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SUPERSEDING
Int. Fed. Spec. JJJ–G–00801a (GSA–FSS)
July 30, 1956 and
Fed. Spec. JJJ–G–801
January 8, 1947

FEDERAL SPECIFICATION

ACACIA, TECHNICAL (GUM ARABIC)

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope.—This specification covers acacia (gum arabic) for use primarily in photographic and lithographic work and as an adhesive.

1.2 Classification.

1.2.1 *Type, grade, and classes.*—Material covered by this specification shall be furnished in one type and one grade, and in the following classes, as specified:

Class A.—Granular.
Class B.—Lump.
Class C.—Powder.

2. APPLICABLE SPECIFICATIONS, STANDARDS, AND OTHER PUBLICATIONS

2.1 Specifications and standards.—The following specifications and standards, of the issues in effect on date of invitation for bids, form a part of this specification:

Federal Specifications:

TT–P–141 — Paint, Varnish, Lacquer, and Related Materials; General Specification for Inspection, Sampling, and Testing.

PPP–B–585—Boxes, Wood, Wirebound.

PPP–B–601—Boxes, Wood, Cleated-Plywood.

PPP–B–621—Boxes, Wood, Nailed and Lock-Corner.

PPP–B–636—Boxes, Fiber.

PPP–C–96—Cans, Metal, 28 Gage and Lighter.

Federal Standards:

No. 102—Preservation, Packaging, and Packing Levels.

No. 123 — Marking for Domestic Shipment (Civilian Agencies).

(Activities outside the Federal Government may obtain copies of Federal Specifications and Standards as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, Seattle, and Washington, D. C.

(Federal Government activities may obtain copies of Federal Specifications and Standards and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Standard:

MIL–STD–129 — Marking for Shipment and Storage.

441887/58/No. 208

FSC 6810

(Copies of Military Specifications and Standards required by the contractor in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. — The following document forms a part of this specification. Unless otherwise specified, the issue in effect on date of invitation for bids shall apply.

Uniform Freight Classification Ratings, Rules and Regulations.

(Copies may be obtained from the Official Classification Committee, 1 Park Avenue at 33rd Street, New York 16, New York.)

3. REQUIREMENTS

3.1 Material.—The gum arabic covered by this specification shall be the dried gummy exudate from the stems and branches of Acacia Senegal (Linne) Willdenow or of other related African species of Acacia (Fam. Leguminosae).

3.2 Insoluble residue.—The insoluble residue shall be not more than 1.0 percent, by weight, when tested as specified in 4.3.1.

3.3 Total ash.—The total ash shall be not more than 4.0 percent, by weight, when tested as specified in 4.3.2.

3.4 Acid-insoluble salt.—The acid-insoluble salt content shall be not more than 0.5 percent, by weight, when tested as specified in 4.3.3.

3.5 Moisture.—The moisture content shall be not more than 15.0 percent, by weight, when tested as specified in 4.3.4.

3.6 Tannin-bearing gums. — The acacia shall be free from tannin-bearing gums when tested as specified in 4.3.5.

3.7 Starch and dextrin.—The acacia shall be free from starch and dextrin when tested as specified in 4.3.6.

3.8 Identification. — A flocculent or curdy white precipitate shall form immediately when the material is tested as specified in 4.3.7.

3.9 Solubility.—A free-flowing liquid, uniform in appearance and without any indication of ropiness, shall be formed when the material is tested as specified in 4.3.8.

3.10 Reduction of Fehling's solution.—Not more than a trace of cuprous oxide (Cu_2O) shall be formed when the material is tested as specified in 4.3.9.

3.11 Acidity.

3.11.1 *Inorganic acidity.*—The acacia shall have no inorganic acidity when tested as specified in 4.3.10.1.

3.11.2 *Organic acidity.*—The organic acidity shall be not more than 0.4 percent as acetic acid when tested as specified in 4.3.10.2.

