



Class I

S1184 ADHESIVE QUALITY ASSURANCE SPECIFICATION

RK-6627

Raychem S1184 Conductive Epoxy Adhesive

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1. SCOPE

This Quality Assurance Specification establishes the quality standard for a two-part, conductive epoxy adhesive for bonding Rayaten Coated Moulded Parts to connector backshells and cable braids.

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2. REQUIREMENTS

2.1. Composition, Appearance and Colour

The two components shall be homogeneous and free from contamination. Both components shall be silver in colour.

2.2. Test Requirements

The adhesive shall meet all the requirements in Table 2.

2.3. Shelf Life

When stored below 23°C in the original syringes, the adhesive shall continue to comply with the requirements of Table 2 for a period of up to 6 months from the date of manufacture.

3. TEST METHODS

3.1. Lap Shear Strength (Aluminium to Aluminium)

Ten test strips 1.5 ± 0.15 mm x 25 ± 1 mm x 115 ± 3 mm of a 2000-series aluminium alloy clad with 1000-series (min. 99% aluminium) Alclad to any of the specifications listed in Table 1 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. Within 2 hours of this preparation the two parts of the adhesive shall be thoroughly mixed and within 30 minutes applied evenly to one surface of the treated end of the strips over a minimum length of 15 mm.

Once applied the strips shall be assembled, coated ends together, into five test joints with an overlap of between 12.5 and 14.3 mm. The joints shall be conditioned for 20 ± 5 minutes at $150 \pm 3^\circ\text{C}$ under a pressure of approximately 35 kPa. The weight used to apply the pressure shall be pre-conditioned at 150°C for 1 hour minimum. The test specimen shall then be stored for at least 24 hours at $23 \pm 2^\circ\text{C}$ and subsequently 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 mean value of the five breaking loads.

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

3.2. Lap Shear Strength (-25C to -25C)

Ten test strips 150 mm x 25 mm x 2mm shall be cut from a moulded test sheet of -25C as specified in RW-3047.

A minimum length of 30 mm from each end shall be degreased using MEK. Within two hours, the two parts of the adhesive shall be mixed and within 30 minutes shall be applied evenly to one surface of the treated ends of the strips over a minimum length of 30 mm. Once applied the strips shall be assembled, coated ends together, into five test joints, with an overlap of between 25 and 28 mm. The joints shall be conditioned for 20 ± 5 minutes at $150 \pm 3^\circ\text{C}$ under a pressure of approximately 35 kPa. The weight used to apply the pressure shall be pre-conditioned at 150°C for 1 hour minimum. The test specimen shall then be stored for at least 24 hours at $23 \pm 2^\circ\text{C}$ and subsequently 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 mean value of the five breaking loads.

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

3.3. Temperature Resistance

Ten specimens shall be prepared as specified in Clause 3.1.

- 1) 5 specimens shall be conditioned at a temperature of -40°C for 45 ± 5 min and the Lap Shear Strength determined on a suitable tensile testing machine at a temperature of -40°C according to Clause 3.1.
- 2) 5 specimens shall be conditioned at a temperature of $100 \pm 3^{\circ}\text{C}$ for 45 ± 5 min and the Lap Shear Strength determined on a suitable tensile testing machine at a temperature of $100 \pm 3^{\circ}\text{C}$ according to Clause 3.1.

3.4. Fluid Resistance

Five -25°C Lap Shear Strength specimens prepared as in Clause 3.3 shall be prepared for each of the fluids listed in Table 2. These will be immersed in the fluid for the time and at the temperature specified in Table 2. The lap shear strength specimens shall then be removed, lightly wiped, air dried at $23 \pm 2^{\circ}\text{C}$ for 45 ± 5 min and tested for lap shear strength as specified in Clause 3.2.

3.5. Electrical Resistance

A volume of adhesive equivalent to a minimum of two graduations shall be dispensed from each syringe and thoroughly mixed for this test. A microscope slide $38\text{ mm} \times 76\text{ mm}$ shall be cleaned with an IMS wipe. Two copper electrodes $48\text{ mm} \times 1\text{ mm} \times 10\text{ mm}$ shall be buff cleaned to ensure all oxides are removed from all faces and then cleaned with an IMS wipe. These shall then be bonded to the microscope slide with a minimal amount of cyanoacrylate ester adhesive so that they are parallel, 10 mm apart with 10 mm overhanging one edge. Care must be taken to ensure that this adhesive does not seep onto the inner edges of the electrodes.

The mixed S1184 adhesive shall then be placed between the electrodes so that the space between them is completely filled and the adhesive is approximately level with the top edge of the copper electrodes.

