GORE® Pressure Vents

PROFIT FROM UNPARALLELED AIRFLOW PERFORMANCE AND GREATER RELIABILITY FOR YOUR DEVICES

Together, improving life

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Engineered to maximize airflow, ingress protection and acoustic performance.

When a device experiences temperature or altitude changes, a pressure differential between the external environment and the interior of the device can occur. This pressure differential can weaken the gaskets and seals within the device and eventually leads to lower resistance to liquid penetration. This also creates transducer bias, compromising acoustic performance.

The latest smart phones and many other consumer electronic devices are now made with a flexible, touch-sensitive screen that deflects inward. In an unvented device, this creates a very large pressure differential, causing a transducer bias that is easily heard during phone calls or when playing music. To avoid this problem, a significant amount of air must be evacuated from the device very quickly.

GORE® Pressure Vents are engineered for maximum airflow at the required level of ingress protection — optimizing venting material, vent size, free volume and target equalization time to provide the best pressure equalization solution without compromising acoustic performance.

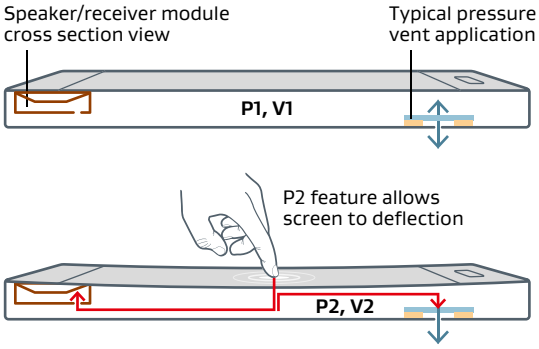
How can speaker/receiver bias occur?

Increased deflection of the enclosure (P2) puts pressure on the speaker/receiver diaphragm via the back cavity and is likely to cause distortion when in operation mode. This can happen when applying or releasing finger pressure.

On compression:

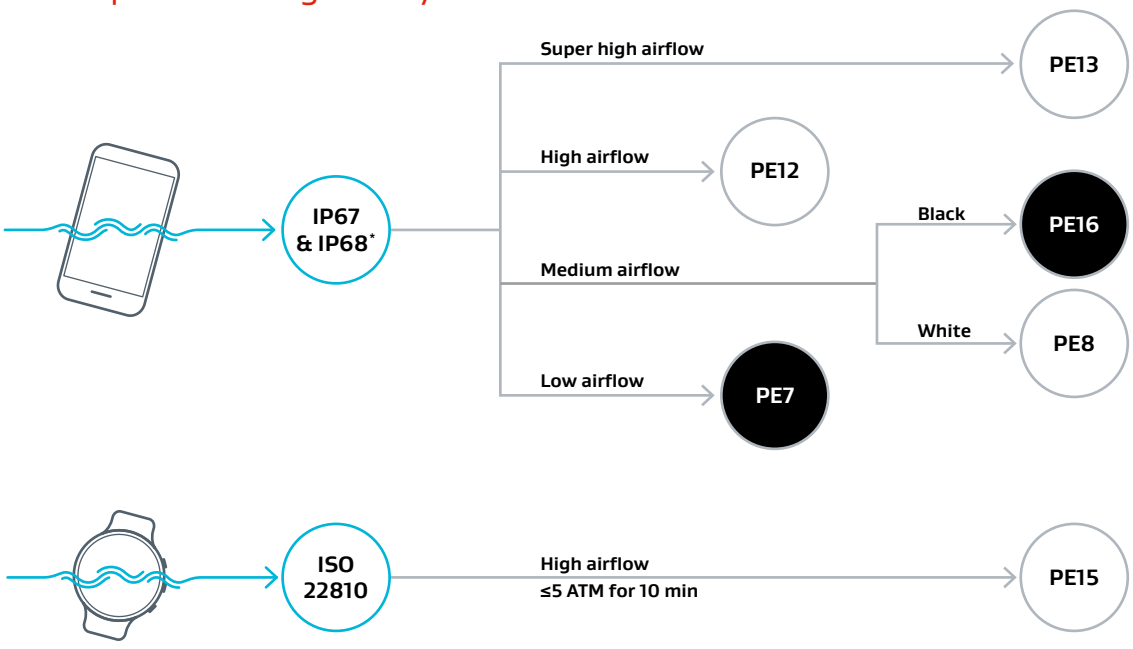
- V2 is less than V1
- Speaker diaphragm displaces outwards
- Sudden P2 causes the vent to begin equalizing pressure
- Our vents provide pressure equalization that
- minimizes speaker distortion

Handset cross sectional view



P: Pressure of inner volume **V**: Volume of device

Which product is right for you?

