SLOVENSKI STANDARD
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Nadomešča:

SIST EN 13739-2:2004

Kmetijski stroji - Odlagalni in metalni trosilniki mineralnih gnojil - Varstvo okolja - 2. del: Preskusne metode

Agricultural machinery - Solid fertilizer broadcasters and full width distributors - Environmental protection - Part 2: Test methods

Landmaschinen - Ausleger- und Wurf-Mineraldüngerstreuer - Umweltschutz - Teil 2: Prüfmethoden

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Matériel agricole - Distributeurs d'engrais solides en nappe et centrifuges - Protection de l'environnement - Partie 2: Méthodes d'essai

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Ta slovenski standard je istoveten z: EN 13739-2:2011

ICS:

13.020.99	Drugi standardi v zvezi z varstvom okolja	Other standards related to environmental protection
65.060.25	Oprema za skladiščenje, pripravo in razdeljevanje gnojiv	Equipment for storage, preparation and distribution of fertilizers

SIST EN 13739-2:2011 **en,fr**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13739-2

October 2011

ICS 65.060.25

Supersedes EN 13739-2:2003

English Version

Agricultural machinery - Solid fertilizer broadcasters and full width distributors - Environmental protection - Part 2: Test methods

Matériel agricole - Distributeurs d'engrais solides en nappe et centrifuges - Protection de l'environnement - Partie 2 : Méthodes d'essai

Landmaschinen - Ausleger- und Mineraldüngerstreuer - Umweltschutz - Teil 2: Prüfverfahren

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 13739-2:2011) has been prepared by Technical Committee CEN/TC 144 “Tractors and machinery for agriculture and forestry”, 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of an identical text or by endorsement, at the latest by April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

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 document supersedes EN 13739-2:2003.

This standard consists of the following parts under the general title *Agricultural machinery — Solid fertilizer broadcasters and full width distributors — Environmental protection:*

— *Part 1: Requirements*;

— *Part 2: Test methods*.

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This document is a revision of EN 13739-2:2003 to take into account the fact that during last years a new concept of testing facility has been developed. The original document has been completed in order to describe how to test a spreader with the new facility and how to calculate the results in order to make them comparable to the ones which would have been obtained with the conventional facilities. Comparative tests carried out in 2007 by test houses and manufacturers have shown that the results obtained with conventional facility are strictly comparable to the ones obtained with new facility using the calculation methods of this document and allow verification.

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The following changes were introduced compared to the previous version:

— updating of normative references;

— addition of definitions;

— addition of 4.1.3, 5.3, 6.6.1.2, 6.6.2.2 and 7.1.1.2 related to the "Rotating test".

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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 and the United Kingdom.

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Introduction

The European Committee for Standardization (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning (test bench CEMIB) given in 4.1.3, 5.3, 6.6.1.2, 6.6.2.2, 7.1.1.2.

CEN takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured CEN that he is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with CEN. Information may be obtained from:

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1 Scope

This European Standard specifies methods to test mounted, trailed and self-propelled broadcasters and full width solid fertilizer distributors used in agriculture and horticulture.

This European Standard does not apply to machines which are:

— combined grain and fertilizer drills; or

— equipment for distributing granulated pesticides; or

— solid fertilizer line-distributors (which are dealt with in EN 13740-1:2003 and in EN 13740-2:2003).

If the term ‘machine’ is used it covers both full width distributors and broadcasters, except in the case of definitions in Part 1.

Two different methods are described in this European Standard to carry out the evaluation test: a transverse test and a rotating test. The rotating test is mainly adapted to centrifugal spreaders.

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.

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EN 1235:1995, *Solid fertilizers — Test sieving (ISO 8397:1988 modified)*

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

EN 13299, *Fertilizers — Determination of flow rate*

EN 13739-1:2011, *Agricultural machinery — Solid fertilizer broadcasters and full width distributors — Environmental protection — Part 1: Requirements*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in EN 13739-1:2011 apply together with the following:

3.1
reference axis of spread pattern on the ground
half-line the origin of which is at the middle of the segment joining the centre of spreading discs parallel to the axis of symmetry of the spreader axis progress, and positive backwards

NOTE See Figure 1.

3.2
angular position of the spreader
angle between the reference axis of spread pattern on the ground and the row of collecting containers during the measurement

