



GORE® Portable Electronic Vents

FOR ACOUSTICS – IMMERSION APPLICATIONS

W. L. Gore & Associates

Gore is a technology-focused materials science company whose passion for performance drives real-world change.

Since 1958, we've engineered solutions for a variety of mission-critical situations — medical, pharmaceuticals, biotechnologies, energy, aerospace, automotive, mobile electronics, music and semiconductors.

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.

GORE® Vents

For almost thirty years, Gore has delivered venting solutions for applications such as automotive, electronic systems, telecommunications, security, heavy-duty vehicles, solar, lighting, chemicals and agricultural packaging.

Engineered with the latest materials and technology, Gore's vents are backed by years of research and testing to help extend product life and enhance reliability, meeting the demands of today's technology.

We don't just provide manufacturers with vents; we offer partnership and a complete venting solution, from product design to testing to support. The result: maximum performance in diverse challenging applications.

Contact Us

For additional assistance, please contact a Gore representative.

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Maintain sound quality and robust immersion protection



GORE® Portable Electronic Vents

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Maintain sound quality and robust immersion protection

Today's consumers increasingly demand immersion-resistant handsets, wearables and other mobile electronic devices. Normally, reliable waterproofing involved a trade-off in audio quality: increased water protection meant decreased sound quality.

With GORE® Acoustic Vents, robust protection and quality audio transmission happily coexist. Gore, a global technology innovator, offers patented venting solutions that protect against the harshest environmental challenges, while maintaining rapid and accurate response to sound transmissions.

A Reliable Balance of Performance Characteristics

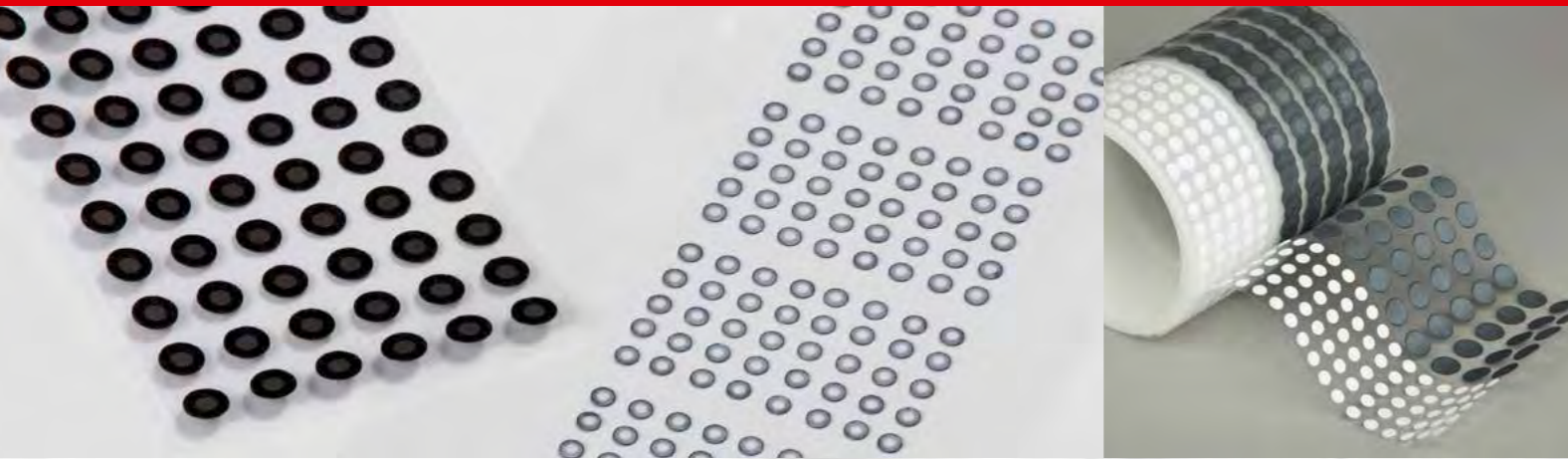
- low-resistance acoustic materials for minimal transmission loss
- blocks dust and liquids during indoor and outdoor use
- immersion protection up to 30 meters at 10 minutes





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The Science Behind the Solution

GORE® Acoustic Vents Series GAW325, GAW333 and GAW331 offer exceptional protection and improved sound quality in immersion applications. The GORE™ Membrane of expanded polytetrafluoroethylene (ePTFE) is engineered to protect in even the harshest environments, while minimizing bias and transmission loss for bright, clear, quality acoustics.

Series GAW325 delivers proven long-term reliability in challenging applications like waterproof handsets, outdoor two-way radios and barcode scanners.

Series GAW333 provides unsurpassed acoustic performance with IPX8 immersion protection, in an incredibly small vent that meets the design needs of today's smartphone industry.

Series GAW331 delivers high-performance acoustics with deep immersion protection – down to 30 meters – ideal for devices like smartwatches, action cameras or fitness bands.

Realize the Benefits of GORE® Acoustic Vents:

Excellent acoustic device performance with consistent sound quality and reliable ingress protection.

Avert damage to sensitive electronics, thanks to reliable hydrophobic and oleophobic protection.

