

# ERIKS sealing elements



**VITON® Fluorelastomers**

**An overview**

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**Table of contents**

Introduction	page 3
Why Genuine Viton® ?	4
How do I make sure that I've got Genuine Viton®?	5
The Viton® families	6
Viton® O-Rings	8
Viton® O-Ring cord	18
Viton® Vulc-O-ring	19
Viton® profiles and rubber moulded products	20
ERIKS Viton® oil seals	21
Viton® sheets	22
Viton® sponge rubber	23
Viton® sealants	24
Frequently asked questions about Viton®	25
Chemical resistance list	28
ERIKS datasheets	30
Remarks	

## **Introduction**

**'Only the best is good enough for you'**

Today's industry sometimes operates under extreme conditions. Heat, aggressive media, corrosive gasses and mechanical stress require the utmost performance from your seals.

Extreme requirements demand quality assurance and the best materials: in those cases Genuine Viton®, the fluoroelastomer made by DuPont Performance Elastomers is the solution. If safety and quality assurance are a must, Genuine Viton® is the only choice.

Genuine Viton® is manufactured with 100% pure fluoroelastomers and is certified with the Viton® certificate, which is granted by DuPont Performance Elastomers. ERIKS was appointed licensed distributor for Genuine Viton® products in 1994. In 1999, our license was renewed.

On the next pages, we introduce you to our product range of Genuine Viton® products:

- O-rings;
- Oil seals;
- Vulc-O-rings;
- O-ring cord;
- Profiles;
- Rubber moulded products;
- Sealants;
- Sheeting products.



All information published in this brochure was collected with the utmost care and precision.

Despite of this, ERIKS cannot and will not accept any liability claims, originating from possible incompleteness and/or inadequacy of the contents of this brochure.

All information included herein is subject to change without prior notice.

### Why Genuine VITON®?

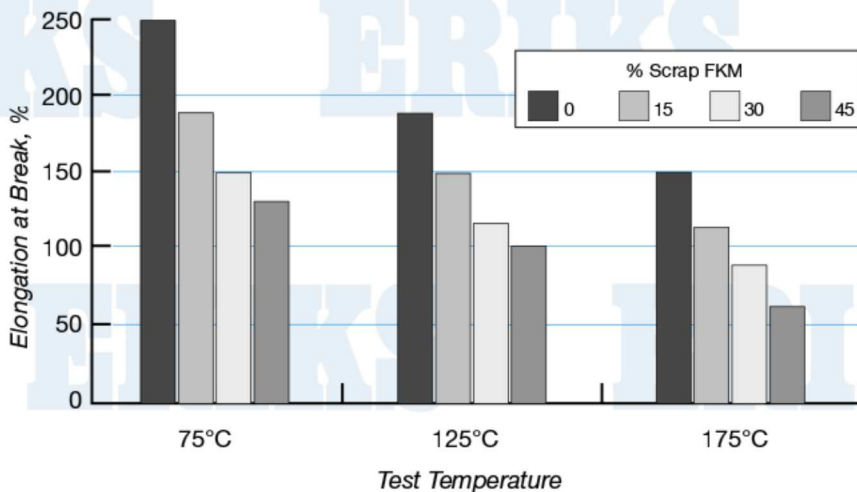
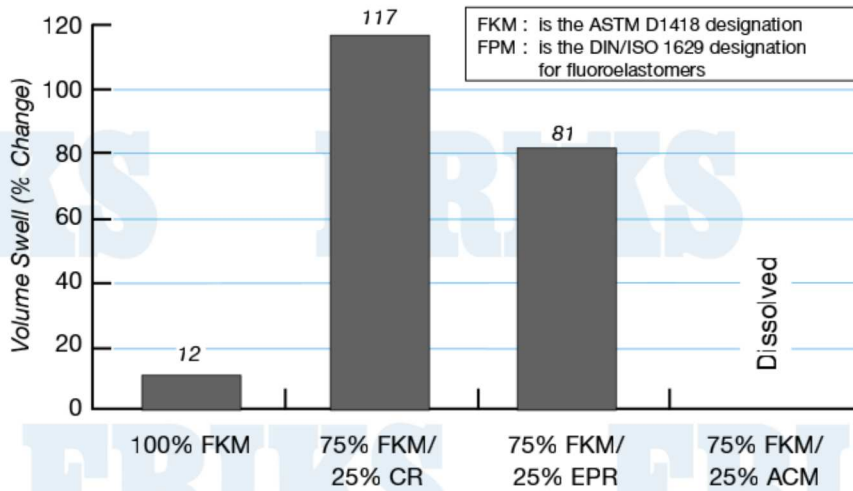
In the marketplace, “low-cost” fluoroelastomers (FKM/FPM1) are being offered which are not manufactured out of 100% fluoroelastomer. Elastomers based on EPDM, Neoprene or Acrylate rubber have been added to form “cheap” compounds, causing the technical properties to be inferior compared to 100% fluoroelastomers.

To some fluoroelastomers, reprocessed scrap materials have been added.

The tables hereafter show the results of swell tests in various media. The properties of “blended” compounds are clearly inferior to those of Genuine Viton® (100% FKM/FPM).



#### Concentrated Sulfuric Acid Aging, 1 week at 70°C



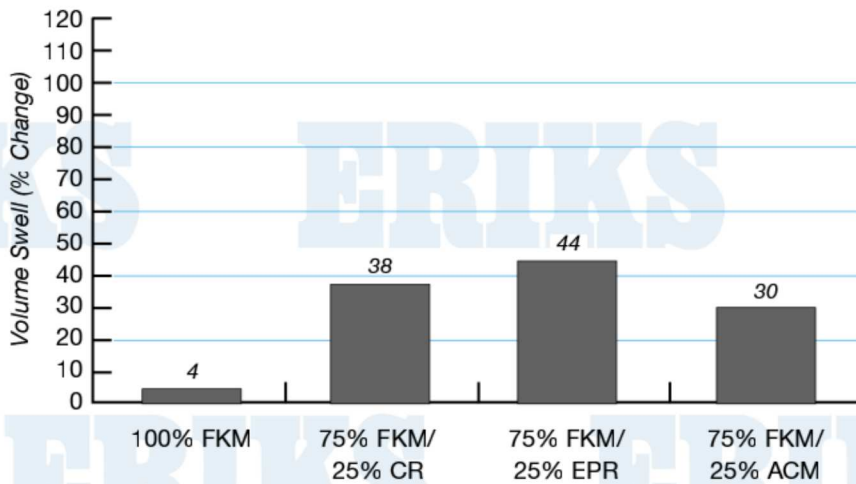
**Why Genuine VITON®?**

Also with regard to sealing capacity at higher temperatures, considerable differences exist. In the tables hereunder, we present the various swelling values, again indicating the superior properties of Genuine Viton®. ERIKS'

Genuine Viton® programme guarantees that you obtain 100% Viton® and, consequently, the assurance of an optimal life time for your seals.



