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Winter maintenance equipment - Spreading machines (gritting machines) - Part 2:
Requirements for distribution and its test

Winterdienstausrüstung - Streumaschinen - Teil 2: Anforderungen an die
Streustoffverteilung und deren Prüfung

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TECHNICAL SPECIFICATION
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ICS 43.160

English Version

Winter maintenance equipment - Spreading machines (gritting machines) - Part 2: Requirements for distribution and its test

Winterdiensttausrüstung - Streumaschinen - Teil 2:
Anforderungen an die Streustoffverteilung und deren
Prüfung

This Technical Specification (CEN/TS) was approved by CEN on 29 August 2011 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 15597-2:2012) has been prepared by Technical Committee CEN/TC 337 “Winter maintenance and road service area maintenance equipment”, the secretariat of which is held by AFNOR.

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.

This European standard comprises two parts:

- EN 15597-1, *Winter maintenance equipment — Spreading machines (gritting machines) — Part 1: General requirements and definitions for spreading machines*;
- CEN/TS 15597-2, *Winter maintenance equipment — Spreading machines (gritting machines) — Part 2: Requirements for distribution and its test*.

This Technical Specification was prepared with the aim of having a 3-year lifetime.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, 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, Turkey and the United Kingdom.

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Introduction

This document is meant to assess the demands made on mobile spreading machines operated in traffic.

Spreading machines (spreaders/gritters) are to be operated in such way that homogeneous distribution of spreading media is given within the set spreading dosage, width and spreading pattern track.

Due to the different kind of thawing materials used and a lack of experience to detect the exact quantity of thawing material spread on the road, CEN/TC 337 decided to publish a Technical Specification giving the possibility to all the operators to test different methods to determine the precision of the spreading pattern. Therefore the test methods have not been specified in detail in this Technical Specification. But the required accuracy of the measuring methods is given.

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1 Scope

This Technical Specification gives the possibility to certify a model of vehicle-mounted or (trailer-)dragged spreading machines for winter service with standard parameters, leaving the possibility for the manufacturer to evolve performance. At the same time, information is given on the minimum content required for operating manuals.

This Technical Specification is valid for machines which are used to spread the following media:

- solid thawing media with or without pre-wetted media;
- liquid thawing media.

The following points are not covered by this Technical Specification:

- requirements for registration and approval;
- requirements made by automobile manufacturers;
- requirements on safety – these are dealt with in EN 13021.

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 15431, *Winter and road service area maintenance equipments — Power system and related controls — Interchangeability and performance requirements*

EN 15597-1, *Winter maintenance equipment — Spreading machines (gritting machines) — Part 1: General requirements and definitions for spreading machines*

3 Terms and definitions

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

3.1

machine model

machine model that includes a spreader of thawing material for road maintenance and its control box

3.2

spreader types

spreader types as defined by using different spreading parameters according to Tables 1 and 2

3.3

test materials

test materials as defined in Clause 5

3.4

test

test realised with different spreading parameters (dosage, spreading width and vehicle speed), for a machine model, a test material and a spreader type

CEN/TS 15597-2:2012 (E)**3.5****qualification**

qualification of a machine model that states the conformity to the requirements defined in this standard

NOTE The compliance with these requirements is verified by a series of static and dynamic tests defined for a type of spreader and a test material.

3.6**test report**

document in which the whole conditions and test results for a qualification are recorded

3.7**technical certificate**

technical certificate that is set for a qualified machine model

NOTE If several qualifications of the same model are realised with different combinations of "test material / spreader type", the whole test results of the different qualifications will be reported on the same technical certificate.

3.8**measurement points**

whole measured data in the static test, which are calculated or set according to the frequency

3.9**outer strips**

two strips of 1 m width which border the left and right side of a theoretical measurement area

3.10**measurement area**

area, in the dynamic test, corresponding to the defined spreading length multiplied by the set theoretical spreading width, and which is the effective area for collecting the spreading agent

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3.11**total collecting area**

measurement area plus the two outer strips

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3.12**effective average dosage**

ratio of the total mass collected on the measurement area

3.13**theoretical dosage**

value set on the control box in g/m^2

3.14**theoretical total amount**

theoretical dosage multiplied by the measurement area

3.15**total amount**

complete mass collected on a measurement area

3.16**effective average dosage in a strip**

total amount of test material collected in this strip, divided by the strip surface area

4 Definition of spreader type

Some spreaders types are defined by using the following range of minimum and maximum parameters: spreading width, dosage and vehicle speed ranges.

The dosages and quantity given for the different test materials are defined in Clause 5 (NaCl).

