Wilden® Diaphragms

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Where Innovation Flows

WILDEN®

Pumping At Peak Performance

The right diaphragm for your air-operated double-diaphragm (AODD) pump is a critical consideration to ensure safe, efficient, cost-effective and trouble-free operation.

This is why, as the inventors of AODD pump technology, Wilden® offers the largest selection of diaphragms in the world specifically designed to enhance pump performance and provide long flex life, significant labor savings and superior durability. With a diaphragm for every industry – from aggressive chemicals to highly abrasive materials to extreme operating temperatures – Wilden ensures that your unique application is fully met with the best possible diaphragm to optimize chemical compatibility, life, flow, suction lift, temperature limit, abrasion resistance and cost.

Since 1955, Wilden has been engineering its diaphragms using world-class manufacturing and quality-control capabilities that ensure each diaphragm is engineered with Wilden legendary quality and superior construction. By utilizing only genuine Wilden diaphragms, you ensure a better fit, easier installation, and 100% warranty compliance and protection of your original Wilden AODD pump purchase.

You own a premier Wilden AODD pump, so keep it operating at peak performance by selecting only genuine Wilden diaphragms – Accept Nothing Less.

How to Select Your Diaphragm

Determining the correct diaphragm requires carefully identifying and factoring all process and application parameters into the analysis. A number of factors must be taken into account when choosing the proper diaphragm suitable for a specific application.

- **Chemical Resistance** – material compatibility with the fluid being pumped.
- **Temperature Ranges** – capability to remain flexible in low temperatures and not deteriorate in high temperatures.
- **Abrasion Resistance** – ability to withstand wear and friction from contract with solids and particles in the fluid being pumped.
- **Sanitary Standards** – requirements that the diaphragm comply with hygienic or sanitary standards.
- **Flex Life** – expected longevity of the diaphragm before requiring replacement.
- **Cost** – total cost of ownership determined by multiple factors such as initial price, rated flex life for the application and costs of downtime and diaphragm replacement labor.

Wilden Diaphragms – Available Materials and Unique Designs

Wilden offers the largest breadth of diaphragm shapes, sizes and material offerings in the industry. Wilden has refined AODD pump diaphragm technology with major innovation breakthroughs, extensive destructive testing and comprehensive critical analysis. As a result, Wilden has taken diaphragm science beyond yesterday's standards to bring you more durable products that will reliably stand up to oil, chemicals, acids and other aggressive fluids. Wilden has also focused on sanitary applications by pioneering new hygienic, FDA-compliant diaphragms with enhanced flex life and durability for significant savings in labor and downtime.

Wilden offers a number of material options that have been tested extensively over the years for use in diaphragms in AODD pumps. These materials can be grouped into three primary families: rubber, TPE (thermoplastic elastomer) and PTFE (Polytetrafluoroethylene). These primary materials are available in a variety of designs – each offering unique benefits depending on the application and the characteristics of the product being pumped. Additionally, Wilden diaphragms are offered in a number of shapes, including traditional, contoured and convolute.

	Materials	Diaphragms							Traits		Chemical Resistance/Applications						Operating Temperature Limits	Cost
		Chem-Fuse	Pure-Fuse	EZ-Install	Full-Stroke PTFE	Reduced-Stroke PTFE	Ultra-Flex	Traditional	Flex Life	Abrasion Resistance	Ketones & Aldehydes	Acetates	Aromatic Hydrocarbons	Chlorinated Hydrocarbons	Oil & Gas	Water / Wastewater	(Max/Min)	($)
Thermoplastic (TPE)	Wil-Flex™	✓	✓	✓				✓	A	A	✓	✓				✓	–40° to 107°C (–40° to 225°F)	$
	Saniflex™		✓	✓				✓	B	A			✓				–29° to 104°C (–20° to 220°F)	$$
	Geolast®			✓				✓	C	B					✓		–40° to 82°C (–40° to 180°F)	$$
	Polyurethane			✓				✓	A	A						✓	-12° to 66°C (10° to 150° F)	$
PTFE	PTFE				✓	✓			A	B	✓	✓	✓	✓	✓	✓	4° to 104°C (40° to 220°F)	$$$
Rubber	Buna-N						✓	✓	C	C					✓		–12° to 82°C (10° to 180°F)	$$
	EPDM						✓	✓	B	C	✓	✓					–51° to 138°C (–60° to 280°F)	$$
	Neoprene						✓	✓	B	C						✓	–18° to 93°C (0° to 200°F)	$
	FKM						✓	✓	C	C			✓	✓			–40° to 177°C (–40° to 350°F)	$$$$

