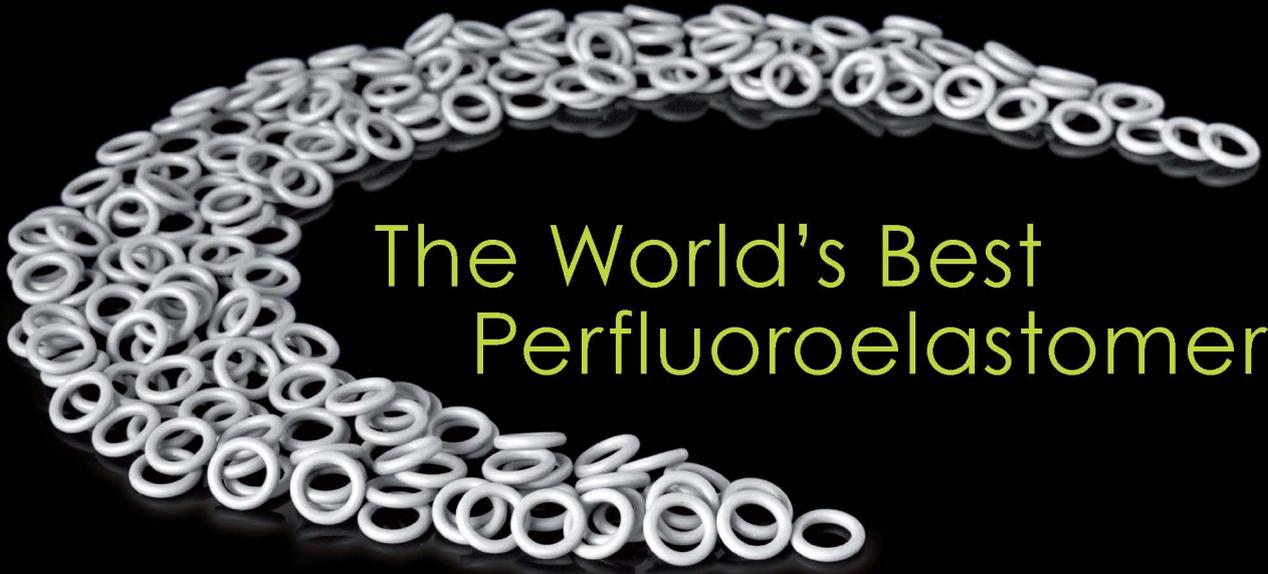


Fluorezi®



The World's Best
Perfluoroelastomer...

< Introduction >

WHO WE ARE

NewDealSeals, a family owned company, was founded in 1994. With a sound business model based on strong family ties, we have created a unique sense of solidarity, flexibility and commitment that underpin our long-term focus on clients, staff, suppliers and the community at large.

WHAT WE MAKE

We design, develop and manufacture the highest quality O-rings and sealing components in the industry. Over 100,000 different sealing components are manufactured each year, from standard O-rings to complex sealing products, each available in a wide number of different dimensions, shapes and materials.

KEY FACTS

- > 20+ years of sealing expertise
- > Design and engineering department
- > Material laboratory
- > Over 100,000 different sealing components available
- > OEM supplier to many different industries

THIS BROCHURE

For the last 20 years, NewDealSeals has been advising companies on the use of perfluoroelastomers, drawing on the extensive knowledge it has gained from many different industries, the producers of perfluoroelastomers and professional literature on the subject.

NewDealSeals is often asked to come up with an alternative to DuPont Kalrez® perfluoroelastomers. This has led us to develop and launch Fluorezi®, a product that is described in this brochure. We believe that Fluorezi® is the best perfluoroelastomer-alternative currently available.



< General perfluoroelastomer information >

HISTORY

In 1957, DuPont introduced the first commercial fluoroelastomer (abbreviated as FKM). It was sold under the trade name Viton® (Viton® A). This fluoroelastomer has a fluorine content of 66%.

Since this time, fluoroelastomer use has increased steadily in line with the introduction of requirements that are more stringent. DuPont was forced to come up with a new type of elastomer that would satisfy the ever more stringent demands of the industry.

