MILITARY SPECIFICATION

THINNER, AIRCRAFT COATING

This specification is approved for use by the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for three types of thinner to be used in reducing aircraft coatings.

1.2 Classification. The aircraft coating thinners shall be furnished in the following types, as specified (see 6.2):

Type I - Polyurethane thinner

Type II - Epoxy thinner

Type III - Acrylic and alkyd thinner

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

PPP-C-96 Can, Metal, 28 Gage and Lighter.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Systems Engineering and Standardization Department (Code 93), Naval Air Engineering Center, Lakehurst, NJ 08733-5100, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 8010

DISTRIBUTION STATEMENT A, Approved for public release; distribution is unlimited.

STANDARDS

FEDERAL

FED-STD-141	-	Paint, Varnish, Lacquer and Related Materials, Methods of Inspection, Sampling and Testing.
FED-STD-313	-	Material Safety Data Sheets, Preparation and Submission of.

MILITARY

MIL-STD-105	-	Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	-	Marking for Shipment and Storage.
MIL-STD-290	-	Packaging of Petroleum and Related Products.

2.1.2 Other Government documents, drawings, and publications. The following other Government documents form a part of this specification to the extent specified herein.

CODE OF FEDERAL REGULATIONS

49 CFR	-	Regulations for the Transportation of Hazardous Materials.

(Application for copies of the Code of Federal Regulations (CFR) should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

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

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 56	Test for Flash Point by Tag Closed Tester.
ASTM D 1296	Test for Odor of Volatile Solvents and Diluents.
ASTM D 1353	Test for Nonvolatile Matter in Volatile Solvents for use in Paint, Varnish, Lacquer and Related Products.
ASTM D 1364	Test for Water in Volatile Solvents.
ASTM D 2804	Test for Purity of Methyl Ethyl Ketone by Gas Chromatography.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

AMERICAN NATIONAL STANDARDS INSTITUTE

ANSI Z 129.1 - Precautionary Labeling of Hazardous Industrial Chemicals.

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018)

UNIFORM CLASSIFICATION COMMITTEE, AGENT

Uniform Freight Classification Rules

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Materials. Materials shall be of the highest quality used in commercial practice and entirely suitable for the purpose intended under normal conditions of use. It shall contain no chlorinated hydrocarbons or other solvents of a toxic nature. Type I materials shall be free from water and alcohols that would adversely affect the performance of polyurethane coatings.

3.2 Composition. The composition shall conform to the percentages by volume given in table I.

3.3 Quantitative requirements. The thinner shall meet the quantitative requirements specified in table II.

3.4 Qualitative requirements.

3.4.1 Appearance. The appearance of the thinner shall be clear and free from suspended matter when examined by transmitted light (see table III).

3.4.2 Odor. The odor shall be characteristic of the ingredients and not noticeable after drying from filter paper (see table III).

3.4.3 Spot test. The thinner shall leave no oily spot or stain on filter paper (see table III).

* 3.5 Material Safety Data Sheets. A Material Safety Data Sheet shall be prepared and submitted in accordance with FED-STD-313. Questions pertinent to the effect of the thinner on the health of personnel when used for its intended purpose shall be referred by the acquiring activity to the appropriate medical service who will act as adviser to the acquiring activity (see 4.4 and 6.2(f)).

* 3.6 Additional unit pack markings. In addition to those markings required in section 5, unit pack markings shall contain use, mixing, handling and precautionary markings as well as noting any protective clothing and equipment required.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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 Classification of inspection. The inspection specified herein is classified as quality conformance inspection.

4.3 Sampling.

4.3.1 Sampling for examinations and tests.

4.3.2.1 Inspection of filled containers. A random sample of filled containers shall be selected from each inspection lot in accordance with MIL-STD-105, inspection level I, and an acceptable quality level (AQL) of 2.5 percent defective to verify compliance with this specification regarding fill, closure, marking and other requirements not involving tests. Inspection shall be as specified in 4.5.1.

4.3.2.2 Inspection of packaging. A random sample of packaged thinner, fully prepared for delivery, shall be selected from each inspection lot in accordance with MIL-STD-105, inspection level S-2, and an AQL of 2.5 percent defective to verify compliance with section 5 not involving tests. Examination shall be in accordance with 4.5.2 and 4.5.3.

