

in the **groove**

The world of seals and service



Oil & Gas

Getting into deep water

Busak+Shamban is a strategic sealing partner with Bluewater



Chemical & Processing

Innovative sealing for innovative equipment

Busak+Shamban provides a multitude of seals for High Performance Liquid Chromatography (HPLC) applications

Semicon

Single technology, single world

Extending our service from one region to another

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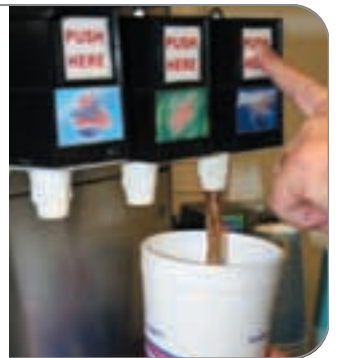
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Editorial

Welcome to our third edition of 'in the groove' focusing on sealing solutions in the Oil & Gas market.

Global demand from emerging countries such as China, India and Asia Pacific in general, means Oil and Gas will remain in high demand for the foreseeable future. That, and a strong oil price, are increasing the development of new fields. In turn this is driving requirements for equipment such as valves, multi-pass swivels and down hole tools, where Busak+Shamban seals are critical elements. Integrity is vital, as the last thing the oil companies want is to shut down production because of equipment failure.

Exploration companies and their suppliers are coming up with innovative methods to effectively extract oil and gas, often in areas that are increasingly difficult to drill. One such solution is the Floating Production Storage Offloading (FPSO) vessels developed by Bluewater, who is featured in our lead article this issue. To make sure people know about our capabilities in oil and gas, Busak+Shamban has attended major exhibitions around the world. This month we are exhibiting at Offshore Northern Seas in Stavanger, Norway. Why not meet us on our stand and discuss your industry?

The Chemical processing section outlines how Busak+Shamban acts as an excellent problem solver in Food and Beverage and Pharmaceutical industries. We are also launching giant O-Rings, with superior product integrity and performance properties, manufactured by a new proprietary manufacturing technology. While our story about seals supplied to a US Fab manufacturer gives details of how we doubled Meantime Between Planned Maintenance (MTBM) with the specification of Isolast® J9670.

Asia Pacific is key to our future growth. We tell you how our experience elsewhere has helped us support our semiconductor customers in the region.

With all this going on, there's never been a better time to contact Busak+Shamban.

Dr. Sandro Johannes Silverio

Global Director - CPI, Semicon, Oil & Gas Segments

news

Wherever there's a major oil & gas exhibition around the globe, you'll find Busak+Shamban. As one of the major seal suppliers to the market, we want to make sure our customers know all about our latest product and material developments related to the industry.

So far this year we have attended the Offshore Technology Conference in the USA, the National Petroleum Show in Canada and the Neftegas exhibition

in Russia. This month will see us at Offshore Northern Seas in Stavanger, Norway.

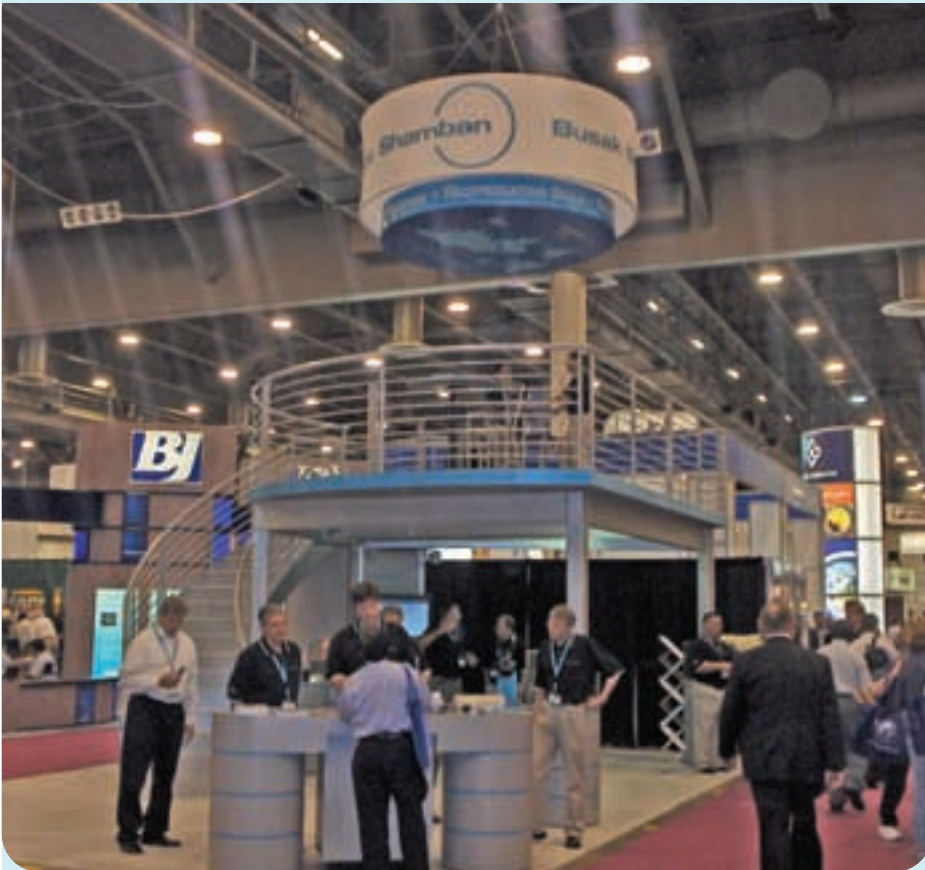
"The industry is very buoyant", Bill Allan, Oil & Gas Segment Manager, told us. "Attendance has been high at all the exhibitions where we have had stands. At OTC there was the highest attendance since the 70s. Visitors have shown a lot of interest in our products and inquiries have resulted in significant new business."