In 1968, DuPont introduced Kalrez®, the first commercial perfluoroelastomer (abbreviated as FFKM). DuPont applied for a patent for this perfluoroelastomer.

FFKM has a fluorine content of more than 71%. These perfluoroelastomers with a higher fluorine content have a better chemical and heat resistance than standard fluoroelastomers do. Perfluoroelastomers can be economical when the costs of seal failure are high, involving downtime and replacement costs, environmental emissions or spills, the safety of people, or the contamination of products.

In fact, perfluoroelastomers resist over 1,800 different chemicals while offering the high temperature stability of P.T.F.E. (320 °C).

DuPont skilfully utilised its position as a monopolist in the worldwide sealing industry. It produced both the raw material and the finished products (sealing parts), because this was more profitable.

BRANDS

In 1988, the perfluoroelastomer patent held by DuPont expired. Subsequently, other raw material producers like 3M, Solvay and Daikin were able to enter the perfluoroelastomer market. These companies offered similar raw materials.

For example:

- > Dupra® (Daikin Industries)
- > Dyneon® (3M Company)
- > Tecnoflon® PFR (Solvay Plastics)

Several suppliers of sealing solutions decided to do business with one of these raw material suppliers, introduced perfluoroelastomers under their own brand name and adopted the high price level applicable for DuPont Kalrez®. Some of these suppliers are:

- > Chemraz® (Greene, Tweed & Company)
- > Isolast® (Trelleborg Sealing Solutions)
- > Parofluor® (Parker)
- > Simriz® (Freudenberg Sealing Technologies)

In recent years, NewDealSeals has received an increased number of requests in which it is asked to come up with a cost-effective alternative to DuPont Kalrez® and the perfluoroelastomer alternatives referred to above. As a result, NewDealSeals developed and launched Fluorezi®, its own perfluoroelastomer, in 2010.

EXPERTISE

Since being founded in 1994, NewDealSeals has been advising companies on the use of elastomers, drawing on the extensive knowledge it has gained from many different industries, the producers of elastomers and professional literature on the subject.

NewDealSeals has been relentless in its efforts to achieve improvements in the manufacture of perfluoroelastomer parts. This has resulted in the introduction of Fluorezi®, our own perfluoroelastomer.

NewDealSeals Fluorezi® sealing solutions are already being used successfully in high-performance environments in several application areas, including the maritime industry, the chemical processing industry, the oil and gas industry and the pharmaceutical industry.