4.3.3 Sampling for tests. Two filled containers shall be selected at random from each inspection lot. If more than one lot is represented in the shipment, each lot represented shall be treated as a separate shipment for sampling purposes. The contents of each filled container, selected at random for sampling, shall be thoroughly mixed immediately prior to sampling. Each sample shall be tested to determine compliance with this specification. The samples selected shall be subjected separately to the tests specified in 4.5.4. If either sample fails one or more of these tests, the lot shall be rejected.

* 4.4 Submission of Material Safety Data Sheets. The contractor shall furnish to the contracting activity the toxicological data and formulations required to evaluate the safety of the material for the proposed use through the submission of the Material Safety Data Sheet detailed in FED-STD-313.

4.5 Methods of inspection.

4.5.1 Examination of filled containers. Each sample filled container selected in accordance with 4.3.2.1 shall be examined for defects of the container and the closure, for evidence of leakage and for unsatisfactory markings (see section 5 and 3.6). Each sample filled container shall also be weighed to determine the amount of contents. Any container in the sample, having one or more defects, or under required fill, shall be rejected and if the number of defective containers in any sample exceeds the acceptance number for the applicable sampling plan of MIL-STD-105, the lot represented by the sample shall be rejected.

* 4.5.2 Examination of packaging and marking. An examination shall be made to determine that packaging, packing and marking comply with the requirements of Section 5 of this specification. Defects shall be scored in accordance with the list below. The sample unit for this examination shall be one shipping container fully prepared for delivery except that it shall not be palletized and need not be sealed. Shipping containers fully prepared for delivery that have not been palletized shall be examined for defects of closure. The lot size shall be the number of shipping containers in the end item inspection lot. The samples for this examination shall be selected at random in accordance with MIL-STD-105, inspection level S-2 and acceptable quality level (AQL) 4.0 defects per hundred units.

Examine	Defect
Packaging	Container not as specified, closures not accomplished by specified or required methods or materials. Leakage or seepage of contents. Non-conforming component, component missing, damaged or otherwise defective. Bulged or distorted container.
Markings	Data, including directions for use, omitted, illegible, incorrect, incomplete, or not in accordance with contract requirements.

* 4.5.3 Examination for palletization. An examination shall be made to determine that palletization complies with the requirements of Section 5 of this specification. Defects shall be scored in accordance with the list below. The sample unit shall be one palletized unit load fully prepared for delivery. The lot size shall be the number of palletized unit loads in the end item inspection lot. The samples for this examination shall be selected at random in accordance with MIL-STD-105, inspection level S-1 and acceptable quality level (AQL) 6.5 defects per hundred units.

Examine	Defect
Finished dimension	Length, width, or height exceeds specified maximum requirement.
Palletization	Not as specified. Pallet pattern not as specified. Interlocking of loads not as specified. Load not bonded with required straps as specified.
Weight	Exceeds maximum load limits.
Marking	Omitted, incorrect, illegible, of improper size, location, sequence or method of application.

4.5.4 Test procedures. The thinner shall be tested in accordance with table III.

5. PACKAGING

5.1 Preservation and unit packing. Preservation and unit packing shall be level A, B, or C, as specified. The thinner shall, in the quantity specified in the contract or order, be packaged and marked in accordance with the requirements of Title 49 of the Code of Federal Regulations. When specified, palletization is required for handling by mechanical equipment (see 6.2).

5.1.1 Level A and B. Unless otherwise specified (see 6.2), the thinner shall be unit packed in one gallon cans in accordance with the requirements of MIL-STD-290.

5.1.2 Level C. The thinner shall be unit packed in one gallon cans conforming with the requirements of 49 CFR.

5.2 Packing. Packing shall be level A, B or C in accordance with the requirements of MIL-STD-290.

* 5.3 Marking. All unit, intermediate and shipping containers shall be marked in accordance with MIL-STD-129 and include the additional special marking requirements as specified by the acquiring activity. All unit and intermediate packs of toxic and hazardous chemicals and materials shall also be labeled in accordance with the applicable laws, statutes, regulations or ordnances, including Federal, State, and municipal requirements. In addition unit and intermediate containers, including unit containers that serve as shipping containers such as pails and drums, shall be marked with the applicable precautionary information detailed in American National Standard ANSI Z 129.1.

6. NOTES

6.1 Intended use. The thinner covered by this specification is intended for use in reducing aircraft coatings to the required viscosity (see 1.2).

