

NORGARD 



**SAINT-GOBAIN® TAPE SOLUTIONS**

# **IMPROVING PERFORMANCE IN FUEL CELLS AND ELECTROLYZERS**

  
**SAINT-GOBAIN**



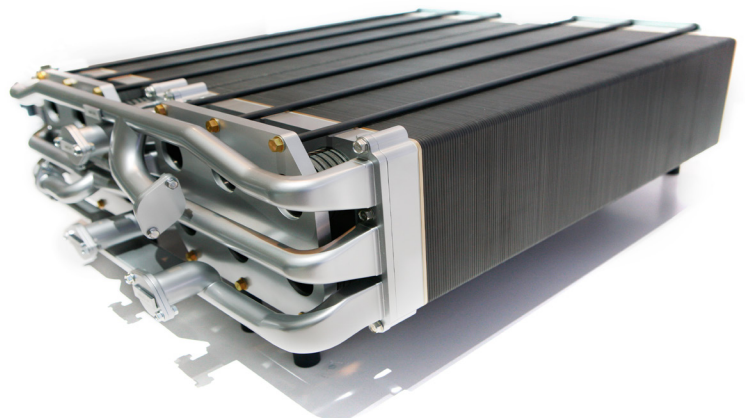
## SOLUTIONS FOR COMPONENTS AND FUTURE ENERGY STRATEGIES

**FUEL CELLS AND HYDROGEN ELECTROLYSIS** are an increasing source of sustainable clean energy and will form the foundation of a new era of energy usage.

**Saint-Gobain®** Tape Solutions is a global leader in high performance materials, processing for reliable performance and converting in formats that are easy to use. Based on over 50 years expertise in polymeric films and fabrics, we provide proven products customized to customers across all hydrogen value chains.

**NORGARD** 

**Norgard® Specialty Products** and components are used in a variety of applications, such as tight tolerance media-resistant fuel cell and electrolyzer gaskets and seals, as well as release solutions for decal processes.





Our technical know-how, global manufacturing capabilities and market knowledge allow us to play a significant role in this rapidly changing market by helping to increase Membrane Electrode Assembly (MEA) efficiency, ensure efficient decal processes, and decrease stack size.



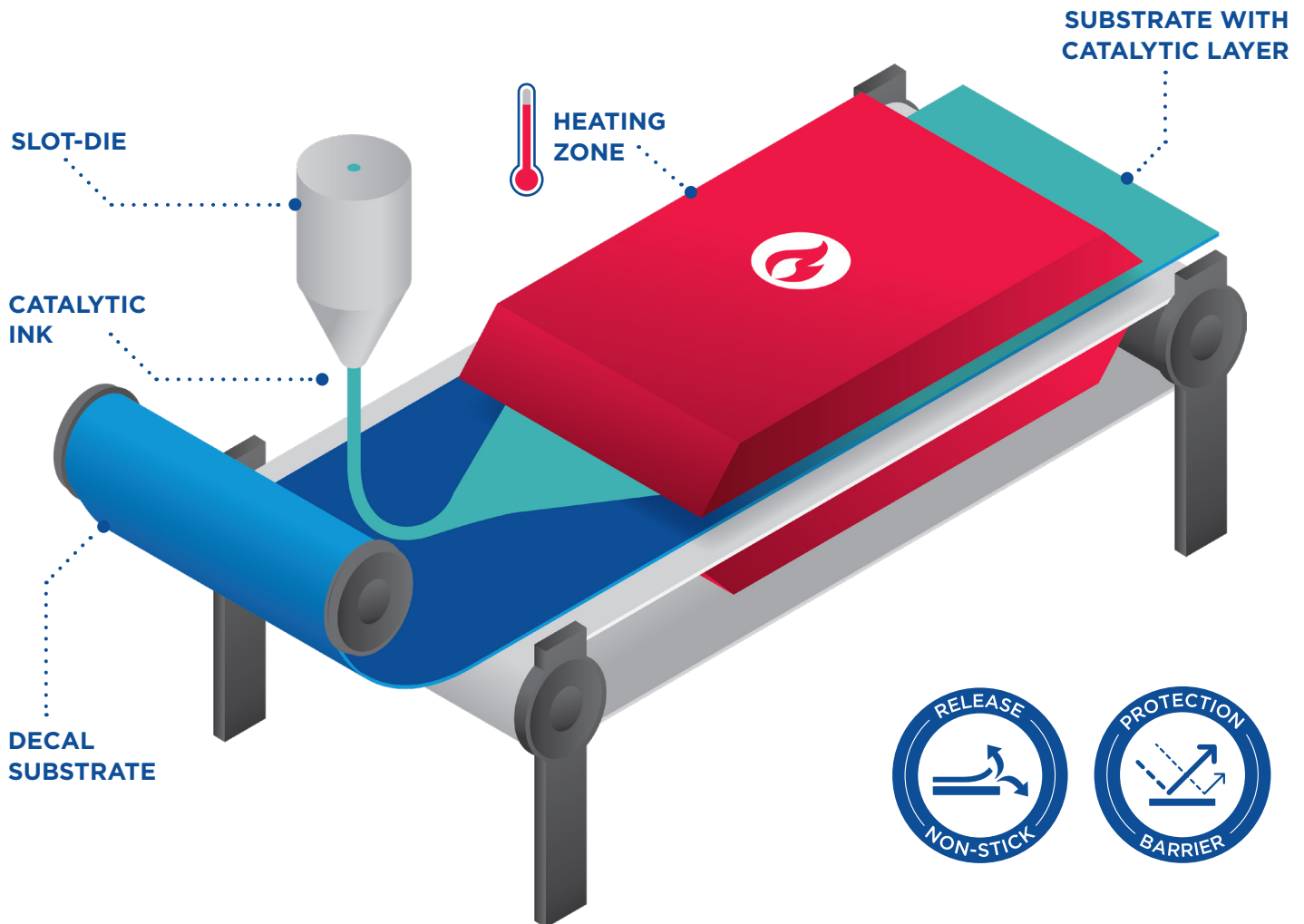
**DIFFERENTIATION AND CO-DEVELOPMENT THANKS TO...**

