

GORE® Acoustic Vents
For Immersion Application

A hand holds a smartphone in the foreground. The phone's screen shows a dolphin leaping from the water, with water droplets visible on the screen's surface. The background of the phone's display is a sunset over a body of water. The entire scene is set against a backdrop of a boat's deck and railing, with a large red diagonal band across the lower half of the image.

PROVIDING LIQUID RESISTANCE,
ACOUSTIC CONSISTENCY,
AND RELIABLE SUPPLY

Together, improving life



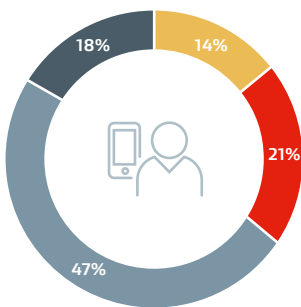
GORE® Acoustic Vents

Solving Trade-offs Between Liquid Resistance and Acoustic Performance

As consumers rely more on smartphones 24/7, the need for enhanced water resistance has become even greater. Based on a recent survey, 82% of consumers are concerned about protecting phones from water damage and 74% believe improved water resistance in

their next phone is key. After price and brand, a water resistance feature would drive more purchases than any other attribute.¹ Acoustic consistency is also more critical as voice recognition becomes an increasingly essential user experience.

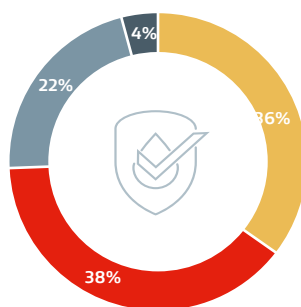
Concerns about protecting phones



Very worried
Quite worried
A bit worried
Not worried at all

82%

Improved Water Resistance Importance



Essential
Important
Nice
Don't care

74%

Normally, reliable water resistance involves a trade-off in audio quality since devices require apertures for efficient sound transmission that often let sound out and allow liquids to enter which creates performance issues. Gore is the leading provider of acoustic vents to successfully resolve this trade-off with an optimum venting solution.

1) Gore Smartphone Consumer Perceptions Research-August 2019

Meeting Demands for Water Resistance Without Sacrificing Acoustic Quality

GORE® Acoustic Vents facilitate transmission of sound with superior acoustics performance, deeper immersion protection and enhanced contamination resistance. As a global material science company, Gore can tailor this material around the desired functionality to repel water, sweat, cleaning solutions and low surface tension liquids like detergent and oils without sacrificing acoustic performance. Our products are subjected to rigorous Extended Water Entry Pressure (eWEP) testing for deeper immersion protection. Smartphones can be protected from water as deep as 5 meters for as long as 30 minutes and wearables as deep as 50 meters for 10 minutes which is superior to the competition and decreases the number of defective products produced.



Greater Design Flexibility

Aesthetics and part sizes of venting systems are often fixed which makes it difficult for designers to get the right products. Gore's vast range of design options set us apart to ensure all specifications can be met.



Reliable Installation

Integrating portable vents with your products can be a technical nightmare since all the requirements make installation costly and time consuming. Gore drives down development time with easy and reliable vent installation all backed by the fact we currently support over 1 billion installations globally.



Unmatched Acoustic Expertise

Acoustics Expertise



Mobile electronics acoustics are at the core of our venting business with over 30 years of experience