Type I - Polyurethane thinner is intended for use with:

	MIL-C-83231	- Coating, Polyurethane, Rain Erosion Resistant for Exterior Aircraft and Missile Plastic Parts
	MIL-C-83286	- Coating, Urethane, Aliphatic Isocyanate, For Aerospace Applications
	MIL-C-85285	- Coating, Polyurethane, Aliphatic, Weather Resistant, Low Infra-Red (IR) Reflective
*	MIL-C-85322	- Coating, Elastomeric, Polyurethane, Rain-Erosion Resistant

Type II - Epoxy thinner is intended for use with:

	MIL-C-22750	- Coating, Epoxy-Polyamide
*	MIL-P-23377	- Primer Coating, Epoxy Polyamide, Chemical and Solvent Resistant

Type III - Acrylic and alkyd thinner is intended for use with:

*	TT-L-20	- Lacquer, Camouflage.
*	TT-L-32	- Lacquer, Cellulose Nitrate, Gloss.
*	TT-P-1757	- Primer Coating, Zinc Chromate, Low-Moisture Sensitivity
*	TT-P-7962	- Primer Coating, Cellulose Nitrate, Modified Alkyd Type, Corrosion Inhibiting, Fast-Drying.
	MIL-L-19537	- Lacquer, Acrylic-Nitrocellulose Gloss (For Aircraft Use)
	MIL-L-19538	- Lacquer, Acrylic Nitrocellulose, Camouflage (For Aircraft Use)
	MIL-L-81352	- Lacquer, Acrylic (For Naval Weapons Systems)

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification
b. Type of thinner desired.
c. Quantity of thinner desired.
d. Type and size of containers if other than as specified in 5.1.1.
e. Selection of applicable levels of preservation-packaging and packing (see section 5).
f. Specify FAR Clauses 23.303 and 52.223-3.
g. Specify if palletization is required.

6.3 Basis of purchase. The thinner should be purchased by volume, the unit being a U.S. gallon of 231 cubic inches at 20°C (68°F). The volume of deliveries may be determined by dividing the net weight, in pounds, by the weight per gallon. To obtain the weight per gallon, multiply the specific gravity at 20°/20°C by 8.322. One gallon of thinner at 20°C (68°) weighs between 7.36 and 7.49 pounds.

6.4 Changes from previous issue. The margins of this specification are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Preparing activity:
Navy - AS
(Project No. 8010-N274)

TABLE I. Composition.

Material	Percent by volume		
	Type I	Type II	Type III
Methyl ethyl ketone	30 min.	50 min.	30 min.
Methyl isobutyl ketone	-	20 max	-
Ethyl acetate	-	-	30 min.
Butyl acetate	10 min.	-	-
* Propylene glycol methyl ether acetate	40 min.	-	20 min.
* Propylene glycol methyl ether	-	30 min.	-
Toluene	12 max.	-	12 max.
Xylene	8 max.	-	8 max.

TABLE II. Quantitative requirements.

Characteristic	Requirements		
	Type I	Type II	Type III
Maximum water content, percent by weight	0.2	-	-
Maximum alcohol content, percent by weight	0.6	-	-
Maximum nonvolatile content, grams per 100 ml	0.02	0.02	0.02
* Minimum flash point, °F(°C)	42°F (6°C)	32°F (0°C)	30°F (-1°C)

TABLE III. Test methods.

Paragraph	Property	ASTM	FED-STD-141 Test method no.
3.2	Composition (gas chromatography)	-	7360
3.3	Water content (Fischer titration)	D 1364	-
3.3	Alcohol content	D 2804	-
3.3	Nonvolatile content	D 1353	-
3.3	Flash point (Tag closed cup)	D 56	-
3.4.1	Appearance	-	4261
3.4.2	Odor	D 1296	-
3.4.3	Spot test	-	4491

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge *(DO NOT STAPLE)*, and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. 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.

(Fold along this line)

(Fold along this line)

DEPARTMENT OF THE NAVY

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 12503 WASHINGTON D C

POSTAGE WILL BE PAID BY THE DEPARTMENT OF THE NAVY

Commanding Officer
Naval Air Engineering Center
Systems Engineering and Standandization
Department Code 93
Lakehurst, NJ 08733-5100

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-T-81772B	Thinner, Aircraft Coating

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ USER
	☐ MANUFACTURER
	☐ OTHER *(Specify)*: ____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 82 MAR 1426

PREVIOUS EDITION IS OBSOLETE.