulcan Refrigeration Seal range.
VULCAN MECHANICAL SEALS TO SUIT REFRIGERATION OEM APPLICATIONS

Various Vulcan Seals Offered For Compressors

Vulcan Direct Replacement Seals
Vulcan Direct Replacement Seals For Food, Beverage And Dairy Industries
VULCAN TYPE 50 SEALS TO SUIT INOXPA PROLAC® PUMPS

Vulcan offer a range of seals to suit both single and double seal arrangements for Inoxpa Prolac® Pumps. Both single and double types of seal are of a unique design to directly replace the original seals, without any modifications to these pumps.

A unique design of multi-spring seal, where the sprung component behaves as the stationary. Suits all Inoxpa Prolac® applications where the single, uncooled mechanical seal is required. This seal is also utilised as the internal seal in double, cooled seal arrangements.

Vulcan Codes

All Type 50 seals are supplied as standard with Viton® ‘O’-rings, if other materials are required please advise at the time of order. Where xxxx is stated in the code, add the appropriate shaft size code. If EP is required, replace the V in the code with an E.

xxxx.50.V.P. Type 50, with stainless steel rotary and inserted Carbon faced multi-spring stationary.

xxxx.50.V.S. Type 50, with monolithic Silicon Carbide rotary and inserted Silicon Carbide multi-spring faced stationary.
A unique design of multi-spring seal, where the sprung component behaves as the stationary. Suits all Inoxpa Prolac® applications where the single, uncooled mechanical seal is required. This seal is also utilised as the internal seal in double, cooled seal arrangements.

**SINGLE SEAL ARRANGEMENT**

**DOUBLE SEAL ARRANGEMENT**

<table>
<thead>
<tr>
<th>Inch Shaft Size D₀</th>
<th>Size Code</th>
<th>L1</th>
<th>L2</th>
<th>D3</th>
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<tbody>
<tr>
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<td>0158</td>
<td>26.00</td>
<td>10.50</td>
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<td>1.000</td>
<td>0254</td>
<td>26.00</td>
<td>10.00</td>
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<tr>
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<td>0381</td>
<td>31.00</td>
<td>15.50</td>
<td>74.00</td>
</tr>
</tbody>
</table>
VULCAN TYPE 9x SEALS TO SUIT VARIOUS ALFA LAVAL® PUMPS.
Vulcan manufacture and stock a complete range to suit CMx, EMx, FMx, and GMx series pumps, as well as MR and LKH series pumps. Seals are available from stock with carbon or silicon carbide rotary heads vs. stainless steel or inserted silicon carbide faced left-hand threaded seats. E.P. ‘O’-Rings are fitted as standard, if another elastomer is required please advise at time of order.

Vulcan Codes
If Nitrile or Viton® is required, replace the E character in the code with an N or V. Where yyyy is stated in code, insert relevant shaft size, where xx is stated in code, insert relevant seal type.

yyyy.xx.E.Q. Complete seals, with carbon rotary head and stainless steel seat.
yyyy.xx.E.D. Complete seals, with carbon rotary head and inserted silicon carbide seat.
yyyy.xx.E.S. Complete seals, with silicon carbide head and inserted silicon carbide seat.

0320.92D.E.YC. Complete double seals, carbon vs. inserted silicon carbide seat inboard and outboard.

yyyy.xx.E.C.SEAL Rotary unit only, with carbon head.
yyyy.xx.E.S.SEAL Rotary unit only, with silicon carbide head.
yyyy.xx.E.Q.STAT Threaded seat unit, in solid stainless steel.
yyyy.xx.E.S.STAT Threaded seat unit, in stainless steel with inserted silicon carbide face.

Vulcan also produce seals to suit other Alfa Laval® MR series pumps, models MR260A to MR300A, as well seals to suit Alfa Laval® Tri-Clover® pumps and face kits for LKH multi-stage pump models. Please ask for details.
VULCAN TYPE 9x SEALS TO SUIT VARIOUS ALFA LAVAL® PUMPS.

Type 91 22mm complete seal, designed to suit pump models CM1A, CM1B, CM1C, CM1D, EM1C and EM1D.

Type 91B 22mm complete seal, designed to suit pump models FM0, FM0S, FM1A, FM1AE, FM2A, FM3A and FM4A.

Type 93 22mm complete seal, designed to suit pump models MR166A, MR166B and MR166E.

Type 93B 22mm complete seal, designed to suit pump model ME155AE, GM1, GM1A, GM2 and GM2A.

