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3M™ Scotch-Weld™ Epoxy Adhesive DP190 Gray Duo-Pak, 200 mL, 12 per case



A gray flexible, two-part adhesive that cures at room temperature and provides high strength bonds with good performance in shear and peel. Can be used to bond rubber, metal, wood, most plastics, and masonry products.

This adhesive has a 90 minute work life, with improved impact and shock resistance over many traditional epoxy adhesives. It is a 1:1 mix ratio of 2216 B/A Gray Adhesive. Packaged in convenient Duo-Pak cartridges designed for use in the EPX Plus Applicato

Product / 3M Id / UPC

3M™ Scotch-Weld™ Epoxy Adhesive DP190 Gray Duo-Pak, 200 mL, 12 per case

3M Id : 62-3553-3830-2

GTIN(UPC/EAN) : 0 00 21200 87840 4

3M Scotch-Weld™ Epoxy Adhesives DP190 Translucent and Gray

Technical Data

Product Description

3M™ Scotch-Weld™ Epoxy Adhesive DP190 Translucent is a 1:1 mix ratio, faster curing version of 3M™ Scotch-Weld™ Epoxy Adhesive 2216 B/A Translucent.

3M™ Scotch-Weld™ Epoxy Adhesive DP190 Gray is a 1:1 by volume mix ratio of 3M™ Scotch-Weld™ Epoxy Adhesive 2216 B/A Gray and exhibits good peel, shear and environmental aging properties.

Available in bulk containers as 3M™ Scotch-Weld™ Epoxy Adhesive 190 B/A Translucent and 190 B/A Gray.

Features

- 90 minute worklife
- Flexible
- Translucent or gray color
- High shear and peel strength
- 1:1 mix ratio

Typical Uncured Physical Properties

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

		Scotch-Weld Epoxy Adhesive DP190 Translucent	Scotch-Weld Epoxy Adhesive DP190 Gray
Base Resins		Epoxy/Amine	Epoxy/Amine
Viscosity¹, Approximate @ 75°F	Base (B) Accelerator (A)	2,000-8,000 cps 7,000-15,000 cps	75,000-150,000 cps 40,000-80,000 cps
Net Weight (Lbs./gal.)	Base (B) Accelerator (A)	9.3-9.7 8.2-8.6	11.0-11.4 10.6-11.0
Color (Lbs./gal.)	Base (B) Accelerator (A)	Clear Amber	White Gray
Mix Ratio (B:A)	By Volume By Weight	1:1 1.15:1	1:1 1.06:1
Worklife² @ 73°F (23°C)	2 gram 20 gram	80 min. 60 min.	— 90 min.

Footnotes:

1. Viscosity determined using 3M test method C-1D. Procedure involves Brookfield RVF, #7 spindle, 20 rpm and 80°F (26°C). Measurement taken after 1 minute rotation.
2. Worklife determined using 3M test method C-3180. Procedure involves periodically measuring a 2 gram mixed mass for self-leveling and wetting properties. This time will also approximate the usable worklife in an 3M™ EPX™ Applicator mixing nozzle.

Scotch-Weld™ Epoxy Adhesives DP190 Translucent and Gray

Typical Cured Properties

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

Footnotes:

3. Tack-free time determined per 3M test method C-3173. Involves dispensing 0.5 gram amount of adhesive onto substrate and testing periodically for no adhesive transfer to metal spatula.
4. Handling strength determined per 3M test method C-3179. Time to handling strength taken to be that required to achieve a 50 psi OLS strength using aluminum substrates.
5. The cure time is defined as that time required for the adhesive to achieve a minimum of 80% of the ultimate strength as measured by aluminum-aluminum OLS.
6. Tensile and Elongation. Used procedure in 3M test method C-3094/ATSM D 882. Samples were 2 in. dumbbells with .0125 in. neck and .030 in. sample thickness. Separation rate was 2 inches per minute. Samples cured 2 hrs RT plus 2 hrs/ 160°F (71°C).
7. Weight loss by TGA reported as that temperature at which 5% weight loss occurs by TGA in air at 5°C rise per minute per ASTM 1131-86.
8. TCE determined using TMA Analyzer using a heating rate of 50°F (10°C) per minute. Second heat values given.
9. Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.
10. Thermal conductivity determined using ASTM C177 and C-matic Instrument using 2 in. diameter samples.
11. Thermal shock resistance run per 3M test method C-3174. Involves potting a metal washer into a 2 in. x 0.5 in. thick section and cycling this test specimen to colder and colder temperatures.