Table 1 — Spreader types for solid thawing media

Type	Spreading width m	Spreading dosage g/m ²	Vehicle speed km/h	Maximum quantity kg/min
A	1 to 6	5 to 30	5 to 40	120
B	2 to 8	5 to 30	5 to 60	240
C	3 to 12	5 to 30	5 to 80	300

Table 2 — Spreader type for liquid thawing media

Type	Spreading width m	Width step m	Spreading dosage g/m ²	Vehicle speed km/h	Maximum quantity kg/min
A	1 to 6	1	10 to 40	5 to 40	160
B	3,75 to 11,25	3,75	10 to 70	5 to 80	750
C	3 to 12	1	10 to 70	5 to 80	750

5 Test materials

The materials used in Europe for winter maintenance are very different. The sodium chloride (NaCl) has different granulometries according to the mine or production type, the humidity of these products is very variable too. For this reason, the test can be done with any kind of sodium chloride for solid material; the following characteristics shall be indicated in the report:

- NaCl content (%);
- humidity (%);
- granulometry (3 sieves minimum for a vacuum salt and 5 sieves minimum for rock salt and sea salt);
- anti-caking agent (nature and concentration).

The characteristics of materials shall be determined in laboratory by using a sample of material used for the test. An official certificate of material delivered by material supplier shall be attached to the test report.

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The de-icing material shall be protected from atmospheric moisture agent, during storage, to avoid changes in the original characteristic during storage period.

The salt solution (sodium chloride, calcium chloride, magnesium chloride) shall have a concentration between 18 % and 23 % of weight.

In case of spreader type for liquid thawing media the kind of salt solution (brine) used for test shall be described:

- sodium chloride, calcium chloride or magnesium chloride, or other de-icing material;
- salt concentration, in percentage of weight;
- density, in kg/dm³.

6 Certification procedure**6.1 Principle of qualification procedure**

The qualification procedure of the spreaders includes two test types, one static and one dynamic.

The static test enables assessment of the regularity of material flow and the accuracy of quantity, it is carried out with moving the spreader stationary. The dynamic test enables assessment of salt spreading pattern, it is carried out by driving the spreading vehicle during spreading operation on a measurement area.

According to the type of spreader tested, the qualification procedure sets the functioning parameters of the machine. These spreading parameters are different for the static and dynamic tests.

Each spreader type, in order to be qualified, has to meet the requirements of the two tests (static and dynamic).

During a qualification, it is forbidden to modify the original calibration of the spreader. Any calibration involves the cancellation of the current qualification procedure.

The weighing equipment, for both tests, shall be certified with a precision of ± 1 %.

The measurement area sizes shall be defined with a precision of ± 1 %.

6.2 Identification and requirements on spreader types

A spreader type includes a spreader and a control box. The spreader and the control box have to be identified in the manufacturer's production (for instance, model number) and shall be in accordance with the actual European standards.

The modification of the components influencing the spreading performances defined in Annex A involves the definition of a new machine model, a new procedure of qualification shall be realised for this new model.

If the model can work with pre-wetted salt, the qualification shall be done with not pre-wetted and pre-wetted salt. The certificate will have the sentence "It can work with not pre-wetted and pre-wetted salt" or "It can work with pre-wetted salt. It meets the requirements of CEN/TS 15597-2 only with pre-wetted salt".

If the machine cannot work with pre-wetted salt, the qualification will be done only with not pre-wetted salt. The certificate will have the sentence "It can work with not pre-wetted salt".

For the same model, the manufacturer can do different qualifications with different combinations of "test material / spreader type".

6.3 Procedure of the static test

6.3.1 General

The static test consists of verification by weighing, the precision and regularity of test material flow and accuracy of quantity. It is carried out without moving the spreader, consequently vehicle speeds shall be simulated by its control box (see EN 15597-1).

- For spreaders having an auxiliary engine, the manufacturer's instructions shall be followed;
- for spreaders driven by the vehicle hydraulics, EN 15431 will be applied (in respect of the engine nominal speed);
- for spreaders driven by a wheel mounted pump, an independent system will have to ensure the pump rotation at the speed needed by the test;
- for spreaders driven by the pump flanged on a vehicle wheel, an independent system will have to ensure the pump rotation needed by the test, applying a theoretical diameter of the vehicle tyre of 1 m.

For machines working with pre-wetted salt, the tests shall be done collecting two media separately (disconnection of injection pipes for the brine). The requirements on the methods and equipments are described in 6.3.3.

6.3.2 Description of static qualification tests per spreader type

The following table shows the tests series which have to be carried for each spreader type with different spreading parameters in order to qualify a spreader type with a test material:

Table 3 — Spreading parameters of type A spreader types for solid thawing media

No.	Dosage g/m ²	Spreading width m	Spreading speed km/h	Theoretical delivery kg/min
1	5	6	20	10
2	10	3	20	10
3	20	3	20	26,7
4	10	6	40	40
5	30	6	40	120

Table 4 — Spreading parameters of type B spreader types for solid thawing media

No.	Dosage g/m ²	Spreading width m	Spreading speed km/h	Theoretical delivery kg/min
1	10	6	10	10
2	30	2	10	10
3	20	4	20	27
4	10	8	60	80
5	20	8	60	160
6	30	8	60	240