

3M™ Wind Epoxy Structural Adhesive W1125

Description

3M™ Wind Epoxy Structural Adhesive W1125 is a two-part, room temperature-curing epoxy adhesive for bonding composite wind blades and for other general purpose applications. This high performance, rigid adhesive combines high shear strength along with excellent peel strength, impact strength, and durability.

Features

3M Wind Epoxy Structural Adhesive W1125 provides the following benefits:

- 90 minute work life
- 8 hour set time
- Sag-resistant viscosity
- Tough
- High peel strength
- High shear strength

Typical Uncured Physical Properties

Properties	Part B (Base Resin)	Part A (Accelerator Hardener)
Chemistry	Epoxy	Amine
Color	Black	Off-White
Density	1.31 g/cm ³	1.28 g/cm ³
Viscosity	800,000 cP	450,000 cP
Mix Ratio (by Weight)	100 parts B	45 parts A
Mix Ratio (by Volume)	100 parts B	50 parts A
Mixed Viscosity	Sag-resistant Paste	
Work Life	90 minutes at 73°F (23°C)	
Set Time	8 hours at 73°F (23°C)	
Full Cure Time	28 days at 73°F (23°C)	

Note: The following information and data should be considered representative or typical only, and should not be used for specification purposes.

Note: Viscosity measured using a Brookfield RVF Viscometer at 23°C.

Typical Cured Physical Properties

Properties	Value		
Color	Black		
Density	1.30 g/cm ³		
Overlap Shear	Aluminum	3,660 psi	25.2 MPa
	Steel	2,460 psi	17.0 MPa
	Stainless Steel	3,560 psi	24.5 MPa
	Glass Fiber Reinforced Epoxy	3,300 psi	22.8 MPa
	Glass Fiber Reinforced Polyester*	880 psi	6.1 MPa
	Polycarbonate	430 psi	3.0 MPa
	Acrylic*	400 psi	2.8 MPa
	ABS*	1,360 psi	9.4 MPa
	PVC	550 psi	3.8 MPa
	Nylon	200 psi	1.4 MPa
Wood*	1180 psi	8.1 MPa	
Shore D Hardness	83		

- Notes: 1. Overlap shear values measured using DIN 1465 / ISO 4587 test method "Adhesives—Determination of Tensile Lap Shear Strength of Rigid-to-Rigid Bonded Assemblies;" 0.5 mm bond line thickness; samples pulled at 1 mm/min; adhesive cured for 28 days at room temperature; metal surface cleaned with the following procedure: (1) tissue wipe using MEK, (2) light abrasion with orbital sander using Scotch-Brite™ 7447 maroon pad, (3) tissue wipe using IPA; substrates for overlap shear testing were 1.6 mm thick aluminum, 1.0 mm thick steel, 3.2 mm thick epoxy, polyester, polycarbonate, and acrylic, and 6.4 mm thick ABS, PVC, and wood. Materials indicated by an asterisk (*) exhibited primarily substrate failure.
2. Hardness values measured using ASTM D2240 "Standard Test Method for Rubber Property—Durometer Hardness".

Properties	Temperature	Value	
Overlap Shear	-40°F (-40°C)	2,350 psi	16.2 MPa
	72°F (22°C)	3,660 psi	25.2 MPa
	122°F (50°C)	2,030 psi	14.0 MPa
	176°F (70°C)	300 psi	2.1 MPa

Tensile Properties

Properties	Value	
Tensile Modulus (E)	565,000 psi	3,890 MPa
Tensile Strength	4,290 psi	29.6 MPa
Strain at Break	5%	5%

Note: Tensile properties measured using ISO 527 test method "Plastics—Determination of Tensile Properties" and Type IV test specimens made according to ASTM D638 "Standard Test Method for Tensile Properties of Plastics;" adhesive cured for 4 hours at 149°F (65°C); samples pulled at 1 mm/min.

