

3M™ Wind Energy Solutions

Building in
productivity.
From the
ground up.





Energizing a more sustainable future.

Build. Protect. Enhance.
It all starts here.

Securing the place of wind as a viable energy source means making continual technological improvements to ensure more uptime. Improve reliability. Reduce costs. Increase efficiency. That's where 3M can help.

From design and manufacturing through day-to-day operations, 3M offers you a wide array of innovative technology solutions – all engineered to build more performance and profit into your system.

Collaborating for success.



Imagine if you could share knowledge and ideas with the top scientists and engineers in your industry. Then think how much easier it would be to overcome design and operations problems. Find more efficient ways to boost performance. Enhance reliability. Provide protection against weathering, harsh environments, and rain erosion. And more.

At 3M you'll find a team of experienced experts who are eager to help you develop new ways to take wind energy to the next level. Let our 100 years of technology, marketing and manufacturing experience help propel you into a sustainable and more profitable future.

▶ **Operations & maintenance**

- 3M™ Wind Protection Tapes
- 3M Wind Fillers
- 3M Acrylic Foam Tape
- 3M Clean Sanding System
- 3M Wind Vortex Generators

▶ **Manufacturing & design**

- 3M Dry Layup Adhesive
- 3M Wind Protection Tapes
- 3M Wind Blade Protection Coatings
- 3M Acrylic Foam Tape
- 3M Clean Sanding System
- 3M Diamond Cutoff Wheels
- 3M Wind Vortex Generators

▶ **Installation**

- 3M Cold Shrink Splices
- 3M Cold Shrink Terminations
- 3M and Scotch® Premium Electrical Tapes
- 3M Cable Grounding Kits
- 3M Wire Management and Marking Supplies
- Scotch® Detectable Buried Barricade Tapes
- 3M Locators and Markers

▶ **Safety**

- 3M Safety-Walk™ Materials
- 3M Filtering Facepiece Respirators
- 3M Half and Full Facepiece Respirators
- 3M Powered and Supplied Air Respirators
- 3M Hearing Protection
- 3M Eye Protection
- 3M Head and Face Protection
- 3M Peltor™ Communications
- 3M Fall Protection
- 3M Speedglas™ Auto-Darkening Filters and Helmets
- 3M Sorbents

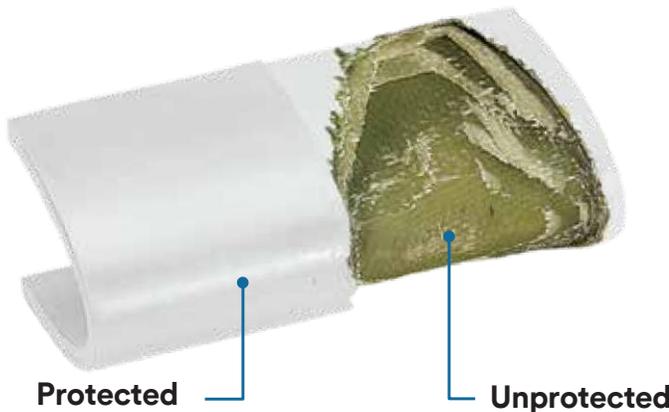
Ad Adhesives	Fi Films	
Mr Micro-replication	Nt Nano-technology	Sm Specialty Materials

3M's technology portfolio is the foundation for thousands of unique and innovative products used in virtually every industry. In particular, 3M's expertise in adhesives, films, microreplication, nanotechnology and specialty materials is ideally suited to help you design and build the next generation of wind energysystems.

Extending equipment life.

Rotating up to 250 mph, wind blades are faced with erosion caused by rain, hail, salt spray and other debris. As a result, many blades can suffer pitting, gouging and delamination that can affect aerodynamic efficiency and even impact the integrity of the entire blade. Poor blade performance can also reduce annual energy production, and repair downtime is costly.

3M™ Wind Erosion Solutions offer an array of products to both repair and help prevent damage caused by minor impacts and erosion. These advanced 3M materials are designed to enhance reliability, improve performance and extend the life of your valuable equipment.



Sample tested in rainfall of one inch per hour at 500 mph at the University of Dayton Research Institute Rain Erosion Test Facility.