Operating in the heart of the semiconductor industry in the United States, Busak+Shamban Silicon Valley has built a team of sales and professionals.

John Dulis serves as the Branch Manager and has over twenty years of experience in industrial and semiconductor sealing applications.

"Busak+Shamban Silicone Valley provides customers with application

Making an exhibition of ourselves in oil & gas – worldwide



Semicon Sales Office Now Open



From left to right: John Dulis, Stacy Clamage, Tom McPherson, Brian Nejib

analysis, product selection and development as well as focused sales support," said Dulis. "We are also capable of providing comprehensive FEA analysis, complete customer-specified testing, and new product design and development for the most challenging of semiconductor sealing applications.

Order your **FREE** Sealing Solutions Toolkit now!

To make the job of engineers specifying seals in their components easier, Busak+Shamban has put together a pack of tools that no design or application engineer should be without.

If FFKM perfluoroelastomer is needed to meet specific performance requirements, bonding this to metal has proved almost impossible. But now Busak+Shamban can successfully bond Isolast® FFKM materials to a wide range of surfaces.

The inert nature of Isolast® means the use of conventional bonding techniques does not give the level of sealing integrity essential in critical chemical processing applications.

Lengthy research has enabled Busak+Shamban to develop proprietary bonding technology for successfully bonding Isolast® seals to metals such as stainless steel, brass and aluminium. Laboratory and field-testing shows bond integrity to be greater than the tensile strength of

Have you ever wondered what "gettering" is? What about "soft bake" or "zeta potential"? Thanks to www.semiconductor glossary.com, definitions of commonly used terms in the semiconductor industry are now just a mouse click away.

There are two ways to search for words in the glossary. Users can either perform a quick search or browse through the glossary and select a term from the list to find a definition.

The Website is the work of Dr. Jerzy Ruzyllo, the Professor of Electrical Engineering and Materials Science and Engineering at Pennsylvania State University in the United States.

Dr. Ruzyllo recently published the glossary in book format. Copies are



Great things come in small packages

What the pack contains:

O-Ring Calculator

Our acclaimed O-Ring calculator makes specifying the correct O-Ring for your application easy.

Semiconductor Glossary

Dr. Ruzyllo's semiconductor glossary in book format.

Expert on Demand

This voucher entitles you to a free consulting talk.

Lunch and Learn Voucher

Let's take your engineers through the basics of sealing technology.

Our latest literature

To order your free Sealing Solutions Toolkit go to www.busakshamban.com/groove and click the Sealing Solutions Toolkit symbol. Or email us directly on groove@busakshamban.com, to make your request.

When bonding really counts



the perfluoroelastomer itself. In addition, immersion tests in a range of chemicals, at elevated temperatures, show the bond to be resistant to chemical attack. In fact, bond strength is proven to be equally as high, following immersion, as it was before the soak tests began.

Medical, pharmaceutical, food and beverage industries have adopted this advanced sealing technology. Metal bonded seals can be manufactured from the Isolast® FDA grades J9515 and J9516 materials, to eliminate the problems associated with groove voids and secondary assembly operations. This helps prevent bacterial build up and subsequent contamination.

Browsing around

available through Busak+Shamban by ordering our semiconductor toolkit. Request your copy today at www.busakshamban.com/groove.

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For exceptional operating conditions, please contact your Busak+Shamban representative.

Getting into deep water



Busak+Shamban is a strategic sealing partner with Bluewater. We talked to them about their offshore activities and why our relationship with them has been a success



When the FPSO is loading oil onto a tanker the diameter that the two ships may rotate is in excess of one kilometer (0.6 miles), often in difficult weather conditions. In all Bluewater designs safety and protection of the environment are the number one priorities. For instance, all of their vessels have double hulls, which prevent spillage in the unlikely event of a collision.

In 1978, Wim van Heijst and Pieter Schelte Heerema started their company in a porta cabin in Heerema's garden. From those humble beginnings, Bluewater has grown to be the global force in the oil and gas industry it is today. It now operates from its modern headquarters in Hoofddorp, just outside Amsterdam in The Netherlands. Four hundred people are based there, while a further 600 are employed elsewhere around the world. The majority of Bluewater's employees spend their time offshore involved in the company's main areas of business. These are the design, development, management, construction and operation of Floating Production Storage Offloading (FPSO) vessels, along with design, delivery and fabrication of mooring systems.

Serving an expanding market

Originally, Bluewater designed Single Point Mooring Systems (SPMs). However, these days FPSOs account for the majority of Bluewater's business.

