

MAY 27 1925

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Specification
No. 293

DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
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CIRCULAR OF THE BUREAU OF STANDARDS, No. 214

[Issued May 21, 1925]

**UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR
MEDIUM AND LIGHT RUST-PREVENTIVE COMPOUNDS**

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 293

This specification was officially promulgated by the Federal Specifications Board on May 20, 1925, for the use of the Departments and Independent Establishments of the Government in the purchase of medium and light rust-preventive compounds.

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I. GRADES

This material shall be furnished in two grades: A, medium; B, light.

II. MATERIAL AND WORKMANSHIP

The manufacturer is given wide latitude in the selection of raw materials and processes of manufacture, so that he may furnish products of the highest quality. However, the purchasing officer may forbid the presence of any ingredient known to be injurious to workmen using same.

III. GENERAL REQUIREMENTS

The materials covered by this specification shall be nondrying rust preventives for the protection of metal. They shall be stable, noncorrosive, free from abrasive substances and readily removable from metal surfaces by the use of waste saturated with kerosene. The materials shall preserve a continuous, complete, and protective film on metal under all normal conditions of use.

IV. DETAIL REQUIREMENTS

	Medium	Light
1. Homogeneity.....	Shall be a homogeneous mixture or compound.	Shall be a homogeneous mixture or compound.
2. Abrasive substances.....	None.	None.
3. Corrosion.....	Shall show no evidence of corroding steel, brass, copper, or aluminum.	Shall show no evidence of corroding steel, brass, copper, or aluminum.
4. Drying.....	Shall not dry or harden.	Shall not dry or harden.
5. Flash point (open cup).....	Not less than 232° C. (450° F.)	Not less than 171° C. (340° F.)
6. Pour test.....	Not more than 27° C. (81° F.)	Not more than -10° C. (+14° F.)
7. Viscosity at 210° F. (Saybolt seconds).....	Not less than 150.	Not less than 90.
8. Viscosity at 130° F. (Saybolt seconds).....		Not more than 500.
9. Precipitation number.....	Not more than 10.	Not more than 10.
10. Adhesion and protection.....	Must pass five-hour oven salt spray and water immersion tests.	Must pass salt spray and water immersion tests.

V. METHODS OF INSPECTION AND TESTS

Deliveries will, in general, be sampled and tested by the following methods, but the purchaser reserves the right to use any additional available information to ascertain whether the material meets the specification.

1. SAMPLING

It is mutually agreed by buyer and seller that a single package out of each lot of not more than 1,000 packages be taken as a representative of the whole. Whenever possible an original unopened container shall be sent to the laboratory, and when for any reason this is not done the inspector shall thoroughly mix the contents of the container sampled, transfer not less than 1 quart to a clean, dry, glass jar or tin can, which must be nearly filled with the sample, securely stoppered with a new, clean cork or well-fitting cover or cap, sealed and distinctly labeled by the inspector. The inspector should take a duplicate from the container sampled to be held for check in case of dispute, and, when requested, should take a sample for the seller.

2. LABORATORY EXAMINATION

2. Except when otherwise stated in the following directions, the tests shall be made in a room at ordinary temperature (not below

15.5° C. (60° F.) and free from laboratory or other corrosive fumes.

(a) **HOMOGENEITY.**—Portions shall be taken from the top, bottom, and intermediate parts of the sample and examined visually to determine that there is no apparent difference in appearance or consistency.

(b) **ABRASIVE SUBSTANCES.**—Heat 50 g of the sample with 100 cc benzol (C_6H_6) on the steam bath to about 75° C. (167° F.) and stir until all soluble matter is in solution. While still hot filter through a clean, dry filter paper. If any residue remains on the paper, wash with 25 cc of benzol, transfer a portion of the residue to a clean piece of polished glass and rub vigorously with a clean finger. Wash the residue from the glass, dry and examine the dry, clean glass. Scratches produced on the glass by this treatment indicate the presence of abrasive substances.

(c) **CORROSION.**—Clean, well-polished sheets of steel, brass, copper, and aluminum shall be used for this test. In general, sheets about 25 mm (1 inch) square will be found most convenient. Place a small portion of the material to be tested on each of the metal plates, taking care not to cover the whole surface of the metal plates. Cover each plate with an inverted watch glass and let stand for five days. There must be no evidence of corrosion on any of the metal plates, either when examined with the sample in place or after removing it by washing with benzol. While it is important to apply this test with all the metals mentioned, it will generally be found that the test with copper is most valuable. Either the development of a green color in the material on the copper or a brown stain remaining on the copper after washing with benzol is evidence of corrosion.

(d) **DRYING.**—Heat the sample to 71° C. (160° F.) and flow it over a clean glass plate approximately 1 foot square. Expose the plate in a nearly vertical position (not more than 10° from the vertical) at room temperature. At the end of five days the coating on the plate shall show no evidence of “drying” or hardening.

(e) **FLASH POINT (OPEN CUP.)**—Follow method 110.31, Federal Specifications Board specification No. 2c (Bureau of Mines Technical Paper 323A).

(f) **POUR TEST.**—Follow method 20.11, Federal Specifications Board specification No. 2c (Bureau of Mines Technical Paper 323A).

(g) **VISCOSITY.**—Follow method 30.4, Federal Specifications Board specification No. 2c (Bureau of Mines Technical Paper 323A).

(h) **PRECIPITATION NUMBER.**—Follow method 310.1, Federal Specifications Board specification No. 2c (Bureau of Mines Technical Paper 323A).

(i) **ADHESION AND PROTECTION.**—Heat the sample to approximately 38° C. (100° F.) and at this temperature coat duplicate mechanically polished bright steel plates approximately 4 by 6 inches by $\frac{1}{8}$ inch, and duplicate mechanically polished bright steel rods, 6 inches by $\frac{3}{4}$ inch. In the case of medium rust-preventive compound suspend the duplicate plates and rods in a vertical position in an oven maintained at 45 to 50° C. (113 to 122° F.) for five hours. In the case of the light rust-preventive compound omit the heating in the oven. Allow the duplicate coated plates and rods to stand in a vertical position at room temperature for 24 hours. Then lay the duplicate plates in a horizontal position and spray lightly with a 3 per cent salt solution twice each day for a period of five days. Suspend the duplicate coated rods in distilled water for five days, changing the water once each day. At the end of this time there shall be no evidence of rust on any plate or rod, and the coating in every case shall be easily removable with waste wet with kerosene.

VI. PACKING AND MARKING

No details specified.

VII. ADDITIONAL INFORMATION

Medium rust-preventive compound is suitable for the protection of metal stored under shelter. It generally can not be expected to furnish as good protection as heavy rust-preventive compound (Federal Specifications Board specification No. 239), but should offer better protection than light rust-preventive compound.

Light rust-preventive compound should only be used in cases where heavy or medium compounds (because of their heavier consistency) can not be used, such as in certain inclosed parts.

Rust-preventive compounds are frequently called "slushing oils" or "slushing grease," but these terms have no fixed meaning and their use is to be discouraged.

VIII. GENERAL SPECIFICATIONS

No details specified.

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