



Vernay® Diaphragms

Custom-designed for quality performance

Vernay specializes in the innovative design and high-volume manufacture of precision elastomeric products. Vernay diaphragms, used to meet the unique needs of many fluid, air and vacuum applications, are custom-engineered to provide quality performance at specific pressures, even under the most demanding environments.

Because of their unique design, diaphragms perform complex tasks in mechanical, fluid and gaseous applications easily and economically. They provide optimum sensitivity as well as the strength to withstand significant pressure change. Our proprietary processes ensure the exclusion of foreign matter during production, which ultimately prevents leakage. Vernay diaphragms are also resistant to harsh environments.

Vernay engineers will work with you to custom-design your diaphragms. Advanced manufacturing processes and compounding capabilities help us achieve the unique design characteristics your applications require.



*Elastomeric
Fluid Controls*





your applications + (our designs + materials) = new opportunities



Servo action diaphragms:

Vernay servo action diaphragms enable pilot valves to operate with a fraction of the normal actuator force required to regulate fluid flow. The primary advantage of using a servo action diaphragm over another valve design is that considerably less energy is needed for actuation. Valves containing these diaphragms are quiet, soil and corrosion resistant, more cost-effective and smaller. Servo action diaphragms are designed for consistent performance and available with metal or plastic insert reinforcements.

Other design features:

- Operating pressure from 0 to 1518 kPa (0 to 220 psi).
- Temperature pressure from -50° to 260° C (-65° to 500° F).
- Compounded to withstand specific fluid media for periods up to 20 years.
- Can be designed to have a very low lift-off force.
- May include an external or molded-in mating component.

Thin convoluted diaphragms:

Used to transmit pressure from one system to another without passing media or contaminants, Vernay thin convoluted diaphragms are suitable for fluid or vapor media used within various pressure and temperature ranges. Closely monitored processing insures consistent convolution thickness as low as 0.2 mm (0.01in.), which minimizes hysteresis and maximizes stroke lengths. Vernay engineers will work with you to find the materials and diaphragm geometry that will enhance your application's performance.

Other design features:

- Stroke length up to 6.4 mm (0.25 in.).
- Operating temperature from -60° to 260° C (-150° to 500° F).
- Available with metal or plastic components, bonded or mechanically held.
- "Tactile feel" may be incorporated in some designs to meet specific load deflection and spring return.

Compounding capabilities

(Not limited to the following polymeric families.)

- Nitrile, NBR
- Fluorosilicone, FVMQ
- Ethylene Propylene, EPDM
- Silicone, VMQ, MQ, PVMQ
- Hydrogenated Nitrile, HNBR
- Butyl, IIR
- Fluorocarbon, FKM
- Polyisoprene, IR, NR
- Epichlorohydrin, CO/ECO
- Chloroprene, CR
- Polyurethane, AU/EU
- Styrene-butadiene, SBR
- Polyacrylate Acrylic, ACM/AEM/ANM

With access to over 23,000 proprietary elastomeric formulations stored in our database for quick retrieval, our engineers and chemists select custom-compound materials suited to your demanding product applications.

Optimal solutions are most often achieved through successful co-development. Vernay specialists are ready to work with you to provide innovative answers to your most demanding design challenges. Working with Vernay as your design partner can result in lower total cost and higher value.

Product advantages

Rolling diaphragms:

Vernay rolling diaphragms (cup or convoluted) act as sealing devices between a moving member and a stationary member. Pressure sensitivity depends on the convolution area, thickness, diameter and material properties of the diaphragm. Vernay rolling diaphragms are also available with metal or plastic insert reinforcements.

Other design features:

- Long-stroke, deep convolutions with relaxation at any point of the stroke.
- Available for pressures of 0.25 to 1380 kPa (1 in. H₂O to 200 psi).
- Parts can be internally lubricated through compounding.
- Excellent long-term flex life.



Applications

Automotive: Emission control devices, cooling systems, vacuum motors, EGR, carburetor metering valves, vacuum switches, brake release switches.

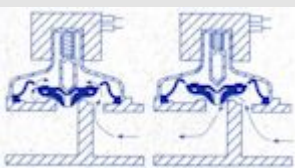
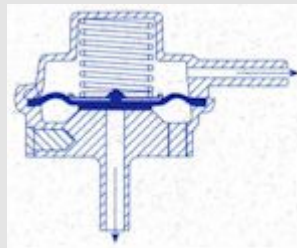
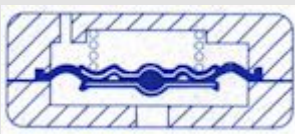
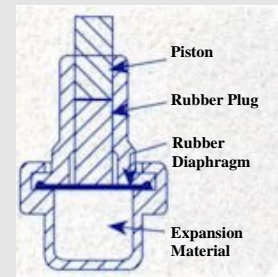
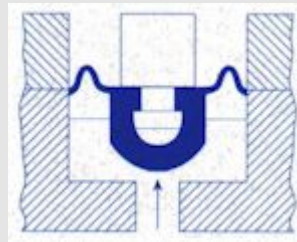
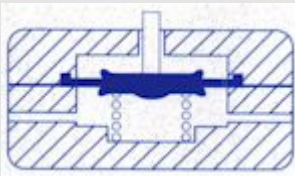
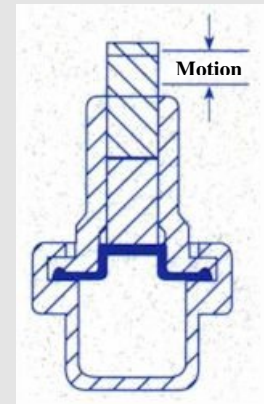
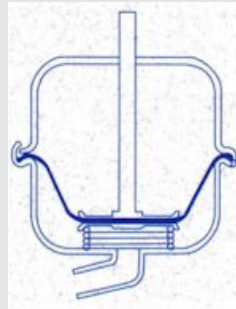
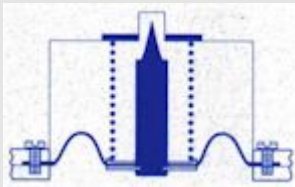
Medical: Disposable medical devices and pumps.