"The floating platforms give operators real benefits over fixed ones, and we are seeing demand continue to grow," stated Peter Burger, Head of Engineering at Bluewater. "Our clients choose to lease FPSO vessels, of which we now have seven, for a number of reasons. It may be that an oil field will have a short life and it is not economically feasible to build a fixed rig. They are also an ideal option when an oil field is too distant from the coast for it to be economic to lay a pipeline to it. This is a growing trend as oil companies are digging wells in ever-deeper water, even further from shore. And we are seeing their use in areas at risk of severe weather, such as experienced last year when hurricane Katrina hit the Gulf of Mexico. This is leading to the latest FPSO models being designed for easier uncoupling from wells and anchors."

Solving technical challenges uniquely

"Tackling technical issues like that is where our innovative character is a real advantage. We aim to provide creative and cost effective solutions and are never afraid of challenges, which we look to solve in effective ways."

Busak+Shamban has been working with Bluewater for over 12 years. At that time Bluewater started searching for seals that would give maximum reliability in their first swivel stack. This was for one of their own FPSOs, the Usige Gorm, developed for the Fife field in the North Sea.



Peter Burger, Head of Engineering at Bluewater

"Up until we entered the FPSO market, the majority of our applications were low pressure and mainly processing stabilized oil, therefore sealing was less problematic," Burger told us. "The design of FPSOs brought new challenges. These operate at high pressures and they process multiphase flows including gas, water and oil as well as chemicals."

Realistic solutions not big promises

Bluewater recognized that reliable sealing solutions were vital. Faced with a large number of offerings from several suppliers, identifying the right option from all of these was so important that Bluewater set up their own test laboratories.

"We needed to find the best quality parts for the job. When you consider the loss of income to our customers in production downtime if a seal fails and must be replaced, the cost of seals is much less relevant than their reliability. We are looking for components that will last for the design life of a FPSO, which is a minimum of 20 to 30 years.

"Other seal manufacturers made big promises, but Busak+Shamban made realistic suggestions," explained Burger. "We liked their ability to cooperate as well as their openness. Most importantly they were 'thinking with us' when it came to developing the best solutions for our clients."

Goal-driven, creative and flexible

"Busak+Shamban has become our strategic sealing partner. They have a good understanding and experience within the off shore industry which allows them to offer proven solutions. We pride ourselves on being goal driven, creative and flexible. We have found the same qualities in Busak+Shamban.

"Since 1994 we have continuously assessed various seal materials, geometries and applications to ensure reliability," Burger continues. "We have tested Busak+Shamban solutions back-to-back with comparable products, and we can see no reason to change vendors when their products consistently perform well. As long as Busak+Shamban continues to meet our technical and commercial needs, we are pleased to maintain our partnership with them."

Seal integrity to prevent downtime

The Turret Mooring System is the integral component of the FPSO. These systems can be internal, where the turret is located inside the ship's hull or external, for instance connected to the bow of the vessel. It consists of a geostatic part connected to the seabed via anchor chains and a rotating part. This allows the vessel to find a neutral position that results in the lowest environmental loads on the FPSO and the safest vessel sea-keeping.

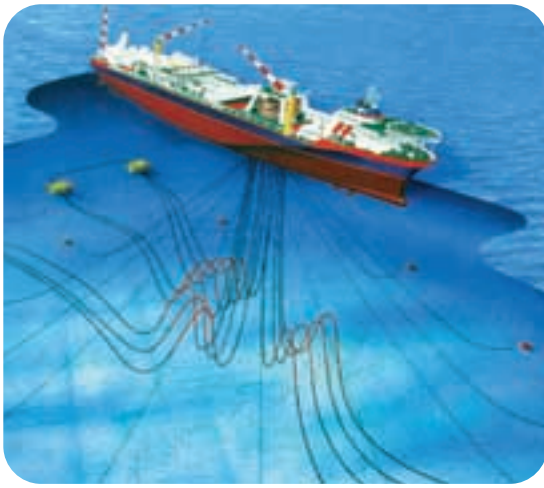
An anchor arrangement connects the FPSO to the seabed. The optimal anchor leg layout is calculated based on predictions for dynamic behavior in wind, wave and current.

At the heart of the turret is the product transfer system. Within this system are risers, flexible hoses that connect the subsea piping to the FPSO and a swivel stack linking it to the FPSO piping. The swivel stack provides multiple fluid paths for transfer of gas, water and crude oil. In addition to the swivel stack a utility swivel is used for hydraulics, chemical injection and an electrical/instrumentation slipring for electrical power and instrument signals including optical signals where needed.

Within the Turret Mooring System, there are hundreds of seals. These may be just a few centimeters in diameter up to sizes greater than two meters. They must withstand temperatures well below zero (32°F) up to those in excess of 100°C (212°F). Pressures are high, sometimes beyond 350 bar (5000 psi) and in addition, seals must be capable of operating at slow rotational speeds. Finally, it is important that the seals are also resistant to explosive decompression, where rapid changes in pressure can cause the seal to rupture.



