OTTOOLSEN

Mekaniske Akseltetninger

Contents

Vulcan Seals are ordered in this brochure by their design features; principally by spring profile, by elastomer component and then into logical sections. Please use the headings below to identify in which section of this brochure your requirement is likely to be.

Introduction To Vulcan Seals P1 - P7 — 1

Technical And Material Standards P8 - P23 — 2

Vulcan Conical Spring 'O'-Ring Mounted Seals P24 - P35 — 3

Seal Types 8 / 8DIN / 8DINS / 82 / 8B / 7D / 9 / 12 / 12DIN / 126 / 13 & 13DIN

Vulcan Elastomeric Bellows Seals P36 - P47 — 4

Seal Types 14DIN / 142DIN / 142DINS / 14DINS / 1511 / 1511J / 1520
193 / 192 / 19 / 19S / 192S / 193S / 19L / 193B / 19B / 192B / 1724 / 1724S & 1724L

Vulcan Parallel Spring Diaphragm Seals P48 - P57 — 5

Seal Types 20 / 10 / 20 / 10 / 20H / 11 / 22 / 11J / N11 (U11) / 24 / 24S & 24L (and n variants)

Vulcan Balanced Diaphragm Seals P58 - P63 — 6

Seal Types A1 / A2 / A2H / A4 / A4J / A5J & A5

Vulcan Parallel Spring 'O'-Ring Mounted Seals P64 - P69 — 7

Seal Types 95 / 96 / 97 & 98

Vulcan Multiple Spring Seals P70 - P81 — 8

Seal Types 1609 / 1609B / 1609S / 1609BS / 1645 / 1645B / 1645S / 1645BS 1659 / 1659B / 1659S / 1659BS / 40L / 40S / 40 / 52B / 55B & 56B

Vulcan Wave Spring Seals P82 - P87 — 9

Seal Types 1677 / 1677M / 1678 & 1688

Vulcan Water Pump Seals P88 - P93 — 10

Seal Types 18 / 70 / 60 / 65 & 75

Vulcan Stock OEM Pump Seals P94 - P105 — 11a

Allweiler®/ Andritz® / Ebara® / Eureka® / Godwin® / Grundfos® / Haigh® / Hidrostal® / I.M.O.® / Kolmeks ® / K.S.B.® / Lowara® / Mission Magnum® / S.P.P® / Sterling Sihi® / Viking® / Wilo® & Compressor Seals

Vulcan Wastewater Pump Seals P106 - P115 — 11b

I.T.T Flygt®, I.T.T Grindex® (Then Alphabetically) A.B.S.®, Ebara®, Gormann-rupp®, Godwin®, Grundfos®, Honda®, K.S.B®, Terex-Pegson®, Tsurumi®, Wemco/Hidrostal®, Wilo emu®.

Vulcan Stock Food, Beverage And Dairy Seals P116 - P135 — 11C

Alfa Laval® / C.S.F. Inox® / A.P.V.® / Fristam® / Grundfos® / Hilge® / Inoxpa® / Jabsco® / Johnson S.P.X.® & G.E.A. Tuchenhagen®

Vulcan Stationary Seat Types, Clamp Rings P136 - P148 — 12

seat Types 8DINL, 8DINS, 24DINL, 24DINS, 'O'Ring Stationaries, 31, 21, 32, 23, Boot Stationaries, 25 & Clamp Rings & Cyclone Separators

“The best ‘Standard’ Mechanical Seal company to do business with”.

Introduction

The Vulcan Group, with someway over four hundred staff, in our six production sites and our global distribution centres, are one of the worlds leading standard Mechanical Seal manufacturers.

Founded in 1987, Vulcan continues to rapidly grow through our exceptional investments in material and design development, vertically integrated, advanced, modern factories with primarily automated manufacturing machinery, and electronically controlled extensive stock-holding, logistics and distribution.

Vulcan have established new leading industry standards, with our product range, performance/quality, ex-stock service and pricing.

We continue to be immensely motivated and dedicated to being the World’s Best ‘Standard’ Mechanical Seal Company. The key features of this policy goal and our company are;

- Advanced production facilities, automated wherever possible.
- In-house component and material manufacture and development.
- The very best quality and inspection systems, CMM checked and electronically systematically controlled.
- The widest range and stock of Seals, available from any company, that’s accessible to our customers, via the internet.
- Well motivated and rewarded staff working in excellent facilities.
- Fully computer controlled, integrated and automated Seal ordering, stocking, logistics and supply systems.
- To be The Electronic Mechanical Seal Warehouse to The Industry.

Vertically Integrated Manufacture

Vulcan's modern production facilities exceed 22,000 square metres of total floor space. These factories were architecturally designed and built to create world-class facilities. We continue to heavily invest in our production processes, machinery, systems and people. This focus has naturally led to extraordinary annual rates of growth in our factories capacity and employment. Growth needed to meet the growth in our customers demands.

Design, Range and Stock-Holding

All Vulcan Seals are manufactured in-house to our own production drawings and designs. We have eliminated the faults common in some original and many copy designs, through close attention to design detail and material improvements.

Vulcan have the widest range of “Standard” Mechanical Seals, available from any manufacturer in the world. We back this very extensive range with a guaranteed ex-stock holding, that is also accessible to our customers to view on the internet.
All Seal Types, in all sizes and materials, shown in this Mechanical Seal Brochure, are available ex-stock, if previously sold. In total some way over one million stock combination, (with an exceeded 99.95% ex-stock target). We can also manufacture practically any special and will even stock them for you, to agreement, for repeat requirements.

Design, Range and Stock-Holding

Most “Single Spring” Seal Companies buy in product or merely assemble components in-house. Previously no manufacturer made all their own parts and components and most of their own materials.

Vulcan do. We produce all our Seals and practically everything for them. For example, all of our eight grades of Tungsten Carbide and Silicon hard-faced materials are made in-house from raw powder. We mould all of our elastomers and even make the moulds for the same.

This vertical integration enables us to absolutely Quality and Cost Control all parts of the Vulcan Seal. With our “Will Do” Philosophy, this also enables us to produce many special designs of Seals for customers, with quantities, costs and lead times lower than our competitors, because we primarily do it all in-house.

Material quality is vital to the capability, performance and life of a Seal. So Vulcan only use 99.5% purity Aluminium Ceramics. M106K+ is our standard Carbon grade. We have heavily invested in even further developing Reaction Bonded and Sintered Silicon and Nickel and Cobalt Tungsten Carbide sintering processes, so that we can exceed previous Single Spring Seals norms. This focus on the best quality face materials is standard throughout the Vulcan Seal range.

Quality Assurance

All Vulcan Mechanical and Encapsulated Seals are solely produced in our own modern factories. Our manufacturing facilities have been audited and certified to ISO 9001.2008 and our distribution operations are examined and certified to IS0.9001.2008.

Vulcan have extremely extensive and intensive Quality, Inspection and Work Documentation Systems. In-depth, electronically integrated, process documents and assessment systems govern all aspects of manufacture, assembly, inspection and supply.

We do not buy Seals nor component assemblies from anyone else. Every Vulcan component and Seal is produced and processed via our Global Inspection System. This system incorporates all of the above controls cumulating in CNC Co-ordinate Measuring Inspection Machine batch sampling verification, prior to despatch from our factories and then again, upon receipt at our World Wide Distribution Centre.

Thus a Vulcan Seal Means Quality and Reliability Assured.

Electronic Investment

Vulcan are firmly focused on the future. Our philosophy is to heavily invest in IT, automation, technology and our people, in order to be the world leaders in “Standard” Mechanical Seals. Our over-riding ethos is Quality and Efficiency through electronic automation of our entire company processes and operations. Manufacturing is primarily automated and supported by computer-controlled inspection machines and systems.

Vulcan create individual Web Portals, for each of our customers, to access a vast database of information on our company, products and all commercial or technical detail. This can also be utilised to initiate a complete electronic supply chain, of bar coded product, moving through all of our processes, from electronic receipt of Portal Enquiry/Order to supply, from our ranks of eight computer integrated and controlled carousel stock machines.

Supply Philosophy

Our ethos is to do extraordinary well, whatever the customer reasonably requires. We have more than a “Can Do” mentality, our “Will Do” determination results in truly exceptional customer service.

Vulcan’s commercial policy is to focus on our products, manufacture, stock holding and supply to the Seal trade. It is not our intention to be diverted into becoming an end-user sales organisation.

Our strengths lie in our unrivalled product range, quality, service and prices. Vulcan will maintain its strong distributor and trade sale focus. Our vision is to be The Electronic Seal Warehouse to the trade and to continue to provide increasing levels of service, product and information to our partners in, already, over ninety countries. We enable companies, who wish to sell our products, to market the same, under our Vulcan or their own brand, as they wish.

Conclusion

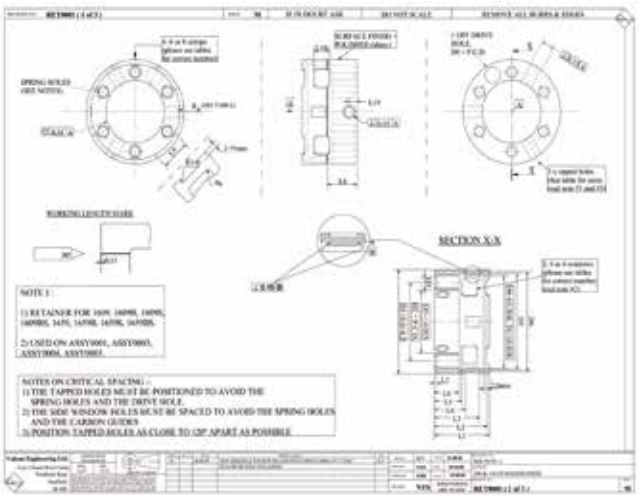
People (customers and staff) are our premier concern. In order to see our commitment, facilities and processes in full, please visit us and experience the Vulcan difference.

Vulcan® Web Portal

Unbeatable Designs

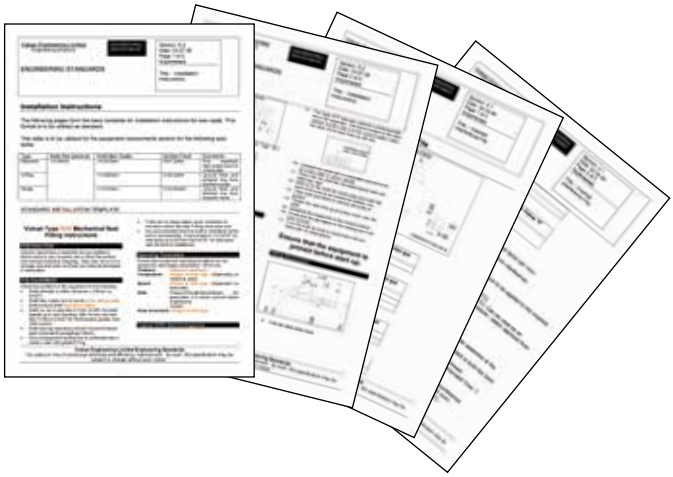
All Vulcan Mechanical Seals are manufactured to our own designs and drawings. Three Vulcan design departments, at Vulcan Sheffield, NB Vulcan Manufacturing and in New Zealand, are utilised to produce the most advanced designs and carefully controlled engineering detail possible.

Competitor Seals are studied and tested and improvements have been incorporated into our designs. Technical advice is readily available to combat application problems and extend Seal reliability and life.



Comprehensive Engineering Standards

Vulcan's Engineering Department produces and documents, in our Engineering Standards Electronic System and Library, extensive and comprehensive detail on all the key technical features of our Mechanical Seal Design, Manufacture, Fitting, Assembly, Inspection and ultimate Seal Installation. Please refer to the Technical and Materials Standards Section following, your Web Portal or request details on any aspect.



Exceptional Materials

We are one of the world's highest volume manufacturers of standard Mechanical Seals and associated products.

Vulcan's policy is to produce superior designs of and stock the widest range of, all common standard Mechanical Seals, manufactured extremely well and specified to contain high quality materials, especially on the critical faces.

We primarily manufacture these materials ourselves and details of the principal grades utilised / made are documented on the following pages. For a full listing

of the grade of every material in each Seal, please refer to the Material Specification Table on Page 12 of this brochure or contact our Technical Department.

Vulcan have created and collated a vast array of Seal identification information, all of which is contained on our Web Portals, which we establish for each of our partner customers.

The first half of the portal contains an entire on-line product enquiry, order and supply processing site. This sleek, easy to use, facility enables you to check stock and production due dates, on all Vulcan products, immediately see your nett quantity related prices, contact us with enquiries and place orders. Orders are received electronically, automatically into Vulcan's system and this initiates an integrated, automated, electronic supply chain, of bar-coded product, moving through all of our processes to despatch. Customers can monitor their account and track all orders live on screen.

The second half of the Portal has been designed as a complete Technical and Commercial Data-Base of all information on Vulcan, and its products. Our aim, in building this over many years, has been to provide our customers with instant answers or detail, on all common, possible commercial or technical questions.

The principal sections are;

- Commercial and Vulcan Information Section
- Mechanical Seals Product Section
- Encapsulated 'O'-Rings Product Section
- Gland Packing Product Section
- Tefcan Expanded PTFE Product Section
- New and Up-Dated Advice Section
- Help and Instructions Section

The Mechanical Seal Section has been developed to provide comprehensive information and support on all aspects of our Seals and contains the following sections;-

- Introduction to Vulcan Seals
- Vulcan Seal Electronic Presentations
- Mechanical Seal Technical Suite
- Seal Material Compatibility Charts
- Seal and Seat Identification Data-Bases

Ready Seal identification is vital for our customers and recognising this, Vulcan have focused heavily on creating the best suite of tools available, to assist. This Data-Base section thus contains;

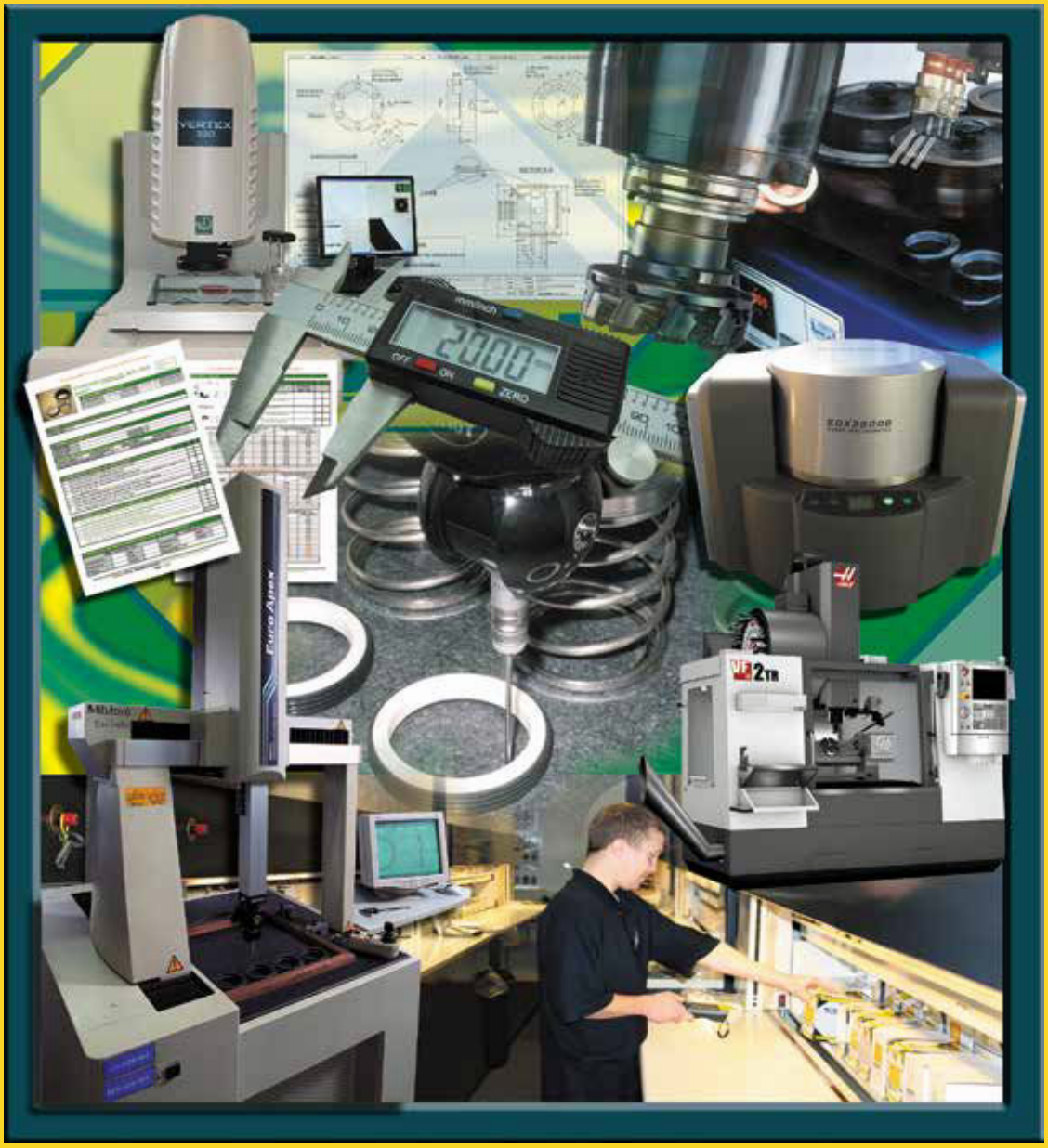
- In depth, Seal / seat cross-reference charts to other manufacturers
- Comprehensive code cracker information on our main competitors
- A Vast Pump Model / Seal Search Engine
- A Unique Seal Identification Suite

This Seal identification suite facility has been designed to enable rapid identification and specification of any common Standard Mechanical Seal. The process allows you to visually recognise any common Seal / seat and then prompts you with advice, to check / stipulate what are the main critical dimensions or application details

The suite is simply and logically laid out, in sections by Seal design type, with photographs for easy recognition. Behind each photograph, there is extensive clear advice showing;

- What are the Main Types
- Tables of Dimensions
- What Dimensions are Crucial
- Our Codes and Competitor Codes
- Material recommendations
- Features / Benefits
- Most Common Applications
- Vulcan Stock Enquiry Link

Technical And Material Standards



Section 2

“Quality and Reliability Assured”.

Quality Mechanical Seals

Quality, Design, Manufacture, Materials, Inspection, Assembly provided by Electronic Systemisation of Product Specification and Supply, are critical to the Mechanical Seal’s Capability, performance and life. Vulcan fully understands the true meaning and importance of Quality and have long practiced the principle of Total Product and Supply Quality, through a dedication to installing built-in reliability and quality into every aspect of our company. Electronic production, inspection and process control is integral to every area of our production and logistics. The foundation for this Total Quality Philosophy is our focus upon investment in and development of world class manufacturing facilities, electronic processes and our Design, Technical and Material Standards.

Reliable Product

There are many alternative Mechanical Seal suppliers around the world. At first sight, their product may look similar but often lacks the many vital aspects which go to make a Quality Mechanical Seal. Failures in supply, fitting or operation can often result. The key is surety, safety, reliability and the resultant Seal capability, performance and life. We pride ourselves on being The Most Cost Competitive, Lowest Total Cost Provider of Quality Mechanical Seals.

Vulcan welcomes visitors to view all of our production and distribution facilities, to see for yourselves the Total Quality and Customer Satisfaction Policy, which is central to our success.

Laser Marking

Reliable identification of product is useful and can add to Seal quality and reliability.

Vulcan has invested in, high specification and cost, laser etching machines to mark both elastomer and Stainless Steel components. We provide this as a service to individual customer contract specification and are increasing it’s use throughout our product range.

In House Production of Quality Materials

Vulcan are the world’s most vertically integrated Mechanical Seal manufacturer. This has naturally followed from our policy and dedication to specifying optimum material standards. Then developing our in-house manufacture of these materials and subsequent components.

As a result, not only is every Vulcan Standard Mechanical Seal solely produced in our own Vulcan factories but also practically all of our component parts and materials. We consider material manufacture and development to be fundamental to the quality, performance, reliability and economy of our Mechanical Seals.

Sintered Silicon Carbide Manufacturing

Vulcan have for over a decade manufactured Reaction Bonded Silicon Carbide for use within our Seals. In 2004, following agreement with a global manufacturer and supplier of Carbides, Vulcan purchased an entire Silicon Carbide production plant, as part of a purchase, installation and technology swap and supply agreement.

As is our practice, we then rapidly developed this plant and facility, adding equipment such as new more efficient furnaces, isostatic presses, over forty

CNC internal and external grinders, and a test and electronic inspection facility.

We also subsequently opened and developed the in-house expertise and infrastructure to manufacture our own raw material; Sintered Silicon Carbide powder.

Our goals in these developments is not just to become a manufacturer and supplier of Silicon Carbide components but to incorporate the optimum quality materials, reliability and cost control into our Mechanical Seals.

‘In-House’ Quality Assured

All Vulcan Mechanical Seals are manufactured in Vulcan’s advanced factories, as are practically all our components and materials. We are highly vertically integrated with consequent close control of our production, costs, quality and logistics.

NB Vulcan Mechanical Seals Manufacturing Company Limited is certified to ISO 9001.2008 and our world-wide distribution centres to ISO 9001.2008.

Modern, increasingly automated, machinery is utilised to produce our designs, via carefully controlled, advanced management and production procedures.

Each stage of production, assembly and inspection, is governed by electronically documented and managed, extensive and intensive, Inspection Systems and Forms.

Vulcan® Quality service

Our Mechanical Seal programme is designed to be totally responsive to all customer requirements. A vast array of Types, sizes and materials are held in computer automated stock to enable same day despatch. The Seals have been designed for maximum technical efficiency and reliable use. All product and any conceivable information required is provided on our Web Portal.

All components are inspected before supply. Vulcan work to established Quality Control Procedures and the company system, is approved to ISO 9001.2008. Vulcan operate a company T.Q.M. Programme to constantly monitor and improve performance.

Our policy of total customer service is further enhanced by the widest range and largest stock of Seals in the market, essentially all Guaranteed Ex-Stock, plus an extensive network of distributors.

Vulcan’s Policy is a continuous commitment to developing our production, inspection, product, process and materials capabilities,then integrating these within our electronic systems and logistics.

Note;

Please note that constantly developing legislation and Vulcan practices, may affect the advice given in this brochure. All of the information supplied within is given in good faith and in Vulcan’s best judgment and is meant for guidance purposes only. We make no warranty that any Vulcan part will perform satisfactorily in a given application and would strongly recommend an independent evaluation prior to acceptance. Vulcan reserves the right to amend all statements, dimensions and technical data without prior notice.

Principles of Shaft Sealing

Product Information

The Vulcan Mechanical Seal Range is divided into four main methods of shaft sealing, namely; Rubber Diaphragm, Rubber Bellows, 'O'-Ring Mounted and PTFE Wedge Seals.

Our extensive Mechanical Seal Range has been designed to service the global Pump market and are our Seals totally interchangeable with all other manufacturer's equivalent Seals, without any modification to the existing Seal housings and gland plates.Such is the variety available from Vulcan, we can offer to replace any single spring Seal and seat, practically always straight from stock.

Typical designs of each of the main shaft Seal groups are;

Rubber Diaphragm	
Rubber Bellows	
'O'-Ring Mounted	
PTFE Wedge	

Diaphragm Sealing operation

The line drawing above shows the standard section of a Vulcan rubber diaphragm Seal. The shaft Seal is provided by the rubber diaphragm which is squeezed onto the shaft by the drive ring. Once fitted, the rubber diaphragm will grip the shaft giving a strong static Seal and very positive drive, via the drive ring, to the Seal face. As there is no relative movement between the shaft and the rubber diaphragm, shaft fretting, wear and hang-up hysteresis are eliminated and the Seal can immediately accommodate some shaft run-out and misalignment.

Shaft axial movement and the movement required during the working life of the Seal is handled by the elastomer rubber flexing at it's junction point

(J on dia). The Seal head automatically adjusts to compensate for any face misalignment, usually caused by shaft end float / Pump body misalignment.

The closing spring force and the Seal Pumping pressure force maintain the faces in full contact, whilst the rubber diaphragm acts as an elastomeric bellows providing sustained flexibility. Positive drive of the Seal face is transmitted via the drive ring and retaining housing and not via the spring, which merely provides some closing force to the Mechanical Seal faces. These Seals can therefore be used to Seal shafts rotating in either direction and in vacuum applications.

Rubber Bellows Sealing operation

Vulcan elastomeric bellows Seals are of compact design with a sealing action that provides many benefits. The bellow's high strength and flexibility is the key to the very reliable performance of this type of Seal; as it readily accommodates Seal misalignment, end-float and Seal face wear.

The convoluted bellows profile makes these Seals ideal for media prone to clogging or for hygienic applications. Designed for confined spaces and limited gland depths, Vulcan rubber bellows Seals are bi-directional in operation and provide secure bellows, for longer life in a wide range of applications.

'O'-Ring Mounted Sealing operation

Our conical spring, 'O'-Ring mounted, Mechanical Seals have been designed by Vulcan to have a small cross-section and a complete recessed 'O'-Ring housing.

A narrow Seal head width allows the Seals to easily fit confined DIN 24960 (EN12756) housings, whilst also providing the benefits of reduced face surface running speed, with increased circulation around the Seal faces.

Seal loading is provided by conical springs or wave springs, with conical springs being the most common.

Seal drive is provided by the conical spring tightly gripping the shaft at it's base, or by grub-screws in the case of wave-spring Seals.

Conical Spring Seals are supplied as standard with right-hand drive springs for clockwise shafts. Left-hand springs for anti-clockwise shaft rotation should be specified on order.

Utilisation of wave spring technology in Vulcan Seals allows the design of extremely compact Seals, in both the axial and radial directions. Wave springs provide equal loading and deflection at a fraction of the free height when compared to helical springs, making them suitable for limited spaces.

Other main advantages for Mechanical Seal use are their insensitivity to contaminates, whilst providing straightforward fitting. These main characteristics make wave springs ideal for food, chemical and restricted fitting applications which are prone to clogging.

Our resilient 'O'-Ring mounted Seal designs are technically efficient (readily accommodating misalignment and vibration) and are highly versatile. Vulcan offer a wide range of face material combinations and spring / seat sizes to suit most applications. Our design standard of a narrow cross-section head with full recessed 'O'-Ring groove, combined with alternative Seal face materials, maximises Seal performance and prolongs Seal life.

PTFE Wedge Sealing operation

The chemically resistant PTFE component 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 Stationaries. The features associated with the wedge Seal design make these Seals ideally suited for chemical process Pumps and many other aggressive media applications.

Vulcan Mechanical Seals

Service capabilities

The limits of pressure, temperature and speed are dependant upon the materials specified for the rotary Seals and Stationaries, as well as the nature of the media to be sealed. The maximum capabilities of each Seal type are shown on the individual data sheets. Changes in Seal operating capabilities are partially a factor of the nature of each Seal design but are highly influenced by selection of elastomer type and Seal face materials.

Elastomer selection primarily sets temperature and chemical resistance;

Material	Standard Recommendation	Temperature Range
Nitrile	For general duties	-30°C to +120°C -22°F to +248°F
Ethylene Propylene	For general duties especially hot water	-40°C to +140°C -40°F to +284°F
Viton™	For general chemical applications	-30°C to +230°C -22°F to +446°F
Neoprene	For refrigeration applications	-50°C to +100°C -58°F to +212°F
FEP/PFA	For near universal chemical resistance	-60°C to +205/260°C -76°F to +401/500°F
Kalrez®	For absolute chemical and temperature capability	-50°C to +310°C -58°F to +590°F

Differing face material combinations affect Seal capability, performance and life. Their PV (Pressure X Velocity) value largely determines the suitability of material combinations of Seal faces and specifically the amount of heat generated at the faces. The ability of the face material to resist wear increases the life of the Seal particularly in abrasive applications. Vulcan offer face combinations, from Carbon, solid Ceramic and Stainless Steel materials, as standard. We recommend fine-grained, Reaction-Bonded Silicon Carbide as the superior “hard face” material, to be used for both faces for maximum wear resistance, or to run against Carbon for ultimate PV capability.

Important Note

All information in this brochure is given in good faith, but without warranty, and is based on our functional evaluations, experience and published technical data. As such all data and recommendations shown in this brochure are indicative only. Particularly, any application data should not be used in conjunction as maximums applicable in any application. Service and equipment conditions greatly affect product capability and performance. All specifications, dimensions and data may change without notice. You should confirm any necessary detail with our technical specialists or distributors. We reserve the right to change specifications without notice. The purchaser should thoroughly test any application and independently conclude satisfactory performance of the product, for his intended use. Vulcan Engineering Limited and any associated companies, accept no claim(s) for legal action rising as a result of the information contained in this document, and shall not be liable for the misuse of the full, or any part of the document, over and above its intended use for information on Vulcan products only.

Brand Names ®

All brand names and product names used in this catalogue are trade names, service marks, trade marks or registered trade marks of their respective owners. All products are manufactured to Vulcan drawings. Use of other brand names is for informational purposes only.

Seat Selection

Correct seat selection lays the foundation for maximising Seal performance.Preferred seat Types are shown with each Seal. However, the large majority of Stationaries will track with practically any Seal, thereby giving a maximum range of possible combinations. Seat housings, for all Vulcan Stationaries, are recommended to have a machined lead in of 1.5 to 2.0 mm (0.060” x 0.080”) at 20 to 30 degrees angle.

Principle Advantages of Single Spring Mechanical Seals

- Single Spring – gives superior axial and angular flexibility. The Seal’s design 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 material.
- Self-adjusting – the flexible moving rubber shaft Seals accommodate shaft end float and take up wear.
- Minimal Wear – strong static Seal to the shaft minimises shaft fretting.
- Versatile – Compact in design and simple to fit. Standard designs and sizes for all common imperial, metric and DIN 24960 (EN12756) housings 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 spring Seals the choice for the majority of applications.
- Large diameter spring wire – can withstand a great deal of corrosion.

Principle Advantages Of Multiple Spring Seals

- Even Face Loading Circumferentially – from the Seal face closing forces exerted by the individual springs.
- Shorter Axial Space – multiple springs require less axial length to provide the required face closing forces, allowing for shorter Seal working length designs, compared to single coil spring Seals.
- More Even Face Closing Pressure - multiple small springs are not as susceptible to distortion at high speeds as are larger single springs. As a result, they will exert a more even closing face pressure on the Seal ring at all times.
- Vulcan Designs – routinely Seal the multiple springs out of the fluid thus minimising the potential for corrosion and/or clogging.

Principle Advantages Of Wave-spring Seals

- Very Short Working Length – wave-springs are superior to coil springs, especially single springs, in certain applications because they provide lower working heights with the same force.
- Consistent Lower Force On Seal Faces – a very low spring rate, with an extremely flat load deflection curve, can be designed by incorporating a multiple turn wave-spring, leading to potential increased Seal life.
- Hygienic – wave-springs eliminate the need to drill blind holes for multiple springs, that will trap product, which along with their non-clogging operation, facilitates wave-springs specification in hygienic duties.
- More Suitable For Highly Viscous Products – especially coagulating or crystallising media, such as heavy slurry or high viscosity sugar applications, as the spring will not become clogged.
- Vulcan Designs – minimise the potential for wave-spring fracture and failure. Single turn wave-springs have over-lapping ends. Our sinusoidal wave-springs are one piece with no weld spots, which are weak-points at the point of maximum stress.

Standard Mechanical Seal Materials Specifications

The following table highlights the Metallurgical and Face Materials offered as standard for the Vulcan stock range of Mechanical Seals. Any other material you may require is usually available, often from stock and always to production. Further stock material information is shown on each Type page; otherwise please contact us. All Face Material grades shown below are detailed on pages 14 and 15. The Metallurgical Grades shown are standard international grades of Stainless Steel and of Hastelloy C ; namely Hastelloy Grade 276.

Brochure Section	Seal Type	Material							
		Spring	Other Metal Parts	Carbon	Ceramic	Silicon Carbide		Tungsten Carbide **	
						Rotary	Stationary	Rotary	Stationary
Conical Spring	7D	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	8B	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	8	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	8DIN	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	82	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	9	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	12	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	12DIN	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	126	316SS	316SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	13	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	13DIN	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
Elastomeric Bellows	14 SERIES	304SS	304SS	M106K+	V99 CER	WNV2	VES2	Ni10	Ni6
	19 SERIES	304SS	304SS	M106K+	V99 CER	WNV2	VES2	Ni10	Ni6
	1511/J	304SS	304SS	M106K+	V99 CER	WNV2	VES2	Ni10	Ni6
	1520/H	304SS	304SS	M106K+	V99 CER	WNV2	VES2	Ni10	Ni6
	1724/L/S	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
Parallel Spring Diaphragm	(N) 10/20	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	(N) 11/22	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	U11/N11	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	11J/20H	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	24/L/S	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
Balanced Diaphragm	A1	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	A2/H	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	A4/J	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	A5/J	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
Parallel Spring 'O'-Ring	95	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	96	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	97	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	98	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
Multiple Spring	1609/1609S	HC276	316SS	FH82Z5	V99 CER	WNV2	WNV2	Ni10	Ni6
	1609B/1609BS	HC276	316SS	FH82Z5	V99 CER	WNV2	WNV2	Ni10	Ni6
	1645/1645S	HC276	316SS	FH82Z5	V99 CER	WNV2	WNV2	Ni10	Ni6
	1645B/1645BS	HC276	316SS	FH82Z5	V99 CER	WNV2	WNV2	Ni10	Ni6
	1659/1659S	HC276	316SS	FH82Z5	V99 CER	WNV2	WNV2	Ni10	Ni6
	1659B/1659BS	HC276	316SS	FH82Z5	V99 CER	WNV2	WNV2	Ni10	Ni6
	40L/S	HC276	316SS	M825	V99 CER	WNV2	WNV2	Ni10	Ni6
	52B / 55B / 56B	HC276	316SS	M825	V99 CER	WNV2	WNV2	Ni10	Ni6
Wave Spring Seals	1677	PH17-7	316SS	M825	V99 CER	WNV2	WNV2	Ni10	Ni6
	1677M	PH17-7	316SS	M825	V99 CER	WNV2	WNV2	Ni10	Ni6
	1678	PH17-7	316SS	M825	V99 CER	WNV2	WNV2	Ni10	Ni6
	1688	PH15-7	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
Water Pump Seals	18	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	60/65	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	70/75	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
Type 06 Seals	06	316SS	316SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
Seals for Food, Beverage And Dairy Industries	No Prefix	304SS	304SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	W - Prefix	316SS	316SS	M106K+	V99 CER	VES2	VES2	Ni10	Ni6
	Y - Prefix	316SS	316SS	M825	V99 CER	WNV2	WNV2	Ni10	Ni6
Stationaries	23	N/A	N/A	N/A	V99 CER	N/A	WNV2	N/A	Ni6
	25	N/A	N/A	N/A	V99 CER	N/A	WNV2	N/A	Ni6
	32	N/A	N/A	N/A	V99 CER	N/A	WNV2	N/A	Ni6
	all REST	N/A	N/A	M106K+	V99 CER	N/A	VES2	N/A	Ni6

Vulcan Elastomers

In order to ensure absolute cost and quality control, all standard secondary Seal materials are manufactured in-house by Vulcan (except for 'O'-Rings). We compound and manufacture the final elastomer and then mould our components, from moulds produced in our own machine shops.

The Vulcan factories' moulding section utilises modern moulding machinery and techniques to produce any and all elastomeric components required for our Seals, or as specials to customer needs. Vulcan thus, uniquely in the Mechanical Seal industry, produce all our standard elastomer components, through final compounding of elastomer material, vulcanisation, oven curing, production of moulds, moulding, final curing and automatic flash removal.

Nitrile Rubber Vulcan Grade

VN19 Specification

Material Analysis

Acrylonitrile Butadiene Rubber	50.2%
Filler	36.6%
Plasticizer	7.5%
Activators	4%
Vulcanizing agents	0.3%
Accelerator	1.4%

Properties

Original

Hardness (Shore A ASTM D2240):	70 ±5
Tensile Strength (ASTM D412):	≥11 Mpa /1.595 ksi
Elongation at Break (%) (ASTM D412):	≥220

Heat Ageing in hot air at 100°C / 212°F for 24hr (ASTM D573)

Tensile Strength change (%):	≥ -15
Elongation at Break change (%):	≥ -35
Hardness (Shore A) change (%)	≥+10

Fluid Immersion in ASTM3 oil at 100°C / 212°F for 24hr (ASTM D472)

Hardness (Shore A) change (%)	-3 ~ +7
Volume change (%):	-8~+6

E.P.D.M Rubber Vulcan Grade

VEP.MAR.4045 Specification

Material Analysis

Ethylene Propylene Rubber	51.92 %
Filler	42.06 %
Plasticizer	2.34 %
Activators	2.6 %
Accelerator	1.08 %

Properties

Original

Specific Gravity (ASTM D1817):	1.12 /1.18
Hardness (Shore A ASTM D2240):	70.0 ±5
Tensile Strength (ASTM D412):	≥14 Mpa/ 1.740 ksi
Elongation at Break (%) (ASTM D412):	≥200
Britlesness Temperature °C / °F	-55 /-67

Heat Ageing in hot air at 150°C / 302°F for 24hr

Elongation at Break change (%):	≤ -20

Neoprene Rubber Vulcan Grade

VNE11 Specification

Material Analysis

Neoprene®	12%
Magnesium Oxide	4%
Zinc Oxide	5%
H.A. Carbon Black	20%
S.R. Carbon Black	40%
Di- Octyl-Phthalate	15%
D.D Accelerator	1%
C.B.S Accelerator	1%
E.T Accelerator	0.5%
Sulphur	0.5%
Stearic Acid	1%

Properties

Original

Specific Gravity (ASTM D1817):	1.5
Hardness: Shore A (ASTM D2240):	70
Tensile Strength (ASTM D412):	11.3 Mpa / 1.638 ksi
Elongation at Break (%) (ASTM D412):	480

Heat Ageing in hot Air at 100°C / 212°F for 70hr (ASTM D573)

Hardness change points shore A:	+2
Elongation change (%):	-20
Tensile strength change:	-0.48 Mpa / 0.069 ksi
Weight loss grams:	Negligible

Fluid Immersion in ASTM 3 oil at 100°C / 212°F for 70hr (ASTM D471)

Hardness change points shore A:	-26.1
Elongation change:	-2.0 Mpa / 0.290 ksi
Tensile Strength change:	-3.0 Mpa / 0.435 ksi

FEP Silicone / Viton™

FEP Encapsulated silicone or Viton™ 'O'-Rings are available, usually from stock. Please refer to our Vulcan Chem-Rings Brochure for further Technical and Material Information.

Please contact our Commercial Technical Department for advice on fitting FEP/PFA Encapsulated 'O'-Rings to Mechanical Seals. Vulcan fit only upon production or supply as separate.

Viton™ Rubber Vulcan Grade

V3F.FE2602 Specification

Material Analysis

Viton™	69%
S.F Carbon Black	15%
Magnesium Oxide	5%
Calcium Hydroxide	7%
NN-Dicinnamal-1,6-hexamethylenediamine	2.5%
Carnauba wax	1.5%

Properties

Original

Hardness: Shore A (ASTM D2240):	70 ±5
Tensile Strength (ASTM D412):	≥10 Mpa / 1.450 ksi
Elongation at Break (%) (ASTM D412):	≥220

Heat ageing in hot air at 200°C / 392°F for 24hr (ASTM D573)

Elongation change (%):	≥ -30
Tensile Strength change:	≥ -20 Mpa / 2.900 ksi
Hardness change (%)	≥ (0 ~ +10)

Fluid Immersion in ASTM3 oil for 70hr at 150°C / 302°F (ASTM D471)

Volume change (%):	-3 ~ -5

Notes:

Vulcan compound has Viton™ mixing content of 66% plus. The Fluoro-Elastomer Rubber content is of course vital for the chemical and heat resistant properties of the elastomer.

Beware of "Viton™" rubbers with incorrect Fluoro-Elastomer content, sometimes only 30% or even less. It is important to obtain the correct quality content specification.

True Viton™ requires a minimum content of 66% Viton™.

Perfluoro Elastomers

Vulcan utilise Kalrez® as standard but can offer any brand of supplied Perfluoro elastomer to meet your requirements and specifications. Please refer to the relevant manufacturer's Technical Information.

Vulcan Face Materials

A Seal's capability, performance and life is significantly influenced by the grade, quality and combination of face materials used. Vulcan's policy is to therefore only utilise the best grades of face materials and to control their specification and manufacture from raw powder.

As such, Vulcan manufacture in-house all of our hard face materials. Silicon Carbide (both Reaction Bonded and Sintered) and Tungsten Carbide (Nickel and Cobalt bound) are produced by Vulcan in all stages, from raw powder to final ground and lapped component.

Extensive research and technological development, allied to advanced manufacturing techniques and facilities, with intensive Quality Control and testing, has enabled Vulcan to produce materials which exceed the standards supplied from competitors, even specialist, international Tungsten Carbide / Silicon Carbide manufacturers. Vulcan also specify and fit 99.5% Purity Alumina Ceramic, as standard, to all Seal/seat Types. Practically all of our "single spring Seal" competitors utilise the lower cost and quality 95 / 96% purity ceramic and may only offer 99.5%, for improved capability and performance, at a premium cost.

Vulcan Grade M106K+ is a machined resin grade fitted to many of our standard Seals giving significant improvements compared to the common competitor standard carbons seen. Our policy is to specify and utilise as standard, only the best quality on all our face materials.

Carbon Grades Specification:

Carbon Grade	FH82Z5 Triple Phenolic Resin Impregnated Carbon / Graphite	M825 Double Phenolic Resin Impregnated Carbon / Graphite FDA Compliant	M106K+ Double Phenolic Resin Impregnated Carbon / Graphite	M106D Antimony Metal Impregnated Carbon / Graphite
Flexural Strength	≥75 Mpa / 10.877 ksi	≥65 Mpa / 9.427 ksi	≥65 Mpa / 9.427 ksi	≥65Mpa / 9.427 ksi
Compressive (Bending Fracture Strength)	≥250 Mpa / 36.259 ksi	≥200 Mpa / 29.007 ksi	≥200 Mpa / 29.007 ksi	≥220 Mpa / 31.908 ksi
Density	1.70 - 1.90 g/cm^3 / 0.061 - 0.068 lb/in^3	1.76 g/cm^3 / 0.063 lb/in^3	1.76 g/cm^3 / 0.063 lb/in^3	2.3g/cm^3 / 0.083 lb/in^3
Hardness	≈100 Hs	≥85 Hs	≥85 Hs	≥80Hs
Porosity	≤2.0%	≤2.0%	≤2.0%	≤2.0%
Temperature Limit	200°C / 392°F	200°C / 392°F	200°C / 392°F	350°C / 662°F
Coefficient of Thermal Expansion	4.7 x 10^{-6}/°C (20 - 200°C)	5.0 x 10^{-6}/°C (20 - 200°C)	5.0 x 10^{-6}/°C (20 - 200°C)	5.0 x 10^{-6}/°C (20 - 200°C)

Notes:

1. The Seal face material grade fitted to all Vulcan's standard Seals is shown on the material specification chart shown on page 12 of this brochure.
2. M825 is N.W.C. approved for use in contact with potable water and is FDA / E.C. regulation number 1935 / 2004 compliant.
3. Usually any material may be specified to be incorporated with any Vulcan Seal, sometimes at additional cost.

Ceramic Grade V99 CER High Purity Alumina Ceramic

Description		
Purity	> 99.30%	
Density	3.85 - 3.90 g/cm^3 / 0.139 - 0.140 lb/in^3	
Apparent Porosity	0.04	
Hardness	> 90 Hs	
Bond Strength	> 3000 Kgf/cm^2 / 42660 lb/in^{2}z	
Sample Dried At 110°C / 230°F		
Silica	0.15%	(Si02)
Titania	< 0.01%	(Ti02)
Ferric Oxide	0.04%	(Fe203)
Lime	0.04%	(Ca0)
Magnesia	0.55%	(Mg0)
Potash	< 0.01%	(K20)
Soda	< 0.03%	(Na20)
Phosphorus Pentoxide	< 0.02%	(P205)
Chromium Sesquioxide	< 0.01%	(Cr203)
Manganic Oxide	< 0.01%	(Mn304)
Zirconia	< 0.02%	(Zr02)
Hafnia	< 0.01%	(Hf02)
Lead Monoxide	< 0.02%	(Pb0)
Barium Oxide	< 0.01%	(Ba0)
Strontia	< 0.01%	(Sr0)
Stannic Oxide	< 0.01%	(Sn02)
Loss on Ignition at 1025 Deg C.	0.04%	
Approx. Sulphur Trioxide After L.O.I. and Fusion	< 0.05%	(S03)
Alumina	99.35%	(Al203)

M106D Antimony Carbon

Antimony metal impregnated Carbon is a stronger, higher density grade of Carbon, with greater wear and temperature resistance compared to many resin impregnated carbons.

It is important to consider, before use of Antimony impregnated Carbon, the potential health hazards posed by the Antimony metal leaching from the Carbon into the media. In no instance should a Mechanical Seal with an Antimony Carbon component be considered to be used on process equipment involved in food, beverage or ingredient production, for humans or animals, in our opinion.

Antimony impregnated Carbon offers greater performance in applications where there is poor, or even temporarily absent, lubrication and cooling to the Seal faces, or the media is high temperature. Such applications could be self-priming Pumps where dry start-up is possible, boiler feed water Pumps, or medias such as volatile solvents or volatile petrochemicals that provide very poor lubrication to the sealing faces.

If in doubt whether to specify Antimony Carbon, please contact our Technical Commercial Department for advice.

Vulcan Face Materials

Silicon Carbide Grades Specification:

Silicon Carbide Grade Material Specification	VES2 Reaction Bonded Silicon Carbide	WHV2 Sintered Silicon Carbide Graphite Loaded	WNV2 Sintered Silicon Carbide	CPV1 Porous Sintered Silicon Carbide	
Purity ; % Pure Silicon Carbide	≥88	Sic – 80-85 Graphite – 15-20	≥99	≥98	**%**
Hardness (Vickers 0.5)	≥2200 / 3129	≥2400 / 3413	≥2600 / 3698	≥2600 / 3698	**Kg/mm² / lb/in²**
Compressive Strength	≥2000 / 290	≥2000 / 290	≥3600 / 319	≥2000 / 290	**Mpa / ksi**
Fracture Strength	≥4 / 0.580	≥3.2 / 0.464	≥3.2 / 0.464	≥3.2 / 0.464	**Mpa / ksi**
Flexural Strength	≥350 / 50.763	≥280 / 40.610	≥400 / 58.015	≥240/34.809	**Mpa / ksi**
Density	≥3.00 / 0.108	≥3.0 / 0.108	≥3.10 / 0.111	≥3.0 / 0.108	**gm/cc / lb/in³**
Grain Size	≤15 / 0.0006	5-500 / 0.002 - 0.02	≤5 / 0.0002	<5	**µm / ins**
Thermal Conductivity	150	≥110	110	≥90	**W/m.k**
Thermal Expansion	4.4	≤4.1	≥4.7	≥4.7	**10-6/°C**
Porosity	0	≤3.0	≤0.2	4-12	**%**
Youngs Modulus	≥350 / 50763	≥400 / 58015	≥410 / 59465	≥400 / 58015	**Gpa / ksi**
Poisson Ratio	0.15	0.15	0.16	0.16	
Maximum Working Temperature	1300°C / 2372°F	1600°C/2912°F	1700°C / 3092°F	1600°C / 2912°F	**°C / °F**
Typical Pore Size	N/A	N/A	N/A	40-75 / 0.0016 - 0.003	**µm / ins**

Notes:

Vulcan manufacture and stock Reaction Bonded and Sintered Silicon Carbide. As such we supply both Reaction Bonded and Sintered Silicon Carbide as standard, so please check the stock code or specify should you require a specific grade.

Tungsten Carbide Grades Specifications

Ni10 Nickel Based T.C Material Specification:		
Chemical Composition (by Weight)		
Tungsten Carbide:	90%	(+/- 0.25%)
Nickel:	10%	(+/- 0.25%)
Description		
Hardness Hv30	1300-1400	
Density	14.4-14.6 gm/cc / 0.520 - 0.527 lb/in³	
Ultimate compressive Strength	> 600,000 psi	
Ultimate Tensile Strength	> 200,000 psi	
Modulus of Elasticity	99.8 x 10⁶psi	

Ni6 Nickel Based T.C. Material Specification		
Chemical Composition (by Weight)		
Tungsten Carbide:	94%	(+/- 0.25%)
Nickel:	6%	(+/- 0.25%)
Description		
Hardness Hv30	1425-1575	
Density	14.8 -15 gm/cc / 0.535 - 0.541 lb/in³	
Ultimate Compressive Strength	680,000 psi	
Ultimate Tensile Strength	210,000 psi	
Modulus of Elasticity	94 x 10⁶psi	

Notes:

Vulcan have set exceptional standards for Quality in our Tungsten Carbide production and routinely produce to our specification of A02, B02, C02 standard.

Fine grain Tungsten Carbide is both more expensive to purchase and difficult to process. However, it produces the finest, most uniform, grain structure and best quality Tungsten Carbide. Beware of Tungsten Carbides manufactured from re-cycled powder, which are lower cost to produce but have reduced product material matrix integrity and performance capability.

Our Tungsten Carbide Quality is governed by and microscopically inspected to IS0 4505:1978, whereby minute pores up to 10 micron / 0.0004 ins (A), 10-25 micron /0.0004 - 0.0009 ins (B) and free Carbon inclusions (C) are classified on a scale from 1 to 8.

Ni-Resist Grade Specification

Ni-Resist Specification	
Carbon [C]:	2.8%
Silicon [Si]:	2.5%
Manganese [Mn]	1.0%
Phosphorus[P]	0.2%
Nickel [Ni]:	20.0%
Chromium [Cr]:	2.0%
Magnesium [Mg]:	0.1%
Iron [Fe]:	Balance
Material Properties	
Tensile Strength 1000lb./sq. in.	60
Hardness: HB	175
Thermal Expansion (32°-212°F) x 10-6in./(in.)(°F):	10.4
Density lb/cu. In.	0.286
Melting Point °F/°C	2250/1232

Face PV Values and Chart

The selection of the optimum face material combination is primarily dependent upon the application conditions and is vital for optimal Seal performance and life. Most particularly, this primarily sets or limits the Seals capability / suitability for any given application, along with the Seals design.

Seal face PV values effectively set the limits of a Seal face combination, due to the relationship between maximum operational pressure and circumferential speed, dictating the performance and life of a Seal.

Seal PV charts have been created in each standard Seal section of this brochure to establish a guidance, theoretical maximum, pressure value, for all standard material face combinations.

Vulcan follow IMECHE (institute of mechanical engineers) guidelines and therefore don't recommend utilisation of un-balanced Seals beyond the published pressure limits. We therefore strongly recommend individual testing / monitoring for any proposed application.

The tables below are to be used in conjunction with the PV charts, where the relevant multiplying factors are applied to arrive at the Seal's maximum pressure rating. See "How to Determine Maximum Operating Pressure" below by way of an illustrative example.

Application Conditions Table

Factor	Selection Criteria	Multiplier
Product Fluid	Lubricating fluids	x 1.00
	Aqueous solutions / Water	x 0.85
Temperature	Below 70°C (158°F)	x 1.00
	Between 71°C and 120°C (160°F and 248°F)	x 0.85
	Between 121°C and 175°C (250°F and 347°F)	x 0.75
	Over 176°C (349°F)	x 0.60
Speed	Up to 1750 R.P.M.	x 1.00
	1750 R.P.M. to 3600 R.P.M.	x 0.80

Face And Seat Material Combinations

Material Face Combinations	Multiplier
Carbon vs Reaction Bonded Silicon Carbide	x 0.90
Carbon vs Tungsten Carbide	x 0.90
Carbon vs Ceramic	x 0.50
Tungsten Carbide vs Tungsten Carbide	x 0.50
Sintered Silicon Carbide vs Sintered Silicon Carbide	x 0.41
Carbon vs Stainless Steel	x 0.30
Reaction Bonded Silicon Carbide vs Reaction Bonded Silicon Carbide	x 0.50
Sintered Silicon Carbide vs Reaction Bonded Silicon Carbide	x 0.41
Carbon vs Sintered Silicon Carbide	x 0.85

"How to Determine Maximum Operating Pressure"

The maximum operating pressures shown in the chart apply to a Carbon face running against a Reaction Bonded Silicon Carbide seat.The ratings given, in this and all P.V. value charts shown in this brochure and Vulcan's Technical Literature , assumes stable operation, at the speeds shown, in a clean, cool, lubricating, non-volatile fluid, with adequate flush rate.

To determine the maximum operating pressure for a specific duty, simply multiply the value obtained, from the graph for a particular Seal size and type, by the appropriate factors given in the tables.

For Example:

Seal Type:	2.000" Type 20
Face Combination:	Carbon / Ceramic.
Speed:	1450 R.P.M.
Temperature:	50°C (122°F)
Media:	Water

Obtain the nominal pressure rating from the Seal Type PV Chart (for a Diaphragm Seal Type) where the 2.000" shaft size line intersects the Seal type line. Go across to find the pressure (i.e. 9 bar).

Then apply the multiplying factors from the table to obtain the final approximated guidance maximum pressure value.

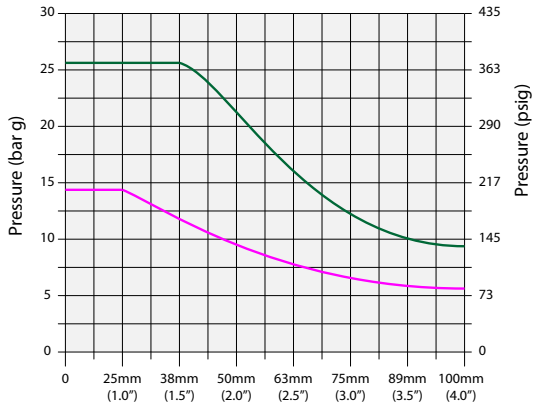


Chart based upon: Carbon vs reaction bonded silicon carbide Seal faces

10/20/11/22/24 A1/A2/A4/A5

For this example the "Approximated Guidance Maximum Pressure Value" would be;

9 bar (from PV Chart) x 0.50 (Face Materials) x 1.00 (Speed) x 1.00 (Temperature) x 0.85 (Fluid Type) = 4.2 bar

Note.

Our policy is one of continuous technical and efficiency improvement. As such, all specifications may be subject to change without prior notice.

Please note that due to the many application variants affecting Seal performance, these charts are for guidance only. Theoretical PV values are based on a Seal life of 9000 hours and were calculated from Vulcan's (and available published) technical data, knowledge and judgment.

Mechanical Seal Testing

Vulcan have designed, specified and installed a unique, tri-parate, static air pressure test rig, into our Seal assembly department. This is utilised, partly for Seal testing purposes, but primarily to sample inspect and test Seals, from production. In addition, we can offer 100% batch inspection and test, to agreed parameters, as part of our supply to individual customer contracts and specification.

The Vulcan Mechanical Seal design Types shown in this brochure have been tested on our rotary test facilities. The Seal performance data produced support Vulcan's published Maximum Recommend Operating Parameters, which can be calculated for each Seal type using the provided PV Charts in combination with the Application Conditions and Material Combination Multiplying Factors, please refer to page 16 for a full explanation on how these are calculated.

Electronic Inspection

Vulcan are and have long been passionate about the benefits, for Seal Quality Assurance and Performance Improvement, of automated, electronic imaging, sizing and analytical machines.

We routinely and systematically electronically inspect at each stage of manufacture, assembly and supply, from incoming materials to final bar-coded despatch.

Material Testing

Our policy has always been to specify the best quality elastomer and Seal face materials, as they are the very essence of "what actually Seals". To support and ensure this and as an integral part of our new material / production developments, we have extensive material test facilities.

This programme of in-house face materials development and manufacture has successfully led to a range of Silicon Carbide materials, for instance, becoming a major separate materials business, within The Vulcan Group.

Fitting Advice

Fitting instructions for rotary Mechanical Seals; please observe the following rules;

Equipment condition

- Check the condition of the equipment shaft and bearings for the following:
- Shaft diameter is within tolerance +/- 0.05mm (+/- 0.002").
- Shaft run out is less than 0.1mm (0.004") for shaft speeds up to and including 1800 R.P.M. and less than 0.05mm (0.002") for shaft speeds greater than 1800 R.P.M.
- Shaft max. ovality (concentricity) +/- 0.025mm (+/- 0.001")
- Shaft bearing clearances should not permit lateral axial movements exceeding 0.12mm (0.005") i.e. Shaft End Float should be less than 0.12mm (0.005")
- Shaft surface finish, should be a maximum of 0.3/0.6µRm.
- Seat housing diameter tolerance should be within +/-0.05mm (+/-0.002") Make sure the seat housing surfaces are free from damage or corrosion.

PREPARATION

- There are no sharp edges, burns, scratches or corrosion where the Seal must pass over. It is recommended that the shaft is chamfered at the end to aid assembly. A typical lead in of 2.5mm(0.098") x 10 degree angle for Seal sizes up to 63.5mm (2.500") and 4mm x 10 degree angle for Seal sizes over 63.5mm (2.500") is satisfactory.
- Do not place face(s) down on any surface unless protected by clean cloth or paper.

Ensure the equipment operating conditions do not exceed the Seals design parameters.

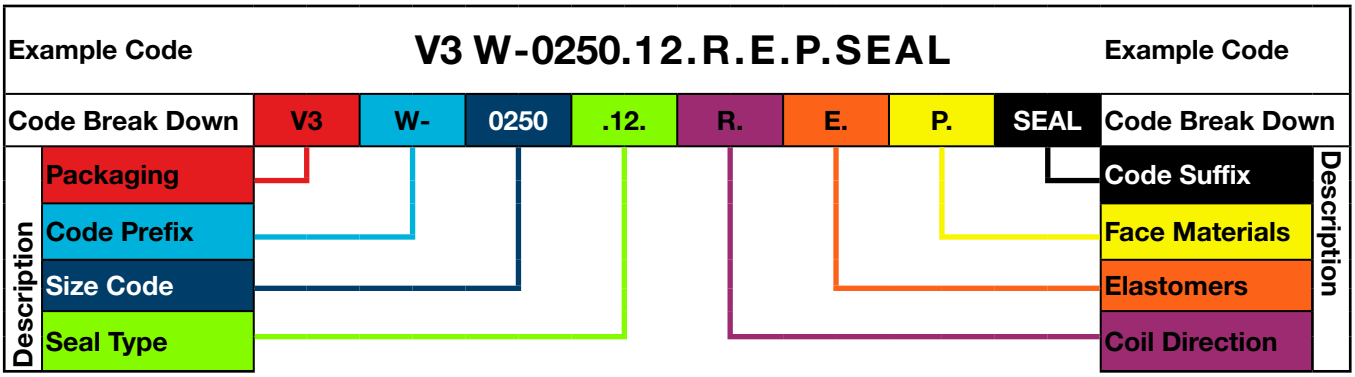
Installation of Seal and Seat

- Extreme cleanliness and care is essential during installation. When ready to use, lay parts onto a clean flat surface and remove protective wrapping. Take care not to cut or damage any Seal parts, as these can easily be damaged if mishandled.
- Seat: Lightly lubricate the seat elastomer and housing with clean water, alcohol or other elastomer compatible liquid. Press fit the stationary seat into the gland plate and check the face is square to the gland plate face, utilizing a small hand press or pillar of a drilling machine if necessary. Protect the seat face first with a suitable plastic material. Place onto the shaft the assembled gland plate and stationary seat.
- Seal: Lightly lubricate the sleeve and the neck of the Seal elastomer with clean water or soft soap. Light oil may be used with elastomers, other than Ethylene Propylene (E.P.). Fitting with grease may prevent a bellows or diaphragm Seal from gripping the shaft. Use grease, if you prefer, solely on 'O'-Rings.
- Slide onto the shaft the rotary Seal and set to the correct working length. If necessary, gently turning the Seal as it slides (in a direction opposite to the direction of the coil, if the Seal is a Conical Spring Seal). If the Seal is fitted with grub-screws, tighten uniformly and lock with thread sealant, if considered desirable. Carefully clean both Seal faces to remove all traces of grease.
- Assemble the equipment in the normal manner. Finally bolt the gland plate to the stuffing box in an even manner, to the correct necessary torque. Turn the shaft by hand to check that it will turn freely with no obstructions.

Ensure that the equipment is primed before start-up

Vulcan Seal / Seat Coding System

Understanding Vulcan Seal Codes:



Packaging

This is always a two digit code, which relates to the product packaging. See Product Packaging Prefix Code explanation in the table below.

Code Prefix

This section primarily specifies the metallurgy. It can also specify if FDA and E.C. Regulation material compliance is required or if specific customer product marking is required. Please refer to Code Prefix key below. Please note that a requirement for a non-standard product type will usually result in minimum order requirements and production lead times.

Size Code

The shaft size, expressed in millimetres is converted to a standard four digit code. For example; 1.000" = 25.4mm = 0254 or 20mm = 0200

For stepped shaft assemblies, the assembly size code is always derived from the larger shaft size, usually found under the rotary. For example; Major shaft size 30mm and shaft size under seat 25mm; Size Code = 0300. For ease, please use the Size Code as specified in the Size Code column on each dimensional table shown.

Seal Type

This denotes the Rotary and Seat Type combination, Rotary or Seat only, Type. Seal Types are shown within this brochure and upon the Price List Cover Sheets and Headers.

Product Packaging Prefix Code Key

Description	Prefix
Vulcan Screen Printed Individual Mechanical Seal Packaging1	V3
Vulcan Screen Printed Bulk Mechanical Seal Packaging	V4
Plain White Individual Mechanical Seal Packaging2	VW
Plain White Bulk Mechanical Seal Packaging	V2

1. Please note, This type of packaging is currently in the form of tubes with plastic lids. However, Vulcan are phasing out tubes, to be replaced with superior individual boxes.
2. Please also note that Vulcan can offer to label any product with your own product code and description, upon agreement. Please advise your labelling requirements upon order placement.

Product Codes Prefix Key

Prefix meaning	Prefix
all Metal Part 304SS	No Prefix
all Metal Part 316SS	W-
all Metal Part HASTELLOY C276	H-
all Metal Part DUPLEX	D-
all Metal Part BRASS	B-
FDA /E.C. REGULATION COMPLIANT (1935/2004)	Y-
MARKED Product	E-

Coil Direction

For direction dependent Seals, the first letter will be L. or R. referring to a left-hand (anti-clockwise) or right-hand (standard clockwise) shaft spring and direction of shaft rotation. For bi-directional Seals this letter is omitted.

Elastomers

One or two letters which specify the elastomer, or gaskets fitted, as shown in the "Secondary Seal (Elastomer or Gaskets) Material Code Key" (see page opposite).

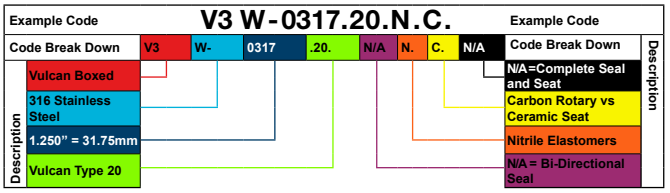
Face Materials

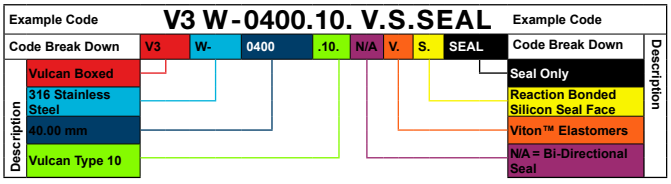
For a complete rotary and seat combination; a compound material code is used.For Rotary or Seat only code; a material specific code is used. Please refer to Face Materials table on opposite page.

Code Suffix

This suffix section is only used for part assemblies or components. Thus if it is left blank, the code is for a complete rotary and seat. This suffix is primarily used as .SEAL and .STAT to signify the code is for the rotary or stationary seat part only.

Example Codes break down





Guaranteed Stock Materials Key

The Guaranteed Stock materials for the Seals found in Brochure Sections 11a and 11b are shown utilising a key system. All letters utilised are Vulcans standard material, elastomer and face material combination codes, as Illustrated upon this and the opposite page. Please note that the material codes shown in section 11, are to show the Guaranteed Stock materials only. Stock materials thus selected by Vulcan are either a direct replacement to the OEM materials, or are our chosen superior replacement. Other materials are available, often from stock, please enquire.

Key Icon	Description
X	Circular icons indicate which elastomers are guaranteed in stock, i.e. "V" for Viton™, "N" for Nitrile and "E" for E.P.
X	Hexagonal icons indicate the rotary and stationary face combination codes which are guaranteed in stock. i.e, "C" for Carbon vs Ceramic.
316	Rectangular grey icons indicates the metallurgy utilised within the Guaranteed Stock Seals.

Vulcan Seal / Seat Coding System

Rotary and Stationary Face Combination Codes:

Seat Face Material

Rotary Face Material	Rotary Only Code	Antimony Carbon M106D	Carbon M106K+	Carbon FH8225	Carbon M825 FDA	Ceramic 95%	Ceramic V99	Lead Bronze	Stainless Steel*	Ni-Resist NiA436-84	Chrome Oxide Coated*	PTFE Carbon Impreg.	VES2 Reaction Bonded Silicon Carbide	WNV2 Sintered Silicon Carbide	WHV2 Sintered Silicon Carbide Graphite Loaded	CPV1 Porous Sintered Silicon Carbide	RHV1 Reaction Bonded Silicon Carbide Graphite Loaded	Tungsten Carbide Ni6
Stationary Only Code		L	P	BI	RD	CJ	A	CB	Q	F	O		S	R	TT	PP		H
Antimony Carbon M106D	A					AJ	A	AE	AQ	AN	AM		AD	AS	AT	AU	AV	AH
Carbon M106K+	C					CJ	C	CB	Q	F	O		D	CS	CT	CU	CQ	E
Carbon FH82Z5	IB					IJ	IB	IE	IQ	IF	IM		IS	IR	IT	IP	IV	IH
Carbon M825 FDA	DB					DJ	DB	DE	DQ	DF	DM		DS	DR	DT	DP	DV	DH
Ceramic 95%	JC	JA	JC	JI	JD							JW	JS	JR	JT	JP	JV	JH
Ceramic V99	B	BA	B	BI	BD	BJ	BB					BW	BG	BR	BT	BP	BV	BH
Lead Bronze	CH	EA	EC	EI	ED	EJ	EB	EE	EQ	CF	EM	EW	ES	ER	ET	EP	EV	CH
Stainless Steel*	P	AP	P	QI	QD			QE		N	QM	QW	PS	QR	QT	QP	QV	QH
Ni-Resist NiA436-84	K	L	K	FI	FD			FE			FM	FW						FH
Chrome Oxide Coated*	M	MA	M	MI	MD	MJ	MB	ME			MM	MW	MS	MR	MT	MP	MV	MH
PTFE Carbon Impreg.							CP	UE	UQ	UF	UM		US	UR	UT	UP	UV	UH
VES2 Reaction Bonded Silicon Carbide	S	TA	T	SI	SD	SJ	G					SW	S	SR	ST	SP	SV	I
WNV2 Sintered Silicon Carbide	R	SA	SC	RI	RD	RJ	SG					RW	SS	R	RT	RP	RV	RH
WHV2 Sintered Silicon Carbide Graphite Loaded	TT	TN	TC	TI	TD	TJ	TB					TW	TS	TR	TT	TP	TV	TH
CPV1 Porous Sintered Silicon Carbide	PP	PA	PC	PI	PD	PJ	PB					PW	PE	PR	PT	PP	PV	PH
RHV1 Reaction Bonded Silicon Carbide Graphite Loaded		VA	VC	VI	VD	VJ	VB					VW	vs	VR	VT	VP	VV	VH
Tungsten Carbide Ni10	H	HA	U	HI	HD	HJ	HC					HW	J	HR	HT	HP	HV	H

Notes;* Stainless Steel Grade - The grade of Stainless Steel is specified by the code Prefix.

Secondary Seal (Elastomer or Gaskets) Material Code Key

Elastomers	Code	Material
	A	AFLAS® Rubber Elastomers
	B	Combined PTFE Wedge and Viton™ 'O'-Ring PTFE Gasket on Seat
	C	Combined PTFE Wedge and Neoprene 'O'-Ring PTFE Gasket on Seat
	D	Combined PTFE Wedge and Neoprene 'O'-Ring Neoprene 'O'-Ring on Seat
	E	E.P. Rubber Elastomers
	E1**	E.P. Rubber 'O'-Rings with PTFE Backup Ring
	EN*	Double Seal, with E.P. Elastomers Inboard and Nitrile Outboard
	F	FEP / Silicone Encapsulated 'O'-Rings
	G	FEP/Viton™ Encapsulated 'O'-Ring
	GV	Double Seal: FEP/Viton™ Encapsulated 'O'-Ring Inboard/STD Viton™ Outboard
	H	HNBR Terban® Rubber Bellows OR 'O'-Rings
	J	PFA/Silicone Encapsulated 'O'-Rings
	K	Perfluroelastomer to your Specification
	M	Expanded Graphite
	N	Nitrile Rubber Elastomers
	N1**	Nitrile Rubber 'O'-Rings with PTFE Backup Ring
	O	Neoprene Rubber Elastomers
	P	PTFE Wedges OR Gaskets
	Q	Neoprene Rubber Elastomers on Rotary PTFE Gasket on Seat
	S	Silicone Rubber Elastomers
	T	E.P. Elastomer on Rotary with PTFE Gasket Seat
	U	Glass Filled PTFE Wedges and Gaskets
	V	Viton™ Elastomers
	V1**	Viton™ 'O'-Rings with PTFE Backup Ring
	W	Viton™ Elastomers on Rotary with PTFE Gasket Seat
	X	No Elastomer Fitted
	Y	PTFE Wedge Rotary, with Viton™ 'O'-Ring on Seat
	Z	PTFE Wedge Rotary, with Nitrile 'O'-Ring on Seat

Notes:

There are a large number of Secondary Seal Material Combinations available; the table to the left shows the most common only. Please contact us for further information on any other requirements.

* Double Secondary Seal Material Codes – As shown in the table on the left, double Seal material codes are a combination of two single elastomer codes. The first letter signifies the inboard material and the second letter the outboard material.

** N1, E1, V1 Elastomer 'O'-Ring with PTFE backup ring – The 1 after standard Secondary Material code signifies requirement for PTFE backup ring.

Imperial / Metric Conversion Charts

Mass/Force/Torque

Imperial	Metric	Metric
2.2 lb	1 kg	1000 g
1 lb	4.44 N	0.454 kg
1 N	0.102 kg	101.97 g

Speed

Imperial	Metric
1 ft/s	= 0.3048 m/s
1 m/s	= 2.237 mph
Convert RPM to M/S	M/s = (rpm/60) x (shaft diameter(m) x 3.142)
Convert M/S to RPM	Rpm = (m/s x 60) / (shaft diameter(m) x 3.142)

Pressure

Metric / Imperial or the reverse	
1 psi	0.06895 bar
1 psi	6.89 kpa
14.5 psi	1 bar
0.145 psi	1 kpa

Flow and Volume

Metric / Imperial or the reverse	
$1m^3/s$	1000 l/s
$1m^3/h$	4.40 Gpm (US)
1 l/s	3.6 m^3/h
1 cc/s	0.061 in^3
3.785 Liters	1 US Gallon
1 Liter	0.264 US Gallon

Length

Imperial	Metric	Metric	Metric
1 in	25.4 mm	2.54 cm	0.0254 M
1 ft	304.8 mm	30.48 cm	0.3048 M
Metric	**Imperial**	**Imperial**	**Imperial**
1 mm	0.0394”	0.0032 ft	0.00109 yd
1 cm	0.394”	0.0328 ft	0.01090 yd
1 meter	1.094 yd	3.2800 ft	1.09400 yd

Temperature

°F	°C
-58 °F	-50 °C
-49 °F	-45 °C
-40 °F	-40 °C
-31 °F	-35 °C
-22 °F	-30 °C
-13 °F	-25 °C
-4 °F	-20 °C
5 °F	-15 °C
14 °F	-10 °C
23 °F	-5 °C
32 °F	0 °C
41 °F	5 °C
50 °F	10 °C
59 °F	15 °C
68 °F	20 °C
77 °F	25 °C
86 °F	30 °C
95 °F	35 °C
104 °F	40 °C
113 °F	45 °C
122 °F	50 °C
131 °F	55 °C
140 °F	60 °C
149 °F	65 °C
158 °F	70 °C
167 °F	75 °C
176 °F	80 °C
185 °F	85 °C
194 °F	90 °C
203 °F	95 °C
212 °F	100 °C
221 °F	105 °C
230 °F	110 °C
239 °F	115 °C
248 °F	120 °C
257 °F	125 °C
266 °F	130 °C
275 °F	135 °C
284 °F	140 °C
293 °F	145 °C
302 °F	150 °C
311 °F	155 °C
320 °F	160 °C
329 °F	165 °C
338 °F	170 °C
347 °F	175 °C
356 °F	180 °C
365 °F	185 °C
374 °F	190 °C
383 °F	195 °C
392 °F	200 °C
401 °F	205 °C
410 °F	210 °C
419 °F	215 °C
428 °F	220 °C
437 °F	225 °C
446 °F	230 °C
455 °F	235 °C
464 °F	240 °C
482 °F	250 °C

Metric / Imperial Size Codes

Shaft Size			Size Code
Imperial		Metric	
3/8	0.375	9.53	0095
7/16	0.438	11.11	0111
1/2	0.500	12.70	0127
9/16	0.563	14.29	0143
5/8	0.625	15.88	0158
11/16	0.688	17.46	0175
3/4	0.750	19.05	0191
13/16	0.813	20.64	0206
7/8	0.875	22.23	0222
15/16	0.938	23.81	0238
1	1.000	25.40	0254
1.1/16	1.063	26.99	0270
1.1/8	1.125	28.58	0286
1.3/16	1.188	30.16	0301
1.1/4	1.250	31.75	0317
1.5/16	1.313	33.34	0333
1.3/8	1.375	34.93	0349
1.7/16	1.438	36.51	0365
1.1/2	1.500	38.10	0381
1.9/16	1.563	39.69	0397
1.5/8	1.625	41.28	0412
1.11/16	1.688	42.86	0428
1.3/4	1.750	44.45	0444
1.13/16	1.813	46.04	0460
1.7/8	1.875	47.63	0476
1.15/16	1.938	49.21	0492
2	2.000	50.80	0508
2.1/16	2.063	52.39	0524
2.1/8	2.125	53.98	0539
2.3/16	2.188	55.56	0555
2/1/4	2.250	57.15	0571

Shaft Size			Size Code
Imperial		Metric	
2.5/16	2.313	58.74	0587
2.3/8	2.375	60.33	0603
2.7/16	2.438	61.91	0619
2.1/2	2.500	63.50	0635
2.9/16	2.563	65.09	0651
2.5/8	2.625	66.68	0666
2.11/16	2.688	68.26	0683
2.3/4	2.750	69.85	0698
2.13/16	2.813	71.44	0714
2.7/8	2.875	73.03	0730
2.15/16	2.938	74.61	0746
3	3.000	76.20	0762
3.1/16	3.063	77.79	0778
3.1/8	3.125	79.38	0794
3.3/16	3.188	80.96	0809
3.1/4	3.250	82.55	0825
3.5/16	3.313	84.14	0841
3.3/8	3.375	85.73	0857
3.7/16	3.438	87.31	0873
3.1/2	3.500	88.90	0889
3.9/16	3.563	90.49	0905
3.5/8	3.625	92.08	0921
3.11/16	3.688	93.66	0937
3.3/4	3.750	95.25	0952
3.13/16	3.813	96.84	0968
3.7/8	3.875	98.43	0984
3.15/16	3.938	100.01	1000
4	4.000	101.60	1016
4.1/16	4.063	103.19	1032
4.1/8	4.125	104.78	1048
4.3/16	4.188	106.36	1064

Shaft Size			Size Code
Imperial		Metric	
4.1/4	4.250	107.95	1079
4.5/16	4.313	109.54	1095
4.3/8	4.375	111.13	1111
4.7/16	4.438	112.71	1127
4.1/2	4.500	114.30	1143
4.9/16	4.563	115.89	1159
4.5/8	4.625	117.48	1175
4.11/16	4.688	119.06	1191
4.3/4	4.750	120.65	1206
4.13/16	4.813	122.24	1222
4.7/8	4.875	123.83	1238
4.5/16	4.938	125.41	1254
5	5.000	127.00	1270
5.1/16	5.063	128.59	1286
5.1/8	5.125	130.18	1302
5.3/16	5.188	131.76	1318
5.1/4	5.250	133.35	1333
5.5/16	5.313	134.94	1349
5.3/8	5.375	136.53	1365
5.7/16	5.438	138.11	1381
5.1/2	5.500	139.70	1397
5.9/16	5.563	141.29	1413
5.5/8	5.625	142.88	1429
5.11/16	5.688	144.46	1445
5.3/4	5.750	146.05	1460
5.13/16	5.813	147.64	1476
5.7/8	5.875	149.23	1492
5.15/16	5.938	150.81	1508
6	6.000	152.40	1524
6.1/2	6.500	165.10	1651
7	7.000	177.80	1778

Vulcan to common competitor Seal Types: Cross-Reference chart

U.S. Seal®	Vulcan
Type A or AV	Type 65
Type B or BV	Type 75
Type C or HV	Type 11
Type D	Type A4
Type E	Type A5
Type G	Type 1511
Type I	Type 1724
Type K	Type 112
Type Q	Type 282
Type R	Type A42
Type T	Type A52
Type U	Type A1
Type W / WT	Type 1645
Type X / XT	Type 1645S
Type VGMA	Type 18
Type VGMB	Type 13
Type VGMBD	Type 13 DIN
Type VGMC-1	Type 19
Type VGMC-12	Type 192
Type VGMC-13	Type 193
Type VGMD	Type 9
Type VGME-1	Type 8B
Type VGME-2	Type 8
Type VGME-3	Type 8 DIN
Type VGMH	Type 24

U.S. Seal® Stat Only	Vulcan
Type 1	Type 11 Stat
Type 2	Type 11 Stat
Type 3	Type 31 Stat
Type 5	Type 32 Stat
Type 8 or 9	Type 73 Stat
Type 25	Type 23 Stat
Type 27	Type 25 Stat
Type VGM-G4	Type 8 STD
Type VGM-G6	Type 8 DINS
Type VGM-G9	Type 8 DINL
Type VGM-G13	Type 8B STD
Type VGM-G50	Type 20/1520
Type VGM-G60	Type 19B Stat
Type VGM-G606	Type 8 DINS
Type Lock Collar	Type Spec Clam

Pac-Seal®	Vulcan
Type 8	Type 1645S
Type 9	Type 1645
Type 16	Type 65
Type 17	Type 18
Type 21/31	Type N11
Type 21D	Type 112
Type 37	Type 8/ 8 DIN
Type 40	Type 282
Type 51	Type A5
Type 51D	Type A52
Type 52	Type 22
Type 68	Type 75
Type 167	Type 1677
Type 250	Type 1724
Type 300	Type A1

Pac-Seal® Stat Only	Vulcan
Type 1 CUP	Type 11 Stat
Type 2 'O'-Ring	Type 31 Stat
Type 3	Type 11 Stat
Type 3P	Type 32
Type 5A	Type 23
Type 5V	Type 25
Type 9	Type 73
Type B9	Type 19B
Type DIN 24960	Type 8 DINL/DINS
Type G6	Type 8 DINS
Type G9	Type 8 DINL

Roten®	Vulcan
Roten® 2	Type 12
Roten® 3	Type 13
Roten® 3Q	Type 13Q
Roten® 5	Consult Vulcan
Roten® 5H2	Type 7B
Roten® 7K	Type 1688U
Roten® 7KS	Type 1688
Roten® EHS	Type 40U
Roten® S	Type 50
Uniten® 2	Type 12DIN
Uniten® 2K	Type 126
Uniten® 3	Type 13DIN
Uniten® 3K	Type 130
Uniten® 5	Type 7D
Uniten® 5K	Type 135
Uniten® 7K	Type 1688L

M.T.U.®	Vulcan
Europa 1	Type 12DIN
Europa 2	Type 12
Europa 4	Type 8B
FA	Type 18
FG 1	Type 19
FG 2	Type 192
FG 3	Type 193
FP/D	Type 24
FP/T35	Type 11
SIMPLEX	Type 13
SIMPLEX DIN	Type 13DIN
TIPO 1 Stat	Type 19B
TIPO 2 Stat	Type 8.DINS

John Crane®	Vulcan
Type 1 (USA)	Type A5
Type 1 (Europe)	Type A1
Type 1 Double	Type A52
Type 2 (USA)	Type A4
Type 2 (Europe)	Type A2
Type 2 Double	Type A42
Type 6 (USA)	Type 65
Type 6A	Type 75
Type 6D / 6J	Type 66
Type 8-1	Type 1609S
Type 8-1T	Type 1645S
Type 8B1	Type 1609BS
Type 8B1T	Type 1645BS
Type 9	Type 1609
Type 9T	Type 1645
Type 9BT	Type 1645B
Type 11A	Type 282
Type 21	Type U11
Type 21 Double	Type 112
Type 58B	Type 1659BS
Type 58U	Type 1659S
Type 59B	Type 1659B
Type 59U	Type 1659
Type 80	Type 1688
Type 87	Type 1682
Type 106	Type 65
Type 109	Type 1609
Type 109B	Type 1609B
Type 502	Type 1724
Type 521	Type 24
Type 2100 K	Type 142 DIN
Type 2100 N	Type 143 DIN
Type 2100 S	Type 14 DIN
Type R00x	Type 95
Type R10x	Type 96
Type R20x	Type 97
Type R30x	Type 95N
Type R33	Type 1633
Type R34	Type 1634

John Crane® Stat Only	Vulcan
Type A	Type 23
Type BC	Type 24.BEZS
Type BD	Type 24.BEZL
Type BO	Type 24.DINS
Type BP	Type 24.DINL
Type BS	Type 8.TDP
Type DF	Type 1688
Type M	Type 19B
Type N/NG	Type 20 Stat
Type P/PP/PG	Type 32
Type V	Type 25
Type W/WM	Type 21
Type Z	Type 20 Stat

AES®	Vulcan
Type N-B01	Type 18
Type N-B012	Type 192B
Type N-B012G	Type 192G
Type N-B012S	Type 192
Type N-B012SL	Type 192L
Type N-B012SS	Type 192S
Type N-B013	Type 193B
Type N-B013S	Type 193
Type N-B013SL	Type 193L
Type N-B013SS	Type 193S
Type N-B02	Type 19B
Type N-B02D	Type 19C
Type N-B02K	Type 192K
Type N-B02S	Type 19
Type N-B02SL	Type 19L
Type N-B02SS	Type 19S
Type N-B02W	Type 191
Type N-B02X /B02XS	Consult Vulcan
Type N-B03	Type 70
Type N-B03U	Type 75
Type N-B04	Type 60
Type N-B04U	Type 65

AES®	Vulcan
Type N-B05	Type 14DIN
Type N-B05S	Type 14DINS
Type N-B052	Type 142DIN
Type N-B052S	Type 142DINS
Type N-B053	Type 143DIN
Type N-B053S	Type 143DINS
Type N-B06	Type 28
Type N-B060	Type 282
Type N-B07	Type 1724
Type N-B07S	Type 1724S
Type N-B07SL	Type 1724L
Type N-B0H	Type 66
Type N-BP02	Type 1520
Type N-BP04	Type 1511
Type N-BP05	Type 1522
Type N-C01	Type CLAM
Type N-C02	Type 96
Type N-C03	Type 97
Type N-M01	Type 1609
Type N-M01S	Type 1609S
Type N-M02	Type 1609B
Type N-M02S	Type 1609BS
Type N-M03	Type 1659
Type N-M03S	Type 1659S
Type N-M04	Type 1659B
Type N-M04S	Type 1659BS
Type N-M05	Type 1645
Type N-M05S	Type 1645S
Type N-M06	Type 1645B
Type N-M06S	Type 1645BS
Type N-M07	Type 50
Type N-M010	Type 40
Type N-M010S1	Type 1663
Type N-M010S2	Type 1663A
Type N-M010S3	Type 1662
Type N-M010S4	Type 1691
Type N-M010SA	Type 42
Type N-MP07	Type 912
Type N-P01	Type 10
Type N-P01U	Type A1
Type N-P02	Type 20
Type N-P02C	Type CAR
Type N-P02G	Type 207
Type N-P02U	Type A2
Type N-P03	Type 24
Type N-P04	Type 11
Type N-P04U	Type A4
Type N-P05	Type 22
Type N-P05U	Type A5
Type N-P06	Type 26
Type N-P07	Consult Vulcan
Type N-P08	Type 95
Type N-P080	Type 98
Type N-P09	Type 94
Type N-P09S	Type B94
Type N-P010	Type 293
Type N-P011	Type 89
Type N-S01	Type 8.STD
Type N-S02	Type 8.DINL
Type N-S03	Type 8.DINS
Type N-S04	Type 24 SEAT
Type N-S040	Type 19B SEAT
Type N-S05	Type 24.DINL
Type N-S06	Type 24.DINS
Type N-S07	Type 21 SEAT
Type N-S070	Type 31 SEAT
Type N-S08	Type 25 SEAT
Type N-S09	Type 23 SEAT
Type N-S010	Type 24.BEZL
Type N-S011	Type 32 SEAT
Type N-S013	Type 24.BEZS
Type N-S0E	Type 1640
Type N-S0S / S0SS	Type 86
Type N-S0Z	Consult Vulcan
Type N-SAIH	Type 41
Type N-T01	Type 8
Type N-T01.DIN	Type 8DIN
Type N-T01A	Type 8W
Type N-T01DB	Type 82
Type N-T01F	Consult Vulcan
Type N-T01SA	Type 81
Type N-T02	Type 8B
Type N-T03	Type 12
Type N-T03.DIN	Type 12DIN
Type N-T04	Type 13
Type N-T04.DIN	Type 13DIN
Type N-T05 Range	Type 06 Range
Type N-T06D	Type 135
Type N-T07	Type 9
Type N-T07D	Type 9+8.DINL
Type N-T0R	Type 29
Type N-T0W	Type 16
Type N-T0WD	Type 16DOUB

AES®	Vulcan
Type N-T0WDW	Type 297
Type N-T0WP	Type 16.PLUS
Type N-W01	Type 1688
Type N-W01TL	Type 1688Z
Type N-W02	Type 1688L
Type N-W03	Type 1688W
Type N-W03S	Type 1682
Type N-W04	Type 1688Y
Type N-W06	Type 1650
Type N-W07D	Type 1677
Type N-W07DM	Type 1677M
Type N-W07DMB	Type 1678
Type N-W07SD	Type 1633
Type N-W08	Type 295
Type N-W09	Type 1655
Type N-W010	Type 294
Type N-W011	Type 1683
Type N-W014	Type 1632
Type N-W015	Type 1651
Type N-W016	Type 1680
Type N-W017	Type 1649
Type N-W0FA / W0FC	Type 1676
Type N-W0FB	Consult Vulcan

Burgmann®	Vulcan
Type BT-AR, BT-AR3	Type 18
Type BT-FN	Type 13
Type BT-RN	Type 12
Type H7N	Type 1678
Type H12N / H17GN	Type 82
Type H12N6	Type 82S
Type HJ92N	Type 40L
Type HJ977GN	Type 40L
Type M2	Type 9
Type M2N	Type 9L
Type M2N4	Type 9S
Type M3	Type 8B
Type M3N	Type 8DIN
Type M3N4	Type 8DINS
Type M3N24	Type 12DIN
Type M3N69	Type 127B
Type M3N86	Type 126
Type M3S	Consult Vulcan
Type M32	Type 8
Type M32N	Type 8DIN
Type M32N2	Type 12DIN
Type M32N4	Type 8DINS
Type M32N9	Type 126L
Type M32N24	Type 12DIN
Type M32N69	Type 127B
Type M32N86	Type 126
Type M32S	Consult Vulcan
Type M37	Type 8
Type M37N	Type 8DIN
Type M37N4	Type 8DINS
Type M37G	Type 8
Type M37GN	Type 8DIN
Type M37GN4	Type 8DINS
Type M377	Type 8
Type M377N	Type 8DIN
Type M377S6	Type 8W
Type M7N	Type 1677
Type M74 or H74	Consult Vulcan
Type MG1	Type 19
Type MG12	Type 192
Type MG13	Type 193
Type MG1S20	Type 1520
Type MG1S	Consult Vulcan
Type MG901	Type 22
Type MG910	Type 10
Type MG912	Type 24
Type MG913	Type 143
Type MG920	Type 20
Type MG921	Type 11
Type MG9S	Consult Vulcan

Burgmann® Stat Only	Vulcan
Type G1 or G2	Consult Vulcan
Type G4	Type 8.STD
Type G6	Type 8.DINS
Type G7 And G8	Type 8.BEZ
Type G9	Type 8.DINL
Type G12	Type 24.DINS
Type G13	Type 8B Stat
Type G15 or G115	Consult Vulcan
Type G16	Consult Vulcan
Type G30	Consult Vulcan
Type G46	Type 24.DINL
Type G50	Type 20 Stat
Type G55	Type 11 Stat
Type G60	Type 19B
Type G61	Type 24 Stat
Type G606	Type 8.DINS

For a more comprehensive and up to date listing; please see the relevant section of your Vulcan customer portal. All information contained in this table is supplied in good faith and was considered correct at the time of printing.

