# IPx7 Testing and Salt Spray Exposure

Acoustic Vents

## Background

Portable electronic devices must be able to withstand exposure to salt spray and water immersion encountered when used by beach goers and avid boaters. W. L. Gore & Associates has tested devices with GORE® Acoustic Vents to ensure that the venting materials protect against exposure to salt water. After the testing, they also verified that the devices were still able to protect against water immersion.

## Test Procedure

Gore selected six different acoustic vents to evaluate in the test (Table 1). Each vent was installed in a separate housing (Figure 1). For the test, the laboratory conditions were controlled with an ambient temperature of 25°C ±3°C and humidity of 55% ±20% RH.

***Table 1: GORE® Acoustic Vent Physical Properties***

| Gore Part Number | Thickness (mm) | Inner Diameter (mm) | Outer Diameter (mm) |
|---|---|---|---|
| GAW3240306 | 0.36 | 3 | 6 |
| GAW3240509 | 0.36 | 5 | 9 |
| GAW3250306 | 0.36 | 3 | 6 |
| GAW3250509 | 0.36 | 5 | 9 |
| PE80306 | 0.27 | 3 | 6 |
| PE80509 | 0.27 | 5 | 9 |

***Figure 1: GORE® Acoustic Vent installed inside housing***

*GORE® Acoustic Vent*

The housings were then placed into a salt spray chamber and exposed to the spray for 168 hours in compliance with ASTM B117-11 (Figure 2):

**Salt Solution:** 5 wt. % NaCl solution

**pH of Solution:** 6.5 – 7.2

**Internal Temperature of Chamber:** 35°C ± 2°C

**Quality of Fog:** (1.0 – 2.0) ml/80cm²/hour

***Figure 2: Housing inside salt spray chamber***

*Sealed housings*

The housings were then placed one meter below the water surface in an immersion tank (Figure 3). The vent openings were positioned on the top of the housing, and the housing remained immersed for 30 minutes, according to IEC 60529 edition 2.1:2001-IPx7 (Figure 4):

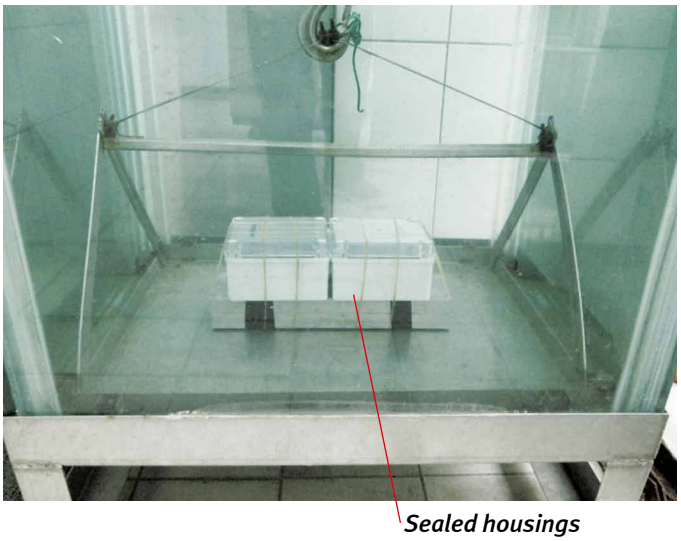
**Test Protocol:** Completely immerse the specimen in water with apertures facing upward

**Test Condition:** Housing positioned one meter below the surface of the water

**Test Duration:** 30 minutes

***Figure 3: Housing in IPx7 chamber***


***Figure 4: GORE® Acoustic Vents positioned at top of housing***




## Test Results

Each vent was inspected, and no oxidation or corrosion was found. In addition, no evidence of water droplets was identified inside each housing after the immersion test, indicating that the vent's ability to prevent water ingress following salt spray was not compromised (Table 2).

***Table 2: Results from Salt Spray and IPx7 Testing***

| Gore Part Number | Salt Spray Test Results | IPx7 Test Results after Salt Spray Exposure |
|---|---|---|
| GAW3240306 | Pass | Pass |
| GAW3240509 | Pass | Pass |
| GAW3250306 | Pass | Pass |
| GAW3250509 | Pass | Pass |
| PE80306 | Pass | Pass |
| PE80509 | Pass | Pass |

## Conclusions

Performing the salt-spray test and the IPx7 test proved that GORE® Acoustic Vents survive exposure to aggressive salt spray and still maintain durable protection against water immersion at one meter for 30 minutes. Integrating GORE® Acoustic Vents into the design of portable electronic devices provides reliable protection against environmental contaminants without compromising sound quality. For more information about the performance of GORE® Acoustic Vents, visit gore.com/portableelectronics.

**INTERNATIONAL CONTACTS**

| | | | |
|---|---|---|---|
| Australia | +61 2 9473 6800 | Mexico | +52 81 8288 1281 |
| 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 2572 | USA | +1 410 506 7812 |
| Korea | +82 2 393 3411 | | |

**W. L. Gore & Associates, Inc.**
401 Airport Road • Elkton, MD 21921 • 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**

FOR INDUSTRIAL USE ONLY. Not for use in food, drug, cosmetic or medical device manufacturing, processing, or packaging operations.



GORE
Creative Technologies Worldwide

PEV-075-TEC-US-AUG13