



# Protective Vents

*ADHESIVE SERIES*

## Improve Your Equipment's Reliability and Durability

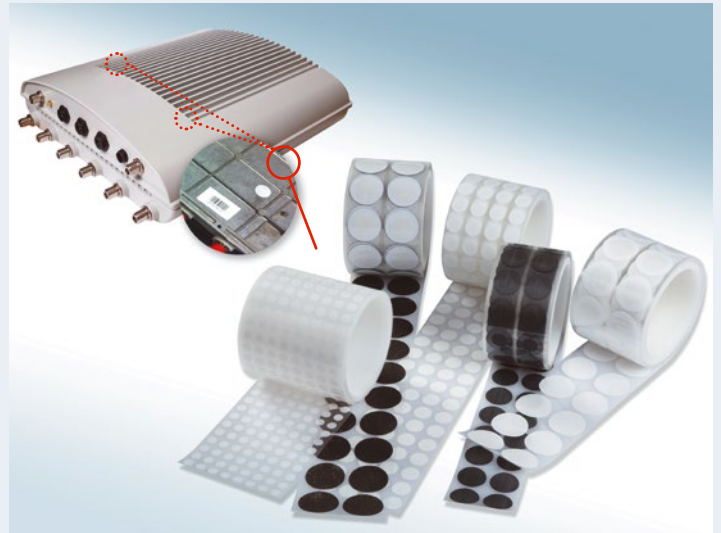
### VENTING FOR PROTECTION

Outdoor enclosures are continuously exposed to harsh environments such as rainstorms, dust, sand and high winds. During changing environmental conditions, pressure can build inside a sealed enclosure, putting stress on seals. Over time stress causes seals to fail, which allows water, corrosive liquids, salt and particulates to enter the enclosure and damage the internal electronics.

With proven performance for more than 20 years, GORE® Protective Vents are the leading solution for protecting your sensitive electronics. GORE® Protective Vents equalize pressure and reduce condensation by allowing air to flow freely into and out of sealed enclosures. At the same time, they provide a durable barrier to protect the electronics from contaminants. The result — improved reliability, increased safety and longer product life for your sealed electronic devices.

### VENTING SOLUTION FOR ANY APPLICATION

Available in a variety of sizes, designs and constructions, GORE® Protective Vents meet the challenges of any application. The low-profile adhesive design is engineered to withstand environmental challenges and can be easily integrated into the inside or outside of an enclosure via a manual or automated installation process. The specific venting solution for an application depends on a variety of factors including enclosure materials, size and performance parameters.



### REALIZE THE BENEFITS OF GORE® PROTECTIVE VENTS ADHESIVE SERIES:

- **Longer product life** with rapid equalization of pressure to reduce stress on enclosure seals
- **Reliable protection** against water, salts, corrosive liquids and particulate by GORE™ Membrane offering hydrophobic and oleophobic characteristics
- **Increases durability** of sealed enclosures by complying with industry standards
- **Easier installation and maintenance** with flexible design
- **Versatile product offering** includes vents engineered with high airflow rates, high temperature stability and strong adhesive bond to enclosure surfaces
- **Outstanding technical expertise** from Gore's engineering organization, currently supporting over 200 million installations worldwide



# Protective Vents

ADHESIVE SERIES

## PRODUCT INFORMATION

	Series VE8	Series VE7	Series VE9
<b>Material Performance</b>			
Typical airflow ( $\Delta P = 70$ mbar)	3300 ml/min/cm <sup>2</sup>	290 ml/min/cm <sup>2</sup>	1150 ml/min/cm <sup>2</sup>
<b>Product Characteristics</b>			
Membrane type	ePTFE		
Membrane characteristic	Oleophobic		
Membrane color	White	Black	White
Backing material	PET nonwoven	None	
Backing material color	White	None	
Adhesive type	Acrylic	Silicone	
Typical thickness (see figure on next page)	0.26 mm	0.34 mm	0.32 mm
Mounting location	Interior of the housing	Interior or exterior of the housing	

## ENVIRONMENTAL PERFORMANCE

GORE® Protective Vents Adhesive Series have been tested by independent laboratories and meet these performance standards.

