

DIACOM COMPANY PROFILE



 **DIA.COM CORPORATION**
The Diaphragm Company
Online Guidebook: www.diacom.com

603.880.1900



DIA.COM CORPORATION

Providing Superior Diaphragms for:
Aerospace · Automotive · Consumer Products · Industrial · Medical · Water · Control/Irrigation



Company Profile:

Why Choose DiaCom Corporation?

DiaCom is an industry-leading provider of innovative, cost-effective molded diaphragm solutions that are critical to the operation of essential systems and equipment in: Industrial, Automotive, Aerospace, Medical Instrumentation, Food and Water processing, and Gas Regulator/Gas Metering Applications. Our reputation for solving the toughest sealing problems is based on our superior quality management system, our engineering expertise, and advanced manufacturing capabilities. DiaCom's commitment to quality is reflected in our latest AS9100 Certification in 2015 and ISO 9001 certification in 2016. We are constantly striving for continuous improvement. The AS-9100 standard implements a strong focus on product quality, process control, and product conformity to specification. By encompassing our Engineering expertise and advanced manufacturing capabilities, DiaCom is able to deliver engineered diaphragm solutions that are unsurpassed in performance. DiaCom uses our core expertise of bonding industrial fabrics, fluorinated films, plastics and metals to our custom engineered elastomers in a variety of molded parts including: fabric reinforced diaphragms, molded diaphragms, rolling diaphragms, diaphragm seals, chemical septums, bellows, accumulators, valve plungers and valve seats.

Advantages:

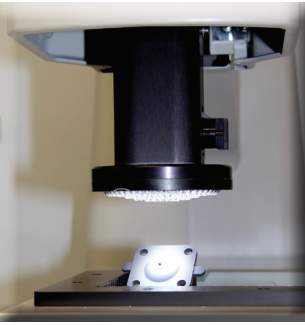
AS 9100
Aerospace/Defense
Certified

In-House
Tooling, Design &
Fabrication

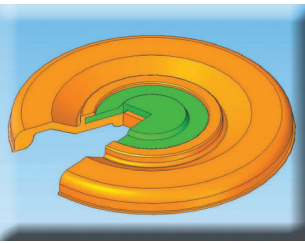
Modern Facility with
State-of-the-Art
Molding presses

Engineering Expertise with Extensive
Diaphragm
Design, Materials &
Application Knowledge

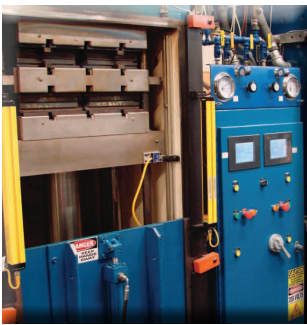
Materials Lab
with Elastomer
and Fabric
Development and
Testing Capabilities



DiaCom's Quality Systems are certified to AS-9100 Quality Management System, an International Standard developed to assure customer satisfaction. AS-9100 uses a process approach when developing, implementing, and improving the effectiveness of a quality management system. DiaCom's "DiaTrac" system enables 100% lot traceability. SPC, FMEA's, 8-D analysis, Process Control Plans, and Process Capability Studies are routinely used in accordance with manufacturing requirements. Zero-defect sampling and continual in-process quality audits insure dimensional and material integrity.



Computer Aided Drafting electronically enhances DiaCom's abilities to provide accurate customer tooling designs on a timely basis. DiaCom's application engineers routinely assist customers in the design of 3-D drawings, standard, or special diaphragms. DiaCom uses only high strength steel for production and prototype molds. DiaCom's internal tool shop has complete CNC machining capabilities that allows for quick turnaround on prototype and production tooling.



Microprocessor-controlled production presses designed specifically for the production of fabric-reinforced and homogeneous elastomeric diaphragms. Our new production presses are built with high-strength components. The microprocessors closely control the vulcanization process, thus assuring precise, repeatable control of the molding process. The result is high quality, low cost diaphragm production. DiaCom utilizes unique compression and transfer molding processes to maximize efficiencies and insure the dimensional integrity of each part.



DiaCom Engineers routinely work with our customer engineering personnel to transform application concepts first into fully functioning prototypes, and ultimately, into production units. Our experience and background allow us to cost-effectively provide a diaphragm that meets or exceeds all customer's diaphragm expectations. Using Auto-Cad drafting software, we are able to communicate electronically with our customers to accelerate the design process. Existing diaphragm applications sometimes do not perform as well as intended. Our technical staff is available as an aid to our customers to analyze performance issues, offer hardware recommendations, and to assist in root cause analysis and the implementation of permanent corrective actions.



