Parker Prädifa

ENGINEERING YOUR SUCCESS.

November 2012

SealingReport

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offer wide application range

COMPAMED

Meet us at

Compamed 2012

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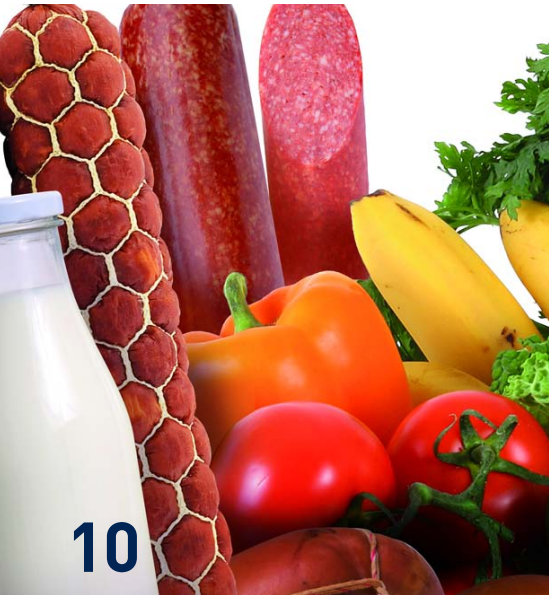

Welcome to Compamed 2012

With this issue of the SealingReport, we also extent a warm welcome to you to our latest trade fair stand showcasing components and systems for medical technology in Düsseldorf. This provides us with yet another opportunity to demonstrate the value added that we can create together with you for your business and your customers.

Our customers know and value Parker Prädifa as a reliable partner in numerous challenging markets and applications. A large number of our solutions can also be found in products and equipment for medical technology and the pharmaceutical sector. The Parker Seal Group has been developing and producing silicone rubber compounds and components for biomedical applications since 1982. In addition, our material laboratories have been developing new biocompatible materials for years.
In the vital market of medical technology or "Life Sciences" we can look back on more than 30 years of experience in development and series production. As a result of joint development partnerships with our customers a number of patents have recently been filed yet again.
We are justifiably proud of these achievements. We have compiled a host of interesting information about our products and services in the Life Sciences sector in this issue of the SealingReport, starting on page 8.

Of course you will find news from other strategic markets of the Parker Seal Group again as well, plus information on the further successful extension of our sales organisation that is locally available to you on a daily basis.

No matter in which market or for what application – we look forward to solving your development tasks in keeping with our promise:
ENGINEERING YOUR SUCCESS.

Jochen Nigge
General Sales Manager
Seal Group Europe

SealingReport

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Products that help to protect lives

Advanced components and systems for medical technology and pharmaceutical uses that combine safety and economy

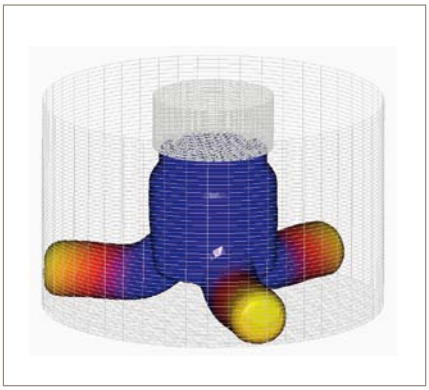
Berthold Röhrich,
Market Manager Life Science,
O-Ring Division Europe

Products for the wide and varied spectrum of the so-called Life Sciences (LS), in the industrial context, encompass components and systems used particularly in medical technology and the pharmaceutical sector. Due to their direct effects on the life and health of patients they are subject to especially stringent requirements. Parker-Prädifa, in addition to an extensive portfolio of existing solutions, offers customers the opportunity for bespoke new developments in close system and development partnerships with them. Unlike many suppliers, Parker can draw on both elastomeric and thermoplastic materials for these comprehensive solutions.

Material selection and optimisation

The demands which "classic" industrial applications make on materials, such as resistance against media or extreme temperatures, do not, or just rarely, occur in the case of LS products. Instead, the proper selection or "refinement" of the materials is of central importance here.
This is done on the basis of customer- or application-specific criteria, with biocompatibility (see also article on page 8 of this issue), e.g. according to USP Class 6 or ISO 10993, is typically the main aspect. In this context, Parker-Prädifa of course supports customers in performing E&L (Extractables & Leachables) analyses as well.
In addition, the planned conversion of the materials into components and systems, for example using injection moulding, extrusion, compression or over-moulding technologies, plus the sterilisation methods intended for subsequent use play an important part in the selection of materials.
The optimisation of material properties to meet application-specific requirements is another key factor. Typical examples are anti-microbial effects to minimise the risk of infection in clinical applications, the optimisation of surfaces with respect to friction in dynamic applications as well as changes concerning hydrophobic properties.