Reference Fuel 'C' Aging, 1 week at 40°C



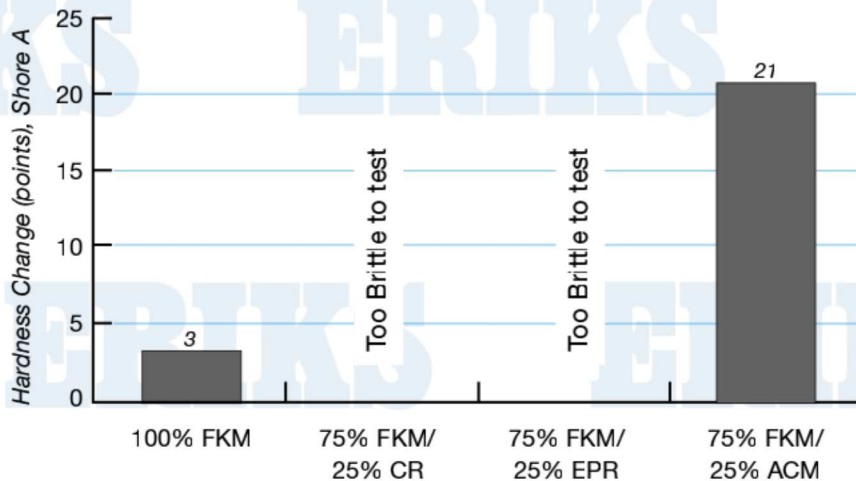
**How do I make sure that I've got Genuine Viton®?**

Only Genuine Viton® products carry the specific, easy-recognizable emblem on their package. All Viton® products are made according to the strict guidelines of DuPont Performance Elastomers, the only manufacturer of Viton®. Each licensee, whether compounder, manufacturer or distributor, has signed a formal agreement with DuPont Performance Elastomers who have the right to regularly inspect or audit the performance of their partners in the programme.

If you buy Genuine Viton®, you can be assured that the product has been manufactured and processed by both DuPont Performance Elastomers and their licensed partners according to guidelines specified in the Materials Integrity Section of the OSHA 1910.119

(Process Safety Management of Highly Hazardous Chemicals). This section includes guidelines regarding, a.o.:

- maintenance procedures;
- training of personnel;
- quality control;
- preventive maintenance.



Viton® is a registered trademark of DuPont Performance Elastomers L.L.C.

### The VITON® families

Viton® was introduced in 1958. There are now three major general use families of Viton fluoroelastomer: A, B, and F. They differ primarily in their resistance to fluids, and in particular aggressive lubricating oils and oxygenated fuels, such as methanol and ethanol automotive fuel blends. There is also a class of high performance Viton grades: GB, GBL, GF, GLT, GFLT, Extreme and Base resistant.

#### 1. Maximum temperature resistance of various compounds

Type	Temperature resistance
Kalrez®	max. 316°C
ZALAK®	max. 250°C
VITON® GF	200°C
VITON® B	200°C
VITON® A	200°C
HNBR	max. 150°C
EPDM	max. 150°C
Neoprène®	max. 120°C
NBR	max. 120°C

#### 2. Main Viton® families

VITON®	A	B	F	GLT	GFLT	Extreme	Base Resistant
% fluor	66	68	70	64	66	56	
Extreme chemical resistance	++	+++	++++	+	++++	++++	++++
High temperature resistance	+++	+++	+++	+++	+++	+++	+++
Low temperature resistance	+	0	-	++++	++	+	+
Compression-set	+++	++	+	+	+	+	+

+ : The more + signs, the better the relative values are.

Note: From these families, all possible parts can be produced.

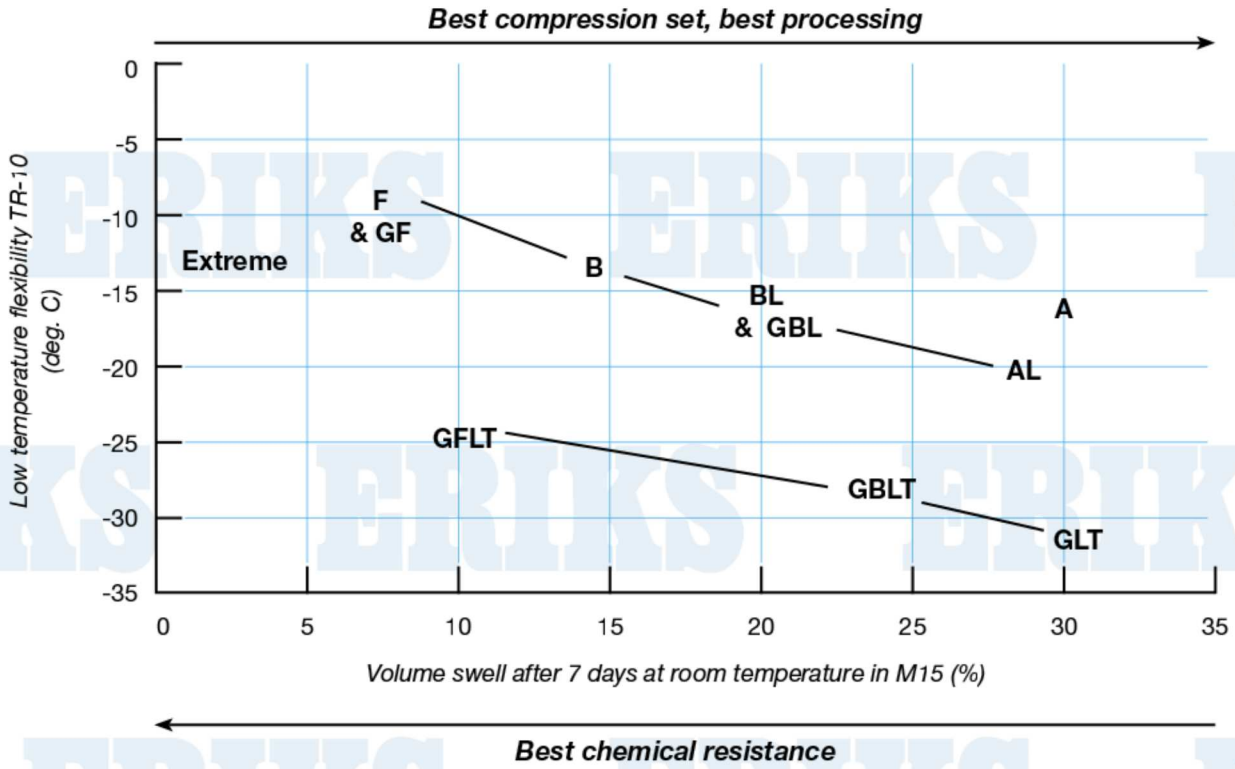
#### 3. Differences in fluids resistance

	A	B	F	Viton® Extreme	GB, GBL	GF	GLT	GFLT
<b>CHEMICAL ENVIRONMENT</b>								
Automotive an aviation fuels	1	1	1	1	1	1	1	1
Automotive fuels oxygenated with MEOH, ETOH, MTBE, etc	NR	2	1	1	2	1	NR	1
Engine lubricating oil, SE and SF	2	1	1	1	1	1	1	1
Engine lubricating oil, SG and SH	3	2	1	1	1	1	2	1
Aliphatic hydrocarbon process - fluids, chemicals	1	1	1	1	1	1	1	1
Aromatic hydrocarbon process - fluids, chemicals	2	2	1	1	1	1	2	1
Aqueous fluids, steam, mineral acids	3	2	2	1	1	1	1	1
Strong base, high pH, caustic, amines	Viton® for BASE RESISTANCE / VITON EXTREME™							
<b>COMPRESSION AND LOW-TEMPERATURE PERFORMANCE</b>								
Resistance to compression set	1	2	2	1	2	3	2	2
Low-temperature sealing capability TR-10 test results	-17°C	-14°C	-7°C	-11°C	-15°C	-6°C	-30°C	-24°C

1 = Excellent, minimal volume swell / 2 = Very Good, small volume swell / 3 = Good, moderate volume swell

**The VITON® families**

**4. Chemical resistance of the various Viton® families**



**Nota:**  
 Please consult us for a detailed recommendation regarding chemical resistance. We have a direct contact with DuPont Performance Elastomers' laboratory in Geneva and, therefore, have admission to the most recently updated data.