Constantly striving to improve existing applications, meeting the demands of new programs, and trouble shooting application issues, DiaCom has established a Rubber Materials Lab that gives us significant rubber testing capabilities. Using ASTM standard procedures, we are able to obtain physical properties, such as, tensile strength, elongation, modulus, durometer, tear strength, compression set, and rheology data, such as viscosity, cure times, scorch date and etc. We are also capable of running a variety of chemical compatibility testing, heat aging, volume swells, etc. using ASTM standard testing procedures, and we can run customer-specific tests. DiaCom can custom formulate materials to meet virtually any application environment. Combining this test capability with our technical expertise allows us to provide materials that meet customer specifications, ASTM material call-out and other certification bodies, such as UL or NSF.

Product Portfolio

Since its founding in 1983, DiaCom has been committed to a single goal - the design and production of the finest molded diaphragm seals available for industrial applications. Today, we produce, and distribute worldwide, one of the industry's broadest lines of standard and custom diaphragms. Built and tested to exacting standards, these quality products are widely used in the automotive, industrial, aerospace, food and water processing, medical instrument and other industries where high-performance, fabric-reinforced and homogeneous elastomeric seals are critical to the operation of essential systems and equipment. The utilization of lean manufacturing principles, statistical process control, microprocessor-based production monitoring and control systems, and other advanced manufacturing, testing and QA techniques ensures DiaCom's position at the leading edge of the technology. DiaCom is proud of its reputation for delivering the finest, state-of-the-art products, on time and at a reasonable cost. Our rapidly expanding worldwide customer base testifies to the success of our efforts.

Principal Diaphragm Types

Homogeneous Diaphragms



For very low-pressure applications, DiaCom offers diaphragms made with a homogeneous, or all-rubber, construction. These diaphragms offer the same functional advantages seen in fabric reinforced diaphragms but they have the same added economy of using homogeneous construction.

Fabric Reinforced Diaphragms



Fabric-reinforced diaphragms utilize a layer of an engineered fabric material as part of the diaphragm construction. This layer of fabric gives tremendous design flexibility. A very thin-walled diaphragm can withstand high pressures while remaining very flexible and responsive to minor pressure variations. Fabrics made of polyester or nylon are commonly used for most applications, with Nomex fabric used for those applications exposed to high-temperature. For those applications exposed to high-temperature. For those applications that require extremely high-strength, DiaCom offers our unique Dia-Tuff Fabric.

Insert Bonded Diaphragms



DiaCom has capabilities to bond metal or plastics to diaphragms during the molding process. Mechanical bonding is generally the least expensive and simplest method to achieve. This process is accomplished by designing the insert with projections or holes. During the molding process, the insert becomes totally or partially encapsulated by the elastomer creating a strong mechanical interlock. Chemical or adhesive bonding utilizes a commercial adhesive applied to the non-elastomeric component. The components then attached to the elastomer during or after vulcanization depending on the type of bond required and geometry of the diaphragm. By bonding inserts to diaphragms, costly assembly operations can be reduced or eliminated. Additionally, rivet, screw or other fastening methods which might create leak paths through the diaphragm would be eliminated with a bonded insert.

PTFE Bonded Diaphragms



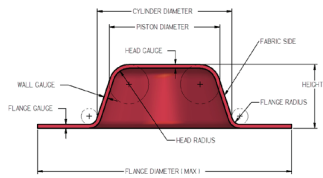
DiaCom has capabilities to design and manufacture composite diaphragms made from PTFE/Elastomeric materials. DiaCom's process bonds PTFE to rubber using PTFE as thin as 0.002" (0.0508 mm) thick. DiaCom's unique process and construction produces a diaphragm that is compatible with harsh environments without limiting the life and responsiveness of the diaphragm. For additional strength, fabric may be added to the PTFE/Elastomer composite.

Fabair® Diaphragms



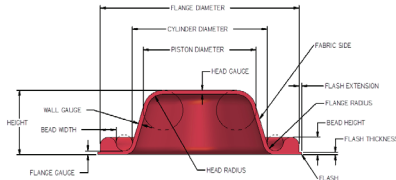
DiaCom has introduced a new line of specialty industrial diaphragms composed of our new Fabair® Materials. Fabair® is a composite elastomer material with a proprietary fiber dispersed throughout the elastomer. Fabair® is typically used in low-pressure applications to eliminate ballooning replacing all rubber diaphragms. It can also be used in conjunction with fabric-reinforced diaphragms in extremely high pressure applications to give the diaphragm added strength and reduce the possibility of blow through.

