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SUPERSEDING
CmlC Tent. 196-131-102
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MILITARY SPECIFICATION

OIL, INCENDIARY, IM, TYPE I

1. SCOPE

1.1 This specification covers one type of incendiary oil prepared from isobutyl methacrylate, stearic acid, unslaked lime, gasoline, and water.

2. APPLICABLE DOCUMENTS

2.1 The following specifications, of the issue in effect on date of invitation for bids, form a part of this specification:

SPECIFICATIONS

FEDERAL

VV-G-101	-	Gasoline; Motor, U.S. Government.
VV-L-791	-	Lubricants, Liquid Fuels, and Related Products; Methods of Inspection, Sampling, and Testing.

MILITARY

MIL-A-271	-	Acid, Stearic.
JAN-I-711	-	Incendiary Oils, Consistency of; Test Procedures.
MIL-I-10903	-	Isobutyl Methacrylate Polymer, AE
MIL-L-12056	-	Lime, Unslaked (For Chemical Purposes).

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

3. REQUIREMENTS

3.1 Composition.- The incendiary oil shall be a uniform mixture of the ingredients in the proportions specified in table I.

Table I.- Composition

Ingredient	Parts by Weight
Stearic Acid	5.0 ± 0.2
Isobutyl Methacrylate	3.0 ± 0.3
Unslaked Lime	2.0 ± 0.3
Gasoline	88.8 ± 0.5
Water	1.2 ± 0.1

3.2 Materials.

3.2.1 Stearic Acid.- The stearic acid shall conform to grade 1 of Specification MIL-A-271 except that there shall be no requirement for iodine number (see 6.7).

3.2.2 Isobutyl methacrylate.- The isobutyl methacrylate shall conform to Specification MIL-I-10903.

3.2.3 Unslaked lime.- The unslaked lime shall conform to grade A of Specification MIL-L-12056, and shall be of such particle size that 100 percent of the material will pass through a No. 40 U.S. Standard sieve.

3.2.4 Gasoline.- The gasoline shall conform to Specification VV-G-101 and in addition shall conform to the following requirements:

a. The gasoline shall have an aniline point of 120 ± 5°F. when tested as specified in method 3601.3 of Specification VV-L-791 (see 6.4).

b. The gasoline shall have a Reid vapor pressure of not less than 10 pounds when tested as specified in method 1201.4 of Specification VV-L-791 (see 6.5).

c. The gasoline shall have an oxidation stability of not less than 480 minutes when tested as specified in method 3352.3 of Specification VV-L-791 (see 6.6).

3.3 Physical characteristics.- The physical characteristics of the incendiary oil shall conform to table II.

Table II.- Physical characteristics

	Minimum	Maximum	Test Paragraph
Elasticity (degrees)	220	300	4.4.1
Consistency (minutes)	1.0	3.0	4.4.1

3.4 Separation.- The gel shall show 0 percent separation at -40°F. and 125°F., when tested as specified in 4.4.2.

4. QUALITY ASSURANCE PROVISIONS

4.1 Lot.- Each manufacturing batch shall constitute a lot (see 6.3).

4.2 Sampling.- A representative 1-pint specimen shall be taken from each batch (see 6.3) by the Government inspector, placed in a clean, dry container and sealed with a vapor tight seal. The container shall be labeled to identify the specimen with the lot represented.

4.3 Inspection.

4.3.1 Materials and components.- The inspector shall ascertain that all materials used in the preparation of the incendiary oil, covered by separate specifications or standards, are in accordance with the applicable specifications or standards prior to final acceptance of the incendiary oil.

4.4 Tests.

4.4.1 Elasticity and consistency.- The elasticity and consistency shall be determined in accordance with method 400 of FTM-I-711.

4.4.2 Separation.

4.4.2.1 At - 40°F. - Weigh about 15 grams of the specimen into a tared test tube of suitable size. Stopper and allow to stand in a vertical position in a bath maintained at - 40 ± 5°F. for 4 hours. Carefully remove the test tube, and immediately pour off any supernatant liquid. Allow to come to room temperature in a desiccator, and weigh.

$$\text{Percent separation at } -40°\text{F.} = \frac{\text{Loss in weight} \times 100}{\text{weight of sample}}$$

4.4.2.2 At 125°F.- Place about 15 grams of the specimen in a test tube and store, in a vertical position, for 40 hours at 125 ± 5°F. Visually examine the material for any evidence of separation.

4.5 Rejection.- If the specimen fails to conform to this specification the lot represented shall be rejected.

5. PREPARATION FOR DELIVERY

5.1 Packaging, packing, and marking.- Packaging, packing, and marking are not applicable to this specification.

6. NOTES

6.1 Intended use.- The material covered by this specification is intended for use as a fill for incendiary munitions.

6.2 Ordering data.- Procurement documents should specify the title, number, and date of this specification.

6.3 Batch.- A batch is defined as that quantity of material which has been subjected to some unit chemical or physical mixing process intended to make the final product substantially uniform.

6.4 Benzene, conforming to Specification VV-B-231 may be added to gasoline with aniline points above 110°F, in a quantity to bring the aniline point to 110°F. For each 1 percent of benzene added, the aniline point of the blend will be reduced by 1.6°F.

6.5 Butane may be added if necessary to raise the Reid vapor pressure to 10 pounds. For each 1.8 percent of butane added to the blend, the vapor pressure will rise approximately 1 pound.

6.6 To obtain the required oxidation stability it is recommended that a gasoline antioxidant of approximately the following composition by weight be used:

50 percent n or iso-butyl-para-aminophenol
30 percent anhydrous isopropanol
20 percent anhydrous methanol

The active ingredient concentration of the antioxidant should be not greater than 35 pounds per 1,000 barrels (42,000 gallons) of the finished gasoline.

6.7 Fatty acids conforming to Specification MIL-F-10943 may be used as a substitute for stearic acid.

6.8 Sampling and testing.- When the contractor consistently produces high quality material and operates under a system of quality control acceptable to the Government, the Government, at its discretion, may modify in whole or in part the sampling and testing procedures specified herein. However, the Government reserves the right to return at any time, without previous notice to the contractor, to the sampling and testing procedures specified in this specification.

Patent notice.- When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Custodian:

Army - Chemical Corps