INCH-POUND

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MILITARY SPECIFICATION

BAFFLE MATERIAL, EXPLOSION SUPPRESSION, EXPANDED ALUMINUM MESH, FOR AIRCRAFT FUEL TANKS

This specification is approved for use by the Department of the Air Force 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 a coarse-pore expanded aluminum mesh baffle material for explosion suppression in aircraft fuel tanks and dry bay areas (cavities).

1.2 Classification. The expanded aluminum mesh shall be of the grades, types, and classes specified herein.

1.2.1 Grades

1.2.1.1 Grade 1. Untreated

1.2.1.2 Grade 2. Treated (Chromate Conversion Coating)

1.2.2 Types

1.2.2.1 Type I. 1.5 Mil foil, nominal 1.6 lb/ft^3 (25.6 kg/m^3)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: ASC/ENOSD, Bldg 125, 4335 Seventh St, Suite 6, Wright-Patterson AFB OH 45433-7809, 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 1560

1.2.2.2 Type II. 2 Mil foil

1.2.2.2.1 Type II, Class A. nominal 1.9 lb/ft^3 (30.4 kg/m^3)

1.2.2.2.2 Type II, Class B. nominal 2.1 lb/ft^3 (33.6 kg/m^3)

1.2.2.3 Type III. 3 Mil foil

1.2.2.3.1 Type III, Class A. nominal 2.5 lb/ft^3 (40.0 kg/m^3)

1.2.2.3.2 Type III, Class B. nominal 3.0 lb/ft^3 (48.0 kg/m^3)

2. APPLICABLE DOCUMENTS

2.1 Government documents

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see *6.2*).

SPECIFICATIONS

FEDERAL

L-P-378	-	Plastic, Sheet and Strip, Thin Gauge, Polyolefin
TT-S-735	-	Standard Test Fluids, Hydrocarbon
PPP-B-636	-	Boxes, Shipping, Fiberboard

MILITARY

MIL-P-116	-	Preservation, Methods of
MIL-C-5541	-	Chemical Conversion Coatings on Aluminum and Aluminum Alloys
MIL-T-5624	-	Turbine Fuel, Aviation, Grades JP-4, JP-5, and JP-5/JP-8 ST
MIL-T-6396	-	Tanks, Aircraft Propulsion Fluid System, Internal, Removable, Non-Self-Sealing
MIL-S-8802	-	Sealing Compound, Temperature-Resistant, Integral Fuel Tanks and Fuel Cell Cavities, High Adhesion
MIL-I-27686	-	Inhibitor, Icing, Fuel System
MIL-C-27725	-	Coatings, Corrosion-Preventive, for Aircraft Integral Fuel Tanks

STANDARDS

MILITARY

MIL-STD-129	-	Marking for Shipment and Storage
MIL-STD-831	-	Tests Reports, Preparation of
MIL-STD-2073-1	-	DoD Materiel, Procedures for Development and Application of Packaging Requirements

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Bldg 4D, 700 Robbins Avenue, Philadelphia PA 19111-5094.)

2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see *6.2*).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D2276	-	Fuels, Aviation Turbine, Particulate Contaminant In

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

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of Precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets, or MS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified, a sample shall be subjected to first article inspection (see *6.4*) in accordance with the quality assurance provisions given in *section 4*.

3.2 Materials. The aluminum alloy foil used in producing the expanded metal mesh shall conform to the Aluminum Association, Incorporated, 3003 H24 or 3010 H24. The Grade 1 foil shall be untreated. The Grade 2 foil shall be coated with a chromate conversion coating conforming to *MIL-C-5541*.

3.3 Physical properties and characteristics. The physical properties and characteristics of the suppression material shall be in accordance with *table I*. The product supplied under this specification shall be of the same quality and manufacturing process as that used in the first article samples. The end product shall be expanded mesh for use in aircraft fuel tanks to suppress pressure build-up and explosions due to ignition of vapor/air mixtures.

