MIL-C-47044(MI)
10 May 1974
SUPERSEDING
MIS 14286
1 March 1965

MILITARY SPECIFICATION

COATING CONFORMAL OF WELDED MODULES, PROCESS REQUIREMENTS FOR

This specification is approved for use by all departments and agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification establishes the requirements for the conformal coating of welded modules.

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATIONS

Federal

TT-I-735	Isopropyl Alcohol
NNN-S-450	Slide, Microscope

STANDARDS

Federal

FED-STD-141	Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling and Testing

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer).

3. REQUIREMENTS

3.1 Equipment.

3.1.1 Mixing equipment. The equipment used in the mixing, stirring or handling of the coating compound materials shall be non-absorbent; clean and visually free from dust or any other foreign substance. The mixing equipment shall not contaminate the coating compound.

3.1.2 Oven. The oven shall be a forced air circulating type with temperature controls capable of maintaining cure temperatures within plus or minus 3 degrees Celsius (C) (plus or minus 5.4 degrees Fahrenheit (F)). The oven shall be equipped with an automatic recorder capable of recording oven working zone temperature within accuracy of plus or minus 1 degree C (plus or minus 1.8 degrees F).

3.1.2.1 Calibration and certification. The oven shall be calibrated and certified as follows and shall display decals or other identification to show evidence of calibration.

a. Oven controlling instruments within accuracy of plus or minus 1 degree C (plus or minus 1.8 degrees F) every 30 days.

b. Oven working zone temperature survey within accuracy of plus or minus 3 degrees C (plus or minus 5.4 degrees F) every 90 days.

3.1.3 Weighing balance. The weighing balance shall be capable of maintaining accuracy of plus or minus 0.1 percent or plus or minus 0.2 gram, whichever is smaller, over a range of 0 to 1000 grams. The weighing balance shall be calibrated and certified every 90 days to within the prescribed accuracy.

3.2 Materials.

3.2.1 Coating compound. The coating compounds shall be as specified on the module part drawing and shall conform

to the requirements of their applicable specifications. Compound materials exceeding their shelf life shall not be used.

3.2.2 Cleaning solvent. The cleaning solvent shall be of a non-etching, non-corrosive type capable of removing oil and grease. The recommended solvent is isopropyl alcohol conforming to TT-I-735, grade A.

3.2.3 Mold releasing agent. The releasing agent shall be capable of preventing the coating compound from adhering to the surface to which the releasing agent is applied. The release agent shall be compatible with the coating compound.

3.3 Procedure.

3.3.1 Coating compound preparation. The coating compound resin and catalyst shall be thoroughly mixed in ratio as recommended by the manufacturer.

3.3.1.1 Application life. The delay time between mixing and coating shall not exceed the application life of the coating compound.

3.3.2 Module preparation.

3.3.2.1 Cleaning. Modules shall be cleaned by immersion in solvent (3.2.2) for 10 seconds, minimum, followed by oven drying at 66 plus or minus 3 degrees C (150 plus or minus 5.4 degrees F) for minimum of 15 minutes.

3.3.2.2 Mold release application. Apply a brush coating of mold release to the outer edges of header.

3.3.3 Conformal coat. Apply a conformal coating (3.3.1) to the module by brushing or other suitable method to meet the coating requirements specified in 3.4.

3.3.3.1 Drain. Allow any excess coating material to drain from modules for minimum of five minutes.

3.3.4 Test specimen. One test specimen shall be processed with each production lot of parts (4.3.1). The material used for specimen shall be from the same mixed batch of compound used to conformal coat modules.

3.3.4.1 Test specimen size. The test specimen shall consist of a standard microscope glass slide approximately 1 by 3 by 1/16 inch thick, in conformance with NNN-S-450 or equivalent. One side of the specimen shall be coated with material to a thickness of 0.001 to 0.002 inch in conformance with FED-STD-141, Method 2021.

3.3.5 Cure. The conformal coated module and representative specimen shall be cured at the temperature and time recommended by the manufacturer. The cure temperature shall not exceed the safe limits of the electronic components.

3.4 Workmanship.

3.4.1 Appearance. The coated module shall be free of any foreign material.

3.4.2 Coverage. The entire module, including components, component leads, welds, ribbons and wafers, but excluding the electrical contact surfaces, or where excluded on module part drawing, shall be completely covered with the conformal coating material.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Inspection records. Suitable inspection records substantiating that the requirements of 3.1, 3.2, 3.3 and 3.4 have been complied with shall be maintained and shall be available to the procuring activity.

4.3 Lot acceptance. Each lot of encapsulated parts and its representative test specimen (3.3.4) shall be subjected to inspection and tests as specified in 4.3.2 and 4.3.3.

4.3.1 Lot size. A production lot shall consist of all the parts submitted for acceptance at the same time which have been conformal coated without a change in compound mixture or processing in one continuous period of operation.

4.3.2 Visual inspection. Unless otherwise specified by the procuring activity, each lot of parts shall be visually inspected 100 percent and shall conform to the requirements of 3.4.

4.3.3 Test specimen testing. Unless otherwise specified by the procuring activity, each representative specimen shall meet the cure test requirement (4.4.1) for lot acceptance of parts.

4.4 Test method.

4.4.1 Cure test. The test specimen shall be tested in accordance with FED-STD-141, Method 4061 (tack free, finger method) to determine if coating material has cured.

5. PREPARATION FOR DELIVERY

This section is not applicable to this specification.

6. NOTES

6.1 Intended use. This specification is intended to cover the requirements for the conformal coating of welded modules.

6.2 Ordering data. Procurement documents shall specify the following:

a. Title, number, and date of this specification.

6.3 Supersession data. This specification includes the requirements of MIS-14286, dated 1 March 1965.

Custodian:
ARMY-MI

Preparing Activity:
ARMY - MI
Project No. 14GP-A053

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

OMB Approval
No. 22-R255

INSTRUCTIONS: The purpose of this form is to solicit beneficial comments which will help achieve procurement of suitable products at reasonable cost and minimum delay, or will otherwise enhance use of the document. DoD contractors, government activities, or manufacturers/vendors who are prospective suppliers of the product are invited to submit comments to the government. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements. Attach any pertinent data which may be of use in improving this document. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity.

DOCUMENT IDENTIFIER AND TITLE

NAME OF ORGANIZATION AND ADDRESS

CONTRACT NUMBER

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES

2. COMMENTS ON ANY DOCUMENT REQUIREMENT CONSIDERED TOO RIGID

3. IS THE DOCUMENT RESTRICTIVE?

☐ YES ☐ NO *(If "Yes", in what way?)*

4 REMARKS

SUBMITTED BY *(Printed or typed name and address - Optional)*

TELEPHONE NO.

DATE

DD FORM 1 JAN 72 1426

REPLACES EDITION OF 1 JAN 66 WHICH MAY BE USED

S/N 0102-014-1802