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Specification
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DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
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UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR RUBBER VALVES

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 114a

[Revised June 15, 1925]

This specification was officially promulgated by the Federal Specifications Board on December 29, 1923, for the use of the Departments and Independent Establishments of the Government in the purchase of rubber valves.

CONTENTS

I. GRADES

Rubber valves shall be furnished in three grades as required—grade A, hard; grade B, medium; and grade C, soft.

II. MATERIAL AND WORKMANSHIP

1. The valves shall consist of properly vulcanized rubber compound and all surfaces shall be smooth and free from pitting, blisters, air checks, and other imperfections. The thickness shall be uniform throughout and the circumference shall be concentric with the hole at the center.

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2. The compound shall contain no rubber substitute of any kind, rubber which has been previously used, or reclaimed rubber and shall be free from all substances which might injuriously affect its quality.

III. GENERAL REQUIREMENTS

1. A tolerance of plus or minus $\frac{1}{32}$ inch will be allowed in the diameter and thickness.

2. No valve, when cut in half and subjected to the following dry heat and steam tests, shall show any disintegration, blistering, or other defects either on the surface or in the interior when cut open:

(*a*) Dry-heat test: One-half of valve at 270° F. (±5° F.) dry heat for one hour.

(*b*) Steam test: One-half of valve in steam at 400° F. (±5° F.) for three hours, the steam pressure to be gradually reduced to atmospheric pressure at the end of the test.

IV. DETAIL REQUIREMENTS

1. Grade A, Hard.—(*a*) The valves shall contain not less than 55 per cent by volume of the best quality new wild or plantation rubber. The acetone extract, corrected for free sulphur, shall not exceed 6 per cent, nor shall the total sulphur, exclusive of that contained in barytes, exceed 25 per cent of the weight of the rubber as compounded. The free sulphur shall not exceed 3 per cent of the weight of the rubber as compounded.

(*b*) The hardness, measured as described in Section V, shall be not less than 0.03 mm nor more than 0.10 mm.

2. Grade B, Medium.—(*a*) The valves shall contain not less than 60 per cent by volume of the best quality new wild or plantation rubber. The acetone extract, corrected for free sulphur, shall not exceed 6 per cent, nor shall the total sulphur, exclusive of that contained in barytes, exceed 12 per cent of the weight of the rubber as compounded. The free sulphur shall not exceed 3 per cent of the weight of the rubber as compounded.

(*b*) The hardness, measured as described in Section V, shall be not less than 0.55 mm nor more than 0.70 mm.

3. Grade C, Soft.—(*a*) The valves shall contain not less than 65 per cent by volume of the best quality new wild or plantation rubber. The acetone extract, corrected for free sulphur, shall not exceed 6 per cent, nor shall the total sulphur, exclusive of that contained in barytes, exceed 8 per cent of the weight of the rubber as compounded. The free sulphur shall not exceed 3 per cent of the weight of the rubber as compounded.

(*b*) The hardness, measured as described in Section V, shall be not less than 0.85 mm nor more than 1 mm.

V. METHODS OF INSPECTION AND TESTS

1. The hardness shall be measured by noting the depth of indentation in millimeters produced by a spherical surface 3.2 mm (0.125 inch) in diameter under a dead-weight pressure of 1 kg (2.2 pounds) applied for one minute. The test shall be made at a temperature not below 60° F. nor above 80° F.

2. One valve representing each class shall be taken for test from each order.

VI. PACKING AND MARKING

Each valve shall be branded on the edge with the name of the manufacturer, the month and year of manufacture, and word "hard," "medium," or "soft."

VII. ADDITIONAL INFORMATION

1. This specification covers the requirements for valves for pumps equipped with grid-type seats and which are used for pumping liquids having very slight, if any, effect on rubber.

2. Valves are classified according to the service for which they are intended as follows:

(*a*) Hard valves, for hot water and a temperature of 150 to 212° F. and a pressure between 200 and 300 lbs./in.^{2}

(*b*) Medium valves, for water at a temperature less than 170° F. and a pressure between 50 and 200 lbs./in.^{2}

(*c*) Soft valves, for water at a temperature less than 170° F. and a pressure less than 50 lbs./in.^{2}

3. The requirements of this specification are essentially the same as those for the corresponding grades contained in A. S. T. M. Specification D151–22T.

VIII. GENERAL SPECIFICATIONS

All tests and analyses shall be made in accordance with the methods described in United States Government General Specification No. 59, General Specifications for Rubber Goods, in effect on date of proposal.

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