TABLE I. Physical properties and characteristics

PROPERTY	REQUIREMENTS					Test
	Type I	Type II		Type III		
		Class A	Class B	Class A	Class B	
Foil Thickness	1.5 mil	2 mil	2 mil	3 mil	3 mil	
Density Range, lb/ft^3 (kg/m^3)	1.5 - 1.7 (24 - 27)	1.7 - 2.0 (24 - 32)	2.0 - 2.3 (32 - 37)	2.3 - 2.7 (37 - 43)	2.7 - 3.2 (43 - 51)	4.4.1.3
Nominal Density, lb/ft^3 (kg/m^3)	1.6 (26)	1.9 (30)	2.1 (34)	2.5 (40)	3.0 (48)	
Cell Count, No./in.	3.5 ± 0.2	3.1 ± 0.2	3.5 ± 0.2	3.0 ± 0.1	3.4 ± 0.2	
Layer Count, No./in. (No./cm)	13.6 ± 0.5 (5.4 ± 0.2)	13.1 ± 0.4 (5.2 ± 0.16)	13.7 ± 0.4 (5.4 ± 0.16)	12.6 ± 0.5 (5.0 ± 0.2)	13.6 ± 0.5 (5.4 ± 0.2)	
Fuel Displacement, Vol %	1.0 ± 0.2	1.0 ± 0.2	1.2 ± 0.2	1.4 ± 0.2	1.7 ± 0.2	4.4.1.4
Fuel Retention, Vol %	1.0 max	0.7 ± 0.1	0.9 ± 0.1	0.6 ± 0.2	0.8 ± 0.1	4.4.1.5
Water Retention, Vol %	1.4 max	0.8 ± 0.2	1.2 ± 0.2	1.0 ± 0.2	1.3 ± 0.2	4.4.1.6
Entrained Solid Contamination, mg/ft^3 (mg/m^3)	14.0 max (500)	14.0 max (500)	14.0 max (500)	14.0 max (500)	14.0 max (500)	4.4.1.7

3.3.1 Run of material. A run of material shall be any continuous batch of product or a machine run produced over any continuous time period the maximum run time being a 12-hour period. When production is interrupted for 2 or more hours, this shall constitute a new run.

3.3.2 Lot. A lot of material shall be 15 machine runs of a product.

3.3.3 Length. The length dimension shall lie in the direction of expansion of the web.

3.3.4 Width. The width dimension shall lie in the direction of machine travel of the web.

3.3.5 Thickness. The thickness dimension shall lie in the direction of the batt, i.e., the layer dimension.

3.4 Batts. The end product shall be formed into batts, as follows. The foil shall be slit longitudinally such that the resultant web, when expanded laterally forms a mesh of hexagonally shaped openings. The expanded foil shall be folded to form a batt having small contiguous apertures.

3.4.1 Standard batt size. Unless otherwise specified (see *6.3*), suppression material shall be produced in standard size batts, 36 x 22 x 12 inches (91.4 x 55.8 x 30.5 cm).

3.4.2 Optional batt sizes. When specified (see *6.3*), batt sizes shall be made with the following maximum dimensions:

3.4.2.1 Optional batt size Type I - 37 x 36 x 18 inches (94 x 91.4 x 45.7 cm).

3.4.2.2 Optional batt size Type II, Class A - 42 x 36 x 18 inches (106.7 x 91.4 x 45.7 cm).

3.4.2.3 Optional batt size Type II, Class B - 38 x 36 x 18 inches (96.5 x 91.4 x 45.7 cm).

3.4.2.4 Optional batt size Type III, Class A - 44 x 36 x 18 inches (111.7 x 91.4 x 45.7 cm).

3.4.2.5 Optional batt size Type III, Class B - 39 x 36 x 18 inches (99 x 91.4 x 45.7 cm).

3.4.3 Tolerances. Production tolerance limits on both standard and optional batt sizes shall be as follows:

3.4.3.1 Length - +1, -0 inches (+2.54, -0 cm).

3.4.3.2 Width - ±1/4 inches (±0.64 cm).

3.4.3.3 Thickness - ±1/8 inches (±0.32 cm).

3.5 Performance requirements. The expanded aluminum mesh explosion suppression baffle material shall meet the requirements specified herein.

