



SLOVENSKI STANDARD SIST EN 13080:2004

01-januar-2004

Kmetijski stroji – Trosilnik hlevskega gnoja – Varovanje okolja – Zahteve in preskusne metode

Agricultural machinery - Manure spreaders - Environmental protection - Requirements and test methods

Landmaschinen - Stalldungstreuer - Umweltschutz - Anforderungen und Prüfmethode

Matériel agricole - Epandeurs de fumier - Protection de l'environnement - Prescriptions et méthodes d'essai

iTeh STANDARD PREVIEW

(standards.itteh.ai)

SIST EN 13080:2004

Ta slovenski standard je istoveten z: **EN 13080:2002**

<https://standards.itteh.ai/catalog/standards/sist/27000366-09c9-4a03-a084-8169f65da31a/sist-en-13080-2004>

ICS:

| | | |
|-----------|--|--|
| 13.020.99 | Drugi standardi v zvezi z varstvom okolja | Other standards related to environmental protection |
| 65.060.25 | Ujeda za opremo za shranjevanje, pripravo in distribucijo gnojil | Equipment for storage, preparation and distribution of fertilizers |

SIST EN 13080:2004

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 13080:2004

<https://standards.iteh.ai/catalog/standards/sist/27000366-09c9-4a03-a084-8169f85da31a/sist-en-13080-2004>

EUROPEAN STANDARD

EN 13080

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2002

ICS 65.060.25

English version

Agricultural machinery - Manure spreaders - Environmental protection - Requirements and test methods

Matériel agricole - Epandeurs de fumier - Protection de l'environnement - Prescriptions et méthodes d'essai

Landmaschinen - Stallungstreuer - Umweltschutz - Anforderungen und Prüfmethoden

This European Standard was approved by CEN on 23 September 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

SIST EN 13080:2004

<https://standards.iteh.ai/catalog/standards/sist/27000366-09c9-4a03-a084-8169f85da31a/sist-en-13080-2004>



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

| | |
|---|----|
| Foreword..... | 3 |
| Introduction | 4 |
| 1 Scope | 5 |
| 2 Terms and definitions | 5 |
| 3 Requirements | 6 |
| 4 Verification | 7 |
| 5 Instruction handbook | 16 |
| 6 Test report | 17 |
| Annex A (normative) Characterisation and determination of physical properties of manure | 18 |
| Annex B (informative) Filtering of data collected in the longitudinal distribution tests | 21 |
| Bibliography | 23 |

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 13080:2004](https://standards.iteh.ai/catalog/standards/sist/27000366-09c9-4a03-a084-8169f85da31a/sist-en-13080-2004)

<https://standards.iteh.ai/catalog/standards/sist/27000366-09c9-4a03-a084-8169f85da31a/sist-en-13080-2004>

Foreword

This document EN 13080:2002 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 May 2003, and conflicting national standards shall be withdrawn at the latest by May 2003.

Annex A is normative and gives information on a method for the characterisation and determination of physical properties of manure.

Annex B is informative.

This document includes a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard : Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 13080:2004](https://standards.iteh.ai/catalog/standards/sist/27000366-09c9-4a03-a084-8169f85da31a/sist-en-13080-2004)

<https://standards.iteh.ai/catalog/standards/sist/27000366-09c9-4a03-a084-8169f85da31a/sist-en-13080-2004>

Introduction

The objective of this standard is to specify test methods and requirements that, as far as possible, allow uniform testing and evaluation of manure spreaders.

The methods and requirements aim at evaluating the manure spreaders regarding the user's ability, when he uses the machine according to the manufacturer instruction handbook, to:

- control the application rate;
- attain an even distribution of the manure;
- reduce the load on the external environment, for example by not unintentionally spreading manure outside the target area.

It should be noted that there is often a great number of varieties of a machine type. This should be considered when selecting the machine configuration for the tests, with the aim of reducing the necessary number of machines to be tested.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 13080:2004](https://standards.iteh.ai/catalog/standards/sist/27000366-09c9-4a03-a084-8169f85da31a/sist-en-13080-2004)

<https://standards.iteh.ai/catalog/standards/sist/27000366-09c9-4a03-a084-8169f85da31a/sist-en-13080-2004>

1 Scope

This European Standard specifies test methods and requirements for the design and construction of manure spreaders for spreading manure in agriculture and horticulture with the intention of minimising the environmental damage.

It specifies requirements for the transverse and longitudinal spreading characteristics such as working widths, characteristic application rate, characteristic flow, the stretch within the tolerance zone and the coefficient of variation for the longitudinal spreading.

These requirements are valid only according to the tests with manure as described in Table A.1.

This standard is not applicable to manure band-spreaders or to sludge spreaders.

NOTE Sludge spreaders can be dealt with in a future revision when there is sufficient data available to determine their classification and to set the limits for the machine requirements.

Personal safety aspects have not been considered in this standard. These aspects are covered by EN 690.

