



**RK-6619 Revision 9**

**Raychem brand S1125 Adhesive**

**SCOPE**

**This Quality Assurance Specification establishes the quality standard for a two-part epoxy adhesive for bonding Raychem heat-shrinkable polymeric and elastomeric tubings, moulded components and other suitable substrates.**

**Approved Signatories\***

**Tyco Electronics :                      Approved electronically via DMTech**

**\* This document is electronically reviewed and approved - therefore no signatures will appear.**

**1. REVISION HISTORY**

<b>Revision Number</b>	<b>Change Request</b>	<b>Date</b>	<b>Incorporated By</b>
7	CR-05-DM-052	May 2005	Paul Dixon
8	CR-10-DM-008	June 2010	Paul Dixon
9	CR10-DM-009	3 Aug 2010	Paul Dixon

**2. REQUIREMENTS****2.1 Composition, Appearance and Colour**

The two components shall be homogeneous and free from large particles. One component shall be a grey viscous paste, the other a black viscous paste.

**2.2 Test Requirements**

The adhesive shall meet all the requirements in Table 1.

**2.3 Shelf Life**

When stored in the original unopened containers at temperatures not exceeding 23°C, the adhesive shall continue to comply with the requirements of Table 1 for a period of not less than 18 months.

### 3. TEST METHODS

#### 3.1 Lap Shear Strength

##### 3.1.1 Aluminium to Aluminium

Ten test strips  $1.5 \pm 0.15$  mm x  $25 \pm 1$  mm x  $115 \pm 3$  mm of aluminium alloy to BS 3L 72 (or alloy with the same composition), shall be degreased with Industrial Methylated Spirits.

At least 25 mm length of one surface of one end of each strip shall be abraded with 320 grit silicon carbide abrasive paper, then wiped with a clean dry tissue to remove dust particles.

The test strips shall be used within 2 hours of this preparation. Adhesive from bi-packs contained in Kit 1 shall be thoroughly mixed and applied evenly to one surface of each of the treated end of the strips.

Within  $60 \pm 5$  minutes of mixing, the strips shall be assembled, coated ends together, into five test joints each separated by silicone paper (to prevent test specimens sticking together), with an overlap of between 12.5 and 14.3 mm. The joints shall be cured for  $60 \pm 5$  minutes at  $85 \pm 2^\circ\text{C}$  under pressure of 35 kPa, using a 1.1 kg weight which has been preconditioned at  $85 \pm 2^\circ\text{C}$  for 1 hour minimum. The test specimen shall then be stored for at least 72 hours at  $23 \pm 2^\circ\text{C}$  and then tested on a suitable tensile testing machine. The initial grip separation shall be 100 mm. The rate of grip separation shall be 50 mm/minute. The lap shear strength shall be reported as the central value of the five breaking loads.

The test shall be carried out at a temperature of  $23 \pm 2^\circ\text{C}$ .

##### 3.1.2 DR-25 to DR-25

Ten test strips  $25 \pm 1$  mm x 100 mm approximately shall be cut from Raychem DR-25-2-0 tubing which has been fully recovered. At least 25 mm length of one surface of one end of each strip shall be degreased with Isopropanol, abraded with 100 grit silicon carbide abrasive paper, and then wiped with a dry tissue to remove abrasion dust and debris. Within 2 hours, of this preparation, adhesive from bi-packs contained in Kit 1 shall be thoroughly mixed and applied evenly to one surface of each of the treated end of the strips. Within  $60 \pm 5$  minutes of mixing, the strips shall be assembled, coated ends together, into five test joints each separated by silicone paper (to prevent test specimens sticking together), with an overlap of between 25 and 28 mm. The joints shall be cured for  $60 \pm 5$  minutes at  $85 \pm 2^\circ\text{C}$  under a pressure of 35 kPa, using a 2.2 kg weight which has been preconditioned at  $85^\circ\text{C}$  for 1 hour minimum. The test specimen shall then be stored for at least 72 hours at  $23 \pm 2^\circ\text{C}$  and tested on a suitable tensile testing machine. The initial grip separation shall be 100 mm. The rate of grip separation shall be 50 mm/min. The lap shear strength shall be reported as the central value of the five breaking loads. The test shall be carried out at a temperature of  $23 \pm 2^\circ\text{C}$ .

##### 3.1.3 -25 to -25

Test plaques approximately 2 mm thick shall be moulded using -25 moulding compound. Ten test strips 100 mm x 25 mm shall be cut from these plaques and shall be prepared and tested as described in clause 3.1.2.