Design

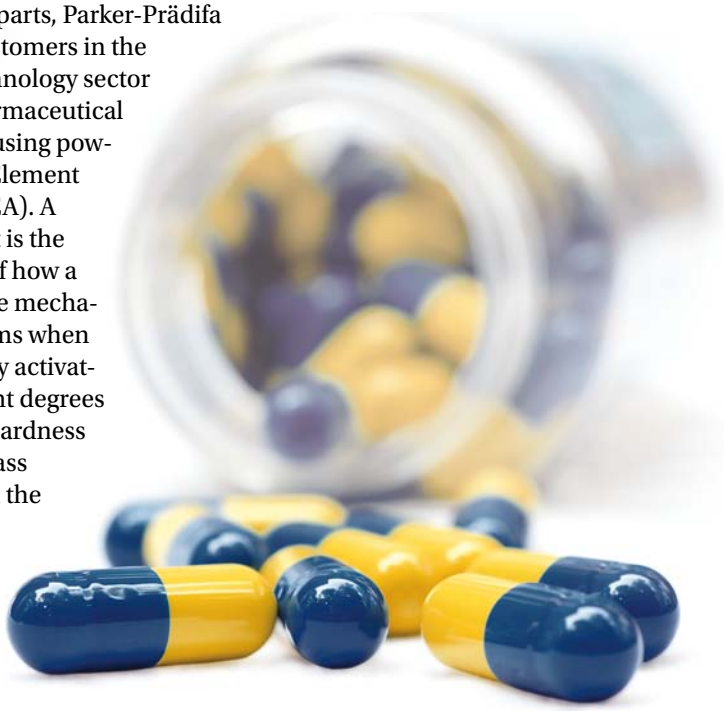


Design optimisation by means of Finite Element Analysis

With respect to the design of moulded elastomeric parts, Parker-Prädifa supports customers in the medical technology sector and the pharmaceutical industry by using powerful Finite Element Analyses (FEA). A case in point is the simulation of how a silicone valve mechanism performs when mechanically activated at different degrees of material hardness or critical mass variances on the component that was performed in order to find the best possible combination. From the initial idea through to production and assembly, Parker-Prädifa develops comprehensive, customised solutions and, as previously mentioned, covers both elastomeric and thermoplastic components. In contrast to dealing with manufacturers that specialise in just one of these materials, this gives customers the benefit of receiving a wider range of solutions from a single source. Only few suppliers in the marketplace have the capabilities to provide this advantage.

System and development partnership

For new LS product developments, Parker-Prädifa has been able to file numerous patents lately. Close collaboration in a spirit of partnership with the customer and a constant exchange of ideas and possible solutions, particularly in the concept phase, are indispensable prerequisites for any new development of this kind. For the customer, this type of development and system partnership means being able to substantially save development time and costs. Faster time to market combined with lower development costs, especially in today's extremely competitive environment in the medical technology and pharmaceuticals markets is crucial to sustained business success.



Economy

Economic aspects play a role as well when it comes to optimising systems, for instance by two-component solutions where Parker-Prädifa's main focus is placed on silicone and thermoplastic materials. In line with the unbroken trend towards miniaturisation, the size of all manner of devices continues to shrink. As a result, the manual assembly of components such as seals becomes more time-intensive and thus more costly. At the same time, the reproducibility of the products must be assured at all times, with the "man and machine" factor and handling playing an important part within the tolerance chain.
This obviously suggests the use of tooling solutions. When choosing this option, the design of both components must be considered as well as the adhesion of the materials and the underlying tooling technology. However, two-component solutions are typically cost-efficient only in the case of high production volumes, as the tools are costly compared with the use of conventional single components. Therefore, the specialists at Parker-Prädifa, together with the customer, will analyse the entire process from assembly through to packaging and work out the break-even point in view of the substantial investment costs.

Production and assembly

Parker-Prädifa is currently making a major investment in the extension of its existing manufacturing capacities by establishing a new manufacturing cell with several clean room facilities at its Sadská site. The aim is to centralise the entire production and assembly operations for Parker-Prädifa's LS products in future, including the associated human resources, also in quality assurance and process engineering, at the Czech location.
Included in these operations are manufacturing facilities according to ISO Class 8 for injection-moulded components made of liquid silicone, rubber or thermoplastic elastomers (TPE), assembly and packaging according to ISO Class 7, warehouse logistics and secondary packaging according to ISO Class 9. In addition, assembly technologies such as ultrasonic welding and riveting of plastic components plus over-moulding of tubes made, for example, from silicone and TPE, all in clean room conditions, are currently being extended.

Quality assurance

Apart from maximum safety, the traceability and identification of materials used in LS products is of central importance. Therefore, processes and technologies used at the manufacturing cell in Sadská are designed according to GMP standards.

Validation and documentation

In addition to typical applications in medical technology, examples of which are shown in the separate overview, another focus at Parker-Prädifa is placed on single-use systems for biotechnological processes which, not least due to their higher economy and flexibility, are increasingly being used by the pharmaceutical industry. Single-use systems are sterile assemblies, typically consisting of a plastic container, a tube, a filter unit and joining components. Pharmaceutical companies use them in the production of vaccines, for example. As these assemblies may come into direct contact with the media used in the system an appropriate validation of the entire assembly based on process-specific parameters is indispensable. This validation encompasses factors such as bio burden, particle count, integrity and sterility.

Packaged assemblies

In addition, Parker-Prädifa assists its customers in optimising various fluid handling processes as an expert manufacturing partner in the field of tube systems, joining technology and sample-taking systems. Apart from the appropriate clean room environment the selection, as previously mentioned, of the right system components and materials according to the relevant process parameters is a key factor. Different sterilisation processes play an equally important role in this context as the interactions with flow media. The use of a qualification matrix adapted to the individual system assures that all relevant standards (E.P. 3.1.9, USP, ISO 10993, FDA 21 CFR 177.2600) are met.

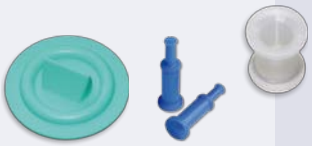
Life Sciences Product Overview

Systems for ventilation, anaesthesia and respiratory therapy

Seals, moulded parts and tube profiles such as
- Tubes for endotracheal and nasogastric lines
- Masks and mouthpieces (moulded parts)
- Seals for oxygynators, ventilators, GDUs, vaporizers, pumps and monitoring systems

Infusion, transfusion and feeding systems

Customer-specific elastomer seals and moulded parts such as
- Injection membranes
- Infusion pumps and systems
- Feeding pumps and supply sets including tube systems
- Valves for infusion therapies



Medical imaging / diagnostics

Seals and moulded parts used, for instance, in
- Ultrasonic equipment
- X-ray equipment
- CTs, MRIs
- OR monitoring cameras and monitors

