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UNITED STATES GOVERNMENT MASTER SPECIFICATION  
FOR WRITING INK

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 164

This specification was officially promulgated by the Federal Specifications Board on June 30, 1924, for the use of the Departments and Independent Establishments of the Government in the purchase of writing ink.

CONTENTS

	Page
I. Types.....	1
II. Material and workmanship.....	1
III. General requirements.....	1
IV. Detail requirements.....	2
V. Method of inspection and tests.....	2
1. Method of taking samples.....	2
(a) Fluid.....	2
(b) Concentrated.....	2
(c) Powder.....	2
(d) Tablets.....	2
2. Tests.....	2
VI. Packing and marking.....	4
VII. Additional information.....	4
VIII. General specifications.....	4

I. TYPES

The writing ink shall be of the following types: (a) Blue-black.—

1. Fluid, 2. Concentrated, 3. Powder, and 4. Tablets.

II. MATERIAL AND WORKMANSHIP

Shall be as described under General Requirements.

III. GENERAL REQUIREMENTS

The writing fluid as received in Type (a) 1 or as prepared by diluting or dissolving the material in Types (a) 2, 3, and 4 in the amount of water stated on the label, shall be gallotannate of iron

ink, not inferior in any essential to one properly prepared according to the following formula, in which all of the ingredients are of the strength and quality prescribed in the United States Pharmacopœia:

	Grams
Tannic acid.....	11.7
Gallic acid crystals.....	3.8
Ferrous sulphate.....	15.0
Hydrochloric acid, dilute, U. S. P.....	12.5
Carbolic acid (phenol).....	1.0
Soluble blue, Schultz No. 539.....	3.5
Water to make a volume of 1,000 cc at 20° C.	

#### IV. DETAILED REQUIREMENTS

Shall be as described under General Requirements.

#### V. METHOD OF INSPECTION AND TESTS

##### 1. METHOD OF TAKING SAMPLES

(a) FLUID.—A pint of ink from each delivery of 100 dozen quarts or less shall be taken as a sample.

An original unopened bottle, bearing all of the manufacturer's marks, shall be sent to the testing laboratory when such bottle contains not less than 16 fluid ounces. When the ink is furnished in smaller bottles, enough of them to aggregate at least 16 fluid ounces shall be sent to the laboratory with all marks intact.

(b) CONCENTRATED.—Enough of the material to make 16 fluid ounces of full-strength writing fluid shall be sent to the testing laboratory in an original unopened container bearing all of the manufacturer's marks.

(c) POWDER.—Enough of the material to make 16 fluid ounces of full-strength writing fluid shall be sent to the testing laboratory in an original unopened container bearing all of the manufacturer's marks.

(d) TABLETS.—Enough of the material to make 16 fluid ounces of full-strength writing fluid shall be sent to the testing laboratory in an original unopened container bearing all of the manufacturer's marks.

##### 2. TESTS

The 16-ounce bottle, or the combined contents of the smaller bottles, or the dissolved or diluted solution of ink, shall be allowed to stand undisturbed for 24 hours to permit any sediment to settle. Enough of the clear ink for all of the tests shall then be drawn off in a pipette. The bottle shall then be inverted slowly and the amount and character of any sediment noted.

The sample shall be tested in comparison with a standard ink made according to the formula in III.

Streaks shall be made by allowing measured portions, of about 0.6 cc each, of the clear ink to flow freely across a sheet of white bond paper which is pinned to a board or clamped to a pane of glass and held at an inclination of 45°. For better comparison streaks of the standard shall be made on the same sheet as those of the sample.

(a) When the streaks are dry, the sheet shall be examined on the front and the reverse sides. The streaks of the sample shall have the same general form as those of the standard. They shall be as uniform in color when viewed from the front and the back and shall show no more evidence of striking through the paper.

(b) The paper shall be cut into inch-wide strips at right angles to the streaks. Some of the strips shall be kept away from light and fumes, and others used for making the following tests, after they have been exposed to diffused daylight for one week.

After a week's exposure to diffused daylight the streaks of the sample shall be as intensely black as those of the standard.

After exposure to direct sunlight for 96 hours, or at a distance of about 10 inches from an arc or ultra-violet light for 48 hours, the streaks of the sample shall show no more evidence of fading than those of the standard.

Strips shall be soaked in water and in 50 per cent alcohol for 24 hours at room temperature. The sample shall show no greater loss of color than the standard.

NOTE.—Ethyl alcohol denatured with methanol is suitable for this test.

Strips shall be soaked in bleaching powder solution containing N/200 available chlorine. The effect upon the sample, in comparison with the standard, shall be noted after 15 minutes, 1 hour, and 24 hours at room temperature. The sample shall show no greater loss of color than the standard.

(c) The content of metallic iron shall be determined in 10 cc of the sample by any suitable chemical procedure. The content of metallic iron shall be not less than 0.29 nor more than 0.35 g per 100 cc.

(d) Twenty-five cc each of the sample and the standard shall be allowed to stand undisturbed in similar colorless glass vessels loosely covered with filter paper to keep out dust. After two weeks' exposure to diffused daylight and air at ordinary room temperature the sample shall be as free from mold and deposit upon its surface and upon the sides and bottom of the container as the standard.

(e) The sample shall be no more corrosive to steel pens than the standard. For each sample under test, including the standard, select two new pens from the same box. Clean the pens with alcohol and ether, dry them in an oven at 105° C., and weigh each pair together to the nearest milligram. Immerse each pair of pens in

25 cc of the ink contained in a small beaker or flask. After 48 hours remove the pens, wash and scrub them with water and a cloth to cleanse them thoroughly, rinse them with alcohol, dry them in an oven, and weigh. If the pens in the sample ink lose more weight than those in the standard, two more tests shall be made. If the loss in one of these tests is greater than the loss in the standard ink, the sample shall be rejected.

#### VI. PACKING AND MARKING

No requirements specified.

#### VII. ADDITIONAL INFORMATION

The ink is suitable for use with ordinary or fountain pens. It can not be used for permanent records or for making more than one press copy.

#### VIII. GENERAL SPECIFICATIONS

No requirements specified.

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