



ONE COMPANY... MANY SOLUTIONS

AUTOMOTIVE

AEROSPACE

TRANSPORT

MARINE

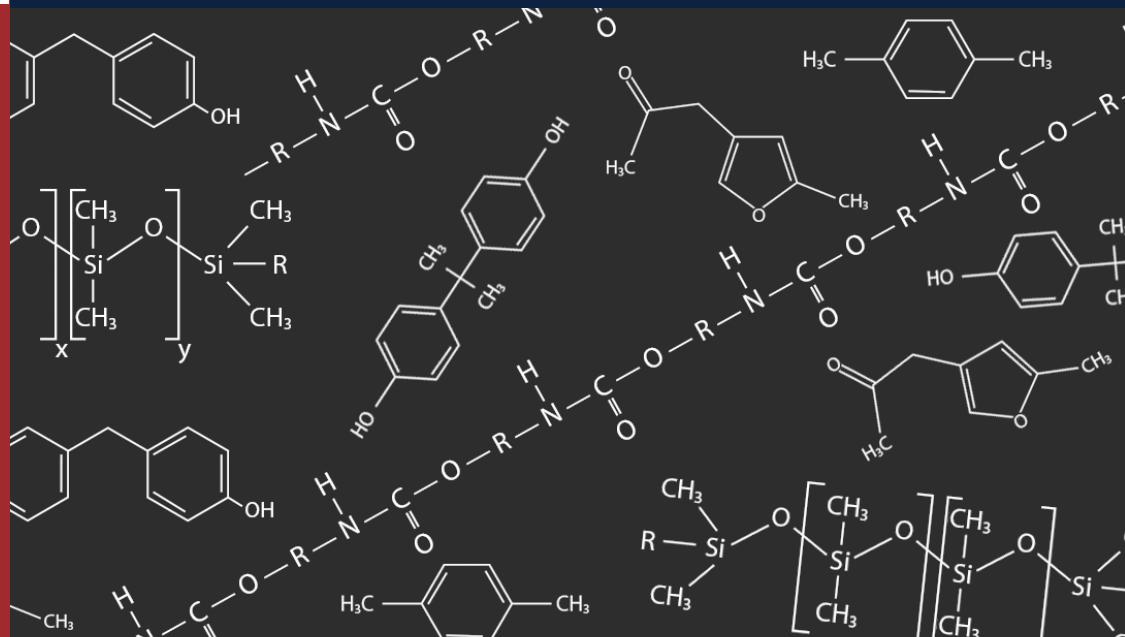
MEDICAL

TELECOMMUNICATIONS

CONSUMER ELECTRONICS

UTILITIES

SPECIALTY ADHESIVES





WHO IS MG CHEMICALS

MG Chemicals is a manufacturer and wholesaler of chemical products for the electronics industry. Our chemical products include dusters and circuit coolers, electronic cleaners, flux removers, contact cleaners, protective coatings, epoxies, adhesives, RTV silicones, lubricants, EMI/RFI shielding coatings, thermal management products, prototyping supplies, solders, and more. We also distribute related non-chemical products such as wipes, swabs, brushes, desoldering braids, copper clad boards and 3D printing filaments.

MG SERVICE

MG Chemicals recognizes that setting up production comes with various challenges. Our service team offers a wide variety of experience in material production, equipment, and technical issues you may encounter during planning, pilot studies, and production runs. To overcome these challenges, we offer professional services.

As a service, MG Chemicals can

- Provide advice on equipment and materials
- Assist with setup and troubleshooting
- Review your proposed application processes
- Suggest ways of optimizing and customizing processes to best meet your needs
- Offer training on the proper use of our products.

Quality Assurance

Since 1955, MG Chemicals has provided the North American electronics industry with a full line of high performance chemicals and accessories. The MG Chemicals manufacturing facility operates under the ISO 9001 Quality System Standard. All products undergo MG Chemicals' design process including the testing and analysis of each product to maximize performance, user safety, environmental safeguards and market desirability.

