

**Karbonaatsed lubiväetised. Reaktiivsuse määramine.
Automaatne tiitrimismeetod sidrunhappega**

**Carbonate liming materials - Determination of reactivity -
Automatic titration method with citric acid**

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English Version

Carbonate liming materials - Determination of reactivity - Automatic titration method with citric acid

Amendements minéraux basiques carbonatés -
Détermination de la réactivité - Méthode par titration
automatique à l'acide citrique

Carbonatische Kalke - Bestimmung der Reaktivität -
Automatisches Titrationsverfahren mit Citronensäure

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Foreword

This document (EN 16357:2013) has been prepared by Technical Committee CEN/TC 260 "Fertilizers and liming materials", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2014, and conflicting national standards shall be withdrawn at the latest by February 2014.

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Introduction

This method has been prepared to improve existing agricultural reactivity methods (see [1], [2], [3], [4] and [5]) for carbonate liming materials: duration, accuracy, representativeness, closer from soil conditions, automation.

Attention is drawn to the following critical steps:

- identification of the liming material type (influence on precision data);
- size distribution (influence on test portion preparation and amount);
- calibration of pH electrode (influence on titrator's pH adjustments);
- pH stat programme setting (influence on accuracy of added amounts of citric acid solution);
- suitability of PCC used to check calibration;
- stirring device (provides homogeneousness without grinding);
- additional uncertainty with neutralising value and MgO content determination.

1 Scope

This European Standard specifies a method for the determination of the reactivity of calcium carbonate and calcium magnesium carbonate liming materials. It assesses the speed and effectiveness of their neutralising potential by automatic titration with citric acid.

This method is applicable only to liming materials with a maximum particle size of 6,3 mm determined according to EN 12948.

NOTE For marble dolomite (BET procedure according to ISO 9277 below 500 m²/kg), see EN 14984.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1482-2, *Fertilizers and liming materials — Sampling and sample preparation — Part 2: Sample preparation*

EN 12048, *Solid fertilizers and liming materials — Determination of moisture content — Gravimetric method by drying at (105 +/- 2) °C (ISO 8190, modified)*

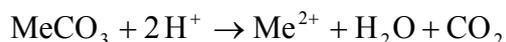
EN 12945, *Liming materials — Determination of neutralizing value — Titrimetric methods*

EN 12948, *Liming materials — Determination of size distribution by dry and wet sieving*

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696)*

3 Principle

Limited decomposition of carbonates in a given time with acid according to the following reaction:



Titration under stable pH conditions (pH 4,5) with an automatic titration apparatus. The citric acid consumption during a given time (15 min) is a direct measure for the reaction of the liming materials being tested.

4 Apparatus

Usual laboratory apparatus and, in particular, the following:

4.1 pH meter with electrode.

This instrument is generally included in the automatic motor driven burette device.

4.2 Automatic motor driven burette, capacity 20 ml.

This kind of burette is generally equipped with all necessary accessories such as pH regulation programme (pH stat), automatic refilling device, pH electrode, continuous pH measurement and propeller stirring device.

Though a propeller stirring device is preferred, a magnetic stirring device (4.7) may be used, provided the central ring of the stirrer rod is thick enough and does not lead to grind the tested material. Make sure the rotation speed of the stirrer rod is fast enough to make homogeneous dispersion in the beaker. If not, increase the speed up to the necessary value.