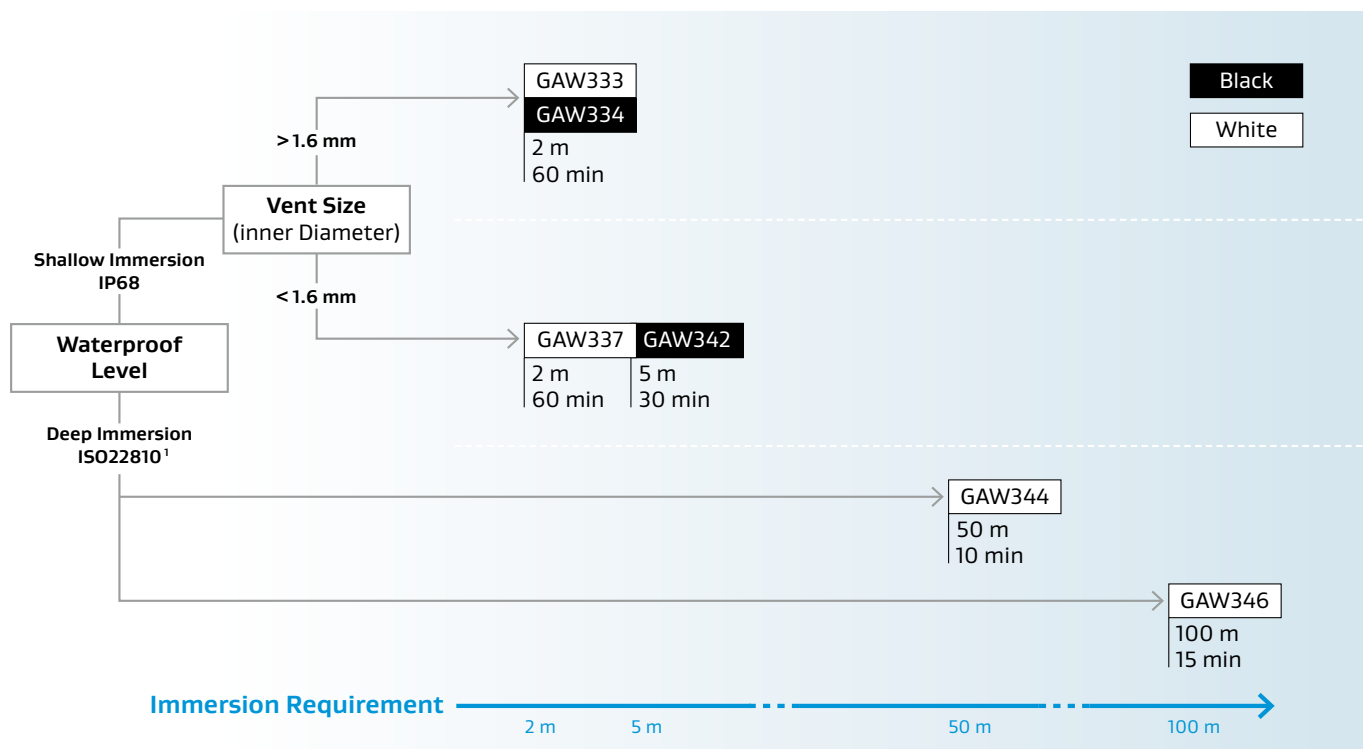


Better measurement of acoustic part performance in design and mass production phase



Proven acoustic modeling capabilities to support your design process

GORE® Acoustic Vents Selection General Guidelines

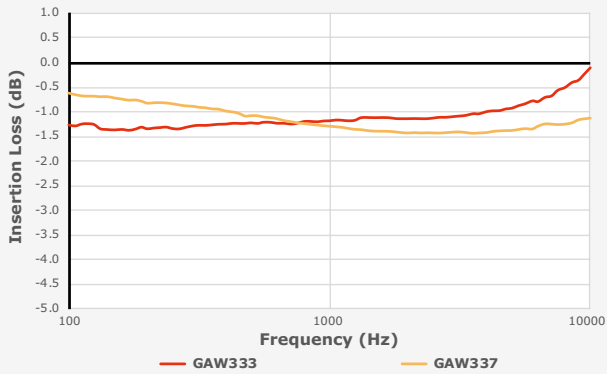


1) In compliance with ISO22810:2010(E) test method 4.3.2 Water resistance to overpressure.

Unparalleled Acoustic Performance

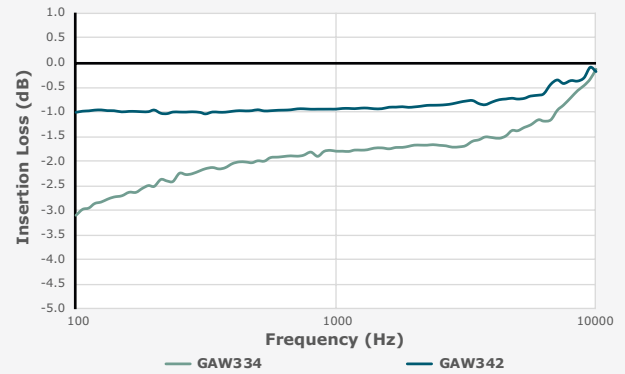
Acoustic Response Comparison at I.D. 1.6 mm

White Products



- The insertion loss of GAW333 and GAW337 is less than 1.5 dB across the whole range. GAW337 performs the best in low frequencies.

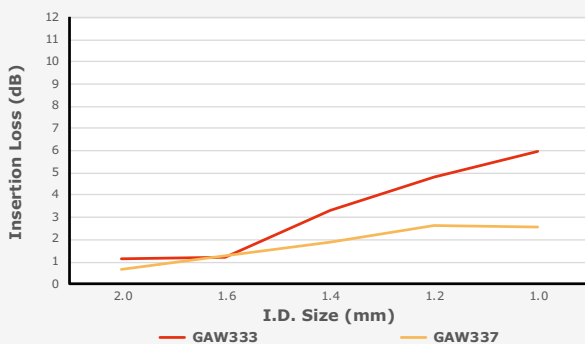
Black Products



- GAW342 has lower insertion loss than GAW334 and maintains a relatively flat response across the entire frequency range.

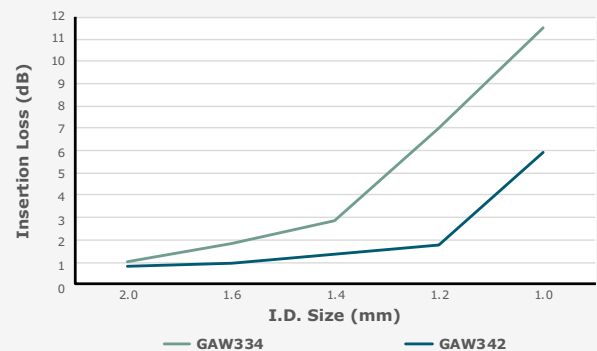
Acoustic Response Comparison at Different I.D. sizes (@1kHz)

White Products



- GAW337 has a lower insertion loss than GAW333. The difference is greater as I.D. size is reduced.
- At 1.0 mm I.D., GAW337 insertion loss is lower than GAW333 by 3 dB.