3.5.1 Combustion overpressure (explosion suppression). The combustion overpressure shall be as follows:

3.5.1.1 Type I - Maximum combustion pressure increase shall not exceed 20 psi when combustion volume (Vc) = 5 Volume Percent: Initial Pressure (Ip) = 3 psig.

3.5.1.2 Type II, Class A - Combustion pressure increase shall not exceed 20 psi when Vc = 5 Volume Percent and Ip = 3 psig.

3.5.1.3 Type II, Class B - Combustion pressure increase shall not exceed 15 psi when Vc = 10 Volume Percent and Ip = 3 psig.

3.5.1.4 Type III, Class A - Combustion pressure increase shall not exceed 18 psi when Vc = 10 Volume Percent and Ip = 3 psig.

3.5.1.5 Type III, Class B - Combustion pressure increase shall not exceed 15 psi when Vc = 10 Volume Percent and Ip = 3 psig.

3.6 Slosh requirements. The baffle matterial shall meet the slosh tests contained in section 4.

3.7 Storage life. The storage life of the suppression material covered by this specification shall not be limited.

3.8 Identification of product. The suppression material shall be sealed in a clean polyethylene bag (see *5.1*) as it comes off the production line. A labeled card shall be provided inside the bag which clearly identifies the manufacturer's part number, date of manufacture, production run number, batt number, and size. When applicable, the government contract or order number shall be included. There shall be no color coding or marking on the batt surface.

3.9 Workmanship. The suppression material shall be fabricated in accordance with high-grade manufacturing practices covering this type of material. The material shall meet the requirements of this specification and shall be free of defects which affect its performance. It shall be of a uniform appearance and free from tears, voids or rips.

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 (examinations and tests) 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 ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of *sections 3 and 5*. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of tests. The inspection and testing of the suppression material specified herein are classified as follows:

a.	First article tests	see *4.4*
b.	Quality conformance tests	see *4.5*

4.3 Test conditions

4.3.1 Temperature and humidity. Unless otherwise specified herein, all tests shall be conducted under conditions of 73° ±5°F (22.7° ±28°C) and 50 ±5 percent relative humidity. Prior to physical property testing, specimens shall be preconditioned in the test environment a minimum of 30 minutes.

4.3.2 Test fluids. Unless otherwise specified (see *6.3*), the test fluids shall be of known properties and certified in accordance with the referenced military specification. The turbine fuels conforming to *MIL-T-5624* can be obtained from the procuring activity along with a certified test report defining, as a minimum, the specific gravity, distillation, and existent gum. This test report shall be included in the first article test reports.

4.3.3 Specimen cutting. Unless otherwise specified (see *6.3*), specimen cutting shall be by reciprocating blade, band saw cutting, or other suitable means.

4.4 First article testing. The test specimen shall be a batt which has been made along with the regular production batts. Three replicates shall be used for each test except foil thickness, density, and cell count. The material shall be representative of the mid range in density. If any value of the three test replicates deviates by more than 20 percent from the average value, two additional replicates shall be tested and the average of five value shall be reported.

4.4.1 First article tests. The first article tests shall consist of foil thickness density, cell and layer count, fluid displacement, fluid retention, water retention, entrained solid contamination, combustion overpressure, and slosh/vibration.

4.4.1.1 Disposition of test specimens. When requested (see *6.3*) all test specimens used in the first article tests shall be made available, as well as the following: a standard size batt from the first article test run; 5 inch cube retention samples from each type and class; a specimen of a size suitable for the explosion suppression test (see *4.4.1.8*).

4.4.1.2 Examination of product. Each finished batt of material shall be visually inspected for consistency of aperture structure; voids, rips and tears; local concentrations; surface imperfections; and for dimensional tolerances specified in *3.4.3* prior to final packaging.

4.4.1.3 Density test. One test specimen shall be tested for all but first article as follows: for first article, three specimens shall be tested. The specimen shall be a 12 x 12 x 12 inch (30.5 x 30.5 x 30.5 cm) cube cut from a standard size batt. It shall be weighed and the result reported to the nearest 0.1 lb/ft^3 (1.6 kg/m^3).