Less bias and distortion in acoustic systems, because pressure differentials are rapidly equalized by breathable membranes.

Design and installation flexibility, whether you choose standard parts, or custom-part designs.

Outstanding technical resources and global engineering support for our customers and products.

Superior Acoustic Response with GORE® Acoustic Vents

Many factors can affect the sound quality of mobile electronic devices, from the housing design to the quality of the electronic components themselves. But for any given device, the best way to retain the “as-designed” audio quality is to select a vent that provides the most sensitive acoustic response at the desired level of ingress protection. Of course, different vents will have different acoustic response patterns.

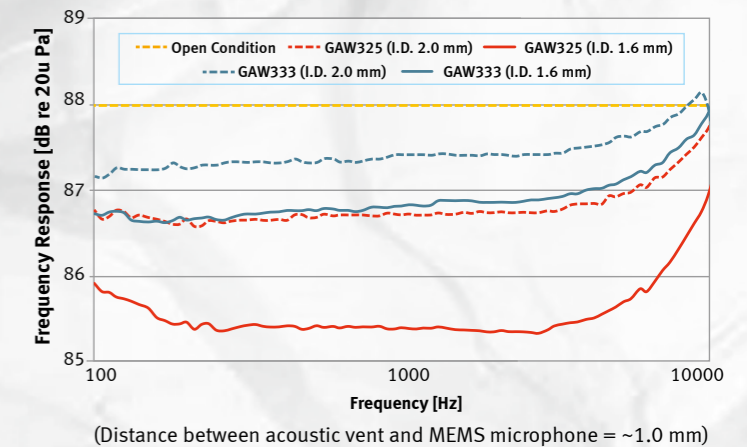
The graph to the right compares the enhanced acoustic response of Series GAW333 to that of Series GAW325. It also shows that acoustic performance is relative to a given vent’s “active area” (the size of the vent membrane, measured as the inner diameter of the finished part).

With an inner diameter (I.D.) of 1.6 mm, Series GAW333 delivers immersion protection with acoustic response that equals or exceeds that of Series GAW325 at 2 mm I.D. GAW333 acoustics also outperform competitive IPX7/IPX8 products of the same size. With this level of acoustic response in a much smaller part, GAW333 offers more flexibility in designing and configuring even smaller mobile electronics.

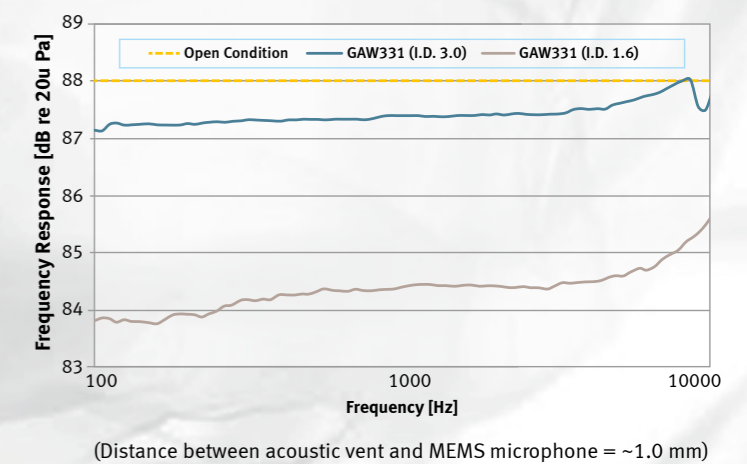
As shown to the right, it is possible to achieve a superior level of ingress protection while maintaining an exceptional level of acoustic response.

Series GAW331 offers IPX8 extended immersion protection (in 30 meters of water for 10 minutes), yet even with a very small active area (I.D. 1.6 mm), it delivers excellent acoustic response, with minimal attenuation.

Acoustic response of GAW325 & GAW333



Acoustic response of GAW331





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Product Information

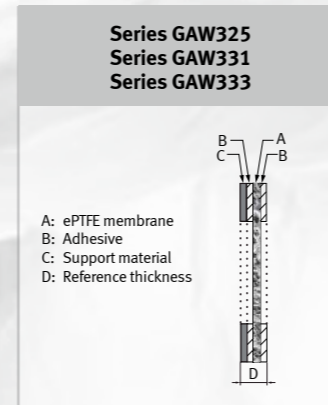
Characteristics/Performance	Series GAW325 ^a	Series GAW333 ^a	Series GAW331 ^a
IP rating (IEC 60529) ^b Extended immersion test conditions	IP67; IP68 2 m water @ 1 hr	IP67; IP68 2 m water @ 1 hr	IP67; IP68 10 m water @ 1 hr ^c
ISO rating (ISO 22810)	N/A	N/A	30 m water @ 10 min ^d
Transmission loss at 1kHz ^e	< 2.5 dB (I.D. 1.6 mm)	< 1.5 dB (I.D. 1.6 mm)	< 4 dB (I.D. 1.6 mm)
Membrane type	ePTFE		
Membrane characteristic	Oleophobic	Hydrophobic	Oleophobic
Membrane color	Black	White	Black
Support material	PET-Nonwoven or PET	PET	
Adhesive temperature resistance	-40 °C to 100 °C	-40 °C to 85 °C	
Adhesive type	Acrylic		
RoHS ^f	Meets threshold requirements		

^a Patent issued: US6512834C1
^b IP ratings for assembled devices depend on the design of the product housing.
^c Part I.D. 3.0 mm / O.D. 6.0 mm.
^d Part I.D. 1.6 mm / O.D. 4.2 mm.