3M Wind Blade Protection Coating and Accessories

3M Wind Blade Protection Coating W4602 is a two-component polyurethane coating. It forms a single durable layer designed to help protect the leading edges of wind blades from damage caused by sand and rain erosion, and minor impacts. Designed for easy brush, spreader or casting application.



Supplies

3M™ Wind Blade Protection Coating W4602
Part A & B 400 mL Duo-Pack Cartridge, Part A 18L Drum, Part B 18L Drum

3M Wind Blade Protection Coating Brush

3M Wind Blade Protection Coating Mixing Nozzles

3M Accessories: 3M Abrasives, 3M Random Orbital Sander, 3M Masking Tape

Other Supplies: Thickness gauge, dropcloth for floor, gloves, knife

3M™ Wind Protection Tapes

3M Wind Protection Tapes help shield leading edges and surfaces from pitting, wear and water ingress. Constructed from tough, abrasion-resistant polyurethane elastomers, 3M Wind Protection Tapes resist puncture, tearing, erosion and weathering. They are UV stable, solvent-free and conform to complex shapes to best protect your valuable equipment. They ensure consistent thickness of protection in a single layer, tolerate a wider variety of ambient application conditions, require no special application tools, and are easily and quickly applied either in the factory or in the field via rope or platform access.

3M Wind Protection Tapes are based on the same dependable technology designed to protect helicopter blades and aircraft radomes for over 40 years. Applied to the leading edge of wind turbine blades, these high-performance polyurethane tapes have a proven ability to maintain turbine efficiency, reduce downtime and maintenance, and extend the useful life of blades – even in the harshest environments.



Wind Protection Tape 2.1			
Product Number	Color	Opacity	Thickness mils (mm)
W8751	Colorless	Translucent	14(0.36)
W8781	Light Gray	Opaque	14(0.36)

3M Wind Protection Tape Accessories

Technologies designed to ensure optimal results and improve production – while simplifying and speeding up installation and repair operations.

3M™ Wind Protection Tapes are constructed from an exceptionally tough, abrasion and puncture-resistant polyurethane elastomer that stands up to sand, rain, hail and wind-borne debris.

Product Number	Name	Size	Qty/Case	Additional Information
W2600	3M™ Wind Protection Tape Edge Sealer W2600	1.7oz. (50 mL)	12	A clear, non-yellowing, durable two-part urethane sealer system used to help smooth and protect the edges of 3M™ Wind Protection Tape. Provides excellent resistance to environmental exposure.
W9910/ W9910-1	3M Wind Tape Adhesion Promoter W9910/W9910-1	7 x 7 in. (17.8 x 17.8cm) wipe	5	Designed to enhance initial adhesion of 3M™ Wind Protection Tapes in demanding situations.
		16oz. (473mL)	12	
50004	3M Scotch-Weld EPX™ Plus II Applicator 50004	-	10	Handheld 50 mL applicator used to apply 3M™ Wind Protection Tape Edge Sealer W2600. Provides fast and easy manual dispensing.
9176	3M Scotch-Weld™ EPX™ Square Gold Mixing Nozzle	-	72	Mixing nozzle used with 50 mL 3M™ Scotch-Weld™ EPX™ Plus II Applicator 50004.
23651	Scotch-Brite™ High Performance Cleaning Cloth 23651, Yellow	12.6 in. x 14.2 in. (32 cm x 36 cm)	50	Provides ultra cleaning power because of its knitted, interwoven design of water- and oil-absorbing microfibers that lift and trap liquids, grease, dust and dirt particles.
471	3M Vinyl Tape 471, Red	1 in. x 36 yd. (2.54 cm x 32.9 m)	36	Used for marking and guiding when applying 3M™ Wind Protection Tapes. Vinyl backing with rubber adhesive. Ideal for masking curved or irregular surfaces.
06856	3M Wetordry™ Rubber Squeegee PN05517 W/D	107mm X 70mm	50	Smaller size available but not recommended. Stiffer wipers may cause wrinkles.

3M™ Wind Epoxy Fillers

3M offers a complete line of fillers, abrasives and or polyurethane fillers used accessories to repair minor damage on wind blade surfaces. 3M™ Wind Fillers are flexible, tough two-part epoxy to finish and smooth wind blade surfaces and leading edges during manufacture, and to repair minor damage on the wind blade surface quickly and reliably during maintenance operations.