This table is presented for your informational use. However, Vulcan cannot entirely guarantee that usingthis information will always result in an entirely suitable replacement, especially as specifications can change.

USA Seal codes; Cross-Reference List

USA	Vulcan Seals
100	0158.65A.N.C.
100V-CMS	0158.65A.V.C.
101	0191.65D.N.C.
102	0158.A4.N.F.
102V	0158.U11J.V.F.
106	0127.U11.N.F.
108	0317.A5.O.F.
109	0158.A4.N.C.SEAL
112	0191.U11.N.F.
112V-CMS	0191.U11.V.F.
113	0158.75D.N.C.
127	0269.A4.N.F.
128	0191.U11.N.C.
129	0150.A4.N.C.
135	0200.A4.N.C.
136	0300.A4.N.C.
137	0317.A5.N.F.
137V	0317.A5J.V.F.
137V-CMS	0317.A5.V.F.
142	0127.70T.N.C.
147	0444.A4.N.C.SEAL
150	0127.75.N.C.SEAL
153V	0158.M65J.V.E.
154	0349.U11.N.C.SEAL
157	0191.U11.N.C.SEAL
159	0254.THK1.O.F.
162	0127.65.N.C.
163	0127.75.N.C.
172	0349.U11.N.C.SEAL
177	0349.U11.N.C.
177V	0349.U11J.V.C.
177V-CMS	0349.U11.V.C.
177V-SC-SC-CMS	0349.U11.V.S.
185	0317.U11.N.C.
185V	0317.U11J.V.C.
186	0349.A4.N.F.
186V	0349.A4J.V.F.
186V-CMS	0349.A4.V.F.
188	0222.A5.N.C.
188V	0222.A5J.V.C.
193	0508.A4J.O.F.
196	0508.A4.N.C.SEAL
200	0158.65.N.C.
200-EPR	0158.65.E.C.
200V-CMS	0158.65.V.F.
200V-SC-SC	0158.65.V.S.
200A	0158.75E.N.C.
201	0191.65.N.C.
201V-CMS	0191.65.V.C.
201V	0191.65J.V.C.
204	0286.A5.N.C.
204V	0286.A5J.V.C.
205	0444.A5.N.C.
205V	0444.A5J.V.C.
205V-CMS	0444.A5.V.C.
208	0222.U11.N.C.SEAL
210	0349.U11.N.F.
210-TC-SEAT	0349.U11.N.E.
210V-CMS	0349.U11.V.F.
210V	0349.U11J.V.F.
210-EPR	0349.U11J.E.F.
218	0158.65.N.C.SEAL
223	0476.A4.N.C.SEAL
224	0381.A5J.O.F.
229	0222.A5J.N.F.
235	0254.U11.N.C.
235-SC-SC	0254.U11.N.S.
235V	0254.U11J.V.C.
235V-CMS	0254.U11.V.C.
236	0254.A5.N.F.
236V	0254.A5J.V.F.
236V-CMS	0254.A5.V.F.
237	0444.A4.N.C.
237V	0444.A4J.V.C
238	0412.U11.N.C.
238V-CMS	0381.U11.V.C.
238V	0412.U11J.V.F.
238V-SC-SEAT	0412.U11J.V.D.
239	0412.U11.N.F.
239-EPR	0412.U11J.E.F.
239V	0412.U11J.V.F.
245	0254.U11.N.C.
245-EPR	0254.U11.E.C.
245V	0254.U11J.V.C.
245V-CMS	0254.U11.V.C.
246	0317.U11.N.C.
246V	0317.U11J.V.C.
247	0381.U11.N.F.
248	0254.U11.N.F.
248-EPR	0254.U11.E.F.
248V	0254.U11J.V.F.
248V-CMS	0254.U11.V.F.
249	0317.U11.N.C.
249V	0317.U11J.V.F.
250	0222.A4J.N.F.
252	0254.A4J.N.F.
252-EPR	0254.A4J.E.F.
254	0254.A4J.N.F.
258	0381.A5J.N.F.
262	0444.A5J.N.F.
262-EPR	0444.A5J.E.C.
264	0317.A5J.N.F.
265	0191.A4J.N.F.
267	0508.U11.N.C.
267V	0508.U11J.V.C.
267V-SC-SC	0508.U11J.V.S
267V-TC-SEAT	0508.U11J.V.E.
267-SC-SC-CMS	0508.U11.N.S.
267V-CMS	0508.U11.V.C.
268	0603.U11J.N.C.
268-CMS	0603.U11.N.C.
268V	0603.U11J.V.C.
269	0635.U11J.N.C.
269V	0635.U11J.V.C.
270	0730.U11J.N.C.
270-CMS	0730.U11.N.C.
274	0158.A5.N.C.
278	0603.A5J.N.C.
278V	0603.A5J.V.C.
279	0635.A5J.N.C.
288	0444.A4.N.F.
288V	0444.A4J.V.F.
290	0158.U11.N.C.
290V	0158.U11.VC.
298	0127.65.N.C.SEAL
299	0158.65.N.C.SEAL
300	0158.65.N.C.
303	0222.A4.N.F.
303V	0222.A4J.V.F.
305	0381.A5.N.C.
305-EPR	0381.A5.E.C.
305V	0381.A5J.V.C.
309	0222.U11.N.C.
309V	0222.U11J.V.C.
309V-CMS	0222.U11.V.C.
309V-SC-SC-CMS	0222.U11.V.S.
312	0476.U11J.N.F.
312V	0476.U11J.V.F.
321	0698.A5J.N.F.
321-CMS	0698.A5.N.F.
323	0571.A5.N.C.
324	0762.A5J.N.C.
324-CMS	0762.A5.N.C.
327	0539.A5J.N.C.
328	0666.A5J.N.C.
328-CMS	0666.A5.N.C.
329	0730.A5J.N.C.
329-CMS	0730.A5.N.C.
332	0508.U11J.N.F.
336	0539.U11J.N.F.
338	0539.U11J.N.C.
338-EPR	0539.U11J.E.C.
338V	0539.U11J.V.C.
338V-SC-SC	0539.U11J.V.S.
340	0476.U11.N.C.
340-TC-TC	0476.U11.N.H.
340-TC-SC	0476.U11.N.J.
340V	0476.U11J.V.C.
342	0508.A5J.O.F.
347	0381.U11.N.C.
347V-CMS	0381.U11.V.C.
348	0286.U11.N.C.SEAL
348V	0286.11.V.C.SEAL
349	0635.A5J.N.F.
349V	0635.A5J.V.F.
350	0603.A5J.N.F.
350-CMS	0603.A5.N.F.
350V-TC	0603.A5J.V.E.
351	0571.A5.N.F.
351V	0571.A5J.V.F.
353	0539.A5.N.F.
354	0349.A5.N.C.
355	0286.U11.N.F.
355-SC-SEAT	0286.U11.N.D.
355-SC-SC	0286.U11.N.S.
355V	0286.U11J.V.F.
356	0286.U11.N.C.
356-EPR	0286.U11.E.C.
356-SC-TC	0286.U11.N.I.
356V	0286.U11J.V.C.
357	0254.U11.N.F.
357V	0254.U11J.V.F.
357V-CMS	0254.U11.V.F.
358	0191.U11.N.C.
358V-CMS	0191.U11.V.C.
359	0158.U11.N.C.
359-EPR-CMS	0158.U11.E.C.
359V	0158.U11J.V.C.
360	0254.65.N.C.
360V	0254.65J.V.C.
360V-CMS	0254.65.V.C.
361	0317.A5.N.C.
361-EPR	0317.A5.E.C.
361V	0317.A5J.V.C.
361V-CMS	0317.A5.V.C.
366	0444.A5.N.F.
366V	0444.A5J.V.F.
366-TC-TC	0444.A5.N.H.
366V-CMS	0444.A5.V.F.
370	0254.65.N.F.
371	0381.A4.N.F.
371V	0381.A4J.V.F.
371V-CMS	0381.U11.V.F.
374	0381.A5.N.F.
374V	0381.A5J.V.F.
376	0349.A4.N.C.SEAL
378	0381.U11.N.F.
378V-CMS	0381.U11.V.F.
380	0254.A4.N.C.
380V	0254.A4J.V.C.
380V-CMS	0254.A4.V.C.
381	0317.A4.N.C.
381-SC-SC	0317.A4.N.S.
381-NEO	0317.A4.O.C.
381V	0317.A4J.V.C.
382	0381.A4.N.C.
383	0317.A4.N.F.
383V	0317.A4J.V.F.
384	0286.A5.N.F.
395	0381.A5J.N.C.
395-EPR	0381.A5J.E.C.
397	0254. 11.N.C.SEAL
399	0191.A4.N.C.SEAL
401	0127.11.N.C.SEAL
416	0317.A4.N.C.SEAL
436	0444.U11J.N.F.
436-SC-SC	0444.U11J.N.S.
436-EPR	0444.U11J.E.F.
436V	0444.U11J.V.E.
445	0508.A4.N.C.
445V	0508.A4J.V.C.
445V-CMS	0508.A4.V.C.
446	0444.U11.N.C.
446-EPR	0444.U11.E.C.
446-SC-SC	0444.U11.N.S.
446-TC-TC	0444.U11.N.H.
446V	0444.U11J.V.C
446V-CMS	0444.U11.V.C.
447	0158.73.N.C.
448	0444.U11.N.F.
448V-CMS	0444.U11.V.F.
449	0444.222.N.WB.
453	0158.73.N.Q.
460	0254.A4.N.F.
460V	0254.A4J.V.F.
460V-CMS	0254.A4.V.F.
461	0412.A4.N.F.
461V	0412.A4J.V.F.
462	0508.A4.N.F.
462V	0508.A4.V.F.
463	0635.A4J.N.F.
463-TC-SC	0635.A4J.N.J.
463V	0635.A4J.V.F.
463-CMS	0635.A4.N.F.
464	0698.A4J.N.F.
464-CMS	0698.A4.N.F.
465	0762.A4J.N.F.
465-CMS	0762.A4.N.F.
466	0317.11T2.N.C.
466V	0317.11H.V.C.
468	0635.A4H.N.C.
469	0635.A4H.N.F.
475	0762.A5J.N.F.
475-CMS	0762.A5.N.F.
477	0508.A5J.N.F.
477-EPR	0508.A5J.E.F
477V	0508.A5J.V.F.
479	0508.A5.N.C.
479V	0508.A5J.V.C.
483	0698.U11J.N.F.
483-EPR	0698.U11J.E.F.
483-CMS	0698.U11.N.F.
483V-TC-SEAT	0698.U11J.V.E.
487	0158.A5.N.F.
491	0349.A4.N.C.
491V	0349.A4J.V.C.
492	0603.U11J.N.F.
492-CMS	0603.U11.N.F.
498	0269.A5.N.F.
499	0254.U11J.N.F.
499-EPR	0254.U11J.E.F.
501	0158.M65.N.C.
507	0158.65.N.F.
507V-CMS	0158.65.V.F.
508	0158.A4.N.C.
508V	0158.A4J.V.C.
510	0317.11T2.N.C.
513V	0476.A5J.V.F.
514	0412.A4.N.C.
514V	0412.A4J.V.C.
515	0381.A5H.N.C.
516	0158.65.N.C.
517	0317.A4J.N.F.
518	0158.65D.N.C.
521	0286.A4T2.N.C.
523	0476.A5.N.C
524	0158.65.N.F.
524-EPR	0158.65.E.F.
525	0317.U11J.N.F.
529	0286.U11J.N.F.
530	0508.A5J.N.C.
532	0508.U11J.N.C.
534	0381.A4J.N.F.
535	0444.A5J.N.C.
537	0539.A5.N.C.
542	0666.A5J.N.F.
542-CMS	0666.A5.N.F.
543	0539.U11.N.F.
543V	0539.U11J.V.F.
544	0412.U11J.N.F.
544V-SC-SC	0412.U11J.V.S.
546	0317.A5J.N.C.
547	0349.U11J.N.F.
548	0254.U11J.N.C.
550	0444.U11J.N.C.
552	0158.U11J.N.C.
553	0381.U11J.N.F.
553-SC-SC	0381.U11J.N.S.
557	0254.A5J.N.C.
578	0222.A4.N.C.SEAL
588	0286.U11J.N.F.
593	0476.A4J.N.F.
594	0603.A4J.N.F.
594-CMS	0603.A4.N.F.
595	0412.A5J.N.C.
598	0317.U11J.N.F.
598-EPR	0317.U11J.E.F.
598-SC-SEAT	0317.U11J.N.D.
598-TC-SEAT	0317.U11J.N.E.
598-SC-SC	0317.U11J.N.S.
601	0191.75.N.C.
601V-CMS	0191.75.V.C.
601V	0191.75J.V.C.
604	0286.A4.N.C.
604-EPR	0286.A4.E.C.
605	0286.A4.N.F.
605V	0286.A4J.V.F.
606	0191.75.N.C.
614	0200.A4.N.F.
614V	0200.A4J.V.F.
617	0222.U11J.N.F.
618	0317.U11J.N.C.
618-TC-TC	0317.U11J.V.H.
628	0158.65J.N.F.
631	0127.U11.N.C.
632	0127.U11.N.F.
633	0158.U11.N.F.
633-EPR-CMS	0158.U11.E.F.
633V	0158.U11J.V.F.
637	0158.65J.N.C.
642	0158.75.N.C.SEAL
647	0191.75.N.C.SEAL
659	0381.U11.N.F.
659-TC	0381.U11.N.E.
659V	0381.U11J.V.F.
659V-CMS	0381.U11.V.F.
677	0349.A5.N.F.
677V	0349.A5J.V.F.
687	0222.U11.N.F.
687V	0222.U11J.V.F.
687V-CMS	0222.U11.V.F.
687V-TC-SEAT	0222.U11J.V.H.
703	0222.A4.N.C.
703V	0222.A4J.V.C.
703V-CMS	0222.A4.V.C.
710	0269.A5.N.C.
711	0158.65A.N.C.
712	0158.75J.N.F.
715	0158.75J.N.C.
732	0158.U11J.N.F.
734	0158.A4J.N.F.
735	0158.A4J.N.C.
738	0158.A5J.N.F.
739	0158.A5J.N.C.
744	0412.A5.N.F.
744V	0412.A5J.V.F.
745	0412.A5.N.C.
745V-CMS	0412.A5.V.C.
745V	0412.A5J.V.C.
750	0191.A4.N.C.
750V-CMS	0191.A4.V.C.
750V	0191.A4J.V.C.
752	0191.A4.N.F.
752V	0191.A4J.V.F.
754	0254.A5.N.C.
754V	0254.A5J.V.C.
754V-CMS	0254.A5.V.C.
756	0317.U11.N.F.
756-EPR	0317.U11.E.F.
756V	0317.U11J.V.F.
758	0381.U11.N.C.
758-EPR	0381.U11J.E.C.

For a more comprehensive and up to date listing; please see page 25/33 from Vulcan's American Mechanical Seal Brochure. All information contained in this table is supplied in good faith and was considered correct at the time of printing.

USA Seal Codes; Cross-Reference List

USA	Vulcan Seals
758V-CMS	0381.U11.V.C.
760	0191.65J.N.C.
760V	0191.65J.V.C.
761	0762.A4J.N.C.
762	0191.65J.N.F.
765	0191.75J.N.C.
766	0191.75J.N.F.
767	0191.11J.N.C.
768	0191.11J.N.F.
771	0191.22J.N.C.
773	0191.22J.N.F.
774	0222.11J.N.F.
775	0222.A4J.N.C.
776	0222.A5J.N.C.
777	0254.65J.N.C.
778	0254.65J.N.F.
779	0254.22M.N.F.
791	0254.A5J.N.F.
791-EPR-TC-SEAT	0254.A5J.E.E.
791-V-TC-SEAT	0254.A5J.V.E.
797	0269.A4J.N.C.
798	0269.A5J.N.C.
799	0269.A5J.N.F.
800	0158.11.N.C.SPEC
801	0286.11J.N.C.
802	0286.A4J.N.C.
804	0317.A4J.N.C.
805	0349.11J.N.C.
806	0349.A4J.N.C.
807	0349.A4J.N.F.
816	0381.11J.N.C.
817	0381.A4J.N.C.
818	0412.11J.N.C.
819	0412.A4J.N.F.
821	0412.A4J.N.C.
822	0412.A5J.N.F.
825	0444.A4J.N.F.
826	0444.A4J.N.C.
828	0476.A4.N.C.
832	0508.A4J.N.F.
833	0508.A4J.N.C.
834	0603.A4J.N.C.
834-CUP SEAT	0603.A4.N.C.
835	0635.A4J.N.C.
835-CUP SEAT	0635.A4.N.C.
836	0698.11J.N.C.
836-CMS	0698.11.N.C.
837	0698.A4J.N.C.
837-CMS	0698.A4.N.C.
838	0698.A5J.N.C.
838-CUP SEAT	0698.A5.N.C.
839	0730.11J.N.F.
839-CUP SEAT	0730.11.N.F.
841	0730.A5J.N.F.
841-CUP SEAT	0730.A5.N.F.
842	0508.11.N.F.
842-TC-SEAT	0508.11.N.E.
843	0508.A5.N.F.
844	0539.11.N.C
846	0571.A4J.N.C.
847	0571.A4J.N.F.
848	0571.A5J.N.C.
849	0571.A5J.N.F.
851	0191.65.N.C.
853	0635.11J.N.F.
853-CUP SEAT	0635.11.N.F.
854	0539.11H.N.C.
855	0539.11H.N.F.
856	0539.A5H.N.C.
857	0539.A5H.N.F.
859-TC-SEAT	0444.A5J.N.E.
864	0349.A5J.N.C.
864V	0349.A5J.V.C.
865	0349.A5J.N.F.
866	0286.A5J.N.C.
867	0286.A5J.N.F.
867-EPR	0286.A5J.E.F.
867V	0286.A5J.V.F.
874	0571.A4.N.C.
882	0158.75.N.C.SEAL
887	0539.112.N.WB.
916	0635.A5J.N.C.
916-CMS	0635.A5.N.C.
921	0191.75.N.F.
933	0158.11.N.C.ZSEAL
935	0222.A5.N.F.
936	0222.A5.N.C.SEAL
937	0254.A5.N.C.SEAL
937V	0254.A5.V.C.SEAL
939	0381.A4.N.C.SEAL
941	0571.A4.N.F.
941V	0571.A4J.V.F.
942	0571.A4.N.C.SEAL
951	0158.11J.V.F.
951-EPR	0158.11J.E.F.
957	0158.65A.N.C
961	0158.75.N.C.
964	0158.75.N.F.

USA	Vulcan Seals
968	0191.65D.N.C.
973	0191.75.N.F.
974	0191.75.N.C.SEAL
975	0254.65.N.C.SEAL
976	0317.4.N.C.SEAL + 0317.20.N.C.STAT
977	0317.A4.N.C.SEAL + 0317.20.N.F.STAT
978	0317.B20.N.C.
979	0317.B20.N.F.
981	0317.A4J.V.F.
1000	0158.75.N.C.
1002	0127.11.N.C.
1012	0127.11.N.C.SPEC
1015	0317.A5.N.C.SEAL
1017	0508.11.N.F.
1017-TC-SEAT	0508.11.N.E.
1050	0127.11.N.C.SEAL
1050-EPR	0127.11.E.C.SEAL
1053	0317.11J.V.F.
1055	0444.11.N.C.SEAL
1057	0539.11J.V.F.
1065	0095.11J.N.C.
1079	0158.11.O.C.
1080	0158.11.O.F.
1081	0317.11.O.C.
1082	0317.11.O.F.
1097	0476.A4.N.F.
1110	0381.22J.N.F.
1110V	0381.22J.V.F.
1128	0317.A4J.O.F.
1145	0508.11J.V.F.
1150	0158.65A.N.E.
1152	0158.75.N.F.
1155	0158.11D.N.C.
1156	0158.11.N.F.
1160	0191.11.N.F.
1167	0286.11.N.F.
1179	0300.A4.N.F.
1179V	0300.A4.V.F.
1185	0317.A5.O.C.
1522	0191.75.N.C.SEAL
1608	0476.11.N.F.
1617	0539.A5J.N.C.
1620	0476.A4J.N.C.
1646	0381.A5J.V.H.
1659	0476.A5J.V.C.
1660	0476.A5J.V.F.
1667	0349.22.N.F.
1667-EPR	0349.22.E.F.
1667V	0349.22.V.F.
1674	0444.22.N.F.
1674-EPR	0444.22.E.F.
1675	0150.A4.N.F.
1676	0571.11J.N.F.
1676-EPR	0571.11J.E.F.
1678	0571.11J.N.C.
1678V	0571.11J.V.C.
1679	0571.11.N.C.
1679V-CMS	0571.11.V.C.
1680	0571.11.N.F.
1680-SC-SC	0571.11.N.S.
1682	0286.11.N.C.
1683	0412.A5J.N.C.
1683V	0412.AJ.V.C.
1685	0508.A5J.N.C.
1686	0539.A4.N.C.
1687	0539.A4.N.F.
1688	0571.A5J.N.C.
1697	0412.A4J.N.F.
1698	0412.A4J.N.C.
1699	0412.A5J.N.F.
1699E-TC	0412.A5J.E.E.
1699V	0412.AJ.V.F.
2000	0158.A4.N.C.
2008	0191.A4.N.C.
2009	0191.A4.N.F.
2010	0191.A4J.N.C.
2011	0191.A4J.N.F.
2012	0191.A5.N.C.
2013	0191.A5.N.F.
2014	0191.A5J.N.C.
2015	0158.A5J.N.F.
2016	0158.A5.N.C.
2017	0158.A5.N.F.
2018	0158.A5J.N.C.
2019	0158.A5J.N.F.
2024	0222.A4.N.C.
2025	0222.A4.N.F.
2026	0222.A4J.N.C.
2027	0222.A4J.N.F.
2027-EPR-TC-SEAT	0222.A4J.E.E.
2027V	0222.A4J.V.F.
2029	0158.A4.N.F.
2002	0158.A4J.N.C.
2003	0158.A4J.N.F.
2029	0222.A5.N.F.
2031	0222.A5J.N.F.

USA	Vulcan Seals
2032	0254.A4.N.F.
2033	0254.A4J.N.C.
2034	0254.A4J.N.F.
2035	0254.A5.N.C.
2036	0254.A5.N.F.
2045	0349.A4.N.C.
2046	0349.A4.N.F.
2047	0349.A4J.N.C.
2047V	0349.A4J.V.C.
2048	0349.A4J.N.F.
2049	0349.A5.N.C.
2049V-CMS	0349.A5.V.C.
2050	0349.A5.N.F.
2055	0412.A4.N.C.
2056	0412.A4.N.F.
2057	0412.A5.N.C.
2058	0412.A5.N.F.
2058V-TC-SEAT	0412.A5.V.E.
2059	0444.A4.N.C.
2060	0444.A4.N.F.
2060-TC-TC	0444.A4.N.H.
2061	0444.A4J.N.C.
2062	0444.A4J.N.F.
2069	0476.A5.N.C.
2070	0476.A5.N.F.
2071	0476.A5J.N.C.
2072	0476.A5J.N.F.
2073	0508.A4.N.C.
2074	0508.A4.N.F.
2075	0508.A4J.N.C.
2076	0508.A4J.N.F.
2077	0508.A5.N.C.
2078	0508.A5.N.F.
2079	0508.A5J.N.F.
2084	0539.A5.N.C.
2085	0539.A5.N.F.
2086	0539.A5J.N.F.
2087	0571.A4.N.C.
2088	0571.A4.N.F.
2089	0571.A4J.N.C.
2090	0571.A4J.N.F.
2091	0571.A5.N.C.
2092	0571.A5.N.F.
2093	0539.A4J.N.C.
2094	0571.A5J.N.F.
2094V	0571.A5J.V.F.
2095	0603.A4J.N.F.
2097	0603.A5J.N.C.
2097-CMS	0603.A5.N.C.
2098	0603.A5J.N.F.
2098V	0603.A5J.V.F.
2098-CMS	0603.A5.N.F.
2101	0635.A5J.N.F.
2101-CUP-SEAT	0635.A5.N.F.
2102	0539.A4J.N.F.
2104	0349.A5.N.C.SEAL
2105	0381.11.N.C.SEAL
2106	0381.A5.N.C.SEAL
2107	0412.11.N.C.SEAL
2108	0444.11.N.C.SEAL
2109-EPR	0444.A5.E.C.SEAL
2111	0508.11.N.C.SEAL
2111V	0508.11.V.C.SEAL
2112	0508.A5.N.C.SEAL
2112V	0508.A5.V.C.SEAL
2114	0476.11J.N.C.
2115	0762.11J.N.F.
2115-TC-SEAT	0762.11J.N.E.
2115-CUP-SEAT	0762.11.N.F.
2116	0762.11J.N.C.
2116-CUP-SEAT	0762.11.N.C.
2117	0381.A5.N.C.
2120	0635.11.N.C.
2133	0508.22.N.C.
2134	0349.22.N.C.
2135	0444.22.N.C.
2142	0444.22.N.C.
2150	0444.22J.N.C.
2151	0444.22J.N.F.
2151-TC-SEAT	0444.22J.N.E.
2151V	0444.22J.V.F.
2155	0269.11J.N.F.
2203	0317.11J.E.F.
2204	0158.65.V.E.
2205	0635.A5J.N.F.
2207	0444.11J.V.E.
2208	0317.11.N.H.
2209	0381.11.N.H.
2210	0444.11.N.E.
2214	0158.11D.E.C.
2216	0254.11.N.H.
2217	0381.11J.N.H.
2219	0508.11.N.H.
2221	0381.22J.E.F.
2223	0381.11J.V.E.
2226	0286.11J.E.E.
2229	0191.11.N.F.
2229V	0191.11.V.F.

USA	Vulcan Seals
2232	0381.11.N.F.
3507	W-0222.A5J.V.J.
3522	W-0508.A5J.N.F.
3530	0571.A5J.V.H.
3537	0571.22.N.C.
3543	W-0412.11.V.E.
3580	0508.11.E.E.
3616	0412.11.E.F.
3625	0254.A5.V.E.
3664	0412.11.N.H.
3674	0508.22.E.F.
3708	0508.A5.N.E.
3772	0412.A4J.V.J.
3773	0571.11.V.H.
3826	0762.A5J.N.C.
3865	0158.75.V.C.
3888	0635.A4J.V.J.
3900	0254.A4.N.F.
3912	0317.11.N.S.
3917	0222.11J.N.C.
3938	0317.A4.V.D.
3985	0191.75.N.C.
3986	0191.75.V.C.
4006	0603.A5.N.E.
4056	0191.75.E.C.
4058	0508.11.V.H.
4100	0381.11.V.C.
4172	0762.A5J.V.F.
4194	0349.A4.V.S.
4246	0317.A4J.N.D.
4263	0286.A5J.V.F.
4272	W-0158.11.N.C.
6002	0666.A4J.V.F.
6094	0476.A4J.V.D.
6155	0698.11J.V.F.
6202	0762.A4J.N.H.
6208	0317.11.N.H.
6210	0444.11.N.H.
6211	0444.11.V.H.
6212	0508.11.N.H.
6213	W-0508.11.V.H.
6216	0158.11.V.H.
6217	W-0444.A4.V.J.
6218	0508.11.V.H.
6219	0762.A4J.N.J.
6222	0381.11.N.S.
6223	0381.11.V.S.
6224	0508.11.V.S.
6232	0762.A4J.V.J.
6259	W-0317.1511.V.C.
6260	W-0317.1511.E.E.
6261	W-0317.1511.E.C.
6264	W-0317.1511.V.C.
6266	W-0317.1511J.N.D.
6315	0254.65.N.C.
6331	0254.A5J.N.F.
7035	0444.11J.E.E.
7305	0191.11.V.S.
7409	W-0381.11.V.C.
7436	0317.11J.E.F.
7520	0150.11.V.F.
7547	0158.11.V.S.
7562	0381.A5J.V.E.
7632	0381.11.E.E.
7736	0444.A5.E.E.
7782	0571.11.N.F.
7787	0412.A5J.E.E.
7792	0381.11.N.I.
7806	0412.11.V.S.
7869	0476.A5.E.E.
7875	0762.11.N.H.
7896	0222.A5J.V.E.
7902	0412.11.V.C
7909	0666.A4J.N.C.
7924	W-0444.A5J.V.D.
7929	0158.75.V.S.
7933	0381.A5.E.E.
7953	0381.11.E.C.
7959	0444.A4J.V.I.
7962	0476.A5J.N.F.
7970	0635.A5J.V.J.
7972	0317.1511.N.S.
7985	0635.A5J.E.E.
7993	0762.A5H.DOUB.N.WB.
8091	0254.1609SJ.V.D.
9313	0254.1609.P.C.SEAL + 0254.11.N.S.STAT
9334	0254.1609.P.C.SEAL + 0254.11.N.S.STAT
FA350	0603.5.N.C.SEAL
FA350E	0603.5.E.C.SEAL
FA350V	0603.5.V.C.SEAL
FA1875	0476.11.N.C.SEAL
FA1875V	0476.11.V.C.SEAL
FA2098	0603.5.N.C.SEAL
FA2120	0539.11.N.C.SEAL
FA3502	W-0539.5.N.C.SEAL
T9-1000	0254.1645.P.C.SEAL

For a more comprehensive and up to date listing; please see page 25/33 from Vulcan's American Mechanical Seal Brochure. All information contained in this table is supplied in good faith and was considered correct at the time of printing.

Vulcan Conical Spring ‘O’-Ring Mounted Type Seals

Section 3

Introduction

The Conical Spring 'O'-Ring Mounted Type Seals offered by Vulcan are extremely popular Seals. 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 Vulcan® Conical Spring Types

Type 8, 8DIN, 8DINS, 82 and 126

Inserted rotary faced, 'O'-Ring mounted, conical spring shaft Seals, to suit standard European or DIN fitting dimensions. The Type 82 is a stepped shaft balanced version of Type 8DIN. Type 126 is a Type 8DINS Seal and seat assembly modified to DIN24960 (EN12756) L1K working length that is also available with Monolithic Stainless Steel head, see below.

Type 8B and 126

'O'-Ring mounted, conical spring Seals Seal of similar design to the standard Type 8, but with a Monolithic Stainless Steel head and Carbon stationary. Type 126 is to full DIN24960 (EN12756) dimension compatibility, L1K working length.

Type 9

Conical spring, 'O'-Ring mounted Seal, with a Monolithic Seal head and Type 8.STD stationary

Type 12 and Type 12DIN

'O'-Ring mounted, conical spring Seals, available with a Monolithic stainless head as standard, or an inserted SiC / T.C. ring face. Suitable for standard or DIN housings.

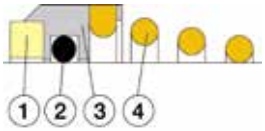
Type 13 and Type 13DIN

'O'-Ring mounted, conical spring Seals with pressed in, 'O'-Ring mounted, rotary face, enabling face material interchange ability, to suit common European or DIN dimensions.

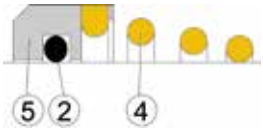
Type 7D

'O'-Ring mounted, conical spring Seal with pressed in, 'O'-Ring mounted, rotary face, with a machined head retainer. Supplied as standard with Type 7D stationary to suit DIN housings.

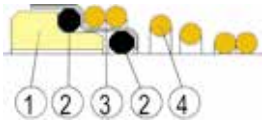
Standard Components



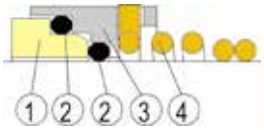
Types 8/8DIN And 126 (Inserted Face)



Types 8B, 9, 12/12DIN And 126 (Mono Face)



Types 13/13DIN



Type 7D

No	Description		
1	Face Ring	4	Coil
2	'O'-Ring	5	Monolithic Face
3	Retainer		

Vulcan® Design Advantages

Positive Drive

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

Standard springs are right hand wound for clockwise shafts. Please specify left hand coils for anti-clockwise shaft or left hand side of "back to back" combinations. The spring coil end is turned upwards to protect the shaft from scoring.

Materials

Suitable for a large variety of applications, through a wide choice of 'O'-Ring and face materials. Stock Guaranteed materials are shown on each Type page.

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.

'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.

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 Conical Spring 'O'-Ring Seals PV Chart

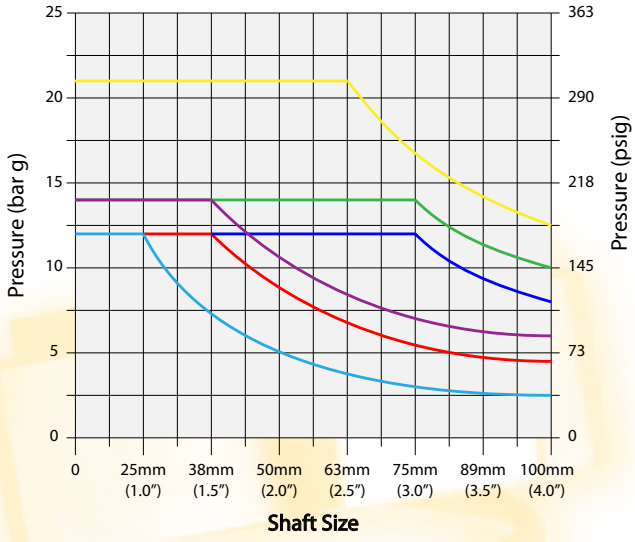
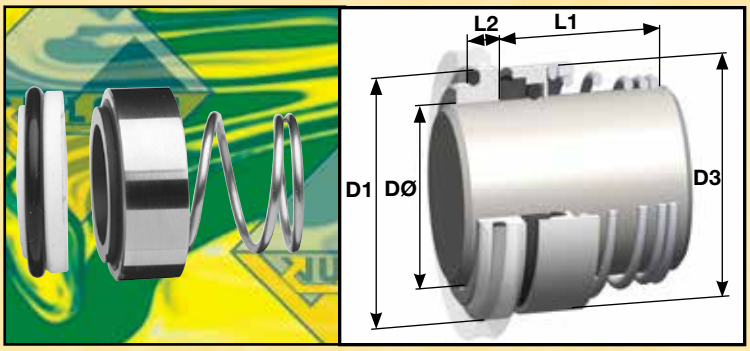


Chart based upon Material Combinations below	
82 - Carbon/SIC	7D,8,8DIN- Carbon/SIC
8B,12,12DIN - Carbon/SS	7D,8,8DIN- Carbon/Cer
9,9L,12,12DIN,13, 13DIN-Carbon/SIC	9,9L,12,12DIN,13, 13DIN-Carbon/Ceramic

Type 8



Conical spring, 'O'-Ring mounted, shaft directional dependent Seal with inserted Seal face. Very similar to the Type 8DINS, shown opposite, but with a stationary to suit common European non-din housings.

Suitable for a wide variety of general, or even medium and heavy duty applications, through a choice of Seal and seat face materials. Type 8 is supplied with a Type 8 STD stationary as standard or maybe ordered as a Seal only to fit a variety of Stationaries.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
10	0100	19.20	19.00	15.50	6.60
12	0120	21.60	21.00	15.50	5.60
14	0140	24.60	23.00	15.50	5.60
15	0150	24.60	24.00	15.50	6.60
16	0160	28.00	26.00	17.50	7.50
18	0180	30.00	29.00	18.50	8.00
19	0190	31.00	31.00	20.00	7.50
20	0200	35.00	31.00	20.00	7.50
22	0220	35.00	33.00	21.50	7.50
24	0240	38.00	35.00	23.00	7.50
25	0250	38.00	36.00	24.50	7.50
26	0260	40.00	37.00	24.50	8.00
28	0280	42.00	40.00	24.50	9.00
30	0300	45.00	43.00	24.50	10.50
32	0320	48.00	46.00	28.00	10.50
33	0330	50.00	46.00	28.00	11.00
35	0350	52.00	50.00	28.00	11.00
38	0380	55.00	53.00	31.00	10.30
40	0400	58.00	56.00	34.00	10.80
42	0420	62.00	59.00	35.00	12.00
43	0430	62.00	59.00	35.00	12.00
45	0450	64.00	61.00	36.50	11.60
48	0480	68.40	64.00	42.00	11.60
50	0500	69.30	66.00	43.00	11.60
55	0550	75.40	71.00	47.00	13.30
58	0580	78.40	76.00	50.00	13.30
60	0600	80.40	78.00	51.00	13.30
65	0650	85.40	84.00	52.00	13.00
70	0700	92.00	90.00	54.00	13.00
75	0750	99.00	98.00	55.00	14.00
80	0800	104.00	100.00	58.00	15.00

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.

However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.

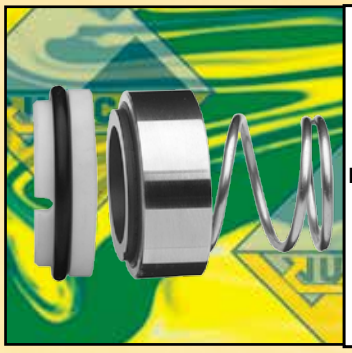
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	T	VES2 RB SiC	S	M106K Carbon*	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

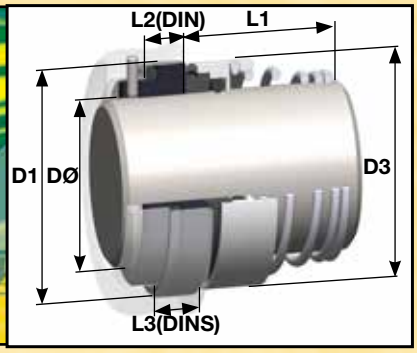
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 8DIN / 8DINS





Conical spring, 'O'-Ring mounted, shaft directional dependent Seal with inserted Seal face and stationary to suit DIN housings. Type 8DIN has a 8DIN LONG stationary with anti-rotation provision,Type 8DINS has an 8 DIN SHORT stationary.

A widely specified Seal type, highly suitable for general and even heavy duty applications, through a combination of a proficient design with a choice of face materials.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	8 DIN Seat L2 (mm)	8 DINS Seat L3 (mm)	8 DIN Slot Width (mm)	8 DIN Slot Depth (mm)
10	0100	21.00	19.00	15.50	10.00	6.60	4.00	5.00
12	0120	23.00	21.00	16.00	10.00	6.60	4.00	5.00
14	0140	25.00	23.00	16.50	10.00	6.60	4.00	5.00
16	0160	27.00	26.00	18.00	10.00	6.60	4.00	5.00
18	0180	33.00	29.00	19.50	11.50	7.50	4.00	5.50
20	0200	35.00	31.00	22.00	11.50	7.50	4.00	5.50
22	0220	37.00	33.00	21.50	11.50	7.50	4.00	5.50
24	0240	39.00	35.00	23.50	11.50	7.50	4.00	5.50
25	0250	40.00	36.00	26.50	11.50	7.50	4.00	5.50
28	0280	43.00	40.00	26.50	11.50	7.50	4.00	5.50
30	0300	45.00	43.00	26.50	11.50	7.50	4.00	5.50
32	0320	48.00	46.00	28.50	11.50	7.50	4.00	5.50
33	0330	48.00	46.00	28.50	11.50	7.50	4.00	5.50
35	0350	50.00	50.00	28.50	11.50	7.50	4.00	5.50
38	0380	56.00	53.00	33.50	14.00	9.00	5.00	5.50
40	0400	58.00	56.00	36.00	14.00	9.00	5.00	5.50
43	0430	61.00	59.00	38.50	14.00	9.00	5.00	5.50
45	0450	63.00	61.00	39.50	14.00	9.00	5.00	5.50
48	0480	66.00	64.00	46.00	14.00	9.00	5.00	5.50
50	0500	70.00	66.00	45.00	15.00	9.50	5.00	5.50
53	0530	73.00	69.00	47.00	15.00	11.00	5.00	5.50
55	0550	75.00	71.00	49.00	15.00	11.00	5.00	5.50
58	0580	78.00	76.00	55.00	15.00	11.00	5.00	5.50
60	0600	80.00	78.00	55.00	15.00	11.00	5.00	5.50
63	0630	83.00	81.00	55.00	15.00	11.00	5.00	5.50
65	0650	85.00	84.00	55.00	15.00	11.00	5.00	5.50
68	0680	90.00	88.00	55.00	18.00	11.30	5.00	5.50
70	0700	92.00	90.00	57.00	18.00	11.30	5.00	5.50
75	0750	97.00	98.00	62.00	18.00	11.30	5.00	5.50
80	0800	105.00	100.00	61.80	18.20	12.00	5.00	5.50
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.								
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.								

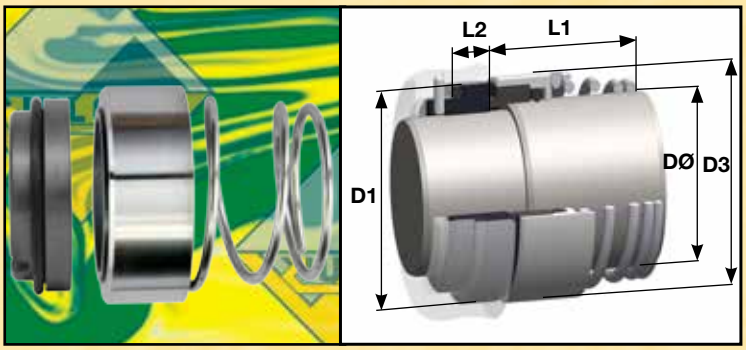
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	T	VES2 RB SiC	S	M106K Carbon*	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 82



Conical spring, 'O'-Ring mounted, stepped-shaft, balanced, shaft directional dependent Seal. Supplied as standard with Type 8 DIN LONG stationary with anti-rotation provision. The standard seat size for each Seal size is shown in the table below.

This balanced Seal arrangement is suitable for a wide variety of general and heavy duty applications, where the shaft sealing area has been designed to accommodate a stepped shaft Seal.

Vulcan Standard Sizes

Metric Shaft Size DØ	Seal Size Code	Seat Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Slot Width (mm)	Slot Depth (mm)
16	0160	0120	23.00	26.00	26.50	10.00	4.00	5.00
18	0180	0140	25.00	29.00	29.50	10.00	4.00	5.00
20	0200	0160	27.00	31.00	31.00	10.00	4.00	5.00
22	0220	0180	33.00	33.00	32.50	11.50	4.00	5.50
24*	0240	0200	35.00	35.00	32.50	11.50	4.00	5.50
28	0280	0240	39.00	40.00	32.50	11.50	4.00	5.50
30	0300	0250	40.00	43.00	33.50	11.50	4.00	5.50
33	0330	0280	43.00	46.00	35.50	11.50	4.00	5.50
35	0350	0300	45.00	49.00	35.50	11.50	4.00	5.50
38	0380	0330	48.00	53.00	39.50	11.50	5.00	5.50
40	0400	0350	50.00	56.00	43.50	11.50	5.00	5.50
43	0430	0380	56.00	59.00	46.00	14.00	5.00	5.50
45	0450	0400	58.00	61.00	48.00	14.00	5.00	5.50
50	0500	0450	63.00	66.00	55.00	14.00	5.00	5.50
53	0530	0480	66.00	69.00	55.00	14.00	5.00	5.50
55	0550	0500	70.00	71.00	58.00	15.00	5.00	5.50
60	0600	0550	75.00	78.00	60.00	15.00	5.00	5.50
63	0630	0580	78.00	81.00	60.00	15.00	5.00	5.50
65	0650	0600	80.00	84.00	60.00	15.00	5.00	5.50
70*	0700	0650	85.00	90.00	61.00	15.00	5.00	5.50
75*	0750	0700	92.00	98.00	63.00	18.00	5.00	5.50
80*	0800	0750	97.00	100.00	68.00	18.00	5.00	5.50
85*	0850	0800	105.00	107.50	68.00	18.00	5.00	5.50
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.								
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.								

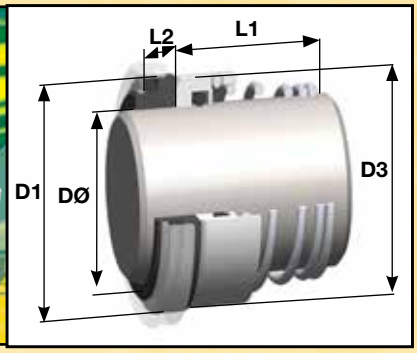
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 8B



Conical spring, 'O'-Ring mounted, shaft directional dependent Seal and stationary of similar design to the Type 8, but with a solid stainless steel head and 'O'-Ring mounted carbon stationary. Type 8B Seal is supplied with a Type 8B seat as standard.

A highly proficient, economical Seal for general duties. For more demanding duties, you may specify a Type 8 Seal, with a choice of inserted faces.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
10	0100	19.20	19.00	15.50	7.10
12	0120	21.60	21.00	15.50	7.60
14	0140	24.60	23.00	15.50	7.60
15	0150	24.60	24.00	15.50	8.60
16	0160	28.00	26.00	17.50	9.00
18	0180	30.00	29.00	18.50	10.00
19	0190	31.00	31.00	20.00	9.00
20	0200	35.00	31.00	20.00	9.50
22	0220	35.00	33.00	21.50	9.50
24	0240	38.00	35.00	23.00	9.50
25	0250	38.00	36.00	24.50	9.50
26	0260	40.00	37.00	24.50	10.00
28	0280	42.00	40.00	24.50	11.00
30	0300	45.00	43.00	24.50	11.00
32	0320	48.00	46.00	28.00	11.00
35	0350	52.00	49.00	28.00	11.50
38	0380	55.00	53.00	31.00	11.50
40	0400	58.00	56.00	34.00	11.50
42	0420	62.00	59.00	35.00	14.30
43	0430	62.00	59.00	35.00	14.30
45	0450	64.00	61.00	36.50	14.30
48	0480	68.40	64.00	42.00	14.30
50	0500	69.30	66.00	43.00	14.30
55	0550	75.40	72.00	47.00	15.30
60	0600	80.40	78.00	51.00	15.30
65	0650	85.40	84.00	52.00	15.30
68	0680	91.50	88.00	53.00	16.00
70	0700	92.00	90.00	54.00	15.30
75	0750	99.00	98.00	55.00	15.30
80	0800	104.00	100.00	58.00	16.30
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.					
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.					

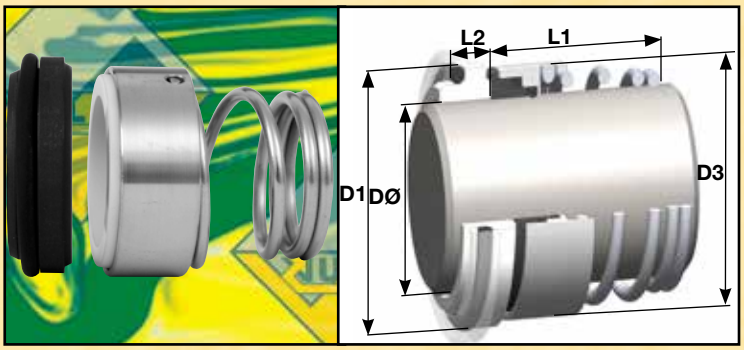
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	P	304 Stainless Steel	P	M106K Carbon	P
Soft vs Hard	PS	304 Stainless Steel	P	VES2 RB SiC*	S
Hard vs Soft	X	Non-standard: Please use alternative shown here or enquire			
Hard	S	VES2 RB SiC*	S	VES2 RB SiC*	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 7D



Resilient, conical spring, 'O'-Ring mounted, shaft directional dependent Seal with a stationary to suit DIN housings.

The 'O'-Ring mounted Seal face offers enhanced versatility and performance.

Type 7D is supplied with a Type 7D stationary as shown, as standard.

Also available as Type 7, from stock in common sizes, with increased "L1" working length and Type 12 stationary. Details and data-sheet are available upon request.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
12	0120	23.00	21.00	18.00	7.00
14	0140	25.00	23.00	22.00	7.00
16	0160	27.00	26.00	23.00	7.00
18	0180	33.00	29.00	24.00	10.00
20	0200	35.00	31.00	25.00	10.00
22	0220	37.00	33.00	25.00	10.00
24	0240	39.00	35.00	27.00	10.00
25	0250	40.00	36.00	27.00	10.00
28	0280	43.00	40.00	29.00	10.00
30	0300	45.00	43.00	30.00	10.00
32	0320	48.00	46.00	30.00	10.00
33	0330	48.00	46.00	39.00	10.00
35	0350	50.00	49.00	39.00	10.00
38	0380	56.00	53.00	42.00	13.00
40	0400	58.00	56.00	42.00	13.00
43	0430	61.00	59.00	47.00	13.00
45	0450	63.00	61.00	47.00	13.00
50	0500	70.00	66.00	46.00	14.00
55	0550	75.00	71.00	56.00	14.00
58*	0580	78.00	76.00	56.00	14.00
60*	0600	80.00	78.00	56.00	14.00
63*	0630	83.00	81.00	56.00	14.00
65*	0650	85.00	84.00	66.00	14.00
68*	0680	90.00	88.00	64.00	16.00
70*	0700	92.00	89.60	64.00	16.00
75*	0750	97.00	98.00	64.00	16.00
80*	0800	105.00	100.00	72.00	18.00
85*	0850	110.00	107.50	72.00	18.00
90*	0900	115.00	111.00	72.00	18.00
95*	0950	120.00	119.00	72.00	18.00
100*	1000	125.00	123.80	72.00	18.00

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*. However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.

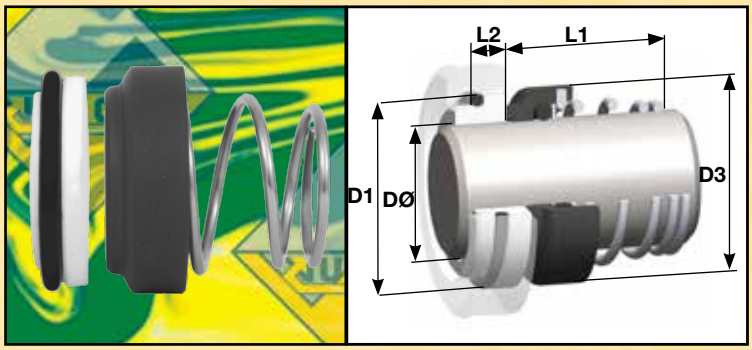
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	B	99% Ceramic	B	M106K Carbon	P
Soft vs Hard	X	Non-standard: Please use alternative shown here or enquire			
Hard vs Soft	T	VES2 RB SiC	S	M106K Carbon	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 9



Conical spring, 'O'-Ring mounted, shaft directional dependent Seal, with a monolithic rotary head. Supplied as standard with Type 8 STD stationary to suit European non-din housing sizes.

Simple but effective, economical design makes this Seal suitable for a wide variety of lighter and general duty applications. The monolithic Seal head provides enhanced heat dissipation away from the Seal faces.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
10	0100	19.20	20.00	15.90	6.60
12	0120	21.60	22.00	16.00	5.60
14	0140	24.60	25.00	16.00	5.60
15	0150	24.60	27.00	17.40	6.60
16	0160	28.00	27.00	19.00	7.50
18	0180	30.00	30.00	20.50	8.00
20	0200	35.00	32.00	22.00	7.50
22	0220	35.00	35.00	23.50	7.50
24	0240	38.00	38.00	25.00	7.50
25	0250	38.00	40.00	26.50	7.50
28	0280	42.00	43.00	26.50	9.00
30	0300	45.00	45.00	25.00	10.50
32	0320	48.00	47.00	28.50	10.50
35	0350	52.00	50.00	28.50	11.00
38	0380	55.00	56.00	32.00	10.30

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.

However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.

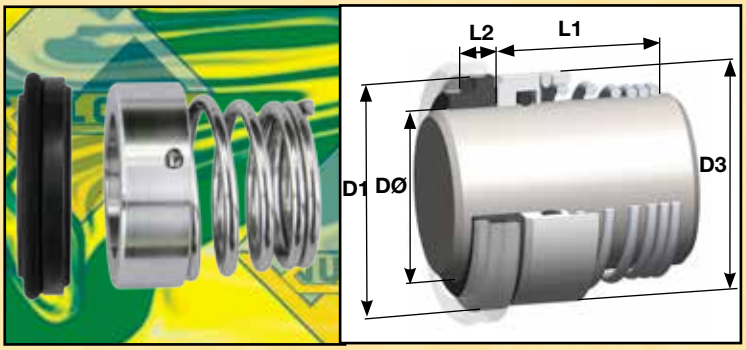
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	X	Non-standard: Please use alternative shown here or enquire			
Hard	S	VES2 RB SiC*	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 12



A range of highly proficient, widely utilised, 'O'-Ring mounted, shaft directional dependent, conical spring Seals, supplied routinely with a solid stainless steel head and a carbon Type 12 stationary, to suit non-din, originally Italian, housing dimensions.

Efficient, popular designs for a wide choice of general duties or available with inserted Carbide ring faces for more demanding applications. For image and diagram, please see Type 12DIN on facing page.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
10	0100	18.10	19.00	15.00	5.50
12	0120	20.60	21.00	18.00	5.50
13	0130	23.10	23.00	22.00	6.00
14	0140	23.10	23.00	22.00	6.00
15	0150	26.90	24.00	22.00	7.00
16	0160	26.90	26.00	23.00	7.00
17	0170	26.90	26.00	23.00	7.00
18	0180	30.90	29.00	24.00	8.00
19	0190	30.90	31.00	25.00	8.00
20	0200	30.90	31.00	25.00	8.00
22	0220	35.40	33.00	25.00	8.00
24	0240	35.40	35.00	27.00	8.00
25	0250	38.20	36.00	27.00	8.50
26	0260	38.20	36.00	27.00	8.50
28	0280	43.30	40.00	29.00	9.00
30	0300	43.30	43.00	30.00	9.00
32	0320	43.30	46.00	30.00	9.00
33	0330	53.50	46.00	39.00	11.50
34	0340	53.50	49.00	39.00	11.50
35	0350	53.50	49.00	39.00	11.50
38	0380	60.50	53.00	39.00	11.50
39	0390	60.50	56.00	39.00	11.50
40	0400	60.50	56.00	39.00	11.50
42	0420	60.50	59.00	39.00	11.50
43	0430	60.50	59.00	39.00	11.50
44	0440	65.50	61.00	41.00	11.50
45	0450	65.50	61.00	41.00	11.50
48	0480	65.50	64.00	41.00	11.50
50	0500	72.50	66.00	45.00	11.50
55	0550	72.50	71.00	47.00	11.50
60	0600	79.30	78.00	49.00	11.50
65	0650	84.50	84.00	51.00	11.50
70	0700	89.50	89.60	51.00	11.50
75	0750	94.50	98.00	57.00	11.50
80	0800	99.50	100.00	59.00	11.50
85	0850	105.50	107.50	59.00	13.50
90	0900	111.50	111.00	62.00	13.50
95	0950	116.50	119.00	62.00	13.50
100	1000	119.50	123.80	75.00	13.50

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*. However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.

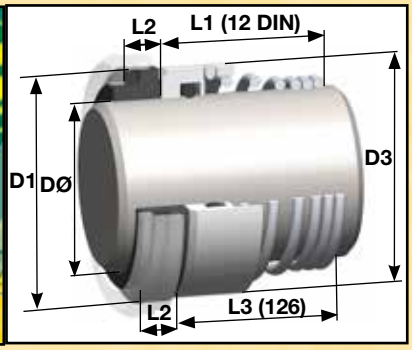
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	P	304 Stainless Steel	P	M106K Carbon	P
Soft vs Hard	PS	304 Stainless Steel	P	VES2 RB SiC	S
Hard vs Soft	T	VES2 RB SiC	S	M106K Carbon	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 12DIN / 126



A range of highly proficient, 'O'-Ring mounted, shaft directional dependent, conical spring Seals. Available as Type 12DIN with Stationaries to suit DIN housings, or as Type 126 to full DIN24960 (EN12756) L1K dimensions.

Both Types have monolithic stainless steel heads and Type 12DIN carbon Stationaries as standard, with inserted carbide heads and monolithic Stationaries available for more demanding applications.

Vulcan Standard Sizes

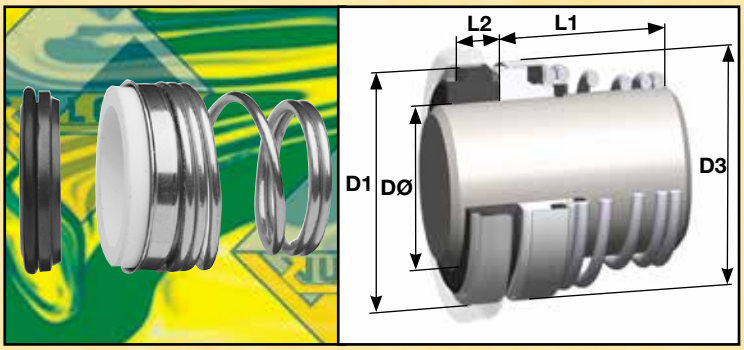
Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	Type 12DIN L1 (mm)	Type 126 L3 (mm)	L2 (mm)
10*	0100	21.00	19.00	15.00	25.50	7.00
12	0120	23.00	21.00	18.00	25.50	7.00
14	0140	25.00	23.00	22.00	28.00	7.00
16	0160	27.00	26.00	23.00	28.00	7.00
18	0180	33.00	29.00	24.00	27.50	10.00
20	0200	35.00	31.00	25.00	27.50	10.00
22	0220	37.00	33.00	25.00	27.50	10.00
24	0240	39.00	35.00	27.00	30.00	10.00
25	0250	40.00	36.00	27.00	30.00	10.00
28	0280	43.00	40.00	29.00	32.50	10.00
30	0300	45.00	43.00	30.00	32.50	10.00
32	0320	48.00	46.00	30.00	32.50	10.00
33	0330	48.00	46.00	39.00	32.50	10.00
35	0350	50.00	49.00	39.00	32.50	10.00
38	0380	56.00	53.00	42.00	32.00	13.00
40	0400	58.00	56.00	42.00	32.00	13.00
43	0430	61.00	59.00	47.00	32.00	13.00
45	0450	63.00	61.00	47.00	32.00	13.00
48	0480	66.00	64.00	47.00	32.00	13.00
50	0500	70.00	66.00	46.00	33.50	14.00
53	0530	73.00	69.00	56.00	33.50	14.00
55	0550	75.00	71.00	56.00	33.50	14.00
58	0580	78.00	76.00	56.00	38.50	14.00
60	0600	80.00	78.00	56.00	38.50	14.00
63	0630	83.00	81.00	56.00	N/A	14.00
65	0650	85.00	84.00	66.00	38.50	14.00
68	0680	90.00	88.00	64.00	N/A	16.00
70	0700	92.00	89.60	64.00	44.00	16.00
75	0750	97.00	98.00	64.00	44.00	16.00
80	0800	105.00	100.00	72.00	42.00	18.00
85	0850	110.00	107.50	72.00	42.00	18.00
90	0900	115.00	111.00	72.00	47.00	18.00
95	0950	120.00	119.00	72.00	47.00	18.00
100	1000	125.00	123.80	72.00	47.00	18.00

Please note: Type 12DIN is guaranteed ex-stock in every right hand shaft size shown to 100mm and in all guaranteed materials. Type 126 is guaranteed ex-stock in all right hand sizes and materials shown, unless the size is asterisked*. However, most Asterisked 126 sizes are stocked in some, but not all, materials. And the asterisked T.C. Material in many sizes.

Type 12DIN Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	P	304 Stainless Steel	P	M106K Carbon	P
Soft vs Hard	PS	304 Stainless Steel	P	VES2 RB SiC	S
Hard vs Soft	T	VES2 RB SiC	S	M106K Carbon	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Type 126 Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	P	316 Stainless Steel	P	M106K Carbon	P
Soft vs Hard	PS	316 Stainless Steel	P	VES2 RB SiC	S
Hard vs Soft	T	VES2 RB SiC	S	M106K Carbon	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 316SS	

Type 13



'O'-Ring mounted, conical spring, shaft directional dependent Seal, with pressed stainless steel head retainer and 'O'-Ring mounted Seal and stationary faces.

Seal and stationary faces can be readily changed and replaced. Supplied with a Type 13 stationary to suit non-din common, originally Italian housing dimensions.

Simple but effective, economical design makes this Seal suitable for a wide variety of lighter and general duty applications.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
10	0100	18.10	19.50	15.00	5.50
11	0110	20.60	22.00	18.00	5.50
12	0120	20.60	22.00	18.00	5.50
13	0130	23.10	24.00	22.00	6.00
14	0140	23.10	24.00	22.00	6.00
15	0150	26.90	26.00	22.00	7.00
16	0160	26.90	26.00	23.00	7.00
17	0170	26.90	26.00	23.00	7.00
18	0180	30.90	32.00	24.00	8.00
19	0190	30.90	32.70	25.00	8.00
20	0200	30.90	32.70	25.00	8.00
21	0210	35.40	36.00	25.00	8.00
22	0220	35.40	36.00	25.00	8.00
23	0230	35.40	36.00	27.00	8.00
24	0240	35.40	37.40	27.00	8.00
25	0250	38.20	38.00	27.00	8.50
28	0280	43.30	42.00	29.00	9.00
30	0300	43.30	44.00	30.00	9.00
32	0320	43.30	45.50	30.00	9.00
33	0330	53.50	46.50	39.00	11.50
35	0350	53.50	49.00	39.00	11.50
38	0380	60.50	56.00	39.00	11.50
40	0400	60.50	58.00	39.00	11.50
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.					
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.					

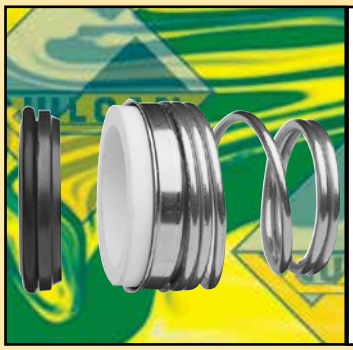
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	B	99% Ceramic	B	M106K Carbon	P
Soft vs Hard	X	Non-standard: Please use alternative shown here or enquire			
Hard vs Soft	T	VES2 RB SiC	S	M106K Carbon	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile		Guaranteed Stock Metallurgy: 304SS			

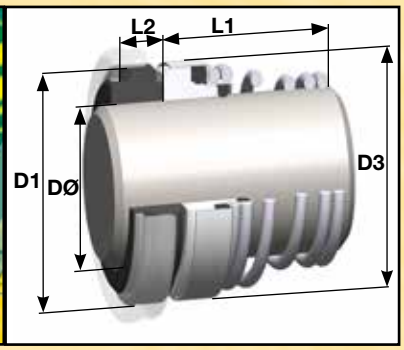
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 13DIN





'O'-Ring mounted, conical spring, shaft directional dependent Seal, with pressed stainless steel head retainer and 'O'-Ring mounted Seal and stationary faces.

Seal and seat faces can be readily changed and replaced. Supplied with Type 13DIN stationary as standard, to suit DIN housing dimensions.

Simple but effective, economical design makes this Seal suitable for a wide variety of lighter and general duty applications.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
10	0100	21.00	19.50	15.00	7.00
12	0120	23.00	22.00	18.00	7.00
14	0140	25.00	24.00	22.00	7.00
16	0160	27.00	26.00	23.00	7.00
18	0180	33.00	32.00	24.00	10.00
20	0200	35.00	32.70	25.00	10.00
22	0220	37.00	36.00	25.00	10.00
24	0240	39.00	37.40	27.00	10.00
25	0250	40.00	38.00	27.00	10.00
28	0280	43.00	42.00	29.00	10.00
30	0300	45.00	44.00	30.00	10.00
32	0320	48.00	45.50	30.00	10.00
33	0330	48.00	46.50	39.00	10.00
35	0350	50.00	49.00	39.00	10.00
38	0380	56.00	56.00	42.00	13.00
40	0400	58.00	58.00	42.00	13.00
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.					
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.					

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	B	99% Ceramic	B	M106K Carbon	P
Soft vs Hard	X	Non-standard: Please use alternative shown here or enquire			
Hard vs Soft	T	VES2 RB SiC	S	M106K Carbon	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile		Guaranteed Stock Metallurgy: 304SS			

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Vulcan Elastomeric Bellows Type Seals

Section 4

Introduction

Vulcan offer an extensive range of technically efficient and highly versatile, elastomeric bellows Seals, suitable for practically 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. Suitable for Pumps, mixers, agitators, compressors and other rotary shaft equipment.

Standard Vulcan® Bellows Types

Type 14DIN Series

Universal compact DIN Seals to suit three standard DIN working lengths.

Type 19 Series

Robust bellows Seal with non-din cross-section, available in three standard DIN working lengths and with Stationaries to suit all common European housing sizes.

Types 1511/1511J

Compact DIN profile, ANSI-compliant, bellows Seals to suit the most common, American standard working lengths, with a choice of Boot or 'O'-Ring Stationaries to suit American housing sizes.

Type 1520

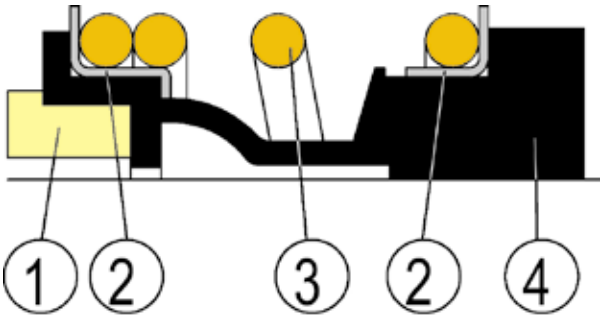
DIN profiled bellows Seal to suit common European working length and housing sizes. Seal has same working length and seat as the Vulcan Type 20 and Type A2 Seals.

Type 1724 Series

Metal encased, rubber bellows Seals to full DIN24960 (EN12756) L1K compatibility. The Vulcan Seal face is retained to avoid damage during Seal installation, a common problem with competitor Seal designs.

Standard Components.

(All Types except Type 1724)



No	Description	No	Description
1	Face	3	Coil
2	Retaining Plates	4	Bellows

STICTION

The use of two identical Silicon Carbide face materials in certain applications can result in the faces ringing together. Such action is rare, but such face Stiction can potentially be a problem, where the rotary faces are not positively driven, which applies to all styles in this section except for Type 1724. As a most effective way to prevent two SIC faces ringing together, Vulcan recommend a Sintered Silicon Carbide (matt lapped) rotary supplied with a Reaction Bonded Silicon Carbide (shiny lapped) stationary, providing both a differential material along with differential lapping.

Vulcan® Design Advantages

Range

Comprehensive range of Bellows Seals, with more working lengths and seat choices and our compact DIN profile designs, than any other Mechanical Seal manufacturer.

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. 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.

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 OEM'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. Vulcan's thorough Quality Control Systems ensure correct and reliable supply.

Vulcan Bellows Type Seals PV Chart

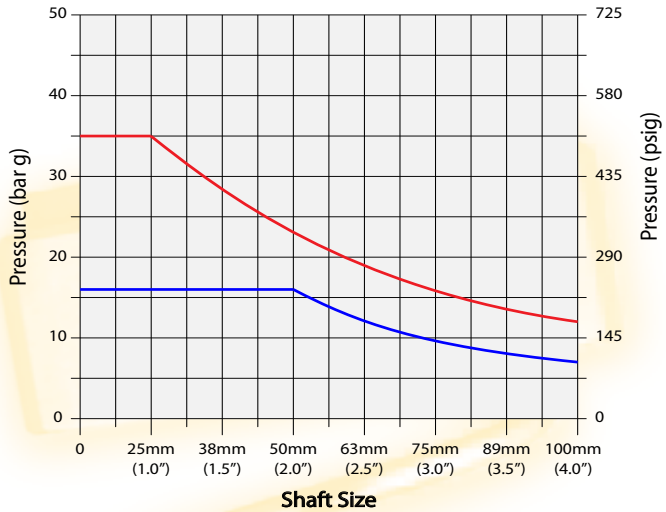
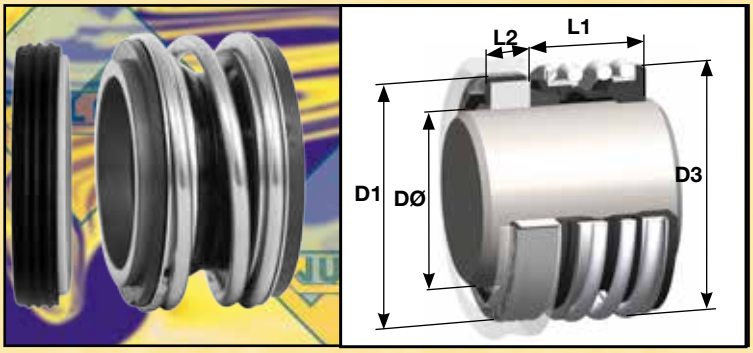


Chart based upon: Carbon vs reaction bonded silicon carbide Seal faces

1724 — 14DIN /15 / 19 series

Types 14DIN / 142DIN



Universal compact DIN Seal and stationary with a choice of DIN working lengths. The robust, heavy duty bellows design provides excellent flexibility and durability.

Type 14DIN series is supplied as standard with Type 19B Boot-mounted Stationaries, to give full DIN24960 (EN12756) dimension compatibility. For the most commonly specified 'O'-Ring mounted stationary alternative, please see the Type 14DINS series opposite.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	Type 14DIN L1 (mm)	Type 142DIN L1 (mm)	L2 (mm)	14DIN Seal + STAT (mm)	142DIN Seal + STAT L1K (mm)
10	0100	21.00	20.00	13.40	25.90	6.60	20.00	32.50
12	0120	23.00	22.00	14.40	25.90	6.60	21.00	32.50
14	0140	25.00	24.00	14.40	28.40	6.60	21.00	35.00
15	0150	27.00	25.00	14.40	28.40	6.60	21.00	35.00
16	0160	27.00	26.00	14.40	28.40	6.60	21.00	35.00
18	0180	33.00	32.00	18.50	30.00	7.50	26.00	37.50
20	0200	35.00	34.00	18.50	30.00	7.50	26.00	37.50
22	0220	37.00	36.00	18.50	30.00	7.50	26.00	37.50
24	0240	39.00	38.00	18.50	32.50	7.50	26.00	40.00
25	0250	40.00	39.00	18.50	32.50	7.50	26.00	40.00
28	0280	43.00	42.00	24.50	35.00	7.50	32.00	42.50
30	0300	45.00	44.00	25.50	35.00	7.50	33.00	42.50
32	0320	48.00	46.00	25.50	35.00	7.50	33.00	42.50
33	0330	48.00	47.00	25.50	35.00	7.50	33.00	42.50
35	0350	50.00	49.00	26.50	35.00	7.50	34.00	42.50
38	0380	56.00	54.00	29.00	36.00	9.00	38.00	45.00
40	0400	58.00	56.00	29.00	36.00	9.00	38.00	45.00
43	0430	61.00	59.00	29.00	36.00	9.00	38.00	45.00
45	0450	63.00	61.00	29.00	36.00	9.00	38.00	45.00
48	0480	66.00	64.00	31.00	36.00	9.00	40.00	45.00
50	0500	70.00	66.00	30.50	38.00	9.50	40.00	47.50
53	0530	73.00	69.00	29.00	36.50	11.00	40.00	47.50
55	0550	75.00	71.00	29.00	36.50	11.00	40.00	47.50
58*	0580	78.00	78.00	32.00	41.50	11.00	43.00	52.50
60	0600	80.00	80.00	34.00	41.50	11.00	45.00	52.50
65	0650	85.00	85.00	34.00	41.50	11.00	45.00	52.50
70*	0700	92.00	90.00	33.70	48.70	11.30	45.00	60.00
75*	0750	97.00	99.00	40.70	48.70	11.30	52.00	60.00
80*	0800	105.00	104.00	40.50	48.00	12.00	52.50	60.00
85*	0850	110.00	109.00	38.50	46.00	14.00	52.50	60.00
90*	0900	115.00	114.00	38.50	51.00	14.00	52.50	65.00
95*	0950	120.00	119.00	38.50	51.00	14.00	52.50	65.00
100*	1000	125.00	124.00	38.50	51.00	14.00	52.50	65.00

Please note: Type 142DIN is guaranteed ex-stock in every size to 100mm and material shown, except Tungsten Carbide.
Type 14DIN is guaranteed ex-stock in every size and material shown, unless the size and / or material is asterisked*.
Most asterisked sizes of Type 142 DIN are stocked in some, but not all, materials. As are the asterisked materials in many sizes.

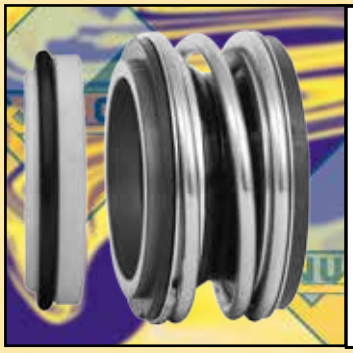
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	X	Non-standard: Please use alternative shown here or enquire			
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

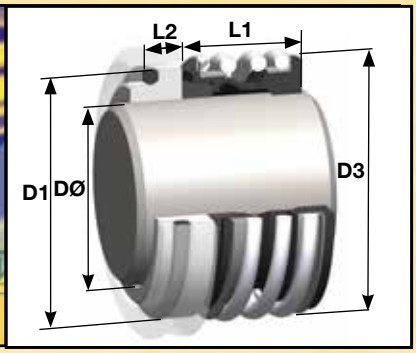
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 14DINS / 142DINS





Universal compact DIN Seal and stationary with a choice of DIN working lengths. The robust, heavy duty bellows design provides excellent flexibility and durability.