Customer Care

Customer care is what separates MG Chemicals from the rest. Our commitment to all of these principles focuses on getting you the quality product and support you deserve.



TABLE OF CONTENTS

WHO IS MG CHEMICALS	2
Electrically Conductive Adhesives	4
Silver Conductive Epoxy - High Conductivity 10 Minute Working Time - 8331	5
Silver Conductive Epoxy - High Conductivity 4 Hour Working Time - 8331S	5
Silver Conductive Epoxy - Extreme Conductivity - 10 Minute Working Time - 8330	5
Silver Conductive Epoxy - Extreme Conductivity 4 Hour Working Time - 8330S	5
Electrically Conductive Adhesives Comparison Chart	6
Thermally Conductive Adhesives	7
PASTES	
Fast Cure Thermally Conductive Adhesive 4 Minute Working Time - 8329TCF	8
Medium Cure Thermally Conductive Adhesive 45 Minute Working Time - 8329TCM	8
Slow Cure Thermally Conductive Adhesive 4 Hour Working Time - 8329TCS	8
FLOWABLE	
Fast Cure Thermally Conductive Adhesive, Flowable - 4 Minute Working Time - 8329TFF	8
Medium Cure Thermally Conductive Adhesive, Flowable - 45 Minute Working Time - 8329TFM	8
Slow Cure Thermally Conductive Adhesive, Flowable - 4 Hour Working Time - 8329TFS	8
Thermally Conductive Adhesives Comparison Chart	9
General Adhesives	
Structural Epoxy Adhesive - 9200 / Flame Retardant Structural Adhesive - 9200FR	10
Fast Set Epoxy - 8332	10
General Adhesives Comparison Chart	11

ELECTRICALLY CONDUCTIVE ADHESIVES

MG Chemicals offers electrically conductive epoxy adhesives for the assembly and repair of electronics.

These are smooth, silver pastes that cure to form hard, durable, highly conductive polymers. They are two part systems with 1:1 mix ratios. The cured polymers adhere strongly to metals, glass, and most plastics used in electronic assemblies. Used as a cold solder, they provide electrical continuity like traditional soldering without the heat-stress, and they adhere to many materials where adhesion with solder is not possible, such as other conductive polymers.

We offer a choice of 10-minute or 4-hour working times, and high or extreme conductivity. The 10-minute working time is good for quick fixes, or when room temperature cure is required. The 4-hour working time is good for assembly operations where the product is mixed and then used as a one part for a four-hour shift, or when extended time is desired to ensure all the silver is efficiently used and waste minimized.

The extreme conductivity versions are the best choice when electrical resistance is the primary concern. The high conductivity versions have slightly lower silver content, making them a little less conductive, but more economical and tougher.

These two options create a two by two system that customers can use to choose the right product for their application:

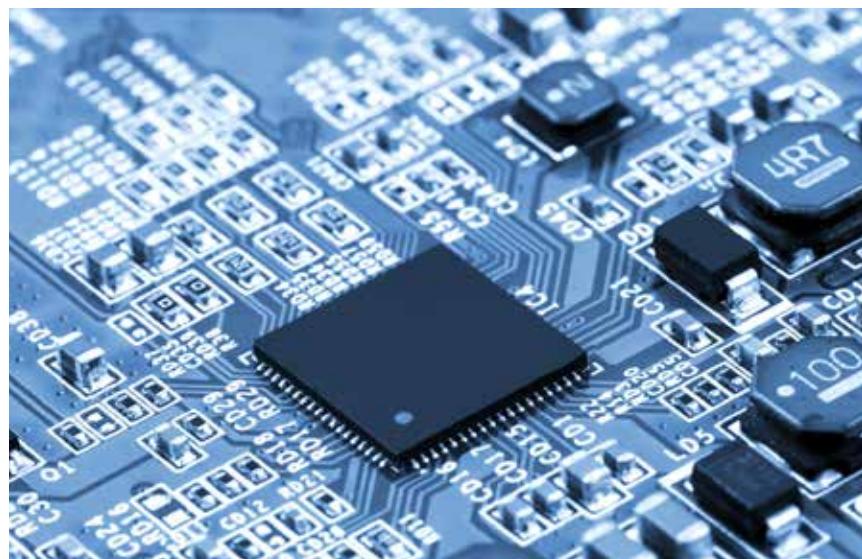
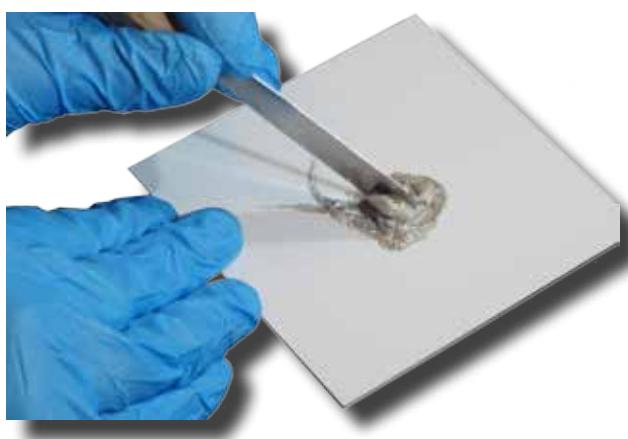
CONDUCTIVITY	WORKING TIME	
HIGH	10 MINUTES	4 HOURS
EXTREME	8331	8331S
	8330	8330S

BENEFITS & FEATURES

- Excellent electrical conductivity
- Excellent Thermal conductivity
- 1:1 mix ratio
- Strong resistance to water, brine, acids, bases, and aliphatic hydrocarbons
- Room temperature storage

APPLICATIONS:

- Bonding heat sensitive electronics
- Bonding to conductive polymers
- Quick cold soldering repairs
- Repairing rear window defrosters
- EMI/RFI shielding



Silver Conductive Epoxy - High Conductivity 10 Minute Working Time - 8331

- Electrical resistivity: 0.007 $\Omega\cdot\text{cm}$
- Thermal conductivity: 0.90 W/(m·K)
- 1:1 mix ratio
- Working time: 10 minutes
- Cure time: 24 hours at room temperature or 15 minutes at 65 °C

Silver Conductive Epoxy - High Conductivity 4 Hour Working Time - 8331S

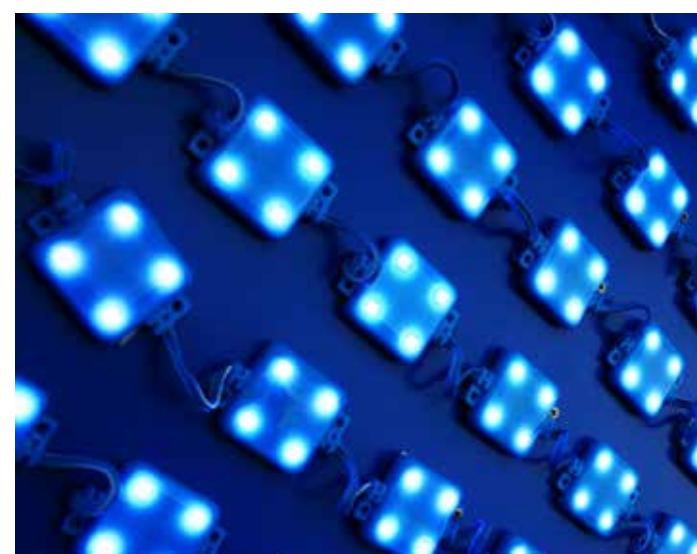
- Electrical resistivity: 0.060 $\Omega\cdot\text{cm}$
- Thermal conductivity: 0.85 W/(m·K)
- 1:1 mix ratio
- Working time: 4 hours
- Cure time: 2 hours at 65 °C (heat cure only)

