# GORE® Portable Electronic Vents

*FOR ACOUSTICS – DUST AND SPLASH APPLICATIONS*

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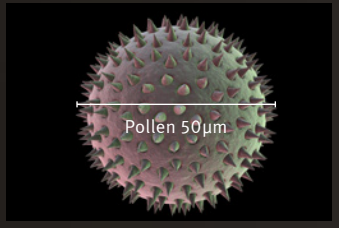
## Beyond IP Targets:

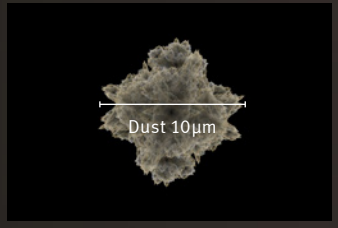
# Averting real-world dust and splash hazards

**Today's portable electronic devices need to stand up to dust and splash hazards that go way beyond commonly used IP standards; which is why Gore testing goes way beyond them too.**

### Real world hazards




IP6x blocks large (>50 µm) particles like pollen.




IP6x admits small (1-10 µm) particles like dust.

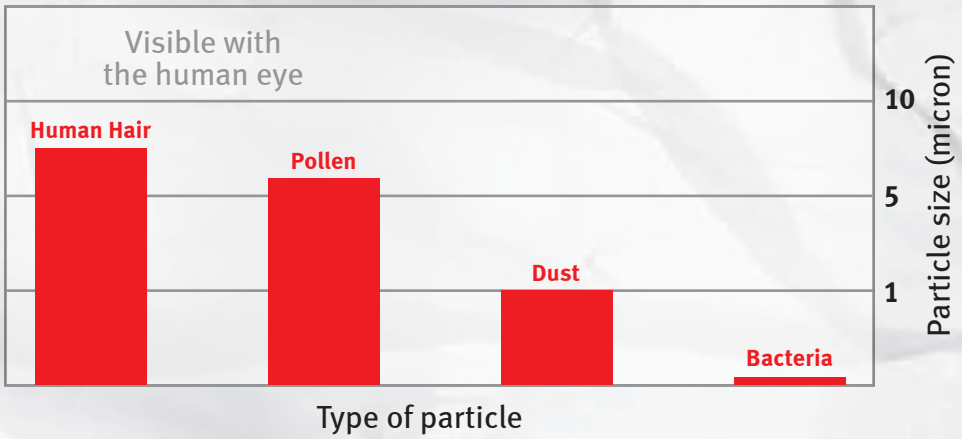
IP6x, for example, covers particulates but not things like smog, fumes, tobacco smoke and dust that can be under 10µm. Likewise, while IPx4 splash testing offers a pass/fail result against fluids, it does nothing to evaluate how different venting materials or housing design might improve the outcome.

Our venting materials are tested and qualified to perform to these standards, but also to additional protocols developed by our engineers that better reflect real-world conditions – in both assembled devices and during the design and development process itself.

# Particulate Testing – The Gore Way

IP6x defines “dust tight” as no ingress of particles. The Gore test evaluates how our vents protect against ALL common sizes of indoor and outdoor particulates, with a focus on particles between 1-10µm – a size range common in environments where mobile electronics are used.

**GORE® Acoustic Vents block contaminants the IP6x rating does not even address**



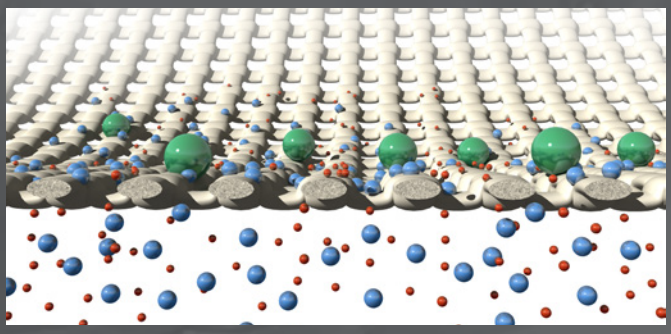

## Pore size only tells half the story

Woven materials have a uniform pore size, so they will block any spherical particle of that size or larger. But there are two issues with that:

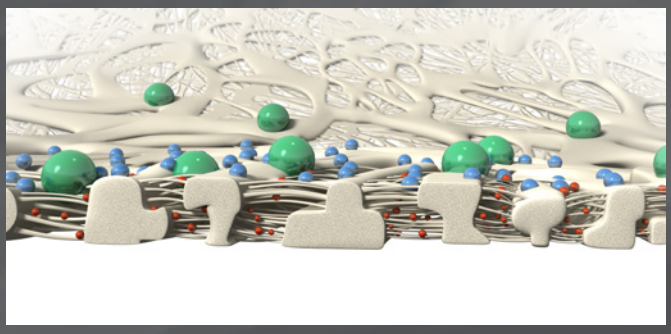
First, as the blocked particles accumulate on the woven surface, they can block airflow and reduce venting effectiveness.