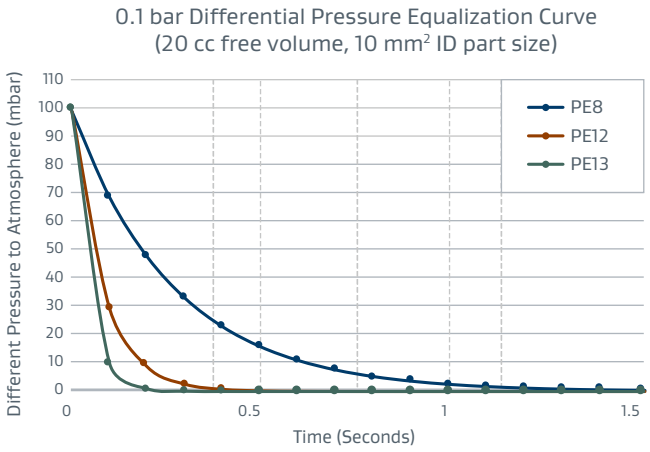


* With appropriate design conditions (please consult Gore associates).
PE12 and PE13 can meet IP68 (1.5 m water for 30 minutes).
Normally, PE16 and PE8 can meet IP67. For certain designs, IP68 (1.5 m water for 30 minutes) can be met.
PE7 can meet IP68 (2 m water for 1 hour).

Delivering next level airflow performance

The graph on the right shows the pressure venting capability of different GORE® Pressure Vents under a simulated condition — initial 0.1 bar differential pressure, 20 cc free volume and pressure vent active area size of 10 mm².

The data is provided for reference only. The actual device performance may vary — depending on factors such as location of pressure vents, housing opening sizes, and individual speaker/receiver performance.



Product Information

Application	**Smartphones, Two-Way radios, Scanners**					**Wearables**
Characteristics/ Performance	**PE13**	**PE12**	**PE8**	**PE16**	**PE7**	**PE15**
IP rating (IEC 529, 2nd)[1]	IP67, IP68[2]	IP67, IP68[2]	IP67[3]		IP67, IP68[4]	IP67, IP68
ISO rating (ISO 22810)	N/A	N/A	N/A		N/A	50m water @ 10min[8]
Typical airflow (dp = 70 mbar)	19,000 ml/min/cm²	10,000 ml/min/cm²	3,300 ml/min/cm²	4,200 ml/min/cm²	290 ml/min/cm²	380 ml/min/cm²
Reference thickness[5]	0.24 mm	0.24 mm	0.27 mm	0.32 mm	0.34 mm	0.29 mm
Adhesive type[6]	Silicone/Acrylic	Silicone/Acrylic	Acrylic		Silicone	Acrylic
Membrane type	ePTFE					
Membrane characteristic	Oleophobic					
Membrane color	White			Black		White
Support material	PET	PET Non-woven			None	PET
Part orientation	Internal mount with ePTFE facing environment				Mount on the interior or exterior of the housing	Internal mount with ePTFE facing environment and back pressure on captive ring is required
Adhesive temperature range	-40 °C to 100 °C					
RoHS[7]	Meet threshold requirements					

1. IP ratings depend on housing design and part size.
2. Extended immersion testing: 1.5 m water immersion for 30 minutes.
3. PE8 and PE16 can meet IP68 (1.5 m water @ 30 minutes) with certain custom design conditions. Please contact Gore associates for details.
4. Extended immersion testing: 2 m water immersion for 1 hour. PE7 can also meet IP65 and IP66 under external mount condition only.
5. Actual thickness may vary due to the compressibility of nonwoven, ePTFE and adhesive layers.
6. A wide range of options available as a custom product.
7. To the best of our knowledge, the parts listed above do not have any restricted substances above the maximum concentration values listed in RoHS Directive 2011/65/EU.
8. Extended immersion testing: 50 m water immersion for 10 minutes with back pressure on captive ring.

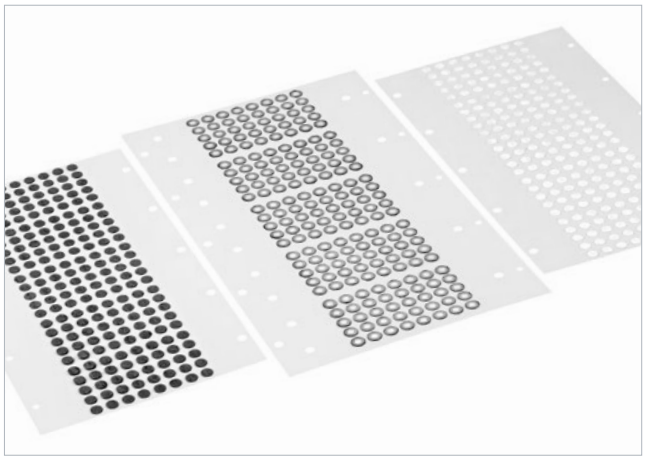
This information is based on our current level of knowledge and does not constitute a representation or warranty beyond those contained in our standard terms and conditions.

