

AEROSPACE MATERIAL SPECIFICATION

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Superseding AMS 3167A and
AMS 3166B

(R) Solvents, Wipe
for Cleaning Prior to Application of Primer and Top Coat Materials,
or Sealing Compounds

1. SCOPE:

1.1 Form:

This specification covers liquid wipe solvent cleaners.

1.2 Application:

These wipe solvents have been typically used for cleaning aircraft primary and secondary structural surfaces prior to application of adhesion promoters, sealing materials, primer materials, and topcoat materials over primed surfaces. However, usage is not limited to such applications.

1.3 Classification:

Solvents covered by this specification are classified as follows (see 8.4):

Type 1 – Cleaning prior to primer or topcoat materials.

Type 2 – Cleaning prior to sealing compounds.

Form 1 – Hydrocarbon-based. Wipe solvents composed of a mixture of photochemically reactive hydrocarbons and/or oxygenated hydrocarbons and/or exempt solvents.

Form 2 - Aqueous. Wipe solvents in which water content is 80% or more by volume of the wipe solvent solution as applied.

Class 1 – Most environmentally preferable (low vapor pressure and/or low HAP/VOC).

Containing de minimis HAP (Hazardous Air Pollutants) and VOC (Volatile Organic Compound) defined as concentrations less than 0.1 percent by weight for carcinogens and 1.0 percent for non-carcinogens, or as defined by the following: for Form 1 - maximum vapor pressure of 7 mm Hg at 68 °F (20 °C) and no HAPs; for Form 2 - flash point greater than 200 °F (93 °C) and the solution must be miscible with water. Class 1 is exempt from housekeeping measures as defined by the Environmental Protection Agency (see 8.4).

Class 2 – Moderately environmentally preferable (moderate vapor pressure). Maximum vapor pressure of 45mm Hg at 68 °F (20 °C).

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1.3 (Continued):

Class 3 – Least environmentally preferable (HAPs and/or high vapor pressure). Vapor pressure greater than 45mm Hg at 68 °F (20 °C).

1.4 Safety:

Hazardous Materials: While the materials, methods, applications and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to insure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order form 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 superceding document has been specified, the last published issue shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2470	Anodic Treatment of Aluminum Alloys, Chromic Acid Process
AMS 2473	Chemical Film Treatment for Aluminum Alloys, General Purpose Coating
AMS 2629	Fluid, Jet Reference
AMS 2825	Material Safety Data Sheets
AMS 3100	Adhesion Promoter for Polysulfide Sealing Compounds
AMS 3276	Sealing Compound, Integral Fuel Tanks and General Purpose, Intermittent Use to 360 °F (182 °C)
AMS 3375	Adhesive/Sealant, Fluorosilicone, Aromatic Fuel Resistant, One- Part, Room Temperature Vulcanizing
AMS 3819	Cloths, Cleaning, for Aircraft Primary and Secondary Structural Surfaces
AMS 4037	Aluminum Alloy Sheet and Plate 4.4Cu-1.5Mg-0.60Mn (2024; -T3 Flat Sheet, -T351 Plate) Solution Heat Treated
AMS 4045	Aluminum Alloy Sheet and Plate 5.6Zn 2.5Mg 1.6Cu 0.23Cr (7075-T6 Sheet, -T651 Plate) Solution and Precipitation Heat Treated
AMS 4101	Aluminum Alloy, Plate, 4.4Cu 1.5Mg 0.60Mn, Solution Heat Treated, Stretch, and Precipitation Heat Treated (T851)
AMS 4202	Aluminum Alloy, Plate, 5.7Zn 2.2Mg 1.6Cu 0.22Cr, Solution Heat Treated, Stress Relieved by Stretching, and Precipitation Heat Treated (T7351)
AMS 4911	Titanium Sheet, Strip and Plate 6Al-4V, Annealed
AMS 5046	Steel Sheet, Strip, and Plate, Carbon Steel Annealed

2.1 (Continued):