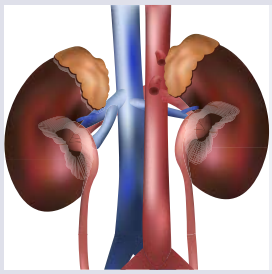
Surgery / minimally invasive surgery

Burr-free precision seals, membranes and moulded parts, validated according to ISO 10993 (e.g. cytotoxicity) used, for instance, in
- Trocars
- Endoscopes
- Biopsy instruments
- Surgical catheters

Pharmacotherapy – inhalers, syringes, pens, accessories

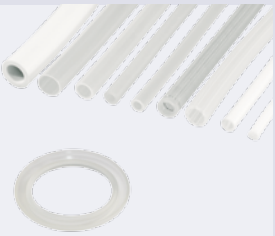
Seal used, for instance, in
- Metered-dose aerosols (sprays)
- Metered-dose aerosols with spacers
- Powder inhalation

Polymer components used in the field of parenteral therapies, such as septa, stoppers, o-rings, ...



Dialysis

Tailored solutions from silicone for the following dialysis applications:
- Dialysers
- Filters
- Concentrate cartridges
- Tube systems
- Monitors



Preventing undesirable side effects

Materials used in medical technology must be biocompatible

Dr Gerhard Haas,
Compound Development,
O-Ring Division Europe

Materials for products used in medical technology interact with the human body. Therefore, such products may only be manufactured from suitable and approved materials, so-called bio materials. Whether or not a material is sufficiently biocompatible depends, among other things, on the intended place and duration of its use. An expert biological evaluation of the materials is the key prerequisite for safe use of products in medical technology.

There are several standards and guidelines in existence for this purpose, albeit no standardised regulations are in place for testing. The following certifications represent standards that are accepted worldwide:

- DIN EN ISO 10993
- USP Class VI
- FDA CFR 21
- EP 3.1.9

Not only finished products are subjected to testing but all basic substances which are used discretely or as mixtures to manufacture a medical product. Furthermore, all auxiliary materials, process additives, production conditions or by-products are evaluated in terms of their compatibility with the human body or organism. There is a very wide range of products in medical technology requiring such evaluations. They include, for example, catheters, bandages or cuffs for sphygmomanometers as well as implants or prostheses. Among others, materials based on polymers, metals and alloys, ceramics or glass may be used as bio materials. However, in the case of these materials not all the properties required for the relevant application are optimal in every respect. Therefore, innovative composite materials with purposely developed application profiles are increasingly being used today as replacements for the conventional materials.

The DIN EN ISO 10993 standard encompasses a range of guidelines (ISO 10993-1 to ISO 10993-20), classifies medical devices by contact duration and type of application, and identifies biological risks to be evaluated according to the category of the product in question. The most relevant guideline regarding biocompatibility is ISO 10993-1. This standard was developed for medical devices and dental materials. It defines three types of contact criteria:

- Surface-contact devices
- External communicating devices
- Implant devices

These are additionally divided into three categories with respect to the anticipated duration of contact (Tab. 1):

Duration of contact	Description
Limited exposure (< 1 day)	Devices whose cumulative single, multiple or repeated use or contact is up to 24 hours.
Prolonged exposure (< 30 days)	Devices whose cumulative single, multiple or repeated long-term use or contact is likely to exceed 24 hours but not 30 days.
Permanent contact (> 30 days)	Devices whose cumulative single, multiple or repeated long-term use or contact exceeds 30 days.

Table 1: Categorization of medical devices by duration of contact (DIN EN ISO 10993)

DIN EN ISO 10993 also includes a test matrix that is helpful for the selection of suitable testing procedures (Table 2). This matrix, however, should not be viewed as a checklist but rather as a guide for the various tests that should be performed prior to introducing a new medical product. For each testing procedure, explanations are provided for the relevant test methods as well as for control materials.

The products of the Parker Seal Group for medical technology are mainly focused on applications for which a duration of contact of <30 days (Prolonged exposure – category B) is required. Parker is already offering a very wide range of materials that are certified according to DIN EN ISO 10993 and/or USP VI. The materials currently available belong to the compound families of ethylene-propylene-diene monomers (EPDMs), fluorinated rubbers (FKMs), highly fluorinated rubbers (FFKMs), liquid silicone rubbers (LSR), solid silicone rubbers and polyisoprenes. Furthermore, Parker is always ready to carry out customer-specific new compound developments or modifications of existing compounds in close collaboration and active exchange of information with the customer.

Parker additionally offers elastomers with a biocompatible coating, which can reduce friction or improve chemical resistance. This highly adhesive coating can also be used as an installation aid. As a general rule when selecting materials for medical technology applications it should be observed that particularly in the case of elastomers (such as FKM) the sterilisation method intended for the product has a major influence on the durability of the material. ■

Body contact		Duration of contact	Biological effect							
Category	Contact with	A - Limited (< 24 hrs) / B - Prolonged (< 30 days) / C - Permanent (> 30 days)	Cytotoxicity	Sensitisation	Irritation / intracutaneous reaction	Acute systemic toxicity	Subchronic toxicity Subchronische	Genotoxicity	Implantation	Blood compatibility
Surface contact devices	Skin	A	x	x	x					
		B	x	x	x					
		C	x	x	x					
	Mucosal membranes	A	x	x	x					
		B	x	x	x					
		C	x	x	x		x	x		
	Compromised skin	A	x	x	x					
		B	x	x	x					
		C	x	x	x		x	x		
External communicating devices	Circulating blood (indirect)	A	x	x	x	x				x
		B	x	x	x	x				x
		C	x	x		x	x	x		x
	Tissue / bones	A	x	x	x					
		B	x	x	x	x	x	x	x	
		C	x	x	x	x	x	x	x	
	Circulating blood (direct)	A	x	x	x	x				x
		B	x	x	x	x	x	x	x	x
		C	x	x	x	x	x	x	x	x

Table 2: Test matrix for biocompatibility evaluation (DIN EN ISO 10993)

Polyurethanes for the food industry

Dr Uwe Wallner,
Innovation & Technology,
Compound Development,
Packing Division Europa

Applications involving foodstuffs are subject to special requirements, as substances contained in the materials can migrate into the food. In the worst case – when using materials with toxic components – they can be hazardous to human health. Therefore, all materials used in the food industry require proof that the assembly components in which they are used will pose no health risks.