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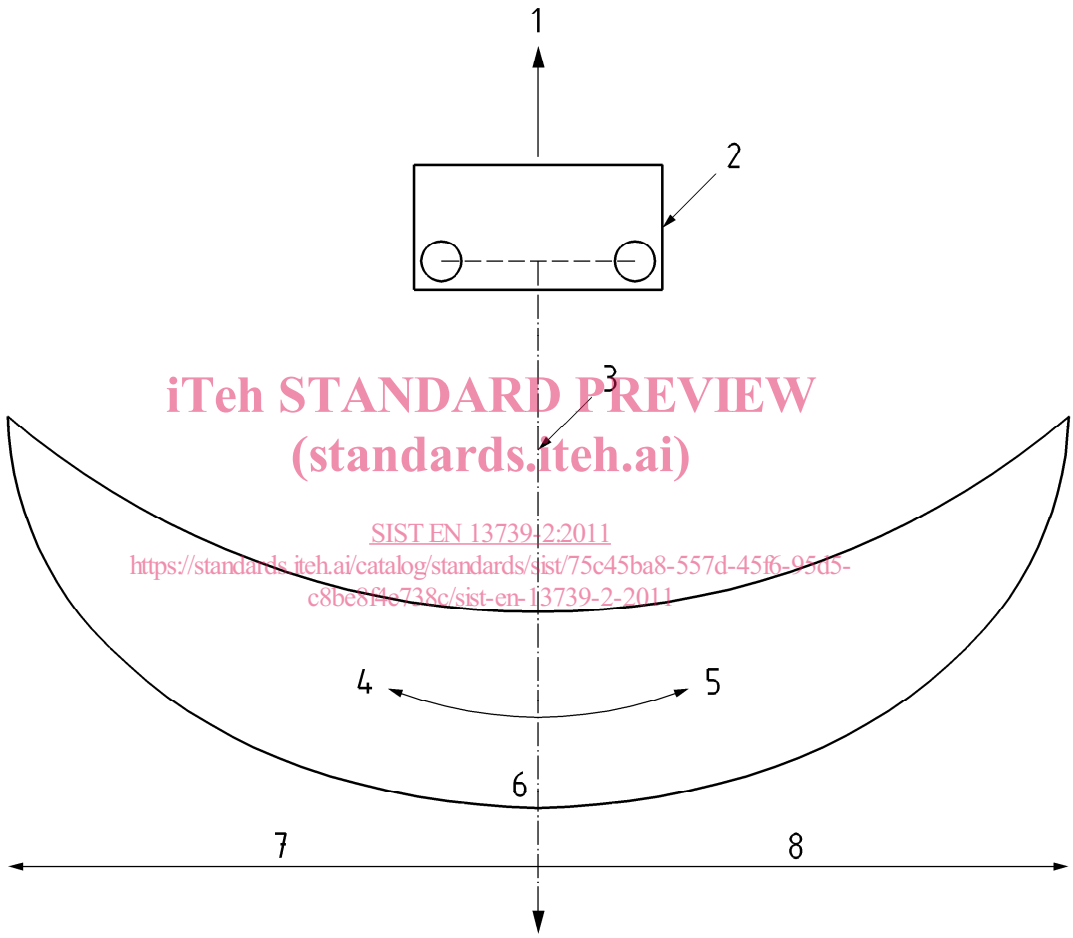
3.3
transverse test
test carried out by collecting the spread fertilizer in a row of collecting containers having a linear relative movement parallel to the axis of symmetry of the spreader (either by moving the spreader or the line of collecting containers)

3.4
rotating test
test carried out by collecting the spread fertilizer in a row of collecting containers having an relative rotating movement which is near the middle of the segment joining the centre of spreading discs and which is obtained with a specific rotating device



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1 Forward movement during in field spreading operation
2 Spreader to be tested
3 Reference axis of the spread pattern on the ground
4 Positive angles of the spread pattern
5 Negative angles of the spread pattern
6 Reference of the spread pattern: 0°
7 Negative values for the transverse distribution (X values in meter)
8 Positive values for the transverse distribution (X values in meter)

Figure 1 — General view of the spreader and of its spread pattern and specification of the reference axis of the spread pattern on the ground, and of the different angles used (in the case of rotating test)

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4 Test conditions

4.1 Machine for test

4.1.1 General

During the tests the machine shall be used according to the instruction handbook.

4.1.2 Transverse test

The machine shall be driven with a forward test speed which does not vary by more than ± 0,1 km/h and which is within the range of (4 ± 0,4) km/h.

The number of runs for each measurement shall be two.

The flow adjustment using 4 km/h shall be set to correspond to the flow rate obtained at a forward driving speed of 10 km/h.

If the machine is not designed to be used at a forward speed of 4 km/h, the forward test speed shall be within the range of (8 ± 0,4) km/h or (10 ± 0,5) km/h or (12 ± 0,6) km/h and the number of runs shall be four resp. five resp. 6 with the flow rate set according to the forward speed. The test speed shall also in this case not vary by more than ± 0,1 km/h from run to run within each test.

The forward speed, PTO ratio and disc speed shall be stated in the test report.

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The distributing mechanism shall be at the height above the fertilizer-collecting containers (the upper edge of the containers) equal to that recommended by the manufacturer for work above the ground or the crop.

4.1.3 Rotating test

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The angular velocity of the rotating device shall be set at 3°/s.

One rotation of the rotary device shall be done for each measurement.

The flow adjustment shall be set to correspond to the flow rate obtained at a forward driving speed of 10 km/h.

The PTO ratio and disc speed and angular velocity shall be stated in the test report.

The distributing mechanism shall be at the height above the fertilizer-collecting containers (the upper edge of the containers) equal to that recommended by the manufacturer for work above the ground or the crop.