4. SAMPLING ,INSPECTION, AND TEST PROCEDURES

4.1 Sampling. — Sampling shall be performed in accordance with method 102.1 of Federal Specification TT–P–141.

4.2 Inspection.—Inspection shall be in accordance with method 101.1 of Federal Specification TT–P–141.

4.3 Test procedures.

4.3.1 *Insoluble residue.*—Dissolve 5 grams of the sample, powdered or finely ground, in 100 milliliters of distilled water in a 250-milliliter Erlenmyer flask. Add 10 milliliters of approximately 10 percent hydrochloric acid (sp. gr. 1.05), reagent quality, and boil gently for 15 minutes. While hot, filter by suction through a weighed Gooch crucible, wash thoroughly with hot distilled water, dry at 100° C., cool in desiccator and weigh. From the increase in weight of the crucible compute the percent of acacia insoluble in approximately 1.0 percent hydrochloric acid.

4.3.2 *Total ash.* — Into a tared crucible weigh 2 to 4 grams of ground acacia. Incinerate at a low temperature (not to exceed very dull redness) until free from carbon. Cool to room temperature in a desiccator and weigh. If a carbon-free ash cannot be obtained in this way, exhaust the charred mass with hot distilled water, collect the insoluble residue on an ashless filter paper, incinerate the residue and filter paper until the ash is white or nearly so, then add to the filtrate, evaporate it to dryness, and heat the whole to a low redness. If a carbon-free ash cannot be obtained in this way, cool the crucible, add 15 milliliters of 95 percent alcohol, break up the ash with a glass rod, burn off the alcohol, and again heat the whole to a low redness. Cool to room temperature in a desiccator, weigh, and compute the total ash. Retain the ash for use in determining the percentage of acid-insoluble ash. (See 4.3.3.)

4.3.3 *Acid-insoluble ash.*—Boil the ash obtained in determining the total ash 4.3.2 with 25 milliliters of approximately 10 percent hydrochloric acid (sp. gr. 1.05), reagent quality, for 5 minutes. Collect the insoluble matter in a weighed Gooch crucible or on an ashless filter, wash with hot distilled water, ignite, cool in a desiccator, and weigh. From the increase in weight of the crucible compute the percent of acid-insoluble ash.

4.3.4 *Moisture.*

4.3.4.1 *Preparation of sample.*—In case of lumps or coarse granules, grind approximately 10 grams of the sample until the particles are about 3 millimeters in thickness.

4.3.4.2 *Procedure.*—Weigh the sample into a tared dish. Dry at 100° to 105° C. for 5 hours. Weigh. Continue the drying and weighing at 1-hour intervals until the loss is not more than 0.25 percent in 1-hour's drying.

4.3.5 *Tannin-bearing gums.*—To 10 milliliters of a 2-percent aqueous solution of the sample add 0.1 milliliter of ferric chloride solution (0.3 *N*). Formation of a blackish coloration or blackish precipitate shall be taken as an indication of the presence of tannin-bearing gums.

4.3.6 *Starch and dextrin.*—Boil a 2-percent aqueous solution of the sample for several minutes. Allow to cool. Add 3 drops iodine as indicator (0.10 *N* solution). Formation of a bluish or reddish coloration shall be taken as an indication of the presence of starch or dextrin.

4.3.7 *Identification.*—To 10 milliliters of a 2-percent aqueous solution of the sample add 0.2 milliliter of dilute lead subacetate (4 gm. of lead subacetate in 96 ml. of water). Examine for the immediate formation of flocculent or curdy white precipitate. The lead subacetate shall be prepared as follows: 14 grams of lead monoxide (PbO), made into a smooth paste by triturating with 10 milliliters of distilled water, is transferred to a bottle, using an additional 10 milliliters of distilled water for rinsing. Dissolve 22 grams of lead acetate, $Pb(C_2H_3O_2)\cdot 3H_2O$, in 70 milliliters of distilled water and add to the lead oxide mixture. Shake it vigorously for 5 minutes, then set it aside, shaking it frequently during 7 days. Finally filter and add enough recently boiled distilled water through the filter to make 100 milliliters.