From ship to shore



"Transferring oil from a tanker to on-shore processing units once involved extensive dredging of harbors and building of jetties and quays where a vessel could be moored," detailed Patrick Ottolini, Section Head Structural and Mechanical at Bluewater. "The cost of that practice was often prohibitive, so one type of Single Point Mooring system, which is basically a large buoy, was developed. A pipeline goes from the processing terminal to a Pipe Line End Manifold (PLEM) located on the seabed. The SPM is anchored to the seabed and connected to the PLEM via underwater hoses. The tanker is moored to the SPM in shallow or deeper water, transferring its cargo to shore via a floating hose, SPM buoy, underwater hoses, PLEM and finally the pipeline.

"The Floating Storage Offloading (FSO) vessel was a further development on this concept. Designers took the SPM and added a tanker to it. This meant that crude oil could be taken from a fixed platform or other production facility then stored in the tanker, ready for offloading to another ship for transport to the production site. The next development was the FPSO, which added production to the functionality of the vessel, including the processing of crude oil, as well as separating the oil from gas, water and other media. Today the FPSO continues to provide a very attractive, economic alternative to conventional platforms, pipelines and onshore storage and export facilities."

Giving 24-7 support

Freek Teunissen began the relationship with Bluewater and now heads up the Busak+Shamban support team for them in the Netherlands marketing company. He told us, "We pride ourselves on the service we give to Bluewater, always aiming to be where we are needed, when we are needed. The back up team includes a full time technical support person. There is also someone looking after documentation, which is a critical element of supply, order handling and purchasing. Hopefully emergencies involving our products do not happen very often, but if one does occur, we are on hand to help out 24-7, whatever the requirement."



**Freek Teunissen, Project Engineer,
Busak+Shamban Netherlands**

FPSO vital statistics

- Aframax size
- Length 250 meters (820 feet)
- Breadth molded 40 meters (131 feet)
- Depth molded 20 meters (65.6 feet)
- Dead weight tonnage 100,000 dwt
- Deck area - 8,000 m² (9,568 yd²)
- Accommodation for 90 people
- Fluid capacity - 150,000 barrels per day
- Crude oil - 100,000 barrels per day or 15.7 million liters (4 million gallons) per day
- Water production - 135,000 barrels per day
- Gas - 60 MMscfd at 270 bar (3915 psi)
- Offloading - 33,000 barrels per hour

Gaining the seals of approval

Busak+Shamban has a range of seal materials that comply to Norsok M-710 standard

Busak+Shamban has been a leading supplier of sealing solutions to the oil and gas industry for over 25 years. To support their customers supplying the Norwegian oil and gas industry in gaining Norsok approval for their assemblies, Busak+Shamban has had a number of sealing materials tested to Norsok standards.

We can now offer the largest range of sealing materials with certificates of compliance to Norsok M-710, available from any seal developer and manufacturer. And most of these are already proven and in long-term use in many demanding exploration, offshore and onshore production, upstream and downstream environments.

Bill Allan, Busak+Shamban Oil and Gas Segment Manager said, "We are thrilled to have been so successful in these tests. The availability of compliant materials will make it easier for existing and new customers to achieve full approval for their assemblies from Norsok."

The sealing materials are available in a range of seal types. The PTFE based materials are commonly used in the industry in the form of Turcon® Variseal®, back up rings and support rings.

Details of tests:

A number of grades of Busak+Shamban polymers were involved in rigorous independent tests, undertaken and supervised by MERL - materials engineering research laboratory, a respected independent laboratory in the United Kingdom. The main focus of the testing was to predict service life of the materials within an offshore working environment, as specified in Norsok M-710 standard, Annex C. Ideally materials should exceed expected well production lifetime of an oil and gas facility of 30 years.

Thermoplastic sealing compounds, PTFE based grades and PEEK based materials, were immersed in a sour (2% H₂S) multi-phase fluid at +200°C to +220°C (+392°F to +428°F), for periods of 7 to 70 days. After saturation in this liquid the mechanical properties, including tensile strength, elongation, Young's modulus and volume changes, were measured. These results were used to predict aging and estimated service life of the materials.

Summary of results:

All 11 thermoplastic materials tested met Norsok acceptance criteria, showing them to have good chemical stability. Changes in tensile strength remained well within the Norsok acceptance range for thermoplastics and all easily exceeded the 30 year expected well production lifetime.



MERL report relating to NORSOK M-710 standards for Busak+Shamban materials.