= passed

**Ingress Protection Testing**

Vent protection against ingress of particulates and water  
IP ratings are housing design, part size and mounting location (interior & exterior) dependent

- IEC 60529, 2nd Ed.
- IP68 was tested for extended immersion: 2 meters for 1 hour

IP Rating		VE8		VE7		VE9	
Particulates	Water	Interior	Interior	Exterior	Interior	Interior	Exterior
6	4	✓	✓	✓	✓	✓	✓
6	5			✓		✓	✓
6	6			✓		✓	✓
6	7	✓	✓	✓	✓	✓	✓
6	8		✓	✓	✓	✓	✓

**Flammability/UV Testing**

ePTFE membrane resistant to flames and ultraviolet light

METHODS:

- UL 94-V-0 f2: VE7
- UL 94-VTMO f2: VE9

**Humidity Testing**

Vent durability in hot, humid environments

METHOD:

- IEC 60068-2-78

TEST CONDITIONS:

- 85°C
- 85% relative humidity
- 1,000 hours

**Salt Fog Testing**

Vent resistance to salty environments

METHODS:

- IEC 60068-2-11 (salt fog)
- IEC 60068-2-52 (cyclic salt fog)

**Salt Spray Testing**

Vent resistance to salt spray

METHOD:

- DIN 50021-SS:1988-06 (7-day test)

No penetration of salt crystals through the membrane into the housing

**Corrosive Gas Testing**

Vent durability in corrosive gas environment (e.g., NO<sub>x</sub>, SO<sub>x</sub>, H<sub>2</sub>S, Cl<sub>x</sub>)

METHOD:

- GR-3108-CORE (telecom)

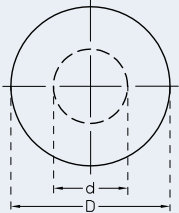
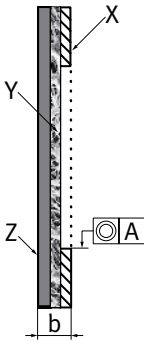
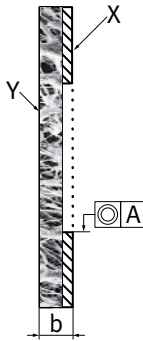
**Temperature Testing**

Vent durability in a range of temperatures

METHODS:

- IEC 60068-2-1: (low temperature of -40°C)
- IEC 60068-2-2: (high temperature of 100°C) VE8
- IEC 60068-2-2: (high temperature of 125°C) VE7, VE9
- IEC 60068-2-14: (cycling temperatures between -40°C and 100°C) VE8
- IEC 60068-2-14: (cycling temperatures between -40°C and 125°C) VE7, VE9

## PRODUCT INFORMATION

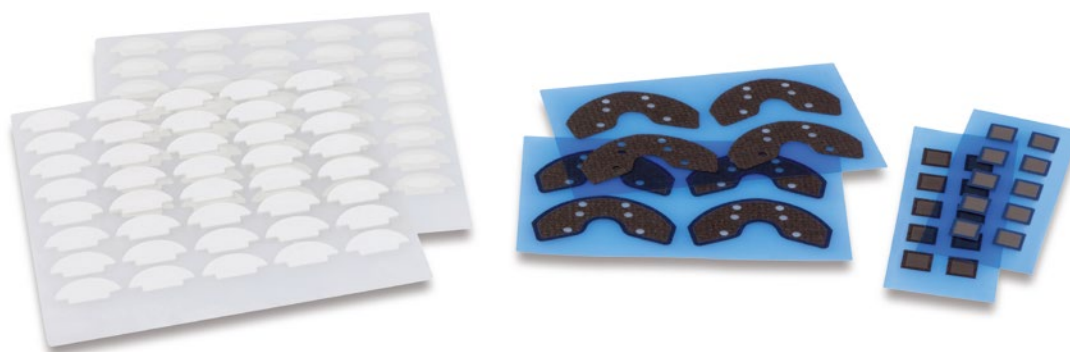
	Series VE8	Series VE7	Series VE9
<b>Design and Dimensions</b>			
 <p>                     D/d = Outer/Inner diameter                      A = Concentricity = 0.8 mm                      Y = ePTFE membrane                      Z = Backing material                      X = Adhesive                      b = Typical thickness                      Tolerance of diameters: +/- 0.25mm                 </p>			

## STANDARD PARTS

Part Dimensions			Packaging		Series VE8	Series VE7	Series VE9
ID (d) x OD (D) (mm)	Active Venting area (mm <sup>2</sup> )	Adhesive Ring area (mm <sup>2</sup> )	Parts across carrier	Carrier width (mm)	Part Number		
2.0 x 5.0	3.14	16.49	5	41	VE80205	–	–
3.3 x 7.6	8.55	36.81	8	88	VE80308	VE70308	VE90308
5.5 x 10.2	23.76	57.95	5	69	VE80510	VE70510	VE90510
8.0 x 14.0	50.26	103.67	4	71	VE80814	VE70814	VE90814
8.9 x 19.1	62.21	224.30	3	69	VE80919	VE70919	VE90919
12.5 x 21.5	122.71	240.32	2	52	VE81221	VE71221	VE91221

## CUSTOM PARTS

Gore engineers can assist in designing a solution that meets your specific application requirements, such as part size, custom shape, adhesive and performance characteristics. For more information on custom part design, please contact a Gore representative.