- World class manufacturing organization drawing from over 350 years of history
- Technical and applications engineering to solve the most demanding applications and help customers
- Significant focus and investment in developing solutions for hydrogen technology
- Close cooperation with universities and research institutions

**AND OUR CAPABILITIES:**

- Film skiving, extrusion and composite manufacturing
- Material science and R&D
- Multi-material lamination
- PTFE & silicone coating and lamination
- Mechanics structure impact
- Up-scaling and industrialization
- Precision converting
- Surface energy modifications

# RELEASE SOLUTIONS FOR DECAL



**NORGARD FILMS** are used as release and protective solutions for production of Catalytic Layers and lamination of CCMs by Decal Transfer.

**Norgard** Release Solutions work as effective pro-cessing aids for the decal process in the production of catalytic layers for energy efficient fuel cells and electrolyzers.

Used as processing belts and release sheets for thermal curing and lamination processes, they are a very flat, smooth and mechanically stable substrate surface upon which the catalytic ink is evenly distributed in a controlled manner. They have excellent thermal stability, up to 500°F / 260°C and, because

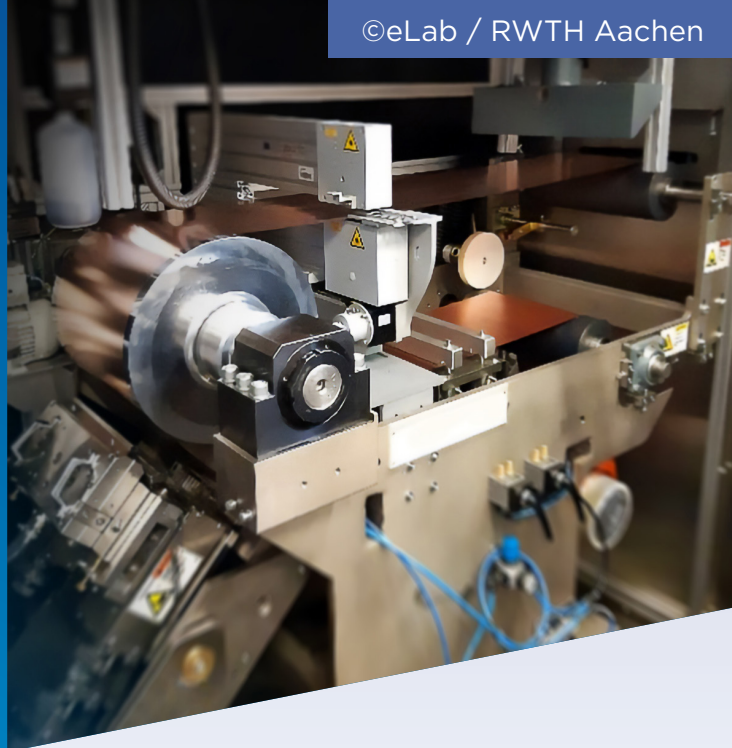
of their hysteresis behavior, are suitable for most decal processes even under challenging conditions. At the end of the production of the Catalyst Coated Membrane (CCM) by decal transfer method, the substrates can easily be removed, allowing 100% transfer of the catalytic layer.