Cat. Number	Packaging	Net Volume		Net Weight	
8331-14G	2 Syringes	6 mL	0.2 fl oz	14.4 g	0.51 oz
8331-50ML	Kit (2 Jars)	53 mL	1.7 fl oz	128 g	4.52 oz
8331-200ML	Kit (2 Cans)	200 mL	6.7 fl oz	482 g	1.06 lb

Cat. Number	Packaging	Net Volume		Net Weight	
8331S-15G	2 Syringes	6 mL	0.2 fl oz	14.7 g	0.52 oz
8331S-50ML	Kit (2 Jars)	50 mL	1.69 fl oz	123 g	4.34 oz
8331S-200ML	Kit (2 Cans)	200 mL	6.76 fl oz	492 g	1.09 lb



Very effective at bonding car rear defrost tabs back on the grid permanently.



Silver Conductive Epoxy - Extreme Conductivity - 10 Minute Working Time - 8330

- Electrical resistivity: 0.0010 $\Omega\cdot\text{cm}$
- Thermal conductivity: 1.6 W/(m·K)
- 1:1 mix ratio
- Working time: 10 minutes
- Cure time: 24 hours at room temperature or 15 minutes at 65 °C

Cat. Number	Packaging	Net Volume		Net Weight	
8330-19G	2 Syringes	6 mL	0.20 fl oz	19 g	0.67 oz
8330-50ML	Kit (2 Jars)	50 mL	1.69 fl oz	157 g	5.57 oz
8330-200ML	Kit (2 Cans)	200 mL	6.76 fl oz	631 g	1.4 lb

Silver Conductive Epoxy - Extreme Conductivity 4 Hour Working Time - 8330S

- Electrical resistivity of 0.0007 $\Omega\cdot\text{cm}$
- Thermal Conductivity of 1.75 W/(m·K)
- 1:1 mix ratio
- Working time: 4 hours
- Cure time: 2 hours at 65 °C (heat cure only)

Cat. Number	Packaging	Net Volume		Net Weight	
8330S-21G	2 Syringes	6 mL	0.2 fl oz	18.7 g	0.66 oz
8330S-50ML	Kit (2 Jars)	50 mL	1.6 fl oz	156 g	5.51 oz
8330S-200ML	Kit (2 Cans)	200 mL	6.7 fl oz	625 g	1.38 lb

Uncured Working Properties	8330	8330S	8331	8331S
Mix Ratio by Volume (A:B)	1:1	1:1	1:1	1:1
Working Time	10 min	4 h	10 min	4 h
Full Cure @22 °C	24 h	N/A	24 h	N/A
Full Cure @65 °C	20 min	2 h	15 min	2 h
Shelf Life	≥3 y	≥3 y	≥3 y	≥3 y

Cured Properties	8330	8330S	8331	8331S
Color	Silver Grey	Silver Grey	Silver Grey	Silver Grey
Density	3.3 g/mL	2.82 g/mL	2.44 g/mL	2.19 g/mL
Hardness	83D	73D	70D	73D
Outgassing Total Mass Loss @24 h	N/A	0.40%	6.27%	0.43%
Mechanical Properties				
Tensile Strength	6.3 N/mm ²	9.0 N/mm ²	6.3 N/mm ²	14 N/mm ²
Elongation %	N/A	7.8%	0.3%	5.3%
Compressive Strength	18 N/mm ²	36.0 N/mm ²	13 N/mm ²	65 N/mm ²
Lap Shear Strength a)	6.5 N/mm ²	1.3 N/mm ²	8.0 N/mm ² b)	1.1 N/mm ²
Electrical Properties				
Volume Resistivity	0.0010 Ω·cm	0.0007 Ω·cm	0.007 Ω·cm	0.0060 Ω·cm
Thermal Properties				
Glass Transition Temperature (T _g)	51 °C	34 °C	50 °C	34 °C
CTE prior T _g	91 ppm/°C	97 ppm/°C	54 ppm/°C	78 ppm/°C
CTE after T _g	278 ppm/°C	208 ppm/°C	169 ppm/°C	158 ppm/°C
Thermal Conductivity @25 °C	1.63 W/(m·K)	1.75 W/(m·K)	0.90 W/(m·K)	0.85 W/(m·K)
Specific Heat @25 °C	0.56 J/(g·K)	0.79 J/(g·K)	N/A	0.90 J/(g·K)