AMS 6419	Steel, Bars, Forgings, and Tubing, 1.6Si 0.82Cr 1.8Ni 0.40Mo 0.08V (0.40-0.45C), Consumable Electrode Vacuum Remelted
AMS-C-27725	Coating, Corrosion Preventive, for Aircraft Integral Fuel Tanks
AMS-QQ-A-250/4	Aluminum Alloy 2024, Plate and Sheet
AMS-QQ-A-250/13	Aluminum Alloy Alclad 7075, Plate and Sheet
AMS-QQ-P-416	Plating, Cadmium
AMS-T-9046	Titanium and Titanium Alloy, Sheet, Strip, and Plate
AS5127	Methods for Testing Aerospace Sealants
AS5127/1	Methods for Testing Aerospace Sealants, Two-Component Synthetic Rubber Compounds

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM D 56	Standard Test Method for Flash Point by Tag Closed Cup Tester
ASTM D 329	Standard Specification for Acetone
ASTM D 740	Standard Specification for Methyl Ethyl Ketone
ASTM D 1193	Standard Specification for Reagent Water
ASTM D 1218	Standard Test Method for Refractive Index and Refractive Dispersion of Hydrocarbon Liquids
ASTM D 1353	Standard Test Method for Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer, and Related Products
ASTM D 1364	Standard Test Method for Water in Volatile Solvents (Karl Fischer Reagent Titration Method)
ASTM D 1475	Standard Test Method for Density of Liquid Coatings, Inks, and Related Products
ASTM D 1613	Standard Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paints, Varnish, Lacquer, and Related Products
ASTM D 2344	Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and their Laminates
ASTM D 3359	Standard Test Methods for Measuring Adhesion by Tape Test
ASTM D 3545	Standard Test Method for Alcohol Content and Purity of Acetate Esters by Gas Chromatography
ASTM D 3960	Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
ASTM D 4420	Standard Test Method for Determination of Aromatics and Finished Gasoline by Gas Chromatography
ASTM F 483	Standard Test Method for Total Immersion Corrosion Test for Aircraft Maintenance Chemicals
ASTM F 502	Standard Test Method for Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces

2.2 (Continued):

ASTM F 519	Standard Test for Mechanical Hydrogen Embrittlement Evaluation of Plating Processes and Service Environments
ASTM F 945	Standard Test Method for Stress-Corrosion of Titanium Alloys by Aircraft Engine Cleaning Materials
ASTM F 1110	Standard Test Method for Sandwich Corrosion Test

2.3 U. S. Government Publications:

Available from DODSSP Subscription Service Desk, Building 4D, 700 Robins Avenue Philadelphia, PA 19111-5094 or www.assist.daps.dla.mil.

A-A-58054	Abrasive Mats, Non-Woven, Non-Metallic
A-A-59281	Cleaning Compound, Solvent Mixtures (s/s MIL-C-38736)
CCC-C-419	Cloth, Duck, Cotton, Unbleached, Plied Yarns, Army and Numbered
MIL-PRF-5606	Hydraulic Fluid, Petroleum Base; Aircraft, Missile and Ordnance
MIL-PRF-23377	Primer Coating, Epoxy Polyamide, Chemical and Solvent Resistant
MIL-PRF-22750	Coating; Epoxy, High Solids
MIL-PRF-83282	Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base
	MIL-DTL-83133 Turbine Fuels, Aviation, Kerosene Types, NATO
	F-34(JP-8), NATO F-35, and JP-8 + 100
MIL-PRF-85285	Coating: Polyurethane, High Solids
MIL-PRF-85582	Primer Coatings, Epoxy, VOC Compliant, Chemical and Solvent Resistant
MIL-STD-290	Packaging, Packing and Marking of Petroleum Products
MIL-DTL-81381	Wire, Electric, Polyimide-Insulated, Copper or Copper Alloy
FED-STD-595	Colors Used in Government Procurement

2.4 U. S. Government Printing Office Publications:

Available from Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

Environmental Protection Agency (EPA), National Emissions Standards for Hazardous Air Pollutants (NESHAP): 40 CFR, Chapter I, Subchapter C, Part 63, Subpart GG National Emission Standards for Aerospace Manufacturing and Rework Facilities

Section 63.741	Applicability and designation of affected sources
Section 63.742	Definitions
Section 63.744	Standards: Cleaning operations

2.5 PRI Publications:

Available from PRI, 161 Thornhill Road, Warrendale, PA 15086-7527, www.pri.sae.org

PD 2000 Procedures For An Industry Qualified Product Management Process
 PRI-QPL-AMS3167 Products Qualified Under AMS 3167

3. TECHNICAL REQUIREMENTS:

3.1 Material:

The wipe solvent shall be a liquid formulated to meet the requirements of this specification.