4.4.1.4 Fuel displacement tests. Three samples per test shall be run using grade JP-5 turbine fuel conforming to *MIL-T-5624*, and the average reported as the fuel displacement. The test shall be conducted under standard conditions using a standard 1,000 milliliters (ml) capacity cylinder having 5 to 10 ml graduations. Each specimen shall be cut into a cylindrical shape having a diameter equal to that of the graduated cylinder and a length which fills the test cylinder to the 900 ml mark. Fuel shall be added to the 900 ml mark in the graduated cylinder and the specimen slowly added until it is completely immersed. The new fluid level shall be noted and the increase in milliliters shall be recorded. The size of each specimen shall be measured and recorded. The displacement shall be calculated as follows:

$$\text{Percent Volume Displacement} = \frac{\text{Milliliters increase}}{\text{Original fluid volume}} \times 100$$

4.4.1.4.1 Calculated fuel displacement. The theoretical volume displacement of the material as calculated from the following formula and based on the material density specified in *4.4.1.3* shall be reported:

$$\text{Percent Displacement (Volume)} = \frac{\text{Material density}}{\text{Density of solid raw material}} \times 100$$

4.4.1.5 Fuel retention test. Fuel retention shall be determined on a 6 x 6 x 6 inch (15.2 x 15.2 x 15.2 cm) specimen using grade JP-5 turbine fuel conforming to *MIL-T-5624* having a specific gravity of 0.788 to 0.845. Two specimens shall be cut from the center of the test section directly adjacent to each other. These shall be used for the fuel and water retention tests. One specimen shall be tested for fuel retention in accordance with the following procedure, and all applicable data shall be recorded:

a. The specimen shall be preconditioned at a temperature of 74° ±3°F (23.3° ±1.7°C) for a minimum of 30 minutes, weighed to the nearest 0.1 gram, and the dimensions measured to the nearest 0.1 inch (0.25 cm). The grade JP-5 test fluid shall be prefiltered through a 0.8 micron filter (Millipore Filter Corporation, or equal) and then preconditioned at the test temperature. Just prior to use, the fluid shall be tested for specific gravity (density) and temperature.

b. The retention test apparatus shall be sized to approximately 7 x 7 x 10 inches (17.8 x 17.8 x 25.4 cm) and shall have a means of draining the fuel from the bottom at the rate of 500±50 cc/minute. The test fluid shall be charged into the container to a level which corresponds to approximately 0.5 inch (1.27 cm) above the top of the specimen.

c. The specimen shall be slowly placed into the container such that the specimen is oriented with the layers horizontal, supported off the bottom of the container by two glass rods, and spaced 0.5 inch (1.27 cm) from all sides of the container. Fuel shall then be drained at the prescribed rate until flow ceases and the specimen then allowed to drain in this position for an additional 2 minutes.

d. The specimen shall be carefully removed from the container and weighed to the nearest 0.1 gram. Using the specimen weights before and after fluid wetting in grams, specimen volume in cubic centimeters, and fuel density in grams per cubic centimeter, the percent volume retention shall be calculated as follows:

$$\text{Percent Retention} = \frac{\text{(Wet Specimen Weight–Dry Specimen Weight)}}{\text{Specimen Volume X Density of Fuel}} \times 100$$

e. All values, including test fluid temperatures, shall be reported.

4.4.1.6 Water retention test. The other test specimen shall be used to determine the volume percent water retention using the same procedure. The test fluid shall be distilled water which has been tested for temperature and density just prior to use.

CAUTION: Do not run more than two tests per batch of water.