### Viton® O-rings

#### Original VITON® compounds - main types

ERIKS offers a large number of Genuine Viton® compounds for a wide range of sealing applications. Hereunder, you'll find the most commonly produced types.



#### Standard Compounds - VITON® A

Type			Description
51414:	70°+5°	IRHD	black and green: standard quality
514320:	90°+5°	IRHD	black: standard quality
V-75:	75°+5°	IRHD	black and brown to MIL-R-83248 low compression-set
V-90:	90°+5°	IRHD	black and brown to MIL-R-83248 low compression-set
51424:	80°+5°	IRHD	black and green
VULC-0-RING 75 - MC 152			black, brown and green
VULC-0-RING 90 - MC-126			black, brown and green

#### Extreme chemical resistance

Type	Description
V-176	best acid and steam resistance - no lead
V-121	Viton B: universally chemically better
V-141	VITON GF: universally chemically better than Viton B
CV-75	Viton Extreme: best resistance to solvents
V-9062-95	extreme hardness (95°IRHD), resistant to steam

#### Petrochemical and offshore applications

Type	Description
V-162	explosion after decompression resistant
V-9021-95	quality with very high modulus, high tensile strength



**Viton® O-rings**



**Food applications**

Type	Description
V-178	FDA-compliant, red, class 1
V-180	FDA-compliant, white, class 1
VULC-O-RING 75 MC 152	FDA-compliant, black, class 1
VULC-O-RING 90 MC 126	FDA-compliant, black, class 1
M 70	FDA-compliant, green, class 1
V 70 H	FDA-compliant, black, class 1

FDA : section 177.2600

**Low temperature applications**

Type	Description
V-115: Viton GLT	to Mil-R-83485
Viton GFLT	also optimal chemical resistance

**High Purity Compounds**

Type	Description
HP-V-75	very low extraction values, for semicon

**Teflex® O-Ringen**

Type	Description
TEFLEX-VITON	FEP of PFA-encapsulated Viton® O-rings for optimal chemical resistance

**Special Compounds**

Type	Description
V-75 White	white - very low extraction values
V-170	compounded for vacuum
M-LN 80	with PTFE particles for low friction coefficient

### Viton® O-rings

#### VITON® A Compounds for general use - a technical overview

We offer six standard O-ring compounds of which thousands of different sizes are available from stock. Please find the most important technical data of these compounds, hereunder.



Standard Genuine Viton® A Compounds

Technical data	51414 black	51414 green	514320 black	V-75 black	V-90 black	51424 black	MC152 VulcORing
Hardness IRHD ± 5° DIN 53519	70	70	90	75	90	80	75
Tensile strength Mpa.min. DIN 53504	13	12	14	14	18	11	10,7
Elongation % DIN 53504	170	170	120	224	121	130	213
Compression set % 24h/200°C on slab max. DIN 53517	12	14	14	10	117	15	4,6
on O-R 3.53 mm max.	18	19	18	11		20	7,5
Heat aging 70h/200°C Hardness ° DIN 53508	+4°	+5°	+5°	+2°	+4°	+5°	+3°
Low temperature TR-10/ ASTM 1329	-16°	-16°	-16°	-16°	-16°	-16°	-16°
Density ASTM 1817	1,85	2,07	1,87	1,90	1,92	1,87	2,32
Max. temperature °C	+200°	+200°	+200°	+200°	+200°	+200°	+200°
Generalities	stock	stock RAL 6011	stock in black/green on demand	Mil spec's R-83248 C Type 1 cl 1 stock	Mil spec's R-83248 C Type 1 cl 1	production	1 to 5 day- production also in FDA

**Viton® O-rings**

**Extreme chemical resistance**

Seals that are exposed to extreme chemicals (amines, concentrated acids, superheated steam), require a compound with excellent chemical resistance. ERIKS offers you the following solutions:

**V-176**

Especially designed for an optimal resistance against concentrated acids. Peroxide cured and with a very good compression set.

**V-121**

Terpolymer based on Viton® B. With better chemical resistance than standard Viton® A compound 51414, however, with a slightly higher compression set.

**V-141**

Based on Genuine Viton® GF. This compound offers the best chemical resistance of all types belonging to the standard Viton® families. Again, the compression set is slightly higher as compared to our standard Viton® compound 51414.

**CV-75**

Viton® Extreme CV-75 is the latest development in the Viton® family. It is a terpolymer of ethylene, tetrafluoroethylene and perfluoromethylvinylether. It bridges the gap between the fluoro (Viton®) and perfluoroelastomers (Kalrez®). It provides the best chemical resistance of all fluoroelastomers and is available in a black and a white colour. A chemical resistance list is available on request.

Viton® Extreme CV75 has proved its highest value in contact with fuels with additives, spray-coating processes, alcohols and chemicals such as MTBE and ETBE. It is produced on demand.



chemical resistance

Swell values in %			
Type	in MeOH 70h / 25°C	in FAM B 48h/50°C	Viton family
51414	100	30	A
V-176	80	28	A
V-121	35	25	B
V-141	3	13	GF

Extreme chemical resistance					
Technical data	V-176 Viton A	V-121 Viton B	V-141 Viton GF	CV-75 Extreme	AFLAS FA 100S
Hardness IRHD +5°	76	75	80	78	70
Tensile strength Mpa.min.	14.8	12	15.7	17.9	16
Elongation%	190	180	230	145	250
Heat aging 70h/250°C					
Hardness ± °		+1°	+2°	-3°	-1°
Tensile strength %	+4°	-9°	-35°	-32°	-23
Compression set % 22h/200°C on slab	7%	31%	29%	17%	40%

Note: Aflas FA 100S has an optimal steam resistance.