2 Terms and definitions

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

2.1

manure spreader

machine for transporting and spreading manure on the field surface

2.2

manure band-spreader

manure spreader which spreads the manure in bands separated by bands with no manure

2.3

sludge spreader

machine for transporting and spreading sludge on the field surface

2.4

working width

distance between the centre of two adjacent bouts

2.5

throwing width

distance between the left and the right end of a transverse distribution

2.6

mass of manure spread

mass of manure spread between the start of the test and the end of the test when the flow is less than 1kg/s during 5 s or when no mass change of 10 kg is registered during 10 s

2.7

unloading time

time needed to empty the first 95 % of the mass of manure spread

2.8

characteristic flow

average flow calculated over a specified part of the unloading time

EN 13080:2002 (E)**2.9****characteristic application rate**

application rate calculated on the basis of characteristic flow, working width and forward speed

2.10**tolerance zone**

interval of flows within – 15 % and + 15 % of the characteristic flow

2.11**stretch within the tolerance zone**

percentage of the unloading time during which the momentary flows lie within the tolerance zone

2.12**unidirectional distribution**

distribution obtained when the manure spreader moves for two adjacent bouts in the same direction

2.13**"to and fro" distribution**

distribution obtained when the manure spreader moves for two adjacent bouts in opposite direction

3 Requirements**3.1 General**

The requirements in this standard are based on the selection of manure for the tests as described in 4.1.3.

The requirements shall be met for manure with different bulk density and dry matter content based on the declaration from the machine manufacturer concerning the manure that the machine can handle.

3.2 Transverse distribution - Working widths

The machine shall, for a specific setting, have at least one working width so that the coefficient of variation (*CV*) is lower than 30 % and wider than the half of the throwing width, but at least equal to the width of the machine frame when simulating unidirectional distribution and/or "to and fro" distribution

The *CV* shall be calculated according to 4.3.1 and the throwing width shall be limited to the total width of adjacent collecting containers as far as the container which is adjacent to three adjacent containers containing less than 50 g of manure.

The requirement shall be fulfilled for two flow settings: low and high corresponding to the application rate indicated in 3.3.1.

If the requirement is not met for one of the settings, one additional test shall be completed with the same setting and with manure selected as specified in 4.1.3 to check the lack of temporary default; this shall be noted in the test report. To fulfil the complete requirements the machine shall fulfil the requirement for the setting at which the retest was completed.

3.3 Longitudinal distribution**3.3.1 Characteristic application rate**

Unless otherwise specified by the manufacturer, the characteristic application rates that can be obtained shall cover at least the interval 1 kg/m² (10 t/ha) to 4 kg/m² (40 t/ha) when calculated in accordance with 4.3.2.

3.3.2 Stretch within the tolerance zone

The stretch within the tolerance zone determined at a specific setting shall exceed 35 % of the unloading time.

The calculation of the stretch within the tolerance zone shall be completed according to 4.3.3.

The requirement shall be fulfilled for two settings: low and high.

If the requirement is not met for one of the settings, one additional test shall be completed with the same setting and with manure selected as specified in 4.1.3. to check the lack of temporary default; this shall be noted in the test report. To fulfil the complete requirements the machine shall fulfil the requirement for the setting at which the retest was completed.

3.3.3 Coefficient of variation

The coefficient of variation (*CV*), determined at a specific setting, shall be less than 40 %.

The calculation of the *CV* shall be done according to 4.3.4, before overlapping.

The requirement shall be fulfilled for two settings: low and high.

If the requirement is not met for one of the settings, one additional test shall be completed with the same setting and with manure selected as specified in 4.1.3. to check the lack of temporary default, this shall be noted in the test report. To fulfil the complete requirements the machine shall fulfil the requirement for the setting at which the retest was completed.

3.3.4 Optimum overlapping

The optimum overlapping in the longitudinal distribution shall be given in the instruction handbook. The overlapping shall be determined in accordance with 4.3.5 and calculated for forward speeds of 3 km/h and 8 km/h respectively.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

4 Verification

[SIST EN 13080:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/27000366-09c9-4a03-a084-8169f85da31a/sist-en-13080-2004>

4.1 Test conditions

4.1.1 Manure spreader

The machine shall be used in accordance with the instructions given in the instruction handbook. If the instructions limit the use of the machine, in relation to 4.1.3, this shall be noted in the test report.

4.1.2 Manure

The manure is classified in four classes as described in annex A. The physical properties of the manure used in the tests shall be determined in accordance with annex A and shall be stated in the test report.

The manure that is to be used for the tests shall have been handled as little as possible prior to the test. Manure that has passed through a spreader shall not be reused.

If the machine is to be tested against the requirements in clause 3, the tests shall be completed with manure from different classes as described in 4.1.3.

4.1.3 Selection of manure

For the verification of the requirements in clause 3, manure defined and handled in accordance with 4.1.2 shall be used. The number of manure classes shall be selected in accordance with Table 1.

EN 13080:2002 (E)

Table 1 — Number of manure classes to be used for the tests

| Number of manure classes suitable for the machine | Number of manure classes to be used in the tests |
|---|--|
| 1 or 2 | 1 |
| 3 or 4 | 2 |

If manure from two classes is to be used, the bulk density shall differ by at least 75 kg/m³ and the manure shall, as far as possible, be chosen from non-adjacent manure classes.