Second, non-spherical particles like human hair or metal fibers may be classified as “larger than” a specified pore size…yet they can pass through pores of that size, due to their narrow shapes.

GORE® Acoustic Vents use non-woven membrane materials. They have a three-dimensional tortuous path structure, so they can capture particles of varied shapes and sizes. And, this structure also means these particles are captured in a way that is more likely to maintain consistent airflow.



**Woven material captures particles equal to or greater than its specified pore size.**



**Non-woven material captures particles of varying size and shape because of its tortuous path structure.**

# The untold story: magnetic attraction

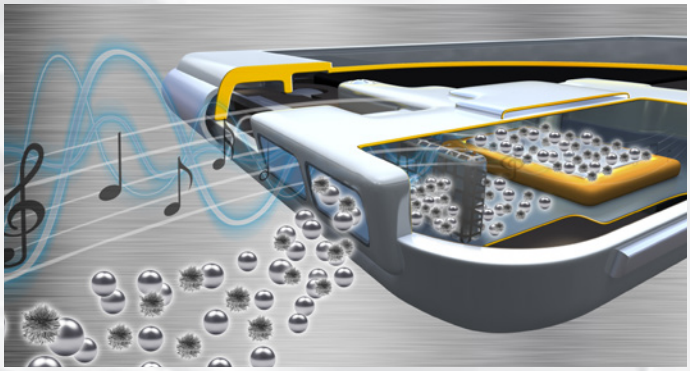
Typically, speakers and receivers are more vulnerable than other components. Because they include a permanent magnet, they generate magnetic fields that attract metal particles.

In a speaker with a woven vent material, these particles can be drawn in by, and settle on top of the speaker magnet. As these particles accumulate, their increasing mass and weight inhibits the diaphragm from producing high levels of sound pressure...significantly degrading acoustic quality.

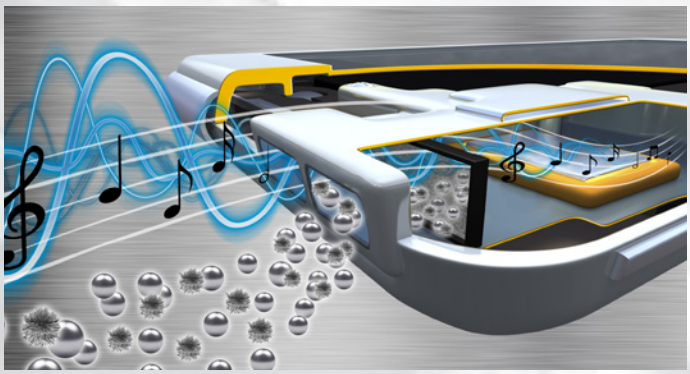
Non-woven GORE® Acoustic Vents, with higher particle-capture efficiency, protect against this type of acoustic degradation, to enhance both speaker longevity and device reliability.

How significant is this? If the sound pressure level drops by half...the acoustic loss can be as great as 6dB and this type of acoustic loss is irreversible. That's why it's critical to use a GORE® Acoustic Vent to block ingress of these metal particles in the first place.

**Speaker Module With Woven Vent Material**



**Speaker Module With Non-Woven GORE® Acoustic Vent**



## Splash Testing – The Gore Way

Gore engineers developed a rigorous "moving showerhead" test that increases the likelihood of water directly splashing on device openings... as would happen under real-world conditions. For devices designed to have openings near the transducers, this test can help to predict how well such devices will function and maintain sound quality, in the consumer's hands.

Using these Gore protocols, design engineers can now evaluate potential housing solutions during the development process, instead of after the device has been completed and assembled.

Finally, every GORE® Acoustic Vent provides oleophobic protection. So they help keep your device protected, whether it's splashed by water or by low surface-tension liquids such as soapy water.

## Improve Protection and Acoustics with Gore

Gore technology combines reliable dust and splash protection with uncompromising sound quality.

