

Technical Data Sheet

3M™ Scotch-Weld™ Epoxy Adhesive 2214 Non-Metallic Filled

Product Description

- One part 250°F (121°C) curing 100% solids, 3M™ Scotch-Weld™ Epoxy Adhesive 2214 is a paste consistency epoxy adhesive designed for bonding metals and many high temperature plastics such as fiberglass reinforced plastic, polyester, and phenolics.
- 3M™ Scotch-Weld™ Adhesive 2214 Non-Metallic Filled is a non-metal filled version of Scotch-Weld adhesive 2214 regular.
- Recognized as meeting UL 94 HB


Technical Information Note


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

Typical Uncured Physical Properties

Property	Values	Additional Information
Color	Cream to Tan	View 

Notes: Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.

Viscosity	50 to 200 s	View 
Notes: Time to deliver 20 gms@ 50 psi thru a 0.10in orifice		

Viscosity	>1,000,000 cP	View 
-----------	---------------	--

Notes: Because of Thixotropic paste nature of these products Brookfield viscosity will be over 1,000,000 cps.


Base	Modified Epoxy
Net Weight	9.6 lb/gal

Typical Physical Properties

Property	Values	Additional Information
Color	Cream to Tan	View 



Test Name: Cured

Typical Mixed Physical Properties

Property	Values	Additional Information
Time to Full Cure	40 min	View 
Temp C: 121C Temp F: 250F		




Typical Cured Characteristics

Property	Values	Additional Information
Modulus	700000 lb/in²	

Shore D Hardness	85	View 
Test Method: ASTM D2240 Temp C: 23C Temp F: 73F		
Tensile Strength	9000 lb/in²	View 
Test Name: At Break		

Typical Performance Characteristics

Property	Values	Additional Information
Elongation at Break	<2 %	



Overlap Shear Strength 7day Cold Rolled Steel	2200 lb/in²	View 
Test Method: ASTM D1002 Test Name: Overlap Shear Strength Dwell/Cure Time: 7.0 Dwell Time Units: day Temp C: 23C Temp F: 73F Environmental Condition: 50%RH Substrate: Cold Rolled Steel Surface Preparation: MEK/Abrade/MEK Notes: Overlap shear (OLS) strengths were measured on 1in wide 1/2in overlap specimens on 1in x 4in x .060in substrates. Jaw separation 0.1 in/min. 0.005-0.008in bondline. Cohesive (CF), Adhesive(AF), and Substrate(SF) Failure		
T-Peel Adhesion 23C Aluminum	7 lb/in width	View 
Test Method: ASTM D1876 Test Name: T-Peel Adhesion Temp C: 23C Temp F: 73F Substrate: Aluminum Notes: T-Peel bonds were measured on 1 in. wide specimens cut from two FPL etched 8 in. x 8 in. x .032 in., 2024 T3 clad aluminum panels bonded together. The separation note of the testing jaws was 20 in./minute.		
T-Peel Adhesion 23C Steel	12 lb/in width	View 

Test Method: ASTM D1876

Test Name: T-Peel Adhesion
Temp C: 23C
Temp F: 73F
Substrate: Steel
Surface Preparation: MEK wipe

Notes: T-Peel bonds were measured on two 1" wide x 8" long specimens bonded together. After bonding they were then pulled apart in 180° Peel at a jaw separation rate of 20"/minute rate.

Electrical and Thermal Properties

Property	Values	Additional Information
Thermal Conductivity	0.121 (btu-ft)/(h-ft²-°F)	
Coefficient of Thermal Expansion	130 x 10^-6 m/m/°C	View 
Test Condition: between -30 - 100°C		
Arc Resistance	26 s	View 
Test Method: ASTM D495		

Storage and Shelf Life

Store products at 40°F (4°C) or below for maximum storage life. Higher temperatures reduce normal storage life. Rotate stock on a “first-in-first-out” basis.

CAUTION: Products are heat sensitive. Storage above 130°F (54°C) may cause an exothermic reaction resulting in evolution of excessive heat, noxious fumes, and possibly fire.

All of these products have a shelf life of 12 months from the date of manufacture when stored in their unopened containers @ 40°F (4°C) or below; or 18 months @ 0°F (-20°C) or below.

Industry Specifications

UL 94 HB

Automotive Disclaimer

Automotive Applications: This product is an industrial product and has not been designed or tested for use in certain automotive applications, including, but not limited to, automotive electric powertrain battery or high voltage applications. This product does not fully adhere to typical automotive design or quality system requirements, such as IATF 16949 or VDA 6.3. This product may not be manufactured in an IATF certified facility and may not meet a Ppk of 1.33 for all properties. The product may not undergo an automotive production part approval process (PPAP). Customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer’s automotive application and for conducting incoming inspections before use of the product. Failure to do so may result in injury, death, and/or harm to property. No written or verbal statement, report, data or recommendation by 3M related to automotive use of the product shall have any force or effect unless in an agreement signed by the Technical Director of 3M’s Automotive Division. Customer assumes all responsibility and risk if customer chooses to use this product in an automotive electric powertrain battery or high voltage application, and 3M will not be liable for any loss or damage arising from or related to the 3M product or customer’s use of the product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity or recall costs), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability. In no event shall 3M be liable for any damages in excess of the purchase price paid for the product.