4.2 Test materials

Unless the instruction handbook states otherwise, test materials shall be used from the following groups and as specified in 6.3 to 6.10:

a) a granular fertilizer with bulk density > 0,9 kg/dm^3;

b) a granular fertilizer with bulk density ≤ 0,9 kg/dm^3;

c) a prilled fertilizer with bulk density > 0,9 kg/dm^3;

d) a prilled fertilizer bulk density ≤ 0,9 kg/dm^3;

e) a compacted fertilizer.

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NOTE Crystalline fertilizers will be considered during the next revision when they have been used more regularly so that experts can agree on their physical properties.

The physical properties for the test material to be used shall be within the limits given in Table A.1.

The physical properties of the test material used shall be specified in the test report.

4.3 Application rates

Unless the instruction handbook states otherwise, the following adjustments calculated for 10 km/h shall be used as selected in 6.3 to 6.10:

— rate 1: a flow rate corresponding to a minimum application rate for the test material depending on the nutrient content, according to Table 2;

— rate 2: a flow rate corresponding to a maximum application rate for the test material depending on the nutrient content , according to Table 2;

— rate 3: a flow rate in between, corresponding to $\frac{rate1 + rate2}{2}$.

The machine shall be adjusted to give the flow rate of the test material within ± 5 kg/min for flow rates < 100 kg/min and ± 5 % for flow rates ≥ 100 kg/min. The flow rates are calculated from application rates and working widths at the forward driving speed determined in 4.1.

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Table 1 — Minimum and maximum application rates depending on nutrient content

Nutrient	Application rate kg/ha	
	minimum	maximum
N	20	120
P_2O_5 (P)	30 (13)	150 (65)
K_2O (K)	40 (33)	300 (249)
MgO (Mg)	25 (15)	100 (60)

NOTE The application rate (kg/ha) is calculated on the basis of the nitrogen (N) content for the test materials which include nitrogen and on the basis of the phosphor (P) content for test materials which include phosphor but no nitrogen.

If there is no (N) or (P), the application rate shall be calculated on the basis of (K) or (K2O), and if no (K), on (Mg) or (MgO).

5 Test equipment

5.1 Accuracy in weighing measurements

The minimum accuracy for the weighing of the samples of test materials shall be:

— ± 0,1 g for the transverse tests of 6.6; 6.7; 6.8;

— ± 0,05 g for the rotating tests of 6.6; 6.7; 6.8;

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— ± 1,0 g for the test of 6.5.2;

— ± 500 g for the tests of 6.2; 6.3; 6.5.1; 6.9; 6.10.

5.2 Transverse test — Devices for receiving fertilizer for transverse distribution

The collecting containers shall have top external dimensions of 500 mm × 500 mm and precautions shall be taken to minimise spillage by ricochet out of the containers.

NOTE The wall thickness at the top edge should be equal or smaller than 1,5 mm. An example of a funnel shaped container is shown in Figure B.1. The container can also be a rectangular or square vertical section. Test collecting containers with external top dimensions of 250 mm x 500 mm could be used side by side if their collected amount is added together. Existing collecting containers of 250 mm x 1000 mm could be used since it has been shown that the result corresponds to 500 mm x 500 mm containers.

90 % to 110 % of the expected amount of test material shall be collected.

This requirement is checked by comparing the application rate calculated from the collecting containers with the application rate obtained in the flow rate test, when using test material from the same batch in both measurements.

5.3 Rotating test

5.3.1 Measurement of the angular position of the spreader

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The measurement of the angular position between the row of collecting containers and the spreader axis shall be done with a sensor. The precision of this angle measurement shall be better than 0,1°.

5.3.2 Data acquisition device

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The angular position of the spreader, the fertilizer mass into the spreader hopper, the fertiliser mass into each of the collecting containers, and the acquisition and storage time shall be measured and registered with a frequency higher or equal to 5 Hz. The response time of the measurement devices should be at least 0,2 s.

Data shall be filtered with a Bessel lowpass at 0,5 Hz.

5.3.3 Devices for receiving fertilizer for spread pattern distribution

The collecting containers shall have top external dimensions of 500 mm × 500 mm and precautions shall be taken to minimise spillage by ricochet out of the containers.

NOTE The wall thickness at the top edge should be equal or smaller than 1,5 mm. An example of a funnel shaped container is shown in Figure B.1.

The rotation axis of the rotating carrier shall be located on the axis between the containers centres of the containers' row. See Figure 4.

90 %-110 % of the expected amount of test material shall be collected. This requirement is checked by comparing the application rate calculated from the collecting containers with the application rate obtained in the flow rate test, when using test material from the same batch in both measurements.

5.4 Test site

The tests shall be carried out on an even, horizontal and hard surface. The air velocity shall be less than 2 m/s during the tests. The air humidity shall be less than 65 % and the temperature 10 °C to 25 °C.

The actual values of air humidity, temperature and air velocity shall be stated in the test report. If tests are done outdoors, this shall also be stated in the test report.