

Technical Data Sheet

Chemtools® Pty Ltd | Ph: 1300 738 250 (+61 2 9833 9866) | Unit 2, 14 – 16 Lee Holm Road ST MARYS NSW 2760
Safety Data Sheets, product photos, and other information can be obtained by visiting www.chemtools.com.au



Rapidstick™ 8-509 Methacrylate Structural Adhesive

PART NUMBER	AVAILABLE SIZE*
8-509-50	50ml, 10:1 Dual Cartridge
8-509-490	490ml, 10:1 Dual Cartridge

*Available colours and/or sizes may change without notice.

DESCRIPTION

Chemtools® Rapidstick™ 8-509 Structural Adhesive is a two-component, 100% reactive toughened adhesive with excellent impact, peel, and shear resistance in a convenient 10:1 mix ratio. Its non-sagging and thixotropic formulation is specially formulated for bonding a wide variety of metals such as galvanised metals, stainless steel, and aluminium, to itself and to plastics, including thermoplastics, thermosets, and composite assemblies.

8-509 uses next-gen nano technology for exceptional results in demanding industrial applications, with ultra-fast strength development in gaps up to 10mm, and resistance to powder coating temperatures of up to 204°C. It requires no surface preparation or priming before application, and is commonly used for bonding automotive components, marine assemblies, thermoform enclosures, electrical components, metal fabrications, and signs.

KEY FEATURES

- Nano technology formulation for enhanced bonding performance
- High strength and impact resistance
- Excellent adhesion to galvanised metals, stainless steel, aluminium, and various plastics
- Fast curing time for efficient production processes
- Resistant to chemicals, oils, and environmental factors

TECHNICAL DATA

Colour	Resin: Off-White / Activator: Blue
Viscosity @ 25°C (Brookfield RVT)	Resin: 200,000 – 350,000 / Activator: 100,000 – 200,000
Density (Kg/L)	Resin: 0.96 / Activator: 1.07
Mix Ratio (Volume)	Resin: 10 / Activator: 1
Mixed Viscosity	250,000 – 300,000
Gap Fill	Up to 10mm
Working/Open Time	3 – 5 minutes
Fixture/Handling Time	8 – 12 minutes
Full Cure	24 hours at room temperature
Shore Hardness (ASTM D2240)	73D
Stress to Strain % (ASTM D638)	20 – 30%
Tensile Strength (ASTM D638)	3,200 – 3,500 psi
Modulus (ASTM D638)	125,000 – 200,000 psi
Temperature Resistance	-40°C to +121°C (Resistance up to 204°C for 60 mins)
Shelf Life	12 months from the date of manufacture

LAP SHEAR STRENGTH DATA (ASTM D1002) AFTER 7 DAYS @ 25°C

Note: Lap shear strength figures are lower for the plastic surfaces due to substrate failure which means substrate is failing before the adhesive bond.

Substrates	Lap Shear Strength & Failure Mode
Stainless Steel / Stainless Steel	3,100 psi (21 MPa) – Cohesive Failure
Aluminium / Aluminium	3,300 psi (23 MPa) – Cohesive Failure
Galvanised / Galvanised	2,800 psi (18 MPa) – Substrate Failure
FRP / FRP	1,700 psi (12 MPa) – Fibre Tear
Aluminium / ABS	2,150 psi (15 MPa) – Substrate Failure

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CLEAVAGE PEEL DATA (ASTM D3807)

Substrates	Initial Strength	Average Strength
Stainless Steel / Stainless Steel	22 pli	20 pli

Result: The above result shows the strength required for the joint to begin to peel and joint resistance with average strength.