The assembly shall then be placed in an oven at $150 \pm 3^{\circ}\text{C}$ for 20 minutes.

On removal from the oven the excess adhesive shall be trimmed flush with the edge of the microscope slide and the assembly allowed to cool to room temperature. The resistance shall then be measured between the two electrodes using a four terminal bridge method.

4. RELATED STANDARDS

| Title | Description |
|--|--|
| AMS4040 | Aluminum Alloy, Sheet and Plate, Alclad 4.4Cu - 1.5Mg - 0.60Mn (2024-O with 1 ½% Alclad); Annealed Cladding: 1230 |
| AMS4041 | Aluminum Alloy, Sheet and Plate, Alclad 4.4Cu - 1.5Mg - 0.60Mn (2024, -T3 Sheet/-T351 Plate with 1-1/2% Alclad) Solution Heat Treated, Cold Worked and Naturally Aged Cladding: 1230 |
| QQA250/5 T3 | Aluminum Alloy Alclad 2024, Plate and Sheet Cladding: 1230 |
| EN 2090 | Aerospace series - Aluminium alloy AL-P2024-T3 - Clad sheet and strip 0,3 mm <a <6 mm Cladding: 1050A / 1145 |
| EN 2703 | Aerospace series - Aluminium alloy AL-P2024-T4 or T42 - Clad sheet and strip - 0,3 mm ≤a ≤6 mm Cladding: 1050A / 1145 |
| BS L163* *By extension (different tempers) - BS L164, BS L165, BS L166, BS L167 | Specification for Sheet and Strip of Aluminium-Coated Aluminium Copper-Magnesium-Silicon-Manganese Alloy (Solution Treated, Cold Worked for Flattening and Aged at Room Temperature) (Cu 4.4, Mg 0.5, Si 0.8, Mn 0.8) Cladding: 1050A |
| EN 2087 | Aerospace series - Aluminium alloy AL-P2014A - T6 or T62 - Clad sheet and strip - 0,4 mm <or= a <or= 6 mm Cladding: 1050A / 1145 |
| EN 2088 | Aerospace series - Aluminium alloy AL-P2014A - T4 or T42 - Clad sheet and strip - 0,4 mm <or= a <or= 6 mm |

| | |
|--|------------------------|
| | Cladding: 1050A / 1145 |
|--|------------------------|

Table 1 – Related Standards

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

Tests shall be carried out on a sample taken at random from each batch of syringes containing both resin and activating agent.

A batch of adhesive is defined as that quantity of adhesive produced at one time from the same batch of ingredients.

Testing frequency shall be Production Routine or Qualification. Production Routine tests consisting of Visual Examination, Aluminium to Aluminium Lap Shear Strength and Electrical Resistance shall be carried out on every batch of resin and activating agent.

Qualification tests shall be carried out to the requirements of the Design Authority.

6. PACKAGING

Packaging shall be in accordance with good commercial practice. Each package shall bear an identification label showing material quantity, description, and batch number. Additional information shall be supplied as specified in the contract or order.

7. TEST REQUIREMENTS

| Test | Test Method | Test Requirements |
|---|--------------------------|----------------------------------|
| Visual Examination | - | As per Clause 2.1 |
| Lap Shear Strength Aluminium to Aluminium -25C to -25C | Clause 3.1 Clause 3.2 | 3.0 kN minimum 250 N minimum |
| Temperature Resistance Al / Al Lap Shear Strength at: -40°C 100°C | Clause 3.3 | 2.0 kN minimum 0.4 kN minimum |
| Fluid Resistance 24 ± 2h immersion at 23 ± 2°C <ul style="list-style-type: none"> • Hydraulic Fluid to DTD 900/4881 • Hydraulic Fluid to H-515 (Mil-H-5606) • Water -25C to -25C Lap Shear Strength Lap Shear Strength | Clause 3.4 | 250 N Minimum |
| Electrical Resistance | Clause 3.5 | 26 milliohms maximum |

Table 2 – Test Requirements

8. REVISION HISTORY

| Author | Date | Rev | Comments |
|--------------|-------------|-----|---|
| Helen Smith | 07 APR 2005 | 6 | CR05-DM-052 |
| Paul Dixon | 03 AUG 2010 | 7 | CR10-DM-009 |
| Phil Hammond | 12 MAR 2019 | 8 | RTS-1468165.1 |
| Justin Chow | 04 APR 2022 | 9 | Updated aluminium grades for lap shear plates |

Table 3 – Revision History

In line with a policy of continual product development, TE Connectivity reserves the right to make changes in construction, materials and dimensions without further notice. You are advised, therefore, to contact TE Connectivity, should it be necessary to ensure that this document is the latest issue.