A = EXCELLENT B = GOOD C = FAIR

Diaphragm Materials

Thermoplastic Elastomers (TPE)

TPE diaphragms are durable, low cost and operate over a wide temperature range. Injection-molded of premium grade engineering resins, TPE diaphragms have inherent tensile strength without the need for fabric reinforcement. TPE diaphragms are available in Wilden integral pistons and EZ-Install diaphragm design as well as the traditional AODD diaphragm shape

Wil-Flex™ (Santoprene®)

- Abrasion and chemical resistant
- For acidic and caustic applications such as sodium hydroxide, sulfuric or hydrochloric acids
- Also available in food-grade option that complies with FDA CFR 21.177
- Excellent flex life, abrasion resistance and durability

Saniflex™ (Hytrel®)

- Outstanding sealing of low specific gravity and highly lubricious materials
- Excellent for food applications including fats and oils
- Complies with FDA CFR 21.177 standards
- Good flex life, excellent abrasion resistance and durability

Geolast®

- Lower cost substitute for Buna-N material
- Best for petroleum/oil-based fluids and applications, including gasoline, fuel oils and motor oils
- Moderate flex life, good abrasion resistance and durability

Polyurethane

- Excellent for general purpose
- Recommended for non-aggressive applications such as water-based slurries, well water and seawater
- Excellent flex life, abrasion resistance and durability

Diaphragm Designs

EZ-Install Diaphragms

EZ-Install TPE diaphragms are a very convenient and simplified direct replacement of traditional diaphragms. With EZ-Install diaphragms, maintenance staff does not need to invert the diaphragm during the installation process. This greatly reduces installation time, lowers maintenance costs, enhances safety and improves uptime.

- Convolute shape allows quick, easy installation and minimizes risk of injury
- Decreased downtime and costs of diaphragm replacement
- Same performance and durability as traditional diaphragms
- 100% compatible with existing hardware
- Available in: Wil-Flex, Saniflex, Polyurethane and Geolast
- Available sizes: 38 mm (1-1/2"), 51 mm (2"), 76 mm (3")

Integral Piston Diaphragms (IPDs)

Wilden one-piece design IPDs offer safe, clean and reliable product transfer with no product entrapment areas to minimize product contamination and risk liabilities. These diaphragms have a smooth, contoured shape and no outer piston. IPDs have greater durability and flex life, and are compatible with existing shafts and supporting hardware. They also provide greater flow rates and faster installation all without sacrificing performance.

- Up to 100% increased flow and suction lift compared to PTFE laminate diaphragms
- Elimination of a potential leak point at the outer piston when pumping product
- Elimination of outer piston abrasion for longer life, especially when pumping abrasive fluids
- No adhesive used in diaphragm construction unlike competitive one-piece diaphragms
- Easy cleanability for faster changeovers between product

Chem-Fuse IPD

Chem-Fuse diaphragms are the ideal solution for general industrial and chemical applications. This diaphragm holds up against acids, caustics and other aggressive fluids.