Type 14DINS series is supplied as standard with Type 8 DIN SHORT 'O'-Ring-mounted Stationaries, to give full DIN24960 (EN12756) dimension compatibility. For the most commonly specified Boot-mounted stationary alternative, please see the Type 14DIN series opposite.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	Type 14DINS L1 (mm)	Type 142DINS L1 (mm)	L2 (mm)	14DINS Seal + STAT (mm)	142DINS Seal + Seat L1K (mm)
10	0100	21.00	20.00	13.40	25.90	6.60	20.00	32.50
12	0120	23.00	22.00	14.40	25.90	6.60	21.00	32.50
14	0140	25.00	24.00	14.40	28.40	6.60	21.00	35.00
15	0150	27.00	25.00	14.40	28.40	6.60	21.00	35.00
16	0160	27.00	26.00	14.40	28.40	6.60	21.00	35.00
18	0180	33.00	32.00	18.50	30.00	7.50	26.00	37.50
20	0200	35.00	34.00	18.50	30.00	7.50	26.00	37.50
22	0220	37.00	36.00	18.50	30.00	7.50	26.00	37.50
24	0240	39.00	38.00	18.50	32.50	7.50	26.00	40.00
25	0250	40.00	39.00	18.50	32.50	7.50	26.00	40.00
28	0280	43.00	42.00	24.50	35.00	7.50	32.00	42.50
30	0300	45.00	44.00	25.50	35.00	7.50	32.00	42.50
32	0320	48.00	46.00	25.50	35.00	7.50	32.00	42.50
33	0330	48.00	47.00	25.50	35.00	7.50	32.00	42.50
35	0350	50.00	49.00	26.50	35.00	7.50	34.00	42.50
38	0380	56.00	54.00	29.00	36.00	9.00	38.00	45.00
40	0400	58.00	56.00	29.00	36.00	9.00	38.00	45.00
43	0430	61.00	59.00	29.00	36.00	9.00	38.00	45.00
45	0450	63.00	61.00	29.00	36.00	9.00	38.00	45.00
48	0480	66.00	64.00	31.00	36.00	9.00	40.00	45.00
50	0500	70.00	66.00	30.50	38.00	9.50	40.00	47.50
53	0530	73.00	69.00	29.00	36.50	11.00	40.00	47.50
55	0550	75.00	71.00	29.00	36.50	11.00	40.00	47.50
58*	0580	78.00	78.00	32.00	41.50	11.00	43.00	52.50
60	0600	80.00	80.00	34.00	41.50	11.00	45.00	52.50
65	0650	85.00	85.00	34.00	41.50	11.00	45.00	52.50
70*	0700	92.00	90.00	33.70	48.70	11.30	45.00	60.00
75*	0750	97.00	99.00	40.70	48.70	11.30	52.00	60.00
80*	0800	105.00	104.00	40.50	48.00	12.00	52.50	60.00
85*	0850	110.00	109.00	38.50	46.00	14.00	52.50	60.00
90*	0900	115.00	114.00	38.50	51.00	14.00	52.50	65.00
95*	0950	120.00	119.00	38.50	51.00	14.00	52.50	65.00
100*	1000	125.00	124.00	38.50	51.00	14.00	52.50	65.00

Please note: Type 142DINS is guaranteed ex-stock in every size to 100mm and material shown, except Tungsten Carbide.
Type 14DINS is guaranteed ex-stock in every size and material shown, unless the size and / or material is asterisked*.

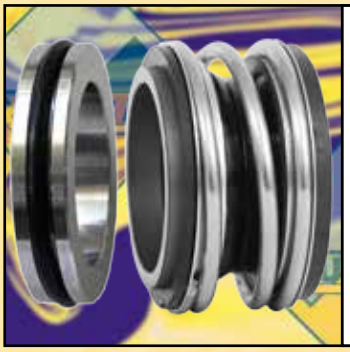
Suggested Operating Limits

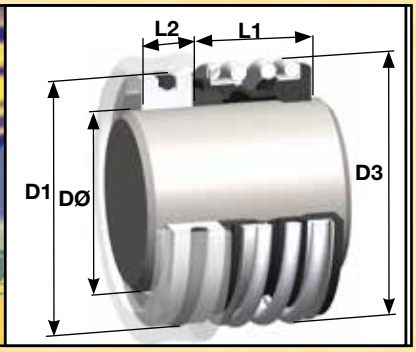
Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	X	Non-standard: Please use alternative shown here or enquire			
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 1511 / 1511J





Rubber bellows Seal with narrow DIN profile of Type 14DIN series, that is also compliant to American ANSI Seal chamber dimensions. The robust, heavy duty bellows design provides excellent flexibility and durability.

Available as standard with a Boot-mounted Type 11 stationary, or as Type 1511 J with an 'O'-Ring mounted stationary, commonly preferred in the North American market. Both Types have the same installation dimensions.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1		D3		L1		L2	
			In	mm	In	mm	In	mm	In	mm
	12	0120	1.000	25.40	0.866	22.00	0.812	20.62	0.312	7.93
0.500		0127	1.000	25.40	0.866	22.00	0.812	20.62	0.312	7.93
0.625		0158	1.250	31.75	1.024	26.00	0.875	22.23	0.405	10.28
	16	0160	1.250	31.75	1.024	26.00	0.875	22.23	0.405	10.28
	18	0180	1.375	34.93	1.260	32.00	0.875	22.23	0.405	10.28
0.750		0191	1.375	34.93	1.260	32.00	0.875	22.23	0.405	10.28
	20	0200	1.500	38.10	1.339	34.00	0.937	23.80	0.405	10.28
	22	0220	1.500	38.10	1.417	36.00	0.937	23.80	0.405	10.28
0.875		0222	1.500	38.10	1.417	36.00	0.937	23.80	0.405	10.28
	24	0240	1.625	41.28	1.496	38.00	1.000	25.40	0.437	11.10
	25	0250	1.625	41.28	1.535	39.00	1.000	25.40	0.437	11.10
1.000		0254	1.625	41.28	1.535	39.00	1.000	25.40	0.437	11.10
	28	0280	1.750	44.44	1.654	42.00	1.062	26.97	0.437	11.10
1.125		0286	1.750	44.44	1.654	42.00	1.062	26.97	0.437	11.10
	30	0300	1.875	47.63	1.732	44.00	1.062	26.97	0.437	11.10
1.250		0317	1.875	47.63	1.811	46.00	1.062	26.97	0.437	11.10
	32	0320	1.875	47.63	1.811	46.00	1.062	26.97	0.437	11.10
	33	0330	2.000	50.80	1.850	47.00	1.125	28.58	0.437	11.10
1.375		0349	2.000	50.80	1.929	49.00	1.125	28.58	0.437	11.10
	35	0350	2.000	50.80	1.929	49.00	1.125	28.58	0.437	11.10
	38	0380	2.125	53.98	2.126	54.00	1.125	28.58	0.437	11.10
1.500		0381	2.125	53.98	2.126	54.00	1.125	28.58	0.437	11.10
	40	0400	2.375	60.33	2.205	56.00	1.375	34.93	0.500	12.70
1.625		0412	2.375	60.33	2.205	56.00	1.375	34.93	0.500	12.70
	43	0430	2.500	63.50	2.323	59.00	1.375	34.93	0.500	12.70
	44	0440	2.500	63.50	2.402	61.00	1.375	34.93	0.500	12.70
1.750		0444	2.500	63.50	2.402	61.00	1.375	34.93	0.500	12.70
	45	0450	2.625	66.68	2.402	61.00	1.500	38.10	0.500	12.70
1.875		0476	2.625	66.68	2.520	64.00	1.500	38.10	0.500	12.70
	48	0480	2.750	69.85	2.520	64.00	1.500	38.10	0.500	12.70
	50	0500	2.750	69.85	2.625	66.70	1.500	38.10	0.500	12.70
2.000		0508	2.750	69.85	2.625	66.70	1.500	38.10	0.500	12.70
	53	0530	3.000	76.20	2.717	69.00	1.688	42.88	0.562	14.28
2.125		0539	3.000	76.20	2.717	69.00	1.688	42.88	0.562	14.28
	55	0550	3.125	79.38	2.815	71.50	1.688	42.88	0.562	14.28
2.250		0571	3.125	79.38	3.071	78.00	1.688	42.88	0.562	14.28
	60	0600	3.250	82.55	3.150	80.00	1.812	46.02	0.562	14.28
2.375		0603	3.250	82.55	3.150	80.00	1.812	46.02	0.562	14.28
2.500		0635	3.375	85.73	3.268	83.00	1.812	46.02	0.562	14.28
	65	0650	3.375	85.73	3.346	85.00	1.937	49.20	0.562	14.28
2.625		0666	3.375	85.73	3.346	85.00	1.937	49.20	0.562	14.28
2.750		0698	3.500	88.90	3.543	90.00	1.937	49.20	0.626	15.88
	70	0700	3.500	88.90	3.543	90.00	1.937	49.20	0.626	15.88
2.875*		0730	3.750	95.25	3.780	96.00	2.062	52.37	0.626	15.88
	75	0750	3.875	98.43	3.898	99.00	2.062	52.37	0.626	15.88
3.000		0762	3.875	98.43	3.898	99.00	2.062	52.37	0.626	15.88

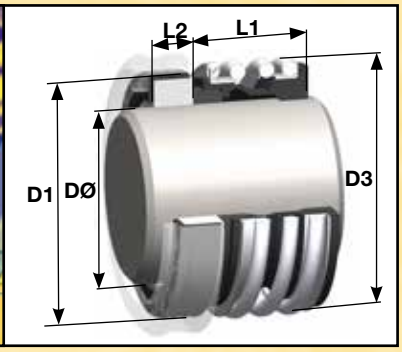
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.

1511					
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Soft vs Metal	X	Non-standard: Please use alternative shown here or enquire			
Hard vs Soft	X	Non-standard: Please use alternative shown here or enquire			
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile		Guaranteed Stock Metallurgy: 304SS			

1511J					
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic*	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Soft vs Metal	Q	M106K Carbon	C	304 Stainless Steel*	Q
Soft vs Metal	F	M106K Carbon	C	Ni-Resist	F
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile		Guaranteed Stock Metallurgy: 304SS			

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 1520



Rubber bellows Seal with narrow DIN profile of Type 14DIN series, with installation dimensions to suit common originally UK metric and imperial Seal chambers.

The robust, heavy duty bellows design provides excellent flexibility and durability.

The Type 1520 is interchangeable with the popular Type 20 parallel-spring diaphragm Seals, to provide a bellows Seal alternative. The Type 1520 is supplied as standard with a Type 20 Boot-mounted stationary.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
	12	0120	27.79	22.00	25.40	8.74
0.500		0127	27.79	22.00	25.40	8.74
	13	0130	27.79	22.00	25.40	8.74
	14	0140	30.95	24.00	25.40	10.32
	15	0150	30.95	25.00	25.40	10.32
0.625		0158	30.95	26.00	25.40	10.32
	16	0160	30.95	26.00	25.40	10.32
	18	0180	34.15	32.00	25.40	10.32
0.750	19	0191	34.15	32.00	25.40	10.32
	20	0200	35.70	34.00	25.40	10.32
	22	0220	37.30	36.00	25.40	10.32
0.875		0222	37.30	36.00	25.40	10.32
	24	0240	40.50	38.00	25.40	10.32
	25	0250	40.50	39.00	25.40	10.32
1.000		0254	40.50	39.00	25.40	10.32
	28	0280	47.63	42.00	33.34	11.99
1.125		0286	47.63	42.00	33.34	11.99
	30	0300	50.80	44.00	33.34	11.99
1.250		0317	50.80	46.00	33.34	11.99
	32	0320	50.80	46.00	33.34	11.99
	33	0330	53.98	47.00	33.34	11.99
1.375		0349	53.98	49.00	33.34	11.99
	35	0350	53.98	49.00	33.34	11.99
	38	0380	57.15	54.00	33.34	11.99
1.500		0381	57.15	54.00	33.34	11.99
	40	0400	60.33	56.00	33.34	11.99
1.625		0412	60.33	56.00	33.34	11.99
	43	0430	63.50	59.00	40.48	11.99
	44	0440	63.50	61.00	40.48	11.99
1.750		0444	63.50	61.00	40.48	11.99
	45	0450	63.50	61.00	40.48	11.99
1.875		0476	66.68	64.00	40.48	11.99
	48	0480	66.68	64.00	40.48	11.99
	50	0500	69.85	66.70	40.48	13.50
2.000		0508	69.85	66.70	40.48	13.50
	53	0530	73.03	69.00	40.48	13.50
2.125		0539	73.03	69.00	40.48	13.50
	55	0550	76.20	71.50	40.48	13.50
2.250		0571	76.20	78.00	40.48	13.50
	58	0580	79.38	78.00	40.48	13.50
	60	0600	79.38	80.00	40.48	13.50
2.375		0603	79.38	80.00	40.48	13.50
2.500		0635	82.55	83.00	40.48	13.50
	65	0650	92.08	85.00	49.21	13.50
2.625		0666	92.08	85.00	49.21	15.88
2.750		0698	95.25	90.00	49.21	15.88
	70	0700	95.25	90.00	49.21	15.88
2.875*		0730	98.43	96.00	49.21	15.88
	75	0750	101.60	99.00	49.21	15.88
3.000		0762	101.60	99.00	49.21	15.88

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.

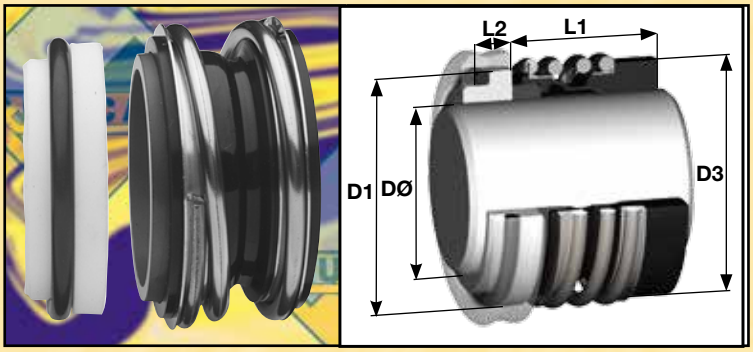
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	X	Non-standard: Please use alternative shown here or enquire			
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 19 / 192 / 193



A robust rubber bellows Seal, with a wide, larger than DIN, cross section, for optimum flexibility and durability. Type 19 series Seals are supplied as standard with a Type 8 STD 'O'-Ring mounted stationary to suit common, originally European, housing dimensions.

Also available as a "Z"-suffix on our stock codes, with bezel-profile Type 8 BEZ stationary, to same installation dimensions, to suit Pumps with seat retention plates.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	Type 19 L1 (mm)	Type 192 L1 (mm)	Type 193 L1 (mm)	L2 (mm)
10	0100	19.20	20.00	14.50	25.90	33.40	6.60
12	0120	21.60	24.30	15.00	25.90	33.40	5.60
14	0140	24.60	28.50	17.00	28.40	33.40	5.60
15	0150	24.60	28.50	17.00	28.40	33.40	6.60
16	0160	28.00	28.50	17.00	28.40	33.40	7.50
18	0180	30.00	31.00	19.50	30.00	37.50	8.00
20	0200	35.00	36.50	21.50	30.00	37.50	7.50
22	0220	35.00	36.50	21.50	30.00	37.50	7.50
24	0240	38.00	41.10	22.50	32.50	42.50	7.50
25	0250	38.00	41.10	23.00	32.50	42.50	7.50
28	0280	42.00	47.60	26.50	35.00	42.50	9.00
30	0300	45.00	47.60	26.50	35.00	42.50	10.50
32	0320	48.00	51.00	27.50	35.00	47.50	10.50
33	0330	50.00	51.00	27.50	35.00	47.50	11.00
35	0350	52.00	54.50	28.50	35.00	47.50	11.00
38	0380	55.00	57.90	30.00	36.00	46.00	10.30
40	0400	58.00	60.00	30.00	36.00	46.00	10.80
43	0430	62.00	63.80	30.00	36.00	51.00	12.00
45	0450	64.00	65.70	30.00	36.00	51.00	11.60
48	0480	68.40	69.30	30.50	36.00	51.00	11.60
50	0500	69.30	71.80	30.50	38.00	50.50	11.60
53	0530	72.30	76.00	33.00	36.50	59.00	12.30
55	0550	75.40	78.30	35.00	36.50	59.00	13.30
58	0580	78.40	82.50	37.00	41.50	59.00	13.30
60	0600	80.40	85.50	38.00	41.50	59.00	13.30
65*	0650	85.40	90.30	40.00	41.50	69.00	13.00
68*	0680	91.50	94.00	40.00	41.20	68.70	13.70
70*	0700	92.00	97.00	40.00	48.70	68.70	13.00
75*	0750	99.00	102.00	40.00	48.70	68.70	14.00
80*	0800	104.00	109.50	40.00	48.00	78.00	15.00
85*	0850	109.00	116.70	41.00	46.00	76.00	14.80
90*	0900	114.00	122.30	45.00	51.00	76.00	14.80
95*	0950	120.30	127.60	46.00	51.00	76.00	15.80
100*	1000	123.30	132.00	47.00	51.00	76.00	15.80

Please note: Types 19 & 192 are guaranteed ex-stock in all sizes to 100mm and material shown, except Tungsten Carbide.

Type 193 is guaranteed ex-stock in all sizes and materials shown, unless the size and / or material is asterisked*. However, most asterisked T193 sizes are stocked in some, but not all, materials. And the asterisked T.C. material in many sizes.

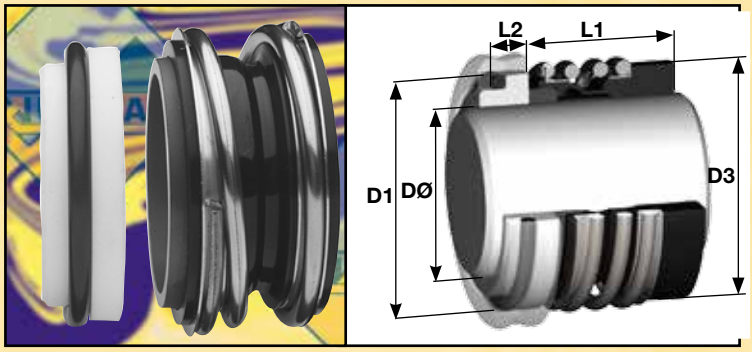
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	X	Non-standard: Please use alternative shown here or enquire			
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 19S / 192S / 193S



A robust rubber bellows Seal, with a wide, larger than DIN, cross-section, for optimum flexibility and durability. Type 19S series Seals are supplied as standard with Type 8 DIN SHORT 'O'-Ring mounted Stationaries to suit DIN 24960 (EN12756) housing dimensions.

Type 192S complete Seal and seat assemblies have working lengths to DIN L1K and Type 193S provides working lengths to DIN L1N.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	Type 19S L1 (mm)	Type 192S L1 (mm)	Type 193S L1 (mm)	L2 (mm)	192S Seal + Seat L1K (mm)	193S Seal + Seat L1N (mm)
10	0100	21.00	20.00	14.50	25.90	33.40	6.60	32.50	40.00
12	0120	23.00	24.30	15.00	25.90	33.40	6.60	32.50	40.00
14	0140	25.00	28.50	17.00	28.40	33.40	6.60	35.00	40.00
15	0150	27.00	28.50	17.00	28.40	33.40	6.60	35.00	40.00
16	0160	27.00	28.50	17.00	28.40	33.40	6.60	35.00	40.00
18	0180	33.00	31.00	19.50	30.00	37.50	7.50	37.50	45.00
20	0200	35.00	36.50	21.50	30.00	37.50	7.50	37.50	45.00
22	0220	37.00	36.50	21.50	30.00	37.50	7.50	37.50	45.00
24	0240	39.00	41.10	22.50	32.50	42.50	7.50	40.00	50.00
25	0250	40.00	41.10	23.00	32.50	42.50	7.50	40.00	50.00
28	0280	43.00	47.60	26.50	35.00	42.50	7.50	42.50	50.00
30	0300	45.00	47.60	26.50	35.00	42.50	7.50	42.50	50.00
32	0320	48.00	51.00	27.50	35.00	47.50	7.50	42.50	55.00
33	0330	48.00	51.00	27.50	35.00	47.50	7.50	42.50	55.00
35	0350	50.00	54.50	28.50	35.00	47.50	7.50	42.50	55.00
38	0380	56.00	57.90	30.00	36.00	46.00	9.00	45.00	55.00
40	0400	58.00	60.00	30.00	36.00	46.00	9.00	45.00	55.00
43	0430	61.00	63.80	30.00	36.00	51.00	9.00	45.00	60.00
45	0450	63.00	65.70	30.00	36.00	51.00	9.00	45.00	60.00
48	0480	66.00	69.30	30.50	36.00	51.00	9.00	45.00	60.00
50	0500	70.00	71.80	30.50	38.00	50.50	9.50	47.50	60.00
53	0530	73.00	76.00	33.00	36.50	59.00	11.00	47.50	70.00
55	0550	75.00	78.30	35.00	36.50	59.00	11.00	47.50	70.00
58	0580	78.00	82.50	37.00	41.50	59.00	11.00	52.50	70.00
60	0600	80.00	85.50	38.00	41.50	59.00	11.00	52.50	70.00
65*	0650	85.00	90.30	40.00	41.50	69.00	11.00	52.50	80.00
68*	0680	90.00	94.00	40.00	41.20	68.70	11.30	52.50	80.00
70*	0700	92.00	97.00	40.00	48.70	68.70	11.30	60.00	80.00
75*	0750	97.00	102.00	40.00	48.70	68.70	11.30	60.00	80.00
80*	0800	105.00	109.50	40.00	48.00	78.00	12.00	60.00	90.00
85*	0850	110.00	116.70	41.00	46.00	76.00	14.00	60.00	90.00
90*	0900	115.00	122.30	45.00	51.00	76.00	14.00	65.00	90.00
95*	0950	120.00	127.60	46.00	51.00	76.00	14.00	65.00	90.00
100*	1000	125.00	132.00	47.00	51.00	76.00	14.00	65.00	90.00

Please note: Types 19S & 192S are guaranteed ex-stock in all sizes to 100mm and material shown, except Tungsten Carbide. Type 193S is guaranteed ex-stock in all sizes and materials shown, unless the size and / or material is asterisked*.However, most asterisked T193S sizes are stocked in some, but not all, materials. And the asterisked T.C. material in many sizes.

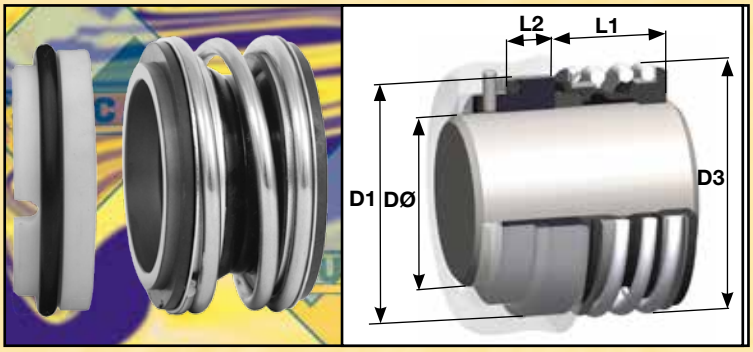
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	X	Non-standard: Please use alternative shown here or enquire			
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 19L



A robust rubber bellows Seal, with a wide, larger than DIN, cross-section, for optimum flexibility and durability. Type 19L is supplied as standard, with a Type 8 DIN LONG 'O'-Ring mounted stationary with an anti-rotation provision, to suit DIN housing dimensions.

The robust heavy duty bellows design Type 19L is a highly proficient design commonly utilised in heavy duty applications, such as abrasive applications, including waste-water.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Seat Slot Width (mm)	Seat Slot Depth (mm)
10	0100	21.00	20.00	14.50	10.00	4.00	5.00
12	0120	23.00	24.30	15.00	10.00	4.00	5.00
14	0140	25.00	28.50	17.00	10.00	4.00	5.00
15	0150	27.00	28.50	17.00	10.00	4.00	5.00
16	0160	27.00	28.50	17.00	10.00	4.00	5.00
18	0180	33.00	31.00	19.50	11.50	4.00	5.50
20	0200	35.00	36.50	21.50	11.50	4.00	5.50
22	0220	37.00	36.50	21.50	11.50	4.00	5.50
24	0240	39.00	41.10	22.50	11.50	4.00	5.50
25	0250	40.00	41.10	23.00	11.50	4.00	5.50
28	0280	43.00	47.60	26.50	11.50	4.00	5.50
30	0300	45.00	47.60	26.50	11.50	4.00	5.50
32	0320	48.00	51.00	27.50	11.50	4.00	5.50
33	0330	48.00	51.00	27.50	11.50	4.00	5.50
35	0350	50.00	54.50	28.50	11.50	4.00	5.50
38	0380	56.00	57.90	30.00	14.00	5.00	5.50
40	0400	58.00	60.00	30.00	14.00	5.00	5.50
43	0430	61.00	63.80	30.00	14.00	5.00	5.50
45	0450	63.00	65.70	30.00	14.00	5.00	5.50
48	0480	66.00	69.30	30.50	14.00	5.00	5.50
50	0500	70.00	71.80	30.50	15.00	5.00	5.50
53	0530	73.00	76.00	33.00	15.00	5.00	5.50
55	0550	75.00	78.30	35.00	15.00	5.00	5.50
58	0580	78.00	82.50	37.00	15.00	5.00	5.50
60	0600	80.00	85.50	38.00	15.00	5.00	5.50
65	0650	85.00	90.30	40.00	15.00	5.00	5.50
68	0680	90.00	94.00	40.00	18.00	5.00	5.50
70	0700	92.00	97.00	40.00	18.00	5.00	5.50
75	0750	97.00	102.00	40.00	18.00	5.00	5.50
80	0800	105.00	109.50	40.00	18.20	5.00	5.50
85	0850	110.00	116.70	41.00	18.20	5.00	5.50
90	0900	115.00	122.30	45.00	18.20	5.00	5.50
95	0950	120.00	127.60	46.00	17.20	5.00	5.50
100	1000	125.00	132.00	47.00	17.20	5.00	5.50

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*. However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.

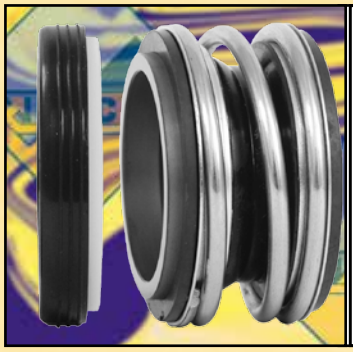
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	X	Non-standard: Please use alternative shown here or enquire			
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

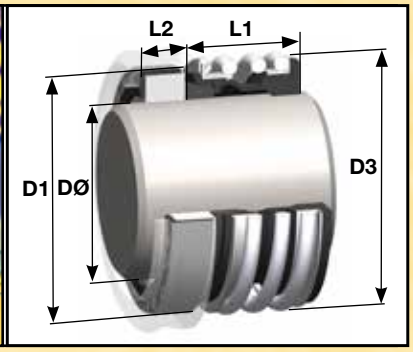
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 19B / 192B / 193B





A robust rubber bellows Seal, with a wide, larger than DIN, cross-section, for optimum flexibility and durability. Type 19B series Seals are supplied as standard with Type 19B Boot mounted Stationaries to suit DIN 24960 (EN12756) housing dimensions.

Type 192B complete Seal and seat assemblies have working lengths to meet DIN L1K and Type 193B provides working lengths to DIN L1N.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	Type 19BL1 (mm)	Type 192BL1 (mm)	Type 193BL1 (mm)	L2 (mm)	192B Seal + Seat L1K (mm)	193B Seal + Seat L1N (mm)
10	0100	21.00	20.00	14.50	25.90	33.40	6.60	32.50	40.00
12	0120	23.00	24.30	15.00	25.90	33.40	6.60	32.50	40.00
14	0140	25.00	28.50	17.00	28.40	33.40	6.60	35.00	40.00
15	0150	27.00	28.50	17.00	28.40	33.40	6.60	35.00	40.00
16	0160	27.00	28.50	17.00	28.40	33.40	6.60	35.00	40.00
18	0180	33.00	31.00	19.50	30.00	37.50	7.50	37.50	45.00
20	0200	35.00	36.50	21.50	30.00	37.50	7.50	37.50	45.00
22	0220	37.00	36.50	21.50	30.00	37.50	7.50	37.50	45.00
24	0240	39.00	41.10	22.50	32.50	42.50	7.50	40.00	50.00
25	0250	40.00	41.10	23.00	32.50	42.50	7.50	40.00	50.00
28	0280	43.00	47.60	26.50	35.00	42.50	7.50	42.50	50.00
30	0300	45.00	47.60	26.50	35.00	42.50	7.50	42.50	50.00
32	0320	48.00	51.00	27.50	35.00	47.50	7.50	42.50	55.00
33	0330	48.00	51.00	27.50	35.00	47.50	7.50	42.50	55.00
35	0350	50.00	54.50	28.50	35.00	47.50	7.50	42.50	55.00
38	0380	56.00	57.90	30.00	36.00	46.00	9.00	45.00	55.00
40	0400	58.00	60.00	30.00	36.00	46.00	9.00	45.00	55.00
43	0430	61.00	63.80	30.00	36.00	51.00	9.00	45.00	60.00
45	0450	63.00	65.70	30.00	36.00	51.00	9.00	45.00	60.00
48	0480	66.00	69.30	30.50	36.00	51.00	9.00	45.00	60.00
50	0500	70.00	71.80	30.50	38.00	50.50	9.50	47.50	60.00
53	0530	73.00	76.00	33.00	36.50	59.00	11.00	47.50	70.00
55	0550	75.00	78.30	35.00	36.50	59.00	11.00	47.50	70.00
58	0580	78.00	82.50	37.00	41.50	59.00	11.00	52.50	70.00
60	0600	80.00	85.50	38.00	41.50	59.00	11.00	52.50	70.00
65*	0650	85.00	90.30	40.00	41.50	69.00	11.00	52.50	80.00
68*	0680	90.00	94.00	40.00	41.20	68.70	11.30	52.50	80.00
70*	0700	92.00	97.00	40.00	48.70	68.70	11.30	60.00	80.00
75*	0750	97.00	102.00	40.00	48.70	68.70	11.30	60.00	80.00
80*	0800	105.00	109.50	40.00	48.00	78.00	12.00	60.00	90.00
85*	0850	110.00	116.70	41.00	46.00	76.00	14.00	60.00	90.00
90*	0900	115.00	122.30	45.00	51.00	76.00	14.00	65.00	90.00
95*	0950	120.00	127.60	46.00	51.00	76.00	14.00	65.00	90.00
100*	1000	125.00	132.00	47.00	51.00	76.00	14.00	65.00	90.00

Please note: Types 19B & 192B are guaranteed ex-stock in all sizes to 100mm and material shown, except Tungsten Carbide.

Type 193B is guaranteed ex-stock in all sizes and materials shown, unless the size and / or material is asterisked*. However, most asterisked T193B sizes are stocked in some, but not all, materials. And the asterisked T.C. material in many sizes.

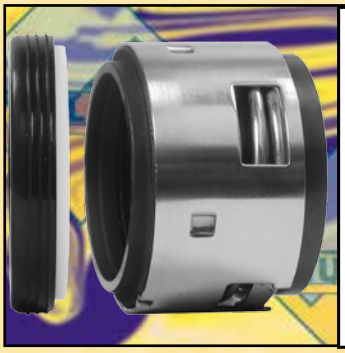
Suggested Operating Limits

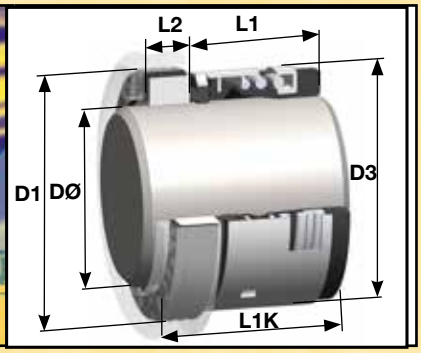
Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	X	Non-standard: Please use alternative shown here or enquire			
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 1724





High performance, heavy duty, full convolution rubber bellows Seal inside a stainless steel casing. Type 1724 features a retained, positively driven, face, with a non-clogging spring and self-alignment capability, and is fully compliant to DIN24960 (EN12756) dimensions.

Type 1724 is supplied as standard with a Type 24 Boot mounted stationary. Please refer to the page opposite, for standard 'O'-Ring mounted seat alternatives.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Seal + SeatL1K (mm)
14	0140	25.00	24.00	26.40	8.60	35.00
16	0160	27.00	26.00	26.40	8.60	35.00
18	0180	33.00	32.00	27.50	10.00	37.50
20	0200	35.00	34.00	27.50	10.00	37.50
22	0220	37.00	36.00	27.50	10.00	37.50
24	0240	39.00	38.00	30.00	10.00	40.00
25	0250	40.00	39.00	30.00	10.00	40.00
28	0280	43.00	42.00	32.50	10.00	42.50
30	0300	45.00	44.00	32.50	10.00	42.50
32	0320	48.00	46.00	32.50	10.00	42.50
33	0330	48.00	47.00	32.50	10.00	42.50
35	0350	50.00	49.00	32.50	10.00	42.50
38	0380	56.00	54.00	34.00	11.00	45.00
40	0400	58.00	56.00	34.00	11.00	45.00
43	0430	61.00	59.00	34.00	11.00	45.00
45	0450	63.00	61.00	34.00	11.00	45.00
48	0480	66.00	64.00	34.00	11.00	45.00
50	0500	70.00	66.00	34.50	13.00	47.50
53	0530	73.00	69.00	34.50	13.00	47.50
55	0550	75.00	71.00	34.50	13.00	47.50
60	0600	80.00	80.00	39.50	13.00	52.50
65	0650	85.00	85.00	39.50	13.00	52.50
68	0680	90.00	88.00	37.20	15.30	52.50
70	0700	92.00	89.00	44.70	15.30	60.00
75	0750	97.00	96.00	44.70	15.30	60.00
80	0800	105.00	104.00	44.30	15.70	60.00
85	0850	110.00	108.00	44.30	15.70	60.00
90	0900	115.00	114.00	49.30	15.70	65.00
95	0950	120.00	118.00	49.30	15.70	65.00
100	1000	125.00	124.00	49.30	15.70	65.00

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*. However, most asterisked Seal and / or seat face materials are stocked in some, but not all, sizes.

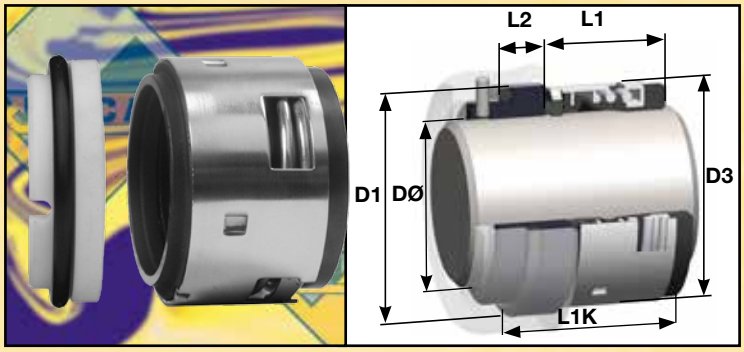
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 1724L / 1724S



High performance, rubber bellows Seal inside a stainless steel casing. Type 1724 features a retained, positively driven, face with a non-clogging spring and self-alignment capability, and is fully compliant to DIN24960 (EN12756) dimensions.

Type 1724L is supplied as standard with a Type 24 DIN LONG 'O'-Ring mounted stationary with anti-rotation provision. Type 1724S is supplied with a Type 24 DIN SHORT 'O'-Ring mounted stationary.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Seal + SeatL1K (mm)	Seat Slot Width 1724L (mm)	Seat Slot Depth 1724L (mm)
14	0140	25.00	24.00	26.40	8.60	35.00	4.00	5.00
16	0160	27.00	26.00	26.40	8.60	35.00	4.00	5.00
18	0180	33.00	32.00	27.50	10.00	37.50	4.00	5.50
20	0200	35.00	34.00	27.50	10.00	37.50	4.00	5.50
22	0220	37.00	36.00	27.50	10.00	37.50	4.00	5.50
24	0240	39.00	38.00	30.00	10.00	40.00	4.00	5.50
25	0250	40.00	39.00	30.00	10.00	40.00	4.00	5.50
28	0280	43.00	42.00	32.50	10.00	42.50	4.00	5.50
30	0300	45.00	44.00	32.50	10.00	42.50	4.00	5.50
32	0320	48.00	46.00	32.50	10.00	42.50	4.00	5.50
33	0330	48.00	47.00	32.50	10.00	42.50	4.00	5.50
35	0350	50.00	49.00	32.50	10.00	42.50	4.00	5.50
38	0380	56.00	54.00	34.00	11.00	45.00	5.00	5.50
40	0400	58.00	56.00	34.00	11.00	45.00	5.00	5.50
43	0430	61.00	59.00	34.00	11.00	45.00	5.00	5.50
45	0450	63.00	61.00	34.00	11.00	45.00	5.00	5.50
48	0480	66.00	64.00	34.00	11.00	45.00	5.00	5.50
50	0500	70.00	66.00	34.50	13.00	47.50	5.00	5.50
53	0530	73.00	69.00	34.50	13.00	47.50	5.00	5.50
55	0550	75.00	71.00	34.50	13.00	47.50	5.00	5.50
60	0600	80.00	80.00	39.50	13.00	52.50	5.00	5.50
63	0630	83.00	83.00	39.50	13.00	52.50	5.00	5.50
65	0650	85.00	85.00	39.50	13.00	52.50	5.00	5.50
68	0680	90.00	88.00	37.20	15.30	52.50	5.00	5.50
70	0700	92.00	89.00	44.70	15.30	60.00	5.00	5.50
75	0750	97.00	96.00	44.70	15.30	60.00	5.00	5.50
80	0800	105.00	104.00	44.30	15.70	60.00	5.00	5.50
85	0850	110.00	108.00	44.30	15.70	60.00	5.00	5.50
90	0900	115.00	114.00	49.30	15.70	65.00	5.00	5.50
95	0950	120.00	118.00	49.30	15.70	65.00	5.00	5.50
100	1000	125.00	124.00	49.30	15.70	65.00	5.00	5.50
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.								
However, most asterisked Seal and / or seat face materials are stocked in some, but not all, sizes.								

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Vulcan Parallel Spring Diaphragm Type Seals

Section

Introduction

Vulcan's Parallel Spring Diaphragm 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 of designs are ideal for a wide spectrum of application conditions, ranging from general duties through to more demanding applications, through their accommodating Single Springs and elastomer Diaphragms. The Seals are highly effective and widely utilised in Pumps, mixers, agitators, compressors and other rotary shaft equipment.

Standard Vulcan® Parallel Types

Types 10, 20 and 20H

Parallel spring, rubber diaphragm Seals to common industry standard dimensions. Fitted as standard with Type 20 Boot mounted Stationaries, Type 20H has a Type 21'O'-Ring mounted stationary.

Types 11, 11J and 22

As above, to common American standard dimensions, fitted with a Type 11 Boot mounted Stationaries, or Type 11J has a Type 31 'O'-Ring mounted seat.

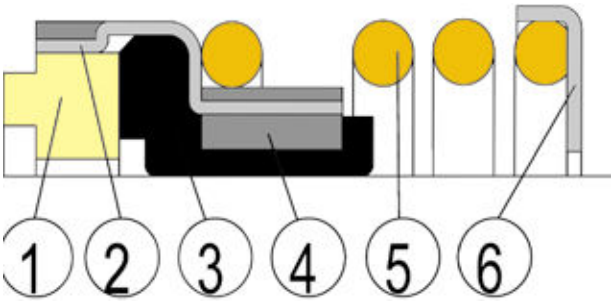
Types U11/N11, U22/N22, N10 & N20

As above Standard Types, but to full ANSI / DIN Seal profile (D3) compatibility, through incorporating a narrow profile Seal design. Types U11/ U22 utilise the same Seal head internal design as our Type 24, whilst Types N10, N11 & N20 incorporate an elastomer resiliently mounted ring face.

Type 24 Series

As above but to full DIN24960 (EN12756) dimensions, L1K-length. Type 24 is supplied with a Type 24 Boot mounted seat as standard. You should specify Type 24S, if a Type 24.DINS stationary is required and Type 24L for the Type 24.DINL stationary.

Standard Components



No	Description
1	Seal Face
2	Retainer
3	Diaphragm
4	Drive Ring
5	Spring
6	Base Plate

Vulcan® Design Advantages

Accommodating

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

Improved Designs

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.

Retained Components

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

Customisable

The technically efficient and highly versatile, parallel spring, Seal design can be readily customised to suit individual requirements; where a standard Seal or seat cannot be utilised. Vulcan can assist in the design of special production runs to fully satisfy customer requirements.

Material Quality

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

Reliability

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

Our Parallel Spring Diaphragm Type Seals PV Chart

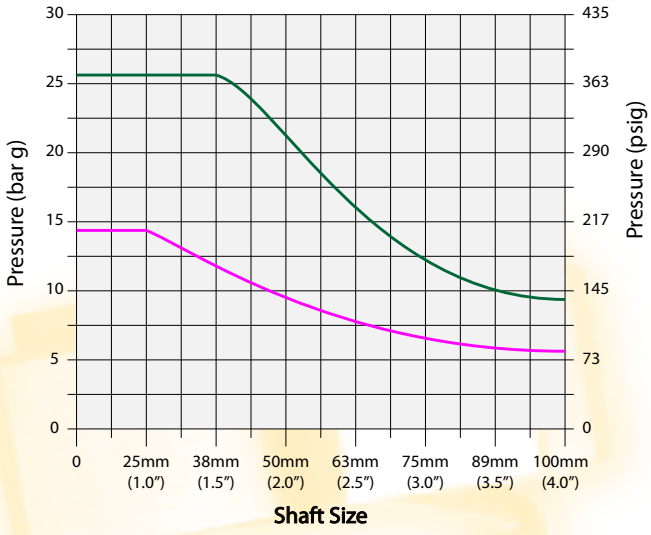
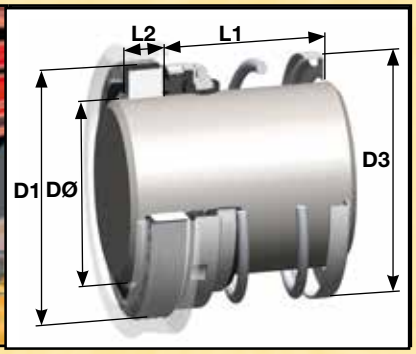


Chart based upon: Carbon vs reaction bonded silicon carbide Seal faces	
(N) 10/20/11/22/24	A1/A2/A4/A5

Types 10 / 20 (N10/ N20) - Metric



Metric shaft size, resilient, single spring, rubber diaphragm Seal with a Type 20 Boot mounted stationary as standard, to suit original common UK housing sizes. A widely utilised Seal type, highly suited to general duties, capable of long service life. Also available with 'O'-Ring mounted Stationaries, as Types 10H and 20H, please refer over-leaf. These Seals are increasingly preferred with a narrow profile and a resilient elastomer mounted face for improved performance and these are shown as Types N10 and N20.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 - 10/20 Standard Profile (mm)	D3 - N10/N20 Narrow Profile (mm)	Type 10/ N10L1 (mm)	Type 20/ N20 L1 (mm)	L2 (mm)
10	0100	24.60	21.80	21.00	43.66	25.40	8.74
12	0120	27.79	23.50	22.00	43.66	25.40	8.74
13	0130	27.79	23.50	22.00	43.66	25.40	8.74
14	0140	30.95	27.00	24.00	43.66	25.40	10.32
15	0150	30.95	27.00	27.00	43.66	25.40	10.32
16	0160	30.95	27.00	27.00	43.66	25.40	10.32
18	0180	34.15	30.70	30.00	43.66	25.40	10.32
19	0191	34.15	30.70	30.00	43.66	25.40	10.32
20	0200	35.70	33.40	33.00	43.66	25.40	10.32
22	0220	37.30	33.40	33.00	43.66	25.40	10.32
24	0240	40.50	39.20	38.00	43.66	25.40	10.32
25	0250	40.50	39.20	39.00	43.66	25.40	10.32
28	0280	47.63	45.60	41.00	60.33	33.34	11.99
29	0290	47.63	45.60	43.00	60.33	33.34	11.99
30	0300	50.80	48.30	43.00	60.33	33.34	11.99
32	0320	50.80	48.30	45.00	60.33	33.34	11.99
33	0330	53.98	52.00	45.00	60.33	33.34	11.99
34	0340	53.98	52.00	48.00	60.33	33.34	11.99
35	0349	53.98	52.00	48.00	60.33	33.34	11.99
38	0381	57.15	55.60	52.00	60.33	33.34	11.99
40	0400	60.33	59.20	56.00	60.33	33.34	11.99
41	0410	60.35	59.20	56.00	60.33	33.34	11.99
42	0420	63.50	65.10	58.00	70.64	40.48	11.99
43	0430	63.50	65.10	58.00	70.64	40.48	11.99
44	0440	63.50	65.10	61.00	70.64	40.48	11.99
45	0450	63.50	65.10	61.00	70.64	40.48	11.99
48	0480	66.68	66.70	64.00	70.64	40.48	11.99
50	0500	69.85	71.00	66.00	70.64	40.48	13.50
53	0530	73.03	73.30	71.00	70.64	40.48	13.50
55	0550	76.20	78.60	71.00	70.64	40.48	13.50
58	0580	79.38	82.10	80.00	70.64	40.48	13.50
60	0600	79.38	82.10	80.00	70.64	40.48	13.50
63	0630	82.55	84.60	82.00	70.64	40.48	13.50
65	0650	92.08	88.60	84.00	69.85	49.21	15.88
70	0700	95.25	90.00	90.00	69.85	49.21	15.88
75	0750	101.60	102.70	96.00	73.03	52.39	15.88
80	0800	114.30	104.00	104.00	79.38	55.56	19.88
85	0850	117.48	108.00	108.00	79.38	55.56	19.88
90	0900	123.83	112.00	111.00	79.38	55.56	19.88
95	0950	127.00	119.00	119.00	82.55	58.74	19.88
100	1000	133.35	124.00	124.00	85.73	61.91	19.88

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*. However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.

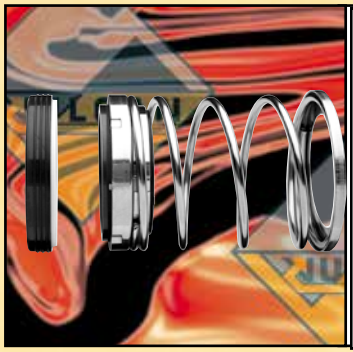
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

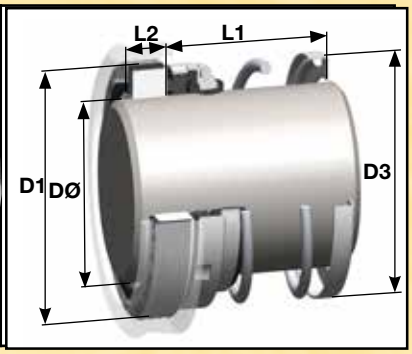
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 10 / 20 (N10 / N20) - Imperial





Imperial shaft size, resilient, single spring, rubber diaphragm Seal with a Type 20 Boot mounted stationary as standard, to suit original common UK housing sizes. A widely utilised Seal type, highly suited to general duties, capable of long service life. Also available with 'O'-Ring mounted Stationaries, as Types 10H and 20H, please refer over-leaf. These Seals are increasingly preferred with a narrow profile and a resilient elastomer mounted face for improved performance and these are shown as Types N10 and N20.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Size Code	D1 (mm)	D3 - 10/20 Standard Profile (mm)	D3 - N10/ N20 Narrow Profile (mm)	Type 10 / N10L1 (mm)	Type 20 / N20 L1 (mm)	L2 (mm)
0.375	0095	24.60	21.80	21.00	43.66	25.40	8.74
0.500	0127	27.79	23.50	22.00	43.66	25.40	8.74
0.625	0158	30.95	27.00	27.00	43.66	25.40	10.32
0.750	0191	34.15	30.70	30.00	43.66	25.40	10.32
0.875	0222	37.30	33.40	33.00	43.66	25.40	10.32
1.000	0254	40.50	43.20	39.00	43.66	25.40	10.32
1.125	0286	47.63	45.60	41.00	60.33	33.34	11.99
1.250	0317	50.80	48.30	45.00	60.33	33.34	11.99
1.375	0349	53.98	52.00	48.00	60.33	33.34	11.99
1.500	0381	57.15	55.60	52.00	60.33	33.34	11.99
1.625	0412	60.33	59.20	56.00	60.33	33.34	11.99
1.750	0444	63.50	65.10	61.00	70.64	40.48	11.99
1.875	0476	66.68	66.70	64.00	70.64	40.48	11.99
2.000	0508	69.85	73.30	66.00	70.64	40.48	13.50
2.125	0539	73.03	73.30	71.00	70.64	40.48	13.50
2.250	0571	76.20	78.60	80.00	70.64	40.48	13.50
2.375	0603	79.38	82.10	80.00	70.64	40.48	13.50
2.500	0635	82.55	84.60	81.00	70.64	40.48	13.50
2.625	0666	92.08	88.60	86.00	69.85	49.21	15.88
2.750	0698	95.25	92.00	90.00	69.85	49.21	15.88
2.875	0730	98.43	95.20	93.00	73.03	52.39	15.88
3.000	0762	101.60	102.70	96.00	73.03	52.39	15.88
3.125	0794	111.15	104.00	104.00	79.38	55.56	19.88
3.250	0825	114.30	104.00	106.00	79.38	55.56	19.88
3.375	0857	117.48	108.00	108.00	79.38	55.56	19.88
3.500	0889	120.65	112.00	111.00	79.38	55.56	19.88
3.625*	0921	123.83	114.00	119.00	82.55	58.74	19.88
3.750	0953	127.00	119.00	119.00	82.55	58.74	19.88
3.875*	0984	130.20	121.00	124.00	85.73	61.91	19.88
4.000	1016	133.35	124.00	124.00	85.73	61.91	19.88

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*. However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.

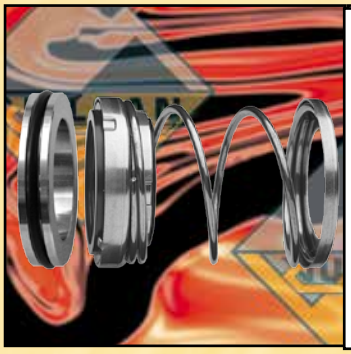
Suggested Operating Limits

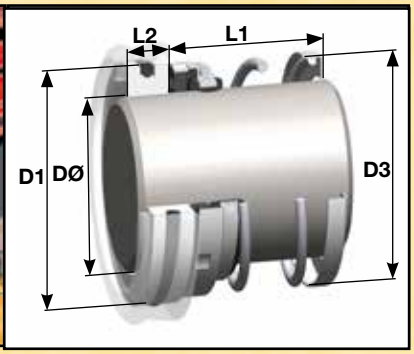
Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 20H (N20H)





Single spring, resilient, rubber diaphragm Seal featuring a Type 20 rotary with an 'O'-Ring mounted Type 21 stationary seat option, to suit common UK housing sizes. A very widely specified and utilised Seal type, highly suited to diverse duties, and capable of long service life.

Should you require a Type 10H / N10H Seal assembly, please order a Type 10 / N10 Seal and a Type 21 stationary as separate components.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Size Code	D1 (mm)	D3 - 20H Standard Profile (mm)	D3 - N20H Narrow Profile (mm)	L1 (mm)	L2 (mm)
0.375	0095	24.60	21.80	21.00	25.40	8.74
0.500	0127	27.79	23.50	22.00	25.40	8.74
0.625	0158	30.95	27.00	27.00	25.40	10.32
0.750	0191	34.15	30.70	30.00	25.40	10.32
0.875	0222	37.30	33.40	33.00	25.40	10.32
1.000	0254	40.50	43.20	39.00	25.40	10.32
1.125	0286	47.63	45.60	41.00	33.34	11.99
1.250	0317	50.80	48.30	45.00	33.34	11.99
1.375	0349	53.98	52.00	48.00	33.34	11.99
1.500	0381	57.15	55.60	52.00	33.34	11.99
1.625	0412	60.33	59.20	56.00	33.34	11.99
1.750	0444	63.50	65.10	61.00	40.48	11.99
1.875	0476	66.68	66.70	64.00	40.48	11.99
2.000	0508	69.85	73.30	66.00	40.48	13.50
2.125	0539	73.03	73.30	71.00	40.48	13.50
2.250	0571	76.20	78.60	80.00	40.48	13.50
2.375	0603	79.38	82.10	80.00	40.48	13.50
2.500	0635	82.55	84.60	81.00	40.48	13.50
2.625	0666	92.08	88.60	86.00	49.21	15.88
2.750	0698	95.25	90.00	90.00	49.21	15.88
2.875	0730	98.43	95.20	93.00	52.39	15.88
3.000	0762	101.60	102.70	96.00	52.39	15.88
3.125*	0794	111.15	104.00	104.00	55.56	19.88
3.250*	0825	114.30	104.00	106.00	55.56	19.88
3.375*	0857	117.48	108.00	108.00	55.56	19.88
3.500*	0889	120.65	112.00	111.00	55.56	19.88
3.625*	0921	123.83	114.00	119.00	58.74	19.88
3.750*	0953	127.00	119.00	119.00	58.74	19.88
3.875*	0984	130.20	121.00	124.00	61.91	19.88
4.000*	1016	133.35	124.00	124.00	61.91	19.88
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.						
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.						

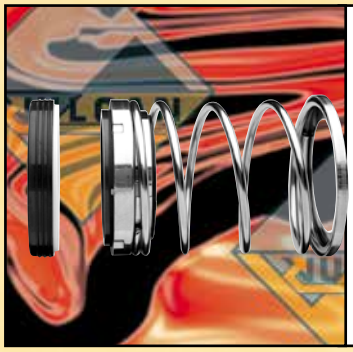
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Metal	Q	M106K Carbon	C	304 Stainless Steel	Q
Soft vs Metal	F	M106K Carbon	C	Ni-Resist*	F
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard	E	M106K Carbon	C	Tungsten Carbide*	H
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

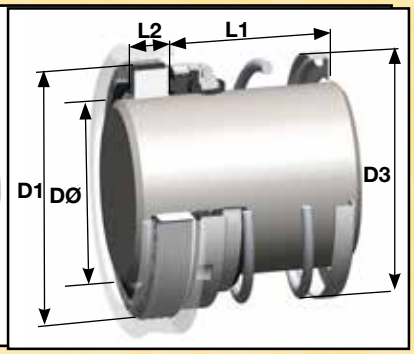
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 11 / 22





Single spring, resilient, rubber diaphragm Seal with two working length options, and a Type 11 Boot mounted stationary as standard, to suit common originally American housing sizes. A widely utilised Seal type, highly suited to general duties, capable of long service life.

Also available with 'O'-Ring mounted Stationaries, as Types 11J and 22J, Please refer over-leaf. In addition, Types 11/22 can be purchased as a Seal only to be installed with any one of a variety of Stationaries.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1		D3 Standard Profile		Type 11L1		Type 22 L1		L2	
			In	mm	In	mm	In	mm	In	mm	In	mm
0.500		0127	1.000	25.40	0.925	23.50	0.812	20.62	1.250	31.75	0.312	7.93
	14	0140	1.250	31.75	1.063	27.00	0.875	22.23	1.375	34.93	0.405	10.28
0.625		0158	1.250	31.75	1.063	27.00	0.875	22.23	1.375	34.93	0.405	10.28
	16	0160	1.250	31.75	1.063	27.00	0.875	22.23	1.375	34.93	0.405	10.28
	18	0180	1.375	34.93	1.209	30.70	0.875	22.23	1.375	34.93	0.405	10.28
0.750		0191	1.375	34.93	1.209	30.70	0.875	22.23	1.375	34.93	0.405	10.28
	20	0200	1.500	38.10	1.315	33.40	0.937	23.80	1.437	36.50	0.405	10.28
	22	0220	1.500	38.10	1.315	33.40	0.937	23.80	1.437	36.50	0.405	10.28
0.875		0222	1.500	38.10	1.315	33.40	0.937	23.80	1.437	36.50	0.405	10.28
	24	0240	1.625	41.28	1.543	39.20	1.000	25.40	1.625	41.28	0.437	11.10
	25	0250	1.625	41.28	1.543	39.20	1.000	25.40	1.625	41.28	0.437	11.10
1.000		0254	1.625	41.28	1.701	43.20	1.000	25.40	1.625	41.28	0.437	11.10
	28	0280	1.750	44.44	1.795	45.60	1.062	26.97	1.687	42.85	0.437	11.10
1.125		0286	1.750	44.44	1.795	45.60	1.062	26.97	1.687	42.85	0.437	11.10
	30	0300	1.875	47.63	1.866	48.30	1.062	26.97	1.687	42.85	0.437	11.10
1.250		0317	1.875	47.63	1.866	48.30	1.062	26.97	1.687	42.85	0.437	11.10
	32	0320	1.875	47.63	1.866	48.30	1.062	26.97	1.687	42.85	0.437	11.10
	33	0330	2.000	50.80	2.047	52.00	1.125	28.58	1.687	42.85	0.437	11.10
1.375		0349	2.000	50.80	2.047	52.00	1.125	28.58	1.687	42.85	0.437	11.10
	35	0350	2.000	50.80	2.071	52.00	1.125	28.58	1.687	42.85	0.437	11.10
	38	0380	2.125	53.98	2.189	55.60	1.125	28.58	1.687	42.85	0.437	11.10
1.500		0381	2.125	53.98	2.197	55.60	1.125	28.58	1.687	42.85	0.437	11.10
	40	0400	2.375	60.33	2.331	59.20	1.375	34.93	2.000	50.80	0.500	12.70
1.625		0412	2.375	60.33	2.331	59.20	1.375	34.93	2.000	50.80	0.500	12.70
	43	0430	2.500	63.50	2.563	65.10	1.375	34.93	2.000	50.80	0.500	12.70
1.750		0444	2.500	63.50	2.563	65.10	1.375	34.93	2.000	50.80	0.500	12.70
	45	0450	2.625	66.68	2.563	65.10	1.500	38.10	2.125	53.98	0.500	12.70
1.875		0476	2.625	66.68	2.626	66.70	1.500	38.10	2.125	53.98	0.500	12.70
	48	0480	2.750	69.85	2.626	66.70	1.500	38.10	2.125	53.98	0.500	12.70
	50	0500	2.750	69.85	2.795	71.00	1.500	38.10	2.125	53.98	0.500	12.70
2.000		0508	2.750	69.85	2.886	73.30	1.500	38.10	2.125	53.98	0.500	12.70
	53	0530	3.000	76.20	2.886	73.30	1.687	42.85	2.375	60.32	0.562	14.28
2.125		0539	3.000	76.20	2.886	73.30	1.687	42.85	2.375	60.32	0.562	14.28
	55	0550	3.125	79.38	3.094	78.60	1.687	42.85	2.375	60.32	0.562	14.28
2.250		0571	3.125	79.38	3.094	78.60	1.687	42.85	2.375	60.32	0.562	14.28
	60	0600	3.250	82.55	3.232	82.10	1.812	46.02	2.500	63.50	0.562	14.28
2.375		0603	3.250	82.55	3.232	82.10	1.812	46.02	2.500	63.50	0.562	14.28
2.500		0635	3.375	85.73	3.331	84.60	1.812	46.02	2.500	63.50	0.562	14.28
	65	0650	3.375	85.73	3.488	88.60	1.937	49.20	2.750	69.85	0.625	15.88
2.625		0666	3.375	85.73	3.488	88.60	1.937	49.20	2.750	69.85	0.625	15.88
2.750		0698	3.500	88.90	3.543	90.00	1.937	49.20	2.750	69.85	0.625	15.88
	70	0700	3.500	88.90	3.543	90.00	1.937	49.20	2.750	69.85	0.625	15.88
2.875		0730	3.750	95.25	3.748	95.20	2.062	52.37	2.875	73.03	0.625	15.88
	75	0750	3.875	98.43	4.043	102.70	2.062	52.37	2.875	73.03	0.625	15.88
3.000		0762	3.875	98.43	4.043	102.70	2.062	52.37	2.875	73.03	0.625	15.88
3.125		0794	4.000	101.60	4.094	104.00	2.187	55.55	3.125	79.37	0.783	19.88
3.250		0825	4.125	104.78	4.094	104.00	2.187	55.55	3.125	79.37	0.783	19.88
3.375		0857	4.250	107.95	4.252	108.00	2.187	55.55	3.125	79.37	0.783	19.88
3.500		0889	4.375	111.13	4.409	112.00	2.187	55.55	3.125	79.37	0.783	19.88
3.625*		0921	4.500	114.30	4.488	114.00	2.312	58.72	3.250	82.55	0.783	19.88
3.750		0953	4.625	117.48	4.685	119.00	2.312	58.72	3.250	82.55	0.783	19.88
3.875*		0984	4.750	120.65	4.764	121.00	2.312	58.72	3.375	85.72	0.783	19.88
4.000		1016	4.875	123.83	4.882	124.00	2.312	58.72	3.375	85.72	0.783	19.88

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.

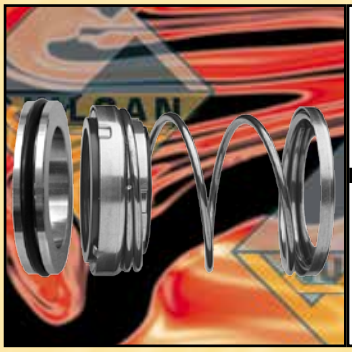
Suggested Operating Limits

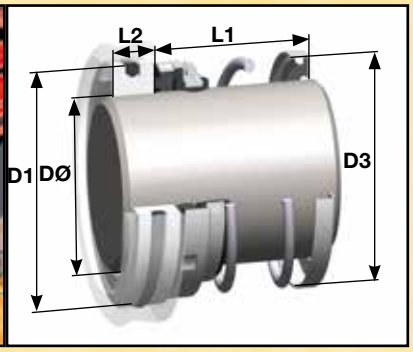
Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 11J





Single spring, resilient, rubber diaphragm Seal featuring Type 11 rotary with an 'O'-Ring mounted Type 31 stationary option, to suit common originally American housing sizes. A very widely specified and utilised Seal type, highly suited to most duties, and capable of long service life.

Should you require a Type 22J Seal assembly, please order a Type 22 Seal and a Type 31 stationary, as separate Seal and seat components.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Size Code	D1		D3 Standard Profile		D3 Narrow Profile		L1		L2	
		In	mm	In	mm	In	mm	In	mm	In	mm
0.500	0127	1.000	25.40	0.925	23.50	0.866	22.00	0.812	20.62	0.312	7.93
0.625	0158	1.250	31.75	1.063	27.00	1.063	27.00	0.875	22.23	0.405	10.28
0.750	0191	1.375	34.93	1.209	30.70	1.181	30.00	0.875	22.23	0.405	10.28
0.875	0222	1.500	38.10	1.315	33.40	1.299	33.00	0.937	23.80	0.405	10.28
1.000	0254	1.625	41.28	1.701	43.20	1.535	39.00	1.000	25.40	0.437	11.10
1.125	0286	1.750	44.44	1.795	45.60	1.614	41.00	1.062	26.97	0.437	11.10
1.250	0317	1.875	47.63	1.866	48.30	1.772	45.00	1.062	26.97	0.437	11.10
1.375	0349	2.000	50.80	2.047	52.00	1.890	48.00	1.125	28.58	0.437	11.10
1.500	0381	2.125	53.98	2.197	55.60	2.047	52.00	1.125	28.58	0.437	11.10
1.625	0412	2.375	60.33	2.331	59.20	2.204	56.00	1.375	34.93	0.500	12.70
1.750	0444	2.500	63.50	2.563	65.10	2.401	61.00	1.375	34.93	0.500	12.70
1.875	0476	2.625	66.68	2.626	66.70	2.519	64.00	1.500	38.10	0.500	12.70
2.000	0508	2.750	69.85	2.886	73.30	2.598	66.00	1.500	38.10	0.500	12.70
2.125	0539	3.000	76.20	2.886	73.30	2.795	71.00	1.687	42.85	0.562	14.28
2.250	0571	3.125	79.38	3.094	78.60	3.150	80.00	1.687	42.85	0.562	14.28
2.375	0603	3.250	82.55	3.232	82.10	3.150	80.00	1.812	46.02	0.562	14.28
2.500	0635	3.375	85.73	3.331	84.60	3.189	81.00	1.812	46.02	0.562	14.28
2.625	0666	3.375	85.73	3.488	88.60	3.386	86.00	1.937	49.20	0.625	15.88
2.750	0698	3.500	88.90	3.543	90.00	3.543	90.00	1.937	49.20	0.625	15.88
3.000	0762	3.875	98.43	3.748	95.20	3.780	96.00	2.062	52.37	0.625	15.88
3.125*	0794	4.000	101.60	4.043	102.70	4.095	104.00	2.187	55.55	0.783	19.88
3.250*	0825	4.125	104.78	4.094	104.00	4.173	106.00	2.187	55.55	0.783	19.88
3.375*	0857	4.250	107.95	4.094	104.00	4.252	108.00	2.187	55.55	0.783	19.88
3.500*	0889	4.375	111.13	4.252	108.00	4.370	111.00	2.187	55.55	0.783	19.88
3.625*	0921	4.500	114.30	4.409	112.00	4.685	119.00	2.312	58.72	0.783	19.88
3.750*	0953	4.625	117.48	4.488	114.00	4.685	119.00	2.312	58.72	0.783	19.88
3.875*	0984	4.750	120.65	4.685	119.00	4.882	124.00	2.312	58.72	0.783	19.88
4.000*	1016	4.875	123.83	4.764	121.00	4.882	124.00	2.312	58.72	0.783	19.88
1All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.											
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.											

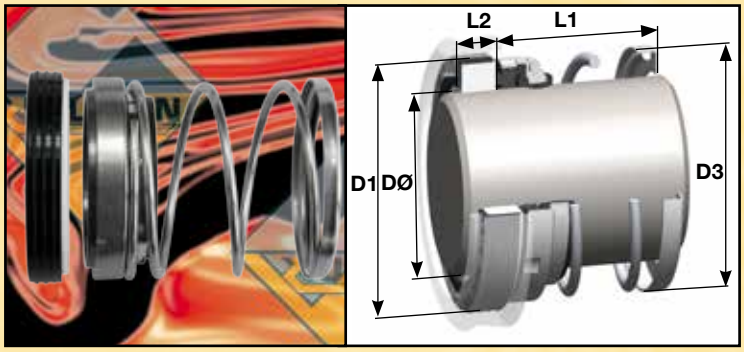
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic*	A
Soft vs Metal	Q	M106K Carbon	C	304 Stainless Steel*	Q
Soft vs Metal	F	M106K Carbon	C	Ni-Resist	F
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard	E	M106K Carbon	C	Tungsten Carbide*	H
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type N11 (U11) / N22 (U22)



Single spring, rubber diaphragm Seal, similar to Type 11/22, but with reduced O.D. (D3) to give full ANSI Seal chamber compatibility. Type N11 / N22; with a resilient elastomer mounted face, is the preferred design supplied up to its design limit of 2.000" / 50 mm. Type U11 / U22 has a retainer lug driven face, as per our Type 24 design and is the preferred design, that is supplied in all sizes above 2.000" / 50 mm. Also available as Types N11J / N22J or U11J / N11Jwith an 'O'-Ring mounted seat.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Size Code	D1		D3		L1 - Types N11/U11		L1 - Types N22/U22		L2	
		In	mm	In	mm	In	mm	In	mm	In	mm
0.500	0127	1.000	25.40	0.898	22.80	0.812	20.62	1.250	31.75	0.312	7.93
0.625	0158	1.250	31.75	1.063	27.00	0.875	22.23	1.375	34.93	0.405	10.28
0.750	0191	1.375	34.93	1.197	30.40	0.875	22.23	1.375	34.93	0.405	10.28
0.875	0222	1.500	38.10	1.315	33.40	0.937	23.80	1.397	35.50	0.405	10.28
1.000	0254	1.625	41.28	1.547	39.30	1.000	25.40	1.625	41.28	0.437	11.10
1.125	0286	1.750	44.44	1.650	41.90	1.062	26.97	1.687	42.85	0.437	11.10
1.250	0317	1.875	47.63	1.787	45.40	1.062	26.97	1.687	42.85	0.437	11.10
1.375	0349	2.000	50.80	1.941	49.30	1.125	28.58	1.687	42.85	0.437	11.10
1.500	0381	2.125	53.98	2.067	52.50	1.125	28.58	1.687	42.85	0.437	11.10
1.625	0412	2.375	60.33	2.185	55.50	1.375	34.93	2.000	50.80	0.500	12.70
1.750	0444	2.500	63.50	2.402	61.00	1.375	34.93	2.000	50.80	0.500	12.70
1.875	0476	2.625	66.68	2.520	64.00	1.500	38.10	2.125	53.98	0.500	12.70
2.000	0508	2.750	69.85	2.587	65.70	1.500	38.10	2.125	53.98	0.500	12.70
2.125	0539	3.000	76.20	2.776	70.50	1.687	42.85	2.375	60.32	0.562	14.28
2.250	0571	3.125	79.38	3.150	80.00	1.687	42.85	2.375	60.32	0.562	14.28
2.375	0603	3.250	82.55	3.134	79.60	1.812	46.02	2.500	63.50	0.562	14.28
2.500	0635	3.375	85.73	3.209	81.50	1.812	46.02	2.500	63.50	0.562	14.28
2.625	0666	3.375	85.73	3.437	87.30	1.937	49.20	2.750	69.85	0.625	15.88
2.750	0698	3.500	88.90	3.543	90.00	1.937	49.20	2.750	69.85	0.625	15.88
3.000	0762	3.875	98.43	3.811	96.80	2.062	52.37	2.875	73.03	0.625	15.88
3.125	0794	4.000	101.60	4.094	104.00	2.187	55.55	3.125	79.37	0.783	19.88
3.250	0825	4.125	104.78	4.094	104.00	2.187	55.55	3.125	79.37	0.783	19.88
3.375	0857	4.250	107.95	4.252	108.00	2.187	55.55	3.125	79.37	0.783	19.88
3.500	0889	4.375	111.13	4.409	112.00	2.187	55.55	3.125	79.37	0.783	19.88
3.625*	0921	4.500	114.30	4.488	114.00	2.312	58.72	3.250	82.55	0.783	19.88
3.750	0953	4.625	117.48	4.685	119.00	2.312	58.72	3.250	82.55	0.783	19.88
3.875*	0984	4.750	120.65	4.764	121.00	2.312	58.72	3.375	85.72	0.783	19.88
4.000	1016	4.875	123.83	4.882	124.00	2.312	58.72	3.375	85.72	0.783	19.88
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.											
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.											

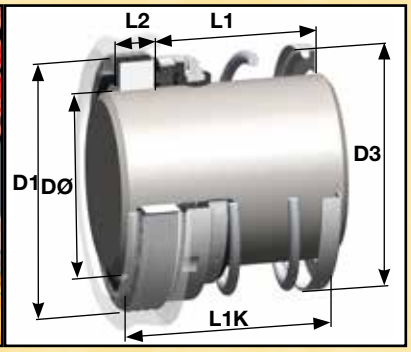
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 24



Compact, single spring, rubber diaphragm Seal specifically designed to comply with DIN 24960 (EN 12756) L1K-length dimensional requirements, for the complete Seal and seat assembly.

Available as standard with Type 24 Boot-mounted stationary. For 'O'-Ring mounted versions, please see opposite page.

In addition, Type 24 is often purchased as a Seal only to be installed with any one of a variety of Stationaries.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L1K (mm)
12	0120	23.00	21.70	23.90	8.60	32.50
14	0140	25.00	24.40	26.40	8.60	35.00
16	0160	27.00	27.00	26.40	8.60	35.00
18	0180	33.00	30.60	27.50	10.00	37.50
20	0200	35.00	33.40	27.50	10.00	37.50
22	0220	37.00	33.40	27.50	10.00	37.50
24	0240	39.00	37.80	30.00	10.00	40.00
25	0250	40.00	39.20	30.00	10.00	40.00
28	0280	43.00	42.10	32.50	10.00	42.50
30	0300	45.00	44.00	32.50	10.00	42.50
32	0320	48.00	45.60	32.50	10.00	42.50
33	0330	48.00	45.60	32.50	10.00	42.50
35	0350	50.00	49.30	32.50	10.00	42.50
38	0380	56.00	52.70	34.00	11.00	45.00
40	0400	58.00	55.70	34.00	11.00	45.00
43	0430	61.00	58.60	34.00	11.00	45.00
45	0450	63.00	61.00	34.00	11.00	45.00
48	0480	66.00	64.00	34.00	11.00	45.00
50	0500	70.00	66.10	34.50	13.00	47.50
53	0530	73.00	70.60	34.50	13.00	47.50
55	0550	75.00	70.60	34.50	13.00	47.50
58	0580	78.00	80.00	39.50	13.00	52.50
60	0600	80.00	80.00	39.50	13.00	52.50
63	0630	83.00	82.10	39.50	13.00	52.50
65	0650	85.00	85.00	39.50	13.00	52.50
68	0680	90.00	90.00	37.20	15.30	52.50
70	0700	92.00	90.00	44.70	15.30	60.00
75	0750	97.00	96.80	44.70	15.30	60.00
80	0800	105.00	104.00	44.30	15.70	60.00
85	0850	110.00	108.00	44.30	15.70	60.00
90	0900	115.00	111.00	49.30	15.70	65.00
95	0950	120.00	119.00	49.30	15.70	65.00
100	1000	125.00	124.00	49.30	15.70	65.00
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.						
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.						

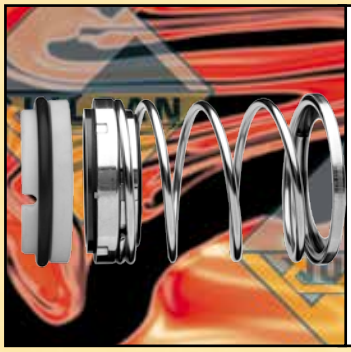
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

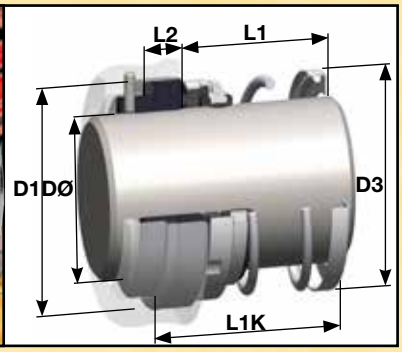
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 24L / 24S





Compact, single spring, rubber diaphragm Seal specifically designed to comply with DIN 24960 (EN 12756) L1K-length dimensional requirements, for the complete Seal and seat assembly.

The Type 24 Seal's highly proficient and accommodating design enables it to be widely utilised.

Available as Type 24L with an 'O'-Ring mounted stationary with anti-rotation provision, or as Type 24S with a short 'O'-Ring mounted stationary.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L1K (mm)	Slot Width 24L (mm)	Slot Depth 24L (mm)
12	0120	23.00	21.70	23.90	8.60	32.50	4.00	5.00
14	0140	25.00	24.40	26.40	8.60	35.00	4.00	5.00
16	0160	27.00	27.00	26.40	8.60	35.00	4.00	5.00
18	0180	33.00	30.60	27.50	10.00	37.50	4.00	5.50
20	0200	35.00	33.40	27.50	10.00	37.50	4.00	5.50
22	0220	37.00	33.40	27.50	10.00	37.50	4.00	5.50
24	0240	39.00	37.80	30.00	10.00	40.00	4.00	5.50
25	0250	40.00	39.20	30.00	10.00	40.00	4.00	5.50
28	0280	43.00	42.10	32.50	10.00	42.50	4.00	5.50
30	0300	45.00	44.00	32.50	10.00	42.50	4.00	5.50
32	0320	48.00	45.60	32.50	10.00	42.50	4.00	5.50
33	0330	48.00	45.60	32.50	10.00	42.50	4.00	5.50
35	0350	50.00	49.30	32.50	10.00	42.50	4.00	5.50
38	0380	56.00	52.70	34.00	11.00	45.00	5.00	5.50
40	0400	58.00	55.70	34.00	11.00	45.00	5.00	5.50
43	0430	61.00	58.60	34.00	11.00	45.00	5.00	5.50
45	0450	63.00	61.00	34.00	11.00	45.00	5.00	5.50
48	0480	66.00	64.00	34.00	11.00	45.00	5.00	5.50
50	0500	70.00	66.10	34.50	13.00	47.50	5.00	5.50
53	0530	73.00	70.60	34.50	13.00	47.50	5.00	5.50
55	0550	75.00	70.60	34.50	13.00	47.50	5.00	5.50
58	0580	78.00	80.00	39.50	13.00	52.50	5.00	5.50
60	0600	80.00	80.00	39.50	13.00	52.50	5.00	5.50
63	0630	83.00	82.10	39.50	13.00	52.50	5.00	5.50
65	0650	85.00	85.00	39.50	13.00	52.50	5.00	5.50
68	0680	90.00	90.00	37.20	15.30	52.50	5.00	5.50
70	0700	92.00	90.00	44.70	15.30	60.00	5.00	5.50
75	0750	97.00	96.80	44.70	15.30	60.00	5.00	5.50
80	0800	105.00	104.00	44.30	15.70	60.00	5.00	5.50
85	0850	110.00	108.00	44.30	15.70	60.00	5.00	5.50
90	0900	115.00	111.00	49.30	15.70	65.00	5.00	5.50
95	0950	120.00	119.00	49.30	15.70	65.00	5.00	5.50
100	1000	125.00	124.00	49.30	15.70	65.00	5.00	5.50
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.								
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.								

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Vulcan Parallel Spring Balanced Diaphragm Type Seals

Introduction

The A1 to A5 range are elastomeric bellows, bi-directional, parallel spring Mechanical Seals, offering superior design and performance compared to market alternatives. This has been achieved by superior face materials and innovative patented design features. As detailed on the next page.

Applications

Suitable for Pumps, mixers, compressors and other rotary equipment. Often utilised for a diverse range of applications including; water, petrochemical, chemical, food processing, refrigeration and other arduous duties.

Standard Vulcan Parallel Types

Type A1

The A1 is a flexible Seal, suitable for the narrower Seal housing, due to the compact radial cross-sectional design and suiting common European Seal housing standards. The Type A1 has a long working length and is fitted with a Seal head retainer backing plate. The Type A1 is supplied as standard with a Type 20 Boot mounted stationary.

Types A2 and A2H

The A2 Type coil fits over the Seal head, reducing the overall working length, making this Seal suitable for short gland depth applications, fitting to common European Seal housing standards. Type A2H has a Type 21 'O'-Ring stationary as standard, whilst the Type A2 comes with a Type 20 Boot mounted seat.

Types A4 and A4J

As per the Type A2 Seal but designed to suit common American standard working length and housing dimensions. Type A4J has the Type 31 'O'-Ring mounted stationary as standard, whilst the Type A4 comes with a Type 11 Boot mounted seat.

Types A5 and A5J

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 A5J has the Type 31 'O'-Ring mounted stationary as standard, whilst the Type A5 comes with a Type 11 Boot mounted seat.

Section 6

Vulcan Design Advantages

Mechanical Drive

We refer to this family of Type A1 - A5 Seals as the Ax range.

The mechanical drive mechanism of the Ax range incorporates a patented 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. As a result, the drive ring does not cut nor groove into the Seal head retainer.

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 entire Seal head assembly.

Balanced

The Vulcan Ax range Seals are hydraulically 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. Competitor's Seals are not balanced throughout this 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 I.D.'s are very close to the shaft and can be problematic, due to bellows extrusion and shaft contact / stiction.

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.

Base Plate Retaining

Types A2 to A5 Seal 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 upon chemical attack, the glue can migrate into Seal components and product.

Seal Type	Crane ® Equivalent
A1	1A (UK / EUROPEAN)
A2	Type 2 (UK / EUROPEAN)
A4	Type 2 (american DIMENSIONS)
A5	Type 1 (american DIMENSIONS)

Vulcan® Type A1 - A5 Seals PV Chart

Please refer to the PV Chart shown on page 49.

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 and spinning leading to Seal failure

Vulcan Type A4

Common Competitor

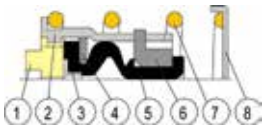
Mechanical Face Loading

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.

Material Quality and Reliability

A wide selection of first-class face materials and elastomers are readily available as standard. These ensure excellent performance and have been verified through extensive testing.