### Viton® O-rings

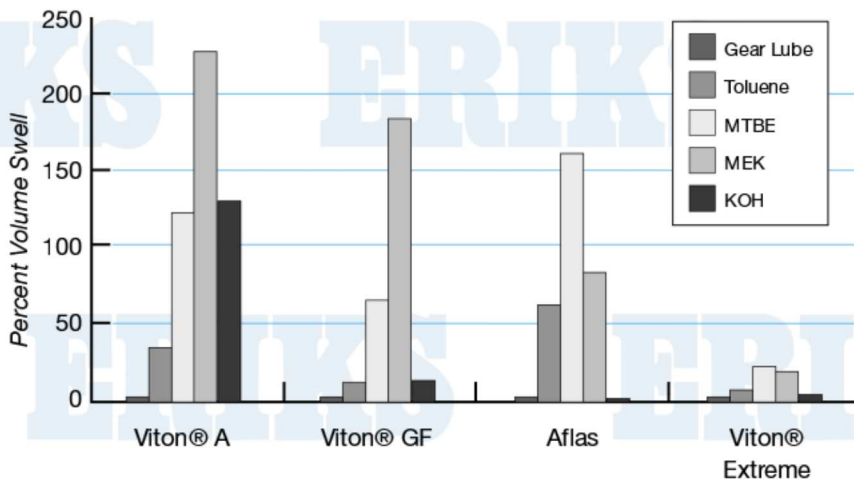
#### Viton® Extreme

Viton® Extreme provides the broadest chemical resistance of all Viton® types. Originally, it was designed by DuPont Performance Elastomers to be used in oil-field applications, in contact with amines and sour oils. Because of its excellent properties, Viton® Extreme is nowadays also frequently used in the Chemical Processing Industry (CPI), under the harshest conditions.

Viton® Extreme can often solve problems in cases where the high cost of perfluoroelastomers such as Kalrez® is not acceptable. Hereunder, we present an overview of the chemical resistance of Viton® A, Viton® GF, Aflas® and Viton® Extreme.



#### Volume Swells in Various Fluids



**Viton® O-rings**

**Petrochemical industry**

Due to the permeability of O-ring compounds, high pressure gas can enter into the O-ring. There it builds microscopic bubbles between the molecular chains. Upon withdrawal of the pressure, the gas bubbles expand and cause cracks in the seal composition. ERIKS offers a compound V-162 that meets the highest demands in these applications: high pressures, high

temperatures, no extrusion, explosive decompression resistant, for contacts with natural gas, steam and corrosion inhibitors, etc. Available in all colours as long as it's black.

Obviously, for less critical applications our standard Viton® compounds are also perfectly suitable.



*petrochemical industry*

**Technical data VITON® V-162**

Hardness	94° Shore A
Tensile strength	16.2 MPa
Elongation	94%
Compression-set 22h/200°C on O-R 3.53mm	34%

### Viton® O-rings

#### Food Industry

ERIKS offers you a number of compounds with approval for contact with food stuffs.

These compounds meet the demands according to the FDA Regulations, title 21, Chapter 1, Subchapter B, Paragraph 177.2600 for use in contact with unpacked food stuffs.

For seals, two relevant FDA classes exist: firstly, Class 2 for contact with liquids and drinks and Class 1 for contact with milk, milk-derived products and edible oils.

Our standard Viton® FDA O-rings meet Class 1 requirements. Following is a specification of what ERIKS can offer with regard to FDA Class 1 approved O-ring compounds.



#### We offer:

##### FDA-approved Viton® Compounds for direct contact with food-stuff

Type	Description
V-178 FDA	red in 75+-5° IRHD : class 1
V-180 FDA	white in 75+-5° IRHD: class 1
Vulc-O-ring FDA-75MC152	in black: class 1
Vulc-O-ring FDA-90 MC 126	in black: class 1
M70 FDA	in green: class 1 /in zwarte kleur: class 1
V70H FDA	in black: class 1

Last but not least, we can supply a number of compounds, hardness varying from 60 to 95° Shore, that also meet FDA Class 2. We kindly invite you to contact us for further information.

**Viton® O-rings**

**Low temperature applications**

Fluoroelastomers do not really excel with regard to low temperature resistance. Because of its molecular construction, Viton® becomes relatively hard at temperatures lower than -10°C. By means of a special molecular structure and linking technology, however, it is possible to create a compound which can be applied with temperatures as low as -40°C: V-115 (based on Viton® GLT). Alternatively, Viton® GFLT is resistant to a minimum of -30°C.

Below, we present the TR-10 values of our compounds. The TR-10 value indicates, according to test standard ASTM D 1329, at which temperature a compound, after having been stretched 100%, returns to a stretch of 10%. In practice, it is accepted that an O-ring can still be applied at a 10°C lower temperature than indicated as the TR-10 value.



TR-10 values of various Viton® compounds

Eriks Type	IRHD±5°	TR-10	Viton® family
51414	70	-16°C	A
51424	80	-16°C	A
514320	90	-16°C	A
V-75	75	-16°C	A
V-90	90	-16°C	A
Vulc-O-Ring MC152	75	-16°C	A
V-115	75	-30°C	G
V-170	80	-17°C	A
V GFLT	75	-25°C	G

low temperatures

**Viton® O-rings****Special compounds**

We now present a range of compounds that can be applied under very specific circumstances. We take the liberty to only describe the main characteristics. More specific details are available on request.

**V-75 wit en V-60 wit**

V-75 white and V-60 white  
Both compounds have been designed in such a way that, despite the lack of carbon black, they possess optimal physical properties. Chemical and temperature resistance are identical to our standard compounds.

**V-170**

This compound is of such a pure composition, that few if any additions are able to flow out under vacuum conditions. This causes the O-ring to optimally maintain its sealing properties. V-170 is based on Viton® A. Hardness 80±5° IRHD.

**9021-95**

High modulus Viton® for optimal resistance against extrusion. Tensile strength is 16.7 Mpa and the modulus at 100% elongation reads 14 Mpa, as compared to 6 Mpa for standard Vitons. Hardness 95° Shore A.

**Note:**

For very specific requirements, we obviously can develop special compounds that meet your demands even better than those compounds described here. At this moment in time, we have disposal of about 65 different compounds that have already been applied successfully all over the world. It goes without saying that these are custom-made items which are usually not available from stock.

**V-9062-95**

Anti extrusion and resistant to acids and steam. Hardness 95° Shore A.

**V-158**

By the addition of PTFE particles, an optimal friction coefficient is achieved, which gives this compound an excellent wear resistance. Therefore, an excellent compound for dynamic seals!

**HP-V-75**

This compound offers a unique combination of chemical resistance and very good plasma resistance. Its contaminating substance content is up to 600 times lower than standard Viton®, it loses very little weight during plasma treatment and contains only one tenth of the surface uncleannesses in reactive plasma. Therefore, a typical compound for the semicon industry. In this respect, we also refer to our Kalrez® range of products for the semicon industry: we will happily send you more information on request.



special  
compounds



**Teflex® Viton® O-Rings**

Teflex® Viton® O-rings offer a unique combination of the sealing properties of a Viton® O-ring, and the chemical resistance of a FEP-Teflon® cover which encapsulates the O-ring. Through a special method of production we have succeeded in putting together a Viton® O-ring with very low compression set values.

On request, we also manufacture Teflex® Viton® O-rings in FDA execution. The FEP cover always meets FDA requirements. We can also supply FPA covers instead. In the following tables we present you the technical data of the Teflex® Viton® O-ring, as well as the test results of the Teflex® FEP/Viton® combination.