Black Products



- GAW342 shows the lowest insertion loss. The difference is greater as I.D. size is reduced.
- At 1.0 mm I.D., GAW342 insertion loss is lower than GAW334 by 5 dB.

The tests represent the response from a typical MEMS microphone system in Gore laboratory with representative sample size. Performance may vary depending on the design of the device.

Product Information

| Characteristics/ Performance | Series GAW333 | Series GAW337 | Series GAW334 | Series GAW342 | Series GAW344 | Series GAW346 |
|----------------------------------------|------------------------------|---------------------------|---------------------------|------------------------------|-------------------------------------|--------------------------------------|
| Application | Shallow Immersion | | | | Deep Immersion | |
| IP Rating (IEC 60529) ¹ | IP68 (2 m water @ 1 hr) | | | IP68 (5 m water @ 30 min) | – | – |
| ISO Rating ⁶ (ISO 22810) | N/A | | | | 50 m water @ 10 min ² | 100 m water @ 15 min ³ |
| Insertion Loss @ 1kHz ⁴ | < 1.3 dB (I.D. 1.6 mm) | < 1.3 dB (I.D. 1.6 mm) | < 1.8 dB (I.D. 1.6 mm) | < 1.3 dB (I.D. 1.6 mm) | < 4 dB (I.D. 1.6 mm) | < 4 dB (I.D. 2.0mm) |
| Membrane Characteristic | Hydrophobic | | Oleophobic | | | |
| Membrane Color | White | | Black | | White | |
| Membrane Type | ePTFE | | | | | |
| Support Material | PET | | | | | |
| Adhesive Type | Acrylic | | | | | |
| RoHS ⁵ | meets threshold requirements | | | | | |

1) IP ratings for assembled devices depend on the design of the product housing.

2) Part I.D. 1.6 mm/O.D. 3.8 mm with back pressure on captive ring.

3) Part I.D. 2.0mm/O.D. 4.2mm with back pressure on captive ring.

4) Average value tested using a typical MEMS microphone system.

Design of the device will affect final performance.

5) 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.

6) In compliance with ISO22810:2010(E) test method 4.3.2 Water resistance to overpressure. 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.

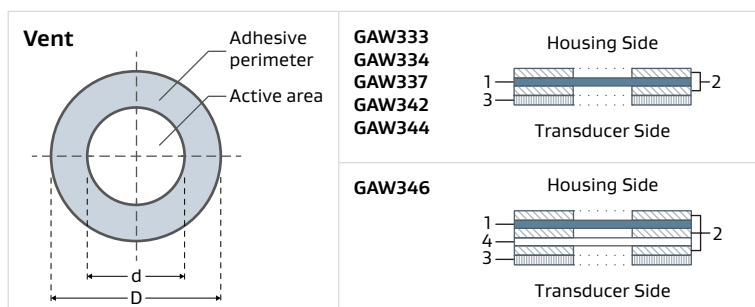
Standard Parts

Transducer Type: Microphone

| Dimension (mm) | | | Part Number | | | | | |
|----------------|-------|----------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Inner | Outer | Reference Thickness* | Series GAW333 | Series GAW334 | Series GAW337 | Series GAW342 | Series GAW344 | Series GAW346 |
| 1.4 | 3.0 | 0.36 | – | – | GAW3371.43.0 | GAW3421.43.0 | – | – |
| 1.6 | 3.2 | 0.31 | GAW3331.63.2 | GAW3341.63.2 | – | GAW3421.63.2 | – | – |
| 1.6 | 3.8 | 0.31 | – | – | – | – | GAW3441.63.8 | – |
| 1.6 | 4.2 | 0.28 | – | – | – | – | – | – |
| 2.0 | 3.6 | 0.31 | GAW3332.03.6 | GAW3342.03.6 | – | GAW3422.03.6 | – | – |
| 2.0 | 4.2 | 0.31 | – | – | – | – | GAW3442.04.2 | – |
| 2.0 | 4.2 | 0.40 | – | – | – | – | – | GAW3462.04.2 |
| 2.4 | 5.0 | 0.31 | – | GAW3342.45.0 | – | – | – | – |
| 3.0 | 6.0 | 0.31 | – | GAW3343.06.0 | – | – | – | – |
| 4.0 | 8.0 | 0.31 | – | GAW3344.08.0 | – | – | – | – |
| 5.0 | 9.4 | 0.31 | – | GAW3345.09.4 | – | – | – | – |
| 2x2 | 4x4 | 0.31 | – | GAW3342.04.0R | – | – | – | – |

* 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.

Vent Design



d = Inner diameter
D = Outer diameter
1 = ePTFE Membrane
2 = Adhesive
3 = Support material
4 = Woven mesh

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 13,000 Associates and a strong, team-oriented culture, Gore generates annual revenues of \$4.8 billion.

Learn more at gore.com/portableelectronics

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