

## **6 . SPECIFICATIONS FOR ALUMINIUM SULPHATE**

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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 30 °C while the relative humidity varies generally from 70% during the day to 90% at night.

### **2 Suitability for Potable Water**

Aluminium Sulphate 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**

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 on his premises according to this specification. If there are no facilities at his own works for making the prescribed tests the Contractor shall bear the cost of carrying out the tests elsewhere.

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

The Contractor shall furnish the Engineer with reasonable facilities and space (without charge) 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.

Further 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 schedule of particulars.

Contractor is held responsibility for the assuring quality of the goods supplied by him until the final delivery point. Aluminium Sulphate is tested at the Employer's final delivery point by the employer and goods shall conform to the standard for the acceptance

## **5 Marking**

All markings shall be legible and durable unless otherwise specified and shall be as specified in this specification.

## **6. Protection During Delivery**

The contractor shall provide protection to the approval of 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 tendered 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 all applicable recommendations of the manufacturers.

The contractor shall give instructions to the shipper on precautions to be taken 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 (SLS 701: 1985) from the independent testing agencies mentioned in General condition of contract. Testing at Manufacturers factory by Employer will perform as specified.

## **9. Quality and Workmanship**

Aluminium Sulphate 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. Document evidence regarding accreditation together with the scope of certification should be provided.

## TECHNICAL SPECIFICATIONS FOR ALUMINIUM SULPHATE

### 1. GENERAL REQUIREMENT

All materials to be supplied under this contract shall conform to Sri Lanka Standard (SLS) 701 : 1985 – Specification for Aluminium Sulphate (Technical Grade).

1. Aluminium Sulphate shall be either in the form of Lumps or Powder
2. Colour – White to Greyish – White
3. Other Requirements

**Table 1 A**

<b>Characteristics</b>	<b>Requirements</b>
Iron as Fe <sub>2</sub> O <sub>3</sub> percent by mass, maximum allowable	0.7
Water soluble Aluminium Sulphate as Al <sub>2</sub> O <sub>3</sub> percent by mass, min	16.0
Water insoluble matter, percent by mass, max	0.5
P <sup>H</sup> at 27 ± 2° C, min	2.8
Arsenic as AS <sub>2</sub> O <sub>3</sub> percent by mass, max	0.01
Heavy metals as Pb, percent by mass, max	0.02
Ammoniacal Nitrogen, percent by mass, max	0.03
<u>Lump Size :-</u> Lumps passing through 40.0 mm sieve, percent by mass, min	100
Age of Aluminium Sulphate from the date of manufacture when shipping.	Not more than 02 months

## **1.2. PACKING REQUIREMENTS**

This material shall be supplied in 50 Kg. (or smaller) polisack bags with polythene inner lining packing.

## **1.3 MARKING**

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

- a) Name of the product
- 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 'NWSDB'
- (g) Conformity to standard as "SLS 701: 1985"

## **2.0 SAMPLING**

### **2.1 LOT**

The quantity of material belonging to one batch of manufacture or supply and ordered for inspection at one time shall constitute a lot.. Weight of a lot shall be 50 kg or less.

### **2.2 GENERAL REQUIREMENTS OF SAMPLING**

In drawing, handling and preparing samples, the following precautions shall be observed.

- 2.2.1 The samples shall not be taken from broken packages.
- 2.2.2 The sampling instrument shall be clean and dry when used.
- 2.2.3 The samples shall be placed in clean, dry and air-tight glass or Suitable containers.2.2.4 The material being sampled, the instruments and the containers for samples shall be protected from adventitious contamination.
- 2.2.4 The sample containers shall be air-tight after filling and marked with necessary details of sampling. Samples shall be stored in the shade.

## **2.3 SAMPLING INSTRUMENTS**

2.3.1 Sampling tube of sufficient length

2.3.2 Shovel

## **2.4 SCALE OF SAMPLING**

**2.4.1. Each lot shall be tested separately for ascertaining its conformity to the requirement of this specification.**

### **2.4.2 Sampling from Bulk**

shovel shall be used to draw material from a heap or lorry or wagon. At least 10 shovel full of material shall be drawn from a heap or a lorry or a wagon to represent the average of all parts of mass being sampled and the material so obtained shall be thoroughly mixed and reduced by coning and quartering to obtain a test sample.

#### **2.4.2.1 Powder Material**

Either a sampling tube of sufficient length shall be inserted or a hole shall be dug to get material from top to the bottom of the mass being sampled. The material so obtained shall be thoroughly mixed and reduced by coning and quartering to obtain a test sample.

### **2.4.3 Sampling from packages**

2.4.3.1 The number of packages to be selected from a lot shall be in accordance with table 2.

2.4.3.2 The packages shall be selected at random. In order to ensure randomness of selection random number tables as given in SLS 428 shall be used.

2.4.3.3 In case of lump material, each bag selected as in 1.4.3.1 shall be emptied and sufficient quantity of material shall be drawn from various parts of the mass being sampled.

2.4.3.4 The material obtained from each package shall be thoroughly mixed and reduced by coning and quartering to obtain a test sample.

2.4.3.5 Five sets of such samples shall be obtained from each package for testing. Three of them shall be analyzed to take the average value. The remaining two samples shall be sealed and kept for future references.

**Table 2 – Scale of Sampling**

Number of Packages in the lot	Number of Packages to be selected
Up to 09	2
09 to 27	3
28 to 64	4
65 to 100	5
101 to 300	6
301 to 500	7
501 to 800	8
801 to 1300	9
1301 to above	10

## **2.5 NUMBER OF TESTS**

- 2.5.1 Each package selected as in 2.4.3 shall be inspected for marking requirements. (This shall be done in case of sampling from packages and may be done at the place of sampling.)
- 2.5.2 The test sample prepared as in 2.4.3.1 or 2.4.3.2 or 2.4.3.3 as the case may be, shall be tested for all the requirements of this specification.

## **3. METHOD OF TEST**

- 3.1 During the analysis, unless otherwise stated, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.
- 3.2 Tests for the requirements laid down shall be carried out as prescribed in SLS 312 and in SLS 701 : 1985

## **4. AGE OF ALUMINIUM SULPHATE**

Aluminium Sulphate shall be new and age from the date of the manufacture shall be not more than two months when shipping.

## **5. CONFORMITY TO SPECIFICATIONS**

A lot shall be declared as conforming to the requirements of this specification, if the following conditions are satisfied.

- 5.1 Each package examined as in 2.5.1 satisfies the relevant packaging and marking requirements.
- 5.2 The test results on test sample when tested as in 2.5.2 satisfy the relevant requirements.
- 5.3 Samples do not satisfy relevant requirements will be rejected.