

MATERIAL MATTERS

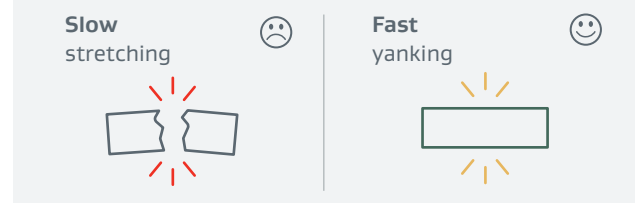
THE SCIENCE BEHIND GORE'S INNOVATIONS

Through the years, W. L. Gore & Associates (Gore) has turned more than 1,000 potentially viable ideas for products into commercially successful solutions and applications.

In fact, our deep understanding of expanded polymer membrane technology has created business successes in numerous sectors – from its use in medical devices, to advanced clothing worn by Everest expeditions, to cables in outer space – all of which helps improve the lives of people around the world.

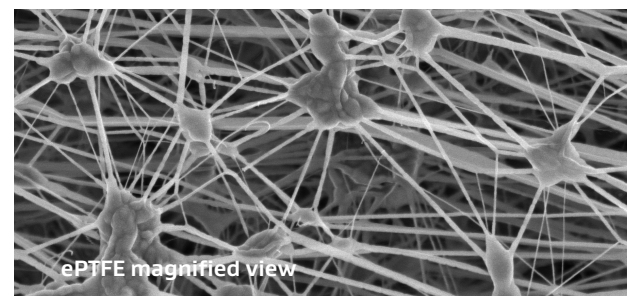
1 A Massive Stretch in Innovation

Robert Gore discovered expanded polytetrafluoroethylene (ePTFE) in 1969. He discovered that under the right conditions, polytetrafluoroethylene (PTFE) could be stretched 800 to 1000 times, forming a porous three-dimensional network structure.



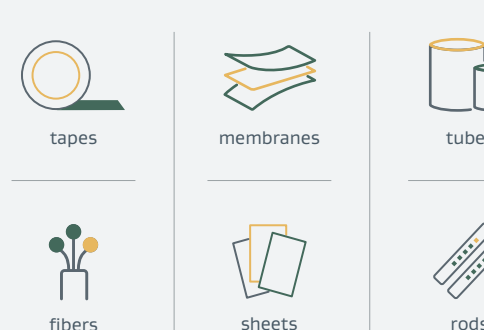
2 At The Forefront of ePTFE Innovations

With impressive properties and incredible performance characteristics, ePTFE can overcome many limitations of normal PTFE. These include a high strength-to-weight ratio, biocompatibility, and high heat resistance.



And by combining the material properties of ePTFE, Gore engineers have customized fibril and node geometries while continually developing ePTFE's capabilities to produce over 3,500 unique inventions and limitless possibilities to come.

Customised forms of ePTFE



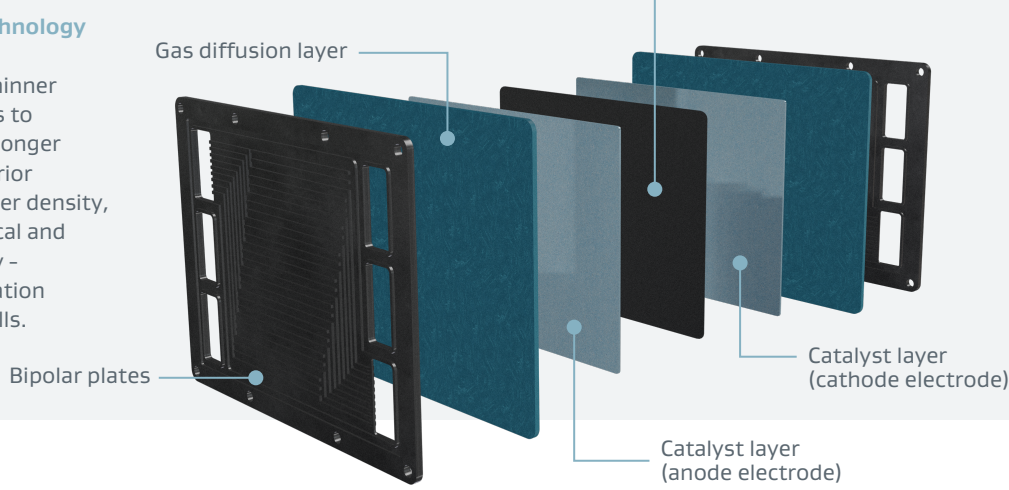
3 A Thinner Membrane, But an Enhanced Vision

The advancements, innovations, and products made with Gore's ePTFE have constantly improved lives. Gore's future focus on alternative energy led us to develop the thinnest proton exchange membrane (PEM). This allows it to have excellent uniformity with high power density, plus chemical and mechanical durability over a long lifecycle.