Physical

	3M™ Scotch-Weld™ Epoxy Adhesive DP190 Translucent	3M™ Scotch-Weld™ Epoxy Adhesive DP190 Gray
Color	Translucent	Gray
Hardness (ASTM D 2240) Shore D	35	60
Worklife²	80 minutes	90 minutes
Tack-free Time³	~ 4 hrs	~ 6 hrs
Time to Handling Strength⁴	6 hrs	8-12 hrs
Full Cure Time⁵	14 days	7 days
Elongation⁶	120%	30%
Tensile Strength⁶	2750 psi	3500 psi

Thermal

	Scotch-Weld Epoxy Adhesive DP190 Translucent	Scotch-Weld Epoxy Adhesive DP190 Gray
Weight Loss by Thermal Gravimetric Analysis (TGA)⁷	1% @ 390°F (199°C) 5% @ 594°F (312°C)	1% @ 477°F (247°C) 5% @ 639°F (337°C)
Thermal Coefficient of Expansion (TCE) by TMA⁸ ($\infty \times 10^{-6}$ units/unit°C)		
Below Tg	86 (41-68°F [5-20°C] range)	62 (41-68°F [5-25°C] range)
Above Tg	166 (167-284°F [75-140°C] range)	177 (167-284°F [65-140°C] range)
Glass Transition Temperature (Tg) by DCS⁹		
Onset	50°F (10°C)	45°F (7°C)
Mid-Point	80°F (27°C)	68°F (20°C)
Thermal Conductivity¹⁰ (@ 110°F on .250 in. samples)		
BTU - ft./ft.² - hr. - °F)	.079	.220
Cal./sec. - cm - °C)	.39 x 10 ⁻³	90.9 x 10 ⁻²
Watt/m - °C	.136	.381
Thermal Shock Resistance¹¹		
Potted Washer Olyphant Test (3M ITSD Test Method C-3174 +100°C [air] to -50°C [liquid])	Pass 5 cycles without cracking	Pass 5 cycles without cracking

Electrical

	Scotch-Weld Epoxy Adhesive DP190 Translucent	Scotch-Weld Epoxy Adhesive DP190 Gray
Dielectric Constant @ 1 KHz @ 73°F (23°C) (ASTM D 150)	6.2	6.5
Dissipation Factor @ 1 KHz @ 73°F (23°C) (ASTM D 150)	0.16	0.09
Dielectric Strength (ASTM D 149) Sample Thickness Approx. 30 mil.	875 volts/mil	830 volts/mil
Volume Resistivity (ASTM D 257)	7.5 x 10 ¹⁰ ohm-cm	5.0 x 10 ¹² ohm-cm

Scotch-Weld™

Epoxy Adhesives

DP190 Translucent and Gray

Storage	Store products at 60-80°F (15-27°C) for maximum shelf life.
Shelf Life	These products have a shelf life of two years in their unopened original bulk containers and 15 months in duo-pak containers from date of shipment.
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.
For Additional Information	To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550 or visit www.3M.com/adhesives . Address correspondence to: 3M Industrial Adhesives and Tapes Division, Building 21-1W-10, 900 Bush Avenue, St. Paul, MN 55144-1000. Our fax number is 651-778-4244. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.
Product Use	All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.
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This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.



Industrial Business
Industrial Adhesives and Tapes Division



Material Safety Data Sheet

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M(TM) Scotch-Weld(TM) Epoxy Adhesive DP-190, Gray (Part B)
MANUFACTURER: 3M
DIVISION: Industrial Adhesives and Tapes Division

Document Group: 10-3348-9

Product Use:

Specific Use: Part B of 2 part Adhesive
 Intended Use: Structural adhesive

SECTION 2: INGREDIENTS

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>% by Wt</u>
EPOXY RESIN	25068-38-6	70 - 100
KAOLIN	1332-58-7	10 - 30

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Viscous

Odor, Color, Grade: white cream, very slight odor

General Physical Form: Liquid

Immediate health, physical, and environmental hazards: May cause allergic skin reaction.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:

Moderate Eye Irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

5.1 FLAMMABLE PROPERTIES

3M MATERIAL SAFETY DATA SHEET 3M(TM) Scotch-Weld(TM) Epoxy Adhesive DP-190, Gray (Part B)

Flash Point

≥ 248 °C [Test Method: Pensky-Martens Closed Cup]

Flammable Limits - LEL

Not Applicable

Flammable Limits - UEL

Not Applicable

5.2 EXTINGUISHING MEDIA

Material will not burn. Ordinary combustible material. Use fire extinguishers with class A extinguishing agents (e.g., water, foam).