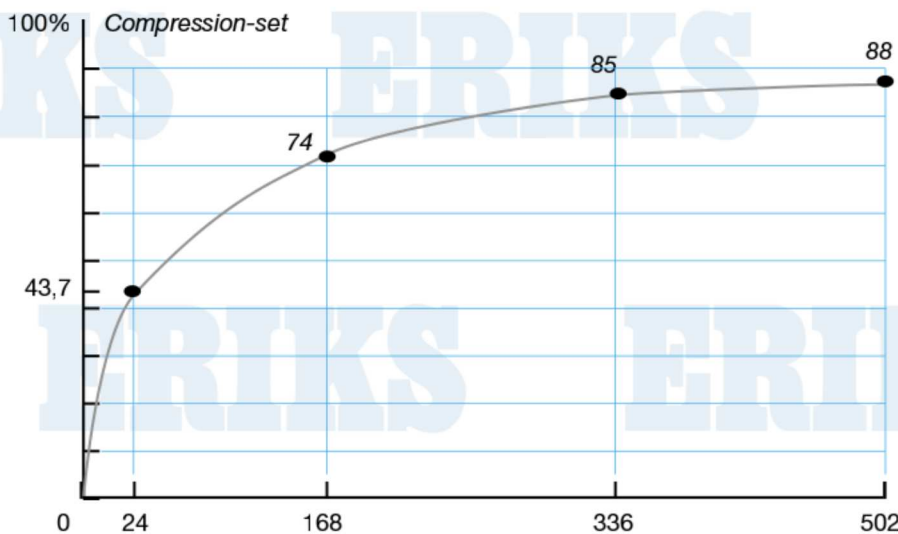
**Technical data Teflex® Viton® O-Ring**

Hardness	75+5° IRHD	ASTM D 2240
Tensile strength	10.7 Mpa	ASTM D 412
Compression-set 24h/200°C on O-R 3.53 mm	7.5%	ASTM D 395D
Heat aging 70h/250°C		ASTM D 573
Hardness	+3°	
Tensile strength	+15%	

**Technical data Teflex® FEP/Viton® combination**

Compression set to DIN 53517

24h / 150°C	32.8 %
336h / 150°C	42.3 %
24h / 200°C	43.7 %
168h / 200°C	74.0 %
336h / 200°C	85.6 %
502h / 200°C	88.5 %



Compression-set values at 200°C (DIN53517)

Feel free to ask for our more specific Teflex® documentation!

### Viton® O-ring cord

Next to the standard FKM cords, ERIKS also offers the most commonly used sizes of Genuine Viton® O-ring cords, from stock.



#### Technical data ERIKS Viton® O-ring cord, type 75 MC 152 E1

Hardness	DIN 53519	75+-5° IRHD
Tensile strength	DIN 53504	10.7 Mpa
Elongation	DIN 53504	213%
Density	DIN 53479	2.32+-0.05
Compression set 24h/200°C	DIN 53517	7.5% on sheet 9% on cord 5mm
Heat aging 70h/150°C	DIN 53508	
Hardness increase		+3%
Volume increase		+0.2%
Colour		black- standard green, brown: on demand
FDA 177.2600, class I		on demand

These cords are being manufactured with an extremely narrow tolerance, namely E1. The following table presents the tolerances of ERIKS Viton® O-ring cord, as compared to standard cords.

#### Tolerance values on Eriks VITON® cord

Diameter (mm)	Tolerances Eriks Viton® cord (mm)	Tolerances standard FPM cord (mm)
0 - 2,5	± 0,20	± 0,35
2,5 - 4,0	± 0,25	± 0,40
4,0 - 6,3	± 0,35	± 0,50
6,3 - 10,0	± 0,40	± 0,70
10 - 16	± 0,50	± 0,80
16 - 25	± 0,70	± 1,00

*Note: We also supply O-ring cords with a cross section tolerance of ± 0.05 mm, manufactured with special laser technology. Available on request.*

**Viton® O-rings**

**Vulc-O-ring MC 152**

Viton® Vulc-O-rings are made out of very homogenous Genuine Viton® O-ring cord with a hardness of 75 and 90° Shore and with very narrow cross section tolerance E1. The rings are made endless under a 45° biased angle, by means of a unique production process. The joint undergoes follow-up treatment and is invisible. Every Vulc-O-ring is made according to DIN 7715 E2. The O-ring cord has an extremely low compression set, resulting in a lifetime for Vulc-O-rings that exceeds the average for standard Viton® A O-rings.

**Note:**

In the chapter “Frequently asked questions about Viton®” you’ll find a comparison table regarding lifetime test results. After 3.000 hours at 200°C, the joint in the Vulco-O-ring showed the same elasticity value (compression set) as the original cord. This leads us to the conclusion that Vulc-O-rings can be considered equivalent to standard O-rings. A copy of the test reports is available upon your request.



- available in cord diameters 1.78 to 25 mm;
- inner diameters 60 to 5.000 mm;
- minimum order quantity 1 piece;
- delivery time 1 to 5 days;
- also available in FDA-approved execution;
- available in all Genuine Viton® compounds;
- available in cord with a cross section tolerance of  $\pm 0.05$  mm.

**All Vulc-O-rings are submitted to the following tests:**

- size check by means of a laser micrometer;
- flex testing of the joint;
- tensile strength test (by sample survey) on demand;
- life time test: see page 25.

**Note:**

we also supply Vulc-O-rings in Viton®, encapsulated by 0.5 mm perfluoroelastomer. This guarantees an optimal chemical resistance combined with an excellent compression set.

### Viton® profiles and rubber moulded products

ERIKS can supply you with Genuine Viton® profiles and rubber moulded products, on request, according to your drawings or models. Feel free to ask for our separate documentation on Profiles. This 80 page publication gives you an overview of the approx. 1.000 standard profiles which ERIKS keeps on stock for you in many different rubber compounds.



A separate mould list of available Viton® profiles and moulded products is also available on request.

#### Tolerances:

ERIKS supplies these Viton® products according to ISO tolerances, which we summarize hereunder.

#### Tolerance class DIN ISO 3302-1 for Viton® profiles

diameter (mm)	tol. class E1 (mm)	tol. class E2 (mm)	tol. class E3 (mm)
0 à 1.5	0.15	0.25	0.40
1.5 à 2.5	0.20	0.35	0.50
2.5 à 4.0	0.25	0.40	0.70
4.0 à 6.3	0.35	0.50	0.80
6.3 à 10	0.40	0.70	1.00
10 à 16	0.50	0.80	1.30
16 à 25	0.70	1.00	1.60
25 à 40	0.80	1.30	2.00
40 à 63	1.00	1.60	2.50
63 à 100	1.30	2.00	3.20

Our standard profiles are manufactured for E2 tolerances.