This requirement can be met by showing that all the components used are contained on an approved ("positive") list and may thus be used without risk. However, these approved lists are neither current nor exhaustive with respect to the actual harmlessness of the substances used. An example are waxes which may, for the purpose of preserving citrus fruits, be used directly on foodstuffs, but are prohibited for use as release agents for polyurethanes.

In cases where harmless substances are not contained on an approved list there is a second possibility to obtain certainty. To do so, the relevant materials are subjected to various extractions to evaluate whether or not substances are dissolved from the material and could thus potentially migrate into foodstuffs.

In addition to P5600 for use in food applications according to FDA 21 CFR 177.2600: Indirect Food Additives (Polymers) – Substances for Use Only as Components of Articles Intended for Repeated Use (Rubber Articles), the polyurethane compounds P5000 (green) and P5029 (clear) have been tested and approved. Both materials exhibit excellent hydrolysis resistance. This is important for materials to withstand cleaning cycles. Furthermore, both materials can also be used with oils and greases without any problem. Together with outstanding mechanical properties P5000 and P5029 are very well suited for uses in the food sector. ■

Physical data P5000 / P5029

Test	Standard	Dimension	Limits	Typical value
Hardness	DIN 53505	Shore A	94 ± 5	94
Specific weight	DIN 53479	g/cm³	1,21 ± 0,02	1,21
Modulus 100 %	DIN 53504	N/mm²	>13	14
Modulus 300 %	DIN 53504	N/mm²	>30	34
Tensile strength	DIN 53504	N/mm²	>50	56
Ultimate elongation	DIN 53504	%	>350	430
Compression set 24 h / 70 °C	DIN ISO 815 7.5.1	%	<26	23
Rebound resilience	DIN 53512	%	>28	29
Glass transition temperature / DSC	ISO 11357-2	°C		-26

New Publications

Components and Systems for Medical Technology and the Pharma Industry

Parker-Prädifa offers manufacturers in the field of medical technology and the pharmaceutical industry advanced, comprehensive solutions ranging from the formulation of rubber mixtures through to component assembly in clean room conditions. A new brochure provides a complete overview of the products and services portfolio for the challenging Life Sciences sector (see article on page 4).

Parofluor® (FFKM) High Performance Compounds

Perfluoroelastomers are successfully used in many industrial manufacturing processes for which conventional elastomers are not suitable due to insufficient chemical and temperature resistance. With a new generation of Parofluor® high-performance elastomers, Parker-Prädifa offers sealing materials with properties that have been significantly improved yet again compared with their predecessors. Thanks to these improvements the new compounds guarantee that the particularly challenging requirements in chemical and pharmaceutical process equipment and other demands are successfully met. Four new flyers are available:

Parofluor Quantum® (FFKM) V8910-75: for chemical processing (up to 220 °C, black)

Parofluor® (FFKM) V8921-75: for chemical processing (up to 260 °C, white)

Parofluor® (FFKM) V8920-75: for chemical processing (up to 260 °C, black)

Parofluor® (FFKM) V8951-75: for sterile applications in the pharmaceutical industry

O-Ring Guide

Parker-Prädifa's O-Ring Guide has been serving designers and users as a sealing technology adviser for years. Now, the popular handy reference work has been published as a new edition with even more current practical knowledge for every-day use.
While the popular handy booklet format that fits into any coat pocket has been retained, the guide has been completely revised, complemented and up-dated in terms of content, structure and visuals.
In it, the user finds around 90 pages of important practical knowledge about O-rings in a compact form. In addition to comprehensive information on product lines, compounds, assembly types, design instructions and other technical explanations, the guide includes the complete dimensional lists for O-rings and and Parbak® backup.

All publications are available in German and English and may be ordered by e-mail from seal-europe@parker.com.

New FKM standard for automotive engineering

Innovative fluoroelastomer compound solution offers wide application range

Dr Heinz-Christian Rost,
Technology and Innovation Manager,
O-Ring Division Europe

The new standard FKM compound V8857-75 developed by the Parker Seal Group exhibits an improvement of around 50 % in long-term setting characteristics at high temperatures (1,008 hrs / 225 °C) as well as clearly improved compression stress relaxation at high temperatures compared with the previous standard compound V0747-75. Thanks to its properties profile V8857-75 offers a wide application range for sealing solutions in automotive engineering.

Along with increasingly efficient space design concepts in the area of the engine compartment and more compact ancillary component designs the demands made on sealing materials used in the automotive industry continue to rise. A special focus in this context is placed on very good long-term setting characteristics combined with very good temperature stability, as both factors significantly affect the performance of a seal across its lifecycle.

Differences to conventional fluoroelastomers

The new FKM standard V8857-75 exhibits a very good properties profile that is oriented to the physical base values that have made the preceding material (V0747-75) the FKM compound of choice in the automotive industry and many other markets for years.

Table 1 contains an overview of the physical base values, complemented by low-temperature behaviour. The set of basic material characteristics of V8857-75 is comparable with that of the preceding V0747-75 compound but has been significantly improved yet again with respect to setting characteristics.

Specialist in terms of setting characteristics

Thanks to their extensive experience in formulating high-performance compounds the Parker-Prädifa materials specialists managed to raise the setting characteristics of V8857-75 to a clearly higher level. Fig. 1 shows the very good development of the compression set of V8857-75 in a test performed according to DIN ISO 815 even when running the test for 6 weeks (1,008 hours).

