



Spectratite 211

Epoxy Paste Adhesive

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Description

Spectratite 211 is a two-component fast curing toughened epoxy-based amine-curable paste adhesive with proven service and wedge crack resistance @ 120F and high humidity.

Features

High lap shear strength at room and elevated temperatures
High T-Peel strength
Superb solvent resistance
Room temperature cure possibility (accelerated cure at elevated temperatures)

Uncured Adhesive Properties

	Part A	Part B	Mixed
Color	Clear	Blue	Light Blue
Viscosity @ 25°C	~20,000 cP Brookfield, DV-I+ viscometer	5 cP	
Density (g/ml)	1.12(estimated)	1.08	
Shelf life			
@ <40°F/4°C	12 months	12 months	
@ <77°F/25°C	6 months	12 months	

This material will normally be shipped at ambient conditions, the recommendation is to place the material into its intended storage upon receipt to secure shelf life.

Handling

Mixing - This product requires mixing two components together just prior to application to the parts to be bonded. Complete mixing is necessary. The temperature of the separate components prior to mixing is not critical, but should be close to room temperature (77°F/25°C).

Mix Ratio	Part A	Part B
By Weight		
Spectratite 211	100	15.4

Note: Volume measurement is not recommended for structural applications unless special precautions are taken to assure proper ratios.

Pot Life (100 g mass)

Spectratite 211 ~ 60-120 minutes @ 77°F/25°C

Established visually as a point at which application to the bonded parts is no longer viable.

Pot life is mass dependent due to self-accelerating nature of the adhesive and needs to be established for the workable mass.

Application

Mixing - Combine Part A and Part B in the correct ratio and mix thoroughly. THIS IS IMPORTANT! Heat buildup during or after mixing is normal. Do not mix quantities greater than 450 grams as dangerous heat buildup can occur causing uncontrolled decomposition of the mixed adhesive. TOXIC FUMES CAN OCCUR, RESULTING IN PERSONAL INJURY. Mixing smaller quantities will minimize the heat buildup.

Applying - Bonding surfaces should be clean, dry and properly prepared. Spectra Group recommends several optimum surface preparation procedures.

Scuff sand/acetone wipe – the surface to be bonded is degreased/wiped with acetone, sanded for 15 sec by Craftsman Random Orbit Sander @ 13,000 rpm outfitted with Craftsman 5" diameter 100 grit (Medium) sanding discs, degreased/wiped with acetone again and bonded by a desired thickness of paste adhesive.

Nylon pad/sol-gel – the surface to be bonded panel is degreased/wiped with acetone, abraded for 15-30 sec by Makita 9553NB Angle Grinder @ 11,000 rpm outfitted with Medium grit Scotch-Brite Roloc surface conditioning disc (Nylon pad), and purged with dry nitrogen of 35 psi pressure to remove loose debris. The resulting panels are treated with sol-gel aqueous solution (see attached information). The surfaces to be bonded are treated so that sol-gel solution is wetting the surface for at least 3 min. After that the surfaces are positioned vertically (in the area of lower humidity for better drying) for film formation. The surfaces are dried for at least 30 min after all visual liquid disappears.

Sol-gel surface preparation is recommended for the most demanding adhesion applications.

The bonded parts should be held in contact until the adhesive is set. Handling strength for this adhesive will occur in 24 hours @ 77°F/25°C, after which the support tooling or pressure used during cure may be removed. Since full bond strength has not yet been attained, load application should be small at this time.

Curing - This adhesive may be cured for 5 - 7 days @ 77°F/25°C. Accelerated cures up to 200°F/93°C (for small masses only) may be used as an alternative. For example, 1 hour @ 180°F/82°C will give complete cure.

Cleanup - It is important to remove excess adhesive from the work area and application equipment before it hardens. Denatured alcohol and many common industrial solvents are suitable for removing uncured adhesive. Consult with your supplier's information pertaining to the safe and proper use of solvents.

Bond Strength Performance

Tensile Lap Shear Strength

Tensile lap shear strength tested per ASTM D1002 after curing for 4 days @77°F/25°C. Adherends are Al 7075-T6 alloy treated with sol-gel surface preparation as described above.

Test Temperature, 77°F /25°C	Average Results psi
Spectratite 211	3610

T-Peel Strength

T-Peel strength tested per ASTM D1876 after curing for 4 days @77°F/25°C. Adherends are Al 7075-T6 alloy treated with sol-gel surface preparation as described above.

Test Temperature, 77°F /25°C	Average Results pli	Minimum results in a set pli
Spectratite 211	21	14

Shore D Hardness (72 hour cure @ 77°F/25°C)

Spectratite 211

87.2

Wedge Crack Resistance

Wedge Crack Resistance test was run in accordance with ASTM D3762:

- a. The specimens were conditioned at 120 +/- 5 °F and 95 – 100% RH for continuous periods of time.
- b. The wedge (ASTM size) was inserted between two adherends and crack propagation was measured at the end of 1 and 24 hrs period, and then on a weekly basis. The crack extension in inches was measured. The nature of failure (cohesive vs. adhesive) in the crack extension region was noted.

Sample	Initial (in)	24 hrs	72 hrs	1 week	2 weeks	3 weeks	Failure Mode
211-1	1.66	1.66	1.66				95% cohes
211-2	1.96	1.96	1.96				100% cohes
211-3	2.03	2.03	2.03	2.03	2.03	2.03	95% cohes
211-4	1.89	1.93	1.93				100% cohes
211-5	1.82	1.82	1.82	1.82			100% cohes

No crack propagation is noted for Spectratite 211.

Handling Precautions

Do not handle or use until the Material Safety Data Sheet has been read and understood.

For industrial use only.

DISCLAIMER: The information supplied in this document is for guidance only and should not be construed as a warranty. All implied warranties are expressly disclaimed, including without limitation any warranty of merchantability and fitness for use. All users of the materials are responsible for assuring that it is suitable for their needs, environmental and use. All data is subject to change as Spectra Group deems appropriate. Users should review the Materials Safety Data Sheet (MSDS) and product label for the material to determine possible health hazards, appropriate engineering controls and precautions to be observed in using the material. Copies of the MSDS and label are available upon request.

General:

As with most epoxy based systems, use this product with adequate ventilation. Do not get in eyes or on skin. Avoid breathing the vapors. Wash thoroughly with soap and water after handling. Empty containers retain product residue and vapors so obey all precautions when handling empty containers.

PART A

CAUTION! This material may cause eye and skin irritation or allergic dermatitis. It contains epoxy resins.

PART B

WARNING! This material causes eye and skin irritation or allergic dermatitis. It contains amines.