Environmental Resistance

Properties	Value		
Overlap Shear	No exposure	3,660 psi	25.2 MPa
	1000 hours in salt water	3,070 psi	21.2 MPa
	1000 hours in diesel fuel	3,500 psi	24.1 MPa
	1000 hours in acid solution (pH=4)	3,180 psi	21.9 MPa
	1000 hours in base solution (pH=10)	3,170 psi	21.9 MPa
	1000 hours at 50°C	3,560 psi	24.5 MPa
	1000 hours in 50°C water	1,930 psi	13.3 MPa
	1000 hours at 50°C and 80% relative humidity	2,820 psi	19.4 MPa
	1000 hours weathering cycle	2,600 psi	17.9 MPa

- Notes: 1. Overlap shear values measured using DIN 1465/ISO 4587 test method; adhesive cured for 28 days at room temperature; lightly abraded 1.6 mm thick aluminum test substrates; 0.5 mm bond line thickness; samples pulled at 1 mm/min.
2. Weathering cycle involves daily humidity changes and temperature variations from -40°C to 60°C.



Directions for Use

1. To obtain high strength structural bonds, all surfaces must be clean, rough, and dry. For molded composite laminates, these conditions can typically be achieved using a peel-ply material that must be removed immediately prior to adhesive application. Otherwise, the surface must be prepared using the following procedure:
 - A. Dust, mold release agents, oils, and all other surface contaminants must be completely removed using a solvent or some other degreaser.**
 - B. The surface must then be lightly abraded using either Scotch-Brite™ pads or fine to medium grit sandpaper to increase surface area and remove gloss.
 - C. The loose debris from abrasion must then be removed using a clean cloth and solvent (such as a 50:50 mixture of isopropyl alcohol and water).**
2. The two adhesive components must be thoroughly mixed using either the weight or volume mix ratio specified in this document. The mixed adhesive should be a uniform black color with no streaks.

When using a cartridge, follow these instructions: Store adhesive cartridges upright (cap end up). Place cartridge into applicator and remove cap. Dispense and discard a small amount of adhesive to ensure free flow from both sides of cartridge, then attach mixing nozzle. Store unused adhesive with mixing nozzle attached, then remove and attach new mixing nozzle when ready to continue use.
3. The mixed adhesive should be applied to the bond area, and the two surfaces mated together, before the work life stated in this document expires. Keep the joined parts together using contact pressure or clamps during the cure process until the set time is reached. Optimal bond line thickness ranges from 4 to 40 mils (0.1 to 1.0 mm).

4. Although this two-part epoxy adhesive will cure at room temperature, a thermal cure can also be used to accelerate the curing process. Allow sufficient time for the bonded parts and adhesive to reach the desired temperature. The optimal cure cycle will need to be determined for each specific application.

****Note:** When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use. Use solvents in accordance with local regulations.

Storage

Store products at 59–77°F (15–25°C) for maximum shelf life. Opened bulk containers with leftover adhesive should be resealed after applying a nitrogen purge of the headspace.

Shelf Life

This product has a shelf life of 24 months in bulk containers, or 15 months in cartridges from date of manufacture, when stored in the original sealed containers at room temperature.

Precautionary Information

Refer to the product label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.

For more information on our wind energy product line, contact 3M Renewable Energy at 800-755-2654 or visit us at www.3M.com/wind.

The technical information, recommendations, and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use: Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

Warranty, Limited Remedy, and Disclaimer: Unless an additional warranty is specifically stated on the applicable 3M product packaging or product literature, 3M warrants that each 3M product meets the applicable 3M product specifications at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If the 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

Limitation of Liability: Except where prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including warranty, contract, negligence, or strict liability.



Renewable Energy Division

3M Center, Building 235-1S-67
St. Paul, MN 55144-1000
1-800-755-2654
www.3M.com/wind

Please recycle. Printed in USA.
Issued: 4/12 © 3M 2012.
All rights reserved. 8628HB
98-0150-0166-6

3M and Scotch-Brite are
trademarks of 3M Company.
Used under license by
3M subsidiaries and affiliates.