Compared with type V0747-75, V8857-75 shows a compression set improvement by more than 50 % (relative). After 1,008 hrs at 225 °C the compression set of V8857-75 is still below 50 %.

Another aspect of the material's very good setting characteristics is evident in its ability to maintain a very high level of counterforce in a state of constant compression over a long period of time, as is the case when the material is used as a seal in static applications. This in turn has a very positive effect on the long-term sealing effect of the system being examined. Here, another significant improvement, demonstrated by a compression stress relaxation (CSR) test, could be achieved with V8857-75 as well (see Fig. 2).

In order to effectively analyse long-term behaviour the duration of the CSR test was extended to more than three months. The test temperature selected was 200 °C, the test medium air. In the test, a CSR improvement by 30 % compared with V0747-75 was achieved.

Property	Unit	Standard	V0747-75	V8857-75
Base elastomer			FKM	FKM
Colour			black	black
Hardness	Shore A	DIN 53 505	75	75
Tensile strength	N/mm²	DIN 53 504	13,4	12,1
Ultimate elongation	%	DIN 53 504	152	127
Modulus (100 %)	N/mm²	DIN 53 504	8,2	8,9
TR10 value	°C	ASTM D 1329	-15	-15

Tab. 1: Comparison of physical properties

Stability – especially at high temperatures

The very good setting characteristics and CSR behaviour of V8857-75 is complemented by another aspect that is of central importance for sealing applications: the stability of the material at high temperatures. For this purpose, hot air storage tests at 225 °C and 250 °C were run for up to 6 weeks (1,008 hrs). Fig. 3 shows examples of the resulting changes in hardness.

Here, another performance leap of V8857-75 could be observed. The brittleness of the material in long-term storage at high temperatures of 225 °C is significantly lower with V8857-75 than with V0747-75. This is again the case when the test temperature is increased even further, to 250 °C, although the difference then is less pronounced. By contrast, the change in elastic properties at the measured test temperatures is less significant than the change in hardness.

Long-term performance clearly enhanced

In the Parker FKM compound V8857-75 users now have a new material available to them with substantially improved compression set for static sealing applications. The comparative ability of the material to sustain a significantly improved sealing force over a long period of time even at high temperatures offers obvious advantages with respect to long-term sealing performance in the application.

