

## Garlock Diaphragms



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# GYLON® Style 3522 PTFE Diaphragms

Your solution for more reliable and longer lived pump and valve diaphragms

No one likes equipment downtime: that's why we created the most durable, long lasting line of pump and valve diaphragms. From pure PTFE to one-piece bolt on PTFE bonded rubber diaphragms, if you have a difficult or critical application, we have the diaphragm to meet your needs.

Exclusive to Garlock, the GYLON® Style 3522 PTFE Diaphragm material is a time proven product, made using a proprietary process which optimizes quality and uniformity. Using the best available technology this material offers the longest cycle life in the industry, and continues to outperform all competitive materials. With a world class molding facility, we can make products to meet all of your requirements.



## Typical Applications

- » Metering pumps
- » Dosing pumps
- » Diverting valves
- » Aseptic valves
- » Double diaphragm pumps

## Reduced Void Content (see Diagram 1)

- » Less permeation
- » Reduced potential for cross-contamination of process media
- » The use of thinner material which reduces material costs and creates energy savings

## Increased Flexibility (see Diagram 2)

- » More time between changeovers
- » Decreased labor and documentation costs
- » Improved equipment reliability and life
- » Increased product uptime
- » Energy savings through increased equipment efficiency
- » Protection of downstream equipment

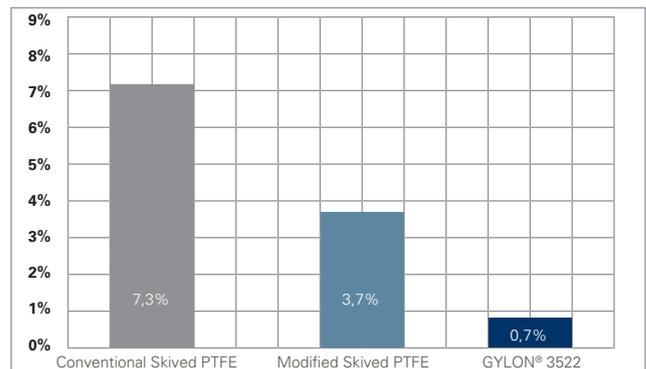
## Material Properties

- » Compressibility 20-25%
- » Temperature Maximum +260°C (+500°F)
- » Pressure 55 bar (800psi)
- » Recovery 50%

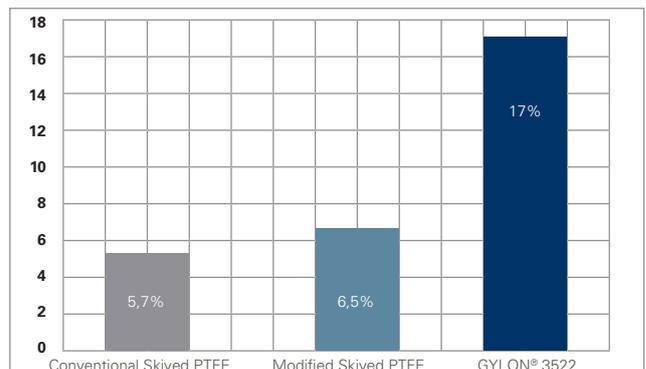
## Specifications

- » FDA Regulation 21CFR177.1550
- » 3A Standard
- » USP Class VI Chapter 87 & 88
- » USP Part 31, 281 and 661

Void Content (Diagram 1)



MIT Flex Endurance (ASTM D2176) (Diagram 2)



# GYLON ONE-UP<sup>®</sup> Pump Diaphragms

## Your solution for sanitary applications in air operated diaphragm pumps

For years the industrial ONE-UP<sup>®</sup> pump diaphragm has been the first choice for the most demanding industrial applications. We are now introducing the new GYLON ONE UP<sup>®</sup> for the most demanding sanitary applications.

Made using our exclusive GYLON<sup>®</sup> PTFE diaphragm material and a proprietary EPDM rubber backing, this product is made with the same patented rib construction as our standard industrial ONE-UP<sup>®</sup>.

### FDA Compliance

This FDA compliant diaphragm will have the same chemical resistance and long life as the industrial ONE-UP<sup>®</sup>, however this diaphragm can be used in food and regulated applications. The GYLON ONE-UP<sup>®</sup> will outperform your current diaphragm; because it is not as abrasive resistant as the industrial ONE-UP<sup>®</sup>, we are recommending it for non-abrasive service only.

### Availability

Available in all of the sizes and pump offerings that the industrial ONE-UP<sup>®</sup> is made: ALMATEC, ARO, DEPA, BLAGDON, FLOTRONICS, GRACO, UNITEC, VERDER, VERSAMATIC, WARREN RUPP, WILDEN AND YAMADA.

### Easy Installation

Made in a one-piece design, this diaphragm is simple to install. Whether it incorporates bolt holes or a perimeter sealing bead, it fits easily into the pump housing without the difficulties associated with installing two-piece diaphragm set.

### Typical Applications

Air operated diaphragm pumps for food and pharmaceutical applications.