N/A = Not available

a) Tested with stainless steel

b) Tested with aluminum



6 ML 2 Syringes



50 ML Kit



200 ML Kit



THERMALLY CONDUCTIVE ADHESIVES

MG Chemicals offers two component thermally conductive adhesives for bonding, heat sinks, LED's, and other heat generating electronic components. Filled with a blend of thermally conductive ceramics, they provide excellent thermal conductivity and strong electrical insulation without the capacitance issues associated with metal filled products. They have strong adhesion to metal, good adhesion to plastics, and excellent physical strength. Compared to one part epoxies, two part systems offer the advantages of extended shelf life, room temperature storage, and much lower cure temperatures.

We offer a choice of fast (4 minutes), moderate (45 minutes), or slow (4 hours) working times, and flowable or paste versions. The flowable may be dispensed automatically and through mix tips, while the paste offers the highest possible thermal conductivity.

These two options create a two by three system that customers can use to choose the right product for their application:

VISCOSITY	WORKING TIME		
	4 MINUTES	45 MINUTES	4 HOURS
FLOWABLE	8329TFF	8329TFM	8329TFS
PASTE	8329TCF	8329TCM	8329TCS

BENEFITS & FEATURES

- High thermal conductivity
- 1:1 mix ratio
- Good adhesion to most electronic substrates
- Good tensile strength
- Strong resistance to water, brine, acids, bases, and aliphatic hydrocarbons
- Room temperature shipping and storage

APPLICATIONS:

BOND:

- Heat sinks
- Other heat generating components in electronic assemblies

SUITABLE FOR:

- Manufacturing
- Repair
- Hobbyist environments



Thermally Conductive

Fast Cure Thermally Conductive Adhesive 4 Minute Working Time - 8329TCF

- Thermal conductivity: 1.02 W/(m·K)
- Working time: 4 minutes
- Cure time: 3 hours at 25 °C or 15 minutes at 65 °C
- Flame retardant – meets UL94V-0 standard

Cat. Number	Packaging	Net Volume		Net Weight	
8329TCF-50ML	Dual cartridge	50 mL	1.6 fl oz	86 g	35 oz

Thermally Conductive FLOWABLE

Fast Cure Thermally Conductive Adhesive Flowable - 4 Minute Working Time - 8329TFF

- Thermal conductivity: 0.63 W/(m·K)
- Working time: 4 minutes
- Cure time: 2 hours at room temperature or 10 minutes at 65 °C
- Flame retardant – meets UL94V-0 standard
- Suitable for automatic dispensing

Cat. Number	Packaging	Net Volume		Net Weight	
8329TFF-25ML	Dual Syringe	25 mL	0.84 fl oz	36.6 g	1.29 oz
8329TFF-50ML	Dual Cartridge	50 mL	1.69 fl oz	73.2 g	2.58 oz

Medium Cure Thermally Conductive Adhesive 45 Minute Working Time - 8329TCM

- Thermal conductivity: 1.36 W/(m·K)
- Working time: 45 minutes
- Cure time: 1 hour @ 65 °C, or 24 hours at room temperature

Cat. Number	Packaging	Net Volume		Net Weight	
8329TCM-6ML	2 Syringes	6 mL	0.2 fl oz	14.8 g	0.52 oz
8329TCM-50ML	Kit (2 Jars)	50 mL	1.6 fl oz	123 g	4.35 oz
8329TCM-200ML	Kit (2 Cans)	200mL	6.76 fl oz	494 g	1.09 oz

Medium Cure Thermally Conductive Adhesive Flowable - 45 Minute Working Time - 8329TFM