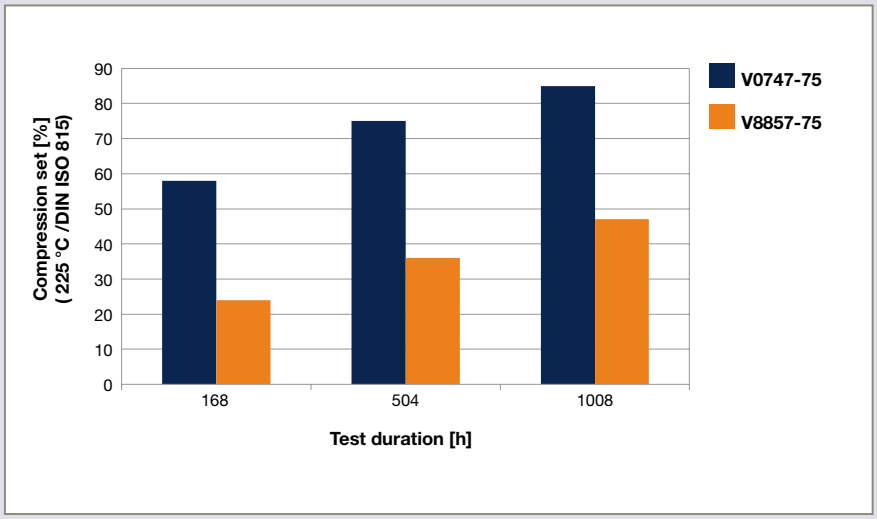


Fig. 1: Development of setting characteristics depending on test duration

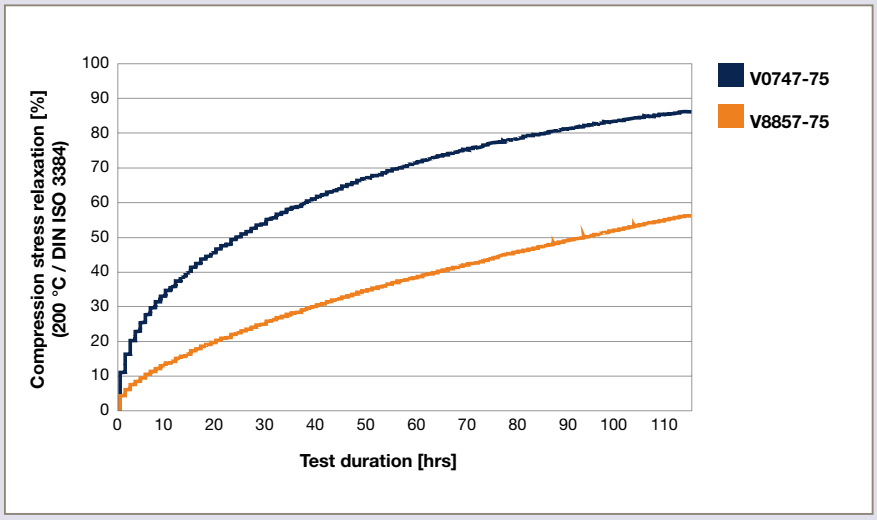


Fig. 2: Relaxation of compression stress over test duration

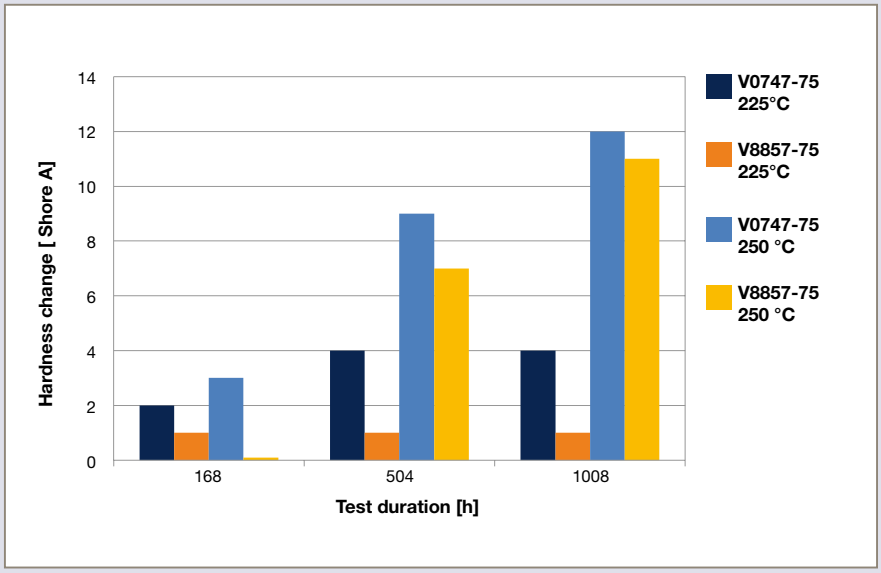


Fig. 3: Change in hardness

New sealing materials for heavy-duty applications

Improved properties for use on wet cylinder liners

Dr Heinz-Christian Rost,
Technology and Innovation Manager,
O-Ring Division Europe

As well as those of passenger cars the engines of modern commercial vehicles have to meet increasingly stricter environmental standards through lower emissions and higher efficiency. This puts more exacting demands on the sealing materials too. While in the past sealing compounds had to withstand maximum temperatures of 120 °C, levels of 150 °C and above are not uncommon today. Parker has developed two new materials that meet the higher operating requirements in heavy-duty applications.

In applications with wet cylinder liners, the new materials, V8550-75 and VG292-75, exhibit clearly improved long-term durability compared with previous compound solutions. In ranges where previous FKM compounds would be destroyed, V8550-75 with a recommended low-temperature value of -15 °C in a water/glycole environment (2000 hrs / 150 °C) shows only minimal changes in the properties profile. VG292-72 as a low-temperature material (recommended low-temperature value of -29 °C) exhibits a significantly better residual properties profile in the same test conditions compared with the standard compound. For both materials, the compression set was substantially improved by around 50 % after 2,000 hrs at 150 °C.

Sealing systems for heavy-duty engines – a class by itself

Sealing systems used in heavy-duty engines of commercial vehicles define a class by itself when considering the demands made on them in terms of long-term stability and thus operating reliability. Therefore, instead of the typical test period of 1,800 hours, the laboratory tests required for qualification are run for up to 2,000 hours at a temperature of 150 °C, which is in the range of field application conditions.

On the media side, a particularly challenging environment is found in the area of the wet cylinder liners, as in critical sealing places both the lubricant circuit and the coolant circuit have to be sealed against each other as well as externally. This means that the sealing material comes into contact with two completely different media (coolant = polar / lubricants = non-polar). In this constellation, the validation of the stability of the material against the coolant is of primary importance.

Time-tested partners for standard applications of up to 120 °C

The peroxidically cross-linked Parker FKM compound V8722-75 (black) and its coloured variant, V8836-75, are time-tested materials and a reliable choice for standard commercial vehicle engines. The recommended maximum operating temperature of 120 °C is the general condition for these materials found in such applications.

Both materials exhibit a well-balanced properties profile in combination with a recommended low-temperature value of -17 °C, respectively. The performance of both compound types after long-term storage of 2,500 hrs in a water/glycole mixture [50 vol% / 50 vol%] at the recommended maximum operating temperature of 120 °C is shown in Fig. 1.

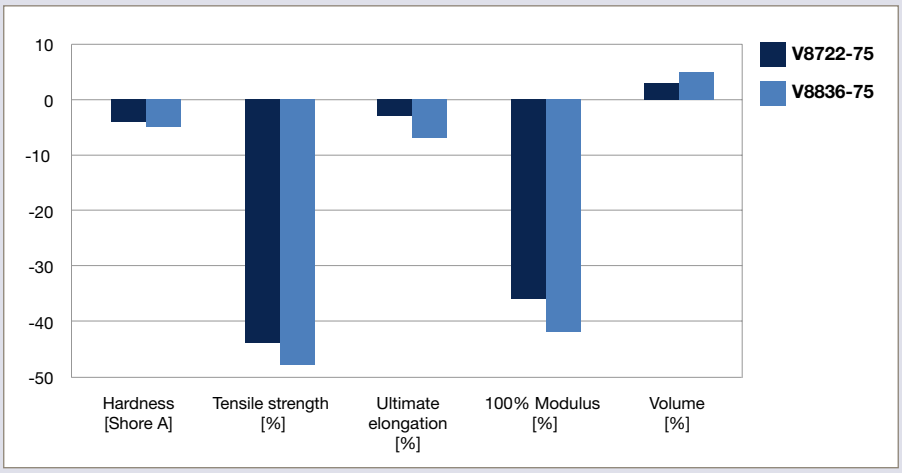


Fig 1: Long-term storage in water /glycole (2,500 hrs / 120 °C)

