



AEROSPACE MATERIAL SPECIFICATION

AMS2517**REV. A**

Issued 1984-04
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Reaffirmed 2013-11

Superseding AMS2517

Dimer, Dichloro 2,2 Para-Cyclophane

RATIONALE

AMS2517A has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Purpose:

This specification covers the properties of a mixed dimer.

1.2 Application:

This product has been used typically in a vapor deposition process for the purpose of providing a protective coating for electronic parts, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2535 Coating, Vapor Deposited Poly-Monochloro-Para-Xylylene for Microcircuits

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 257 D-C Resistance or Conductance of Insulating Materials

ASTM D 3030 Volatile Matter (Including Water) of Vinyl Chloride Resins

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<http://www.sae.org/technical/standards/AMS2517A>**

2.3 IPC Publications:

Available from Institute of Interconnecting and Packaging Electronic Circuits, 2215 Sanders Road, Northbrook, IL 60062-6135.

IPC B-25 Multi-purpose Test Board Pattern

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

The material shall be a mixed dimer consisting of various isomers of chlorinated 2,2 para-cyclophane with the following composition in percent by weight as shown in Table 1:

TABLE 1

Ingredient	min	max
Di-Para-Cyclophane	--	2.0
Monochloro-Di-Para-Cyclophane	--	10.0
Dichloro-Di-Para-Cyclophane	75.0	--
Trichloro-Di-Para-Cyclophane	--	20.0
Higher Isomers	--	2.0
Other Compounds	--	1.0

3.1.1 Color and Appearance: The dimer shall be supplied as a white granular product.

3.2 Properties:

The dimer shall conform to the requirements shown in Table 2, determined in accordance with specified test methods insofar as practicable:

TABLE 2 - Dimer Properties

	Value	Percent	Test Method
3.2.1	Vaporization at 185 °C (365 °F) and 0.01 torr, min	99%	4.5.1
3.2.2	Solids Content, min	99%	4.5.2
3.2.3	Solubility, min	99%	4.5.3
3.2.4	Insulation Resistance, min	1 x 10 ⁹ ohms	4.5.4

3.3 Quality:

Dimer, as received by purchaser, shall be uniform in quality and condition and free from foreign materials and other contaminants detrimental to usage of the dimer.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the dimer shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and perform any confirmatory testing deemed necessary to ensure that the dimer conforms to the requirements of this specification.

4.2 Classification of Tests:

All technical requirements of this specification are acceptance tests and as preproduction tests and shall be performed prior to or on the initial shipment of dimer to a purchaser, on each lot, when a change in material or processing, or both, requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.3 Sampling:

Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient dimer shall be taken at random from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1.1 A lot shall be all dimer produced in a single run from the same raw materials under the same fixed conditions and presented for vendor's inspection at one time. An inspection lot shall not exceed 500 pounds (225 kg).

4.4 Approval:

4.4.1 The dimer shall be approved by purchaser before dimer for production use is supplied, unless such approval be waived by purchaser. Results of tests on production dimer shall be essentially equivalent to those on the approved sample dimer.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production dimer which are essentially the same as those used on the approved sample. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material or processing, or both, and, when requested, sample dimer. Production dimer made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

- 4.5.1 Vaporization: A dimer specimen of 5 to 10 grams, weighed to the nearest milligram in a tared container, shall be placed in the polymer coating equipment described in AMS 2535. The pressure in the vaporization chamber shall be reduced to a maximum of 0.1 torr (1.33 Pa) and the temperature stabilized at $185^{\circ}\text{C} \pm 5$ ($365^{\circ}\text{F} \pm 9$). Maintain the temperature and pressure for 15 minutes ± 1 , increase the pressure to atmospheric, and remove the specimen container. Place the container in a desiccator and allow it to cool to room temperature. Weigh the container and determine the percent of material not volatilized.
- 4.5.2 Solids Content: Shall be determined in accordance with ASTM D 3030, using $50^{\circ}\text{C} \pm 3$ ($122^{\circ}\text{F} \pm 5$) as the volatilization temperature, and report percent of solids.
- 4.5.3 Solubility: Place approximately 10 grams of dimer, weighed to the nearest milligram, in a closed container with 100 grams of methylene chloride. Agitate the mixture for 20 minutes ± 5 . Filter the resultant solution through a preweighed 5 micron (5 μm) filter, exercising care to ensure that all non-dissolved material is removed from the container with the liquid. Vacuum dry the filter membrane and residue, and reweigh. Report the percentage by weight of undissolved material.
- 4.5.4 Insulation Resistance:
- 4.5.4.1 Specimens: Test specimens for measuring insulation resistance shall be prepared in accordance with IPC B25, Pattern B. The comb pattern specimens shall be cleaned to ensure removal of all residual etchants and handling soils. After cleaning, do not touch the pattern surfaces with bare hands. Place the specimens in a humidity chamber maintained at $35^{\circ}\text{C} \pm 1$ ($95^{\circ}\text{F} \pm 2$) and not less than 93% relative humidity. After not less than 2 hours, remove the panels from the humidity chamber and immediately measure insulation resistance without drying or blowing off moisture from the specimen surface. The insulation resistance shall be not less than 1×10^9 ohms. If specimens meet the insulation resistance requirement, they shall be rinsed in distilled water, vacuum baked for not less than 2 hours at $100^{\circ}\text{C} \pm 5$ ($212^{\circ}\text{F} \pm 10$), and polymer coated in accordance with AMS 2535. Specimens which do not meet the insulation resistance requirements of 1×10^9 ohms may be recleaned and retested.
- 4.5.4.2 Test Procedure: Solder wires to the pads on the comb pattern of the test specimens using a minimum amount of nonactivated rosin flux. Clean the specimens thoroughly to remove residual flux. Condition the specimens for not less than 24 hours at $50^{\circ}\text{C} \pm 5$ ($122^{\circ}\text{F} \pm 9$). Place the test specimens in the humidity chamber with provisions for bringing the attached wires outside of chamber to permit electrical measurements. Specimens shall be hung or placed in such a way as to prevent touching each other or chamber surfaces, and in a position which ensures relatively uniform exposure to humidity. Expose the specimens to 10 cycles of humidity with each cycle made up of the following steps: Start test at $25^{\circ}\text{C} \pm 2$ ($77^{\circ}\text{F} \pm 4$) and raise temperature to $65^{\circ}\text{C} \pm 2$ ($149^{\circ}\text{F} \pm 4$) over a period of 2-1/2 hours, maintaining the relative humidity at 90 to 98%. Maintain the temperature at $65^{\circ}\text{C} \pm 2$ ($149^{\circ}\text{F} \pm 4$), 90 to 98% RH, for 3 hours ± 0.1 . Reduce the temperature from $65^{\circ}\text{C} \pm 2$ ($149^{\circ}\text{F} \pm 4$) to $25^{\circ}\text{C} \pm 5$ ($77^{\circ}\text{F} \pm 9$) while maintaining 90 to 98% RH, over a period of approximately 2-1/2 hours. Raise the temperature to $65^{\circ}\text{C} \pm 2$ ($149^{\circ}\text{F} \pm 4$) over a period of 2-1/2 hours while maintaining 90 to 98% relative humidity. Maintain a temperature of