Type A1



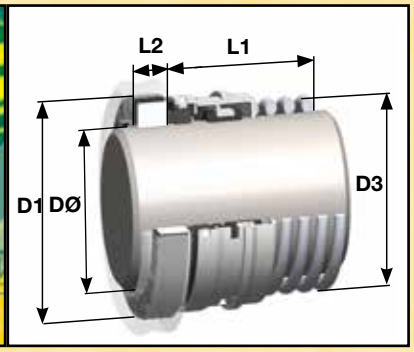
Type A2

Type A4

Type A5

No	Description
1	Face
2	Retainer
3	Bellows Disk
4	Plate
5	Bellows
6	Drive Ring
7	Coil
8	Backing Plate
9	Sleeve

Type A1



Robust, long working length, highly accommodating and reliable, rubber diaphragm balanced Seal, which provides enhanced Seal capability, performance and life. The Type A1 has a retainer backing plate, a narrow profile and a no spring base plate. Also now available for metric shafts.

Improved design features further enhance this popular Seal. Available with a Type 20 Boot-mounted seat as standard, suitable for originally common UK housing dimensions.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
	12*	0120	27.79	23.90	43.66	8.74
0.500		0127	27.79	23.90	43.66	8.74
	14*	0140	30.95	27.07	43.66	10.32
0.625		0158	30.95	27.07	43.66	10.32
	16	0160	30.95	27.07	43.66	10.32
	18*	0180	34.15	30.25	43.66	10.32
0.750	19	0191	34.15	30.25	43.66	10.32
	20*	0200	35.70	33.42	43.66	10.32
	22	0220	37.30	33.42	43.66	10.32
0.875		0222	37.30	33.42	43.66	10.32
	24*	0240	40.50	38.10	43.66	10.32
	25*	0250	40.50	38.10	43.66	10.32
1.000		0254	40.50	38.10	43.66	10.32
	28*	0280	47.63	41.28	60.33	11.99
1.125		0286	47.63	41.28	60.33	11.99
	30*	0300	50.80	46.00	60.33	11.99
1.250		0317	50.80	46.00	60.33	11.99
	32	0320	50.80	46.00	60.33	11.99
	33*	0330	53.98	48.68	60.33	11.99
1.375		0349	53.98	48.68	60.33	11.99
	35	0350	53.98	48.68	60.33	11.99
	38	0380	57.15	51.85	60.33	11.99
1.500		0381	57.15	51.85	60.33	11.99
	40*	0400	60.33	58.10	60.33	11.99
1.625		0412	60.33	58.10	60.33	11.99
	43*	0430	63.50	61.67	70.64	11.99
1.750		0444	63.50	61.67	70.64	11.99
	45*	0450	63.50	61.67	70.64	11.99
1.875		0476	66.68	64.84	70.64	11.99
	48*	0480	66.68	64.84	70.64	11.99
	50*	0500	69.85	68.01	70.64	13.50
2.000		0508	69.85	68.01	70.64	13.50
	53*	0530	73.03	72.02	70.64	13.50
2.125		0539	73.03	72.02	70.64	13.50
	55*	0550	76.20	75.30	70.64	13.50
2.250		0571	76.20	75.30	70.64	13.50
	60	0600	79.38	78.37	70.64	13.50
2.375		0603	79.38	78.37	70.64	13.50
	63*	0630	82.55	81.54	70.64	13.50
2.500		0635	82.55	81.54	70.64	13.50
	65*	0650	92.08	86.22	69.85	15.88
2.625		0666	92.08	86.22	69.85	15.88
2.750		0698	95.25	89.40	69.85	15.88
	70	0700	95.25	89.40	69.85	15.88
2.875		0730	98.43	92.57	73.03	15.88
	75*	0750	101.60	95.75	73.03	15.88
3.000		0762	101.60	95.75	73.03	15.88

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.

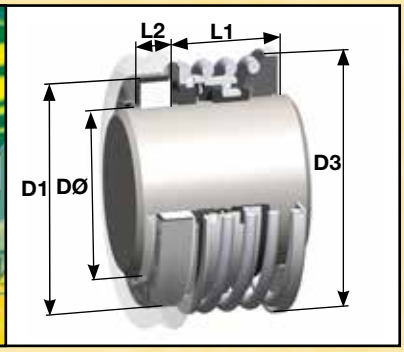
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile			Guaranteed Stock Metallurgy: 304SS		

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types A2 / A2H



Robust, short working length, highly accommodating and reliable, rubber diaphragm balanced Seal, which provides enhanced Seal capability, performance and life. The A2 Type coil fits over the Seal head, reducing the overall working length, making this Seal suitable for short gland depth applications. Improved design features further enhance this popular Seal. Available with a Type 20 Boot-mtd seat as standard Type A2, or with a Type 21 'O'-Ring mounted stationary as Type A2H, both Types suitable for imperial dimensions.

Vulcan Standard Sizes

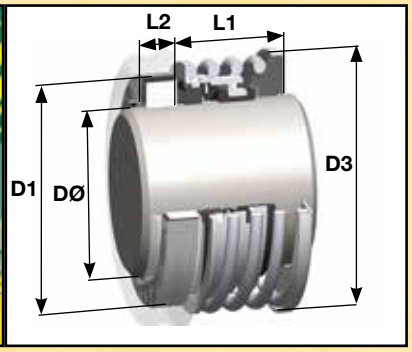
Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
	12*	0120	27.79	30.20	25.40	8.74
0.500		0127	27.79	30.20	25.40	8.74
	13*	0130	27.79	30.20	25.40	8.74
	14*	0140	30.95	33.37	25.40	10.32
	15*	0150	30.95	33.37	25.40	10.32
0.625		0158	30.95	33.37	25.40	10.32
	16	0160	30.95	33.37	25.40	10.32
	18*	0180	34.15	36.55	25.40	10.32
0.750	19	0191	34.15	36.55	25.40	10.32
	20*	0200	35.70	39.72	25.40	10.32
	22	0220	37.30	39.72	25.40	10.32
0.875		0222	37.30	39.72	25.40	10.32
	24*	0240	40.50	44.30	25.40	10.32
	25*	0250	40.50	44.30	25.40	10.32
1.000		0254	40.50	44.30	25.40	10.32
	28*	0280	47.63	49.07	33.34	11.99
1.125		0286	47.63	49.07	33.34	11.99
	30*	0300	50.80	53.40	33.34	11.99
1.250		0317	50.80	53.40	33.34	11.99
	32	0320	50.80	53.40	33.34	11.99
	33*	0330	53.98	57.58	33.34	11.99
1.375		0349	53.98	57.58	33.34	11.99
	35	0350	53.98	57.58	33.34	11.99
	38	0380	57.15	60.75	33.34	11.99
1.500		0381	57.15	60.75	33.34	11.99
	40*	0400	60.33	67.40	33.34	11.99
1.625		0412	60.33	67.40	33.34	11.99
	43*	0430	63.50	71.97	40.48	11.99
1.750		0444	63.50	71.97	40.48	11.99
	45*	0450	63.50	71.97	40.48	11.99
1.875		0476	66.68	75.14	40.48	11.99
	48*	0480	66.68	75.14	40.48	11.99
	50*	0500	69.85	78.31	40.48	13.50
2.000		0508	69.85	78.31	40.48	13.50
	53*	0530	73.03	82.72	40.48	13.50
2.125		0539	73.03	82.72	40.48	13.50
	55*	0550	76.20	86.00	40.48	13.50
2.250		0571	76.20	86.00	40.48	13.50
	60	0600	79.38	89.00	40.48	13.50
2.375		0603	79.38	89.00	40.48	13.50
	63*	0630	82.55	92.24	40.48	13.50
2.500		0635	82.55	92.24	40.48	13.50
	65*	0650	92.08	97.92	49.21	15.88
2.625		0666	92.08	97.92	49.21	15.88
2.750		0698	95.25	101.10	49.21	15.88
	70	0700	95.25	101.60	49.21	15.88
2.875		0730	98.43	105.27	52.39	15.88
	75*	0750	101.60	108.45	52.39	15.88
3.000		0762	101.60	108.45	52.39	15.88
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.						
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.						

Type A2					
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Metal	X	Non-standard: Please use alternative shown here or enquire			
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Soft vs 1ST alt	X	Non-standard: Please use alternative shown here or enquire			
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Type A2H					
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Metal	Q	M106K Carbon	C	304 Stainless Steel	Q
Soft vs Metal	F	M106K Carbon	C	Ni-Resist*	F
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Soft vs 1ST alt	E	M106K Carbon	C	Tungsten Carbide*	H
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types A4 / A4J



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 originally American standard housing and working length dimensions. Available with a Type 11 Boot-mounted seat as Type A4, or with a Type 31 'O'-Ring mounted stationary as Type A4J.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Size Code	D1		D3		L1		L2	
		in	mm	in	mm	in	mm	in	mm
0.500	0127	1.000	25.40	1.187	30.14	0.813	20.64	0.312	7.93
0.625	0158	1.250	31.75	1.312	33.32	0.875	22.23	0.405	10.28
0.750	0191	1.375	34.93	1.438	36.52	0.875	22.23	0.405	10.28
0.875	0222	1.500	38.10	1.564	39.72	0.937	23.80	0.405	10.28
1.000	0254	1.625	41.28	1.783	45.30	1.000	25.40	0.437	11.10
1.125	0286	1.750	44.44	1.908	48.47	1.062	26.97	0.437	11.10
1.250	0317	1.875	47.63	2.079	52.80	1.062	26.97	0.437	11.10
1.375	0349	2.000	50.80	2.204	55.98	1.125	28.58	0.437	11.10
1.500	0381	2.125	53.98	2.329	59.15	1.125	28.58	0.437	11.10
1.625	0412	2.375	60.33	2.636	66.96	1.375	34.93	0.500	12.70
1.750	0444	2.500	63.50	2.761	70.12	1.375	34.93	0.500	12.70
1.875	0476	2.625	66.68	2.880	73.16	1.500	38.10	0.500	12.70
2.000	0508	2.750	69.85	3.011	76.48	1.500	38.10	0.500	12.70
2.125	0539	3.000	76.20	3.256	82.71	1.687	42.85	0.562	14.28
2.250	0571	3.125	79.38	3.381	85.89	1.687	42.85	0.562	14.28
2.375	0603	3.250	82.55	3.506	89.06	1.812	46.02	0.562	14.28
2.500	0635	3.375	85.73	3.631	92.24	1.812	46.02	0.562	14.28
2.625	0666	3.375	85.73	3.875	98.43	1.937	49.20	0.625	15.88
2.750	0698	3.500	88.90	4.000	101.60	1.937	49.20	0.625	15.88
2.875	0730	3.750	95.25	4.125	104.78	2.062	52.37	0.625	15.88
3.000	0762	3.875	98.43	4.250	107.95	2.062	52.37	0.625	15.88
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.									
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.									

Suggested Operating Limits

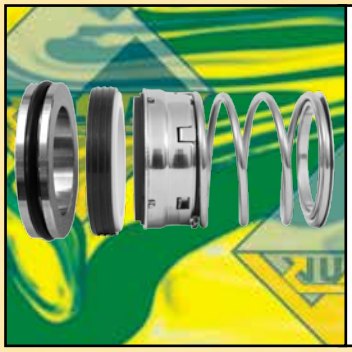
Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

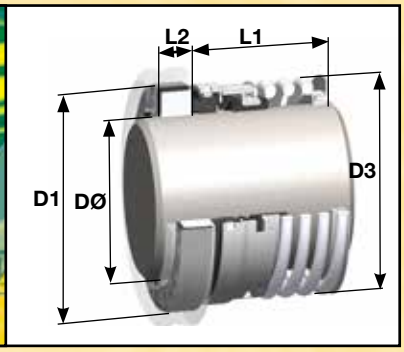
Type A4 Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Metal	X	Non-standard: Please use alternative shown here or enquire			
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Soft vs 1ST alt	X	Non-standard: Please use alternative shown here or enquire			
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile		Guaranteed Stock Metallurgy: 304SS			

Type A4J Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic*	A
Soft vs Metal	Q	M106K Carbon	C	304 Stainless Steel*	Q
Soft vs Metal	F	M106K Carbon	C	Ni-Resist	F
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Soft vs 1ST alt	E	M106K Carbon	C	Tungsten Carbide*	H
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile		Guaranteed Stock Metallurgy: 304SS			

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types A5 / A5J





Robust, long working length, highly accommodating and reliable, rubber diaphragm balanced Seal which provides enhanced Seal capability, performance and life. Improved design features enhance this popular Seal. Suitable for common US standard housing and working length dimensions. Available with Type 11 Boot-mounted seat as Type A5, or with Type 31 'O'-Ring mounted stationary as Type A5J.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Size Code	D1		D3		L1		L2	
		in	mm	in	mm	in	mm	in	mm
0.500	0127	1.000	25.40	0.937	23.80	1.187	30.16	0.312	7.93
0.625	0158	1.250	31.75	1.093	27.76	1.312	33.32	0.405	10.28
0.750	0191	1.375	34.93	1.218	30.94	1.312	33.32	0.405	10.28
0.875	0222	1.500	38.10	1.343	34.11	1.375	34.93	0.405	10.28
1.000	0254	1.625	41.28	1.500	38.10	1.562	39.67	0.437	11.10
1.125	0286	1.750	44.44	1.625	41.28	1.625	41.28	0.437	11.10
1.250	0317	1.875	47.63	1.812	46.02	1.625	41.28	0.437	11.10
1.375	0349	2.000	50.80	1.917	48.68	1.687	42.85	0.437	11.10
1.500	0381	2.125	53.98	2.041	51.85	1.687	42.85	0.437	11.10
1.625	0412	2.375	60.33	2.287	58.10	2.000	50.80	0.500	12.70
1.750	0444	2.500	63.50	2.412	61.27	2.000	50.80	0.500	12.70
1.875	0476	2.625	66.68	2.537	64.44	2.125	53.98	0.500	12.70
2.000	0508	2.750	69.85	2.646	67.21	2.125	53.98	0.500	12.70
2.125	0539	3.000	76.20	2.835	72.02	2.375	60.33	0.562	14.28
2.250	0571	3.125	79.38	2.965	75.30	2.375	60.33	0.562	14.28
2.375	0603	3.250	82.55	3.083	78.30	2.500	63.50	0.562	14.28
2.500	0635	3.375	85.73	3.210	81.54	2.500	63.50	0.562	14.28
2.625	0666	3.375	85.73	3.394	86.22	2.750	69.85	0.625	15.88
2.750	0698	3.500	88.90	3.520	89.40	2.875	73.03	0.625	15.88
2.875	0730	3.750	95.25	3.644	92.57	2.875	73.03	0.625	15.88
3.000	0762	3.875	98.43	3.770	95.75	2.875	73.03	0.625	15.88
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.									
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.									

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Type A5					
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Metal	X	Non-standard: Please use alternative shown here or enquire			
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Soft vs 1ST alt	X	Non-standard: Please use alternative shown here or enquire			
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Type A5J					
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic*	A
Soft vs Metal	Q	M106K Carbon	C	304 Stainless Steel*	Q
Soft vs Metal	F	M106K Carbon	C	Ni-Resist	F
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Soft vs 1ST alt	E	M106K Carbon	C	Tungsten Carbide*	H
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Vulcan Parallel Spring ‘O’-Ring Mounted Seals

Section 7

Introduction

The Vulcan Type 95 to 98 Series (referred to below as the Type 9x range) Mechanical Seals are robust, general purpose, parallel spring, Seals, 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 industrial applications, including; marine, textile, pulp and paper, refrigeration compressors, waste-water treatment etc.

Standard Vulcan® Types

Types 95, 96 and 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.

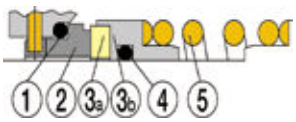
Three versions are available and vary only by the method of providing the drive to the rotary Seal face.

- Type 95 - Drives directly from shaft.
- Type 96 - Consists of the Type 95 components with the addition of a split ring and washer for simple shaft abutment.
- Type 97 - Consists of the Type 95 components with the addition of a grub screw drive collar.

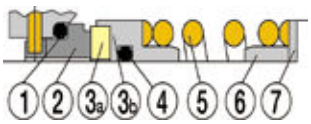
Type 98

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 grub screw 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.

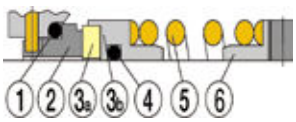
Standard Components



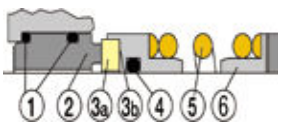
Type 95



Type 96



Type 97



Type 98

No	Description	4	Rotary 'O'-Ring
1	Stationary 'O'-Ring	5	Coil
2	Stationary Seat	6	Split Ring
3a	Rotary Face	7	Washer
3b	Seal Head Retainer	8	Drive Collar with Grub Screws

Vulcan® Design Advantages

Face Material Options

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

The full range of stock materials are shown on each Seal type page following.

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 prolong Seal life.

Some main competitors Seals do not have a linear progression of increasing spring force with shaft size nor optimum face closing forces.

Superior Face Combinations

As is evidenced from face material factors applied to the PV Chart below 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 Vulcan's preferred face combination of Carbon vs Silicon Carbide.

This Carbon vs Reaction Bonded Silicon Carbide 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 demanding, common marine and textile duties?

Vulcan Parallel Spring 'O'-Ring Mounted Type Seals pv Chart

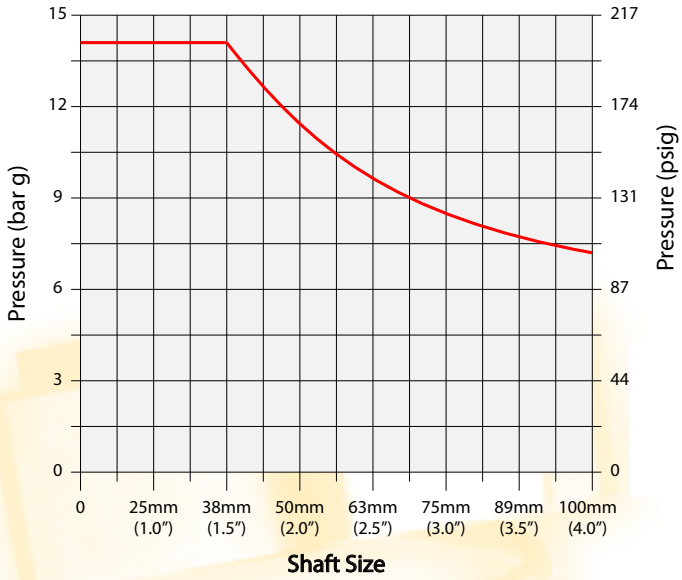
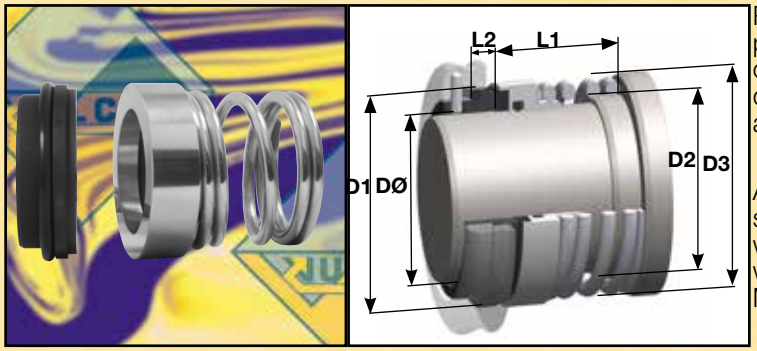


Chart based upon: reaction bonded silicon carbide Seal faces vs Carbon	
95, 96, 97 and 98	

Type 95



Robust, general purpose, unbalanced pusher-type, 'O'-Ring mounted Seal, capable of many shaft-sealing duties. The Type 95 drives directly from the shaft, via a raised area of the shaft.

Available as standard with the Type 95 stationary, with anti-rotation provision and with either Monolithic Stainless Steel head, or with inserted Carbide faces, as per the Face Material Codes shown below.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Slot Width (mm)	Slot Depth (mm)
0.625		0158	28.57	19.05	29.00	24.50	9.00	5.00	5.00
0.750		0191	31.75	22.23	32.50	24.50	9.00	5.00	5.00
	20	0200	33.32	24.00	34.50	27.50	9.00	5.00	5.00
0.875		0222	34.93	25.40	34.93	26.00	9.00	5.00	5.00
	25	0250	39.85	28.57	38.10	30.00	10.00	5.00	5.00
1.000		0254	39.85	28.57	38.10	30.00	10.00	5.00	5.00
	28	0280	43.05	31.75	42.60	31.50	10.00	5.00	5.00
1.125		0286	43.05	31.75	42.60	31.50	10.00	5.00	5.00
	30	0300	44.63	33.32	45.50	31.50	10.00	5.00	5.00
1.250		0317	46.32	34.92	46.20	34.50	10.00	5.00	5.00
	32	0320	46.32	34.92	46.20	34.50	10.00	5.00	5.00
1.375		0349	49.48	38.10	49.50	37.50	10.00	5.00	5.00
	35	0350	49.48	38.10	49.50	37.50	10.00	5.00	5.00
	38	0380	52.56	42.88	52.50	37.50	10.00	5.00	5.00
1.500		0381	52.56	42.88	52.50	37.50	10.00	5.00	5.00
	40	0400	54.25	44.45	55.00	37.50	10.00	5.00	5.00
1.625		0412	55.83	46.02	55.50	37.50	10.00	5.00	5.00
	42	0420	55.83	46.02	55.50	37.50	10.00	5.00	5.00
	44	0440	59.02	49.20	59.20	37.50	10.00	5.00	5.00
1.750		0444	59.02	49.20	59.20	37.50	10.00	5.00	5.00
	45	0450	59.02	49.20	59.20	37.50	10.00	5.00	5.00
1.875		0476	63.68	52.37	59.20	42.50	10.00	5.00	6.50
	50	0500	65.37	53.97	66.00	45.50	10.00	5.00	6.50
2.000		0508	66.85	55.57	66.68	45.50	10.00	5.00	6.50
2.125		0539	70.03	58.72	70.20	47.00	10.00	5.00	6.50
	55	0550	70.03	58.72	70.20	47.00	10.00	5.00	6.50
2.250		0571	73.20	61.90	73.02	47.00	10.00	5.00	6.50
	60	0600	76.38	65.07	77.00	50.50	10.00	5.00	6.50
2.375		0603	76.38	65.07	76.20	50.50	10.00	5.00	6.50
2.500		0635	79.56	68.28	79.38	50.50	10.00	5.00	6.50
	65	0650	81.23	69.85	82.00	53.50	10.00	5.00	6.50
2.625		0666	82.73	71.42	82.55	53.50	10.00	5.00	6.50
2.750		0698	85.90	74.60	86.20	53.50	10.00	5.00	6.50
	70	0700	85.90	74.60	86.20	53.50	10.00	5.00	6.50
2.875		0730	89.08	77.77	90.00	56.50	10.00	5.00	6.50
	75	0750	90.77	79.37	91.50	56.50	10.00	5.00	6.50
3.000		0762	95.43	80.97	95.25	63.00	10.00	5.00	6.50
	80	0800	100.29	85.73	99.50	63.00	10.00	5.00	6.50
3.250		0825	101.78	87.30	101.60	63.00	10.00	5.00	6.50
	85	0850	104.95	89.40	105.50	63.00	10.00	5.00	6.50
3.375		0857	104.95	89.40	104.85	63.00	10.00	5.00	6.50
3.500		0889	108.13	93.67	107.95	63.00	10.00	5.00	6.50
	90	0900	109.82	95.25	110.50	68.00	10.00	5.00	6.50
	95	0950	114.30	100.00	115.50	68.00	10.00	5.00	6.50
	100	1000	119.33	104.77	120.00	68.00	10.00	5.00	6.50
4.000		1016	124.00	107.95	124.50	72.50	10.00	5.00	6.50
	120	1200	142.87	126.00	144.00	78.90	10.00	5.00	6.50

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.

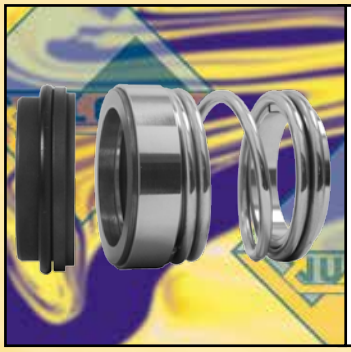
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	P	304 Stainless Steel	P	M106K Carbon	P
Hard vs Hard	T	VES2 RB SiC	S	M106K Carbon	P
Hard vs Soft	U	Tungsten Carbide*	H	M106K Carbon	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard	I	VES2 RB SiC	S	Tungsten Carbide*	H
Hard	J	Tungsten Carbide*	H	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

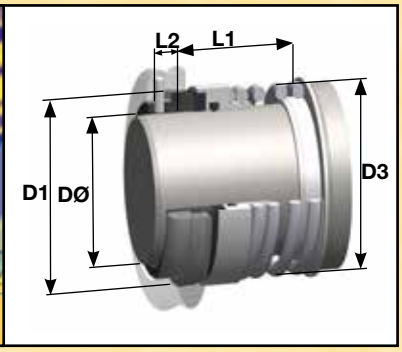
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 96





Robust, general purpose, unbalanced pusher-type, 'O'-Ring mounted Seal, capable of many shaft-sealing duties. The Type 96 drives from the shaft via a split ring, inserted in the coil tail.

Available as standard with the Type 95 stationary, with anti-rotation provision and with either monolithic stainless steel head, or with inserted carbide faces, as per the Face Material Codes shown below.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Slot Width (mm)	Slot Depth (mm)
0.625		0158	28.57	29.00	26.00	9.00	5.00	5.00
0.750		0191	31.75	32.50	26.00	9.00	5.00	5.00
	20	0200	33.32	34.50	29.00	9.00	5.00	5.00
0.875		0222	34.93	34.93	27.50	9.00	5.00	5.00
	25	0250	39.85	38.10	31.50	10.00	5.00	5.00
1.000		0254	39.85	38.10	31.50	10.00	5.00	5.00
	28	0280	43.05	42.60	33.00	10.00	5.00	5.00
1.125		0286	43.05	42.60	33.00	10.00	5.00	5.00
	30	0300	44.63	45.50	33.00	10.00	5.00	5.00
1.250		0317	46.32	46.20	36.00	10.00	5.00	5.00
	32	0320	46.32	46.20	36.00	10.00	5.00	5.00
1.375		0349	49.48	49.50	39.00	10.00	5.00	5.00
	35	0350	49.48	49.50	39.00	10.00	5.00	5.00
	38	0380	52.56	52.50	39.00	10.00	5.00	5.00
1.500		0381	52.56	52.50	39.00	10.00	5.00	5.00
	40	0400	54.25	55.00	39.00	10.00	5.00	5.00
1.625		0412	55.83	55.50	39.00	10.00	5.00	5.00
1.750		0444	59.02	59.20	39.00	10.00	5.00	5.00
	45	0450	59.02	59.20	39.00	10.00	5.00	5.00
1.875		0476	63.68	59.20	44.00	10.00	5.00	6.50
	50	0500	65.37	66.00	47.00	10.00	5.00	6.50
2.000		0508	66.85	66.68	47.00	10.00	5.00	6.50
2.125		0539	70.03	70.20	48.50	10.00	5.00	6.50
	55	0550	70.03	70.20	48.50	10.00	5.00	6.50
2.250		0571	73.20	73.02	48.50	10.00	5.00	6.50
	60	0600	76.38	77.00	52.00	10.00	5.00	6.50
2.375		0603	76.38	76.20	52.00	10.00	5.00	6.50
2.500		0635	79.56	79.38	52.00	10.00	5.00	6.50
	65	0650	81.23	82.00	55.00	10.00	5.00	6.50
2.625		0666	82.73	82.55	55.00	10.00	5.00	6.50
2.750		0698	85.90	86.20	55.00	10.00	5.00	6.50
	70	0700	85.90	86.20	55.00	10.00	5.00	6.50
2.875		0730	89.08	90.00	60.00	10.00	5.00	6.50
	75	0750	90.77	91.50	60.00	10.00	5.00	6.50
3.000		0762	95.43	95.25	66.00	10.00	5.00	6.50
	80	0800	100.29	99.50	66.00	10.00	5.00	6.50
3.250		0825	101.78	101.60	66.00	10.00	5.00	6.50
	85	0850	104.95	105.50	66.00	10.00	5.00	6.50
3.500		0889	108.13	107.95	66.00	10.00	5.00	6.50
	90	0900	109.82	110.50	71.00	10.00	5.00	6.50
	95	0950	114.30	115.50	71.00	10.00	5.00	6.50
	100	1000	119.33	120.00	71.00	10.00	5.00	6.50
4.000		1016	124.00	124.50	75.50	10.00	5.00	6.50
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.								
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.								

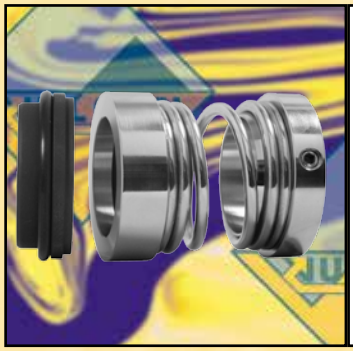
Suggested Operating Limits

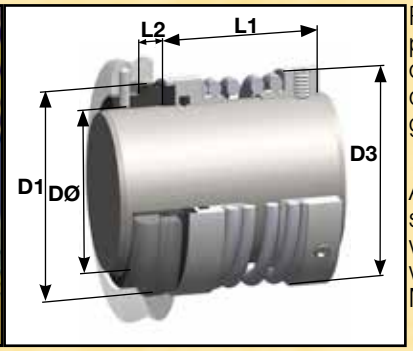
Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	P	304 Stainless Steel	P	M106K Carbon	P
Hard vs Hard	T	VES2 RB SiC	S	M106K Carbon	P
Hard vs Soft	U	Tungsten Carbide*	H	M106K Carbon	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard	I	VES2 RB SiC	S	Tungsten Carbide*	H
Hard	J	Tungsten Carbide*	H	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 97





Robust, general purpose, unbalanced pusher-type 'O'-Ring mounted Seal capable of many shaft-sealing duties. The Type 97 drives from the shaft, via the drive collar with grub screws, inserted in the spring coil tail.

Available as standard with the Type 95 stationary, with anti-rotation provision and with either Monolithic Stainless Steel head, or with inserted Carbide faces, as per the Face Material Codes shown below.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Slot Width (mm)	Slot Depth (mm)
0.625		0158	28.57	29.00	32.50	9.00	5.00	5.00
0.750		0191	31.75	32.50	32.50	9.00	5.00	5.00
	20	0200	33.32	34.50	35.50	9.00	5.00	5.00
0.875		0222	34.93	34.93	35.50	9.00	5.00	5.00
	25	0250	39.85	38.10	39.00	10.00	5.00	5.00
1.000		0254	39.85	38.10	39.00	10.00	5.00	5.00
	28	0280	43.05	42.60	41.00	10.00	5.00	5.00
1.125		0286	43.05	42.60	41.00	10.00	5.00	5.00
	30	0300	44.63	45.50	41.00	10.00	5.00	5.00
1.250		0317	46.32	46.20	44.00	10.00	5.00	5.00
	32	0320	46.32	46.20	44.00	10.00	5.00	5.00
1.375		0349	49.48	49.50	47.00	10.00	5.00	5.00
	35	0350	49.48	49.50	47.00	10.00	5.00	5.00
	38	0380	52.56	52.50	47.00	10.00	5.00	5.00
1.500		0381	52.56	52.50	47.00	10.00	5.00	5.00
	40	0400	54.25	55.00	47.00	10.00	5.00	5.00
1.625		0412	55.83	55.50	47.00	10.00	5.00	5.00
	42	0420	55.83	55.50	47.00	10.00	5.00	5.00
1.750		0444	59.02	59.20	47.00	10.00	5.00	5.00
	45	0450	59.02	59.20	47.00	10.00	5.00	5.00
1.875		0476	63.68	59.20	55.00	10.00	5.00	6.50
	50	0500	65.37	66.00	58.50	10.00	5.00	6.50
2.000		0508	66.85	66.68	58.50	10.00	5.00	6.50
2.125		0539	70.03	70.20	60.00	10.00	5.00	6.50
	55	0550	70.03	70.20	60.00	10.00	5.00	6.50
2.250		0571	73.20	73.02	60.00	10.00	5.00	6.50
	60	0600	76.38	77.00	63.00	10.00	5.00	6.50
2.375		0603	76.38	76.20	63.00	10.00	5.00	6.50
2.500		0635	79.56	79.38	63.00	10.00	5.00	6.50
	65	0650	81.23	82.00	66.00	10.00	5.00	6.50
2.625		0666	82.73	82.55	66.00	10.00	5.00	6.50
2.750		0698	85.90	86.20	66.00	10.00	5.00	6.50
	70	0700	85.90	86.20	66.00	10.00	5.00	6.50
2.875		0730	89.08	90.00	71.00	10.00	5.00	6.50
	75	0750	90.77	91.50	71.00	10.00	5.00	6.50
3.000		0762	95.43	95.25	77.50	10.00	5.00	6.50
	80	0800	100.29	99.50	77.50	10.00	5.00	6.50
3.250		0825	101.78	101.60	77.50	10.00	5.00	6.50
	85	0850	104.95	105.50	77.50	10.00	5.00	6.50
3.500		0889	108.13	107.95	77.50	10.00	5.00	6.50
	90	0900	109.82	110.50	82.00	10.00	5.00	6.50
	95	0950	114.30	115.50	82.00	10.00	5.00	6.50
	100	1000	119.33	120.00	82.00	10.00	5.00	6.50
4.000		1016	124.00	124.50	88.50	10.00	5.00	6.50
	115	1150	136.52	137.50	88.50	10.00	5.00	6.50
	120	1200	142.87	144.00	95.00	10.00	5.00	6.50

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.

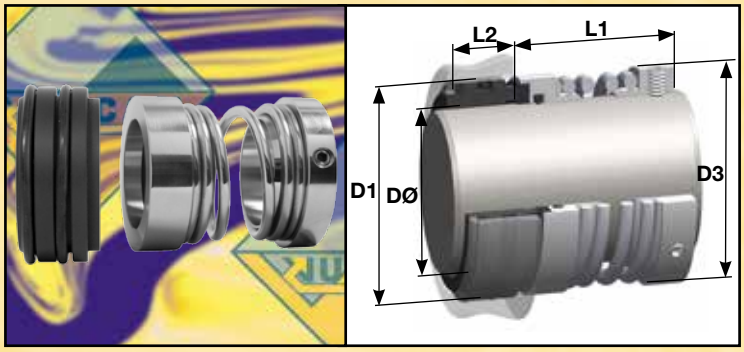
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	P	304 Stainless Steel	P	M106K Carbon	P
Hard vs Hard	T	VES2 RB SiC	S	M106K Carbon	P
Hard vs Soft	U	Tungsten Carbide*	H	M106K Carbon	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard	I	VES2 RB SiC	S	Tungsten Carbide*	H
Hard	J	Tungsten Carbide*	H	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 98



Robust, general purpose, unbalanced pusher-type, 'O'-Ring mounted Seal, very similar to the Type 97, but with a double elastomeric Type 98 'O'-Ring mounted stationary and dimensions to suit common Asian marine Pump dimensions.

The Type 98 drives from the shaft, via the drive collar with grub screws, inserted in the spring coil end.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
20	0200	37.00	34.50	38.00	23.00
22	0220	39.00	34.93	38.00	23.00
25	0250	40.00	38.10	38.00	23.00
28	0280	44.00	42.00	40.00	23.00
30	0300	47.00	43.50	40.00	24.00
32	0320	48.00	47.00	40.00	24.00
35	0350	51.00	50.00	40.00	24.00
38	0380	54.00	53.00	45.00	24.00
40	0400	57.00	55.00	45.00	24.00
42	0420	60.50	55.50	50.00	24.00
45	0450	61.00	60.00	50.00	24.00
48	0480	64.00	62.00	55.00	24.00
50	0500	67.00	66.00	55.00	24.00
52	0520	70.00	68.00	58.00	24.00
55	0550	73.00	71.00	58.00	24.00
58	0580	76.00	74.00	58.00	24.00
60	0600	80.00	77.00	60.00	26.00
62	0620	83.00	78.00	60.00	26.00
65	0650	86.00	82.00	62.00	26.00
68	0680	89.00	84.00	62.00	26.00
70	0700	89.00	87.00	65.00	26.00
75*	0750	95.00	91.50	65.00	26.00
80*	0800	99.00	99.50	70.00	26.00
85*	0850	105.00	105.50	70.00	26.00
90*	0900	111.00	110.50	70.00	26.00
95*	0950	114.00	115.50	75.00	26.00
100*	1000	118.00	120.00	75.00	26.00
105*	1050	132.00	128.00	75.00	28.00
110*	1100	137.00	133.00	80.00	28.00
115*	1150	140.00	137.50	80.00	28.00
120*	1200	147.00	144.00	85.00	28.00
125*	1250	150.00	149.00	85.00	28.00
130*	1300	156.00	154.00	85.00	28.00
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.					
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in many sizes.					

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	P	304 Stainless Steel	P	M106K Carbon	P
Hard vs Hard	T	VES2 RB SiC	S	M106K Carbon	P
Hard vs Soft	U	Tungsten Carbide*	H	M106K Carbon	P
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard	I	VES2 RB SiC	S	Tungsten Carbide*	H
Hard	J	Tungsten Carbide*	H	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Vulcan Multiple Spring Seals

Section 8

16xx Series Introduction (XX = 09, 45 OR 59)

Vulcan's Types 1609 / 1645 / 1659 Series Range of Multi-Spring 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 Stationaries, most commonly our Type 25 V Seat. Balanced stepped-shaft 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 Seals in this Range are ideally suited for corrosive duties and are commonly utilized in chemical industries, 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 Vulcan 16xx Types

1609 Series

Standard Multi-Spring, grub screwed Seal, available in a wide variety of face and secondary Seal, materials and designs.

1659 Series

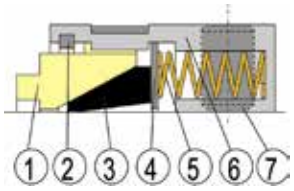
As above, but compact design complies to DIN24960 (EN12756) and ISO 3069 standards.

1645 Series

Thin profiled, Multi-Spring, grub screw Mounted Seal, conforming to ANSI B 73 for American standard equipment.

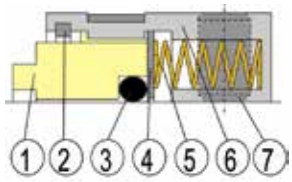
Standard Components

tYPE 16XX



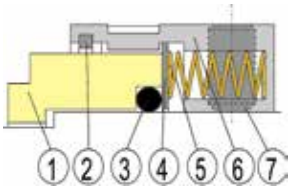
Standard Wedge Type

tYPE 16XXs



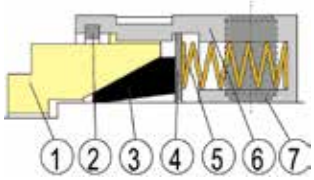
Standard 'O'-Ring Type 'S'

Type 16xxbs



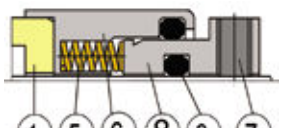
Balanced 'O'-Ring Type 'BS'

Type 16xxb



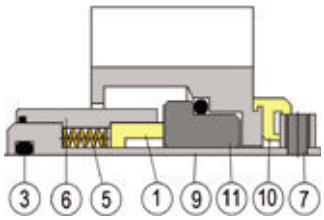
Balanced Wedge Type 'B'

Type 40



Balanced 'O'-Ring Type

Type 52B/55B/56B



Balanced Cartridge Type

No	Description	4	Plate
1	Face	5	Coils
2	Circlip	6	Retainer
3	Wedge/'O'-Ring	7	Grub Screws
8	Inner Barrel	9	Sleeve
10	Spacer	11	Seat

Vulcan Design Advantages; 16xx Series

Materials

Grade FH82Z5 Triple Phenolic Resin Impregnated Carbon has been adopted by Vulcan, as our standard for this 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, improving chemical resistance capabilities. Please refer to our data-sheets for all Seal material alternatives, such as Carbide Seal faces and 'O'-Ring material options.

Improved Design

These Vulcan 1609 / 1645 / 1659 Series are superior performance Seals, specifically designed to incorporate a number of improvements, compared to the original Seal designs and other direct copies.

No awkward setting pieces - Our designs have eliminated the setting clips, making the Seals easier and more reliable to fit.

Improved face loading values - Vulcan's proven face loading designs are superior to competitor designs with higher loading values, which are detrimental to Seal performance and life.

Reliability

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

Vulcan Type 40

Vulcan Type 40 is an internally Balanced, Multiple-Spring internal Seal of advanced robust design and proficient performance. Versatile and economical, the Type 40 can be supplied with a wide Range of elastomers, face materials and be installed with a variety of Stationaries.

Vulcan Type 52B/ 55B/ 56B

The Vulcan Type 52B, 55B, 56B are designed to conveniently replace and upgrade, unbalanced component Seals or Gland Packings with a Multiple-Spring, Balanced cartridge Seal assembly. With pressure Balanced Seal faces, anti clogging and spring protecting features, these offers improved Seal performance, capability and life, combined with economical cost and ease of fitting.

Vulcan multiple spring Type Seals PV Chart

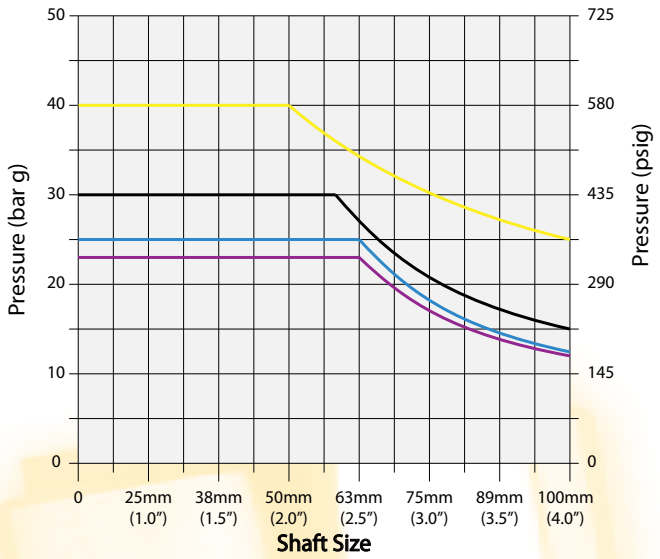
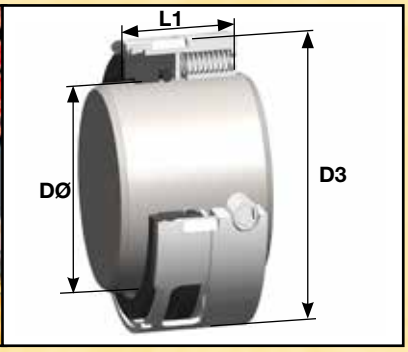


Chart based upon: Carbon vs reaction bonded Silicon Carbide Seal faces			
	16XX, 16XXS		16XXB,16XXBS
	40		52B, 55B, 56B

Types 1609 / 1609S / 1609B* / 1609BS*



Multiple Spring Seal with a highly effective design, commonly used in chemical and petrochemical duties. Frequently fitted along with the Type 25 clamped Stationary. Type 1609 incorporates a PTFE Wedge secondary Seal, Type 1609S is an 'O'-Ring Mounted design. PTFE Back-Up Ring is recommended to be specified for higher pressure 'O'-Ring applications. Types 1609B and 1609BS are designed for stepped shafts.

The stock size code is always set by the shaft size under the Seal body.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Seal / Assembly Stock Code	Seat Size Fitted (1609B/ BS Only)	D3		Type 1609/S L1		Type 1609B/BS L1	
				in	mm	in	mm	in	mm
0.625		0158	0127	1.209	30.70	0.750	19.05	1.062	26.97
0.750		0191	0158	1.366	34.70	0.875	22.23	1.187	30.14
	20	0200	N/a	1.406	35.70	0.937	23.81	N/a	N/a
	22	0220	N/a	1.457	37.00	0.937	23.81	N/a	N/a
0.875		0222	0191	1.496	38.00	0.937	23.81	1.250	31.75
	24	0240	N/a	1.563	39.70	1.000	25.40	N/a	N/a
	25	0250	N/a	1.614	41.00	1.000	25.40	N/a	N/a
1.000		0254	0222	1.614	41.00	1.000	25.40	1.313	33.34
	28	0280	N/a	1.752	44.50	1.059	26.90	N/a	N/a
1.125		0286	0254	1.732	44.00	1.059	26.90	1.375	34.93
	30	0300	N/a	1.870	47.50	1.059	26.90	N/a	N/a
1.250		0317	0286	1.929	49.00	1.059	26.90	1.375	34.93
	32	0320	N/a	1.996	50.70	1.125	28.58	N/a	N/a
1.375		0349	0286	2.047	52.00	1.125	28.58	1.437	36.50
	35	0350	N/a	2.047	52.00	1.125	28.58	N/a	N/a
	38	0380	N/a	2.189	55.60	1.125	28.58	N/a	N/a
1.500		0381	0317	2.189	55.60	1.125	28.58	1.437	36.50
	40	0400	N/a	2.358	59.90	1.375	34.93	N/a	N/a
1.625		0412	0349	2.402	61.00	1.375	34.93	1.750	44.45
1.750		0444	0381	2.531	64.30	1.375	34.93	1.750	44.45
	45	0450	N/a	2.555	64.90	1.375	34.93	N/a	N/a
1.875		0476	0412	2.563	65.10	1.375	34.93	1.750	44.45
	48	0480	N/a	2.563	65.10	1.375	34.93	N/a	N/a
	50	0500	N/a	2.751	69.90	1.375	34.93	N/a	N/a
2.000		0508	0444	2.783	70.70	1.375	34.93	1.750	44.45
2.125		0539	0476	3.031	77.00	1.687	42.86	2.063	52.39
	55	0550	N/a	3.078	78.20	1.687	42.86	N/a	N/a
2.250		0571	0508	3.154	80.10	1.687	42.86	2.063	52.39
	60	0600	N/a	3.272	83.10	1.687	42.86	N/a	N/a
2.375		0603	0539	3.272	83.10	1.687	42.86	2.063	52.39
2.500		0635	0571	3.409	86.60	1.687	42.86	2.063	52.39
	65	0650	N/a	3.461	87.90	1.687	42.86	N/a	N/a
2.625		0666	0603	3.528	89.60	1.687	42.86	2.063	52.39
2.750		0698	0635	3.654	92.80	1.687	42.86	2.063	52.39
	70	0700	N/a	3.654	92.80	1.687	42.86	N/a	N/a
2.875		0730	0666	3.776	95.90	1.687	42.86	2.063	52.39
	75	0750	N/a	3.787	96.20	1.687	42.86	N/a	N/a
3.000		0762	0698	3.846	97.70	1.687	42.86	2.063	52.39
3.125*		0794	0730	3.965	100.70	1.687	42.86	2.063	52.39
	80*	0800	N/a	3.984	101.20	1.687	42.86	N/a	N/a
3.250*		0825	0762	4.154	105.50	1.687	42.86	2.063	52.39
	85*	0850	N/a	4.240	107.70	1.687	42.86	N/a	N/a
3.375*		0857	0794	4.280	108.70	1.687	42.86	2.063	52.39
3.500*		0889	0825	4.409	112.00	1.687	42.86	2.063	52.39
	90*	0900	N/a	4.441	112.80	1.687	42.86	N/a	N/a
3.625*		0921	0857	4.528	115.00	1.687	42.86	2.063	52.39
	95*	0950	N/a	4.634	117.70	1.687	42.86	N/a	N/a
3.750*		0953	0889	4.654	118.20	1.687	42.86	2.063	52.39
3.875*		0984	0921	4.776	121.30	1.687	42.86	2.063	52.39
	100*	1000	N/a	4.831	122.70	1.687	42.86	N/a	N/a
4.000*		1016	0953	4.906	124.60	1.687	42.86	2.063	52.39

All Type, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.

However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in some sizes.

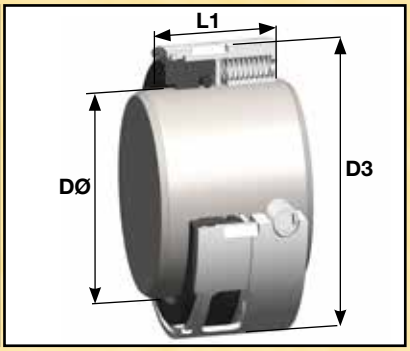
Guaranteed Stock Materials and Face Material Code					
Seal And Seat Assembly		Rotary face		Stationary face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	IB	Carbon FH82Z5	IB	99% Ceramic	A
Soft vs Hard	IS	Carbon FH82Z5	IB	VES2 RB SiC	S
Hard vs Soft	SG	WNV2 SiNSiC Carbide	R	99% Ceramic	A
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: PTFE Wedge, Viton™, E.P. And Nitrile				Guaranteed Stock Metallurgy: 316SS	

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 1645 / 1645S / 1645B* / 1645BS*



Narrow profile, multiple spring Seal, designed for the common American ANSI B73-1974 Centrifugal Pump standard. Frequently fitted with Type 23 PTFE Boot Stationary. Type 1645 utilizes a PTFE Wedge secondary Seal, Type 1645S is 'O'-Ring Mounted design, Types 1645B and 1645BS are balanced designs for stepped-shafts. PTFE Back-Up Ring is recommended for higher pressure 'O'-Ring applications.

The stock size code is always set by the shaft size under the Seal body.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Seal / Assembly Stock Code	Seat Size Fitted (1645B/BS Only)	D3		Type 1645/S L1		Type 1645B/BS L1	
			in	mm	in	mm	in	mm
0.500	0127	N/a	0.937	23.80	0.937	23.80	N/a	N/a
0.625	0158	N/a	1.063	27.00	0.937	23.80	N/a	N/a
0.750	0191	0158	1.189	30.20	0.937	23.80	1.250	31.75
0.875	0222	0191	1.315	33.40	0.937	23.80	1.250	31.75
1.000	0254	0222	1.437	36.50	1.000	25.40	1.312	33.32
1.125	0286	0254	1.563	39.70	1.000	25.40	1.375	34.93
1.250	0317	0286	1.689	42.90	1.000	25.40	1.375	34.93
1.375	0349	0286	1.941	49.30	1.375	34.93	1.685	42.80
1.500	0381	0317	1.941	49.30	1.125	28.58	1.437	36.50
1.625	0412	0349	2.260	57.40	1.157	29.40	1.594	40.50
1.750	0444	0381	2.315	58.80	1.375	34.93	1.750	44.45
1.875	0476	0412	2.500	63.50	1.375	34.93	1.750	44.45
2.000	0508	0444	2.626	66.70	1.375	34.93	1.750	44.45
2.125	0539	0476	2.815	71.50	1.687	42.86	2.063	52.39
2.250	0571	0508	2.846	72.30	1.375	34.93	1.749	44.43
2.375	0603	0539	3.008	76.40	1.687	42.86	2.063	52.39
2.500	0635	0571	3.126	79.40	1.375	34.93	1.749	44.43
2.625	0666	0603	3.252	82.60	1.687	42.86	2.063	52.39
2.750	0698	0635	3.374	85.70	1.687	42.86	2.063	52.39
2.875	0730	0666	3.500	88.90	1.687	42.86	2.063	52.39
3.000	0762	0698	3.626	92.10	1.687	42.86	2.063	52.39
3.125*	0794*	0730	3.752	95.30	1.687	42.86	2.063	52.39
3.250*	0825*	0762	3.874	98.40	1.687	42.86	2.063	52.39
3.375*	0857*	0793	4.000	101.60	1.687	42.86	2.063	52.39
3.500*	0889*	0825	4.126	104.80	1.687	42.86	2.063	52.39
3.625*	0921*	0857	4.252	108.00	1.687	42.86	2.063	52.39
3.750*	0953*	0889	4.374	111.10	1.687	42.86	2.063	52.39
3.875*	0984*	0921	4.500	114.30	1.687	42.86	2.063	52.39
4.000*	1016*	0952	4.626	117.50	1.687	42.86	2.063	52.39
All Type, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.								
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in some sizes.								

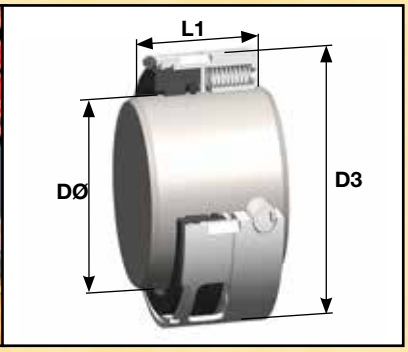
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Material Code					
Seal And Seat Assembly		Rotary face		Stationary face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	IB	Carbon FH82Z5	IB	99% Ceramic	A
Soft vs Hard	IS	Carbon FH82Z5	IB	VES2 RB SiC	S
Hard vs Soft	SG	WNV2 SiNSiC Carbide	R	99% Ceramic	A
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: PTFE Wedge, Viton™, E.P. And Nitrile				Guaranteed Stock Metallurgy: 316SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 1659 / 1659S / 1659B* / 1659BS*



Narrow profile, metric shaft, multiple spring Seal with a highly efficient design.

These Seals are frequently fitted with Type 24 DIN Long 'O'-Ring stationaries, see the opposite Page. Type 1659 incorporates a PTFE Wedge secondary Seal, Type 1659S is an 'O'-Ring Mounted design. Types 1659B and 1659BS are balanced designs for stepped-shafts.PTFE Back-Up Ring is recommended for higher pressure 'O'-Ring applications. The stock size code is always set by the shaft size under the Seal body.

Vulcan Standard Sizes

Metric Shaft Size DØ	Seal / Assembly Stock Code	Seat Size Fitted (1659B/BS Only)	D3 (mm)	Type 1659/SL1 (mm)	Type 1659B/ BSL1 (mm)
16	0160	N/a	26.00	23.00	N/a
18	0180	0140	32.00	24.00	30.50
20	0200	0160	34.50	24.00	30.50
22	0220	0180	36.50	24.00	31.50
24	0240	0200	38.60	26.70	31.50
25	0250	N/a	40.00	27.00	N/a
28	0280	0240	43.00	30.00	34.50
30	0300	0250	45.00	30.50	34.50
32	0320	N/a	47.10	30.50	N/a
33	0330	0280	48.20	30.50	37.50
35	0350	0300	50.00	30.50	38.00
38	0380	0330	54.00	32.00	38.00
40	0400	0350	56.00	32.00	38.00
43	0430	0380	59.00	32.00	39.50
45	0450	0400	61.00	32.00	39.50
48	0480	0430	64.20	32.00	39.50
50	0500	0450	66.30	34.00	39.50
53	0530	0480	69.70	34.00	39.50
55	0550	0500	70.80	34.00	44.00
58	0580	0530	78.00	39.00	44.00
60	0600	0550	80.10	39.00	44.00
63	0630	0580	85.20	39.00	49.00
65	0650	0600	85.20	39.00	49.00
68	0680	0630	87.80	39.00	49.00
70	0700	0650	90.00	45.50	49.00
75*	0750	0700	95.00	45.50	55.50
80*	0800	0750	104.10	45.00	55.50
85*	0850	0800	109.30	45.00	55.00
90*	0900	0850	114.00	50.00	60.00
95*	0950	0900	119.20	50.00	60.00
100*	1000	0950	124.10	50.00	60.00
All Type, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.					
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in some sizes.					

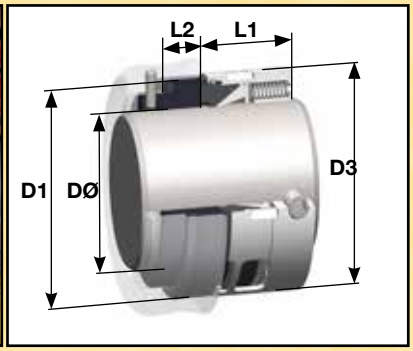
Guaranteed Stock Materials and Face Material Code					
Seal Only Assembly		Rotary face		Stationary face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	IB	Carbon FH82Z5	IB	N/a	X
Hard	R	WNV2 SiNSiC Carbide	R	N/a	X
Hard 1st alt	H	Tungsten Carbide*	H	N/a	X
Guaranteed Stock Elastomers: PTFE Wedge, Viton™, E.P. And Nitrile		Guaranteed Stock Metallurgy: 316SS			

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 1659L / 1659SL / 1659BSL*



Narrow profile, multiple spring Rotary with standard Type 24 DIN LONG Stationary to DIN dimensions with anti-rotation provision. This combination is widely utilized in many chemical duties. Type 1659L incorporates a PTFE .Wedge secondary Seal. Type 1659SL is an 'O'-Ring Mounted Rotary design, with Type 1659BSL as the balanced stepped-shaft version. PTFE Back-Up Ring is recommended for higher pressure 'O'-Ring applications. The stock size code is always set by the shaft size under the Seal body.

Vulcan Standard Sizes

Metric Shaft Size DØ	Seal Assembly Stock Code	Seat Size Fitted (1659BSL Only)	1659L /1659SL			D3 (mm)	1659BSL		
			D1 (mm)	L1 (mm)	L2 (mm)		D1 (mm)	L1 (mm)	L2 (mm)
16	0160	N/a	27.00	23.00	8.60	26.00	N/a	N/a	N/a
18	0180	0140	33.00	24.00	10.00	32.00	25.00	30.50	8.60
20	0200	0160	35.00	24.00	10.00	34.50	27.00	30.50	8.60
22	0220	0180	37.00	24.00	10.00	36.50	33.00	31.50	10.00
24	0240	0200	39.00	26.70	10.00	38.60	35.00	31.50	10.00
25	0250	N/a	40.00	27.00	10.00	40.00	N/a	N/a	N/a
28	0280	0240	43.00	30.00	10.00	43.00	39.00	34.20	10.00
30	0300	0250	45.00	30.50	10.00	45.00	40.00	34.50	10.00
32	0320	N/a	48.00	30.50	10.00	47.10	N/a	N/a	N/a
33	0330	0280	48.00	30.50	10.00	48.20	43.00	37.50	10.00
35	0350	0300	50.00	30.50	10.00	50.00	45.00	38.00	10.00
38	0380	0330	56.00	32.00	11.00	54.00	48.00	38.00	10.00
40	0400	0350	58.00	32.00	11.00	56.00	50.00	38.00	10.00
43	0430	0380	61.00	32.00	11.00	59.00	56.00	39.50	11.00
45	0450	0400	63.00	32.00	11.00	61.00	58.00	39.50	11.00
48	0480	0430	66.00	32.00	11.00	64.20	61.00	39.50	11.00
50	0500	0450	70.00	34.00	13.00	66.30	63.00	39.50	11.00
53	0530	0480	73.00	34.00	13.00	69.20	66.00	39.50	11.00
55	0550	0500	75.00	34.00	13.00	70.80	70.00	44.00	13.00
58	0580	0530	78.00	39.00	13.00	78.00	73.00	44.00	13.00
60	0600	0550	80.00	39.00	13.00	80.10	75.00	44.00	13.00
63	0630	0580	83.00	39.00	13.00	83.20	78.00	49.00	13.00
65	0650	0600	85.00	39.00	13.00	85.20	80.00	49.00	13.00
68	0680	0630	90.00	39.00	15.30	87.80	83.00	49.00	13.00
70	0700	0650	92.00	45.50	15.30	90.00	85.00	49.00	13.00
75*	0750	0700	97.00	45.50	15.30	95.00	92.00	55.50	15.30
80*	0800	0750	105.00	45.00	15.70	104.10	97.00	55.50	15.30
85*	0850	0800	110.00	45.00	15.70	109.30	105.00	55.00	15.70
90*	0900	0850	115.00	50.00	15.70	114.00	110.00	60.00	15.70
95*	0950	0900	120.00	50.00	15.70	119.20	115.00	60.00	15.70
100*	1000	0950	125.00	50.00	15.70	124.10	120.00	60.00	15.70
All Type, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.									
However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in some sizes.									

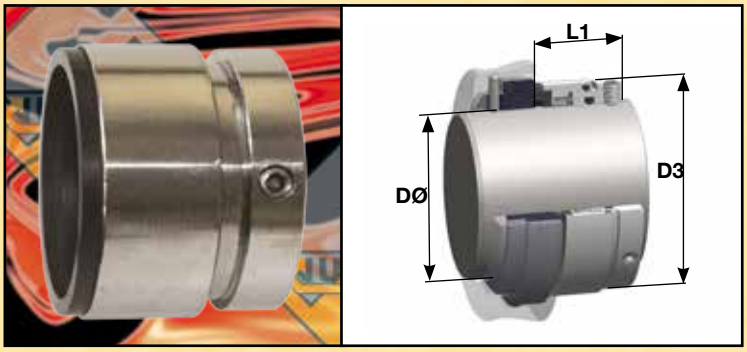
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Material Code					
Seal And Seat Assembly		Rotary face		Stationary face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	IB	Carbon FH82Z5	IB	99% Ceramic	A
Soft vs Hard	IS	Carbon FH82Z5	IB	VES2 RB SiC	S
Hard vs Soft	SG	WNV2 SiNSiC Carbide	R	99% Ceramic	A
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: PTFE Wedge, Viton™, E.P. And Nitrile				Guaranteed Stock Metallurgy: 316SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 40



Narrow profile, multiple spring, 'O'-Ring Mounted, set screw driven, non-clogging, Balanced Mechanical Seal. The Balanced design, protected springs sealed out of the fluid and dynamic 'O'-Ring enable use in demanding applications. A PTFE Back-up Ring is recommended to be specified for higher pressure applications.

Available as Type 40 Rotary only to match with a wide variety of Stationary Ring Styles, or as Type 40L/40S stock assemblies. Please see opposite Page for specific details.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D3		L1	
			in	mm	in	mm
	18	0180	1.280	32.50	1.181	30.00
0.750		0191	1.319	33.50	1.181	30.00
	20	0200	1.358	34.50	1.181	30.00
	22	0220	1.437	36.50	1.181	30.00
0.875		0222	1.437	36.50	1.181	30.00
	24	0240	1.516	38.50	1.181	30.00
	25	0250	1.559	39.60	1.181	30.00
1.000		0254	1.559	39.60	1.181	30.00
	28	0280	1.689	42.90	1.280	32.50
1.125		0286	1.689	42.90	1.280	32.50
	30	0300	1.752	44.50	1.280	32.50
1.250		0317	1.815	46.10	1.280	32.50
	32	0320	1.815	46.10	1.280	32.50
	33	0330	1.815	46.10	1.280	32.50
1.375		0349	1.941	49.30	1.280	32.50
	35	0350	1.941	49.30	1.280	32.50
	38	0380	2.079	52.80	1.339	34.00
1.500		0381	2.079	52.80	1.339	34.00
	40	0400	2.205	56.00	1.339	34.00
1.625		0412	2.205	56.00	1.339	34.00
	43	0430	2.330	59.20	1.339	34.00
1.750		0444	2.330	59.20	1.339	34.00
	45	0450	2.330	59.20	1.339	34.00
1.875		0476	2.457	62.40	1.339	34.00
	48	0480	2.457	62.40	1.339	34.00
	50	0500	2.583	65.60	1.358	34.50
2.000		0508	2.583	65.60	1.358	34.50
	53	0530	2.709	68.80	1.358	34.50
2.125*		0539	2.709	68.80	1.358	34.50
	55	0550	2.787	70.80	1.358	34.50
2.250		0571	2.831	71.90	1.358	34.50
	58	0580	2.961	75.20	1.358	34.50
	60	0600	2.961	75.20	1.358	34.50
2.375		0603	2.961	75.20	1.358	34.50
	63	0630	3.083	78.30	1.358	34.50
2.500		0635	3.083	78.30	1.358	34.50
	65	0650	3.315	84.20	1.417	36.00
2.625		0666	3.315	84.20	1.417	36.00
2.750		0698	3.441	87.40	1.417	36.00
	70	0700	3.441	87.40	1.417	36.00
2.875*		0730	3.567	90.60	1.417	36.00
	75	0750	3.689	93.70	1.417	36.00
3.00		0762	3.689	93.70	1.417	36.00

All Type, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*. However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in some sizes.

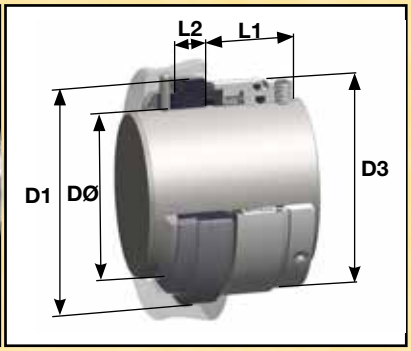
Guaranteed Stock Materials and Face Material Code					
Seal And Seat Assembly		Rotary face		Stationary face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	N/a	M825 FDA Carbon	DB	N/a	A
Soft vs Hard	N/a	N/a	N/a	N/a	S
Hard vs Soft	N/a	N/a	N/a	N/a	A
Hard	N/a	WNV2 SiNSiC Carbide	R	N/a	S
Hard 1st alt	N/a	Tungsten Carbide*	H	N/a	H
Guaranteed Stock Elastomers: Viton™ , E.P. And Nitrile			Guaranteed Stock Metallurgy: 316SS		

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Types 40L / 40S



Types 40L and 40S feature the same robust, Balanced, 'O'-Ring Mounted, set-screw driven, Rotary unit as described on the preceding Page. The Type 40 Rotary can be used with a wide variety of Stationary Seat Rings depending on the dimensions of the equipment the Seal is to be fitted to. The most widely utilized stationaries are the 'O'-Ring Mounted Type 24 to suit metric DIN housing sizes. For convenience Vulcan stock these combinations as Type 40L with a 24 DIN LONG with anti-rotation pin provision. Or as Type 40S with a 24 DIN SHORT Seat without such pin drive provision.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1		D3		L1		L2		40L Slot Width		40L Slot Depth	
			in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	18	0180	1.299	33.00	1.280	32.50	1.181	30.00	0.394	10.00	0.157	4.00	0.217	5.50
0.750		0191	N/a		1.319	33.50	1.181	30.00	N/a		N/a		N/a	
	20	0200	1.378	35.00	1.358	34.50	1.181	30.00	0.394	10.00	0.157	4.00	0.217	5.50
	22	0220	1.457	37.00	1.437	36.50	1.181	30.00	0.394	10.00	0.157	4.00	0.217	5.50
0.875		0222	N/a		1.437	36.50	1.181	30.00	N/a		N/a		N/a	
	24	0240	1.535	39.00	1.516	38.50	1.181	30.00	0.394	10.00	0.157	4.00	0.217	5.50
	25	0250	1.575	40.00	1.559	39.60	1.181	30.00	0.394	10.00	0.157	4.00	0.217	5.50
1.000		0254	N/a		1.559	39.60	1.181	30.00	N/a		N/a		N/a	
	28	0280	1.693	43.00	1.689	42.90	1.280	32.50	0.394	10.00	0.157	4.00	0.217	5.50
1.125		0286	N/a		1.689	42.90	1.280	32.50	N/a		N/a		N/a	
	30	0300	1.772	45.00	1.752	44.50	1.280	32.50	0.394	10.00	0.157	4.00	0.217	5.50
1.250		0317	N/a		1.815	46.10	1.280	32.50	N/a		N/a		N/a	
	32	0320	1.89	48.00	1.815	46.10	1.280	32.50	0.394	10.00	0.157	4.00	0.217	5.50
	33	0330	1.89	48.00	1.815	46.10	1.280	32.50	0.394	10.00	0.157	4.00	0.217	5.50
1.375		0349	N/a		1.941	49.30	1.280	32.50	N/a		N/a		N/a	
	35	0350	1.969	50.00	1.941	49.30	1.280	32.50	0.394	10.00	0.157	4.00	0.217	5.50
	38	0380	2.205	56.00	2.079	52.80	1.339	34.00	0.433	11.00	0.197	5.00	0.217	5.50
1.500		0381	N/a		2.079	52.80	1.339	34.00	N/a		N/a		N/a	
	40	0400	2.283	58.00	2.205	56.00	1.339	34.00	0.433	11.00	0.197	5.00	0.217	5.50
1.625		0412	N/a		2.205	56.00	1.339	34.00	N/a		N/a		N/a	
	43	0430	2.402	61.00	2.330	59.20	1.339	34.00	0.433	11.00	0.197	5.00	0.217	5.50
1.750		0444	N/a		2.330	59.20	1.339	34.00	N/a		N/a		N/a	
	45	0450	2.48	63.00	2.330	59.20	1.339	34.00	0.433	11.00	0.197	5.00	0.217	5.50
1.875		0476	N/a		2.457	62.40	1.339	34.00	N/a		N/a		N/a	
	48	0480	2.598	66.00	2.457	62.40	1.339	34.00	0.433	11.00	0.197	5.00	0.217	5.50
	50	0500	2.756	70.00	2.583	65.60	1.358	34.50	0.433	13.00	0.197	5.00	0.217	5.50
2.00		0508	N/a		2.583	65.60	1.358	34.50	N/a		N/a		N/a	
	53	0530	2.874	73.00	2.709	68.80	1.358	34.50	0.433	13.00	0.197	5.00	0.217	5.50
2.125*		0539	N/a		2.709	68.80	1.358	34.50	N/a		N/a		N/a	
	55	0550	2.953	75.00	2.787	70.80	1.358	34.50	0.433	13.00	0.197	5.00	0.217	5.50
2.250		0571	N/a		2.831	71.90	1.358	34.50	N/a		N/a		N/a	
	58	0580	3.071	78.00	2.961	75.20	1.358	34.50	0.433	13.00	0.197	5.00	0.217	5.50
	60	0600	3.15	80.00	2.961	75.20	1.358	34.50	0.433	13.00	0.197	5.00	0.217	5.50
2.375		0603	N/a		2.961	75.20	1.358	34.50	N/a		N/a		N/a	
	63	0630	3.268	83.00	3.083	78.30	1.358	34.50	0.433	13.00	0.197	5.00	0.217	5.50
2.500		0635	N/a		3.083	78.30	1.358	34.50	N/a		N/a		N/a	
	65	0650	3.346	85.00	3.315	84.20	1.417	36.00	0.433	13.00	0.197	5.00	0.217	5.50
2.625		0666	N/a		3.315	84.20	1.417	36.00	N/a		N/a		N/a	
2.750		0698	N/a		3.441	87.40	1.417	36.00	N/a		N/a		N/a	
	70	0700	3.622	92.00	3.441	87.40	1.417	36.00	0.433	15.30	0.197	5.00	0.217	5.50
2.875*		0730	N/a		3.567	90.60	1.417	36.00	N/a		N/a		N/a	
	75	0750	3.819	97.00	3.689	93.70	1.417	36.00	0.433	15.30	0.197	5.00	0.217	5.50
3.00		0762	N/a		3.689	93.70	1.417	36.00	N/a		N/a		N/a	

All Type, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*. However, most asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in some sizes.

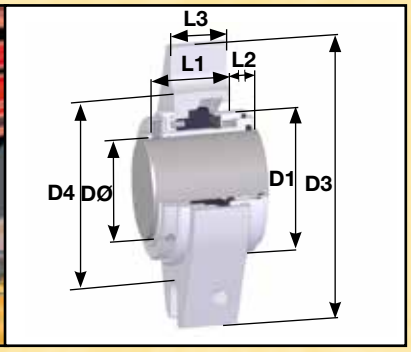
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Material Code					
Seal And Seat Assembly		Rotary face		Stationary face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	DB	M825 FDA Carbon	DB	99% Ceramic	A
Soft vs Hard	DS	M825 FDA Carbon	DB	VES2 RB SiC	S
Hard vs Soft	SG	WNV2 SiNSiC Carbide	R	99% Ceramic	A
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. And Nitrile				Guaranteed Stock Metallurgy: 316SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 55B



Modular design, Balanced, multiple spring, 'O'-Ring Mounted, two-bolt gland Cartridge Seal Assembly, with dual tangential flush as standard. Designed with minimal internal and external protrusion and with gland dimensions for near universal fitting.

Easy to install, reliable and economical. Ideal for replacing Gland Packing on common marine and general Pump applications. Highly effective design, complimented by Carbon vs SiC faces as standard, provides superior performance, ability, life and reliability.

Imperial and Metric Shaft Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1 Rotary OD		Seal Chamber Min I.D.		Seal Chamber Max I.D.		Gland Height D3		D4 Slot to Slot		L1 Ext W/L		L2 Int W/L		L3 Gland Width		Gland Slot Width	
			in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	25	0250	1.66	42.30	1.73	44.00	1.89	48.00	4.00	101.60	2.22	56.50	1.83	46.40	0.46	11.80	1.20	30.50	0.51	13.00
1.000		0254	1.66	42.30	1.73	44.00	1.89	48.00	4.00	101.60	2.22	56.50	1.83	46.40	0.46	11.80	1.20	30.50	0.51	13.00
	28	0280	1.81	46.00	1.87	47.50	2.01	51.00	4.00	101.60	2.44	62.00	1.83	46.40	0.46	11.80	1.20	30.50	0.51	13.00
1.125		0286	1.81	46.00	1.87	47.50	2.01	51.00	4.00	101.60	2.44	62.00	1.83	46.40	0.46	11.80	1.20	30.50	0.51	13.00
	30	0300	1.92	48.90	1.97	50.00	2.17	55.00	4.37	111.00	2.79	70.90	1.83	46.40	0.48	12.30	1.20	30.50	0.51	13.00
1.250		0317	1.92	48.90	1.97	50.00	2.17	55.00	4.37	111.00	2.79	70.90	1.83	46.40	0.48	12.30	1.20	30.50	0.51	13.00
	32	0320	1.92	48.90	1.97	50.00	2.17	55.00	4.37	111.00	2.79	70.90	1.83	46.40	0.48	12.30	1.20	30.50	0.51	13.00
	33	0330	2.07	52.80	2.12	53.90	2.30	58.50	4.37	111.00	2.79	70.90	1.83	46.40	0.52	13.30	1.20	30.50	0.51	13.00
1.375		0349	2.07	52.80	2.12	53.90	2.30	58.50	4.37	111.00	2.79	70.90	1.83	46.40	0.52	13.30	1.20	30.50	0.51	13.00
	35	0350	2.07	52.80	2.12	53.90	2.30	58.50	4.37	111.00	2.79	70.90	1.83	46.40	0.52	13.30	1.20	30.50	0.51	13.00
	38	0380	2.20	56.00	2.25	57.15	2.44	62.00	5.25	133.40	2.80	71.00	1.83	46.40	0.54	13.80	1.20	30.50	0.51	13.00
1.500		0381	2.20	56.00	2.25	57.15	2.44	62.00	5.25	133.40	2.80	71.00	1.83	46.40	0.54	13.80	1.20	30.50	0.51	13.00
	40	0400	2.33	59.20	2.37	60.30	2.60	66.00	5.25	133.40	2.97	75.50	1.83	46.40	0.54	13.80	1.20	30.50	0.51	13.00
1.625		0412	2.33	59.20	2.37	60.30	2.60	66.00	5.25	133.40	2.97	75.50	1.83	46.40	0.54	13.80	1.20	30.50	0.51	13.00
	42	0420	2.33	59.20	2.37	60.30	2.60	66.00	5.25	133.40	2.97	75.50	1.83	46.40	0.54	13.80	1.20	30.50	0.51	13.00
	43	0430	2.45	62.40	2.50	63.50	2.91	74.00	5.28	134.00	3.27	83.00	1.83	46.40	0.54	13.80	1.20	30.50	0.51	13.00
	44	0440	2.45	62.40	2.50	63.50	2.91	74.00	5.28	134.00	3.27	83.00	1.83	46.40	0.54	13.80	1.20	30.50	0.51	13.00
1.750		0444	2.45	62.40	2.50	63.50	2.91	74.00	5.28	134.00	3.27	83.00	1.83	46.40	0.54	13.80	1.20	30.50	0.51	13.00
	45	0450	2.45	62.40	2.50	63.50	2.91	74.00	5.28	134.00	3.27	83.00	1.83	46.40	0.54	13.80	1.20	30.50	0.51	13.00
1.875		0476	2.59	65.80	2.62	66.67	2.91	74.00	5.25	133.40	3.25	82.50	1.83	46.40	0.62	15.80	1.20	30.50	0.63	16.00
	48	0480	2.59	65.80	2.62	66.67	2.91	74.00	5.25	133.40	3.25	82.50	1.83	46.40	0.62	15.80	1.20	30.50	0.63	16.00
	50	0500	2.70	68.80	2.75	69.85	3.11	79.00	5.37	136.50	3.66	93.00	1.94	49.40	0.50	12.80	1.32	33.50	0.63	16.00
2.000		0508	2.70	68.80	2.75	69.85	3.11	79.00	5.37	136.50	3.66	93.00	1.94	49.40	0.50	12.80	1.32	33.50	0.63	16.00
2.125		0539	2.83	71.90	2.87	73.02	3.25	82.55	6.00	152.40	3.76	95.40	1.94	49.40	0.50	12.80	1.32	33.50	0.63	16.00
	55	0550	2.96	75.20	3.01	76.50	3.37	85.72	6.00	152.40	3.76	95.50	1.94	49.40	0.50	12.80	1.32	33.50	0.63	16.00
2.250		0571	2.96	75.20	3.01	76.50	3.37	85.72	6.00	152.40	3.76	95.50	1.94	49.40	0.50	12.80	1.32	33.50	0.63	16.00
	60	0600	3.08	78.30	3.12	79.37	3.50	88.90	6.50	165.00	3.78	96.00	2.03	51.50	0.45	11.50	1.40	35.50	0.63	16.00
2.375		0603	3.08	78.30	3.12	79.37	3.50	88.90	6.50	165.00	3.78	96.00	2.03	51.50	0.45	11.50	1.40	35.50	0.63	16.00
	63	0630	3.31	84.20	3.37	85.72	3.63	92.25	6.87	174.60	4.38	111.30	2.13	54.00	0.50	12.80	1.38	35.00	0.63	16.00
2.500		0635	3.31	84.20	3.37	85.72	3.63	92.25	6.87	174.60	4.38	111.30	2.13	54.00	0.50	12.80	1.32	33.50	0.63	16.00
	65	0650	3.44	87.40	3.50	88.90	3.87	98.42	6.87	174.60	4.38	111.30	2.13	54.00	0.57	14.60	1.40	35.50	0.63	16.00
2.625*		0666	3.44	87.40	3.50	88.90	3.87	98.42	6.87	174.60	4.38	111.30	2.13	54.00	0.57	14.60	1.40	35.50	0.63	16.00
2.750*		0698	3.56	90.60	3.62	92.07	3.87	98.42	6.87	174.60	4.38	111.30	2.13	54.00	0.57	14.60	1.40	35.50	0.63	16.00
	70	0700	3.56	90.60	3.62	92.07	3.87	98.42	6.87	174.60	4.38	111.30	2.13	54.00	0.57	14.60	1.40	35.50	0.63	16.00
	75	0750	3.81	96.90	3.88	98.43	4.50	114.30	7.48	190.00	4.92	125.00	2.13	54.00	0.59	15.00	1.40	35.50	0.63	16.00
3.000*		0762	3.81	96.90	3.88	98.43	4.50	114.30	7.48	190.00	4.92	125.00	2.13	54.00	0.59	15.00	1.40	35.50	0.63	16.00
3.125*		0794	3.93	100.00	4.00	101.60	4.50	114.30	7.48	190.00	4.96	126.00	2.13	54.00	0.63	16.00	1.40	35.50	0.79	20.00
	80	0800	3.93	100.00	4.00	101.60	4.50	114.30	7.48	190.00	4.96	126.00	2.13	54.00	0.63	16.00	1.40	35.50	0.79	20.00
3.250*		0825	4.06	103.30	4.13	104.78	4.62	117.47	7.99	203.00	5.28	134.00	2.13	54.00	0.63	16.00	1.40	35.50	0.79	20.00
	85	0850	4.18	106.40	4.25	107.95	4.75	120.65	7.99	203.00	5.28	134.00	2.13	54.00	0.63	16.00	1.40	35.50	0.79	20.00
3.375*		0857	4.18	106.40	4.25	107.95	4.75	120.65	7.99	203.00	5.28	134.00	2.13	54.00	0.63	16.00	1.40	35.50	0.79	20.00
3.500*		0889	4.31	109.60	4.38	111.13	4.75	120.65	8.50	216.00	5.67	144.00	2.13	54.00	0.63	16.00	1.40	35.50	0.79	20.00
	90	0900	4.44	112.80	4.50	114.30	5.25	133.40	8.50	216.00	5.67	144.00	2.13	54.00	0.63	16.00	1.40	35.50	0.79	20.00
3.625*		0921	4.44	112.80	4.50	114.30	5.25	133.40	8.50	216.00	5.67	144.00	2.13	54.00	0.63	16.00	1.40	35.50	0.79	20.00
	95	0950	4.56	116.00	4.63	117.48	5.37	136.52	8.50	216.00	5.75	146.00	2.13	54.00	0.63	16.00	1.40	35.50	0.79	20.00
3.750*		0953	4.56	116.00	4.63	117.48	5.37	136.52	8.50	216.00	5.75	146.00	2.13	54.00	0.63	16.00	1.40	35.50	0.79	20.00
	100	1000	4.94	125.60	5.13	130.18	5.75	146.05	9.00	228.60	6.10	155.00	2.24	57.00	0.43	10.80	1.40	35.50	0.79	20.00
4.000*		1016	4.94	125.60	5.13	130.18	5.75	146.05	9.00	228.60	6.10	155.00	2.24	57.00	0.43	10.80	1.40	35.50	0.79	20.00

Please Note; up to and including 2.500 / 65mm, Type 55B is Guaranteed Ex-Stock in every metric and imperial size shown in SINSiC vs RBSiC and M825 Carbon vs RBSiC faces. Above these sizes, Type 55B is Guaranteed Ex-Stock in metric sizes and SiNSiC vs RBSiC faces only. However, imperial shaft sizes above 2.500 are readily available; please enquire.

