

MIL-A-81236(OS)
Amendment 2
9 September 1968
Superseding
Amendment 1
19 November 1966

MILITARY SPECIFICATION

ADHESIVE: EPOXY RESIN WITH POLYAMIDE CURING AGENT

This amendment forms a part of Military Specification MIL-A-81236(OS), dated 29 March 1965, and has been approved by the Naval Ordnance Systems Command, Department of the Navy.

By this amendment the basic Specification MIL-A-81236(WP) is designated as MIL-A-81236(OS)

Page 1, paragraph 1.1, delete and substitute:

"1.1 Scope - This specification covers one type of adhesive consisting of an epoxy resin and a polyamide curing agent for general use under normal circumstances. It provides for an additional type of material suitable for use under AIR POLLUTION REGULATIONS (see 6.4)."

Page 1, Add new paragraph:

"1.2 Classification: The adhesive covered by this specification shall be of the following types as specified (see 6.2):

Type I - For general use under normal circumstances.

Type II - For use where AIR POLLUTION REGULATIONS are enforced."

Page 1, paragraph 2.1: Delete "QQ-A-362 Aluminum Alloy, Plate and Sheet, Alclad 2024" and substitute "QQ-A-250/5 Aluminum Alloy, Alclad 2024, Plate and Sheet."

Page 2, paragraph 2.2, Under publications, add. "ASTM D 2267 Aromatics and Light Naphthas, Reformates and Gasolines by Gas Chromatography."

Pages 2 and 3, Section 3: Delete entire section 3 and substitute:

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"3. REQUIREMENTS

3.1 Preproduction samples. Unless otherwise specified in the contract or order, preproduction samples of the adhesive shall be manufactured using the methods and procedures proposed for the production. The sample shall be tested as specified in Section 4 herein and is for the purpose of determining that, prior to starting production, the contractor's production methods are capable of yielding items that comply with the requirements of this specification. After satisfactorily passing all the preproduction tests specified herein, no changes in raw materials and processing of materials for production shall be made without prior written approval of the procuring activity.

3.2 Data requirements. No data is required by this specification or by applicable documents referenced in Section 2 unless specified in the contract or order (see 6.2).

3.3 Material. The material shall be a two-part thermosetting adhesive containing a base material of the epoxy resin type and a polyamide curing agent.

3.3.1 Solvents. The solvent content of Type I adhesive shall be of the type normally used in the formulation when the finished product is for general use under normal circumstances. For Type II adhesive, the solvent content of the adhesive shall consist of a non-photochemically reactive solvent. A non-photochemically reactive solvent is any solvent with an aggregate of less than 20 percent of its total volume composed of the chemical compounds classified below or which does not exceed any of the following individual percentage composition limitations, referred to the total volume of solvent.

a. A combination of hydrocarbons, alcohols, aldehydes, esters, ethers, or ketones having an olefinic or cycloolefinic type of unsaturation: 5 percent;

b. A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene: 8 percent,

c. A combination of ethylbenzene, ketones having branched hydrocarbon structures, trichloroethylene or toluene: 20 percent."

3.4 Physical and chemical properties. The physical and chemical properties shall be as specified in Table I.

Table I - Physical and Chemical Properties

Property	Minimum	Maximum
Epoxy Resin		
Viscosity at 25 degrees Centigrade (C), poises	110	160
Density at 25 degrees C, gm/ml	1.15	1.21
Epoxide equivalent, gm/eq	187	191
Polyamide curing agent		
Viscosity at 75 degrees C, poises	2	6
Density at 25 degrees C, gm/ml	0.94	1.00
Amine value	350	400

3.4.1 Adhesive properties. The adhesive, consisting of three parts by weight of epoxy resin and two parts by weight of polyamide curing agent, shall have the following properties:

3.4.1.1 Curability. When the epoxy resin and curing agent are mixed, the blend shall cure to a Shore "D" hardness of 75 ± 10 in not more than 16 hours at 110 ± 5 degrees Fahrenheit (F).

3.4.1.2 Tensile shear strength. The cured adhesive shall have a minimum tensile shear strength of 1500 pounds per square inch (psi) at 75 ± 5 degrees F when cured for not more than 16 hours at 110 ± 5 degrees F.

3.5 Workmanship. The material shall be uniform in quality and shall be free from impurities and other defects that could adversely affect its use."

Page 4, paragraph 4.5.2: Add to end of paragraph "except that the test temperature shall be 25 degrees Centigrade (C) for testing the epoxy resin base, and 75 degrees C for testing the polyamide curing agent."

Page 6, paragraph 4.5.6.2c: Delete "QQ-A-362." and substitute "QQ-A-250/5."

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Page 6, Add new paragraph:

"4.5.6.3 Non-photochemically reactive solvents - The non-photochemically reactive solvent composition shall be determined using a gas chromatograph or other suitable device in accordance with Method ASTM-D-2267 (See 3.3.1)."

Page 7, paragraph 6.2, add the following subparagraph:

"g. Type required (See 1.2)."

Page 7, Add new paragraph:

"6.4 Type II adhesive - Type II adhesive should be specified for use in areas with regulations controlling the emission of solvents into the atmosphere."

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