Epoxy chemistries minimize outgassing during the cure process allowing for more immediate application of Wind Protection Tapes and Coatings, while innovative 3M Duo-Pak Cartridges and Applicators ensure accurate mixing, reduce waste and virtually eliminate messy and time-consuming hand mix operations. This allows for the flexibility to finish and repair blades at the manufacturing facility or during operations and maintenance repairs either on the ground or up tower.



Product Number	Chemistry	Work Time	Sand Time	Color
W3120	Epoxy	10 min.	30 min.	Blue

3M Wind Filler Accessories

Product Number	Product Name	Size	Quantity / Case
W2600	3M™ Scotch-Weld™ EPX™ Plus II Applicator	1.7 oz. (50 mL)	1
W3120	3M Scotch-Weld™ EPX™ Manual Applicator	6.8 oz. (200 mL)	36
42646	3M Plastic Applicator, PA1-B Blue	2 ¾ x 4 in.	25



3M™ Scotch-Weld™ EPX™ Manual Applicator



3M™ Applicator PA1-B



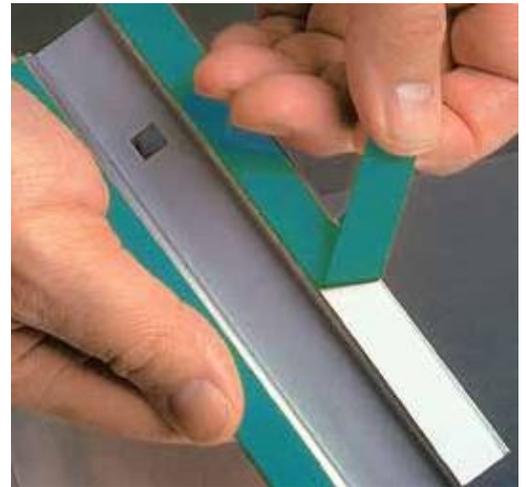
3M™ Clean Sanding System

For dry-sanding composites, metal, coatings or almost any other substrate, almost nothing reduces dust more completely and efficiently than 3M Clean Sanding technology. Featuring a carefully-matched system of abrasives, random orbital tools, and accessories, these easy-to-use products work together to improve productivity – while delivering faster, more consistent results.

The patented, precise multi-hole patterns of 3M Clean Sanding Discs and Sheets can evacuate dust better than 5 or 6-hole products – for improved faceside performance and dramatically longer disc life.

3M™ Acrylic Foam Tapes

3M Acrylic Foam Tapes can be used for a variety of surface bonding applications. The technology behind 3M Acrylic Foam Tapes has been used around the world since 1980 to replace liquid adhesives and mechanical fasteners in permanent bonding and sealing applications.



Product Number	Thickness		Density lb/ft ³ (kg/m ³)	Color
	mil	mm		
W4155	62	1.55	37 (592.7)	Black
W4110	45	1.10	37 (592.7)	
W4080	32	0.80	37 (592.7)	
W4063	25	0.63	37 (592.7)	
W2304	120	3.00	45 (720.8)	White
W2204	79	2.00	45 (720.8)	
W2155	62	1.55	52 (833)	Dark Gray
W2110	45	1.10	52 (833)	
W2063	25	0.63	52 (833)	



3M Wind Vortex Generators

3M Wind Vortex Generators (VGs) can help improve a wind turbine's annual energy production (AEP) an average of 1-3% depending on turbine model and wind conditions. They are made of a tough thermoplastic with dimensional stability and strength which has a proven track record of superb weathering resistance. Our Vortex Generators are equipped with 3M™ Wind Acrylic Foam Tape die-cuts that provide excellent long-term durability and holding power while treating the blade surface with care.



Color	Plastic Type
Gray	Durable Thermoplastic ready to bond with Acrylic Foam Tape

3M™ Dry Layup Adhesive

This sprayable, high tack and fast-drying adhesive is a synthetic elastomer-based formulation for bonding/holding glass fabrics and roving, reinforcements and other materials (i.e., flow media) in place during the infusion process. Its particle spray pattern and color provide a visual check of spray level for more consistent application. Available in red or a vanishing green which turns clear after resin infusion to minimize the appearance of visual streaking.