NOTWITHSTANDING ANY OTHER STATEMENT TO THE CONTRARY, 3M MAKES NO REPRESENTATIONS, WARRANTIES OR CONDITIONS WHATSOEVER, EXPRESS OR IMPLIED, REGARDING THE PRODUCT IF USED IN AN AUTOMOTIVE ELECTRIC POWERTRAIN BATTERY OR HIGH VOLTAGE APPLICATION, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY ON PERFORMANCE, LONGEVITY, SUITABILITY, COMPATIBILITY, OR INTEROPERABILITY, OR ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE.

Bottom Matter

3M Center, Building 225-3S-06
St. Paul, MN 55144-1000
800-362-3550

Trademarks

3M and Scotch-Weld are trademarks of 3M Company.

Handling/Application Information

Application Equipment

These products may be applied by spatula, trowel, or flow equipment.

Dispensing equipment is available for intermittent or production line use. These systems are ideal because of their variable shot size and flow rate characteristics and are adaptable to most applications. For more information, contact your local 3M sales representative.

Note: Minimum pumping temperature is 65°F (18°C) for all products.

3M™ Scotch-Weld™ Epoxy Adhesive 2214 Regular Production Extrusion Equipment

- Pump: Ratio 55:1 with a chopping check valve and priming piston, 8 in. air motor. 3.7in³ cycle
- Ram: Pneumatic type capacity-12 psi on material surface
- Hose: Super high pressure with standard lining
- Flow Gun: High pressure type

Output based on 1/4 in tip flow gun (material temperature 65°F [18°C]) (minimum pumping temperature is 65°F [18°C])

Hose Assembly Material Pressure (psi) (Output lb/min)

Length-20', I.D.-1/2 in 4800* .36

Length-20', I.D.-3/4 in 4800* 1.0

3M™ Scotch-Weld™ Epoxy Adhesive 2214 Non-Metallic Filled Production Extrusion Equipment

- Pump: Ratio 38:1 with a chopping check valve and priming piston
- Ram: Pneumatic type capacity-10 psi on material surface
- Hose: Super high pressure with standard lining
- Flow Gun: High pressure type

Output based on 1/4 in tip flow gun (material temperature 65°F [18°C]) (minimum pumping temperature is 65°F [18°C])

Hose Assembly Material Pressure (psi) (Output lb/min)

Length-10', I.D.-3/4 in 3000 2.3

Length-20', I.D.-3/4 in 3000 1.6

Length-20', I.D.-3/4 in

+10, I.D.-1/2 in 3000 1.2

Length-20', I.D.-1/2 in 3000 0.84

3M™ Scotch-Weld™ Epoxy Adhesive 2214 Hi-Temp Production Extrusion Equipment

- Pump: Ratio 40:1 with a chopping check valve and priming piston, 6 in. air motor. 2in³/cycle
- Ram: Pneumatic type capacity-12 psi on material surface
- Hose: Super high pressure with standard lining
- Flow Gun: High pressure type

Output based on 1/4 in tip flow gun (material temperature 65°F [18°C])

Hose Assembly Material Pressure (psi) (Output lb/min)

Length-20', I.D.-1/2 in 2400 0.4

Length-20', I.D.-3/4 in 2400 1.1

3M™ Scotch-Weld™ Epoxy Adhesive 2214 Hi-Dense Production Extrusion Equipment

- Pump: Ratio 55:1 with a chopping check valve and priming piston, 8 in. air motor. 3.7in³/cycle
- Ram: Pneumatic type capacity-12 psi on material surface
- Hose: Super high pressure with standard lining
- Flow Gun: High pressure type

Output based on 1/4 in tip flow gun (material temperature 65°F [18°C]) (minimum pumping temperature is 65°F [18°C])

Hose Assembly Material Pressure (psi) (Output lb/min)

Length-20', I.D.-1/2 in 4500* 0.45

Length-20', I.D.-3/4 in 4500* 0.9

3M™ Scotch-Weld™ Epoxy Adhesive 2214 Hi-Temp New Formula Production Extrusion Equipment

- Pump: Ratio 55:1 with a chopping check valve and priming piston, 8 in. air motor. 3.7in³/cycle
- Ram: Pneumatic type capacity-12 psi on material surface
- Hose: Super high pressure with standard lining
- Flow Gun: High pressure type

Output based on 1/4 in tip flow gun (material temperature 65°F [18°C]) (minimum pumping temperature is 65°F [18°C])

Hose Assembly Material Pressure (psi) (Output lb/min)

Length-20', I.D.-1/2 in 4800* 0.36

Length-20', I.D.-3/4 in 4800* 1.0

*These pressures will require a special consideration during hose selection. They are actual working pressures.

