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**Raychem**

Specification

This Issue:

Date:

Replaces:

**RT-1006**

Issue 2

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Issue 1

## **Adhesive S-1006 Epoxy, Flexible**

### **1. SCOPE**

This specification covers the requirements for one type of adhesive for use with heat-shrinkable tubing and molded parts.

### **2. APPLICABLE DOCUMENTS**

The specifications and standards listed in Table I under "Method of Test" shall form a part of this specification to the extent specified herein.

### **3. REQUIREMENTS**

#### **3.1 MATERIAL**

The adhesive shall consist of a 2-part modified epoxy resin.

#### **3.2 PROPERTIES**

The adhesive shall meet the requirements of Table I.

### **4. QUALITY ASSURANCE PROVISIONS**

#### **4.1 CLASSIFICATION OF TESTS**

##### **4.1.1 Qualification Tests**

Qualification tests are those performed on samples submitted for qualification as satisfactory products and shall consist of all tests listed in this specification.

##### **4.1.2 Acceptance Tests**

Acceptance tests are those performed on adhesive submitted for acceptance under contract. Acceptance tests shall consist of tests for peel strength, flow and pot life. Other tests may be carried out as often as necessary to insure compliance with all requirements of this specification.

#### **4.2 SAMPLING INSTRUCTIONS**

##### **4.2.1 Qualification Test Samples**

Qualification test samples shall consist of 90 grams of adhesive.

##### **4.2.2 Acceptance Test Samples**

Acceptance test samples shall consist of not less than 30 grams of adhesive from each lot. A lot shall consist of all adhesive from the same production run offered for inspection at the same time. Three specimens, each approximately 3 grams, shall be subjected to each test.

#### **4.3 TEST PROCEDURES**

Prior to tests, each specimen of adhesive shall be thoroughly mixed for from 1 to 2 minutes.

##### **4.3.1 Peel Strength**

Peel strength shall be determined with 1 ¼ inch heat-shrinkable tubing, Thermofit NT-FR, and 1 ½ inch heat-shrinkable polyolefin tubing, Thermofit RNF-100.

#### 4.3.1.1 Assembly of Specimens

For each adhesive specimen, a 6-inch length of neoprene tubing shall be recovered on a glass-laminated plastic mandrel or a metal tube 1 inch in diameter. Heat shall be applied with a HG-501A Thermogun equipped with a A-170-HG reflector and operating at 288 - 343° C (550 - 650 °F).

The recovered tubing then shall be cooled to  $25 \pm 3^\circ\text{C}$  ( $77 \pm 5^\circ\text{F}$ ). After cooling, the outside of the recovered tubing and the insides of three 1 ½ inch lengths of expanded polyolefin tubing shall be lightly abraded with No. 320 emery cloth and wiped with a clean cloth or paper towel wet with methyl propyl ketone. Three grams of adhesive then shall be evenly spread approximately 0.020 inch thick on the recovered tubing except that a ¾-inch space the length of the tubing shall be uncoated. The three lengths of polyolefin tubing then shall be placed over the adhesive-coated tubing and shall be recovered as described above. Heat shall be continued for 30 seconds after the tubing recovers. This assembly (Figure 1A) shall be cured for 45 minutes in an oven maintained at  $121 \pm 3^\circ\text{C}$  ( $250 \pm 5^\circ\text{F}$ ). After cooling to approximately  $110^\circ\text{C}$  ( $230^\circ\text{F}$ ) the tubing shall be cut along one edge of the adhesive-free area, removed from the mandrel, and flattened between 6- x 3 ¼-inch metal plates to form a slab (Figure 1B). This slab shall be cooled for 1 hour at  $25 \pm 3^\circ\text{C}$  ( $77 \pm 5^\circ\text{F}$ ). A specimen one inch wide (Figure 1C) then shall be cut from the center of each double thickness.

#### 4.3.1.2 Procedure

The unbonded ends of each specimen shall be inserted in the jaws of a tensile tester which shall be operated at a jaw-separation speed of 2 inches per minute. Readings of peel strength shall be taken at every ½ inch of jaw separation after 1 inch initial separation. The average of five readings shall define peel strength.

#### 4.3.2 Flow

##### 4.3.2.1 Room Temperature

Three grams of mixed adhesive shall be formed into a compact mass about ½ inch high and 1 inch in diameter on a smooth glass surface that has been cleaned with methyl propyl ketone. At  $25 \pm 3^\circ\text{C}$  ( $77 \pm 5^\circ\text{F}$ ), the glass shall be placed on edge and shall be marked on a line tangent to the bottom edge of the adhesive. After 10 minutes, the glass again shall be marked on a line tangent to the bottom edge of the adhesive and the distance between marked lines shall be measured.