Standard Configurations



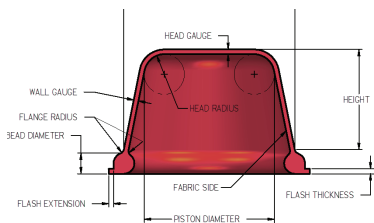
Type F Diaphragms

It exhibits all of the benefits that are associated with rolling diaphragms. These diaphragms have the longest stroke-to-bore ratio, zero spring rate, no breakaway friction, constant effective pressure area, and long life. The flange of the diaphragm is designed to seal like a gasket between the two flat surfaces of the cylinder and bonnet. The outside edge and bolt holes can be cut into any configuration desired.



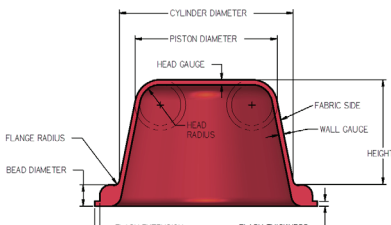
Type D Diaphragms

This style diaphragm is the same as the Type F in all respects, except flange mounting. The parts are molded with what equates to half an O-Ring on the flange rather than a large flat surface. This O-Ring half fits into a groove machined into the cylinder half of the hardware. Sealing is achieved by squeezing the bead into a properly sized groove.



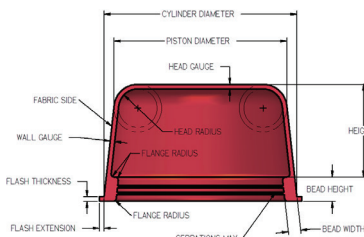
Type O Diaphragms

This type of diaphragm has no flange. An O-Ring is molded to the bottom of the sidewall. Unlike the other types of diaphragms, the Type O is put into convolution by folding the sidewall back onto itself. The bead is then squeezed into a groove machined into the bonnet half of the hardware. This type enables the greatest reduction in hardware diameter, while keeping a full stroke potential.



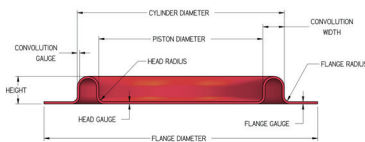
Type OA Diaphragms

This diaphragm is second generation to the Type O. It fits into identical hardware. It differs from the Type O in that its sidewall attaches to the inside diameter of the O-Ring and the fabric is on the outside, requiring the head corner radius to be inverted for installation. The Type OA tends to be easier to install.



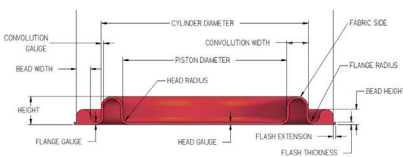
Type OB Diaphragms

This type of diaphragm has a rectangular bead molded inside the cylinder wall. This design requires the smallest hardware diameter of any diaphragm type. Since clamping and sealing in this style is against the inside wall of the cylinder, the stroke capability is restricted to the lower half of the diaphragm.



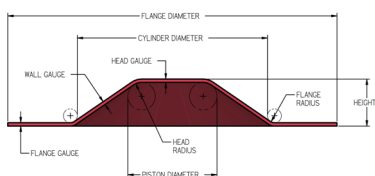
Type FC Diaphragms

In this style, the piston and the flange are molded on the same plane. The benefit of this style is that the handwork of forming the convolution is eliminated, which greatly reduces the assembly time, especially in high-volume applications. The drawbacks to this type of diaphragm are: a built-in spring rate, due to the molded-in convolution, which must be considered during the design stage, and a limited stroke-to-bore ratio, an offset pre-convoluted diaphragm can be designed.



Type DC Diaphragms

This style of diaphragm is similar in function to the Type FC diaphragm, while the sealing and hardware designs are the same as the Type D.



Type P Diaphragms

This diaphragm type, commonly referred to as "dish-shaped", has a sidewall that slopes gradually from the cylinder to the piston. This diaphragm is designed to be flexed in both directions to its full height. It may be double-coated to take pressure in both directions.

Applications

The molded elastomeric diaphragm is a tough, versatile, dynamic seal that eliminates virtually all of the problems and limitations associated with other sealing methods such as U-Cups, O-Rings, metal bellows and flat, die-cut diaphragms. Unlike alternative techniques, molded diaphragms do not leak, offer no friction, have exceptional sensitivity, and display a hysteresis that is, in most cases, negligible. They can withstand pressures up to 6000 PSI over a temperature range of -65°F to 600°F (-50°C to 315°C), require no maintenance or lubrication, and are extremely cost-effective in most applications. DiaCom molded diaphragms are available in two forms: contoured, annular disks that provide high sensitivity and freedom of motion in short-stroke applications, and rolling diaphragms for frictionless, leak-proof sealing in cylinders and other application requiring a long piston stroke.