4.4.1.7 Entrained solid contamination tests. Solid contamination tests shall be conducted on a cylindrical specimen of layered material having dimensions of 8-1/4 inches (20.96 cm) in diameter and 8 inches (20.32 cm) in height. The 8 inch (20.32 cm) dimension shall be cut in the direction of layers (batt-height). For material having more than 8 inches (20.32 cm) in batt height, the specimen shall be taken from the lower portion of the test section. Testing shall be conducted using a U.S. Testing Company model 6523 dry cleaning machine having a tumbler rotation speed of 45 rpm. The specimen shall be positioned in the center of the tumbler. The test cycle shall be 5 minutes using a 4-liter charge of Type I fluid conforming to *TT-S-735* which has been prefiltered through a 0.8 micron Millipore Filter Corporation filter, or equal. Upon completion of the test cycle, the specimen shall be positioned slightly above the fluid level and allowed to drain for 5 minutes prior to removal. The test fluid shall then be tested for level of solid contamination in accordance with appendix A2 (Laboratory Filtration) of *ASTM D2276*. Following filtration of the test fluid and just prior to removal of the filter pad from the apparatus, the filter and contamination shall be neutralized of static charge with a Nuclear Products Company model 2U500 air deionizer, or equivalent (see *6.5*). This step shall preclude the loss of particles from the filter pad during transfer to the drying oven. Each filter used shall be dried at 194°F (90°C) for a minimum of 15 minutes and then cooled for a minimum of 15 minutes. A minimum of one control filter shall be run for each set of samples. Test results shall be reported in milligrams per cubic foot of material.

4.4.1.8 Explosion suppression (pressure increase or combustion overpressure). If required by the procuring activity (see *6.3*), explosion suppression (pressure increase) characteristics of the suppression material shall be defined using a small scale flame tube type apparatus having a minimum total volume of 5 ft^3 (0.14 m^3) and a 100 in^2 (0.06 m^2) cross-sectional area. The following parameters shall be met in all testing:

a. Stoichiometric propane/air mixture (4.5 to 5.1 percent propane) shall be verified by bomb sampling.

b. Spark ignition source shall have a minimum of 0.25 millijoules energy.

c. Dry suppression material shall be in the lower half of the density range.

d. Instrumentation shall measure and include: pressure rise; combustion temperature indication; and visual, photographic, or photocell indication of flame propagation.

e. Combustion relief area shall be 80 percent of cross-sectional area or greater. The material used for the testing shall be taken from given batts which have been tested to establish density and expansion characteristics. The material shall always be oriented in the test apparatus to permit flame penetration normal to the layers of material.

f. The material shall always be sized to fit snugly when installed and restraints used to avoid material movement during testing. The combustible mixture on each test shall be verified by bomb sampling and shall meet the following minimum criteria for pressure rise:

$P_{(min)} = (8XP_0)$ 0.7, where P_0 = initial pressure of system in psia. The following definitions shall apply (see *figure 1*):

Vc = Combustion (Ignition) volume

Vs = Suppression Material volume

Vt = Total volume of apparatus = Vc + Vs

g. The following testing shall be conducted, and all data and results shall be reported for each test condition (see *figure 1* for typical explosion suppression apparatus): Single void ignitions shall be conducted at 0 and 3 psig initial pressure with percent combustion volumes (percent Vc) of:

0, 10, 20, 30, and 40 volume percent.

h. A minimum of two tests shall be conducted for a given condition and all data such as bomb and system pressure rise, test temperature, extent and location of suppression material damage, and any other related information shall be made available. A plot of pressure rise versus (percent) combustion volume shall be submitted for each initial pressure condition. Repeat tests may be conducted on the material provided the damaged portions are replaced after each test. All tests shall be conducted at standard temperatures and conditions.

4.4.1.9 Slosh testing. Slosh testing shall be conducted on tanks packed with the explosion suppression material. At the end of each test the batts of material shall be carefully removed for inspection. The physical integrity of the batts shall be maintained and batts shall not shrink more than 2 percent in any dimension. Total suppression material breakdown in any of the tests shall not exceed 0.3 percent by weight of the total material installed. Abrasion to tank coating and sealant materials shall be minimal and the effect shall not be detrimental to the operation of the fuel system. Any abrasion to the tank wall shall not have any influence on the fuel tanks performance.