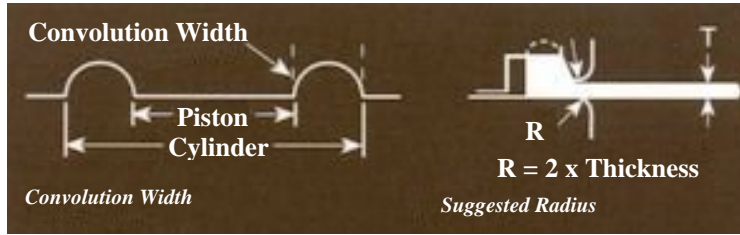
Appliance: Washing machines, dishwashers, refrigerators, vending machines, water softeners.

Specialty: Fluid level indicators, pressure regulators, timing devices, natural and LP gas valves, thermostats.



Typical Applications





Quality commitment

Vernay is committed to the philosophy of continuous improvement in everything we do. Product quality is achieved through the stabilization and continuous improvement of all processes and activities that impact quality.

| Assembly Design Suggestions | |
|--|---|
| Stroke length for flat diaphragms: Stroke in either direction should be a maximum of 10% of the inside housing diameter. | (See convolution Width above.) |
| Stroke length for convoluted diaphragms: Stroke should be a maximum of 2.5 times the convolution height. | Normally, the sealing bead is compressed 10% to 15% maximum. (The actual percentage depends on the cross-sectional shape and material.) Use a machine squared groove approximately 12% larger in width to allow for rubber compression radially. Avoid sharp corners around the diaphragm and mating parts. (See Suggested Radius above.) |
| Effective diameter = (piston diameter + cylinder diameter) / 2 Effective area = π (effective diameter) ² / 4 | |
| Note: This convolution pertains only when the flange and piston area are in the same plane. | |

The Vernay Quality System has been established to enforce the vital component of the customer-supplier relationship.

The Vernay Quality System is based on the ISO-9001 Quality System Standards, the Automotive QS-9000 and TS-16949 System Requirements, the FDA Quality System Regulations, and the ISO-14001 Environmental Quality Standard.

Actual quality certifications, for each of our global locations can be downloaded in PDF format on our website www.vernay.com!



Global Locations:

Vernay Laboratories, Inc. Corporate Headquarters
120 E. South College Street
Yellow Springs, Ohio
45387-1623 USA
Phone: (800) 666-5227
Sales: (866) 837-6291
Fax: (937) 767-7913

Vernay Manufacturing, Inc.
804 Greenbelt Parkway
Griffin, GA 30224 USA
Phone: (770) 228-6291
Fax: (770) 228-4279

Vernay Mfg. – Milledgeville
270 Industrial Park Drive
Milledgeville, GA 31061 USA
Phone: (478) 454-1872
Fax: (478) 451-0840

Vernay Mfg. – Marion
HCG Industrial Center
2406 Highway 76 East
Marion, SC 29571 USA
Phone: (843) 431-9090
Fax: (843) 423-0402

Vernay Europa B.V.
Kelvinstraat 6, Postbus 45
7570 AA Oldenzaal
The Netherlands
Phone: 31-541-589999
Fax: 31-541-533060

Vernay Italia, s.r.l.
Località Rilate, 21
14100 Asti, Italy
Phone: 39-0141-413511
Fax: 39-0141-214111

Vernay Southeast Asia Sales Representation
Contact Corporate Office

Vernay Israel, LTD
Industrial Park Rotem
Misor Yamin
N.P.S Arava 86800
Israel
Phone: 972-8-657-9435
Fax: 972-8-657-9436

Vernay Laboratories, Inc. Japan Branch
Chai Building, 1st Floor,
1006, 1-Chome,
Hirabari, Tenpaku-ku,
Nagoya, Aichi 468-0011
Japan
Phone: 81-52-805-1201
Fax: 81-52-805-1911

Vernay Brasil – Sales Office
Cacaldas das Paineiras, 22 sala
04
Centro Comercial Alphaville
Barueri Sao Paulo Brasil
CEP 06453-000
Phone: 5511-4191-0583
Fax: 5511-4191-9283

Disclaimer

This brochure is provided without charge for general information purposes only. It is correct to the best of Vernay's belief; however, Vernay **disclaims any warranties, expressed or implied, as to this information** and assumes no obligation or liability therefore. Much of this information is proprietary to Vernay and by providing this information Vernay does not waive or release any patent, copyright or other proprietary right it may own in this information.

Vernay® is a registered trademark of Vernay Laboratories, Inc.

©Vernay Laboratories, Inc., 1-24-08 All rights reserved.