Features:

- Minimum hysteresis - accurate, Repeatable positioning,
- No spring rate (rolling diaphragms)
- Long stroke length capabilities
- No Lubrication
- No break-away or sliding friction
- Long cycle life
- Effective in harsh environments
- Constant effective pressure area
- Low assembly and associated hardware costs

Consumer Products:

Small Engine Carburetors	Camping Stoves and Lanterns	Pneumatic Nail Guns
Gas Grill Regulators	Vacuum Cleaners	Firing Systems

Aerospace:

Fuel Regulator	Oxygen Regulators	Engine Governor
Expansion Chambers	Actuators	

Automotive:

EGR Valve	Fuel Pressure Regulators	Transmission Pressure Switches
Turbo Charge Wastegate Actuators	Automatic Tire Inflation Valves	Brake Pressure Switches

Medical:

Oxygen Regulator	Air Pump	Hospital Beds
IV Pump	Oxygen Conserver	

Water Controls/Irrigation:

Water Pressure Regulators	Pop Up Sprinkler Heads	Flow Control Valves
Irrigation Valves	Back-flow Preventers	

Industrial:

Valve Actuators	Weir Valves	Industrial Printers
Pneumatic Air Cylinders	Chemical Pumps	
Diaphragm Pumps	Pressure Switches	

Pneumatic Controls:

Precision Air Regulators	Pneumatic Relays	Volume Boosters FRL Systems
I/P Transducers	Valve Positioners	

Natural Gas/Propane:

Residential NG/LPG Regulators	Industrial Service NG Regulators	Shut Off Valves
Commercial Service NG/LPG Regulators	Tank Blanketing Valves	
	Pilot Valves	

Food/Dairy Processing:

Positive Displacement Pump	Flow Control Valve
Shutoff Valve	Protective Boot

Elastomers:

DiaCom has developed an extensive inventory of rubber compound formulations to meet the demands of a wide range of diaphragm applications, and maintains a full-time rubber Chemist on staff, constantly working to develop rubber formulations to meet the demands of an ever-changing industry. DiaCom works with all types of rubber materials, such as Nitrile, EPDM, Neoprene, Fluorosilicone, Silicone, SBR, Fluoroelastomers (Viton®), Hydrin and Vamac®. Rubber has a variety of physical properties, such as: tensile strength, elongation modulus, compression set, and tear resistance, as well as chemical compatibility. All of these properties must be considered when selecting a rubber to be used in a diaphragm. Contact a DiaCom representative for proper rubber selection.

Specialty Elastomers:

DiaCom has also developed a range of Specialty Elastomers that provide Elastomeric solutions to difficult applications & environments. These materials provide properties that are not found in other materials and can be used in the harshest of uses.

Specialty Compounds have been developed that include FDA grade, chloramine resistant compounds NSF 61 approved, UL-157 and EN-549 approved for use in propane, Bio-Diesel resistant compound, chemically resistant compounds for use in acids, alkalies & organic materials, Ionic Hybrid Elastomers and USP Class VI Compounds.

Fabrics:

A key component of diaphragms is the fabric reinforcement selected to ensure the diaphragm will withstand the application pressure and cycle life expectations. DiaCom has developed a comprehensive selection of standard fabric styles, each with a specific physical characteristics, that are selected based on weave patterns, tensile strength, formability and chemical and heat resistance capabilities, as well as other variables. The fabrics most commonly used are Polyester, Nylon, Nomex & DiaTuff. DiaCom technical personnel are available to assist in selecting the proper fabric for a specific application.

Coated Fabrics:

Many diaphragm applications require that the diaphragms be coated with rubber on both sides, commonly referred to as “double-coat” diaphragms. This type of diaphragm is typically required when the application sees pressure on both sides. DiaCom has two processes to produce double-Coat diaphragms; a coated fabrics process and a proprietary double-coat process. By utilizing our proprietary double-coat molding process, we are able to provide double-coat diaphragms directly from rubber and fabric. The selection of the proper double-coat process and materials requires an understanding of both the rubber and fabric used in its fabrication, as well as the overall geometry of the diaphragm. DiaCom also develops and maintains an inventory of standard “coated-fabrics” that is, fabric that is coated on both sides by a sub-contractor using a variety of materials. DiaCom technical personnel are available to assist in the proper selection of coated fabric.

Fluorinated Films:

For use in applications with aggressive media & process conditions, diaphragms bonded with fluorinated films are used. Most common types are PTEE, TEM, FEP & PFA.

DiaCom has recently introduced diaphragms using a new high-strength PTEE material. This new DiaCom material is specially designed to not thin in formed areas as associated with the standard PTFE material and will outlast a standard PTFE Diaphragm in a side-by-side cycle test by as much as ten times!

Molded Diaphragms - Ideal solutions to tough sealing problems.

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The Diaphragm Company

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