- Thermal conductivity: 1.14 W/(m·K)
- Working time: 45 minutes
- Cure time 150 minutes @ 65°C, or 24 hours at room temperature
- Suitable for automatic dispensing

Cat. Number	Packaging	Net Volume		Net Weight	
8329TFM-25ML	Dual Syringe	25 mL	0.8 fl oz	55 g	1.9 oz
8329TFM-50ML	Dual Cartridge	50 mL	1.6 fl oz	110 g	3.88 oz

Slow Cure Thermally Conductive Adhesive 4 Hour Working Time - 8329TCS

- Thermal conductivity 1.44 W/(m·K)
- Working time: 4-hours
- Cure time 1 hour @ 80°C, or 96 hours at room temperature

Cat. Number	Packaging	Net Volume		Net Weight	
8329TCS-6ML	2 Syringes	6 mL	0.20 fl oz	13.5 g	0.47 oz
8329TCS-50ML	Kit (2 Jars)	50 mL	1.6 fl oz	113 g	3.99 oz
8329TCS-200ML	Kit (2 Cans)	200 mL	6.7 fl oz	452 g	1.0 lb

Slow Cure Thermally Conductive Adhesive, Flowable

4 Hour Working Time - 8329TFS

- Thermal conductivity 1.22 W/m*K
- Working Time: 4 hours
- Cure time 80 minutes @ 80°C, or 96 hours at room temperature
- Suitable for automatic dispensing

Cat. Number	Packaging	Net Volume		Net Weight	
8329TFS-25ML	Dual Syringe	25 mL	0.8 fl oz	52.5 g	1.85 oz
8329TFS-50ML	Dual Cartridge	50 mL	1.6 fl oz	105 g	3.7 oz

Uncured Working Properties	8329TCS	8329TFS	8329TCM	8329TFM	8329TCF	8329TFF
Mix Ratio by Volume (A:B)	1:1	1:1	1:1	1:1	1:1	1:1
Working Time	4 h	4 h	45 min	45 min	4 min	4 min
Viscosity	Paste	Flowable	Paste	Flowable	Paste	Flowable
Full Cure @22 °C	96 h	96 h	24 h	24 h	3 h	2 h
Full Cure @65 °C	1 h ^{a)}	4 h	1 h	150 min	15 min	10 min

Cured Properties	8329TCS	8329TFS	8329TCM	8329TFM	8329TCF	8329TFF
Color	Dark Grey	Dark Grey	Dark Grey	Black	Off White	Off White
Hardness	62D	68D	76-77D	72D	82D	83D
Mechanical Properties						
Tensile Strength	11.4 N/mm ²	4.2 N/mm ²	10 N/mm ²	4.5 N/mm ²	12.8 N/mm ²	12.8 N/mm ²
Compressive Strength	43 N/mm ²	42 N/mm ²	34 N/mm ²	44 N/mm ²	36 N/mm ²	67 N/mm ²
Lap Shear Strength ^{b)}	7.7 N/mm ²	6.3 N/mm ²	8.2 N/mm ²	6.6 N/mm ²	8.2 N/mm ²	TBD
Electrical Properties						
Volume Resistivity	2 x 10 ¹³ Ω·cm	1 x 10 ¹³ Ω·cm	9 x 10 ¹² Ω·cm	9 x 10 ¹² Ω·cm	3 x 10 ¹³ Ω·cm	7 x 10 ¹² Ω·cm
Breakdown Voltage	26.3 kV	19.8 kV	29.0 kV	16.5 kV	35.3 kV	48.9 kV
Dielectric Strength	6.6 kV/mm	8.5 kV/mm	6.5 kV/mm	7.3 kV/mm	16.2 kV/mm	15.4 kV/mm
Electrically Insulating	Yes	Yes	Yes	Yes	Yes	Yes
Electrically Conductive	No	No	No	No	No	No
Thermal Properties						
Thermal Conductivity @25 °C	1.44 W/(m·K)	1.22 W/(m·K)	1.36 W/(m·K)	1.14 W/(m·K)	1.02 W/(m·K)	0.63 W/(m·K)
Thermal Diffusivity @25 °C	0.72 mm ² /s	0.58 mm ² /s	0.61 mm ² /s	0.49 mm ² /s	0.44 mm ² /s	0.26 mm ² /s
Specific Heat @25 °C	0.92 J/(g·K)	1.01 J/(g·K)	0.91 J/(g·K)	1.06 J/(g·K)	1.32 J/(g·K)	1.62 J/(g·K)
Glass Transition Temperature	20 °C	9 °C	46 °C	76 °C	88 °C	67 °C
CTE prior T _g	53 ppm/°C	64 ppm/°C	71 ppm/°C	67 ppm/°C	23 ppm/°C	50 ppm/°C
CTE after T _g	137 ppm/°C	159 ppm/°C	131 ppm/°C	125 ppm/°C	107 ppm/°C	143 ppm/°C