# Protective Vents

ADHESIVE SERIES

## HANDLING AND INSTALLATION GUIDELINES

Series: VE8, VE7 and VE9

### GENERAL GUIDELINES

These general factors play a significant role when installing adhesive vents to enclosures.

- 1) Enclosure surface finish
- 2) Cleanliness of the enclosure's mounting surface
- 3) Surface profile of the enclosure's mounting surface
- 4) Surface energy of the enclosure's mounting surface
- 5) Dwell time during application and cure time after application

### Storage Recommendations

- Vents have a maximum shelf life of one year from the shipment date
- Recommended storage conditions are 21°C (~70°F) with 50% relative humidity (RH)
- Store in the original packaging in a clean environment
- Keep out of direct sunlight and away from heat sources

### HANDLING GUIDELINES

- Operators should wear latex and powder-free gloves or finger cots when handling adhesive vents
- Avoid direct contact with the active venting area (Figure 1) or adhesive ring
- Keep all sharp or jagged items away from the ePTFE membrane

### DISPENSING GUIDELINES

- The carrier roll has an inner diameter of 76.2 mm
- Vents can be dispensed manually or with automated equipment
- To prevent damage, do not pry the parts off the carrier roll
- **For manual dispensing**, roll the liner under the vent, slowly over an edge, until the vent extends beyond the liner and becomes accessible
- Blunt-edged tweezers may be used to remove the vent gently from the liner (Figure 2)

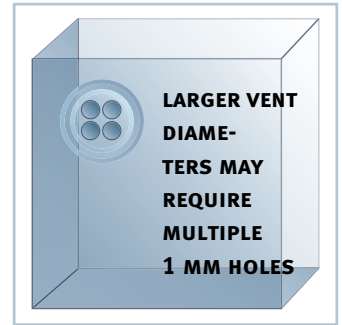
### INSTALLATION GUIDELINES

#### Preparation

- Ensure that the vent and housing temperature are > 10 °C
- Ensure that the enclosure's mounting surfaces are smooth, clean and free from oils, particles or other contaminants; free from jagged or rough edges that could damage the vent

- Isopropyl alcohol can be used to clean the enclosure's mounting surface
- Ensure that the enclosure's mounting surface is dry prior to vent installation
- Typically recommend to use minimum of 1 mm hole size
- Multiple 1 mm holes may be used for larger vent diameters (Figure 3)\*

FIGURE 3: Recommended holes



#### Positioning

- Series VE7 and VE9 can be installed on internal or external surfaces
- Series VE8 should be mounted only on interior housing surfaces with the membrane or adhesive side facing the external (liquid) environment
- Orient the part on a flat, vertical surface where water or other contaminants won't pool
- The accuracy of the vent placement can be improved by making or establishing a "target area" on the vent housing (Figure 4)
- Using the target frame as a guide, place the vent inside the frame

NOTE: A raised ridge target area around the circumference of the vent mounting location may help to prevent damage to the vent edge in aggressive environments.

FIGURE 4: Target ring used to identify correct position of an Adhesive Vent

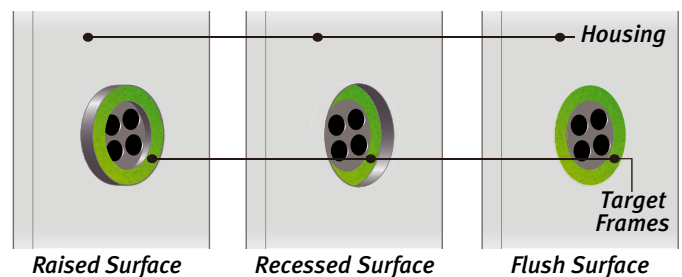


FIGURE 1: Active area of an Adhesive Vent

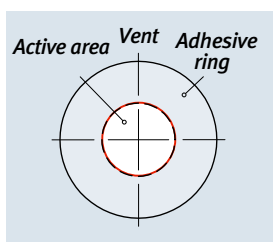
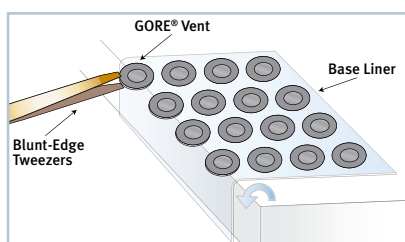


