



# SLOVENSKI STANDARD

## SIST EN 16811-2:2016

01-oktober-2016

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### Oprema za zimska vzdrževalna dela - Sredstva za odtajanje - 2. del: Kalcijev klorid in magnezijev klorid - Zahteve in preskusne metode

Winter maintenance equipment - De-icing agents - Part 2: Calcium chloride and Magnesium chloride - Requirements and test methods

Winterdienstausrüstung - Enteisungsmittel - Teil 2: Calcium- und Magnesiumchlorid - Anforderungen und Prüfmethoden

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#### ICS:

13.030.40	Naprave in oprema za odstranjevanje in obdelavo odpadkov	Installations and equipment for waste disposal and treatment
71.100.45	Hladiva in antifrizi	Refrigerants and antifreezes

**SIST EN 16811-2:2016**

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EUROPEAN STANDARD

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## Winter service equipment and products - De-icing agents - Part 2: Calcium chloride and Magnesium chloride - Requirements and test methods

Matériels de viabilité hivernale - Fondants routiers -  
Partie 2 : Chlorure de calcium et chlorure de  
magnésium - Exigences et méthodes d'essai

Winterdienstausrüstung - Enteisungsmittel - Teil 2:  
Calcium- und Magnesiumchlorid - Anforderungen und  
Prüfverfahren

This European Standard was approved by CEN on 15 April 2016.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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**EN 16811-2:2016 (E)****European foreword**

This document (EN 16811-2:2016) has been prepared by Technical Committee CEN/TC 337 “Road operation equipment and products”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by February 2017, and conflicting national standards shall be withdrawn at the latest by February 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

EN 16811, *Winter service equipment and products — De-icing agents*, is currently composed with the following parts:

- *Part 1: Sodium chloride — Requirements and test methods*;
- *Part 2: Calcium chloride and Magnesium chloride — Requirements and test methods*;
- *Part 3: Other solid and liquid de-icing agents — Requirements and test methods* [CEN/TS].

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

De-icing agents are important for the winter maintenance of roads. They can prevent and, in addition to it, eliminate slippery conditions.

The standard describes the requirements for de-icing agents and their testing methods. The requirements are different for using, storage and type of distribution (spreading and spraying). These need different properties.

The aim of this standard is an easy description of the product specifications for tenders and other purchasing procedures.

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**EN 16811-2:2016 (E)****1 Scope**

This European Standard specifies the essential requirements of calcium chloride and magnesium chloride for spreading on roads for winter maintenance and includes tests of these requirements. The requirements are specified for calcium chloride and magnesium chloride in solid form and in water solution, which is delivered to the customer.

**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 932-1, *Tests for general properties of aggregates — Part 1: Methods for sampling*

EN 1235, *Solid fertilizers — Test sieving (ISO 8397:1988 modified)*

EN 1236, *Fertilizers — Determination of bulk density (loose) (ISO 3944:1992 modified)*

EN 1484, *Water analysis — Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC)*

EN 14016-2, *Binders for magnesite screeds — Caustic magnesia and magnesium chloride — Part 2: Test methods*

EN 15144, *Winter maintenance equipment — Terminology — Terms for winter maintenance*

EN 16198, *Fertilizers — Determination of magnesium by complexometry*

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EN 16811-1, *Winter service equipment and products — De-icing agents — Part 1: Sodium chloride — Requirements and test methods*

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

EN ISO 9377-2, *Water quality — Determination of hydrocarbon oil index — Part 2: Method using solvent extraction and gas chromatography (ISO 9377-2)*

EN ISO 10523, *Water quality — Determination of pH (ISO 10523)*

EN ISO 11885, *Water quality — Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (ISO 11885)*

EN ISO 12846, *Water quality — Determination of mercury — Method using atomic absorption spectrometry (AAS) with and without enrichment (ISO 12846)*

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 649-2, *Laboratory glassware — Density hydrometers for general purposes — Part 2: Test methods and use*

ISO 758, *Liquid chemical products for industrial use — Determination of density at 20 degrees C*



ISO 2479, *Sodium chloride for industrial use — Determination of matter insoluble in water or in acid and preparation of principal solutions for other determinations*

ISO 2480, *Sodium chloride for industrial use — Determination of sulphate content — Barium sulphate gravimetric method*

ISO 2591-1, *Test sieving — Part 1: Methods using test sieves of woven wire cloth and perforated metal plate*

ISO 6227, *Chemical products for industrial use — General method for determination of chloride ions — Potentiometric method*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15144 and the following apply.

#### 3.1

##### calcium chloride

CaCl<sub>2</sub>

substance which is produced from calcium carbonate and hydrochloric acid, as by-product of the synthetic soda ash process, and as by-product of magnesium oxide production

Note 1 to entry: It can also result from flue gas cleaning (e.g. waste incinerators). It is available in varying concentrations, as flakes with crystal water (calcium chloride dihydrate), and as anhydrous solid like pellets, prills or granules. For the application in winter maintenance the calcium chloride is also used as water solutions in varying concentrations.