THE BENEFITS OF NEWDEALSEALS FLUOREZI®

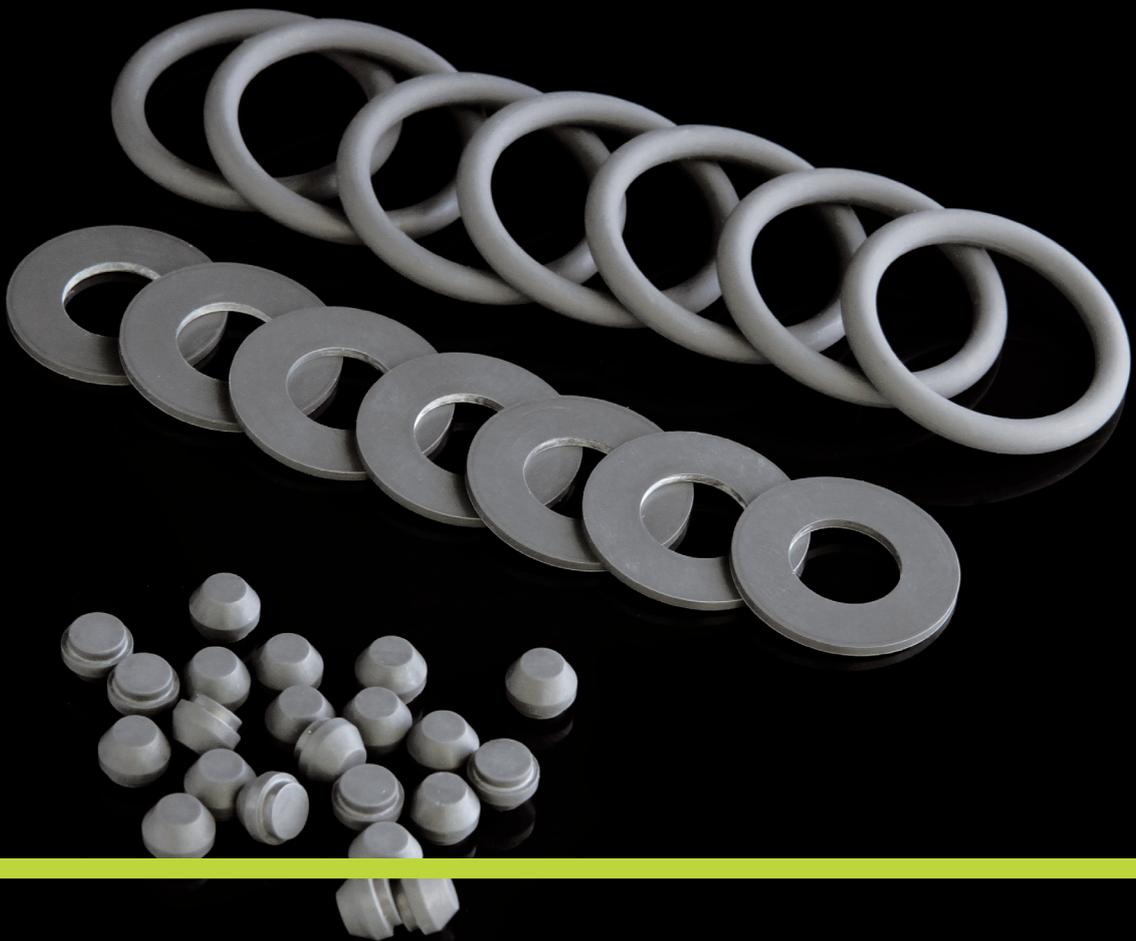
NewDealSeals Fluorezi® has the following advantages in comparison with other established perfluoroelastomer sealing solution suppliers:

- > Lower costs for a comparable high level of quality, by using the same raw material suppliers as established companies
- > A high and consistent quality, which we achieve by using our own production facility
- > Flexibility (from single-piece to large-series production)
- > Customized service
- > A short delivery time

< Industries >

Fluorezi® perfluoroelastomers bring all these benefits to a wide range of applications required by equipment manufacturers and end users in many different industries:

- > Chemical processing
- > The pharmaceutical and food industries
- > Oil and gas
- > Hydrocarbon processing
- > Semiconductor and nanotechnology
- > Lacquer, print and coatings
- > The aerospace and aviation industries
- > The maritime industry
- > Power generation



< Key chemical resistance >

Fluorezi® is resistant to the following chemical groups:

- Concentrated alkalis and bases
- Alcohols and aldehydes
- Ketones, esters and ethers
- Halogens and strong oxidizing media
- Hydraulic and fuel oils and fuels
- Organic solvents
- Hot water and steam
- CIP and SIP cleaning media
- Aliphatic and aromatic amines
- Ethylene oxide and propylene oxide

For more detailed information, please see the Chemical Compatibility Guide (Pages 34-85) in our Technical Handbook: The World's Best O-ring Handbook.



< Product Range >

O-RINGS

O-rings provide engineers with a high-performance sealing element in a wide range of static and dynamic applications. NewDealSeals offers O-rings according to the following standards:

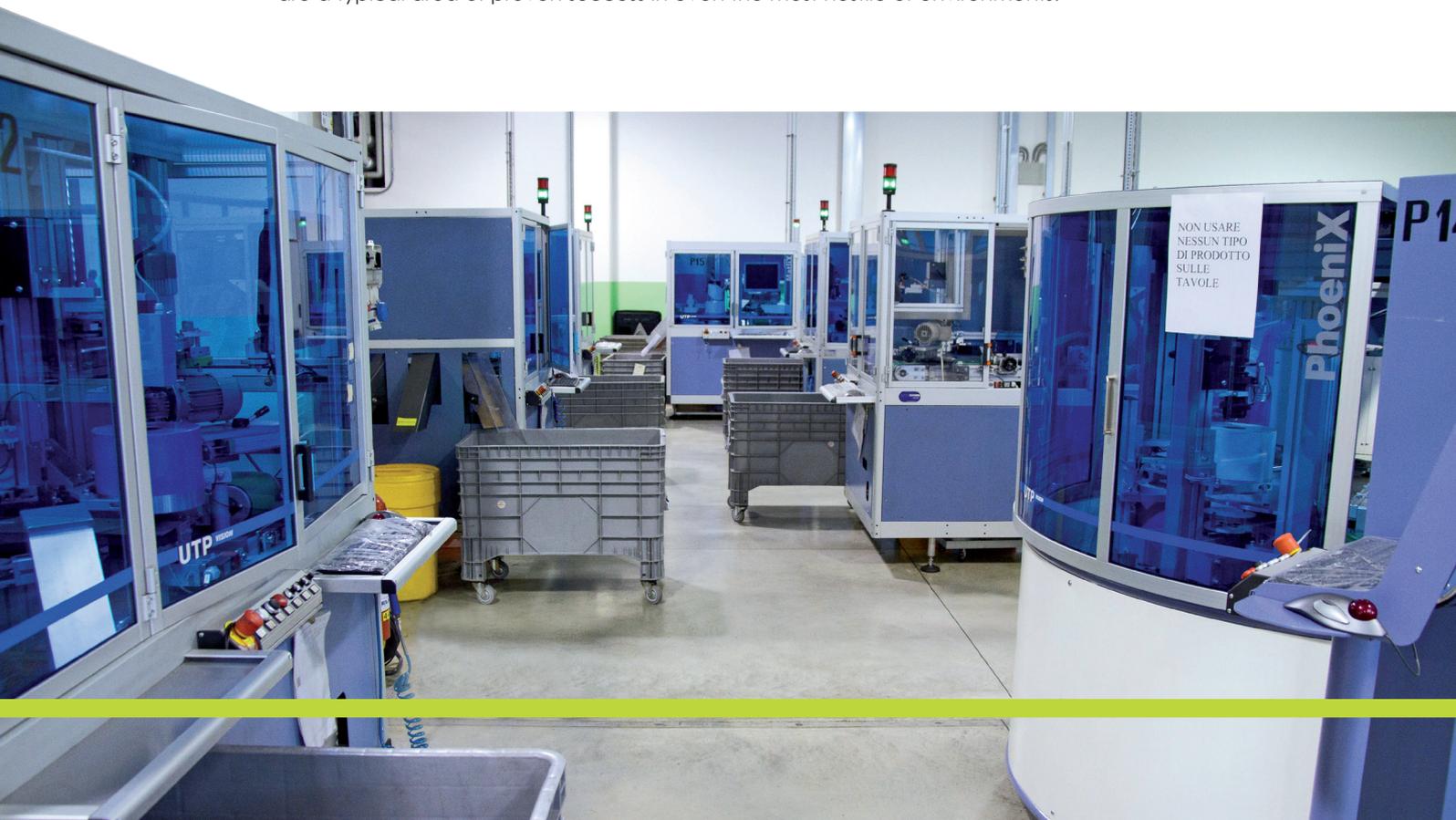
- > AS 568A American standard
- > DIN 3701 German standard
- > BS 1806/ BS 4518 British standard
- > JIS B2401 Japanese standard
- > NFT47-501 French standard
- > SMS 1568 Swedish standard
- > ISO 3601 International standard

Moulded O-rings in non-standard sizes are available according to customer specifications.

CUSTOM-MOULDED PARTS

Specific parts are designed, developed and produced in conjunction with customers to ensure that all requirements are satisfied. NewDealSeals offers custom-moulded parts in virtually any shape.

The physical characteristics of perfluoroelastomers require careful design input from engineers at NewDealSeals. NewDealSeals perfluoroelastomer custom-moulded parts are a typical area of proven success in even the most hostile of environments.