Design Considerations

Predicting the conditions your product will encounter can be difficult, so our application engineers will work with you to ensure the right vent is selected.

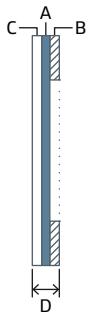
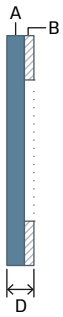
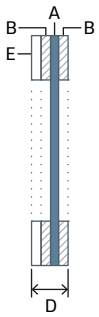
Factors that might be considered include:

- Product dimensions (device air volume)
- How your product will be used
- Potential altitude changes
- Minimum and maximum temperatures it may face
- Time between minimum and maximum temperature exposures
- Target equalization time
- Required liquid, particulate and contaminant protection levels
- Vent mounting surfaces and required adhesives



GORE® Pressure Vents are available with various water resistance, airflow and color options.

Part Cross-Section

P8, PE12, PE16	PE7	PE13, PE15
		

A: ePTFE membrane

B: Adhesive

C: Non-woven support material

D: Reference thickness

E: PET support material

Standard Parts

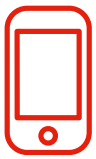
Dimension (mm)		Part Number					
Inner Diameter	Outer Diameter	PE13	PE12	PE8	PE16	PE7	PE15
1.6	4.2	—	—	—	—	—	—
2.0	5.0	PE130205	PE120205	PE80205	PE160205	—	—
3.0	6.0	PE130306	PE120306	PE80306	PE160306	PE70306	—
5.0	9.4	—	—	—	PE160509	—	—
5.5	10.2	—	—	PE80510	—	PE70510	—
1.6	3.8	—	—	—	—	—	PE151.63.8
2.0	4.2	—	—	—	—	—	PE152.04.2

Available in custom and standard sizes to give manufacturers greater design flexibility — to either reduce the number of pressure vents used in their devices, or reduce the size of pressure vents for devices with limited internal space — without reducing effectiveness.

Gore applications engineers are also available to assist in selecting the right solution for your specific application requirements.

Why Choose GORE® Portable Electronic Vents for Your Electronic Devices?

Leading OEMs have specified over 5 billions of GORE® Portable Electronic Vents because they know our products and services can help accelerate their development of innovative and differentiated devices in fast-paced, highly competitive markets.



Product & Application Leadership

Grounded in a deep understanding of material science and acoustics, Gore can provide the optimum venting solution. We balance trade-offs between diverse problems such as adverse operating environments, immersion events and acoustic performance.

Reliable Performance

To ensure products are “fit for use”, every Gore product must adhere to the highest standards of quality, performance and reliability. Through a comprehensive understanding of end-use applications and requirements, our products do what they say they will do.

Fast Development

The mobile electronics industry develops and releases new products quickly. Our fast response to customer requests during the development process sets us apart. Gore supports this need for quickness with designs and prototypes to ensure engineering teams can meet their project timelines and their application requirements.

Supply Security

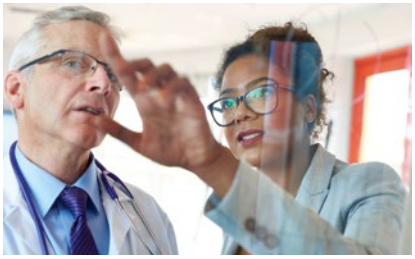
Leading OEMS specify Gore because we have consistently proven our ability to quickly ramp up to supply vents for projects of over 10 million devices per year and to continue to supply high quality products on-time without disruption.

Material Science

Gore is a global materials science company dedicated to transforming industries and improving lives. Gore develops materials with microporous structures that provide desirable attributes and performance characteristics to engineer vents and other products used in a variety of markets and industries.

Global Support

Our global teams of sales associates, application engineers, manufacturing engineers, and research personnel enable us to provide agile and robust support to customers around the world.



A materials science company dedicated to transforming industries and improving lives

About Gore

W. L. Gore & Associates is a global materials science company dedicated to transforming industries and improving lives. Since 1958, Gore has solved complex technical challenges in demanding environments — from outer space to the world's highest peaks to the inner workings of the human body. With more than 11,000 Associates and a strong, team-oriented culture, Gore generates annual revenues of $3.8 billion.

Learn more at gore.com/portableelectronics

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