# GORE® Protective Vents

*Case History*

## Enable Battery Outgasing in Waterproof Enclosures


### Situation

BriarTek, Incorporated, the global manufacturer of ORCA® man-overboard alarm systems, develops transmitters, receivers and direction finders used by the military to ensure safety of their personnel. On-deck personnel wear a pager-sized transmitter that automatically activates after 3.5 seconds of water immersion, sending a signal to the on-board receivers to trigger an audible alarm. The signal is also received by multiple direction finders of emergency response authorities who can then locate and rescue the person in the water. BriarTek has recently expanded this technology with the new Cerberus global communication system to enable outdoor enthusiasts to maintain contact with family and friends back home — even when traveling through the more isolated areas of the world.

### Challenge

BriarTek faced several challenges when designing the alarm systems. First, government specifications required the use of certain batteries in the alarm systems. The gases from these batteries need to have an exit path from the enclosure to prevent internal buildup. BriarTek also had to meet the Ingress Protection 67 (IP67) standard for water immersion, so they could not use a tortuous path or open hole to allow the gases to escape. Yet, completely sealing the enclosure would prevent the battery from venting air in the event of gas buildup. Sealed enclosures are not designed to account for negative pressure differentials in which the outside air is at a lower pressure than the air found inside the enclosure. This can lead to gas buildup inside the enclosure and create a potential explosion.

The third challenge BriarTek encountered was the need to account for internal pressure differentials caused by altitude changes as the systems were shipped to customer locations around the world. Because most shipping containers are not pressurized, the alarm and tracking systems could experience pressure differentials, particularly at high altitudes. If the altitude changes are not compensated for, the resulting vacuum could cause the devices to bulge out or even explode. BriarTek needed a means to allow the battery to outgas while protecting the electronics from water during immersion as well as maintaining equalized pressure inside the enclosure during transport.

> ***"We have used GORE® Protective Vents in our products for more than five years without any failures. We are in the business of saving lives, so we need to ensure reliable performance in the most rugged environments. That's why we incorporate these vents into our products."***

### Solution

After researching alternatives, BriarTek selected several GORE® Protective Vents for their applications. According to Alex Rich, the mechanical engineer for product development at BriarTek, they selected different vents based on the size and airflow requirements of each device. For example, they selected a vent with a 2.35 millimeter (mm) outer diameter and an airflow of 7 milliliters/minute combined with a polypropylene housing for the ORCA® transmitter and the CerberLink™ satellite messaging device, because they needed the smallest possible vent with minimal airflow. However, the ORCA® direction finder's antenna system was larger with more free air volume inside, so they selected a GORE® Press-fit Vent with a 10 mm outer diameter that has a typical airflow of 44 milliliters/minute and a thermoplastic elastomer housing.

According to Rich, they find it very simple to install the vents. "We chose a press-fit vent because it's transparent to the user and easy to install on the outside, taking up no space inside the enclosure. We simply press the vent onto the housing using a soft plastic dowel — on the battery door of the portable devices and on the front of the direction finder. And the low profile of the vents decreases the chance of users damaging the vent."

When asked about the vents' performance, Rich replied, "We installed our first GORE® Protective Vent over five years ago in the original ORCA® TX-104, and we have not had any failures. We are in the business of saving lives, so we need to ensure reliable performance in the most rugged environments. That's why we incorporate these vents into our products."

# GORE® Protective Vents



## Diverse Product Line Engineered for Simple Integration

GORE® Protective Vents are manufactured in many different sizes and shapes, making it easy to choose the right vent for any application. With a diverse product portfolio, these vents are easy to integrate into new or existing designs to meet the needs of a broad range of applications and markets. The versatility of GORE® Protective Vents is apparent in both their range of protection and their ease of installation. For example, these vents:

- tolerate temperatures ranging from –40°C to 125°C
- perform to protection standards up to IP69K*
- provide maximum protection for applications in harsh environments through molded plastic or metal vents
- install easily by being adhered, threaded, snapped, bolted or heat/ultrasonic-welded to a variety of enclosure materials
- adhere to the device with adhesive backing for applications with insufficient free space to install a vent inside

## The Gore Advantage

Gore is a technology-driven company focused on discovery and product innovation. Well-known for waterproof, breathable GORE-TEX® fabric, the company's portfolio includes everything from high-performance fabrics and implantable medical devices to industrial manufacturing components and aerospace electronics. Founded in 1958 and headquartered in Newark, Delaware, Gore employs approximately 10,000 associates in 30 countries worldwide.

For more than ten years, Gore has delivered protective venting solutions for outdoor equipment installed throughout the world. When working with Gore, our customers are paired with a technical sales associate and an applications engineer to assess the intended application, the product design, and the environment in which it will be used. Gore's team tests various vents to determine the best material, size and placement of the GORE® Protective Vents. This collaborative process has ensured that hardware of some of the largest OEMs and equipment manufacturers maintain durable, reliable performance in extremely challenging environments.

GORE® Protective Vents are integrated easily into BriarTek devices.




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*IP ratings depend on the product housing's design. Please contact a Gore representative for more information.

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