3M™ Accuspray™ ONE Spray Gun Kit for 3M™ PPS™ Series 2.0



3M Dry Layup Adhesive is designed to reduce the amount of time required for dry layup of fiberglass. It also helps reduce wrinkles, which can be a major source of failures. Bulk versions are ideal for robotic application.

Product Number	Color	Size	Application Method
09091		16oz. (473mL) Aerosol	Aerosol Can
09092	Red	5 Gallon (18.9L)	3M™ Accuspray ONE Spray Gun with PPS™ Series 2.0
09093		55 Gallon (208L)	3M™ Accuspray ONE Spray Gun with PPS™ Series 2.0
W7900	Green	14.7 oz. (435 mL) Aerosol	Aerosol Can
		5 Gallon (18.9L)	3M™ Accuspray ONE Spray Gun with PPS™ Series 2.0

3M™ Accuspray™ ONE Spray Gun Kit for 3M™ PPS™ Series 2.0

Part No.	Qty/Case	Contains
26578	2/Case	Kit: 3M™ Accuspray™ ONE spray gun, Accuspray™ Atomizing Heads(1 each: 1.2mm, 1.3mm, 1.4mm, 2.0mm), air control valve, color ID clips

3M™ Accuspray™ Atomizing Head for 3M™ PPS™ Series 2.0

- Designed specifically for use with 3M™ PPS™ Series 2.0 – our next generation, highest performing disposable spray cup system.
- Fast, simple head replacement affords the performance of a brand-new spray gun on demand.
- See-through design makes it easy to see when the heads are clean.

Part No.	Size	Color	Case Qty.	Features
26620	2.0mm	Red	4/Pack, 6 Packs/Case	Works with 3M™ Accuspray™ ONE and 3M™ PPS™ 2.0 Systems
26586			1/Pack, 5 Packs/Case	
26618	1.8mm	Clear	4/Pack, 6 Packs/Case	
26585			1/Pack, 5 Packs/Case	
26614	1.4mm	Orange	4/Pack, 6 Packs/Case	
26584			1/Pack, 5 Packs/Case	
26613	1.3mm	Green	4/Pack, 6 Packs/Case	
26583			1/Pack, 5 Packs/Case	
26612	1.2mm	Blue	4/Pack, 6 Packs/Case	
26582			1/Pack, 5 Packs/Case	

3M™ PPS™ Series 2.0 Spray Cup System Kit

- Domed lid geometry and a wider fluid spout allows up to 3 fl. oz (90mL) of material to be held below the filter reducing inconsistent spray due to air-entrapment and sputter.
- Full-diameter filters are built into every lid for the highest quality filtration; aids with fluid flow.
- A new reusable hard cup is included in every lid/liner kit.

Part No.	Description	Size	Micron Filter	Case Qty.	Part No.	Description	Size	Micron Filter	Case Qty.
26024	Large	28 fl oz, 850mL	200	1 Kit/Case	26325	Large	28 fl oz, 850mL	125	1 Kit/Case
26000	Standard	22 fl oz, 650mL			26301	Standard	22 fl oz, 650mL		
26112	Midi	13.5 fl oz, 400 mL			26312	Midi	13.5 fl oz, 400mL		
26114	Mini	6.8 fl oz, 200mL			26314	Mini	6.8 fl oz, 200mL		

Contains System Kit – Each kit contains: 50 lids and liners, 32 sealing plugs, 1 hard cup

Building for safety and reliability.



Installation

The full line of 3M Locators and Markers helps you quickly and accurately identify underground assets. From finding the exact path and estimated depth of underground utilities, to locating buried passive markers, to reading and writing information directly to the new RFID markers, 3M offers the precision tools needed to manage your assets. And now, certain 3M™ Dynatel™ Locators interface with select GPS/GIS field mapping instruments.



3M™ Cold Shrink Splices and Terminations

Ensure easy installation, effective insulation and outstanding peace of mind. Dynamic, compressive seals have proven reliable for over 40 years of field use. Meets IEEE standards. Available for applications up to 69kW.



Safety

3M™ Personal Protection Equipment

Designed to improve worker safety and reduce lost time injuries, with a broad range of personal protection equipment engineered for comfort, convenience and functionality.