Extremely thin and light, our release liners carry the finished CCM during wind-up, allowing customers to have more CCM on each roll for increased productivity.

**CASE STUDY:****INCREASING THE CCM OUTPUT BY THREEFOLD****Improved productivity and cost effectiveness**

After switching to our solution, one of our customers reported a threefold increase in his output of CCM per roll.

Used as the carrier belt for their CCM wind-up, our film showed exceptional tensile strength, which in combination with a release coating, allowed the customer to go significantly thinner with the carrier — therefore optimizing the ratio of carrier vs. CCM on the roll. We are committed to working in partnership with our customers and developing customized solutions — while utilizing our wide range of different material options available in various thicknesses to identify the best solution for customer needs.

**NORGARD PRODUCTS OF CHOICE:****ETFE**

Proven, reliable product and durable release for **decal substrates**.

**E124**

Smooth, uniform surface with superior release properties for **decal substrates**.

**APPLICATIONS:**

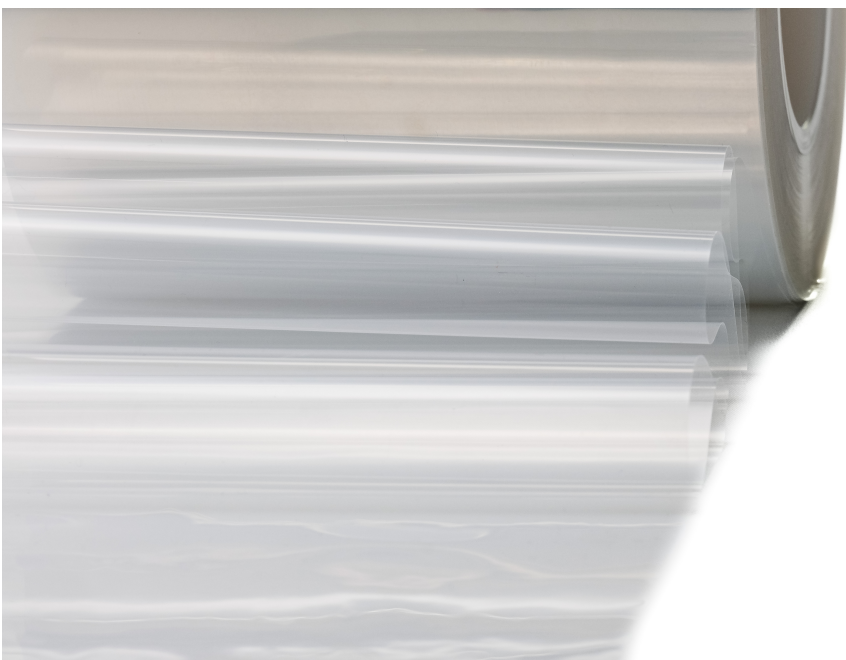
Processing aids for catalyst coating and lamination of MEAs