Directions for Use

CAUTION: Use caution if your bond line is thicker than 1 mm as an exothermic reaction may occur during cure with production of intense heat and smoke. The likelihood of this happening depends on your joint design, the mass of material cured, and the ability for heat to be dissipated by the substrates.

1. Warm products to room temperature before opening containers to restore proper application consistency and to prevent moisture condensation on adhesive surface. Containers may be stored at room temperature for 1-2 days to thaw. Do not warm at temperatures above 80°F (27°C).
2. For high strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. However, the amount of surface preparation directly depends on the substrates, the required bond strength, environmental aging resistance, and requirements determined by the user in light of the user's particular purpose and method of application. For specific surface preparations on common substrates, see the section on surface preparation.
3. Use gloves to minimize skin contact and do not use solvents for cleaning hands.
4. For maximum bond strength, apply product evenly to both surfaces to be joined.
5. Join the adhesive coated surfaces and heat cure using the appropriate bondline temperature and time for the specific product being used.
6. Keep parts from moving during cure as contact pressure is necessary.
7. Cleanup can be accomplished with solvent such as 3M™ Scotch-Grip™ Solvent No. 3 or Methyl Ethyl Ketone.*

*Note: Prior to use of these solvents, extinguish or eliminate any ignition sources and read and follow supplier's environmental, health, and safety recommendations listed on the MSDS and product label.

Surface Preparation

The following cleaning methods are suggested for common surfaces:

Steel:

1. Wipe free of dust with oil-free solvent such as Methyl Ethyl Ketone.*
2. Sandblast or abrade using clean fine grit abrasives.
3. Wipe again with solvent to remove loose particles.

Aluminum:

1. Vapor Degrease – Perchloroethylene* condensing vapors for 5-10 minutes.
2. Alkaline Degrease – Oakite 164 solution (9-11 oz./gallon water) at 190°F ± 10°F (87°C ± 5°C) for 10-20 minutes. Rinse immediately in large quantities of cold running water.
3. Acid (FPL) Etch – Place panels in their following solution for 10 minutes at 150°F ± 5°F (66°C ± 2°C).

Sodium Dichromate 4.1-4.9 oz./gallon

Sulfuric Acid, 66°Be 38.5-41.5 oz./gallon 2024-T3 aluminum (dissolved) 0.2 oz./gallon minimum Tap water as needed to balance

4. Rinse – Rinse panels in clear running tap water.
5. Dry – Air dry 15 minutes; force dry 10 minutes at 150°F ± 10°F (66°C ± 5°C).
6. If primer is to be used, it should be applied within 4 hours after surface preparation.

Plastics:

1. Solvent wipe with Isopropyl Alcohol.*
2. Abrade using clean fine grit abrasives.
3. Solvent wipe with Isopropyl Alcohol.*

Rubbers:

1. Solvent wipe with Methyl Ethyl Ketone.*
2. Abrade using clean fine grit abrasives.
3. Solvent wipe with Methyl Ethyl Ketone.*

Glass:

1. Solvent wipe with acetone or Methyl Ethyl Ketone.*

Note: For glass applications which will be subjected to high moisture/humidity conditions, 3M™ Scotch-Weld™ Primer EC-3901 should be used to prime the glass.

*Note: Prior to use of these solvents, extinguish or eliminate any ignition sources and read and follow supplier’s environmental, health, and safety recommendations listed on the MSDS and product label.

References

Property	Values
3m.com Product Page	https://www.3m.com/3M/en_US/p/d/b40068294/
Safety Data Sheet SDS	https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=2214 Non-Metallic Filled

ISO Statement

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

Precautionary Information

Refer to 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.

Information

Technical Information: The technical information, guidance, and other statements contained in this document or otherwise provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license under any 3M or third party intellectual property rights is granted or implied with this information.

Product Selection and 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. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer’s application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.). Failure to properly evaluate, select, and use a 3M product and appropriate safety products, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy, and Disclaimer: Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification 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, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 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 for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.

Disclaimer: 3M industrial and occupational products are intended, labeled, and packaged for sale to trained industrial and occupational customers for workplace use. Unless specifically stated otherwise on the applicable product packaging or literature, these products are not intended, labeled, or packaged for sale to or use by consumers (e.g., for home, personal, primary or secondary school, recreational/sporting, or other uses not described in the applicable product packaging or literature), and must be selected and used in compliance with applicable health and safety regulations and standards (e.g., U.S. OSHA, ANSI), as well as all product literature, user instructions, warnings, and limitations, and the user must take any action required under any recall, field action or other product use notice. Misuse of 3M industrial and occupational products may result in injury, sickness, or death. For help with product selection and use, consult your on-site safety professional, industrial hygienist, or other subject matter expert. For additional product information, visit www.3M.com.