

**STATE OF CALIFORNIA**  
**Specification 8040-91D-07**  
**RAPID SET EPOXY ADHESIVE FOR PAVEMENT MARKERS**  
**CONTAINING SHORT STUFF® POLYETHYLENE E380F**

**1.0 SCOPE**

This specification covers a high viscosity paste rapid set epoxy formulated primarily for use in bonding pavement markers to portland cement concrete and asphalt concrete.

**2.0 APPLICABLE SPECIFICATIONS**

The following specifications, test methods and standards in effect on the date of the Invitation for Bid form a part of this specification where referenced:

Test Method No. California 425  
Federal Standard No. 595  
Department of Transportation, Standard Specification  
State of California Specification

**3.0 REQUIREMENTS****Composition:**

<b>Component A</b>	<b>Parts by Weight</b>
Epoxy Resin *1	90.00
Orthocresyl Glycidyl Ether *2	10.00
Titanium Dioxide, ASTM D476 Type III or IV	3.00
Talc *3	50.00
SHORT STUFF® Polyethylene E380F *4	1.00*
Glycerin, ASTM Designation D1257	0.50
<b>Component B</b>	
High Functionality Polymercaptan Hardener *5	60.00
2,4,6-Tri (Dimethylaminomethyl Phenol) *6	7.00
Polysulfide Polymer *7	35.00
Furnace Black *8	0.10
Talc *3	50.00
SHORT STUFF® Polyethylene E380F *4	1.10*
Silicone Anti Foam Type DB100, 100% Solids	0.01

\*A range of 0.60 - 1.5 parts is permitted in the A component and 0.95 - 1.3 parts in the B component to achieve the required viscosity and thixotropy. Small preproduction batches should be made to determine the polyethylene fiber level best suited for manufacturing equipment used.

(over)

\*1 Diglycidyl ether of bisphenol A; viscosity, 100-160 poise at 25°C; epoxide equivalent 180-200; color, Gardner 1933, 3 max.

\*2 Viscosity at 25°C, 5-10 centipoise; weight per gallon, 9.0-9.1 pounds; epoxide equivalent, 180-200.

\*3 Percent passing US No. 325 sieve, 99 minimum; Hegman rating, 3-4; oil absorption (spatula), 32-35; reflectance (green filter), 92-94.

\*4 High density, fluff dried SHORT STUFF® Polyethylene fiber E380F.

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 2923 Boones Creek Road  
 Johnson City, TN 37615-4662  
 Telephone 423/282-4242

\*5 Liquid polymercaptan resin; viscosity, 100-130 poise at 25°C; specific gravity, 1.14- 1.16; mercaptan value, 3.6/meq/gram; color, Gardner 1933, 1. Infrared curve shall match the curve on file in the Transportation Laboratory.

\*6 Formula weight 265; specific gravity at 25°C/25°C, 0.973; refractive index, 1.514 at 25°C, distillation range, 96% at 130°C to 160°C (0.5-1.5 mm); flash point, Tag Open Cup, 300°F, minimum; water content, 0.06% maximum.

\*7 Specific gravity, 1.24-1.30 at 20°C/20°C; viscosity, 700-1200 centipoise, Brookfield at 25°C; pH water extract, 6.0-8.0; moisture content, 0.1% maximum; pour point, -15°F; average molecular weight, 1000; flash point, Cleveland Open Cup, 390°F, minimum; sulfur content, 36-40 percent; color, Hellige, 9-12. The product shall be a difunctional mercaptan made from 98 mole percent of bis (2-chloroethyl) formal and 2 mole percent of trichloropropane.

\*8 Surface area, 115-130 square meters/gram; particle diameter, 18-30 millimicrons; pH, 7.0-8.5; fixed carbon (moisture free), 96-98 percent; volatile matter, 1-4 percent; oil absorption, stiff paste endpoint, 0.80-0.90 CCS/gram.

All tests shall be performed in accordance with Test Method No. California 425.

**Characteristics:**

Test	Components	
	Component A	Component B
(1) Viscosity, Poise, TE Helipath Spindle at 77°F	2000 to 3000	2000 to 3000
(2) Shear Ratio, Minimum at 77°F	2.0	2.0
(3) Density, Lbs. per Gallon at 77°F	11.75 to 12.2	11.75 to 12.2
(4) Skinning (Original Container)	None	Slight
(5) Infrared Curves, Components A and B	Shall match curves in Test Method No. California 425.	
(6) Storage Stability	The Components A and B shall not change in viscosity and shear ratio by more than +/-15 percent when stored for two weeks in closed containers at 115°F, +/- 2°F. All measurements shall be made at 77°F using the same spindle and apparatus as in Item 1 above. The adhesive shall meet other requirements for 12 months from date of manufacture. There shall be no settling of the fillers that cannot be easily redispersed with a paddle.	
(7) Percent Air, Maximum	2.0	2.0

**Combined Components**

Test	Requirements
(1) Gel Time, minutes	7 min.
(2) Bond Strength to Concrete, Time, minutes (maximum) to reach not less than 200 psi, at 77°F, +/-2°F	35
at 50°F, +/-2°F	45
at 30°F, +/-2°F	85
(3) Slant Shear Strength, 24 hours at 77°F, +/-2°F, psi	1000 min.
24 hours at 77°F, +/-2°F, plus water soak, psi	800 min.
(4) Tensile Adhesion and Cohesion, (a) Class II polyester marker bottom, psi	475 min.
(b) Class III and IV ceramic marker bottom, psi	700 min.
(c) Class III and IV ceramic marker bottom, including post cure, psi	700 min.
(d) Reflective pavement marker bottom, psi	500 min.
(5) Color of Mixed Components	Approximately that of Color No. 26152 of Federal Standard No. 595

**Directions:**

Just before use, components A and B shall be mixed in a one-to-one ratio by volume. When automatic proportioning and mixing machine is used, the temperature of the components shall be maintained by indirect heating or cooling, so that the adhesive will meter, mix and extrude properly. The maximum temperature shall be such that after proper mixing there shall be no excess flow of adhesive from under the marker other than that specified in Section 85-1.06, "Placement," of the Department of Transportation, Standard Specifications.

This material shall emit no objectionable odor.

The working properties shall be satisfactory.

This material must comply with the anti-air pollution requirements of Regulation 3 of the Bay Area Air Pollution Control District and Rule 66 of the County of Los Angeles Air Pollution Control District. Evidence of such facts shall be available to the California Department of General Services, Office of Procurement.

**4.0 QUALITY ASSURANCE PROVISIONS****4.1 Inspection:**

This material shall be inspected and tested in accordance with State of California Specification 8010-XXX-99, or as otherwise deemed necessary.