#### 3.2

##### magnesium chloride

MgCl<sub>2</sub>

substance which is produced from natural underground deposits, from salt lakes, from natural brines, from sea water and as by-product of potassium chloride and potassium sulphate production

Note 1 to entry: It is available as flakes, prills, or pellets with crystal water (magnesium chloride hexahydrate). For the application in winter maintenance the magnesium chloride is also used as water solutions in varying concentrations.

#### 3.3

##### multi-chloride blends

solid or liquid blends, respectively multi-chloride brines of calcium chloride and magnesium chloride with sodium and/or potassium chloride

Note 1 to entry: Such blends are produced by mixing or as by-product from potash production.

## 4 Requirements for calcium chloride and magnesium chloride

### 4.1 Chemical requirements

#### 4.1.1 Calcium chloride

The product shall conform to the requirements specified in Table 1.

Table 1 — Chemical requirements for calcium chloride

Parameter	Limit Weight %	
	Flakes	Pellets, prills, granules
Calcium chloride	Min. 75	Min. 94
Other chlorides (magnesium chloride, potassium chloride, sodium chloride)	Max. 5	
Sulfate	Max. 0,5	
Water insoluble matter	Max. 0,5	
NOTE 1	Other chlorides and sulfate are expressed as percentage in the anhydrous product.	
NOTE 2	Other chlorides expressed as NaCl.	

#### 4.1.2 Magnesium chloride

The product shall conform to the requirements specified in Table 2.

Table 2 — Chemical requirements for magnesium chloride

Parameter	Limit Weight %	
	Flakes, prills, pellets	
Magnesium chloride	Min. 46,5	
Other chlorides (calcium chloride, potassium chloride, sodium chloride)	Max. 5	
Sulfate	Max. 1,5	
Water insoluble matter	Max. 0,5	
NOTE 1	Other chlorides and sulfate are expressed as percentage in the anhydrous product.	
NOTE 2	Other chlorides expressed as NaCl.	

#### 4.2 Sieve analysis

##### 4.2.1 Calcium chloride

The product shall conform to the requirements specified in Table 3.

**Table 3 — Sieve analysis for calcium chloride**

Sieve size	Weight % passing test sieve	
	Flakes	Pellets, prills, granules
20 mm	100	-
10 mm	Min. 95	100
5 mm	80 - 100	80 - 100
2 mm	Max. 40	0 - 20
0,8 mm	0 - 10	0 - 5

#### 4.2.2 Magnesium chloride

The product shall conform to the requirements specified in Table 4.

**Table 4 — Sieve analysis for magnesium chloride**

Sieve size	Weight % passing test sieve	
	Flakes	Pellets, prills
20 mm	100	-
10 mm	Min. 95	100
5 mm	Max. 90	80 - 100
2 mm	Max. 25	0 - 20
0,8 mm	0 - 10	0 - 5

#### 4.3 General requirements

The product shall conform to the requirements specified in Table 5.

Table 5 — General requirements for calcium chloride and magnesium chloride

Parameter	Limit	Unit
pH of 10 weight % solution	between 5 and 11	
Al (Aluminium)	≤ 50	mg/kg
As (Arsenic)	≤ 2,5	mg/kg
Cd (Cadmium)	≤ 2	mg/kg
Co (Cobalt)	≤ 2	mg/kg
Cr (Chromium)	≤ 5	mg/kg
Cu (Copper)	≤ 5	mg/kg
Hg (Mercury)	≤ 0,5	mg/kg
Ni (Nickel)	≤ 5	mg/kg
Pb (Lead)	≤ 5	mg/kg
Zn (Zinc)	≤ 20	mg/kg
Hydrocarbons	≤ 100	mg/kg
NOTE 1 The limits for Al (Aluminium) and hydrocarbons are foreseen for products which are not of natural origin. There is no need to determine these parameters in natural based CaCl <sub>2</sub> resp. MgCl <sub>2</sub> .		
NOTE 2 The parameters are stated as mg/kg of anhydrous product.		

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The product shall arrive at purchaser's delivery point in a free-flowing and usable condition.

For products from flue gas cleaning (e.g. waste incinerators, etc.) the supplier shall supply the content of total organic carbon (TOC) for the evaluation of the environmental impact.

#### 4.4 Packaging and marking

The product shall be packaged and transported in a manner that protects the product from moisture.

The following information shall be marked on the packaging or on associated documents:

- the name and address of the producer or supplier;
- the name of the product ("Calcium chloride", "Magnesium chloride");
- the quality of the product ("Flakes", etc.);
- the percentage of calcium chloride resp. magnesium chloride;
- the net weight;
- the number of this European Standard.

NOTE The marking of the product will be in accordance with Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 [10].

All information shall be given in the languages of the countries of destination.