

SPECIFICATIONS FOR POTASSIUM PERMANGANATE

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GENERAL

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GENERAL

1 Ambient Conditions

All materials shall be in every respect suitable for storage, use and operation in the conditions of temperature and humidity appertaining in Sri Lanka.

The annual average temperature is 35 °C while the relative humidity varies generally from 70% during the day to 90% at night.

2 Suitability for Potable Water

Potassium Permanganate will come into contact with potable water shall not constitute a toxic hazard, shall not support microbial growth,

3 Definitions

The definitions given in the relevant standards which are referred to in the specification shall apply for the terms used in this specification.

4 Inspection and Testing

All materials shall be tested to the appropriate tests at the manufacturer's premises and shall be supported by a test certificate from the manufacturer.

The format for test certificate shall be in accordance with the format given in the Bidding Document.

The Manufacturer shall supply, furnish and prepare the necessary test samples of materials and supply the labour facilities and appliances for such testing as may be required to be carried out in the manufacturer's premises according to this specification. If there are no facilities at his own works for making the prescribed tests, the Manufacturer shall arrange to perform such tests from a reputed testing Agency and shall bear all costs associated with such tests.

The Contractor shall furnish the Engineer with all required facilities and space at Manufacturer's cost for the inspection, testing and obtaining of such information, as he desires regarding the character of material in use and the progress and manner of the work.

The Engineer or his representatives and nominated Inspection authority shall have full access to all parts of the plant that are concerned with the manufacturing, testing, furnishing or preparation of materials for the performance and testing of work under this Specification.

Contractor shall be held responsible for the assuring the quality of the goods supplied by him up the final delivery point. Potassium Permanganate is tested at the Employer's final delivery point by the employer and goods shall conform to the relevant standard for the acceptance.

5. Marking

All markings shall be legible and durable unless otherwise specified and shall be as specified in the Technical Specification.

6. Protection During Delivery

The contractor shall provide protection as approved by the Engineer, prior to the materials leaving the place of manufacture and shall maintain such protection until the items reach their destination in order to guard effectively against damage during transit and storage and the ingress of foreign matter inside the packages.

All details of the proposed method of providing such protection shall be submitted at the time of tendering.

The cost of providing protection shall be included in the unit prices offered in the Bills of Quantities.

7. Storing, Handling and Hauling of Materials.

All materials shall be stored in an approved location and in such a manner as to preserve their quality and condition.

Storage shall be in accordance with the manufacturers recommendation and shall be stored in a dry place with a proper packing.

Materials and components shall be handled in such a manner as to avoid any damage or contamination and in accordance with the recommendations of the manufacturers.

The contractor shall give instructions to the shipper on precautions to be followed in the handling of materials during loading, towage delivery and unloading and shall give particulars of these instructions to the purchaser.

8. Manufacturer's Certificate

The Contractor shall supply to the Engineer a certificate stating that each item supplied has been subjected to the tests laid down herein and conforms in all respects to this Specification or such other Specification which has been submitted to and approved by the Engineer. In addition to this, contractor shall provide certificate for the conformity to the Standards (BSEN 12672:2008) from an independent testing agency mentioned in General condition of contract. Testing at Manufacturers factory by Employer will perform as specified.

9. Quality and Workmanship

Potassium Permanganate which are intended to supply shall be manufactured in compliance with the ISO 9001 : 2008 Quality Management System Standards. Any certificate regarding product conformity and quality management should be from an organization accredited to issue such certification and the manufacturer shall have this certification valid during the period of supply and delivery of the materials. Documentary evidence regarding accreditation together with the scope of certification should be provided.

10. Technical Specifications for Potassium Permanganate

10.1. General Requirements

10.1.1 All materials to be supplied under this contract shall conform to BSEN 12672:2008 – Chemicals used for Treatment of Water for Human Consumption – Potassium Permanganate.

10.1.2 The material shall be of crystals of dark purple and bronze colour, density of 2.75 g/cm^3 at 20°C and bulk density of $1.45 - 1.6 \text{ g/cm}^3$.

10.1.3 The material solubility shall be of 89.71 g/l at 30°C and Potassium Permanganate content shall not be less than a mass fraction of 98.5%.

10.2. Other Requirements

Purity Criteria

MnO_2 (water insolubles) less than a mass fraction of 1.00%

Moisture (H_2O) : less than a mass fraction of 0.5%

Chemical parameters

The chemical parameters shall comply to the following table.

Parameters	Limit (mg /kg) of product
Arsenic (As) Max	20
Cadmium (Cd) Max	50
Chromium (Cr) Max	50
Mercury (Hg) Max	10
Nickel (Ni) Max	50
Lead (Pb) Max	50
Antimony (Sb) Max	50
Selenium (Se) Max	50

10.3. Transportation & Storage

Means of delivery

The product shall be delivered in steel drums. In order that the purity of the product is not affected the means of delivery shall not have been used previously for different product or it shall have been specially cleaned and prepared before use.

10.4. Marking & Labeling

10.4.1 Marking

Each package shall be marked legibly & indelibly with the following information : (letter height shall be 50 mm)

- a) The name : “Potassium permanganate” the Trade Name and the grade.
- b) Name and address of the manufacturer and local agent
- c) Trade mark
- d) Net mass, in Kg.
- e) Type and Grade
- f) Employer’s Name as ‘National Water Supply & Drainage Board’
- g) The statement “This product conforms to BSEN 12672”

10.4.2 Rules for safe handling and use

- The supplier shall provide current safety instructions covering first aid spillage fire etc.

10.4.3 Risk & Safety Labeling according to the European Union directives

The following labeling shall apply to potassium permanganate. Symbols and indications of danger.

- a)
 - i) Xn : Harmful
 - ii) O : Oxidizing
 - iii) N: Dangerous for the environment

- b) Nature of special risk attributed to dangerous substances
 - i) R8 : Contact with combustible material may cause fire
 - ii) R22 : Harmful if swallowed
 - iii) R 50/53 : Very toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment

- c) Safety advise concerning dangerous substances
 - i) S2 : Keep out of reach of Children
 - ii) S60 : This material and its containers must be disposed as hazardous waste.
 - iii) S61 : Avoid released to the environment

10.5. Sampling & Testing

Sampling and testing shall be in accordance with the BSEN 12672:2008.