



Protective Vents

FOR TELECOMMUNICATION SYSTEMS

*Improve equipment robustness
and reliability*





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LEAD THE RAPIDLY CHANGING INDUSTRY WITH GORE AS YOUR TRUSTED PARTNER

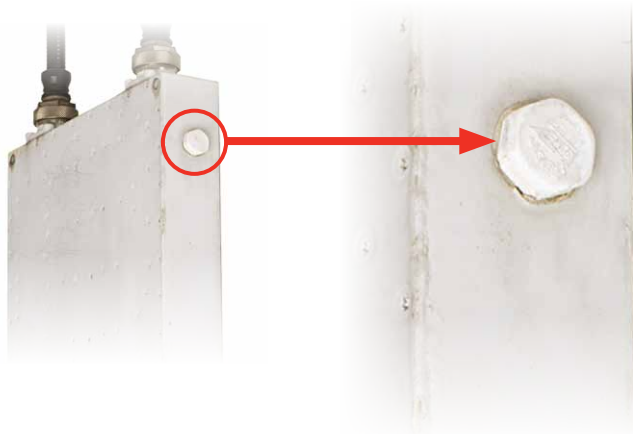
The migration of networks to 4G technologies marks the most challenging and expensive upgrade in the telecommunication industry. Components are now installed everywhere from telephone poles and building eaves in metropolitan areas to remote towers in the countryside. The increased use of small cell technology means that telecommunication infrastructure and its electronics are becoming more sophisticated and complex. In addition, consumer expectations and the amount of data being transferred by mobile devices are rapidly increasing the demands for efficient, reliable wireless coverage throughout the world — consumers expect to stay connected regardless of where they are.

Understanding the challenges of these complex systems and how they are changing is the only way to ensure success. We are here to collaborate with you to ensure that your infrastructure components stay protected and connected.

Maintain Reliable Connectivity

Service providers and end users expect your product to operate consistently and reliably, regardless of where it is installed. However, the equipment is usually located in areas that experience extremely harsh environmental conditions — insect and animal infestation, high winds, rainstorms and even blizzards. These systems must be protected from harsh conditions that can compromise the equipment, increase warranty claims and lead to customer dissatisfaction.

The GORE® Protective Vent installed in this tower-mounted amplifier has facilitated reliable performance for more than ten years.



Decrease Maintenance

Because of the location of installed equipment, troubleshooting and maintenance are often difficult, which can compromise worker safety and increase operating costs. To minimize maintenance, components must be engineered to withstand the environmental conditions they encounter.

Reduce Manufacturing Costs

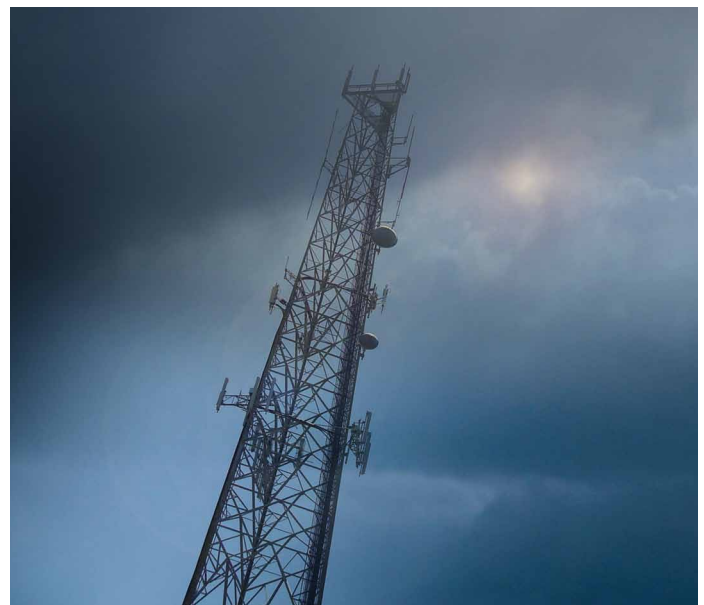
Designing a more ruggedized housing that meets telecommunications and IEC standards, such as ingress protection, is often considered the solution for ensuring durable protection from challenging environments; however, ruggedized designs increase manufacturing costs and do not address the root cause of pressure differentials.

Meet Equipment Life Expectancy

Installing telecommunication equipment requires a substantial capital investment, so service providers and end users expect the equipment to operate reliably for years, regardless of the environment in which it is used.

Improve Integration and Automation

The rapid changes in technology translate to the need for flexibility and quick prototyping in system design, component integration, performance testing and equipment production. Quick prototyping and easy installation with automated technology are essential for the fast turn-around required for success.



DON'T LET CONTAMINATION, WATER INGRESS OR CONDENSATION COST YOU MONEY OR CUSTOMERS

REALIZE THE BENEFITS OF GORE® PROTECTIVE VENTS IN YOUR TELECOMMUNICATION COMPONENTS



EQUALIZE PRESSURE

GORE® Protective Vents reduce strain on seals of an IP65 (and higher) enclosure by equalizing pressure and allowing air to flow continuously through the membrane.