ENVIRONMENTAL RESISTANCE DATA (ASTM D1002)

Testing Conditions: 8hrs @ -30°C, 8hrs @ 85°C, 8 hours @ 30°C and 100% Relative Humidity

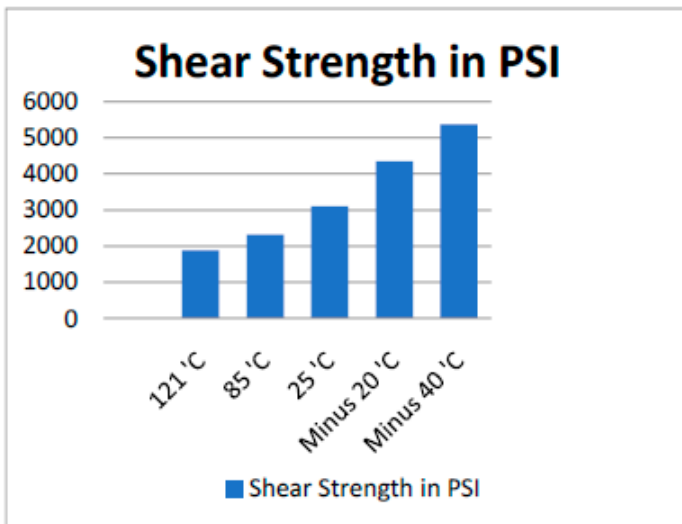
Condition	Lap Shear Strength & Mode of Failure
Initial	3,180 psi (22 MPa) – Cohesive Failure
Environmental Cycle – 30 days	3,200 psi (22 MPa) – Cohesive Failure

Result: Excellent resistance to harsh environment conditions.

Notes: The Lap Shear Strength had increased after environmental cycle and performed better under these conditions compared to the substrates bonded. Substrates may have less resistance to these conditions compared to adhesive.

TEMPERATURE RESISTANCE DATA (ASTM D1002)

Testing Substrates: Stainless Steel to Stainless Steel



Result: Lap shear strength reduces with heat and increases in cold temperature. The failure mode was cohesive failure in all above cases.

CHEMICAL RESISTANCE DATA

The chemical resistance was studied by bonding the Aluminium/Aluminium as per specification and cured for 7 days @ 25°C, then kept immersed in the media listed here and tested for Lap Shear Strength (ASTM D1002).

Effect of 1 month immersion in different media:

Media	Lap Shear Strength
Petrol	3,180 psi (22 MPa)
Acetic Acid (10%)	3,120 psi (21 MPa)
Xylene	3,150 psi (21 MPa)
Lubricating Oil – HD30	3,240 psi (23 MPa)
Paraffin	2,950 psi (20 MPa)
Water @ 23°C	3,100 psi (22 MPa)
Water @ 90°C	3,000 psi (21 MPa)

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COVERAGE GUIDE

MMA COVERAGE CHART							BOND LINE COVERAGE ↓
BEAD SIZE (ROUND) VS APPROX. BOND LINE COVERAGE PER CARTRIDGE							
CARTRIDGE TYPE	1/8 inch 3.175 mm	1/4 inch 6.35 mm	3/8 inch 9.525 mm	1/2 inch 12.70 mm	5/8 inch 15.875 mm		
1:1 MIX RATIO							
50ML	12,649.2	3,149.6	1,397	787.4	508	mm	
	126.50	31.50	13.97	7.87	5.08	cm	
	1.26					M	
200ML	55,575.2	13,868.4	6,197.6	3,454.4	2,209.8	mm	
	555.76	138.68	61.98	34.55	22.10	cm	
	5.56	1.39				M	
400ML	101,015.8	25,273	1,126.8	6,299.2	4,038.6	mm	
	1,010.16	252.73	11.27	62.99	40.39	cm	
	10.10	2.53				M	

APPLICATION

All surfaces must be clean and dry, and free of dust and grease. Best results will be achieved with surfaces that have been lightly abraded immediately prior to bonding.

Adhesive should be dispensed using the 10:1 static mixer supplied with the cartridge, following application guidelines below.

After application, test the curing adhesive at the edges for fingernail hardness before removing any clamps or fixtures.

APPLICATION GUIDELINES

Preparing the Cartridge and Static Mixer

Ensure the cartridge is properly loaded into the dispensing gun. Attach the 10:1 static mixer securely to the end of the cartridge, ensuring a tight fit.

