

IMPREGNITE I

A. APPLICABLE SPECIFICATIONS AND DRAWINGS.

A-1. The latest issue of the following specification and of the specifications and drawings listed in the bill of material on C.W.S. Drawing No. B18-4-1, in effect on date of invitation for bids, shall form a part of this specification:

Standard Specifications for Marking Shipments - U.S. Army Specification No. 100-2.

B. GRADE.

B-1. This Specification covers one grade of impregnating material for protective clothing.

C. MATERIAL AND WORKMANSHIP.

C-1. Material. Not applicable (see Notes, Section H, paragraph H-1)

C-2. Workmanship. Not applicable to this specification.

D. GENERAL REQUIREMENTS.

D-1. See Section E.

E. DETAIL REQUIREMENTS.

E-1. Fineness. The finished product shall all pass a #10 U.S. Standard sieve under the test conditions specified in Section F, Paragraph F-4 hereof.

E-2. Moisture. The total moisture content of the finished product shall not be more than 0.3 per cent by weight.

E-3. Matter Insoluble in Chloroform. The finished product shall not contain matter insoluble in chloroform in excess of 4.25 per cent by weight on the dry basis.

E-4. Sodium Chloride. The finished product shall not contain sodium chloride in excess of 1 per cent by weight on the dry basis.

E-5. Active Chlorine. The active chlorine in the finished product calculated on the dry chloroform soluble basis, shall not be less than 14.00 per cent nor more than 14.80 per cent.

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F. METHOD OF SAMPLING, INSPECTION AND TESTS.

- F-1. The material and work shall be subject at all times to inspection at the place of manufacture and every facility shall be afforded Government inspectors for the prosecution of their work.
- F-2. Samples. For sampling purposes each shipment of Impregnite I shall be divided into groups consisting of from 8 to 10 containers. A sample of approximately one pound shall be taken from one container selected at random from each group. Each sample shall be divided into three equal portions and each portion shall be put into a clean dry glass bottle provided with a ground glass stopper. Each bottle shall be sealed and labeled by the inspector in a manner that will insure the identity of the sample with the group represented. The portions of the sample shall be used as follows:

One portion for making the acceptance tests specified herein.

One portion to be available for the contractor upon request.

One portion to be held as a reference sample to be used in case of dispute.

Failure of any sample to meet the requirements of this specification shall warrant the rejection of the group represented. The contractor may, however, at his expense, and in collaboration with the War Department, have the contents of each individual container sampled and subjected to the tests specified herein. All material successfully passing the requirements of this specification shall be accepted.

- F-3. Lot Size. Unless otherwise specified in purchase order or contract, a lot shall consist of 10,000 pounds of Impregnite I.
- F-4. Fineness. Compliance with the fineness requirements specified in Section E, paragraph E-1 hereof, shall be determined as follows:

Place a No. 10 U.S. Standard testing sieve, nested with a receiving pan on a standard testing sieve shaker (see Section H, paragraph H-2). Place 100 grams \pm 0.5 grams of the sample to be tested on the No. 10 sieve, cover sieve and secure in vibrating machine. Operate the machine and tapper for three minutes. The entire sample shall pass through the sieve. Replace the sample in the bottle from which it was taken.

- F-5. Moisture. The moisture content of the finished product shall be determined as follows:

Break up all lumps due to caking in the container, in the sample to be tested and pass the entire sample through a No. 30 U.S.

METHODS OF SAMPLING, INSPECTION AND TESTS.

Standard sieve to insure uniformity of the sample and return to bottle. Weigh out, accurately, a portion (approximately 5 grams) of the sample. Dry the weighed sample for four hours in an oven maintained at a temperature of 50°C. and under a partial vacuum corresponding to a pressure of not more than 80 mm. of mercury. Weigh dried sample accurately and determine loss in weight. Calculate the percentage of moisture as follows:

$$\text{Percentage moisture} = \frac{100 \times \text{loss in weight in grams}}{\text{Original weight of sample in grams}}$$

F-6. Matter insoluble in Chloroform. The chloroform insoluble matter in the finished product shall be determined as follows:

F-6a. Solvent. The chloroform used as the solvent shall be of U. S. Pharmacopoeia grade and shall be purified as follows, on the same day it is used:

Place one liter of chloroform in a two liter separating funnel and shake with three changes of distilled water, 500 cc. each. Filter the washed chloroform through dry filter paper and then dry over granular calcium chloride for one hour with occasional shaking. Remove chloroform from the calcium chloride and distill. Discard the first 100 cc. of distillate. Any chloroform, which does not give a slight blank, contains a reducing agent and shall not be used. If a blank higher than 0.20 cc. of N/10 Sodium Thio-sulphate is obtained the chloroform shall be repurified.