INTEGRATE EASILY

Available in a variety of designs and sizes, GORE® Protective Vents are engineered with a screw-in, snap-fit or adhesive membrane construction that integrates easily into any housing design.



PREVENT CONTAMINATION

GORE® Protective Vents increase reliability of sensitive electronics by providing a durable barrier against contaminants such as liquid, insects, salt, sand and even dust.



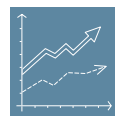
EXTEND LIFETIME

GORE® Protective Vents extend product lifetime by relieving pressure and reducing condensation without requiring stronger seals, additional bolts or other ruggedized solutions.



REDUCE CONDENSATION

GORE® Protective Vents minimize condensation by allowing water vapor to diffuse through the microporous membrane — improving power output and reducing damage to internal components.



MEETS INDUSTRY STANDARDS

With sophisticated laboratories throughout the world, Gore tests its venting products to meet the most rugged protocols of UL, ETSI and IEC standards for enclosure protection.

VENTING SOLUTIONS FOR DIFFERENT TELECOMMUNICATION APPLICATIONS



TOWER-TOP ELECTRONIC ENCLOSURES

Water can cause corrosion and shorts to the electronics in tower-top enclosures. By allowing moisture vapor to diffuse easily, GORE® Protective Vents reduce potential condensation that leads to corrosion and shorts.



BASE STATION BATTERY UNITS

To prevent potential explosions, hydrogen gases from batteries must have an exit path. The continuous airflow of GORE® Protective Vents enables gases to flow out of the unit while creating a barrier against contaminants.



SMALL CELL NODES

Plastic housings commonly used in small cell nodes are more susceptible to pressure equalization issues. Gore's venting solutions protect the electronics from water damage and comply with environmental standards.



ANTENNA TILT MOTORS

Mechanical components of the antenna motors can fail when exposed to liquids and other contaminants. GORE® Protective Vents provide a barrier against liquid and other contaminants that can lead to corrosion.



COVERAGE SYSTEMS

Water ingress can compromise the signal integrity of coverage devices like repeaters and backhaul devices, including point-to-point and microwave radios. By equalizing pressure inside the device housing, GORE® Protective Vents prevent stress on the housing seals so water cannot enter.



TOWER-MOUNTED SENSORS

Rapid temperature changes create a vacuum inside the sensor, which can cause a seal to fail. Moisture vapor can enter and condense on the sensor dome, obstructing sunlight and compromising sensor measurements. GORE® Protective Vents equalize pressure and prevent vacuums that compromise seal integrity.



Protective Vents

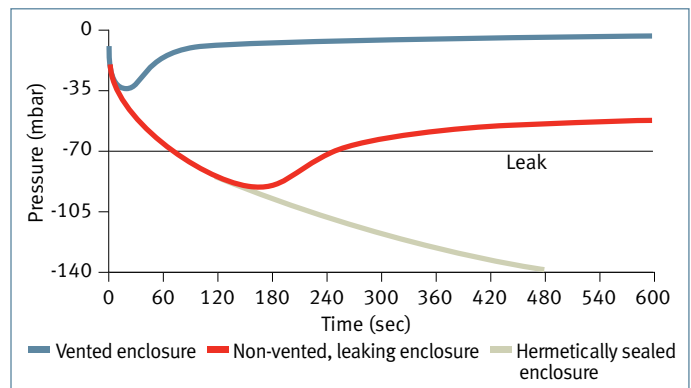
FOR TELECOMMUNICATION SYSTEMS

THE CHALLENGES: INTERNAL PRESSURE BUILDUP, CONDENSATION, WATER INGRESS AND CONTAMINATION

GORE® PROTECTIVE VENTS EQUALIZE PRESSURE

Changing weather patterns directly affect the internal pressure of a sealed enclosure, whether it's a sudden thunderstorm or a more subtle shift between a hot day and cold night. When external temperatures change quickly, pressure differentials can occur inside the enclosure, sometimes as much as 200 mbar (3 psi). These pressure changes can put extreme stress on mating joints, connector points and housing seals, eventually causing them to fail and allowing moisture and other contaminants to enter.

GORE® Protective Vents equalize pressure by enabling air to pass through the membrane.

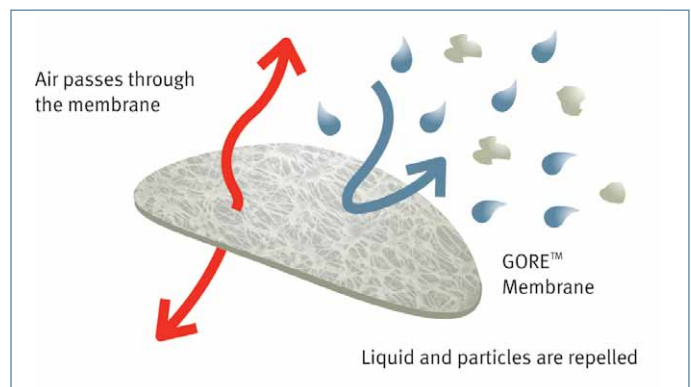


In non-vented housings, 70 mbar (1 psi) of pressure can cause seals to leak after repeated temperature cycles. Vented housings equalize pressure and prevent stress on seals.

