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2-GP-27
1 May 1945
CANCELLATION
26 February 1960

CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Specification
for

SODIUM METAPHOSPHATE, TECHNICAL

CGSB Specification 2-GP-27, dated 1 May 1945, is cancelled as of 26 February 1960.

REFERENCE COPY

TENTATIVE

No. 2-GP-27-1945.

Issued 1 May, 1945.

CANADIAN GOVERNMENT PURCHASING STANDARDS COMMITTEE

Specification for Sodium Metaphosphate, Technical

1. Definition

The material required by this specification shall be sodium metaphosphate ($NaPO_3$) of technical grade.

2. General

The material shall be suitable for use in admixture with soap for preventing the formation of insoluble calcium and magnesium soaps in laundering operations in which hard water is used. It shall also be suitable for removing deposits of calcium and magnesium soaps occurring in fabrics which have been washed in soap and hard water.

It shall be of a uniformly white colour and shall be supplied in the form of thin flakes, readily soluble in water. It shall be free from dirt and other foreign matter.

3. Chemical Composition

The material, as received, shall conform to the following chemical requirements:-

		Per Cent	Appendix
Available phosphate, as P_2O_5	(min.)	61.0	B
Moisture (max)		0.5	C
Matter insoluble in water	(max.)	0.1	D
Hydrogen ion concentration of 0.5, 1.0 and 5.0 per cent solutions	(min.)	8.3	E
	(max.)	9.0	

4. Water Softening Capacity

There shall be no formation of precipitate and the suds shall last for 5 minutes under the conditions of the test described in Appendix F.

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APPENDIX

A. Sampling

(a) When Packed in Cans or Cartons

One can or carton shall be taken at random from not less than one per cent of the shipment, provided that the latter consists of containers of not less than 50 pounds each. In the case of smaller containers a can or carton shall be taken at random from each lot of containers totalling not more than 2,000 lb. The total sample shall in all cases consist of not less than three cans or cartons taken at random from separate cases.

(b) When in Bulk

A grab sample of not less than one-half pound shall be taken at random from not less than one per cent of the shipping containers provided that the latter contain not less than 100 lb. each. In the case of smaller containers a grab sample of not less than one-half pound shall be taken at random from each lot of containers totalling not more than 2,000 lb. The total sample shall in all cases consist of not less than three grab portions taken at random from separate containers.

Samples when taken shall be placed immediately in air-tight cans and kept in a cool place.

B. Phosphate Content

50 gm. of the sample are placed in a one litre volumetric flask, dissolved in distilled water, the solution made up to the mark and thoroughly mixed. 100 ml. of the solution are pipetted to another one litre volumetric flask, made up to the mark with distilled water and thoroughly mixed. 50 ml. aliquots of the solution are transferred to 250 ml. beakers and evaporated to dryness on a steam bath. To the residue in the beakers are added 5 ml. of concentrated nitric acid, 20 ml. of concentrated hydrochloric acid and 25 ml. of distilled water. The mixture is stirred until clear and evaporated to dryness on a steam bath. The addition of the acids and water is repeated and the mixture again evaporated to dryness. 50 ml. of distilled water are now added, the residue dissolved and phosphate determined as magnesium pyrophosphate by the standard procedure, the phosphate being calculated as phosphorus pentoxide (P_2O_5).

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C. Moisture

5 gm. of the sample are placed in a tared wide-mouth weighing bottle and accurately weighed. The bottle with stopper removed is placed in a drying oven at 105°C. for 2 hours. The stopper is replaced, the bottle and contents allowed to cool in a desiccator and weighed.

D. Material Insoluble in Water

5 gm. of the sample are accurately weighed and placed in a 400 ml. beaker, 300 ml. of hot distilled water added and the mixture heated until clear. The solution is filtered through a weighed Gooch crucible, the residue in the crucible being well washed with distilled water. The crucible and contents are dried for two hours in an oven at 105°C., cooled in a desiccator and weighed.

E. Hydrogen Ion Concentration

50 gm. of the sample are dissolved in 950 gm. of distilled water and solutions containing 1.0 and 0.5 per cent are prepared by dilution. The pH values of the 5.0, 1.0 and 0.5 per cent solutions so prepared are determined at 25°C.

F. Water Softening Capacity

(a) Hard Water Solution

0.3540 gm. calcium nitrate, $Ca(NO_3)_2.4H_2O$, are dissolved in CO_2-free distilled water and made up to one litre. This solution is equivalent to a water containing 150 parts per million of calcium carbonate ($CaCO_3$).

(b) Test Procedure

100 ml. portions of the hard water solution are placed in each of two 250 ml. flasks. To each flask are added 15 ml. of a metaphosphate solution containing 8.0 gm. per litre and a few drops of phenolphthalein solution. The acidity or alkalinity of the contents of the flasks is then adjusted with dilute sodium hydroxide or dilute hydrochloric acid until a faint pink colour develops. To one of the flasks there is added 0.5 ml. of a standard soap solution containing 8.0 gm. castile soap (Specification 2-GP-17) dissolved in one litre of 80 per cent ethyl alcohol and to the other flask 1.0 gm. of trisodium phosphate. The contents of both flasks are well-shaken. The formation of a precipitate, and the duration of the suds in the flask containing soap are noted.

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