The benefits? More freedom for R&D engineers to innovate, design and manufacture next-generation fuel cells for a greener world.

PEM for fuel cell technology

Gore has created a thinner film that allows PEMs to perform better over longer life cycles, with superior uniformity, high power density, and improved chemical and mechanical durability – enabling next-generation production of fuel cells.



4 Made For Extreme Conditions

GORE-SELECT® Membrane are reinforced PEM that have a high power density due to their high proton conductance. Gore's ePTFE technology contributes to the advancement of ultra-thin PEM properties through enhanced mechanical durability and improved chemical durability.

And the proof is clear. These factors improve performance in the areas of increased water management and enabling low gas permeance.

-10°C & -40°C

* Maintaining -10°C low temperature start-up at -10°C and -40°C

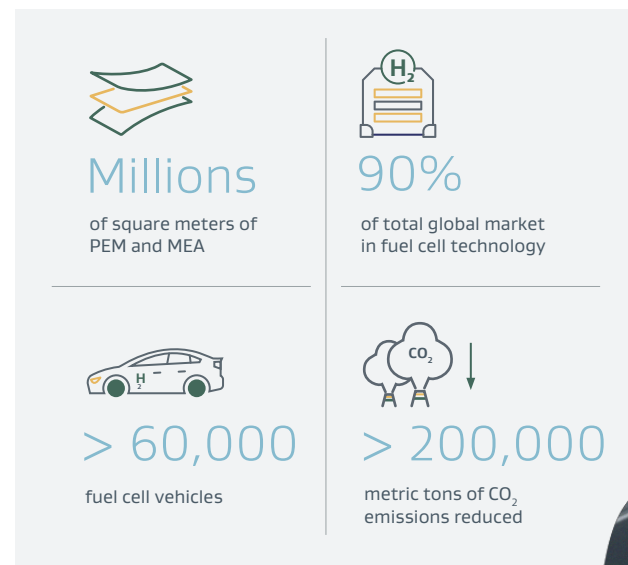
30,000hrs / 500,000km

* 30,000hrs of usage, or more than 500,000km mileage for heavy-duty vehicles (HDV) users

* Depending on the circumstances, actual figures may vary.

5 Collaborative Approach to Hydrogen Power

Millions of square meters of GORE-SELECT® Membrane have been used to manufacture over 60,000 fuel cell vehicles. We are proud to have contributed to 90% of the total global market share in fuel cell technology, which has directly led to the reduction of 200,000 tons of carbon dioxide emissions, equivalent to planting 270,000 mature camphor trees.



But we are not done yet. We aim to build a better ecosystem for hydrogen-based energy supply by working closely with leading automakers.

reduce

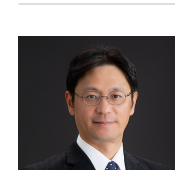
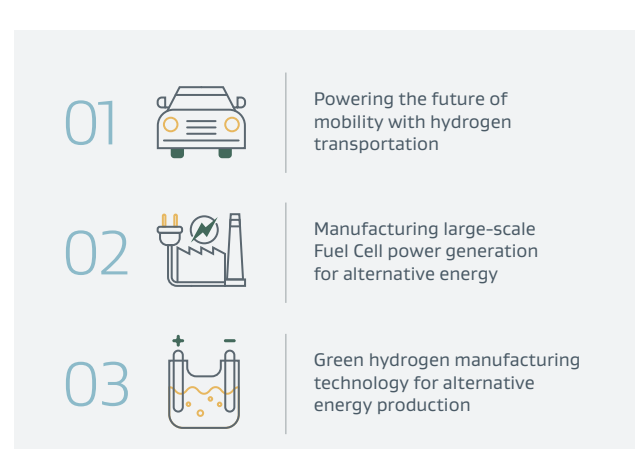
- Carbon emission reductions
- Fuel extraction reductions

improve

- Improve energy efficiencies
- Sustainable resource management

6 Fuel Cell Technology – The Future is Bright

As a response to the severe challenges facing the environment today, acceleration to carbon neutrality by 2050 is a major focus. And we believe we can help. It is Gore's mission to accelerate the production, storage, and application of alternative energy to achieve a sustainable future through the development of key technologies in these areas:



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Shinichi Nishimura is W. L. Gore & Associates Fuel Cell Technologies Global Product Specialist. He has been working with the field of polymer electrolyte membranes for fuel cells and other applications for 20 years.

If you wish to learn more about Gore and its GORE-SELECT® Membrane technology, please visit <https://www.gore.com/alt-energy>.

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 13,000 Associates and a strong, team-oriented culture, Gore generates annual revenues of \$4.8 billion.

For more information, please visit [gore.com](https://www.gore.com)

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