TBD=To be determined

a) Full Cure @80 °C

b) Tested on aluminum



6 mL - 2 Syringes



25 mL Dual Syringe



50 mL Dual Cartridge



50 mL Kit



200 mL Kit

Structural Epoxy Adhesive - 9200 / Flame Retardant Structural Adhesive - 9200FR

These are two-part, thixotropic, toughened adhesives, designed to create load bearing joints. They have excellent adhesion to a wide range of difficult to bond to materials including glass, ceramics, metals, engineered thermoplastics, and thermoset laminates such as SMC (sheet molding compound) and GRP (glass reinforced plastics). They are sag resistant, and can be applied to vertical surfaces.

Their toughened nature imparts a stiff flexibility when fully cured, ensuring its bonds hold tight under vibration and temperature cycling, even when bonding materials with vastly different coefficients of thermal expansion.

They are electrically insulating, and have excellent resistance to moisture, salt water, detergents, gasoline, hydraulic fluids, antifreeze, automotive fluids, acids, and bases.

MG Chemical offers both our 9200 Structural Epoxy Adhesive, and our 9200FR Flame Retardant Structural Epoxy Adhesive.



BENEFITS & FEATURES:

- **Toughened, smooth, thixotropic paste**
- **1:1 mix ratio**
- **Working time: 30 minutes**
- **Cure time: 24 hours at room temperature**
- **Non-sagging and gap filling**
- **Very strong adhesion**
- **Bonds dissimilar materials**
- **Highly resistant to vibration and temperature cycling**
- **Low shrinkage**
- **Easy to dispense**

APPLICATIONS & USAGES:

These adhesives are primarily used for creating long lasting load bearing joints, especially in situations where vibration resistance is key, or where dissimilar materials are being joined. They are great gap fillers, and perfect for use on vertical surfaces.

Use the 9200 Structural Epoxy Adhesive when maximum physical strength is desired and 9200FR Flame Retardant Structural Adhesive when flammability is an issue.

Cat. Number	Packaging	Net Volume		Net Weight	
9200-25ML	Dual syringe	25 mL	0.8 fl oz	31.3 g	1.01 oz
9200-50ML	Dual cartridge	50 mL	1.6 fl oz	62.6 g	2.01 oz

Cat. Number	Packaging	Net Volume		Net Weight	
9200FR-25ML	Dual syringe	25 mL	0.8 fl oz	32 g	1.1 oz
9200FR-50ML	Dual cartridge	50 mL	1.6 fl oz	64.1 g	2.26 oz

Fast Set Epoxy - 8332

The 8332 Fast Set Epoxy is an adhesive that combines quick set time, high strength, and ease of use. The adhesive bonds well to several plastics, ceramics, woods, fiberglass, glass, concrete, and most metals. Its convenient 1-to-1 mix ratio means it is perfectly suitable for both dual syringe and automated 2-part dispenser applications.