< Fluorezi® material range >

HIGH CHEMICAL RESISTANT FFKM (40 SERIES)

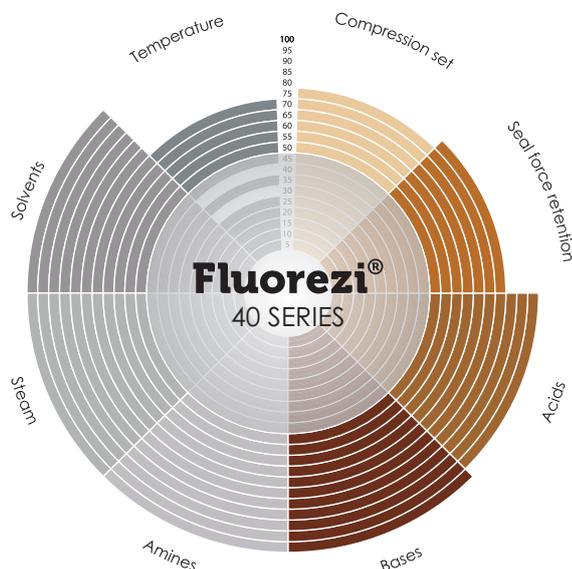
Equivalent to Kalrez® 6375, Chemraz® 505

Typical Physical Properties	Method	4075B	4076B	4090B
Hardness (Shore A)	ASTM D2240	78	76	89
Color		Black	Black	Black
100% Modulus (MPa)	ASTM D412	7.3	9.8	13.6
Tensile Strength at Break (MPa)	ASTM D412	12.5	16.8	22.5
Elongation at Break (%)	ASTM D412	223	187	145
Compression Set (%; 70 hr @ 200 °C)	ASTM D395B	34	28	45
Maximum Continuous Service Temperature (°C)		230	230	230
Maximum Service Temperature (°C)		250	250	250

The 4075B compound provides the chemical processing industry with an economic solution with excellent chemical resistance. This compound has improved acid resistance and thermal stability, which facilitates excellent performance even under harsh chemical conditions. It is also ideal for wet chemical fluid handling, cleaning and chemical etching processes.

The 4076B compound is a FFKM compound and additionally has a high purity, low metal ion content with low extractable in a wide range of chemicals.

The 4076B compound is ideal for wet process electronics manufacturing in the semiconductor, flat panel display and aerospace industries.



The 40 Series is produced in black and white, in different hardnesses and is made and packaged in a clean room to ensure outstanding cleaning quality. Please contact our sales department for any additional information you might require.

HIGH TEMPERATURE RESISTANT FFKM (41 SERIES)

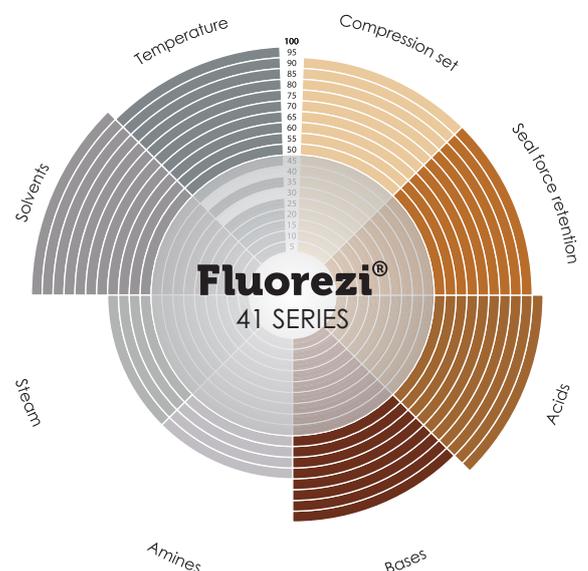
Equivalent to Kalrez® 4079

Typical Physical Properties	Method	4175B	4190B
Hardness (Shore A)	ASTM D2240	73	91
Color		Black	Black
100% Modulus (MPa)	ASTM D412	5.9	8.3
Tensile Strength at Break (MPa)	ASTM D412	11.8	14.5
Elongation at Break (%)	ASTM D412	257	170
Compression Set (% 70 hr @ 200 °C)	ASTM D395B	27.4	36
Maximum Continuous Service Temperature (°C)		315	315
Maximum Service Temperature (°C)		330	330

The 41 Series is a technically advanced high temperature perfluoroelastomer. It is designed to meet the challenges of higher temperature applications. Its fully fluorinated back bone structure provides a very broad chemical and thermal stability.