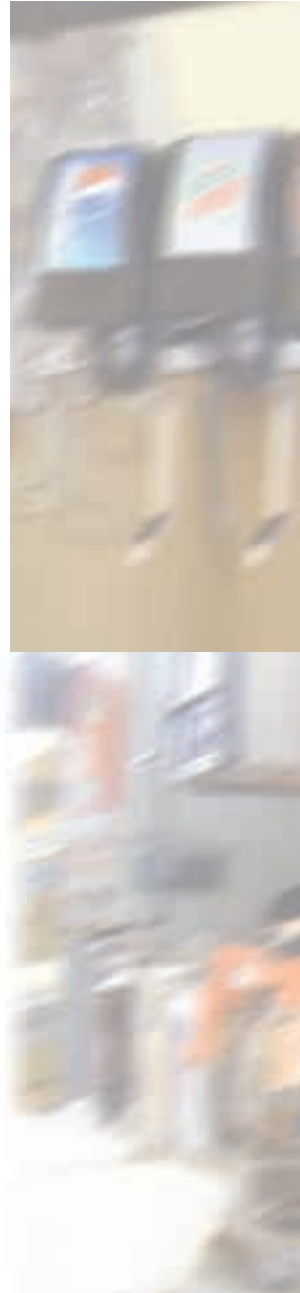
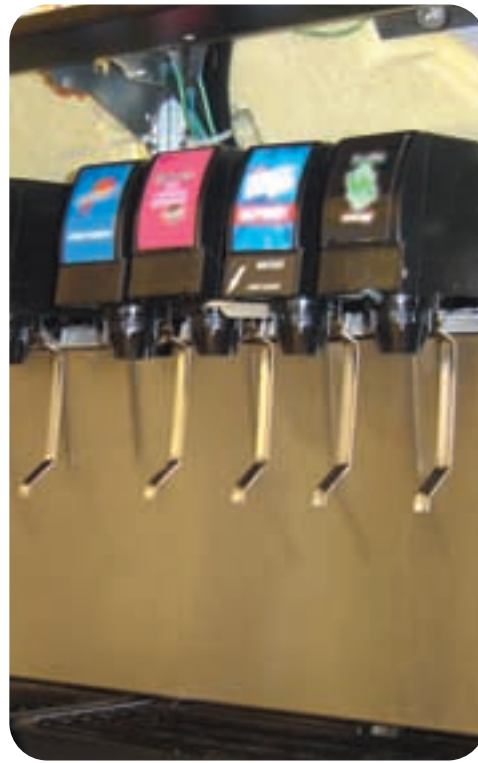
The NORSOK Standards

The Norwegian petroleum industry has developed the NORSOK standards to ensure safety, add value to and improve cost effectiveness of petroleum industry developments and operations.

Usually the NORSOK standards are based on recognized international standards with modifications to specifically meet the needs of the Norwegian petroleum industry. One of the objectives of these standards is to contribute Norwegian knowledge to improve international standards.

Different from previous approvals, is that all individual components within an assembly must meet and be approved to NORSOK standards, rather than just the complete assembly.

The preparation and publication of the NORSOK standards is supported by OLF (The Norwegian Oil Industry Association) and TBL (Federation of Norwegian Manufacturing Industries). NORSOK standards are managed and issued by Standards Norway.



Fast food sealing

Compliance achieved and seal performance outstanding

Busak+Shamban worked with a leading pump manufacturer to resolve problems for a beverage dispensing application in two areas: regulatory compliance and seal performance.

Two Problems

A leading pump manufacturer, serving the food and beverage industries, needed to find solutions to regulatory compliance and seal performance issues. This was required to specifically engineer beverage dispensing pumps for a leading OEM dispensing manufacturer.

Two Solutions

The new seals had to be compliant with the NSF International (formerly the National Sanitary Foundation) regulation 51 regarding food equipment materials. Busak+Shamban jumped into action. By working with an international supplier, NSF 51 compliancy on a black fluoroelastomer material was obtained.



To maximize performance and remedy leakage problems, a new two-part design was created for the customer. The primary seal component is the NSF-approved FKM (fluoroelastomer), and the wiper component is a Z48 injection molded lip seal with a garter spring. Busak+Shamban application engineers worked hard with segment management and product engineering at Trelleborg American Variseal to develop the new design. FEA (finite element analysis) testing was also a major contributor.

Utilizing our international presence and cutting edge research and development capabilities, we were able to provide a sealing solution so the beverage dispensing pumps could be manufactured. This has enabled the seamless operation of equipment that will be used by a global fast food chain.

"We worked closely with our customer, their customer, our supplier and the regulatory agency," said Marty Hugney, Segment Manager of Food, Drink, Pharmaceutical and

Biotech for Busak+Shamban. "By doing this we developed a superior and industry compliant sealing system."

It is through these kinds of endeavors that Busak+Shamban continues to set the industry standard for customer satisfaction.

A large step in size, a giant leap in sealing technology

Proprietary manufacturing method
for high quality larger O-Rings



Features and Benefits

- Capable of producing any diameter above 500 mm/ 20 inches
- Full visual and dimensional product integrity
- High quality, tight tolerances
- Performance capabilities matching molded O-Rings
- Elimination of leakage risks associated with spliced O-Rings
- No tooling charges for standard cross sections
- Available in Isolast® perfluoroelastomer and a wide range of other elastomers

Product availability:

Sizes:

- Recommended for diameters > 500 mm / 20 inches

Cross Sections:

- All standard cross sections available without purchase of dedicated tool
- Larger and special size cross sections available upon request
- Non standard seal profiles available upon request

International Standard	Cross Section, mm	Reference Section, inches
Metric	3.00	0.118
JIS B 2401	3.10	0.122
Metric/JIS	3.50	0.138
AS-568	3.53	0.139
JIS B 2401	3.55	0.140
Metric	4.00	0.157
Metric	5.00	0.197
JIS B 2401	5.30	0.209
AS-568	5.34	0.210
Metric/JIS	5.70	0.224
AS-568	6.99	0.275
JIS B 2401	7.00	0.275
Metric	8.00	0.315
JIS B 2401	8.40	0.330
Metric	10.00	0.394