FIGURE 2: Manually dispensing an Adhesive Vent



The following target area dimensions can be used as guidelines:

Target Area Wall Height	0.51 mm (0.02") minimum
Target Area Wall Inner Diameter	Vent O.D. +2.54 mm (0.10")
Target Wall Thickness	as required by mold/housing design

\* Please consult with a Gore Representative to verify the hole size dimensions align with your specific adhesive vent and application requirements.

## HANDLING AND INSTALLATION GUIDELINES

Series: VE8, VE7 and VE9

### Compression — For Manual Installation

- Ensure the entire adhesive ring is pressed against the surface
- Apply firm finger force at least twice in a circular motion directly to the adhesive ring area to seal the vent to the housing, being careful not to touch center of the vent area (Figure 5)
- Allow 24 hour cure time before using or testing
- These steps are critical to ensure that the vent adheres to the housing

**FIGURE 5:** Sealing the Vent to the Housing



- The compression head should be perpendicular to the enclosure's mounting surface and located so that it can apply pressure inside the target/protective ring
- A pressure about 2 bar should be uniformly applied to the adhesive area of the vent and the compression head surface should be relieved to prevent compression of the breathable area of the vent
- The compression head dwell time should be > 5 seconds
- Allow 24 hour cure time before using or testing
- These steps are critical to ensure that the vent adheres to the housing

### Compression — For Semi-Automated Systems

Follow these general recommendations for achieving an optimal compression head design and applied pressure:

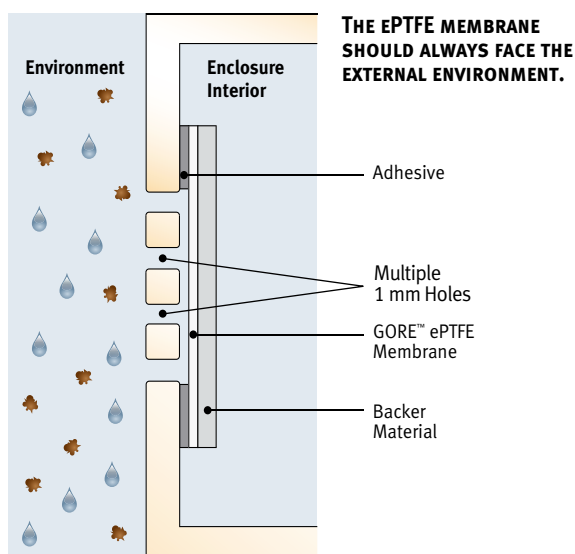
- The compression head should be made of soft rubber (durometer of 20 – 40 Shore A) with a uniform thickness of at least 5.0 mm

### Final Inspection

- If a target ring is used, the vent should be fully inside the target frame and not riding up on the wall
- Once installed, vents should not be repositioned
- Vents will be damaged when they are removed from the mounting surface

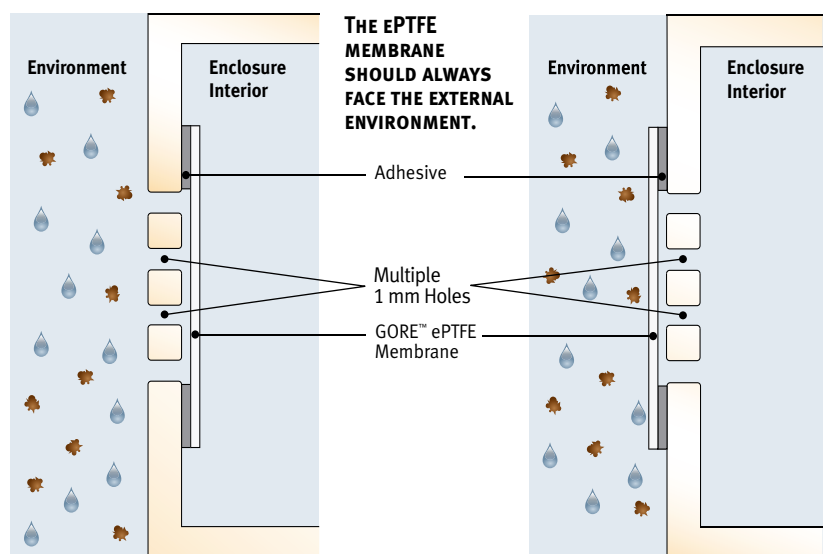
*NOTE: W. L. Gore & Associates Quality Assurance Procedure dictates removal of some vents from the liner prior to shipment. Sufficient extra length of liner and vents is provided to make a full product count. This procedure assures that all parts are handled minimally to avoid contamination and/or damage.*