The 4175B compound is very suitable for use in a large number of different semiconductor process environments. Examples include rapid thermal processing, dry etch, wet etch and wet clean. It is also an excellent product for chemical sealing applications. It exhibits low weight loss in reactive plasmas and has a high tolerance to temperature fluctuations.

The 41 Series is produced in black and white, in different hardnesses and is made and packaged in a clean room to ensure outstanding cleaning quality. Please contact our sales department for any additional information you might require.



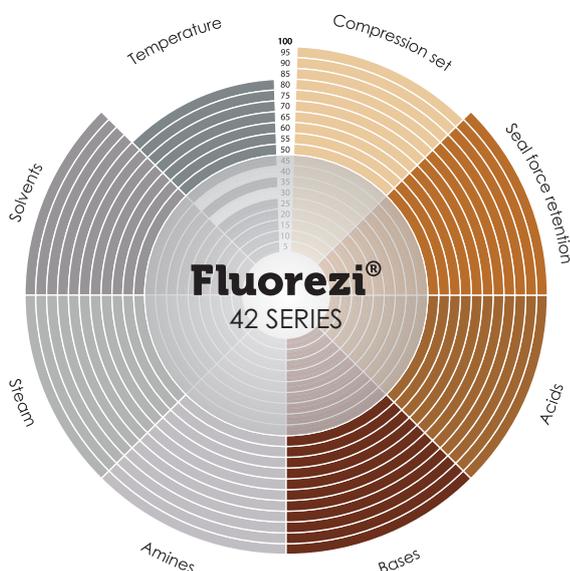
HIGH PURITY FFKM (42 SERIES)

Equivalent to Kalrez® 8100, 9100, 9300

Typical Physical Properties	Method	4275A	4280A
Hardness (Shore A)	ASTM D2240	76	81
Color		Dark amber	Dark amber
100% Modulus (MPa)	ASTM D412	6.2	7.2
Tensile Strength at Break (MPa)	ASTM D412	16.9	17.8
Elongation at Break (%)	ASTM D412	253	210
Compression Set (% 70 hr @ 200 °C)	ASTM D395B	17.4	23
Maximum Continuous Service Temperature (°C)		280	285
Maximum Service Temperature (°C)		305	305

The 4275A compound is a technically advanced ultra clean perfluoroelastomer. It has been designed specifically to meet the challenging demands of the semiconductor industry and other applications requiring an extremely low extraction grade polymer in demanding environments. Its fully fluorinated backbone structure provides very broad chemical and thermal stability. It has a low compression set, excellent chemical resistance, good mechanical properties and outstanding thermal stability.

Ultrapure post-cleaning and packaging are standard for all parts of the 42 Series. The 42 Series is produced in transparent dark amber and white and in different hardnesses. Please contact our sales department for any additional information you might require.



< Fluorezi® comparison >

COMPARISON TABLE FOR FLUOREZI®, KALREZ® AND CHEMRAZ®

Fluorezi Compounds	4075B	4081B	4090B	4175B	4176B	4275A	4360B	4470B	4475B	4580W
Kalrez compounds										
1050LF	•									
2035	•									
2037						•				
4079				•	•					
6221										•
6230										•
6375	•	•								
6380	•									
7075									•	
8475							•			
8575							•			
8900				•	•					
9100						•				
Chemraz compounds										
505	•									
510	•									
513	•	•								
520			•							
543		•								
550	•									
551					•					
555				•						
562				•						
570		•								
571		•								
592		•								
600				•						
605	•			•						
615				•						
629						•				
639						•				
640					•					
644					•					
653					•					
655					•					
656		•								
661					•					
667						•				
E38								•		
SD517										•
SD585										•
SD625										•
XCD					•					
XRZ						•				
XTR							•			

*4075B and 4175B are recommended for standard applications

*4081B and 4176B are recommended for ultra high pure environments



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