GORE® Protective Vents
Adhesive Series VE8, VE7 and VE9



IMPROVE YOUR EQUIPMENT'S RELIABILITY AND DURABILITY

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.

Venting for protection

With proven performance for more than 25 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 Adhesive Series 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, semi or fully automated installation process. The specific venting solution for an application depends on a variety of factors including enclosure materials, size and performance parameters.

Benefits of GORE® Protective Vents Adhesive Series:

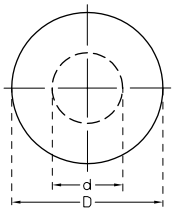
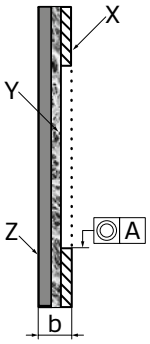
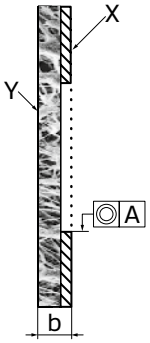
- **Longer product life** with rapid equalization of pressure to reduce stress on enclosure seals
- **Reliable protection** against water, salts, corrosive liquids and particulate by GORE Membrane offering hydrophobic and oleophobic characteristics
- **Increases durability** of sealed enclosures by complying 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
- **Reduces condensation** by allowing air exchange

Product Information

Material Performance	Series VE8	Series VE7	Series VE9
Typical airflow (ΔP = 70 mbar)	3300 ml/min/cm²	290 ml/min/cm²	1150 ml/min/cm²

Product Characteristics	Series VE8	Series VE7	Series VE9
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 below)	0.26 mm	0.34 mm	0.32 mm
Mounting location	Interior of the housing	Interior or exterior of the housing	

Design and Dimensions

	Series VE8	Series VE7	Series VE9
 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			

IP Rating

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

Standard Parts

Part Dimensions			Installation	Packaging		Series VE8		Series VE7		Series VE9	
ID (d) x OD (D) (mm)	Active Venting area (mm2)	Adhesive Ring area (mm2)	Compression Force (N / > 5 sec)	Parts across carrier	Carrier width (mm)	Part Number	Typ. airflow (ml/min - dp = 70 mbar)	Part Number	Typ. airflow (ml/min - dp = 70 mbar)	Part Number	Typ. airflow (ml/min - dp = 70 mbar)
2.0 x 5.0	3.14	16.49	3.3	5	41	VE80205	104	VE70205	9	–	–
3.3 x 7.6	8.55	36.81	7.4	8	88	VE80308	282	VE70308[1]	25	VE90308	98
5.5 x 10.2	23.76	57.95	11.6	5	69	VE80510	784	VE70510[1]	69	VE90510[1]	273
8.0 x 14.0	50.27	103.67	20.7	4	71	VE80814	1,659	VE70814	146	VE90814	578
8.9 x 19.1	62.21	224.31	44.9	3	69	VE80919[1]	2,053	VE70919	180	VE90919	715
12.5 x 21.5	122.72	240.33	48.1	2	52	VE81221	4,050	VE71221	356	VE91221	1,411
20.0 x 29.0	314.16	346.36	69.3	2	67	VE82029[1,2]	10,367	VE72029	911	VE92029	3,613

1. Available as one-up configuration for automatic installation indicated by -1 after part number.
2. In case of IP 67 requirement, please contact your Gore sales representative.

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.



RoHS Information

Product Stewardship RoHS Status: W. L. Gore & Associates declares that we do not intentionally add substances listed in RoHS Directive 2011/65/EU in its current valid version including all valid amendments to GORE® Protective Vents.

Recommendation for storage

Gore recommend to store products in cool dry conditions (20–25 °C / 30–50% RH) and out of direct sun light, preferably in the original packaging.

Recommendation for shelf life

Gore recommends to install our GORE® Adhesive Vents within 12 months after delivery.

HANDLING AND INSTALLATION GUIDELINES

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 after delivery
- Gore recommends to store products in cool dry conditions (20–25 °C with 30–50% 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 (or synthetic) rubber 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
- For guidance on automated installation, please contact your Gore representative
- Blunt-edged tweezers may be used to remove the vent gently from the liner (Figure 2)

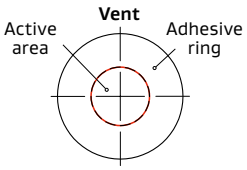


Figure 1: Active area of an Adhesive Vent

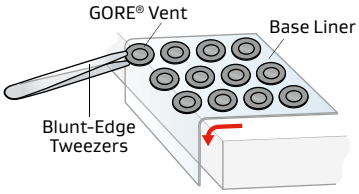


Figure 2: Manually dispensing an Adhesive Vent

Installation Guidelines

Preparation

- Ensure that the vent and housing temperature should be 10–25 °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)

