



SLOVENSKI STANDARD
SIST-TS CEN/TS 15084:2006

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Sredstva za apnjenje – Vodilo za ugotavljanje potreb po apnjenju

Liming materials - Guide to the determination of the lime requirement

Calcium-/Magnesium-Bodenverbesserungsmittel - Leitlinie für die Bestimmung des Kalkbedarfs

Amendements minéraux basiques - Guide pour la détermination du besoin en bases

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Ta slovenski standard je istoveten z: CEN/TS 15084:2006

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ICS:

65.080 Gnojila Fertilizers

SIST-TS CEN/TS 15084:2006 **en,fr,de**

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ICS 65.080

English Version

Liming materials - Guide to the determination of the lime requirement

Amendements minéraux basiques - Guide pour la détermination de la besoin en chaux

Calcium-/Magnesium-Bodenverbesserungsmittel - Leitlinie für die Bestimmung des Kalkbedarfs

This Technical Specification (CEN/TS) was approved by CEN on 27 May 2006 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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Foreword

This document (CEN/TS 15084:2006) has been prepared by Technical Committee CEN/TC 260 "Fertilizers and liming materials", the secretariat of which is held by DIN.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this CEN Technical Specification: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

Regular liming for regulation of the pH value of the soil has a long tradition in agriculture. Liming has a neutralizing effect on the natural acidification of the soil and thus serves the maintenance of soil fertility.

The desired effects of liming are mainly:

- **physical:** Increased structure stability of the flocculation and porosity of mineral soils, leading to better drainage, structure stability of the soil and improved aeration of the soil.
- **chemical:** Positive influence on solubility of macro- and some micro-nutrients, a reduction in the availability of aluminium and other toxic elements in the soil and avoid aluminium toxicity.
- **biological:** general support of active soil organisms.

Existing European Standards specify methods for assessing the value of liming materials. It is also necessary to establish the principles to be used when calculating the amount of liming material required.

Throughout Europe, wide national and regional variations in soil type, climate and types of farming prohibit the general use of detailed and specific recommendations. The principles set out in this standard should be used by experts at a local level to establish lime requirement.

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1 Scope

This Technical Specification gives guidance on the parameters that should be taken into account in order to determine the lime requirement of agricultural soils.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 12944-3:2001, *Fertilizers and liming materials — Vocabulary — Part 3: Terms relating to liming materials*

ISO 10390, *Soil quality — Determination of pH*

ISO 11259, *Soil quality — Simplified soil description*

ISO 11277, *Soil quality — Determination of particle size distribution in mineral soil material — Method by sieving and sedimentation*

ISO 14235, *Soil quality — Determination of organic carbon by sulfochromic oxidation*

3 Terms and definitions

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For the purposes of this document, the terms and definitions given in EN 12944-3:2001 and the following apply.

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3.1 soil group

texture and organic matter to describe the cultivation characteristic of the soils (light, medium or heavy soils)

3.2 rainfall

water reaching the ground in the form of rain, snow and dew

3.3 pH class

defined pH range as determined by ISO 10390

3.4 target pH

soil pH to be achieved

3.5 basal liming

increase of soil pH from very low pH value to the target pH value with liming materials

3.6 improvement liming

recovery of soils from low pH value to a target pH value with liming materials

3.7 preservation liming

maintaining soil pH to the defined optimum pH value with liming materials

3.8

base saturation rate

proportion of calcium, magnesium, potassium and sodium of the total cation exchange capacity of the soil

NOTE The ratio expressed as a percentage: $(Ca+Mg+K+Na \text{ expressed as } cmol^+/kg) \times 100 / \text{cation exchange capacity (expressed as } cmol^+/kg)$.

3.9

crop rotation

sequence of agricultural crops on a field

3.10

soil cultivation

management of mechanical/physical soil treatment

3.11

lime loss

annual loss and consumption of neutralizing materials from the soil

4 Classification of soils

4.1 Basic scheme

Many chemical and most of the physical properties of agricultural soils depend on the clay fraction, organic matter content and pH. Therefore the clay content (fraction < 2 µm), the organic matter content and the actual and target pH are very important when establishing the lime requirement. A basic scheme for the classification of soils is given in Table 1.

Table 1 — Basic scheme for the classification of soils as specified in ISO 11259

Number	Typical group of soil general description	clay content ^a % (mass fraction)
1	sand	≤ 5
2	slightly loamy sand	> 5 to 12
3	heavy loamy sand	> 12 to 17
4	sandy silty loam	> 17 to 25
5	clayey loam, clay	> 25
6	peat	organic matter > 30 %

^a a grain size < 0,002 mm in % mineral dry matter according to ISO 11277

4.2 pH classes A to E

The pH classes A to E define the actual state of lime in the soil. This classification is the basis of determination of lime requirement within the specific system of national or regional standard. In this definition particular consideration is given to the aspects of soil fertility, soil structure, nutrients and the availability of other elements as well as general practical advice on liming (see Table 2).

Table 2 — Definition of pH classes for the supply of lime as well as liming recommendations

pH class soil state of lime	Description of status and target	Requirement of liming materials and fertilizers
A very low	Status: Extreme restriction of soil structure and nutrient availability, very high lime requirement, significant losses of yield of almost all crops up to total loss of yield, extreme increase in plant availability of elements which become increasingly harmful as their plant availability increases at low pH Target: Achievement of targeted, optimal soil reaction; Liming has the highest priority above all other fertilizing and cultivating measures	Basal liming
B low	Status: Optimal conditions for soil structure and nutrient availability are not yet achieved, high lime requirement, still significant losses of yield with crops with a high lime demand, still high plant availability of elements which become increasingly harmful as their plant availability increases at low pH Target: Achievement of targeted, optimal soil reaction; liming within crop rotation, preferably prior to crops with a high lime requirement	Improvement liming
C optimum	Status: Optimal condition for soil structure and nutrient availability is given, low liming requirement, low respectively no increased yield by liming, but stable yield on this pH value Target: Preservation of lime condition by appropriate liming of crops with a high lime demand during crop rotation. The annual proton production has to be neutralized by preservation liming	Preservation liming
D high	Status: Lime supply is higher than targeted, no lime requirement Target: Slow decrease of soil reaction by refrain from liming	No liming
E very high	Status: Soil reaction is much higher than targeted and may have a negative influence on nutrient availability Target: Refrain from any liming	No liming

NOTE In some instances, the application of liming materials to improve soil structure will take precedence over soil pH status when assessing lime requirement.

5 General principles

The determination of the required amount of liming material shall consider the various parameters to establish a recommendation of tonnes of liming material per hectare (see Table 3).