3.2 Properties:

The wipe solvent shall conform to the requirements found in Table 1.

TABLE 1 - Properties

Paragraph	Property	Requirement	Test Method
3.2.1	Refractive Index	± 2% of qualification test value*	ASTM D 1218
3.2.2	Density	± 2% of qualification test value*	ASTM D 1475
3.2.3	Acidity	0.05% maximum, expressed as acetic acid	ASTM D 1613
3.2.4	Vapor Pressure, mm Hg	Defined by Form and Class, Ref 1.3	4.5.6
3.2.5	VOC, grams/L	Defined by Form and Class, Ref 1.3	ASTM D 3960
3.2.6	Flash Point	Defined by Form and Class, Ref 1.3	ASTM D 56
3.2.7	Nonvolatile Matter	5mg/100 ml maximum	4.5.7
3.2.8	Stress Corrosion , Ti 6-4 titanium	No Failure/Breakage	ASTM F 945, Method A
3.2.9	Sandwich Corrosion	Shall not cause a corrosion rating greater than one (1) on any test panel	4.5.8
3.2.10	Total Immersion Corrosion	Weight Change less than 0.03 mg/cm ² /24 hrs; no pitting, corrosion or heavy stain	4.5.9
3.2.11	Dissimilar Metal Corrosion	No pitting, etching, or formation of corrosion products on faying surfaces of panels above and beyond those formed on control panels	4.5.10
3.2.12	Hydrogen Embrittlement	No rupture of specimens	4.5.11

TABLE 1 (con't.)

Paragraph	Property	Requirement	Test Method
3.2.13	Type 1: Cleaning prior to painting – removal of contaminants	No separation of primer from substrate or separation of topcoat from primer	4.5.12.1
3.2.14	Type 2: Cleaning prior to sealant – removal of contaminants	20 lbf/inch width (3580 N/m), 100% cohesive failure for AMS 3276 Sealant 8 lbf/inch width (1401 N/m), 100% cohesive failure for AMS 3375 Sealant	4.5.12.2
3.2.14.1	Type 2: Removal of Uncured Sealant	Sealant removal Same as control wipe solvent	4.5.12.3
3.2.14.2	Type 2: Removal of AMS 3100 Adhesion Promoter	Promoter removal same as control wipe solvent	4.5.12.4
3.2.15	Effects on Painted Surfaces	No more deterioration than with the control wipe solvent	4.5.13
3.2.16	Effects on Fuel Tank Sealants	No more deterioration than with the control wipe solvent	4.5.14
3.2.17	Effects on Carbon/Epoxy Composites	Solvent shall not cause a greater loss in interlaminar shear strength than the control solvent	4.5.15
3.2.18	Effects on Polyimide Insulated Wire	No dielectric leakage, no visual effect greater than that of distilled water	4.5.16
3.2.19	Cold Storage Stability	All components shall be miscible	4.5.17

* "Qualification Test Values" shall be obtained from Qualification Test Report (ref 4.2.2)

3.3 Shelf Life Stability:

When stored in its original unopened container at 80 °F (27 °C) or below, the material shall retain properties capable of meeting all Table 1 requirements for at least 12 months from date of packaging.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The manufacturer of the wipe solvent shall supply all samples for supplier's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests:

- 4.2.1 Acceptance Tests: Tests for the requirements in Table 2 are acceptance tests and shall be performed on each lot. A lot shall be all wipe solvent produced in a single production run under the same fixed conditions and presented for vendor's inspection at one time.