Type 92 32mm complete seal, designed to suit pump models LKH5 through to LKH60 with single or flushed seals fitted. Type 92D 32mm complete double seal also available. Type 92B 32mm drive bases for single or flushed seals available. Face kit available for LKH 112-114 series multi-stage pumps.
Vulcan manufacture seals to suit the Alfa Laval® ALC, ALP and other Alfa Laval® pump and equipment ranges.

Type 19C
Vulcan produce a special Type 19 seal to suit Alfa Laval ALC® series pumps, motor sizes from 1.5kW to 22kW. Available from stock with silicon carbide vs. carbon seat as standard, in all common elastomers.
VULCAN SEAL TO SUIT ALFA LAVAL CONTHERM® DRYER SEAL SYSTEM

Vulcan Codes

All components are supplied as standard with Nitrile ‘O’-Rings, if other materials are required please advise at time of order.

A SHELLEND 2.000” Outer shaft rotary head, with inserted tungsten carbide face.
   SHELLEND.CARB 2.000” Outer shaft rotary head, with inserted carbon face.
B SHELLEND.COIL Spring to suit 2.000” outer shaft rotary head.
C 2”FLUSHSINGLE 2.000” Outer shaft collet, with chrome dioxide coated running face.
D 1.1/2”.SHELLEND 1.1/2” Inner shaft rotary head, with inserted carbon face.
E 1.1/2”.SHELLEND.COIL Spring to suit 1.1/2” inner shaft rotary head.
F 1.1/2”FLUSHSINGLE 1.1/2” Inner shaft bush, with chrome dioxide coated running face.

We also produce and stock an alternative component C, with a reduced length and no flush ports.

C 2”NONFLUSHSINGLE 2.000” Outer shaft collet, with chrome dioxide coated running face.
Vulcan have been successfully supplying the dairy and beverage industries with seals to suit APV Puma® pumps for over 15 years. Vulcan produce and stock all the seals and associated components commonly used on the 1.000” and 1.500” shaft Puma® pumps. Every seal, seat and gasket component, used on the range of these pumps, is available ex-stock, in all common face and elastomer materials.
**VULCAN SEALS TO SUIT ALFA LAVAL CONTHERM® DRYER SEAL SYSTEM**

**Vulcan Codes**

Where XXXX is stated in the code, add 0254 for 1.000” or 0381 for 1.500” shaft size as required.

If E.P. or Viton® is required, replace the N with an E or V respectively.

**INTERNAL SEAL = A**

- XXXX.26.N.C.SEAL Type 26 ‘O’-Ring mounted rotary with inserted carbon face.
- XXXX.26.N.S.SEAL Type 26 ‘O’-Ring mounted rotary with inserted silicon carbide face.
- XXXX.26.N.H.SEAL Type 26 ‘O’-Ring mounted rotary with inserted tungsten carbide face.

**SEAT ARRANGEMENT ONE =B and C**

- XXXX.26.S.S. Type 26 monolithic stainless steel stationary plate, lapped one side.
- XXXX.26.S.S.D. Type 26 monolithic stainless steel stationary plate, lapped both sides.
- XXXX.26.C.C.D. Type 26 monolithic ceramic stationary plate, lapped both sides.
- XXXX.26.N.C.GASK Gasket set, with flat and L-shaped gasket, for above plate seat.

**SEAT ARRANGEMENT TWO =D and C**

- XXXX.26.N.C.SEAT Type 26 boot mounted ceramic seat, inserted in stainless adaptor.
- XXXX.26.N.S.SEAT Type 26 boot mounted silicon carbide seat, inserted in stainless adaptor.
- XXXX.26.N.C.GASK Gasket set, with flat and L-shaped gasket, for above plate seat.

**ADDITIONAL DOUBLE SEAL COMPONENTS, FOR WATER JACKETED PUMPS, WITH EXTERNAL SEAL =E and F**

- XXXX.26.S.S.PLAT Type 26 stainless steel backing plate with flush connection holes.
- XXXX.18.N.C.SEAL Type 18 inboard rotary, Nitrile bellows and carbon face.
The APV W® and APV W+® pumps have been introduced to replace the APV Puma® pumps. Vulcan manufacture and stock a complete range of mechanical seals designed to suit APV W® and APV W+® pumps, in single and double configuration.
VULCAN TYPE 16 SEALS TO SUIT APV W® AND APV W+® PUMPS

Vulcan Codes

Where XXXX is stated in the code, add 0250 or 0350 for 25mm or 35mm shaft size as appropriate.