### Material properties

- » Temperature Minimum +4°C (+40°F)
- » Temperature Maximum +149°C (+300°F)

### Specifications GYLON<sup>®</sup>

- » FDA Regulation 21CFR177.1550
- » 3A Standard
- » USP Class VI Chapter 87 & 88, USP Part 31, 281 and 661
- » EC 1935/2004 and EC 10/2011

### Specifications EPDM

- » FDA Regulation 21CFR177.2600

# Garlock ONE-UP® Pump Diaphragms

## Your solution for industrial applications

### Guaranteed to last longer

Garlock ONE-UP® pump diaphragms, containing high performance PTFE sheet on the wetted side, are a significant advancement over conventional PTFE diaphragms. Considerably stronger, with greater flex life, they provide a dramatic improvement in service life: Satisfaction guaranteed!

### Durable Versatility

Chemical resistance is the property that makes Garlock ONE-UP® pump diaphragms so versatile. Suitable for use with most chemicals and in elevated temperatures and pressures, these diaphragms are ideally suited for those general service pumps that are likely to be put to one use today and another use tomorrow. You can expect long, effective service life and reduced maintenance costs with these durable one-piece diaphragms. Strength and chemical resistance make Garlock ONE-UP® pump diaphragms perfect for most of your pumping requirements.

### Material / Construction

» One-piece composite design with a proprietary 100% PTFE on wetted side.

### Temperature Range

- » Neopren backing: -10°C to 93°C ( 14°F to 200°F)
- » EPDM backing: -10°C to 137°C (14°F to 280°F)
- » VITON® baking: 0°C to 176°C (32°F to 350°F)

### Chemical Resistance

» Chemical resistance to all media in pH 0 – 14 range, except molten alkali metals and elemental fluorine.

### Flex Life

» >70 million cycles (ASTM-D-2176, 0.020 inch thick, 0.600 inch wide)

### Impact Strength

» 30.4 feet pound/inch (ASTM-D-256, 0.220 inch thick)

### Physiological Safety

» FOR INDUSTRIAL USE ONLY. Not for use in food, drug, cosmetic or medical device manufacturing, processing or packaging operations.

### Easy Installation

» Since the Garlock ONE-UP® pump diaphragm is a one-piece design, it is simple to install. Whether it incorporates bolt holes or a perimeter sealing bead, it fits easily into the pump housing without the difficulties associated with installing two piece diaphragm set.



### Key Features

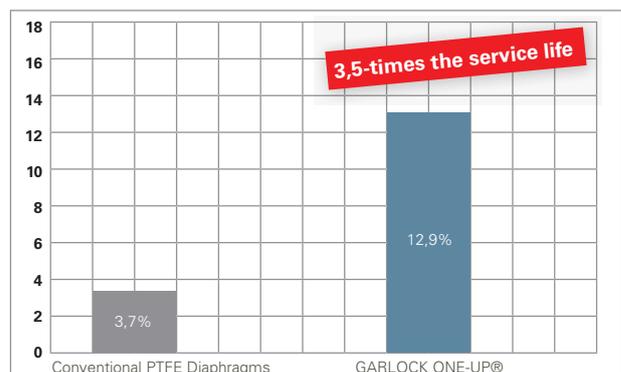
- » Contains high performance PTFE sheet
- » Bonded to a reinforced rubber backing
- » Patented rib construction
- » Chemically inert & temperature resistant
- » Greater flex life
- » Available for most brands of pumps & sizes

### Key Benefits

- » Lasts Longer: Replace diaphragms less often
- » Versatility: Diaphragms work with most chemicals
- » Cost: Lowers maintenance and operating costs

### Field Testing

- » Garlock ONE-UP® pump diaphragms have been extensively field tested in a wide variety of industries including chemical processing, paint, solvent and detergent manufacturing and wastewater treatment.
- » Documented case histories show that the average service life is 3.5 times longer than conventional PTFE diaphragms.



# Example Cases

## Production of resins – Garlock ONE-UP® Diaphragms

### Chemical production

Our client is a leading global chemical company with industrial facilities around the world. At this site resins are being produced.

### Operating Conditions

1. Media: resins
2. Temperature: 85 °C

### Challenges faced

The customer was dissatisfied with the service life of their diaphragms in AODD pumps. The lifetime of the original OEM diaphragms was only 1 - 2 months. The diaphragm then showed prominent tears through it's membrane. The pumps operate at 85 °C, are used for the moving of partial and complete process products which often contain small particles. The pumps operate 24/7.

### Solution

By using Garlock ONE-UP® with Neoprene backing the lifetime increased significantly from 2 to 12 months, dramatically lowering maintenance costs, increasing production up-time, safety and efficiency. The customer was very satisfied and changed all the original OEM diaphragms in his applications.



## Air-Operated Double Diaphragm Pumps (AODD) – GYLON ONE-UP® Diaphragms

### Pharmaceutical industry

The customer's plant is dedicated to the manufacture of pharmaceutical active substances, mainly intended for proprietary medicinal products, exporting to more than 15 countries.

