



Class I

S1005 ADHESIVE QUALITY ASSURANCE SPECIFICATION

RK-6611

Raychem Brand S1005 Adhesive

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1. SCOPE

This Quality Assurance Specification establishes the quality standard for a two-part epoxy adhesive for bonding TE Connectivity's heat-shrinkable plastic and elastomeric sleeves, moulded components and other suitable substrates.

Table of Contents

1. SCOPE	2
2. REQUIREMENTS	3
2.1. Composition, Appearance and Colour	3
2.2. Test Requirements	3
2.3. Shelf Life	3
3. TEST METHODS	4
3.1. Lap Shear Strength	4
3.2. Fluid Resistance	5
3.3. Environmental Stress Cracking	5
4. RELATED STANDARDS	6
5. SAMPLING	7
6. PACKAGING	7
7. TEST REQUIREMENTS	8
8. REVISION HISTORY	9

Table of Tables

Table 1 - Related Standards	6
Table 2 - Test Requirements	8
Table 3 - Revision History	9

2. REQUIREMENTS

2.1. Composition, Appearance and Colour

The two components shall be homogeneous and free from particles. One component shall be a pale-yellow viscous resin, the other an amber viscous activating agent.

2.2. Test Requirements

The test requirements shall be as specified in Table 2.

2.3. Shelf Life

When stored in the original unopened containers at temperatures not exceeding 23°C, the adhesive shall comply with the requirements of Table 2 for a period of up to 12 months.

3. TEST METHODS

3.1. Lap Shear Strength

3.1.1 Aluminium to Aluminium

Ten test strips 1.5 ± 0.1 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 or similar solvent.

At least 25 mm length of one surface of one end of each strip shall be abraded with 100 grit silicon carbide abrasive paper, then degreased again to remove dust particles. Within 2 hours of abrasion, 2 parts by weight of the resin and 3 parts by weight of the activating agent shall be thoroughly mixed in an uncontaminated dish and applied evenly to each of the abraded surface of the aluminium strips.

Within 60 ± 5 minutes of mixing, the strips shall be assembled, coated ends together, into five test joints, with an overlap of between 12.5 and 14.3 mm. Where metal jigs are used the jigs and weights shall be preheated at the curing temperature for a minimum of 4 hours before the strips are placed in the jigs. The joints shall be cured for 60 ± 5 minutes at $95 \pm 2^\circ\text{C}$ under pressure of 35 kPa, allowed to cool in the jig, then stored for at least 72 hours at $23 \pm 2^\circ\text{C}$ and tested on a suitable tensile testing machine with mechanically self-tightening jaws. Initial grip separation shall be 100 mm. Rate of grip separation shall be 50 mm per 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 $23 \pm 2^\circ\text{C}$. Additional sample sets shall also be cured for 4 hours (± 15 minutes) at 60°C ($\pm 2^\circ\text{C}$) and for 24 (± 5) minutes at 120°C ($\pm 5^\circ\text{C}$) under a pressure of 35 kPa and conditioned and tested as described above.

3.1.2 RNF-100 to RNF-100

Ten test strips 25 ± 1 mm x 100 mm approximately shall be cut from TE Connectivity's RNF-100-2-0 recovered sleeving, degreased with Industrial Methylated Spirits or similar solvent and air dried. At least 25 mm length of one surface of one end of each strip shall be abraded with 100 grit silicon carbide abrasive paper and dry wiped to remove dust particles. Within 2 hours, 2 parts by weight of the resin and 3 parts by weight of the activating agent shall be thoroughly mixed in an uncontaminated dish, and applied evenly to the abraded surface of the strips. Within 60 ± 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. Where metal jigs are used the jigs and weights shall be preheated at the curing temperature for a minimum of 4 hours before the strips are placed in the jigs. The joints shall be cured for 60 ± 5 minutes at $95 \pm 2^\circ\text{C}$ under a pressure of 35 kPa, allowed to cool in the jig, stored for at least 72 hours at $23 \pm 2^\circ\text{C}$ and tested on a suitable tensile testing machine. Initial grip separation shall be 100 mm. Rate of grip separation shall be 50 mm/min. 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 $23 \pm 2^\circ\text{C}$. Additional sample sets shall also be cured for 4 hours (± 15 minutes) at 60°C ($\pm 2^\circ\text{C}$) and for 24 (± 5) minutes at 120°C ($\pm 5^\circ\text{C}$) under a pressure of 35 kPa and conditioned and tested as described above.