Guaranteed Stock Materials and Face Material Code					
Seal And Seat Assembly		Rotary face		Stationary face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	X	Non-standard: Please use alternative shown here or enquire.			
Soft vs Hard	DS	M825 FDA Carbon	DB	VES2 RB SiC	S
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. And Nitrile		Guaranteed Stock Metallurgy: 316SS			

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

FEATURE BENEFITS OF VULCAN 55B CARTRIDGE SEALS

With modular design, Types 55B, 52B and 56B are designed to be swiftly and easily interchangeable. Therefore all three of these cartridge seals types can be built from stock, using otherwise standard common components.

Centrifugal Forces
Act to throw media and particles away from, rather than into, the seal faces. In addition, the materials used are designed to efficiently transfer heat away from the seal faces.

Universal Slotted 2-Bolt Gland Design
Fits all common bolt sizes and pitch circle diameters. Compact seal design allows fitting to most pumps without modification.

Pre-Set
The seal can be swiftly and easily fitted by merely clamping it to the shaft and bolting up to the gland face. Awkward setting clips are thus not required.

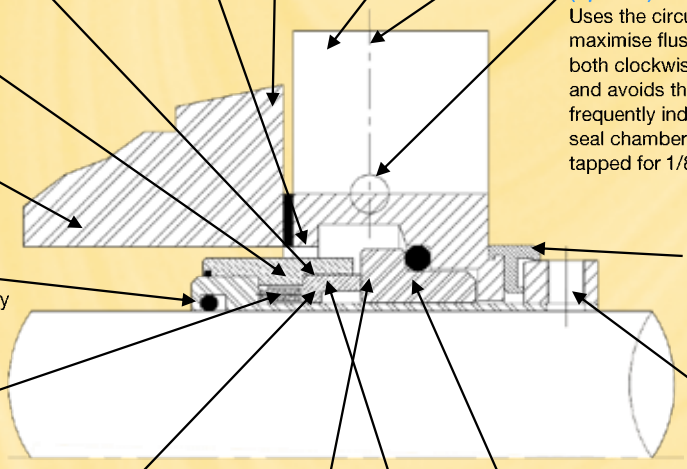
Hydraulically Balanced Faces
Efficiently reduces the seal closing forces, giving true running faces with lower friction, heat and wear build-up and therefore increases the pressure range and the life of the seal.

Cartridge Design
Pre-assembled, set and tested for easy, accurate and assured installation.

Balanced Design
Eliminates shaft/sleeve fretting.

(Optional) Tangential Flush Cavity
Uses the circumferential motion of the seal to maximise flush circulation to the faces. Works for both clockwise and anticlockwise seal rotation and avoids the pressure imbalance and vibration frequently induced by flush liquid entering the seal chamber axially against the seal. Drilled and tapped for 1/8" NPT connections.

Smooth Contoured Geometry
For minimal erosion and avoids turbulence.



Larger Diameter Static 'O'-Ring Seal
For sealing on shaft sleeves previously worn by other seals or gland packing.

PTFE Ring
Accurately sets working length and prevents metal-to-metal contact.

Set Screw Drive
Easy shaft attachment and torque transmission given by even distribution of an optimum number of set screws.

Non-Clogging Design
Multiple springs isolated from the product to prevent clogging by dirty fluids and give even face loading. Hastelloy C springs are fitted as standard for maximum corrosion resistance and seal life.

Automatic Seal Face Alignment
Vulcan's floating stationary face self-aligns to compensate for shaft-seal misalignment.

Seals with standard stationary face designs can fail and wear more rapidly. Self-alignment increases seal life by providing a steady and true face contact, with full fluid film lubrication and no point-contact wear.

High PV Value Faces
The pressure velocity (PV) factor of the seal faces largely determines their suitability for an application, based specifically on the amount of heat generated by the seal faces.

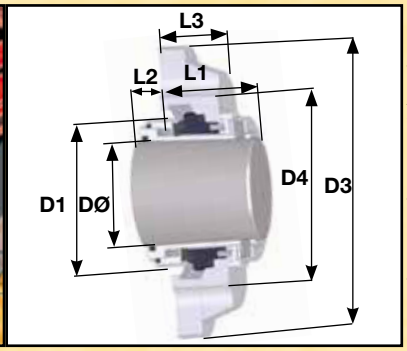
Silicon Carbide has the best combination of heat dissipation, running, hardness and chemical resistance capabilities of any seal face material.

Vulcan fit triple phenolic resin impregnated Carbon vs Silicon Carbide faces as standard, providing the highest face PV combination of 630 bar m/s. Compared to just 210 bar m/s for Carbon vs Ceramic. This maximises the capability, performance and life of the seal.

Solid Silicon Carbide Seat Faces
Are not subject to heat check, as it can be solid or plated, Ceramic, Chrome Dioxide, Tungsten Carbide, Ni-Resist or Stellite.

Centroidally Loaded Faces
Designed to evenly distribute face stresses for further increased performance.

Type 52B/56B



Modular Design Balanced, multiple spring, 'O'-Ring Mounted, self-aligning Stationary, four-bolt Gland, Rotary Cartridge Seal Assembly. Plain Gland Type 52B or Type 56B with Tangential Flush, Quench and Drain. Designed with minimal internal and external protrusion and with gland dimensions suitable for near universal fitting. Easy to install, reliable and economical. Advanced design features (as illustrated opposite) combined with superior face materials as standard, result in a highly effective and cost beneficial general Cartridge Seal.

Imperial and Metric Shaft Sizes

Imperial Shaft Size DØ	Metric Shaft Size Ø	Size Code	D1 Rotary OD		Seal Chamber Min I.D.		Seal Chamber Max I.D.		Gland Height D3		D4 Slot to Slot		L1 Ext W/L		L2 Int W/L		L3 Gland Width		Gland Slot Width	
			in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	25	0250	1.66	42.30	1.73	44.00	1.89	48.00	3.86	98.00	2.34	59.5	1.83	46.40	0.46	11.80	1.42	36.00	0.51	13.00
1.000		0254	1.66	42.30	1.73	44.00	1.89	48.00	3.86	98.00	2.34	59.5	1.83	46.40	0.46	11.80	1.42	36.00	0.51	13.00
	28	0280	1.81	46.00	1.87	47.50	2.01	51.00	3.86	98.00	2.56	65.0	1.83	46.40	0.46	11.80	1.42	36.00	0.51	13.00
1.125		0286	1.81	46.00	1.87	47.50	2.01	51.00	3.86	98.00	2.56	65.0	1.83	46.40	0.46	11.80	1.42	36.00	0.51	13.00
	30	0300	1.92	48.90	1.97	50.00	2.17	55.00	4.25	108.00	2.56	65.0	1.83	46.40	0.48	12.30	1.42	36.00	0.51	13.00
1.250		0317	1.92	48.90	1.97	50.00	2.17	55.00	4.25	108.00	2.91	74.0	1.83	46.40	0.48	12.30	1.42	36.00	0.51	13.00
	32	0320	1.92	48.90	1.97	50.00	2.17	55.00	4.25	108.00	2.91	74.0	1.83	46.40	0.48	12.30	1.42	36.00	0.51	13.00
	33	0330	2.07	52.80	2.12	53.90	2.30	58.50	4.25	108.00	2.91	74.0	1.83	46.40	0.52	13.30	1.42	36.00	0.51	13.00
1.375		0349	2.07	52.80	2.12	53.90	2.30	58.50	4.25	108.00	2.91	74.0	1.83	46.40	0.52	13.30	1.42	36.00	0.51	13.00
	35	0350	2.07	52.80	2.12	53.90	2.30	58.50	4.25	108.00	2.91	74.0	1.83	46.40	0.52	13.30	1.42	36.00	0.51	13.00
	38	0380	2.20	56.00	2.25	57.15	2.44	62.00	4.63	117.50	2.91	74.0	1.83	46.40	0.54	13.80	1.42	36.00	0.51	13.00
1.500		0381	2.20	56.00	2.25	57.15	2.44	62.00	4.63	117.50	2.91	74.0	1.83	46.40	0.54	13.80	1.42	36.00	0.51	13.00
	40	0400	2.33	59.20	2.37	60.30	2.60	66.00	4.63	117.50	3.09	78.5	1.83	46.40	0.54	13.80	1.42	36.00	0.51	13.00
1.625		0412	2.33	59.20	2.37	60.30	2.60	66.00	4.63	117.50	3.09	78.5	1.83	46.40	0.54	13.80	1.42	36.00	0.51	13.00
	42	0420	2.33	59.20	2.37	60.30	2.60	66.00	4.63	117.50	3.09	78.5	1.83	46.40	0.54	13.80	1.42	36.00	0.51	13.00
	43	0430	2.45	62.40	2.50	63.50	2.91	74.00	5.26	133.50	3.35	85.0	1.83	46.40	0.54	13.80	1.42	36.00	0.51	13.00
	44	0440	2.45	62.40	2.50	63.50	2.91	74.00	5.26	133.50	3.35	85.0	1.83	46.40	0.54	13.80	1.42	36.00	0.51	13.00
1.750		0444	2.45	62.40	2.50	63.50	2.91	74.00	5.26	133.50	3.35	85.0	1.83	46.40	0.54	13.80	1.42	36.00	0.51	13.00
	45	0450	2.45	62.40	2.50	63.50	2.91	74.00	5.26	133.50	3.35	85.0	1.83	46.40	0.54	13.80	1.42	36.00	0.51	13.00
1.875		0476	2.59	65.80	2.62	66.67	2.91	74.00	5.26	133.50	3.39	86.0	1.83	46.40	0.62	15.80	1.42	36.00	0.63	16.00
	48	0480	2.59	65.80	2.62	66.67	2.91	74.00	5.26	133.50	3.39	86.0	1.83	46.40	0.62	15.80	1.42	36.00	0.63	16.00
	50	0500	2.70	68.80	2.75	69.85	3.11	79.00	5.89	149.50	3.78	96.0	1.94	49.40	0.50	12.80	1.54	39.00	0.63	16.00
2.000		0508	2.70	68.80	2.75	69.85	3.11	79.00	5.89	149.50	3.78	96.0	1.94	49.40	0.50	12.80	1.54	39.00	0.63	16.00
2.125		0539	2.83	71.90	2.87	73.02	3.25	82.55	5.89	149.50	3.88	98.5	1.94	49.40	0.50	12.80	1.54	39.00	0.63	16.00
	55	0550	2.96	75.20	3.01	76.50	3.37	85.72	5.89	149.50	3.88	98.5	1.94	49.40	0.50	12.80	1.54	39.00	0.63	16.00
2.250		0571	2.96	75.20	3.01	76.50	3.37	85.72	6.38	162.00	3.88	98.5	1.94	49.40	0.50	12.80	1.54	39.00	0.63	16.00
	60	0600	3.08	78.30	3.12	79.37	3.50	88.90	6.38	162.00	3.90	99.0	2.03	51.50	0.45	11.50	1.61	41.00	0.63	16.00
2.375		0603	3.08	78.30	3.12	79.37	3.50	88.90	6.38	162.00	3.90	99.0	2.03	51.50	0.45	11.50	1.61	41.00	0.63	16.00
	63	0630	3.31	84.20	3.37	85.72	3.63	92.25	6.75	171.50	3.90	99.0	2.13	54.00	0.50	12.80	1.61	41.00	0.63	16.00
2.500		0635	3.31	84.20	3.37	85.72	3.63	92.25	6.75	171.50	3.90	99.0	2.13	54.00	0.50	12.80	1.61	41.00	0.63	16.00
	65	0650	3.44	87.40	3.50	88.90	3.87	98.42	6.75	171.50	4.50	114.3	2.13	54.00	0.57	14.60	1.61	41.00	0.63	16.00
2.625*		0666	3.44	87.40	3.50	88.90	3.87	98.42	6.75	171.50	4.50	114.3	2.13	54.00	0.57	14.60	1.61	41.00	0.63	16.00
2.750*		0698	3.56	90.60	3.62	92.07	3.87	98.42	6.75	171.50	4.50	114.3	2.13	54.00	0.57	14.60	1.61	41.00	0.63	16.00
	70	0700	3.56	90.60	3.62	92.07	3.87	98.42	6.75	171.50	4.50	114.3	2.13	54.00	0.57	14.60	1.61	41.00	0.63	16.00
	75	0750	3.81	96.90	3.88	98.43	4.50	114.30	7.38	187.50	5.04	128.0	2.13	54.00	0.59	15.00	1.61	41.00	0.63	16.00
3.000*		0762	3.81	96.90	3.88	98.43	4.50	114.30	7.38	187.50	5.04	128.0	2.13	54.00	0.59	15.00	1.61	41.00	0.63	16.00
3.125*		0794	3.93	100.00	4.00	101.60	4.50	114.30	7.38	187.50	5.08	129.0	2.13	54.00	0.63	16.00	1.61	41.00	0.79	20.00
	80	0800	3.93	100.00	4.00	101.60	4.50	114.30	7.38	187.50	5.08	129.0	2.13	54.00	0.63	16.00	1.61	41.00	0.79	20.00
3.250*		0825	4.06	103.30	4.13	104.78	4.62	117.47	7.87	200.00	5.08	129.0	2.13	54.00	0.63	16.00	1.61	41.00	0.79	20.00
	85	0850	4.18	106.40	4.25	107.95	4.75	120.65	7.87	200.00	5.39	137.0	2.13	54.00	0.63	16.00	1.61	41.00	0.79	20.00
3.375*		0857	4.18	106.40	4.25	107.95	4.75	120.65	7.87	200.00	5.39	137.0	2.13	54.00	0.63	16.00	1.61	41.00	0.79	20.00
3.500*		0889	4.31	109.60	4.38	111.13	4.75	120.65	7.87	200.00	5.79	147.0	2.13	54.00	0.63	16.00	1.61	41.00	0.79	20.00
	90	0900	4.44	112.80	4.50	114.30	5.25	133.40	7.87	200.00	5.79	147.0	2.13	54.00	0.63	16.00	1.61	41.00	0.79	20.00
3.625*		0921	4.44	112.80	4.50	114.30	5.25	133.40	8.39	213.00	5.79	147.0	2.13	54.00	0.63	16.00	1.61	41.00	0.79	20.00
	95	0950	4.56	116.00	4.63	117.48	5.37	136.52	8.39	213.00	5.87	149.0	2.13	54.00	0.63	16.00	1.61	41.00	0.79	20.00
3.750*		0953	4.56	116.00	4.63	117.48	5.37	136.52	8.39	213.00	5.87	149.0	2.13	54.00	0.63	16.00	1.61	41.00	0.79	20.00
	100	1000	4.94	125.60	5.13	130.18	5.75	146.05	9.27	235.50	6.22	158.0	2.24	57.00	0.43	10.80	1.61	41.00	0.79	20.00
4.000*		1016	4.94	125.60	5.13	130.18	5.75	146.05	9.27	235.50	6.22	158.0	2.24	57.00	0.43	10.80	1.61	41.00	0.79	20.00

Please Note; up to and including 2.500 / 65mm, Type 52B/56B is Guaranteed Ex-Stock in every metric and imperial size shown in SiNSiC vs RBSiC, M825 Carbon vs RBSiC and TC vs. SiNSiC faces. Above these sizes, Type 52B/56B is Guaranteed Ex-Stock in metric sizes and SiNSiC vs RBSiC faces only. However, imperial shaft sizes above 2.500 are readily available; please enquire.

Guaranteed Stock Materials and Face Material Code					
Seal And Seat Assembly		Rotary face		Stationary face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	X	Non-standard: Please use alternative shown here or enquire.			
Soft vs Hard	DS	M825 FDA Carbon	DB	VES2 RB SiC	S
Hard	SS	WNV2 SiNSiC Carbide	R	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Hard 2nd alt	HR	Tungsten Carbide	H	WNV2 SiNSiC Carbide	R
Guaranteed Stock Elastomers: Viton™ , E.P. And Nitrile		Guaranteed Stock Metallurgy: 316SS			

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

FEATURE BENEFITS OF VULCAN TYPE 52B/56B CARTRIDGE SEALS

With modular design, Types 55B, 52B and 56B are designed to be swiftly and easily interchangeable. Therefore all three of these cartridge seals types can be built from stock, using otherwise standard common components.

The 52B has a Plain Gland, and the 56B Gland has Flush, Quench and Drain environmental control ports.

Universal Slotted 4-Bolt Gland Design
Fits all common bolt sizes and pitch circle diameters. Compact seal design allows fitting to most pumps without modification.

Pre-set
The seal can be swiftly and easily fitted by simply clamping it to the shaft and bolting up to the gland face. Troublesome setting clips are therefore not required.

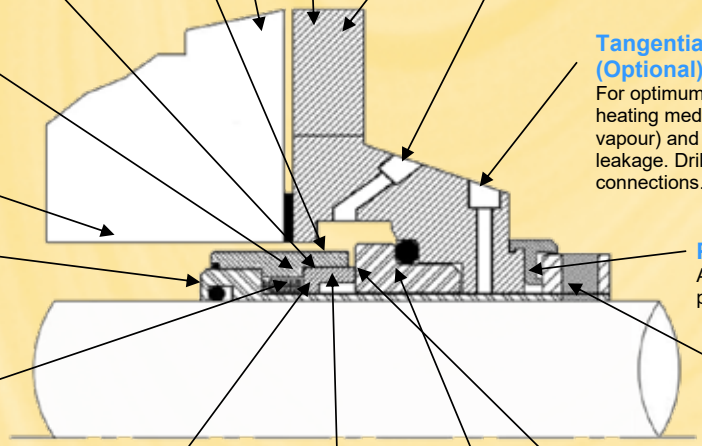
Centrifugal Forces
Act to throw media and particles away from, rather than into, the seal faces. In addition, the materials used are designed to efficiently transfer heat away from the seal faces.

Cartridge Design
Pre-assembled, set and tested for easy, accurate and assured installation.

Hydraulically Balanced Faces
Efficiently reduces the seal closing forces, giving true running faces with lower friction, heat and wear build-up and therefore increases the pressure range and the life of the seal.

Tangential Flush Cavity (Optional)
Uses the circumferential motion of the seal to maximise flush circulation to the faces. Works for both clockwise and anticlockwise seal rotation and avoids the pressure imbalance and vibration frequently induced by flush liquid entering the seal chamber axially against the seal. Drilled and tapped for 1/4" NPT connections.

Balanced Design
Eliminates shaft/sleeve fretting.



Tangential Quench and Drain Cavity (Optional)
For optimum circulation of barrier, cooling or heating media. Or to provide vent (fume vapour) and drain (liquid) facilities for controlled leakage. Drilled and tapped for 1/4" NPT connections.

Smooth Contoured Geometry
For minimal erosion and avoids turbulence.

Larger Diameter Static 'O'-Ring Seal
For sealing on shaft sleeves previously worn by other seals or gland packing.

PTFE Ring
Accurately sets working length and prevents metal-to-metal contact.

Set Screw Drive
Easy shaft attachment and torque transmission given by even distribution of an optimum number of set screws.

Non-Clogging Design
Multiple springs isolated from the product to prevent clogging by dirty fluids and give even face loading. Hastelloy C springs are fitted as standard for maximum corrosion resistance and seal life.

Solid Silicon Carbide Seat Faces
Are not subject to heat check, as it can be solid or plated, Ceramic, Chrome Dioxide, Tungsten Carbide, Ni-Resist or Stellite.

High PV Value Faces
The pressure velocity (PV) factor of the seal faces largely determines their suitability for an application, based specifically on the amount of heat generated by the seal faces.

Silicon Carbide has the best combination of heat dissipation, running, hardness and chemical resistance capabilities of any seal face material.

Vulcan fit triple phenolic resin impregnated Carbon vs Silicon Carbide faces as standard, providing the highest face PV combination of 630 bar m/s. Compared to just 210 bar m/s for Carbon vs Ceramic. This maximises the capability, performance and life of the seal.

Centroidally Loaded Faces
Designed to evenly distribute face stresses for further increased performance.

Automatic Seal Face Alignment
Vulcan's floating stationary face self-aligns to compensate for shaft-seal misalignment.

Seals with standard stationary face designs can fail and wear more rapidly. Self-alignment increases seal life by providing a steady and true face contact, with full fluid film lubrication and no point-contact wear.

Vulcan Wave Spring Type Seals

Section 9

Introduction

The Vulcan Wave Spring Range of Bi-directional Mechanical Seals offer proven Seal design and wave spring technology, in a range of material combinations, enhanced by superior design features, all at very competitive pricing.

Applications

The 1688 range was specifically designed for short working length and hygienic requirements, such as rotary lobe Pumps. Their principle applications are often also for liquids of high viscosity. These are commonly found in the food, dairy, brewery and pharmaceutical industries. The compact design makes this Seal an excellent choice for confined, shallow Seal housing areas, or even external Seal mounted applications.

The 1677 / 1678 Seal Type Series provide a high quality, general purpose Seal, suitable for many sealing application requirements, including chemical duties.

Standard Vulcan® Wave Spring Types

Types 1677 and 1677M

The Type 1677 is a positively, driven wave spring Seal, utilising sinusoidal wave spring technology, offering excellent axial movement capabilities.

The Seal is radially compacted and designed to suit DIN24960 (EN12756).

The design of this Seal head enables easy utilisation of a wide range of high quality materials and elastomers, supplied as standard. Type 1677M differs in having a Monolithic Seal head, for optimal heat dissipation and Seal capability / performance.

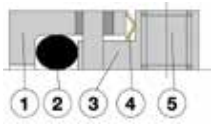
Types 1678

Designed as per the Type 1677 but with a stepped face, to provide a balanced Seal for stepped shafts.

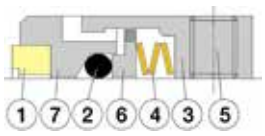
Type 1688

The robust wave spring Seal is ideally suited for standard, rotary lobe Pump, glands, of compact design. The Seal is positively driven by grub screws and supplied from Vulcan with Monolithic Seal heads, in soft and hard face materials as our standard.

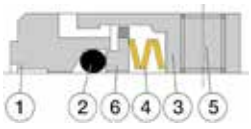
Standard Components



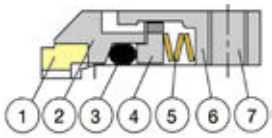
Type 1688 Series



Type 1677



Type 1677M Series



Type 1678

No	Description	4	wave spring
1	Face	5	grub screw
2	'O'-Ring	6	backing plate
3	Sleeve/Retainer	7	face retainer

Vulcan® Design Advantages

Type 1688 Superior Design

Type 1688 is supplied with a Monolithic rotary head, 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 co-agulating fluids which are common to rotary lobe Pump applications. Common, popular sizes of Type 1688 Seals are fitted with our Sinusoidal Wave-Springs. These 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.

Type 1677 and 1678 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 1677 / 1678 Seals incorporate a one-piece designed, sinusoidal 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.

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.

Vulcan WAVE Spring Type Seals PV Chart

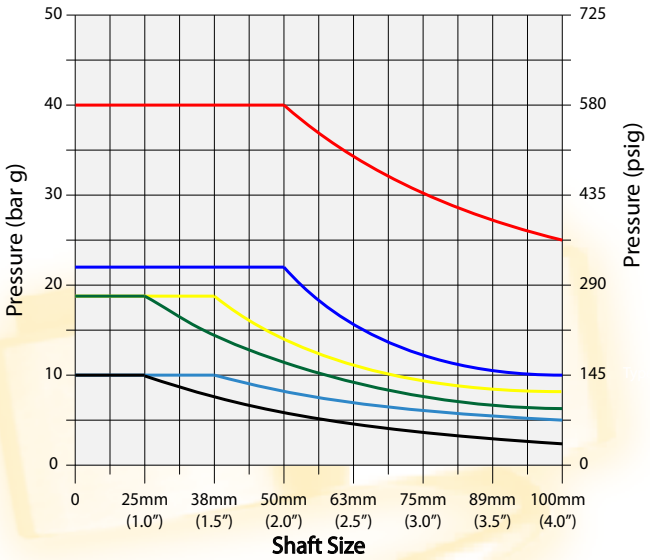
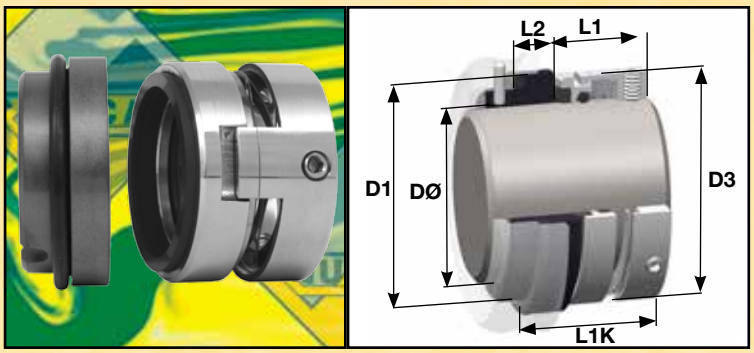


Chart based upon: Carbon Seal face vs seat face materials shown below	
1678/M - Carbon/SIC	1682 - Carbon/SS
1677/M - Carbon/SIC	1688X - Carbon/TC
1682 - Carbon/TC	1688X - Carbon/SS

Type 1677



Sinusoidal wave-spring, 'O'-Ring mounted Seal commonly utilised in the European chemical process industries. Manufactured to suit DIN24960 (EN12756) dimensions.

Supplied as Type 1677 with a stainless steel head retainer and inserted face. Or increasingly as Type 1677M with Monolithic head, see the page opposite. Stocked as a standard assembly with Type 8 DIN LONG 'O'-Ring seat with anti-rotation provision.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L1K (mm)	Slot Width (mm)	Slot Depth (mm)
14*	0140	25.00	24.00	25.00	10.00	35.00	4.00	5.00
16	0160	27.00	26.00	25.00	10.00	35.00	4.00	5.00
18	0180	33.00	32.00	26.00	11.50	37.50	4.00	5.50
20	0200	35.00	34.00	26.00	11.50	37.50	4.00	5.50
22	0220	37.00	36.00	26.00	11.50	37.50	4.00	5.50
24	0240	39.00	38.00	28.50	11.50	40.00	4.00	5.50
25	0250	40.00	39.00	28.50	11.50	40.00	4.00	5.50
28	0280	43.00	42.00	31.00	11.50	42.50	4.00	5.50
30	0300	45.00	44.00	31.00	11.50	42.50	4.00	5.50
32	0320	48.00	46.00	31.00	11.50	42.50	4.00	5.50
33	0330	48.00	47.00	31.00	11.50	42.50	4.00	5.50
35	0350	50.00	49.00	31.00	11.50	42.50	4.00	5.50
38	0380	56.00	54.00	31.00	14.00	45.00	5.00	5.50
40	0400	58.00	56.00	31.00	14.00	45.00	5.00	5.50
43	0430	61.00	59.00	31.00	14.00	45.00	5.00	5.50
45	0450	63.00	61.00	31.00	14.00	45.00	5.00	5.50
48	0480	66.00	64.00	31.00	14.00	45.00	5.00	5.50
50	0500	70.00	66.00	32.50	15.00	47.50	5.00	5.50
53	0530	73.00	69.00	32.50	15.00	47.50	5.00	5.50
55	0550	75.00	71.00	32.50	15.00	47.50	5.00	5.50
58	0580	78.00	78.00	37.50	15.00	52.50	5.00	5.50
60	0600	80.00	80.00	37.50	15.00	52.50	5.00	5.50
63	0630	83.00	83.00	37.50	15.00	52.50	5.00	5.50
65	0650	85.00	85.00	37.50	15.00	52.50	5.00	5.50
68	0680	90.00	88.00	34.50	18.00	52.50	5.00	5.50
70	0700	92.00	89.00	42.00	18.00	60.00	5.00	5.50
75	0750	97.00	96.00	42.00	18.00	60.00	5.00	5.50
80	0800	105.00	104.00	41.80	18.20	60.00	5.00	5.50
85	0850	110.00	108.00	41.80	18.20	60.00	5.00	5.50
90	0900	115.00	114.00	46.80	18.20	65.00	5.00	5.50
95	0950	120.00	118.00	47.80	17.20	65.00	5.00	5.50
100	1000	125.00	124.00	47.80	17.20	65.00	5.00	5.50

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.

However, the asterisked Seal and / or seat face materials are stocked in some, but not all, materials.
And the asterisked materials in some sizes.

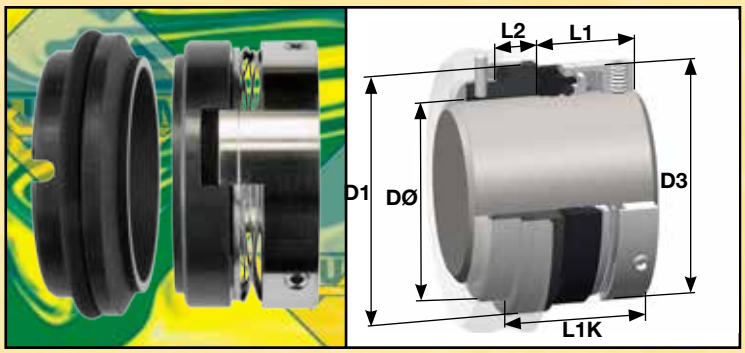
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	DB	M825 FDA Carbon	DB	99% Ceramic	A
Soft vs Hard	DR	M825 FDA Carbon	DB	WNV2 SiNSiC Carbide	S
Hard vs Soft	RD	WNV2 SiNSiC Carbide	R	M825 FDA Carbon	RD
Hard	R	WNV2 SiNSiC Carbide	R	WNV2 SiNSiC Carbide	R
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 316SS	

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 1677M



Sinusoidal wave-spring, 'O'-Ring mounted Seal commonly utilised in the European chemical process industries. Manufactured to suit DIN24960 (EN12756) dimensions.

Type 1677M has a Monolithic head, instead of the inserted face as per the Type 1677, see the page opposite. Stocked as a standard assembly with Type 8 DIN LONG 'O'-Ring seat with anti-rotation provision. Monolithic Carbon stationary material option is illustrated.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L1K (mm)	Slot Width (mm)	Slot Depth (mm)
14*	0140	25.00	24.00	25.00	10.00	35.00	4.00	5.00
16	0160	27.00	26.00	25.00	10.00	35.00	4.00	5.00
18	0180	33.00	32.00	26.00	11.50	37.50	4.00	5.50
20	0200	35.00	34.00	26.00	11.50	37.50	4.00	5.50
22	0220	37.00	36.00	26.00	11.50	37.50	4.00	5.50
24	0240	39.00	38.00	28.50	11.50	40.00	4.00	5.50
25	0250	40.00	39.00	28.50	11.50	40.00	4.00	5.50
28	0280	43.00	42.00	31.00	11.50	42.50	4.00	5.50
30	0300	45.00	44.00	31.00	11.50	42.50	4.00	5.50
32	0320	48.00	46.00	31.00	11.50	42.50	4.00	5.50
33	0330	48.00	47.00	31.00	11.50	42.50	4.00	5.50
35	0350	50.00	49.00	31.00	11.50	42.50	4.00	5.50
38	0380	56.00	54.00	31.00	14.00	45.00	5.00	5.50
40	0400	58.00	56.00	31.00	14.00	45.00	5.00	5.50
43	0430	61.00	59.00	31.00	14.00	45.00	5.00	5.50
45	0450	63.00	61.00	31.00	14.00	45.00	5.00	5.50
48	0480	66.00	64.00	31.00	14.00	45.00	5.00	5.50
50	0500	70.00	66.00	32.50	15.00	47.50	5.00	5.50
53	0530	73.00	69.00	32.50	15.00	47.50	5.00	5.50
55	0550	75.00	71.00	32.50	15.00	47.50	5.00	5.50
58	0580	78.00	78.00	37.50	15.00	52.50	5.00	5.50
60	0600	80.00	80.00	37.50	15.00	52.50	5.00	5.50
63	0630	83.00	83.00	37.50	15.00	52.50	5.00	5.50
65	0650	85.00	85.00	37.50	15.00	52.50	5.00	5.50
68	0680	90.00	88.00	34.50	18.00	52.50	5.00	5.50
70	0700	92.00	89.00	42.00	18.00	60.00	5.00	5.50
75	0750	97.00	96.00	42.00	18.00	60.00	5.00	5.50
80	0800	105.00	104.00	41.80	18.20	60.00	5.00	5.50
85	0850	110.00	108.00	41.80	18.20	60.00	5.00	5.50
90	0900	115.00	114.00	46.80	18.20	65.00	5.00	5.50
95	0950	120.00	118.00	47.80	17.20	65.00	5.00	5.50
100	1000	125.00	124.00	47.80	17.20	65.00	5.00	5.50
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.								
However, some asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in some sizes.								

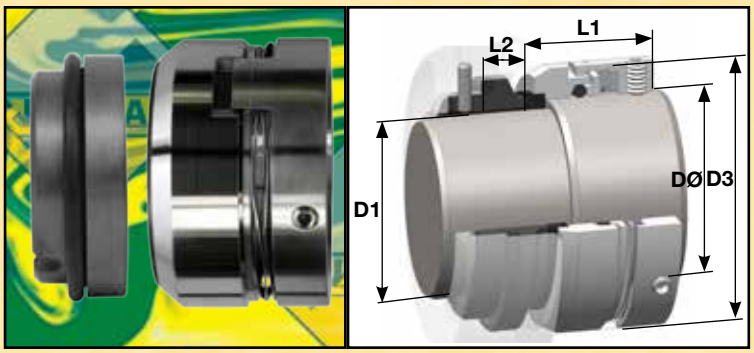
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	DB	M825 FDA Carbon	DB	99% Ceramic	A
Soft vs Hard	DR	M825 FDA Carbon	DB	WNV2 SiNSiC Carbide	S
Hard vs Soft	RD	WNV2 SiNSiC Carbide	R	M825 FDA Carbon	RD
Hard	R	WNV2 SiNSiC Carbide	R	WNV2 SiNSiC Carbide	R
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 316SS	

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 1678



Stepped shaft, balanced sinusoidal wave-spring, 'O'-Ring mounted Seal, similar to Type 1677, most commonly utilised in higher-pressure Pump applications. Vulcan Types 1677, 1677M and 1678 all have sinusoidal continuous wave-springs without joints or weld-spots, for maximum spring reliability.

Stocked as a standard assembly with "stepped-size down" Type 8 DIN LONG 'O'-Ring seat with anti-rotation provision. Monolithic SiC stationary is illustrated.

Vulcan Standard Sizes

Seal Shaft Size DØ	Seal Size Code	Seat Shaft Size	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Seat Slot Width (mm)	Seat Slot Depth (mm)
18*	0180	14	25.00	32.00	32.50	10.00	4.00	5.00
20*	0200	16	27.00	34.00	32.50	10.00	4.00	5.00
22*	0220	18	33.00	36.00	33.50	11.50	4.00	5.50
24*	0240	20	35.00	38.00	33.50	11.50	4.00	5.50
28	0280	24	39.00	42.00	36.00	11.50	4.00	5.50
30	0300	25	40.00	44.00	36.00	11.50	4.00	5.50
33	0330	28	43.00	47.00	38.50	11.50	4.00	5.50
35	0350	30	45.00	49.00	38.50	11.50	4.00	5.50
38	0380	33	48.00	54.00	38.50	11.50	4.00	5.50
40	0400	35	50.00	56.00	38.50	11.50	4.00	5.50
43	0430	38	56.00	59.00	38.50	14.00	5.00	5.50
45	0450	40	58.00	61.00	38.50	14.00	5.00	5.50
50*	0500	45	63.00	66.00	38.50	14.00	5.00	5.50
53*	0530	48	66.00	69.00	38.50	14.00	5.00	5.50
55*	0550	50	70.00	71.00	42.50	15.00	5.00	5.50
60*	0600	55	75.00	80.00	42.50	15.00	5.00	5.50
65*	0650	60	80.00	85.00	47.50	15.00	5.00	5.50
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.								
However, some asterisked sizes are stocked in some, but not all, materials. And the asterisked materials in some sizes.								

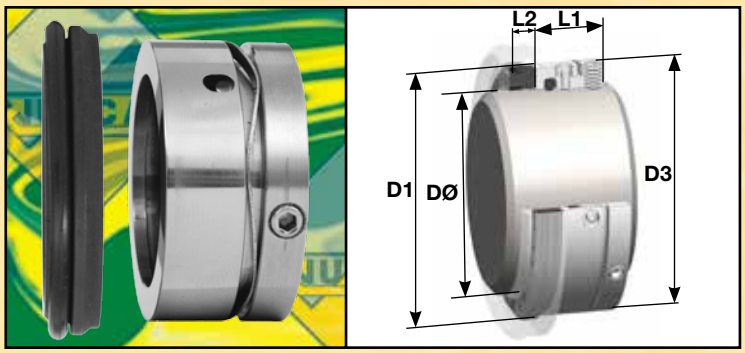
Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	DB	M825 FDA Carbon	DB	99% Ceramic	A
Soft vs Hard	DR	M825 FDA Carbon	DB	WNV2 SiNSiC Carbide	S
Hard vs Soft	X	Non-standard: Please use 1678M "Hard vs Soft" or enquire.			
Hard	R	WNV2 SiNSiC Carbide	R	WNV2 SiNSiC Carbide	R
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile				Guaranteed Stock Metallurgy: 316SS	

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 1688



Wave spring 'O'-Ring mounted Mechanical Seal with narrow cross-section, short working length and set-screw drive. Most commonly installed on lobe-rotor Pumps, where the twin-shafts and compact Pump design make this very compact Seal an ideal solution. Lobe-rotor Pumps are extensively found in the food, process and dairy industries. The Type 1688 has been optimally designed for such confined spaces and hygienic applications. And further benefits from our monolithic head and one piece sinusoidal wave-spring .

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
0.625		0158	28.50	27.00	19.10	5.32
	16	0160	28.50	27.00	19.10	5.32
0.750		0191	31.70	30.00	19.10	5.32
	24	0240	35.40	34.10	19.10	6.62
	28	0280	42.00	39.00	19.10	6.62
1.125		0286	41.20	39.50	19.10	6.62
	30	0300	42.70	41.00	19.10	6.62
1.250		0317	44.40	42.40	19.10	6.62
	32	0320	44.40	42.40	19.10	6.62
1.375		0349	47.60	45.50	19.10	6.62
	35	0350	47.60	45.50	19.10	6.62
	38	0380	53.90	51.80	21.10	7.12
1.500		0381	53.90	51.80	21.10	7.12
1.750		0444	60.30	58.20	21.10	7.12
1.875		0476	63.50	61.40	21.10	7.12
	50	0500	63.90	61.90	21.10	7.12
2.000		0508	66.60	64.60	21.10	8.62
2.125		0539	73.02	71.00	22.10	8.62
	54	0540	73.95	71.00	22.10	8.62
	54.6	0546	75.00	72.00	22.10	8.62
	55	0550	75.00	72.00	22.10	8.62
	63	0630	83.00	79.30	25.80	7.83
2.500		0635	88.90	79.30	25.80	7.83
2.750		0698	95.25	90.80	25.80	7.83
2.875		0730	98.43	94.00	25.80	7.83
	75	0750	100.40	96.00	25.80	7.83
3.000		0762	101.60	96.90	25.80	7.83
	80	0800	104.00	101.00	25.80	7.83
	95	0950	125.00	116.00	25.80	7.83
	100	1000	130.00	121.00	25.80	7.83
All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*.						
However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.						

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	P	304 Stainless Steel	P	M106K Carbon	C
Soft vs Hard	X	Non-standard: please use alternative shown below or enquire			
Hard vs Soft	U	Tungsten Carbide	H	M106K Carbon	C
Hard	H	Tungsten Carbide	H	Tungsten Carbide	H
Hard 1st alt	X	Non-standard: please use alternative shown here or enquire			
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile		Guaranteed Stock Metallurgy: 304SS			

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Vulcan Water Pump Type Seals

Section 10

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.

Seal performance and life is frequently compromised by the nature of these applications and the fact that water is a poor lubricator of Seal faces. As such, our standard stock product as shown on the following pages, incorporates superior Seal face materials. That's our ethos, focusing upon Seal performance. We can also manufacture and supply to enquires in more competitive standard materials.

Vulcan Advanced Design water Pump Seals

Types 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.

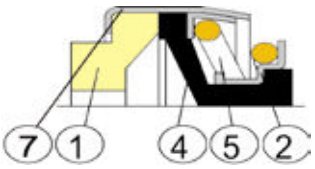
Types 70 and 75

Stationary based, unitised elastomer bellows Seals, utilised in small shaft diameter applications. Compact, unitised design, provides excellent flexibility in accommodating shaft mis-alignment and with quality Seal face materials, to extend Seal performance and life. The adequate shaft clearance enables one size to be used on a number of shaft sizes, whilst being stationary based increases the Seals bi-directional rotational speed capabilities.

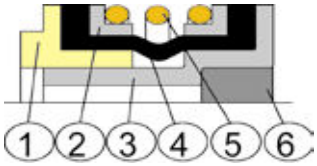
Type 18

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 more demanding applications. The Seal is also fitted with an internal plug as standard to aid assembly, this should be removed before the Seal is installed.

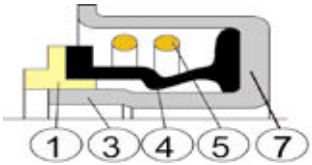
Standard Components



Type 18



Types 60/65



Types 70/75

No	Description		
1	Face	4	Bellows
2	Retaining Plates	5	Coil
3	Sleeve	6	Drive Ring
		7	Retainer

Swimming Pool / SPA Seals

With several decades extensive specific experience, Vulcan are leading manufacturers of Seals for the International Swimming Pool / Spa 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.

Vulcan® Design Advantages

Material Quality

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

Design

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

For instance, the Vulcan Type 18;

- The Type 18 is supplied with a fitting plug, as standard, which provides support to the elastomer bellows prior to fitting these Seals.
- The Type 18 is of robust bellows design, compared to some competitors' equivalents, which are prone to falling apart on assembly.
- Type 18 is designed to eliminate bellows wear during operation, which can be a fault in competitors designs.
- The Type 18 is fitted with our M106K+ Carbon Seal face, which provides superior performance and life.

Cost Effective

These proven, mass produced Seals, with their additional benefits and superior material quality, result in an exceptional, cost effective choice of Seal.

Vulcan water Pump Type Seals PV Chart

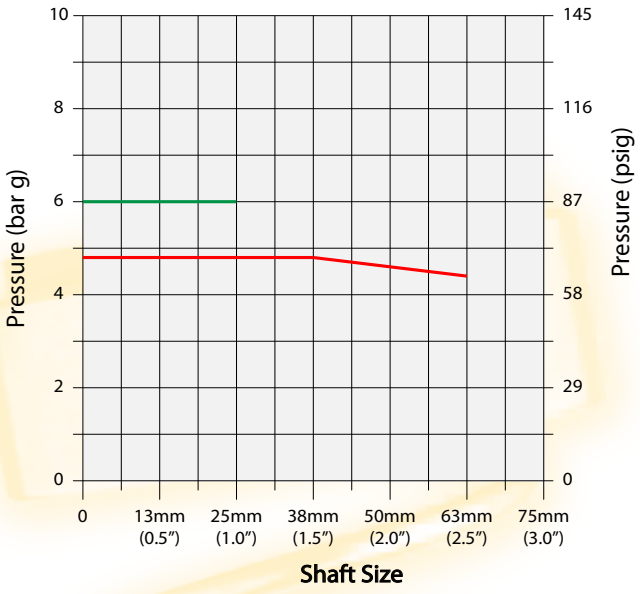


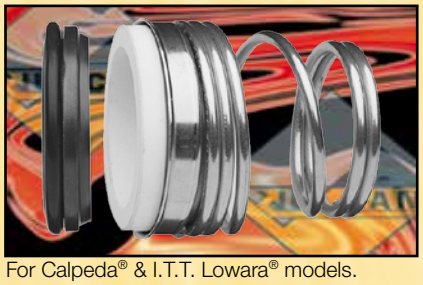
Chart based upon: Carbon vs Ceramic Seal faces

60, 65, 70, 75 — 18

Vulcan Seals to suit Swimming Pool and Spa Pump Applications

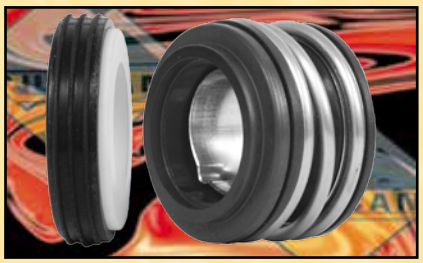
With over twenty five years specific experience, Vulcan are leading manufacturers of Seals for the International Swimming Pools / Spa Industry. We have a comprehensive range of Seals assemblies and designs, backed by an ex-stock service. Water is a poor lubricant and this in combination with the frequent high shaft speeds, possible dry running and the chemicals utilised in pool systems, creates demanding environments for Mechanical Seal faces. Vulcan Seal and stationary face materials, as standard, are superior to industry norms. Please see our Face Material Section. In addition, we have specialist Carbon Grades available to exceed the requirements of difficult applications and duties. Exact designs, excellent materials, a wide stock range and the ability to manufacture to any industry design or requirement further enhance the Vulcan Swimming Pool Range.

For American Products® 397102, Premier® 31-813 & P19-0, Swim-Rite®, Waterway® & Wet Institute® models.

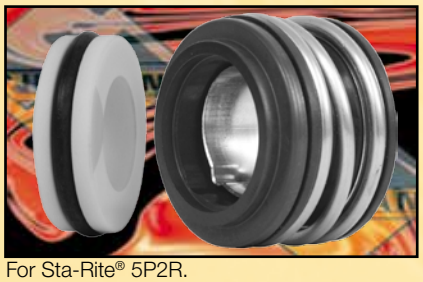


For Calpeda® & I.T.T. Lowara® models.

For Doll®, Hydronaut® 100, Kripsol® Ondina, & Structural® 100.

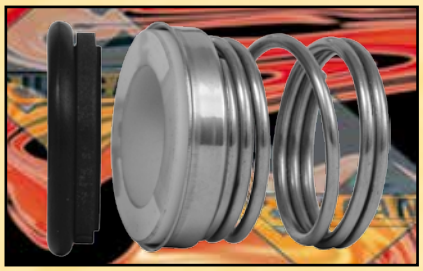


For Hayward® Cup Mount, Jacuzzi® 10.486 & 10.487, Showertux® 0755L, Vico® & Premier®.



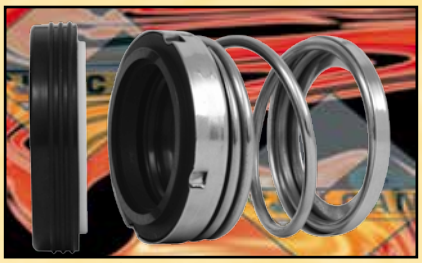
For Sta-Rite® 5P2R.

- Acura Spa Systems®
- American Products®
- Ampro-Diaclear®
- Anthony®
- Aqua-Flo®
- Arneson®
- Astral®
- Badu®
- Baker-Hydro®
- Calpeda®
- Certikin®
- Challenger®
- Christ Kennicott®
- Columbia®
- D.A.B.®
- Doll®
- Doughboy®
- Dynamo®
- Ebara®
- Espa®
- Eurostar®
- Fibrepool®
- Fluvo®
- G.G. Industries®
- Goldcoast®
- Grundfos®
- Hayward®
- Hydra-Bath®
- Hydronaut®
- Hydrotech®
- I.T.T. Argonaut®
- I.T.T. Gemini®
- I.T.T. Hydro-Air®
- I.T.T. Lowara®
- I.T.T. Marlow®
- Jacuzzi®
- Jandy®
- Jet Stream®
- Kripsol®
- Lee Howl®
- Lomart®
- Mega®
- Modern®
- Muskin®
- Nocchi®
- Pacific Fabrications®
- Pentair®
- Plastica®
- Polaris®
- Premier®
- Purex®
- Showertux®
- Speck®
- Sta-Rite Industries®
- Structural®
- Stuart Turner®
- Swim-Rite®
- Swim-Quip®
- Vico®
- Waterco®
- Waterway Plastics®
- Wet Institute®



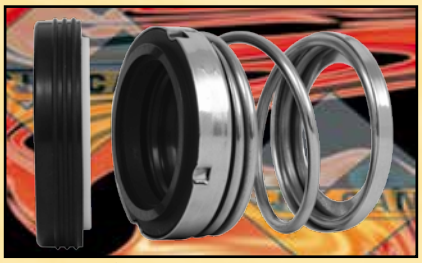
For Astral® Flipper® (post 1986) & Sprint®

For Lee Howl® 4277 & 4278

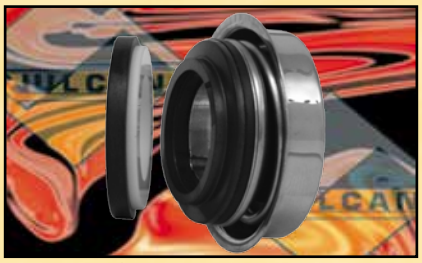


For Modern® models

For Purex® P28280



For Sta-Rite® U109-220

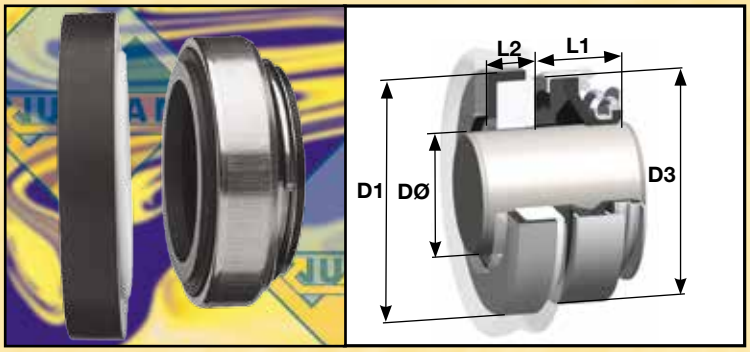


For Sta-Rite® U109-136SS

Vulcan Seals for the all the above Pump Models shown are Guaranteed Ex-Stock.

For stock codes, prices and guaranteed stock information, please refer to the Web Portal OEM database and relevant section of the OEM pricelist.

Type 18



Compact, enclosed rubber bellows Seal, with a Boot mounted stationary with a smooth outer profile. The very short working length makes the Type 18 ideal for equipment where Seal chamber space is restricted.

Our Type 18 rotaries are supplied with a "top hat" metal retainer inserted in the tail of the Seal, to provide support to the bellows, prior to fitting. Please remove this prior to installation.

Vulcan Standard Sizes

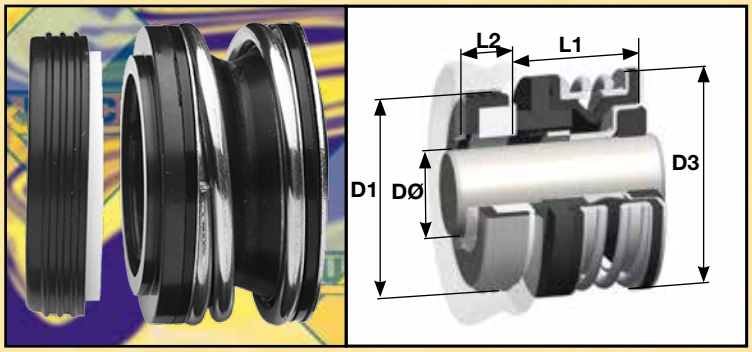
Metric Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
8	0080	26.00	24.00	11.00	8.00
10	0100	26.00	24.00	11.00	8.00
11	0110	26.00	24.00	11.00	8.00
12	0120	26.00	24.00	11.00	8.00
12*	0120.B	26.00	24.00	13.00	8.00
12*	0120.C	35.00	32.00	13.00	8.00
13	0130	26.00	24.00	13.00	8.00
13*	0130.C	26.00	24.00	13.00	5.50
14	0140	35.00	32.00	13.00	8.00
14*	0140.B	29.50	32.00	13.00	7.95
15	0150	38.00	35.00	13.00	8.00
15*	0150.B	29.50	32.00	13.00	7.95
16	0160	38.00	35.00	13.00	8.00
16*	0160.B	42.00	39.00	13.00	8.00
17	0170	42.00	39.00	13.00	8.00
18	0180	42.00	39.00	13.00	8.00
19	0190	42.00	39.00	13.00	8.00
20	0200	42.00	39.00	13.00	8.00
20*	0200.B	45.00	42.00	13.00	10.00
22	0220	45.00	42.00	13.00	10.00
23	0230	50.00	47.00	14.00	10.00
24	0240	50.00	47.00	14.00	10.00
24*	0240.B	42.00	42.00	13.00	9.00
25	0250	50.00	47.00	14.00	10.00
25*	0250.B	39.50	42.00	14.00	8.00
27	0270	50.00	47.00	15.00	10.00
28	0280	57.00	54.00	15.00	10.00
30	0300	57.00	54.00	15.00	10.00
32	0320	57.00	54.00	15.00	10.00
35	0350	63.00	60.00	16.00	10.00
38	0380	68.00	65.00	17.00	12.00
40	0400	68.00	65.00	17.00	12.00
45	0450	73.00	70.00	20.00	12.00
50	0500	88.00	85.00	23.00	15.00
55	0550	88.00	85.00	23.00	15.00
60	0600	110.00	105.00	30.00	15.00
65	0650	110.00	105.00	30.00	15.00
70	0700	110.00	105.00	32.00	15.00
Please note: Type 18 is guaranteed ex-stock in every size and material shown, except Tungsten Carbide.					
The asterisked sizes relate solely to special dimensions which are stocked in some, but not all, materials.					

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Hard 1st alt	H	Tungsten Carbide*	H	Tungsten Carbide*	H
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Type 60



Sleeve mounted, rubber bellows Seal, of compact unitised designed, with elastomer shaft drive ring.

Effective design and easily installed, this is a common Seal for low pressure, general duty applications on small diameter shafts.

Supplied as standard with Boot mounted Stationaries, but also available with 'O'-Ring mounted Stationaries to the same installation dimensions.

Vulcan Standard Sizes

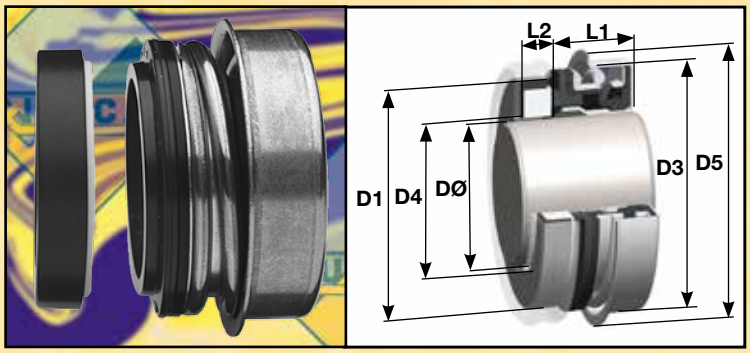
Imperial Shaft Size DØ	Size Code	D1		D3		L1		L2	
		in	mm	in	mm	in	mm	in	mm
0.375	0095	0.875	22.23	0.937	23.80	0.631	16.02	0.244	6.20
0.500	0127	1.000	25.40	1.062	26.97	0.654	16.60	0.244	6.20
0.625	0158	1.250	31.75	1.218	30.94	0.737	18.71	0.405	10.29
0.750	0191	1.375	34.93	1.343	34.11	0.737	18.71	0.405	10.29
1.000	0254	1.625	41.28	1.732	44.00	0.812	20.63	0.437	11.10

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Type 70



Stationary based, unitised elastomer bellows Seals, utilised in small shaft diameter applications. Compact, unitised design, provides excellent flexibility in accommodating shaft mis-alignment and with quality Seal face materials, to extend Seal performance and life. The adequate shaft clearance enables one size to be used on a number of shaft sizes, whilst being stationary based increases the Seals bi-directional rotational speed capabilities.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Size Code	D1		D3		D4		D5		L1		L2	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
0.500	0127	0.984	25.00	1.124	28.56	0.559	14.20	1.248	31.70	0.520	13.20	0.197	5.00
0.625	0158	1.220	31.00	1.435	36.45	0.717	18.20	1.625	41.27	0.583	14.80	0.197	5.00
0.750	0191	1.378	35.00	1.575	40.00	0.843	21.40	1.720	43.70	0.610	15.50	0.197	5.00
1.125	0286	1.890	48.00	2.047	52.00	1.220	31.00	2.250	57.15	0.748	19.00	0.315	8.00

Suggested Operating Limits

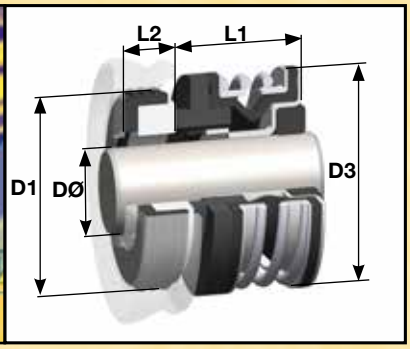
Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Guaranteed Stock Elastomers: Viton™, E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*. However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 65



Sleeve mounted, rubber bellows Seal with shaft drive ring. Similar to Type 60 but with dimensions to suit common American standards.

Effective design and easily installed, this is a common Seal for low pressure, general duty applications on small diameter shafts. Supplied as standard with Boot mounted Stationaries, but also available with 'O'-Ring mounted Stationaries to the same installation dimensions.

Vulcan Standard Sizes

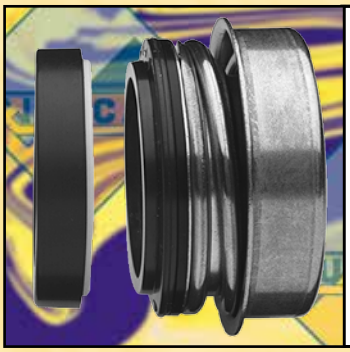
Imperial Shaft Size DØ	Size Code	D1		D3		L1		L2	
		in	mm	in	mm	in	mm	in	mm
0.375	0095	1.000	25.40	1.062	26.97	0.656	16.66	0.312	7.92
0.500	0127	1.000	25.40	1.062	26.97	0.656	16.66	0.312	7.92
0.625	0158	1.250	31.75	1.218	30.94	0.718	18.24	0.406	10.31
0.750	0191	1.375	34.93	1.343	34.11	0.718	18.24	0.406	10.31
1.000	0254	1.625	41.28	1.732	44.00	0.812	20.62	0.437	11.10

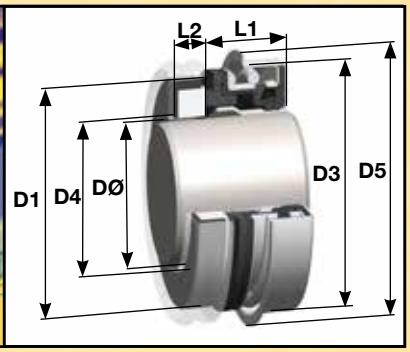
Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC	S
Hard vs Soft	G	VES2 RB SiC	S	99% Ceramic	A
Hard	S	VES2 RB SiC	S	VES2 RB SiC	S
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

Type 75





Stationary based, unitised elastomer bellows Seals, utilised in small shaft diameter applications. Compact, unitised design, provides excellent flexibility in accommodating shaft mis-alignment and with quality Seal face materials, to extend Seal performance and life. The adequate shaft clearance enables one size to be used on a number of shaft sizes, whilst being stationary based increases the Seals bi-directional rotational speed capabilities.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Size Code	D1		D3		D4		D5		L1		L2	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
0.500	0127	1.000	25.40	1.124	28.56	0.559	14.20	1.248	31.70	0.543	13.79	0.312	7.93
0.625	0158	1.250	31.75	1.435	36.45	0.717	18.20	1.625	41.27	0.605	15.36	0.406	10.31
0.750	0191	1.375	34.93	1.575	40.00	0.843	21.40	1.720	43.70	0.605	15.36	0.406	10.31

Suggested Operating Limits

Maximum Operating Pressure Limits primarily depend upon Face Materials, Shaft Size, Speed and Media. Please refer to the Seal Type Specific PV Chart, found at the front of this Brochure Section, in combination with the Vulcan Multiplying Factors found in Technical and Material Standards Section 2.

Guaranteed Stock Materials and Face Marterial Code					
Seal And Seat Assembly		Rotary Face		Stationary Face	
Face Reference Term	Code	Material	Code	Material	Code
Soft	C	M106K Carbon	C	99% Ceramic	A
Soft vs Hard	D	M106K Carbon	C	VES2 RB SiC*	S
Hard vs Soft	G	VES2 RB SiC*	S	99% Ceramic	A
Hard	S	VES2 RB SiC*	S	VES2 RB SiC*	S
Guaranteed Stock Elastomers: Viton™ , E.P. and Nitrile				Guaranteed Stock Metallurgy: 304SS	

All Types, sizes and materials shown are part of Vulcan's Guaranteed Ex-Stock Range, unless marked with an asterisk*. However, the asterisked Seal and / or seat face materials are stocked in many, but not all, sizes.

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Vulcan Stock OEM Pump Seals

We are the Seal manufacturer most likely to have available what you need ex-stock

Vulcan are renowned for our complete Range of Seal Designs and Guaranteed Stocks. We can supply the vast majority of global Seal requirements from stock. The following Section gives an indication of the most commonly requested special dimension Seals supplied ex-stock by Vulcan. In addition, extensive further information is readily available in our OEM Section Price List and in the massive OEM data-base within our Web Portal.

Therefore, if you cannot see what you require, or are unsure of your requirement, please contact us, or your supplier. The Vulcan Range of OEM specific Seals is constantly expanding and this Brochure Section is thus dated and particularly, it only covers the “Guaranteed Stock” portion of our wider existing tooled designed and produced previously Range (or those in future development).

Section 11a

Vulcan OEM Pump Seal Supply

In addition to our Standard Range of Stock Seal Types, Vulcan also manufactures many thousands of individual Seal designs, for specific Pumps and applications. The most common American and International Pump Types and Models are shown on the following Pages and Sections.

Vulcan are leading providers of volume Standard Mechanical Seals for OEM Pump Manufacturers, due to the following principal advantages;

- A Can-Do Philosophy linked to a commercial readiness to produce specials for OEM'S.
- The best Designs, Quality, Service and Price Available from any one source of Mechanical Seals.
- In-house specification and production of practically all materials, components and even the tools/molds for the same. Vulcan are the most vertically integrated Seal Manufacturer there is globally.

- Vulcan has the ability to design and manufacture, almost any, Seal to customer requirements.
- Many Seal Manufacturers bring in their complete Single Spring Type Design Seals from elsewhere, often from copyist Asian companies. A few assemble from components brought in from similar sources. Vulcan manufacture in-house. Not just our Seals but also most of our components and even some of our materials, such as Carbide Seal Faces.

- We routinely offer to produce special designs, often marked with OEM Names or Part Numbers, that are not made available for sale to anybody else. This has exceptional Commercial value to OEM's who usually nowadays implement "Must Use Genuine Parts" Guidelines and who value sales of their Replacement Parts, such as Seals.
- We offer OEM's their own unique Seal, designed and optimized for their applications, branded as their own and protectable as their own. Which are then not available for sale by others to their after market.
- Automated Production, Electronic Manufacturing, Inspection and Logistics Systems ensure Reliability of Quality and Service, at highly competitive Pricing.

Guaranteed Stock Materials Key

The guaranteed stock materials for the OEM and food sections are shown utilising a key system; for example; N Q 304

All letters shown are the Vulcan standard elastomer and face combination codes, please refer to Pages 18 / 19 for more information.

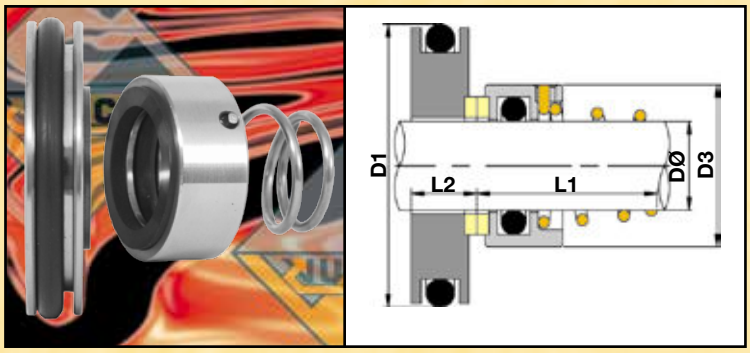
Key Icon	What the Key Icon Represents
X	Circular icons indicate which elastomers are guaranteed in stock, i.e. "V" for Viton™, "N" for Nitrile and "E" for E.P.
N E V	If more than one elastomer is guaranteed, all the relevant code letters are shown.
X	Hexagonal icons indicate the rotary and stationary face combination codes which are guaranteed in stock, i.e.; "C" for Carbon vs Ceramic.
D Q	Seals with multiple guaranteed stock face materials are shown with two or more hexagonal icons.
316	Rectangular icons indicates the metallurgy utilised within the guaranteed stock Seals.

The following OEM Seals in this section appear in OEM alphabetical order For a more comprehensive listing of American Pump Seals Please see Vulcan's American Mechanical Seal Brochure

Vulcan Seals for Allweiler® Pumps

Vulcan manufacture and stock a wide range of Seals to suit Allweiler® Pumps, including many standard range Seals, such as the Type 8DIN and 8DINS, Type 24 and Type 1677M Seals. The following are examples of specific dimensions Seals designed to suit the internal dimensions of certain Allweiler® Pumps only.

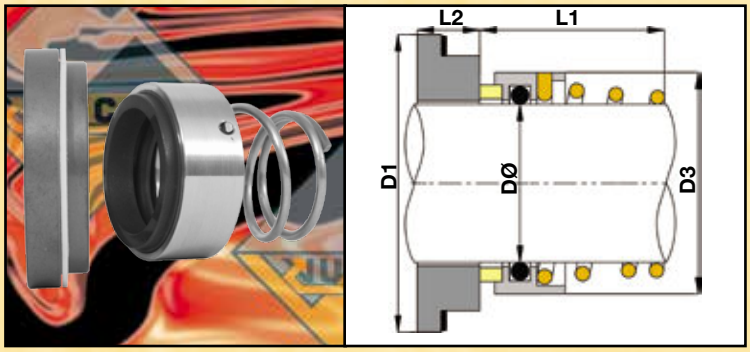
Type 8W to suit BAS, SPF, ZAS and ZASV series Pumps V H D 304



'O'-Ring mounted conical spring Seals with distinctive stationaries, to suit the Seal chambers of "BAS, SPF, ZAS and ZASV" series spindle or screw Pumps, commonly found in ship's engine rooms on oil and fuel duties. Clockwise rotation springs are standard.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
15.00	0150	38.00	24.00	15.00	8.00
20.00	0200	45.00	31.00	19.50	8.50

Type 8X to suit sob and soh series Pumps V D 304

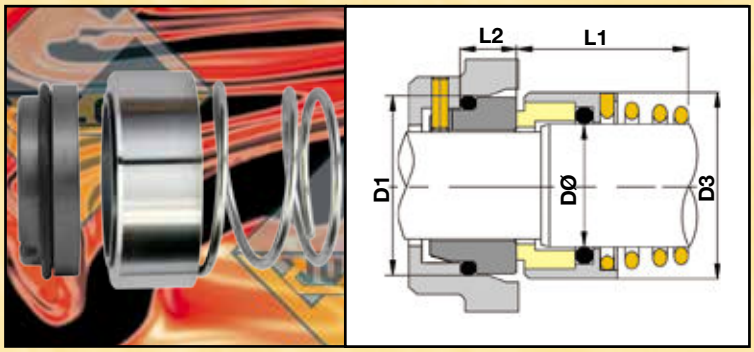


'O'-Ring mounted conical spring 22mm Seals with distinctive gasket mounted seat rings, to suit "SOB" and "SOH" series Pumps, commonly found in ship's engine rooms.

Clockwise rotation springs are standard.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
22.00*	0220	44.00	33.00	21.50	11.25

Type 82A to suit I- and Iv- series Pumps E D 304



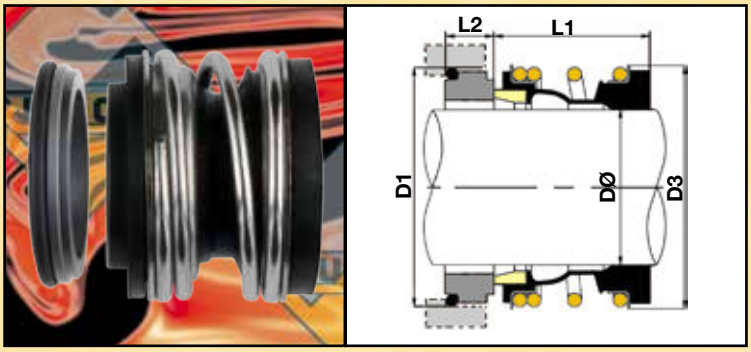
'O'-Ring mounted conical spring, stepped shaft, balanced Seals with 'O'-Ring mounted stationaries, to suit specific dimensions of commonly marine-application "L and LV" series Pumps."LV" Pumps have vertical shafts and only require one clockwise rotation Seal, but "L– "series are horizontal, double-ended Pumps and require one clockwise and one anti-clockwise Seal per Pump.

Many Allweiler Pumps accept Vulcan standard range Seals, such as Types 8DIN and 8DINS. Some of the Seals, are detailed here or in earlier sections of the catalogue, if you can not find what you require, please contact us with the OEM details for cross-reference on our database.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
28.00*	0330	43.00	46.00	39.50	8.5
30.00*	0350	45.00	49.00	39.50	9.0
45.00*	0500	63.00	66.00	55.00	9.0

Vulcan Type 198 Seals to suit Andritz® Pumps

E V AS SS 304



'O'-Ring mounted rubber bellows Seals to DIN24960 / EN12756 dimensions, but with a balanced rotary face profile and special stationary profiles, to suit service in Andritz® "S-"series centrifugal Pumps, commonly found in paper and cellulose processing.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
38.00	0380	56.00	57.30	36.00	9.00
48.00	0480	66.00	69.00	36.00	9.00
53.00	0530	73.00	76.00	36.50	11.00
65.00*	0650	85.00	90.00	41.50	11.00
90.00*	0900	115.00	126.00	51.00	14.00

11 a

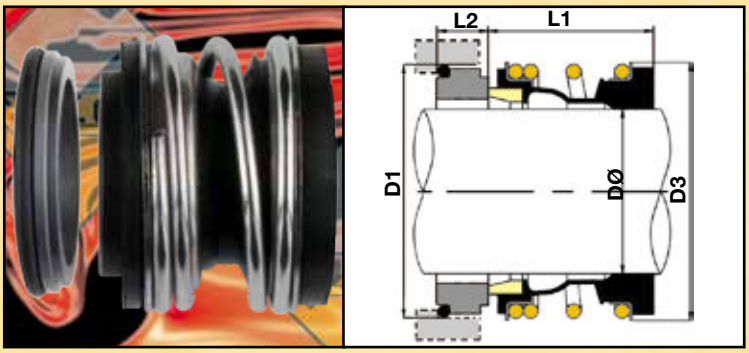
Advice on our Material Codes shown above and our standard coding system are on Pages 91 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals for Ebara® Pumps

Vulcan offer a wide range of Seals to suit Ebara® Pumps, especially European models, including many standard range Seals such as the Type 13, 13DIN and Type 126 Seals. The following are specific dimension Seals designed to suit the internal dimensions of certain Ebara® Pumps.

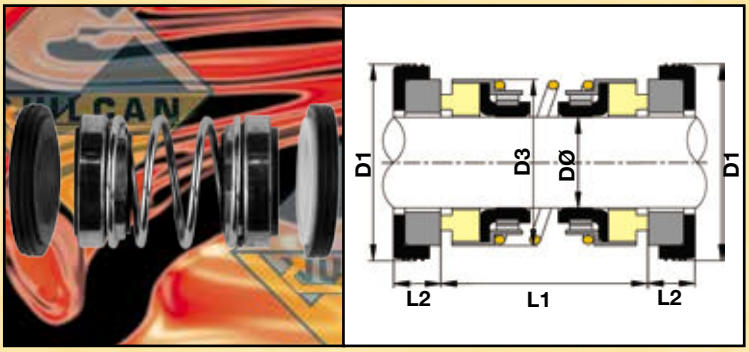
Type 198 to suit evm- and evmw- series Pumps V SS D 316



Rubber-bellows Seals with Boot mounted stationaries and Stainless Steel spacer-rings, to suit internal dimensions of Ebara® "EVM" and "EVMW" vertical multi- stage Pumps.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
0.500	0127	23.00	24.00	15.00	8.60
16.00	0160	26.00	27.10	17.00	10.00
20.00	0200	35.00	36.00	21.50	11.50
28.00*	0280	43.00	47.00	26.50	10.00

Type 260A to suit best-, right- and dw- series Pumps V WA 304

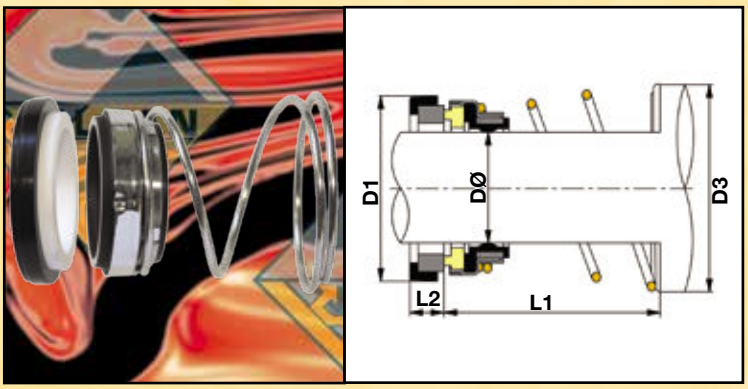


Rubber diaphragm double-ended Seals with Boot mounted stationaries, to suit the internal dimensions of Ebara® "Best-", "Right-" and "DW-" series, small submersible Pumps. This common Seal type is also utilised by other Pump manufacturers for small portable submersible Pumps.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
14.00	0140	30.00	20.00	26.00	5.00
15.00	0150	30.00	20.00	26.00	5.00
16.00	0160	30.00	20.00	26.00	5.00

Vulcan Seals to suit Eureka® Pumps

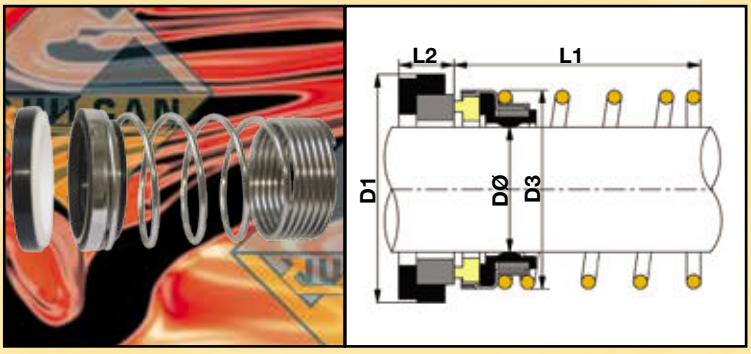
Type 277 to suit cg- series Pumps N C 304



Vulcan manufacture and stock a variety of standard range Seals to suit various Eureka® Pumps (now part of Hamworthy®, formerly Thune-Eureka®). Type 277 is an elastomer diaphragm Seal, with reverse taper Seal to specifically suit the "CG-" series centrifugal Pumps, widely used in marine applications.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Ref.
29.00	0290	47.63	46.00	32.00	11.99	CGA
35.00	0350	53.98	58.60	31.50	11.99	CGB
41.00	0410	60.35	59.30	32.50	11.99	CGC
48.00	0480	66.70	66.00	38.50	11.99	CGD
54.00	0540	73.05	70.00	41.00	13.50	CGE

Type 278 to suit cac, cav and cax series Pumps N C 304



Elastomer diaphragm Seals to 2.3/8" shaft size, with extended taper coil, to suit internal dimensions of Eureka® "CAC, CAV and CAX-" series centrifugal Pumps, widely used in marine applications.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
2.375	0603	79.40	82.00	82.60	13.50

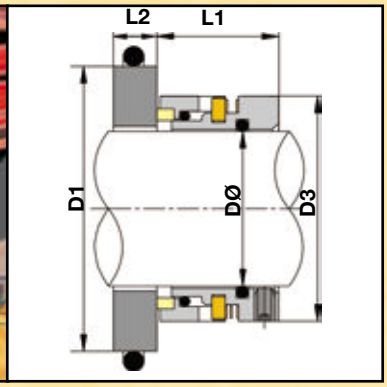
11 a

Advice on our Material Codes shown above and our standard coding system are on Pages 91 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals for Godwin® Pumps

Type 1653 to suit dri-prime® series Pumps N V S 304



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
40.00	0400	69.90	56.00	32.00	7.50
50.00	0500	89.90	71.00	34.00	13.00

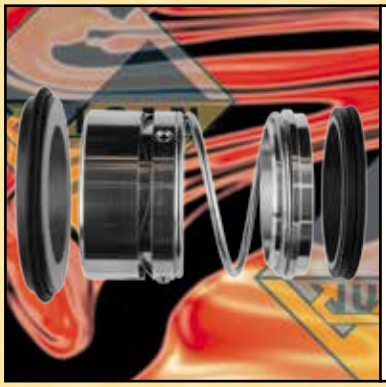
Vulcan manufacture and stock a range of specific Seal Types to suit Godwin® "Dri-Prime®" Pumps, in materials suitable for all clean and dirty water transfer duties.

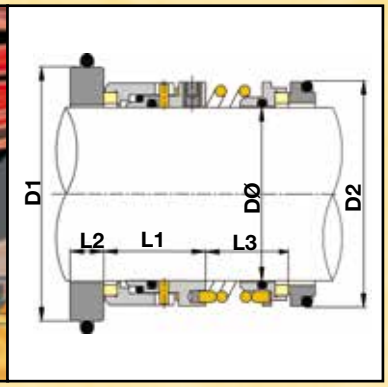
40mm and 50mm sizes normally operate as single Seals.

Please contact is if you require 60mm size Seals.

The Type 1653 is a robust heavy-duty design for more abrasive medias, for lower solid content fluids, the Type 1724P can be used, please see details below.

Type 1653D to suit dri-prime® series Pumps N V Z 304



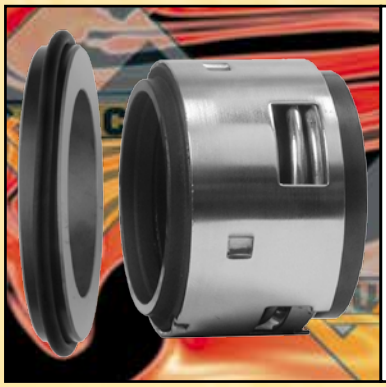


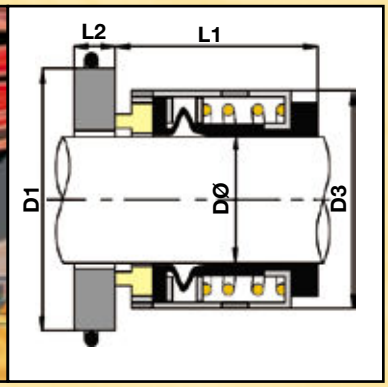
Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	L3 (mm)
75.00	0750	109.90	98.00	45.50	14.90	37.00

For larger "Dri-Prime®" Pumps with 75mm shaft sizes, a double Seal is required. The most common arrangement is directly replaced by the Vulcan Type 1653D, which shares a similar construction to the Type 1653 but with an additional single-spring component Seal assembly to Seal the oil-bath.

For all Godwin® Pumps, please contact us with the OEM details for cross-reference and identification.

Types 1724P and 1725P to suit dri-prime® series Pumps N S 304





Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Vulcan Type
40.00	0400	69.90	56.00	32.00	7.35	1725P
50.00	0500	64.50	66.00	34.50	10.30	1724P

Vulcan Types 1724P and 1725P are designed to suit smaller models of "Dri-Prime®" Pumps, and offer an easy to install elastomer bellows Seal that is designed to suit the length of the Seal chamber, removing the need to set the Seal on the shaft with set screws. Type 1724 uses a standard Vulcan rotary, Type 1725 has the same design but with a reduced working length.

For a heavy-duty alternative design, please see the Type 1653 detailed at the top of the page.

