



**PRODUCT MANUAL
FOR ZINC SULPHATE MONOHYDRATE, AGRICULTURAL GRADE
ACCORDING TO IS 15848 : 2009**

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

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| 1. | Product | : | IS 15848 : 2009 |
| | Title | : | Zinc Sulphate Monohydrate, Agriculture Grade |
| | No. of Amendments | : | 01 |
| 2. | Sampling Guidelines: | | |
| a) | Raw material | : | No specific requirement |
| b) | Grouping guidelines | : | NA |
| c) | Sample Size | : | 500 g |
| 3. | List of Test Equipment | : | Please refer ANNEX – <u>A</u> |
| 4. | Scheme of Inspection and Testing | : | Please refer ANNEX – <u>B</u> |
| 5. | Possible tests in a day : | | |
| | (i) Matter insoluble in water (ii) Cu (iii) Zn (iv) pH of 5 percent solution | | |
| 6. | Scope of the Licence : | | |
| | Licence is granted to use Standard Mark as per IS 15848 : 2009 with the following scope: | | |
| | Name of the product | : | Zinc Sulphate, Monohydrate, Agriculture Grade. |

ANNEX A

TO PRODUCT MANUAL
FOR ZINC SULPHATE MONOHYDRATE, AGRICULTURAL GRADE
ACCORDING TO IS 15848 : 2009

LIST OF TEST EQUIPMENT

Major test equipment required to test as per the Indian Standard

| Sl. No. | Tests used in with Clause Reference | Test Equipment |
|---------|--|---|
| 1. | Zinc Cl 3.2 , 6.2.2, 6.2.3, 6.2.4 and 7 & Table 1 (Annex A of IS 15848) | <p>Method I (A-2 Ethylene Diamine Tetra Acetate (EDTA) Method):</p> <p>Dilute Sulphuric Acid, 1:100, Ammonium Sulphate AR Grade, Hydrochloric Acid 1:1, Sodium Hydroxide Solution ,1N, Methyl Orange Indicator, Methyl Red Indicator, Hydrogen Sulphide Generator, EDTA (Ethylene Diamine Tetra Acetate), Zinc Ion Solution Buffer Solution pH 10, Eriochrome Black Indicator, Absolute Alcohol, Analytical balance, Standard glassware.</p> |
| | | <p>Method 2 {Modified Ethylene Diamine Tetra Acetate (EDTA) (FCO Alinged)}:</p> <p>Disodium Ethylene Diamine Tetra Acetate (EDTA), Standard Zinc Solution, Ammonium Hydroxide, Ammonium Chloride, Sodium Cyanide, Sodium Chloride, Eriochrome Black Indicator, Formaldehyde Hydroxylamine, Hydroxyl chloride AR Grade.</p> |
| | | <p>Method 3 (Absorption Spectrophotometric Method):</p> <p>Standard Zinc Solution, Glass Distilled or Demineralized Water of pH 2.5± 0.5, Atomic Absorption Spectrophotometer at a wavelength of 213.8 nm.</p> |

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| 2. | Magnesium (as Mg) Cl 3.2 , 6.2.2, 6.2.3, 6.2.4 and 7 & Table 1 (Annex B of IS 15848) | <p>Method I (EDTA Method): Dilute Sulphuric Acid, Dilute Nitric Acid, Sodium Sulphide Solution, Eriochrome Black T Indicator - Diammonium Hydrogen Phosphate, Ammonium Hydroxide - Ammonium Chloride Buffer Solution Standard Magnesium Solution. 0.01 M, Ethylene Diamine Tetra Acetate (EDTA) Solution, Analytical balance, Standard glassware.</p> <p>Method 2 (Atomic Absorption Method): Strontium Chloride, Standard Magnesium Solution, Atomic Absorption Spectrophotometer wavelength of 285.5 nm.</p> |
| 3. | Copper Cl 3.2 , 6.2.2, 6.2.3, 6.2.4 and 7 & Table 1 (Annex C of IS 15848) | <p>Method I (Diethyl Dithiocarbonate Method): Strontium Chloride, Standard Magnesium Solution, Standard glassware.</p> <p>Method 2 (Atomic Absorption Method): Standard Copper Solution, Glass Distilled or Mineralized Acidified water pH 2.5 ±0.5, Atomic Absorption Spectrophotometer wavelength of 285.5 nm.</p> |
| 4. | Lead Cl 3.2 , 6.2.2, 6.2.3, 6.2.4 and 7 & Table 1 (Annex D of IS 15848) | <p>Method 1 (D-2 Dithiozone Method): Strontium Chloride, Standard Magnesium Solution, Dilute Nitric acid, Standard glassware.</p> <p>Method 2 (Atomic Absorption Method): Standard Lead Solution, Nitric Acid Solution 1 Percent, Zinc Sulphate Solution 20 Percent, Analytical balance, Standard glassware.</p> |
| 5. | pH Cl 3.2 , 6.2.2, 6.2.3, 6.2.4 and 7 & Table 1 (Annex E of IS 15848) | Arrangement for boiling water, pH meter. |
| 6. | Matter Insoluble in water Cl 3.2 , 6.2.2, 6.2.3, 6.2.4 and 7 & Table 1 (Annex F of IS 15848) | Dilute Sulphuric Acid 10 percent, Weighing balance, Gooch crucible or sintered glass crucible (G No. 4), Hot air oven-capable of operating at 110±5°C. |