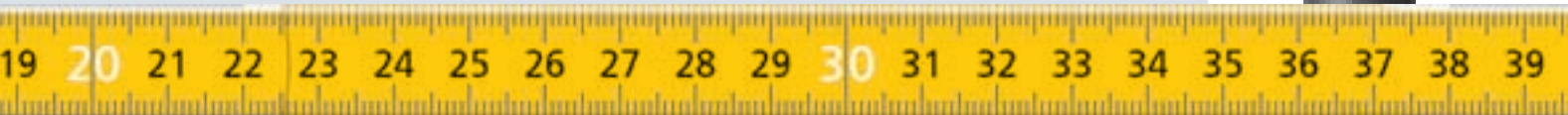
Busak+Shamban launches giant O-Rings manufactured by an innovative technique that ensures high integrity.

Better quality with no tooling costs

A new proprietary manufacturing technology developed by Busak+Shamban means we can now manufacture giant O-Rings with superior product integrity and performance properties. That's O-Rings of sizes more than 500 mm/ 20 inches in diameter, commonly used in process industries

including chemical, hydrocarbon, pharmaceutical, food, beverage and electronics applications.

This innovative technique achieves the full visual and dimensional integrity of a molded O-Ring. Its circular form is stable with complete homogeneity of thermal and chemical resistance properties. These are major advantages over conventional production techniques, such as splicing of extruded cord, where attaining such characteristics is almost impossible. In addition, the long lead-times and costs of a dedicated tool are not usually involved with this method of manufacturing.



Materials:

- Isolast® perfluoroelastomer (FFKM)
- Resifluor™ High Performance Fluorinated Elastomers
- Fluorocarbon (FKM)
- Ethylene Propylene (EPDM)
- Acrylonitrile Butadiene Rubber (HNBR)
- FDA, USP Class IV approved compounds
- Explosive Decompression Resistant (EDR) materials

Service:

- O-Rings supplied to standards ISO 3601-1, AS568, and JIS B 2401
- Product inspected to zero defect policy
- Parts packaged and labeled individually
- Washed and packed in Class 100 Cleanroom if required
- Express delivery service available

Examples of Applications

- Flat Panel Display
- Large Cover Seals
- Vessels
- Electrolysers
- Filters
- Power Generation
- Other large processing equipment





Innovative sealing for innovative equipment

Busak+Shamban provides
a multitude of seals for HPLC
applications

Busak+Shamban works closely with a major HPLC equipment manufacturer to provide seals for over 50 component parts.

Over 50 component parts

Busak+Shamban provides sealing solutions for a major HPLC system manufacturer, primarily for their main pumps. These are generally piston-type with smooth sapphire pistons and plungers. The seal of choice in these applications is usually Variseal® in Turcon®, our proprietary PTFE based material or Zurcon® Z80, ultra high molecular weight (UHMW) polyethylene that is specially developed for sealing applications.

The seals are used to repair or rebuild OEM pumps for different companies. With over 50 seals in production for this particular manufacturer, Busak+Shamban is a forerunner in providing sealing solutions for HPLC systems.