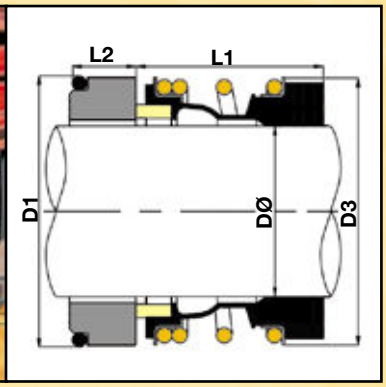
Advice on our Material Codes shown above and our standard coding system are on Pages 91 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals for Grundfos® Pumps

Vulcan manufacture and stock a wide range of standard range and specific Seal Types to suit all Types of Grundfos® Pumps, including former Sarlin® submersible Pumps and Hilge® sanitary Pumps. Vulcan Seals for Grundfos® Hilge® sanitary Pumps are dealt with in the following Food and Dairy Seals section. Please contact us with the OEM details and part numbers for cross-reference and identification, if your requirement is not shown.

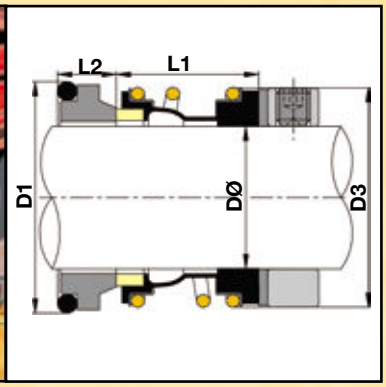
Type 192G Seals to suit Grundfos® Pump ranges EV E H 304



Vulcan manufacture and stock Type 192G elastomer bellows Seals designed to replace the Grundfos® Seal styles "A-" and "B-" with a single, superior performing and easier to install Seal design, in the majority of their centrifugal Pump ranges.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
12.00	0120	23.00	24.00	25.90	15.00
16.00	0160	27.00	28.00	28.40	12.30
22.00	0220	37.00	36.50	30.00	11.10
33.00	0330	48.00	51.00	35.00	7.50

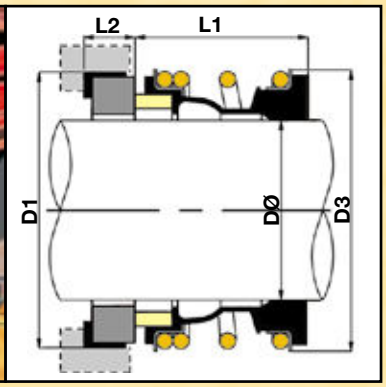
Type 196 16mm Seals to suit CP-Series Pumps E D 304



Vulcan manufacture and stock 16mm elastomer bellows Seals with spacer and clamp ring to suit the Grundfos® "CP" series Pumps. Widely utilised in building service applications.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
16.00	0160	31.50	28.50	21.50	10.50

Type 196 22mm Seals to suit LP-Series Pumps E E H 304



Vulcan manufacture and stock 22mm elastomer bellows Seals with special profile Boot mounted Stationaries to suit Grundfos® "LM", "LP, LPD and LPE" series Pumps. Widely utilised in building service applications.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
22.00	0220	37.00	36.00	33.00	12.00

Types 953 and 954 Seals to suit CR-Series Pumps EV U H 316

Vulcan manufacture and stock 12mm and 16mm Type 953 screw-fit semi-cartridge Seals and 22mm Type 954 push-fit semi-cartridge Seals to replace Grundfos® "H-" code Seals installed in CR, CRI, CRIE series vertical multi-stage Pumps.

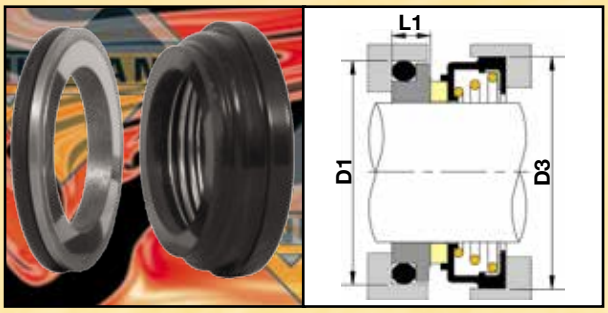
Type 953 and 954 are intended for all standard clockwise rotation Pumps. 16mm Type 953 is also available in "953L" format specifically for "CR15SF" models with anti-clockwise rotation shafts.

Advice on our Material Codes shown above and our standard coding system are on Pages 91 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals to suit Haigh® / I.M.O.®

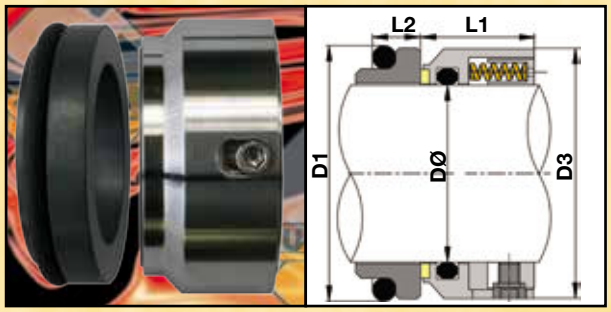
Vulcan® Type 28 to suit Haigh® Macerators (N) (F) 304



Vulcan manufacture 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 cast iron stationary with a Nitrile 'O'-Ring.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)
1.250	0317	N/A	57.50	N/A
1.750	0444	67.00	70.00	7.50

Vulcan® Type 1620 to suit Haigh® Macerators (V) (S) 304

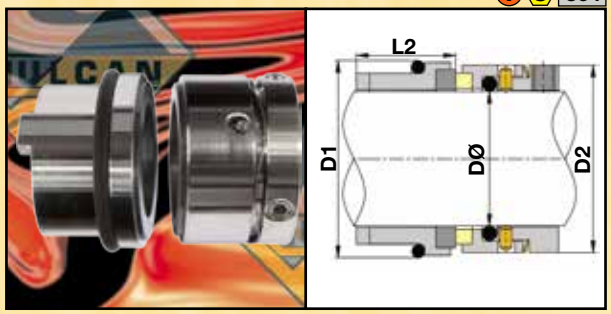


Vulcan manufacture and stock 42mm complete multi-spring 'O'-Ring mounted Seals with 'O'-Ring mounted Stationaries to suit Haigh® macerators.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
42.00	0420	62.00	65.00	30.15	14.10

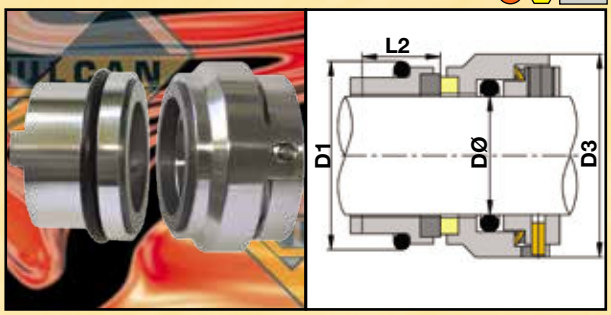
Vulcan® Type 1689 to suit I.M.O.® Pumps

(V) (S) 304



Vulcan® Type 1690 to suit I.M.O.® Pumps

(V) (S) 304



Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L2 (mm)
22.00	0220	35.00	33.00	38.00	23.50

Vulcan® Seals to suit I.M.O.® Pumps

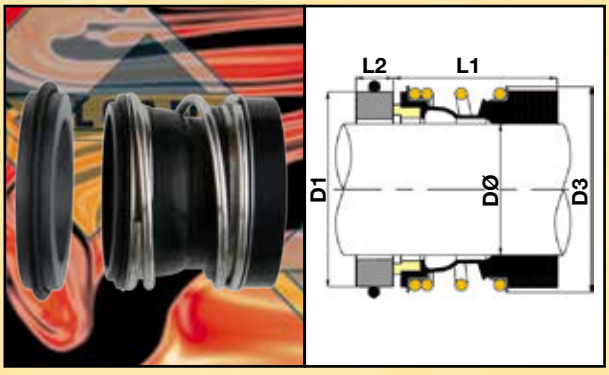
Vulcan manufacture and stock a wide range of standard dimension Seals to suit I.M.O.® Pumps, commonly found in marine applications. To replace the five-part OEM Seal supplied for ACE series Pumps, generations 3 and above, Vulcan have designed the following Seals, which offer a standard configuration Seal with a rotary and a stationary, which is far easier to install than the original OEM Seal.

To replace OEM Seal Types "T" and "Q" please use Vulcan Type 1689

To replace OEM Seal Types "U" and "V" please use Vulcan Type 1690.

For other I.M.O.® requirements, please contact us with details.

Vulcan® Type 144 to suit Kolmeks® Pumps (E) (D) 304



Vulcan manufacture and stock a range of rubber bellows Seals with distinctive 'O'-Ring mounted stationaries, to suit Kolmeks® A–, L–, N– and T– series circulating Pumps. These Pumps are also seen with other brand names, such as Armstrong®, Pullen® and I.T.T.. Flygt®.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
12.00	0120	22.22	22.00	25.40	5.50
18.00	0180	30.15	32.00	24.50	8.00
25.00	0250	36.73	39.00	25.40	8.00
32.00	0320	46.00	46.00	30.15	8.50
40.00	0400	58.00	56.00	36.00	9.00

Advice on our Material Codes shown above and our standard coding system are on Pages 91 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

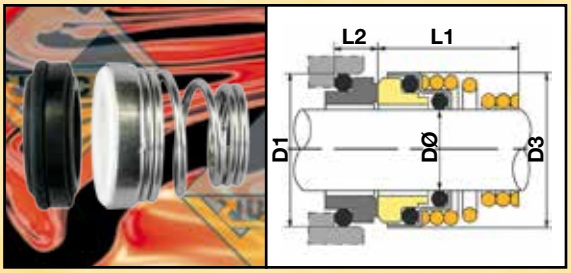
All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals for Lowara® Pumps

Vulcan offer a wide range of Seals to suit I.T.T. Lowara® Pumps, especially centrifugal circulation Pumps. Many I.T.T. Lowara® Pumps use standard range Seals, especially Type 13 and Type 13DIN, the following Types are specific dimension Seals to suit certain ranges where a standard Seal cannot be installed. For other I.T.T. Lowara® requirements, please contact us with details.

Type 130 to suit fc-, fh- and sh- series Pumps

E V B 304

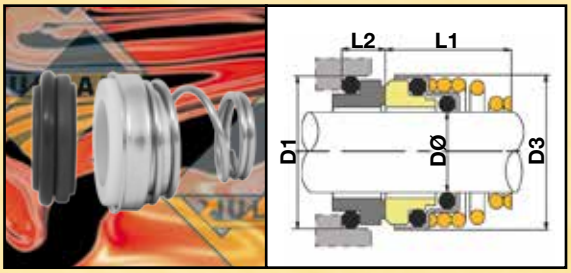


Vulcan manufactures a range of 'O'-Ring mounted conical spring Seals to EN12756/DIN24960 "L1K" dimensions, to suit "FC-, FH-, SH-" series Pumps.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
14.00	0140	25.00	24.00	22.20	7.00
22.00	0220	37.00	36.00	27.50	10.00
28.00	0280	43.00	42.00	32.50	10.00
33.00*	0330	48.00	46.50	32.50	10.00

Type 131 to suit ce- and co- series Pumps

N E V B I H 304

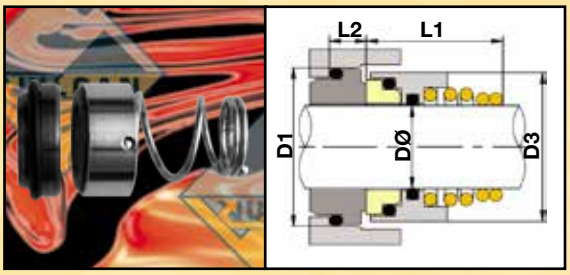


Vulcan manufacture and stock a 14mm Type 131 Seal to suit the reduced length Seal chamber ofvarious circulating Pumps, such as "CE-" and "CO-" ranges with newer "A" suffix motors. The Type 131 is the same dimensions to Vulcan Type 13, except for the reduced rotary working length.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
14.00	0140	23.10	24.00	16.60	6.00

Type 135 to suit sv- and svi- series Pumps

E V I 304

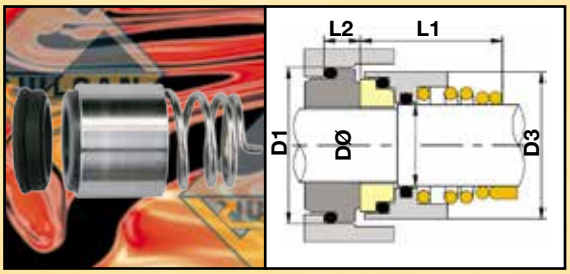


Vulcan manufacture and stock a range of 'O'-Ring mounted, robust conical spring Seals to EN12756 / DIN24960 "L1K" dimensions, to suit "SV- and SVI-" series Pumps. 12mm and 16mm also suit certain "e-SV-" series models

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
12.00	0120	23.00	21.00	25.50	7.00
16.00	0160	27.00	26.00	28.00	7.00
25.00	0250	40.00	36.00	30.00	10.00

Type 139 to suit e-sv series Pumps

V R SC 316



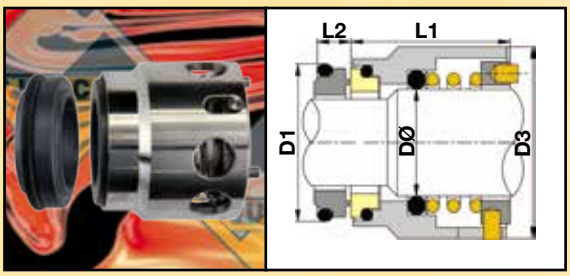
Vulcan manufacture and stock a 20 / 18mm step-balanced, 'O'-Ring mounted, robust conical spring Seal with positive drive from the coil, to suit certain models of "e-SV-" series Pumps.

Vulcan Stock Codes; W-0200.139.R.V.R. - SiC vs SiC
W-0200.139.R.V.SC. - SiC vs Carbon

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
16.00	0200	26.90	29.50	34.00	7.00

Type 822 to suit sv and e-sv series Pumps

E S 316



Vulcan manufacture and stock a 22/26mm step-balanced, 'O'-Ring mounted, robust single spring Seal with positive drive from three drive studs on the coil base, to suit larger models of "SV- and e-SV-" series Pumps.

Vulcan Stock Code; W-0220.822.E.S. - SiC vs SiC

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
26.00	0220	37.00	43.00	38.00	10.00

11 a

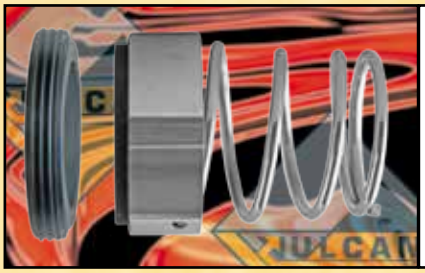
Advice on our Material Codes shown above and our standard coding system are on Pages 91 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

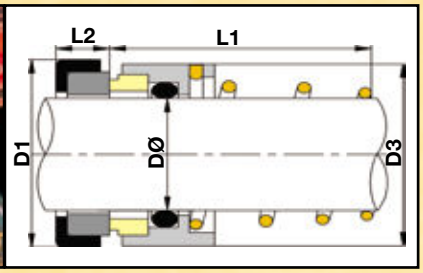
All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals for K.S.B.® Pumps

Vulcan offer a wide range of Seals from stock and to special order, to suit K.S.B.® equipment, especially centrifugal and waste-water Pumps. Please contact us with OEM details for cross reference and identification.

Type 127B to suit eta- and sy- series Pumps E AS 316

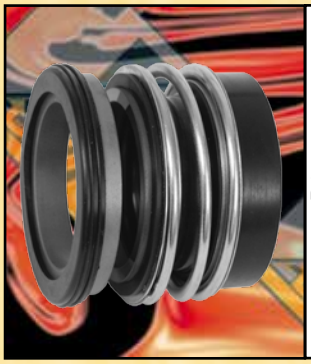


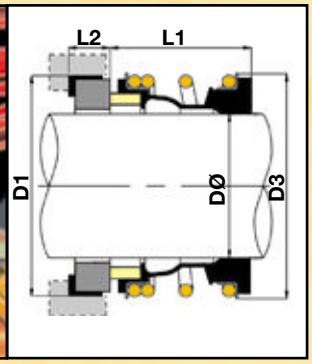


Vulcan manufacture and stock 'O'-Ring mounted conical spring rotaries with Type 19B Boot mounted stationaries, to give operating dimensions to EN12756/ DIN24960 L1N, for "ETA-" series Pumps with "SY-, SYA-, SYN-, or SYT-" designations. These Seals are available from stock in materials especially suitable for hot water duties.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
28.00	0280	43.00	40.00	42.50	7.50
38.00	0380	56.00	53.00	46.00	9.00
48.00	0480	66.00	64.00	51.00	9.00

Type 192K to suit eta- series Pumps E V D SS 304



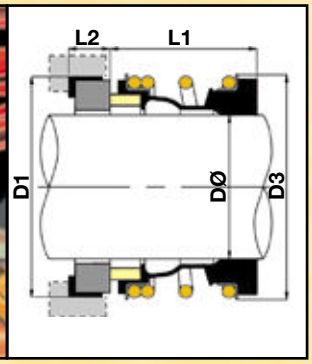


Vulcan manufacture and stock a range of elastomer bellows Seals to suit the common Types of K.S.B.® "ETA-" series centrifugal Pumps commonly found throughout the fluid industry.

Contact us with OEM details for cross reference and identification.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
16.00*	0160	27.00	26.00	22.20	12.10
22.00	0220	37.00	36.00	25.50	12.10
28.00	0280	43.00	47.00	36.50	14.40
38.00	0380	56.00	58.00	42.00	13.20
48.00	0480	66.00	69.00	50.50	9.60

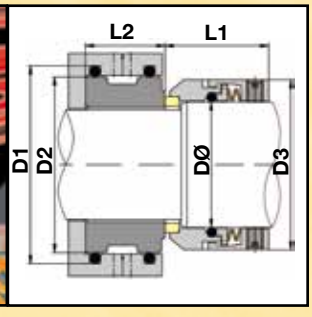
Type 197 to suit ama-, krt-, and sewA- series Pumps



Vulcan manufacture and stock a range of elastomer bellows Seals to suit the specific dimensions of K.S.B.® "AMA-", "KRT-" and "SEWA-" series waste-water Pumps with "SU-" prefix Seals installed. 25mm size is commonly used in the 'oil bath' position, with 22mm Type 19B found on page 45 in the 'outer' position, 33mm sizes are used in pairs in the same Pump series. 28mm is commonly used in "Vitachrom" Pumps in tandem with Type 127B.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Guaranteed Stock Materials
25.00	0250	38.00	41.00	23.00	7.50	V C 304
28.00*	0280	43.00	47.00	26.50	9.00	V SS 304
33.00	0330	48.00	51.00	27.50	11.00	V SS 304

Type 1678Y to suit various K.S.B.® Pumps E AD 304



Vulcan manufacture and stock two sizes of step-balanced, 'O'-Ring mounted wave-spring Seals, with specific stationary design to replace OEM Seal type "H75G115". These Seals are available from stock in materials especially suitable for hot water duties.

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
28.00	0330	55.20	48.80	47.00	38.50	25.00
33.00	0380	59.20	52.80	54.00	38.50	29.00

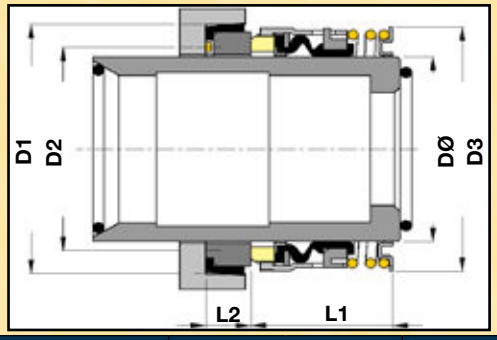
Advice on our Material Codes shown above and our standard coding system are on Pages 91 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Our Seals for Mission, SPP & Sihi Pumps

Vulcan® Type N5 to suit National Oilwell® Mission Magnum® Pumps. V H 316

Vulcan manufacture and stock the Type N5, specifically designed to suit the common "Mission™" range of Well-Head service Pumps, found in both on-shore and off-shore drilling duties. The Vulcan N5 features innovative design details, such as a unique style of Seat ring with an elastomeric cup; with special profile that also allows for locating the Stationary ring onto the existing anti-rotation provision in the Pump housing. This gives greater sealing performance over the traditional 'O'-Ring only Stationary designs, which are prone to cutting on fitting or in operation. Especially considering the housings on these Pumps can frequently become corroded and provide poor surfaces for a simple 'O'-Ring to Seal on. Our Boot design reduces corrosion across a far wider sealing surface.



Shaft Size DØ		Size Code	D1		D3		L1		L2	
In	mm		In	mm	In	mm	In	mm	In	mm
2.500	63.50	0635	3.375	85.73	3.210	81.54	2.500	63.50	0.567	14.40
3.500	88.90	0889	4.375	111.13	4.375	111.13	3.125	79.38	0.783	19.88

Bellows Torque-Transfer Disk - Maximum Reliability

The Vulcan A and N Series 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 I.D.'s are very close to the shaft and can be problematic, due to bellows extrusion and shaft contact/stiction.

Improved Design

The flexible bellows compensates for primary Seal face wear, machinery misalignment and shaft end float. The Vulcan 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.

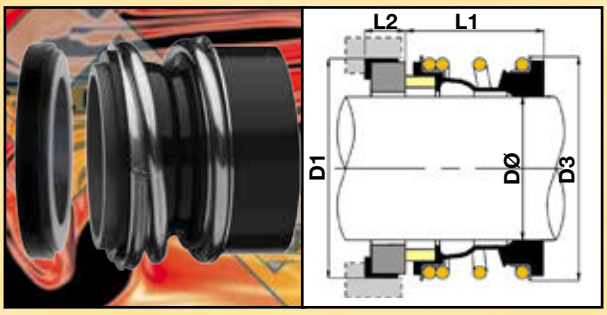
Improved Reliability

These are proven, very effective designs, successfully installed in countless applications. They give extremely reliable performance as a result of the bellows design, high strength and flexibility. When the advantages of our rotary unit design are then added to the additional reliability of the unique cup-mounted design over the normal single 'O'-Ring design, then major performance and life benefits are seen. The Rotary Seal Faces are retained by inert grease and NOT glue. Some Seal suppliers choose to utilize glue which can create a leakage path, and on chemical attack, the glue can migrate into Seal components and product.

Balanced Seal Design

The Vulcan A and N Series Seals are specially hydraulically Balanced to a recognized industry standard, to reduce heat and friction at the Seal interface. This allows for higher operating parameters to be achieved and prolongs Seal life. Competitor Seals are not balanced and therefore do not offer the full benefits of a Balanced Seal.

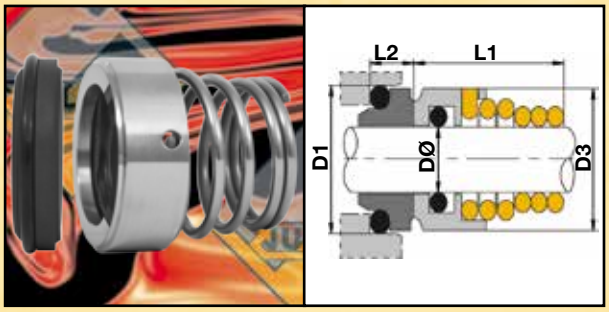
Vulcan® Type 196 32mm to suit S.P.P.® Pumps. E D 304



Vulcan manufacture and stock 32mm elastomer bellows Seals with smooth-Boot stationaries, to suit the extended Seal chamber of S.P.P.® Eurostream® centrifugal Pumps, commonly associated with large building service applications, such as heating and fire systems.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
32.00	0320	48.00	51.00	40.00	7.50

Vulcan® Type 121 to suit Sterling Sihi® Pumps. N E V P 304



Vulcan manufacture and stock 38mm 'O'-Ring mounted conical spring Seals, in clockwise and anti-clockwise rotation, to suit the housing dimensions of common Sterling Sihi® Pumps.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
38.00	0380	53.50	53.00	42.00	9.50

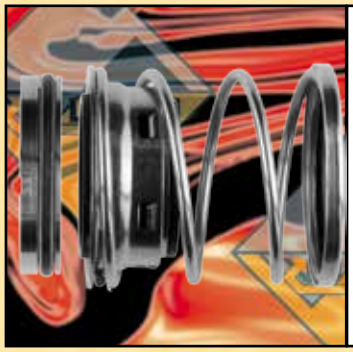
Vulcan stocks many standard range Seals to suit Sterling Sihi® Pumps, such as Type 12, Type 12DIN, Type 192S, Type 40L and Type 1677M.Please contact us with the OEM details for cross reference and identification.

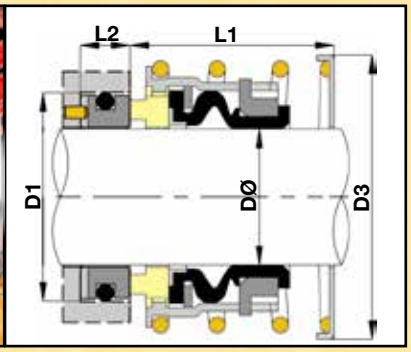
Advice on our Material Codes shown above and our standard coding system are on Pages 91 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Viking® / Wilo® Pumps Seals

Vulcan® Type V4 to suit Viking® Pumps. O AN 304



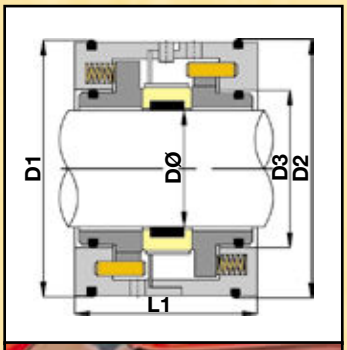


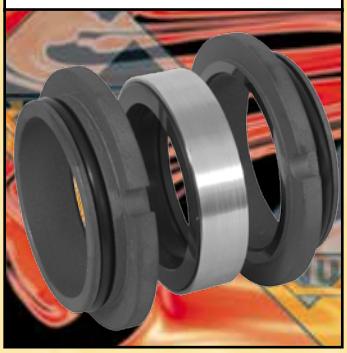
Vulcan manufacture a wide range of differing elastomer diaphragm Seals with 'O'-Ring or Boot mounted stationaries, to suit the specific dimensions required by various Idex® Viking® Pumps, of which the Vulcan Type V4 1.1/4" shaft size is a common example. Please contact us with OEM details for cross reference and identification, for any other Seal assembly required for this popular brand of Pumps.

Shaft Size DØ		Size Code	D1		D3		L1		L2	
In	mm		In	mm	In	mm	In	mm	In	mm
1.250	31.70	0317	1.875	47.50	2.027	51.50	1.000	25.40	0.381	9.65

Vulcan® Type 1640 and 1642 to suit Wilo® E.M.U. Submersible Pumps. V ZS 304

Vulcan manufacture and stock several standard range Seals to suit Wilo® E.M.U. Submersible Pumps, as well as Type 1640 and 1642 Seals to replace the OEM "EBU" enclosed-block Seals.





The Vulcan Type 1640 is a direct replacement for the older-generation "EBS" OEM Seals. Newer Pumps have a slightly modified Seal installed, which is directly replaced by the Vulcan Type 1642. Please check the outer dimensions of the seat housing for correct identification, utilising the table below, D3 dimension.

Type 1640 is available as complete Mechanical Seal assemblies or in repair kit form. The kits comprise both stationary faces, with 'O'-Rings, central rotary with elastomer diaphragm, anti-rotation pins and springs for stationaries, and retaining pins for the collets. Specify .KIT as a suffix on the stock code.

Type 1640 Dimensions V ZS 304

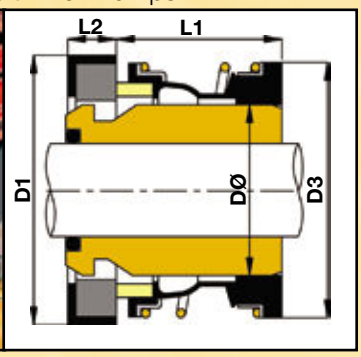
Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)
35.00	0350	72.00	72.00	47.00	47.50
50.00	0500	92.00	90.00	63.00	52.00
75.00	0750	130.00	128.00	95.50	75.00

Type 1642 Dimensions V ZS 304

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)
35.00	0350	72.00	72.00	49.00	47.00
50.00	0500	92.00	90.00	65.00	52.00

Vulcan® Type 191 to suit Wilo® Centrifugal Pumps. E D 304

Vulcan manufacture and stock two sizes of Type 191 elastomer bellows Seals to suit common Wilo® centrifugal Pumps, commonly utilised in heating Pumps applications. Vulcan stocks the brass shaft sleeves the Seals are mounted onto. Vulcan also offers other standard range Seals, such as 17mm Type 19B, and 18mm, 24mm or 32mm Type 192B Seals, to suit Wilo® Pumps.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
32.00	0320	50.80	51.00	33.34	11.99
55.00	0550	76.20	78.00	41.00	13.50

Brass Shaft Sleeves.
Please use codes;
0320.191.E.X.SLEE
0550.191.E.X.SLEE
For ordering relevant Shaft Sleeves

Advice on our Material Codes shown above and our standard coding system are on Pages 91 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals for Compressors

Vulcan have extensive experience in providing effective replacement Mechanical Seals for Refrigeration Compressors. Materials knowledge and Quality is vital for these applications. As 'O'-Ring and Carbon grade compatibility with the various Types of lubricant oils and refrigerant liquids used in this equipment, together with the effects of fluctuating temperatures, are critical for assuring Seal capability, performance and life.

It's a false economy to risk utilizing Seals that haven't been engineered and designed to incorporate Seal feature, elastomer and Carbon materials technology, especially considering the expense involved in replacing a leaking Seal in a Refrigeration Compressor. We can check the lubricating oil and refrigerants you are using against our compatibility list and provide a Seal Design and Materials that will prove reliable.

Most Refrigeration Compressors have a unique Mechanical Seal Design applicable to each model Range. Vulcan has a wide Range of direct replacement designs available, incorporating our performance enhancing design amendments and materials where applicable. The most common of which are illustrated below, but this is in no way a definitive list of what is available from Vulcan. Please contact us with the details of your equipment and the oil and refrigerant combination. We will respond with our recommendations based upon decades of experience.

Vulcan guaranteed ex-stock Seal range

J & E Hall® HS18-20 Screw

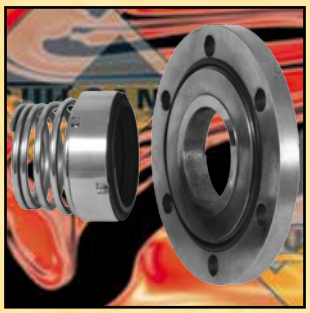
Howden® WRV205

Howden® WRV225 Mk1

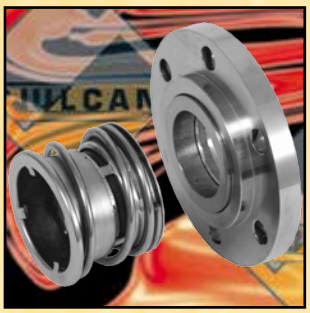
Sabroe® TCM028

- A.P.V. Hall® HS18-20 Screw
- A.P.V. Hall® V54 6 And 8 Cylinder
- A.P.V. Hall® V92 Range
- A.P.V. Hall® V127 Range
- Bitzer®4F, 6F And 6G
- Bitzer® 4N, 4P, 4T And 4U
- Bock® AM And BFO Ranges
- Bock® F And FK Ranges
- Carrier® 05K
- Carrier® 05G
- Carrier® 05G Emergency Clutch
- Carrier® 05H
- Carrier® V60
- Copeland® 2, 4 And 6 Cylinder
- Copeland® 8 Cylinder
- Daikin® C55 4, 6 And 8 Cylinder
- Daikin® C75 4, 6 And 8 Cylinder
- Dunham Bush® Big 4
- Frick® RDB Range
- Frick® RWB Range
- Frick® TDSH/GDSH Range
- Gram® HC075
- Gram® HC100
- Grasso® RC9 Non-bellows
- Grasso® RC11 Non-bellows
- Howden® WRV163 And XRV163
- Howden® WRV204 Mk4
- Howden® WRV204 Mk5
- Howden® WRV204 Mk6
- Howden® WRV205
- Howden® WRV255 Mk1 To 4F
- Howden® WRV255 Mk5
- Howden® WRV321
- Sabroe® CM018
- Sabroe® CM024, 026 And 028
- Sabroe® SAB 128 Non-bellows
- Sabroe® SAB 163 Non-bellows
- Sabroe® SMC100 To 104
- Sabroe® TCM024, 026 And 028
- Sabroe® TSMC108 To 165
- Sabroe® VMY225
- Sabroe® VMY236
- Sabroe® VMY325
- Sabroe® VMY336
- Sabroe® VMY447
- Sabroe® VMY525
- Sabroe® VMY536
- Stal® P24 And PK24
- Stal® P42
- Stal® PK6, PK8
- Stal® S50, S51, S56 And S57
- Stal® S70, S71, S73 And S75
- Thermo-King® "22-0777" Seal
- Thermo-King® "22-0778" Seal
- Thermo-King® "22-0899" Seal
- Thermo-King® "22-1100" Seal
- Thermo-King® "22-1101" Seal
- Vilter® 320VMC to 350VMC
- Vilter® 440 With 2.500" Crank
- Vilter® 450 With 2.500" Crank
- Witt® GP42 Pump
- Witt® GP51 Pump

Vulcan Seals for all of the above Compressor Models shown are Guaranteed Ex-Stock. For further information and any other Types, please view our Web Portal and / or our Compressor Seal Price List, or enquire.

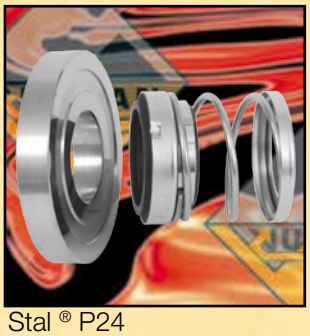


Copeland® 4CC



Carrier® 05G

J & E Hall® V54



Stal ® P24

Advice on our Material Codes shown above and our standard coding system are on Pages 91 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Wastewater Pump Seals

I.T.T. FLYGT® / Grindex®, (THEN alphabetically) A.B.S.®, Ebara®, Gormann-RUPP®, Godwin®, Grundfos®, Honda®, K.S.B.®, Terex-Pegson®, Tsurumi®, Wemco/Hidrostal®, Wilo EMU®

Section 11b

Vulcan Mechanical Seals for Flygt® and I.T.T. Grindex® Pumps

Flygt® design and manufacture excellent Pumps. However, in our opinion and long experience, the designs, materials and performance of the OEM Mechanical Seals in these Pumps can be less than optimum for the demanding conditions that these Pumps routinely encounter. The OEM Seals rely upon plastic materials and design features and principles that you would not find on any Vulcan design Mechanical Seal within this catalogue. Most particularly, these Flygt® Pumps frequently, in fact routinely, operate in highly demanding mechanical and abrasive media conditions, usually remote and often Down-Well. The combination of highly demanding Mechanical Seal conditions and costly Pump removal, over-haul or replacement and then re-installation, also make preferable, the specification and use of the optimum design engineering and materials within the Mechanical Seal. The Vulcan Type 06 and Type 06X Ranges have specifically been developed to meet these needs. They are designed and engineered to provide superior Mechanical Seal performance, capability, reliability and life.

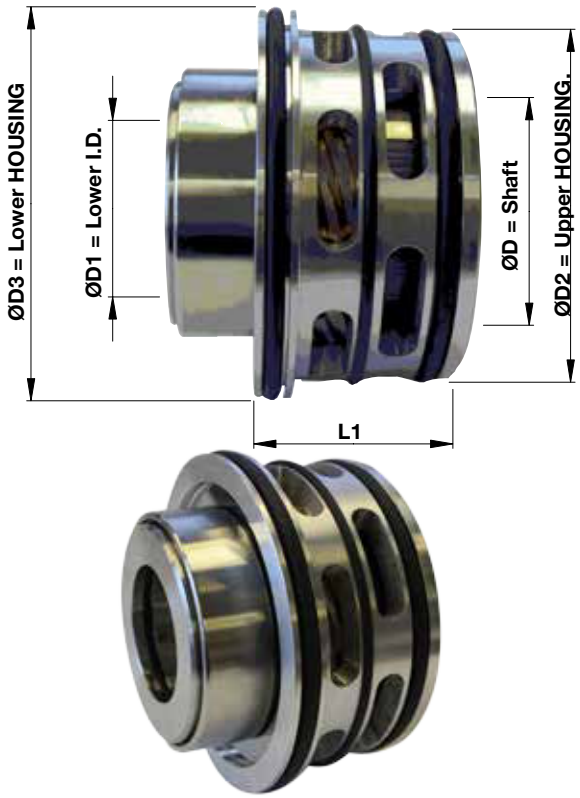
The Vulcan Type 06 Range (over-leaf) reduces costs through it's Mechanical Seal engineered designs, materials, easier more assured fitting and installation (with no expensive fitting tool nor Pump modification necessary), combined with leading market competitive pricing and most especially; application designed Mechanical Seal performance, reliability and life.

Vulcan's Range of speciality Mechanical Seal designs for Flygt® and other Wastewater and Submersible Pump OEM's is unrivalled in the Mechanical Seal industry. The most commonly requested examples of this Range follow in this Section, but this is only a partial stock Seal representation of what is available from Vulcan. If the specific Seal Type or OEM you are looking for is not shown here, please contact us so we can progress your requirement. Further details on this exceptional Range from Vulcan are shown on this and the following two pages.

Vulcan Seals To Replace Flygt® 'Plug-In'™ Cartridge Seals

Flygt® and Grindex® have introduced a Range of Pumps (detailed below) designed with unitized Double Seals, instead of the previous Upper- & Lower- Seal arrangement. With the intention of providing an easier to install, pre-tensioned Mechanical Seal unit; one that on sizes of 35mm and above, also helps to circulate cooling fluid around the Pump internals. The original Seal's feature plastic bodies that are glued together and are easily damaged. The sealing faces are frequently retained by plastic anti-rotation lugs that can quickly wear, or are driven by thin-section pressed metal sleeves that can become worn and subsequently lock the Seal internals together. Resulting in Seal failure and the Pump requiring service or replacement. The original plastic body Seals are permanently joined and cannot be repaired. Thus they must be replaced each time at considerable cost. The Vulcan Type 06X is specifically designed to solve these issues, by providing a direct replacement, best-for-purpose, engineered Seal, that installs in the same way and in the same dimensions, located using the Shaft-Mounted circlip supplied with each Vulcan Seal for convenience.

The Type 06X features a strong one-piece metal body with Tungsten or Silicon Carbide Seal faces on the product side and on 35mm sizes or above, an internal circulation system to move cooling fluid around the Pump internals. The relevant Pump models with 'Plug-In'™ Seals, suitable for the Type 06X direct replacement, are detailed in the Table below. For a full listing of all Flygt® Pump models, along with the part codes for the Vulcan Mechanical Seal and 'O'-Ring Sets, please see the following two pages.



Type 06X Shaft Size Range

Shaft Size D	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	Guaranteed Stock Materials
20.00	0200	18.00	55.00	60.50	35.50	
25.00	0250	22.00	60.00	66.00	36.00	V XV 304
35.00	0350	32.00	80.00	90.00	44.50	V XV 304
45.00	0450	38.00	90.00	99.00	60.00	V ZR 304
60.00	0600	50.00	115.00	126.00	60.00	V ZR 304
						V ZR 304

Flygt® Model Number to Size Code Cross-Reference

OEM	Type 06X Size Code
2610 - Series	0200
2620 - Series	0200
2630 - Series	0200
2640 - Series	0200
2660 - Series	0250
2670 - Series	0350
3171 - Series	0450
3202 - Series	0600
4610 - Series	0200
4620 - Series	0200
4630 - Series	0250
4640 - Series	0250
4650 - Series	0450
4660 - Series	0450
4670 - Series	0600
4680 - Series	0600
5100 - 210 to -221 Models	0350.06XL
5100 - 250 to -261 Models	0450
5100 -300 and -310 Models	0600
5150 -300 and -310 Models	0600

Vulcan Mechanical Seals for Flygt® Pumps

Flygt® Pumps - Type 06 range for Superior Performance

0200.06G.U.N.E.

0350.06M.U.N.E.

0600.06R.U.N.E.

0600.06Q.U.N.E.

The Vulcan Range of Type 06 Seals are designed as superior replacement Seals for Flygt® and Grindex® Submersible Pumps and mixers, with no Pump modifications necessary. The Type 06 designs require no additional fitting tool and most Types have pre-set working lengths, operated by a removable setting clip for easy installation. All Vulcan Type 06 Seals are stocked and fitted with optimal Nitrile elastomers and Carbon vs. T.C (with an option of Carbon vs. SiC) faces for Upper Seals and optimum Viton™ elastomers with T.C vs. T.C (with an option of SiC vs. SiC) faces for the Lower Seals. The stock codes tabulated below are for a complete Seal and Stationary.

Vulcan also stock Lip Seals and sets of 'O'-Rings for Flygt® Pumps to complement our Type 06 Range. The contents of each set is dependent upon Pump model. Their Vulcan stock code is constructed from the shaft size of the Upper Seal, our Type code "06" and the Flygt® Pump model preceded by a "V" and the material letter for the 'O'-Rings, either "N" or "V". e.g.; To order Vulcan 'O'-Ring set for Pump model "2102-040", use Vulcan code "0220.06.N.V2102-000".The stock codes shown below are for the preferred T.C face options

Flygt® Pump Model Series	Seal Shaft Sizes	Vulcan Upper Seal Stock Code	Vulcan Lower Seal Stock Code	Vulcan 'O'-Ring Set Code	Vulcan Additional Parts Code
2004, 2008, 2012, 2016	15mm	Lower Seal Only	0150.06D.N.Z.		
2024	20mm	0200.06A.U.N.E.	0200.06A.L.V.H.		
2050, 2052	15mm	Lower Seal Only	0150.06D.N.Z.		
2060	20mm	0200.06G.U.N.E.	0200.06G.L.V.H.		
2066	20mm	0200.06A.U.N.E.	0200.06A.L.V.H.	0200.06.N.V2066-000	
2070	22mm	0220.06E.U.N.E.	0220.06E.L.V.H.	0220.06.V.V2070-000	
2071	22mm	0220.06F.U.N.E.	0220.06F.L.V.H.	0220.06.V.V2070-000	
2075	20mm	0200.06A.U.N.E.	0200.06A.L.V.H.	0200.06.N.V2075-000	
2082-330	28mm	0280.06I.U.N.E.	0280.06I.L.V.H.	0280.06.N.V2082-330	
2084	35mm	0350.06K.U.N.E.	0350.06L.L.V.H.	0350.06.N.V2084-000	
2090, 2125, 2140	28mm	0280.06I.U.N.E.	0280.06I.L.V.H.	0280.06.N.V2125-000	
2135	35mm	0350.06K.U.N.E.	0350.06L.L.V.H.	0350.06.N.V2135-000	
2101	20mm	0200.06A.U.N.E.	0200.06A.L.V.H.		
2102	22mm	0220.06C.U.N.E.	0220.06C.L.V.H.	0220.06.V.V2102-000	
2151-010, -011, -050	35mm	0350.06K.U.N.E.	0350.06L.L.V.H.	0350.06.N.V2151-000	0350.06.LIP
2201-010	45/35mm	0450.06O.U.N.E.	0350.06K.L.V.H.	0450.06.V.V2201-000	
2201-011 HT or MT	45/35mm	0450.06O.U.N.E.	0350.06N.L.V.H.	0450.06.V.V2201-000	0450.06.LIP
2201-011 LT	45/35mm	0450.06O.U.N.E.	0450.06O.L.V.H.	0450.06.V.V2201-000	
2201-080, -320, -430, -480, -590, -690	45/35mm	0450.06O.U.N.E.	0350.06N.L.V.H.	0450.06.V.V2201-000	
2250	60mm	0600.06P.U.N.E.	0600.06P.L.V.H.	0600.06.N.V2250-000	
2400	60mm	0600.06R.U.N.E.	0600.06R.L.V.H.	0600.06.N.V2400-000	0600.06.LIP
2610, 2620	20mm	Lower Seal Only	0200.06X.V.XV.	0200.06.N.V2610-000	
2630, 2640	20mm	Lower Seal Only	0200.06X.V.XV.	0200.06.N.V2630-000	
2660	25mm	Lower Seal Only	0250.06X.V.XV.	0250.06.N.V2660-000	
2670	35mm	Lower Seal Only	0350.06X.V.ZR.	0350.06.N.V2670-000	
3041 (NOT -250 Size)	20mm	0200.06G.U.N.E.	0200.06G.L.V.H. OR 0200.06H.L.V.H.		
3057	20mm	0200.06G.U.N.E.	0200.06G.L.V.H. OR 0200.06H.L.V.H.	0200.06.N.V3057-000	
3065	20mm	0200.06A.U.N.E.	0200.06A.L.V.H.		
3067	20mm	0200.06G.U.N.E.	0200.06G.L.V.H. OR 0200.06H.L.V.H.	0200.06.V.V3067-000	
3068	20mm	0200.06G.U.N.E.	0200.06G.L.V.H. OR 0200.06H.L.V.H.	0200.06.V.V3068-000	
3080 (NOT -330 Size)	20mm	0200.06A.U.N.E.	0200.06A.L.V.H.	0200.06.V.V3080-000	
3080-330	35mm	0350.06K.U.N.E.	0350.06K.U.N.E.		
3082	22mm	0220.06E.U.N.E.	0220.06E.L.V.H.	0220.06.N.V3082-000	
3085	20mm	0200.06G.U.N.E.	0200.06G.L.V.H. OR 0200.06H.L.V.H.	0200.06.N.V3085-000	
3101	28mm	0280.06B.U.N.E.	0280.06B.L.V.H.	0280.06.N.V3101-000	
3102	25mm	0250.06J.U.N.E.	0250.06J.L.V.H.	0250.06.N.V3102-000	
3126-090, 3126-180	35mm	0350.06K.U.N.E.	0350.06K.L.V.H.	0350.06.N.V3126-000	0350.06.LIP
3126-091, -180, -280, -290, -998	35mm	0350.06K.U.N.E.	0350.06M.L.V.H.	0350.06.N.V3126-000	
3126-181	35mm	0350.06M.U.N.E.	0350.06M.L.V.H.	0350.06.N.V3126-000	
3127	35mm	0350.06M.U.N.E.	0350.06M.L.V.H.	0350.06.N.V3127-000	
3140 (NOT -980 Size)	45mm	0450.06O.U.N.E.	0450.06O.L.V.H.		0450.06.LIP
3152	45mm	0450.06O.U.N.E.	0450.06O.L.V.H.	0450.06.N.V3152-000	0450.06.LIP
3170	60mm	0600.06Q.U.N.E.	0600.06Q.L.V.H.	0600.06.N.V3170-000	0600.06.LIP
3171	45mm	Lower Seal Only	0450.06X.V.ZR.	0450.06.V.V3171-000	
3200	60mm	0600.06P.U.N.E.	0600.06P.L.V.H.		
3201	60mm	0600.06Q.U.N.E.	0600.06Q.L.V.H.	0600.06.N.V3170-000	0600.06.LIP
3202	60mm	Lower Seal Only	0600.06X.V.ZR.	0600.06.V.V3202-000	
3230, 3305, 3357	90/80mm	0900.06S.U.N.H.[i]	0800.06S.L.V.H.		

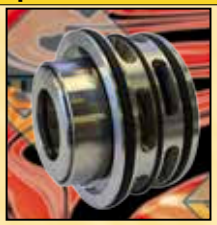
For any Pump models not listed above, please contact us, as models continually evolve. For all Seals annotated with "i", the part code shown for this model is the applicable one in the vast majority of instances. However some alternatives do exist; please check the Part Number found on the OEM database

Vulcan Mechanical Seals for Flygt® and I.T.T. Grindex®

Flygt® Pumps - Type 06 range for Superior Performance

0200.06H.L.V.H.

0350.06M.L.V.H.



0600.06X.V.ZR.

0600.06Q.L.V.H.

Robust, superior design replacement Mechanical Seal designs, with Stainless Steel Parts and Monolithic Carbide faces, provide higher Seal capability, performance, reliability and pro-longed operating life. Pre-set, easy to install, with no Pump modifications necessary. No plastic working Seal Parts, no brazed nor inserted faces, no wave-springs nor any other design features or material which are prone to wear and failure, Particularly in such arduous applications. Highly successful, proven designs, with over two decades of service, have now been even further developed with the enhancements.

The Vulcan Type 06 Range is designed to dimensionally replace the original Seals and provide a more engineered, longer life sealing solution. We recommend the Type 06 Range for their greater Seal performance, capability and life. However, we also offer direct replacement like for like designs, as our Type 04 Range. Contact us for details should you require.

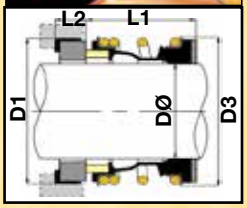
Flygt® Pump Model Series	Seal Shaft Sizes	Vulcan Upper Seal Stock Code	Vulcan Lower Seal Stock Code	Vulcan 'O'-Ring Set Code	Vulcan Additional Parts Code
3231, 3306, 3356	90/80mm	0900.06S.U.N.H.[i]	0800.06S.L.V.H.	0900.06.N.V3231-000	
3300	90/80mm	0900.06S.U.N.H.	0800.06S.L.V.H.	0900.06.N.V3300-000	
3310, 3350	90/120mm	0900.06S.U.N.H.[i]	1200.06T.L.V.H.		
3311, 3312	90/120mm	0900.06S.U.N.H.[i]	1200.06T.L.V.H.	1200.06.N.V3311-000	
3351	90/120mm	0900.06S.U.N.H.[i]	1200.06T.L.V.H.	0900.06.N.V3400-000	
3355	90/80mm	0900.06S.U.N.H.[i]	0800.06S.L.V.H.	1200.06.N.V3311-000	
3400, 3501, 3531, 3602	90mm	0900.06S.U.N.H.[i]	0900.06U.L.V.H.[i]	0900.06.N.V3400-000	
3500, 3530, 3600, 3601	90/120mm	0900.06S.U.N.H.[i]	1200.06T.L.V.H.	1200.06.N.V3500-000	
3800	90/120mm	0900.06S.U.N.H.[i]	1200.06T.L.V.H.	1200.06.N.V3800-000	
4351, 4352, 4400	20mm	0200.06G.U.N.E.	0200.06H.L.V.H.		
4410, 4430, 4460	60mm	Lower Seal Only	0600.06Q.L.V.H.	0600.06.N.V4410-000	0600.06.LIP
4450	35mm	Lower Seal Only	0350.06M.L.V.H.		
4630, 4640	45mm	Lower Seal Only	0250.06X.V.X.V.	0250.06.V.V4630-000	
4650, 4660	45mm	Lower Seal Only	0450.06X.V.ZR.	0450.06.V.V4650-000	
4670, 4680	60mm	0600.06Q.U.N.E.	0600.06Q.L.V.H.		0600.06.LIP
5100-210 , -211 , -220 , -221	35mm	Lower Seal Only	0350.06X.V.ZR.	0350.06.V.V5100-211	
5100-250 , -251 , -260 , -261	45mm	Lower Seal Only	0450.06X.V.ZR.	0450.06.V.V5100-250	
5100-300, -310	60mm	Lower Seal Only	0600.06X.V.ZR.	0600.06.V.V5100-350	
5150-300, -310	60mm	Lower Seal Only	0600.06X.V.ZR.	0600.06.V.V5150-300	
5150-350, -360	90mm	Lower Seal Only	0900.06X.V.ZH.	0900.06.V.V5150-350	
5530	35mm	0350.06M.U.N.E.	0350.06M.L.V.H.		
5540	45mm	0450.06O.U.N.E.	0450.06ON.L.V.H.		
7045	60mm	0600.06Q.U.N.E.[i]	0600.06Q.L.V.H.	0800.06.N.V7045-000	
7050, 7051	90/80mm	0900.06S.U.N.H.[i]	0800.06S.L.V.H.	0800.06.N.V7045-000	
7060, 7076	90/80mm	0900.06S.U.N.H.[i]	0800.06S.L.V.H.	0800.06.N.V7045-000	
7055, 7061	90/80mm	0900.06S.U.N.H.[i]	0800.06S.L.V.H.	0800.06.N.V7045-000	
7080	90/80mm	0900.06S.U.N.H.[i]	0800.06S.L.V.H.		
7081, 7101, 7121	90mm	0900.06S.U.N.H.[i]	0900.06U.L.V.H.	0900.06.N.V7081-000	
7100, 7115, 7120, 7140	90/120mm	0900.06S.U.N.H.[i]	1200.06T.L.V.H.		
7570, 7585	90/120mm	0900.06S.U.N.H.[i]	1200.06T.L.V.H.		
600-SERIES MOTORS, NOT 600 OR 680 Sizes	90mm	0900.06S.U.N.H.[i]	N/A	0900.06.N.V605-000	
700-SERIES MOTORS	90mm	0900.06S.U.N.H.[i]	N/A	0900.06.N.V705-000	
800-SERIES MOTORS	105mm	CONTACT US	N/A	1050.06.N.V805-000	
900-SERIES MOTORS	105mm	CONTACT US	N/A	1050.06.N.V905-001	
I.T.T. Grindex® Models					
MAJOR 8116	25/24mm	0250.06Z.U.N.E.[i]	0240.06Z.L.V.H.		
MASTER 8105 180	25/24mm	0250.06Z.U.N.E.[i]	0240.06Z.L.V.H.		
MATADOR	25/24mm	0250.06Z.U.N.E.[i]	0240.06Z.L.V.H.		
MAXI 5154, 8107 H & N	45/35mm	0450.06O.U.N.E.	0350.06N.L.V.H.		
MAXI 8107 LOW	45mm	0450.06O.U.N.E.	0450.06O.L.V.H.		
MIDI, MINEX, MINI	25/24mm	0250.06Z.U.N.E.[i]	0240.06Z.L.V.H.		
MINETTE 8115	25/24mm	0250.06Z.U.N.E.[i]	0240.06Z.L.V.H.		
MINOR 2501	25/24mm	0250.06Z.U.N.E.[i]	0240.06Z.L.V.H.		
SALVADOR 7121,					
8118 280	25/24mm	0250.06Z.U.N.E.[i]	0240.06Z.L.V.H.		
SANDY 8120 280	25/24mm	0250.06Z.U.N.E.[i]	0240.06Z.L.V.H.		
SENIOR 8119 280	25/24mm	0250.06Z.U.N.E.[i]	0240.06Z.L.V.H.		
READY 4, 8, 12, 16	15mm	Lower Seal Only	0150.06D.N.Z.		
READY 24	20mm	0200.06A.U.N.E.	0200.06A.L.V.H.		
READY 90	28mm	0280.06I.U.N.E.	0280.06I.L.V.H.		
STEADY 7	20mm	0200.06G.U.N.E.	0200.06G.L.V.H.		

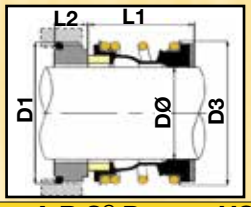
For any Pump models not listed above, please contact us, as models continually evolve. For all Seals annotated with "i", the part code shown for this model is the applicable one in the vast majority of instances. However some alternatives do exist; please check the Part Number found on the OEM database

Vulcan Stock Seals for Wastewater Pumps

Vulcan Part Number	Head Type	Seat Type	Seat O.D.	Shaft Diameter	Material Code	Pump Nameplate Data	Manufacturer Part Number
A.B.S® Pumps USA®							
VS851	A	1	1.375	.750 (3/4")	BCFJF		11107939
VS446	C	1	2.5	1.750 (1-3/4")	BCFJF		11116013
VS267	C	1	2.75	2.000 (2")	BCFJF		11116014
VS1679	C	1	3.125	2.250 (2-1/4")	BCFJF		11116015
VS2116	C	3	3.875	3.000 (3")	BCFJF		11116016

A.B.S® Pumps USA ® - Type 195 to suit AFP- series Pumps





Elastomeric bellows Seals for Lower position in many common Submersible Pumps, including "AFP"-Ranges. Each is supplied with a back-washer, unless stated. Commonly paired with either Type 282, Type 1577 or Type 1632 Upper Seals, details of which are below. For identification purposes, please Cross-Reference the OEM Part Number shown below, or enquire.

The first Table shows those size assemblies stocked and supplied with a Boot Mounted Stationary.

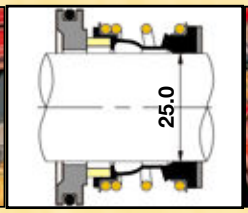
Whilst the second Table shown is for those with an 'O'-Ring Mounted Stationary.

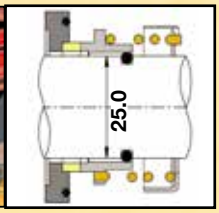
N V P 304

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Part Number
15.00	0150	35.00	28.00	17.00	4.00	11110172
20.00	0200	38.00	36.00	21.50	7.50	11110001
25.00	0250	40.50	41.00	22.50	8.50	11110095
30.00	0300	50.80	47.00	24.00	9.50	11110096
40.00*	0400.B	58.00	60.00	33.50	11.00	11110144
45.00	0450	65.50	64.30	30.50	12.50	11110093
55.00*	0550	76.20	78.00	37.50	13.50	11110135
80.00	0800	104.00	106.50	40.00	15.00	11110051

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Part Number
40.00	0400	58.00	60.00	33.50	11.00	11110055
48.00	0480	67.00	69.00	30.50	10.00	11110003
65.00	0650	86.00	90.00	39.00	12.00	11110050
90.00	0900	114.00	125.00	46.00	13.30	11110052
100.00	1000	123.30	130.00	46.00	13.30	11110053

A.B.S® Pumps USA ® - Type 195P Upper Seal & Type 820 Lower Seal



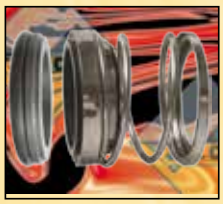


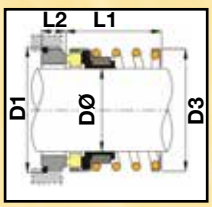
Upper and Lower 25 mm shaft size Seals for use together, but available separately, to suit various A.B.S.® Submersible Pumps, including certain "Jumbo", "SP" and "RP" Series, which were previously supplied as the "Pumpex®" brand.

Upper Seal N Q 304

Lower Seal N V S 304

A.B.S® Pumps USA ® - Type 215 to suit Jumbo® J- series and Piranha® series Pumps



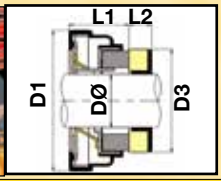


Elastomer Diaphragm Seals with parallel-springs, either with cup-mounted (20mm size) or 'O'-Ring Mounted, Bezel-face Seat Rings, to suit certain models of "Jumbo® J-" or "Piranha®" Series Pumps. The Vulcan Type 215 design Seal will interchange with elastomer bellows version Seals sometimes found in recently produced "J- Series" Pumps.

N S 304

Shaft Size DØ	Size Code	D1 (mm)		D2 (mm)		L1 (mm)		L2 (mm)		OEM Part Number
0.787	0200~	1.378	35.00	1.339	34.00	0.866	22.00	0.283	7.20	11110086
0.984	0250*	1.496	38.00	1.496	38.00	0.965	24.50	0.374	9.50	11110087
1.181	0300	1.772	45.00	1.732	44.00	0.984	25.00	0.413	10.50	11110088
1.771	0450*	2.520	64.00	2.402	61.00	1.465	37.20	0.535	13.60	11110089

A.B.S® Pumps USA ® - Type 282 to suit AF - and Piranha® series Pumps

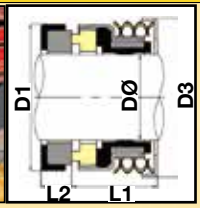


Rubber-encased Upper Seals primarily for "Piranha®-M or -S" Range Submersible Pumps. The Lower Seal is normally 25mm or 30mm Type 195 Seal, detailed above. For identification purposes, please Cross-Reference the OEM Part Number, or enquire.

N P 304

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Part Number
25.00	0250	52.00	41.30	12.00	5.00	11100027 & 28
30.00	0300	57.00	41.30	12.00	5.50	11100029

A.B.S® Pumps USA ® - Type 1577 to suit AFP® series Pumps

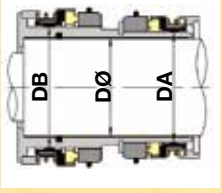


Elastomer Diaphragm Seals with sinusoidal wave-springs. 50mm size is routinely used as Upper Seal in certain "AFP" Range Submersible Pumps, with 45mm Type 195 as the Lower Seal. The 65mm Type 1577 is a Lower Seal, and is normally paired with the 55mm Type 195. For identification purposes, please Cross-Reference the OEM Part Number shown below, or enquire.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Part Number	Guaranteed Stock Materials
50.00	0500	72.00	66.10	19.00	10.00	11100083	N A 304
65.00	0650	85.00	86.50	27.00	13.00	11110173	N S 304

Vulcan Stock Seals for Wastewater Pumps

A.B.S® Pumps USA ® - Type 1578 to suit K-series Pumps

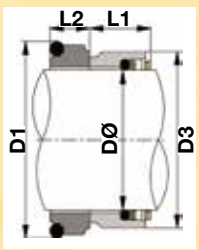


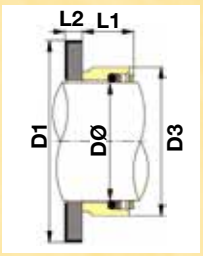
Elastomer Diaphragm Seals with sinusoidal wave-springs, supplied as Upper and Lower Seals, ready mounted on a shaft sleeve, for installation directly into the bell-chamber style housing of A.B.S.® / Pumpex® "K" Series Pumps. For 25mm, 32mm or 35mm shaft sizes, please enquire.

V WA 304

Shaft Size DØ	Size Code	DA	DB
50.00	0500	55.00	60.00

A.B.S® Pumps USA ® - Type 1632 to suit afp- Series Pumps

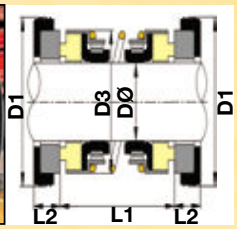




'O'-Ring Mounted Wave-Spring Seals, routinely utilized in the Upper-position of "AFP" Series Submersible Pumps. The Lower Seal will normally be of Type 195, please see opposite. For identification purposes, please Cross-Reference the OEM Part Number, or enquire

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Part Number	Guaranteed Stock Materials
20.00	0200	52.00	31.00	13.50	6.00	11100066	N Q 304
48.00	0480	67.00	62.00	15.80	14.50	11100058	N P 304
65.00	0650	86.00	79.00	17.80	15.30	11100059	N P 304
80.00	0800	104.00	98.00	19.50	16.30	11100053	N P 304
90.00	0900	114.00	105.00	19.50	16.30	11100055	N P 304
100.00*	1000	123.00	116.00	21.00	17.10	11100052	N P 304

Ebara® Pumps - Type 260A to suit best-, right- and DW Series Pumps

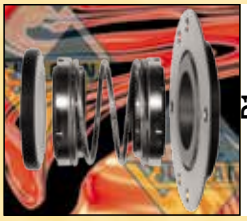


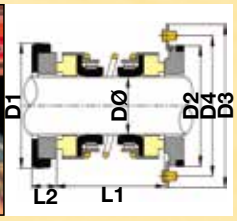
Rubber Diaphragm Double-Ended Seals with Boot Mounted stationaries, to suit the internal dimensions of Ebara® "Best-", "Right-" and "DW-" Series, small Submersible Pumps. This common Seal Type is also utilized by other Pump manufacturers for small portable Submersible Pumps.

V WA 304

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
14.00	0140	30.00	20.00	26.00	5.00
15.00	0150	30.00	20.00	26.00	5.00
16.00	0160	30.00	20.00	26.00	5.00

Ebara® Pumps - Vulcan Type 260B to suit eBARA® Pumps





Vulcan manufacture and stock a Range of elastomer Diaphragm Double-Ended Seals, with Boot stationaries at oil side and Bezel Stationaries at impeller side, to suit the Seal chamber of various Ebara® Submersible Pumps.

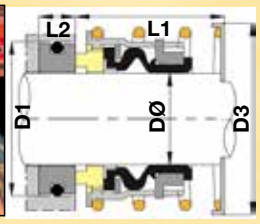
Type 260B Seals are supplied complete with Bezel plates for the inboard Seat.

For information on Vulcan Seals to suit other Ranges of Ebara® Pumps please see the alphabetical listing in Section 4.

V WA 304

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	D4 P.C.D. (mm)	L1 (mm)	L2 (mm)
20.00	0200	38.00	44.00	72.00	60.00	34.00	8.00
25.00	0250	44.00	50.00	72.00	60.00	34.00	8.00
30.00	0300	50.00	57.00	82.00	70.00	42.00	8.00
35.00	0350	58.00	65.00	94.00	80.00	42.00	9.00
40.00	0400	64.00	70.00	100.00	85.00	44.50	9.00
45.00	0450	66.00	70.00	105.00	90.00	45.00	9.00
50.00	0500	72.00	80.00	109.00	95.00	49.50	9.00

Gorman - Rupp® Pumps - Vulcan Type 207 to suit T- Series® Pumps



Vulcan manufacture a Range of Seals to suit Gorman-Rupp® Pumps. The most specific of which is the Type 207 to suit the common T-Series®. The Vulcan design feature a single piece Monolithic Carbide Seat, to remove the existing face and sub housing arrangement. Seal sleeves and shims are also available.

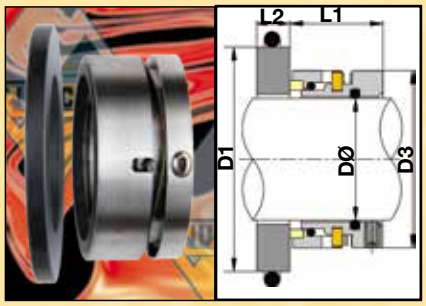
For information on Vulcan Seals to suit other Ranges of Gorman-Rupp® Pumps please see the alphabetical listing in Section 4.

N V H 304

Shaft Size DØ	Size Code	D1 (mm)		D3 (mm)		L1 (mm)		L2 (mm)		OEM Part Number
1.500	0381	2.375	60.32	2.329	59.15	1.125	28.58	0.500	12.70	46512-047
1.625	0412	2.375	60.32	2.636	66.96	1.375	34.93	0.500	12.70	25271-922

Vulcan Stock Seals for Wastewater Pumps

Godwin® Pumps - Type 1653 to suit dri-prime® Series Pumps



Vulcan manufacture and stock a Range of specific Seal Types to suit Godwin® "Dri-Prime®" Pumps, in materials suitable for all clean and dirty water transfer duties.

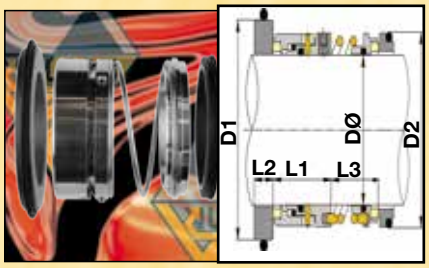
40mm and 50mm sizes normally operate as Single Seals. Please contact is if you require 60mm size Seals.

The Type 1653 is a robust heavy-duty design for more abrasive media's, for lower solid content fluids, the Type 1724P can be used, please see details below.

N V S 304

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
40.00	0400	69.90	56.00	32.00	7.50
50.00	0500	89.90	71.00	34.00	13.00

Godwin® Pumps - Type 1653D to suit dri-prime® Series Pumps

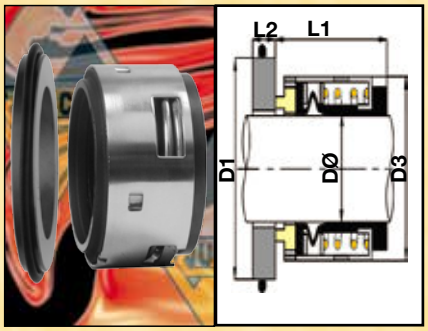


For larger "Dri-Prime®" Pumps with 75mm shaft sizes, a Double Seal is required. The most common arrangement is directly replaced by the Vulcan Type 1653D, which shares a similar construction to the Type 1653 but with an additional single-spring component Seal assembly to Seal the oil-bath. For all Godwin® Pumps, please contact us with the OEM details for Cross-Reference and identification.

N V Z 304

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	L3 (mm)
75.00	0750	109.90	98.00	45.50	14.90	37.00

Godwin® Pumps - Types 1724P and 1725P to suit dri-prime® Series Pumps



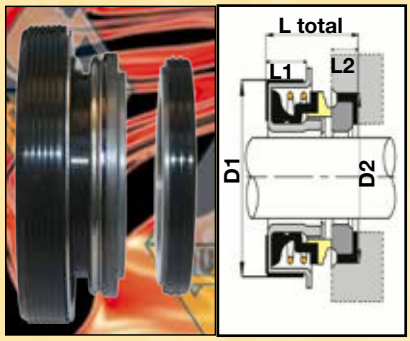
Vulcan Types 1724P and 1725P are designed to suit smaller models of "Dri-Prime®" Pumps, and offer an easy to install elastomer bellows Seal that is designed to suit the length of the Seal chamber, removing the need to set the Seal on the shaft with set screws. Type 1724 uses a standard Vulcan Rotary, Type 1725 has the same design but with a reduced working length.

For a heavy-duty alternative design, please see the Type 1653 detailed at the top of the Page.

N S 304

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Vulcan Type
40.00	0400	69.90	56.00	32.00	7.35	1725P
50.00	0500	64.50	66.00	34.00	10.30	1724P

Honda® Pumps - Type 78 to suit portable 'trash' Pumps

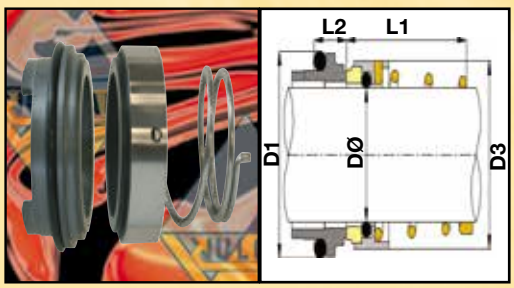


Vulcan manufacture a Range of Seals to suit portable petrol or diesel powered Honda® Pumps. The Vulcan Seals utilize Silicon Carbide Seal faces and full elastomer Boots to ensure secure mounting in the Pump housings.

N S 304

Shaft Size DØ	Size Code	D1 (mm)		D2 (mm)		L1 (mm)		L2 (mm)		L TOTAL	
0.669	0170	1.614	41.00	1.220	31.00	0.354	9.00	0.207	5.25	0.886	22.50
0.787	0200	1.772	45.00	1.378	35.00	0.433	11.00	0.197	5.00	0.886	22.50
0.984	0250	2.047	52.00	1.732	44.00	0.472	12.00	0.276	7.00	1.063	27.00
1.181	0300	2.283	58.00	1.890	48.00	0.492	12.50	0.315	8.00	1.142	29.00

Grundfos® Pumps - Type 81 Seals to suit S-Series Submersible Pumps



Vulcan manufacture and stock 'O'-Ring Mounted Conical Spring Seals with positive drive, specifically designed to suit Grundfos® "S-" Series Pumps, with the older generation Seal style installed. The OEM older style Seal is a conical Single Spring Seal. For newer style Seals, being Multiple-Spring, please see Types 40S8 and 42, on the following Page.

V S D 304

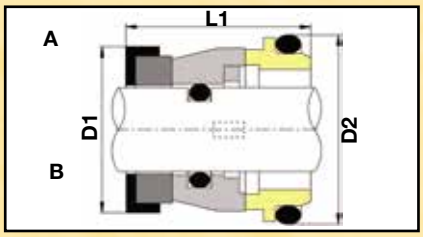
Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
25.00	0250	38.00	36.00	26.50	10.00
32.00	0320	48.00	46.00	28.50	11.00
38.00	0380	55.00	53.00	33.50	11.50

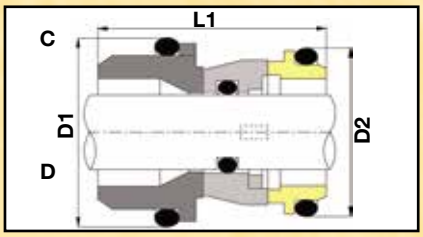
Vulcan Stock Seals for Wastewater Pumps

Grundfos® Pumps - Type 86 Seals to suit SE- and SV-Series Pumps

Vulcan manufacture and stock 'O'-Ring Mounted Double Seals with varying face profiles, specifically designed for Grundfos® "SE-" and "SV-" Series Submersible Pumps. Each size has a unique face profile, Particularly relating to the central Rotary face. Inboard Seal and Stationary faces are Monolithic Silicon Carbide, whilst the oil-bath side Stationary is Monolithic Carbon.

V Z N/A





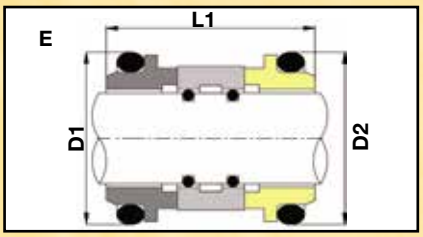
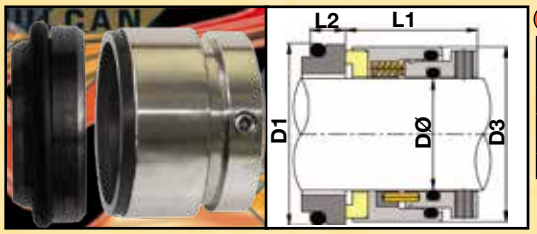


Diagram	Shaft Size DØ	Size Code	Type Code	D1 (mm)	D2 (mm)	L1 (mm)
A	16.00	0160	86B	28.00	35.00	30.00
B	16.00	0160	86	28.00	35.00	30.00
C	24.00	0240	86	48.00	45.00	50.00
D	24.00	0300	86	48.00	45.00	50.00
E	38.00	0380	86	53.00	56.00	65.50

Grundfos® Pumps - Types 40S8 and 42 Seals to suit S– Series Pumps

Vulcan manufacture and stock 'O'-Ring Mounted Multi-Spring, Balanced Seals, specifically designed for Grundfos® "S-" Series Submersible Pumps; Upper and Lower positions. Type 40S8 is for the Upper, oil bath position, and Type 42 with the distinctive Stationary profile, is for the Lower, impeller position. 65mm Size Type 42 Lower Seal has a distinctive extended barrel with two 'O'-Rings to Seal inside impeller recess, as per the original OEM Seal.

Type 40S8 - Upper Seal

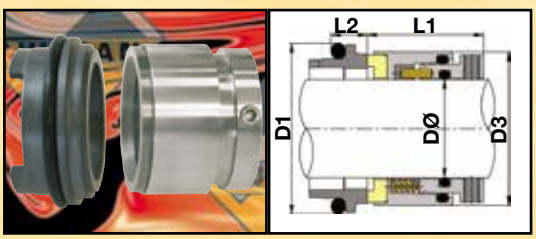


V DS 316

Shaft Size DØ	Size Code	Type Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
38.00	0380	40S	56.00	53.00	34.00	11.00
50.00	0500	40S8	70.00	65.60	34.50	9.50
65.00	0650	40S8	85.00	84.20	36.50	11.00

Please refer to our extensive OEM database in our Web Portal or contact us with the OEM details or part numbers for Cross-Reference and identification.

Type 42 - Lower Seal



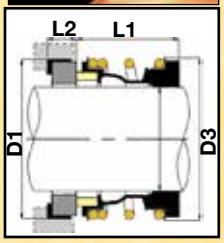
V S 304

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
32.00	0320	48.00	46.00	34.00	11.00
38.00	0380	55.00	53.00	34.00	11.50
50.00	0500	70.00	65.60	34.50	14.00
65.00	0650	85.00	84.20	66.00	15.00

Vulcan have an extensive Cross-Reference for Grundfos® part numbers and Pump models. The above are only common examples from specific Wastewater Pump Ranges. Please contact Vulcan with your part numbers so we can progress with your requirement.

Vulcan Stock Seals for Wastewater Pumps

K.S.B® Pumps - Type 197 to suit ama-, krt- and sewa Series Pumps



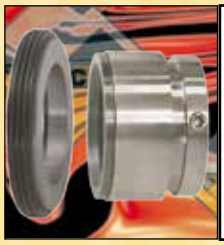
Vulcan produce a Range of elastomer bellows Seals to replace the "SU" Range of K.S.B.® Seals, commonly utilized in "Amarex KRT-" Series Pumps.

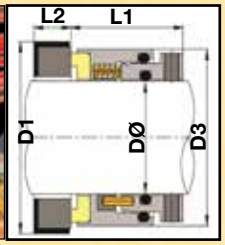
Vulcan has an extensive Range of Seals available for other K.S.B® Pumps in all industries, please see proceeding Section for further examples.

V SS 304

Shaft Size DØ	Size Code	D1 (mm)		D3 (mm)		L1 (mm)		L2 (mm)		OEM Seal Code
10mm*	0100	0.756	19.20	0.787	20.00	0.570	14.50	0.260	6.60	SU 010
15mm*	0150	0.968	24.60	1.102	28.00	0.669	17.00	0.276	7.00	SU 015
25mm	0250	1.496	38.00	1.614	41.00	0.906	23.00	0.295	7.50	V C 304
28mm*	0280	1.629	43.00	1.850	47.00	1.043	26.50	0.354	9.00	SU 028
30mm	0300	1.771	45.00	1.850	47.00	1.043	26.50	0.413	10.50	SU 030
33mm	0330	1.889	48.00	2.000	51.00	1.083	27.50	0.433	11.00	SU 033
43mm*	0430	2.401	61.00	2.448	62.20	1.181	30.00	0.472	12.00	SU 043
48mm*	0480	2.598	66.00	2.716	69.00	1.201	30.50	0.453	11.50	SU 048
75mm*	0750	3.818	97.00	4.015	102.00	1.575	40.00	0.551	14.00	SU 075
90mm*	0900	4.527	115.00	4.960	126.00	1.772	45.00	0.591	15.00	SU 090

Terex® Pumps - Type 47 to suit terex - pegson® transportable Pumps



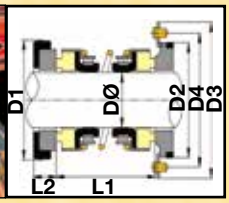


Vulcan Manufacture and stock Balanced Multi-Spring Seals with cup-mount stationaries suitable for the high Head and suction found in this Range of diesel powered trailer Pumps.

V SS 316

Shaft Size DØ	Size Code	D1 (mm)		D3 (mm)		L1 (mm)		L2 (mm)	
1.575	0400	2.480	63.00	2.205	56.00	1.339	34.00	0.433	11.00
1.771	0450	2.756	70.00	2.323	59.00	1.339	34.00	0.512	13.00
2.165	0550	3.150	80.00	2.787	70.80	1.358	34.50	0.512	13.00

Tsurumi® Pumps - Vulcan Type 260B to suit Tsurumi® Pumps



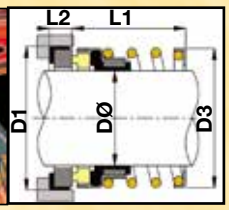
Vulcan manufacture and stock a Range of elastomer Diaphragm Double-Ended Seals, with Boot stationaries at oil side and Bezel Stationaries at impeller side, to suit the Seal chamber of various Tsurumi® Submersible Pumps.

V WA 304

Type 260B Seals are supplied complete with Bezel plates for the inboard Seat.

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	D4 P.C.D. (mm)	L1 (mm)	L2 (mm)
20.00	0200	38.00	44.00	72.00	60.00	34.00	8.00
25.00	0250	44.00	50.00	72.00	60.00	34.00	8.00
30.00	0300	50.00	57.00	82.00	70.00	42.00	8.00
35.00	0350	58.00	65.00	94.00	80.00	42.00	9.00
40.00	0400	64.00	70.00	100.00	85.00	44.50	9.00
45.00	0450	66.00	70.00	105.00	90.00	45.00	9.00
50.00	0500	72.00	80.00	109.00	95.00	49.50	9.00

WEMCO® / Hidrostal® Pumps - Type 11



Vulcan standard Type 11 Diaphragm Seals to replace OEM "C-" and "V-" Type Seals.

NB:- Size Code 0250 is a Type 20 not our Type 11.

These Seals are fitted in the inner oil bath position.

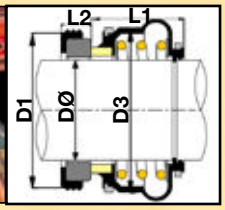
Product side Seals are either a Rubber Bellows Type Seal, as per our Type 194, shown on the following Page. Or rubber encased Seals which can be replaced by our Type 41, as detailed on the following Page.