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| 7. | Iron Cl 3.2 , 6.2.2, 6.2.3, 6.2.4 and 7 & Table 1 (Annex G of IS 15848) | Method I (Spectrophotometric Method): Photoelectric –colorimeter, Bromophenol Blue Indicator, Sodium Citrate Solution 25%, Hydroquinone Solution 1 %, Ortho -phenanthroline Solution 0 .25 %, Dilute Hydrochloric Acid, Standard Iron Solution, Heating mental, Whatman filter paner No. 40. Method 2 (Atomic Absorption Method): Standard Iron Solution (1000 ppm), Glass Distillated or Demineralized Water of pH-2.5± 0.5, Atomic Absorption Spectrophotometer wavelength of 248.3 nm. |
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The above list is indicative only and may not be treated as exhaustive.

ANNEX B

SCHEME OF TESTING AND INSPECTION

FOR ZINC SULPHATE, MONOHYDRATE, AGRICULTURAL GRADE ACCORDING TO IS 15848 : 2009

1. **LABORATORY** - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.
 - 1.1 The manufacturer shall prepare a calibration plan for the test equipment.
2. **TEST RECORD** - The manufacturer shall maintain test records for the tests carried out to establish conformity.
3. **PACKAGING AND MARKING** – The Standard Mark, as given in the Schedule of the licence, shall be applied on each bag of zinc sulphate, monohydrate, agricultural grade provided always that the material in the bag so marked conform to every requirement of the specification.
 - 3.1 Packing and marking shall be done as per the provision of Indian Standard. In addition, the following details shall be mentioned on each container/package: -
 - a) BIS Licence No. CM/L-----.
 - b) BIS website details i.e. – “For details of BIS certification please visit www.bis.gov.in”.
 - 3.2 **HANDLING AND STORAGE** - Factors to be kept in view in the handling and storage of the material shall be as prescribed in IS 5985.
4. **CONTROL UNIT** – For the purpose of this Scheme, the quantity of the material produced in a day shall constitute a control unit.
 - 4.1 In case the material produced is not to be sold directly and is to be stored for sale during season, the following shall constitute a control unit.
 - 4.1.1 At the time of repacking, the material from the various batches to be mixed together, pulverized/sieved and repacked in new bags. Ten tonnes of such material/ one day mixing whichever is less shall constitute the new control unit.
5. **LEVELS OF CONTROL** - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

- 5.1 All production which conforms to the Indian Standard and covered by this licence shall be marked with BIS Standard Mark.
- 5.2 On this basis of the tests and analysis results decision regarding conformity or other wise of a batch of production to the requirement of specification shall be made as follows:
 - 5.2.1 The samples of zinc sulphate, monohydrate, agricultural grade as per the stipulated frequency in Table 1, shall be tested for the requirements as specified. In case the sample fails in any of the requirements as specified in IS 15848, the entire material in the control unit shall be suitably reprocessed so as to rectify the defects. Such reprocessed material when tested shall satisfy all the requirements of the specification. In case any sample fails, the control unit shall be rejected. Thereafter, two samples from each control unit for all requirements except Zinc for which four samples from each control unit shall be tested and the original frequency shall be restored after three consecutive control units show conformity to the requirements of the specification.
 - 5.2.2 Two samples from every control unit shall be tested for zinc percent by mass. The value of zinc obtained shall not be less than minimum value specified in the standard for both the samples.
6. **RAW MATERIALS** - Each consignment of raw zinc ash as received shall be tested and analyzed for requirements of zinc, magnesium, copper, Iron and lead. In case consignment fails to meet the limit of magnesium, copper, iron and lead as specified in Table 1 of IS 15848, the consignment shall be deemed to be unfit for the manufacture of Zinc Sulphate, Monohydrates, Agricultural Grade and shall be rejected. The records of such rejection shall be maintained.
7. **REJECTION** - Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1
LEVELS OF CONTROL

| (1) | | | | (2) | (3) | | |
|-------------------|--|----------------------|----------------|--|-------------------|--------------------|---------|
| TEST DETAILS | | | | Test equipment requirement R: required (or) S: Sub-contracting permitted | LEVELS OF CONTROL | | |
| Clause | Requirement | Test Method Cl. Ref. | Test Method IS | | No. of Sample | Frequency | Remarks |
| 3.1 | Description | 3.1 | IS 15848 | R | One | Each control Unit | |
| 3.2 & table 1 (i) | Zinc (as Zn), Percent by mass | Annex A | -do- | R | Two * | -do- | |
| (ii) | Magnesium (as Mg), Percent by mass | Annex B | -do- | R | One | Third Control Unit | |
| (iii) | Copper (as Cu), Percent by mass | Annex C | -do- | R | -do- | -do- | |
| (iv) | Lead (as Pb), Percent by mass | Annex D | -do- | R | -do- | -do- | |
| (v) | pH of 5 percent solution | Annex E | -do- | R | -do- | Each control Unit | |
| (vi) | Matter insoluble in water, Percent by mass | Annex F | -do- | R | -do- | -do- | |
| (vii) | Iron (as Fe), Percent by mass | Annex G | -do- | R | -do- | -do- | |

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

Note-3: The representative sample shall be prepared by drawing the material from five different places in the batch. (*) The value of zinc obtained in the samples shall not be less than the minimum specified value of the standard.