**FEATURES:**

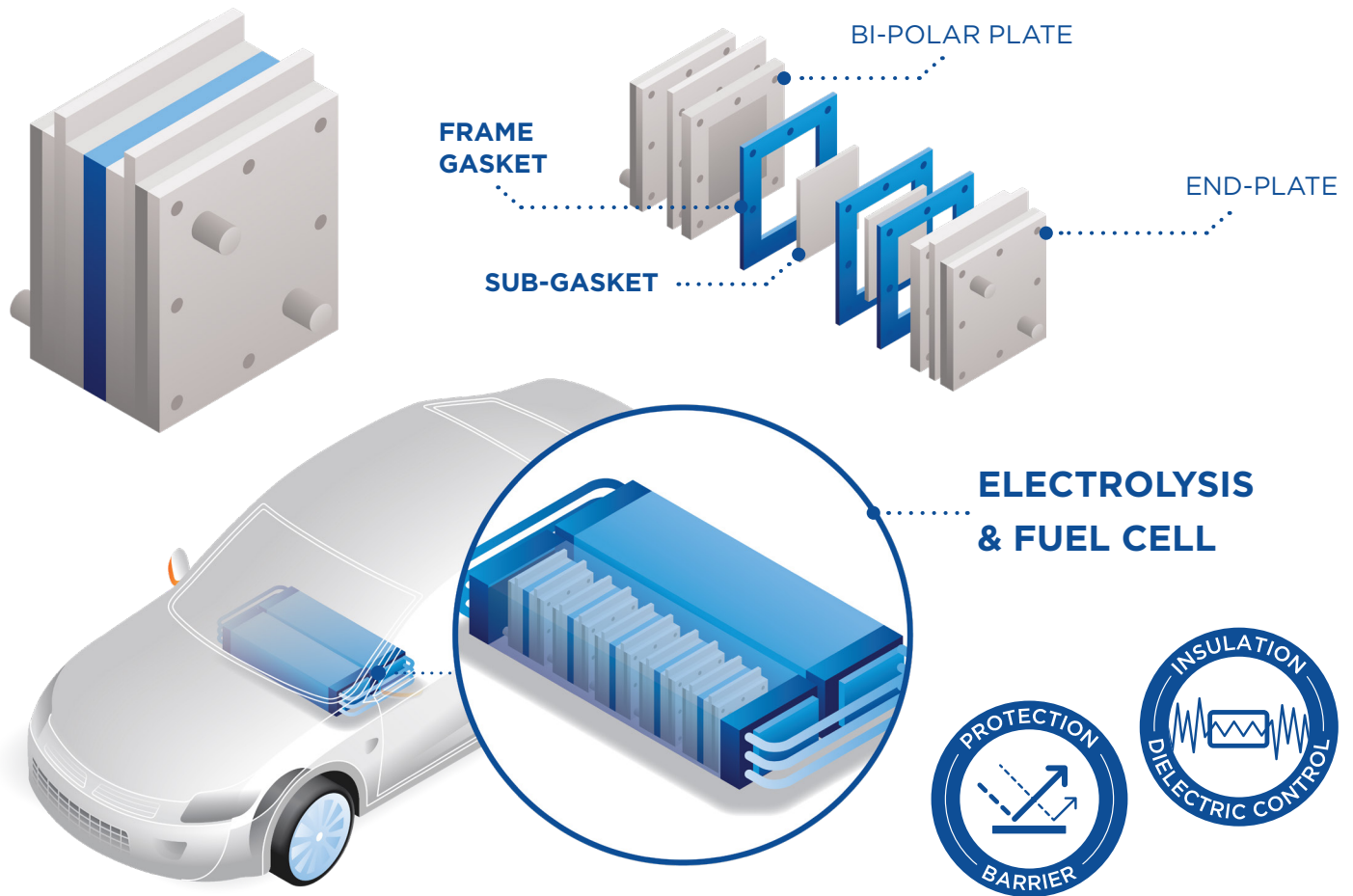
- Excellent non-stick surface
- Excellent dielectric properties
- Superior chemical resistance
- Excellent smooth surface
- Configurable for any required size
- Low thickness tolerance
- High temperature resistance up to 500°F / 260°C
- Excellent heat transfer
- Low shrinkage/hysteresis

**BENEFITS:**

- Improved productivity due to higher process speed
- Optimal release, allowing both wettability and release
- Low risk of creasing
- Less downtime
- Consistent production processes
- Low risk of failure due to chemical inertness
- Increased cell efficiency by thinner catalyst layers



# GASKETS FOR ELECTROLYZERS AND FUEL CELLS



**NORGARD FILMS AND COMPOSITE MATERIALS** are incorporated as the frame and sub-gaskets within the PEM, alkaline and phosphoric acid fuel cell and electrolyzer systems.

Multi-functional, reliable and robust, **Norgard** composites are used as seals and separator component parts within the fuel cell system. Suitable as sub-gaskets or frame gaskets, they ensure the energy efficiency of the fuel cell stacks and provide modularity to the system.

One of the critical features of **Norgard** gasket and seal components solutions are their reduced material creep and excellent tensile strength. This strength provides long-lasting performance in fuel cells, which are often operating in very challenging environments.

Our multi-material composites work as protection and barrier solutions within the Fuel Cell Systems.

They can perform well in the presence of multiple stress factors or challenging conditions, even accommodating peak excursions up to 570°F / 300°C, frequent flexing, elevated pressures, as well as multiple exposures to chemicals.

Finally, their non-burning characteristics are paramount even in the presence of fire. All of our protection barrier solutions are components, capable of being customized and configured for many new developments in the energy sector.