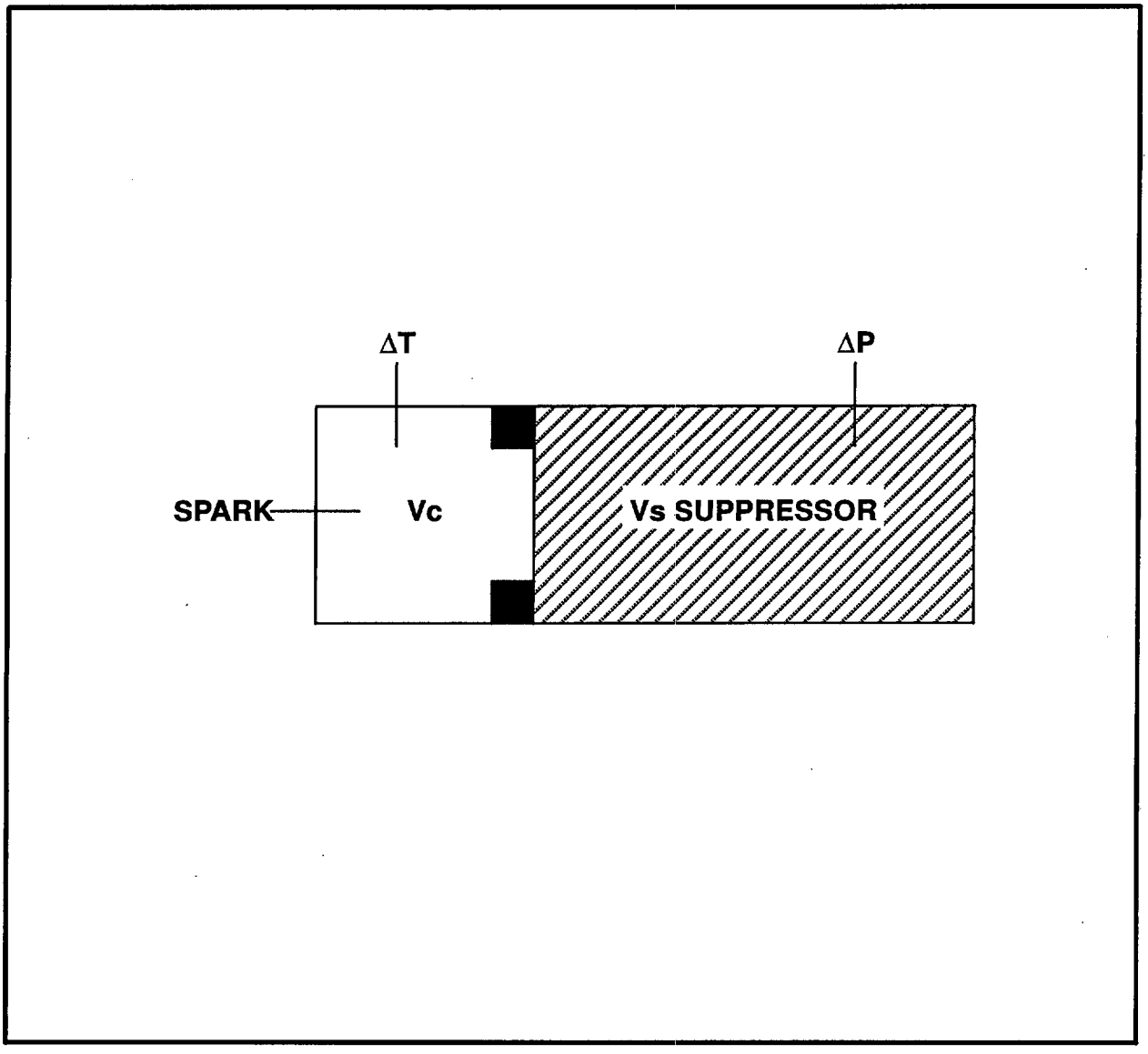

FIGURE 1. Explosion Suppression Apparatus

4.4.1.9.1 Metal tank slosh test. A tank slosh test shall be performed in a metal fuel tank conforming to *MIL-T-6396*, Type I. The tank, complete with all internal components and plumbing, shall be packed with the suppression material of the type under examination and typical of future production with regard to physical properties and method of installation. Material dimensions and weights shall be recorded and the installation documented by photographic evidence. The tank shall be coated internally with test patches of topcoating and sealant in accordance with *MIL-C-27725* and *MIL-S-8802*, Classes A and B respectively. The test patches shall be on the bottom of the tank and not be smaller than 6 inches (15.2 cm) wide and 2 ft^2 (0.18m^2) in area for the topcoating and 6 x 6 inches (15.2 x 15.2 cm) for each class of sealant. The test patches shall be in direct contact with the suppression material. The test tank shall be mounted in a support jib to simulate pitching in the actual aircraft. The support jig shall be rigidly mounted on a rocker assembly of a design acceptable to the procuring activity (see *6.2*).

4.4.1.9.1.1 Test conditions. The tank shall be two-thirds filled with the test fluid defined in *4.3.2*. The test shall be conducted with the test fluid at room temperature and under ambient pressure conditions. The slosh rocking angle shall be 30 degrees total, approximately 15 degrees on either side of the horizontal position. The test duration and procedure shall be:

a. slosh for 25 hours at 16 to 20 slosh cpm, or

b. slosh for 40 hours at 10 to 16 slosh cpm.

4.4.1.9.1.2 Test results. On completion of the test, the suppression material shall be removed and inspected for damage, shrinkage, and breakdown. The interior surface of the tank and coating sealant patches shall be inspected for evidence of abrasion and damage. Results and observations shall be noted and the condition of test articles documented by photography. All fragments of material shall be collected and weighed. An analysis shall be made, if necessary, to distinguish suppression material fragments from sealant/coating/tank material. Material dimensions shall be recorded, and all of the data shall be included in the first article test report.