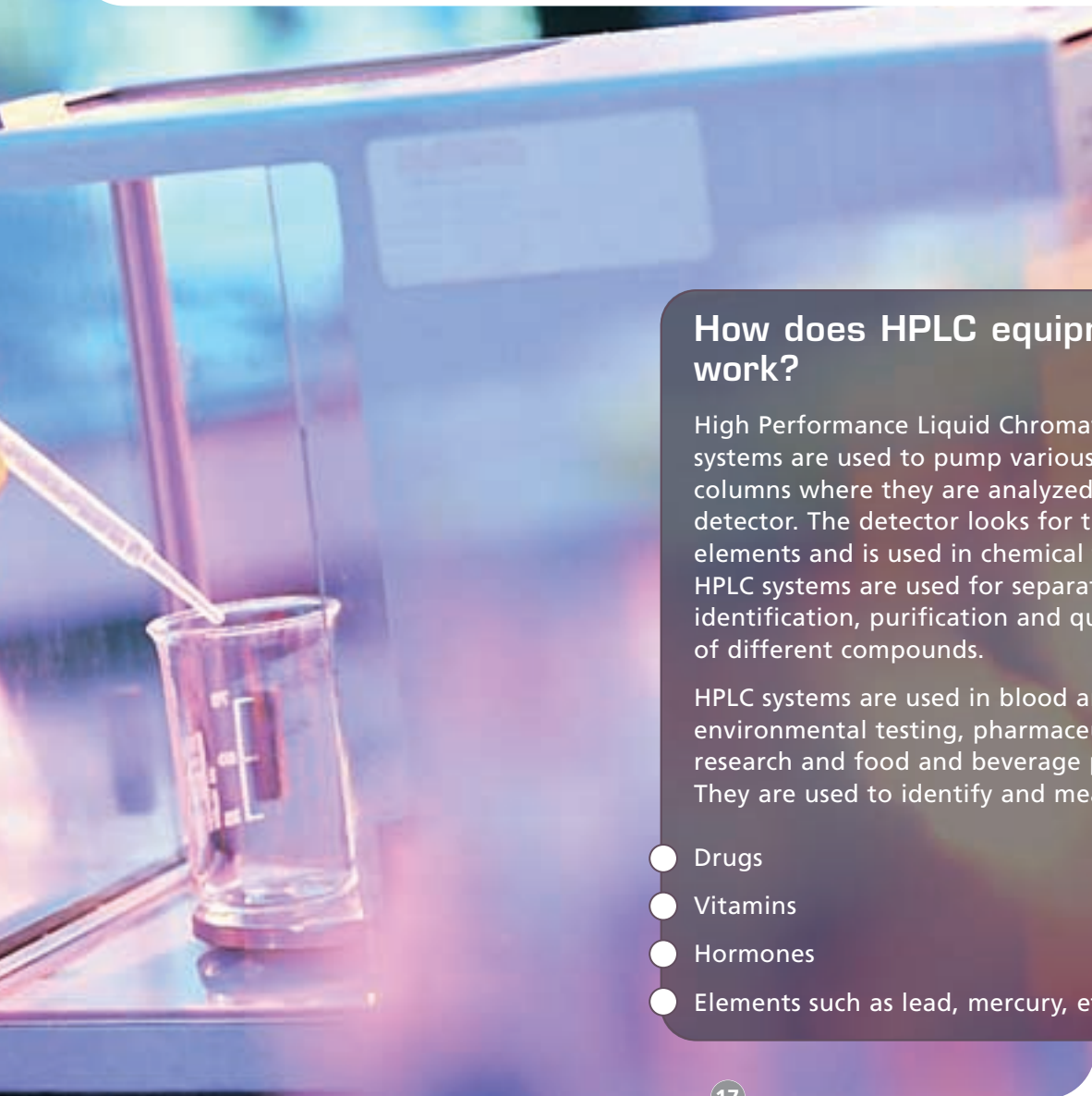
Columns as well as pumps

Busak+Shamban also engineers and supplies seals to a major HPLC column manufacturer. According to Jerome Zawada, Medical Segment Manager for Busak+Shamban, "The sample fluids must be compressed in the columns by a piston prior to the detection process."

Sealing is achieved in columns and pistons using O-Rings, Square Rings, Excluder®, Wipers and Glyd Ring®.

Friction reduction on the piston is attained by the use of Wear Rings. A specially designed Wynseal is used to seal the mesh through which fluid must pass to obtain proper separation. Typical materials for O-Rings and Square-Rings are EPDM or Isolast®, with most of our other seals being in Turcon®.

HPLC systems and testing are a part of an innovative and cutting-edge field. The Busak+Shamban role in these applications is a testament to the company's industry-leading sealing solutions capabilities.



How does HPLC equipment work?

High Performance Liquid Chromatography systems are used to pump various fluids into columns where they are analyzed by a detector. The detector looks for trace elements and is used in chemical testing. HPLC systems are used for separation, identification, purification and quantification of different compounds.

HPLC systems are used in blood and environmental testing, pharmaceutical drug research and food and beverage production. They are used to identify and measure:

- Drugs
- Vitamins
- Hormones
- Elements such as lead, mercury, etc.

For a major semiconductor wafer fab manufacturing linear and mixed signal integrated circuits based in Texas, producing high-volume semiconductor wafers is a challenging operation. It involves multiple manufacturing steps, and maximizing throughput is a key requirement.

Seals needed to withstand aggressive dry 'strip' system

As a part of the fab manufacturing process, following each processing step of film deposition, a dry 'strip' system removes photoresist and residues from wafers. To do this the wafer is exposed to gaseous oxygen plasma at high temperatures. This was causing the seals within the systems to quickly deteriorate, interrupting production with frequent seal changeover.

The fab manufacturer decided to look for an alternative seal material that could extend service life and increase mean time between planned maintenance. We proposed Isolast® J9670 from our Fab Range™. Specifically formulated for high temperature plasma applications in wafer processing, it is capable of operating at continuous temperatures up to 315°C / 599°F.



When less maintenance is a good thing

Busak+Shamban seals help significantly reduce intervals between planned maintenance

Meantime between planned maintenance more than doubled

In this application, Isolast® J9670 has extended the maintenance cycle, increasing production from 15,000 - 20,000 to over 50,000 wafers between seal changes. This met the fab manufacturer's aim of increasing mean time between planned maintenance, improving overall production yield and lowering costs.

The success of Isolast® J9670 has led to Busak+Shamban being considered for other applications by the fab manufacturer, putting Busak+Shamban in the running for exclusive O-Ring supply.



Single technology, single world

Extending our service from one region to another

Busak+Shamban has global experience in a wide range of high technology industries. That knowledge has allowed us to provide proven solutions to new semiconductor customers in Asia Pacific.

Sealing expertise appreciated

“We have found that many companies are struggling to find the right sealing solutions for their applications,” explained Elke Voehringer-Klein, Semiconductor

Segment Manager. “Often they have fitted seals that are not giving the right performance, leading to short mean time between planned maintenance which lowers production and yield. We have seen our market share grow rapidly over the last couple of years. At first, we tend to work with customers to improve the performance of an existing product, often recommending different materials to extend seal life. Increasingly though, we are the first choice when customers are designing new equipment. Our sealing expertise really seems to be appreciated.”