##### 4.3.2.2 Cure Temperature

Following the test of 4. 3. 2. 1, the glass shall be mounted vertically in an oven at  $121 \pm 3^\circ\text{C}$  ( $250 \pm 5^\circ\text{F}$ ). After 10 minutes, the glass again shall be marked on a line tangent to the bottom edge of the adhesive and the distance between the second and third lines shall be measured.

#### 4.3.3 Dielectric Strength

Two polyethylene films, 6 x 6 x 0.002 inches, shall be coated on one side with a release agent such as Dow Corning #4 Compound or equivalent. Three grams of mixed adhesive shall be spread on the coated side of one of these films as a disk from 1 to 3 inches in diameter. The adhesive then shall be covered with the second coated film and the adhesive and films shall be placed between 6 x 6-inch metal plates. The plates shall be pressed together until the intervening disk of adhesive is from 0.005 to 0.025 inch thick. This assembly then shall be cured for 2 hours in an oven maintained at  $95 \pm 3^\circ\text{C}$  ( $203 \pm 5^\circ\text{F}$ ). After curing, the disk of adhesive shall be removed from the assembly, cooled to  $25 \pm 3^\circ\text{C}$  ( $77 \pm 5^\circ\text{F}$ ), and tested for dielectric strength in accordance with the short-time test of ASTM D 149.

#### 4.3.4 Pot Life

Three grams of mixed adhesive shall be conditioned in an uncovered container for 1 hour at  $25 \pm 3^\circ\text{C}$  ( $77 \pm 5^\circ\text{F}$ ). After conditioning, specimens shall be prepared with this adhesive and tested for peel strength in accordance with 4.3.1.

**4.3.5**      Solvent Resistance

Three specimens, prepared in accordance with 4.3.1, shall be completely immersed in each listed solvent for  $24 \pm 2$  hours at  $25 \pm 3^{\circ}\text{C}$  ( $77 \pm 5^{\circ}\text{F}$ ). After immersion, the specimens shall be lightly wiped and air dried for 30 - 60 minutes at room temperature. The specimens then shall be tested for peel strength in accordance with 4.3.1.2.

**4.3.6**      Rejection and Retest

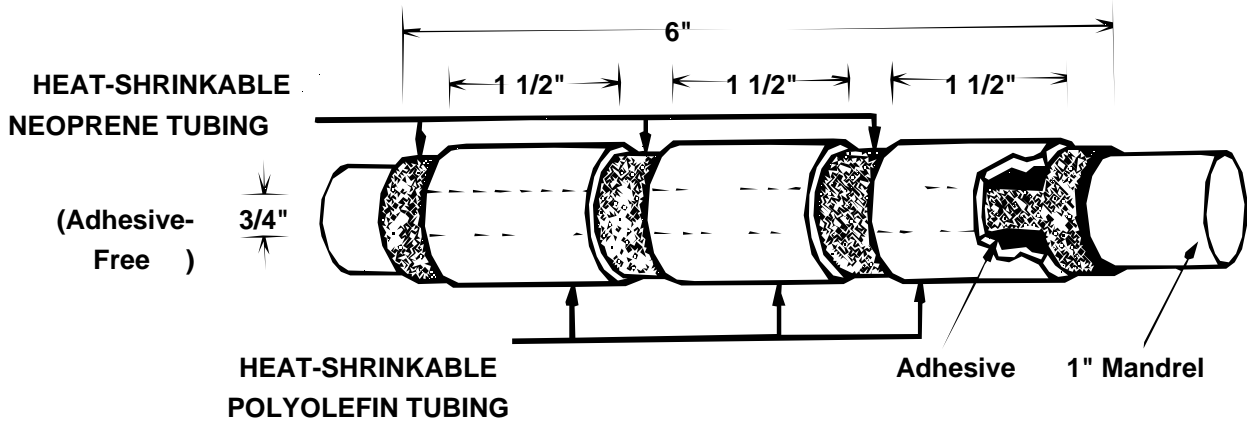
Failure of any sample of adhesive to conform to any one of the requirements of this specification shall be cause for rejection of the lot represented. Adhesive which has been rejected may be replaced or reworked and resubmitted for acceptance. Before resubmitting, full particulars concerning previous rejection and action taken to correct the defects shall be furnished the inspector.