The 8332 is adaptable to many uses and conditions. At mixing, the product offers a low viscosity that wets and conforms to many types of bonding surfaces. Generally, the glued parts only need to be held together for about 8–10 minutes to be sufficiently set to handle. The bonds that are formed are electrically insulating and will generally resist both thermal and mechanical shocks. As well, the bond offers high chemical resistance to water, salts, acids, bases, and even some organic solvents.

BENEFITS & FEATURES:

- **Easy 1:1 mix ratio**
- **Set time of only 8 to 10 minutes**
- **Heat cure in only 15 minutes at 65 °C—safe for heat sensitive components**
- **Strong water and chemical resistance to brine, acids, bases, and aliphatic hydrocarbons**
- **Excellent adhesion to most electronic substrates**
- **Solvent Free**

APPLICATIONS & USAGES:

The 8332 is perfect wherever a strong fast-set adhesive is required.

Cat. Number	Packaging	Net Volume		Net Weight	
8332-25ML	Dual syringe	25 mL	0.84 fl oz	2.86 g	1.01 oz



	5 Minute Epoxy	Structural Epoxy	
Uncured Working Properties	8332	9200	9200FR
Mix Ratio by Volume (A:B)	1:1	1:1	1:1
Viscosity @25 °C	12 000 cP (A), 14 000 cP (B)	Thixotropic paste	Thixotropic paste
Shelf Life	2 y	3 y	3 y
Application Properties			
Working Time	3-5 min	30 min	30 min
Full Cure @22 °C	3 h	24 h	24 h
Full Cure @65 °C	15 min	3 h	3 h
Cured Properties	8332	9200	9200FR
Color	Light amber	Yellowish grey	Light yellow
Density @25 °C [77 °F]	1.14 g/mL	1.23 g/mL	1.29 g/mL
Mechanical Properties			
Tensile Strength	34 N/mm ²	16 N/mm ²	13 N/mm ²
Compressive Strength	63 N/mm ²	64 N/mm ²	46 N/mm ²
Lap Shear Strength (Stainless Steel)	14.8 N/mm ²	20 N/mm ²	14 N/mm ²
Hardness	82D	76D	78D
Electrical Properties			
Volume Resistivity	1.7×10^{14} Ω·cm	2.5×10^{13} Ω·cm	1.14×10^{13} Ω·cm
Breakdown Voltage @3.175 mm [1/8"]	27.1 kV	51 kV	50 kV
Dielectric Strength @3.175 mm [1/8"]	14.6 kV/mm	16.1 kV/mm	15.7 kV/mm
Thermal Properties			
Glass Transition Temperature (T _g)	64 °C	44 °C	59 °C
CTE prior T _g	76 ppm/°C	95 ppm/°C	79 ppm/°C
CTE after T _g	175 ppm/°C	215 ppm/°C	126 ppm/°C
Thermal Conductivity @25 °C	—	0.31 W/(m·K)	0.40 W/(m·K)





HEAD OFFICE

9347 - 193rd Street
Surrey, B.C., Canada
V4N 4E7
Phone 1-800-201-8822
1-604-888-3084
Fax 1-604-888-7754
Website mgchemicals.com

MANUFACTURING

1210 Corporate Drive
Burlington, Ontario, Canada
L7L 5R6
Phone 1-800-340-0772
1-905-331-1396
Fax 1-905-331-2682
Website mgchemicals.com

CUSTOMER SERVICE

NORTH AMERICA

Phone 1-800-340-0772
Fax 1-800-340-0773
Email East SalesEast@mgchemicals.com
Email west SalesWest@mgchemicals.com

EUROPE AND UK

Phone +44 1663 362888
Email SalesUK@mgchemicals.com

INTERNATIONAL

Phone 1-604-888-3084
Fax 1-604-888-7754
Email SalesIntl@mgchemicals.com

FOR SAFETY DATA SHEETS

mgchemicals.com/resources/datasheets

FOR TECHNICAL SUPPORT

mgchemicals.com/resources/technical-support
Toll-free line 1-800-340-0772
or +1 905 331-1396