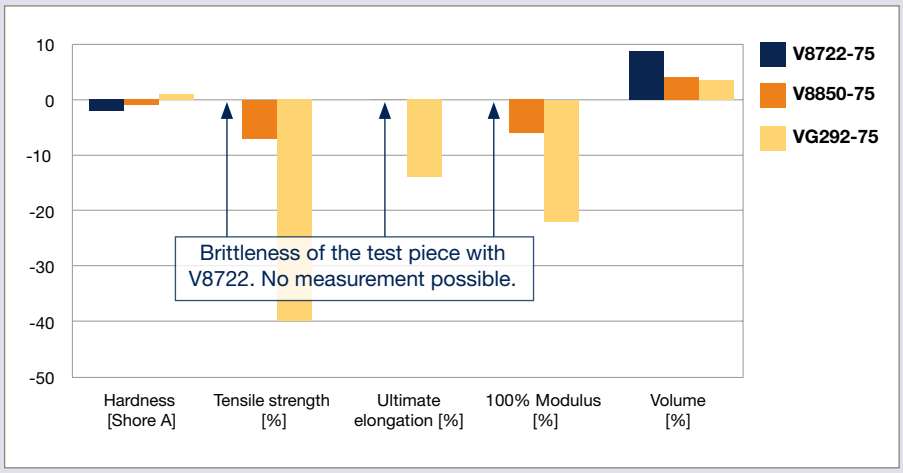


Fig. 2: Long-term storage in water/glycole (2,000 hrs / 150 °C)

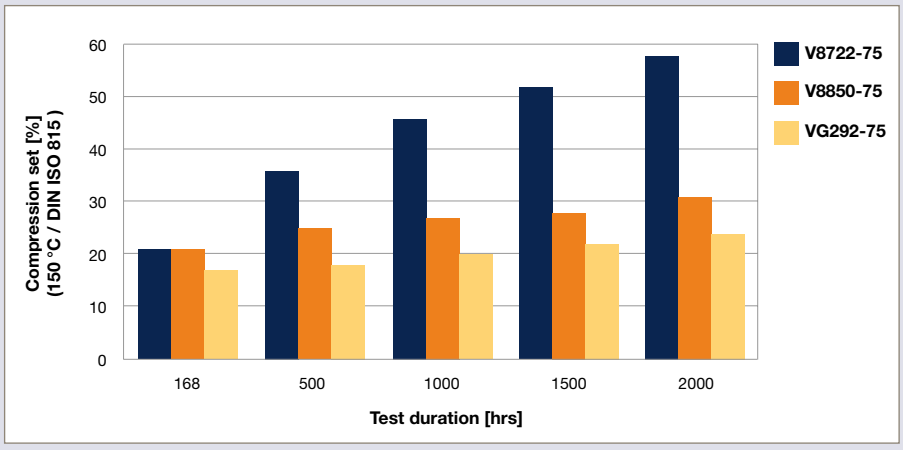


Fig. 3: Change in compression set

Again, based on the very good aging values, specifically the merely low change in Shore A hardness, ultimate elongation and volume, it is obvious why V8722-75 and V8836-75 in the temperature range of up to 120 °C are among the standard materials for commercial vehicle applications focused on cylinder liners offered by Parker.

New materials with significantly improved long-term performance

The demands made on sealing materials increase along with the lower exhaust emissions and the higher efficiency of commercial vehicle engines. Customers have measured peak temperatures beyond 150 °C in critical sealing places, which clearly exceed the previous maximum recommended operating temperature of 120 °C. By contrast, the material grades that have been newly developed by Parker-Prädifa are superbly suited for a permanent service temperature of 150° C.

The Parker FKM compound V8850-75 was developed with a focus on achieving unrivalled chemical resistance in the envisaged media environment and high-/low-temperature performance that is comparable to the V8722-75 reference material. The impressive results obtained after a storage period of 2,000 hours at 150 °C in a water/glycole mixture [50 vol% / 50 vol%] are shown in Fig. 2.

V8850-75, particularly with respect to the fact that there is no change in resilient behaviour, achieves a new performance level at 150 °C. Likewise, significant improvements were obtained with the low-temperature type, VG292-75, in all relevant test areas (change in hardness, elastic properties, volume).

The reference material, V8722-75, exceeds its performance limit at a permanent temperature of 150 °C and a storage period of 2,000 hours and becomes brittle, which makes it impossible to determine its elastic characteristics any more after storage. By contrast, the compound types V8850-75 and VG292-75 exhibit excellent material values that are clearly above the previous standard even after having been subjected to these highly challenging test conditions.

The very good storage results of material types V8850-75 and VG292-75 are complemented by another significant improvement of a compound property that is central to sealing applications: setting characteristics. For a realistic evaluation of compression set, a test in a water/glycole mixture [50 vol% / 50 vol%] was run at 150 °C over a period of 2,000 hrs.

Particularly in the range of more than 1,000 hours, in which the long-term properties of the compound formulations are made transparent, an improvement of compression set according to DIN ISO 815 of nearly 50 % (relative) was achieved for both types, V8850-75 and VG292-75 (see Fig. 3).

Development objectives

- Development of a material with unrivalled chemical long-term resistance in a water/glycole environment for a permanent service temperature of 150 °C and typical recommended low-temperature value.
  The solution: V8550-75.
- Realisation of a material concept that combines very good low-temperature performance, long-term resistance at a permanent service temperature of 150 °C and clearly improved chemical resistance compared with the current standard for water/glycole applications.
  The solution: VG292-75.

Prepared for the future

Through the development of the FKM compounds V8850-75 and VG292-75 the Parker Seal Group underlines its consistent efforts of offering viable solutions to its customers in a dynamically growing application environment. Both materials – V8850-75 with its outstanding media resistance in extreme conditions and VG292-75, which combines media resistance and low-temperature performance at a high level – make it possible for users today to meet the increased requirements of current and future systems.