3.2. Fluid Resistance

Three sets of five RNF-100 to RNF-100 lap shear strength specimens prepared as in Clause 3.1.2 shall be immersed in one of the fluids specified in Table 2, removed, lightly wiped, air dried at $23 \pm 2^{\circ}\text{C}$ for 1 hour \pm 15 minutes and tested. The lap shear strength of each specimen shall be determined as in Clause 3.1.2. The test shall be repeated on the remaining specified fluids.

3.3. Environmental Stress Cracking

A new strip of polymethyl methacrylate 150 mm x 25 mm x 3 mm shall be cleaned by soaking in a 1% detergent solution in distilled water for approximately 30 minutes at $35 \pm 5^{\circ}\text{C}$, rinsed with distilled water and air dried. The strip shall be suspended freely for 20 minutes in an oven at $155 \pm 2^{\circ}\text{C}$ and allowed to cool to $87 \pm 2^{\circ}\text{C}$ in the oven at a rate of cooling of less than $30^{\circ}\text{C}/\text{hour}$. The strip shall be maintained at this temperature for at least 4 hours and allowed to cool to room temperature in the oven at a rate of cooling of less than $30^{\circ}\text{C}/\text{hour}$. The strip shall be stressed to a radius of 199 ± 1 mm in a suitable jig and conditioned at $35 \pm 2^{\circ}\text{C}$ for at least 30 minutes. 2 parts by weight of the resin and 3 parts by weight of the activating agent shall be thoroughly mixed and applied immediately over the full width and central third of the length of the outer surface of the strip. The coated strip shall be conditioned at $35 \pm 2^{\circ}\text{C}$ for at least 30 minutes, released from stress and visually examined.

4. RELATED STANDARDS

Title	Description
AMS4040	Aluminum Alloy, Sheet and Plate, Alclad 4.4Cu - 1.5Mg - 0.60Mn (2024-O with 1 1/2% 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 resin and activating agent.

Testing frequency shall be Production Routine or Qualification. Production Routine tests consisting of Visual Examination and Aluminium to Aluminium Lap Shear Strength tests on samples cured at 95°C 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.

Note: The Environmental Stress Cracking test shall be carried out on every batch where orders require certification to DTD900/4962.

6. PACKAGING

Packaging shall be in accordance with good commercial practice. 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.

7. TEST REQUIREMENTS

Test	Test Method	Test Requirements
Visual Examination	-	As per Clause 2.1
Lap Shear Strength Aluminium to Aluminium RNF-100 to RNF-100	Clause 3.1 Clause 3.1.1 Clause 3.1.2	7.2 kN minimum 180 N minimum
Fluid Resistance (24 ± 2h immersion at 23 ± 2°C) <ul style="list-style-type: none"> Hydraulic Fluid DTD900/4881 Hydraulic Fluid to H-515 (MIL-H-5606) Water Lap Shear Strength RNF-100 to RNF-100	Clause 3.2 Clause 3.1 Clause 3.1.2	 180 N minimum
Environmental Stress Cracking	Clause 3.3 ASTM D2671	No crazing

Table 2 - Test Requirements

8. REVISION HISTORY

Author	Date	Revision	Comments
Paul Dixon	3 Aug 2010	3	CR10-DM-009
Paul Dixon	Nov 2010	4	-
Paul Dixon	6 Jun 2013	5	See DMTEC
Pedro Vu	7 Aug 2017	6	RTS - 1331016
Justin Chow	4 Jul 2022	7	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.