
Agricultural liming materials — Specification



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Foreword

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Agricultural liming materials — Specification

1 Scope

This Draft African Standard specifies the requirements, sampling and test methods for agricultural liming materials.

This standard applies to agricultural liming materials, such as quicklime (burnt lime), hydrated lime, limestone (calcitic and dolomitic), marl, shells, and by-products including slag, and other materials.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7409, *Fertilizers — Marking — Presentation and declarations*

ISO 8157, *Fertilizers and soil conditioners — Vocabulary*

ISO 8397, *Solid fertilizers and soil conditioners — Test sieving*

ISO 11047, *Soil quality — Determination of cadmium, chromium, cobalt, copper, lead, manganese, nickel and zinc — Flame and electrothermal atomic absorption spectrometric methods*

ISO 11465, *Soil quality — Determination of dry matter and water content on a mass basis — Gravimetric method*

ISO 14820-1, *Fertilizers and liming materials — Sampling and sample preparation — Part 1: Sampling*

ISO 14820-2, *Fertilizers and liming materials — Sampling and sample preparation — Part 2: Sample preparation*

ISO 17318, *Fertilizers and soil conditioners — Determination of arsenic, cadmium, chromium, lead and mercury contents*

ISO 20978, *Liming material — Determination of neutralizing value — Titrimetric methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions in ISO 8157 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at: <http://www.iso.org/obp>

— IEC Electropedia: available at: <http://www.electropedia.org/>

4 Requirements

4.1 Chemical classifications

Agricultural liming materials shall be classified in terms of calcium carbonate equivalent (C.C.E) as shown in Table 1.

Table 1 — Agricultural liming material requirements

S/N	Material	Calcium carbonate equivalent (CCE), %, min.	Test method
i.	Quicklime	140	ISO 20978
ii.	Hydrated lime	110	
iii.	Limestone	80	
iv.	Slag	80	
v.	Shells	80	
NOTE Marl and some by-product liming materials are used for neutralizing soil acidity, but due to their varying composition, their chemical limits are not included. In some economic circumstances limestone, slag, and shells of less than 80 % C.C.E. may be used.			

4.2 Requirements for agricultural limestone

4.2.1 Sieve analysis classifications for agricultural limestone

The sieve analysis shall be done in accordance with ISO 8397.

Agricultural limestone shall be classified according to the minimum percentage passing the no. 8 ie 236 μ m (0.236-mm) and no. 60 ie 250 μ m (0.25 mm) as shown in Table 2.

Table 2 — Sieve analysis classification for agricultural limestone

S/N	Class designation	Passing no. 8 ie 236 µm (0.236 mm) sieve, % min	Passing no. 60 ie 250 µm (0.25 mm) sieve, % min
i.	S	100	100
ii.	T	99	75
iii.	O	95	55
iv.	N	90	40
v.	E	80	25

NOTE These classifications apply where the agricultural limestone is obtained by the normal crushing procedure and the product contains the fines of fracture. In some economic circumstances, coarser products are used. The No. 60 ie 250-µm (0.25 mm) sieve was selected because research has shown that this sieve gives a more accurate representation of the particle size distribution of most agricultural limestones presently produced than a finer or coarser sieve. The No. 8 ie 236 µm (0.236-mm) sieve is used to control the upper limit on the amount of coarse limestone particles that may be in the product.

4.2.2 Neutralizing requirements for calcitic limestone

Calcite shall comply with the neutralizing requirement in Table 3.

Table 3 — Requirements for calcitic limestone

S/N	Characteristic	Grade I	Grade II	Test method
i.	Calcium Carbonate Equivalent (CEE), %, min	70	50	AOAC 955.01
ii.	Active lime (total available as $\text{CaCO}_3 + \text{MgCO}_3$), %, min	50	40	ISO 22145
iii.	Magnesium, %, max	10	10	AOAC 964.01
iv.	Moisture content, %, max	10	12	ISO 11465

4.3 Sieve analysis classifications for agricultural slag

4.3.1 Air-cooled blast-furnace slag

Air-cooled blast-furnace slag shall be classified the same as agricultural limestone as shown in Clause 4.2.

4.3.2 Granulated blast-furnace slag

Granulated blast-furnace slag shall be classified in accordance with the minimum percentages passing the No. 8 ie 236 µm (0.236-mm) and the No. 60 ie 250-µm (0.25 mm) sieves.

4.4 Requirement for hydrated lime and burnt lime**4.4.1 Fineness**

Hydrated lime and quicklime for agricultural use shall be classified in accordance with the minimum percentages passing the No. 8 ie 236 μm (0.236-mm) and No. 60 ie 250- μm (0.25 mm) sieves, as indicated in table 4

Table 4 — Particle size requirements for hydrated lime and quicklime

Passing sieve No.	Particle size min. %	
	Hydrated lime	Quick lime
8 ie 236 μm (0.236 mm)	100	95
60 ie 250 μm (0.25 mm)	97	35

4.4.2 Neutralizing requirements of hydrated lime and quicklime

Hydrated lime and burnt lime shall comply with the requirement in Table 5.

Table 5 — Requirements for hydrated lime and burnt lime as soil amendments

S/N	Characteristic	Grade I	Grade II	Test method
i.	Calcium Carbonate Equivalent (CEE), %, min	85	70	ISO 11465
ii.	Active lime (available as CaO, MgO, Ca(OH) ₂ , or Mg(OH) ₂ , %, m/m, min	60	50	
iii.	Moisture content, %, m/m, max	10	12	

4.5 Heavy metal contaminants

The heavy metal contaminants, if present, shall not exceed the limits stipulated in Table 6.

Table 6 — Allowable level of heavy metals for agricultural liming materials

S/N	Properties	Allowable maximum level mg/kg, dry weight	Test method
i.	Arsenic (As)	10	ISO 17318
ii.	Lead (Pb)	30	
iii.	Chromium (Cr)	50	
iv.	Nickel (Ni)	50	ISO 11047
v.	Mercury (Hg)	2	ISO 17318
vi.	Cadmium (Cd)	5	

5 Packaging

The fertilizer shall be packed in clean, non-defective and appropriate containers that protect its integrity during handling, transportation and storage.

NOTE The product may be also supplied in bulk containers.

6 Labelling

In addition to the labelling requirements of ISO 7409, each container of agricultural liming material shall be legibly and indelibly marked in accordance with Globally Harmonized System (GHS) and with the following information:

- i. name of the product as "Agricultural Lime";
- ii. type of the agricultural liming material;
- iii. brand or trade name of the material, if any;
- iv. name and address of the manufacturer/packer/distributor;
- v. grade
- vi. net weight, by mass in metric units;
- vii. percentage of calcium carbonate equivalent (CCE);
- viii. percentage of calcium oxide and magnesium oxide neutralizing value;
- ix. country of origin;
- x. handling instructions;
- xi. effective neutralizing value (%)
- xii. date of production;
- xiii. expiry date;
- xiv. batch number; and
- xv. storage conditions.

7 Sampling

Sampling and sample preparation shall be carried out in accordance with ISO 14820-1 and ISO 14820-2, respectively

Bibliography

- [1] KS 2526:2014, *Agricultural liming materials — Specification*
- [2] ASTM C602:2013, *Standard specification for agricultural liming materials*