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Water may be used to blanket the fire. Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: Not applicable. No unusual fire or explosion hazards are anticipated.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Observe precautions from other sections. Call 3M- HELPS line (1-800-364-3577) for more information on handling and managing the spill. Ventilate the area with fresh air. Contain spill. Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Avoid breathing of dust created by cutting, sanding, grinding or machining. Avoid contact with oxidizing agents.

7.2 STORAGE

Store away from acids. Store away from heat. Store away from oxidizing agents.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS

Not applicable. Provide appropriate local exhaust for cutting, grinding, sanding or machining. Use in a well-ventilated area. Provide ventilated enclosure for heat curing.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection

Avoid eye contact.

The following eye protection(s) are recommended: Safety Glasses with side shields, Indirect Vented Goggles.

8.2.2 Skin Protection

Avoid skin contact.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.

Gloves made from the following material(s) are recommended: Polyethylene/Ethylene Vinyl Alcohol.

8.2.3 Respiratory Protection

Avoid breathing of dust created by cutting, sanding, grinding or machining.

Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half facepiece or fullface air-purifying respirator with P100 particulate filters, Half facepiece or fullface air-purifying respirator with P95 particulate filters, Half facepiece or fullface air-purifying respirator with N95 particulate filters.

Consult the current 3M Respiratory Selection Guide for additional information or call 1-800-243-4630 for 3M technical assistance.

8.2.4 Prevention of Swallowing

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

8.3 EXPOSURE GUIDELINES

<u>Ingredient</u>	<u>Authority</u>	<u>Type</u>	<u>Limit</u>	<u>Additional Information</u>
KAOLIN	ACGIH	TWA, respirable	2 mg/m3	Table A4
KAOLIN	OSHA	TWA, respirable	5 mg/m3	Table Z-1
KAOLIN	OSHA	TWA, Vacated, as dust	10 mg/m3	
KAOLIN	OSHA	TWA, as total dust	15 mg/m3	Table Z-1

VAC Vacated PEL: Vacated Permissible Exposure Limits [PEL] are enforced as the OSHA PEL in some states. Check with your local regulatory agency.

SOURCE OF EXPOSURE LIMIT DATA:

ACGIH: American Conference of Governmental Industrial Hygienists

CMRG: Chemical Manufacturer Recommended Guideline

OSHA: Occupational Safety and Health Administration

AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Viscous
Odor, Color, Grade:	white cream, very slight odor
General Physical Form:	Liquid
Autoignition temperature	<i>Not Applicable</i>
Flash Point	>=248 °C [<i>Test Method:</i> Pensky-Martens Closed Cup]
Flammable Limits - LEL	<i>Not Applicable</i>
Flammable Limits - UEL	<i>Not Applicable</i>
Boiling point	<i>Not Applicable</i>
Density	1.33 g/ml
Vapor Density	<i>Not Applicable</i>
Vapor Pressure	<=0.1 mmHg [@ 25 °C]
Specific Gravity	1.33 [<i>Ref Std:</i> WATER=1]
pH	<i>Not Applicable</i>
Melting point	<i>Not Applicable</i>
Solubility in Water	Nil
Evaporation rate	<i>Not Applicable</i>
Volatile Organic Compounds	0.8 g/l [<i>Test Method:</i> tested per EPA method 24]

Percent volatile	0.00 % weight
VOC Less H2O & Exempt Solvents	0.8 g/l [<i>Test Method:</i> tested per EPA method 24]
Viscosity	100,000 centipoise

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: Strong acids; Strong oxidizing agents; Heat is generated during cure. Do not cure a mass larger than 50 grams in a confined space to prevent a premature reaction (exotherm) with production of intense heat and smoke.

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

<u>Substance</u>	<u>Condition</u>
Aldehydes	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Ketones	During Combustion

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not determined.

CHEMICAL FATE INFORMATION

Not determined.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Dispose of completely cured (or polymerized) wastes in a sanitary landfill. As a disposal alternative, incinerate uncured product in an industrial or commercial incinerator in the presence of a combustible material.

EPA Hazardous Waste Number (RCRA): Not regulated

Since regulations vary, consult applicable regulations or authorities before disposal.