4.4.1.9.2 Bladder tank slosh vibration test. A slosh test shall be conducted on a bladder tank conforming to *MIL-T-6396*, Type II, Class A. The tank shall be fully packed with the suppression material of the type under examination and typical of future production with regard to physical properties and method of installation. Material dimensions and weights shall be recorded and the installation documented by photographic evidence. Testing shall be conducted per *MIL-T-6396, 4.6.6.4,* except:

a. All lines and components external to the tank shall be excluded.

b. The fuel temperature and operating pressure shall be ambient.

4.4.1.9.2.1 Test results. At the conclusion of the bladder tank slosh vibration test, the material shall be removed and inspected for damage, shrinkage, and breakdown. The interior surface of the tank shall be inspected for evidence of abrasion and damage. Results and observations shall be noted and the condition of test articles documented by photography. Any fragments of material shall be collected and weighed. An analysis shall be made, if necessary, to distinguish suppression material fragments from tank material. Material dimensions shall be recorded, and all of the data shall be included in the first article test report.

4.4.2 Inspection of preparation for delivery. Inspection of the preservation, packaging, packing, and marking for shipment shall be in accordance with the requirements of *section 5*.

4.4.3 First article test report, disposition of test specimens, and data. The following shall be furnished as a first article package:

4.4.3.1 Test report. A first article test report shall be prepared in accordance with *MIL-STD-831* and shall include the following:

a. A tabulation of all first article test data including production test data on the first article material run. All values obtained shall be included as well as sample calculations.

b. Details of any failures.

4.4.3.2 Test specimens. When requested (see *6.3*), all test specimens used in the first article tests shall be made available, as well as the following:

a. A standard size batt (see *3.4.1*) from the first article test run.

b. Retention samples (6 x 6 x 6 inches) (15.2 x 15.2 x 15.2 cm) near the low, middle, and top of the density range for each type and class.

c. Material from the first article test run cut to size for the explosion suppression tests specified in *4.4.1.8* .