N V C 304

Shaft Size DØ		Size Code	D1		D3		L1		L2		OEM Seal code
In	mm		In	mm	In	mm	In	mm	In	mm	
0.875	22.23	0222	1.500	38.10	1.315	33.400	0.937	23.80	0.405	10.28	C0.8
0.984	25.00	0250	1.594	40.50	1.543	39.200	1.000	25.40	0.406	10.32	C025
1.125	28.58	0286	1.750	44.44	1.823	46.300	1.062	26.97	0.437	11.10	C1.1 , V1.1
1.375	34.93	0349	2.000	50.80	2.071	52.600	1.125	28.58	0.437	11.10	C1.3
1.500	38.10	0381	2.125	53.98	2.197	55.800	1.125	28.58	0.437	11.10	C1.5
2.000	50.80	0508	2.750	69.85	2.874	73.000	1.500	38.10	0.500	12.70	C2.0
2.500	63.50	0635	3.375	85.73	3.343	84.900	1.812	46.02	0.562	14.28	C2.5
3.000	76.20	0762	3.875	98.43	4.043	102.700	2.062	52.37	0.625	15.88	C3.0

Vulcan Stock Seals for Wastewater Pumps

WEMCO® / Hidrostal® Pumps - Type 68

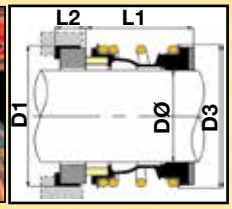


Vulcan manufacture and stock a direct replacement for the rubber encased 'M'-Type Seals. Available in the three common sizes from stock with Tungsten Carbide faces. If a robust steel body Seal is preferred the Vulcan Type 41 detailed below can be utilized without modification.

V H 304

Shaft Size DØ	Size Code	D1 (mm)		D3 (mm)		L1 (mm)		L2 (mm)		OEM Ref.
1.125	0286	1.750	44.45	2.000	50.80	1.125	28.58	0.417	10.58	M 1.1
1.500	0381	2.125	53.98	2.375	60.33	1.375	34.93	0.437	11.10	M 1.5
2.000	0508	2.750	69.85	2.933	74.50	1.781	45.25	0.500	12.70	M 2.0

WEMCO® / Hidrostal® Pumps - Type 194



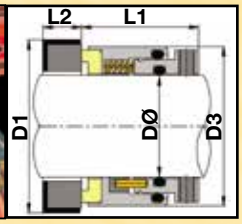
Vulcan Type 194 robust Rubber Bellows Seals to replace OEM"G-" Type Seals. Seal sizes from 0286 and up are supplied with Steel back-washer, to separate the Seal bellows from the shaft circlip. Size code 0200 to replace OEM "G020K" is standard Vulcan Type 19B Seal.

Usually fitted in tandem with our Type 11 Seals, detailed above, or our Type 41 Seals, shown below.

V SS 304

Shaft Size DØ		Size Code	D1		D3		L1		L2		OEM Seal Code
In	mm		In	mm	In	mm	In	mm	In	mm	
0.625	15.88	0158	1.187	30.14	1.102	28.00	0.875	22.23	0.405	10.28	G016 , M0.6
0.787	20.00	0200	1.500	38.10	1.417	36.00	1.181	30.00	0.394	10.00	G020
0.787	20.00	0200	1.378	35.00	1.594	40.50	0.846	21.50	0.295	7.50	G020K
1.125	28.58	0286	1.750	44.44	1.850	47.00	1.062	26.97	0.437	11.10	G1.1
1.500	38.10	0381	2.125	53.98	2.283	58.00	1.125	28.58	0.437	11.10	G1.5
2.000	50.80	0508	2.750	69.85	2.795	71.00	1.500	38.10	0.500	12.70	G2.0
2.500	63.50	0635	3.375	85.73	3.543	90.00	1.812	46.02	0.562	14.28	G2.5
3.000	76.20	0762	3.875	98.43	4.016	102.00	2.062	52.37	0.625	15.88	G3.0
3.740	95.00	0950	4.876	123.85	5.157	131.00	2.375	60.33	0.752	19.10	G095
3.937*	100.00	1000	4.876	123.85	5.157	131.00	2.375	60.33	0.752	19.10	G100

WEMCO® / Hidrostal® Pumps - Type 41

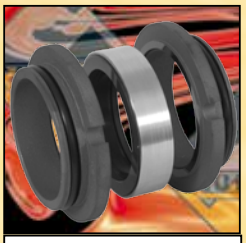


Vulcan Type 41 is a unitized, highly robust, Balanced Multi-Spring Seal to replace OEM "M-" and "X-" Type Seals. Type 41 is designed to replace the single-spring rubber-encased OEM Seals, that can often fail when the rubber loses its bond with the Seal faces and metal Parts. Seal size 0950 has an 'O'-Ring Type Stationary, not Boot Mounted.

Usually fitted in tandem with either our Type 11 or Type 194 Seals, shown on the previous Page

Shaft Size DØ		Size Code	D1		D3		L1		L2		OEM Seal Code	Guaranteed Stock Materials
Imperial	Metric		In	mm	In	mm	In	mm	In	mm		
1.125	28.60	0286	1.750	44.44	1.732	44.00	1.181	30.00	0.319	8.10	M1.1	V I 316
1.500	38.10	0381	2.125	53.98	2.157	54.80	1.244	31.60	0.319	8.10	M1.5	V I 316
2.000	50.80	0508	2.750	69.85	2.661	67.60	1.500	38.10	0.500	12.70	M2.0 , X2.0	V S 316
2.500	63.50	0635	3.375	85.73	3.082	78.30	1.812	46.20	0.562	14.28	M2.5 , X2.5	V S 316
3.000*	76.20	0762	3.875	98.43	3.689	93.70	2.063	52.40	0.625	15.88	M3.0 , X3.0	V S 316
3.740	95.00	0950	4.876	123.85	5.039	128.00	2.477	62.90	0.649	16.50	X095	V S 316

Wilo® Pumps - Vulcan Type 1640 and 1642 to suit Wilo® E.M.U. Submersible Pumps.

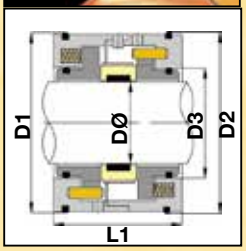


Vulcan manufacture and stock several standard Range Seals to suit Wilo® E.M.U. Submersible Pumps, as well as Type 1640 and 1642 Seals to replace the OEM "EBS" Enclosed-Block Seals.

The Vulcan Type 1640 is a direct replacement for the older-generation "EBS" OEM Seals. Newer Pumps have a slightly modified Seal installed, which is directly replaced by the Vulcan Type 1642. Please check the outer dimensions of the Seat housing for correct identification, utilizing the Table below, D3 dimension.

Type 1640 is available as complete Mechanical Seal assemblies or in repair kit form. The kits comprise both Stationary faces, with 'O'-Rings, central Rotary with elastomer Diaphragm, anti-rotation pins and springs for stationaries, and retaining pins for the collets. Specify .KIT as a suffix on the stock code.

Type 1640 Dimensions V ZS 304



Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)
35.00	0350	72.00	72.00	47.00	47.50
50.00	0500	92.00	90.00	63.00	52.00
75.00	0750	130.00	128.00	95.50	75.00

Type 1642 Dimensions V ZS 304

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)
35.00	0350	72.00	72.00	49.00	47.00
50.00	0500	92.00	90.00	65.00	52.00

Vulcan Stock Food, Beverage And Dairy Seals

Vulcan offer a comprehensive range of direct replacement Seals to suit all common and widely utilised Pumps in the global food process, beverage and dairy industries. All Seals are manufactured to our exacting highest standards, utilising the highest quality materials and can be retrofitted, as direct design replacements, to the original OEM Pumps without modification.

The Range illustrated in this section is guaranteed available from stock but represents only part of the complete design and stock profile available. Within this range, Vulcan also manufacture a series of Seals specified to be compliant with FDA, 3-A Sanitary standards and European E.C. Food Industry Regulations. Our Seal designs and materials are not only compliant, they reduce growths, contamination and provide superior, assured sealing. For more information, please refer to the following pages.

Section

E.C. Food Industry Regulations and 3-A Sanitary / FDA Requirements: Materially Compliant Seals From Vulcan

Vulcan offer from stock all common food and dairy Seals, specified and specifically manufactured to be complaint with FDA and E.C. Food Industry Regulations.

The principle underlying European Community (E.C) Regulation Number 1935/2004 "On Materials and Articles Intended to Come into Contact with Food" is that any material or article intended to come into contact directly or indirectly with food, must be sufficiently inert to preclude substances from being transferred to food, in quantities large enough to endanger human health, or to bring about an unacceptable change in the composition of the food, or a deterioration in its organoleptic properties.

Understanding the implications of these regulations is increasingly leading to food industry manufacturers stipulating that all materials, including Mechanical Seals, that come into contact with food should be made from FDA specified compliant materials, which comply with the above E.C. Regulations and have full traceability of said materials.

In order to comply with these regulations where specified and as an integral part of Vulcan's standard policy to only offer superior designs and materials, we have made available from stock, all of our market leading range of food industry Seals, specified to be manufactured from certified compliant materials to meet U.S. and European Food Industry Regulations.

The materials, production and surface finish of Vulcan's Food Industry Compliant Seals have been carefully specified to meet all of the EHEDG recommendations and FDA or 3-A Sanitary Standard criteria. Full details are available in the materials guideline section of Vulcan's information pack on these Seals; please enquire upon our Commercial Technical Department.

This range of Vulcan Seals offer superior performance, reliability and life. They are specified to be compliant to the existing known regulations applicable in Europe and North America.

Material Guidelines

These materials are specified to comply firstly with Part 177 of Title 21 of the Food and Drug Administration Regulations for safe use as articles or components of articles for producing, manufacturing, processing, preparing, treating, packing, transporting or holding food, in accordance with FDA Regulation 21. CFR.177.1550. and 177.2600.
Secondly, The Sub Group Mechanical Seals of the European Hygienic Engineering & Design Group (EHEDG), Specification of August 2002, stipulates requirements for component materials of Mechanical Seals, which come into contact with food.

Carbon-Graphite

Vulcan Specification: M825 grade of Carbon, with approval certification available from Vulcan's selected Carbon manufacturer. This Carbon grade is resin impregnated both prior to and subsequent to machining to minimise porosity.

Ceramics and Silicon Carbide

Vulcan Specification: Silicon Carbide Faces are considered to be G.R.A.S. (Generally Regarded As Safe). We solely specify our pure sintered Silicon Carbide, C.N.C. ground on all surfaces. Reaction Bonded SiC is not utilised, as the free Silicon is readily attacked by the Caustics in C.I.P. Systems. Vulcan's Ceramic Grade is 99.5% pure, providing better integrity and performance, than the 95/96% pure Ceramics utilised as standard elsewhere.

Elastomer Material

Vulcan Specification: Our Elastomer Components and 'O' Rings are moulded from FDA Compliant Material Compounds and manufactured in accordance with Title 21. Code of Federal Regulations – paragraph 177.2600. and 177.1550.

Hard Metal

Vulcan Specification: Nickel Bound Tungsten Carbide which is CNC ground on all surfaces to comply.

Metallurgy

Vulcan Specification: All our metal parts and springs are specified compliant AISI Type 316 austenite Stainless Steel (as specified by EHEDG) and are manufactured on our ILDEMEISTER® and HAAS® machining centres to produce Seal part surface finishes of within 0.8 Ra µm. This standard is required to inhibit micro bacterial growth on Seal surfaces.

W.R.A.S.® Approved Elastomers and Seal faces

The elastomers and face materials utilised are generally suitable for use in contact with potable water and food processing. The following materials are UK Water Regulation Advisory Scheme Approved: it is necessary for you to specify your requirements upon order and obtain our confirmation.

Material	Vulcan Grade	Approval Number	Notes
Sintered Silicon Carbide	WNV2	1404509	W.R.A.S® approved Sintered Silicon Carbide.
Reaction Bonded Silicon Carbide	VES2	1207529	W.R.A.S® approved Reaction Bonded Silicon Carbide
Alumina Ceramic	V99.CER	1003531	W.R.A.S® approved Ceramic.
Carbon	M825	1404508	W.R.A.S® approved Carbon.
Viton™	V3F. FE2602	1003530	Moulded components
Nitrile	ME0995	1204551	Available for 'O'-Rings only, not moulded parts. Please ask for other Nitrile / E.P components
E.P.	VEP.MAR.4045	1210518	
Please ask for approval details on other Seal materials and elastomers.			

Many other countries have their own standards and there are far too many to include all compliances. If you have a specific requirement, please refer to our Commercial Technical Department.

Guaranteed Stock Materials Key

The guaranteed stock materials for the Seals shown in these Sections 11a and 11b are shown utilising a key system. All letters used are Vulcan standard elastomer and face combination codes, please refer to Pages 18 / 19 for more information.

Key Icon	Description
X	Circular icons indicate which elastomers are guaranteed in stock, i.e "V" for Viton™, "N" for Nitrile and "E" for E.P.
N E V	If more than one elastomer is guaranteed, the relevant code letters are shown.
X	Hexagonal icons indicate the rotary and stationary face combination codes which are guaranteed in stock. i.e "C" for Carbon vs Ceramic.
D Q	Seals with multiple guaranteed stock face materials are shown with two or more hexagonal icons.
316	Rectangular grey icons indicates the metallurgy utilised within the guaranteed stock Seals.
FDA	Rectangular blue icons indicates all Seals materials and surface finishes are compliant to FDA / E.C Food Regulations as described and outlined on this page.

The materials codes shown, on each page in this Section 11c following, are solely for our equivalents to the most popular known OEM original Seal specifications. Other materials are usually, also in stock or, are readily available.

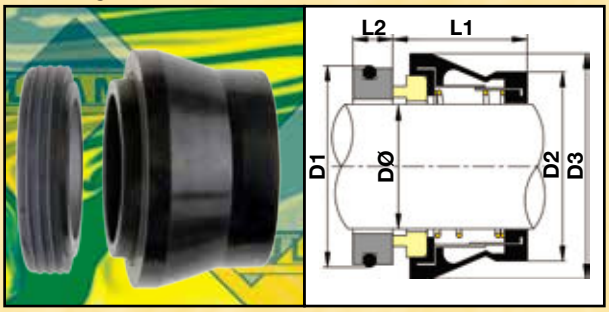
Vulcan Seals for Alfa Laval® Pumps

Vulcan make a wide range of Seal parts for Alfa Laval® equipment, please contact us with the OEM details for cross-reference and identification.

Type 17B to suit lkr Series Agitators

E D 304

Vulcan manufacture and stock 30mm and 35mm rubber-encased Type 17B Seals to suit Alfa Laval® LKR–series agitators.

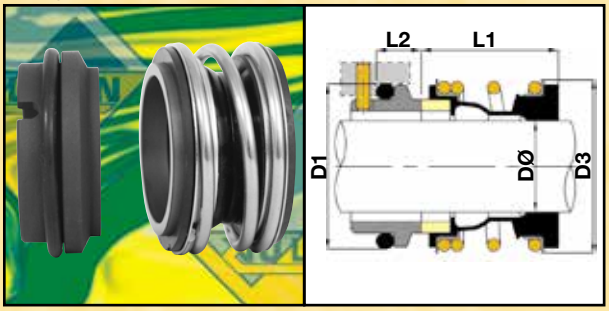


Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
30.00	0300	50.80	45.80	53.00	26.90	11.99
35.00	0350	53.98	52.00	62.00	34.90	11.99

Type 19C to suit ALC Series Pumps

N E V T 304 FDA

Vulcan manufacture and stock modified Type 19 style Seals to suit Alfa Laval® ALC series Pumps, commonly utilised in food and dairy processes. For ALC Pumps with flush housings, please see Type 90 on following page. Type 19C is available from stock in all three common elastomers, as well as FDA / E.C. Regulation compliant materials.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
40.00	0400	58.00	60.00	30.00	14.00
53.00	0530	73.00	76.00	33.00	15.00

Vulcan Seals to suit Alfa Laval® CONTHERM® SCRAPED-SURFACE HEAT EXCHANGERS

1.1/2”FLUSHSINGLE

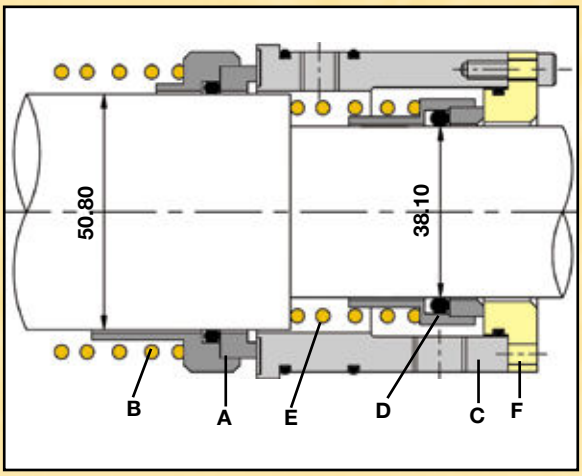
2”NONFLUSHSINGLE

SHELLEND.TC

2”FLUSHSINGLE.180/90

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

A	SHELLEND.TC	2.000” Outer Shaft rotary head, with Tungsten Carbide face
A	SHELLEND.CARB	2.000” Outer Shaft rotary head, with Carbon face
B	SHELLEND.COIL	Coil to suit 2.000” Outer Shaft rotary head
C	2”FLUSHSINGLE.90	2.000” Outer Shaft flush housing, with ports at 90 Degrees, and chrome oxide face
C	2”FLUSHSINGLE.180	Same as above, but with flush ports at 180 Degrees
C	2”NONFLUSHSINGLE	2.000” Outer Shaft Collet, with chrome oxide coated running face.
D	1.1/2”.SHELLEND	1.500” Inner Shaft rotary head, with Carbon face.
E	1.1/2.SHELLEND. COIL	Coil to suit 1.500” Inner Shaft rotary head
F	1.1/2”FLUSHSINGLE	1.500” Inner Shaft stationary, with bolt holes to allow fixing to base of 2.000” flush housing.



11 C

Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM’s name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

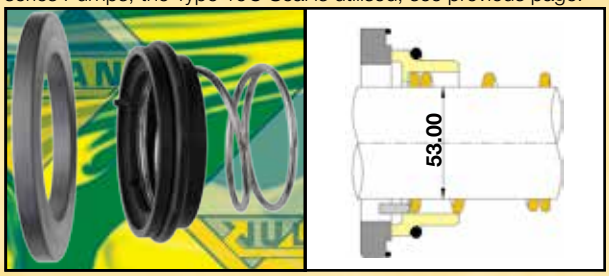
All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Type 9x range for Alfa Laval® Pumps

Vulcan manufacture and stock a wide range of Seals to suit the common Alfa Laval® centrifugal Pumps, each of which is dealt with below.

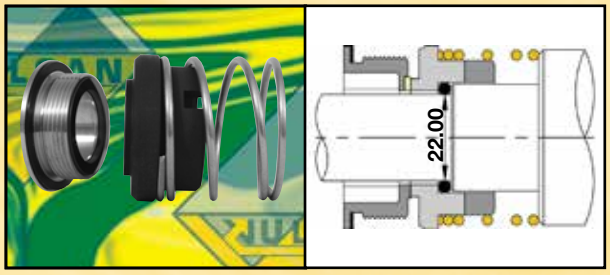
Type 90 (53mm) E D 304

Type 90-53mm complete Seals, designed to suit all sizes of ALC Pump, with the larger flush-housings fitted. For non-flushed ALC series Pumps, the Type 19C Seal is utilised, see previous page.



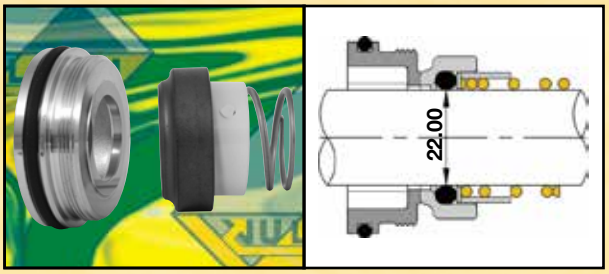
Type 91B (22mm) E D S Q 304 FDA

Type 91B-22mm complete Seal, designed to suit Pump models FM0, FM0S, FM1A, FM2A, FM3A and FM4A



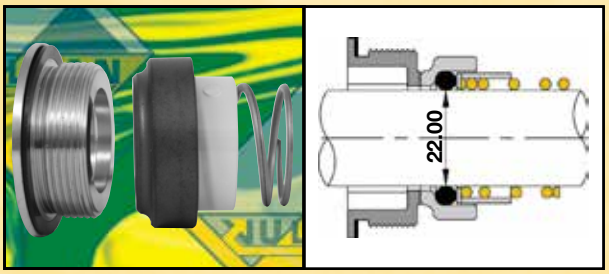
Type 93 (22mm) E Q 304 FDA

Type 93-22mm complete Seal for MR166A, MR166B and MR166E Pumps.



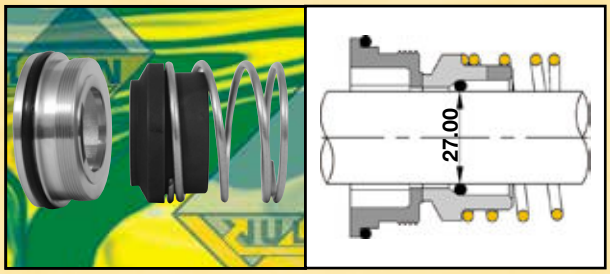
Type 93B (22mm) E D Q 304

Type 93B-22mm complete Seal, designed to suit Pump models ME155AE, GM1, GM1A, GM2 and GM2A MR166E



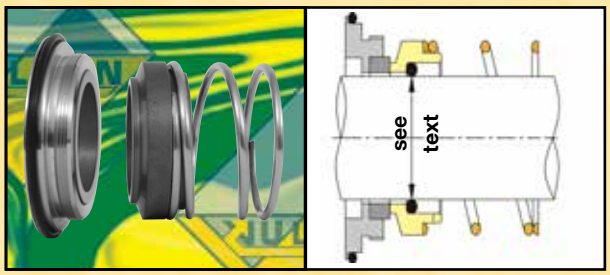
Type 92 (27mm) E D Q 304 FDA

Type 92-27mm complete Seal, designed to suit Pump models MR185A and MR200A



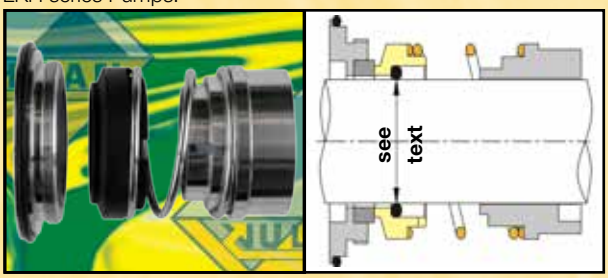
Type 92 (32mm and 42mm) E D S 304 FDA

Type 92-32mm and 42mm complete Seals, designed to suit LKH series Pumps with standard Seal chamber. For Pumps with flushed Seal chambers, please see Types 92C and 92D.



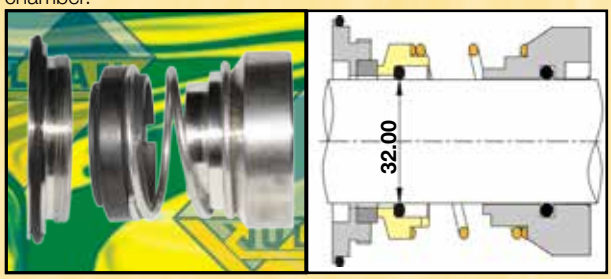
Type 92B (32mm and 42mm) E D S 304 FDA

Type 92B-32mm and 42mm complete Seals, designed to suit LKH series Pumps.



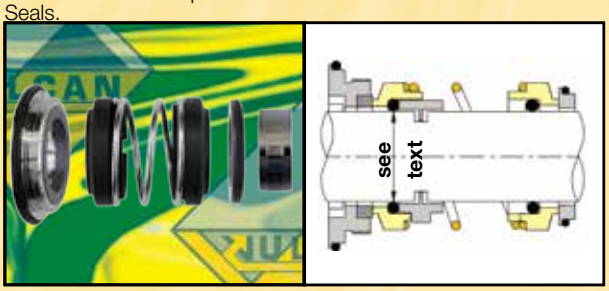
Type 92c (32mm) E D S 304 FDA

Type 92C features a base-plate designed to Seal inside a metal-encased PTFE lip Seal. Designed to suit Pumps with a flushed Seal chamber.



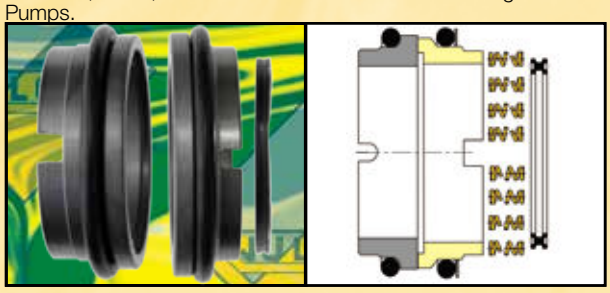
Type 92D (32mm and 42mm) E YC ZS 304 FDA

Type 92D-32mm & 42mm complete double Seals, designed to suit LKH series Pumps with a flushed Seal chamber and double Seals.



Type 912 (32mm and 42mm) E S AD 304 FDA

Type 912-32mm and 42mm multi- spring Seal kits, designed to suit LKHI, LKHP, LKHSP and LKH 100 series multi-stage series Pumps.



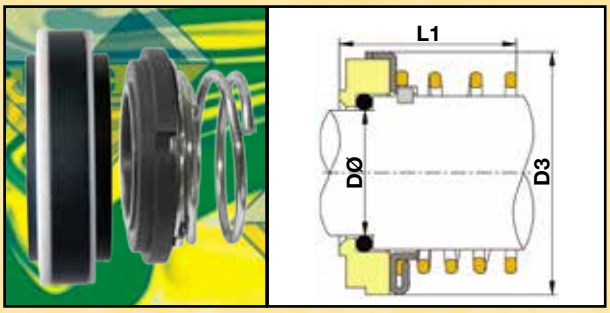
Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals for Alfa Laval® Pumps

Type 293 to suit Alfa Laval® Tri-Clover® Pumps E C 304

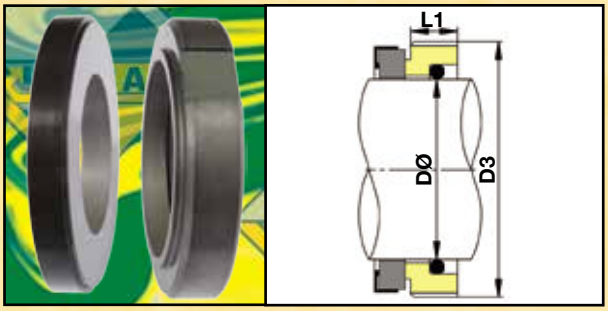
Vulcan manufacture direct replacement rotary parts to replace the OEM 'O'-Ring mounted, hydraulically-balanced "Type-D" Seals fitted to Tri-Clover® brand centrifugal Pumps. Clamped stationaries with gaskets are also available to work with the Type 293 rotary, to replace the OEM "Type-DG" Seals for those Pumps with flushed Seal chambers. Please contact us with your requirements.



Shaft Size DØ		Size Code	D3		L1		OEM Seal Code
In	mm		In	mm	In	mm	
0.750	19.10	0191	1.850	47.00	1.555	39.50	C114
1.125	28.60	0286	2.125	54.00	1.535	39.00	C216
1.500	38.10	0381	2.625	66.60	1.319	33.50	C218, C328

Type 1628 to suit Alfa Laval® Tri-Clover® Pumps V S N/A

Vulcan manufacture direct replacement repair parts for OEM 'O'-Ring mounted, multi- spring Seals fitted to Tri-Clover® brand "Centrifugal 200" series Pumps with the common Imperial 1.750" shaft size. The Vulcan wear parts will interchange with the non-wearing parts, such as the drive ring and multiple springs, to allow rapid Seal refurbishment and re-assembly. Seal part codes are as follows;

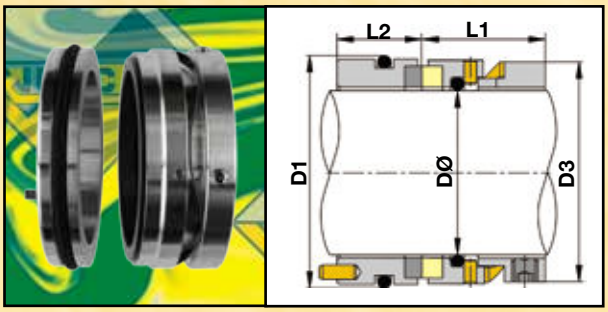


0444.1628.V.S.FACE	Rotary Face with 'O'-Ring
0444.1628.X.S.STAT	Stationary Seat
0444.1628.V.X.Boot	Stationary Cup Boot

Shaft Size DØ		Size Code	D3		L1		OEM Seal Code
In	mm		In	mm	In	mm	
1.750	44.45	0444	3.125	79.38	0.406	10.32	2045, 2065, 2085, 2105

Type 1655 to suit MOG and ALP Lobe Pumps E V Q 316

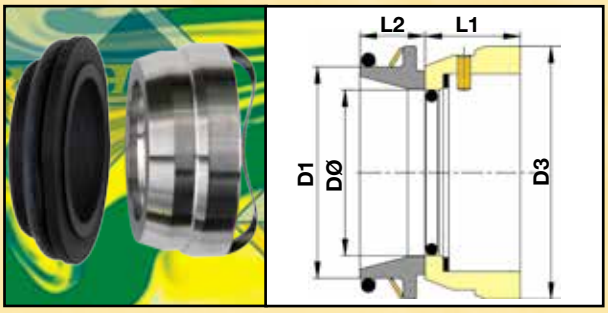
Vulcan manufacture direct replacement wave-spring 'O'-Ring mounted Seals to suit Alfa Laval® MOG and ALP series lobe-rotor Pumps.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
1.187	0300	41.70	41.00	22.20	14.00
1.375	0349	47.60	46.75	20.60	15.80
2.000	0508	66.60	65.40	23.80	12.00
3.000*	0762	95.20	98.60	39.70	12.00

Type 1680 to suit LKPL, NMOG and SRU Lobe Pumps E P 316

Vulcan manufacture direct replacement wave-spring 'O'-Ring mounted Seals to suit Alfa Laval® new generation lobe rotor Pumps, such as LKPL, NMOG and SRU series, fitted with OEM "Hy-clean®" style Seals. For older generation Pumps, see Type 1682 on facing page. Further sizes are available, please contact us with your requirements.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
1.187	0300	36.40	45.00	21.50	14.50
1.375	0350	46.00	55.00	22.00	14.00
1.813	0450	59.40	65.00	25.00	16.00
2.187	0550	69.00	75.00	26.90	17.00

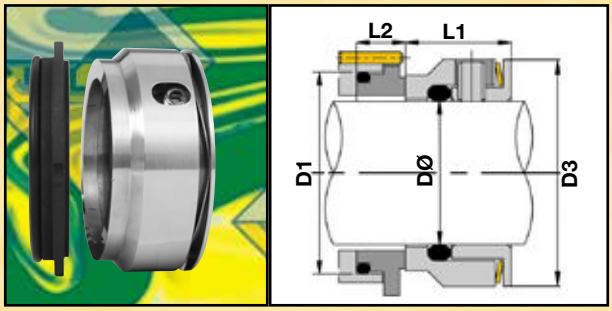
Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals to suit Alfa Laval® & C.S.F. Inox® Pumps

Type 1682 to suit LKPL, NMOG and SRU Lobe Pumps E V P H 304

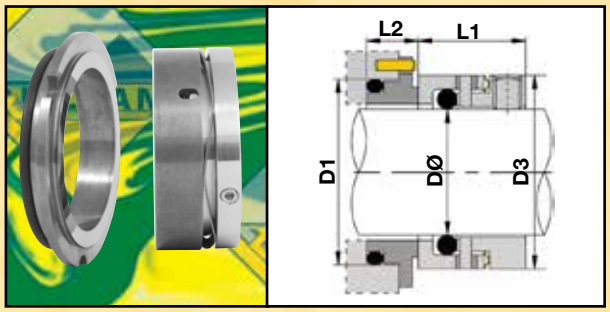
Vulcan manufacture direct replacement wave-spring 'O'-Ring mounted Seals to suit Alfa Laval® older generation lobe rotor LKPL, NMOG and SRU series, fitted with OEM "R90®" style Seals. For Pumps with flush and double Seals installed, see Type 1694 detailed below.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
20.00	0200	30.00	32.40	20.00	10.50
30.00	0300	41.30	44.00	21.40	11.10
35.00	0350	46.95	50.80	22.00	12.00
45.00	0450	58.26	62.40	22.90	12.60
55.00	0550	69.55	76.00	29.30	13.20
75.00	0750	92.15	99.20	31.10	14.40

Type 1688W to suit Alfa Laval® SR Lobe Rotor Pumps E P H 304

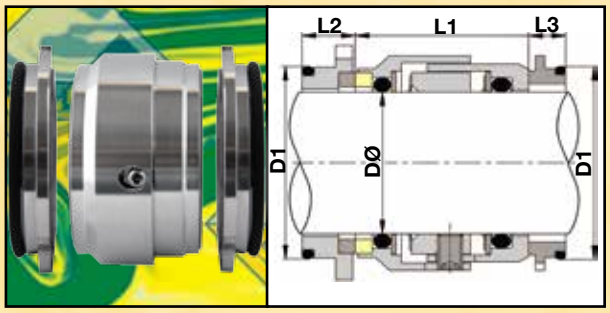
Vulcan manufacture Type 1688W 'O'-Ring mounted wave-spring Seals to suit former "S.S.P.®" brand SR– series A-&-G-series lobe rotor Pumps. Further sizes are available, please contact us with your requirements.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
20.00	0200	30.00	31.00	19.10	10.70
30.00	0300	41.30	41.00	19.10	10.90
35.00	0350	46.95	45.50	19.10	12.20
45.00	0450	58.26	58.20	21.10	11.60
55.00	0550	69.55	72.00	22.10	13.00
75.00	0750	92.15	96.00	25.80	14.50

Type 1694 to suit Alfa Laval® SR Lobe Rotor Pumps E ZH 316

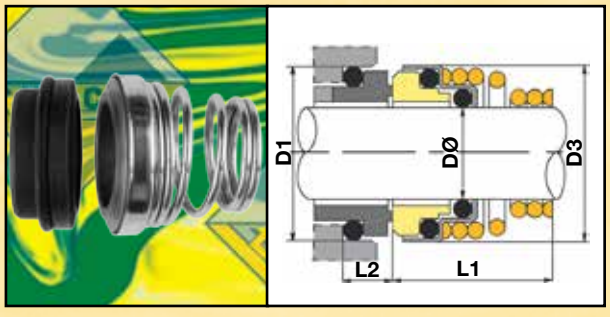
Vulcan manufacture Type 1694 'O'-Ring mounted wave-spring double Seals to suit former "S.S.P.®" brand SR– series lobe rotor Pumps, designed for and fitted with flushed Seal chambers and double Seals.



Shaft Size DØ	Size Code	D1 (mm)	L1 (mm)	L2 (mm)	L3 (mm)
30.00	0300	41.30	31.40	10.50	11.10
35.00	0350	46.95	32.50	11.50	11.50
45.00	0450	58.26	35.90	11.30	11.30
55.00	0550	69.55	45.50	12.50	11.50

Type 13M to suit C.S.F. Inox® Pumps E SC 316

Vulcan manufacture 28mm Type 13M 'O'-Ring mounted conical spring Seals, to suit C.S.F. Inox® AS– and CS– centrifugal Pump ranges. Vulcan also offers other Seals to suit C.S.F. Inox® Pumps, including the Type 1605 hygienic single-spring Seals to replace the OEM "U" or "Y" type externally mounted Seals.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
28.00	0280	43.00	45.50	29.00	9.50

Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

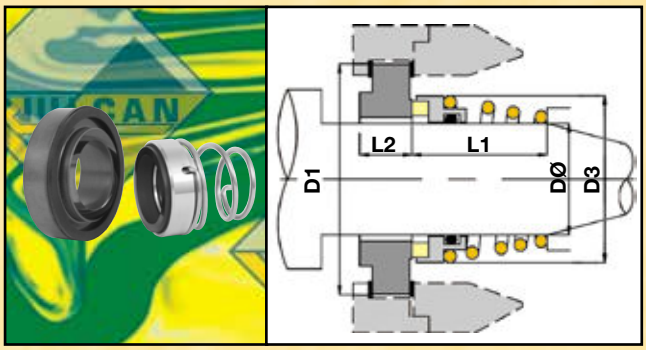
All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Type 16 Series for A.P.V.® World® Pumps

The A.P.V. W® and W+® Pump series have been introduced to replace the A.P.V. Puma® Pumps. Vulcan manufacture and stock a comprehensive range of Mechanical Seals designed to suit these popular Pumps, in single and double Seal configurations.

Type 16 Single Seals to suit APV® W Pumps

N E D S 304 FDA

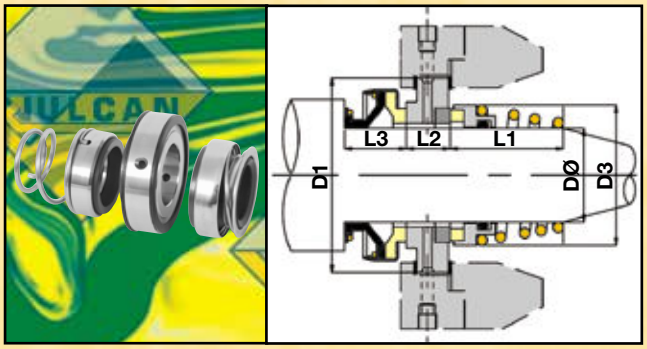


Vulcan manufacture 25mm and 35mm Seals to suit A.P.V. World ® series Pumps, with standard single Seals. For Pumps with flushed Seal chambers and double Seals, please see the Type 16 DOUB below.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
25.00	0250	52.00	38.20	25.40	16.00
35.00	0350	62.50	49.50	33.30	16.00

Type 16.DOUB Double Seals to suit APV® W Pumps

E Y Z 304 FDA

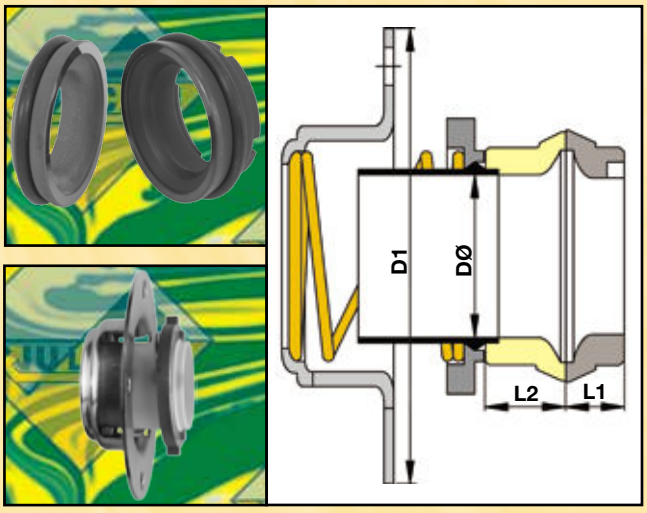


Vulcan manufacture 25mm and 35mm double Seals to suit A.P.V. World ® series Pumps, with flushed Seal chambers and double Seals installed. You can contact us with the OEM details for cross-reference and identification, should you require.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)
25.00	0250	52.00	38.20	25.40	17.00	13.00
35.00	0350	62.50	49.50	33.30	20.00	16.00

Type 16.PLUS to suit APV® W+ Pumps

E CS S D 304 FDA



Vulcan manufacture 25mm and 35mm face sets and face-holding kits to suit A.P.V. W+ ® series Pumps.

The Type 16.PLUS face sets include a Silicon Carbide “short” rotary face, a Carbon or Silicon Carbide “long” stationary (with four drive slots), two ‘O’-Rings and one drive pin, to drive the rotary face.

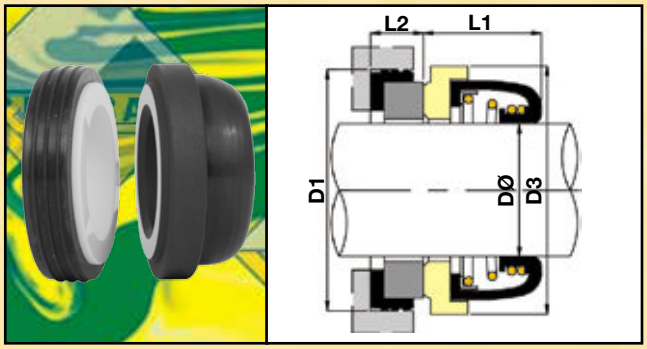
The static coil unit, with PTFE sleeve, is available as a separate part.

Vulcan Type 16.PLUS.KIT, in both 25mm and 35mm sizes, is also available in FDA grade materials as standard.

Shaft Size DØ	Size Code	D1 (mm)	L1 (mm)	L2 (mm)
25.00	0250	84.00	11.50	17.50
35.00	0350	88.00	11.50	17.50

Type 66 to suit APV® agitators

N E C 304 FDA



Vulcan manufacture a 1.000” Type 66 rubber-encased Seal to suit A.P.V.® agitators, available as rotary part only, or as a complete Seal with a Type 20 stationary. For further sizes, please contact us with your requirements.

Rotary part only uses code 0254.66.E.C.Seal for E.P. or N.C.Seal for Nitrile.

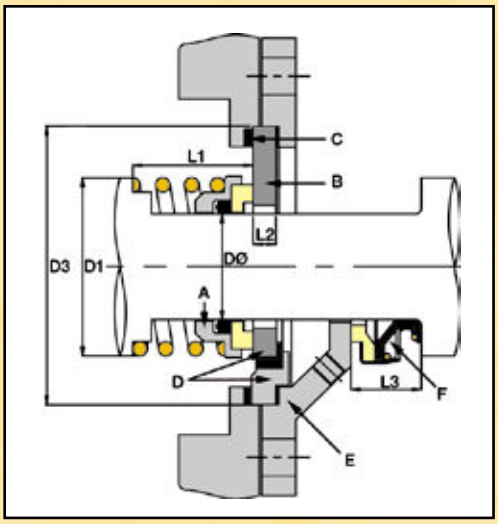
Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
1.000	0254	47.63	48.50	15.85	11.99

Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM’s name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

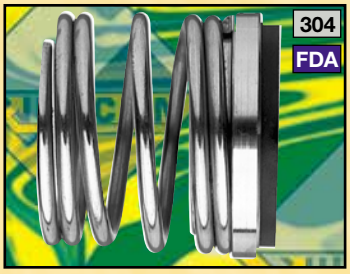
Type 26 Series for A.P.V.® Puma® Pumps

Vulcan produce the entire range of Seals and associated components commonly found on the 1.000” and 1.500” shaft A.P.V.® Puma® Pumps, in single or double Seal configurations.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)
1.000	0254	41.20	68.20	25.40	7.80	14.00
1.500	0381	55.70	80.10	33.30	9.00	17.00

XXXX.26.N.C.SEAL NEVC



XXXX.26.N.C.SEAT NEVC

XXXX.26.S.S.D 304

Vulcan Stock Codes.

Where XXXX is stated in the codes below, utilise 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.

XXXX.26.N.C.GASK NE FDA

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.

XXXX.26.S.S.PLAT 304

Seat Arrangement Two = D and C

XXXX.26.N.C.SEAT Type 26 Boot mounted Ceramic seat, inserted in a stainless steel adaptor.
XXXX.26.N.S.SEAT Type 26 Boot mounted Silicon Carbide seat, inserted in a stainless adaptor.
XXXX.26.N.C.GASK Gasket set, with a 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, with Nitrile bellows and Carbon face.

XXXX.18.N.C.SEAL NEVC

Ancillary Information.

All parts are fitted with Nitrile elastomers as standard. If E.P. or Viton™ are required, please specify this, by replacing ‘N’ in the code with ‘E’ or ‘V’.
A ‘Y’ Pre-fix to the code, denotes FDA / E.C. Regulation compliant.

Vulcan also manufacture the following square-section replacement gaskets to suit the body of the APV Puma® Pump;

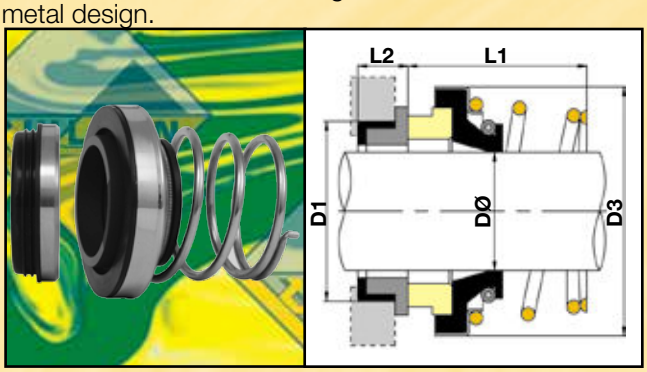
P.7”BODYSEAL Square section Nitrile gasket, with 7.0” I.D.
P.9”BODYSEAL Square section Nitrile gasket, with 9.0” I.D.
P.11”BODYSEAL Square section Nitrile gasket, with 11.0” I.D.

Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM’s name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

Type 29 Series for A.P.V.® Pumps

Type 29 to suit ZM-® Series Pumps N E Q S 304 FDA

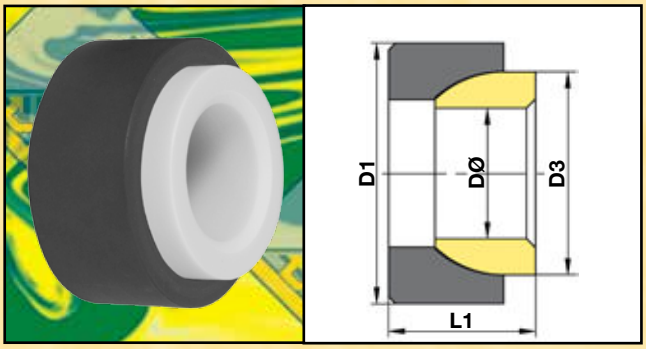
Vulcan manufacture the Type 29 to suit former "Pasilac Rosista®" brand ZM® series Pumps. The Type 29 design features the enhanced sealing benefits of a Boot mounted seat, to the same dimensions as the OEM metal to metal design.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Pump Model
20.00	0200	30.00	40.60	30.00	9.80	ZMA, ZMB, ZMH1 & 2, ZMK1 & 2
25.00	0250	35.00	45.40	31.00	9.80	ZMS3, ZMS4
30.00	0300	42.00	57.00	40.00	13.00	ZMH4, ZMK3, ZMD

Type 292 to suit A.P.V.® Agitators X C N/A

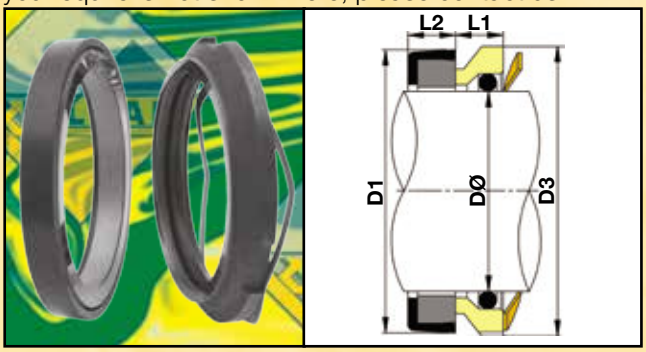
Vulcan manufacture our Type 292 bearing set to suit former "Osborne Craig®" brand agitators. Type 292 features a ceramic self-aligning face set in a Carbon cup bearing.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)
1.125	0286	57.00	44.44	32.50

Type 294 to suit A.P.V.® Cleanline® Pumps E D S 304

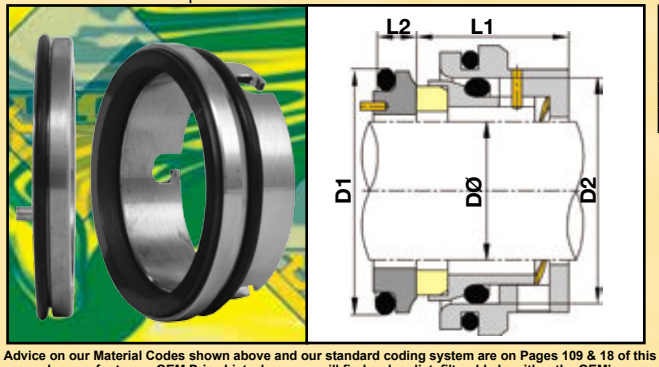
Vulcan manufacture our Type 294 face kits to suit APV® Cleanline® series Pumps. The Vulcan parts are designed to directly replace the wear parts of the OEM Seals, it is rarely necessary to replace the Seal sleeve and housing as these are non-wearing parts. The kits are supplied with the wave-spring as standard. If the size you require is not shown here, please contact us.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Pump Model
1.125	0286	41.20	42.00	7.70	7.70	CL 0, CL 1
1.875	0476	63.50	66.00	9.00	8.30	CL 2
2.125*	0539	73.03	74.00	12.30	9.30	CL 3

Type 295 to suit ZM-® Series Pumps N E Q 304 FDA

Vulcan manufacture our Type 295 'O'-Ring mounted wave-spring Seal to suit former "Pasilac Rosista®" brand ZM® series Pumps.



Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	OEM Pump Model
1.875	0480	63.50	63.50	23.00	7.90	ZMS 5
2.125	0540	73.00	73.00	26.40	7.90	ZMS 6

Note: Due to the clearance between shaft and Seal faces,

Vulcan's size code may not reflect the actual shaft sizes.

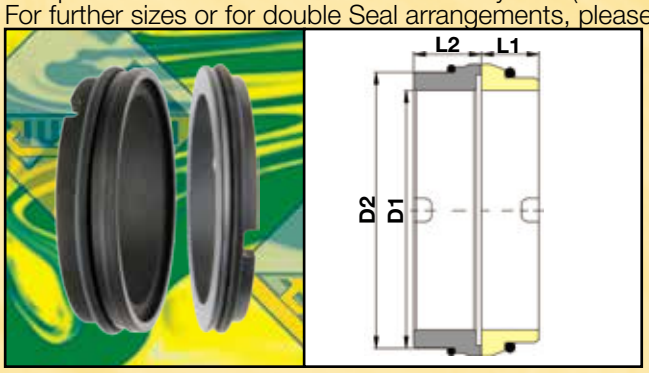
Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Type 29 Series for A.P.V.® Pumps

Type 297 to suit A.P.V.® DW® Lobe Rotor Pumps (E) (S) N/A

Vulcan manufacture replacement Seal face kits, complete with 'O'-Rings, to suit A.P.V.® DW® series lobe rotor Pumps. Available with Silicon Carbide rotary face (short face) and Silicon Carbide stationary face (long face). For further sizes or for double Seal arrangements, please contact us.



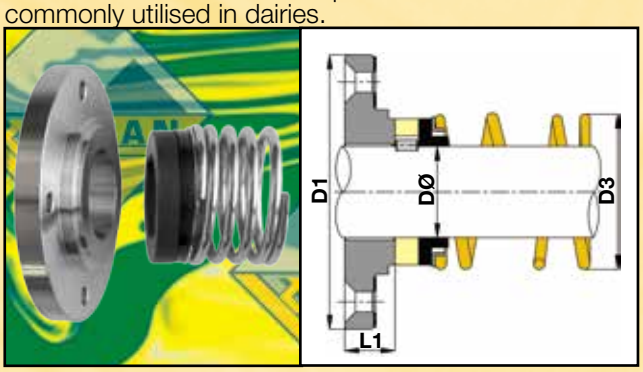
Nominal Shaft Size	Size Code	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	OEM Pump Model
28.00	0280	32.00	40.00	8.50	13.50	DW 1
38.00	0380	41.00	50.00	8.50	13.50	DW 2
48.00	0480	50.00	59.00	9.00	14.50	DW 3
58.00	0580	59.00	68.00	9.00	14.50	DW 4

Note: Due to the clearance between shaft and Seal faces,

Vulcan's size code may not reflect the actual shaft sizes.

Type 272 to suit A.P.V.® former D.D.M.M® Pumps (N) (Q) 316

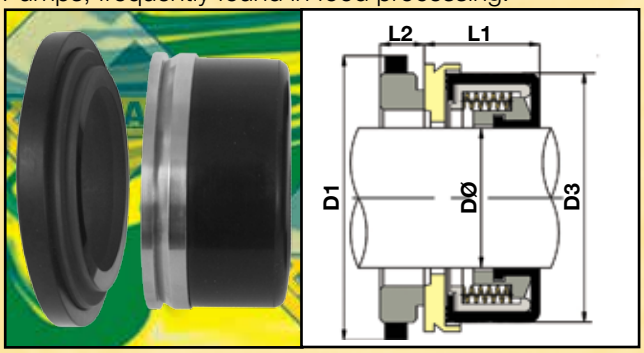
Vulcan manufacture direct replacement Seals for former D.D.M.M. Kolding® or Pasilac® centrifugal Pumps, commonly utilised in dairies.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)
20.00	0200	75.00	38.00	14.00
25.00	0250	75.00	40.00	14.00

Type 1644 to suit Common Positive Displacement Pumps (N) (P) 316

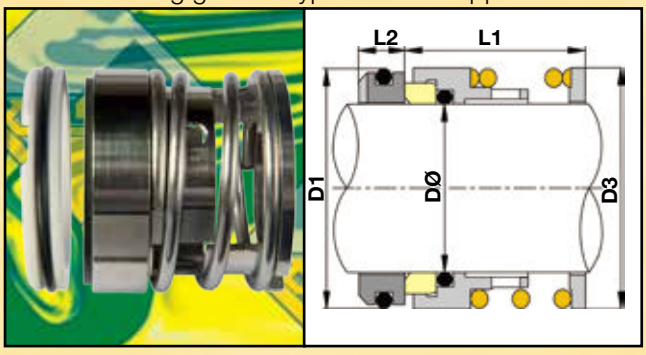
Vulcan manufacture a 1.500" Type 1644 rubber-encased multi- spring Seal, for use in positive displacement Pumps, frequently found in food processing.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
1.500	0381	75.70	65.00	33.33	14.00

Vulcan® Type 962 to suit Wild® Indag® Mixer Pumps (V) (DB) 316 FDA

Vulcan manufacture direct replacement Seals for Wild® Indag® in-line mixer Pumps, commonly utilised in dairy, especially yoghurt, production. The Seal size code 0270 has the stationary 'O'-Ring mounted into the housing with a push fit block stationary ring, the larger size Seals have more conventional stationaries with a central 'O'-Ring groove. Type 962 are supplied in FDA complaint materials as standard.



Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
1.187	0270	41.20	39.00	25.40	11.30
1.500	0381	49.21	49.00	36.50	8.00
1.875	0476	60.30	60.00	38.10	7.70

Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

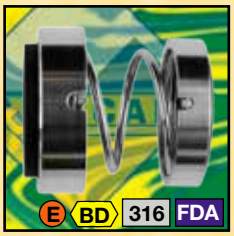
All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Mechanical Seals to suit Fristam® Pumps

Fristam® centrifugal and lobe-rotor Pumps are widely utilised in the dairy, beverage and pharmaceutical industries. Vulcan offer a wide range of components and complete Seal sets to directly replace the OEM Seal components, without any modification to the Seal housings or the Pump Seal chamber. Vulcan supply from stock individual Seal components and complete Seal sets, if you require anything not illustrated on the following pages, please contact us.

W-XX08/12

W-XX08/12B



Y-XX08/2

Individual Vulcan® Rotary Components;

Inboard Rotaries

Vulcan's Stock Code	Description
Where XX is stated in the code, apply 22, 30 or 35 as appropriate to shaft size required.	
W-XX08/12	Inboard rotary, with base, with inserted Carbon face.
W-XX08/12.S.C.	Inboard rotary, with base, with inserted Silicon Carbide face.
W-XX08/12.T.C.	Inboard rotary, with base, with inserted Tungsten Carbide face.
Y-XX08/2	Inboard rotary, with tappit base, with inserted Carbon.
Y-3508/3	Inboard rotary, with flat tappit base, with inserted Carbon.
Y-3508/4	Inboard rotary, with extended tappit base, with inserted carbon.
Y-XX08/2.R.	Inboard rotary, with tappit base, with inserted SiCSiC.
W-2209/2	22mm Inboard rotary, rubber encased, with base, with Carbon face.
W-3009/2	30mm Inboard rotary, rubber encased, with base, with Carbon face.

Outboard Rotaries

Vulcan's Stock Code	Description
W-XX08/12B	Outboard rotary (no base), with inserted Carbon face.
W-XX08/12B.S.C.	Outboard rotary (no base), with inserted Silicon Carbide face.
W-XX08/12B.T.C.	Outboard rotary (no base), with inserted Tungsten Carbide face.
W-XX09/1	Outboard rotary, rubber encased, Carbon face.
W-XX09/3	Outboard rotary, rubber encased, Carbon face, with garter spring.

Individual Vulcan® Stationary Components;

Inboard Stationaries

Vulcan's Stock Code	Description
Where XX is stated in the code, apply 22, 30 or 35 as appropriate to shaft size required.	
W-XX06/61	Inboard pinned-seat, Monolithic Stainless Steel
W-XX06/61.S.C.	Inboard pinned-seat, inserted Silicon Carbide face
W-XX06/61.T.C.	Inboard pinned-seat, inserted Tungsten Carbide face
W-3006/8	Inboard bi-elastomer seat, Monolithic Stainless Steel
W-3006/8.CER	Inboard bi-elastomer seat, Monolithic Ceramic

Outboard Stationaries

Vulcan's Stock Code	Description
W-XX05/6	Outboard seat, Monolithic Stainless Steel
W-XX05/6.S.C.	Outboard seat, inserted Silicon Carbide face
W-XX05/6.T.C.	Outboard seat, inserted Tungsten Carbide face
W-XX05/6.S.C.MON	Outboard seat, Monolithic Silicon Carbide
W-2207/1	Outboard seat, Monolithic Ceramic

flush Stationaries

Vulcan's Stock Code	Description
W-2205/1	22mm Flush Seat, 50mm O.D. x 22.5mm Thick, Monolithic Stainless Steel
W-2205/2	22mm Flush Seat, 45mm O.D. x 31.0mm Thick, Monolithic Stainless Steel
W-3005/2	30mm Flush Seat, 60mm O.D. x 28.0mm Thick, Monolithic Stainless Steel
W-3502/2	35mm Flush Seat, 64mm O.D. x 30.0mm Thick, Monolithic Stainless Steel

W-XX09/1

W-2209/2-W-3009/2

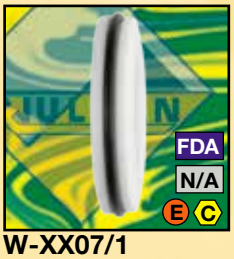
W-XX09/3

W-XX06/61

W-XX06/8

W-XX05/6

W-3005/2



W-XX07/1

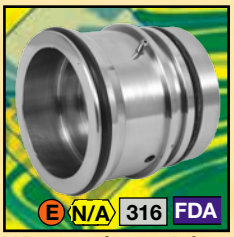
W-XX04/9

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

Vulcan Mechanical Seals to suit Fristam® Pumps

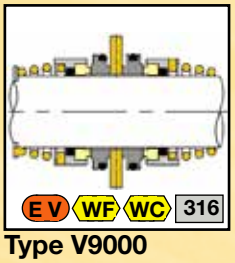
W-2201/1



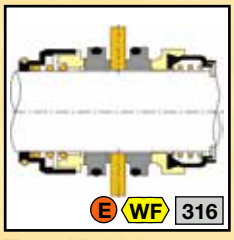
W-2201/2 and /3

W-2201/4

W-2201/8



Type V9000



Type V9002

Individual Vulcan® Collet and Housing Components;

Vulcan's Stock Code		Description
W-2201/1		Flush collet for double Seal, without bush
W-3001/1		Flush collet for single or double Seal
W-3501/1		Flush collet for single or double Seal
W-2201/2		Flush collet for double Seal, with bush
W-3001/2		Flush housing with integral Seal faces, Stainless Steel
W-3001/2.CER		Flush housing with integral Seal faces, Ceramic
W-3501/2		Flush housing with integral Seal faces, Stainless Steel
W-3501/2.CER		Flush housing with integral Seal faces, Ceramic
W-2201/3		Flush collet for double Seal, with bush and internal retaining lip for the Carbon bush
W-2201/4		Single Seal stationary housing, without flush
W-3001/4		Single Seal stationary housing, without flush
W-2201/5		Flush collet for double Seal, with extended bushing
W-2201/51		Flush collet for double Seal, standard bush
W-2201/53		Flush collet for single Seal, with extended bushing
Y-2201/6		Flush collet for double Seals, without bush
Y-3001/6		Flush collet for double Seals, without bush
W-3501/7		Flush collet for double Seal, with gland plate
W-2201/8		Flush collet for single Seal, with extended bushing
Y-2201/91		Flush collet for double Seal, without bush
Y-2201/92		Flush collet for double Seal, without bush, without internal groove

Individual Vulcan® Additional Components;

Vulcan's Stock Code		Description
W-2204/1		Spacer ring for single Seals without flush
W-2204/3		Extended Carbon bush for W-2201/8 Collet
W-2204/6		Extended Carbon bush for W-2201/5 Collet
W-2204/9		Carbon bush for W-2201/2, /3 and /51 Collets

Vulcan® Repair Sets (Without Collet or Housing Components);

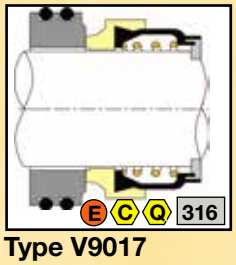
Vulcan's Stock Code		Description
Type V9000		Internal and external open-spring Seals
Type V9000A		As above, plus W-2204/9 Carbon bush
Type V9001		Internal open spring Seal, rubber encased external Seal
Type V9002		Internal and external rubber encased Seals
Type V9005		Internal and external open-spring Seals, both with short external type seat
Type V9006		Internal open-spring Seal, external rubber encased Seal, both with short external type seat
Type V9007		Internal tappit-base Seal, with external open spring Seal
Type V9008		Internal tappit-base Seal, with external rubber-encased Seal
Type V9010		Internal open-spring Seal only
Type V9011		Internal rubber-encased Seal only
Type V9012		Internal open-spring Seal only, with short external seat.
Type V9016		W-3009/1 rubber encased rotary with bi-elastomer seat.
Type V9017		W-3009/2 rubber encased rotary with bi-elastomer seat.
Type V9020		External open-spring Seal only
Type V9021		External rubber-encased Seal only
Type V9023		30mm Internal open-spring rotary with bi-elastomer seat
Type V9030		Internal tappit-base Seal only
Type V9040		Internal tappit-base rotary, with short external seat.

W-3001/1

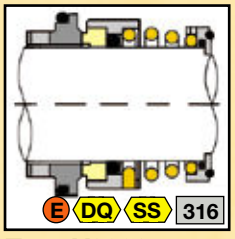
W-3501/2

W-2201/51

Y-2201/91 and 92



Type V9017



Type V9030

All the above repair Seal sets are supplied with appropriate 'O'-Rings and locating pins for the collet flush housing. For other repair set combinations, please refer to the OEM database and /or our OEM Price List or contact us with your requirements.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

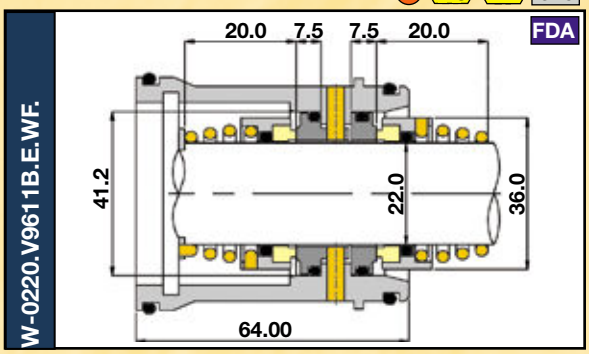
For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

Vulcan complete collet Seal sets to suit Fristam® Pumps

Vulcan supply from stock complete Seal units for Fristam® Pumps, based on the extensive range of Vulcan components. These complete Seal units directly replace the Fristam® OEM assembly, while offering the benefits of Vulcan quality and reliability. The following illustrations only show the most common arrangements for each flush collet or housing type, please ask for alternatives, we have a huge range of variations available to suit your requirements.

W-2201/1 Collet Arrangement

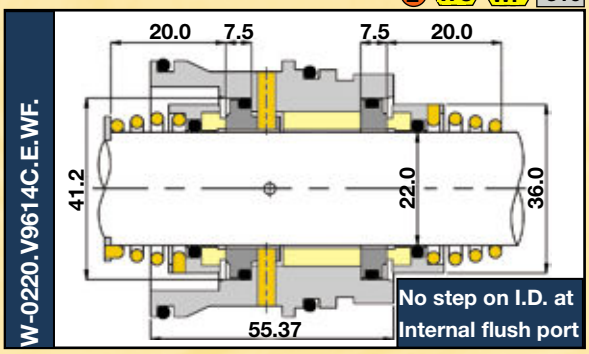
E WC WF 316



W-2208/12	W-2206/61	W-2205/6	W-2208/12B
Inboard Rotary	Inboard Seat	Outboard Seat	Outboard Rotary

W-2201/2 Collet Arrangement

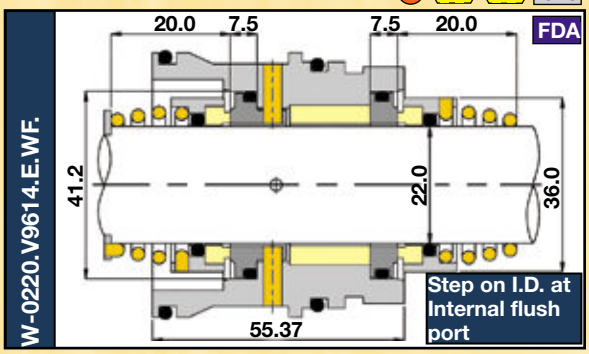
E WC WF 316



W-2208/12	W-2206/61	W-2204/9	W-2205/6	W-2208/12B
Inboard Rotary	Inboard Seat	Carbon Bush	Outboard Seat	Outboard Rotary

W-2201/3 Collet Arrangement

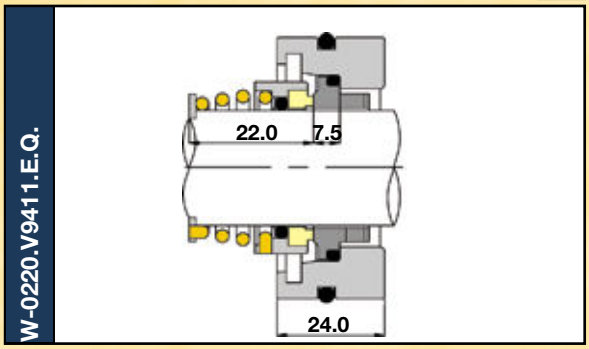
E WC WF 316



W-2208/12	W-2206/61	W-2204/9	W-2205/6	W-2208/12B
Inboard Rotary	Inboard Seat	Carbon Bush	Outboard Seat	Outboard Rotary

W-2201/4 Collet Arrangement

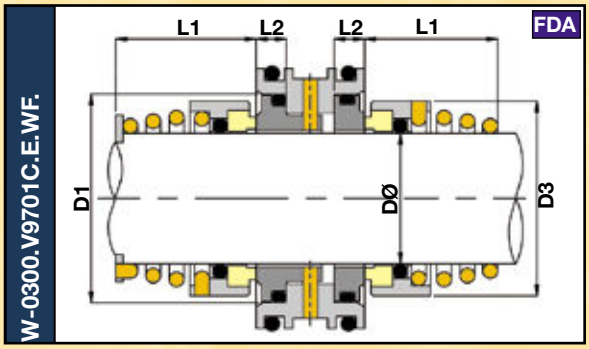
E Q S 316



W-2208/12	W-2206/61	W-2201/4
Inboard Rotary	Inboard Seat	Seat Housing

W-3X01/1 Arrangement

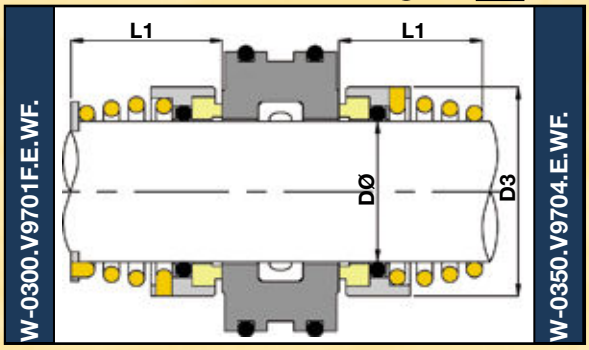
E WC WF 316



W-XX08/12	W-XX06/61	W-XX05/6	W-XX08/12B
Inboard Rotary	Inboard Seat	Outboard Seat	Outboard Rotary

W-3X01/2 Arrangement

E WF 316 FDA



W-XX08/12	W-XX08/12B
Inboard Rotary	Outboard Rotary

Shaft Size DØ	Size Code	D1	D3	L1	L2
30.00	0300	48.00	43.80	22.00	7.60
35.00	0350	55.50	48.90	26.00	8.60

Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

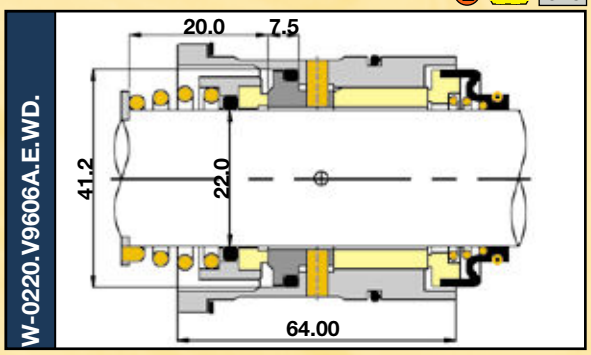
All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan complete collet Seal sets to suit Fristam® Pumps

To aid the identification of the correct Seal unit, the Vulcan code is derived from the original OEM Seal set code, with both a “W-” for 316 Stainless Steel (or “Y” for “FDA”) and a shaft size prefix, and a standard format Vulcan material code suffix. For example, a 316 Stainless Steel Vulcan Seal set to replace OEM code “9.611b” would be W-0220.V9611B.E.WF., where the 0220 denotes 22mm shaft size, E denotes EP ‘O’-rings, and WF denotes Carbon vs Stainless Steel in a double Seal arrangement. The following illustrations only show the most common arrangements for each collet style. We have a huge range of variations available to suit your requirements. Please refer our OEM Price List or Web Portal OEM Data-Base, or enquire.

W-2201/5 Collet Arrangement

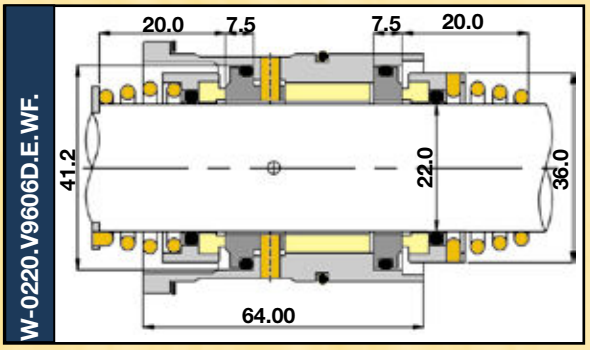
E WD 316



W-2208/12	W-2206/61	W-2204/6	W-2209/3
Inboard Rotary	Inboard Seat	Carbon Bush	Outboard Rotary

W-2201/51 Collet Arrangement

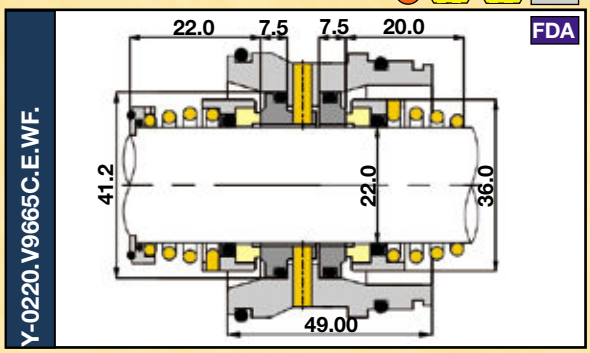
E WC WF 316



W-2208/12	W-2206/61	W-2204/9	W-2205/6	W-2208/12B
Inboard Rotary	Inboard Seat	Carbon Bush	Outboard Seat	Outboard Rotary

Y-2201/6 Collet Arrangement

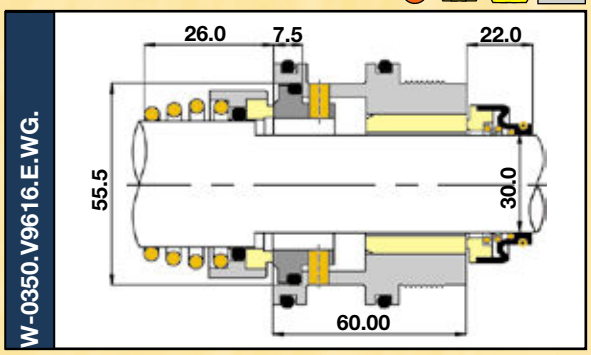
E WC WF 316



Y-2208/2	W-2206/61	W-2205/6	W-2208/12
Inboard Rotary	Inboard Seat	Outboard Seat	Outboard Rotary

W-3501/7 Collet Arrangement

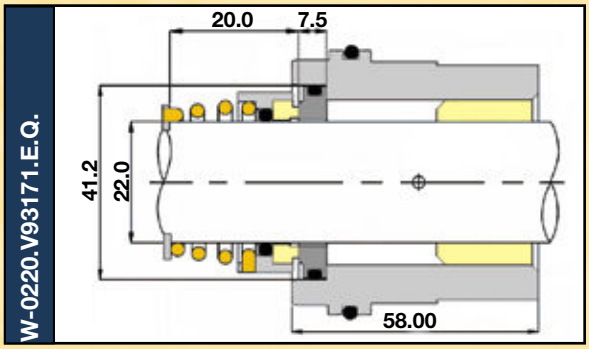
E WC WF 316



W-3508/12	W-3506/61	W-3004/7	W-3009/3
Inboard Rotary	Inboard Seat	Carbon Bush	Outboard Rotary

W-2201/8 Collet Arrangement

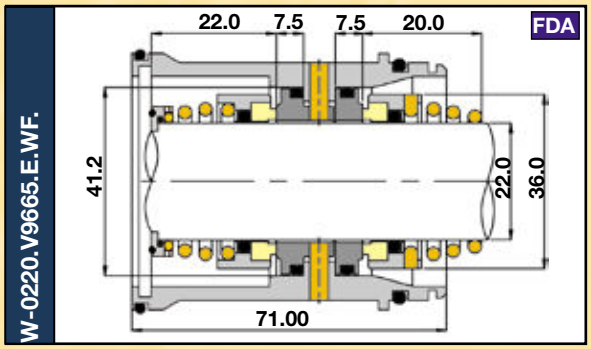
E Q C 316



W-2208/12	W-2205/6	W-2204/3
Inboard Rotary	Inboard Seat	Carbon Bush

W-2201/91 Collet Arrangement

E WC WF 316



Y-2208/2	W-2206/61	W-2205/6	W-2208/12
Inboard Rotary	Inboard Seat	Outboard Seat	Outboard Rotary

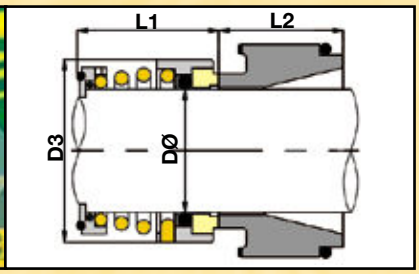
11 C

Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM’s name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Fristam® Pump Seal sets

Vulcan Seals to suit non-flush Fristam® FPX Pumps (E) RD 316 FDA



Shaft Size DØ	Size Code	D3 (mm)	L1 (mm)	L2 (mm)
22.00	0220	45.00	22.00	30.00
30.00	0300	60.00	24.00	27.00

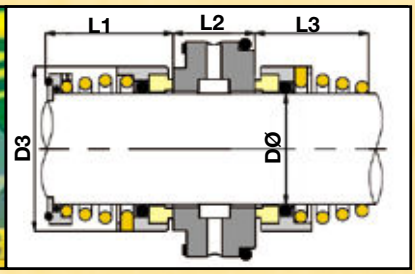
NON-FLUSH SINGLE Seals, with Silicon Carbide rotary, Monolithic Carbon stationary, and E.P. elastomers, FDA Compliant.

Vulcan's Stock Code

Y-0220.V9018.E.RD.

Y-0300.V9018.E.RD.

Vulcan Seals to suit flushed Fristam® FPX Pumps



Shaft Size DØ	Size Code	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)
22.00	0220	45.00	22.00	31.00	20.00
30.00	0300	60.00	24.00	26.00	22.00
35.00	0350	64.00	26.00	30.00	26.00

FLUSH SINGLE Seals, with Carbon rotary, Monolithic Silicon Carbide stationary, and E.P. Elastomers, FDA Compliant. Dimension L3 does not apply.

Vulcan's Stock Code

Y-0220.V9019.E.DR. (E) DR 316 FDA

Y-0300.V9019.E.DR. (E) DR 316 FDA

Y-0350.V9019.E.DR. (E) DR 316 FDA

FLUSH DOUBLE Seals, with Carbon rotaries, Monolithic Silicon Carbide stationary, and E.P. elastomers, FDA Compliant. L3 Applies.

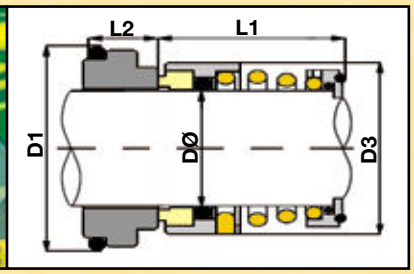
Vulcan's Stock Code

Y-0220.V0633.E.YR. (E) YR 316 FDA

Y-0300.V0735.E.YR. (E) YR 316 FDA

Y-0350.V0736.E.YR. (E) YR 316 FDA

Type V9200 to suit Fristam® FT-® Series Pumps (E) (R) 316 FDA

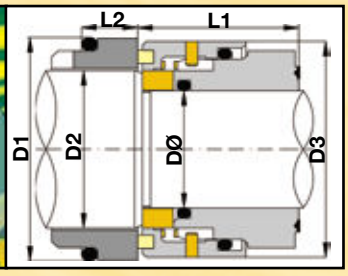


Vulcan manufacture and stock 30mm single Seals to suit Fristam® FT200 and FT400 series centrifugal Pumps. FDA Compliant.

Vulcan Stock Code = Y-0300. V9200.E.R.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
30.00	0300	54.50	44.00	24.00	12.00

Type 1676 and 1696 to suit Fristam® Multi-stage Pumps (V) (R) 316



Vulcan make multi- spring hydraulically balanced high-performance Type 1676 Seals to suit Fristam® FM, FPE, FPH and FPHP series multi-stage centrifugal Pumps. Vulcan Stock Code = W-XXXX.1676.V.R.

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
18.00	0220	37.00	22.00	36.00	32.50	9.00
32.00	0430	61.00	43.00	59.00	40.00	14.00
35.00	0350	61.00	43.00	59.00	30.00	14.00

To complement the Type 1676, Vulcan also supplies the 38mm sleeve and lip Seal to Seal the flush fluid. For high-performance, we also offer the 38mm Type 1696 external Seal, in Carbon vs Ceramic with E.P., as a Mechanical Seal for the flush position. Vulcan Stock Codes; W-XXXX.1676.V.X.SLEE and W-XXXX.1696.E.C.

Shaft Size DØ	Size Code	D1 (mm)	L1 (mm)	L2 (mm)
22.00	0220	45.00	25.40	8.10
38.00	0380	62.00	23.80	8.10

Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

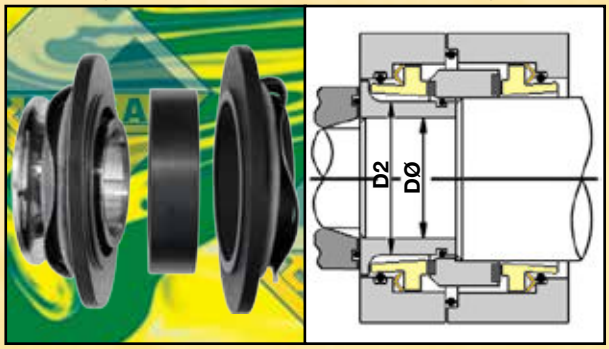
All seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals to suit Fristam® Lobe Rotor Pumps

Vulcan Seals to suit Fristam® FLII Series lobe rotor Pumps

E Z 316

Vulcan manufacture and stock Seal sets to directly replace the single and double arrangements in Fristam® FLII Series lobe rotor Pumps. Available with Monolithic Silicon Carbide central rotary face and inboard stationary, with Carbon outboard stationary for double Seal arrangements.