Property	Unit	Standard	V8722-75	V8836-75	V8550-75	VG292-75
Base elastomer			FKM	FKM	FKM	FKM
Colour			black	black	black	green
Temp. max.	°C	-	120	120	150	150
Hardness	Shore A	DIN 53 505	78	78	77	78
Tensile strength	N/mm²	Din 53 504	22.8	11.1	17.2	11.8
Ultimate elongation	%	DIN 53 504	220	329	179	231
Modulus (100 %)	N/mm²	DIN 53 504	7.5	5.4	7,8	3.7
TR10-Wert	°C	ASTM D 1329	-17	-17	-15	-29
Compression set, air 70 hrs / 200 °C	%	DIN ISO 815	23	25	28	18

Tab. 1: Comparison of physical properties

New distribution partner: Kubo Tech Austria

Following the appointment of the Swiss company Kubo Tech AG as an official Parker Hannifin distribution partner with "Certified Distributor" status in January (see also issue June 2012 of the Sealing Report), a corresponding agreement was signed in July with the company's Austrian branch as well.

From left:
Peter Redl, Key Account Manager, Parker Hannifin Austria
Gerhard Wehrberger, Market Manager Distribution, Parker Hannifin Austria
Hermann Kirchberger, Managing Director, Kubo Tech GmbH, Austria
Dr Thomas Raible, Owner/Shareholder, Kubo Tech AG
Bernd Wemmer, Sales Manager Central Europe, Parker Seal Group

Brief introduction of the Kubo Group

Products

- Seals (67%): O-rings, hydraulic and pneumatic seals, radial, axial and face seals, flat seals and sealing plates, packings
- Springs (6%)
- Moulded rubber parts (27%)

Locations/employees

- Effretikon, 90 employees
- Linz, 16 employees
- Zurich, 14 employees

Companies

- Kubo Tech AG, Effretikon
- Kubo Form AG, Effretikon
- Kubo Immo AG, Effretikon
- Kubo Tech GmbH, Linz (Austria)
- Johannsen AG, Zurich

Kubo Tech Gesellschaft m.b.H. belongs to the Kubo Group and was founded in 1986 as an Austrian branch of the Swiss Kubo Tech AG based in Effretikon that was established in 1980. The Austrian branch is located in Linz and has 16 employees who work in inside sales, administration and as field sales engineers.
Like the Swiss parent company that is certified according to ISO 9001 / ISO 14001, Kubo Tech Austria possesses comprehensive sealing technology expertise and sells the company's own products as well as trade products. The customer portfolio ranges from the pharmaceutical and chemical industries, medical technology, the food industry, energy and power-plant sector, mechanical and plant engineering through to valves and fittings manufacturers, the watch industry as well as the catering sector and household appliance manufacturers.
The Parker seal products sold by Kubo Tech AG encompass the entire Parker-Prädifa portfolio of static and dynamic seals which now, after the signing of the official distribution partnership agreement with Parker, can be purchased by customers in Austria directly from Kubo Tech Gesellschaft m.b.H. in Linz. ■

Event Calendar

ADIPEC	Abu Dhabi, United Arabian Emirates	11.11. – 14.11.2012
Electronica	Munich, Germany	13.11. – 16.11.2012
COMPAMED	Düsseldorf, Germany	14.11. – 16.11.2012
DDL23 (Drug Delivery to the Lungs Conference)	Edinburgh, Scotland, UK	05.12. - 07.12.2012
WIN Hydraulic & Pneumatic Fair	Istanbul, Turkey	21.03. – 24.03.2012
Hanover Industrial Fair	Hanover, Germany	08.04. – 12.04.2012
BAUMA	Munich, Germany	15.04. – 21.04.2012

We look forward to your visit.

Parker People

- **Andrew D. Ross is new President of the Parker Seal Group and Corporate Vice President.**
- **Roland Schüssler assumes role of Market Unit Manager "Pneumatics" at Packing Division Europe**

Since August 2012, **Roland Schüssler** has been serving in the role of Market Unit Manager "Pneumatics" for the Packing Division Europe. After studying mechanical engineering at the Stuttgart University, majoring in precision engineering and plastics technology, he initially worked for one year at the IKP (Institute for Plastics Technology and Testing). In 1992, Schüssler joined the O-Ring Division of Parker's European Seal Group where, among others, he was involved in establishing the QA system according to ISO 9001 which in 1993 culminated in the O-Ring Division being the first ever seal manufacturer to be certified according to this standard.
From 1993 to 2000, as a member of the quality engineering team, he introduced automatic O-ring measurement and surface testing machines. Later in 2000, he switched to the Marketing department as Market Manager for the Heavy Duty, Consumers, Industrials and Life Science markets. Among other things, he carried out several market research projects during this time and was responsible for introducing new materials for power tool applications. In addition, his activities were focused on new drinking water compounds. Schüssler was responsible for handling key coordination tasks during the development of these compounds including national and international approvals and the roll-out of the compounds at Parker's manufacturing site in China.

Parker People

Parker Seal Group under new leadership

On 30 June 2012, **Andrew D. Ross** was elected President of the Parker Seal Group and Corporate Vice President. In this role, he succeeds Kurt Keller, who has assumed responsibility for the Asia Pacific Group.
Ross has a Bachelor of Science degree from the University of Saint Francis, Fort Wayne, Indiana, along with an Executive Master of Business Administration from Case Western Reserve University in Cleveland, Ohio. In his new role, he is responsible for accelerating growth within Parker's Global Markets.

In 1998, Andrew D. Ross joined Parker's Seal Group as a Product Manager before becoming the National Sales Manager and subsequently, Vice President of Sales and Marketing for the Group. During his tenure in the Seal Group, Ross transitioned from a sales capacity to General Manager for the Integrated Sealing Systems Division in Lynchburg, VA. Prior to joining Parker, Ross worked for another seal company for 9 years in a variety of sales and operational roles.
In 2007, Ross was appointed General Manager of the Hydraulic Valve Division, one of the largest industrial divisions in the company. In 2011, he became Vice President of Operations – Hydraulics Group.

On returning to the Seal Group, Ross said, *"The Seal Group has a long history of strong results and talent development. It is my commitment that we will work hard to ensure the success of our business and I am confident the future holds great things for our team."*

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