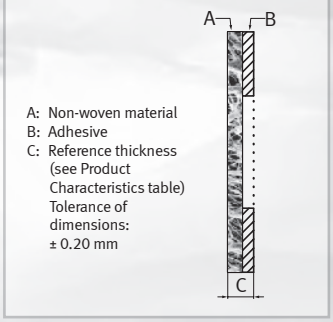
Our years of expertise in acoustic applications, as well as our membrane technology that maintains sound-wave integrity, enable Gore to deliver a reliable combination of ingress protection with high-quality acoustics for portable electronic devices.

## Product Information: Series GAW111 and GAW112 - For Dust and Splash Applications

| Characteristics/ Performance | Series GAW111 | Series GAW112 |
|---|---|---|
| IP rating (IED 529, 2nd)[a] | IP4x | IP4x, IP6x |
| Comparative water spray efficiency[b] | 60% | 75% |
| Average acoustic impedance (impedance from 200–5000 Hz, per ASTM 1050, modified) | 45 rayls MKS | 105 rayls MKS |
| Maximum transmission loss (max value 200–5000 Hz, per ASTM WK5285) | ‹ 1 dB | ‹ 2 dB |
| Material type & color | Cellulose/PET-Nonwoven & dark gray | |
| Material characteristic | Oleophobic | |
| Reference thickness[c] | 0.18 mm | 0.24 mm |
| Recommended part orientation | Mount on interior of housing | |
| Adhesive temperature range | -40°C to 70°C | |
| Adhesive type | Acrylic | |
| RoHS[d] | Meets threshold requirements | |

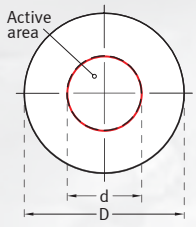
## Part Cross-Section

**Series GAW111**
**Series GAW112**




A: Non-woven material
B: Adhesive
C: Reference thickness (see Product Characteristics table)
Tolerance of dimensions: ± 0.20 mm

## Round Part Design




D: Outer diameter
d: Inner diameter

## Standard Parts: Series GAW112

| Transducer Type | Dimension (mm) | | Part Number |
|---|---|---|---|
| | Inner | Outer | |
| Round Microphone | 3.0 | 8.0 | GAW1120308 |
| | 5.0 | 9.4 | GAW1120509 |
| Round Speaker | 6.4 | 12.7 | GAW1120613 |
| | 9.0 | 19.0 | GAW1120919 |
| | 12.7 | 25.4 | GAW1121325 |
| | 20.0 | 29.0 | GAW1122029 |

## Custom Part Designs: Series GAW111 and GAW112

Gore 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.*

a IP ratings depend on the design of the product housing.

b Per Gore Water Spray-001: Direct stream at 70ml/min at 10psi; 0% efficiency represents open condition.

c Nominal aggregate thickness of adhesive and PET nonwoven layers. Actual thickness may vary due to the compressibility of materials.

d 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.

# 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 10,500 Associates and a strong, team-oriented culture, Gore generates annual revenues of $3.7 billion.

# GORE® Portable Electronic Vents

Gore is the global leader in venting solutions for portable electronic consumer devices. Our acoustic and pressure venting technology provides our customers with optimal venting solutions, balancing the tradeoffs amongst problems such as adverse operating environments, immersion events, acoustic performance, space constraints, device assembly challenges and cost. Furthermore, our acoustic modelling capabilities enables our customers to accelerate the development of robust acoustic solutions, while our resilient and agile global supply chain enables us to support the largest programs and provide the fastest ramps.

## Contact Us

For additional assistance, please contact a Gore representative.

**INTERNATIONAL CONTACTS**

| | | | |
|---|---|---|---|
| Australia | +61 2 9473 6800 | Mexico | +52 81 8288 1283 |
| Benelux | +49 89 4612 2211 | Scandinavia | +46 31 706 7800 |
| China | +86 21 5172 8299 | Singapore | +65 6733 2882 |
| France | +33 1 5695 6565 | South America | +55 11 5502 7800 |
| Germany | +49 89 4612 2211 | Spain | +34 93 480 6900 |
| India | +91 22 6768 7000 | Taiwan | +886 2 2173 7799 |
| Italy | +39 045 6209 240 | United Kingdom | +44 1506 460123 |
| Japan | +81 3 6746 2570 | USA | +1 410 506 7812 |
| Korea | +82 2 393 3411 | | |

**W. L. Gore & Associates, Inc**
401 Airport Road • Elkton, MD 219221 • USA
Phone: +1 410 506 7812 (USA) • Toll free: +1 800 523 4673
Fax: +1 410 506 8749 • Email: portableelectronics@wlgore.com

**gore.com/portableelectronics**

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