### Interior Mount



**FIGURE 6:** Interior mounting is recommended for Parts Series VE8

### Interior Mount



**FIGURE 7:** Interior or exterior mounting is recommended for Parts Series VE7 and VE9



# Protective Vents

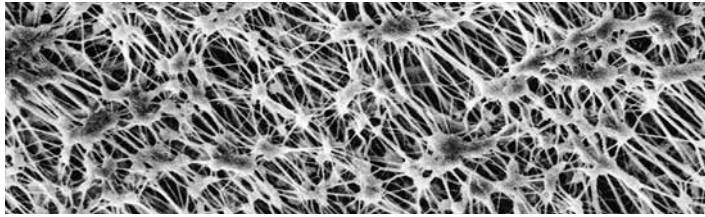
ADHESIVE SERIES

## THE SCIENCE BEHIND THE SOLUTION

GORE® Protective Vents incorporate a membrane of expanded polytetrafluoroethylene (ePTFE). This unique membrane is constructed with billions of pores 700 times larger than an air molecule. These pores allow air to flow freely in and out of the housing, which prevents stress on seals. At the same time, the membrane pores — which are 20,000 times smaller than a drop of water — serve as a barrier against water, dirt and debris. GORE® Protective Vents can be designed with a variety of specific properties for maximum performance in any venting application.

### The GORE™ Membrane is:

- chemically inert
- UV-resistant
- non-shedding
- temperature-resistant



Gore's expanded PTFE membrane magnified 40,000 times.

## ROHS INFORMATION

W. L. Gore & Associates declares that the products listed in this document are below the thresholds established in EU Commission Decision Directive 2011/65/EC, Directive 2002/95/EC (RoHS) and Directive 2003/11/EC.

## INTERNATIONAL CONTACTS

Australia	+61 2 9473 6800	Mexico	+52 81 8288 1283
Benelux	+49 89 4612 2211	Scandinavia	+46 31 706 7800
Brazil	+55 11 5502 7800	Singapore	+65 6733 2882
China	+86 21 5172 8299	South Africa	+27 11 894 2248
France	+33 1 5695 6565	South America	+55 11 5502 7800
Germany	+49 89 4612 2211	Spain	+34 93 480 6900
India	+91 22 6768 7000	Taiwan	+886 2 2173 7799
Italy	+39 045 6209 240	Turkey	+90 216 3935749
Japan	+81 3 6746 2570	United Kingdom	+44 1506 460123
Korea	+82 2 393 3411	USA	+1 410 506 7812

### W. L. Gore & Associates GmbH

Hermann-Oberth-Str. 26 • 85640 Putzbrunn • Germany  
Tel.: +49 89 4612 2211 • Fax: +49 89 4612 2302  
E-mail: protectivevents@wlgore.com

[gore.com/protectivevents](http://gore.com/protectivevents)

## ABOUT W. L. GORE & ASSOCIATES

Well known for waterproof, breathable GORE-TEX® fabric, Gore is a technology-driven company focused on product innovation. The company's portfolio includes everything from high-performance fabrics and implantable medical devices to industrial manufacturing components and aerospace electronics. Gore products have remained at the forefront of creative solutions because they are engineered specifically for challenging applications requiring durable performance where other products fail.

For more than twenty years, Gore has delivered venting solutions for a variety of applications installed in rugged environments throughout the world — applications such as solar, lighting, security, telecommunication and other electronic systems. Engineered with the latest materials and technology, GORE® Protective Vents are backed by years of research and testing to help extend product life and enhance reliable performance — all to ensure that these venting products maximize performance and extend the life of products used in the most demanding applications.

Headquartered in the United States, Gore employs approximately 10,000 associates in 30 countries worldwide.

Learn more at [gore.com/protectivevents](http://gore.com/protectivevents).

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