If E.P. is required, replace the N character in the code with an E.

SINGLE SEAL ARRANGEMENTS

XXXX.16.N.D. Type 16 with carbon rotary face and monolithic silicon carbide seat.
XXXX.16.N.S. Type 16 with silicon carbide rotary face and monolithic SIC seat.
XXXX.16.N.H. Type 16 with tungsten carbide rotary face and monolithic TC seat.
XXXX.16.N.C.GASK Two-part gasket set for the Type 16 stationary.

DOUBLE SEAL ARRANGEMENTS

XXXX.16.DOUB.N.WS. Silicon carbide vs silicon carbide inboard, stainless vs carbon outboard.
XXXX.16.DOUB.N.ZS. Silicon carbide vs silicon carbide inboard, silicon vs silicon outboard.
XXXX.16.DOUB.N.ZH. Tungsten carbide vs tungsten inboard, tungsten vs tungsten outboard.
XXXX.16.D.NWSTATMON Central seat only, monolithic silicon carbide.
Vulcan produce and stock a wide range of mechanical seals designed to directly replace all other common APV® pump seals. We are continually extending this range, if what you require is not shown in this brochure, then please ask.

Vulcan Type 29, suitable for APV® ZMA, ZMB, ZMD, ZMS, ZMH & ZMK "Rosista®" and "Pasilac®" pumps. Available with carbon rotary face vs. stainless boot mounted seat as standard, or with hard silicon carbide faces, in all standard elastomers.
VULCAN TYPE 295 SERIES
SEALS TO SUIT APV® PUMPS

Type 295
Wave-spring seal for 48mm shaft size, suitable for APV® ZMS-5 pump. Rotary unit has inserted carbon rotary face, with a monolithic stainless steel pinned-seat.

Type 292
Bearing face kits, for 1.1/8” shaft size, suitable for APV, Osborne Craig® mixers. The bearing seat is monolithic carbon, with the bearing being monolithic ceramic.

Further Vulcan types for APV® pumps.
Vulcan also produce mechanical seals to suit APV®, ZMS410 and ZM8-610 pumps. Vulcan Type 294 repair kits for APV Howard® Cleanline R900® wave-spring seals, in single or double arrangement, consisting of rotary face with ‘O’-Ring, stationary face with elastomer boot, and a wave-spring, are available usually from stock.
Vulcan produce a simple, 1.0” shaft size rubber encased, single-spring seal for use in several common food and dairy equipment applications.

**Type 1644**

Vulcan Type 1644 rubber-encased multi-spring seal, for use in the food, beverage and dairy industries applications. Available with Ni-Resist seal face and carbon seat-ring, Nitrile elastomers, other material combinations available to special order.
VULCAN TYPE 1655 WAVE-SPRING SEALs TO SUIT IBEX® MOG PUMPS

**Type 1655**

Vulcan manufacture and stock a range of face repair kits and barrels to suit MOG® and ALP® pumps. Available with inserted carbon or silicon carbide faced rotary heads, and monolithic stainless steel, or inserted silicon carbide pinned seats as standard, with inserted tungsten carbide faces available to order. Repair kits comprise of rotary head with ‘O’-Ring and wave-spring, with seat and ‘O’-Ring. The barrels to complete the rotary unit are available as separate items. Other shaft sizes are available to suit APV® Howard CL® pumps.
Further Vulcan Types for the Food and Dairy Industries

As can be seen from this section of this brochure, Vulcan offer an exceptional range of mechanical seals specifically for the Food and Dairy Industries, and this range is constantly under further expansion. For example, Vulcan have recently developed repair kits to suit Maso-Sine® SPS pumps, consisting of ceramic rotary face with ‘O’-Ring, pressure ring and double-wave spring, together with carbon, ‘O’-Ring mounted seat. If you require details of these, or any other application not illustrated here, please ask. With our excellent design and production facilities, we are sure to be able to help.
VULCAN MECHANICAL SEALS TO SUIT FRISTAM® PUMP APPLICATIONS

3001/1 and 3501/1 Arrangement

xx08/12 INBOARD ROTARY
xx06/61 INBOARD STAT
xx01/1 COLLET
xx05/6 OUTBOARD STAT
xx08/12B OUTBOARD ROTARY
VULCAN MECHANICAL SEALS TO SUIT FRISTAM® PUMP APPLICATIONS