F-6b. Determination. Weigh out accurately a portion (approximately 2 grams) of the uniformly mixed sample and transfer it to a beaker, add 100 cc. of the purified chloroform. Filter the contents of the beaker through a dry, carefully weighed Gooch crucible, using suction, and wash the residue remaining in the crucible with another 100 cc. of the purified chloroform. Reweigh the crucible; the increase in weight is the matter insoluble in chloroform. Calculate the percentage as follows:

$$\% \text{ Insoluble} = \frac{\text{Weight of insoluble matter in grams} \times 10,000}{(\text{Weight of sample in grams}) (100 - \% \text{ moisture})}$$

F-7. Sodium Chloride. The sodium chloride content of the finished product shall be determined as follows:

Wash the residue obtained in the preceding test together with the asbestos mat from the crucible into a 250 cc. flask, with distilled water. Shake the solution continuously for three to five minutes then filter and wash filter free from chlorides. Acidify the filtrate with 3 cc. of 1:1 HNO₃ and determine the chlorides by the

METHODS OF SAMPLING, INSPECTION AND TESTS (CONT'D).

Volhard method. Calculate result on the dry basis as NaCl.

F-8. Active Chlorine. Weigh out accurately a portion (approximately 0.65 gram) of the uniform sample and transfer it to a 250 cc. glass stoppered Erlenmeyer flask, washing through a funnel with 50 cc. of chloroform, purified as specified in paragraph F-6a, hereof. Also put 50 cc. of the purified chloroform in another 250 cc. glass stoppered Erlenmeyer flask for blank determination. Gently agitate the flask containing the sample to dissolve the impregnite. Immediately after the solution is effected add 50 cc. of freshly prepared KI solution and shake vigorously for five minutes. Use same procedure for the blank determination. Prepare the KI solution so that each 50 cc. portion contains five grams KI, 45 cc. of distilled water and 5 cc. of a solution consisting of equal parts by volume of distilled water and concentrated HCl. Dissolve the KI in the water and when the solution is complete add the HCl solution thereto. The finished solution is added to the determinations immediately. Cool the flask for an instant in cold water; open flask and wash stopper and flask walls down with distilled water. Titrate the liberated iodine with 0.1N sodium thiosulfate, shaking the contents of the flask thoroughly after each addition of thiosulfate to extract the iodine from the chloroform. However, at no time should an excess of the sodium thiosulfate 0.1N, be present in the aqueous layer. Add starch indicator, when after shaking, the iodine color is slightly apparent. Titrate to the disappearance of the blue color. Subtract the number of cc's of sodium thiosulfate required by the blank determination from the cc's required in the impregnite titration and substitute the remainder in the following formula:

$$\text{Active Chlorine on Dry, Chloroform Soluble Basis} = \frac{\text{cc. Na}_2\text{S}_2\text{O}_3 \times \text{Normality Factor} \times 17728}{\text{Weight of sample} \times (100 - \% \text{ moisture}) (100 - \% \text{ insoluble matter}^*)}$$

*This is percent of insoluble matter in the undried sample and is determined by the following formula:

$$\frac{\text{Weight of Insoluble matter in grams} \times 100}{\text{Weight of undried sample in grams}}$$

G. PACKING AND MARKING.

G. Packing. The finished product shall be packed in non-metallic containers which conform to the design, dimensions and specifications shown on C.W.S. Drawing No. B6-16-1. Each non-metallic container shall be packed for shipment in tight wooden box (C.W.S. Drawing No. B18-4-2) as shown in packing diagram on C.W.S. Drawing No. B18-4-1.

PACKING AND MARKING (CONT'D).

G-2. Marking.

G-2a. Technical. Each packing box shall be marked for identification of the contents as specified on C.W.S. Drawing No. E18-4-3.

G-2b. Shipment. All shipments shall be marked as prescribed in U. S. Army Specification No. 100-2.

H. NOTES.

- H-1. Copies of C.W.S. Manufacturing Process Method No. 46, describing a method used for manufacturing Impregnite I may be obtained upon application to The Chief, Chemical Warfare Service, Washington, D. C.
- H-2. The sieve shaker which has been adopted by the Chemical Warfare Service as a standard machine for the screening test specified herein, is a W. S. Tyler Company's Ro-tap sieve shaker having the serial No. 3019. The shaker shall be operated by a direct connected electric motor which rotates at 1750 revolutions per minute.
- H-3. The use of this specification, whenever applicable, is mandatory on all procuring agencies of the Army.
- H-4. 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 or 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.