- Withstands wide range of temperature limits
- Elimination of potential leak point increases containment and safety when pumping critical or dangerous fluids
- Available in: Wil-Flex material
- Available sizes: 25 mm (1"), 38 mm (1-1/2"), 51 mm (2"), 76 mm (3")

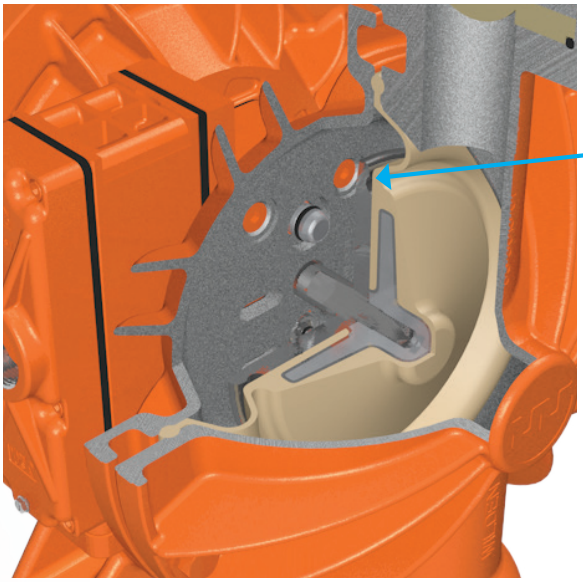
Pure-Fuse IPD

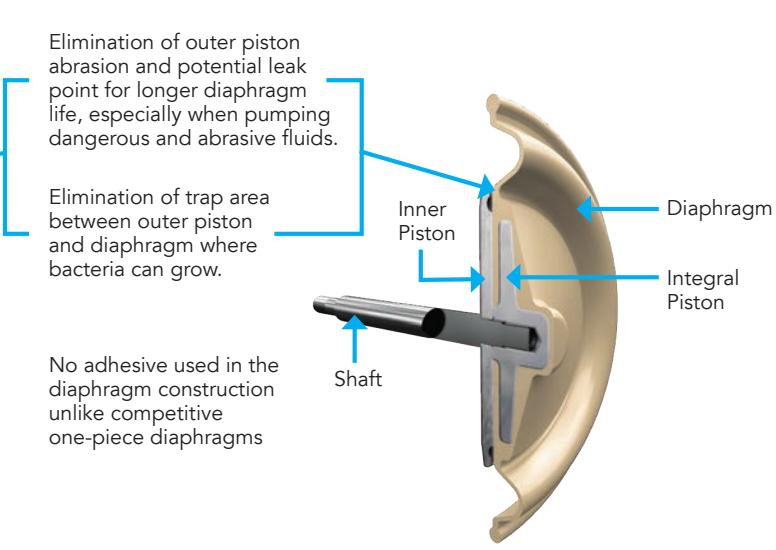
Pure-Fuse diaphragms are the ideal solution for food and pharmaceutical applications. They offer clean-in-place (CIP) capability, superior flow and suction lift over competitor IPDs.

- Up to 50% price reduction compared to PTFE laminate diaphragms
- Sanitary materials meet FDA CFR 21.177, 3A requirements, and 1935/2004/EC*
- Available in: Saniflex and sanitary Wil-Flex materials
- Available sizes: 25 mm (1"), 38 mm (1-1/2"), 51 mm (2"), 76 mm (3")

*only available in Saniflex

Pure-Fuse and Chem-Fuse IPDs





Diaphragm Material

Polytetrafluoroethylene Elastomers (PTFE)

Available in two-, reduced- and full-stroke configurations, Wilden PTFE diaphragms are the ideal choice for aggressive chemical applications. PTFE diaphragms are also offered with several back-up diaphragm materials, including Neoprene, Buna-N, EPDM, Wil-Flex and Saniflex.

- Chemically inert
- Optimal choice for aggressive applications such as aromatic or chlorinated hydrocarbons, acids, caustics, ketones, aldehydes and acetates
- Excellent flex life, good abrasion resistance and durability

Diaphragm Designs

Full-Stroke PTFE Diaphragms

When the job requires peak performance and maximum containment, Wilden Full-Stroke PTFE diaphragms deliver the suction lift, life, flow rates, efficiency and reliability needed to get the job done safely and securely.