3001/2 and 3501/2 Arrangement

xx08/12 INBOARD ROTARY
xx01/2 COLLET
xx08/12B INBOARD ROTARY
VULCAN MECHANICAL SEALS TO SUIT FRISTAM® PUMP APPLICATIONS

2201/2 Collet Arrangement

2208/12 INBOARD ROTARY
2206/61 INBOARD STAT
2201/1 COLLET
2205/6 OUTBOARD STAT
2208/12B OUTBOARD ROTARY
VULCAN MECHANICAL SEALS TO SUIT FRISTAM® PUMP APPLICATIONS

2201/2 Collet Arrangement

- 2208/12 INBOARD ROTARY
- 2206/61 INBOARD STAT
- 2201/2 COLLET
- 2204/9 CARBON BUSH
- 2208/12B OUTBOARD ROTARY
- 2208/12B OUTBOARD ROTARY
VULCAN MECHANICAL SEALS TO SUIT FRISTAM® PUMP APPLICATIONS

2201/3 Collet Arrangement

2208/12 INBOARD ROTARY
2206/61 INBOARD STAT
2201/3 COLLET
2204/9 CARBON BUSH
2205/6 OUTBOARD STAT
2208/12B OUTBOARD ROTARY
VULCAN MECHANICAL SEALS TO SUIT FRISTAM® PUMP APPLICATIONS

2201/4 Collet Arrangement

2208/12 INBOARD ROTARY
2206/61 INBOARD STAT
2201/4 COLLET
VULCAN STATIONARY SEAT TYPES, CLAMP RINGS
**Common Vulcan ‘O’-Ring Mounted Seats.**

Common Vulcan ‘O’-Ring Mounted Short Stationary designs to suit DIN and other standard housings. These short ‘O’-Ring Mounted Seats are not pinned and rely upon compression on the ‘O’-Ring for retention. Consideration should be given to Long Pinned Seats or Boot Mounted Seats where conditions necessitate.

**Vulcan Boot Mounted Seats.**

Vulcan offer a wide variety of stock Boot Mounted Seats, to suit a variety of different housings and working length standards, as well as different ring I.D.’s to track against all Vulcan Seal faces. Boot Mounted Seats offer optimum cost and performance benefits and are widely utilised. Please specify your shaft size because each seat size shown has a unique I.D.

**Vulcan NON-DIN ‘O’-Ring Mounted Seats.**

‘O’-Ring mounted ‘H’ configuration stationary seat, to suit both standard European (Type 21) or American (Type 31) housing dimensions. These seats provide the benefit of being able to be pinned through-out the size range.
COMMON VULCAN SEATS

Type 8 DIN SHORT.

Common ‘O’-Ring mounted DIN Short seat.
DIN Short seats are normally only best recommended for smaller shaft sizes or for non-arduous duties.

Type 8 DIN LONG.

DIN Long Type seats, with anti-rotation slot, are preferred for higher shaft size/speeds/pressures or sticky, co-adulating etc. media.
COMMON VULCAN SEATS

Type 24 DIN SHORT.

‘O’-Ring mounted stationary seat to DIN 24960 (EN12756) Standard with short tail. The seat offers different axial dimensions to the Type 8 DIN short seat and can be utilised with most seals particularly the Type 24 and 1724 designs.

Type 24 DIN LONG.

‘O’-Ring mounted stationary seat to DIN 24960 (EN12756) Standard with long tail and drive slot. The seat offers different axial dimensions to the Type 8 DIN long seat and can be utilised with most seals particularly the Type 24 and 1724 designs.
COMMON VULCAN SEATS

Type 25.

The Type 25 seat is an industry standard stationary design with ‘V’ shape profile, supplied complete with 2 off PTFE gaskets. Commonly used with a wide variety of seals, particularly the multi-spring Type 16XX series.

Type 27.

The Type 27 seat is an industry standard stationary design with ‘L’ shape profile, supplied complete with two off compressed fibre gaskets. Commonly used with multiple-spring balanced seals.
Clamp Rings

Stainless Steel, working length setting, Clamp Rings, available in all common imperial and metric shaft sizes. Standard thickness as shown, but other sizes and widths available to order. All fitted with three grub screws at 120° apart.

The Clamp Rings have a variety of uses, most particularly to set or amend seal housing depth to suit the preferred seal’s working length.
FINISH
FIN
ENDE