GORE® PROTECTIVE VENTS PREVENT CONTAMINATION

Traditionally, engineers have protected against contamination by enclosing electronics in ruggedized housings. To equalize pressure they have used tortuous paths and open holes; however, these options cannot be used with telecommunication equipment because wind-driven rain, dirt and other particulates can easily enter through these openings.

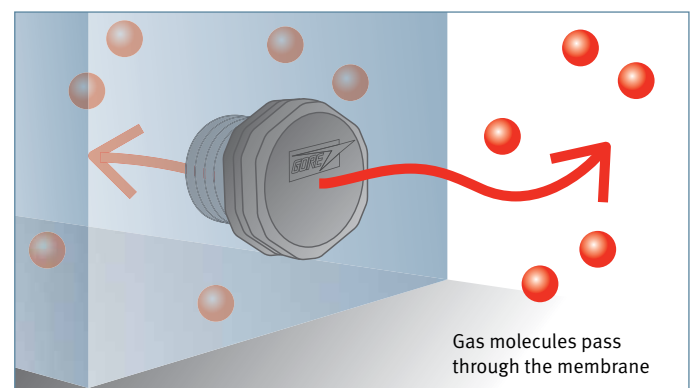
GORE® Protective Vents provide a durable barrier against liquid, dust, dirt and other contaminants.



GORE® PROTECTIVE VENTS REDUCE CONDENSATION

When a negative pressure differential occurs inside a housing, moisture can be drawn inside. If the pressure is not equalized, the moisture cannot escape, and eventually it condenses. Third-party research has shown that condensation is more damaging than rain because it remains on the surface. Condensation leads to corrosion that can degrade sensitive electronics inside the housing.

GORE® Protective Vents reduce condensation because water vapor molecules can pass through the membrane.





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TRUST THE EXPERTS AT GORE TO ENGINEER THE OPTIMAL VENTING SOLUTION FOR YOUR TELECOMMUNICATION APPLICATION

Leveraging our 15 years of collaboration with leading global manufacturers of telecommunication equipment, Gore has helped set new standards for reliable and high-performance products. With more than 40 million vents currently in the field, our technical support team is ready to assist you from initial product concept through integration into the manufacturing process.

GORE RESPONDS TO THE DEMANDS OF THE INDUSTRY BY OFFERING:

- Tailored venting solutions that increase your product reliability, durability and profitability
- Global R&D and engineering teams who work with you throughout the product life-cycle
- Rigorous performance testing that improves product reliability
- Rapid sampling to shorten the product design process
- Production flexibility with multiple installation options
- Venting products that integrate easily into any enclosure

We offer you more than a venting product — we deliver a full-service solution.

Gore offers a variety of designs, sizes and product forms that are easy to integrate into your telecommunication enclosures.



Installed in Radio Frequency Systems' tower-mounted amplifier, a Gore screw-in vent blocks water ingress that can cause corrosion and shorts.



DragonWave® Inc., maintains signal integrity in its Horizon packet microwave systems by providing a barrier against moisture and other contaminants with a Gore screw-in vent.



Sunsight Instruments ensures maximum efficiency and accurate measurements with its AntennAware Attitude Sensor by integrating Gore's high airflow screw-in vent in the sensor housing, which reduces potential condensation inside the enclosure.

vent installed internally



PureWave Networks improves global reliability and meets IP67 immersion requirements by installing Gore's adhesive vent into its PureWave Quantum™ base stations.



China Potevio enhances the reliability of its remote radio units by integrating Gore's rugged screw-in vent to equalize internal pressure, protect against contaminants and reduce condensation.

ABOUT W. L. GORE & ASSOCIATES, INC.

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. 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.

For almost thirty years, Gore has delivered venting solutions for a variety of applications installed in rugged environments throughout the world — applications such as solar, lighting, security,

telecommunication and other electronic systems; automotive and heavy-duty vehicles; and chemical 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 reliable performance — all to ensure that these venting products can meet the challenging environments and application demands of today's technology.

Headquartered in the United States, Gore employs approximately 10,000 associates in 30 countries worldwide. In Europe, Gore started its first business operations only a few years after the Enterprise's founding in 1958. Learn more at gore.com.



PLEASE CONTACT GORE TO LEARN ABOUT THE RIGHT GORE® PROTECTIVE VENT FOR YOUR UNIQUE APPLICATION

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China	86.21.5172.8299	Singapore	65.6733.2882
France	33.1.5695.6565	South Africa	27.11.894.2248
Germany	49.89.4612.2211	South America	55.11.5502.7800
India	91.22.6768.7000	Spain	34.93.480.6900
Italy	39.045.6209.240	Taiwan	886.2.2173.7799
Japan	81.3.6746.2572	United Kingdom	44.1506.460123
Korea	82.2.393.3411	USA	1.410.392.4440

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