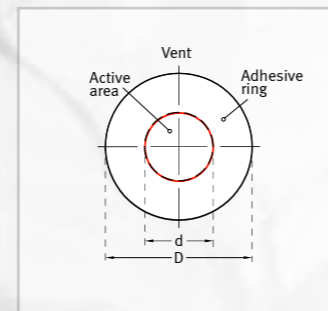
^e Tested using a typical MEMS microphone system. Design of assembled device will affect performance.

^f 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. 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.

Part Cross-Section



Round Part Design



Standard Parts

Transducer Type	Dimension (mm)			Part Number		
	Inner	Outer	Reference Thickness**	Series GAW325	Series GAW333	Series GAW331
Round Microphone (Round Active Area)	1.6	3.2	0.31	–	GAW3331.63.2*	–
	1.6	4.2	0.28	–	–	GAW3310204*
	2.0	3.6	0.31	–	GAW3332.03.6*	–
	2.4	5.0	0.36 0.31	GAW3250205 GAW3250205P*	–	–
	3.0	6.0	0.36 0.31	GAW3250306 GAW3250306P*	–	–
	4.0	8.0	0.36 0.31	GAW3250408 GAW3250408P*	–	–
Square Microphone (Square Active Area)	2 x 2	4.4	0.31	GAW3250204R*	–	–

* Indicates parts with PET support material; all others have PET-nonwoven support material.

** Nominal aggregate thickness of all layers (adhesive/membrane/support material) of finished part. Actual thickness may vary due to construction of finished part and compressibility of materials.

Custom Part Designs: Series GAW325, Series GAW333 and Series GAW331

Gore application engineers can assist in designing an application-specific solution around your requirements for part size, adhesive and performance characteristics. Ask your Gore representative for more information.

Visit gore.com/portableelectronics for the detailed *Installation and Handling Guidelines for GORE® Acoustic Vents*.

Why Choose GORE?

A wide range of high performance solutions with an advanced, innovative membrane at its core.

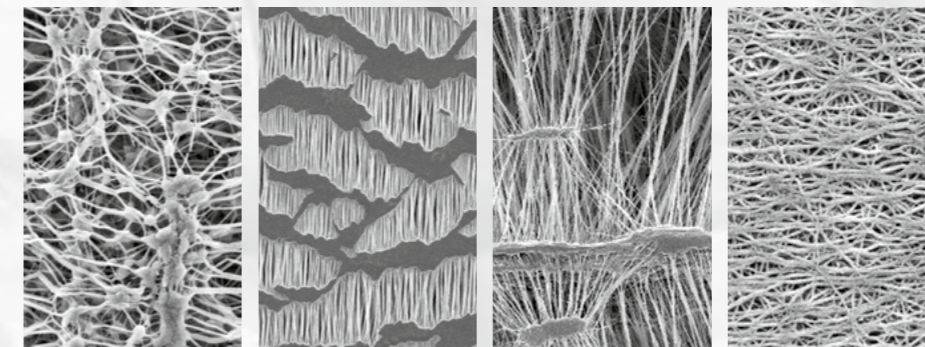
The Gore range is the product of over 20 years of industry expertise which continues to respond to the demands of an ever-changing world.

We offer the very best to our customers, with services that include:

- Global research, development and engineering support
- Materials for every environment and application
- Production flexibility
- Rapid sampling

The GORE™ Membrane: The heart of our venting technology

What gives our vents their superior performance qualities is expanded polytetrafluoroethylene (ePTFE), the remarkably versatile polymer at the heart of our products. Gore is the world leader in understanding ePTFE and its capabilities. For each implementation, we use the GORE™ Membrane to engineer an ePTFE membrane structure with a variety of different properties tailored for various challenging applications.



Our knowledge of fluoropolymers and our noteworthy engineering capabilities is at the heart of a wide range of remarkable materials.

Acoustic transparency

A membrane thin and low mass enough for optimal sound transmission, responding quickly and easily to sound waves, for high quality acoustics.

Pressure equalization

Optimal transmission properties ensure the membrane equalizes pressures rapidly, to avert seal stress and protect sensitive electronics from condensation.

Immersion protection

Although thin, the membrane structure is engineered to repel water effectively, protecting devices against immersion up to IP68 standards.

Fluid resistance

Oleophobic acoustic vents effectively repel oils, sweat, cleaning solutions and other common fluids that can threaten mobile electronics.

Global experience, global support

GORE® Portable Electronic Vents has worldwide facilities dedicated to testing and evaluating acoustic venting solutions. Our global team of acoustical engineers can help you assess overall acoustic system designs, or specific acoustic test results, to help improve the sound quality and reliability of your immersion-resistant devices.