4.1.4 Loading of manure

The machine shall be loaded as evenly as possible. If a loader with a bucket is used for loading, the bucket shall not be wider than 1/2 the length of the machine's body. The bucket shall be emptied by tipping at a height which does not exceed the height of the body by more than 1 m. The manure shall be levelled out manually so that the surface of the manure is even with the upper edge of the body. The manure shall not be artificially compressed.

4.1.5 Test site and ambient conditions

The tests shall be carried out on an even, horizontal surface, indoors or outdoors, and with the driving direction of the machine oriented as far as possible against the direction of the wind.

During the transverse distribution tests, the wind velocity shall not exceed 3 m/s, measured 1,5 m above ground level with a limit deviation of $\pm 0,5$ m/s.

The average values for the wind velocity and wind direction shall be stated in the test report.

4.1.6 Containers for collecting manure in the transverse distribution test

The containers shall have external dimensions of 500 mm \times 500 mm, with a limit deviation of ± 2 mm, with a maximum wall thickness of 3 mm and with a minimum depth of 100 mm.

Measures shall be taken to avoid spillage of manure by ricochets out of the containers e.g. by inserts in the containers. The upper edges of the containers shall all be at the same level within ± 10 mm, and maximum 100 mm above the average ground level.

NOTE It is preferable to keep the upper edges of the containers as close as possible to either the ground or, if the spreader is elevated during the tests so that wheels are above containers, to the lowest part of the wheels of the machine.

4.1.7 Accuracy in weighing of collected manure

The collected manure shall be weighed with a limit deviation of ± 10 g or $\pm 0,5$ % of the reading, whichever is the highest value.

If any manure has stuck to the outside of a container, that manure shall be removed before weighing the container.

NOTE Since climatic variations may influence the mass of the manure, there should be as short a time interval as possible between the weightings.

4.1.8 Device for measuring the flow of manure in the longitudinal distribution test

The flow of manure shall be determined by registration of the changes of the mass of the machine and the time elapsed since the beginning of the test.

The mass shall be registered with a limit deviation of ± 10 kg or $\pm 0,5$ % of the reading, whichever is the highest value. The signal transmitted to the registration equipment shall have a resolution of at least 1 kg.

The time shall be registered with a limit deviation of 0,01 s or $\pm 0,1$ % of the reading, whichever is the highest value. The signal transmitted to the registration equipment shall have a resolution of at least 0,01 s.

4.2 Test procedure

4.2.1 Transverse distribution test

4.2.1.1 The containers shall be placed with their edges parallel to the ground surface so that they are perpendicular to the line of travel of the machine and cover the total throwing width. In the case of a rearward throwing machine, the containers shall be placed so that the dividing line between the two containers in the middle coincides with the longitudinal vertical plane dividing the machine in two halves. In the case of a side throwing machine, the containers need only to be placed to the side of the longitudinal vertical plane of the machine from which the manure is spread.

NOTE Special arrangements can be needed (e.g. an overpass for the wheels of the spreader) in order to ensure that the measurement can be made on the whole width.

4.2.1.2 All transverse distribution tests shall be performed when at least 30 % and at most 70 % of the original mass of manure loaded in the spreader has been spread.

For PTO-driven machines, the PTO speed shall be kept within ± 5 % of the nominal recommended speed.

For each batch of manure to be tested, at least two tests shall be performed, each at a different flow rate setting of the machine. The flow rate settings shall be chosen among those presented in the instruction handbook, and shall represent one high flow rate setting and one low flow rate setting.

The forward driving speed during the test shall be chosen to be between 1 km/h and 6 km/h. The true speed shall be held within ± 10 % of the selected speed.

The number of runs shall be equal to the number for the selected driving speed (in km/h), rounded off to the nearest whole number (e.g. if driving speed 4,7 km/h is chosen, the number of runs shall be 5).

If more than one run is performed, the time between the runs shall be as short as possible and the containers need only to be weighed after the last run.

4.2.2 Longitudinal distribution test

The flow rate shall be determined from a longitudinal distribution test. The machine shall be loaded according to 4.1.4. The test shall be carried out with manure from the same batches as those used in 4.2.1 and shall be carried out for the two flow rate settings used in 4.2.1.

The registrations of mass and time shall be made simultaneously according to one of the following methods:

- the mass shall be registered at least once per second preferably at a constant rate of 2 Hz; or
- the time shall be registered every time a mass-change of 10 kg is registered.

Each test shall continue until the flow rate is less than 1 kg/s during 5 s or until no registration is made during 10 s, depending on the method used.

NOTE In order to avoid extreme peak-values in the registrations of the mass, the weighing equipment and/or the data processing system should smoothen out the signal from the mass transducer e.g. by computing the average value between two registrations.

4.2.3 Filtering of sampled data

If the data-collecting system cannot collect data at a constant rate the data shall be resampled since the filtering method to be used needs a constant sampling rate. This shall be achieved by using a linear interpolation between the data values and the sampling rate (of the resampling) shall be 2 Hz.