**TEST METHODS continued****3.2 Peel strength**

Five cylindrical aluminium rolling drum peel strength mandrels 25 mm x 25 mm diameter shall be abraded with 100 grit emery cloth and degreased with Isopropanol. A 15 mm wide strip of masking tape shall be placed axially along the surface of the aluminium mandrel.

The inside surface of 5 pieces of DR-25-1-1/2-0 expanded tubing approximately 40 mm in length shall be degrease with Isopropanol , abraded with P320 grit emery cloth, and wiped with a dry tissue to remove any dust created by abrasion. These pieces of prepared tubing shall be used within 2 hours of preparation.

Within  $60 \pm 5$  minutes of mixing, a layer of adhesive shall be evenly applied to the outer surface of the prepared aluminium mandrels. The pieces of prepared DR-25 tubing shall be recovered onto the aluminium mandrels in a air circulating oven and conditions at  $150 \pm 3$  °C for 20 minutes. The tubing should be position in relation to the aluminium mandrel so that the tubing recovers over each side of the mandrel. The test specimens shall be stored for at least 72 hours at  $23 \pm 2$  °C before testing. The specimens shall then be trimmed so that the tubing which has recovered over the end of the aluminium mandrel is removed. The tubing on the test specimen shall then be slit axially at the edge of the masking tape and the flap of tubing over the tape peeled back. The test specimen shall be mounted onto a rolling drum peel strength jig in a suitable tensile testing machine and the flap gripped in the upper jaws. The sample shall be peeled at a rate of 50 mm/minute. The test shall be carried out at  $23 \pm 2$  °C. The mean peel force for each specimen shall be recorded and the central value of the five recorded measurements reported as the peel strength.

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**3.3 Temperature resistance**

Five aluminium lap shear strength test specimens shall be prepared for each temperature described in table 1 Test specimen preparation shall be as described in clause 3.1.1. In all cases each sample shall be stabilized in the test chamber for a period of 30 minutes minimum.

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**3.4 Fluid Resistance**

Five lap shear strength specimens prepared as in Clause 3.1.1 shall be prepared for each of the fluids listed in Table 1. These will be immersed in the fluid for the time and at the temperature specified in table 1. The lap shear strength specimens shall then be removed, lightly wiped, air dried at  $23 \pm 2$  °C for 18 to 24 hours and tested for lap shear strength as specified in clause 3.1.1.

**4. RELATED STANDARDS & issue**

BS 3L72 *NOTE superceded BSL163	Aluminium-coated Sheet and Strip of Aluminium-Copper-Magnesium-Silicon-Manganese Alloy
VG95343 Part 15	Specification for the testing of 2 part adhesives

**Subsequent amendments to, or revisions of, any of the above publications apply to this standard only when incorporated in it by updating or revision.**

**5. SAMPLING**

Production routine tests consisting of Visual Examination, Peel Strength and Aluminium to Aluminium Lap Shear shall be carried out on every batch of resin and activating agent.

Qualification test samples shall consist of not less than 60 grams of adhesive (6 bi-packs). Qualification tests shall be carried out to the requirements of the Design Authority.

**6. PACKAGING**

Packaging shall be in accordance with PS 5142. Each package shall bear an identification label showing material quantity, description, batch number and "use before" date. Additional information shall be supplied as specified in the contract or order.

TABLE 1 Test Requirements

Test	Test Method	Test Requirements
Visual Examination	-	As per Clause 2.1
Lap Shear Strength Aluminium to Aluminium Dr-25 to DR-25 -25 to -25	Clause 3.1 Clause 3.1.1 Clause 3.1.2 Clause 3.1.3	5.0 kN minimum 300 N minimum 300 N minimum
Peel strength DR25 to Aluminium	Clause 3.2	80 N/25 mm minimum
Temperature resistance Lap shear strength at: -40 °C 50 °C 70 °C 100 °C 120 °C 150 °C	Clause 3.3	5.0 kN minimum 3.5 kN minimum 2.5 kN minimum 1.5 kN minimum 1.3 kN minimum 1.0 kN minimum
Fluid Resistance 24 ± 2h immersion at 24 ± 2 °C • ISO 1817 Test Liquid 103 • Water 24 ± 2h immersion at 70 ± 3 °C • ISO 1817 Test Liquid F • ISO 1817 Test Liquid B • Hydraulic Fluid H-520 24 ± 2h immersion at 100 ± 4 °C • ISO 1817 Test Liquid 101 Lap Shear Strength Aluminium to Aluminium	Clause 3.4          Clause 3.1.1	            5.0 kN minimum

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