Vulcan's Stock Code

W-XX02/1 Single Seal in SSiC vs SSiC — E R 316 FDA

W-XX02/1.CAR Single Seal in SSiC vs Carbon — E RD 316 FDA

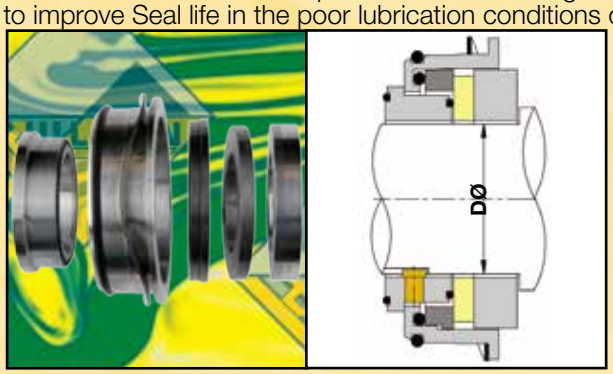
W-XX02/2 Double Seal in SSiC vs SSiC vs Carbon — E EZ 316 FDA

Sleeve O.D. D2	Size Code DØ	OEM Pump Model
28.00	0200	FLII 55
38.00	0300	FLII 75
50.00	0400	FLII 100
62.00	0520	FLII 130

Vulcan Seals to suit Fristam® FL, FLF and FLFN series lobe rotor Pumps

E H 316

Vulcan manufacture and stock complete Seals to directly replace the OEM Seals in Fristam® FL, FLF and FLFN series lobe rotor Pumps. Available with Tungsten Carbide vs. Tungsten Carbide Seal faces as standard, to improve Seal life in the poor lubrication conditions common in the applications these Pumps are utilised for.



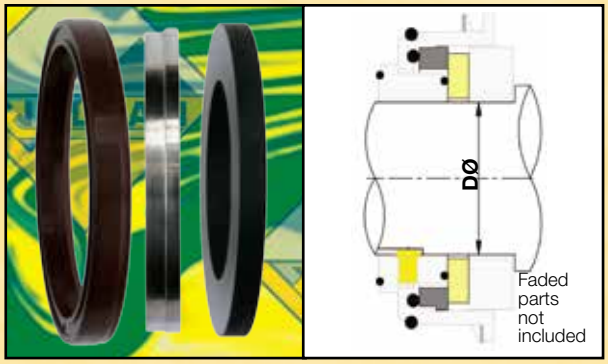
Vulcan's Stock Code

W-XX10/1 Single Seal in Tungsten Carbide Vs Tungsten Carbide with EP 'O'-Rings.

Shaft Size DØ	Size Code	OEM Pump Model
20.00	0200	FL55 , FLF55
31.00	0300	FL75 , FLF75
38.00	0380	FL100 , FLF100

Vulcan Seals to suit Fristam® FK and FL series Seals

Vulcan also supply repair sets for the Fristam® FK and FL series Seals. These kits will suit either Vulcan or original OEM Seals, and contain rotary face, stationary face, lip Seals, and necessary 'O'-rings. The kits contain parts to repair two Seals, so only one repair kit is required for each Pump repair.



Vulcan's Stock Code

W-XX11/2 Repair set in T.C. Vs T.C. with EP 'O'-Rings — E H 316

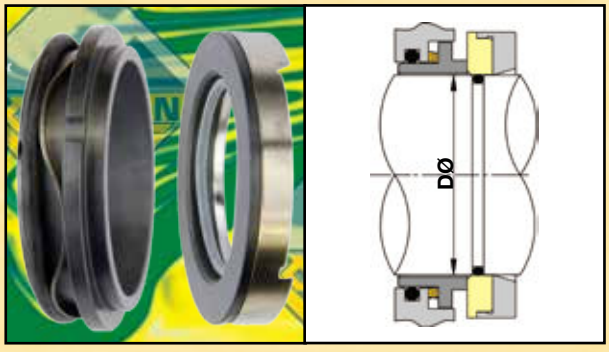
W-XX11/3 Repair set in Carbon vs Stainless Steel with EP 'O'-Rings. — E Q 316

W-XX11/3.VIT Repair set in Carbon vs Stainless Steel with Viton™ 'O'-Rings. — V Q 316

Shaft Size DØ	Size Code	OEM Pump Model
20.00	0200	FL55 , FLF55
31.00	0300	FL75 , FLF75
38.00	0380	FL100 , FLF100
52.00	0520	FL130 , FLF130

Vulcan Seals to suit Fristam® FKL50 lobe rotor Pumps

E V R 316 FDA



Vulcan manufacture complete single and double Seals for the common FKL50 lobe rotor Pump. The Vulcan design incorporates an inserted Silicon Carbide rotary, removing the OEM chrome oxide rotary and providing a cleaner solution for food process. For further FKL series Seals, please contact us.

Vulcan's Stock Code

W-4820/1 Single Seal in SSiC vs SSiC with Viton™ 'O'-Rings

W-4820/2 Double with SSiC vs SSiC vs Carbon, Viton™ 'O'-Rings.

Shaft Size DØ	Size Code	OEM Pump Model
48.00	0480	FKL50 , FZX 2100, FZX 2150, FZX 2200 , FZX 2250

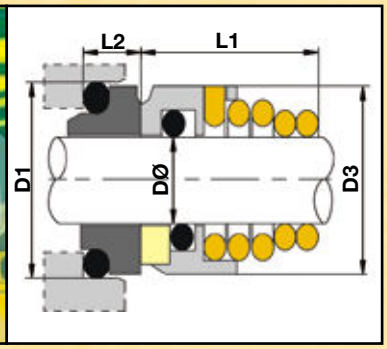
Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals to suit Grundfos® Hilge® Pumps

Conical Spring Seal Types

Vulcan manufacture and stock a wide range of conical spring Seals to suit several Grundfos® Hilge® centrifugal Pump ranges, such as Hygia®, Maxana® and Sipla®. To aid identification of these very similar looking Seals, please use the table below as your guide, showing the installed dimensions with the Vulcan Type code and the OEM Type code.



Vulcan's Stock Code Example

Please replace XXXX with the size code and YY with the relevant Vulcan Type code.

W-XXXX.YY.R.E.P.

Type YY, as per Vulcan Type Code shown below, with clockwise coil, Stainless Steel vs Carbon, and E.P. elastomer.

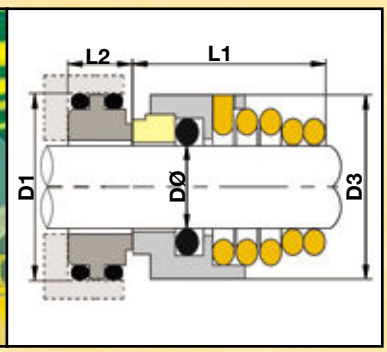
W-XXXX.YY.R.E.S.

Type YY, as per Vulcan Type Code shown below, with clockwise coil, Silicon Carbide Seal faces, and E.P. elastomer.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	Vulcan Type Code	OEM Seal Code	Guaranteed Stock Materials
19.00	0190	30.90	31.00	25.00	8.00	12	001-19 O3	EV PS 316 FDA
19.00	0190	30.90	31.00	25.00	8.00	12S	001-19 O5	EV PS 316
19.00	0190	35.00	31.00	20.00	9.50	8BU	002-19 O3	EV PS 316
22.00	0220	37.00	33.00	27.50	10.00	126	L1K-22 F3	EV PS 316 FDA
28.00	0280	43.30	40.00	29.00	9.00	12	001-28 O3	EV PS 316 FDA
28.00	0280	43.30	40.00	29.00	9.00	12H	001-28 A3	EV S 316
28.00	0280	43.30	40.00	29.00	9.00	12S	001-28 O5	EV PS 316
28.00	0280	42.00	40.00	24.60	11.00	8B	002-28 O3	EV P 316
30.00	0300	45.00	43.00	32.50	10.00	126	L1K-30 F3	EV PS 316 FDA
30.00	0300	45.00	43.00	32.50	10.00	126L	L1K-30 G3	EV S 316
30.00	0300	45.00	43.00	40.00	10.00	127	L1N-30 D3	EV PS 316
38.00	0380	60.50	53.00	39.00	11.50	12	001-38 O3	EV PS 316 FDA
38.00	0380	55.00	53.00	31.00	11.50	8B	002-38 O3	EV P 316
40.00	0400	58.00	56.00	32.00	13.00	126	L1K-40 F3	EV PS 316 FDA
40.00	0400	58.00	56.00	32.00	13.00	126L	L1K-40 G3	EV S 316
50.00	0500	70.00	66.00	38.00	14.00	126	L1K-50 F3	EV P 316
50.00	0500	70.00	66.00	38.00	14.00	126L	L1K-50 G3	EV S 316
50.00*	0500	70.00	66.00	43.00	14.00	8BU	1238-50 O3	EV P 316

If the final digit of the OEM Seal code is "2" then the replacement Seal requires an anti-clockwise rotation coil. Please replace the "R" character in the Vulcan code with "L" for anti-clockwise coil. If the OEM code you require is not listed, check the two Seal Types following or please contact us with your requirements.

Type 128 E P R 316



Vulcan manufacture and stock our Type 128 conical spring Seals with bi-elastomeric Stationaries, for Pumps with flushed Seal chambers.

The Type 128 is frequently installed in tandem with the Type 12 Seals listed above, on Grundfos®, Hilge® centrifugal Pumps.

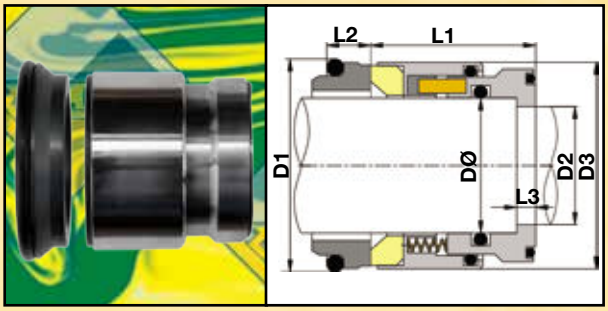
Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Seal Code
19.00	0190	39.30	31.00	20.00	17.50	0B3-19 B3
28.00	0280	47.30	40.00	26.50	18.00	0B3-28 B3
38.00	0380	59.30	53.00	33.50	16.80	0B3-38 B3

Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals to suit Grundfos® Hilge® Inoxpa® & Jabsco® Pumps

Hygienic 1662/1663 Seal Types



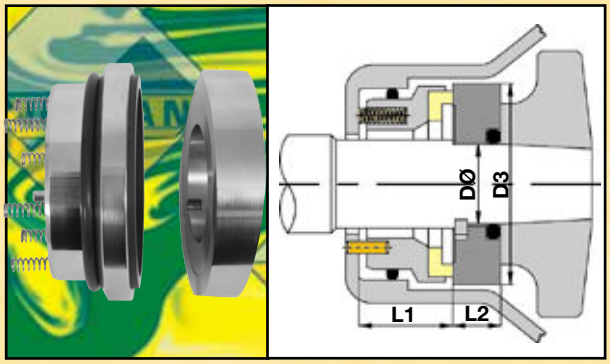
Vulcan manufacture and stock multi- spring Seals to replace the original OEM wave-spring Seals, utilised for hygienic applications in Grundfos® Hilge® centrifugal Pumps.

The common centrifugal series includes; Hygiana®, Euro Hygia®, Maxana®, Dura®, Sipla®, Contra® and Durietta®. However, the Seal codes are universal and you may identify your Seal from the codes below.

Conversion to the direct replacement Vulcan balanced multiple-spring design avoids the potential for premature single wave-spring failure.

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	Vulcan Type Code	OEM Seal Code	Guaranteed Stock Materials
19.00	0190	30.90	16.00	33.50	29.00	8.00	4.00	1662	001-19 O1	EV CS R 316 FDA
28.00	0280	43.30	24.00	43.00	34.50	9.00	4.00	1662	001-28 O1	EV CS R 316 FDA
28.00	0280	43.30	24.00	43.00	33.00	9.00	4.00	1662L	001-28 A1	EV R 316 FDA
28.00	0280	48.00	24.00	43.00	35.00	10.50	0.50	1663	BS2-28 O1	EV CS R 316
28.00	0280	48.00	24.00	43.00	38.00	10.50	4.00	1663A	BS3-28 O1	EV CS R 316
38.00*	0380	60.50	35.00	52.80	43.00	11.50	4.00	1662	001-38 O1	EV CS R 316 FDA
38.00	0380	57.10	35.00	52.80	35.00	10.50	0.50	1663	BS2-38 O1	EV CS R 316

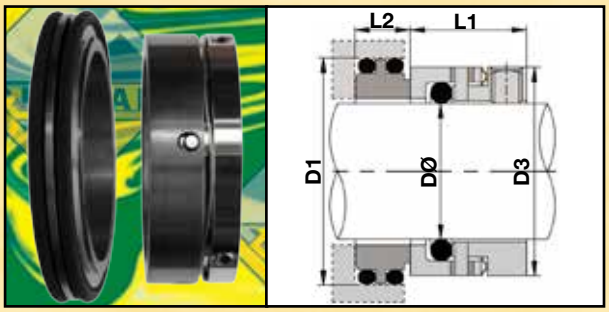
Vulcan Seals to suit Inoxpa® Pumps
Type 50 Seals to suit Prolac® Series Pumps EV P H S 316 FDA



Vulcan manufacture and stock Type 50 stationary multi- spring Seals, to suit Inoxpa® Prolac® "S-" series Pumps, with single or tandem Seal arrangements. With stationary Seals like the Type 50, the coils are on the stationary and the rotary is a counter-ring. Pumps with flushed Seal chambers use tandem Seals, with the Vulcan Type 50 in the impeller position, and a standard Vulcan Type 1688 in the outer flush water position. Dimensions for the Type 1688 can be found in the Wave-Spring Seals section.

Shaft Size DØ	Size Code	D3 (mm)	L1 (mm)	L2 (mm)
0.625	0158	44.50	26.00	10.50
1.000	0254	53.50	26.00	10.00
1.500	0381	74.00	31.00	15.50

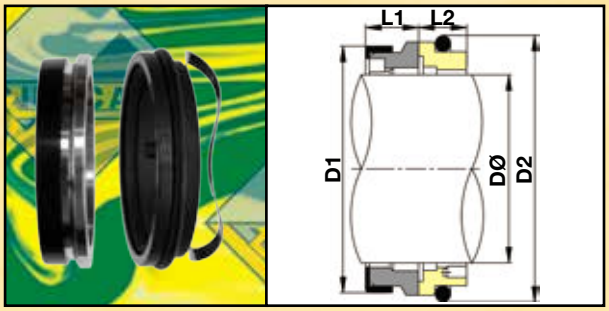
Type 1683 Seals to suit inoxpa® SLR® Series Lobe Rotor Pumps V P 316



Vulcan manufacture and stock Type 1683 wave-spring 'O'-Ring mounted Seals with bi-elastomeric Stationaries, to suit Inoxpa® SLR® series lobe-rotor Pumps. As with the majority of lobe rotor designs, two Seals are required for each Pump.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
28.00	0280	45.00	39.00	19.10	12.00
35.00	0350	53.00	45.50	19.10	12.00
50.00	0500	70.00	63.50	23.00	12.00
65.00	0650	92.50	82.30	25.80	14.00

Vulcan® Type 1651 Seals to suit Jabsco® Pumps N P 304 FDA



Vulcan manufacture and stock Type 1651 face sets to suit I.T.T. Jabsco® Hy-line® lobe-rotor Pumps. Vulcan also offers other Seals to suit common I.T.T. Jabsco® OEM equipment, please contact us for details.

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	OEM Pump Model
1.000	0254	37.00	38.00	11.10	12.30	LH 32, 34 & 42
1.375	0349	48.00	51.50	11.50	12.50	LH 44 , LH 52
1.875	0476	60.50	64.50	12.70	13.70	LH 62 , LH 64

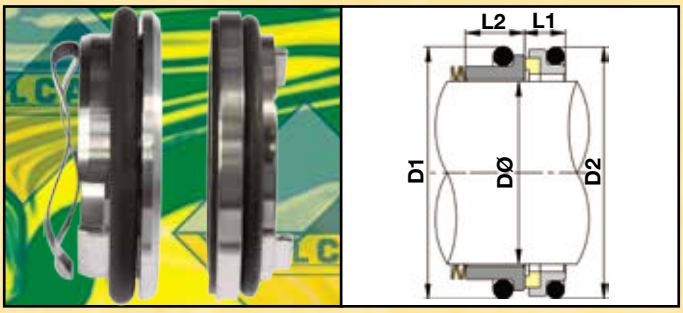
Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals for Johnson® Pumps

Vulcan manufacture and stock a wide range of standard range Seals that are utilised in S.P.X.® Johnson® equipment, such as our Type 24S, Type192B and Type 1677M Seal ranges. Vulcan also make and stock several special design / dimension Seals, the most common of which are detailed below.

Type 1650 Face Sets to suit OL® -Series Lobe Rotor Pumps V Q 304

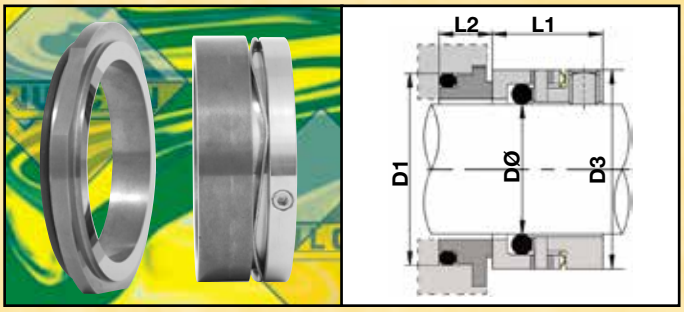


Vulcan manufacture and stock replacement Seal face sets, complete with wave-springs and the necessary 'O'-Rings, in shaft sizes 24, 40 and 53mm.

For 75mm and all double Seal versions, to suit Pumps with flushed chambers, please contact us.

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)	OEM Pump Model
24.00	0240	38.00	37.50	11.00	14.00	OL 1
40.00	0400	58.00	56.00	12.50	15.50	OL 2
53.00	0530	71.00	69.00	11.50	17.50	OL 3

Type 1688Y Seals to suit IC® and PD® -Series Lobe Rotor Pumps E H 304



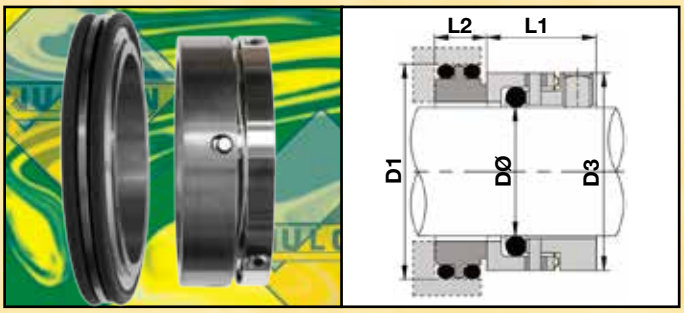
Vulcan manufacture and stock our Type 1688Y 'O'-Ring mounted wave-spring Seals, with the very distinctive seat outer profile.

30mm size stationary has a single semi-circular anti-rotation slot, other sizes have three flat anti-rotation "slots".

Vulcan also offer our Type 1682Y in 30mm and 35mm sizes, featuring a standard Type 1682 rotary with the 1688Y stationary, which maybe the prefered option for these shaft sizes.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Pump Model
30.00	0300	40.00	41.00	19.10	9.30	IC 10 , PD 10
35.00	0350	44.50	45.50	19.10	9.20	IC 20 , PD 20
50.00	0500	62.00	61.90	21.10	10.40	IC 30 , PD 30
70.00*	0700	85.00	88.90	25.80	14.10	IC 40 , PD 40
80.00*	0800	95.00	101.00	25.80	16.20	IC 50 , PD 50

Type 1688Z Seals to suit TL® -Series Lobe Rotor Pumps E U H 316



Vulcan manufacture and stock our Type 1688Z 'O'-Ring mounted wave-spring Seals with bi-elastomeric stationaries, to suit "Top Lobe®" series lobe-rotor Pumps.

please note;

Vulcan offer other specific design Seals to suit S.P.X. Johnson Pumps, such as our Type 1649 to suit "Top Wing®" and our Type 1698 to suit "SQ®" series Pumps. Please contact us with your requirements and for stock availability on these.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Pump Model
30.00	0300	48.00	41.00	19.10	10.30	TL 1
35.00	0350	55.00	45.50	19.10	12.00	TL 2
50.00	0500	72.00	61.90	21.10	12.00	TL 3

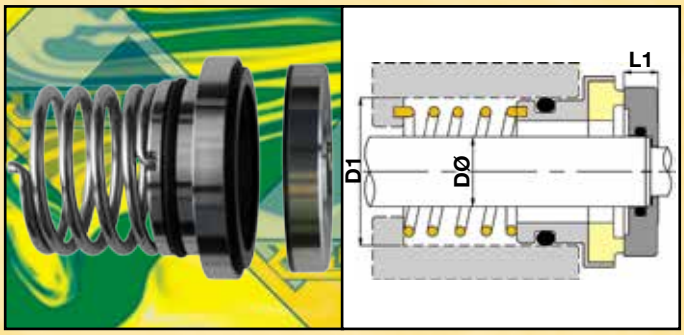
11 C

Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Seals to suit G.E.A.® Tuchenhagen® Pumps

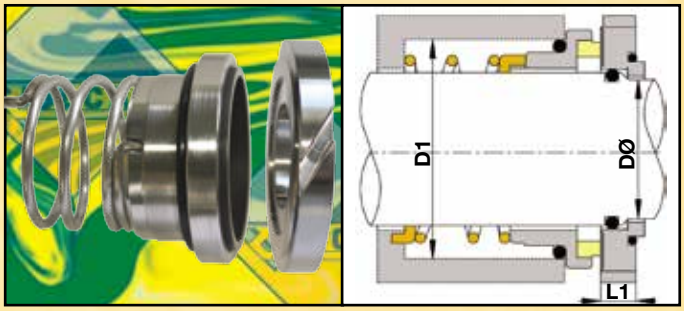
Type 94 Stationary Seals to suit ag, zg, ar and zr series Pumps E D 304



Vulcan manufacture and stock a range of single-spring stationary Seals, with Silicon Carbide faced counter-ring rotaries, and inserted Carbon sprung-stationaries to replace the chrome-oxide coated rotaries of the OEM Seals.

Shaft Size DØ	Size Code	D1 (mm)	L1 (mm)
16.00	0120	30.00	7.00
24.00	0180	50.00	11.00
25.00	0210	50.00	11.00
35.00	0280	50.00	11.00

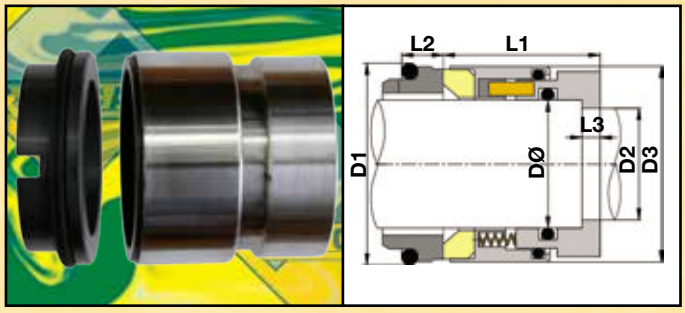
Type B94 Stationary Seals to suit VP series Pumps E P 304



Vulcan manufacture and stock a range of single-spring stationary Seals, with Stainless Steel counter-ring rotaries with outer turning-vane, and inserted Carbon sprung-stationaries.

Shaft Size DØ	Size Code	D1 (mm)	L1 (mm)
18.00	0210	40.00	10.00
22.00	0300	55.00	11.00
30.00	0350	55.00	11.00

Type 1661 Hygienic Seals to suit Variflow® KN Pumps E CS 316

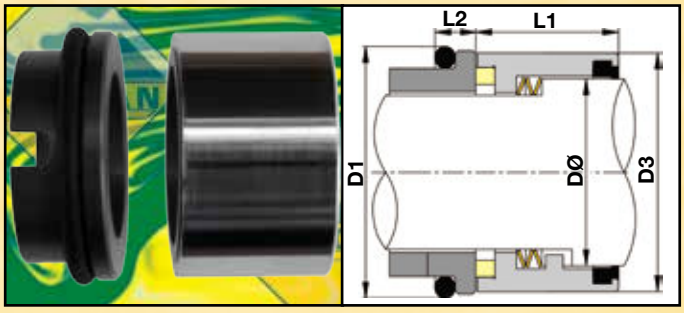


Vulcan manufacture and stock two sizes of hydraulically balanced, multi- spring hygienic Seals to suit Variflow® KN-series Pumps, directly replacing the original design.

Please contact us if you require the 50mm size or double Seals for Pumps with flushed Seal chambers.

Shaft Size DØ	Size Code	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	OEM Type Code
30.00	0300	45.00	21.50	44.50	32.50	7.00	4.00	KN 1
35.00	0350	50.00	28.00	49.30	40.50	7.00	4.00	KN 3

Type 1691 Hygienic Seals to suit Variflow® TP Pumps E DR R 316 FDA



Vulcan manufacture and stock two sizes of hydraulically balanced, multi- spring hygienic Seals to suit Variflow® TP-series Pumps.

The rotary head locates directly onto a specific area of the shaft, removing the need for an inner barrel. The rotary also has a distinctive very low Seal face protrusion profile.

Shaft Size DØ	Size Code	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	OEM Pump Model
30.00	0250	40.00	39.00	24.50	7.00	TP10, TP15, TP20, TP30
35.00	0300	45.00	44.00	25.50	7.00	TP16, TP25, TP50, TP80

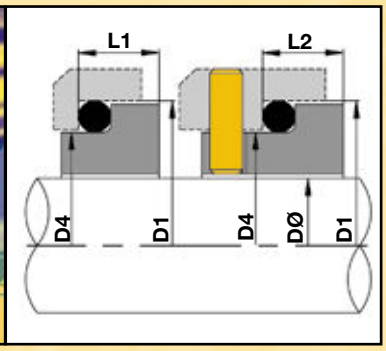
Advice on our Material Codes shown above and our standard coding system are on Pages 109 & 18 of this brochure. For ease, please refer to our OEM Price List where you will find a clear list, filterable by either the OEM's name or Vulcan Seal Type number, showing all common materials and stock codes, pricing and Stock Guarantee.

All Seals / sizes / materials detailed above are guaranteed ex-stock, unless asterisked. For any other sizes, or identification by Cross-Reference , please refer to the on-line OEM database, or contact us with your requirements.

Vulcan Stationary Seat Types, Clamp Rings And Cyclone Separators

Section 12

Type 8DIN Short/Long ‘O’-Ring Seats



Common ‘O’-Ring mounted stationaries to suit EURO-DIN housing sizes, designed to provide a wide range of compatibility with Vulcan rotary Seal Types.

Type 8DIN Long has an anti-rotation pin provision and is recommended particularly for larger shaft sizes and / or more viscous media. Type 8DIN Short is a standard short EURO-DIN seat with no pin slot.

Vulcan Standard Sizes

Metric Shaft Size DØ	Size Code	D1 (mm)	D4 (mm)	DINSL1 (mm)	DINL L2 (mm)	DINL Slot Width (mm)	DINL Slot Depth (mm)
10	0100	21.00	16.42	6.60	10.00	4.00	5.00
12	0120	23.00	18.42	6.60	10.00	4.00	5.00
14	0140	25.00	20.42	6.60	10.00	4.00	5.00
16	0160	27.00	22.42	6.60	10.00	4.00	5.00
18	0180	33.00	26.60	7.50	11.50	4.00	5.50
20	0200	35.00	28.60	7.50	11.50	4.00	5.50
22	0220	37.00	30.60	7.50	11.50	4.00	5.50
24	0240	39.00	32.60	7.50	11.50	4.00	5.50
25	0250	40.00	33.60	7.50	11.50	4.00	5.50
28	0280	43.00	36.60	7.50	11.50	4.00	5.50
30	0300	45.00	38.60	7.50	11.50	4.00	5.50
32	0320	48.00	41.60	7.50	11.50	4.00	5.50
33	0330	48.00	41.60	7.50	11.50	4.00	5.50
35	0350	50.00	43.80	7.50	11.50	4.00	5.50
38	0380	56.00	48.80	9.00	14.00	5.00	5.50
40	0400	58.00	50.80	9.00	14.00	5.00	5.50
43	0430	61.00	53.80	9.00	14.00	5.00	5.50
45	0450	63.00	55.80	9.00	14.00	5.00	5.50
48	0480	66.00	58.80	9.00	14.00	5.00	5.50
50	0500	70.00	61.25	9.50	15.00	5.00	5.50
53	0530	73.00	64.25	11.00	15.00	5.00	5.50
55	0550	75.00	66.25	11.00	15.00	5.00	5.50
58	0580	78.00	69.25	11.00	15.00	5.00	5.50
60	0600	80.00	71.25	11.00	15.00	5.00	5.50
63	0630	83.00	74.25	11.00	15.00	5.00	5.50
65	0650	85.00	76.25	11.00	15.00	5.00	5.50
68	0680	90.00	80.50	11.30	18.00	5.00	5.50
70	0700	92.00	82.60	11.30	18.00	5.00	5.50
75	0750	97.00	87.60	11.30	18.00	5.00	5.50
80	0800	105.00	94.70	12.00	18.20	5.00	5.50
85	0850	110.00	99.70	14.00	18.20	5.00	5.50
90	0900	115.00	104.70	14.00	18.20	5.00	5.50
95	0950	120.00	109.70	14.00	17.20	5.00	5.50
100	1000	125.00	114.70	14.00	17.20	5.00	5.50

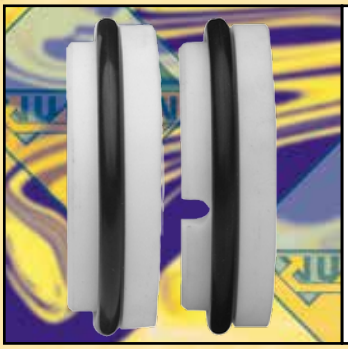
All sizes shown of Type 8 DINL and 8 DINS Stationaries are part of our Guaranteed Ex-stock Range, in 99% Ceramic and RB SiC Carbide; but Type 8 DINS is guaranteed up to and including 80 mm size only.

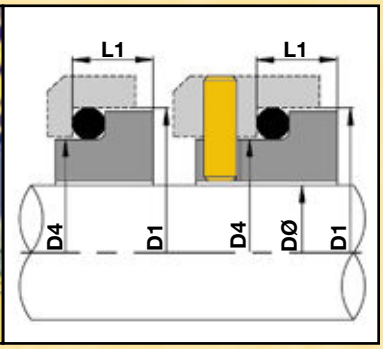
Carbon, SiNSiC Carbide and Tungsten Carbide Stationaries, along with larger sizes of Type 8 DINS over 80 mm, are stocked in most, but not all, sizes. All stocked Stationaries are available with either Nitrile, E.P. or Viton™ Elastomers.

For more information on guaranteed materials on these Types, please refer to Page 27

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 24 Short/Long ‘O’-Ring Seats





Common ‘O’-Ring mounted stationaries to suit DIN housing sizes, designed to provide a wide range of compatibility with Vulcan rotary Types.

Type 24DIN LONG has anti-rotation provision and is recommended particularly for larger shaft sizes and / or more viscous media. Type 24DIN SHORT is a standard short DIN seat with no pin slot.

Vulcan Standard Sizes

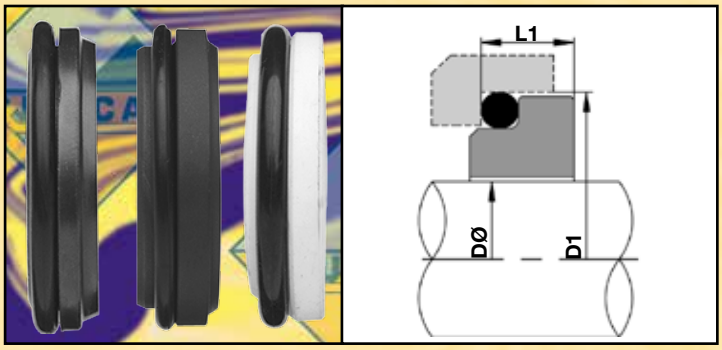
Metric Shaft Size DØ	Size Code	D1 (mm)	D4 (mm)	DINS / DINL L1 (mm)	DINL Slot Width (mm)	DINL Slot Depth (mm)
10	0100	21.00	16.42	8.60	4.00	5.00
12	0120	23.00	18.42	8.60	4.00	5.00
14	0140	25.00	20.42	8.60	4.00	5.00
16	0160	27.00	22.42	8.60	4.00	5.00
18	0180	33.00	26.60	10.00	4.00	5.50
20	0200	35.00	28.60	10.00	4.00	5.50
22	0220	37.00	30.60	10.00	4.00	5.50
24	0240	39.00	32.60	10.00	4.00	5.50
25	0250	40.00	33.60	10.00	4.00	5.50
28	0280	43.00	36.60	10.00	4.00	5.50
30	0300	45.00	38.60	10.00	4.00	5.50
32	0320	48.00	41.60	10.00	4.00	5.50
33	0330	48.00	41.60	10.00	4.00	5.50
35	0350	50.00	43.80	10.00	4.00	5.50
38	0380	56.00	48.80	11.00	5.00	5.50
40	0400	58.00	50.80	11.00	5.00	5.50
43	0430	61.00	53.80	11.00	5.00	5.50
45	0450	63.00	55.80	11.00	5.00	5.50
48	0480	66.00	58.80	11.00	5.00	5.50
50	0500	70.00	61.25	13.00	5.00	5.50
53	0530	73.00	64.25	13.00	5.00	5.50
55	0550	75.00	66.25	13.00	5.00	5.50
58	0580	78.00	69.25	13.00	5.00	5.50
60	0600	80.00	71.25	13.00	5.00	5.50
63	0630	83.00	74.25	13.00	5.00	5.50
65	0650	85.00	76.25	13.00	5.00	5.50
68	0680	90.00	80.50	15.30	5.00	5.50
70	0700	92.00	82.60	15.30	5.00	5.50
75	0750	97.00	87.60	15.30	5.00	5.50
80	0800	105.00	94.70	15.70	5.00	5.50
85	0850	110.00	99.70	15.70	5.00	5.50
90	0900	115.00	104.70	15.70	5.00	5.50
95	0950	120.00	109.70	15.70	5.00	5.50
100	1000	125.00	114.70	15.70	5.00	5.50

All sizes shown of Type 24 DINL and 24 DINS Stationaries are part of our Guaranteed Ex-Stock range, in 99% Ceramic and RB SiC; but Type 24 DINS Stationaries is guaranteed up to and including 80 mm size only. Tungsten Carbide Stationaries and larger sizes of Type 24 DINS, over 80 mm, are stocked in most, but not all, sizes.

All stocked Stationaries are available with either Nitrile, E.P. or Viton™ Elastomers.

For more information on guaranteed materials on these Types, please refer to Page 57

Standard ‘O’-Ring Mounted Seats



Common Vulcan ‘O’-Ring mounted designs without anti-rotation provision, to suit common European housing sizes including DIN.

These are industry standard Stationaries, commonly specified for Conical Spring Seals on general duties. However, consideration should be given to using long-style Stationaries, with anti-rotation provision, should the conditions necessitate.

Vulcan Standard Sizes

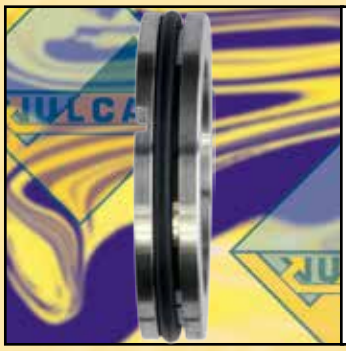
Metric Shaft Size DØ	Size Code	Type 8.STD (mm)		Type 8B (mm)		Type 12 (mm)		Type 12DIN (mm)		Type 13 (mm)		Type 13DIN (mm)	
		D1	L1	D1	L1	D1	L1	D1	L1	D1	L1	D1	L1
10	0100	19.20	6.60	19.20	7.10	18.10	5.50	21.00	7.00	18.10	5.50	21.00	7.00
11	0110	--	--	--	--	20.60	5.50	--	--	20.60	5.50	--	--
12	0120	21.60	5.60	21.60	7.60	20.60	5.50	23.00	7.00	20.60	5.50	23.00	7.00
13	0130	--	--	--	--	23.10	6.00	--	--	23.10	6.00	--	--
14	0140	24.60	5.60	24.60	7.60	23.10	6.00	25.00	7.00	23.10	6.00	25.00	7.00
15	0150	24.60	6.60	24.60	8.60	26.90	7.00	--	--	26.90	7.00	--	--
16	0160	28.00	7.50	28.00	9.00	26.90	7.00	27.00	7.00	26.90	7.00	27.00	7.00
17	0170	--	--	--	--	26.90	7.00	--	--	26.90	7.00	--	--
18	0180	30.00	8.00	30.00	10.00	30.90	8.00	33.00	10.00	30.90	8.00	33.00	10.00
19	0190	31.00	7.50	31.00	9.00	30.90	8.00	--	--	30.90	8.00	--	--
20	0200	35.00	7.50	35.00	9.50	30.90	8.00	35.00	10.00	30.90	8.00	35.00	10.00
21	0210	--	--	--	--	35.40	8.00	--	--	35.40	8.00	--	--
22	0220	35.00	7.50	35.00	9.50	35.40	8.00	37.00	10.00	35.40	8.00	37.00	10.00
23	0230	--	--	--	--	35.40	8.00	--	--	35.40	8.00	--	--
24	0240	38.00	7.50	38.00	9.50	35.40	8.00	39.00	10.00	35.40	8.00	39.00	10.00
25	0250	38.00	7.50	38.00	9.50	38.20	8.50	40.00	10.00	38.20	8.50	40.00	10.00
26	0260	40.00	8.00	40.00	10.00	38.20	8.50	--	--	--	--	--	--
28	0280	42.00	9.00	42.00	11.00	43.30	9.00	43.00	10.00	43.30	9.00	43.00	10.00
30	0300	45.00	10.50	45.00	11.00	43.30	9.00	45.00	10.00	43.30	9.00	45.00	10.00
32	0320	48.00	10.50	48.00	11.00	43.30	9.00	48.00	10.00	43.30	9.00	48.00	10.00
33	0330	50.00	11.00	--	--	53.50	11.50	48.00	10.00	53.50	9.00	48.00	10.00
35	0350	52.00	11.00	52.00	11.50	53.50	11.50	50.00	10.00	53.50	11.50	50.00	10.00
38	0380	55.00	10.30	55.00	11.50	60.50	11.50	56.00	13.00	60.50	11.50	56.00	13.00
40	0400	58.00	10.80	58.00	11.50	60.50	11.50	58.00	13.00	60.50	11.50	58.00	13.00
42	0420	62.00	12.00	62.00	14.30	60.50	11.50	--	--	--	--	--	--
43	0430	62.00	12.00	62.00	14.30	60.50	11.50	61.00	13.00	--	--	--	--
44	0440	--	--	--	--	65.50	11.50	--	--	--	--	--	--
45	0450	64.00	11.60	64.00	14.30	65.50	11.50	63.00	13.00	--	--	--	--
48	0480	68.40	11.60	68.40	14.30	65.50	11.50	66.00	13.00	--	--	--	--
50	0500	69.30	11.60	69.30	14.30	72.50	11.50	70.00	14.00	--	--	--	--
53	0530	--	--	--	--	--	--	73.00	14.00	--	--	--	--
55	0550	75.40	13.30	75.40	15.30	72.50	11.50	75.00	14.00	--	--	--	--
58	0580	78.40	13.30	78.40	15.30	--	--	78.00	14.00	--	--	--	--
60	0600	80.40	13.30	80.40	15.30	79.30	11.50	80.00	14.00	--	--	--	--
63	0630	--	--	--	--	--	--	83.00	14.00	--	--	--	--
65	0650	85.40	13.00	85.40	15.30	84.50	11.50	85.00	14.00	--	--	--	--
68	0680	91.50	13.70	91.50	16.00	--	--	90.00	16.00	--	--	--	--
70	0700	92.00	13.00	92.00	15.30	89.50	11.50	92.00	16.00	--	--	--	--
75	0750	99.00	14.00	99.00	15.30	94.50	11.50	97.00	16.00	--	--	--	--
80	0800	104.00	15.00	104.00	16.30	99.50	11.50	105.00	18.00	--	--	--	--
85	0850	109.00	14.80	--	--	105.50	13.50	110.00	18.00	--	--	--	--
90	0900	114.00	14.80	--	--	111.50	13.50	115.00	18.00	--	--	--	--
95	0950	120.30	15.80	--	--	116.50	13.50	120.00	18.00	--	--	--	--
100	1000	123.30	15.80	--	--	119.50	13.50	125.00	18.00	--	--	--	--

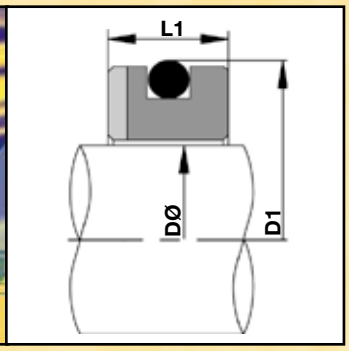
All sizes shown of Type 8 STD, 8B, 12, 12DIN,13 & 13DIN Stationaries are part of our Guaranteed Ex-Stock range, in RB SiC; but Type 8 STD Stationaries are guaranteed up to and including 80 mm size only. Tungsten Carbide Stationaries and larger sizes of Type 8 STD, over 80 mm, are stocked in most, but not all, sizes. All stocked Stationaries are available with either Nitrile, E.P. or Viton™ Elastomers.

For more information on guaranteed materials on these Types, please refer to P26 - P35

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, guaranteed stock policies and more advice on operating limits.

Type 21/31 NON-DIN 'O'-Ring Seats





'O'-Ring mounted, monolithic 'H'- configuration Stationaries, to suit common European housings (Type 21) or common American (Type 31) housing dimensions.

These Stationaries provide the benefits of both a short fitting length with a rear face pinhole and thus of being able to be pinned throughout the size range. This provides an optional anti-rotation feature within a seat of short operational length.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	Type 21				Type 31			
			D1		L1		D1		L1	
			In	mm	In	mm	In	mm	In	mm
0.375	10	0095	0.969	24.60	0.344	8.74	0.812	20.62	0.312	7.93
	12	0120	1.094	27.79	0.344	8.74	--	--	--	--
0.500		0127	1.094	27.79	0.344	8.74	1.000	25.40	0.312	7.93
0.625	16	0158	1.219	30.95	0.406	10.32	1.250	31.75	0.405	10.28
	18*	0180	1.344	34.15	0.406	10.32	--	--	--	--
0.750	19	0191	1.344	34.15	0.406	10.32	1.375	34.93	0.405	10.28
	20*	0200	1.406	35.70	0.406	10.32	--	--	--	--
0.875	22	0222	1.500	38.10	0.406	10.32	1.469	37.30	0.406	10.32
1.000	25	0254	1.594	40.50	0.406	10.32	1.625	41.28	0.437	11.10
	28	0280	1.875	47.63	0.472	11.99	--	--	--	--
1.125		0286	1.875	47.63	0.472	11.99	1.750	44.44	0.437	11.10
	30*	0300	2.000	50.80	0.472	11.99	--	--	--	--
1.250	32	0317	2.000	50.80	0.472	11.99	1.875	47.63	0.437	11.10
	33*	0330	2.125	53.98	0.472	11.99	--	--	--	--
1.375	35	0349	2.125	53.98	0.472	11.99	2.000	50.80	0.437	11.10
1.500	38	0381	2.250	57.15	0.472	11.99	2.125	53.98	0.437	11.10
	40*	0400	2.375	60.33	0.472	11.99	--	--	--	--
1.625		0412	2.375	60.33	0.472	11.99	2.375	60.33	0.500	12.70
	43*	0430	2.500	63.50	0.472	11.99	--	--	--	--
1.750	45	0444	2.500	63.50	0.472	11.99	2.500	63.50	0.500	12.70
1.875	48	0476	2.625	66.68	0.472	11.99	2.625	66.68	0.500	12.70
	50	0500	2.750	69.85	0.531	13.50	--	--	--	--
2.000		0508	2.750	69.85	0.531	13.50	2.750	69.85	0.500	12.70
	53	0530	2.875	73.03	0.531	13.50	--	--	--	--
2.125		0539	2.875	73.03	0.531	13.50	3.000	76.20	0.562	14.28
	55*	0550	3.000	76.20	0.531	13.50	--	--	--	--
2.250		0571	3.000	76.20	0.531	13.50	3.125	79.38	0.562	14.28
2.375	60	0603	3.125	79.38	0.531	13.50	3.250	82.55	0.562	14.28
2.500		0635	3.250	82.55	0.531	13.50	3.375	85.73	0.562	14.28
	65*	0650	3.625	92.08	0.625	15.88	--	--	--	--
2.625		0666	3.625	92.08	0.625	15.88	3.375	85.73	0.562	14.28
2.750	70	0698	3.750	95.25	0.625	15.88	3.500	88.90	0.625	15.88
2.875		0730	3.875	98.43	0.625	15.88	3.750	95.25	0.625	15.88
	75*	0750	4.000	101.60	0.625	15.88	--	--	--	--
3.000		0762	4.000	101.60	0.625	15.88	3.875	98.43	0.625	15.88
3.125*	80*	0794	4.375	111.13	0.783	19.88	4.000	101.60	0.783	19.88
3.250*		0825	4.500	114.30	0.783	19.88	4.125	104.78	0.783	19.88
3.375*	85*	0857	4.625	117.48	0.783	19.88	4.250	107.95	0.783	19.88
3.500*	90*	0889	4.750	120.65	0.783	19.88	4.375	111.13	0.783	19.88
3.625*		0921	4.875	123.83	0.783	19.88	4.500	114.30	0.783	19.88
3.750*	95*	0953	5.000	127.00	0.783	19.88	4.625	117.48	0.783	19.88
3.875*		0984	5.125	130.17	0.783	19.88	--	--	--	--
4.000*	100*	1016	5.250	133.35	0.783	19.88	4.875	123.83	0.783	19.88

All non-asterisked sizes shown of Type 21 Stationaries are part of our Guaranteed Ex-stock Range, in 99% Ceramic,

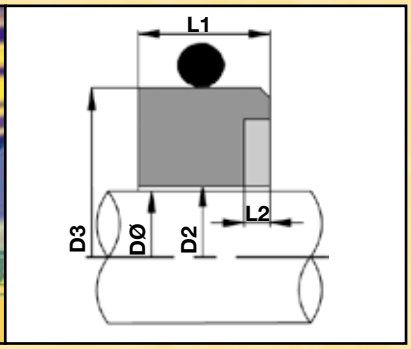
304 Stainless Steel and RB SiC. All non-asterisked sizes shown of Type 31 Stationaries are part of our Guaranteed Ex-stock Range in Ni-Resist and RB SiC. Ni-Resist and Tungsten Carbide Type 21 and 99% Ceramic, 304 Stainless Steel and Tungsten Carbide Type 31 are stocked in most, but not all, sizes.

All stocked Stationaries are available with either Nitrile, E.P. or Viton™ Elastomers.

For more information on guaranteed materials on these Types, please refer to Pages 52-54

Please refer to the Technical and Material Standards Section for advice and information on our full range of materials, Guaranteed stock policies and more advice on operating limits.

Type 32 PUSH-FIT “Block” Seats



Monolithic stationary ring, with an ‘O’-Ring installed in a radial groove outside of the stationary ring. This method of installation allows direct contact between the back of the stationary ring and the Pump housing.

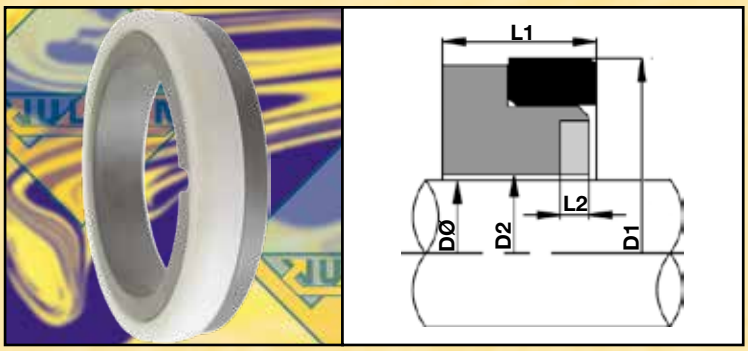
This design of stationary promotes efficient heat transfer, from the Seal faces and the seat ring, to the Pump body. Making this seat design ideal for higher temperature media duties. The anti-rotation provision is recommended on this Type 32.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Size Code	D2		D3		L1		L2		Slot P.C.D.		'O'-Ring Size
		In	mm	In	mm	In	mm	In	mm	In	mm	
0.500*	0127	0.543	13.80	0.996	25.30	0.311	7.90	0.098	2.50	0.780	19.80	BS214
0.625*	0158	0.669	16.98	1.246	31.65	0.406	10.30	0.098	2.50	0.953	24.20	BS218
0.750*	0191	0.793	20.15	1.371	34.82	0.406	10.30	0.098	2.50	1.093	27.75	BS220
0.875*	0222	0.919	23.33	1.496	38.00	0.406	10.30	0.098	2.50	1.220	31.00	BS222
1.000	0254	1.043	26.50	1.621	41.18	0.439	11.15	0.098	2.50	1.343	34.10	BS223
1.125	0286	1.184	30.08	1.746	44.35	0.439	11.15	0.098	2.50	1.469	37.30	BS224
1.250	0317	1.309	33.25	1.871	47.53	0.439	11.15	0.098	2.50	1.594	40.50	BS225
1.375	0349	1.434	36.43	1.996	50.70	0.439	11.15	0.098	2.50	1.717	43.60	BS226
1.500	0381	1.559	39.60	2.121	53.88	0.439	11.15	0.098	2.50	1.843	46.80	BS227
1.625	0412	1.684	42.78	2.371	60.23	0.502	12.75	0.118	3.00	2.031	51.60	BS229
1.750	0444	1.809	45.95	2.496	63.40	0.502	12.75	0.118	3.00	2.157	54.80	BS230
1.875	0476	1.934	49.13	2.621	66.58	0.502	12.75	0.118	3.00	2.280	57.90	BS231
2.000	0508	2.059	52.30	2.746	69.75	0.502	12.75	0.118	3.00	2.406	61.10	BS232
2.125	0539	2.184	55.48	2.996	76.10	0.564	14.33	0.138	3.50	2.594	65.90	BS234
2.250	0571	2.309	58.65	3.121	79.28	0.564	14.33	0.138	3.50	2.717	69.00	BS235
2.375	0603	2.434	61.83	3.246	82.45	0.564	14.33	0.138	3.50	2.843	72.20	BS236
2.500	0635	2.559	65.00	3.371	85.63	0.564	14.33	0.138	3.50	2.969	75.40	BS237
2.625	0666	2.684	68.18	3.371	85.63	0.627	15.93	0.138	3.50	3.031	77.00	BS237
2.750	0698	2.809	71.35	3.496	88.80	0.627	15.93	0.138	3.50	3.157	80.20	BS238
2.875	0730	2.934	74.53	3.746	95.15	0.627	15.93	0.138	3.50	3.343	84.90	BS240
3.000	0762	3.059	77.70	3.871	98.33	0.627	15.93	0.138	3.50	3.469	88.10	BS241
3.125*	0794	3.225	81.92	3.996	101.50	0.781	19.84	0.138	3.50	3.594	91.30	BS242
3.250*	0825	3.350	85.10	4.121	104.68	0.781	19.84	0.138	3.50	3.717	94.40	BS243
3.375*	0857	3.475	88.27	4.246	107.85	0.781	19.84	0.138	3.50	3.843	97.60	BS244
3.500*	0889	3.600	91.44	4.371	111.03	0.781	19.84	0.138	3.50	3.969	100.80	BS245
3.625*	0921	3.725	94.62	4.496	114.20	0.781	19.84	0.138	3.50	4.094	104.00	BS246
3.750*	0953	3.850	97.79	4.621	117.38	0.781	19.84	0.138	3.50	4.217	107.10	BS247
3.875*	0984	3.975	100.97	4.746	120.55	0.781	19.84	0.138	3.50	4.343	110.30	BS248
4.000*	1016	4.100	104.14	4.871	123.73	0.781	19.84	0.138	3.50	4.469	113.50	BS249

All non-asterisked sizes shown of Type 32 Stationaries are part of our Guaranteed Ex-stock Range in SiNSiC.
Ni-Resist and Tungsten Carbide and RB SiC Type 32 are stocked in some, but not all, sizes.
All stocked Stationaries are available with either Nitrile, E.P. or Viton™ Elastomers.

Type 23 PTFE Boot Mounted Seats



'L'-Shaped PTFE Boot-mounted stationary, to suit common American housing sizes. Due to the low-friction nature of PTFE, this stationary seat has necessarily been designed with an anti-rotation provision, and it is recommended to ensure this is utilised.

Widely utilised in chemical process equipment, due to the exceptional chemical resistance that can be provided.

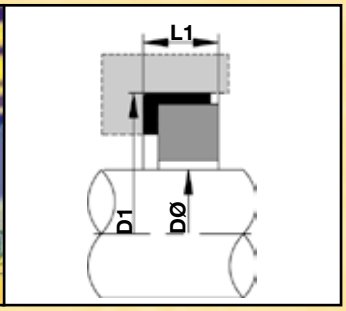
Vulcan Standard Sizes

Imperial Shaft Size DØ	Size Code	D1		D2		L1		PIN P.C.D.		PIN Ø	
		In	mm	In	mm	In	mm	In	mm	In	mm
0.750	0191	1.375	34.93	0.792	20.12	0.405	10.28	0.937	23.81	0.079	2.00
0.875	0222	1.500	38.10	0.919	23.33	0.405	10.28	1.063	26.99	0.079	2.00
1.000	0254	1.625	41.28	1.043	26.50	0.437	11.10	1.187	30.15	0.079	2.00
1.125	0286	1.750	44.44	1.184	30.08	0.437	11.10	1.313	33.35	0.079	2.00
1.250	0317	1.875	47.63	1.309	33.25	0.437	11.10	1.437	36.50	0.079	2.00
1.375	0349	2.000	50.80	1.434	36.43	0.437	11.10	1.563	39.70	0.079	2.00
1.500	0381	2.125	53.98	1.559	39.60	0.437	11.10	1.687	42.85	0.079	2.00
1.625	0412	2.375	60.33	1.684	42.78	0.500	12.70	1.875	47.63	0.118	3.00
1.750	0444	2.500	63.50	1.809	45.95	0.500	12.70	2.000	50.80	0.118	3.00
1.875	0476	2.625	66.68	1.934	49.13	0.500	12.70	2.125	53.98	0.118	3.00
2.000	0508	2.750	69.85	2.059	52.30	0.500	12.70	2.250	57.15	0.118	3.00
2.125	0539	3.000	76.20	2.184	55.48	0.562	14.28	2.375	60.33	0.118	3.00
2.250	0571	3.125	79.38	2.309	58.65	0.562	14.28	2.500	63.50	0.118	3.00
2.375	0603	3.250	82.55	2.438	61.93	0.562	14.28	2.625	66.68	0.118	3.00
2.500	0635	3.375	85.73	2.559	65.00	0.562	14.28	2.750	69.85	0.118	3.00
2.625	0666	3.375	85.73	2.684	68.18	0.625	15.88	2.875	73.03	0.118	3.00
2.750	0698	3.500	88.90	2.809	71.35	0.625	15.88	3.000	76.20	0.118	3.00
2.875*	0730	3.750	95.25	2.934	74.53	0.625	15.88	3.125	79.38	0.118	3.00
3.000*	0762	3.875	98.43	3.059	77.70	0.625	15.88	3.250	82.55	0.118	3.00

All non-asterisked sizes shown of Type 23 Stationaries are part of our Guaranteed Ex-stock Range, in 99% Ceramic and RB SiC. Ni-Resist and Tungsten Carbide Type 23 are stocked in most, but not all, sizes.

All stocked Stationaries are supplied with PTFE Gaskets.

DIN/NON-DIN Boot Mounted Seats



Common Vulcan Boot-mounted stationary designs, to fit and suit a variety of international housing and working length standards.

Boot-mounted stationaries offer optimum cost and performance benefits. The ribbed profile and increased elastomer contact area with the housing is often preferred.

Please specify the actual shaft size code required when ordering, as a seat separate to the Seal, as each size has a unique I.D.

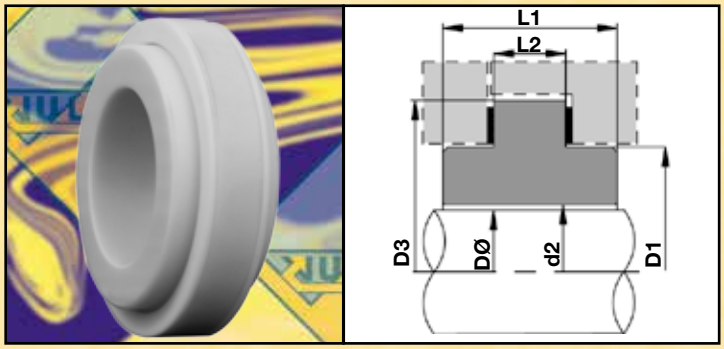
Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	Type 11				Type 20				Type 19B		Type 24	
			D1		L1		D1		L1		D1	L1	D1	L1
			In	mm	In	mm	In	mm	In	mm	(mm)	(mm)	(mm)	(mm)
0.375		0095	0.875	22.23	0.312	7.93	0.969	24.60	0.344	8.74	--	--	--	--
	10	0100	0.875	22.23	0.312	7.93	0.969	24.60	0.344	8.74	21.00	6.60	21.00	8.60
	12	0120	1.000	25.40	0.312	7.93	1.094	27.79	0.344	8.74	23.00	6.60	23.00	8.60
0.500		0127	1.000	25.40	0.312	7.93	1.094	27.79	0.344	8.74	--	--	--	--
	13	0130	1.000	25.40	0.312	7.93	1.094	27.79	0.344	8.74	--	--	--	--
	14	0140	1.250	31.75	0.405	10.28	1.219	30.95	0.406	10.32	25.00	6.60	25.00	8.60
	15	0150	--	--	--	--	1.219	30.95	0.406	10.32	27.00	6.60	27.00	8.60
0.625		0158	1.250	31.75	0.405	10.28	1.219	30.95	0.406	10.32	--	--	--	--
	16	0160	1.250	31.75	0.405	10.28	1.219	30.95	0.406	10.32	27.00	6.60	27.00	8.60
	18	0180	1.375	34.93	0.405	10.28	1.344	34.15	0.406	10.32	33.00	7.50	33.00	10.00
0.750		0191	1.375	34.93	0.405	10.28	1.344	34.15	0.406	10.32	--	--	--	--
	20	0200	1.500	38.10	0.405	10.28	1.406	35.70	0.406	10.32	35.00	7.50	35.00	10.00
	22	0220	1.500	38.10	0.405	10.28	1.469	37.30	0.406	10.32	37.00	7.50	37.00	10.00
0.875		0222	1.500	38.10	0.405	10.28	1.469	37.30	0.406	10.32	--	--	--	--
	24	0240	1.625	41.28	0.437	11.10	1.594	40.50	0.406	10.32	39.00	7.50	39.00	10.00
	25	0250	1.625	41.28	0.437	11.10	1.594	40.50	0.406	10.32	40.00	7.50	40.00	10.00
1.000		0254	1.625	41.28	0.437	11.10	1.594	40.50	0.406	10.32	--	--	--	--
	28	0280	1.750	44.44	0.437	11.10	1.875	47.63	0.472	11.99	43.00	7.50	43.00	10.00
1.125		0286	1.750	44.44	0.437	11.10	1.875	47.63	0.472	11.99	--	--	--	--
	30	0300	1.875	47.63	0.437	11.10	2.000	50.80	0.472	11.99	45.00	7.50	45.00	10.00
1.250		0317	1.875	47.63	0.437	11.10	2.000	50.80	0.472	11.99	--	--	--	--
	32	0320	1.875	47.63	0.437	11.10	2.000	50.80	0.472	11.99	48.00	7.50	48.00	10.00
	33	0330	2.000	50.80	0.437	11.10	2.125	53.98	0.472	11.99	48.00	7.50	48.00	10.00
1.375	35	0350	2.000	50.80	0.437	11.10	2.125	53.98	0.472	11.99	50.00	7.50	50.00	10.00
1.500	38	0380	2.125	53.98	0.437	11.10	2.250	57.15	0.472	11.99	56.00	9.00	56.00	11.00
	40	0400	2.375	60.33	0.500	12.70	2.375	60.33	0.472	11.99	58.00	9.00	58.00	11.00
1.625		0412	2.375	60.33	0.500	12.70	2.375	60.33	0.472	11.99	--	--	--	--
	43	0430	2.500	63.50	0.500	12.70	2.500	63.50	0.472	11.99	61.00	9.00	61.00	11.00
1.750		0444	2.500	63.50	0.500	12.70	2.500	63.50	0.472	11.99	--	--	--	--
	45	0450	2.625	66.68	0.500	12.70	2.500	63.50	0.472	11.99	63.00	9.00	63.00	11.00
1.875		0476	2.625	66.68	0.500	12.70	2.625	66.68	0.472	11.99	--	--	--	--
	48	0480	2.750	69.85	0.500	12.70	2.625	66.68	0.472	11.99	66.00	9.00	66.00	11.00
	50	0500	2.750	69.85	0.500	12.70	2.750	69.85	0.531	13.50	70.00	9.50	70.00	13.00
2.000		0508	2.750	69.85	0.500	12.70	2.750	69.85	0.531	13.50	--	--	--	--
	53	0530	3.000	76.20	0.562	14.28	3.000	76.20	0.531	13.50	73.00	11.00	73.00	13.00
2.125		0539	3.000	76.20	0.562	14.28	2.875	73.03	0.531	13.50	--	--	--	--
	55	0550	3.125	79.38	0.562	14.28	3.000	76.20	0.531	13.50	75.00	11.00	75.00	13.00
2.250		0571	3.125	79.38	0.562	14.28	3.000	76.20	0.531	13.50	--	--	--	--
	58	0580	3.250	82.55	0.562	14.28	3.125	79.38	0.531	13.50	78.00	11.00	78.00	13.00
	60	0600	3.250	82.55	0.562	14.28	3.125	79.38	0.531	13.50	80.00	11.00	80.00	13.00
2.375		0603	3.250	82.55	0.562	14.28	3.125	79.38	0.531	13.50	--	--	--	--
	63	0630	3.375	85.73	0.562	14.28	3.250	82.55	0.531	13.50	--	--	83.00	13.00
2.500		0635	3.375	85.73	0.562	14.28	3.250	82.55	0.531	13.50	--	--	--	--
	65	0650	3.375	85.73	0.625	15.88	3.625	92.08	0.625	15.88	85.00	11.00	85.00	13.00
2.625		0666	3.375	85.73	0.625	15.88	3.625	92.08	0.625	15.88	--	--	--	--
2.750		0698	3.500	88.90	0.625	15.88	3.750	95.25	0.625	15.88	--	--	--	--
	70	0700	3.500	88.90	0.625	15.88	3.750	95.25	0.625	15.88	92.00	11.30	92.00	15.30
2.875		0730	3.750	95.25	0.625	15.88	3.875	98.43	0.625	15.88	--	--	--	--
	75	0750	3.875	98.43	0.625	15.88	4.000	101.60	0.625	15.88	97.00	11.30	97.00	15.30
3.000		0762	3.875	98.43	0.625	15.88	4.000	101.60	0.625	15.88	--	--	--	--
3.125		0794	4.000	101.60	0.783	19.88	4.375	111.13	0.783	19.88	--	--	--	--
	80	0800	--	--	--	--	4.500	114.30	0.783	19.88	105.00	12.00	105.00	15.70
3.250		0825	4.125	104.78	0.783	19.88	4.500	114.30	0.783	19.88	--	--	--	--
	85	0850	--	--	--	--	4.625	117.48	0.783	19.88	110.00	14.00	110.00	15.70
3.375		0857	4.250	107.95	0.783	19.88	4.625	117.48	0.783	19.88	--	--	--	--
3.500		0889	4.375	111.13	0.783	19.88	4.750	120.65	0.783	19.88	--	--	--	--
	90	0900	--	--	--	--	4.875	123.83	0.783	19.88	115.00	14.00	115.00	15.70
3.625		0921	4.500	114.30	0.783	19.88	4.875	123.83	0.783	19.88	--	--	--	--
	95	0950	--	--	--	--	5.000	127.00	0.783	19.88	120.00	14.00	120.00	15.70
3.750		0953	4.625	117.48	0.783	19.88	5.000	127.00	0.783	19.88	--	--	--	--
3.875		0984	4.750	120.65	0.783	19.88	5.125	130.17	0.783	19.88	--	--	--	--
	100	1000	--	--	--	--	5.250	133.35	0.783	19.88	125.00	14.00	125.00	15.70
4.000		1016	4.875	123.83	0.783	19.88	5.250	133.35	0.783	19.88	--	--	--	--

All sizes shown of Type 20, 19B, 11 and 24 Stationaries are part of our Guaranteed Ex-Stock range, in 99% Ceramic and RB SiC; But Type 11 Stationaries are guaranteed up to and including 3.000 / 75 mm size only. Tungsten Carbide Stationaries are stocked in some, but not all, sizes. All stocked Stationaries are available with either Nitrile, E.P. or Viton™ Elastomers.

For more information on guaranteed materials on these Types, please refer to P45 - P56

Type 25 Gasket Clamped “V” Seats



The Type 25 stationary is an industry standard design with a “T”-shaped profile. Supplied complete with two PTFE flat gaskets, for clamping as illustrated.

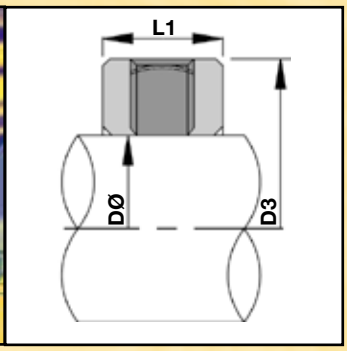
The Type 25 is designed for medias that are aggressive towards elastomers, and is widely utilised with Type 1609/1645/1659 series multi- spring rotaries. For shaft sizes up-to 1.000”/25mm; please add 1.60mm to dimension L2 for the gaskets width, similarly add 3.20mm for shaft sizes 1.125”/28.00mm and above.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D1		D2		D3		L1		L2	
			In	mm	In	mm	In	mm	In	mm	In	mm
0.500	12	0127	1.144	29.05	0.539	13.70	1.563	39.70	0.685	17.40	0.311	7.90
	15*	0150	1.256	31.90	0.630	16.00	1.614	41.00	0.685	17.40	0.311	7.90
0.625	16	0158	1.301	33.04	0.661	16.80	1.720	43.69	0.685	17.40	0.311	7.90
0.750	19	0191	1.426	36.21	0.787	20.00	1.831	46.50	0.685	17.40	0.311	7.90
	20	0200	1.453	36.90	0.827	21.00	1.850	47.00	0.685	17.40	0.311	7.90
0.875	22	0222	1.551	39.39	0.913	23.20	1.949	49.50	0.685	17.40	0.311	7.90
	25	0250	1.650	41.90	1.024	26.00	2.047	52.00	0.685	17.40	0.311	7.90
1.000		0254	1.676	42.56	1.039	26.40	2.067	52.50	0.685	17.40	0.311	7.90
1.125	28	0286	1.801	45.74	1.165	29.60	2.303	58.50	1.059	26.90	0.437	11.10
	30	0300	1.917	48.69	1.220	31.00	2.313	58.75	1.059	26.90	0.437	11.10
1.250		0317	1.988	50.50	1.287	32.70	2.500	63.50	1.059	26.90	0.437	11.10
	33*	0330	2.059	52.30	1.339	34.00	2.559	65.00	1.059	26.90	0.437	11.10
1.375	35	0349	2.113	53.68	1.417	36.00	2.579	65.50	1.059	26.90	0.437	11.10
1.500	38	0381	2.238	56.85	1.539	39.10	2.736	69.50	1.059	26.90	0.437	11.10
	40	0400	2.437	61.90	1.614	41.00	2.953	75.00	1.059	26.90	0.437	11.10
1.625		0412	2.488	63.20	1.661	42.20	3.012	76.50	1.059	26.90	0.437	11.10
1.750		0444	2.613	66.38	1.787	45.40	3.130	79.50	1.059	26.90	0.437	11.10
	45	0450	2.634	66.90	1.811	46.00	3.150	80.00	1.059	26.90	0.437	11.10
1.875	48	0476	2.738	69.55	1.929	49.00	3.248	82.50	1.059	26.90	0.437	11.10
	50	0500	2.831	71.90	2.008	51.00	3.346	85.00	1.059	26.90	0.437	11.10
2.000		0508	2.863	72.73	2.039	51.80	3.366	85.50	1.059	26.90	0.437	11.10
2.125		0539	3.113	79.08	2.161	54.90	3.760	95.50	1.312	33.33	0.563	14.30
	55*	0550	3.146	79.90	2.205	56.00	3.780	96.00	1.312	33.33	0.563	14.30
2.250		0571	3.238	82.25	2.287	58.10	3.878	98.50	1.312	33.33	0.563	14.30
	60	0600	3.343	84.90	2.402	61.00	3.976	101.00	1.312	33.33	0.563	14.30
2.375		0603	3.363	85.43	2.413	61.30	3.996	101.50	1.312	33.33	0.563	14.30
2.500		0635	3.488	88.60	2.539	64.50	4.114	104.50	1.312	33.33	0.563	14.30
	65*	0650	3.539	89.90	2.598	66.00	4.173	106.00	1.312	33.33	0.563	14.30
2.625		0666	3.613	91.78	2.661	67.60	4.272	108.50	1.312	33.33	0.563	14.30
2.750	70	0698	3.736	94.90	2.795	71.00	4.370	111.00	1.312	33.33	0.563	14.30
2.875		0730	3.863	98.13	2.913	74.00	4.508	114.50	1.312	33.33	0.563	14.30
	75*	0750	3.933	99.90	2.992	76.00	4.567	116.00	1.312	33.33	0.563	14.30
3.000		0762	3.926	99.71	3.039	77.20	4.547	115.50	1.312	33.33	0.563	14.30
3.125*		0794	4.051	102.89	3.165	80.40	4.705	119.50	1.312	33.33	0.563	14.30
	80*	0800	4.130	104.90	3.189	81.00	4.764	121.00	1.312	33.33	0.563	14.30
3.250*		0825	4.232	107.50	3.295	83.70	4.862	123.50	1.350	34.30	0.563	14.30
	85*	0850	4.327	109.90	3.386	86.00	4.961	126.00	1.350	34.30	0.563	14.30
3.375*		0857	4.364	110.85	3.421	86.90	5.020	127.50	1.350	34.30	0.563	14.30
3.500*		0889	4.488	114.00	3.539	89.90	5.138	130.50	1.350	34.30	0.563	14.30
	90*	0900	4.508	114.50	3.583	91.00	5.138	130.50	1.350	34.30	0.563	14.30
3.625*		0921	4.610	117.10	3.673	93.30	5.256	133.50	1.350	34.30	0.563	14.30
	95*	0950	4.720	119.90	3.780	96.00	5.354	136.00	1.350	34.30	0.563	14.30
3.750*		0953	4.738	120.35	3.791	96.30	5.374	136.50	1.350	34.30	0.563	14.30
	100*	1000	4.917	124.90	3.976	101.00	5.551	141.00	1.350	34.30	0.563	14.30
4.000*		1016	4.988	126.70	4.039	102.60	5.610	142.50	1.350	34.30	0.563	14.30
4.250*		1079	5.238	133.05	4.291	109.00	5.886	149.50	1.350	34.30	0.563	14.30
4.500*		1143	5.488	139.40	4.539	115.30	6.122	155.50	1.350	34.30	0.563	14.30
5.000*		1270	6.488	164.80	5.039	128.00	7.382	187.50	1.417	36.00	0.630	16.00
5.500*		1397	6.988	177.50	5.539	140.70	7.894	200.50	1.417	36.00	0.630	16.00

All non-asterisked sizes shown of Type 25 Stationaries are part of our Guaranteed Ex-stock Range, in 99% Ceramic and RB SiC. Ni-Resist and Tungsten Carbide Type 25 are stocked in some, but not all, sizes.
All stocked Stationaries are available with PTFE gaskets.

Clamp Ring Locking Collars



Stainless steel, grub-screwed, locking collars, utilised primarily for setting the working length to suit or fit the Seal preferred.

Available in all common imperial and metric shaft sizes. A comprehensive range is offered from stock and any size can be manufactured.

All shaft sizes of Vulcan Type SPEC.CLAM are fitted with grub screws evenly separated apart as shown below, for secure fitting.

Vulcan Standard Sizes

Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D3		L1		No of Grub Screws	Imperial Shaft Size DØ	Metric Shaft Size DØ	Size Code	D3		L1		No of Grub Screws
			In	mm	In	mm					In	mm	In	mm	
0.375		0095	0.748	19.00	0.295	7.50	3 x 120°		48	0480	2.480	63.00	0.394	10.00	3 x 120°
	10	0100	0.748	19.00	0.295	7.50	3 x 120°		50	0500	2.559	65.00	0.394	10.00	3 x 120°
	12	0120	0.827	21.00	0.295	7.50	3 x 120°	2.000		0508	2.559	65.00	0.394	10.00	3 x 120°
0.500		0127	0.827	21.00	0.295	7.50	3 x 120°		53	0530	2.677	68.00	0.394	10.00	3 x 120°
	14	0140	0.906	23.00	0.295	7.50	3 x 120°	2.125		0539	2.677	68.00	0.394	10.00	3 x 120°
	15	0150	0.945	24.00	0.295	7.50	3 x 120°		55	0550	2.756	70.00	0.394	10.00	3 x 120°
0.625		0158	0.984	25.00	0.295	7.50	3 x 120°	2.250		0571	2.756	70.00	0.394	10.00	3 x 120°
	16	0160	0.984	25.00	0.295	7.50	3 x 120°		58	0580	3.031	77.00	0.394	10.00	3 x 120°
	18	0180	1.220	31.00	0.295	7.50	3 x 120°		60	0600	3.11	79.00	0.394	10.00	3 x 120°
0.750		0191	1.220	31.00	0.295	7.50	3 x 120°	2.375		0603	3.11	79.00	0.394	10.00	6 X 60°
	20	0200	1.299	33.00	0.295	7.50	3 x 120°	2.500		0635	3.228	82.00	0.394	10.00	6 X 60°
	22	0220	1.378	35.00	0.295	7.50	3 x 120°		65	0650	3.307	84.00	0.472	12.00	6 X 60°
0.875		0222	1.378	35.00	0.295	7.50	3 x 120°	2.625		0666	3.307	84.00	0.472	12.00	6 X 60°
	24	0240	1.457	37.00	0.295	7.50	3 x 120°		68	0680	3.425	87.00	0.472	12.00	6 X 60°
	25	0250	1.496	38.00	0.349	10.00	3 x 120°	2.750		0698	3.504	89.00	0.472	12.00	6 X 60°
1.000		0254	1.496	38.00	0.349	10.00	3 x 120°		70	0700	3.504	89.00	0.472	12.00	6 X 60°
	28	0280	1.614	41.00	0.349	10.00	3 x 120°	2.875		0730	3.740	95.00	0.472	12.00	6 X 60°
1.125		0286	1.614	41.00	0.349	10.00	3 x 120°		75	0750	3.858	98.00	0.472	12.00	6 X 60°
	30	0300	1.693	43.00	0.349	10.00	3 x 120°	3.000		0762	3.858	98.00	0.472	12.00	6 X 60°
1.250		0317	1.772	45.00	0.349	10.00	3 x 120°	3.125		0794	4.055	103.00	0.472	12.00	6 X 60°
	32	0320	1.772	45.00	0.394	10.00	3 x 120°		80	0800	4.055	103.00	0.472	12.00	6 X 60°
	33	0330	1.811	46.00	0.394	10.00	3 x 120°	3.250		0825	4.055	103.00	0.472	12.00	6 X 60°
1.375		0349	1.890	48.00	0.394	10.00	3 x 120°		85	0850	4.252	108.00	0.472	12.00	6 X 60°
	35	0350	1.890	48.00	0.394	10.00	3 x 120°	3.375		0857	4.252	108.00	0.472	12.00	6 X 60°
	38	0380	2.087	53.00	0.394	10.00	3 x 120°	3.500		0889	4.449	113.00	0.472	12.00	6 X 60°
1.500		0381	2.087	53.00	0.394	10.00	3 x 120°		90	0900	4.449	113.00	0.472	12.00	6 X 60°
	40	0400	2.165	55.00	0.394	10.00	3 x 120°	3.625*		0921	4.449	113.00	0.472	12.00	6 X 60°
1.625		0412	2.165	55.00	0.394	10.00	3 x 120°		95*	0950	4.646	118.00	0.472	12.00	6 X 60°
	43	0430	2.283	58.00	0.394	10.00	3 x 120°	3.750*		0953	4.646	118.00	0.472	12.00	6 X 60°
1.750		0444	2.362	60.00	0.394	10.00	3 x 120°	3.875*		0984	4.764	121.00	0.472	12.00	6 X 60°
	45	0450	2.362	60.00	0.394	10.00	3 x 120°		100*	1000	4.843	123.00	0.472	12.00	6 X 60°
1.875		0476	2.480	63.00	0.394	10.00	3 x 120°	4.000*		1016	4.843	123.00	0.590	15.00	8 X 40°

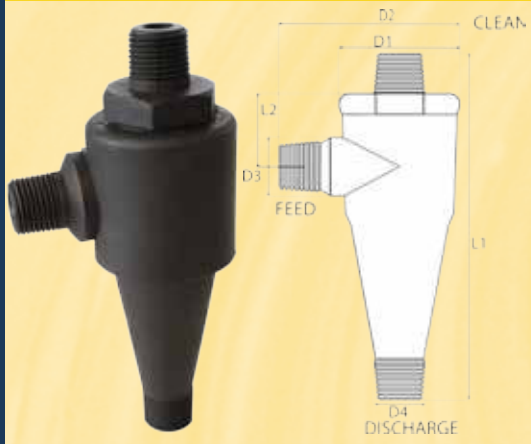
All non-asterisked sizes shown of Vulcan clamp ring locking collars are part of our Guaranteed Ex-stock Range.
All Vulcan clamp ring locking collars are produced in 304 Stainless Steel.

Vulcan Cyclone Separators

Vulcan stock advanced design Cyclone Separators to provide a simple and effective method of preventing the majority of abrasive particles from entering the Seal chamber of your Pumps. This results in a cleaner environment for the Seal faces and therefore increases Seal face life and commonly extends the periods between necessary maintenance.

The Separators are usually connected to the Seal chamber flush line, receiving fluid from the discharge side of the Pump, removing the solids and providing clean flow through to the Seal chamber, while returning any solids back to the suction side. Once installed, the cyclone is self-cleaning, with no moving parts nor running costs and is virtually maintenance free. The Vulcan Range of Separators covers two styles, free-standing and flange mount. Available in cast Nylon and 316SS as standard, to provide a high-quality, reliable Separator.

Free Standing Cyclone Separator: Type VCYCM - 050



D1		D2		D3		D4		L1		L2	
In	mm	In	mm	In	mm	In	mm	In	mm	In	mm
2.125	53.98	3.125	79.38	1.313	33.34	0.813	20.65	6.281	159.54	2.313	58.74

CONNECTIONS ARE 0.500” - 14 NPT (3off)

Notes:

1. Maximum Pressure is 650psi (44bar) at Ambient temperature
2. Temperature Range: -18’C to +115’C (0’F to 240’F).
3. Black Nylon Construction.

Flange Mounted Cyclone Separator: Type VCYC - 060

D1		D2		D3		D4		L1		L2	
In	mm	In	mm	In	mm	In	mm	In	mm	In	mm
1.562	39.67	2.656	67.47	1.500	38.10	1.500	38.10	6.500	165.10	1.188	30.16

Two off fixing holes 0.438” (11.11mm) diameter, 1.750” (44.45mm) centre-to-centre.

CONNECTIONS ARE 0.500” - 14 NPT (3off)

Notes:

1. Maximum pressure is 250 psi (17bar) at ambient temperature.
2. Temperature Range: -30’C to +150’C (-20’F to 300’F)
3. Stainless Steel Construction.

Free Standing Cyclone Separator: Type VCYC - 070

D1		D2		D3		D4		L1		L2	
In	mm	In	mm	In	mm	In	mm	In	mm	In	mm
1.515	38.50	2.250	57.15	1.250	31.75	1.500	38.10	5.500	139.70	1.500	38.10

CONNECTIONS ARE 0.500” - 14 NPT (3off)

Notes:

1. Maximum pressure is 600 psi (40bar) at ambient temperature.
2. Temperature Range: -30’C to +150’C (-20’F to 300’F)
3. Stainless Steel Construction.

Required Operating Conditions

A minimum pressure differential across suction and discharge is necessary for the separators to perform adequately. This differential should be at least 20 psi. In-line actual pressures up to 600psi can be accommodated. Cyclone Separators work on centrifugal forces and the specific gravity of the particles must be greater than that of the fluid being pumped for separation to occur. Therefore, these Separators only work with suspended solids and will not separate out such as dissolved salts from a pumped fluid. Solids content of the pumped fluid should not exceed 10%, higher levels are likely to result in clogging of the separator internals.

Otto Olsen er et markedsledende handels- og produksjonsfirma som leverer tekniske produkter og komplekse løsninger til industri og handel, hovedsakelig i Norge, men også i utlandet.

Trondheimsveien 183,
2020 Skedsmokorset
(+47) 63 89 08 00
post@oo.no

www.oo.no

OTTO OLSEN