



HOW TO DESIGN WITH GORE® PORTABLE ELECTRONIC VENTS?

How GORE® Portable Electronic Vents help solve the dual design challenges of preserving acoustic sound quality and device reliability.

The challenge of designing electronic devices that stay protected from dust, liquids and pressure becomes increasingly difficult when acoustics are introduced.

To enable sufficient sound transmission, devices require apertures. But these apertures that let the sound out

also allow dust and liquids to enter the device and create performance and reliability issues. Creating clear crisp sound while protecting device reliability requires careful design of the cavities in front of and behind all transducers.



Cross-section of remote speaker microphone

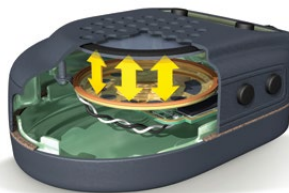
Evaluating Design Options for the Front Cavity

Open apertures provide unimpeded sound, but provide no protection from dust, liquids or immersion — hazards that nearly all portable electronics encounter. Designs with open apertures are highly susceptible to component failures, decreased device life and consumer perceptions of poor quality.

Waterproof transducers that seal the front cavity from the device prevent water and dust contamination from reaching components. But, waterproof transducers still allow water and particulates onto and around the transducer surface, which degrades acoustic performance over time. Additionally, waterproof transducers often impose an “acoustic penalty” by providing lower overall acoustic quality and requiring increased drive power levels to operate the transducer.

Non-porous covers such as urethane, silicone or PEEK can be used to cover apertures when immersion protection is needed. They can allow satisfactory sound transmission while protecting the transducer from dust and liquid submersion. However, these materials do not breathe. When pressure in the front cavity builds

(due to temperature or altitude changes), the pressure on the compliant surfaces of the transducer increases. This pressure creates transducer bias that can significantly degrade sound quality and transducer performance.



Increased pressure creating transducer bias

GORE® Acoustic Vents for immersion applications offer new solutions to the challenges of designing front cavities. The ePTFE membrane in Gore’s immersion vents protects the transducer and the device from dust and liquid immersion up to IP68. Our highly breathable ePTFE membrane rapidly equalizes pressure in the front cavity, continuously providing exceptional acoustic performance in all designed conditions.



Evaluating Design Considerations for the Back Cavity

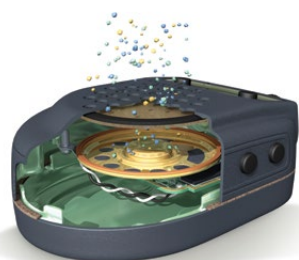
Sealed housings protect electronic devices by providing a barrier against water or dust. But as electronic devices operate they generate heat, causing internal temperatures to increase and pressure to build inside the housing. Internal pressure can also change rapidly if the device is exposed to sudden changes in environmental temperatures or altitudes. These internal pressure changes put significant stress on the housing seals. Over time this leads to failed seals, which then allow water and contaminants to enter the device.

Additional Considerations for Dust and Splash Protection

Woven mesh covers are a partial solution, in that they can protect an aperture from liquid splash, spray or rain. However, these products consist of a single-layer grid and spacing pattern with a defined hole size. So any dust particles smaller than the defined hole size will pass through the screen and deposit on the transducer, or they will propagate through the device, potentially causing catastrophic device failure.

GORE® Acoustic Vents for dust and splash applications provide added protection because of their non-woven structure. While they reliably repel liquid splash, spray

or rain exposure, they also offer greater protection from small particles. Gore's expertly engineered non-woven materials provide a tortuous path that more effectively traps smaller particulates. This added protection reduces quality issues and improves device functionality.



Particulates entering through a woven mesh

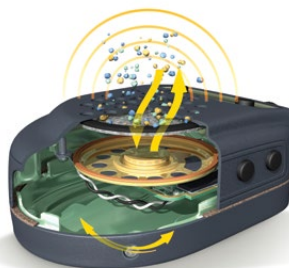


Tortuous path of non-woven material used in GORE® Acoustic Vents for Dust and Splash Applications



Transducer bias created by pressure on compliant surfaces

When dealing with acoustic transducers, there is an additional problem with sealed back cavities: pressure on the compliant surfaces of the transducer can create transducer bias, which can greatly degrade sound quality and transducer performance.



Properly designed products protect from dust, water, pressure, and transmit high-quality sound

GORE® Pressure Vents are specifically engineered for back cavities. Their breathable construction effectively equalizes pressure while providing reliable protection from liquid submersion and dust contamination. Our product portfolio includes a range of materials and structures that meet the most challenging environmental demands and application needs.

For more information on acoustic vent technology, click over to gore.com/portableelectronics and see these articles:

- [PDF](#) Why choose a GORE® Acoustic Vent?
- [PDF](#) How to select an Acoustic Vent?

Contact Gore to learn about the right GORE® Portable Electronic Vent for your unique application.

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.

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 12,000 Associates and a strong, team-oriented culture, Gore generates annual revenues of \$4.5 billion.

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