### Operating Conditions

1. Media: various (acids, solvents, active substances, ...)
2. Size: AODD pumps 1", 1-1/2" & 2"
3. Temperature: various, up to 130 °C

### Challenges faced

The original membranes were not lasting as expected in the customer's applications. Additionally, some pumps used for liquid transfer were regularly failing: when tanks or vessels emptied and the pump was working in dry running conditions inadvertently, the original membranes tore due to the high stresses found in these working conditions.

### Solution

Our customer agreed in testing FDA compliant GYLON ONE-UP® pump diaphragms in their toughest applications instead of the original membranes. After 12 months testing in several pumps, they decided to convert all their AODD pumps (over 80 units) to GYLON ONE-UP® diaphragms due to their much longer lifetime in comparison with the original membranes. Our customer is very satisfied with this decision and keeps installing GYLON ONE-UP® membranes regularly.



# Example Cases

## Improving diaphragm valve performance in UHT dairy plant – Diaphragms in GYLON® Style 3522

### Food & Pharma

The customer designs and manufactures valves for sanitary applications. From Italy the valves are supplied to more than 110 countries.

### Operating Conditions

1. Media (process): Milk and milk product
2. Media (sterilization): Steam
3. Size (pipe/hose): from DN25 to DN100
4. Temperature (process): 80 °C
5. Temperature (sterilization): 150 °C
6. Pressure: 10 bar

### Challenges faced

The manufacturer had the need to increase operating temperature up to 150 °C keeping good flexibility. Their previous solution was a double diaphragm, PTFE and EPDM backed. At 130 °C the glue between two parts started to melt and two diaphragms lost contact reducing performance.

### Solution

Garlock implemented diaphragms in GYLON® Style 3522. The valves were tested in third party plants, in UHT milk at 150 °C and 13,000 cycles and 8,000 working hours. GYLON® 3522 diaphragms are now specified in all of their aseptic valves.



## Dosing pumps in petrochemical applications – Diaphragms in GYLON® Style 3522

### Chemical processing, Oil & Gas

Our customer is an Italian company specialized in the design and construction of package dosing systems, manufactured according to customer's specifications and the main governing standards for Oil & Gas, chemical and petrochemical markets.

### Operating Conditions

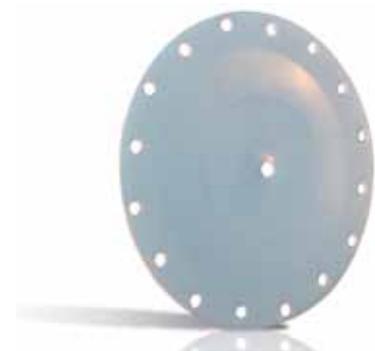
1. Media: pumps are used in many different applications but mostly with hydrocarbons according API 675
2. Size: OD up to 270 mm
3. Temperature: from -30° C up to 150° C
4. Frequency: from 25 up to 140 strokes/min

### Challenges faced

Incorrect installation caused equipment failures. Seat lifetime should be increased and higher temperature limits compared to standard PTFE and elastomers should be achieved with a new solution.

### Solution

Our GYLON® helped the customer to reduce inventory using just one material for all the process. In addition, the one piece design reduced failures due to incorrect assembly. Initially GYLON® Style 3510 and later Style 3522 cut gaskets were implemented in the inlet and outlet valve seats (4-6 for each pump) to increase seat lifetime due to a better wear resistance and higher temperature limits compared with standard PTFE and elastomers.



## ONE-UP® / GYLON ONE-UP®

### Application Data Sheet: Diaphragms

#### Contact Information

Company \_\_\_\_\_  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 \_\_\_\_\_  
 Phone No. \_\_\_\_\_  
 E-Mail \_\_\_\_\_

#### Request

Date \_\_\_\_\_  
 Enquire No. \_\_\_\_\_  
 Attachment Yes  No   
 Garlock ID \_\_\_\_\_

#### Pump Data

Manufacturer \_\_\_\_\_  
 Pump Typ \_\_\_\_\_  
 Model No. \_\_\_\_\_  
 Pump Size \_\_\_\_\_  
 Housing Material Metal  Plastic   
 Diaphragm Material \_\_\_\_\_

#### Operating Conditions

Media \_\_\_\_\_  
 Abrasive Yes  No   
 Pressure \_\_\_\_\_  
 Temperature \_\_\_\_\_  
 FDA Yes  No

#### Design (please mark)



Flange Connection



PTFE-Flange



Metal-Mounting



Plug-In Connection



Corner Connection

#### Diaphragm Design

OD \_\_\_\_\_  
 ID \_\_\_\_\_

No of bolt holes \_\_\_\_\_  
 Bolt hole diameter \_\_\_\_\_  
 Design \_\_\_\_\_

#### Remarks

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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Note:  
Properties/applications shown throughout this brochure are typical. Your specific application should not be undertaken without independent study and evaluation for suitability. For specific application recommendations consult Garlock. Failure to select the proper sealing products could result in property damage and/or serious personal injury. Performance data published in this brochure has been developed from field testing, customer field reports and/or in-house testing. While the utmost care has been used in compiling this brochure, we assume no responsibility for errors. Specifications subject to change without notice. This edition cancels all previous issues. Subject to change without notice GARLOCK is a registered trademark for packings, seals, gaskets, and other products of Garlock.  
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