#### Tolerance class DIN ISO 3302-1 Viton® for moulded products

diameter (mm)	tol. class M1 (± mm)		tol. class M2 (± mm)		tol. class M3 (± mm)		tol. class M4 (± mm)	
0 à 4.0	0.08	0.10	0.10	0.15	0.25	0.40	0.50	
4.0 à 6.3	0.10	0.12	0.15	0.20	0.25	0.40	0.50	
6.3 à 10	0.10	0.15	0.20	0.20	0.30	0.50	0.70	
10 à 16	0.15	0.20	0.20	0.25	0.40	0.60	0.80	
16 à 25	0.20	0.20	0.25	0.35	0.50	0.80	1.00	
25 à 40	0.20	0.25	0.35	0.40	0.60	1.00	1.30	
40 à 63	0.25	0.35	0.40	0.50	0.80	1.30	1.60	
63 à 100	0.35	0.40	0.50	0.70	1.00	1.60	2.0	
100 à 160	0.40	0.50	0.70	0.80	1.30	2.0	2.5	
160 à -	0.3%	0.4%	0.5%	0.7%	0.8%	1.3%	1.5%	

Our standard profiles are manufactured for M2 tolerances.

**ERIKS Viton® oil seals**

Most of our standard FPM oil seals have been manufactured with Genuine Viton®. The Viton® name has been embossed in the oil seal itself for the sake of identification. Roughly 2000 standard, black sizes are available from stock, however, we invite you to send us your enquiries for whatever special size or execution you may need. Below, we present you the technical data of the Viton® compound used in our oil seals.

**Note:** Most of our Viton® oil seals are type GR or GRST. This implies that also the inner thread (is dat de juiste vertaling?) is provided with a thin Viton® cover, guaranteeing an optimal protection. Please ask for our technical manual on oil seals!



**Eriks Compound VK 801, black**

	Units	Requirements	Test Results
<b>PHYSICAL PROPERTIES</b>			
- Tensile Strength	P.S.I.	1450 min	1812
- Elongation	%	150 min	268
- Hardness (Shore A)	Points	80 ± 5	78
- Tear Strength	Kgf/cm	25 min	41
- Special Gravity		1.85 ± 0.02	1.85
<b>HEAT RESISTANCE (250°C FOR 70 HOURS)</b>			
- Tensile Strength Change	%	-25 max	-7
- Elongation Change	%	-25 max	-4
- Hardness Change	Points	+10 max	+3
<b>COMPRESSION SET (200°C FOR 24 HOURS)</b>			
	%	+50 max	+17
<b>ASTM N°. 1 OIL (150°C FOR 22 HOURS)</b>			
- Tensile Strength Change	%		+11
- Elongation Change	%		-4
- Hardness Change	Points		-1
- Volume Change	%		+4
<b>FUEL (23°C FOR 70 HOURS)</b>			
- Tensile Strength Change	%	-25 max	-9
- Elongation Change	%	-20 max	-7
- Hardness Change	Points	-5 to +5	-4
- Volume Change	%	0 to +10	+4
<b>COLD IMPACT TEST (-25°C FOR 3 MINUTES)</b>		Nonbrittle	Pass

*This material is tested to ASTM D2000 - M2HK810, A1-10, B38, EO16, EO36, EF31, F15  
 The Vulcanized Slabs - Press Cure 170°C for 10 Minutes, Post Cure 235°C for 24 Hours  
 The Vulcanized Pellets - Press Cure 170°C for 10 Minutes, Post Cure 235°C for 24 Hours*

### Viton®-sheets

ERIKS offers you, next to its well-known range of FPM standard sheet compounds, now also a Genuine Viton® compound. These sheets are being manufactured under type code 1270-40C and have the following properties:

- hardness: 75° Shore;
- specific weight: 1,85;
- tensile strength: 84 kg/cm<sup>2</sup>;
- elongation at break: 200%;
- compression set 22 hrs / 175°C: 40%;
- colour: black;
- ASTM 2HK707B 38EO 782

Cut seals are available in thickness varying from 0.5 to 10 mm.

#### Our other specialties in Viton® sheets are:

1. White FDA-CFR 177.2600 Viton® sheet
  - food quality KM-2-41-3;
  - available in thickness 1.5 and 3 mm (rolls 10 x 1.2 m)
2. Viton® sheet with Nomex reinforcement inner layer
  - TD-70NCI for membranes;
  - 37 yarns / inch;
  - tensile strength: 50 kg/cm in both directions;
  - available in thickness 1.5 and 3 mm (rolls 10 x 1.2 m)

#### Special production runs:

- brown and green compounds;
- hardness varying from 55 to 90° Shore A;
- Viton® B/GF/GLT/Extreme compounds
- Viton® acc. to MIL-R-83248-2 Type 11, class 1 QPL-83248-2 3953-MLS95-009;
- Viton® according to MIL-R-83248-2 Type 11, class 11

#### Overview of the various standard compounds

Technical data	Viton® 1270-40C	Viton® KM-2-41-3	Viton® TD 70 NCI
Hardness shore A ±5	70°	65°	75°
Tensile strength kg/cm <sup>2</sup>	100	80	84
Elongation	165%	200%	200%
Density	1,85	2,09	1,85
Colour	zwart	wit	black/inlay
Standard available	0,5 to 10 mm	1,5 and 3 mm	1,5 and 3 mm

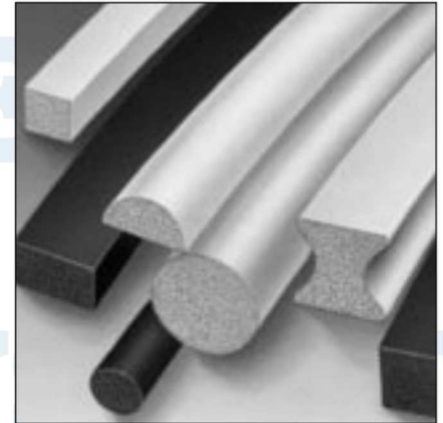
#### Note:

A full study of the various FPM and Viton® compounds is available on request.

**Viton®-Sponge rubber**

**Sponge type HE/Viton® as a profile**

HE/Viton® sponge is an open/closed cell sponge rubber with high density and is highly resistant to most chemicals. Temperature resistance ranges from -25° to +200°C. We supply shape-vulcanised profiles in round, square and rectangular execution from stock. A list of available profiles can be provided on request.



**Specifications**

- Description : open cell sponge rubber with closed cell strong construction, cell size < 0,6 mm
- available products : profiles, that can be fabricated into custom-made products by cutting, grinding, fraising and glueing;
- fire resistance : hardly inflammable;
- ozone resistance : DIN 53509 - no cracks;
- specific weight : 700-800 kg/cm<sup>3</sup>;
- compression : 50% compression of Ø12 mm round profile: 4.000 N/m;
- Hardness : 20-30° Shore A;
- Temperature resistance : -25° to +200°C;
- Chemical resistance : similar to Genuine Viton® A;
- Compression set : at 200°C, 22 hrs, 50% transformation: 55%;  
 at 85°C, 22 hrs, 50% transformation: 8%

### Viton® sealants

#### Eriks viton® lijm en kit

ERIKS Viton® sealant is a Genuine Viton® compound sealant, manufactured in co-operation with DuPont Performance Elastomers. Our Viton®, single-component glue is resistant against most concentrated acids and many other chemicals, and also against ozone, steam and heat up to 200°C.