4.3.8 *Solubility.* — Add approximately 35 grams of the sample to 100 milliliters of distilled water in a 250-milliliter Erlenmeyer flask. With occasional shaking, allow to stand from 18 to 24 hours at room temperature. Pour into a beaker. Inspect for uniformity in appearance, free flow, and absence of ropiness.

4.3.9 *Reduction of Fehling's solution.*—Mix 25 to 50 milliliters of a 2-percent aqueous solution of the sample with an equal volume of the mixed Fehling's solutions. Heat to boiling and continue for 2 minutes. Examine for the formation of cuprous oxide (Cu_2O).

4.3.10 *Acidity.*

4.3.10.1 *Inorganic.*—Treat a 1-gram portion of the sample with 100 milliliters of distilled water until the gum is evenly dispersed. Add 1 milliliter of an 0.1 percent methyl orange solution. Note whether inorganic acidity is absent, indicated by the solution remaining yellow in color.

4.3.10.2 *Organic.*—Treat approximately 1 gram of the sample with 100 milliliters of distilled water until the gum is evenly dispersed. Add 0.1 milliliter of a 1-percent phenolphthalein solution and titrate with 0.1 *N* sodium hydroxide solution. Calculate the organic acidity to acetic acid as follows:

$$\text{Percent acetic acid} = \frac{6.0\ VN}{W}$$

where

V = milliliters of sodium hydroxide solution used.
N = normality of the sodium hydroxide solution.
W = weight of sample.

5. PREPARATION FOR DELIVERY

The definitions and applications of the levels of packaging and packing shall be in accordance with Federal Standard No. 102.

5.1 Preservation and packaging.

5.1.1 *Level A.*—Unless otherwise specified, the acacia shall be packaged in 1- or 10-pound metal cans conforming to type V, class 2 of Federal Specification PPP–C–96.

5.1.2 *Level C.*—Acacia shall be packaged in 1-pound canisters or 10-pound canisters or drums in accordance with commercial practice.

5.2 Packing.

5.2.1 *Level A.*—Unless otherwise specified, 24 one-pound cans, or 4 ten-pound cans of acacia shall be overpacked in an exterior shipping container conforming to Federal Specification PPP–B–585, PPP–B–601, PPP–B–621, class 2, or PPP–B–636, type I or II, class 2.

5.2.2 *Level B.*—Unless otherwise specified, 24 one-pound cans, or 4 ten-pound cans of acacia shall be overpacked in an exterior shipping container conforming to Federal Specification PPP–B–585, PPP–B–601, PPP–B–621, class 1, or PPP–B–636, type I or II, class 1.

5.2.3 *Level C.*—Acacia shall be packed in substantial commercial containers of the type, size, and kind commonly used for the purpose, so constructed as to afford protection against damage during direct shipment from the supply source to the first receiving activity for immediate use. Containers shall comply with the Uniform Freight Classification Rules or other common carrier regulations applicable to the mode of transportation.

5.3 Marking.

5.3.1 *Civilian agencies.*—Marking of shipments shall be in conformance with Federal Standard No. 123.

5.3.2 *Military agencies.* — In addition to any special marking required by the contract or order, marking of shipments shall be in accordance with Military Standard MIL–STD–129.

6. NOTES

6.1 Ordering data.—Purchasers should exercise any desired options offered herein and should specify the following in procurement documents:

(*a*) Number, title, and date of this specification.
(*b*) Class desired (see 1.2.1).
(*c*) Level of packaging and packing, and size of container (see 5.1 and 5.2).

6.2 Users of acacia (gum arabic) for pharmaceutical purposes are referred to the United States Pharmacopoeia.

6.3 **Transportation description.**—Transportation description applicable to this item is:

Gum arabic (released valuation not to exceed $.50 per pound)
Carload minimum weight 30,000 pounds.
Motor volume minimum weight 30,000 pounds.

MILITARY INTEREST:
Army—C E O Q M
Navy—Or A
Air Force.

Copies of this specification may be purchased for 5 cents each.