The **Saint-Gobain** Tape Solutions range of materials for sub-gaskets and gaskets can be supplied as sheets or roll-to-roll process, or we can die cut to your requirements.



## NORGARD PRODUCTS OF CHOICE:

**150FH** Smooth surface and good friction properties for **sub-gaskets**.

**E124** Thinner gauges, uniform, pinhole and crack-free, isotropic product with low permeability for **frame gaskets**.

**T100** Thicker gauges, low permeability and durable product for **frame gaskets**.

**T500** High modulus, low permeability, durable product for **frame gaskets**.

**mT100** Excellent dielectric properties and low permeability for **frame gaskets**.

## APPLICATIONS:

Frame and sub-gaskets for:

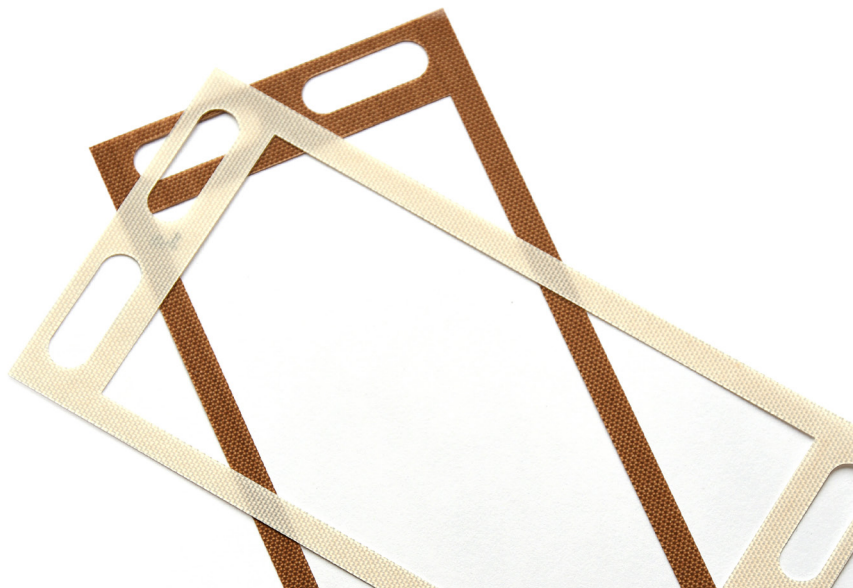
- PEM electrolyzers
- PEM fuel cell systems
- Alkaline electrolyzers
- Alkaline fuel cell systems
- PAFC (phosphoric acid)

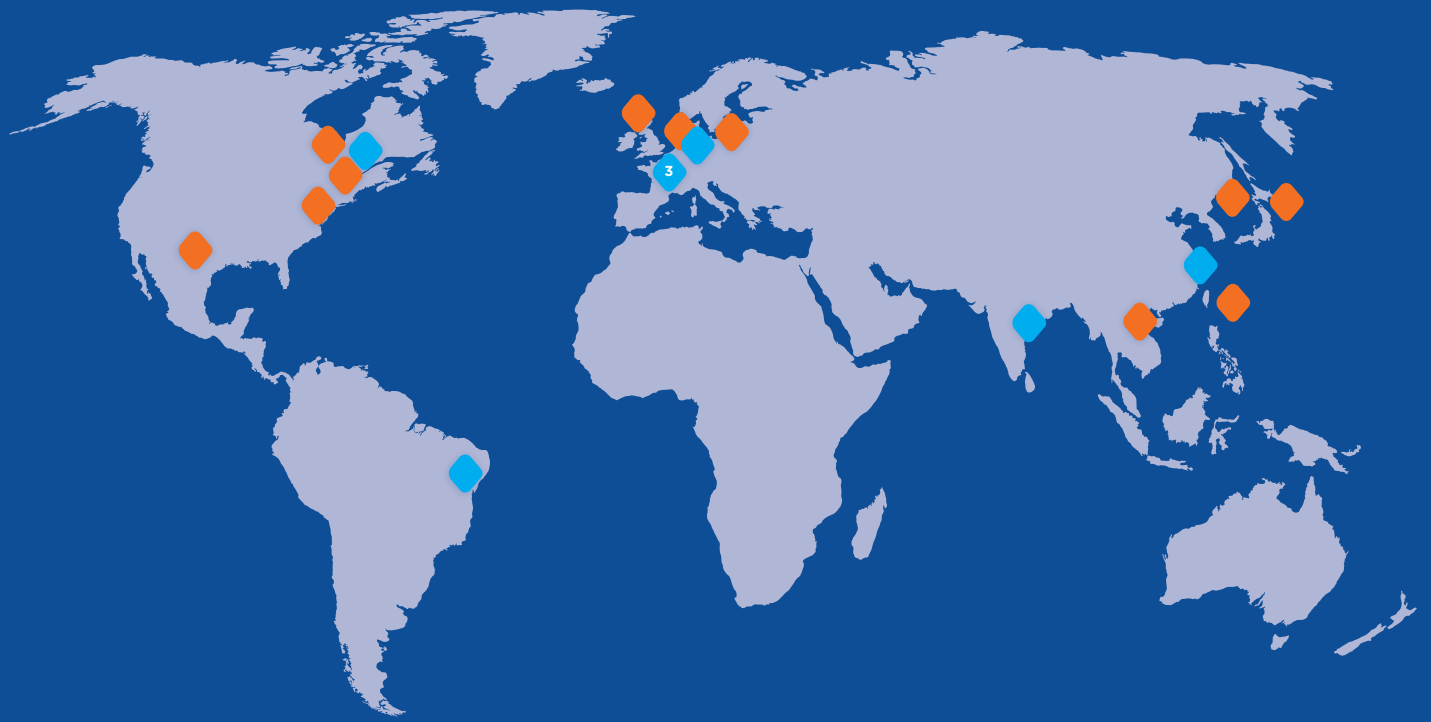
## FEATURES:

- Excellent non-stick surface
- Excellent dielectric properties
- Superior chemical resistance
- Excellent smooth surface
- Configurable for any required size
- Low thickness tolerance
- High temperature resistance up to 500°F / 260°C
- Excellent heat transfer
- Low shrinkage/hysteresis

## BENEFITS:

- Low permeability
- Low risk of failure due to chemical inertness
- Durable sealing properties
- Providing multiple gasketing functions
- Usable in harsh environments
- Reliable mechanical protection
- Bondability to the proton exchange membrane
- Tight seal under pressure holding the proton exchange membrane in place





**Saint-Gobain Research  
and Development Centers**



**Saint-Gobain  
Tape Solutions Sites**

## NORGARD

Versatile, designed, and manufactured with the most demanding applications in mind, Norgard products offer a combination of high mechanical strength, smooth surface, excellent dielectric properties, and outstanding release behavior even at elevated temperatures and where exposed to aggressive chemicals.

Our Norgard offering encompasses the broadest range of high-performance material solutions on the market — while our technical expertise, global manufacturing capabilities, and market knowledge, combined with our research and development resources, meet customers' evolving needs worldwide.



Effective **release** for high speed decal processes and homogeneous catalyst layers



Chemical, and thermal **protective barrier** within the fuel cell systems



Reliable **electric insulation** in stack separating anode and cathode; also in facility structures

[www.tapesolutions.saint-gobain.com](http://www.tapesolutions.saint-gobain.com)

**IMPORTANT:** It is the user's responsibility to ensure the suitability and safety of Saint-Gobain products for all intended uses and that the materials to be used comply with all applicable regulatory requirements. Saint-Gobain assumes no responsibility for any product failures that occur due to your actions or inactions, including your use, design, fabrication or application of the products into which the materials are incorporated.

**WARRANTY:** This document should not be considered a warranty or a guarantee. The descriptions of the Product provided hereinabove may vary based on specifications requested and testing protocols. Typically, Saint-Gobain warrants that product(s) will meet mutually agreed specifications at delivery and Saint-Gobain honors any breach of warranty claims for six (6) months from delivery of the products. If a product is determined to be nonconforming with its warranty, Saint-Gobain's sole obligation is, at its option, to either replace the nonconforming products or reimburse the purchase price for the same.

The only obligation under any applicable product warranty will be to replace any portion proving defective, or at our option, to refund the purchase price thereof. SAINT-GOBAIN DISCLAIMS ALL OTHER EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR USE.

Form #2005 | © Saint-Gobain February 2025 | All the mentioned trademarks are registered trademarks of Saint-Gobain Tape Solutions or affiliates, part of Saint-Gobain group.



### SAINT-GOBAIN TAPE SOLUTIONS

14 McCaffrey Street  
Hoosick Falls, NY 12090, USA  
Tel: 800-962-2666  
Tel: 518-686-7301

150 Dey Road  
Wayne, NJ 07470, USA  
Tel: 973-696-4700