#### Instructions for use:

Remove any grease and oils from the surfaces. Apply sealant to one surface and allow to dry for about 20 seconds, then join the two surfaces while pressing them together for about 2 minutes. If possible, continue to apply pressure as long as possible. Use of a hot air blower is recommended. Please make sure to also read the instructions that come with the sealant.

#### Standaardly available in:

- 50 ml tubes: 48.70 Euro
- 320 ml cartouche : 180 Euro

#### Applications

- custom-made production of seals;
- repair of Viton® parts;
- anti corrosion treatments

#### Advantages:

- easy to use (no mixture required);
- resistant to 200°C;
- 10 year shelf life if kept in refrigerator
- very flexible
- chemical resistance as Genuine Viton®;
- also available in various colours;
- also available, on request, in 850 ml packages.

#### Note:

Original DuPont-brochure on demand.

#### Technical data

Viton® content : 75%  
 Tensile strength : 1655 psi (1.150 N/cm<sup>2</sup>)  
 Elongation at break : 285%  
 Concentrated sulphuric acid : +6% vol.  
 Chloric acid : +3% volume

#### Viton® sealant safety instructions

- Storage: do not stock on an inflammable location;
- Prevent contact with eyes and skin and wash hands after use;
- Provide enough ventilation according to OSHA regulations;
- Close the packing after use;
- After use, keep in a refrigerator for optimal storage;
- After contact with eyes or skin: wash during 15 minutes at east;
- After inhalation: make sure to inhale lots of fresh air, if necessary ask for a doctor;
- Never bring the glue in contact with the mouth. Should this happen nevertheless, immediately consult a doctor.





**Frequently asked questions about VITON®**

**1. Does the compound colour affect the quality of the seal?**

Our experience is that chemical and temperature resistance do not change. Mechanical properties of black compounds, however, are often much better than those of coloured compounds.

**2. Does the type of carbon black affect the quality of a seal?**

Definitely! The standard MT990 carbon black filler offers very good results in all respects. Specific carbon black, such as e.g. Austin Black, can strongly improve the sealing properties. Our compound V-75 brown is made with Austin Black and shows the lowest values in all compression set tests. Other carbon blacks offer the advantage of e.g. a higher tensile strength or wear resistance.

**3. How fast can you supply odd-size O-rings?**

Through our unique vulcanisation process, we can supply any Vulc-O-ring within 48 hours, if required. Standard delivery time for odd-sizes is 1 à 2 weeks.

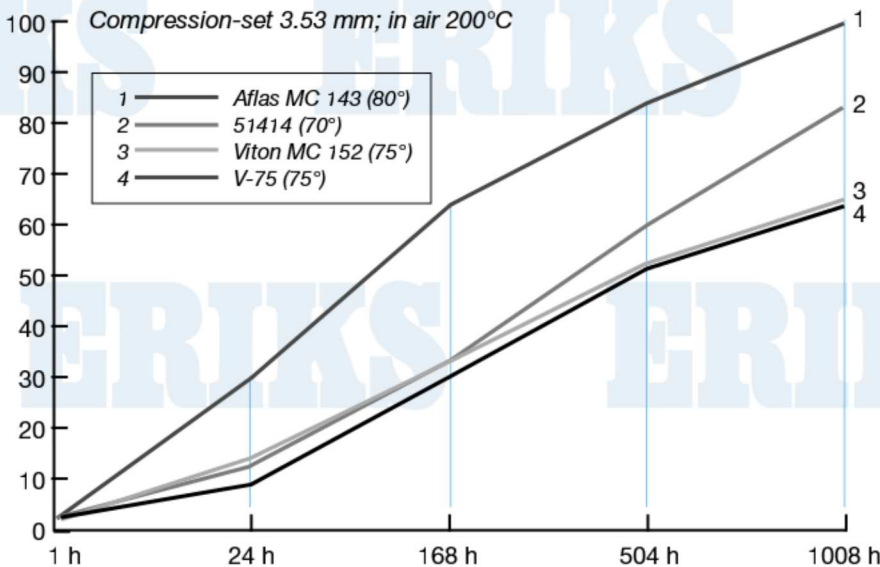
**4. What is post-curing?**

After moulding, Viton® parts have to be post-cured at 200°C during 8 to 24 hours. Post-curing optimizes the vulcanisation, causing all links in the molecule structure to develop. The method of post-curing can strongly affect the final quality of the compound.

**5. Is there a difference in lifetime among the various compounds?**

For sure! We have subjected some of our compounds to lifetime tests. We measured the compression set in air at 200°C during 1.000 hours. One may assume that an O-ring has lost its sealing properties after the compression set has reached 100%. The following table gives an overview of four different compounds.

**• Viton® Lifetime Test**



### Frequently asked questions about VITON®

#### 6. What is the price difference among these various compounds?

It is difficult to give an indication, since prices highly depend on sizes and production quantities. As a guideline, one may count with the following:

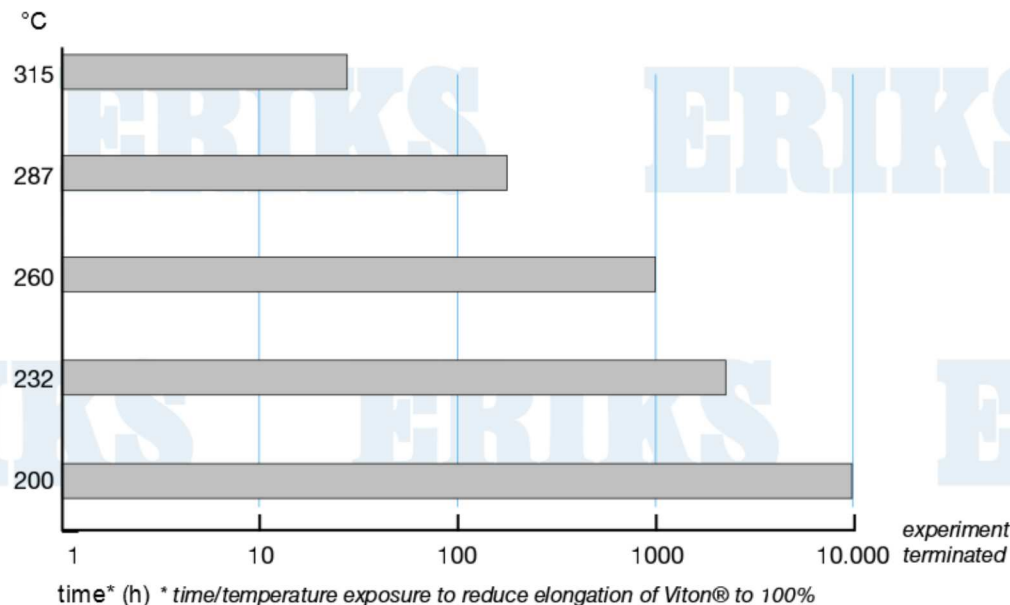
Viton® A - standard	1
Viton® A - V-75	1,5
Viton® B	5
Viton® GF	10
Viton® Extreme	50

#### 7. How does media temperature affect the lifetime of a Viton® seal?

The lifetime of a seal is strongly affected by media temperature. We have measured the time after which the elongation at break is reduced to 50%, at different media temperatures.