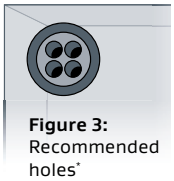


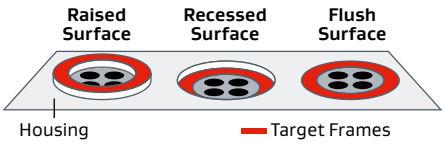
Figure 3: Recommended holes*

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



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.

Compression — 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

Compression — Semi-Automated and Automated Installation

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
- 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 compression force as indicated in the *Adhesive Vents Data Sheet "Standard Parts" table*, should be uniformly applied to the adhesive area of the vent. 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

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.

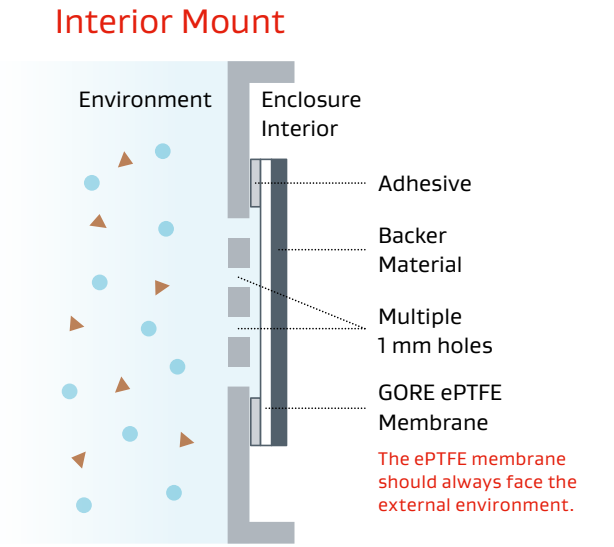


Figure 6: Interior mounting is recommended for Parts Series VE8

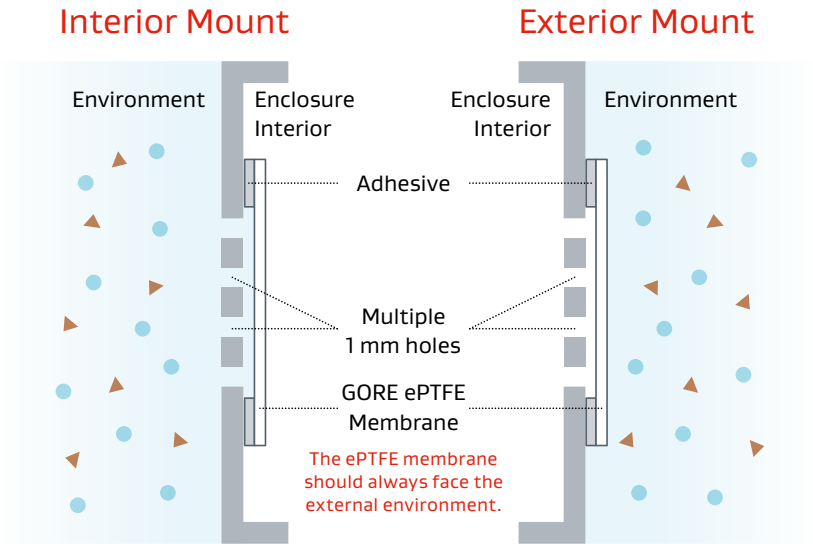


Figure 7: Interior or exterior mounting is recommended for Parts Series VE7 and VE9

For additional questions about handling and installation, please contact a Gore representative.

Environmental Performance

GORE® Protective Vents Adhesive Series have been tested by independent laboratories and meet these performance standards. **All certificates are available upon request.**

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**
- **IP68** was tested for extended immersion: 2 meters for 1 hour

IP Rating		VE8	VE7		VE9	
Particulates	Water	Interior	Interior	Exterior	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 VTM0 f2**: VE9

Corrosive Gas Testing

Vent durability in corrosive gas environment (e.g., NO_x, SO_x, H_2S, Cl_x)

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

Salt Fog Testing

Vent resistance to salty environments

METHODS:

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

Humidity Testing

Vent durability in hot, humid environments

METHOD:

- **IEC 60068-2-78**

TEST CONDITIONS:

- 85 °C
- 85% relative humidity
- 1000 hours

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

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