4.5 Quality conformance tests. Quality conformance tests shall consist of visual examination, density, entrained solid contamination, and inspection for preparation for delivery. Quality conformance tests shall be conducted on each run of material produced (see *3.3.1*) except that the entrained solids contamination test (*4.4.1.7*) shall be conducted on each lot (see *3.3.2*). The minimum testing frequency shall be every one hundred standard size batts (see *3.4*), or an equivalent volume thereof when producing various sizes. The following visual examinations and tests shall be conducted:

a. Prior to slitting the raw material, conformance to the required alloy shall be determined as well as the thickness and web width.

b. The raw material shall be visually inspected to ensure that perforations and damaged edges do not exist prior to slitting.

c. At the start of slitting, a cut off portion of the material shall be taken and manually expanded to ascertain that the rotary knives are cleanly penetrating the foil.

d. During the expanding operation, a visual check shall be made to determine that all apertures are open and rips, tears and voids are absent.

e. During the fan folding operation, the creases shall be kept aligned and batt dimensions shall be maintained within the specified tolerances.

5. PACKAGING

5.1 Preservation - packaging. The suppression material (batts), shall be preserved and packaged in accordance with *MIL-P-116*, method III. The finished material (batts), shall be enclosed and sealed in a 4-mil polyethylene (plastic) wrap/bag conforming to *L-P-378*, type I, class I, grade B. If tape sealing is used it shall be Permacel Masking Tape 785, or equal.

5.2 Packing. Packing shall be level A, B, or C as specified (see *6.3*).

5.2.1 Level A. Batts, preserved and packaged as specified in *5.1*, shall be packed in a weather-resistant exterior container selected from and in accordance with *MIL-STD-2073-1*.

5.2.2 Level B. Batts, preserved and packaged as specified in *5.1*, shall be packed as specified in *5.2.1* except, containers shall be of the domestic type. If containers conforming to *PPP-B-636* are used, the total size limitation specified may be waived.

5.2.3 Level C. Batts, preserved and packaged as specified in *5.1* shall be packed in a manner to ensure acceptance by common carrier and afford protection against physical and mechanical damage during shipment from the supply source to the first receiving activity for immediate use. This level shall comply with uniform freight classification rules and regulations or other carrier regulations as applicable to the mode of transportation.

5.3 Marking. Marking shall be in accordance with *MIL-STD-129*. The nomenclature shall be as follows:

BAFFLE MATERIAL, AIRCRAFT FUEL TANK

5.3.1 Additional marking. In addition to the nomenclature, each unit package or container shall contain the following information:

Specification No.
Suppression Material: Grade, Type, Class
Manufacturer's Part No.
Date of Manufacture

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The suppression material covered by this specification is intended for use in aircraft fuel tanks and dry bay areas (cavities), using hydrocarbon fuels at all service temperatures, for explosion suppression.

6.1.1 Storage life. The suppression material covered by this specification should be maintained in the original sealed polyethylene bag (see *5.1*) to keep it free of dirt or other contaminants. The material should be inspected for evidence of damage or surface deterioration prior to use.

6.2 Issue of DODISS. When this standard is used in acquisition, the applicable issue of the DODISS must be cited in the solicitation (see *2.1.1* and *2.2*).

6.3 Acquisition requirements. Acquisition documents should specify the following:

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

b. Grade, type, and class of explosion suppression material required (see *1.2*).

c. Batt size(s) required (see *3.4.1* and *3.4.2*).

d. Use of test fluids and availability of turbine fuels and certified test report (see *4.3.2*).

e. Whether special specimen cutting is required (see *4.3.3*).

f. Whether test specimens are required for submission (see *4.4.1.1* and *4.4.3.2*).

g. Whether explosion suppression (pressure increase or combustion overpressure) is required (see *4.4.1.8*).

h. Acceptance of test design for metal tank slosh test (see *4.4.1.9.1*).

i. Level of packing required (see *5.2*).

6.4 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a preproduction sample, a first article sample, a first production item, a sample selected from the first production items, a standard production item from the contractor's current inventory (see *3.1*), and the number of items to be tested as specified in *4.4*. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.5 Air deionizer. An available source for the model 2U500 air deionizer specified in *4.4.1.7* is the Nuclear Products Company, 2519 N. Merced Avenue, South El Monte, California 91733.

6. 6 Subject term (key word) listing

baffle material
explosion suppressant
suppression material

6.7 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:
Air Force - 11

Review activities:
Air Force - 99

Preparing activity:
Air Force - 11

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