- Increased displacement per stroke for enhanced suction lift, flow rates and operating efficiencies
- Features an exceptionally smooth, contoured shape with the same shaft and hardware utilized by current Wilden rubber and TPE diaphragms
- Available sizes: 25 mm (1"), 38 mm (1-1/2"), 51 mm (2") and 76 mm (3")

Reduced-Stroke PTFE Diaphragms

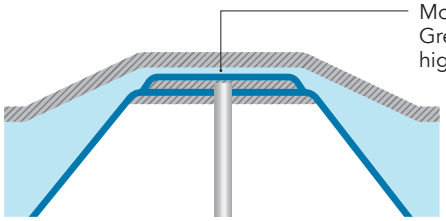
Wilden was the first AODD manufacturer to offer PTFE diaphragms. Wilden continues to offer this original PTFE diaphragm, which features a reduced stroke and reduced displacement to minimize abrasive contact with the pump housing to provide long flex life.

- Excellent flex life and good abrasion resistance
- Utilizes rubber and TPE backup diaphragms
- Available sizes: 6 mm (1/4"), 13 mm (1/2"), 25 mm (1"), 38 mm (1-1/2"), 51 mm (2") and 76 mm (3")

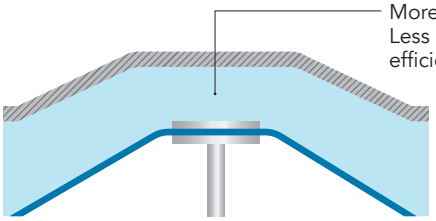
Full-Stroke PTFE Diaphragms

Reduced-Stroke PTFE Diaphragms

Full-Stroke PTFE Diaphragm During Discharge Stroke



Reduced-Stroke PTFE Diaphragm During Discharge Stroke



Diaphragm Material

Rubber Elastomers

Wilden uses various compounds that consist of natural rubber and man-made additives to increase the compounds' resistance to specific types of fluids. Rubber diaphragms provide the greatest temperature spans as well as long flex life and are specifically engineered to significantly increase chemical resistance. These diaphragms have exceptional durability from integral nylon fabric mesh. Rubber diaphragms are available in the Wilden Ultra-Flex™ design as well as the traditional AODD diaphragm shape (pie-shape).

Rubber Diaphragms

Buna-N

- Common industry material
- Excellent for applications involving petroleum/oil-based fluids
- Moderate flex life, abrasion resistance and durability

EPDM

- Low-cost alternative to PTFE for dilute acids and caustics and can handle wide temperature range
- Perfect for applications with extremely cold temperatures
- Good flex life, moderate abrasion resistance and durability

Neoprene

- General-purpose diaphragm
- Frequently used for nonaggressive applications such as water-based slurries, well water or seawater
- Good flex life, moderate abrasion resistance and durability

FKM

- Exceptional performance with aggressive fluids such as aromatic or chlorinated hydrocarbons and strong, aggressive acids – largest temperature range
- Excellent for extremely hot temperatures
- Moderate flex life, abrasion resistance and durability

Diaphragm Design

Ultra-Flex™ Diaphragms

Wilden developed Ultra-Flex technology to make it the longest-lasting rubber compound diaphragms in the industry. Their "operational" convolute shape minimizes stress concentration throughout the entire stroke providing the key to long diaphragm life.

- Utilizes longest-lasting rubber compound diaphragm in the industry
- Design maximizes material movement while decreasing diaphragm loading and stress concentration
- Increased abrasion resistance with corrosive materials
- Available in all rubber materials
- Available sizes: 38 mm (1-1/2"), 51 mm (2"), 76 mm (3")

Ultra-Flex Diaphragm

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