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INTERNATIONAL



**GORE® MOISTURE BARRIERS**

## The “Fit For Use” principle

### Key Information:

By immersing Gore products in the real world, Gore ensures they're built to last and fit for use. Protective but highly breathable materials alone cannot provide maximum functionality. Environmental conditions as well as the type and duration of the wearer's activities must also be taken into account.

Gore's holistic philosophy puts each product in context, at each stage of manufacturing. The product is never viewed in isolation, but as equipment for a specific end use.

To make Gore products “Fit For Use”, Gore associates acquire specialised knowledge about the fields in which the products will be used. They develop functional solutions for scenarios that might arise in that field.

### Bullet Points:

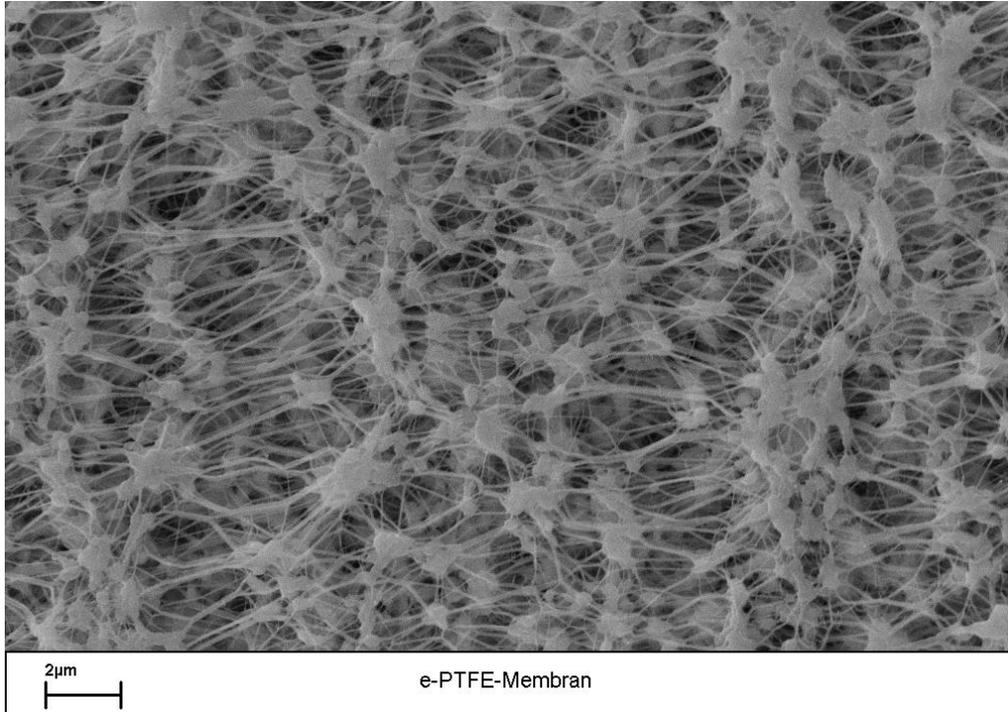
- Materials, components, constructions and designs in their end product fit the wearers activity and environment:  
That's what “fit for use” means
- Monitoring the needs of a specific wearer in specific applications and selection of fitting laminates and construction methods
- Consideration of all outer circumstances concerning a special application
- Knowledge about the best material, design and technology
- Analysis of the end product in use
- Gore products stand for protection and comfort for a better performance

### Description:

The ability of protective clothing to perform in use depends on the correct selection of the laminate, and the laminate's correct construction into a garment, boot or glove. Proper selection varies based on the needs of specific wearers in specific applications. Materials alone cannot provide maximum functionality. Consideration has to be given to climatic conditions in the wearer's environment, as well as to the type and duration of the wearer's physical activities.

The special Gore product philosophy analyses the interdependency of all relevant protective clothing components, such as the material and the way in which it is crafted as well as the wearer's activity and environment. This is the only way for Gore products to fully satisfy the wearer's specific requirements and ensure that the products are “Fit For Use”.

To fulfil this principle, Gore's development work concentrates on building up a comprehensive knowledge base about the best materials, designs and technologies as well as on the analysis of the end product (garment, footwear, gloves). Gore established a highly detailed test and monitoring system that makes it possible to determine exactly what the performance potential is for each product and its specified requirements.



## The GORE-TEX® membrane – what it is

### Key Information:

#### High tech for the body

The GORE-TEX® membrane is the core of all GORE-TEX® products. It is durably waterproof, windproof and breathable, this is permeable for water vapour.

The result: Water from the outside will never penetrate, cold winds cannot pass through and perspiration can escape easily. This is why the body stays dry and comfortable with GORE-TEX® products. Gore has developed different GORE-TEX® membranes and applies them as appropriate.

### Bullet Points:

#### What is GORE-TEX® membrane?

- The waterproof, windproof, breathable core of all GORE-TEX® products
- 1,4 million micropores per cm<sup>2</sup>
- Each pore is 20,000 times smaller than a water droplet, but 700 times bigger than a single water molecule
- Resists contamination of oils, like body oils, or insect repellents

### Technical Description:

The GORE-TEX® membrane is the core of all GORE-TEX® products. It contains over 1.4 billion microscopic pores per square cm (9 billion per inch). These pores are 20.000 times smaller than a water droplet, but 700 times larger than a water vapour molecule, which makes the GORE-TEX® membrane durably waterproof from the outside, while allowing perspiration to escape from the inside. An oleophobic (or oil-hating) substance is integrated into the membrane, preventing the penetration of body oils and insect repellent that could otherwise affect the membrane. In order to meet the specific needs of each end use, Gore has developed different GORE-TEX® membranes and applies them as appropriate.