**5.            PREPARATION FOR DELIVERY****5.1           PACKAGING**

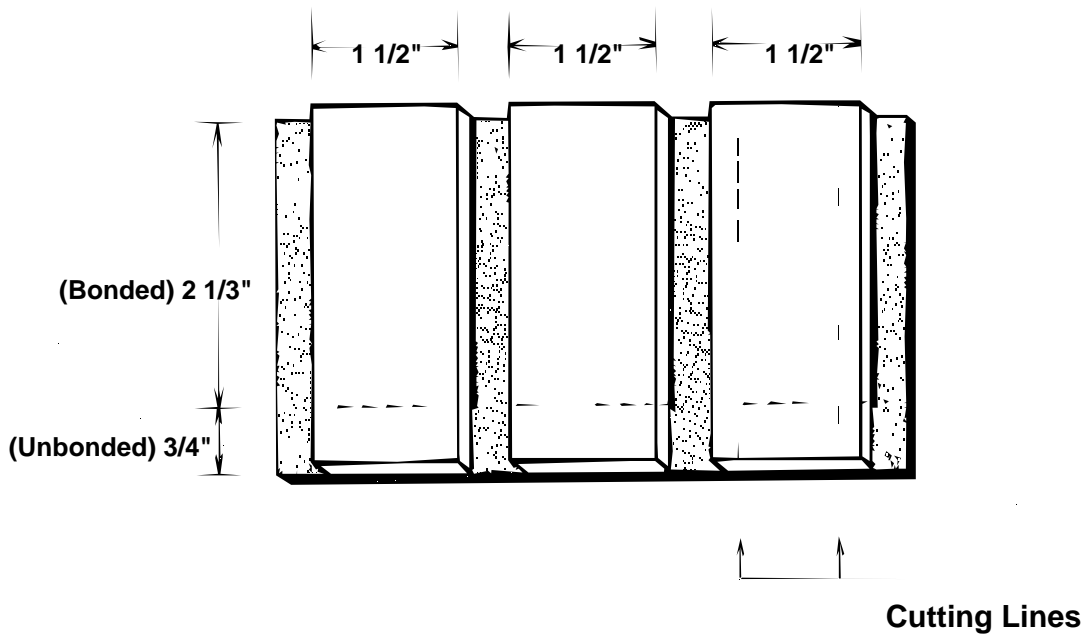
Unless otherwise specified, the adhesive shall be packaged in mixer packages containing a measured quantity of each adhesive part, in conformance with good commercial practice.

**5.2           MARKING**

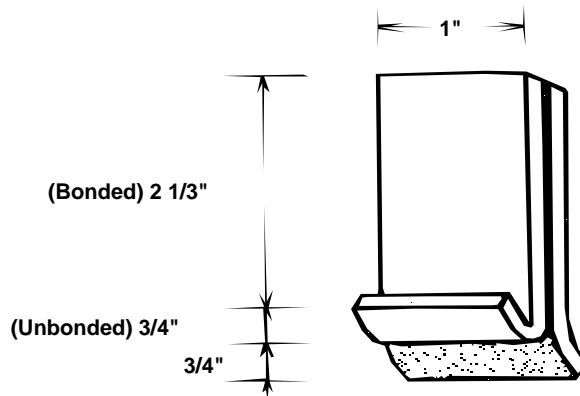
Each mixer package of adhesive shall be marked with the product designation. Each kit of mixer packages shall be marked with the batch number and other appropriate information.



A. MANDREL ASSEMBLY



B. SPECIMEN SLAB



C. PEEL STRENGTH SPECIMEN

**TABLE 1**  
**Requirements**

<b>PROPERTY</b>	<b>UNIT</b>	<b>REQUIREMENT</b>	<b>TEST METHOD</b>
<b>PHYSICAL</b> Peel Strength	Pounds /inch width	14 minimum	Section 4.3.1
Flow			
Room Temperature	Inch	1 maximum	Section 4.3.2.1
Cure Temperature	Inch	1 maximum	Section 4.3.2.2
<b>ELECTRICAL</b> Dielectric Strength	Volts per mil	500 minimum	Section 4.3.3 ASTM D 149
<b>CHEMICAL</b> Pot Life	Hours	1 minimum	Section 4.3.4
Followed by test for: Peel Strength	Pounds /inch width	10 minimum	Section 4.3.1
Solvent Resistance 24 hours at $23 \pm 3^{\circ}\text{C}$ ( $73 \pm 5^{\circ}\text{F}$ ) in: JP-8 (MIL-DTL-83133) Skydrol* 500B Hydraulic Fluid (MIL-H-5606) Water	---	---	Section 4.3.5
Followed by test for: Peel Strength	Pounds /inch width	10 minimum	Section 4.3.1.2

Note: Unless otherwise specified, latest issue of referenced documents applies.

\* Trademark Solutia, Inc.

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