Priming the Mixer

To ensure that both components are flowing evenly and mixing correctly, dispense a small amount of adhesive through the mixer until a uniform colour is achieved.

The Mixing Process

As the two components pass through the static mixer, the compound with the greater volume in the cartridge enters the nozzle at a ratio 10 times that of the other. The internal elements of the mixer ensure that both components are thoroughly combined before exiting the tip, providing optimal performance of the adhesive.

Dispensing the Adhesive

Squeeze the trigger of the dispensing gun and ensure a steady and consistent flow of the mixed material by maintaining a constant pressure on the trigger.

Apply the mixed adhesive directly to the substrate or surface where bonding is required. Work quickly, as the adhesive may start to cure once mixed.

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Cleaning and Storage

After use, remove the cartridge from the dispensing gun and dispose of any unused material properly. If the adhesive cures inside the mixer, it will need to be replaced before the next use. Store the cartridge and static mixer in a cool, dry place to prolong shelf life.

Adhesive components and mixed adhesive should be removed from mixing and application equipment with a suitable industrial solvent or cleaner before the mixed adhesive cures. Once cured, soaking in a strong solvent or paint remover will be required to soften the adhesive for removal.

Maintenance

Regularly inspect the static mixer for any blockages or damage that may affect the dispensing process. Replace the static mixer when necessary to ensure proper mixing and dispensing at the correct ratio for optimum adhesive performance.

CURING

Working Time is the approximate time after mixing components A and B that the adhesive remains fluid and bondable.

Fixture Time is the approximate time after mixing components A and B required for the adhesive to develop sufficient strength to allow careful movement, unclamping, or demolding of assembled parts. Parts can generally be put into service when 80 percent of full strength is developed.

The time to achieve 80% cure is approximately 2-3 times that required for fixturing.

Note: The chemical curing reaction that occurs when components A and B are mixed generates heat. The amount of heat generated is controlled by the mass and thickness of the mixed product. Large masses over 12.7mm thick can develop heat in excess of +120°C and can generate harmful, flammable vapours. Large curing masses should be carefully moved to a well-ventilated area where the chance of personal contact is minimised.

ADVICE ABOUT DISPENSING EQUIPMENT

Care must be taken to ensure compatibility between the adhesive components and the materials in the equipment that they contact. All wetted metal components should be constructed of stainless steel or aluminium, or have a sufficient thickness of chemically resistant material that prevents contact between the adhesive components and the base metal.

Contact with copper, zinc, brass, or other alloys containing these materials must be strictly prevented. All non-metallic seals and gaskets should be fabricated from Teflon® or UHMW polyethylene-based materials.

SHELF LIFE

12 months from the date of manufacture in accordance with the following conditions:

Store continuously between 13°C and 23°C. Long term exposure above 23°C will reduce the shelf life of these materials. Prolonged exposure of activators, including cartridges which contain activators, above 37°C quickly diminishes the product's reactivity and should be avoided. Shelf life can be extended by refrigeration (8°C - 12°C). Do not freeze.

FIRST AID & SAFETY PRECAUTIONS

Always refer to Safety Data Sheet/s before use. Use proper Personal Protection Equipment. Do not get in eyes, on skin, or on clothing. Use with adequate ventilation. Avoid breathing fumes. Keep away from heat, sparks, open flames, and hot surfaces. This product may produce adverse health conditions, ranging from minor skin irritation to serious systemic effects. It should not be used, stored, or transported until the handling precautions and recommendations as stated in the Safety Data Sheet/s for this product have been fully understood by all persons who will work with the material.

STORAGE & TRANSPORT

Refer to Safety Data Sheet/s for recommendations. As a general precaution, keep containers tightly closed, protect from sunlight, and do not expose to temperatures exceeding 50°C. Store in a cool, dry place at room temperature (5 – 40°C). Do not return any unused material to its original container. Containers should be secured and stored upright during transit.

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