- ▶ 3M™ Filtering Facepiece Respirators
- ▶ 3M™ Half and Full Facepiece Respirators
- ▶ 3M™ Powered and Supplied Air Respirators
- ▶ 3M™ Hearing Protection
- ▶ 3M™ Eye Protection
- ▶ 3M™ Head and Face Protection
- ▶ 3M™ Peltor™ Communications
- ▶ 3M™ Fall Protection
- ▶ 3M™ Speedglas™ Auto-Darkening Filters and Helmets
- ▶ 3M™ Sorbents



3M™ Safety-Walk™ Slip-Resistant Materials

Protect against costly slips and falls while reducing worker fatigue. Treads, tapes, matting and a variety of pre-cut, easy-to-apply shapes also prevent ice, snow and mud buildup. Available in sizes, colors and grades for virtually any surface.



Connecting you to a world of 3M resources.

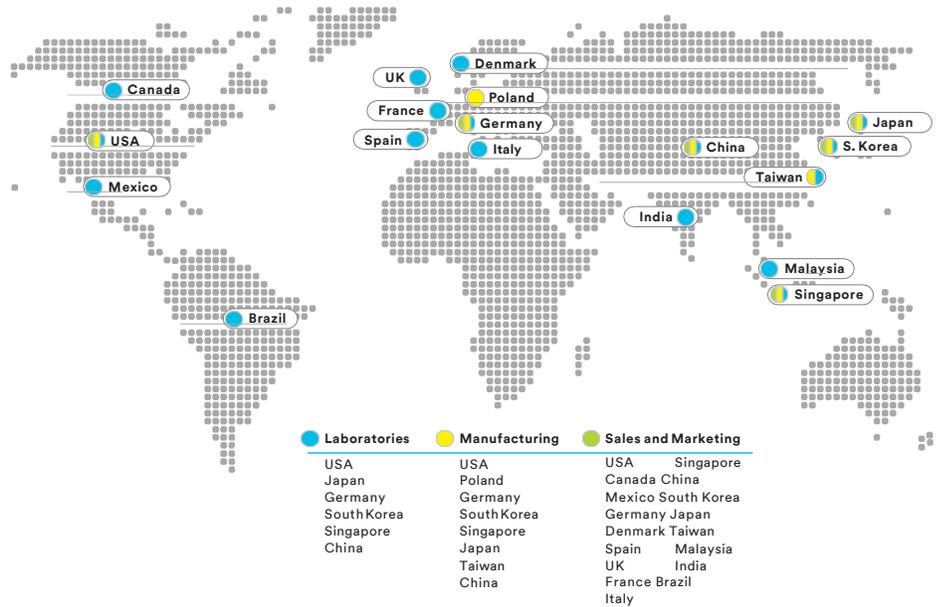
Your reliable supplier of technologies for wind energy

When you're being challenged to find new ways to make wind and other forms of sustainable energy more reliable and cost efficient, you need people on your side who have the industry experience and technical know-how to make that happen. With 3M, you have the advantage of an experienced, reliable partner, with the resources and expertise to help you develop applications, provide technical support and supply products almost anywhere in the world.

From tapes and adhesives used in blade manufacturing to electrical splices and terminations for connecting to the grid, 3M is ready to help you build the next generation of wind energy systems – with products designed to enhance reliability, improve performance and provide protection against weathering and harsh environments.

Working with a single, dedicated supplier like 3M gives you one contact for many solutions. And as a global company with operations in 70 countries, and laboratories in 36 countries, we have the ability to connect you with local 3M personnel to provide expert technical and business support almost anywhere in the world. Contact us today to see how 3M's renewable energy expertise can help you meet the challenges of today's marketplace.

3M Global Footprint



United States

800 676 8381

Germany

49 2131 144450

Denmark

45 43 480100

Spain

34 91 3216000

France

33 130316161

United Kingdom

44 1344858000

Italy

39 02 70351

Singapore

65 6450 8888

China

86 2162753535

South Korea

82 2 3771 4043

India

9180 22231414

Canada

800 364 3577

Brazil

0800 132333

Mexico

52 55 52702250

Taiwan

886 933 896752

Japan

813 37098283

Malaysia

603 78062888

Other Areas

800 7552654

For more information on our wind energy product line, contact 3M at 800 676 8381 or visit us at 3M.com/Wind

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