Following are the results, that are only applicable to Genuine Viton® compounds.

##### • Heat resistance (air)



#### 8. How do I learn about the chemical resistance of a Viton® seal?

We will gladly send you a full and continuously updated chemical resistance list, upon request. A summarized list is included in this brochure. Since we are in close contact with DuPont Performance Elastomers' laboratory in Geneva, we are always assured of possessing the latest data. In our own test laboratory, we can also organise specific tests with our Viton compounds in media specified by you.

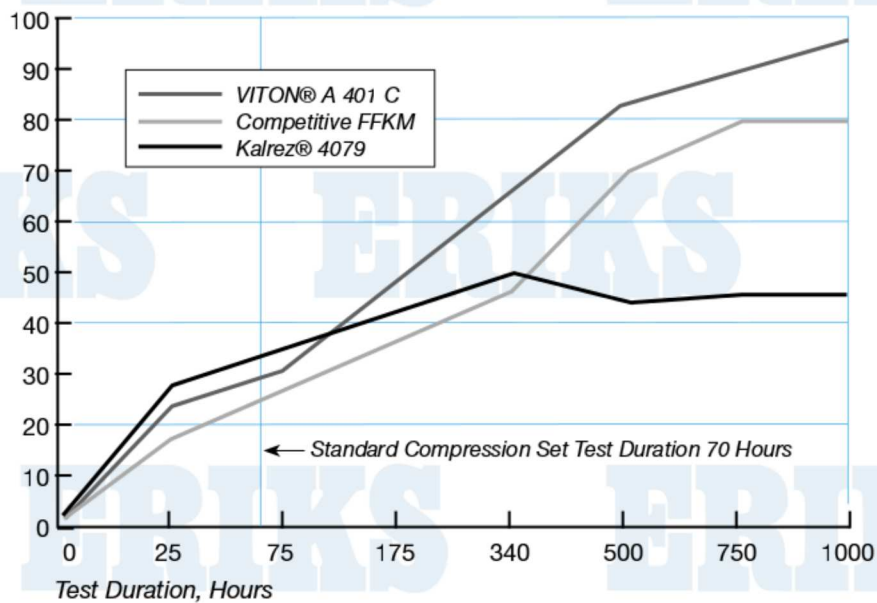
**Frequently asked questions about VITON®**

**9. When do I have to chose Kalrez®?**

Kalrez® is a perfluoroelastomer and, as such, offers chemical and temperature resistance of a different grade, compered to Viton®. Please consult us for more specific information about this “top of the list” problem-solver. Hereunder, we present the results of compression set tests with Viton® and Kalrez®.

**• Long-Term Compression Set in Air at 200°C (Comparison as a function of time)**

Compression set %



**Note:**

Also ask for our new Kalrez Spectrum compound.

### Chemical Resistance List (Summary)

Chemical Resistance List				
Ericks Compound:	Kalrez®	Viton® Extreme CV75	Viton® GF V141	Viton® A 51414
<b>AROMATIC HYDROCARBONS</b>				
- Benzene	1	1	1	1
- Toluene	1	1	1	1
<b>FUEL &amp; FUEL BLENDS</b>				
- ASTM Reference Fuel C	1	1	1	1
- Gasoline (Shell SU-2000)	1	2	2	2
- R. Fuel C/Methanol 85/15	1	1	1	3
- R. Fuel C/Methanol 15/85	1	1	1	4
- R. Fuel C/MTBE 75/25	1	1	1	3
- R. Fuel C/MTBE 25/75	1	2	4	4
- R. Fuel C/ETBE 75/25 (Ethyl tert-butyl ether)	1	1	1	1
- R. Fuel C/ETBE 25/75	1	1	1	1
<b>ALIPHATIC HYDROCARBONS</b>				
- ASTM oil #3	1	1	1	1
<b>SOLVENTS</b>				
- Carbon Tetrachloride	1	1	1	1
- Methylene Chloride	1	1	2	2
- Trichloroethane	1	1	1	1
- Dimethylformamide (DMF)	1	1	4	4
- MEK/Toluene 92/8	1	2	4	4
- Iso-octane/Toluene 90/10	1	1	1	1
- MTBE/Toluene 92/8	1	3	4	4
<b>KETONES</b>				
- Acetone	1	3	4	4
- MEK (Methyl Ethyl Ketone)	1	3	4	4
<b>AIRCRAFT HYDRAULIC FLUIDS</b>				
- SKYDROL 500B	1	2	3	4
- SKYDROL LD	1	2	4	4
<b>PETROLEUM ENVIRONMENT</b>				
- Sour gas (20% H <sub>2</sub> S), aged 72 hrs./150°C	1	2	4	4
- Sour oil (10% H <sub>2</sub> S)+NACE B, aged 72hrs./150°C	1	2	4	4
- Sour Brine (10% H <sub>2</sub> S)+NACE A, aged 72hrs./150°C	1	2	4	4
- Crude Oil, aged 70 hrs./100°C	1	1	1	1
- EP Gear Lube 80W/90, aged 168 hrs./150°C	1	2	4	4
- Steam < 149°C	1*	2	2	2
- Steam > 149°C	1*	3	3	3

1 = resistant / 2 = 5 à 10% swell / 3 = 10 à 40% swell / 4 = 50% swell or more

\* = Capability is compound specific

**Chemical Resistance List (Summary)**

Chemical Resistance List				
<i>Eriks Compound:</i>	<i>Kalrez®</i>	<i>Viton® Extreme CV75</i>	<i>Viton® GF V141</i>	<i>Viton® A 51414</i>
<b>OTHER FLUIDS</b>				
- Water/Nalcool 2000/KOH	1	1	4	4
<b>ACIDS</b>				
- Acetic Acid, glacial	1	2	3	4
- Hydrochloric Acid, conc.	1	1	1	1
- Hydrofluoric Acid, 48%	1	1	1	1
- Anh. Hydrofluoric Acid (AHF)	1	2	3	4
- Nitric Acid, 60%	1	1	2	4
- Sulfuric Acid, 90%	1	1	1	1
<b>INORGANIC BASES</b>				
- Potassium Hydroxide, sat.	1	1	4	4
- Sodium Acetate	1	1	2	3
<b>ESTERS</b>				
- Dimethylphthalate	1	1	1	2
- Butyl Acetate	1	3	4	4
- Ethyl Acetate	1	3	4	4
<b>AMINES</b>				
- Aniline	1	1	1	1
- Ethylenediamine	1	3	4	4
<b>ALCOHOLS</b>				
- Isopropyl Alcohol	1	1	1	1
- Methanol	1	1	1	4
- Phenol	1	1	1	1
<b>ETHERS</b>				
- Tetrahydrofuran	1	3	4	4
- MTBE (Methyl tert-butyl ether)	1	3	4	4

1 = resistant / 2 = 5 à 10% swell / 3 = 10 à 40% swell / 4 = 50% swell or more  
 \* = Capability is compound specific

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