## Gore Rain Tower

### Key Information:

#### Proves the waterproofness of GORE-TEX® Technical Garments

The Gore rain tower is the most important test method to ensure that GORE-TEX® Technical Garments are waterproof under even challenging practical conditions.

Gore requires all styles of GORE-TEX® Technical Garments to endure simulated hours of rain before going into production.

This extreme test exposes sample garments to a range of rain conditions – from moderate to heavy, vertical and wind driven – while worn by a rotating mannequin equipped with sensors to detect any leakage. If leaks are detected, construction and functional design is rejected or modified to improve its performance until it passes.

The wearer benefits from the highest quality of GORE-TEX® Technical Garments with lasting protection against rain.

### Bullet Points:

- First controlled rain test for the waterproofness of finished garments
- Moisture sensors at critical points beneath the clothing measure incoming moisture and indicate any area in the clothing's construction that is not waterproof
- Possible to simulate different types of rain
- Different from the EN 14360 test conditions, there are proven pass/fail criteria

### Description:

More than 20 years ago, Gore installed their rain tower, the first high-performance textile manufacturer in the world to do so. This enabled the first controlled and reproducible rain test for the waterproofness of finished garments. In order to simulate rainfall as closely as possible, GORE-TEX® Technical Garments are pre-washed, put onto a test manikin, and then exposed to artificial rain. Moisture sensors at critical points beneath the clothing such as at the shoulders, chest, wrist, stomach, back and front closure, measure in-coming moisture, and indicate any area in the clothing's construction that is not waterproof. A special software records the test's progress. By varying the time, amount of water and the droplet size it is possible to simulate different types of rain ranging from a dense drizzle to a heavy cloudburst. Additional side nozzles simulate windblown rain or storm conditions.



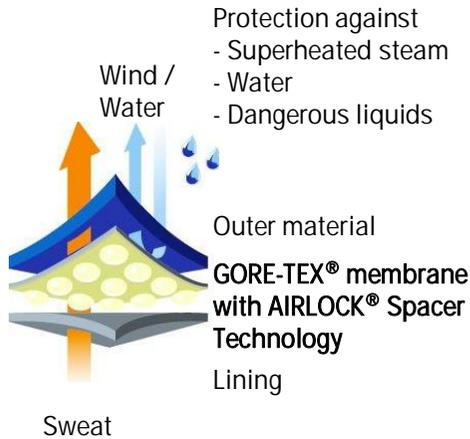
## Waterproofness Test (Hydrostatic Head Tester)

### Key Information

The Waterproofness (Suter) Test determines the water pressure resistance of waterproof materials. The pressure range is adaptable. Gore standards are of such a high level that durable waterproofness is ensured even under stress conditions

### Bullet Points

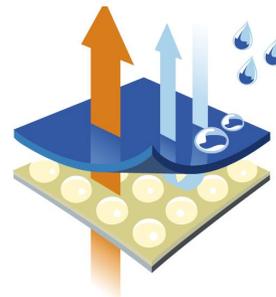
- The Waterproofness Test determines the waterproofness of seams and laminates under high water pressure
- Water entry pressure for seams of GORE-TEX® Technical Garments is applied for several minutes
- Applied pressure for GORE-TEX® Laminates is 1 bar (compared to 0,13 bar as requested by standard EN343 for weatherproof clothes)



#### AIRLOCK® Spacer Technology towards outer material:



GORE-TEX® Liner Construction with AIRLOCK® Spacer Technology



3layer GORE-TEX® Construction with AIRLOCK® Spacer Technology

#### AIRLOCK® Spacer Technology towards lining:



GORE-TEX® Liner Construction with AIRLOCK® Spacer Technology

## AIRLOCK® Spacer Technology

### Key Information:

#### The protective air cushion

Firefighters during duty often require heavy protective equipment. That might slow them down and reduce capability and concentration. GORE-TEX® Products with AIRLOCK® Spacer Technology help firefighters maintain a high level of protection against heat without the burden of heavy, cumbersome clothing that doesn't breathe and prevents agility.

### Bullet Points:

- Insulating air cushion created by a heat-stable and chemically inert spacer applied to the GORE-TEX® moisture barrier
- Reduced heat stress due to significantly increased breathability
- High thermal protection remains after washing and dry cleaning
- Reduced risk of injury from scalding due to minimal moisture absorption and high moisture vapour transfer
- Reduced insulation weight by 50% or more
- Great freedom of movement due to flexible and lightweight materials
- Quicker re-drying due to lower sweat absorption in the insulative layer
- Top grades in THERMO-MAN® Test

### Description:

A heat-stable and chemically inert spacer is applied to the GORE-TEX® moisture barrier, creating an insulating air cushion. This lightweight innovation offers thermal protection, a matching reduction of heat stress and optimum freedom of movement without a bulky, restrictive insulation layer. Because of its unique features, the bicomponent ePTFE-based laminate is the most suitable base for the application of foamed silicone spacers. Even at very high and low temperatures, the ePTFE membrane stays supple and does not crack: a pre-requisite for a durable combined thermal liner/moisture barrier product. The absence of the separate textile insulation layer enhances an already superior feature of the GORE-TEX® fabric: its very high breathability.