



## Spectratite 121, 183, 121-LV

### Epoxy Paste Adhesive

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#### **Description**

**Spectratite 121, 183, 121-LV** are two-component fast curing epoxy-based amine-curable paste adhesives with excellent microcrack resistance under thermal cycling, high compressive strength and superb solvent resistance.

#### **Features**

Resistant to microcracking under 2,000 thermal cycles  
High compressive strength  
Superb solvent resistance  
Low slump  
Thick film build, if necessary  
Room temperature cure possibility (accelerated cure at elevated temperatures)

#### **Uncured Adhesive Properties**

	<b>Part A</b>	<b>Part B</b>	<b>Mixed</b>
Color	Dark Gray	Colorless	Gray
Viscosity @ 25°C	~20,000 cP (after anti-sag additive is removed) Brookfield, DV-I+ viscometer	45 cP	
Density (g/ml)	1.57(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.

\*121-LV has a lower viscosity version for Part A, Part A and Part B are now closer in terms of viscosity for ease of mixing.

## **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).

<b>Mix Ratio</b>	<b>Part A</b>	<b>Part B</b>
By Weight		
Spectratite 121	100	18
Spectratite 183	100	18
Spectratite 121-LV	100	17.9

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

## **Pot Life** (100 g mass)

Spectratite 121, 121-LV ~ 60 minutes @ 77°F/25°C  
Spectratite 183 ~ 45 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	Minimum individual in set psi
Spectratite 121, 121-LV	1746	1637
Spectratite 183	2021	1626

**Physical Performance****Thermal Cycling Performance**

This test was run manually for 100 Cycles (90 regular and 10 “shock” cycles). Adhesives were cast on the Al 7075-T6 alloy piece pretreated with the nylon-pad/sol-gel and cured for 4 days at 25°C and then kept for 15 hours at 120°F and 95% RH.

In cycling procedure, the testing piece was placed for several minutes on the 20 kg steel block constantly located in the 250°F oven, then kept at room temperatures until it is slightly warm, then placed for 2 minutes on dry ice to insure that the testing piece temperature reached -65°F, then kept at room temperature until it is slightly cold, which concluded One Cycle. In the “shock” cycles, the testing piece was transferred directly from the oven to the dry ice container and back. Disbondments and microcracks were observed using a 10X Intel optical digital microscope. No microcrack or disbondment observation constitutes a “pass”.

**Thermal cycling**

Spectratite 121, 121-LV	Pass
Spectratite 183	Pass

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

Spectratite 121, 121-LV	89.5
Spectratite 183	87.2

**Solvent and Humidity Resistance**

Adhesives were cured for 4 days at 25°C. Pencil hardness was measured before exposure. In the JRF soak test, the samples were immersed in Jet Reference Fuel (JRF, 32% Cyclohexane, 32% Toluene, 36% Isooctane) for 7 days. In the MEK soak test, the samples were immersed in Methyl Ethyl Ketone for 1 day. In the Humidity Exposure test, the samples were kept at 160°F and 95% RH for 7 days. After exposure, all samples were wiped, dried at room temperature for 10 minutes, and tested for pencil hardness again.

	Pencil Hardness, Initial	Pencil Hardness, JRF Soak	Pencil Hardness, MEK Soak	Pencil Hardness, Humidity Exposure
Spectratite 121, 121-LV	9H	9H	9H	8H-9H
Spectratite 183	9H	9H	7H-8H	9H

**Compressive Properties** - tested using castings per ASTM D695.

Test Temperature, 77°F/25°C	Strength at 2% Strain psi
Spectratite 121, 121-LV	12,400
Spectratite 183	Not measured

**Glass Transition Temperature, °C**

Spectratite 121, 121-LV	151
Spectratite 183	Not measured

**Handling Precautions**

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

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**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.