We detail here just a few of the many solutions we are supplying to semiconductor equipment manufacturers in Asia Pacific.



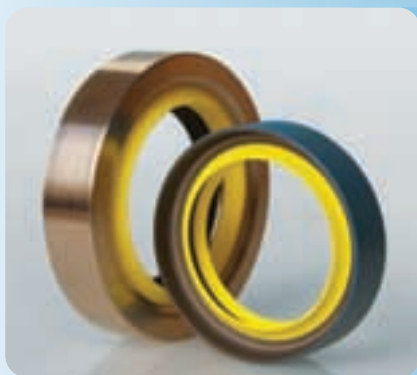
Turcon® Roto Variseal® for etching equipment

In etching machines, seals in rotating assemblies must be resistant to aggressive chemicals. There must also be no potential contamination from deteriorating seals.

Busak+Shamban rapidly responded to the customer's request for a proposed solution, with a Roto Variseal® of our proprietary Turcon® PTFE based

material. From our experience, we knew that this would be ideal for the application. Turcon® is almost universally chemically resistant and Roto Variseal® specifically designed for rotating applications.

We quickly backed up these claims with reports to support potential performance. That and the rapid supply of samples, which worked well in application, won the order.



Turcon® Rotary Shaft seals for vacuum pumps

A major manufacturer of pumps was developing a new product. In their previous designs, power consumption was 0.8 Kw. We knew the design of seals could help reduce this relatively high power consumption.

Elastomer seals tend to stick to rotating shafts and power is required to move them, especially after extended periods of rest. Our Turcon® PTFE based materials have excellent friction characteristics, and a Turcon® Rotary Shaft Seal design, where a Turcon® lip is bonded to a metal substrate, was proposed. This solution reduced power consumption to 0.23 Kw and extended seal life.



Airseals for ovens and PCB exposure machines

A manufacturer of ovens and PCB exposure machines could only source extruded and spliced inflatable seals locally. The seal life of these proved to be poor. They approached us to offer a solution that could extend seal life.

Busak+Shamban responded quickly to the customer's concerns. They provided engineering support and troubleshooting. Airseal, a "high quality" inflatable seal fabricated in a single piece, was proposed as an alternative. These performed excellently in application, achieving the required improvement in seal life.

Online sealing – so much more

Check out www.busakshamban.com

The best sealing solution resource on-line

When we set out to redesign our website, we wanted to have the best sealing solutions resource on-line. We believe we have achieved this with the new look www.busakshamban.com. Available in 20 different country-specific versions in 18 different languages, it will make the job of engineers specifying seals easier worldwide.

Powerful electronic catalog

Our powerful electronic catalog allows you to search for seals by item number or by their properties, such as type of seal, installation dimensions or approvals. You can even compare one seal to another to find the best product to suit your needs.

Innovative interactive quote facility

Once you know the product you require, request a quotation on-line. A simple-to-use service lets you load up a shopping cart and send it through to your local marketing company for quotation. You are guaranteed a rapid response, making the whole process of specifying and ordering seals easier and quicker than ever!



than just a website!

Versatile CAD service makes drawing production easier

The CAD download facility has major benefits for engineers specifying seals, providing thousands of drawings from a wide seal range. Believed to be the most advanced and easy-to-use service of its kind, it provides the option of two or three dimensional files, in a range of formats to suit most commonly used CAD systems. File format and preferred method of delivery can be specified. Unique to this program is a 'Direct 2 CAD' facility. With this, seal profiles can be directly imported into the user's drawing, without the requirement to download or save the drawing to the desktop.

Save time and energy with our O-Ring calculator

Available on-line is a free-of-charge program for calculating O-Ring specifications and housing designs. The calculator has unique functions and is remarkably easy to use. It includes a sizing capability, recommendations on design parameters and complete measurements. Results and comments may be printed, saved on-line or as a PDF. Using a great deal of 'sealing expertise', the calculator even takes into account compression, seal expansion and groove fill.

In depth product detail

The Busak+Shamban catalogs have always been recognized as industry-leading. On our product pages you can access information on sealing elements and link to detailed catalog information. You can also view and download full versions of related literature, go to relevant news articles and CAD seal profiles.



Member area

By registering as a member you can access all the advanced services on the website. Register now and make sure you are getting the best from the Busak+Shamban website.

What does the website offer:

Powerful electronic catalog – With innovative interactive quote facility

O-Ring calculator – Save time and energy

Versatile CAD service – Makes drawing production easier

In depth product detail – Industry leading catalogs on-line for download

Busak+Shamban at a glance

- Part of Trelleborg Sealing Solutions, a business area of the Trelleborg Group
- Employees: 5700 (Trelleborg Sealing Solutions)
- Research and Development Centers in Europe and America
- Over 30 manufacturing plants worldwide
- 40 Marketing Companies worldwide
- Quality Certifications: ISO 9001:2000 and ISO/TS 16949:2002
- In-house polytetrafluor-ethylene, polyurethane development and elastomer development
- More than 2000 material formulations
- Worldwide distribution network

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